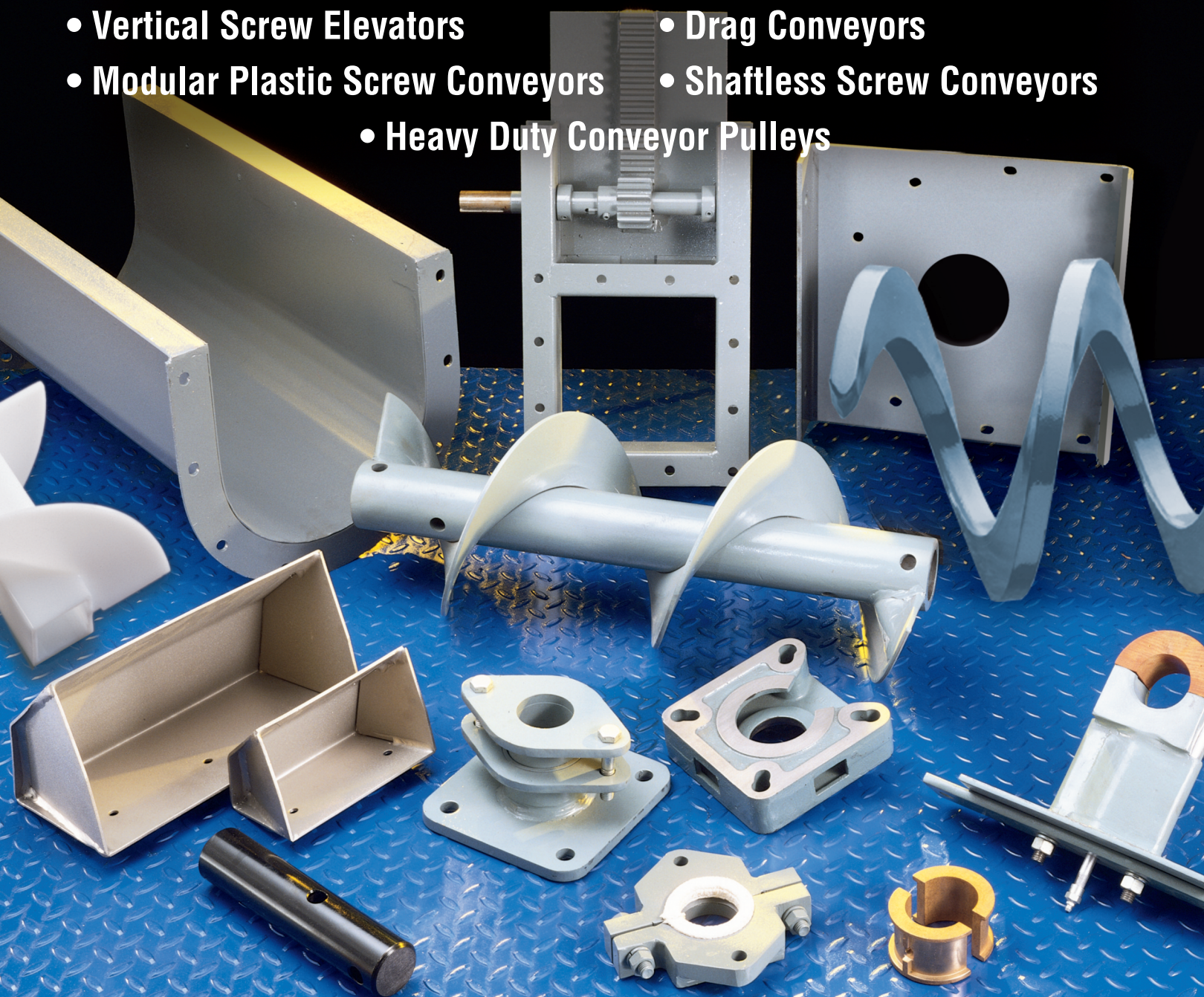
MHC-2010
(replaces MHC-2005)

MATERIAL HANDLING PRODUCTS CATALOG

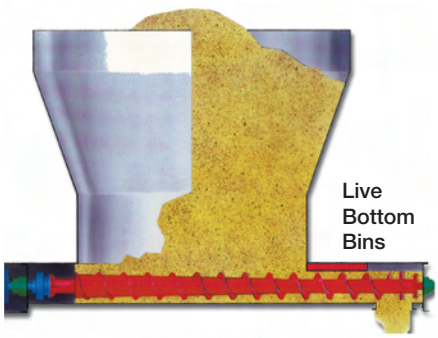
- Screw Conveyors
- Vertical Screw Elevators
- Modular Plastic Screw Conveyors
- Bucket Elevators
- Drag Conveyors
- Shaftless Screw Conveyors
- Heavy Duty Conveyor Pulleys

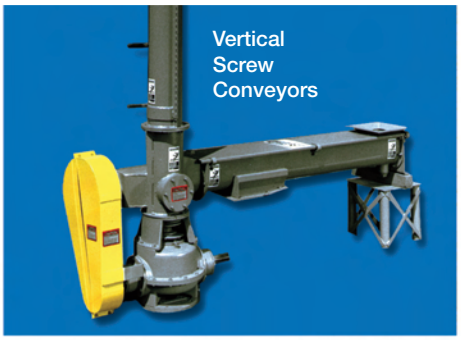


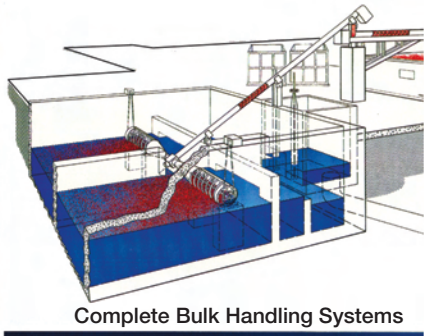
Martin SPROCKET & GEAR, INC.

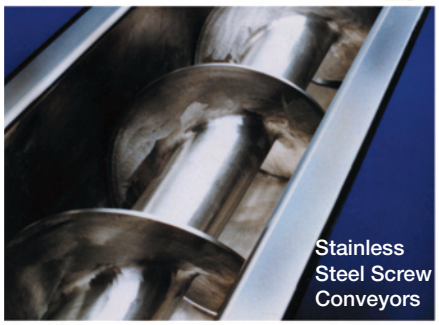
www.martinsprocket.com

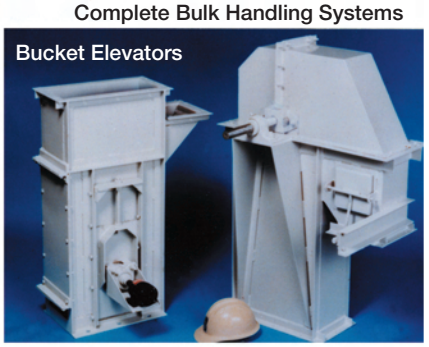
Martin. Single Source for Innovative Material Handling Products/Systems.






Complete Bulk Handling Systems





INTRODUCTION

There have been a lot of changes in the world since Joe Martin, Sr., opened the first plant back in 1951, but one thing that has not changed is the Martin way of doing business.

Our philosophy is very simple - be easy to do business with, and put every sale, no matter how large or small, on a very personal and very friendly basis.

No matter what industry we serve, we want to provide the utmost in service, product availability and high quality. In order to meet these objectives, Martin is improving manufacturing methods to ensure the best possible costs to compete in world markets.

After more than 50 years, we have become one of the nation's leading manufacturers, offering a comprehensive product line that provides a complete range of quality power transmission, material handling equipment and hand tools for the world's marketplace. Our company is committed to providing stock and custom items needed to keep industry moving. This commitment is backed by a nationwide network of Martin warehouses, manufacturing facilities, and one of the largest and most efficient distributor organizations available.

This is our commitment.

WARNING AND SAFETY REMINDERS FOR SCREW , DRAG , AND BUCKET ELEVATOR CONVEYORS

APPROVED FOR DISTRIBUTION BY THE SCREW CONVEYOR SECTION OF THE CONVEYOR EQUIPMENT MANUFACTURERS ASSOCIATION (CEMA)

It is the responsibility of the contractor, installer, owner and user to install, maintain and operate the conveyor, components and, conveyor assemblies in such a manner as to comply with the Williams-Steiger Occupational Safety and Health Act and with all state and local laws and ordinances and the American National Standards Institute (ANSI) B20.1 Safety Code.

In order to avoid an unsafe or hazardous condition, the assemblies or parts must be installed and operated in accordance with the following minimum provisions.

1. Conveyors shall not be operated unless all covers and/or guards for the conveyor and drive unit are in place. If the conveyor is to be opened for inspection cleaning, maintenance or observation, the electric power to the motor driving the conveyor must be LOCKED OUT in such a manner that the conveyor cannot be restarted by anyone; however remote from the area, until conveyor cover or guards and drive guards have been properly replaced.

2. If the conveyor must have an open housing as a condition of its use and application, the entire conveyor is then to be guarded by a railing or fence in accordance with ANSI standard B20.1.(Request current edition and addenda)

3. Feed openings for shovel, front loaders or other manual or mechanical equipment shall be constructed in such a way that the conveyor opening is covered by a grating. If the nature of the material is such that a grating cannot be used, then the exposed section of the conveyor is to be guarded by a railing or fence and there shall be a warning sign posted.

4. Do not attempt any maintenance or repairs of the conveyor until power has been LOCKED OUT.

5. Always operate conveyor in accordance with these instructions and those contained on the caution labels affixed to the equipment.

6. Do not place hands, feet, or any part of your body, in the conveyor.

7. Never walk on conveyor covers, grating or guards.

8. Do not use conveyor for any purpose other than that for which it was intended.

9. Do not poke or prod material into the conveyor with a bar or stick inserted through the openings.

10. Keep area around conveyor drive and control station free of debris and obstacles.

11. Eliminate all sources of stored energy (materials or devices that could cause conveyor components to move without power applied) before opening the conveyor.

12. Do not attempt to clear a jammed conveyor until power has been LOCKED OUT.

13. Do not attempt field modification of conveyor or components.

14. Conveyors are not normally manufactured or designed to handle materials that are hazardous to personnel. These materials which are hazardous include those that are explosive, flammable, toxic or otherwise dangerous to personnel. Conveyors may be designed to handle these materials. Conveyors are not manufactured or designed to comply with local, state or federal codes for unfired pressure vessels. If hazardous materials are to be conveyed or if the conveyor is to be subjected to internal or external pressure, manufacturer should be consulted prior to any modifications.

CEMA insists that disconnecting and locking out the power to the motor driving the unit provides the only real protection against injury. Secondary safety devices are available; however, the decision as to their need and the type required must be made by the owner-assembler as we have no information regarding plant wiring, plant environment, the interlocking of the screw conveyor with other equipment, extent of plant automation, etc. Other devices should not be used as a substitute for locking out the power prior to removing guards or covers. We caution that use of the secondary devices may cause employees to develop a false sense of security and fail to lock out power before removing covers or guards. This could result in a serious injury should the secondary device fail or malfunction.

There are many kinds of electrical devices for interlocking of conveyors and conveyor systems such that if one conveyor in a system or process is stopped other equipment feeding it, or following it can also be automatically stopped.

Electrical controls, machinery guards, railings, walkways, arrangement of installation, training of personnel, etc., are necessary ingredients for a safe working place. It is the responsibility of the contractor, installer, owner and user to supplement the materials and services furnished with these necessary items to make the conveyor installation comply with the law and accepted standards.

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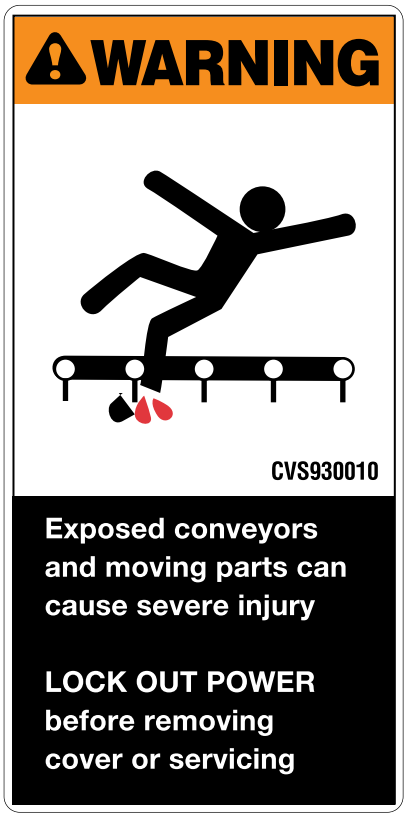
The Conveyor Equipment Manufacturers Association (CEMA) has produced an audio-visual presentation entitled “Safe Operation of Screw Conveyors, Drag Conveyors, and Bucket Elevators.” CEMA encourages acquisition and use of this source of safety information to supplement your safety program.

SEE OTHER SIDE FOR SAFETY LABELS



PROMINENTLY DISPLAY THESE SAFETY LABELS ON INSTALLED EQUIPMENT

SEE OTHER SIDE FOR SAFETY REMINDERS

Note: Labels alone do not substitute for a thorough in-plant safety training program centered on the hazards associated with operating your installed equipment.

Contact CEMA or Your Equipment Manufacturer for Replacement Labels

CONVEYOR EQUIPMENT MANUFACTURERS ASSOCIATION
6724 Lone Oak Blvd., Naples, Florida 34109
239-514-3441

Stock Material Handling Products

Screw Conveyor Components and Accessories

ANGLE FLANGED "U" TROUGH

FORM FLANGED "U" TROUGH

TUBULAR HOUSING

FLAT RACK AND PINION DISCHARGE GATE

TROUGH ENDS WITH AND WITHOUT FEET

THRUST ASSEMBLY TYPE E WITH DRIVE SHAFT

INLET AND DISCHARGE

SPLIT GLAND

PACKING GLAND SHAFT SEAL COMPRESSION TYPE

WASTE PACK SHAFT SEAL

PLATE SHAFT SEAL

DROP-OUT SHAFT SEAL FLANGED PRODUCT

HELICOID SCREWS

HELICOID FLIGHTING RIGHT HAND AND LEFT HAND

BOX ICER

SECTIONAL SCREWS

SPECIALS

SECTIONAL FLIGHTS

COUPLING SHAFTS

ELEVATOR BUCKETS

HANGER STYLE 220

HANGER STYLE 226

HANGER STYLE 216

HANGER STYLE 70

HANGER STYLE 19B

TROUGH END BEARINGS BALL AND ROLLER

HANGER BEARINGS
STYLE 220/226
Martin HARD IRON
Martin BRONZE
NYLATRON
WHITE NYLON
WOOD
CERAMIC

SADDLES AND FEET

SCREW CONVEYOR DRIVE WITH ACCESSORIES

SPEED REDUCER SHAFT MOUNTED WITH ACCESSORIES.

FLANGED COVER WITH ACCESSORIES

Martin manufactures the most complete line of stock components in the industry. We stock mild steel, stainless, galvanized, and many other items that are "special order" from the others in the industry.

Stock Power Transmission Products

All Steel Stock Sprockets

BORED TO SIZE HARDENED TEETH | DOUBLE HARDENED TEETH | TB SABER TOOTH® HARDENED TEETH | TRIPLE B

Stock Bushings/Hubs

QD BUSHING | TAPERED BUSHING | QD IDLER BUDSHING

Stock Gears/Steel and Cast

Spur Gears - Stocked in both 14-1/2º & 20º Pressure Angles

SPUR TYPE B | SPUR 3 DP | GEAR RACK

BEVEL | MITER | WORM GEAR | WORM

Stock Timing Pulleys

TIMING PULLEY TAPERED BUSHING | TIMING PULLEY QD | TIMING PULLEY STOCK BORE

STOCK BORE | QD | MTO

Martin's NEW HTS (HIGH TORQUE SPROCKETS)

Stock QD V-Belt Sheaves

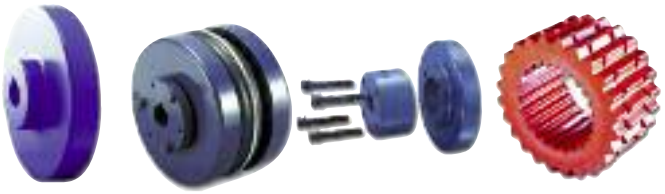
A, B, C, D 3V, 5V, 8V

Stock Tapered Bushed V-Belt Sheaves

A, B, C, D 3V, 5V, 8V

Stock Couplings/Covers

RUBBER ELEMENT Martin-FLEX® STOCK BORE | ROLLER CHAIN STOCK BORE | JAW | COUPLING COVERS



FINISHED BORE | "QD" | SC SPACER | HYTREL ELEMENT

Martin's NEW QUADRA-FLEX® COUPLING

Stock Sintered Metal and Sintered Steel Products

BRONZE & HARD IRON HANGER BEARINGS

Heavy Duty Wing and Drum Pulleys

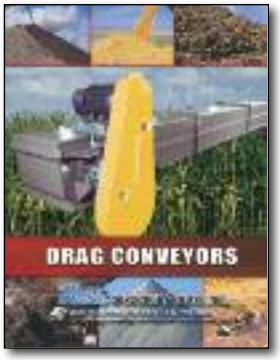
Literature

Unpredictable failures should not be tolerated. Our Philosophy is to increase uptime by designing conveyors based on application requirements. As a result, wear becomes predictable, allowing our customers to schedule downtime and replace components.

Martin offers **Failure Analysis Target Training** in several industries. Contact Martin to set up a training program for you.

General Catalog 3000

Material Handling Catalog MHC-2010



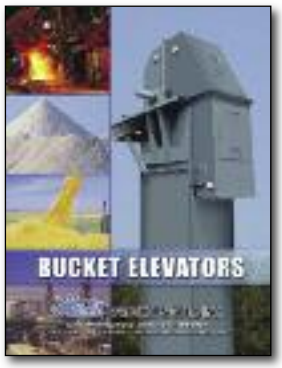
Drag Conveyor Catalog

Screw Conveyor Hanger Bearings

Plastic Screw Conveyor Catalog

Wastewater Treatment Capabilities

Shaftless Screw Technology

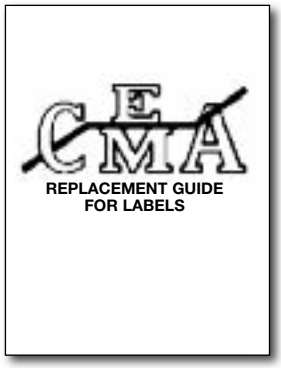


Bucket Elevator Brochure

Heavy Duty Conveyor Pulleys

Safety Installation Maintenance Manual

Safety DVD



Replacement Guide for Safety Labels

ISO Certification

The ISO 9001:2008 Certification is another way for Martin to show its commitment to be a quality manufacturer. We intend to uphold this commitment by continually improving the effectiveness of our quality management system. Our objectives for continual improvement.

- Customer Satisfaction
- Product Design
- Employee Safety
- Employee Product and Process Training
- Process Efficiencies

Martin CONVEYOR DIVISION
811 FOURTH AVENUE • MANSFIELD, TX 76063-0193

ISO 9001
CERTIFICATE
NO. 31336

MEMBER
CONVEYOR EQUIPMENT MANUFACTURERS ASSOCIATION

AMERICAN FEED INDUSTRY ASSOCIATION

PTDA
Channeling the Power of Industry

Terms & Conditions

CANCELLATION OR SUSPENSION: Cancellation or suspension of manufacturing or shipping date of any order will be accepted only on terms which will indemnify us against loss.

MADE-TO-ORDER SIZES AND OVERRUNS: Because in manufacturing it is necessary to make slightly more of any article than the exact amount specified, in order to offset losses and ensure the required number of parts being produced, made-to-order items are subject to having a run of plus or minus 5% of the total order and may be shipped and invoiced without prior notice. The foregoing is not applicable to standard stock merchandise.

TAXES: Any sales, use, consumption, or other similar tax applicable to the sale, purchase, or use of product is not included in these prices and shall be paid by the purchaser.

"LIMITED WARRANTY": Subject to the limitation expressed in subsequent paragraphs, Martin Sprocket & Gear, Inc. and Martin Sprocket & Gear Canada Inc., make the following warranties: We warrant that each of our products of manufacture will be free from defects in material and workmanship under normal use and service for twelve months from the date of delivery to the original user. We will correct any such defects in material or workmanship by repair or replacement of the product F.O.B. our plant. Tools will carry the following lifetime warranty: If a Martin tool fails to satisfactorily perform its designated use, it may be returned to the Martin distributor from which such tool was purchased and will be repaired or replaced without cost.

THE FOREGOING WARRANTIES ARE EXPRESSLY IN LIEU OF ANY AND ALL REPRESENTATIONS, WARRANTIES AND CONDITIONS EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WHETHER ARISING FROM STATUTE, COMMON LAW, CUSTOM, OR OTHERWISE. THE REMEDY OF REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT OR TOOL SET FORTH IN THE FOREGOING WARRANTIES SHALL BE THE EXCLUSIVE REMEDY AVAILABLE TO ANY PERSON.

Charges for correcting defects will not be allowed, nor can we accept goods returned to us for repair or replacement, unless we are previously notified of the defect in writing and the return or correction is authorized by us in writing. All warranty claims alleging defects of materials or workmanship must be submitted in writing within thirty days of the discovery of a defect or such claim shall be considered waived. (This paragraph is subject to the provisions of the Consumer Protection laws of Mexico.)

The foregoing warranties shall not apply to any products or tools which have been subjected to misuse, neglect or accident, or have been altered or tampered with, or have been used beyond their normal useful or expected life, or which have had corrective work done thereon without our written consent. WE SHALL NOT BE LIABLE FOR ANY LOSS, INJURY, EXPENSE, OR DAMAGE, WHETHER DIRECT, CONSEQUENTIAL, INCIDENTAL, OR OTHERWISE, RESULTING FROM THE USE OF OUR PRODUCTS OR TOOLS OR CAUSED BY ANY DEFECT, FAILURE, OR MALFUNCTION OF ANY PRODUCT OR TOOL, WHETHER A CLAIM FOR SUCH DAMAGES IS BASED UPON WARRANTY, CONTRACT, NEGLIGENCE, OR OTHERWISE. Equipment manufactured by others, and included in our proposal, is not warranted in any way by us but carries only the manufacturer's warranty, if any. No person has the authority to bind us to any representation or warranty other than the foregoing limited warranties as disclaimed.

The provisions of the United Nations Convention on Contracts for the International Sale of Goods or any local statute declaring it to have the force of law in the jurisdiction of one of the parties shall not apply to Products supplied hereunder.

"YOU ARE HEREBY NOTIFIED THAT ANY ADDITIONAL OR DIFFERENT TERMS FROM THOSE CONTAINED IN THIS LIMITED WARRANTY ARE OBJECTIONABLE. NO ADDITIONS OR CHANGES ARE BINDING ON Martin UNLESS THEY ARE IN WRITING AND SIGNED BY AN AUTHORIZED OFFICER."

NOTE: All past due invoices shall be payable to Martin Sprocket & Gear, Inc., at P.O. Box 91588, Arlington, Tarrant County, Texas 76015-0088. All past due invoices of Martin Sprocket & Gear Canada Inc., shall be payable at 896 Meyerside Drive, Mississauga, Ontario, Canada L5T 1R9. Reasonable attorneys' fees will be added if collection is forced.

RETURNED MATERIAL: When it is desired to return material for credit or exchange, it is necessary that permission in writing first be obtained from the nearest office.

SHIPMENTS: If we are not able to meet your shipment requirements and/or our expected dates of shipment, we will not accept liability for delays beyond our control, nor will we accept cancellations unless a settlement has been agreed upon between us.

FREIGHT ALLOWANCE: Freight allowances are shown on the different product discount sheets. In cases where a specific routing of any order is more costly than the routing selected by us, the excess charges will be added to the net amount of the invoice. Weights shown in catalog are approximate, and may not be used to determine qualifications for freight allowance.

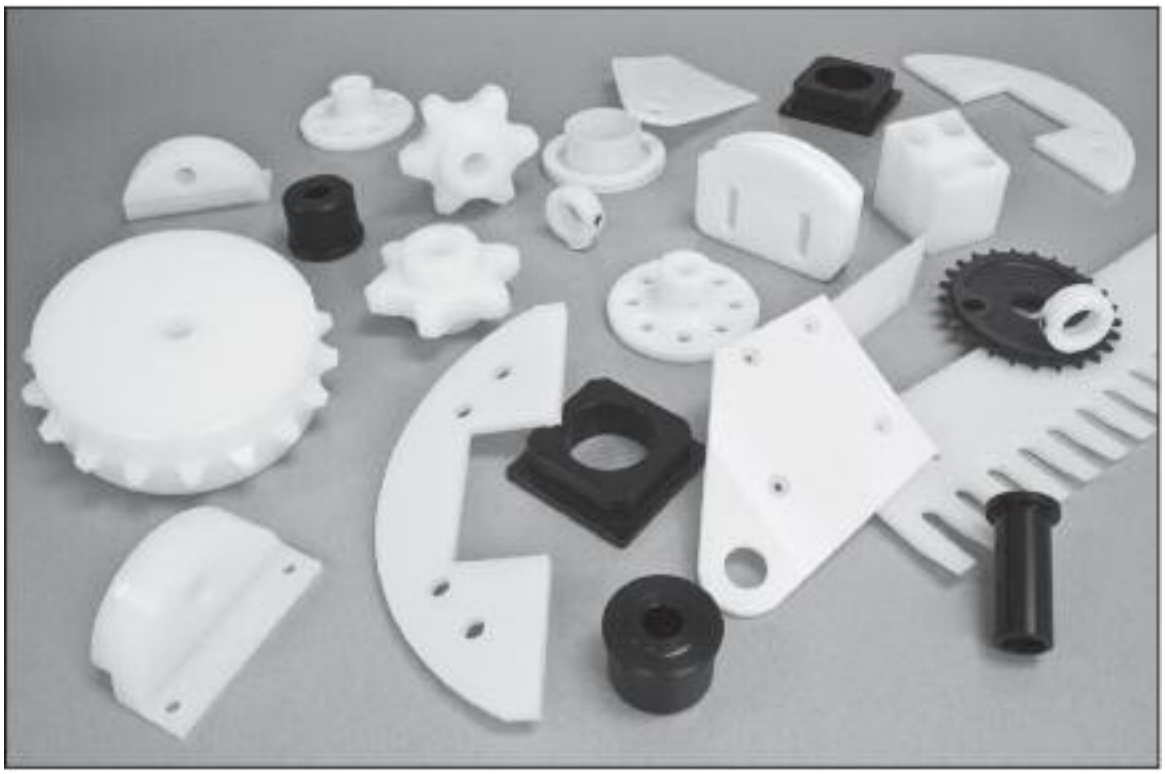
CASH DISCOUNT: 1% 10th and 25th Net 30 Days. A 1% cash discount will be allowed on invoices dated the 1st through the 15th if paid by the 25th of the same month and on invoices dated the 16th through the end of the month if payment is made by the 10th of the next month. All invoices are due in 30 days. Cash discount does not apply to other charges such as freight, postage, or delivery charges.

This catalog supersedes all previous editions. Every effort has been put forward to produce what we feel is the best catalog in the industry. However, due to changes in engineering and manufacturing processes and procedures, it becomes necessary, from time to time, to make alterations to products, and such alterations may not be reflected in this catalog. Therefore, if dimensions, specifications or appearances represented by pictures or drawings or tables are critical in their applications, please consult the factory for clarification or certified drawings.

When it comes to

PLASTIC COMPONENTS

Martin's got you covered!



CONSIDER US YOUR SOURCE...

Martin manufactures both stock and MTO plastic parts for all your material handling projects.

- Wear Strips
- Shaft Collars
- Static Shaft Bushings
- Spiral Jaw Couplings
- Chain Guides
- Wearshoes
- Weld Washers
- UHMW 78 & 720 Series Sprockets
- UHMW Shear Pin Sprockets

Martin stocks gears & sprockets in Nylon and UHMW. Made-to-orders manufactured in a variety of materials, sizes and shapes. Milled plastic quanties 1 to 1000 pieces, injection molding available for larger quantities.

Contact Martin for more information or to Quote your next project.

Index
SECTION H

PRODUCT **PAGE**

Click on the section to go to the page.

WARNING AND SAFETY REMINDERS FOR SCREW , DRAG , AND BUCKET ELEVATOR CONVEYORS

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PROMINENTLY DISPLAY THESE SAFETY LABELS ON INSTALLED EQUIPMENT

DUST TIGHT

Martin Dust Tight (MDT™) Inspection Doors

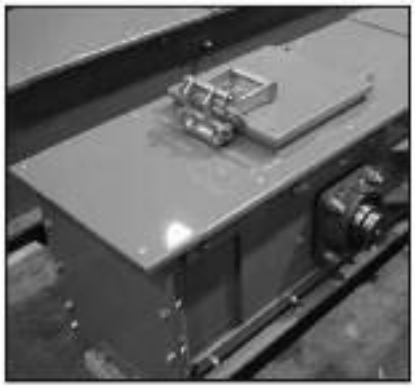
NOW AVAILABLE

- Moisture and Dust Tight
- Heavy Duty Construction
- Installs Easily on Existing Equipment
- Simple Operation
- Stocked in 304 SS and Carbon Steel

The Martin dust tight inspection door is ideal for visual inspection in dusty applications. Once installed, the Martin inspection door will give you years of trouble free service. It allows efficient access by authorized personnel while maintaining security with a latch that can be bolted or locked. The door comes with a poured black rubber door seal for chemical resistance and long life. The hinge and latch on all models are laser cut of 304 SS material for precision and corrosion resistance.

The MDT doors can be supplied with an expanded metal screen welded inside the opening to prevent physical access to moving parts.

These doors are available from stock in many sizes. Custom sizes can be manufactured to fit your specific needs. Call your local Martin Distributor for more information.



SECTION I

ENGINEERING SECTION I

Click on the page number to go to the page

Introduction

The following section is designed to present the necessary engineering information to properly design and layout most conveyor applications. The information has been compiled from many years of experience in successful design and application and from industry standards.

We hope that the information presented will be helpful to you in determining the type and size of screw conveyor that will best suit your needs.

The “Screw Conveyor Design Procedure” on the following page gives ten step-by-step instructions for properly designing a screw conveyor. These steps, plus the many following tables and formulas throughout the engineering section will enable you to design and detail screw conveyor for most applications.

If your requirements present any complications not covered in this section, we invite you to contact our Engineering Department for recommendations and suggestions.

SCREW CONVEYOR DESIGN PROCEDURE		
STEP 1	Establish Known Factors	1. Type of material to be conveyed. 2. Maximum size of hard lumps. 3. Percentage of hard lumps by volume. 4. Capacity required, in cu.ft./hr. 5. Capacity required, in lbs./hr. 6. Distance material to be conveyed. 7. Any additional factors that may affect conveyor or operations.
STEP 2	Classify Material	Classify the material according to the system shown in Table 1-1. Or, if the material is included in Table 1-2, use the classification shown in Table 1-2.
STEP 3	Determine Design Capacity	Determine design capacity as described on pages H-17–H-19.
STEP 4	Determine Diameter and Speed	Using known capacity required in cu.ft./hr., material classification, and % trough loading (Table 1-2) determine diameter and speed from Table 1-6.
STEP 5	Check Minimum Screw Diameter for Lump Size Limitations	Using known screw diameter and percentage of hard lumps, check minimum screw diameter from Table 1-7.
STEP 6	Determine Type of Bearings	From Table 1-2, determine hanger bearing group for the material to be conveyed. Locate this bearing group in Table 1-11 for the type of bearing recommended.
STEP 7	Determine Horsepower	From Table 1-2, determine Horsepower Factor "F_m" for the material to be conveyed. Refer to page H-24 and calculate horsepower by the formula method.
STEP 8	Check Torsional and/or Horsepower ratings of Standard Conveyor Components	Using required horsepower from step 7 refer to pages H-26 and H-27 to check capacities of standard conveyor pipe, shafts and coupling bolts.
STEP 9	Select Components	Select basic components from Tables 1-8, 1-9, and 1-10 in accordance with Component Group listed in Table 1-2 for the material to be conveyed. Select balance of components from the Components Section of catalog.
STEP 10	Conveyor Layouts	Refer to pages H-40 and H-41 for typical layout details.

Table 1-1
Material Classification Code Chart

Major Class	Material Characteristics Included		Code Designation
Density	Bulk Density, Loose		Actual Lbs/PC
Size	Very Fine	No. 200 Sieve (.0029″) And Under	A_{200}
		No. 100 Sieve (.0059″) And Under	A_{100}
		No. 40 Sieve (.016″) And Under	A_{40}
	Fine	No. 6 Sieve (.132″) And Under	B_{6}
	Granular	½″ And Under (6 Sieve to ½″)	$C_{½}$
		3″ And Under (½ to 3″)	D_{3}
		7″ And Under (3″ to 7″)	D_{7}
	Lumpy	16″ And Under (0″ to 16″)	D_{16}
		Over 16″ To Be Specified X=Actual Maximum Size	D_{X}
	Irregular	Stringy, Fibrous, Cylindrical, Slabs, Etc.	E
Flowability	Very Free Flowing		1
	Free Flowing		2
	Average Flowability		3
	Sluggish		4
Abrasiveness	Mildly Abrasive		5
	Moderately Abrasive		6
	Extremely Abrasive		7
Miscellaneous Properties Or Hazards	Builds Up and Hardens		F
	Generates Static Electricity		G
	Decomposes — Deteriorates in Storage		H
	Flammability		J
	Becomes Plastic or Tends to Soften		K
	Very Dusty		L
	Aerates and Becomes a Fluid		M
	Explosiveness		N
	Stickiness — Adhesion		O
	Contaminable, Affecting Use		P
	Degradable, Affecting Use		Q
	Gives Off Harmful or Toxic Gas or Fumes		R
	Highly Corrosive		S
	Mildly Corrosive		T
	Hygroscopic		U
	Interlocks, Mats or Agglomerates		V
	Oils Present		W
	Packs Under Pressure		X
	Very Light and Fluffy — May Be Windswept		Y
	Elevated Temperature		Z

Table 1-2
Material Characteristics

Material Characteristics

The material characteristics table (page H-8 or H-16) lists the following Design Data for many materials.

A. The weight per cubic foot data may be used to calculate the required capacity of the conveyor in cubic feet per hour.

B. The material code for each material is as described in Table 1-1, and as interpreted below.

C. The Intermediate Bearing Selection Code is used to properly select the intermediate hanger bearing from Table 1-11 (Page H-23).

D. The Component Series Code is used to determine the correct components to be used as shown on page H-22.

E. The Material Factor F_m is used in determining horsepower as described on pages H-24 thru H-26.

F. The Trough Loading column indicates the proper percent of cross section loading to use in determining diameter and speed of the conveyor.

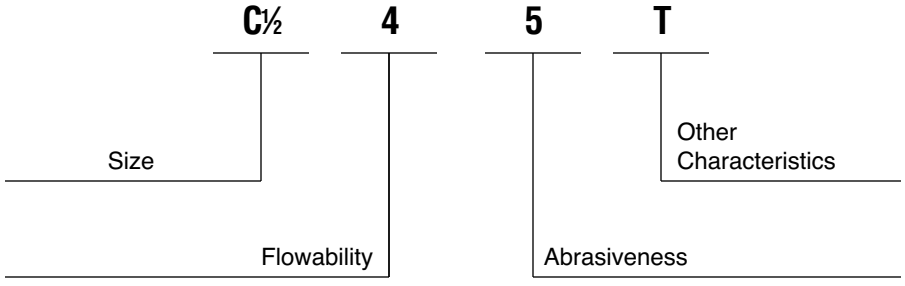
For screw conveyor design purposes, conveyed materials are classified in accordance with the code system in Table 1-1, and listed in Table 1-2.

Table 1-2 lists many materials that can be effectively conveyed by a screw conveyor. If a material is not listed in Table 1-2, it must be classified according to Table 1-1 or by referring to a listed material similar in weight, particle size and other characteristics.

HOW TO READ THE MATERIAL CODE

FROM TABLE 1-2

Material: Brewers Grain Spent Wet



CONVEYORS

Table 1-2
Material Characteristics

Material	Weight lbs. per cu. ft.	Intermediate Material Code	Bearing Selection	Component Series	Mat'l Factor Fm	Trough Loading
Adipic Acid	45	A 100-35	S	2	.5	30A
Alfalfa Meal	14-22	B6-45WY	H	2	.6	30A
Alfalfa Pellets	41-43	C½-25	H	2	.5	45
Alfalfa Seed	6 10-15	B6-15N	L-S-B	1	.4	45
Almonds, Broken	27-30	C½-35Q	H	2	.9	30A
Almonds, Whole Shelled	28-30	C½-35Q	H	2	.9	30A
Alum, Fine	45-50	B6-35U	L-S-B	1	.6	30A
Alum, Lumpy	50-60	B6-25	L-S	2	1.4	45
Alumina	55-65	B6-27MY	H	3	1.8	15
Alumina, Fine	35	A100-27MY	H	3	1.6	15
Alumina Sized Or Briquette	65	D3-37	H	3	2.0	15
Aluminate Gel (Aluminate Hydroxide)	45	B6-35	H	2	1.7	30A
Aluminum Chips, Dry	7-15	E-45V	H	2	1.2	30A
Aluminum Chips, Oily	7-15	E-45V	H	2	.8	30A
Aluminum Hydrate	13-20	C½-35	L-S-B	1	1.4	30A
Aluminum Ore (See Bauxite)	—	—	—	—	—	—
Aluminum Oxide	60-120	A100-17M	H	3	1.8	15
Aluminum Silicate (Andalusite)	49	C½-35S	L-S	3	.8	30A
Aluminum Sulfate	45-58	C½-25	L-S-B	1	1.0	45
Ammonium Chloride, Crystalline	45-52	A100-45FRS	L-S	3	.7	30A
Ammonium Nitrate	45-62	A40-35NTU	H	3	1.3	30A
Ammonium Sulfate	45-58	C½-35FOTU	L-S	1	1.0	30A
Antimony Powder	—	A100-35	H	2	1.6	30A
Apple Pomace, Dry	15	C½-45Y	H	2	1.0	30A
Arsenate Of Lead (See Lead Arsenate)	—	—	—	—	—	—
Arsenic Oxide (Arsenolite)	100-120	A100-35R	L-S-B	—	—	30A
Arsenic Pulverized	30	A100-25R	H	2	.8	45
Asbestos — Rock (Ore)	81	D3-37R	H	3	1.2	15
Asbestos — Shredded	20-40	E-46XY	H	2	1.0	30B
Ash, Black Ground	105	B6-35	L-S-B	1	2.0	30A
Ashes, Coal, Dry — ½″	35-45	C½-46TY	H	3	3.0	30B
Ashes, Coal, Dry — 3″	35-40	D3-46T	H	3	2.5	30B
Ashes, Coal, Wet — ½″	45-50	C½-46T	H	3	3.0	30B
Ashes, Coal, Wet — 3″	45-50	D3-46T	H	3	4.0	30B
Ashes, Fly (See Fly Ash)	—	—	—	—	—	—
Asphalt, Crushed — ½″	45	C½-45	H	2	2.0	30A
Bagasse	7-10	E-45RVXY	L-S-B	2	1.5	30A
Bakelite, Fine	30-45	B6-25	L-S-B	1	1.4	45
Baking Powder	40-55	A100-35	S	1	.6	30A
Baking Soda (Sodium Bicarbonate)	40-55	A100-25	S	1	.6	45
Barite (Barium Sulfate) + ½″ — 3″	120-180	D3-36	H	3	2.6	30B
Barite, Powder	120-180	A100-35X	H	2	2.0	30A
Barium Carbonate	72	A100-45R	H	2	1.6	30A
Bark, Wood, Refuse	10-20	E-45TVY	H	3	2.0	30A
Barley, Fine, Ground	24-38	B6-35	L-S-B	1	.4	30A
Barley, Malted	31	C½-35	L-S-B	1	.4	30A
Barley, Meal	28	C½-35	L-S-B	1	.4	30A
Barley, Whole	36-48	B6-25N	L-S-B	1	.5	45
Basalt	80-105	B6-27	H	3	1.8	15
Bauxite, Dry, Ground	68	B6-25	H	2	1.8	45
Bauxite, Crushed — 3″	75-85	D3-36	H	3	2.5	30B
Beans,Castor, Meal	35-40	B6-35W	L-S-B	1	.8	30A
Beans, Castor, Whole Shelled	36	C½-15W	L-S-B	1	.5	45
Beans, Navy, Dry	48	C½-15	L-S-B	1	.5	45
Beans, Navy, Steeped	60	C½-25	L-S-B	1	.8	45

Table 1-2 Material Characteristics (Cont'd)

Material	Weight lbs. per cu. ft.	Intermediate Material Code	Bearing Selection	Component Series	Mat'l Factor Fm	Trough Loading
Bentonite, Crude	34-40	D3-45X	H	2	1.2	30A
Bentonite, –100 Mesh	50-60	A100-25MXY	H	2	.7	45
Benzene Hexachloride	56	A100-45R	L-S-B	1	.6	30A
Bicarbonate of Soda (Baking Soda)	—	—	S	1	.6	—
Blood, Dried	35-45	D3-45U	H	2	2.0	30A
Blood, Ground, Dried	30	A100-35U	L-S	1	1.0	30A
Bone Ash (Tricalcium Phosphate)	40-50	A100-45	L-S	1	1.6	30A
Boneblack	20-25	A100-25Y	L-S	1	1.5	45
Bonechar	27-40	B6-35	L-S	1	1.6	30A
Bonemeal	50-60	B6-35	H	2	1.7	30A
Bones, Whole*	35-50	E-45V	H	2	3.0	30A
Bones, Crushed	35-50	D3-45	H	2	2.0	30A
Bones, Ground	50	B6-35	H	2	1.7	30A
Borate of Lime	60	A100-35	L-S-B	1	.6	30A
Borax, Fine	45-55	B6-25T	H	3	.7	30B
Borax Screening — ½″	55-60	C½-35	H	2	1.5	30A
Borax, 1½-2″ Lump	55-60	D3-35	H	2	1.8	30A
Borax, 2″-3″ Lump	60-70	D3-35	H	2	2.0	30A
Boric Acid, Fine	55	B6-25T	H	3	.8	30A
Boron	75	A100-37	H	2	1.0	30B
Bran, Rice — Rye — Wheat	16-20	B6-35NY	L-S-B	1	.5	30A
Braunite (Manganese Oxide)	120	A100-36	H	2	2.0	30B
Bread Crumbs	20-25	B6-35PQ	L-S-B	1	.6	30A
Brewer's Grain, Spent, Dry	14-30	C½-45	L-S-B	1	.5	30A
Brewer's Grain, Spent, Wet	55-60	C½-45T	L-S	2	.8	30A
Brick, Ground — ⅛″	100-120	B6-37	H	3	2.2	15
Bronze Chips	30-50	B6-45	H	2	2.0	30A
Buckwheat	37-42	B6-25N	L-S-B	1	.4	45
Calcine, Flour	75-85	A100-35	L-S-B	1	.7	30A
Calcium Carbide	70-90	D3-25N	H	2	2.0	30A
Calcium Carbonate (See Limestone)	—	—	—	—	—	—
Calcium Fluoride (See Fluorspar)	—	—	—	—	—	—
Calcium Hydrate (See Lime, Hydrated)	—	—	—	—	—	—
Calcium Hydroxide (See Lime, Hydrated)	—	—	—	—	—	—
Calcium Lactate	26-29	D3-45QTR	L-S	2	.6	30A
Calcium Oxide (See Lime, Unslaked)	—	—	—	—	—	—
Calcium Phosphate	40-50	A100-45	L-S-B	1	1.6	30A
Calcium Sulfate (See Gypsum)	—	—	—	—	—	—
Carbon, Activated, Dry Fine*	—	—	—	—	—	—
Carbon Black, Pelleted*	—	—	—	—	—	—
Carbon Black, Powder*	—	—	—	—	—	—
Carborundum	100	D3-27	H	3	3.0	15
Casein	36	B6-35	H	2	1.6	30A
Cashew Nuts	32-37	C½-45	H	2	.7	30A
Cast Iron, Chips	130-200	C½-45	H	2	4.0	30A
Caustic Soda	88	B6-35RSU	H	3	1.8	30A
Caustic Soda, Flakes	47	C½-45RSUX	L-S	3	1.5	30A
Celite (See Diatomaceous Earth)	—	—	—	—	—	—
Cement, Clinker	75-95	D3-36	H	3	1.8	30B
Cement, Mortar	133	B6-35Q	H	3	3.0	30A
Cement, Portland	94	A100-26M	H	2	1.4	30B
Cement, Aerated (Portland)	60-75	A100-16M	H	2	1.4	30B
Cerrusite (See Lead Carbonate)	—	—	—	—	—	—
Chalk, Crushed	75-95	D3-25	H	2	1.9	30A
Chalk, Pulverized	67-75	A100-25MXY	H	2	1.4	45
Charcoal, Ground	18-28	A100-45	H	2	1.2	30A

Table 1-2 Material Characteristics (Cont'd)

Material	Weight lbs. per cu. ft.	Intermediate Material Code	Bearing Selection	Component Series	Mat'l Factor Fm	Trough Loading
Charcoal, Lumps	18-28	D3-45Q	H	2	1.4	30A
Chocolate, Cake Pressed	40-45	D3-25	S	2	1.5	30A
Chrome Ore	125-140	D3-36	H	3	2.5	30B
Cinders, Blast Furnace	57	D3-36T	H	3	1.9	30B
Cinders, Coal	40	D3-36T	H	3	1.8	30B
Clay (See Bentonite, Diatomaceous Earth, Fuller's Earth, Kaolin & Marl)	—	—	—	—	—	—
Clay, Ceramic, Dry, Fines	60-80	A100-35P	L-S-B	1	1.5	30A
Clay, Calcined	80-100	B6-36	H	3	2.4	30B
Clay, Brick, Dry, Fines	100-120	C½-36	H	3	2.0	30B
Clay, Dry, Lumpy	60-75	D3-35	H	2	1.8	30A
Clinker, Cement (See Cement Clinker)	—	—	—	—	—	—
Clover Seed	45-48	B6-25N	L-S-B	1	.4	45
Coal, Anthracite (River & Culm)	55-61	B6-35TY	L-S	2	1.0	30A
Coal, Anthracite, Sized-½″	49-61	C½-25	L-S	2	1.0	45
Coal, Bituminous, Mined	40-60	D3-35LNXY	L-S	1	.9	30A
Coal, Bituminous, Mined, Sized	45-50	D3-35QV	L-S	1	1.0	30A
Coal, Bituminous, Mined, Slack	43-50	C½-45T	L-S	2	.9	30A
Coal, Lignite	37-45	D3-35T	H	2	1.0	30A
Cocoa Beans	30-45	C½-25Q	L-S	1	.5	45
Cocoa, Nibs	35	C½-25	H	2	.5	45
Cocoa, Powdered	30-35	A100-45XY	S	1	.9	30A
Cocoanut, Shredded	20-22	E-45	S	2	1.5	30A
Coffee, Chaff	20	B6-25MY	L-S	1	1.0	45
Coffee, Green Bean	25-32	C½-25PQ	L-S	1	.5	45
Coffee, Ground, Dry	25	A40-35P	L-S	1	.6	30A
Coffee, Ground, Wet	35-45	A40-45X	L-S	1	.6	30A
Coffee, Roasted Bean	20-30	C½-25PQ	S	1	.4	45
Coffee, Soluble	19	A40-35PUY	S	1	.4	45
Coke, Breeze	25-35	C½-37	H	3	1.2	15
Coke, Loose	23-35	D7-37	H	3	1.2	15
Coke, Petrol, Calcined	35-45	D7-37	H	3	1.3	15
Compost	30-50	D7-45TV	L-S	3	1.0	30A
Concrete, Pre-Mix Dry	85-120	C½-36U	H	3	3.0	30B
Copper Ore	120-150	DX-36	H	3	4.0	30B
Copper Ore, Crushed	100-150	D3-36	H	3	4.0	30B
Copper Sulphate, (Bluestone)	75-95	C½-35S	L-S	2	1.0	30A
Copperas (See Ferrous Sulphate)	—	—	—	—	—	—
Copra, Cake Ground	40-45	B6-45HW	L-S-B	1	.7	30A
Copra, Cake, Lumpy	25-30	D3-35HW	L-S-B	2	.8	30A
Copra, Lumpy	22	E-35HW	L-S-B	2	1.0	30A
Copra, Meal	40-45	B6-35HW	H	2	.7	30A
Cork, Fine Ground	5-15	B6-35JNY	L-S-B	1	.5	30A
Cork, Granulated	12-15	C½-35JY	L-S-B	1	.5	30A
Corn, Cracked	40-50	B6-25P	L-S-B	1	.7	45
Corn Cobs, Ground	17	C½-25Y	L-S-B	1	.6	45
Corn Cobs, Whole*	12-15	E-35	L-S	2		30A
Corn Ear*	56	E-35	L-S	2		30A
Corn Germ	21	B6-35PY	L-S-B	1	.4	30A
Corn Grits	40-45	B6-35P	L-S-B	1	.5	30A
Cornmeal	32-40	B6-35P	L-S	1	.5	30A
Corn Oil, Cake	25	D7-45HW	L-S	1	.6	30A
Corn Seed	45	C½-25PQ	L-S-B	1	.4	45
Corn Shelled	45	C½-25	L-S-B	1	.4	45
Corn Sugar	30-35	B6-35PU	S	1	1.0	30A
Cottonseed, Cake, Crushed	40-45	C½-45HW	L-S	1	1.0	30A

Table 1-2 Material Characteristics (Cont'd)

Material	Weight lbs. per cu. ft.	Intermediate Material Code	Bearing Selection	Component Series	Mat'l Factor Fm	Trough Loading
Cottonseed, Cake, Lumpy	40-45	D7-45HW	L-S	2	1.0	30A
Cottonseed, Dry, Delinted	22-40	C½-25X	L-S	1	.6	45
Cottonseed, Dry, Not Delinted	18-25	C½-45XY	L-S	1	.9	30A
Cottonseed, Flakes	20-25	C½-35HWY	L-S	1	.8	30A
Cottonseed, Hulls	12	B6-35Y	L-S	1	.9	30A
Cottonseed, Meal, Expeller	25-30	B6-45HW	L-S	3	.5	30A
Cottonseed, Meal, Extracted	35-40	B6-45HW	L-S	1	.5	30A
Cottonseed, Meats, Dry	40	B6-35HW	L-S	1	.6	30A
Cottonseed, Meats, Rolled	35-40	C½-45HW	L-S	1	.6	30A
Cracklings, Crushed	40-50	D3-45HW	L-S-B	2	1.3	30A
Cryolite, Dust	75-90	A100-36L	H	2	2.0	30B
Cryolite, Lumpy	90-110	D16-36	H	2	2.1	30B
Cullet, Fine	80-120	C½-37	H	3	2.0	15
Cullet, Lump	80-120	D16-37	H	3	2.5	15
Culm, (See Coal, Anthracite)	—	—	—	—	—	—
Cupric Sulphate (Copper Sulfate)	—	—	—	—	—	—
Detergent (See Soap Detergent)	—	—	—	—	—	—
Diatomaceous Earth	11-17	A40-36Y	H	3	1.6	30B
Dicalcium Phosphate	40-50	A40-35	L-S-B	1	1.6	30A
Disodium Phosphate	25-31	A40-35	H	3	.5	30A
Distiller's Grain, Spent Dry	30	B6-35	H	2	.5	30A
Distiller's Grain, Spent Wet	40-60	C½-45V	L-S	3	.8	30A
Dolomite, Crushed	80-100	C½-36	H	2	2.0	30B
Dolomite, Lumpy	90-100	DX-36	H	2	2.0	30B
Earth, Loam, Dry, Loose	76	C½-36	H	2	1.2	30B
Ebonite, Crushed	63-70	C½-35	L-S-B	1	.8	30A
Egg Powder	16	A40-35MPY	S	1	1.0	30A
Epsom Salts (Magnesium Sulfate)	40-50	A40-35U	L-S-B	1	.8	30A
Feldspar, Ground	65-80	A100-37	H	2	2.0	15
Feldspar, Lumps	90-100	D7-37	H	2	2.0	15
Feldspar, Powder	100	A200-36	H	2	2.0	30B
Feldspar, Screenings	75-80	C½-37	H	2	2.0	15
Ferrous Sulfide — ½"	120-135	C½-26	H	2	2.0	30B
Ferrous Sulfide — 100M	105-120	A100-36	H	2	2.0	30B
Ferrous Sulphate	50-75	C½-35U	H	2	1.0	30A
Fish Meal	35-40	C½-45HP	L-S-B	1	1.0	30A
Fish Scrap	40-50	D7-45H	L-S-B	2	1.5	30A
Flaxseed	43-45	B6-35X	L-S-B	1	.4	30A
Flaxseed Cake (Linseed Cake)	48-50	D7-45W	L-S	2	.7	30A
Flaxseed Meal (Linseed Meal)	25-45	B6-45W	L-S	1	.4	30A
Flour Wheat	33-40	A40-45LP	S	1	.6	30A
Flue Dust, Basic Oxygen Furnace	45-60	A40-36LM	H	3	3.5	30B
Flue Dust, Blast Furnace	110-125	A40-36	H	3	3.5	30B
Flue Dust, Boiler H. Dry	30-45	A40-36LM	H	3	2.0	30B
Fluorspar, Fine (Calcium Fluoride)	80-100	B6-36	H	2	2.0	30B
Fluorspar, Lumps	90-110	D7-36	H	2	2.0	30B
Fly Ash	30-45	A40-36M	H	3	2.0	30B
Foundry Sand, Dry (See Sand)	—	—	—	—	—	—
Fuller's Earth, Dry, Raw	30-40	A40-25	H	2	2.0	15
Fuller's Earth, Oily, Spent	60-65	C½-450W	H	3	2.0	30A
Fuller's Earth, Calcined	40	A100-25	H	3	2.0	15
Galena (See Lead Sulfide)	—	—	—	—	—	—
Gelatine, Granulated	32	B6-35PU	S	1	.8	30A
Gilsonite	37	C½-35	H	3	1.5	30A
Glass, Batch	80-100	C½-37	H	3	2.5	15
Glue, Ground	40	B6-45U	H	2	1.7	30A

Table 1-2 Material Characteristics (Cont'd)

Material	Weight lbs. per cu. ft.	Intermediate Material Code	Bearing Selection	Component Series	Mat'l Factor Fm	Trough Loading
Glue, Pearl	40	C½-35U	L-S-B	1	.5	30A
Glue, Veg. Powdered	40	A40-45U	L-S-B	1	.6	30A
Gluten, Meal	40	B6-35P	L-S	1	.6	30A
Granite, Fine	80-90	C½-27	H	3	2.5	15
Grape Pomace	15-20	D3-45U	H	2	1.4	30A
Graphite Flake	40	B6-25LP	L-S-B	1	.5	45
Graphite Flour	28	A100-35LMP	L-S-B	1	.5	30A
Graphite Ore	65-75	DX-35L	H	2	1.0	30A
Guano Dry*	70	C½-35	L-S	3	2.0	30A
Gypsum, Calcined	55-60	B6-35U	H	2	1.6	30A
Gypsum, Calcined, Powdered	60-80	A100-35U	H	2	2.0	30A
Gypsum, Raw — 1″	70-80	D3-25	H	2	2.0	30A
Hay, Chopped*	8-12	C½-35JY	L-S	2	1.6	30A
Hexanedioic Acid (See Adipic Acid)	—	—	—	—	—	—
Hominy, Dry	35-50	C½-25	L-S-B	1	.4	45
Hops, Spent, Dry	35	D3-35	L-S-B	2	1.0	30A
Hops, Spent, Wet	50-55	D3-45V	L-S	2	1.5	30A
Ice, Crushed	35-45	D3-35Q	L-S	2	.4	30A
Ice, Flaked*	40-45	C½-35Q	S	1	.6	30A
Ice, Cubes	33-35	D3-35Q	S	1	.4	30A
Ice, Shell	33-35	D3-45Q	S	1	.4	30A
Ilmenite Ore	140-160	D3-37	H	3	2.0	15
Iron Ore Concentrate	120-180	A40-37	H	3	2.2	15
Iron Oxide Pigment	25	A100-36LMP	H	2	1.0	30B
Iron Oxide, Millscale	75	C½-36	H	2	1.6	30B
Iron Pyrites (See Ferrous Sulfide)	—	—	—	—	—	—
Iron Sulphate (See Ferrous Sulfate)	—	—	—	—	—	—
Iron Sulfide (See Ferrous Sulfide)	—	—	—	—	—	—
Iron Vitriol (See Ferrous Sulfate)	—	—	—	—	—	—
Kafir (Corn)	40-45	C½-25	H	3	.5	45
Kaolin Clay	63	D3-25	H	2	2.0	30A
Kaolin Clay-Talc	32-56	A40-35LMP	H	2	2.0	30A
Kryalith (See Cryolite)	—	—	—	—	—	—
Lactose	32	A40-35PU	S	1	.6	30A
Lamp Black (See Carbon Black)	—	—	—	—	—	—
Lead Arsenate	72	A40-35R	L-S-B	1	1.4	30A
Lead Arsenite	72	A40-35R	L-S-B	1	1.4	30A
Lead Carbonate	240-260	A40-35R	H	2	1.0	30A
Lead Ore — ⅛″	200-270	B6-35	H	3	1.4	30A
Lead Ore — ½″	180-230	C½-36	H	3	1.4	30B
Lead Oxide (Red Lead) — 100 Mesh	30-150	A100-35P	H	2	1.2	30A
Lead Oxide (Red Lead) — 200 Mesh	30-180	A200-35LP	H	2	1.2	30A
Lead Sulphide — 100 Mesh	240-260	A100-35R	H	2	1.0	30A
Lignite (See Coal Lignite)	—	—	—	—	—	—
Limanite, Ore, Brown	120	C½-47	H	3	1.7	15
Lime, Ground, Unslaked	60-65	B6-35U	L-S-B	1	.6	30A
Lime Hydrated	40	B6-35LM	H	2	.8	30A
Lime, Hydrated, Pulverized	32-40	A40-35LM	L-S	1	.6	30A
Lime, Pebble	53-56	C½-25HU	L-S	2	2.0	45
Limestone, Agricultural	68	B6-35	H	2	2.0	30A
Limestone, Crushed	85-90	DX-36	H	2	2.0	30B
Limestone, Dust	55-95	A40-46MY	H	2	1.6-2.0	30B
Lindane (Benzene Hexachloride)	—	—	—	—	—	—
Linseed (See Flaxseed)	—	—	—	—	—	—
Litharge (Lead Oxide)	—	—	—	—	—	—
Lithopone	45-50	A325-35MR	L-S	1	1.0	30A

Table 1-2 Material Characteristics (Cont'd)

Material	Weight lbs. per cu. ft.	Intermediate Material Code	Bearing Selection	Component Series	Mat'l Factor Fm	Trough Loading
Maize (See Milo)	—	—	—	—	—	—
Malt, Dry, Ground	20-30	B6-35NP	L-S-B	1	.5	30A
Malt, Meal	36-40	B6-25P	L-S-B	1	.4	45
Malt, Dry Whole	20-30	C½-35N	L-S-B	1	.5	30A
Malt, Sprouts	13-15	C½-35P	L-S-B	1	.4	30A
Magnesium Chloride (Magnesite)	33	C½-45	L-S	1	1.0	30A
Manganese Dioxide*	70-85	A100-35NRT	L-S	2	1.5	30A
Manganese Ore	125-140	DX-37	H	3	2.0	15
Manganese Oxide	120	A100-36	H	2	2.0	30B
Manganese Sulfate	70	C½-37	H	3	2.4	15
Marble, Crushed	80-95	B6-37	H	3	2.0	15
Marl, (Clay)	80	DX-36	H	2	1.6	30B
Meat, Ground	50-55	E-45HQTX	L-S	2	1.5	30A
Meat, Scrap (w\bone)	40	E-46H	H	2	1.5	30B
Mica, Flakes	17-22	B6-16MY	H	2	1.0	30B
Mica, Ground	13-15	B6-36	H	2	.9	30B
Mica, Pulverized	13-15	A100-36M	H	2	1.0	30B
Milk, Dried, Flake	5-6	B6-35PUY	S	1	.4	30A
Milk, Malted	27-30	A40-45PX	S	1	.9	30A
Milk, Powdered	20-45	B6-25PM	S	1	.5	45
Milk Sugar	32	A100-35PX	S	1	.6	30A
Milk, Whole, Powdered	20-36	B6-35PUX	S	1	.5	30A
Mill Scale (Steel)	120-125	E-46T	H	3	3.0	30B
Milo, Ground	32-36	B6-25	L-S-B	1	.5	45
Milo Maize (Kafir)	40-45	B6-15N	L-S-B	1	.4	45
Molybdenite Powder	107	B6-26	H	2	1.5	30B
Monosodium Phosphate	50	B6-36	H	2	.6	30B
Mortar, Wet*	150	E-46T	H	3	3.0	30B
Mustard Seed	45	B6-15N	L-S-B	1	.4	45
Naphthalene Flakes	45	B6-35	L-S-B	1	.7	30A
Niacin (Nicotinic Acid)	35	A40-35P	H	2	2.5	30A
Oats	26	C½-25MN	L-S-B	1	.4	45
Oats, Crimped	19-26	C½-35	L-S-B	1	.5	30A
Oats, Crushed	22	B6-45NY	L-S-B	1	.6	30A
Oats, Flour	35	A100-35	L-S-B	1	.5	30A
Oat Hulls	8-12	B6-35NY	L-S-B	1	.5	30A
Oats, Rolled	19-24	C½-35NY	L-S-B	1	.6	30A
Oleo Margarine (Margarine)	59	E-45HKPWX	L-S	2	.4	30A
Orange Peel, Dry	15	E-45	L-S	2	1.5	30A
Oxalic Acid Crystals — Ethane Diacid Crystals	60	B6-35QS	L-S	1	1.0	30A
Oyster Shells, Ground	50-60	C½-36T	H	3	1.6-2.0	30B
Oyster Shells, Whole	80	D3-36TV	H	3	2.1-2.5	30B
Paper Pulp (4% or less)	62	E-45	L-S	2	1.5	30A
Paper Pulp (6% to 15%)	60-62	E-45	L-S	2	1.5	30A
Paraffin Cake — ½″	45	C½-45K	L-S	1	.6	30A
Peanuts, Clean, in shell	15-20	D3-35Q	L-S	2	.6	30A
Peanut Meal	30	B6-35P	S	1	.6	30A
Peanuts, Raw, Uncleaned (unshelled)	15-20	D3-36Q	H	3	.7	30B
Peanuts, Shelled	35-45	C½-35Q	S	1	.4	30A
Peas, Dried	45-50	C½-15NQ	L-S-B	1	.5	45
Perlite — Expanded	8-12	C½-36	H	2	.6	30B
Phosphate Acid Fertillizer	60	B6-25T	L-S	2	1.4	45
Phosphate Disodium (See Sodium Phosphate)	—	—	—	—	—	—
Phosphate Rock, Broken	75-85	DX-36	H	2	2.1	30B
Phosphate Rock, Pulverized	60	B6-36	H	2	1.7	30B

Table 1-2 Material Characteristics (Cont'd)

Material	Weight lbs. per cu. ft.	Intermediate Material Code	Bearing Selection	Component Series	Mat'l Factor Fm	Trough Loading
Phosphate Sand	90-100	B6-37	H	3	2.0	15
Plaster of Paris (See Gypsum)	—	—	—	—	—	—
Plumbago (See Graphite)	—	—	—	—	—	—
Polystyrene Beads	40	B6-35PQ	S	1	.4	30A
Polyvinyl, Chloride Powder	20-30	A100-45KT	S	2	1.0	30A
Polyvinyl, Chloride Pellets	20-30	E-45KPQT	S	1	.6	30A
Polyethylene, Resin Pellets	30-35	C½-45Q	L-S	1	.4	30A
Potash (Muriate) Dry	70	B6-37	H	3	2.0	15
Potash (Muriate) Mine Run	75	DX-37	H	3	2.2	15
Potassium Carbonate	51	B6-36	H	2	1.0	30B
Potassium Chloride Pellets	120-130	C½-25TU	H	3	1.6	45
Potassium Nitrate — ½″	76	C½-16NT	H	3	1.2	30B
Potassium Nitrate — ⅛″	80	B6-26NT	H	3	1.2	30B
Potassium Sulfate	42-48	B6-46X	H	2	1.0	30B
Potato Flour	48	A200-35MNP	L-S	1	.5	30A
Pumice — ⅛″	42-48	B6-46	H	3	1.6	30B
Pyrite, Pellets	120-130	C½-26	H	3	2.0	30B
Quartz — 100 Mesh	70-80	A100-27	H	3	1.7	15
Quartz — ½″	80-90	C½-27	H	3	2.0	15
Rice, Bran	20	B6-35NY	L-S-B	1	.4	30A
Rice, Grits	42-45	B6-35P	L-S-B	1	.4	30A
Rice, Polished	30	C½-15P	L-S-B	1	.4	45
Rice, Hulled	45-49	C½-25P	L-S-B	1	.4	45
Rice, Hulls	20-21	B6-35NY	L-S-B	1	.4	30A
Rice, Rough	32-36	C½-35N	L-S-B	1	.6	30A
Rosin — ½″	65-68	C½-45Q	L-S-B	1	1.5	30A
Rubber, Reclaimed Ground	23-50	C½-45	L-S-B	1	.8	30A
Rubber, Pelleted	50-55	D3-45	L-S-B	2	1.5	30A
Rye	42-48	B6-15N	L-S-B	1	.4	45
Rye Bran	15-20	B6-35Y	L-S-B	1	.4	45
Rye Feed	33	B6-35N	L-S-B	1	.5	30A
Rye Meal	35-40	B6-35	L-S-B	1	.5	30A
Rye Middlings	42	B6-35	L-S	1	.5	30A
Rye, Shorts	32-33	C½-35	L-S	2	.5	30A
Safflower, Cake	50	D3-26	H	2	.6	30B
Safflower, Meal	50	B6-35	L-S-B	1	.6	30A
Safflower Seed	45	B6-15N	L-S-B	1	.4	45
Saffron (See Safflower)	—	—	—	—	—	—
Sal Ammoniac (Ammonium Chloride)	—	—	—	—	—	—
Salt Cake, Dry Coarse	85	B6-36TU	H	3	2.1	30B
Salt Cake, Dry Pulverized	65-85	B6-36TU	H	3	1.7	30B
Salicylic Acid	29	B6-37U	H	3	.6	15
Salt, Dry Coarse	45-60	C½-36TU	H	3	1.0	30B
Salt, Dry Fine	70-80	B6-36TU	H	3	1.7	30B
Saltpeter — (See Potassium Nitrate)	—	—	—	—	—	—
Sand Dry Bank (Damp)	110-130	B6-47	H	3	2.8	15
Sand Dry Bank (Dry)	90-110	B6-37	H	3	1.7	15
Sand Dry Silica	90-100	B6-27	H	3	2.0	15
Sand Foundry (Shake Out)	90-100	D3-37Z	H	3	2.6	15
Sand (Resin Coated) Silica	104	B6-27	H	3	2.0	15
Sand (Resin Coated) Zircon	115	A100-27	H	3	2.3	15
Sawdust, Dry	10-13	B6-45UX	L-S-B	1	1.4	15
Sea — Coal	65	B6-36	H	2	1.0	30B
Sesame Seed	27-41	B6-26	H	2	.6	30B
Shale, Crushed	85-90	C½-36	H	2	2.0	30B
Shellac, Powdered or Granulated	31	B6-35P	S	1	.6	30A

Table 1-2 Material Characteristics (Cont'd)

Material	Weight lbs. per cu. ft.	Material Code	Intermediate Bearing Selection	Component Series	Mat'l Factor F_m	Trough Loading
Silicon Dioxide (See Quartz)	—	—	—	—	—	—
Silica, Flour	80	A40-46	H	2	1.5	30B
Silica Gel + ½″ - 3″	45	D3-37HKQU	H	3	2.0	15
Slag, Blast Furnace Crushed	130-180	D3-37Y	H	3	2.4	15
Slag, Furnace Granular, Dry	60-65	C½-37	H	3	2.2	15
Slate, Crushed, — ½″	80-90	C½-36	H	2	2.0	30B
Slate, Ground, — ⅛″	82-85	B6-36	H	2	1.6	30B
Sludge, Sewage, Dried	40-50	E-47TW	H	3	.8	15
Sludge, Sewage, Dry Ground	45-55	B-46S	H	2	.8	30B
Soap, Beads or Granules	15-35	B6-35Q	L-S-B	1	.6	30A
Soap, Chips	15-25	C½-35Q	L-S-B	1	.6	30A
Soap Detergent	15-50	B6-35FQ	L-S-B	1	.8	30A
Soap, Flakes	5-15	B6-35QXY	L-S-B	1	.6	30A
Soap, Powder	20-25	B6-25X	L-S-B	1	.9	45
Soapstone, Talc, Fine	40-50	A200-45XY	L-S-B	1	2.0	30A
Soda Ash, Heavy	55-65	B6-36	H	2	2.0	30B
Soda Ash, Light	20-35	A40-36Y	H	2	1.6	30B
Sodium Aluminate, Ground	72	B6-36	H	2	1.0	30B
Sodium Aluminum Fluoride (See Kryolite)	—	—	—	—	—	—
Sodium Aluminum Sulphate*	75	A100-36	H	2	1.0	30B
Sodium Bentonite (See Bentonite)	—	—	—	—	—	—
Sodium Bicarbonate (See Baking Soda)	—	—	—	—	—	—
Sodium Chloride (See Salt)	—	—	—	—	—	—
Sodium Carbonate (See Soda Ash)	—	—	—	—	—	—
Sodium Hydrate (See Caustic Soda)	—	—	—	—	—	—
Sodium Hydroxide (See Caustic Soda)	—	—	—	—	—	—
Sodium Borate (See Borax)	—	—	—	—	—	—
Sodium Nitrate	70-80	D3-25NS	L-S	2	1.2	30A
Sodium Phosphate	50-60	A-35	L-S	1	.9	30A
Sodium Sulfate (See Salt Cake)	—	—	—	—	—	—
Sodium Sulfite	96	B6-46X	H	2	1.5	30B
Sorghum, Seed (See Kafir or Milo)	—	—	—	—	—	—
Soybean, Cake	40-43	D3-35W	L-S-B	2	1.0	30A
Soybean, Cracked	30-40	C½-36NW	H	2	.5	30B
Soybean, Flake, Raw	18-25	C½-35Y	L-S-B	1	.8	30A
Soybean, Flour	27-30	A40-35MN	L-S-B	1	.8	30A
Soybean Meal, Cold	40	B6-35	L-S-B	1	.5	30A
Soybean Meal Hot	40	B6-35T	L-S	2	.5	30A
Soybeans, Whole	45-50	C½-26NW	H	2	1.0	30B
Starch	25-50	A40-15M	L-S-B	1	1.0	45
Steel Turnings, Crushed	100-150	D3-46WV	H	3	3.0	30B
Sugar Beet, Pulp, Dry	12-15	C½-26	H	2	.9	30B
Sugar Beet, Pulp, Wet	25-45	C½-35X	L-S-B	1	1.2	30A
Sugar, Refined, Granulated Dry	50-55	B6-35PU	S	1	1.0-1.2	30A
Sugar, Refined, Granulated Wet	55-65	C½-35X	S	1	1.4-2.0	30A
Sugar, Powdered	50-60	A100-35PX	S	1	.8	30A
Sugar, Raw	55-65	B6-35PX	S	1	1.5	30A
Sulphur, Crushed — ½″	50-60	C½-35N	L-S	1	.8	30A
Sulphur, Lumpy, — 3″	80-85	D3-35N	L-S	2	.8	30A
Sulphur, Powdered	50-60	A40-35MN	L-S	1	.6	30A
Sunflower Seed	19-38	C½-15	L-S-B	1	.5	45
Talcum, — ½″	80-90	C½-36	H	2	.9	30B
Talcum Powder	50-60	A200-36M	H	2	.8	30B
Tanbark, Ground*	55	B6-45	L-S-B	1	.7	30A
Timothy Seed	36	B6-35NY	L-S-B	1	.6	30A
Titanium Dioxide (See Ilmenite Ore)	—	—	—	—	—	—

Table 1-2 Material Characteristics (Cont'd)

Material	Weight lbs. per cu. ft.	Material Code	Intermediate Bearing Selection	Component Series	Mat'l Factor F_m	Trough Loading
Tobacco, Scraps	15-25	D3-45Y	L-S	2	.8	30A
Tobacco, Snuff	30	B6-45MQ	L-S-B	1	.9	30A
Tricalcium Phosphate	40-50	A40-45	L-S	1	1.6	30A
Triple Super Phosphate	50-55	B6-36RS	H	3	2.0	30B
Trisodium Phosphate	60	C½-36	H	2	1.7	30B
Trisodium Phosphate Granular	60	B6-36	H	2	1.7	30B
Trisodium Phosphate, Pulverized	50	A40-36	H	2	1.6	30B
Tung Nut Meats, Crushed	28	D3-25W	L-S	2	.8	30A
Tung Nuts	25-30	D3-15	L-S	2	.7	30A
Urea Prills, Coated	43-46	B6-25	L-S-B	1	1.2	45
Vermiculite, Expanded	16	C½-35Y	L-S	1	.5	30A
Vermiculite, Ore	80	D3-36	H	2	1.0	30B
Vetch	48	B6-16N	L-S-B	1	.4	30B
Walnut Shells, Crushed	35-45	B6-36	H	2	1.0	30B
Wheat	45-48	C½-25N	L-S-B	1	.4	45
Wheat, Cracked	40-45	B6-25N	L-S-B	1	.4	45
Wheat, Germ	18-28	B6-25	L-S-B	1	.4	45
White Lead, Dry	75-100	A40-36MR	H	2	1.0	30B
Wood Chips, Screened	10-30	D3-45VY	L-S	2	.6	30A
Wood Flour	16-36	B6-35N	L-S	1	.4	30A
Wood Shavings	8-16	E-45VY	L-S	2	1.5	30A
Zinc, Concentrate Residue	75-80	B6-37	H	3	1.0	15
Zinc Oxide, Heavy	30-35	A100-45X	L-S	1	1.0	30A
Zinc Oxide, Light	10-15	A100-45XY	L-S	1	1.0	30A

*Consult Factory

Selection of Conveyor Size and Speed

In order to determine the size and speed of a screw conveyor, it is necessary first to establish the material code number. It will be seen from what follows that this code number controls the cross-sectional loading that should be used. The various cross-sectional loadings shown in the Capacity Table (Table 1-6) are for use with the standard screw conveyor components indicated in the Component Group Selection Guide on page H-22 and are for use where the conveying operation is controlled with volumetric feeders and where the material is uniformly fed into the conveyor housing and discharged from it. Check lump size limitations before choosing conveyor diameter. See Table 1-7.

Capacity Table

The capacity table, (Table 1-6), gives the capacities in cubic feet per hour at one revolution per minute for various size screw conveyors for four cross-sectional loadings. Also shown are capacities in cubic feet per hour at the maximum recommended revolutions per minute.

The capacity values given in the table will be found satisfactory for most applications. Where the capacity of a screw conveyor is very critical, especially when handling a material not listed in Table 1-2, it is best to consult our Engineering Department.

The maximum capacity of any size screw conveyor for a wide range of materials, and various conditions of loading, may be obtained from Table 1-6 by noting the values of cubic feet per hour at maximum recommended speed.

Conveyor Speed

For screw conveyors with screws having standard pitch helical flights the conveyor speed may be calculated by the formula:

$$N = \frac{\text{Required capacity, cubic feet per hour}}{\text{Cubic feet per hour at 1 revolution per minute}}$$

N = revolutions per minute of screw, (but not greater than the maximum recommended speed.)

For the calculation of conveyor speeds where special types of screws are used, such as short pitch screws, cut flights, cut and folded flights and ribbon flights, an equivalent required capacity must be used, based on factors in the Tables 1-3, 4, 5.

Factor CF_1 relates to the pitch of the screw. Factor CF_2 relates to the type of the flight. Factor CF_3 relates to the use of mixing paddles within the flight pitches.

The equivalent capacity then is found by multiplying the required capacity by the capacity factors. See Tables 1-3, 4, 5 for capacity factors.

$$\begin{pmatrix}\text{Equiv. Capacity}\\ \text{Cubic Feet Per Hour}\end{pmatrix} = \begin{pmatrix}\text{Required Capacity}\\ \text{Cubic Feet Per Hour}\end{pmatrix} (CF_1)\,(CF_2)\,(CF_3)$$

Capacity Factors

Table 1-3

Special Conveyor Pitch Capacity Factor CF_1		
Pitch	Description	CF_1
Standard	Pitch = Diameter of Screw	1.00
Short	Pitch =⅔ Diameter of Screw	1.50
Half	Pitch =½ Diameter of Screw	2.00
Long	Pitch = 1½ Diameter of Screw	0.67

Table 1-4

Special Conveyor Flight Capacity Factor CF_2			
Type of Flight	Conveyor Loading		
	15%	30%	45%
Cut Flight	1.95	1.57	1.43
Cut & Folded Flight	N.R.*	3.75	2.54
Ribbon Flight	1.04	1.37	1.62

*Not recommended
If none of the above flight modifications are used: $CF_2 = 1.0$

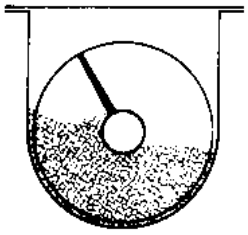
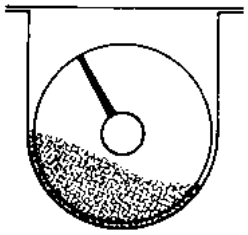
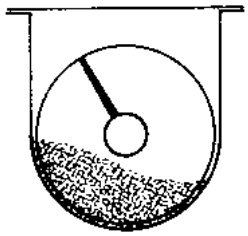
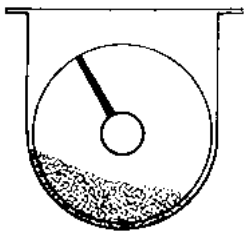
Table 1-5

Special Conveyor Mixing Paddle Capacity CF_3					
Standard Paddles at 45° Reverse Pitch	Paddles Per Pitch				
	None	1	2	3	4
Factor CF_3	1.00	1.08	1.16	1.24	1.32

Capacity Table
Horizontal Screw Conveyors

(Consult Factory for Inclined Conveyors)

Table 1-6

Trough Loading		Screw Dia. Inch	Capacity Cubic Feet Per Hour (Full Pitch)		Max. RPM
			At One RPM	At Max RPM	
45%		4	0.62	114	184
		6	2.23	368	165
		9	8.20	1270	155
		10	11.40	1710	150
		12	19.40	2820	145
		14	31.20	4370	140
		16	46.70	6060	130
		18	67.60	8120	120
		20	93.70	10300	110
		24	164.00	16400	100
		30	323.00	29070	90
30% A		4	0.41	53	130
		6	1.49	180	120
		9	5.45	545	100
		10	7.57	720	95
		12	12.90	1160	90
		14	20.80	1770	85
		16	31.20	2500	80
		18	45.00	3380	75
		20	62.80	4370	70
		24	109.00	7100	65
		30	216.00	12960	60
30% B		4	0.41	29	72
		6	1.49	90	60
		9	5.45	300	55
		10	7.60	418	55
		12	12.90	645	50
		14	20.80	1040	50
		16	31.20	1400	45
		18	45.00	2025	45
		20	62.80	2500	40
		24	109.00	4360	40
		30	216.00	7560	35
15%		4	0.21	15	72
		6	0.75	45	60
		9	2.72	150	55
		10	3.80	210	55
		12	6.40	325	50
		14	10.40	520	50
		16	15.60	700	45
		18	22.50	1010	45
		20	31.20	1250	40
		24	54.60	2180	40
		30	108.00	3780	35

Lump Size Limitations

The size of a screw conveyor not only depends on the capacity required, but also on the size and proportion of lumps in the material to be handled. The size of a lump is the maximum dimension it has. If a lump has one dimension much longer than its transverse cross-section, the long dimension or length would determine the lump size.

The character of the lump also is involved. Some materials have hard lumps that won't break up in transit through a screw conveyor. In that case, provision must be made to handle these lumps. Other materials may have lumps that are fairly hard, but degradable in transit through the screw conveyor, thus reducing the lump size to be handled. Still other materials have lumps that are easily broken in a screw conveyor and lumps of these materials impose no limitations.

Three classes of lump sizes are shown in TABLE 1-7 and as follows

Class 1

A mixture of lumps and fines in which not more than 10% are lumps ranging from maximum size to one half of the maximum; and 90% are lumps smaller than one half of the maximum size.

Class 2

A mixture of lumps and fines in which not more than 25% are lumps ranging from the maximum size to one half of the maximum; and 75% are lumps smaller than one half of the maximum size.

Class 3

A mixture of lumps only in which 95% or more are lumps ranging from maximum size to one half of the maximum size; and 5% or less are lumps less than one tenth of the maximum size.

Table 1-7

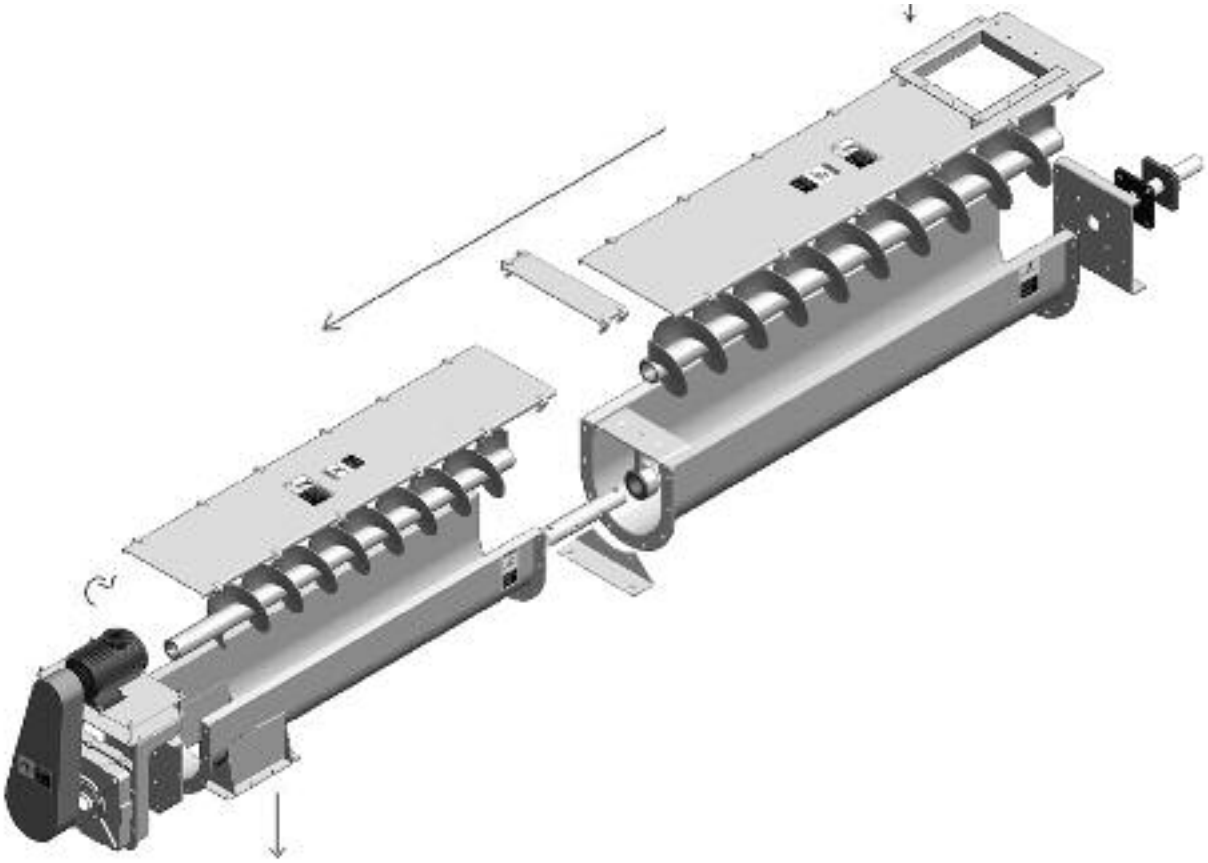
Maximum Lump Size Table

Screw Diameter Inches	Pipe *O.D. Inches	Radial Clearance Inches Δ	Class I 10% Lumps Max. Lump, Inch	Class II 25% Lumps Max. Lump, Inch	Class III 95% Lumps Max. Lump, Inch
6	2⅜	2⁵⁄₁₆	1¼	¾	½
9	2⅜	3⁵⁄₁₆	2¼	1½	¾
9	2⅞	3⁹⁄₁₆	2¼	1½	¾
12	2⅞	5¹⁄₁₆	2¾	2	1
12	3½	4¾	2¾	2	1
12	4	4½	2¾	2	1
14	3½	5¾	3¼	2½	1¼
14	4	5½	2½	1¼	1¼
16	4	6½	3¾	2¾	1½
16	4½	6¼	3¾	2¾	1½
18	4	7½	4¼	3	1¾
18	4½	7½	4¼	3	1¾
20	4	8½	4¾	3½	2
20	4½	8¼	4¾	3½	2
24	4½	10¼	6	3¾	2½
30	4½	13¼	8	5	3

*For special pipe sizes, consult factory.
ΔRadial clearance is the distance between the bottom of the trough and the bottom of the conveyor pipe.

EXAMPLE: Lump Size Limitations

To illustrate the selection of a conveyor size from the Maximum Lump Size Table, Table 1-7, consider crushed ice as the conveyed material. Refer to the material charts Table 1-2 and find crushed ice and its material code D3-35Q and weight of 35-45 lbs./C.F. D3 means that the lump size is ½″ to 3″, this is noted by referring to the material classification code chart on page H-6. From actual specifications regarding crushed ice it is known that crushed ice has a maximum lump size of 1½″ and only 25% of the lumps are 1½″. With this information refer to Table 1-7, Maximum Lump Size Table. Under the column Class II and 1½″ Max. lump size read across to the minimum screw diameter which will be 9″.



Component Groups

To facilitate the selection of proper specifications for a screw conveyor for a particular duty, screw conveyors are broken down into three Component Groups. These groups relate both to the Material Classification Code and also to screw size, pipe size, type of bearings and trough thickness.

Referring to Table 1-2, find the component series designation of the material to be conveyed.

Having made the Component Series selection, refer to Tables 1-8, 9, 10 which give the specifications of the various sizes of conveyor screws. (The tabulated screw numbers in this table refer to standard specifications for screws found on pages H-78 - H-82 Component Section.) These standards give complete data on the screws such as the length of standard sections, minimum edge thickness of screw flight, bushing data, bolt size, bolt spacing, etc.

EXAMPLE: For a screw conveyor to handle brewers grain, spent wet, refer to the material characteristics Table 1-2. Note that the component series column refers to series 2. Refer now to page H-22, component selection, Table 1-9, component group 2. The standard shaft sizes, screw flight designations, trough gauges and cover gauges are listed for each screw diameter.

Table 1-8

Component Group 1					
Screw Diameter Inches	Coupling Diameter Inches	Screw Number		Thickness, U.S. Standard Gauge or Inches	
		Helicoid Flights	Sectional Flights	Trough	Cover
6	1½	6H304	6S307	16 Ga.	16 Ga.
9	1½	9H306	9S307	14 Ga.	14 Ga.
9	2	9H406	9S409	14 Ga.	14 Ga.
12	2	12H408	12S409	12 Ga.	14 Ga.
12	2 7/16	12H508	12S509	12 Ga.	14 Ga.
14	2 7/16	14H508	14S509	12 Ga.	14 Ga.
16	3	16H610	16S612	12 Ga.	14 Ga.
18	3	—	18S612	10 Ga.	12 Ga.
20	3	—	20S612	10 Ga.	12 Ga.
24	3 7/16	—	24S712	10 Ga.	12 Ga.
30	3 7/16	—	30S712	10 Ga.	12 Ga.

Table 1-9

Component Group 2					
Screw Diameter Inches	Coupling Diameter Inches	Screw Number		Thickness, U.S. Standard Gauge or Inches	
		Helicoid Flights	Sectional Flights	Trough	Cover
6	1½	6H308	6S309	14 Ga..	16 Ga..
9	1½	9H312	9S309	10 Ga.	14 Ga.
9	2	9H412	9S412	10 Ga.	14 Ga.
12	2	12H412	12S412	3/16 In.	14 Ga.
12	2 7/16	12H512	12S512	3/16 In.	14 Ga.
12	3	12H614	12S616	3/16 In.	14 Ga.
14	2 7/16	—	14S512	3/16 In.	14 Ga.
14	3	14H614	14S616	3/16 In.	14 Ga.
16	3	16H614	16S616	3/16 In.	14 Ga.
18	3	—	18S616	3/16 In.	12 Ga.
20	3	—	20S616	3/16 In.	12 Ga.
24	3 7/16	—	24S716	3/16 In.	12 Ga.
30	3 7/16	—	30S716	3/16 In.	12 Ga.

Table 1-10

Component Group 3					
Screw Diameter Inches	Coupling Diameter Inches	Screw Number		Thickness, U.S. Standard Gauge or Inches	
		Helicoid Flights	Sectional Flights	Trough	Cover
6	1½	6H312	6S312	10 Ga.	16 Ga.
9	1½	9H312	9S312	3/16 In.	14 Ga.
9	2	9H414	9S416	3/16 In.	14 Ga.
12	2	12H412	12S412	¼ In.	14 Ga.
12	2 7/16	12H512	12S512	¼ In.	14 Ga.
12	3	12H614	12S616	¼ In.	14 Ga.
14	3	—	14S624	¼ In.	14 Ga.
16	3	—	16S624	¼ In.	14 Ga.
18	3	—	18S624	¼ In.	12 Ga.
20	3	—	20S624	¼ In.	12 Ga.
24	3 7/16	—	24S724	¼ In.	12 Ga.
30	3 7/16	—	30S724	¼ In.	12 Ga.

Bearing Selection

The selection of bearing material for intermediate hangers is based on experience together with a knowledge of the characteristics of the material to be conveyed. By referring to the material characteristic tables, page H-8 thru H-16 the intermediate hanger bearing selection can be made by viewing the Bearing Selection column. The bearing selection will be made from one of the following types: B, L, S, H. The various bearing types available in the above categories can be selected from the following table.

Table 1-11

Hanger Bearing Selection

Bearing Component Groups	Bearing Typos	Recommended Coupling Shaft Material Δ	Max. Recommended Operating Temperature	F_b
B	Ball	Standard	180°F	1.0
L	Bronze	Standard	300°F	
S	Martin Bronze*	Standard	850°F	2.0
	Graphite Bronze	Standard	500°F	
	Oil Impreg. Bronze	Standard	200°F	
	Oil Impreg. Wood	Standard	160°F	
	Nylatron	Standard	250°F	
	Nylon	Standard	160°F	
	Teflon	Standard	250°F	
	UHMW	Standard	225°F	
	Melamine (MCB)	Standard	250°F	
	Ertalyte® Quadrent	Standard	200°F	
	Urethane	Standard	200°F	
H	Martin Hard Iron*	Hardened	500°F	3.4
	Hard Iron	Hardened	500°F	4.4
	Hard Surfaced	Hardened or Special	500°F	
	Stellite	Special	500°F	
	Ceramic	Special	1,000°F	

*Sintered Metal. Self-lubricating.

Δ OTHER TYPES OF COUPLING SHAFT MATERIALS
Various alloys, stainless steel, and other types of shafting can be furnished as required.

Horsepower Requirements

Horizontal Screw Conveyors

***Consult Factory for Inclined Conveyors or Screw Feeders**

The horsepower required to operate a horizontal screw conveyor is based on proper installation, uniform and regular feed rate to the conveyor and other design criteria as determined in this book.

The horsepower requirement is the total of the horsepower to overcome friction (HP_f) and the horsepower to transport the material at the specified rate (HP_m) multiplied by the overload factor F_o and divided by the total drive efficiency e, or:

$$HP_f = \frac{LN\ F_d\ f_b}{1{,}000{,}000} = \text{(Horsepower to run an empty conveyor)}$$

$$HP_m = \frac{CLW\ F_f F_m F_p}{1{,}000{,}000} = \text{(Horsepower to move the material)}$$

$$\text{Total HP} = \frac{(HP_f + HP_m)F_o}{e}$$

The following factors determine the horsepower requirement of a screw conveyor operating under the foregoing conditions.

L = Total length of conveyor, feet
N = Operating speed, RPM (revolutions per minute)
F_d = Conveyor diameter factor (See Table 1-12)
F_b = Hanger bearing factor (See Table 1-13)

C = Capacity in cubic feet per hour
W = Weight of material, lbs. per cubic foot
F_f = Flight factor (See Table 1-14)
F_m = Material factor (See Table 1-2)
F_p = Paddle factor, when required. (See Table 1-15)

F_o = Overload factor (See Table 1-16)
e = Drive efficiency (See Table 1-17)

Table 1-12

Conveyor Diameter Factor, F_d			
Screw Diameter Inches	Factor F_d	Screw Diameter Inches	Factor F_d
4	12.0	14	78.0
6	18.0	16	106.0
9	31.0	18	135.0
10	37.0	20	165.0
12	55.0	24	235.0
		30	300

Table 1-13

Hanger Bearing Factor F_b		
Bearing Type		Hanger Bearing Factor F_b
B	Ball	1.0
L	Martin Bronze	2.0
S	*Graphite Bronze *Melamine *Oil Impreg. Bronze *Oil Impreg. Wood *Nylatron *Nylon *Teflon *UHMW *Ertalyte® *Urethane	2.0
	*Martin Hard Iron	3.4
H	*Hard Surfaced *Stellite *Ceramic	4.4

*Non lubricated bearings, or bearings not additionally lubricated.

Table 1-14
Flight Factor, F_f

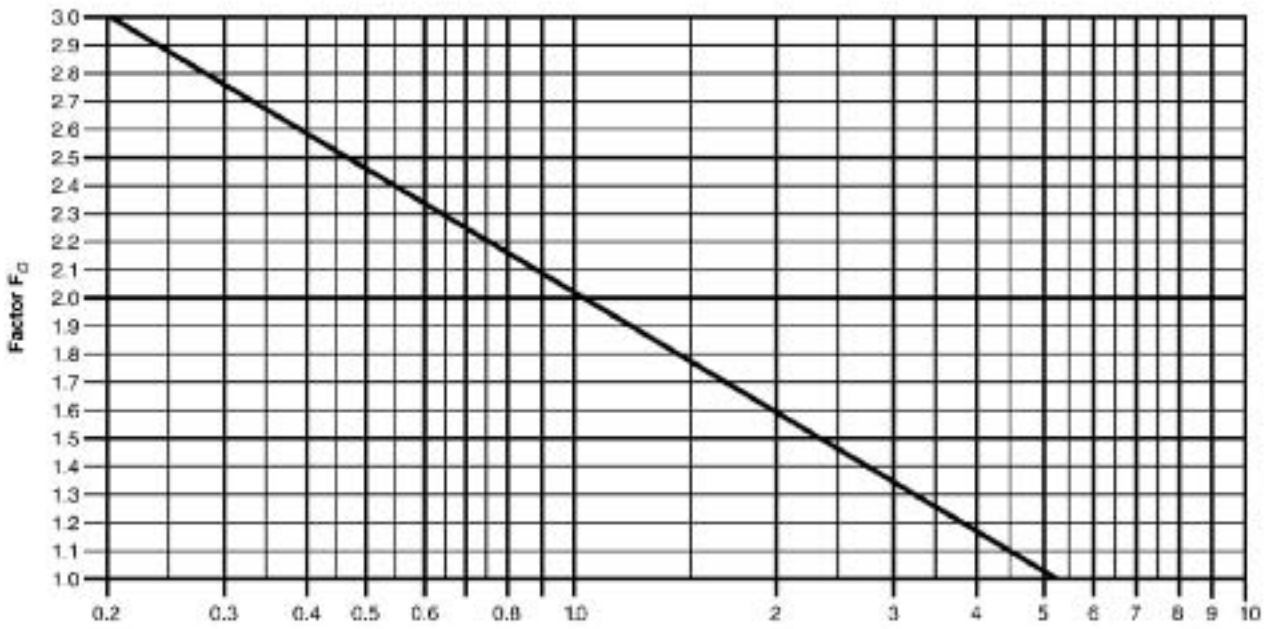
Flight Type	F_f Factor for Percent Conveyor Loading			
	15%	30%	45%	95%
Standard	1.0	1.0	1.0	1.0
Cut Flight	1.10	1.15	1.20	1.3
Cut & Folded Flight	N.R.*	1.50	1.70	2.20
Ribbon Flight	1.05	1.14	1.20	—
	*Not Recommended			

Table 1-15

Paddle Factor F_p					
Standard Paddles per Pitch, Paddles Set at 45° Reverse Pitch					
Number of Paddles per Pitch	0	1	2	3	4
Paddle Factor — F_p	1.0	1.29	1.58	1.87	2.16

Table 1-16

F_o — Overload Factor



Horsepower $HP_f + HP_m$

For values of $HP_f + HP_m$ greater than 5.2, F_o is 1.0

Trace the value of ($HP_f + HP_m$) vertically to the diagonal line, then across to the left where the F_o value is listed.

Table 1-17

e Drive Efficiency Factor				
Screw Drive or Shaft Mount w/ V-Belt Drive	V-Belt to Helical Gear and Coupling	Gearmotor w/ Coupling	Gearmotor w/ Chain Drive	Worm Gear
.88	.87	.95	.87	Consult Manufacturer

Horsepower

EXAMPLE: Horsepower Calculation (See page H-207 for sample worksheet)

PROBLEM: Convey 1,000 cubic feet per hour Brewers grain, spent wet, in a 25´-0″ long conveyor driven by a screw conveyor drive with V-belts.

SOLUTION:

1. Refer to material characteristic table 1-2 for Brewers grain, spent wet and find:
   A. wt/cf: 55 - 60
   B. material code: C½ - 45T
      Refer to Table 1-1, material classification code chart where:
      C½ = Fine ½″ and under
      4 = Sluggish
      5 = Mildly abrasive
      T = Mildly corrosive
   C. Intermediate bearing selection: L or S
      Refer to Table 1-11 Bearing Selection, Find:
      L = Bronze
      S = Nylatron, Nylon, Teflon, UHMW Melamine, Graphite Bronze, Oil-impreg. Bronze, and oil-impreg. wood and Urethane.
   D. Material Factor: F_m = .8
   E. Trough Loading: 30%A
      Refer to Table 1-6 capacity table and find 30%A which shows the various capacities per RPM of the standard size screw conveyors and the maximum RPM's for those sizes.
2. From Table 1-6, Capacity table under 30%A note that a 12″ screw will convey 1,160 cubic feet per hour at 90 RPM maximum, therefore at 1 RPM a 12″ screw will convey 12.9 cubic feet. For 1,000 CFH capacity at 12.9 CFH per RPM, the conveyor must therefore run 78RPM (1000 ÷ 12.9 = 77.52).
3. With the above information and factors from Tables 1-12 through 1-17 refer to the horsepower formulas on H-24 and calculate the required horsepower to convey 1000 CF/H for 25 feet in a 12″ conveyor.

   Using the known factors find that:

   L = 25´
   N = 78 RPM from step 2 above
   F_d = 55 see Table 1-12, for 12″
   F_b = 2.0 see Table 1-13 for L
   C = 1000 CFH
   W = 60#/CF from step 1A
   F_f = 1 see Table 1-14, standard 30%
   F_p = 1 see Table 1-15
   e = .88 see Table 1-17

4. Solve the following horsepower equations:

   A. $HP_f = \frac{L\ N\ F_d\ F_b}{1{,}000{,}000} = \frac{25 \times 78 \times 55 \times 2.0}{1{,}000{,}000} = 0.215$

   B. $HP_m = \frac{C\ L\ W\ F_f\ F_m\ F_p}{1{,}000{,}000} = \frac{1000 \times 25 \times 60 \times 1 \times .8 \times 1}{1{,}000{,}000} = 1.2$

   Find the F_o factor from 1-16; by adding HP_f and HP_m and matching this sum to the values on the chart.

   C. $HP_f = \frac{(HP_f + HP_m)\ (F_o)}{e} = \frac{(1.414)\ (1.9)}{.88} = 3.05$

SOLUTION: 3.05 Horsepower is required to convey 1,000 CFH Brewers grain, spent wet in a 12″ conveyor for 25 feet. A 5 H.P. motor should be used.

Torsional Ratings of Conveyor Screw Parts

Screw conveyors are limited in overall design by the amount of torque that can be safely transmitted through the pipes, couplings, and coupling bolts.

The table below combines the various torsional ratings of bolts, couplings and pipes so that it is easy to compare the torsional ratings of all the stressed parts of standard conveyor screws.

Table 1-18

Coupling	Pipe		Couplings		Bolts				
Shaft Dia. In.	Sch. 40		Torque in Lbs.*		Bolt Dia. In.	Bolts in Shear in Lbs. ▲		Bolts in Bearing in Lbs.	
	Size In.	Torque In. Lbs.	CEMA Std. (C-1018)	Martin Std. (C-1045)		No. of Bolts Used		No. of Bolts Used	
						2	3	2	3
1	1½	3,140	820	999	⅜	1,380	2,070	1,970	2,955
1½	2	7,500	3,070	3,727	½	3,660	5,490	5,000	7,500
2	2½	14,250	7,600	9,233	⅝	7,600	11,400	7,860	11,790
2 7/16	3	23,100	15,090	18,247	⅝	9,270	13,900	11,640	17,460
3	3½	32,100	28,370	34,427	¾	16,400	24,600	15,540	23,310
3	4	43,000	28,370	34,427	¾	16,400	24,600	25,000	37,500
3 7/16	4	43,300	42,550	51,568	⅞	25,600	38,400	21,800	32,700

▲ Values shown are for A307-64, Grade 2 Bolts. Values for Grade 5 Bolts are above × 2.5
*Values are for unheattreated shafts.

The lowest torsional rating figure for any given component will be the one that governs how much torque may be safely transmitted. For example, using standard unhardened two bolt coupling shafts, the limiting torsional strength of each part is indicated by the underlined figures in Table 1-18.

Thus it can be seen that the shaft itself is the limiting factor on 1″, 1½″ and 2″ couplings. The bolts in shear are the limiting factors on the 2 7/16″ coupling and on the 3″ coupling used in conjunction with 4″ pipe. The bolts in bearing are the limiting factors for the 3″ coupling used in conjunction with 3½″ pipe, and for the 3 7/16″ coupling.

Formula: Horsepower To Torque (In. Lbs.)

$$\frac{63{,}025 \times HP}{RPM} = \text{Torque (In. Lbs.)}$$

EXAMPLE: 12″ Screw, 78 RPM, 5 Horsepower

$$\frac{63{,}025 \times 5}{78} = 4{,}040 \text{ In. Lbs.}$$

From the table above 2″ shafts with 2 bolt drilling and 2½″ std. pipe are adequate (4,040 < 7600).

If the torque is greater than the values in the above table, such as in 2″ couplings (torque > 7600), then hardened shafts can be used as long as the torque is less than the value for hardened couplings (torque < 9500). If the torque is greater than the 2 bolt in shear value but less than the 3 bolt in shear value then 3 bolt coupling can be used. The same applies with bolts in bearing. When the transmitted torque is greater than the pipe size value, then larger pipe or heavier wall pipe may be used. Other solutions include: high torque bolts to increase bolt in shear rating, external collars, or bolt pads welded to pipe to increase bolt in bearing transmission. For solutions other than those outlined in the above table please consult our Engineering Department.

Horsepower Ratings of Conveyor Screw Parts

Screw conveyors are limited in overall design by the amount of horsepower that can be safely transmitted through the pipes, couplings, and coupling bolts.

The table below combines the various horsepower ratings of bolts, couplings and pipes so that it is easy to compare the ratings of all the stressed parts of standard conveyor screws.

Table 1-19

Coupling	Pipe		Couplings		Bolts				
Shaft Dia. In.	Size In.	H.P. per R.P.M.	H.P. per R.P.M.		Bolt Dia. In.	Bolts in Shear H.P. per R.P.M. ▲		Bolts in Bearing H.P. per R.P.M.	
			CEMA Std. (C-1018)	Martin Std. (C-1045)		No. of Bolts Used		No. of Bolts Used	
						2	3	2	3
1	1¼	.049	.013	.016	⅜	.021	.032	.031	.046
1½	2	.119	.048	.058	½	.058	.087	.079	.119
2	2½	.226	.120	.146	⅝	.120	.180	.124	.187
2 7/16	3	.366	.239	.289	⅝	.147	.220	.184	.277
3	3½	.509	.450	.546	¾	.260	.390	.246	.369
3	4	.682	.450	.546	¾	.260	.390	.396	.595
3 7/16	4	.682	.675	.818	⅞	.406	.609	.345	.518
3	3½	.509	.450	.546	¾	.260	.390	.246	.369

▲ Values shown are for A307-64, Grade 2 Bolts.

The lowest horsepower rating figure for any given component will be the one that governs how much horsepower may be safely transmitted. The limiting strength of each part is indicated by the underlined figures in the table above.

Formula: Horsepower To Horsepower @ 1 RPM

EXAMPLE: 12″ Screw, 78 RPM, 5 Horsepower

$$\frac{5\ \text{HP}}{78\ \text{RPM}} = 0.06\ \text{HP at 1 RPM}$$

From the table above .038 is less than the lowest limiting factor for 2″ couplings, so 2″ standard couplings with 2 bolts may be used. Solutions to limitations are the same as shown on H-27.

Screw Conveyor End Thrust Thermal Expansion

End thrust in a Screw Conveyor is created as a reaction to the forces required to move the material along the axis of the conveyor trough. Such a force is opposite in direction to the flow of material. A thrust bearing and sometimes reinforcement of the conveyor trough is required to resist thrust forces. Best performance can be expected if the conveyor end thrust bearing is placed so that the rotating members are in tension; therefore, an end thrust bearing should be placed at the discharge end of a conveyor. Placing an end thrust bearing assembly at the feed end of a conveyor places rotating members in compression which may have undesirable effects, but this is sometimes necessary in locating equipment.

There are several methods of absorbing thrust forces, the most popular methods are:

1. Thrust washer assembly — installed on the shaft between the pipe end and the trough end plate, or on the outside of the end bearing.
2. Type "E" end thrust assembly, which is a Double Roller Bearing and shaft assembly.
3. Screw Conveyor Drive Unit, equipped with double roller bearing thrust bearings, to carry both thrust and radial loads.

Past experience has established that component selection to withstand end thrust is rarely a critical factor and thrust is not normally calculated for design purposes. Standard conveyor thrust components will absorb thrust without resorting to special design in most applications.

Expansion of Screw Conveyors Handling Hot Materials

Screw conveyors often are employed to convey hot materials. It is therefore necessary to recognize that the conveyor will increase in length as the temperature of the trough and screw increases when the hot material begins to be conveyed.

The recommended general practice is to provide supports for the trough which will allow movement of the trough end feet during the trough expansion, and during the subsequent contraction when handling of the hot material ceases. The drive end of the conveyor usually is fixed, allowing the remainder of the trough to expand or contract. In the event there are intermediate inlets or discharge spouts that cannot move, the expansion type troughs are required.

Furthermore, the conveyor screw may expand or contract in length at different rates than the trough. Therefore, expansion hangers are generally recommended. The trough end opposite the drive should incorporate an expansion type ball or roller bearing or sleeve bearing which will safely provide sufficient movement.

The change in screw conveyor length may be determined from the following formula:

$\Delta L = L (t_1 - t_2) C$

Where: ΔL = increment of change in length, inch

L = overall conveyor length in inches

t_1 = upper limit of temperature, degrees Fahrenheit

t_2 = limit of temperature, degrees Fahrenheit,
(or lowest ambient temperature expected)

C = coefficient of linear expansion, inches per inch per degree Fahrenheit. This coefficient has the following values for various metals:

(a) Hot rolled carbon steel, 6.5×10^{-6}, (.0000065)

(b) Stainless steel, 9.9×10^{-6}, (.0000099)

(c) Aluminum, 12.8×10^{-6}, (.0000128)

EXAMPLE:

A carbon steel screw conveyor 30 feet overall length is subject to a rise in temperature of 200°F, reaching a hot metal temperature of 260°F from an original metal temperature of 60°F.

$t_1 = 260$ $\quad t_1 - t_2 = 200$

$t_2 = 60$

$L = (30)(12) = 360$

$\Delta L = (360)(200)(6.5\times10^{-6})$

$= 0.468$ inches, or about $^{15}/_{32}$ inches.

Conveyor Screw Deflection

When using conveyor screws of standard length, deflection is seldom a problem. However, if longer than standard sections of screw are to be used, without intermediate hanger bearings, care should be taken to prevent the screw flights from contacting the trough because of excessive deflection. The deflection at mid span may be calculated from the following formula.

$$D = \frac{5WL^3}{384\ (29{,}000{,}000)\ (I)}$$

Where: D = Deflection at mid span in inches

W = Total screw weight in pounds, see pages H-80 to H-83

L = Screw length in inches

I = Movement of inertia of pipe or shaft, see table 1-20 or 1-21 below

Table 1-20 Schedule 40 Pipe

Pipe Size	2″	2½″	3″	3½″	4″	5″	6″	8″	10″
I	.666	1.53	3.02	4.79	7.23	15.2	28.1	72.5	161

Table 1-21 Schedule 80 Pipe

Pipe Size	2″	2½″	3″	3½″	4″	5″	6″	8″	10″
I	.868	1.92	3.89	6.28	9.61	20.7	40.5	106	212

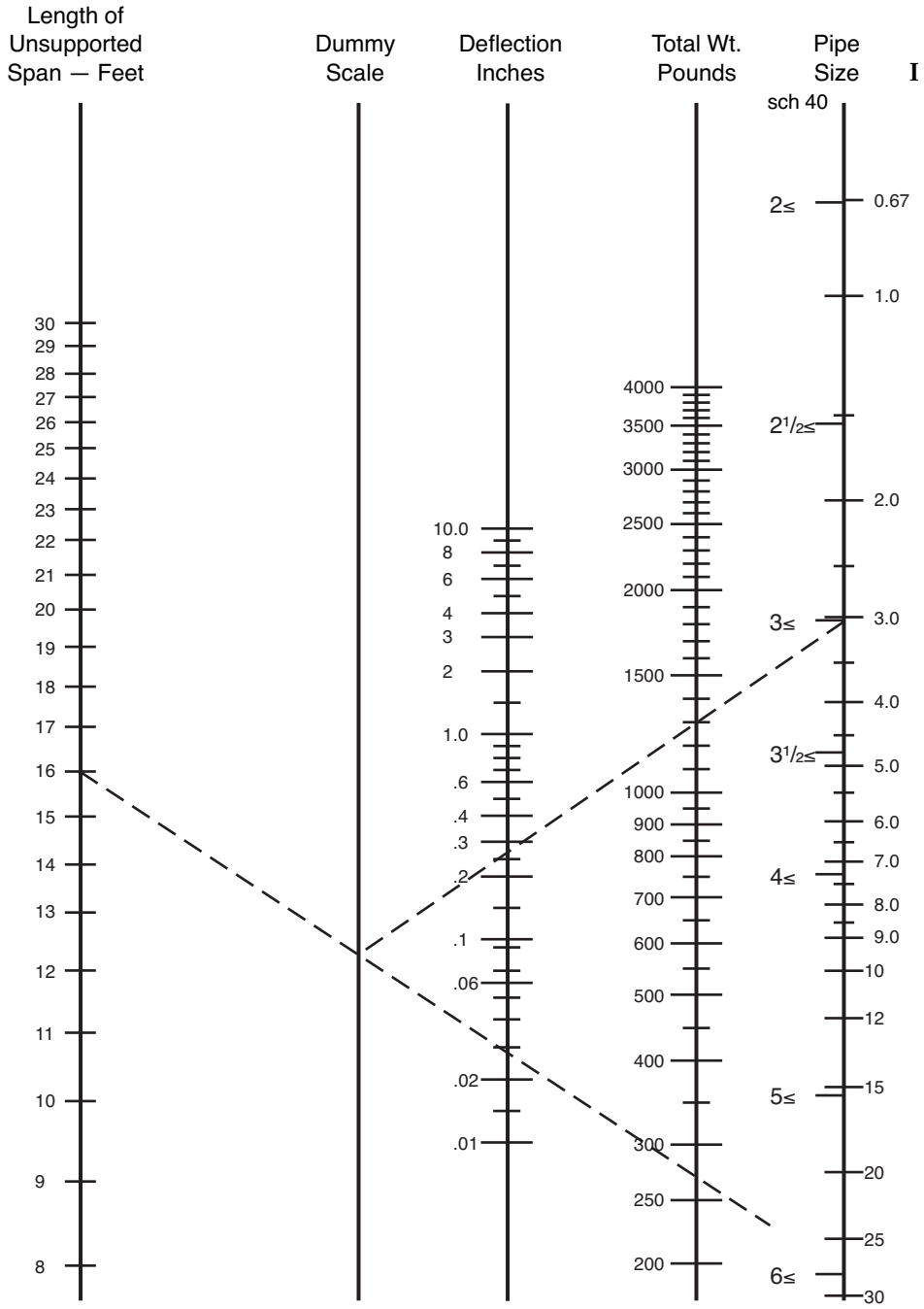
EXAMPLE: Determine the deflection of a 12H512 screw conveyor section mounted on 3″ sch 40 pipe, overall length is 16′-0″.

W = 272#
L = 192″
I = 3.02 (From chart above)

$$D = \frac{5\ (272\#)\ (192^3)}{384\ (29{,}000{,}000)\ (3.02)} = .29 \text{ inches}$$

Applications where the calculated deflection of the screw exceeds .25 inches (¼″) should be referred to our Engineering Department for recommendations. Very often the problem of deflection can be solved by using a conveyor screw section with a larger diameter pipe or a heavier wall pipe. Usually, larger pipe sizes tend to reduce deflection more effectively than heavier wall pipe.

Conveyor Screw Deflection



I = Moment of inertia of pipe or shaft, see Table 1-20 or 1-21

The above Nomograph can be used for a quick reference to check deflection of most conveyors.

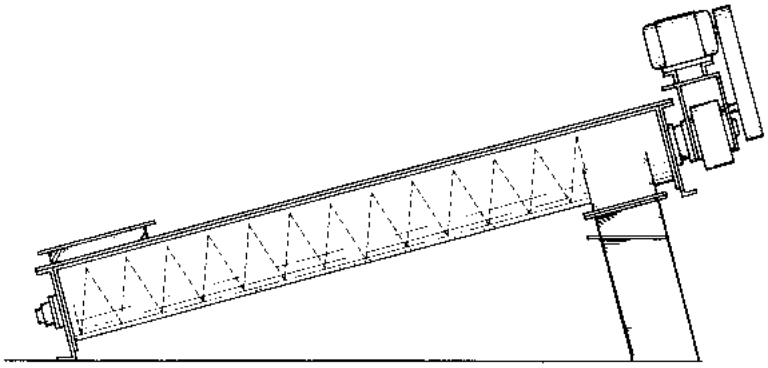
Inclined and Vertical Screw Conveyors

Inclined Screw Conveyors

Inclined screw conveyors have a greater horsepower requirement and a lower capacity rating than horizontal conveyors. The amounts of horsepower increase and capacity loss depend upon the angle of incline and the characteristics of the material conveyed.

Inclined conveyors operate most efficiently when they are of tubular or shrouded cover design, and a minimum number of intermediate hanger bearings. Where possible, they should be operated at relatively high speeds to help prevent fallback of the conveyed material.

Consult our Engineering Department for design recommendations and horsepower requirements for your particular application.



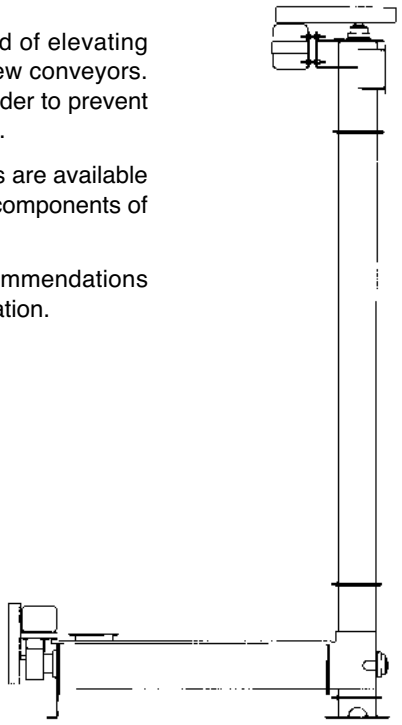
Vertical Screw Conveyors

Vertical screw conveyors provide an efficient method of elevating most materials that can be conveyed in horizontal screw conveyors. Since vertical conveyors must be uniformly loaded in order to prevent choking, they are usually designed with integral feeders.

As with horizontal conveyors, vertical screw conveyors are available with many special features and accessories, including components of stainless steel or other alloys.

Consult our Engineering Department for design recommendations and horsepower requirements for your particular application.

SEE VERTICAL SCREW CONVEYOR SECTION OF CATALOG FOR ADDITIONAL INFORMATION.



Screw Feeders

Screw Feeders are designed to regulate the rate of material flow from a hopper or bin. The inlet is usually flooded with material (95% loaded). One or more tapered or variable pitch screws convey the material at the required rate. Screw feeders are regularly provided with shrouded or curved cover plates for a short distance beyond the end of the inlet opening, to obtain feed regulation. As the pitch or diameter increases beyond the shroud the level of the material in the conveyor drops to normal loading levels. Longer shrouds, extra short pitch screws and other modifications are occasionally required to reduce flushing of very free flowing material along the feeder screw.

Feeders are made in two general types: Type 1 with regular pitch flighting and Type 2 with short pitch flighting. Both types are also available with uniform diameter and tapering diameter screws. The various combinations are shown on pages H-34–H-35. Screw feeders with uniform screws, Types 1B, 1D, 2B, 2D are regularly used for handling fine free flowing materials. Since the diameter of the screw is uniform, the feed of the material will be from the foreport of the inlet and not across the entire length. Where hoppers, bins, tanks, etc. are to be completely emptied, or dead areas of material over the inlet are not objectionable, this type of feeder is entirely satisfactory, as well as economical. Screw feeders with tapering diameter screws will readily handle materials containing a fair percentage of lumps. In addition, they are used extensively where it is necessary or desirable to draw the material uniformly across the entire length of the inlet opening to eliminate inert or dead areas of material at the forepart of the opening. Types 1A, 1C, 2A, and 2C fall into this category. Variable pitch screws can be used in place of tapering diameter screws for some applications. They consist of screws with succeeding sectional flights increasing progressively in pitch. The portion of the screw with the smaller pitch is located under the inlet opening.

Screw feeders with extended screw conveyors are necessary when intermediate hangers are required, or when it is necessary to convey the material for some distance. A screw conveyor of larger diameter than the feeder screw is combined with the feeder to make the extension. See types 1C, 1D, 2C, 2D.

Multiple screw feeders are usually in flat bottom bins for discharging material which have a tendency to pack or bridge under pressure. Frequently, the entire bin bottom is provided with these feeders which convey the material to collecting conveyors. Such arrangements are commonly used for handling hogged fuel, wood shavings, etc.

Screw feeders are available in a variety of types to suit specific materials and applications. We recommend that you contact our Engineering Department for design information.

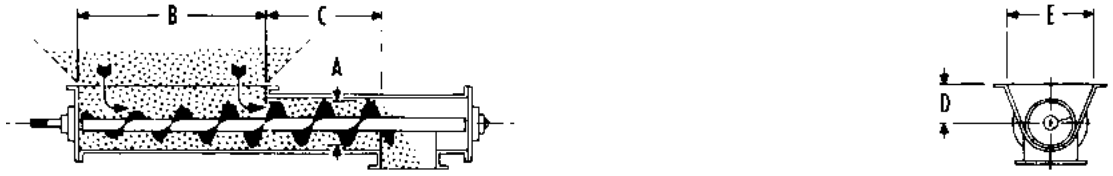
Screw Feeders

(For Inclined Applications Consult Factory)

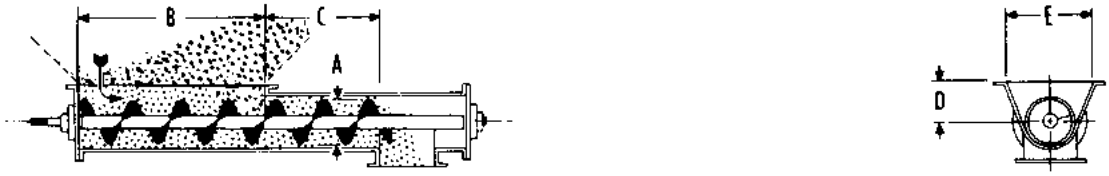
Typical Type 1

Feeder Type	Inlet Opening	Material Removal	Pitch	Feeder Screw Diameter	Extended Screw
SF1A	Standard	Uniform Full Length of Inlet Opening	Standard	Tapered	None
SF1B	Standard	Forepart Only of Inlet Opening	Standard	Uniform	None
SF1C	Standard	Uniform Full Length of Inlet Opening	Standard	Tapered	As Required
SF1D	Standard	Forepart Only of Inlet Opening	Standard	Uniform	As Required

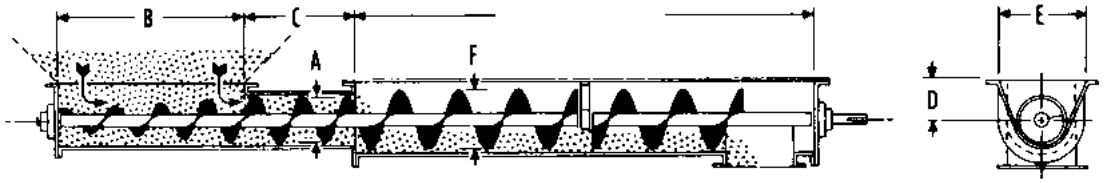
SF1A



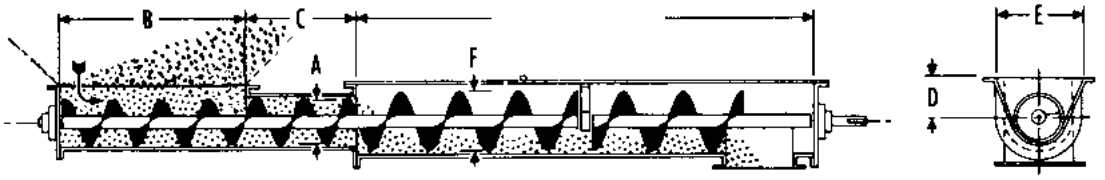
SF1B



SF1C



SF1D



Feeder Diameter A	Maximum Lump Size	Maximum Speed RPM	Capacity Cubic Feet per Hour		B	C	D	E	Extended Screw Diameter F		
			At One RPM	At Maximum RPM					Trough Loading %		
									15	30	45
6	¾"	70	4.8	336	36	12	7	14	12	9	9
9	1½"	65	17	1105	42	18	9	18	18	14	12
12	2"	60	44	2640	48	24	10	22	24	18	16
14	2½"	55	68	3740	54	28	11	24		20	18
16	3"	50	104	5200	56	32	11½	28		24	20
18	3"	45	150	6750	58	36	12⅛	31			24
20	3½"	40	208	8320	60	40	13½	34			
24	4"	30	340	10200	64	48	16½	40			

*Consult factory if inlet exceeds these lengths.

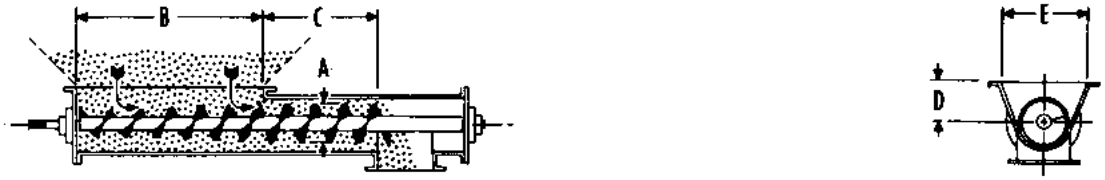
Screw Feeders

(For Inclined Applications Consult Factory)

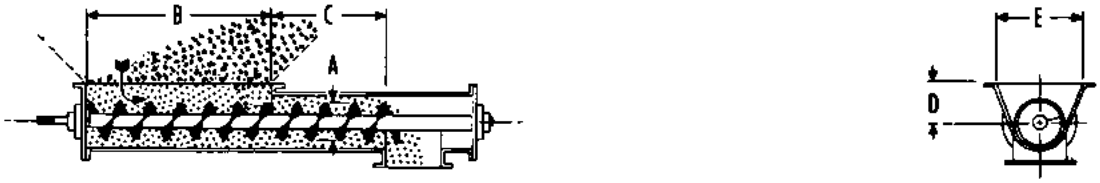
Typical Type 2

Feeder Type	Inlet Opening	Material Removal	Pitch	Feeder Screw Diameter	Extended Screw
SF2A	Long	Uniform Full Length of Inlet Opening	Short (⅔)	Tapered	None
SF2B	Long	Forepart Only of Inlet Opening	Short (⅔)	Uniform	None
SF2C	Long	Uniform Full Length of Inlet Opening	Short (⅔)	Tapered	As Required
SF2D	Long	Forepart Only of Inlet Opening	Short (⅔)	Uniform	As Required

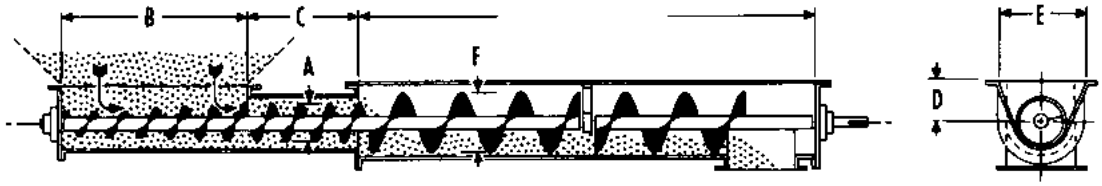
SF2A



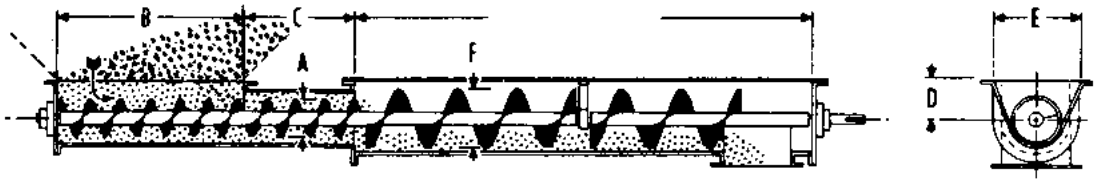
SF2B



SF2C



SF2D



Feeder Diameter A	Maximum Lump Size	Maximum Speed RPM	Capacity Cubic Feet per Hour		B	C	D	E	Extended Screw Diameter F		
			At One RPM	At Maximum RPM					Trough Loading %		
									15	30	45
6	½″	70	3.1	217	60	18	7	14	10	9	9
9	¾″	65	11	715	66	26	9	18	14	12	10
12	1″	60	29	1740	72	36	10	22	20	16	14
14	1¼″	55	44	2420	76	42	11	24	24	18	16
16	1½″	50	68	3400	78	48	11½	28		20	18
18	1¾″	45	99	4455	80	54	12⅛	31		24	20
20	2″	40	137	5480	82	60	13½	34			24
24	2½″	30	224	6720	86	72	16½	40			

SECTION II

DESIGN AND LAYOUT SECTION II

Click on the page number to go to that page

Classes of Enclosures

Conveyors can be designed to protect the material being handled from a hazardous surrounding or to protect the surroundings from a hazardous material being conveyed.

This section establishes recommended classes of construction for conveyor enclosures — without regard to their end use or application. These several classes call for specific things to be done to a standard conveyor housing to provide several degrees of enclosure protection.

Enclosure Classifications

Class IE — Class IE enclosures are those provided primarily for the protection of operating personnel or equipment, or where the enclosure forms an integral or functional part of the conveyor or structure. They are generally used where dust control is not a factor or where protection for, or against, the material being handled is not necessary — although as convey- or enclosures a certain amount or protection is afforded.

Class IIE — Class IIE enclosures employ constructions which provide some measure of protection against dust or for, or against, the material being handled.

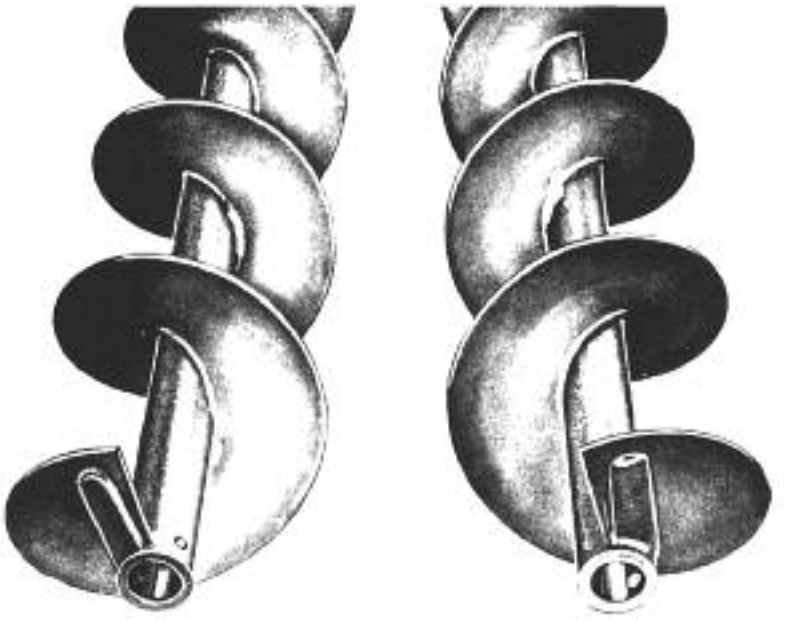
Class IIIE — Class IIIE enclosures employ constructions which provide a higher degree of protection in these classes against dust, and for or against the material being handled.

Class IVE — Class IVE enclosures are for outdoor applications and under normal circumstances provide for the exclusion of water from the inside of the casing. They are not to be construed as being water-tight, as this may not always be the case.

When more than one method of fabrication is shown, either is acceptable.

Enclosure Construction

Component Classification	Enclosure Classifications			
	I E	II E	III E	IV E
A. TROUGH CONSTRUCTION				
Formed & Angle Top Flange				
1. Plate type end flange				
a. Continuous arc weld	X	X	X	X
b. Continuous arc weld on top of end flange and trough top rail	X	X	X	X
2. Trough Top Rail Angles				
(Angle Top trough only)				
a. Staggered intermittent arc and spot weld	X			
b. Continuous arc weld on top leg of angle on inside of trough and intermittent arc weld on lower leg of angle to outside of trough		X	X	X
c. Staggered intermittent arc weld on top leg of angle on inside of trough and intermittent arc weld on lower leg of angle to outside of trough, or spot weld when mastic is used between leg of angle and trough sheet		X	X	X
B. COVER CONSTRUCTION				
1. Plain flat				
a. Only butted when hanger is at cover joint	X			
b. Lapped when hanger is not at cover joint	X			
2. Semi-Flanged				
a. Only butted when hanger is at cover joint	X	X	X	X
b. Lapped when hanger is not at cover joint	X			
c. With buttstrap when hanger is not at cover joint		X	X	X
3. Flanged				
a. Only butted when hanger is at cover joint		X	X	X
b. Buttstrap when hanger is not at cover joint		X	X	X
4. Hip Roof				
a. Ends with a buttstrap connection				X
C. COVER FASTENERS FOR STANDARD GA. COVERS				
1. Spring, screw or toggle clamp fasteners or bolted construction*				
a. Max. spacing plain flat covers	60″			
b. Max. spacing semi-flanged covers	60″	30″	18″	18″
c. Max. spacing flanged and hip-roof covers		40″	24″	24″
D. GASKETS				
1. Covers				
a. Red rubber or felt up to 230° F		X	X	
b. Neoprene rubber, when contamination is a problem		X	X	
c. Closed cell foam type elastic material to suit temperature rating of gasket		X	X	X
2. Trough End flanges				
a. Mastic type compounds		X	X	X
b. Red rubber up to 230° F		X	X	X
c. Neoprene rubber, when contamination is a problem		X	X	
d. Closed cell foam type elastic material to suit temperature rating of gasket		X	X	X
E. TROUGH END SHAFT SEALS*				
1. When handling non-abrasive materials			X	X
2. When handling abrasive materials	X	X	X	X
*Lip type seals for non-abrasive materials				
Felt type for mildly abrasive materials				
Waste type for highly abrasive materials				
Waste type for moderately abrassive				
Air purged Martin Super Pac for extremely abrasive				
Bulk Heads may be required for abrasive & hot materials				
NOTE: CHECK MATERIAL TEMPERATURE.				



Right and Left Hand Screws

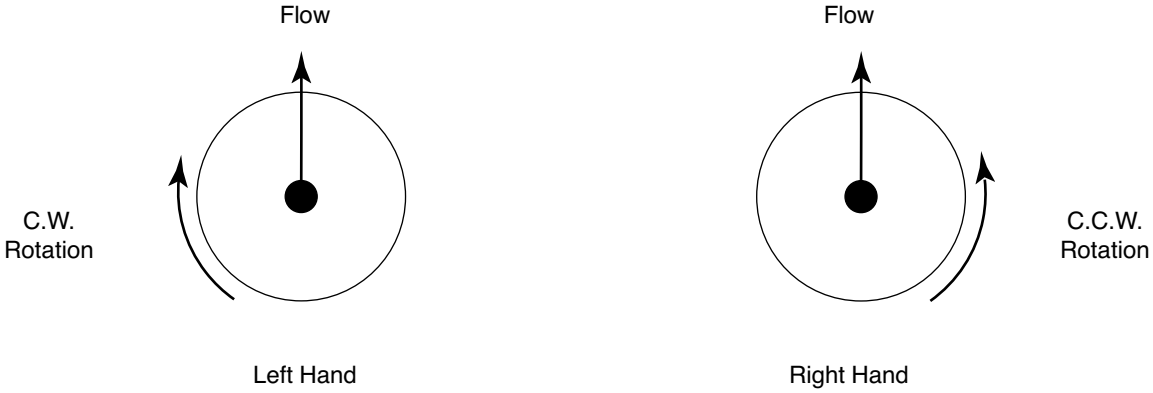
A conveyor screw is either right hand or left hand depending on the form of the helix. The hand of the screw is easily determined by looking at the end of the screw.

The screw pictured to the left has the flight helix wrapped around the pipe in a counter-clockwise direction, or to your left. Same as left hand threads on a bolt. This is arbitrarily termed a LEFT hand screw.

The screw pictured to the right has the flight helix wrapped around the pipe in a clockwise direction, or to your right. Same as right hand threads on a bolt. This is termed a RIGHT hand screw.

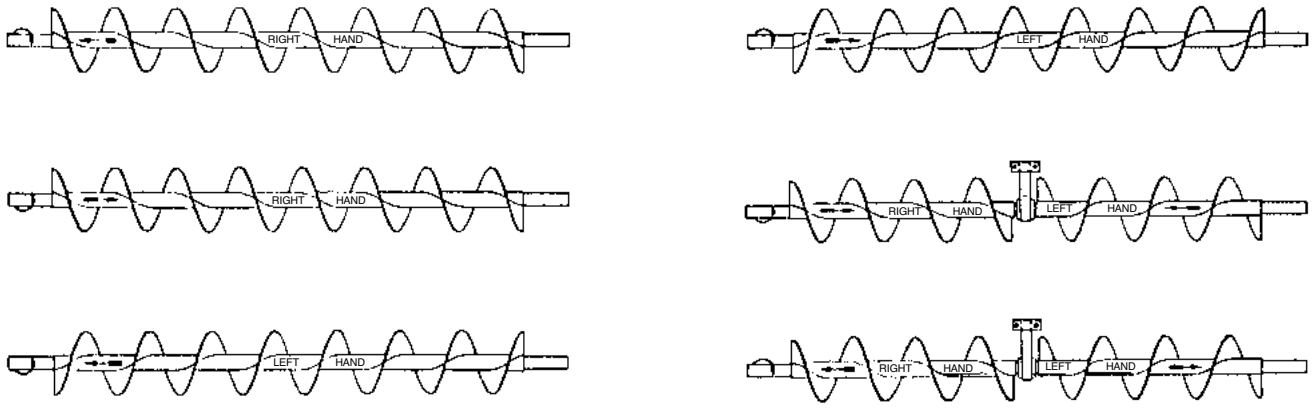
A conveyor screw viewed from either end will show the same configuration. If the end of the conveyor screw is not readily visible, then by merely imagining that the flighting has been cut, with the cut end exposed, the hand of the screw may be easily determined.

Conveyor Screw Rotation



The above diagrams are a simple means of determining screw rotation. When the material flow is in the direction away from the end being viewed, a R.H. screw will turn counter clockwise and a L.H. screw will turn clockwise rotation as shown by the arrows.

Conveyor Screw Rotation



The above diagram indicates the hand of conveyor screw to use when direction of rotation and material flow are known.

Special Screw Conveyor Continuous Weld Finishes

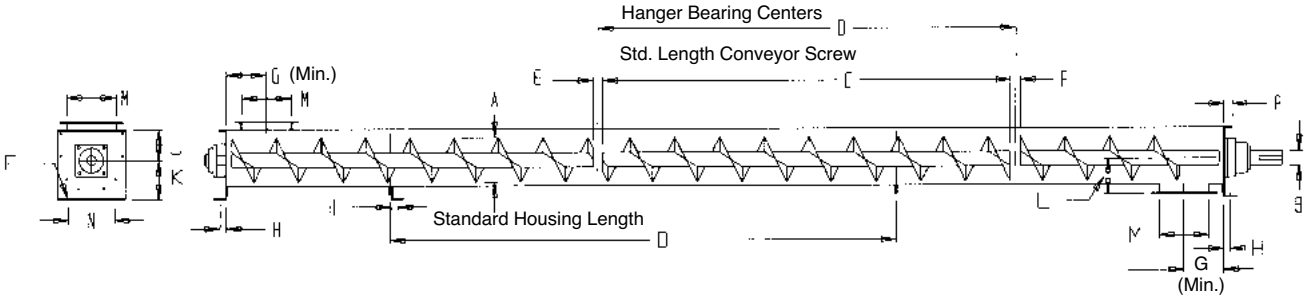
Specifications on screw conveyor occasionally include the term “grind smooth” when referring to the finish on continuous welds. This specification is usually used for stainless steel, but occasionally it will appear in carbon steel specifications as well.

“Grind smooth” is a general term and subject to various interpretations. This Table establishes recommended classes of finishes, which should be used to help find the class required for an application.

Operation	Weld Finishes			
	I	II	III	IV
Weld spatter and slag removed	X	X	X	X
Rough grind welds to remove heavy weld ripple or unusual roughness (Equivalent to a 40-50 grit finish)		X		
Medium grind welds — leaving some pits and crevices (Equivalent to a 80-100 grit finish)			X	
Fine grind welds — no pits or crevices permissible (Equivalent to a 140-150 grit finish)				X

* Martin IV Finish: CEMA IV welds, polish pipe & flights to 140-150 grit finish.
* Martin IV Polish: Same as above plus Scotch-Brite Finish.

Trough

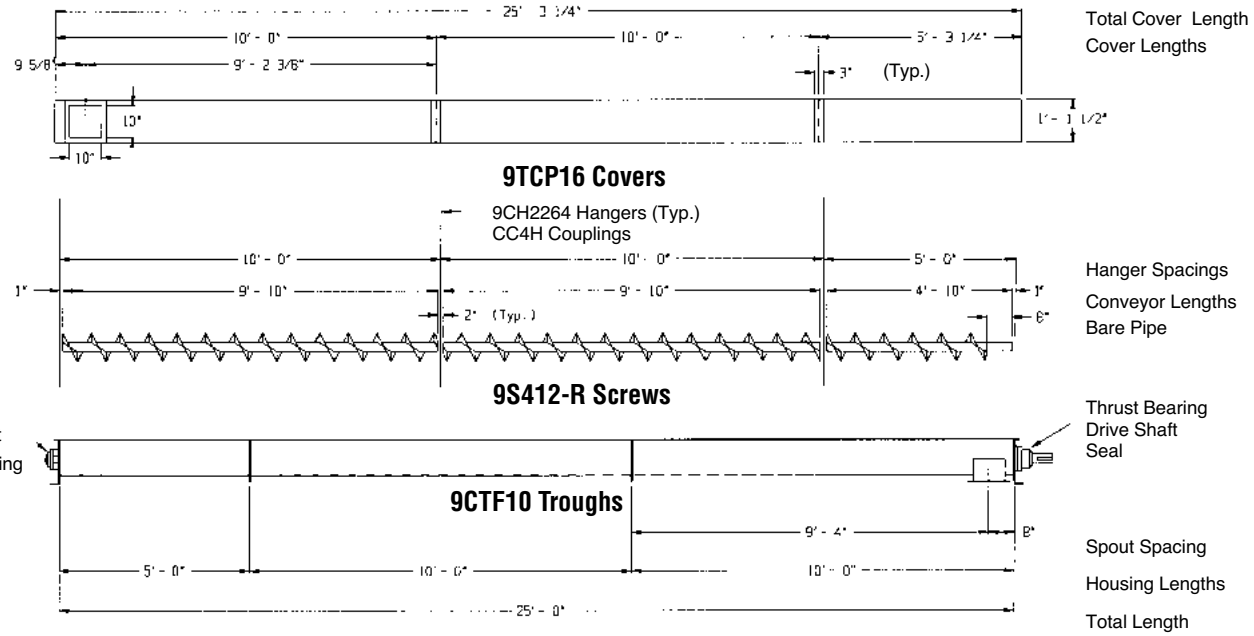


A Screw Diameter	B Coupling Diameter	C Length	D Length	E	F	G (Min.)	H	J	K	L	M	N	P	R
4	1	9-10½	10	1½	⅜	4½	⅞	3⅝	4⅝	3¾	5	5¾	1⁷⁄₁₆	1
6	1½	9-10	10	2	⅜	6	¹³⁄₁₆	4½	5⅝	5	7	8⅛	1½	1
9	1½ 2	9-10	10	2	½	8	1⁵⁄₁₆	6⅛	7⅛	7⅛	10	9⅜	1⅝	1½
10	1½ 2	9-10	10	2	½	9	1⁹⁄₁₆	6⅜	8⅛	7⅛	11	9½	1¾	1¾
12	2 2⁷⁄₁₆ 3	11-10 11-9 11-9	12	2 3 3	⅝	10½	1⅜	7¾	9⅝	8⅞	13	12¼	2	1⅝
14	2⁷⁄₁₆ 3	11-9	12	3	⅝	11½	1⅜	9¼	10⅞	10⅛	15	13½	2	1⅝
16	3	11-9	12	3	⅝	13½	1¾	10⅝	12	11⅛	17	14⅞	2½	2
18	3 3⁷⁄₁₆	11-9 11-8	12	3 4	⅝	14½	1¾	12⅛	13⅜	12⅜	19	16	2½	2
20	3 3⁷⁄₁₆	11-9 11-8	12	3 4	¾	15½	2	13½	15	13⅜	21	19¼	2½	2¼
24	3⁷⁄₁₆	11-8	12	4	¾	17½	2¼	16½	18⅛	15⅜	25	20	2½	2½

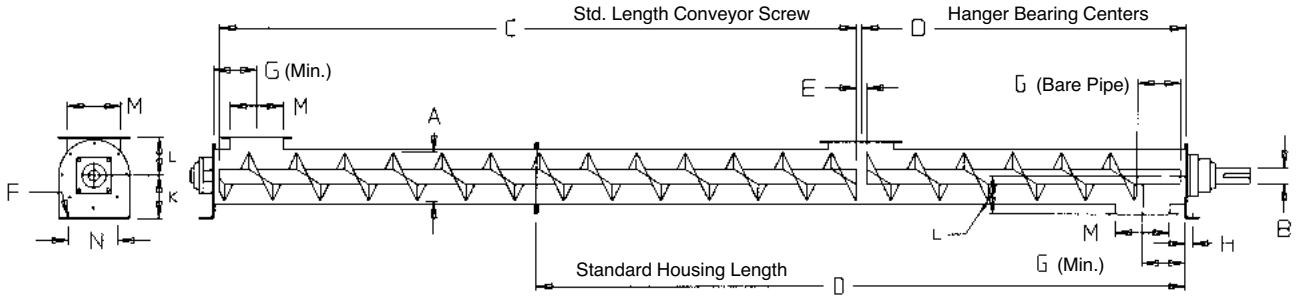
Screw clearance at trough end is one half of dimension E

Typical Method of Detailing

9″ × 2″ × 25′-0″ Conveyor



Tubular Housing

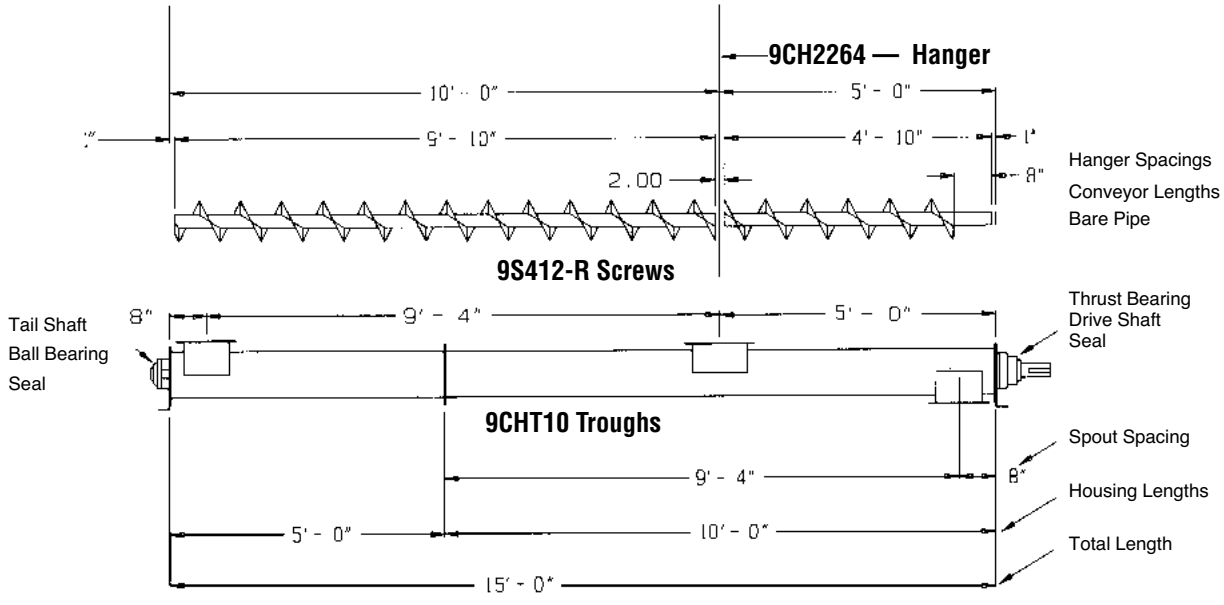


A Screw Dia.	B Coupling Dia.	C Length	D Length	E	F	G (Min.)	H	J	K	L	M	N	P	R
4	1	9-10½	10	1½	⅜	4½	⅞	3⅝	4⅝	3¾	5	5¾	1⁷⁄₁₆	1
6	1½	9-10	10	2	⅜	6	¹³⁄₁₆	4½	5⅝	5	7	8⅛	1½	1
9	1½ 2	9-10	10	2	½	8	1⁵⁄₁₆	6⅛	7⅛	7⅛	10	9⅜	1⅝	1½
10	1½ 2	9-10	10	2	½	9	1⁹⁄₁₆	6⅜	8⅛	7⅛	11	9½	1¾	1¾
12	2 2⁷⁄₁₆ 3	11-10 11-9 11-9	12	2 3 3	⅝	10½	1⅜	7¾	9⅝	8⅞	13	12¼	2	1⅝
14	2⁷⁄₁₆ 3	11-9	12	3	⅝	11½	1⅜	9¼	10⅞	10⅛	15	13½	2	1⅝
16	3	11-9	12	3	⅝	13½	1¾	10⅝	12	11⅛	17	14⅞	2½	2
18	3 3⁷⁄₁₆	11-9 11-8	12	3 4	⅝	14½	1¾	12⅛	13⅜	12⅜	19	16	2½	2
20	3 3⁷⁄₁₆	11-9 11-8	12	3 4	¾	15½	2	13½	15	13⅜	21	19¼	2½	2¼
24	3⁷⁄₁₆	11-8	12	4	¾	17½	2¼	16½	18⅛	15⅜	25	20	2½	2½

Screw clearance at trough end is one half of dimension E

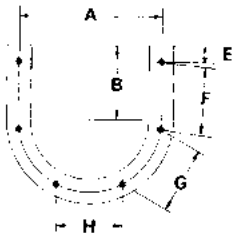
Typical Method of Detailing

9″ × 2″ × 15′-0″ Conveyor

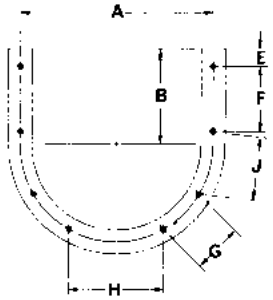


Bolt Patterns

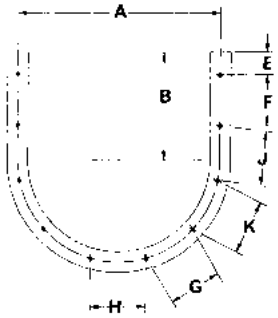
U-Trough End Flanges



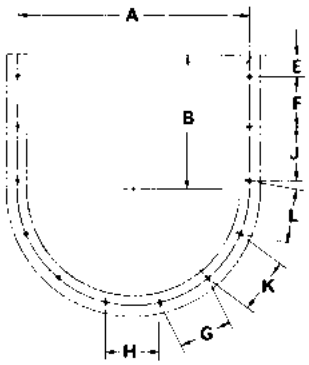
6 Bolts



8 Bolts



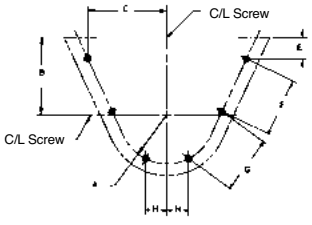
10 Bolts



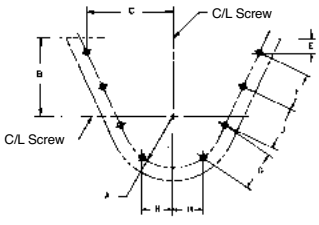
12 Bolts

Screw Diameter	Bolts		A	B	E	F	G	H	J	K	L
	Number	Diameter									
4	6	⅜	7	3⅜	1⅛	3⅛	3⅛	3⅛	X	X	X
6	6	⅜	8⅞	4½	1 1/32	4⅛	4 1/16	4 1/16	X	X	X
9	8	⅜	12½	6⅛	1 3/16	4⅛	3¾	5⅛	4⅛	X	X
10	8	⅜	13¼	6⅜	2¼	3½	4 3/16	5 1/16	4⅛	X	X
12	8	½	15⅞	7¾	1½	5 5/16	4 1/16	7¾	5 3/16	X	X
14	8	½	17⅞	9¼	2 17/32	5⅝	5 15/16	6	5 15/16	X	X
16	8	⅝	20	10⅝	2⅝	6⅜	6⅝	7½	6⅝	X	X
18	10	⅝	22	12⅛	2 23/32	5 15/16	5⅞	5⅞	5⅞	5⅞	X
20	10	⅝	24⅜	13½	2 25/32	6¼	6 1/16	6 1/16	6 1/16	6 1/16	X
24	12	⅝	28½	16½	2 25/32	6⅛	6⅝	6⅝	6⅝	6⅝	6⅝

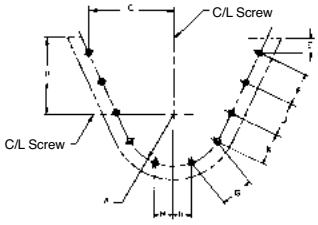
Flared Trough End Flanges



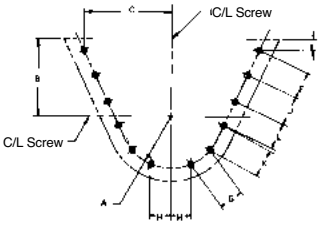
6 Bolts



8 Bolts



10 Bolts

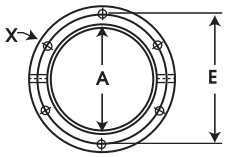


12 Bolts

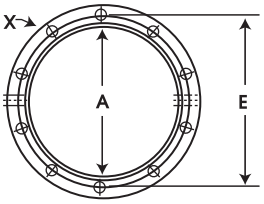
Screw Diameter Inches	Bolts		A	B	C	E	F	G	H	J	K	L
	Diameter Number	Holes	Inches									
6	⅜	6	4 7/16	7	7 3/16	1 27/32	5¼	5¼	2 1/32	—	—	—
9	⅜	8	6¼	9	9 21/32	1 43/64	5	5	2 9/16	5	—	—
12	½	8	7 15/16	10	11 13/16	1 13/16	5¾	5¾	3⅞	5¾	—	—
14	½	10	8 15/16	11	12 49/64	2 1/16	5⅛	5⅛	3	5⅛	5⅛	—
16	⅝	10	10	11½	14 1/16	2 15/64	5½	5½	3¾	5½	5½	—
18	⅝	10	11	12⅛	16	2⅝	6 3/16	6 3/16	2 15/16	6 3/16	6 3/16	—
20	⅝	10	12 3/16	13½	17⅞	2 9/32	7	7	3 1/32	7	7	—
24	⅝	12	14¼	16½	20 61/64	2 5/16	6⅞	6⅞	3 5/16	6⅞	6⅞	6⅞

Bolt Patterns

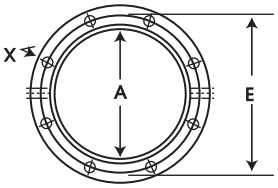
Tubular Housing Flanges



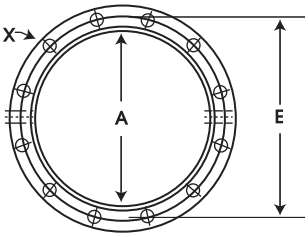
6 bolts



10 bolts

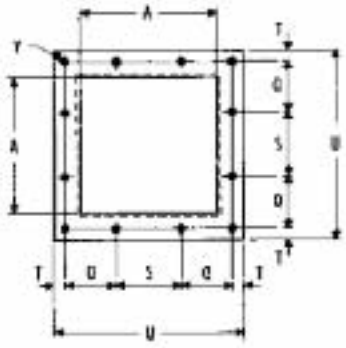


8 bolts

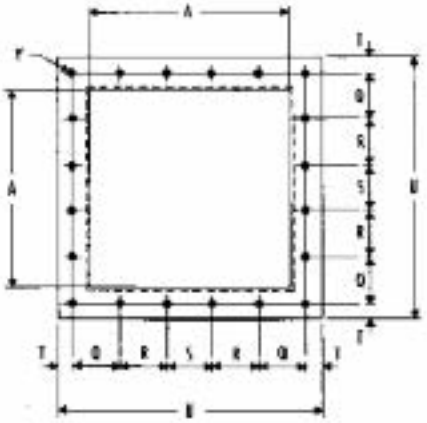


12 bolts

Intake & Discharge Flanges



12 bolts



20 bolts

Screw Size	Flange Bolts		A	E	Q	R	S	T	U
	Tubular X	Discharge Y							
4	6--⅜	12--¼	5	7	2¼	—	2¼	⅜	7½
6	8--⅜	12--⅜	7	8⅞	2 13/16	—	3	11/16	10
9	8--⅜	12--⅜	10	11⅞	4	—	4	½	13
10	8--⅜	12--⅜	11	13¼	4 5/16	—	4⅜	⅝	14¼
12	8--½	12--⅜	13	15	5⅛	—	5¼	⅞	17¼
14	8--½	20--⅜	15	17	3½	3½	3½	⅞	19¼
16	8--⅝	20--⅜	17	19½	3¾	4	4	⅞	21¼
18	10--⅝	20--½	19	22	4 7/16	4⅜	4⅜	1⅛	24¼
20	10--⅝	20--½	21	24⅜	4⅞	4¾	4¾	1⅛	26¼
24	12--⅝	20--½	25	28½	5⅝	5⅝	5½	1⅛	30¼

Bolt Requirements Related to Conveyor Trough Sizes										
Part Name	**4**	**6**	**9**	**10**	**12**	**14**	**16**	**18**	**20**	**24**
Flange, Trough	6-⅜ × 1	6-⅜ × 1	8-⅜ × 1	8-⅜ × 1	8-½ × 1¼	8-½ × 1¼	8-⅝ × 1½	10-⅝ × 1½	10-⅝ ×1½	12-⅝ × 1½
Flange, Tubular Housing	6-⅜ × 1	8-⅜ × 1	8-⅜ × 1	8-⅜ × 1	8-½ × 1¼	8-½ × 1¼	8-⅝ × 1½	10-⅝ × 1½	10-⅝ × 1½	12-⅝ × 1½
Ends, Trough										
Inside	6-¼ ×¾	6-5⁄16 ×¾	8-⅜ × 1	8-⅜ × 1	8-½ × 1	8-½ × 1¼	8-⅝ × 1¼	10-⅝ × 1¼	10-⅝ × 1½	12-⅝ × 1½
Inside Discharge	2-¼ ×¾	2-5⁄16 ×¾	4-⅜ × 1	4-⅜ × 1	4-½ × 1	4-½ × 1¼	4-⅝ × 1¼	4-⅝ × 1½	4-⅝ × 1½	6-⅝ × 1½
Inside Rectangular	5-¼ ×¾	6-5⁄16 ×¾	8-⅜ × 1	8-⅜ × 1	10-½ × 1	11-½ × 1¼	12-⅝ × 1¼	12-⅝ × 1¼	12-⅝ × 1½	12-⅝ × 1½
Outside Type	6-⅜ × 1	6-⅜ × 1	8-⅜ × 1	8-⅜ × 1	8-½ × 1¼	8-½ × 1¼	8-⅝ × 1½	10-⅝ × 1½	10-⅝ × 1½	12-⅝ × 1½
Outside Discharge	2-⅜ × 1	2-⅜ × 1	4-⅜ × 1	4-⅜ × 1	4-½ × 1¼	4-½ × 1¼	4-⅝ × 1½	4-⅝ × 1½	4-⅝ × 1½	6-⅝ × 1½
Ends, Tubular Housing	6-⅜ × 1	8-⅜ × 1	8-⅜ × 1	8-⅜ × 1	8-½ × 1¼	8-½ × 1¼	8-⅝ × 1½	10-⅝ × 1½	10-⅝ × 1½	12-⅝ × 1½
Hanger, Trough										
Style 60		2-½ × 2	2-½ × 2	2-½ × 2	2-½ × 2½	2-½ × 2½	2-⅝ × 2¾	2-⅝ × 2¾	2-⅝ × 2¾	
Style 70		4-⅜ × 1	4-⅜ × 1¼	4-⅜ × 1¼	4-½ × 1½	4-½ × 1½	4-½ × 1½	4-½ × 1¾	4-⅝ × 2	
Style 216		4-⅜ × 1¼	4-⅜ × 1¼	4-⅜ × 1¼	4-½ × 1½	4-½ × 1½	4-½ × 1½	4-⅝ × 1¾	4-⅝ × 2	4-⅝ × 2½
Style 220	4-¼ × 1	4-⅜ × 1	4-⅜ × 1	4-⅜ × 1	4-½ × 1¼	4-½ × 1½	4-½ × 1½	4-⅝ × 1¾	4-⅝ × 1¾	4-⅝ × 1¾
Style 226	4-¼ × 1	4-⅜ × 1¼	4-⅜ × 1¼	4-⅜ × 1¼	4-½ × 1½	4-½ × 1½	4-½ × 1½	4-⅝ × 1¾	4-⅝ × 2	4-⅝ × 2½
Style 230		4-⅜ × 1	4-⅜ × 1	4-⅜ × 1	4-½ × 1¼	4-½ × 1½	4-½ × 1½	4-⅝ × 1¾	4-⅝ × 1¾	4-⅝ × 1¾
Style 316	4-¼ × 1	4-⅜ × 1	4-⅜ × 1	4-⅜ × 1	4-½ × 1½	4-½ × 1¼	4-½ × 1¼	4-⅝ × 1½	4-⅝ × 1½	4-⅝ × 1½
Style 326	4-¼ × 1	4-⅜ × 1	4-⅜ × 1	4-⅜ × 1	4-½ × 1¼	4-½ × 1¼	4-½ × 1¼	5-⅝ × 1½	4-⅝ × 1½	4-⅝ × 1½
Covers, Trough (Std. 10 ft.)	10-5⁄16 × ¾	10-5⁄16 × ¾	10-5⁄16 × ¾	10-5⁄16 × ¾	10-5⁄16 × ¾	10-5⁄16 × ¾	10-5⁄16 × ¾	10-5⁄16 × ¾	10-5⁄16 × ¾	10-5⁄16 × ¾
Saddle — Feet										
Flanged Feet	2-⅜ × 1¼	2-⅜ × 1¼	2-⅜ × 1¼	2-⅜ × 1¼	2-½ × 1½	2-½ × 1½	2-⅝ × 1¾	2-⅝ × 1¾	2-⅝ × 1¾	2-⅝ × 1¾
Saddle	2-¼ × 1	2-¼ × 1	2-⅜ × 1	2-⅜ × 1	2-½ × 1¼	2-½ × 1¼	2-½ × 1¼	2-⅝ × 1¼	2-⅝ × 1¼	2-⅝ × 1¼
Spouts, Discharge										
Attaching Bolts	8-⅜ × 1½	8-⅜ × 1½	8-⅜ × 1½	8-⅜ × 1½	8-⅜ × 1½	12-⅜ × 1½	12-⅜ × 1½	12-½ × 1½	12-½ × 1½	12-½ × 1½
Flange	12-⅜ × 1	12-⅜ × 1	12-⅜ × 1	12-⅜ × 1	12-⅜ × 1	20-⅜ × 1	20-⅜ × 1	20-½ × 1	20-½ × 1	20-½ × 1
Flange w/Slide	10-⅜ × 1	10-⅜ × 1	10-⅜ × 1	10-⅜ × 1	10-⅜ × 1	16-⅜ × 1	16-⅜ × 1	16-½ × 1¼	16-½ × 1¼	16-½ × 1¼

All bolts hex head cap screws with hex nuts and lock washers.

Bolt Requirements Related to Shaft Coupling Sizes						
Part Name	**1**	**1½**	**2**	**2 7/16**	**3**	**3 3/16**
Bearings, End						
Discharge Bronze	3-⅜ × 1¼	3-½ × 1½	3-⅝ × 1¾ 3-⅝ × 1¾	3-¾ × 2	3-¾ × 2¼	
Discharge Ball	3-⅜ × 1¼	3-½ × 1½	3-⅝ × 1½ 3-⅝ × 1¾	3-¾ × 2	3-¾ × 2¼	
Flanged Bronze	4-⅜ × 1¼	4-½ × 1½	4-⅝ × 1¾ 4-⅝ × 1¾	4-¾ × 2	4-¾ × 2¼	
Flanged Ball	4-⅜ × 1¼	4-½ × 1½	4-⅝ × 1½ 4-⅝ × 1¾	4-¾ × 2	4-¾ × 2¼	
Flanged Roller		4-½ × 2	4-½ × 2¼ 4-⅝ × 2½	4-¾× 2¾	4-¾ × 3¼	
Pillow Block Bronze	2-⅜ × 1½	2-½ × 1¾	2-⅝ × 2 2-⅝ × 2¼	2-¾ × 2½	2-⅞ × 2¾	
Pillow Block Ball	2-⅜ × 1¾	2-½ × 2¼	2-⅝ × 2½ 2-⅝× 2¾	2-⅞ × 3½	2-⅞ × 3¾	
Pillow Block, Roller		2-½ × 2¼	2-⅝ × 2½ 2-⅝ × 2¾	2-¾ × 3	2-⅞ × 3½	
Bearings, Thrust						
Type “E” Roller		4-½ × 2¾	4-½ ×2¾ 4-⅝ × 3¼	4-¾ × 3½	4-¾ × 3¾	
Coupling Bolts	⅜ × 2 1/16	½ × 3	⅝ × 3⅝ ⅝ × 4⅜		¾ × 5-3½″ Pipe ⅞ × 5½ ¾ × 5½-4″ Pipe	
Seals, Shafts						
Flanged Gland		4-½ × 1½	4-⅝ × 1½ 4-⅝ × 1½	4-¾ × 1¾	4-¾ × 1¾	
Plate w/Ball or Bronze		4-½ × 2	4-⅝ × 2¼ 4-⅝ × 2¼	4-¾ × 2¾	4-¾ × 3	
Plate w/Roller		4-½ × 2½	4-½ × 2¾ 4-⅝ × 3	4-¾ × 3¼	4-¾ × 3½	
Split Gland		2-½ × 1½	2-½ × 1½ 2-⅝ × 1¾	2-⅝ × 1¾	2-¾ × 2¼	
Waste Pack, w/Ball or Bronze		4-½ × 3¼	4-⅝ × 3½ 4-⅝ × 3¾	4-¾ × 4	4-¾ × 4¾	
Waste Pack, w/Roller		4-½ × 3¾	4-½ × 4 4-⅝ × 4	4-¾ × 4¼	4-¾ × 4½	

*See page H-86 for special coupling bolts.
All other bolts hex head cap screws with hex nuts and lock washers.

Pipe Sizes, Dimensions and Weights

Nominal Pipe Size Inches	Outside Diameter Inches	I.P.S. Schedule	Wall Inches	Inside Diameter Inches	Wt./Ft. Pounds
⅛	.405	10S	.049	.307	.1863
		40 40S Est	.068	.269	.2447
		80 80S Ex. Hvy.	.095	.215	.3145
¼	.540	10S	.065	.410	.3297
		40 40S Est.	.088	.364	.4248
		80 80S Ex. Hvy.	.119	.302	.5351
⅜	.675	10S	.065	.545	.4235
		40 40S Std.	.091	.493	.5676
		80 80S Ex. Hvy.	.126	.423	.7388
½	.840	5S	.065	.710	.5383
		10S	.083	.674	.6710
		40 40S Est.	.109	.622	.8510
		80 80S Ex. Hvy.	.147	.546	1.088
		160	.187	.466	1.304
		XX Hvy.	.294	.252	1.714
¾	1.050	5S	.065	.920	.6838
		10S	.083	.884	.8572
		40 40S Std.	.113	.824	1.131
		80 80S Ex. Hvy.	.154	.742	1.474
		160	.218	.614	1.937
		XX Hvy.	.308	.434	2.441
1	1.315	5S	.065	1.185	.8678
		10S	.109	1.097	1.404
		40 40S Std.	.133	1.049	1.679
		80 80S Ex. Hvy.	.179	.957	2.172
		160	.250	.815	2.844
		XX Hvy.	.358	.599	3.659
1¼	1.660	5S	.065	1.530	1.107
		10S	.109	1.442	1.806
		40 40S Std.	.140	1.380	2.273
		80 80S Ex. Hvy.	.191	1.278	2.997
		160	.250	1.160	3.765
		XX Hvy.	.382	.896	5.214
1½	1.900	5S	.065	1.770	1.274
		10S	.109	1.682	2.085
		40 40S Std.	.145	1.610	2.718
		80 80S Ex. Hvy.	.200	1.500	3.631
		160	.281	1.338	4.859
		XX Hvy.	.400	1.100	6.408
2	2.375	5S	.065	2.245	1.604
		10S	.109	2.157	2.638
		40 40S Std.	.154	2.067	3.653
		80 80S Ex. Hvy.	.218	1.939	5.022
		160	.343	1.689	7.444
		XX Hvy.	.436	1.503	9.029
2½	2.875	5S	.083	2.709	2.475
		10S	.120	2.635	3.531
		40 40S Std.	.203	2.469	5.793
		80 80S Ex. Hvy.	.276	2.323	7.661
		160	.375	2.125	10.01
		XX Hvy.	.552	1.771	13.69
3	3.500	5S	.083	3.334	3.029
		10S	.120	3.260	4.332
		40 40S Est.	.216	3.068	7.576
		80 80S Ex. Hvy.	.300	2.900	10.25
		160	.438	2.624	14.32
		XX Hvy.	.600	2.300	18.58
3½	4.000	5S	.083	3.834	3.472
		10S	.120	3.760	4.973
		40 40S Std.	.226	3.548	9.109
		80 80S Ex. Hvy.	.318	3.364	12.50
4	4.500	5S	.083	4.334	3.915
		10S	.120	4.260	5.613
		40 40S Est.	.237	4.026	10.79
		80 80S Ex. Hvy.	.337	3.826	14.98
		120	.438	3.624	19.00
		160	.531	3.438	22.51
		XX Hvy.	.674	3.152	27.54
5	5.563	5S	.109	5.345	6.349
		10S	.134	5.295	7.770
		40 40S Est.	.258	5.047	14.62
		80 80S Ex. Hvy.	.375	4.813	20.78
		120	.500	4.563	27.04
		160	.625	4.313	32.96
		XX Hvy.	.750	4.063	38.55
6	6.625	5S	.109	6.407	7.585
		10S	.134	6.357	9.289
		40 40S Std.	.280	6.065	18.97
		80 80S Ex. Hvy.	.432	5.761	28.57
		120	.562	5.491	36.39
		160	.718	5.189	45.30
		XX Hvy.	.864	4.897	53.16
8	8.625	5S	.109	8.407	9.914
		10S	.148	8.329	13.40
		20	.250	8.125	22.36
		30	.277	8.071	24.70
		40 40S Est.	.322	7.981	28.55
		60	.406	7.813	35.64
		80 80S Ex. Hvy.	.500	7.625	43.39
		100	.593	7.439	50.87
		120	.718	7.189	60.63
		140	.812	7.001	67.76
		XX Hvy.	.875	6.875	72.42
		160	.906	6.813	74.69
10	10.750	5S	.134	10.482	15.19
		10S	.165	10.420	18.70
		20	.250	10.250	28.04
		30	.307	10.136	34.24
		40 40S Std.	.365	10.020	40.48
		60 80S Ex. Hvy.	.500	9.750	54.74
		80	.593	9.564	64.33
		100	.718	9.224	76.93
		120	.843	9.064	89.20
		140	1.000	8.750	104.1
		160	1.125	8.500	115.7

NOTE:
Weights shown are in pounds per foot, based on the average wall of the pipe. The following formula was used in calculating the weight per foot.

W = 10.68 (D — t)t
W = Weight in pounds per foot (to 4 digits)
D = Outside Diameter in inches (to 3 decimal places)
t = Wall thickness in decimals (to 3 decimal places)

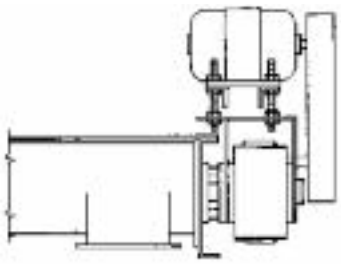
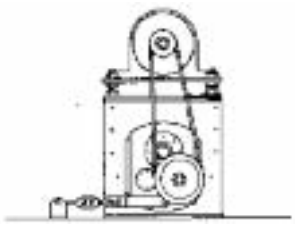
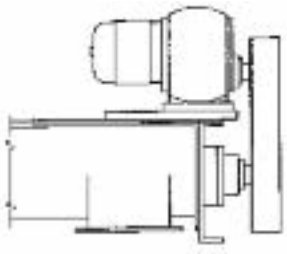
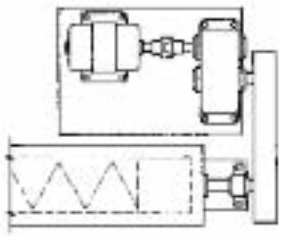
All weights are carried to four digits only, the fifth digit being carried forward if five or over, or dropped if under five.

Typical Drive Arrangements

The most common types of drives for Screw Conveyors are illustrated below.

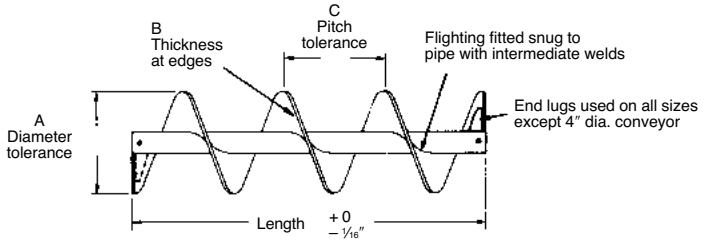
In addition to those shown, other types availble are: variable speed drives, hydraulic drives, and take-off drives for connection to other equipment.

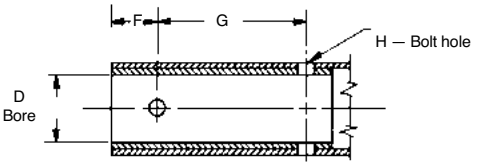
For special drive requirements, consult our Engineering Department.

Screw Driver Reducer	 (Side View)	Reducer mounts on trough end, and is directly connected to the conveyor screw and includes integral thrust bearing, seal gland, and drive shaft. Motor mount may be positioned at top, either side, or below. Separate drive shaft, end bearing, and seal are not required.
Shaft Mounted Reducer	 (End View)	Reducer mounts on conveyor drive shaft. Motor and "V"-Belt drive may be in any convenient location. The torque arm may be fastened to the floor, or fitted to trough end. Requires extended drive shaft, end bearing, and seal. Note: Requires thrust unit or collars to hold thrust.
Gearmotor Drive	 (Side View)	Integral motor-reducer with chain drive to conveyor drive shaft. Usually mounted to top of trough by means of an adapter plate.
Base Type Reducer Drive	 (Top View)	Motor direct-coupled to base type reducer, with chain drive to conveyor drive shaft. Usually mounted on floor or platform as close as possible to conveyor.

CEMA Standards

Helicoid Screw Conveyors

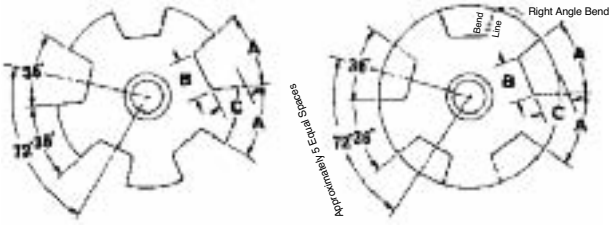




Listed Screw Diameter and Pitch	Coupling Diameter	Size Designation	Pipe Size Schedule 40	Length Feet and Inches	A		B		C		D		F	G	H
					Diameter Tolerance		Thickness		Pitch Tolerance		Bushing Bore Inside Diameter		Spacing 1st Bolt Hole	Centers 2nd Bolt Hole	Nominal Bolt Hole Size
					Plus	Minus	Inner Edge	Outer Edge	Plus	Minus	Minimum	Maximum			
4	1	4H206	1¼	9-10½	1/16	1/8	3/16	3/32	1/2	1/4	1.005	1.016	1/2	2	13/32
6	1½	6H304	2	9-10	1/16	3/16	1/8	1/16	1/2	1/4	1.505	1.516	7/8	3	17/32
6	1½	6H308	2	9-10	1/16	3/16	1/4	1/8	3/4	1/4	1.505	1.516	7/8	3	17/32
6	1½	6H312	2	9-10	1/16	3/16	3/8	3/16	3/4	1/4	1.505	1.516	7/8	3	17/32
9	1½	9H306	2	9-10	1/16	3/16	3/16	3/32	3/4	1/4	1.505	1.516	7/8	3	17/32
9	1½	9H312	2	9-10	1/16	3/16	3/8	3/16	3/4	1/4	1.505	1.516	7/8	3	17/32
9	2	9H406	2½	9-10	1/16	3/16	3/16	3/32	3/4	1/4	2.005	2.016	7/8	3	21/32
9	2	9H412	2½	9-10	1/16	1/4	3/8	3/16	3/4	1/4	2.005	2.016	7/8	3	21/32
9	2	9H414	2½	9-10	1/16	1/4	7/16	7/32	3/4	1/4	2.005	2.016	7/8	3	21/32
10	1½	10H306	2	9-10	1/16	3/16	3/16	3/32	3/4	1/4	1.505	1.516	7/8	3	17/32
10	2	10H412	2½	9-10	1/16	1/4	3/8	3/16	3/4	1/4	2.005	2.016	7/8	3	21/32
12	2	12H408	2½	11-10	1/8	5/16	1/4	1/8	1	1/4	2.005	2.016	7/8	3	21/32
12	2	12H412	2½	11-10	1/8	5/16	3/8	3/16	1	1/4	2.005	2.016	7/8	3	21/32
12	2 7/16	12H508	3	11-9	1/8	5/16	1/4	1/8	1	1/4	2.443	2.458	15/16	3	21/32
12	2 7/16	12H512	3	11-9	1/8	5/16	3/8	3/16	1	1/4	2.443	2.458	15/16	3	21/32
12	3	12H614	3½	11-9	1/8	3/8	7/16	7/32	1	1/4	3.005	3.025	1	3	25/32
14	2 7/16	14H508	3	11-9	1/8	5/16	1/4	1/8	1	1/4	2.443	2.458	15/16	3	21/32
14	3	14H614	3½	11-9	1/8	3/8	7/16	7/32	1	1/4	3.005	3.025	1	3	25/32
16	3	16H610	3½	11-9	1/8	3/8	5/16	5/32	1½	1/4	3.005	3.025	1	3	25/32
16	3	16H614	4	11-9	1/8	3/8	7/16	7/32	1½	1/4	3.005	3.025	1	3	25/32

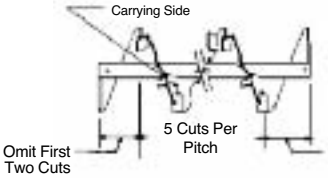
NOTE: All dimensions in inches.

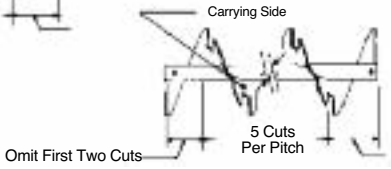
Cut Flight/Cut & Folded Flight Conveyors



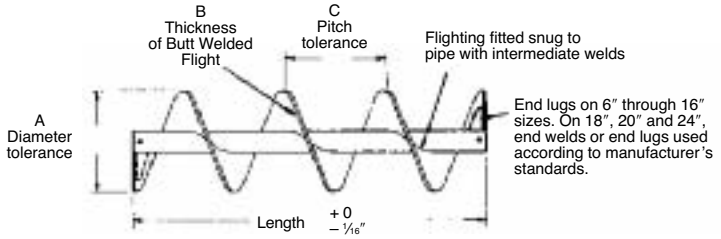
Depth of cut "C" is one half the flight width for normal maximum pipe size. Lengths "A" and "B" are calculated from the developed O.D. for standard pitch.

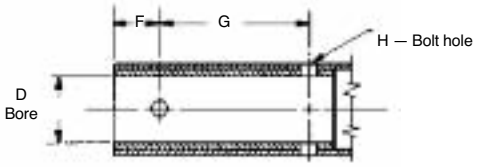
Screw Diameter	A	B	C
4	1⅜	1	⅝
6	2	1½	⅞
9	3	2⅛	1½
10	3⅜	2¼	1¾
12	4	2¾	2
14	4⅝	3⅛	2½
16	5¼	3½	3
18	6	3⅞	3⅜
20	6⅝	4¼	3⅞
24	7⅞	4⅞	4⅞





Sectional Screw Conveyors





Listed Screw Diameter and Pitch	Cplng. Dia.	Size Designation	Pipe Size Schedule 40	Length Feet and Inches	A		B	C		D		F	G	H
					Diameter Tolerance		Flight Thickness	Pitch Tolerance		Bushing Bore Inside Diameter		Spacing 1st Bolt Hole	Centers 2nd Bolt Hole	Nominal Bolt Hole Size
					Plus	Minus		Plus	Minus	Minimum	Maximum			
6	1½	6S312	2	9-10	1/16	3/16	3/16	3/8	1/4	1.505	1.516	7/8	3	17/32
9	1½	9S312	2	9-10	1/16	3/16	3/16	1/2	1/4	1.505	1.516	7/8	3	17/32
	2	9S412	2½	9-10	1/16	3/16	3/16	1/2	1/4	2.005	2.016	7/8	3	21/32
	2	9S416	2½	9-10	1/16	1/4	1/4	1/2	1/4	2.005	2.016	7/8	3	21/32
10	2	10S412	2½	9-10	1/16	3/16	3/16	1/2	1/4	2.005	2.016	7/8	3	21/32
12	2	12S412	2½	11-10	1/8	5/16	3/16	3/4	1/4	2.005	2.016	7/8	3	21/32
	2 7/16	12S512	3	11-9	1/8	5/16	3/16	3/4	1/4	2.443	2.458	15/16	3	21/32
	2 7/16	12S516	3	11-9	1/8	5/16	1/4	3/4	1/4	2.443	2.458	15/16	3	21/32
	3	12S616	3½	11-9	1/8	5/16	1/4	3/4	1/4	3.005	3.025	1	3	25/32
	3	12S624	3½	11-9	1/8	3/8	3/8	3/4	1/4	3.005	3.025	1	3	25/32
14	2 7/16	14S512	3	11-9	1/8	5/16	3/16	3/4	1/4	2.443	2.458	15/16	3	21/32
	3	14S616	3½	11-9	1/8	5/16	1/4	3/4	1/4	3.005	3.025	1	3	25/32
	3	14S624	3½	11-9	1/8	3/8	3/8	3/4	1/4	3.005	3.025	1	3	25/32
16	3	16S612	3½	11-9	1/8	3/8	3/16	3/4	1/4	3.005	3.025	1	3	25/32
	3	16S616	3½	11-9	1/8	3/8	1/4	3/4	1/4	3.005	3.025	1	3	25/32
	3	16S624	3½	11-9	1/8	3/8	3/8	3/4	1/4	3.005	3.025	1	3	25/32
	3	16S632	3½	11-9	1/8	1/2	1/2	3/4	1/4	3.005	3.025	1	3	25/32
18	3	18S612	3½	11-9	3/16	3/8	3/16	3/4	1/2	3.005	3.025	1	3	25/32
	3	18S616	3½	11-9	3/16	3/8	1/4	3/4	1/2	3.005	3.025	1	3	25/32
	3	18S624	3½	11-9	3/16	3/8	3/8	3/4	1/2	3.005	3.025	1	3	25/32
	3	18S632	3½	11-9	3/16	1/2	1/2	3/4	1/2	3.005	3.025	1	3	25/32
20	3	20S612	3½	11-9	3/16	3/8	3/16	7/8	1/2	3.005	3.025	1	3	25/32
	3	20S616	3½	11-9	3/16	3/8	1/4	7/8	1/2	3.005	3.025	1	3	25/32
	3	20S624	3½	11-9	3/16	3/8	3/8	7/8	1/2	3.005	3.025	1	3	25/32
24	3 3/16	24S712	4	11-8	3/16	3/8	3/16	7/8	1/2	3.443	3.467	1½	4	29/32
	3 3/16	24S716	4	11-8	3/16	3/8	1/4	7/8	1/2	3.443	3.467	1½	4	29/32
	3 3/16	24S724	4	11-8	3/16	3/8	3/8	7/8	1/2	3.443	3.467	1½	4	29/32
	3 3/16	24S732	4	11-8	3/16	1/2	1/2	7/8	1/2	3.443	3.467	1½	4	29/32

NOTE: All dimensions in inches.

SECTION III

Click on the page number to take you to the section

SEE PRICE LIST FOR ITEMS CARRIED IN STOCK

Required Information

Screw diameter
Shaft diameter
Material component group
Unusual material characteristics

Conveyor Screws

Standard length conveyor screws should be used whenever possible to reduce the number of hanger bearings required.

The recommended screws listed in the Component Series Table are standard helicoid and sectional screw conveyors. The use of helicoid or sectional conveyors is largely a matter of individual preference.

Right hand screw conveyors pull material toward the end which is being rotated in a clockwise direction. If the rotation is reversed (counterclockwise), the material is pushed away from that end.

In left hand screw conveyors, the material flow is opposite to that of right hand screws, the direction of rotation being unchanged.

To determine hand of screw see pages H-38 and H-39.

The material is carried on one face of the conveyor flighting in conveyors which are required to transport material in one direction, therefore, conveyor end lugs are located on the opposite face to facilitate unimpeded flow of the material. Conveyor sections must be installed in such a manner that all end lugs are toward the inlet end of the conveyor. Conveyor sections must not be turned end for end without reversing the direction of rotation, or conversely, the direction of rotation must not be reversed without turning the conveyor sections end for end.

Requirements for reversible conveyor screws intended for material transport in either direction should be referred to our Engineering Department.

Flighting should be omitted from the conveyor pipe over the last discharge opening to ensure complete discharge of material without carryover.

Continuity of material flow at hanger points is accomplished by opposing adjacent flight ends approximately 180º. (As close to 180° as the predrilled holes will allow.)

Conveyor Trough and Tubular Housing

Standard trough and housing sections are available in five, six, ten, and 12 foot lengths. Standard five and six foot lengths should be used when connecting flanges coincide with discharge openings or hanger bearings.

Shafts

The primary consideration in determining the type and size of coupling and drive shafts is whether the shafts selected are adequate to transmit the horsepower required, including any overload. Normally, cold-rolled shafts are adequate. However, high-tensile shafts may be required due to torque limitations. Also, stainless steel shafts may be necessary when corrosive or contaminable materials are to be handled. Conveyors equipped with non-lubricated hard iron hanger bearings require hardened coupling shafts. Specific shaft size determination is covered in the Torsional Rating Section, page H-27.

Shaft Seals

Several conveyor end seal types are available to prevent contamination of the conveyed material or to prevent the escape of material from the system.

Bearings

Hanger Bearing — The purpose of hanger bearings is to provide intermediate support when multiple screw sections are used. Hanger bearings are designed primarily for radial loads. Therefore, adequate clearance should be allowed between the bearings and the conveyor pipe ends to prevent damage by the thrust load which is transmitted through the conveyor pipe.

The hanger bearing recommendations listed in the Material Characteristic Tables are generally adequate for the material to be handled. Often, however, unusual characteristics of the material or the conditions under which the conveyor must operate make it desirable to use special bearing materials. Regarding the use of special bearing materials, consult our Engineering Department.

End Bearings — Several end bearing types are available, and their selection depends on two basic factors: Radial load and thrust load. The relative values of these loads determines end bearing types.

Radial load is negligible at the conveyor tail shaft. However, drive ends (unless integrated with the conveyor end plate) are subject to radial loading due to overhung drive loads, such as chain sprockets or shaft-mounted speed reducers. Screw Conveyor Drive Reducers at the drive end will adequately carry both thrust and radial loads.

Discharge Spouts and Gates

Standard discharge spouts and gates are available for either conveyor trough or tubular housing in several designs, operated either manually or by remote controls.

In installations where it is possible to overfill the device to which material is being transported, an additional overflow discharge opening or overflow relief device should be provided. Consult our Engineering Department for suggested electrical interlock and safety devices to prevent overflow or damage to equipment.

It is sometimes found that the material characteristics are such that standard component specifications are inadequate. Should unusual material characteristics or severe conditions exist, our Engineering Department should be consulted.

Conveyor Ends

A complete line of conveyor ends are available as standard for either conveyor trough or tubular housing with a choice of many bearing types and combinations.

Special Applications

More common of the unusual material characteristics which require other than the recommended components are:

Corrosive Materials — Components may be fabricated from alloys not affected by the material or may be coated with a protective substance.

Contaminable Materials — Require the use of oil impregnated, sealed, or dry type hanger bearings. End shafts should be sealed to prevent entrance of contaminants from the outside. Due to the necessity for frequent cleaning conveyor components should be designed for convenient disassembly.

Abrasive Materials — These materials may be handled in conveyors, troughs, or housings constructed of abrasion resistant alloys with hard surfaced screws. Lining of all exposed surfaces with rubber or special resins also materially reduces abrasive damage.

Interlocking or Matting Materials — Conveying with standard components is sometimes possible by the use of special feeding devices at the conveyor inlet.

Hygroscopic Materials — Frequently these materials may be handled successfully in a conveyor which is substantially sealed from the exterior atmosphere. In extreme cases it is necessary to provide jacketed trough or housing with an appropriate circulating medium to maintain the material at an elevated temperature. Purging of the conveyor with a suitable dry gas is also used in some installations.

Viscous or Sticky Materials — Ribbon flight conveyor screws are most frequently used for conveying these materials although standard components may be specially coated to improve the flow of material.

Harmful Vapors or Dusts — These materials may be safely handled in dust sealed trough, plain tubular housing, or gasketed flanged tubular housing with particular attention to shaft sealing. Trough or housing exhaust systems have also been successfully used in some installations.

Blending in Transit — Ribbon, cut flight, paddle, or a combination of these screw types may be designed to produce the desired degree of blending, aeration or mixing.

Explosive Dusts — The danger of this condition may be minimized in most installations by the use of components which are fabricated from non-ferrous materials and proper conveyor sealing techniques observed. Exhaust systems are also advisable for the removal of explosive dusts.

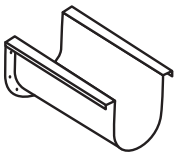
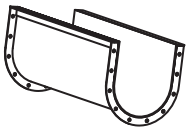
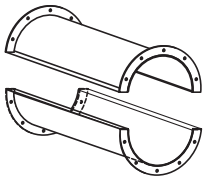
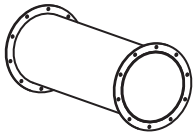
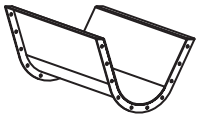
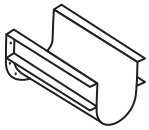
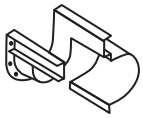
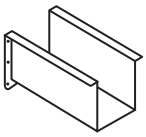
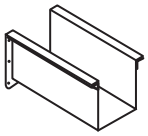
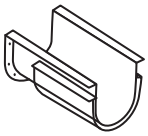
Materials Subject to Packing — This condition requires the use of aerating devices at the conveyor inlet when materials are pulverulent and a special feeder device when material particles are large or fibrous.

Materials which are Fluid when Aerated — This condition may be used to advantage in some installations by declining the conveyor system toward the discharge end.

Degradable Materials — Some particles that are easily broken or distorted may usually be handled in screw conveyors by reducing the speed and selecting a larger conveyor size sufficient to deliver the required volume of material.

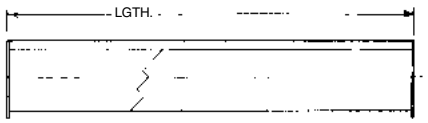
Elevated Temperature — Components should be fabricated from high temperature alloys. Should the process be such that cooling of the material in the conveyor is permissible, jacketed trough or housing may be used at the inlet end to cool the material and standard components used after the point where material temperature has been reduced to a safe degree.

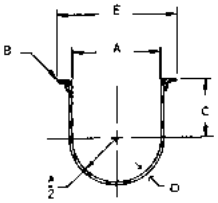
Conveyor Trough

FORMED FLANGE U-TROUGH		Commonly used economical trough. One piece construction. Standard lengths in stock.
ANGLE FLANGE U-TROUGH		Rigid construction. Standard lengths in stock.
FORMED FLANGE TUBULAR TROUGH		Loadable to full cross section for feeder applications. Minimizes fall back in inclined applications. Easily taken apart for maintenance. Can be gasketed for dust tight enclosure. Hanger pockets required for use with standard hangers.
SOLID TUBULAR TROUGH		One piece construction for totally enclosed or inclined applications. Hanger pockets required for use with standard hangers.
FLARED TROUGH		Used where materials tend to bridge or when flared inlets are needed.
CHANNEL TROUGH		Adds structural support for longer than standard spans.
DROP BOTTOM TROUGH		Used when complete material clean-out is critical. Can be furnished with hinges either side and bolts or clamps opposite side.
FORMED FLANGE RECTANGULAR TROUGH		Material being conveyed forms its own trough thereby reducing trough wear. One piece construction.
ANGLE FLANGE RECTANGULAR TROUGH		The same as formed flange rectangular except top flanges are made from structural angle.
JACKETED TROUGH		Jacket allows heating or cooling of material being conveyed.

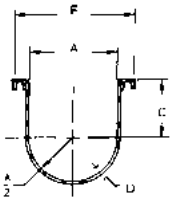
Standard Conveyor Trough

Standard conveyor troughs have a U-shaped steel body with angle iron top flanges or formed top flanges and jig drilled end flanges.





Angle Flange



Formed Flange

Conveyor Diameter	D	Angle Flanged	Angle Flanged Trough				Formed Flanged Trough ▲					A	B	C	E	F
			Weight		Weight			Weight		Weight						
	Trough Thick.	Part Number	10´* Length	5´ Length	12´ Length	6´ Length	Part Number	10´ Length	5´ Length	12´ Length	6´ Length					
4	□ 16 GA.	4CTA16	53	29	—	—	4CTF16	41	23	—	—				7⅝	7¼
4	14	4CTA14	60	33	—	—	4CTF14	50	28	—	—	5	1¼	3⅜	7 11/16	7¼
4	12	4CTA12	78	42	—	—	4CTF12	70	38	—	—				7¾	7¼
6	□ 16 GA.	6CTA16	67	44	—	—	6CTF16	55	32	—	—				9⅝	9 11/16
6	14	6CTA14	78	49	—	—	6CTF14	67	38	—	—				9 11/16	9 11/16
6	12	6CTA12	101	60	—	—	6CTF12	91	50	—	—	7	1¼	4½	9¾	
6	10	6CTA10	123	73	—	—	6CTF10	117	64	—	—				9¾	
6	3/16	6CTA7	164	86	—	—	6CTF7	150	79	—	—				9⅞	
9	16 GA.	9CTA16	113	66	—	—	9CTF16	83	51	—	—				13⅛	13¼
9	□ 14	9CTA14	127	73	—	—	9CTF14	99	59	—	—				13 3/16	
9	12	9CTA12	156	87	—	—	9CTF12	132	75	—	—	10	1½	6⅛	13¼	
9	10	9CTA10	176	102	—	—	9CTF10	164	91	—	—				13 5/16	
9	3/16	9CTA7	230	124	—	—	9CTF7	214	116	—	—				13⅜	
9	¼	9CTA3	286	152	—	—	9CTF3	276	147	—	—				13½	
10	16 GA.	10CTA16	118	69	—	—	10CTF16	88	54	—	—				14⅛	14¼
10	□ 14	10CTA14	133	76	—	—	10CTF14	105	62	—	—				14 3/16	
10	12	10CTA12	164	92	—	—	10CTF12	140	80	—	—	11	1½	6⅜	14¼	
10	10	10CTA10	178	102	—	—	10CTF10	167	91	—	—				14 5/16	
10	3/16	10CTA7	233	131	—	—	10CTF7	217	123	—	—				14⅜	
10	¼	10CTA3	306	163	—	—	10CTF3	296	158	—	—				14½	
12	□ 12 GA.	12CTA12	197	113	236	135	12CTF12	164	95	197	114				17¼	17½
12	10	12CTA10	234	133	281	160	12CTF10	187	117	224	140	13	2	7¾	17 5/16	
12	3/16	12CTA7	294	164	353	197	12CTF7	272	150	326	180				17⅜	
12	¼	12CTA3	372	203	446	244	12CTF3	357	194	428	233				17½	
14	□ 12 GA.	14CTA12	214	121	257	145	14CTF12	183	102	219	122				19¼	19⅜
14	10	14CTA10	258	143	309	172	14CTF10	207	127	248	152	15	2	9¼	19 5/16	
14	3/16	14CTA7	328	180	394	216	14CTF7	304	168	365	202				19⅜	
14	¼	14CTA3	418	224	501	269	14CTF3	403	215	483	258				19½	
16	□ 12 GA.	16CTA12	238	133	285	160	16CTF12	206	107	247	128				21¼	21⅜
16	10	16CTA10	288	159	345	191	16CTF10	234	144	281	173	17	2	10⅝	21 5/16	
16	3/16	16CTA7	368	200	442	240	16CTF7	345	188	414	226				21⅜	
16	¼	16CTA3	471	243	565	291	16CTF3	455	228	546	273				21½	
18	□ 12 GA.	18CTA12	252	159	302	191	18CTF12	240	133	288	160				24¼	24½
18	10	18CTA10	353	170	423	204	18CTF10	269	165	323	198	19	2½	12⅛	24 5/16	
18	3/16	18CTA7	444	243	533	291	18CTF7	394	217	473	260				24⅜	
18	¼	18CTA3	559	298	671	358	18CTF3	520	275	624	330				24½	
20	□ 10 GA.	20CTA10	383	228	460	274	20CTF10	296	190	355	228				26 5/16	26½
20	3/16	20CTA7	484	271	581	325	20CTF7	434	247	521	296	21	2½	13½	26⅜	
20	¼	20CTA3	612	334	734	401	20CTF3	573	315	687	378				26½	
24	□ 10 GA.	24CTA10	443	255	531	306	24CTF10	384	227	461	272				30 5/16	30½
24	3/16	24CTA7	563	319	676	383	24CTF7	514	293	617	352	25	2½	16½	30⅜	
24	¼	24CTA3	717	363	860	435	24CTF3	678	339	813	406				30½	

□ **Standard Gauge**

Bolt Patterns
Page H-42

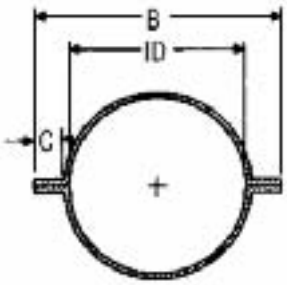
All troughs available in other materials such as stainless, aluminum, abrasion resistant, etc.

▲ Double formed flange standard on all sizes through 10 ga.

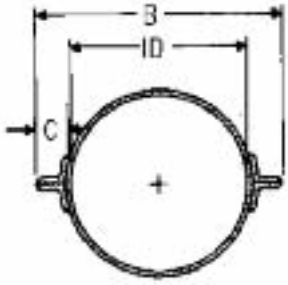
Tubular Housing

Tubular conveyor housings are inherently dust and weather-tight, and may be loaded to a full cross section. Conveyors with tubular housings are rigid and are highly suitable for conveying material on an incline. Three types shown are available.

Tubular housing



Flanged tubular housing



Angle flanged tubular housing

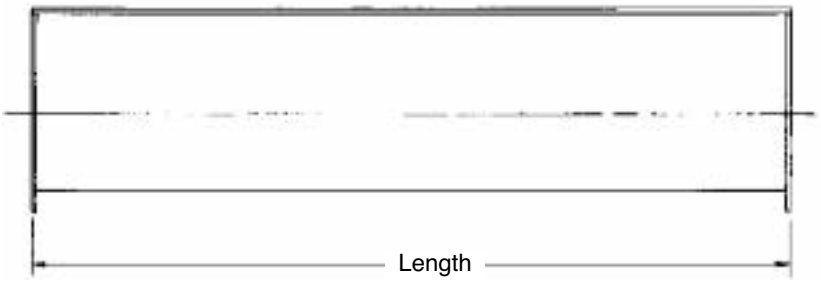
Conveyor Diameter	Trough Thickness	Tubular Housing			Formed Flange		Angle Flange		A	B	C
		Part Number	Weight 10´ Length	Weight 5´ Length	Part Number	Weight 10´	Part Number	Weight 10´			
4	□ 16 GA.	4CHT16			4CHT16-F	43	4CHT16-A	81		7⅛	
4	14	4CHT14	60	31	4CHT14-F	53	4CHT14-A	89	5	7³⁄₁₆	1
4	12	4CHT12			4CHT12-F	74	4CHT12-A	106		7¼	
6	□ 16 GA.	6CHT16	50	27	6CHT16-F	60	6CHT16-A	110		9⅝	
6	14	6CHT14	62	33	6CHT14-F	75	6CHT14-A	122		9¹¹⁄₁₆	
6	12	6CHT12	85	44	6CHT12-F	103	6CHT12-A	145	7	9¾	1¼
6	10	6CHT10	109	56	6CHT10-F	133	6CHT10-A	187		9¹³⁄₁₆	
6	³⁄₁₆	6CHT7	145	74	6CHT7-F	168	6CHT7-A	205		9⅞	
9	16 GA.	9CHT16	72	39	9CHT16-F	84	9CHT16-A	131		12⅝	
9	□ 14	9CHT14	89	47	9CHT14-F	104	9CHT14-A	148		12¹¹⁄₁₆	
9	12	9CHT12	122	64	9CHT12-F	143	9CHT12-A	181		12¾	
9	10	9CHT10	155	80	9CHT10-F	182	9CHT10-A	214	10	12¹³⁄₁₆	1¼
9	³⁄₁₆	9CHT7	208	107	9CHT7-F	245	9CHT7-A	267		12⅞	
9	¼	9CHT3	275	140	9CHT3-F	324	9CHT3-A	334		13	
10	16 GA.	10CHT16	79	42	10CHT16-F	91	10CHT16-A	138		13⅝	
10	□ 14	10CHT14	97	52	10CHT14-F	112	10CHT14-A	156		13¹¹⁄₁₆	
10	12	10CHT12	133	70	10CHT12-F	154	10CHT12-A	192		13¾	
10	10	10CHT10	169	88	10CHT10-F	196	10CHT10-A	228	11	13¹³⁄₁₆	1¼
10	³⁄₁₆	10CHT7	227	117	10CHT7-F	264	10CHT7-A	286		13⅞	
10	¼	10CHT3	301	154	10CHT3-F	350	10CHT3-A	360		14	
12	□ 12 GA.	12CHT12	163	88	12CHT12-F	193	12CHT12-A	235		16¼	
12	10	12CHT10	208	111	12CHT10-F	247	12CHT10-A	280		16⁵⁄₁₆	
12	³⁄₁₆	12CHT7	275	144	12CHT7-F	328	12CHT7-A	347	13	16⅜	1½
12	¼	12CHT3	362	188	12CHT3-F	432	12CHT3-A	434		16½	
14	□ 12 GA.	14CHT12	187	101	14CHT12-F	217	14CHT12-A	259		18¼	
14	10	14CHT10	236	126	14CHT10-F	275	14CHT10-A	308		18⁵⁄₁₆	
14	³⁄₁₆	14CHT7	316	166	14CHT7-F	369	14CHT7-A	388	15	18⅜	1½
14	¼	14CHT3	416	216	14CHT3-F	486	14CHT3-A	488		18½	
16	□ 12 GA.	16CHT12	212	114	16CHT12-F	242	16CHT12-A	310		21¼	
16	10	16CHT10	268	142	16CHT10-F	307	16CHT10-A	366		21⁵⁄₁₆	
16	³⁄₁₆	16CHT7	358	187	16CHT7-F	411	16CHT7-A	456	17	21⅜	2
16	¼	16CHT3	472	244	16CHT3-F	542	16CHT3-A	570		21½	
18	□ 12 GA.	18CHT12	242	133	18CHT12-F	280	18CHT12-A	340		23¼	
18	10	18CHT10	304	164	18CHT10-F	352	18CHT10-A	402		23⁵⁄₁₆	
18	³⁄₁₆	18CHT7	405	214	18CHT7-F	471	18CHT7-A	503	19	23⅜	2
18	¼	18CHT3	533	278	18CHT3-F	621	18CHT3-A	631		23½	
20	□ 10 GA.	20CHT10	335	188	20CHT10-F	381	20CHT10-A	433		25⁵⁄₁₆	
20	³⁄₁₆	20CHT7	446	237	20CHT7-F	510	20CHT7-A	544	21	25⅜	2
20	¼	20CHT3	586	307	20CHT3-F	671	20CHT3-A	684		25½	
24	□ 10 GA.	24CHT10	399	215	24CHT10-F	445	24CHT10-A	497		29⁵⁄₁₆	
24	³⁄₁₆	24CHT7	531	281	24CHT7-F	594	24CHT7-A	629	25	29⅜	2
24	¼	24CHT3	699	365	24CHT3-F	784	24CHT3-A	797		29½	

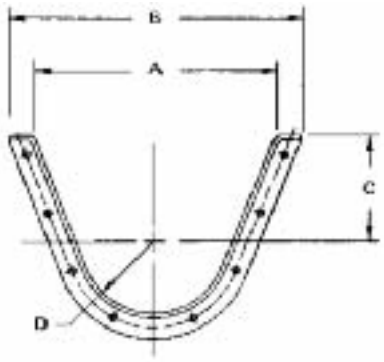
□ Standard Gauge

For Bolt Patterns See Page H-43

Flared Trough

Flared troughs are used primarily to convey materials which are not free-flowing or which have a tendency to stick to the trough.





Conveyor Diameter	Trough Thickness	Part Number	Weight Per Foot	A	B	C	D	Standard Length Foot
6	□ 14 GA.	6FCT14	9	14	16⅝	7	3½	10
6	12	6FCT12	12		16¾			
9	□ 14 GA.	9FCT14	13		21 3/16			
9	12 GA.	9FCT12	14		21¼			
9	10	9FCT10	19	18	21¼	9	5	10
9	3/16	9FCT7	22		21⅜			
9	¼	9FCT3	25		21½			
12	□ 12 GA.	12FCT12	20		26¼	10	6½	12
12	10	12FCT10	24	22	26¼			
12	3/16	12FCT7	32		26⅜			
12	¼	12FCT3	43		26½			
14	□ 12 GA.	14FCT12	23		28¼	11	7½	12
14	10	14FCT10	27	24	28¼			
14	3/16	14FCT7	37		28⅜			
14	¼	14FCT3	49		28½			
16	□ 12 GA.	16FCT12	25		32¼			
16	10	16FCT10	31	28	32¼	11½	8½	12
16	3/16	16FCT7	39		32⅜			
16	¼	16FCT3	52		32½			
18	□ 12 GA.	18FCT12	27		36¼			
18	10	18FCT10	35	31	36¼	12⅛	9½	12
18	3/16	18FCT7	45		36⅜			
18	¼	18FCT3	56		36½			
20	□ 10 GA.	20FCT10	36		39¼			
20	3/16	20FCT7	48	34	39⅜	13½	10½	12
20	¼	20FCT3	60		39½			
24	□ 10 GA.	24FCT10	41	40	45¼	16½	12½	12
24	3/16	24FCT7	54		45⅜			
24	¼	24FCT3	69		45½			

□ **Standard Gauge**

See Page H-42 for Bolt Pattern

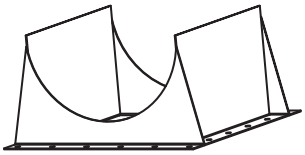
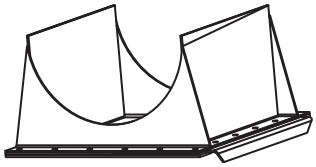
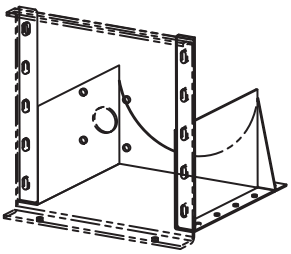
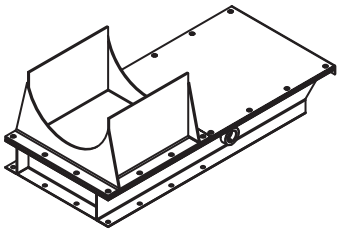
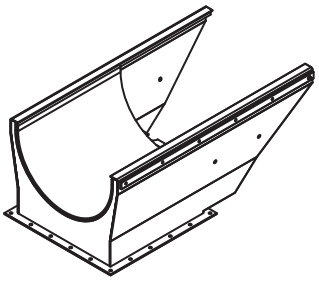
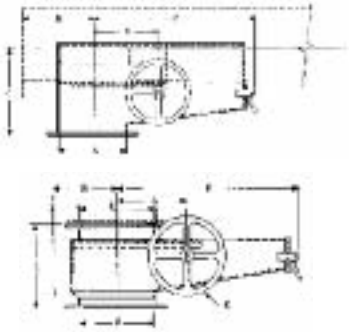
Discharge Spout Index

14	TSD	12

Conveyor Diameter

Types
TSD - Plain, Fixed Spout
TSDS - Plain Fixed Spout W/Slide
TSDF - Flush End Spout
RPF - Rack & Pinion/Flat Side
RPFD - Rack & Pinion/Flat Slide Dust Tight
RPC - Rack & Pinion/Curved Slide
RPCD - Rack & Pinion/Curved Slide Dust Tight

Spout Thickness
16 - 16 Gauge
14 - 14 Gauge
12 - 12 Gauge
10 - 10 Gauge
7 - 3/16

STANDARD DISCHARGE SPOUT		Most commonly used. Flanged hole drilling is per CEMA Standards. Select spout thickness according to trough thickness.
STANDARD DISCHARGE SPOUT WITH HAND SLIDE		Standard spout shown above with the addition of the slide and side guides. Select spout thickness according to trough thickness.
FLUSH END DISCHARGE SPOUT		Reduces distance from centerline of discharge to end of the conveyor which eliminates ledge at end of trough and product build-up. Special flush-end trough ends required when this style of discharge is used.
FLAT SLIDE GATE		Rack & pinion type available with hand wheel, rope wheel, pocket wheel and chain. Discharge spout is included when fitted. Flat slide (less rack & pinion) can be furnished with pneumatic, hydraulic, or electric actuators. (Not dust-tight).
CURVED SLIDE GATE		Contoured shape of slide eliminates pocket found in flat slide type. Rack & pinion type available with handwheel, or rope wheel, or pocket wheel with chain. Curved slide (less rack & pinion) can be furnished with pneumatic, hydraulic, or electric actuators. (Standard curved slide gate is not dust-tight.) All curved slide gates should be installed at factory.
DUST TIGHT RACK AND PINION FLAT SLIDE		Dust tight rack and pinions are totally enclosed and can be furnished with either flat or curved slide. Handwheel is normally furnished but is also available with chain or rope wheel.

Discharge Spouts

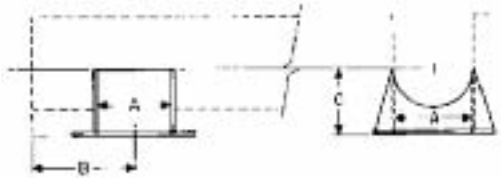
Plain Opening

Plain spout openings are cut in the trough permitting free material discharge.

Fixed Spout with Slide Gate

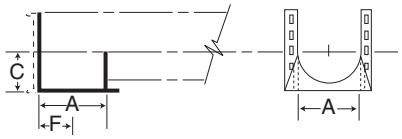
Fixed spouts with slide gates are used where distribution of material is to be controlled. Bolted flange permits slide to be operated from any side.

Fixed Spout



Fixed spouts are fabricated in proportion to size and thickness of trough. Can be furnished loose or welded to trough.

Flush End Spout



Flush end discharge spouts are designed for use at the final discharge point. The end of the spout is comprised of a housing end with bottom flange drilled with standard discharge flange bolt pattern. Because it is located at the extreme end of the conveyor, there is no carryover of material past the final discharge point. The flush end arrangement eliminates the unnecessary extension of trough and interior components beyond the actual discharge point.

Screw Diameter	A	B	C	D	G	H	F
4	5	4½	3¾	5/16	5⅝	11	2½
6	7	6	5	5/16	6⅝	14	3½
9	10	8	7⅛	5/16	8	19	5
10	11	9	7⅞	5/16	8⅜	20	5½
12	13	10½	8⅞	5/16	10⅛	24	6½
14	15	11½	10⅛	5/16	11¼	27	7½
16	17	13½	11⅛	5/16	12⅜	30	8½
18	19	14½	12⅜	5/16	13⅜	33	9½
20	21	15½	13⅜	⅜	14⅜	36	10½
24	25	17½	15⅜	⅜	16⅜	42	12½

Screw Diameter	Trough Thickness Gauge	Spout and Gate Thickness Gauge	Part Number			Weight		
			Fixed Spout		Flush End Spout	Fixed Spout		Flush End Spout
			Plain	With Slide		Plain	Slide	
4	16-14	□ 14	4TSD14	4TSDS14	4TSDF14	2	6	1.5
4	12	12	4TSD12	4TSDS12	4TSDF12	3	7	2.25
6	14-12	□ 14	6TSD14	6TSDS14	6TSDF14	4	11	3.0
6	3/16	12	6TSD12	6TSDS12	6TSDF12	6	13	4.50
9	16-14-12-10	□ 14	9TSD14	9TSDS14	9TSDF14	8	18	6.0
9	3/16-¼	10	9TSD10	9TSDS10	9TSDF10	13	22	9.75
10	14-12-10	□ 14	10TSD14	10TSDS14	10TSDF14	10	21	7.5
10	3/16-¼	10	10TSD10	10TSDS10	10TSDF10	16	27	12.0
12	12-10	□ 12	12TSD12	12TSDS12	12TSDF12	17	36	12.75
12	3/16-¼	3/16	12TSD7	12TSDS7	12TSDF7	29	48	21.75
14	12-10	□ 12	14TSD12	14TSDS12	14TSDF12	22	46	16.50
14	3/16-¼	3/16	14TSD7	14TSDS7	14TSDF7	38	62	28.50
16	12-10	□ 12	16TSD12	16TSDS12	16TSDF12	21	49	15.75
16	3/16-¼	3/16	16TSD7	16TSDS7	16TSDF7	40	68	30.0
18	12-10	□ 12	18TSD12	18TSDS12	18TSDF12	32	69	24.0
18	3/16-¼	3/16	18TSD7	18TSDS7	18TSDF7	60	97	45.0
20	10	□ 12	20TSD12	20TSDS12	20TSDF12	40	91	30.0
20	3/16-¼	3/16	20TSD7	20TSDS7	20TSDF7	67	118	50.25
24	10	□ 12	24TSD12	24TSDS12	24TSDF12	52	116	39.0
24	3/16-¼	3/16	24TSD7	24TSDS7	24TSDF7	87	151	65.25

□ **Standard Gauge**

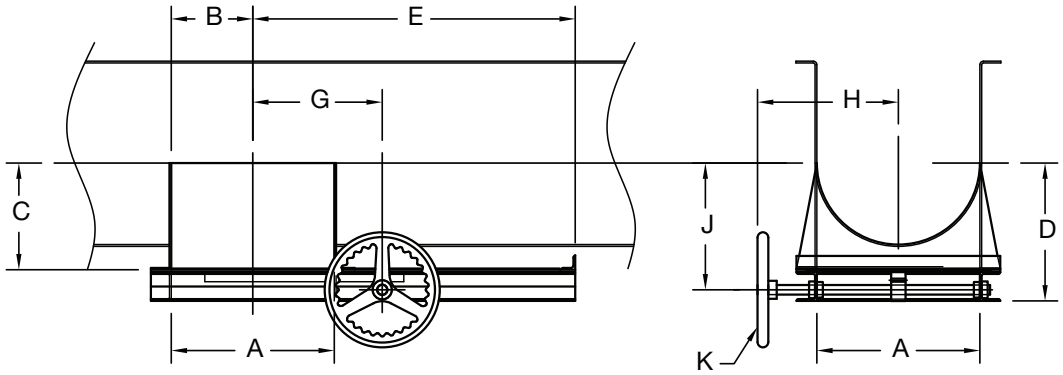
① Add –F for Fitted

For Bolt Patterns See Page H-43

Discharge Gates

Flat rack and pinion slide gates can be bolted to standard discharge spouts at any of the four positions desired. Hand wheel is normally furnished but is also available with chain or rope wheel.

Rack and Pinion Flat Slide



Screw Diameter	A	B	C	D	E	G	H	J	K Diameter
4	5	2½	3¾	7	13½	6½	5	5½	12
6	7	3½	5	8¼	16	7½	6	6¾	12
9	10	5	7⅛	10⅜	20¼	9	9½	8⅜	12
10	11	5½	7⅞	11⅛	23½	10½	10	9⅞	12
12	13	6½	8⅞	12⅛	25½	11	12¼	10⅞	12
14	15	7½	10⅛	13⅜	31¼	12½	13¼	12	12
16	17	8½	11⅛	14⅜	33⅝	13½	14¼	13	12
18	19	9½	12⅜	15⅝	37⅞	14½	15¾	14⅛	12
20	21	10½	13⅜	16 1⁄16	40¾	15½	16¾	15⅛	12
24	25	12½	15⅜	18 1⁄16	46½	17½	18¾	17⅜	12

Screw Diameter	Trough Thickness Gauge	Spout and Gate Thickness Gauge	Part Number Rack and Pinion† ①	Weight Rack and Pinion
4	16-14	□ 14	4RPF14	18
4	12	12	4RPF12	21
6	16-14-12	□ 14	6RPF14	28
6	3⁄16	12	6RPF12	31
9	14-12-10	□ 14	9RPF14	49
9	3⁄16-¼	10	9RPF10	54
10	14-12-10	□ 14	10RPF14	56
10	3⁄16-¼	10	10RPF10	62
12	12-10	□ 12	12RPF12	94
12	3⁄16-¼	3⁄16	12RPF7	106
14	12-10	□ 12	14RPF12	107
14	3⁄16 -¼	3⁄16	14RPF7	123
16	12-10	□ 12	16RPF12	112
16	3⁄16-¼	3⁄16	16RPF7	131
18*	12-10	□ 12	18RPF12	157
18*	3⁄16-¼	3⁄16	18RPF7	185
20*	10	□ 12	20RPF12	185
20*	3⁄16-¼	3⁄16	20RPF7	212
24*	10	□ 12	24RPF12	233
24*	3⁄16-¼	3⁄16	24RPF7	268

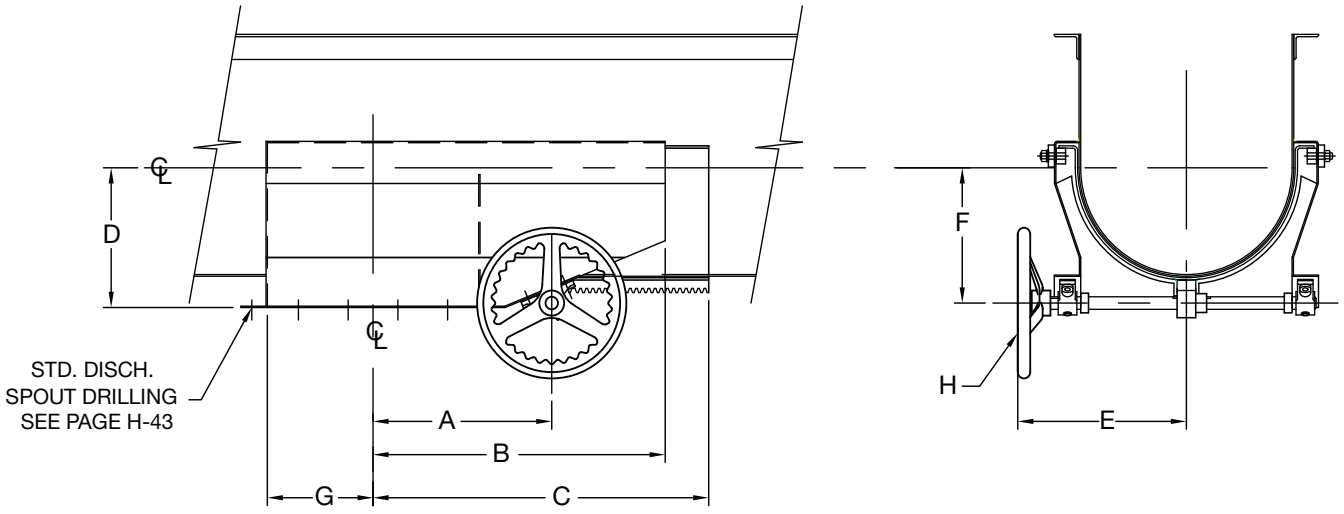
* Handwheel supplied as Standard Assembly
— C Chain Wheel
— R Rope Wheel

□ **Standard Gauge**
For Bolt Patterns See Page H-43
†**All Rack & Pinion Gates 18″ and Larger Have Double Rack & Pinion.**

① Add –F for Fitted

Discharge Gates

Rack and Pinion Curved Slide



Conveyor Diameter	Trough Thickness	Spout Thickness	Part Number*①	Weight Pounds	A	B	C	D	E	F	G	H Diameter
4 4	14,16 Cal. 12 Cal.	□ 14 Cal. 12 GA.	4RPC14 4RPC12	20 22	6¼ 6¼	8¾ 8¾	12 12	3¾ 3¾	6 6	4½ 4⅝	2½	12
6 6	16,14,12 GA. 3⁄16″	□ 14 GA. 12 GA.	6RPC14 6RPC12	25 28	7½ 7½	10½ 10½	15 15	5 5	8 8	5½ 5⅝	3½	12
9 9	14,12,10 GA. 3⁄16″,¼″	□ 14 GA. 10 GA.	9RPC14 9RPC10	46 54	9 9	15 15	20½ 20½	7⅛ 7⅛	8¾ 8¾	7 7⅛	5	12
10 10	14,12,10 GA. 3⁄16″,¼″	□ 14 GA. 10 GA.	10RPC14 10RPC10	53 62	9½ 9½	14½ 14½	21 21	7⅞ 7⅞	9⅛ 9⅛	7½ 7⅝	5½	12
12 12	12,10 GA. 3⁄16″,¼″	□ 12 GA. 3⁄16″	12RPC12 12RPC7	81 97	11⅜ 11⅜	17½ 17½	25¾ 25¾	8⅞ 8⅞	11 11	8½ 8⅝	6½	12
14 14	10,12 GA. 3⁄16″,¼″	□ 12 GA. 3⁄16″	14RPC12 14RPC7	95 114	12⅞ 12⅞	20½ 20½	30¼ 30¼	10⅛ 10⅛	12 12	9½ 9⅝	7½	12
16 16	10,12 GA. 3⁄16″,¼″	□ 12 GA. 3⁄16″	16RPC12 16RPC7	103 116	14⅜ 14⅜	23½ 23½	36 36	11⅛ 11⅛	13 13	10½ 10⅝	8½	12
18 18	10,12 GA. 3⁄16″,¼″	□ 12 GA. 3⁄16″	18RPC12 18RPC7	157 187	15⅞ 15⅞	25½ 25½	37¼ 37¼	12⅜ 12⅜	15⅜ 15⅜	11½ 11⅝	9½	12
20 20	12 GA. 3⁄16″,¼″	□ 12 GA. 3⁄16″	20RPC12 20RPC7	175 208	17⅜ 17⅜	28½ 28½	39 39	13⅜ 13⅜	16⅜ 16⅜	12½ 12⅝	10½	12
24 24	10 GA. 3⁄16″,¼″	□ 12 GA. 3⁄16″	24RPC12 24RPC7	220 265	19⅜ 19⅜	35½ 35½	47 47	15⅝ 15⅝	18⅜ 18⅜	14½ 14⅝	12½	12

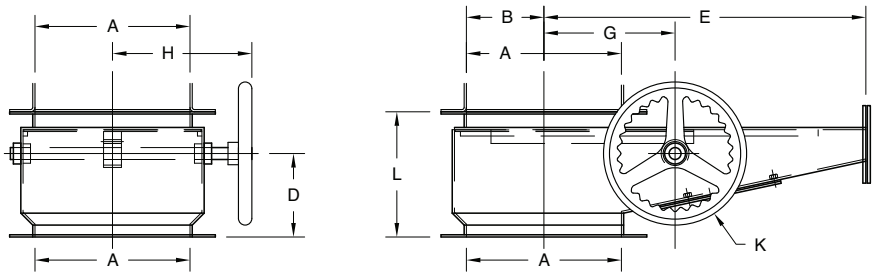
* Hand wheel supplied as Standard Assembly
— C Chain Wheel
— R Rope Wheel

□ Standard Gauge

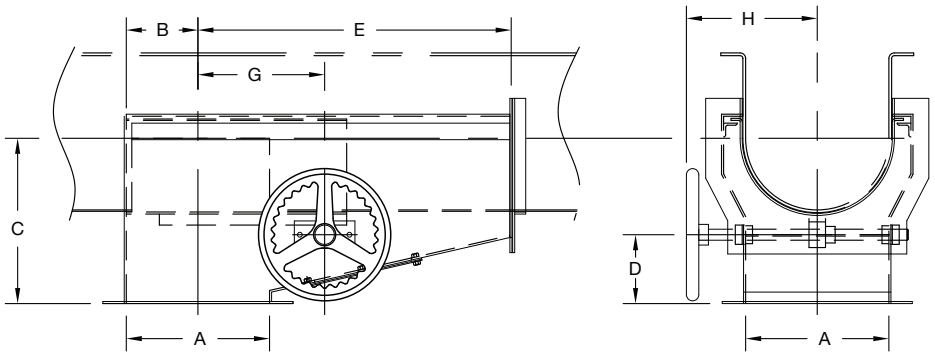
① Add –F for Fitted

Dust Tight Rack and Pinion Flat Slide

Dust tight rack and pinions are totally enclosed and can be furnished with either flat or curved slide. Handwheel is normally furnished but is also available with chain or rope wheel.



Dust Tight Rack and Pinion Curved Slide



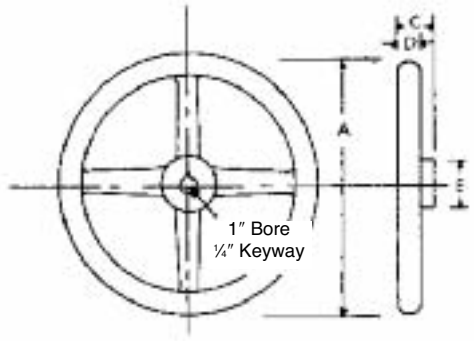
Screw Diameter	A	B	C	D	E	G	H	K Diameter	L
4	5	2½	7½	2½	12	6	7	12	7½
6	7	3½	10	4	18½	7½	8	12	9
9	10	5	12½	5	23	9	11	12	10
10	11	5½	13	5	25	10	11½	12	10½
12	13	6½	15	5	28	11½	13	12	10½
14	15	7½	15½	5½	31	12½	14	12	10½
16	17	8½	16½	5½	34	13½	15	12	10½
18	19	9½	18½	6½	38½	15	16½	12	11½
20	21	10½	20	7	40½	16	17½	12	12
24	25	12½	23	8	47½	18	19½	12	13

Screw Diameter	Trough Thickness Gauge	Spout and Slide Thickness Gauge	Part Number			
			Flat Slide * ①	Weight	Curved Slide * ①	Weight
4	16-14	14	4RPFD14	27	4RPCD16	30
4	12	12	4RPFD12	32	4RPCD12	35
6	16-14-12	14	6RPFD14	42	6RPCD16	46
6	3/16	12	6RPFD12	47	6RPCD12	52
9	14-12-10	14	9RPFD12	74	9RPCD12	81
9	3/16-¼	10	9RPFD10	81	9RPCD10	89
10	14-12-10	14	10RPFD14	84	10RPCD14	92
10	3/16-¼	10	10RPFD10	93	104PCD10	102
12	12-10	12	12RPFD12	141	12RPCD12	155
12	3/16-¼	3/16	12RPFD7	158	12RPCD7	174
14	12-10	12	14RPFD12	160	14RPCD12	176
14	3/16-¼	3/16	14RPFD7	185	14RPCD7	204
16	12-10	12	16RPFD12	168	16RPCD12	185
16	3/16-¼	3/16	16RPFD7	197	16RPCD7	217
18	12-10	12	18RPFD12	240	18RPCD12	264
18	3/16-¼	3/16	18RPFD7	277	18RPCD7	305
20	10	12	20RPFD12	278	20RPCD12	306
20	3/16-¼	3/16	20RPFD7	318	20RPCD7	350
24	10	12	24RPFD12	350	24RPCD12	385
24	3/16-¼	3/16	24RPFD7	402	24RPCD7	442

* Handwheel supplied as standard assembly
— C Chain Wheel
— R Rope Wheel

Flange drilling is standard. See page H-43
① Add –F for Fitted

Discharge Gate Accessories

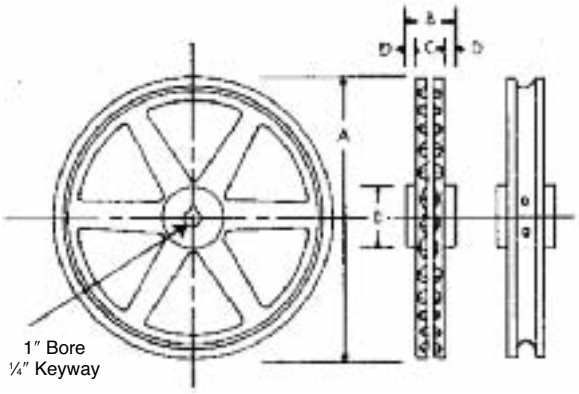


Hand Wheel

Dimensions in Inches and Weight in Pounds

Wheel Diameter	Part No.	Weight	C	D	E
12	12HW1	11	2	1⅛	1⅞

The hand wheel is regularly furnished to rotate the pinion shaft when the slide gate is readily accessible.
NOTE: Zinc or nickel plated hand wheels available on request.



Pocket Wheel & Rope Wheel

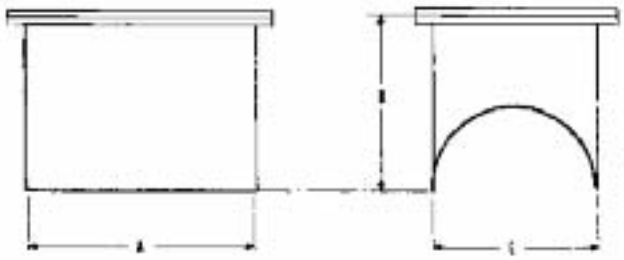
Dimensions in Inches and Average Weights in Pounds

Wheel Diameter	Part No.	Weight	A	B	C	D	E
Chain Wheel	20PW1	11	12¾	2	1⅜	5⁄16	2
Rope Wheel	12RW1	13	12⅝	2¼	1⅝	1¼	1⅞

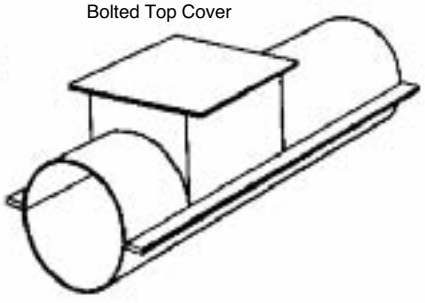
Pocket chain and rope wheels are used to rotate pinion shaft where remote operation is desired. It is designed to be used with number 3⁄16 pocket chain.
NOTE: Zinc or nickel plated hand wheels available on request.
316 PC Pocket Chain in Stock

Hanger Pockets

Hanger pockets are used with tubular trough and are mounted on the trough at bearing connections. The hanger pocket forms a “U” shaped section for a short distance, allowing the use of standard hangers and providing easy access to them.



Bolted Top Cover



Conveyor Diameter	Part Numer	A	B	C	Weight Each
4	4CPH16	8	3¾	5	2
6	6CPH16	12	4¾	7	3
9	9CPH14	12	6⅜	10	4
10	10CPH14	12	6⅝	11	9
12	12CPH12	18	8	13	18
14	14CPH12	18	9½	15	24
16	16CPH12	18	10⅞	17	26
18	18CPH12	18	12⅜	19	55
20	20CPH10	18	13¾	21	70
24	24CPH10	18	16¾	25	85

Trough Ends

Trough Ends

9	TEF	3	-BB	-P

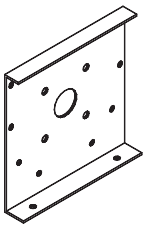
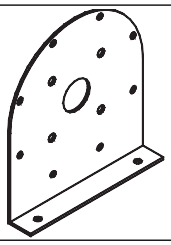
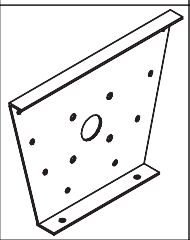
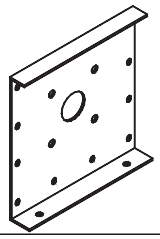
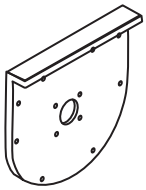
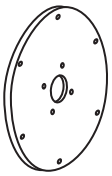
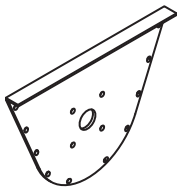
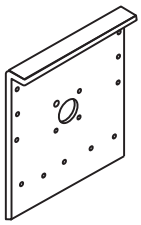
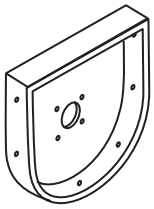
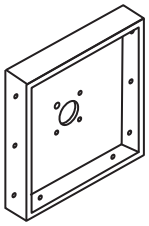
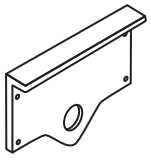
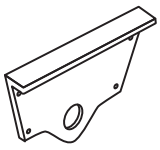
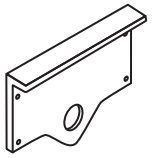
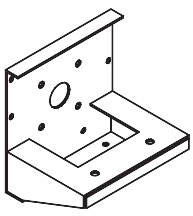
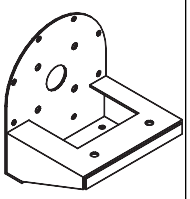
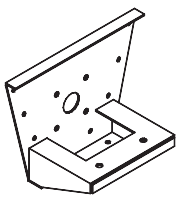
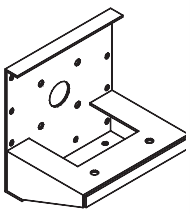
Conveyor Diameter

Type
TE — Outside W/O Feet
TEF — Outside W/Feet
TEI — Inside
TER — Inside Rectangular
TEO — Single Bearing Pedestal
TEOD — Double Bearing Pedestal
FTEF — Outside Flared W/Feet
FTE — Outside Flared W/O Feet
FTEO — Single Bearing Flared Pedestal
FTDO — Flared Discharge End
TDO — Outside Discharge End
TDI — Inside Discharge End
CHTE — Outside Tubular W/O Feet
CHTEF — Outside Tubular W/Feet
SCD —Dorris Screw Drive

Bearing Type
BB - Ball
RB - Roller

Plate Only

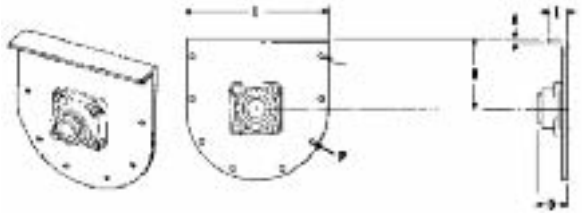
Coupling Diameter
2 — 1"
3 — 1-1/2"
4 — 2"
5 — 2-7/16"
6 — 3"
7 —3-7/16"

	U-TROUGH	TUBULAR TROUGH	FLARED TROUGH	RECTANGULAR TROUGH	
OUTSIDE TROUGH ENDS WITH FEET					Most common type used as trough support is included.
OUTSIDE TROUGH ENDS WITHOUT FEET					Trough support not included.
INSIDE PATTERN TROUGH ENDS		Available on application	Available on application		Used where space is limited or trough does not have end flange.
DISCHARGE TROUGH ENDS		Available on application			For end discharge conveyors. Special flange bearing required.
OUTBOARD BEARING TROUGH ENDS SINGLE					Used when compression type packing gland seal or split gland seal required.

Trough Ends

Outside Less Feet

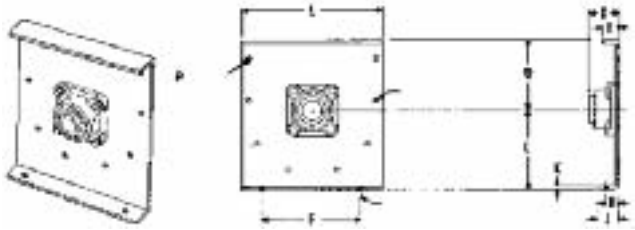
Outside trough ends less feet are used to support end bearing and cover when no trough support is required. Drilling for bronze bearing or flanged ball bearing is standard.



Conveyor Diameter	Shaft Diameter	▲ Part Number	B	D			E	K	L	N	Weight	P Slot
				Friction Bearing	Ball Bearing	Roller Bearing						
4	1	4TE2–*	3⅜	2⁹⁄₁₆	1⅝		1⁷⁄₁₆	¼	8⅛	⅜	3	⁷⁄₁₆ × ⁹⁄₁₆
6	1½	6TE3–*	4½	3⁹⁄₁₆	2⁹⁄₁₆	3¹¹⁄₁₆	1½	¼	10⅛	⅜	4	⁷⁄₁₆ × ⁹⁄₁₆
9	1½ 2	9TE3–* 9TE4–*	6⅛ 6⅛	3¼ 4¼	2⁹⁄₁₆ 2½	3¹¹⁄₁₆ 3¹³⁄₁₆	1⅝ 1⅝	¼ ¼	13¾ 13¾	⅜ ⅜	9 9	⁷⁄₁₆ × ⁹⁄₁₆
10	1½ 2	10TE3–* 10TE4–*	6⅜ 6⅜	3¼ 4¼	2⁹⁄₁₆ 2½	3¹¹⁄₁₆ 3¹³⁄₁₆	1¾ 1¾	¼ ¼	14¾ 14¾	⅜ ⅜	11 11	⁷⁄₁₆ × ⁹⁄₁₆ ⁷⁄₁₆ × ⁹⁄₁₆
12	2 2⁷⁄₁₆ 3	12TE4–* 12TE5–* 12TE6–*	7¾ 7¾ 7¾	4¼ 5¼ 6¼	2⁹⁄₁₆ 2¹⁵⁄₁₆ 3¾	3⅞ 4⁷⁄₁₆ 4¹⁵⁄₁₆	2 2 2	¼ ¼ ¼	17¼ 17¼ 17¼	½ ½ ½	20 20 20	⁹⁄₁₆ × ¹¹⁄₁₆
14	2⁷⁄₁₆ 3	14TE5–* 14TE6–*	9¼ 9¼	5⁵⁄₁₆ 5⁵⁄₁₆	2¹⁵⁄₁₆ 3¾	4⁷⁄₁₆ 4¹⁵⁄₁₆	2 2	¼ ¼	19¼ 19¼	½ ½	35 35	⁹⁄₁₆ × ¹¹⁄₁₆
16	3	16TE6–*	10⅝	6⁵⁄₁₆	3¹³⁄₁₆	5	2½	⁵⁄₁₆	21¼	⅝	42	¹¹⁄₁₆ × ¹³⁄₁₆
18	3 3⁷⁄₁₆	18TE6–* 18TE7–*	12⅛ 12⅛	6⅜ 7⅜	3¹³⁄₁₆ 4⁵⁄₁₆	5 5⁹⁄₁₆	2½ 2½	⅜ ⅜	24¼ 24¼	⅝ ⅝	60 60	¹¹⁄₁₆ × ¹³⁄₁₆
20	3 3⁷⁄₁₆	20TE6–* 20TE7–*	13½ 13½	6⅜ 7⅜	3⅞ 4⅜	5¹⁄₁₆ 5⅝	2½ 2½	⅜ ⅜	26¼ 26¼	⅝ ⅝	90 90	¹¹⁄₁₆ × ¹³⁄₁₆
24	3⁷⁄₁₆	24TE7–*	16½	7⅜	4⅜	5⅝	2½	⅜	30¼	⅝	120	¹¹⁄₁₆ × ¹³⁄₁₆

Outside With Feet

Outside trough ends with feet are used to support end bearing, cover and trough. Drilling for bronze or flanged ball bearing is standard.



Conveyor Diameter	Shaft Diameter	▲ Part Number	B	C	D			E	F	H	J	K	L	M	N	Weight	P Slot
					Friction Bearing	Ball Bearing	Roller Bearing										
4	1	4TEF2–*	3⅝	4⅝	2¹⁵⁄₁₆	1⅝	—	1⁷⁄₁₆	5¾	1	1⅝	¼	8⅛	⅜	⅜	4	⁷⁄₁₆ × ⁹⁄₁₆
6	1½	6TEF3–*	4½	5⅝	3¹⁵⁄₁₆	2⁹⁄₁₆	3¹¹⁄₁₆	1½	8⅛	1	1¾	¼	10⅛	⅜	⅜	7	⁷⁄₁₆ × ⁹⁄₁₆
9	1½ 2	9TEF3–* 9TEF4–*	6⅛ 6⅛	7⅞ 7⅞	3¹⁵⁄₁₆ 4¹⁵⁄₁₆	2⁹⁄₁₆ 2½	3¹¹⁄₁₆ 3¹³⁄₁₆	1⅝ 1⅝	9⅜ 9⅜	1½ 1½	2⅝ 2⅝	¼ ¼	13¾ 13¾	½ ½	⅜ ⅜	12 12	⁷⁄₁₆ × ⁹⁄₁₆ ⁷⁄₁₆ × ⁹⁄₁₆
10	1½ 2	10TEF3–* 10TEF4–*	6⅜ 6⅜	8⅞ 8⅞	3¹⁵⁄₁₆ 4¹⁵⁄₁₆	2⁹⁄₁₆ 2½	3¹¹⁄₁₆ 3¹³⁄₁₆	1¾ 1¾	9½ 9½	1¾ 1¾	2⅞ 2⅞	¼ ¼	14¾ 14¾	½ ½	⅜ ⅜	14 14	⁷⁄₁₆ × ⁹⁄₁₆ ⁷⁄₁₆ × ⁹⁄₁₆
12	2 2⁷⁄₁₆ 3	12TEF4–* 12TEF5–* 12TEF6–*	7¾ 7¾ 7¾	9⅝ 9⅝ 9⅝	5 5½ 5⅝	2⁹⁄₁₆ 2¹⁵⁄₁₆ 3¾	3⅞ 4⁷⁄₁₆ 4¹⁵⁄₁₆	2 2 2	12¼ 12¼ 12¼	1⅝ 1⅝ 1⅝	2¾ 2¾ 2¾	¼ ¼ ¼	17¼ 17¼ 17¼	⅝ ⅝ ⅝	½ ½ ½	23 23 23	⁹⁄₁₆ × ¹¹⁄₁₆ ⁹⁄₁₆ × ¹¹⁄₁₆ ⁹⁄₁₆ × ¹¹⁄₁₆
14	2⁷⁄₁₆ 3	14TEF5–* 14TEF6–*	9¼ 9¼	10⅞ 10⅞	5½ 5⅝	2¹⁵⁄₁₆ 3¾	4⁷⁄₁₆ 4¹⁵⁄₁₆	2 2	13½ 13½	1⅝ 1⅝	2⅞ 2⅞	¼ ¼	19¼ 19¼	⅝ ⅝	½ ½	38 38	⁹⁄₁₆ × ¹¹⁄₁₆ ⁹⁄₁₆ × ¹¹⁄₁₆
16	3	16TEF6–*	10⅝	12	5¹¹⁄₁₆	3¹³⁄₁₆	5	2½	14⅞	2	3¼	⁵⁄₁₆	21¼	⅝	⅝	45	¹¹⁄₁₆ × ¹³⁄₁₆
18	3 3⁷⁄₁₆	18TEF6–* 18TEF7–*	12⅛ 12⅛	13⅜ 13⅜	5¹¹⁄₁₆ 6¹⁵⁄₁₆	3¹³⁄₁₆ 4⁵⁄₁₆	5 5⁹⁄₁₆	2½ 2½	16 16	2 2	3¼ 3¼	⅜ ⅜	24¼ 24¼	⅝ ⅝	⅝ ⅝	67 67	¹¹⁄₁₆ × ¹³⁄₁₆ ¹¹⁄₁₆ × ¹³⁄₁₆
20	3 3⁷⁄₁₆	20TEF6–* 20TEF7–*	13½ 13½	15 15	5¾ 7	3⅞ 4⅜	5¹⁄₁₆ 5⅝	2½ 2½	19¼ 19¼	2¼ 2¼	3¾ 3¾	⅜ ⅜	26¼ 26¼	¾ ¾	⅝ ⅝	120 120	¹¹⁄₁₆ × ¹³⁄₁₆ ¹¹⁄₁₆ × ¹³⁄₁₆
24	3⁷⁄₁₆	24TEF7–*	16½	18⅛	7	4⅜	5⅝	2½	20	2½	4⅛	⅜	30¼	¾	⅝	162	¹¹⁄₁₆ × ¹³⁄₁₆

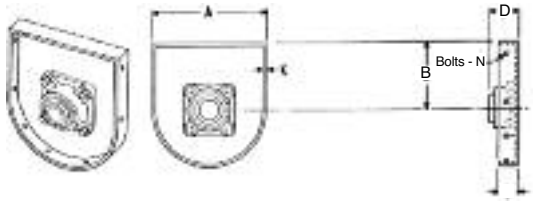
▲ Can be furnished with CSP, CSW, or CSFP seals

–*BB Ball Bearing
–*BR Bronze Bearing
–*RB Roller Bearing
–*P Less Bearing

CONVEYORS

Inside

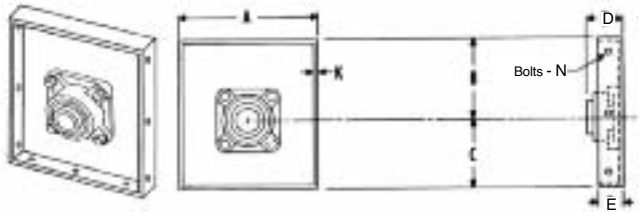
Inside trough ends are used in place of outside type where no trough end flanges are required. Drilling for bronze bearings or flanged ball bearing is standard.



Conveyor Diameter	Shaft Diameter	▲ Part Number	A	B	D			E	K	N	Weight
					Friction Bearing	Ball Bearing	Roller Bearing				
4	1	4TEI2–*	5	3⅝	2 3/16	1⅝	—	2	¼	¼	3
6	1½	6TEI3–*	7	4½	3 3/16	2 3/16	3 11/16	2	¼	5/16	5
9	1½	9TEI3–*	10	6⅛	3¼	2 3/16	3 11/16	2	¼	⅜	9
	2	9TEI4–*	10	6⅛	4¼	2½	3 13/16	2	¼	⅜	9
10	1½	10TEI3–*	11	6⅜	3¼	2 3/16	3 11/16	2	¼	⅜	11
	2	10TEI4–*	11	6⅜	4¼	2½	3 13/16	2	¼	⅜	11
12	2	12TEI4–*	13	7¾	4¼	2 3/16	3⅞	2	¼	½	19
	2 7/16	12TEI5–*	13	7¾	5¼	2 15/16	4 7/16	2	¼	½	19
	3	12TEI6–*	13	7¾	6¼	3¾	4 15/16	2	¼	½	19
14	2 7/16	14TEI5–*	15	9¼	5 5/16	2 15/16	4 7/16	2	¼	½	34
	3	14TEI6–*	15	9¼	6 5/16	3¾	4 15/16	2	¼	½	34
16	3	16TEI6–*	17	10⅝	6 5/16	3 13/16	5	2	5/16	⅝	40
18	3	18TEI6–*	19	12⅛	6⅜	3 13/16	5	2	⅜	⅝	58
	3 7/16	18TEI7–*	19	12⅛	7⅜	4 5/16	5 9/16	2	⅜	⅝	58
20	3	20TEI6–*	21	13½	6⅜	3⅞	5 1/16	2	⅜	⅝	83
	3 7/16	20TEI7–*	21	13½	7⅜	4⅜	5⅝	2	⅜	⅝	83
24	3 7/16	24TEI7–*	25	16½	7⅜	4⅜	5⅝	2	⅜	⅝	116

Inside Rectangular

Rectangular trough ends are used inside of rectangular trough. Drilling for bronze bearing or flanged ball bearing is standard.



Conveyor Diameter	Shaft Diameter	▲ Part Number	A	B	C	D			E	K	N	Weight
						Friction Bearing	Ball Bearing	Roller Bearing				
4	1	4TER2–*	5	3⅝	2½	2 3/16	1⅝	—	2	¼	¼	4
6	1½	6TER3–*	7	4½	3½	3 3/16	2 3/16	3 11/16	2	¼	5/16	6
9	1½	9TER3–*	10	6⅛	5	3¼	2 3/16	3 11/16	2	¼	⅜	9
	2	9TER4–*	10	6⅛	5	4¼	2½	3 13/16	2	¼	⅜	9
10	1½	10TER3–*	11	6⅜	5½	3¼	2 3/16	3 11/16	2	¼	⅜	12
	2	10TER4–*	11	6⅜	5½	4¼	2½	3 13/16	2	¼	⅜	12
12	2	12TER4–*	13	7¾	6½	4¼	2 3/16	3⅞	2	¼	½	21
	2 7/16	12TER5–*	13	7¾	6½	5¼	2 15/16	4 7/16	2	¼	½	21
	3	12TER6–*	13	7¾	6½	6¼	3¾	4 15/16	2	¼	½	21
14	2 7/16	14TER5–*	15	9¼	7½	5 5/16	2 15/16	4 7/16	2	¼	½	35
	3	14TER6–*	15	9¼	7½	6 5/16	3¾	4 15/16	2	¼	½	35
16	3	16TER6–*	17	10⅝	8½	6 5/16	3 13/16	5	2	5/16	⅝	41
18	3	18TER6–*	19	12⅛	9½	6⅜	3 13/16	5	2	⅜	⅝	60
	3 7/16	18TER7–*	19	12⅛	9½	7⅜	4 5/16	5 9/16	2	⅜	⅝	60
20	3	20TER6–*	21	13½	10½	6⅜	3⅞	5 1/16	2	⅜	⅝	88
	3 7/16	20TER7–*	21	13½	10½	7⅜	4⅜	5⅝	2	⅜	⅝	88
24	3 7/16	24TER7–*	25	16½	12½	7⅜	4⅜	5⅝	2	⅜	⅝	125

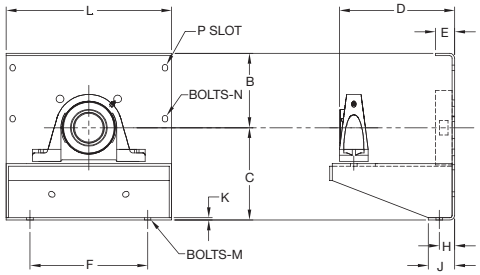
▲ Can be furnished with CSP, CSW, or CSS seals

–*BB Ball Bearing
–*BP Bronze Bearing
–*RB Roller Bearing
–*P Less Bearing

Trough Ends

Single Bearing

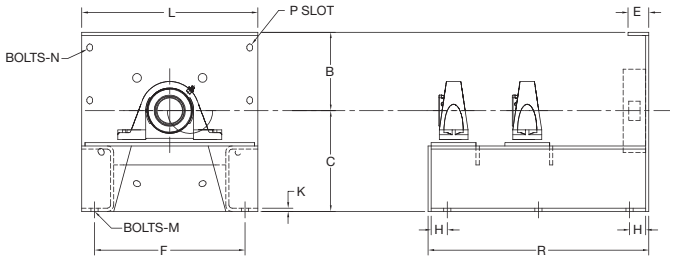
Single bearing pedestal type trough ends are constructed with base for mounting pillow block bearings and shaft seal or packing gland.



Conveyor Diameter	Shaft Diameter	Part Number	B	C	D	E	F	H	J	K	L	M	N	P Slot	Weight
6	1½	6TEO3	**Consult Factory**												
9	1½ 2	9TEO3 9TEO4													
10	1½ 2	10TEO3 10TEO4													
12	2 2 7/16 3	12TEO4 12TEO5 12TEO6													
14	2 7/16 3	14TEO5 14TEO6													
16	3	16TEO6													
18	3 3 7/16	18TEO6 18TEO7													
20	3 3 7/16	20TEO6 20TEO7													
24	3 7/16	24TEO7													

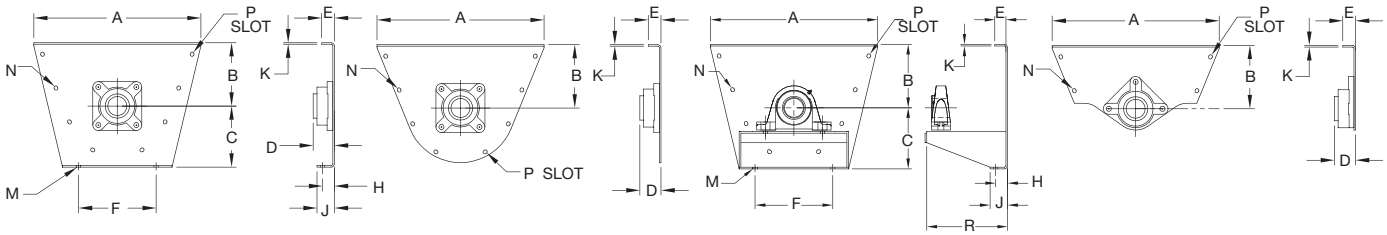
Double Bearing

Double bearing pedestal type trough ends are for use with pillow block bearing in conjunction with a flanged bearing providing extra shaft support.



Conveyor Diameter	Shaft Diameter	Part Number	B	C	E	F	H	K	L	M	N	R	P Slot	Weight
6	1½	6TEOD3	**Consult Factory**											
9	1½ 2	9TEOD3 9TEOD4												
10	1½ 2	10TEOD3 10TEOD4												
12	2 2 7/16 3	12TEOD4 12TEOD5 12TEOD6												
14	2 7/16 3	14TEOD5 14TEOD6												
16	3	16TEOD6												
18	3 3 7/16	18TEOD6 18TEOD7												
20	3 3 7/16	20TEOD6 20TEOD7												
24	3 7/16	24TEOD7												

Trough Ends



Outside With Feet **Outside Less Feet** **Outboard Bearing** **Discharge**

Application: same as standard trough ends except for flared trough.

Conveyor Diameter	Shaft Diameter	A	B	C	D			E	F	H	J	K	M	N	R	P Slot
					Friction Bearing	Ball Bearing	Roller Bearing									
6	1½	16⅝	7	5⅝	3³⁄₁₆	2³⁄₁₆	3¾	1½	8⅛	1	1¾	¼	⅜	⅜	Consult Factory	7⁄₁₆ × 9⁄₁₆
9	1½	21¼	9	7⅞	3¼	2³⁄₁₆	3¾	1⅝	9⅜	1½	2⅝	¼	½	⅜		7⁄₁₆ × 9⁄₁₆
	2	21¼	9	7⅞	4¼	2½	3⅞	1⅝	9⅜	1½	2⅝	¼	½	⅜		7⁄₁₆ × 9⁄₁₆
12	2	26⅜	10	9⅝	4¼	2⁹⁄₁₆	3⅜	2	12¼	1⅝	2¾	¼	⅝	½		9⁄₁₆ × 1¹⁄₁₆
	2⁷⁄₁₆	26⅜	10	9⅝	5¼	2¹⁵⁄₁₆	4½	2	12¼	1⅝	2¾	¼	⅝	½		9⁄₁₆ × 1¹⁄₁₆
	3	26⅜	10	9⅝	6¼	3¾	5	2	12¼	1⅝	2¾	¼	⅝	½		9⁄₁₆ × 1¹⁄₁₆
14	2⁷⁄₁₆	28⅜	11	10⅞	5⁵⁄₁₆	2¹⁵⁄₁₆	4½	2	13½	1⅝	2⅞	¼	⅝	½		9⁄₁₆ × 1¹⁄₁₆
	3	28⅜	11	10⅞	6⁵⁄₁₆	3¾	5	2	13½	1⅝	2⅞	5⁄₁₆	⅝	½		9⁄₁₆ × 1¹⁄₁₆
16	3	32½	11½	12	6⁵⁄₁₆	3¹³⁄₁₆	5	2½	14⅞	2	3¼	5⁄₁₆	⅝	⅝		1¹⁄₁₆ × 1³⁄₁₆
18	3	36½	12⅛	13⅜	6⅜	3¹³⁄₁₆	5	2½	16	2	3¼	⅜	⅝	⅝		1¹⁄₁₆ × 1³⁄₁₆
	3⁷⁄₁₆	36½	12⅛	13⅜	7⅜	4⁵⁄₁₆	5⅝	2½	16	2	3¼	⅜	⅝	⅝		1¹⁄₁₆ × 1³⁄₁₆
20	3	39½	13½	15	6⅜	3⅞	5	2½	19¼	2¼	3¾	⅜	¾	⅝		1¹⁄₁₆ × 1³⁄₁₆
	3⁷⁄₁₆	39½	13½	15	7⅜	4⅜	5⅝	2½	19¼	2¼	3¾	⅜	¾	⅝		1¹⁄₁₆ × 1³⁄₁₆
24	3⁷⁄₁₆	45½	16½	18⅛	7⅜	4⅜	5⅝	2½	20	2½	4⅛	⅜	¾	⅝		1¹⁄₁₆ × 1³⁄₁₆

Conveyor Diameter	Shaft Diameter	Part Number							
		Outside With Feet	Weight	Outside Less Feet	Weight	Outboard Bearing	Weight	Discharge	Weight
6	1½	6FTEF3.*	15	6FTE3–*	13	6FTEO3–*	22	6FTDO3–**	11
9	1½	9FTEF3–*	22	9FTE3–*	19	9FTEO3–*	31	9FTDO3–**	15
	2	9FTEF4–*	27	9FTE4–*	24	9FTEO4–*	36	9FTDO4–**	20
12	2	12FTEF4–*	43	12FTE4–*	36	12FTEO4–*	63	12FTDO4–**	28
	2⁷⁄₁₆	12FTEF5–*	44	12FTE5–*	37	12FTEO5–*	64	12FTDO5–**	29
	3	12FTEF6–*	56	12FTE6–*	49	12FTEO6–*	76	12FTDO6–**	41
14	2⁷⁄₁₆	14FTEF5–*	52	14FTE5–*	43	14FTEO5–*	75	14FTDO5–**	33
	3	14FTEF6–*	64	14FTE6–*	55	14FTEO6–*	87	14FTDO6–**	45
16	3	16FTEF6–*	85	16FTE6–*	72	16FTEO6–*	125	16FTDO6–**	56
18	3	18FTEF6–*	98	18FTE6–*	83	18FTEO6–*	138	18FTDO6–**	63
	3⁷⁄₁₆	18FTEF7–*	104	18FTE7–*	89	18FTEO7–*	144	18FTDO7–**	69
20	3	20FTEF6–*	133	20FTE6–*	103	20FTEO6–*	196	20FTDO6–**	75
	3⁷⁄₁₆	20FTEF7–*	139	20FTE7–*	109	20FTEO7–*	202	20FTDO7–**	81
24	3⁷⁄₁₆	24FTEF7–*	179	24FTE7–*	132	24FTEO7–*	250	24FTDO7–**	96

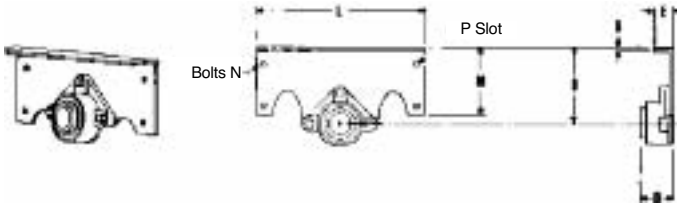
–*BB Ball Bearing
–*BR Bronze Bearing
–*RB Roller Bearing
–*P Less Bearing

For Bolt Pattern see Page H-42

Trough Ends

Outside Discharge

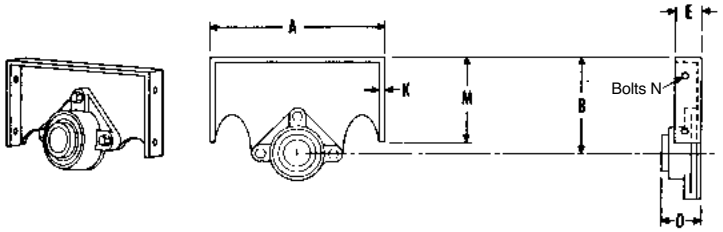
Outside discharge trough ends are used to support end bearing and will allow material to discharge or overflow through the end of the trough. Drilling for three bolt bronze or flanged ball bearing is standard.



Conveyor Diameter	Shaft Diameter	Part Number	B	D			E	K	L	M	N	P Slot	Weight
				Friction Bearing	Ball Bearing	Roller Bearing							
4	1	4TDO2.*	3⅝	2⁹⁄₁₆	1⅝		2	¼	8	3⅝	⅜	⁷⁄₁₆ × ⁹⁄₁₆	2
6	1½	6TDO3–*	4½	3⁹⁄₁₆	2⁹⁄₁₆	3¹¹⁄₁₆	2	¼	9¾	4½	⅜	⁷⁄₁₆ × ⁹⁄₁₆	3
9	1½	9TDO3–*	6⅛	3¼	2⁹⁄₁₆	3¹¹⁄₁₆	2	¼	13¾	6⅛	⅜	⁷⁄₁₆ × ⁹⁄₁₆	5
	2	9TDO4–*	6⅛	4¼	2½	3¹³⁄₁₆	2	¼	13¾	6⅛	⅜	⁷⁄₁₆ × ⁹⁄₁₆	5
10	1½	10TDO3–*	6⅜	3¼	2⁹⁄₁₆	3¹¹⁄₁₆	2	¼	14¾	6⅜	⅜	⁷⁄₁₆ × ⁹⁄₁₆	6
	2	10TDO4–*	6⅜	4¼	2½	3¹³⁄₁₆	2	¼	14¾	6⅜	⅜	⁷⁄₁₆ × ⁹⁄₁₆	6
12	2	12TDO4–*	7¾	4¼	2⁹⁄₁₆	3⅞	2	¼	17½	7¾	½	⁹⁄₁₆ × ¾	12
	2⁷⁄₁₆	12TDO5–*	7¾	5¼	2¹⁵⁄₁₆	4⁷⁄₁₆	2	¼	17½	7¾	½	⁹⁄₁₆ × ¾	12
	3	12TDO6–*	7¾	6¼	3¾	4¹⁵⁄₁₆	2	¼	17½	7¾	½	⁹⁄₁₆ × ¾	12
14	2⁷⁄₁₆	14TDO5–*	9¼	5⁵⁄₁₆	2¹⁵⁄₁₆	4⁷⁄₁₆	2	¼	19¼	9¼	½	⁹⁄₁₆ × ¾	17
	3	14TDO6–*	9¼	6⁵⁄₁₆	3¾	4¹⁵⁄₁₆	2	¼	19¼	9¼	½	⁹⁄₁₆ × ¾	17
16	3	16TDO6–*	10⅝	6⁵⁄₁₆	3¹³⁄₁₆	5	2	⁵⁄₁₆	21⅛	10⅝	⅝	¹¹⁄₁₆ × ⅞	26
18	3	18TDO6–*	12⅛	6⅜	3¹³⁄₁₆	5	2	⅜	23½	12⅛	⅝	¹¹⁄₁₆ × ⅞	33
	3⁷⁄₁₆	18TDO7–*	12⅛	7⅜	4⁵⁄₁₆	5⁵⁄₁₆	2	⅜	23½	12⅛	⅝	¹¹⁄₁₆ × ⅞	33
20	3	20TDO6–*	13½	6⅜	3⅜	5¹⁄₁₆	2	⅜	26¾	13½	⅝	¹¹⁄₁₆ × ⅞	55
	3⁷⁄₁₆	20TDO7–*	13½	7⅜	4⅜	5⅝	2	⅜	26¾	13½	⅝	¹¹⁄₁₆ × ⅞	55
24	3⁷⁄₁₆	24TDO7–*	16½	7⅜	4⅜	5⅝	2	⅜	30½	16½	⅝	¹¹⁄₁₆ × ⅞	81

Inside Discharge

Inside discharge trough ends are used to support end bearing and will allow material to discharge or overflow through the end of the trough. This trough end is used inside the trough where no trough end flanges are required. Drilling for three bolt bronze or flanged ball bearing is standard.

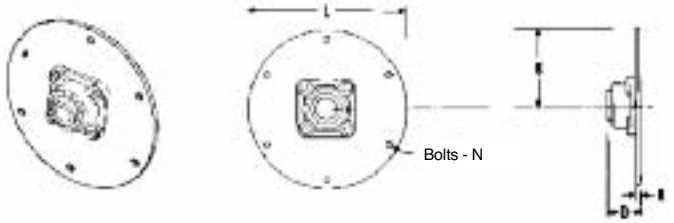


Conveyor Diameter	Shaft Diameter	Part Number	A	B	D			E	K	M	N	Weight
					Friction Bearing	Ball Bearing	Roller Bearing					
4	1	4TDI2–*	5	3⅝	2⁹⁄₁₆	1⅝		2	¼	3⅝	⅜	2
6	1½	6TDI3–*	7	4½	3⁹⁄₁₆	2⁹⁄₁₆	3¹¹⁄₁₆	2	¼	4½	⅜	3
9	1½	9TDI3–*	10	6⅛	3¼	2⁹⁄₁₆	3¹¹⁄₁₆	2	¼	6⅛	⅜	5
	2	9TDI4–*	10	6⅛	4¼	2½	3¹³⁄₁₆	2	¼	6⅛	⅜	5
10	1½	10TDI3–*	11	6⅜	3¼	2⁹⁄₁₆	3¹¹⁄₁₆	2	¼	6⅜	⅜	6
	2	10TDI4–*	11	6⅜	4¼	2½	3¹³⁄₁₆	2	¼	6⅜	⅜	6
12	2	12TDI4–*	13	7¾	4¼	2⁹⁄₁₆	3⅞	2	¼	7¾	½	12
	2⁷⁄₁₆	12TDI5–*	13	7¾	5¼	2¹³⁄₁₆	4⁷⁄₁₆	2	¼	7¾	½	12
	3	12TDI6–*	13	7¾	6¼	3¾	4¹⁵⁄₁₆	2	¼	7¾	½	12
14	2⁷⁄₁₆	14TDI5–*	15	9¼	5⁵⁄₁₆	2¹⁵⁄₁₆	4⁷⁄₁₆	2	¼	9¼	⅝	16
	3	14TDI6–*	15	9¼	6⁵⁄₁₆	3¾	4¹⁵⁄₁₆	2	¼	9¼	⅝	16
16	3	16TDI6–*	17	10⅝	6⁵⁄₁₆	3¹³⁄₁₆	5	2	⁵⁄₁₆	10⅝	⅝	25
18	3	18TDI6–*	19	12⅛	6⅜	3¹³⁄₁₆	5	2	⅜	12⅛	⅝	32
	3⁷⁄₁₆	18TDI7–*	19	12⅛	7⅜	4⁵⁄₁₆	5⁵⁄₁₆	2	⅜	12⅛	⅝	32
20	3	20TDI16–*	21	13½	6⅜	3⅞	5⁵⁄₁₆	2	⅜	13½	⅝	50
	3⁷⁄₁₆	20TDI7–*	21	13½	7⅜	4⅜	5⅝	2	⅜	13½	⅝	50
24	3⁷⁄₁₆	24TDI7–*	25	16½	7⅜	4⅜	5⅝	2	⅜	16½	⅝	76

–*BB Ball Bearing
–*BR Bronze Bearing
_*RB Roller Bearing
–*P Less Bearing

Outside

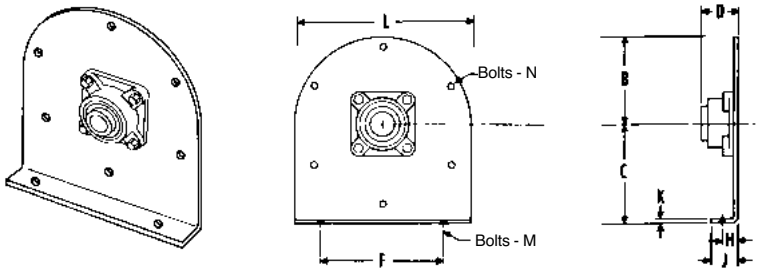
Outside tubular trough ends less feet are used to support end bearings on tubular trough where no foot or support is required. Drilling for bronze or flanged ball bearing is standard.



Conveyor Diameter	Shaft Diameter	Part Number	B	D			K	L	N	Weight
				Friction Bearing	Ball Bearing	Roller Bearing				
4	1	4CHTE2–*	4	2 3/16	1 5/8		1/4	8	3/8	2
6	1 1/2	6CHTE3–*	5 1/16	3 3/16	2 3/16	3 11/16	1/4	10 1/8	3/8	3
9	1 1/2	9CHTE3–*	6 5/8	3 1/4	2 3/16	3 11/16	1/4	13 1/4	3/8	6
	2	9CHTE4–*	6 5/8	4 1/4	2 1/2	3 13/16	1/4	13 1/4	3/8	6
10	1 1/2	10CHTE3–*	7 5/8	3 1/4	2 3/16	3 11/16	1/4	14 3/4	3/8	7
	2	10CHTE4–*	7 5/8	4 1/4	2 1/2	3 13/16	1/4	14 3/4	3/8	7
12	2	12CHTE4–*	8 1/8	4 1/4	2 3/16	3 7/8	1/4	16 1/4	1/2	13
	2 7/16	12CHTE5–*	8 1/8	5 1/4	2 15/16	4 7/16	1/4	16 1/4	1/2	13
	3	12CHTE6–*	8 1/8	6 1/4	3 3/4	4 15/16	1/4	16 1/4	1/2	13
14	2 7/16	14CHTE5–*	9 1/8	5 5/16	2 15/16	4 7/16	1/4	18 1/4	1/2	19
	3	14CHTE6–*	9 1/8	6 5/16	3 3/4	4 15/16	1/4	18 1/4	1/2	19
16	3	16CHTE6–*	10 5/8	6 5/16	3 13/16	5	5/16	21 1/4	5/8	29
18	3	18CHTE6–*	12 1/8	6 3/8	3 13/16	5	3/8	24 1/4	5/8	39
	3 7/16	18CHTE7–*	12 1/8	7 3/8	4 5/16	5 5/16	3/8	24 1/4	5/8	39
20	3	20CHTE6–*	13 1/8	6 5/8	3 7/8	5 1/16	3/8	26 1/4	5/8	63
	3 7/16	20CHTE7–*	13 1/8	7 3/8	4 3/8	5 5/8	3/8	26 1/4	5/8	63
24	3 7/16	24CHTE7–*	15 1/8	7 3/8	4 3/8	5 5/8	3/8	30 1/4	5/8	87

Outside with Feet

Outside tubular trough ends with feet are used to support end bearing where trough support is required. Drilling for bronze bearing or flanged ball bearing is standard.

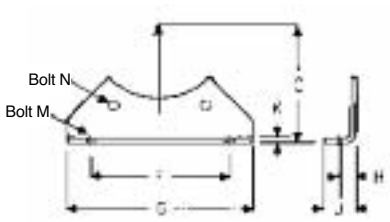


Conveyor Diameter	Shaft Diameter	Part Number	B	C	D			F	H	J	K	L	M	N	Weight
					Friction Bearing	Ball Bearing	Roller Bearing								
4	1	4CHTEF2–*	4	4 5/8	2 3/16	1 5/8		5 3/4	1	1 5/8	1/4	8	3/8	3/8	3
6	1 1/2	6CHTEF3–*	5 1/16	5 5/8	3 3/16	2 3/16	3 11/16	8 1/8	1	1 3/4	1/4	10 1/8	3/8	3/8	5
9	1 1/2	9CHTEF3–*	6 5/8	7 5/8	3 1/4	2 3/16	3 11/16	9 3/8	1 1/2	2 5/8	1/4	13 1/4	1/2	3/8	10
	2	9CHTEF4–*	6 5/8	7 5/8	4 1/4	2 1/2	3 13/16	9 3/8	1 1/2	2 5/8	1/4	13 1/4	1/2	3/8	10
10	1 1/2	10CHTEF3–*	7 5/8	8 5/8	3 1/4	2 3/16	3 11/16	9 1/2	1 3/4	2 7/8	1/4	14 3/4	1/2	3/8	12
	2	10CHTEF4–*	7 5/8	8 5/8	4 1/4	2 1/2	3 13/16	9 1/2	1 3/4	2 7/8	1/4	14 3/4	1/2	3/8	12
12	2	12CHTEF4–*	8 1/8	9 5/8	4 1/4	2 3/16	3 7/8	12 1/4	1 5/8	2 3/4	1/4	16 1/4	5/8	1/2	22
	2 7/16	12CHTEF5–*	8 1/8	9 5/8	5 1/4	2 15/16	4 7/16	12 1/4	1 5/8	2 3/4	1/4	16 1/4	5/8	1/2	22
	3	12CHTEF6–*	8 1/8	9 5/8	6 1/4	3 3/4	4 15/16	12 1/4	1 5/8	2 3/4	1/4	16 1/4	5/8	1/2	22
14	2 7/16	14CHTEF5–*	9 1/8	10 7/8	5 5/16	2 15/16	4 7/16	13 1/2	1 5/8	2 7/8	1/4	18 1/4	5/8	1/2	24
	3	14CHTEF6–*	9 1/8	10 7/8	6 5/16	3 3/4	4 15/16	13 1/2	1 5/8	2 7/8	1/4	18 1/4	5/8	1/2	24
16	3	16CHTEF6–*	10 5/8	12	6 5/16	3 13/16	5	14 7/8	2	3 1/4	5/16	21 1/4	5/8	5/8	44
18	3	18CHTEF6–*	12 1/8	13 3/8	6 3/8	3 13/16	5	16	2	3 1/4	3/8	24 1/4	5/8	5/8	56
	3 7/16	18CHTEF7–*	12 1/8	13 3/8	7 3/8	4 5/16	5 5/16	16	2	3 1/4	3/8	24 1/4	5/8	5/8	56
20	3	20CHTEF6–*	13 1/8	15	6 3/8	3 7/8	5 1/16	19 1/4	2 1/4	3 3/4	3/8	26 1/4	3/4	5/8	92
	3 7/16	20CHTEF7–*	13 1/8	15	7 3/8	4 3/8	5 5/8	19 1/4	2 1/4	3 3/4	3/8	26 1/4	3/4	5/8	92
24	3 7/16	24CHTEF7–*	15 1/8	18 1/8	7 3/8	4 3/8	5 5/8	20	2 1/2	4 1/8	3/8	30 1/4	3/4	5/8	134

–*BB Ball Bearing
–*RB Roller Bearing
–*BR Bronze Bearing

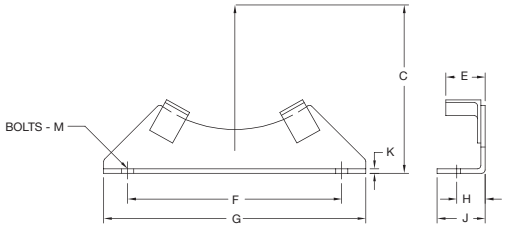
For Bolt Pattern see Page H-43

Saddles — Feet
Trough End Flanges



Flange Foot

Trough feet are used to support trough at trough connections.



Saddle

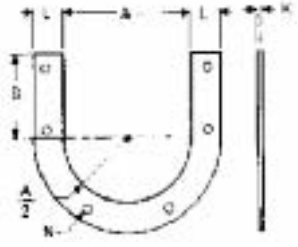
Trough saddles are used to support trough where flange feet cannot be used at connections.

Conveyor Diameter	Part Number			Weight		
	Saddle	Tubular	Flange Foot	Saddle	Tubular	Flange Foot
4	4TS	4CHTFF	4TFF	1.5	1	1.5
6	6TS	6CHTFF	6TFF	2.0	2	2.0
9	9TS	9CHTFF	9TFF	4.5	4.5	4.5
10	10TS	10CHTFF	10TFF	5.0	4.5	5.0
12	12TS	12CHTFF	12TFF	6.0	5	6.0
14	14TS	14CHTFF	14TFF	7.0	7	7.0
16	16TS	16CHTFF	16TFF	8.0	8	7.5
18	18TS	18CHTFF	18TFF	10	10	9.5
20	20TS	20CHTFF	20TFF	13	11	12.51
24	24TS	24CHTFF	24TFF	15	12	14.5

Conveyor Diameter	C	E	F	G	H	J	K	M*	N
4	4⅝	1 3/16	5¾	7⅜	1	1⅝	3/16	½	⅜
6	5⅝	1 3/16	8⅛	10	1¼	2	3/16	½	⅜
9	7⅞	1½	9⅜	12	1½	2⅝	3/16	½	⅜
10	8⅞	1½	9½	12⅜	1¾	2⅞	3/16	½	⅜
12	9⅝	1½	12¼	15	1⅝	2¾	¼	⅝	½
14	10⅞	1¾	13½	16½	1⅜	2½	¼	⅝	½
16	12	1¾	14⅞	18	2	3¼	¼	⅝	⅝
18	13⅜	1¾	16	19⅛	2	3¼	¼	⅝	⅝
20	15	2¼	19¼	22¾	2¼	3¾	¼	¾	⅝
24	18⅛	2¼	20	24	2¼	4	¼	¾	⅝

*Holes for Bolt M Slotted

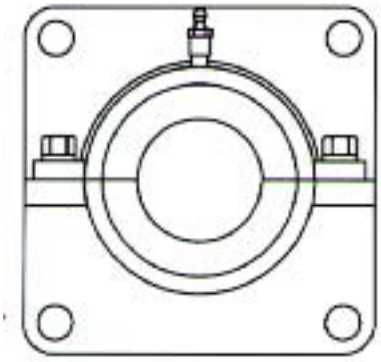
Trough End Flanges

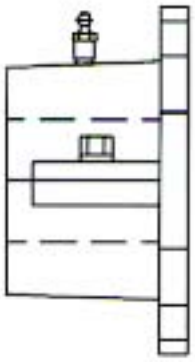


Size	Part No.	A Trough Thickness Thru 10 Ga.	A Trough Thickness 3/16 & ¼	B	K	L	N	Weight	Red Rubber Gasket Part No.
4	4TF*	5¼	5⅜	3⅜	¼	1¼	⅜	.09	4TFG
6	6TF*	7¼	7⅜	4¼	¼	1½	⅜	1.5	6TFG
9	9TF*	10¼	10½	5⅞	¼	1¾	⅜	2.4	9TFG
10	10TF*	11¼	11½	6⅛	¼	1¾	⅜	2.6	10TFG
12	12TF*	13¼	13½	7½	¼	2	½	5.6	12TFG
14	14TF*	15¼	15½	9	¼	2	½	6.5	14TFG
16	16TF*	17¼	17½	10⅜	¼	2	⅝	7.4	16TFG
18	18TF*	19¼	19½	11 13/16	¼	2½	⅝	10.2	18TFG
20	20TF*	21¼	21½	13 3/16	¼	2½	⅝	11.3	20TFG
24	24TF*	25¼	25½	16½	¼	2½	⅝	15.5	24TFG

*–10 used for troughs through 10 ga., –3 used for troughs 3/16 and ¼ thick.
**Subtract 1/8 when using plate trough.
*** For White Rubber Gasket Add WN

KEEP THE HOUSING REPLACE THE INSERT.





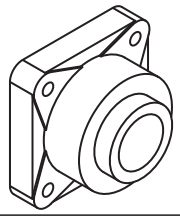
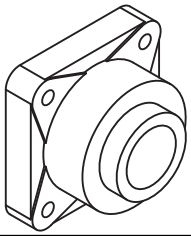
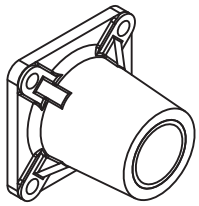
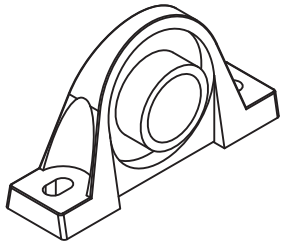
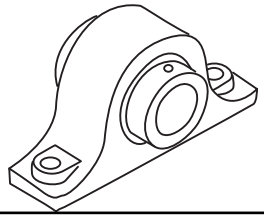
TEBH- Split Bearing Housings will help cut down on a plant's repair parts inventory, as well as the cost of the bearing. The rugged cast iron housing is not subject to wear, only the Style 220 Hanger bearing insert needs to be replaced.

The housings match CEMA standard ball bearing bolt pattern, so they can be used with most seals.

Split bearing housings are stocked in all Martin stocking facilities. Call your Martin distributor for more information.

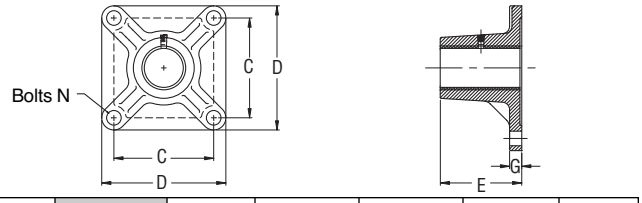
TROUGH END BEARING HOUSINGS

Martin Split Bearing Housings utilize Martin Style 220 Hanger Bearings.

FLANGE UNITS	Mounted on trough end plate.		Ball Bearing Flange Unit
			Roller Bearing Flange Unit
			Bronze Sleeve Bearing Flange Unit
PILLOW BLOCKS	Mounted on pedestal of outboard bearing trough end.		Ball Bearing Pillow Block
			Roller Bearing Pillow Block

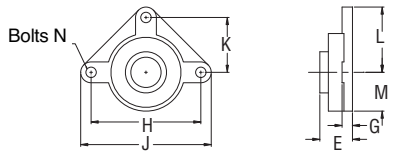
End Bearings

Bronze Flange Unit



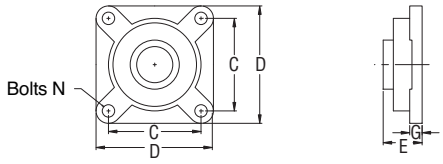
Bore	Part Number	C	D	E	G	N
1	TEB2BR	2¾	3¾	2	7/16	⅜
1½	TEB3BR	4	5⅜	3¼	¾	½
2	TEB4BR	5⅛	6½	4 3/16	⅞	⅝
2 7/16	TEB5BR	5⅝	7⅜	4 15/16	1	⅝
3	TEB6BR	6	7¾	5 1/16	1⅛	¾
3 7/16	TEB7BR	6¾	9¼	6¼	1¼	¾

Ball Bearing Discharge Unit



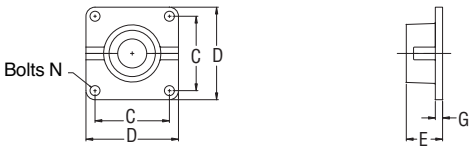
Bore	Part Number	E	G	H	J	K	L	M	N
1	TDB2BB	1⅜	½	3⅞	5⅜	1 15/16	2 1/16	2	⅜
1½	TDB3BB	2	9/16	5⅝	7¼	2 13/16	3⅝	2½	½
2	TDB4BB	2⅛	⅝	7¼	8	3⅝	4	3	⅝
2 7/16	TDB5BB	2½	1 1/16	8	9⅞	4	4 15/16	3½	⅝
3	TDB6BB	3½	⅞	8½	11	4¼	5½	4	¾
3 7/16	TDB7BB	4	1	9½	12	4¾	6	4½	¾

Ball Bearing Flange Unit



Bore	Part Number	C	D	E	G	N
1	TEB2BB	2¾	3¾	1⅜	½	⅜
1½	TEB3BB	4	5⅛	2	9/16	½
2	TEB4BB	5⅛	6½	2⅜	1 1/16	⅝
2 7/16	TEB5BB	5⅝	7	2½	1 1/16	⅝
3	TEB6BB	6	7¾	3½	⅞	¾
3 7/16	TEB7BB	6¾	8 7/16	4	1	¾

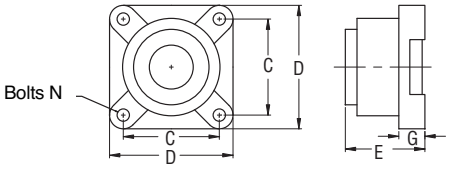
Trough End Bearing Housing



Bore	Part Number	C	D	E	G	N
1½	TEBH3	4	5¼	2½	½	½
2	TEBH4	5⅛	6⅜	2½	½	⅝
2 7/16	TEBH5	5⅝	6⅞	3 9/16	9/16	⅝
3	TEBH6	6	7¾	3⅜	⅝	¾
3 7/16	TEBH7	7	9¼	4¾	¾	¾

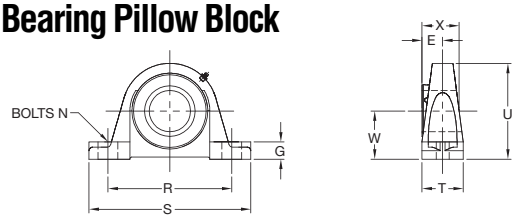
Use #220 Type Hanger Bearings, See Page H-92.

Roller Bearing Flange Unit



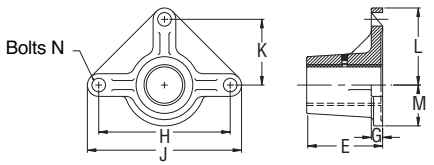
Bore	Part Number	C	D	E	G	N
1½	TEB3R	4⅛	5⅜	3½	1 3/16	½
2	TEB4R	4⅜	5⅝	3⅝	1 3/16	½
2 7/16	TEB5R	5⅜	6⅞	4 3/16	1½	⅝
3	TEB6R	6	7¾	4 11/16	1⅝	¾
3 7/16	TEB7R	7	9¼	5¼	1⅞	¾

Ball Bearing Pillow Block



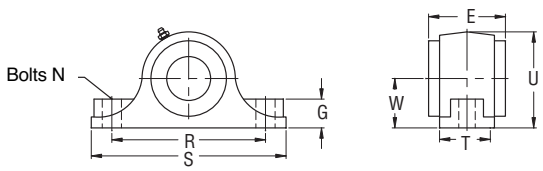
Bore	Part Number	E	G	N	R	S	T	U	W	X
1	TPB2BB	49/64	37/64	⅜	4⅛	5½	1 13/32	2 25/32	1 7/16	1 3/16
1½	TPB3BB	1 3/32	15/16	½	5½	7¼	1 15/16	4 3/16	2⅛	1 11/16
2	TPB4BB	1 5/32	¾	⅝	6⅜	8⅛	2¼	4 17/32	2¼	1¾
2 7/16	TPB5BB	1 5/16	⅞	⅝	7⅜	9½	2⅜	5 13/32	2¾	1 63/64
3	TPB6BB	1½	1¼	⅞	9	11¾	3	6 31/32	3½	2 11/32
3 7/16	TPB7BB	1 9/16	1 5/16	⅞	11	14	3⅜	8	4	2 31/64

Bronze Discharge Unit



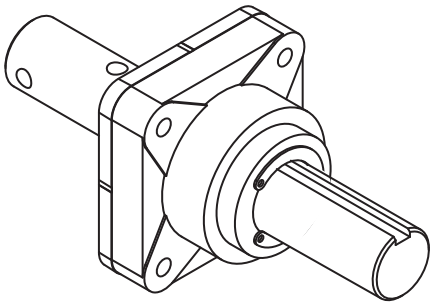
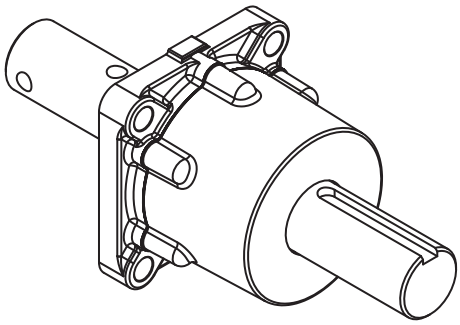
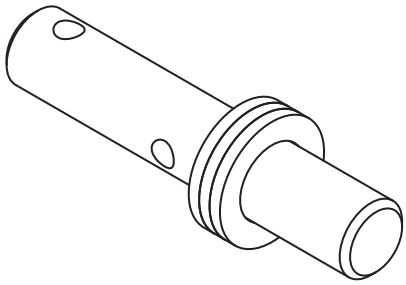
Bore	Part Number	E	G	H	J	K	L	M	N
1	TDB2BR	2	½	3⅞	5⅜	1 15/16	2 1/16	1	⅜
1½	TDB3BR	3¼	9/16	5⅝	7¼	2 13/16	3⅝	1¼	½
2	TDB4BR	4 3/16	⅝	7¼	8	3⅝	4	1⅝	⅝
2 7/16	TDB5BR	4 15/16	1 1/16	8	9⅞	4	4 15/16	1⅞	⅝
3	TDB6BR	5 1/16	⅞	8½	11	4¼	5½	2⅛	¾
3 7/16	TDB7BR	6¼	1	9½	12	4¾	6	2½	¾

Roller Bearing Pillow Block



Bore	Part Number	E	G	N	R	S	T	U	W
1½	TPB3R	3⅜	1¼	½	6¼	7⅞	2⅜	4¼	2⅛
2	TPB4R	3½	1⅜	⅝	7	8⅞	2½	4½	2¼
2 7/16	TPB5R	4	1⅝	⅝	8½	10½	2⅞	5½	2¾
3	TPB6R	4½	1⅞	¾	9½	12	3⅛	6¼	3⅛
3 7/16	TPB7R	5	2¼	⅞	11	14	3⅝	7½	3¾

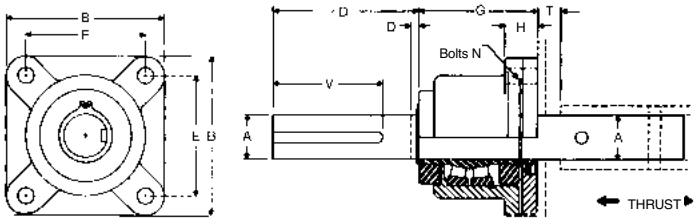
Thrust Bearings

TYPE E THRUST BEARINGS		Most common and economical thrust unit when a screw conveyor type drive is not being used.
TYPE H THRUST BEARINGS		For heavy duty thrust requirements.
BRONZE WASHER		Light duty applications only. Used inside the trough and when screw used in compression.

Thrust Bearings

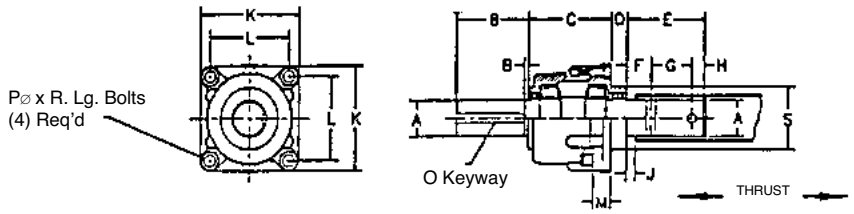
Type E Thrust Assembly

Type E roller thrust bearings are designed to carry thrust in both directions and carry radial load under normal conditions. This double roller bearing is furnished with a lip type seal plate and either drive or tail shaft whichever is applicable to conveyor design.



A	Part Number		B	D		E	G	H	N	T	V	Weight	
Shaft Diameter	Drive Shaft	End Shaft		Drive Shaft	End Shaft							Drive Shaft	End Shaft
1½	CT3D	CT3E	5⅜	4¾	¾	4⅛	4	1 11/16	½	1¼	4	22	20
2	CT4D	CT4E	5⅝	5	¾	4⅜	4⅛	1 11/16	½	1¼	4½	32	29
2 7/16	CT5D	CT5E	6⅞	5½	¾	5⅜	4 11/16	2	⅝	1 13/16	5	50	44
3	CT6D	CT6E	7¾	6½	¾	6	5 9/16	2⅛	¾	1⅞	6	73	60
3 7/16	CT7D	CT7E	9¼	7½	¾	7	6	2⅝	¾	2⅜	7	111	88

Heavy Duty RB End Thrust Bearings

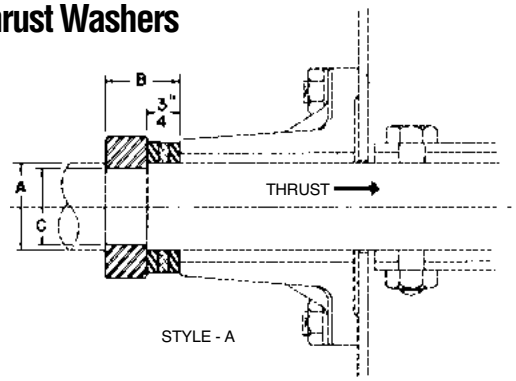


Dimensions in inches and average weight in pounds

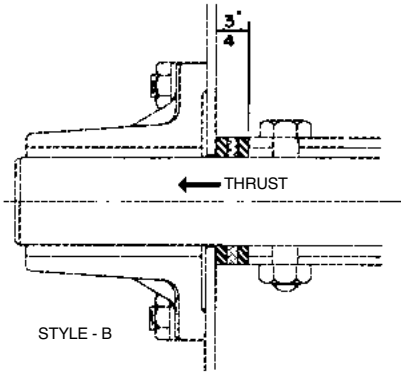
A	With Drive Shaft		With Tail Shaft		B		C	D	E	F	G	H	J	K	L	M	O	P	R	S
Shaft Dia.	Part No.	Weight	Part No.	Weight	Drive Shaft	End Shaft											Keyway			
1½	CTH3D	60	CTH3E	52	4½	¼	6¾	1⅛	4⅞	1	3	⅞	⅛	7¼	5¾	1 3/16	⅜ × 4¼	¾	2½	4¾
2	CTH4D	65	CTH4E	56	4½	¼	6¾	1⅛	4⅞	1	3	⅞	⅛	7¼	5¾	1 3/16	½ × 4¼	¾	2½	4¾
2 7/16	CTH5D	80	CTH5E	66	5 9/16	5/16	6¼	1¼	5 7/16	1½	3	15/16	9/16	8	6¼	1½	⅝ × 5¼	¾	3	5½
3	CTH6D	145	CTH6E	119	6⅛	¼	8¼	1½	5⅝	1⅜	3	1	⅜	10	8	1¾	¾ × 5¾	1	3½	6
3 7/16	CTH7D	170	CTH7E	140	7⅛	⅜	8¼	1½	7⅝	2⅜	4	1¼	⅞	10	8	1¾	⅞ × 6¾	1	3½	6

Other shaft sizes available are 3 15/16″, 4 7/16″ & 4 15/16″. Please consult factory.

Thrust Washers

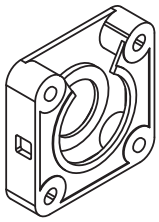
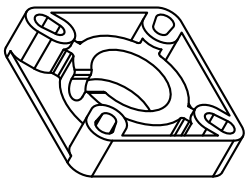
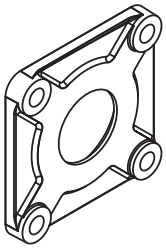
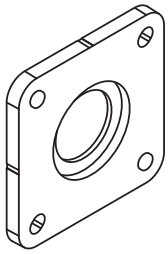
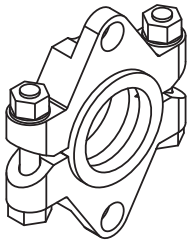
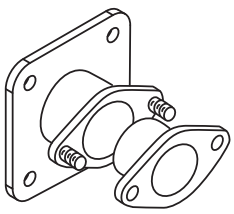
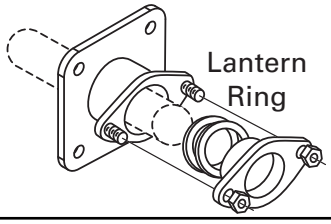


Thrust washers are designed for use where light thrust loads prevail. Style A or B mounting may be used depending on direction of thrust. This unit consists of two steel washers separated by one bronze washer, and Style B is not recommended for use in conveyors handling abrasive materials.



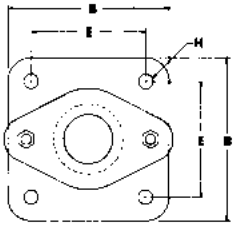
A	Washers & Collar Style A		Washer Set Style B		B	C
Size Shaft	Part No.	Weight	Part No.	Weight		
1½	CTCW3	2.4	CTW3	1	1¼	1¼
2	CTCW4	2.8	CTW4	1.25	1 7/16	1¾
2 7/16	CTCW5	3.9	CTW5	1.5	1½	2⅛
3	CTCW6	4.6	CTW6	2	1½	2¾
3 7/16	CTCW7	6.1	CTW7	3	1⅝	3¼

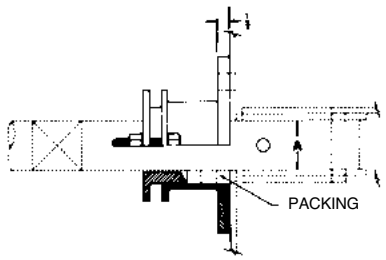
Shaft Seals

WASTE PACK SEAL		Waste pack seals can be furnished with waste packing or in combination with lip seal. This type seal is normally installed between the trough end and bearing, but may be used separately on pedestal type trough ends. An opening is provided at top for repacking without removing seal from trough end. Can be used with flanged ball, roller or other standard 4-bolt bearings.
Martin SUPER PACK SEAL		Martin Super Pack Seal combines the heavy duty waste pack housing with the superior sealing characteristics of a Super Pack Seal. Seal may also be air or grease purged for difficult sealing applications.
PRODUCT DROP OUT SEAL		This flange type dust seal is designed for insertion between trough end and flanged ball bearing. The cast iron housing is open on all four sides for exit of material that might work past seal or lubricant from bearing.
PLATE SEAL		Plate seals are the most common and economical seal. It is normally furnished with a lip seal. This type seal is normally installed between the trough end and bearing, but may be used separately on pedestal type trough ends. Can be used with flanged ball, roller or other standard 4-bolt bearings.
SPLIT GLAND SEAL		Split gland compression type seals provide for easy replacement and adjustment of packing pressure on the shaft without removal of the conveyor. These seals can be installed inside or outside the end plates.
COMPRESSION TYPE PACKING GLAND SEAL		Flanged packing gland seals consist of an external housing and an internal gland which is forced into the housing to compress the packing. This is the most positive type shaft seal and may be used where minor pressure requirements are desired.
AIR PURGED SEAL		Air purge shaft seals are arranged for attaching to standard or special trough ends. A constant air pressure is maintained to prevent material from escaping from the trough along the shaft. The air purge seal is desirable for sealing highly abrasive materials. May be purged with grease or water.

Shaft Seals

Compression Type Packing Gland Seal



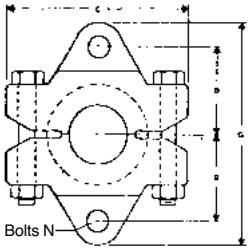


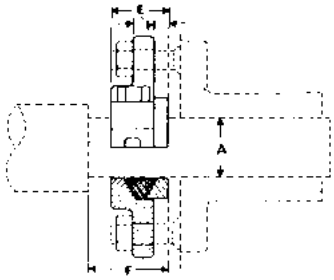
A Shaft Diameter	Part Number	B	E	H Bolts	Weight
1½	PGC3	5¼	4	½	14
2	PGC4	7⅛	5⅛	⅝	18
2⁷⁄₁₆	PGC5	7⅝	5⅝	⅝	21
3	PGC6	8½	6	¾	27
3⁷⁄₁₆	PGC7	9¼	6¾	¾	30

*Braided rope graphite packing is standard. Other types available on request.

Flanged gland seals consist of an external housing and an internal gland which is forced into the housing to compress the packing. This is the most positive type shaft seal and may be used where pressure requirements are desired.

Split Gland Seal

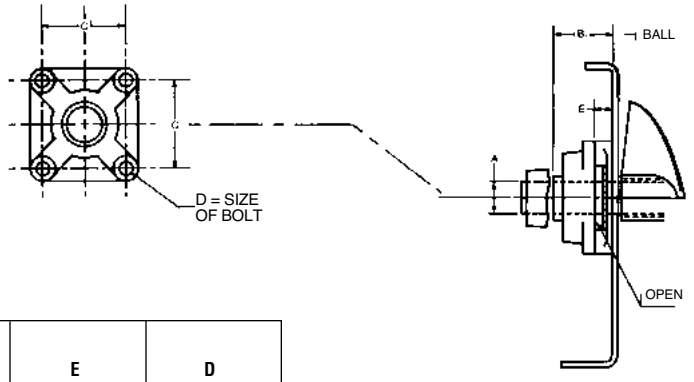




A Shaft Diameter	Part Number	C	D	E	F	G	H	N	Weight
1½	CSS3	4¾	2³⁄₁₆	1⁷⁄₁₆	2½	5⅞	⅞	½	5
2	CSS4	6¼	2⅝	1½	2½	6½	⅞	½	10
2⁷⁄₁₆	CSS5	6⅞	3¹⁄₁₆	1⅝	3¼	7⅝	1	⅝	15
3	CSS6	7½	3⁹⁄₁₆	1⅝	3¼	8⅝	1	⅝	22
3⁷⁄₁₆	CSS7	8¾	4⅛	2⅛	3¾	10¼	1¼	¾	30

Split gland compression type seals provide for easy replacement and adjustment of packing pressure on the shaft without removal of the conveyor. These seals are normally installed inside the end plates.

Flanged Product Drop-Out Seal

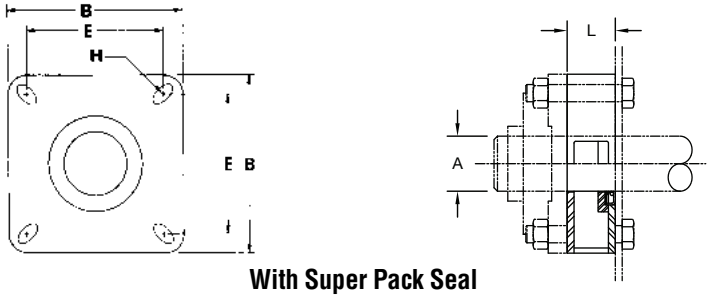


Dimensions in inches and average weight in pounds

A Shaft Diameter	Part Number	Weight	B_1	C	E	D
1	CSFP2	1.75	2⅛	2¾	1¹⁄₁₆	⅜
1½	CSFP3	3.4	2⁵⁷⁄₆₄	4	⅞	½
2	CSFP4	5.3	3³⁄₁₆	5⅛	⅞	⅝
2⁷⁄₁₆	CSFP5	5.8	3³⁄₁₆	5⅝	⅞	⅝
3	CSFP6	7.2	4⅜	6	⅞	¾
3⁷⁄₁₆	CSFP7	10.3	4³¹⁄₃₂	6¾	1	¾

This flange type dust seal is designed for insertion between trough end and flanged bearing. The cast iron housing is open on all four sides for exit of material that might work past seal or lubricant from bearing.

Super Pack Seal

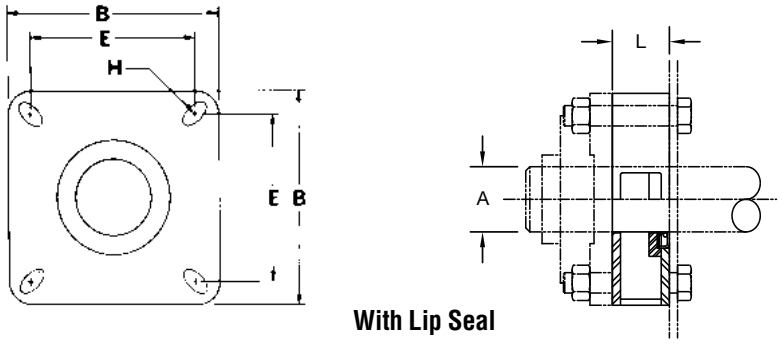


With Super Pack Seal

A Shaft	Part Number	B	L	E		H Bolts		Weight
				(–B)	(–R)	(–B)	(–R)	
1½	MSP3	5⅜	1¾	4	4⅛	½	½	6
2	MSP4	6½	1¾	5⅛	4⅜	⅝	½	8
2⁷⁄₁₆	MSP5	7⅜	1¾	5⅝	5⅜	⅝	⅝	10
3	MSP6	7¾	1¾	6	6	¾	¾	13
3⁷⁄₁₆	MSP7	9¼	2¼	6¾	7	¾	¾	16

Martin Super Pack Seal combines the heavy duty waste pack housing with the superior sealing characteristics of a Super Pack Seal. Seal may also be air or grease purged for difficult sealing applications.

Waste Pack Seal



With Lip Seal

A Shaft	Part Number	B	L	E		H Bolts		Weight
				(–B)	(–R)	(–B)	(–R)	
1½	CSW3	5⅜	1¾	4	4⅛	½	½	6
2	CSW4	6½	1¾	5⅛	4⅜	⅝	½	8
2⁷⁄₁₆	CSW5	7⅜	1¾	5⅝	5⅜	⅝	⅝	10
3	CSW6	7¾	1¾	6	6	¾	¾	13
3⁷⁄₁₆	CSW7	9¼	2¼	6¾	7	¾	¾	16

Waste pack seals are furnished with waste packing in combination with lip seal. This type seal is normally installed between the trough end and bearing, but may be used separately on pedestal type trough ends. An opening is provided at top for repacking without removing seal from trough end.

Plate Seal

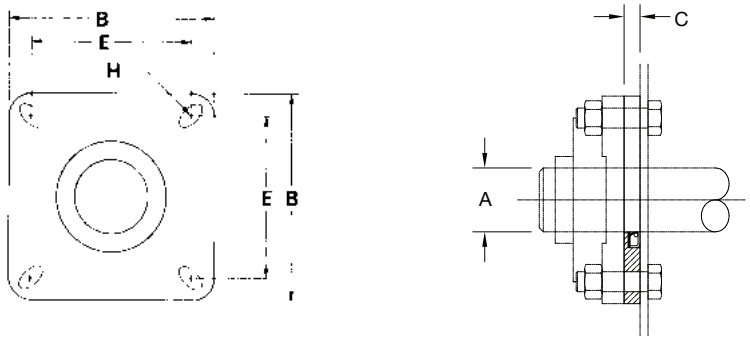
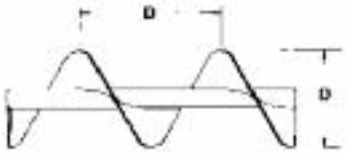


Plate seals are the most common and economical seal. They are furnished with a lip seal. This type seal is normally installed between the trough end and bearing, but may be used separately on pedestal type trough ends. Slotted mounting holes allow use with both ball and roller flanged bearings.

A Shaft Diameter	Part Number	B	C	E		H Bolts		Weight
				(–B)	(–R)	(–B)	(–R)	
1½	CSP3	5⅜	½	4	4⅛	½	½	2
2	CSP4	6½	½	5⅛	4⅜	⅝	½	3
2⁷⁄₁₆	CSP5	7⅜	½	5⅝	5⅜	⅝	⅝	4
3	CSP6	7¾	½	6	6	¾	¾	5
3⁷⁄₁₆	CSP7	9¼	¾	6¾	7	¾	¾	8

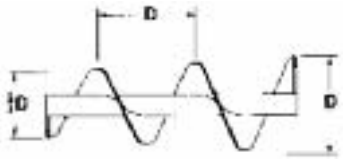
Conveyor Screws

STANDARD PITCH, SINGLE FLIGHT



Conveyor screws with pitch equal to screw diameter are considered standard. They are suitable for a whole range of materials in most conventional applications.

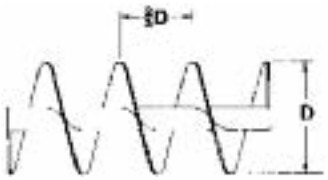
TAPERED, STANDARD PITCH, SINGLE FLIGHT



Price on Application

Screw flights increase from 2/3 to full diameter. Used in screw feeders to provide uniform withdrawal of lumpy materials. Generally equivalent to and more economical than variable pitch.

SHORT PITCH, SINGLE FLIGHT

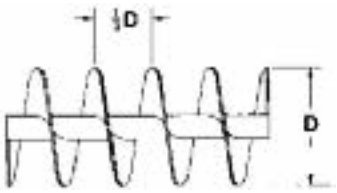


Flight pitch is reduced to 2/3 diameter. Recommended for inclined or vertical applications. Used in screw feeders. Shorter pitch reduces flushing of materials which fluidize.

SINGLE CUT-FLIGHT, STANDARD PITCH

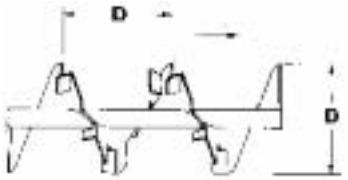
Screws are notched at regular intervals at outer edge. Affords mixing action and agitation of material in transit. Useful for moving materials which tend to pack.

HALF PITCH, SINGLE FLIGHT



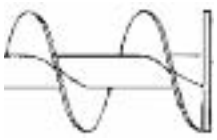
Similar to short pitch except pitch is reduced to 1/2 standard pitch. Useful for inclined applications, for screw feeders and for handling extremely fluid materials.

CUT & FOLDED FLIGHT, STANDARD PITCH



Folded flight segments lift and spill the material. Partially retarded flow provides thorough mixing action. Excellent for heating, cooling or aerating light substances.

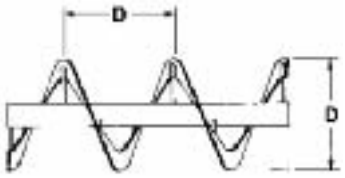
END DISC ON CONVEYOR SCREW



Price on Application

An end disc is the same diameter as the screw and is welded flush with the end of the pipe shaft at its discharge end and, of course, rotates with the screw. The end disc helps to keep discharging material away from the trough end seal.

SINGLE FLIGHT RIBBON



Price on Application

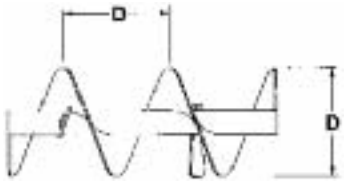
Excellent for conveying sticky or viscous materials. Open space between flighting and pipe eliminate collection and build-up of material.

VARIABLE PITCH, SINGLE FLIGHT

Price on Application

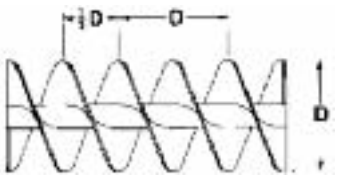
Flights have increasing pitch and are used in screw feeders to provide uniform withdrawal of fine, free flowing materials over the full length of the inlet opening.

STANDARD PITCH WITH PADDLES



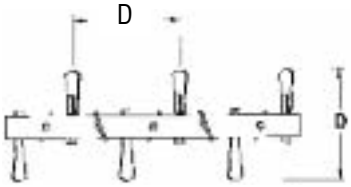
Adjustable paddles positioned between screw flights opposed flow to provide gentle but thorough mixing action.

DOUBLE FLIGHT, STANDARD PITCH



Double flight, standard pitch screws provide smooth regular material flow and uniform movement of certain types or materials.

PADDLE



Adjustable paddles provide complete mixing action, and controlled material flow.

Helicoid flights are formed in a special rolling machine by forming a steel strip into a continuous one-piece helix of the desired diameter, pitch and thickness to fit conveyor screw pipes. The helicoid flight is tapered in cross section, with the thickness at the inner edge approximately twice the thickness of the outer edge.

Sectional flights are individual flights or turns blanked from steel plates and formed into a spiral or helix of the desired diameter and pitch to fit conveyor screw pipes. The flights are butt welded together to form a continuous conveyor screw. Modifications can be furnished, such as, fabrication from various metals, different flight thicknesses, other diameters and pitches. The buttweld flight is the same thickness in the full cross section.

Helicoid Flight

Sectional Flight

Key to Conveyor Size Designation

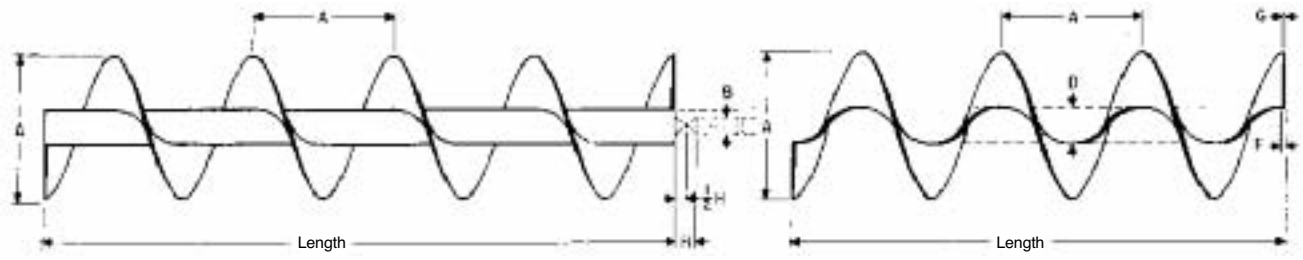
The letter "H" indicates screw conveyor with helicoid flighting. The figures to the left of the letters indicate the nominal outside diameter of the conveyor in inches. The first figure following the letters is twice the diameter of the couplings in inches. The last two figures indicate the nominal thickness of flighting at the outer edge in 1/64". Thus conveyor 12H408 indicates 12" diameter helicoid conveyor for 2" couplings with flighting 6/64" or 1/8" thickness at outer edge. Hand of conveyor is indicated by "R" or "L" following the designation.

Comparison Table • helicoid flight and sectional flight conveyor screws

Screw Diameter, Inches	Helicoid Flight						Sectional Flight			
	Conveyor Screw Size Designation ▲	Former Designation	Coupling Diameter, Inches	Nominal Inside Diameter of Pipe, Inches	Thickness of Flight, Inches		Conveyor Screw Size Designation ▲	Coupling Diameter, Inches	Nominal Inside Diameter of Pipe, Inches	Thickness of Flight
					Inner Edge	Outer Edge				
4	4H206	4X	1	1 3/8	3/16	3/32				
6	6H304	6 Standard	1 1/2	2	1/8	1/16				
	6H308	6 X	1 1/2	2	1/4	1/8	6S309	1 1/2	2	10 ga.
	6H312	6 XX	1 1/2	2	3/8	3/16	6S312	1 1/2	2	3/16 in.
9	9H306	9 Standard	1 1/2	2	3/16	3/32	9S307	1 1/2	2	12 ga.
	9H406	9 Special	2	2 1/2	3/16	3/32	9S407	2	2 1/2	12 ga.
	9H312	9 X	1 1/2	2	3/8	3/16	9S312	1 1/2	2	3/16 in.
	9H412	9 XX	2	2 1/2	3/8	3/16	9S412	2	2 1/2	3/16 in.
	9H414	—	2	2 1/2	7/16	7/32	9S416	2	2 1/2	1/4 in.
10	10H306	10 Standard	1 1/2	2	3/16	3/32	10S309	1 1/2	2	10 ga.
	10H412	10 XX	2	2 1/2	3/8	3/16	10S412	2	2 1/2	3/16 in.
12	12H408	12 Standard	2	2 1/2	1/4	1/8	12S409	2	2 1/2	10 ga.
	12H508	12 Special	2 7/16	3	1/4	1/8	12S509	2 7/16	3	10 ga.
	12H412	12 X	2	2 1/2	3/8	3/16	12S412	2	2 1/2	3/16 in.
	12H512	12 XX	2 7/16	3	3/8	3/16	12S512	2 7/16	3	3/16 in.
	12H614	—	3	3 1/2	7/16	7/32	12S616	3	3 1/2	1/4 in.
14	14H508	14 Standard	2 7/16	3	1/4	1/8	14S509	2 7/16	3	10 ga.
	14H614	14 XX	3	3 1/2	7/16	7/32	14S616	3	3 1/2	1/4 in.
16	16H610	16 Standard	3	3 1/2	5/16	5/32	16S609	3	3 1/2	10 ga.
	16H614	—	3	4	7/16	7/32	16S616	3	3 1/2	1/4 in.

▲ Size designation: Examples: 12H412 and 12S412.
12 = screw diameter in inches
H = helicoid flight
S = sectional flight
4 = 2 times 2" coupling diameter
12 = thickness of flight at periphery in increments of 1/64"

Conveyor Screws (Helicoid)



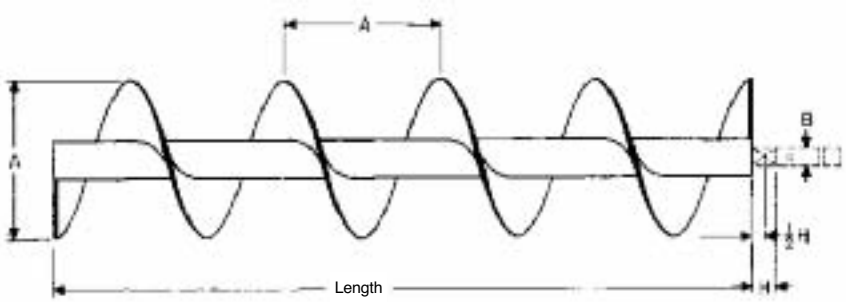
Helicoid Conveyor Screw **Flighting**

A	B	Size Part No. Conveyor Mounted	Size Part No. Flighting Only	D Pipe Size		Flight Thickness		H	Standard Length Feet-Inches	Average Weight			
										Complete Screw		Flighting Only	
Screw Diameter	Coupling Diameter			Nominal Inside	Outside	F	G	Coupling Bearing Length		Standard Length	Per Foot	Standard Length	Per Foot
						Inside	Outside						
4	1	4H206–*	4HF206–*	1⅜	1⅝	3/16	3/32	1½	9-10½	40	4	16	1.3
6	1½	6H304–*	6HF304–*	2	2⅜	⅛	1/16	2	9-10	52	5	14	1.4
	1½	6H308–*	6HF308–*	2	2⅜	¼	⅛	2	9-10	62	6	28	2.8
	1½	6H312–*	6HF312–*	2	2⅜	⅜	3/16	2	9-10	72	7	42	4.3
9	1½	9H306–*	9HF306–*	2	2⅜	3/16	3/32	2	9-10	70	7	31	3.2
	1½	9H312–*	9HF312–*	2	2⅜	⅜	3/16	2	9-10	101	10	65	6.1
	2	9H406–*	9HF406–*	2½	2⅞	3/16	3/32	2	9-10	91	9	30	3.0
	2	9H412–*	9HF412–*	2½	2⅞	⅜	3/16	2	9-10	121	12	60	6.6
	2	9H414–*	9HF414–*	2½	2⅞	7/16	7/32	2	9-10	131	13	70	6.3
10	1½	10H306–*	10HF306–*	2	2⅜	3/16	3/32	2	9-10	81	8	48	4.9
	2	10H412–*	10HF412–*	2½	2⅞	⅜	3/16	2	9-10	130	13	76	7.7
12	2	12H408–*	12HF408–*	2½	2⅞	¼	⅛	2	11-10	140	12	67	5.7
	2	12H412–*	12HF412–*	2½	2⅞	⅜	3/16	2	11-10	180	15	102	8.6
	2 7/16	12H508–*	12HF508–*	3	3½	¼	⅛	3	11-9	168	14	64	5.4
	2 7/16	12H512–*	12HF512–*	3	3½	⅜	3/16	3	11-9	198	17	96	8.2
	3	12H614–*	12HF614–*	3½	4	7/16	7/32	3	11-9	220	18	112	9.3
14	2 7/16	14H508–*	14HF508–*	3	3½	¼	⅛	3	11-9	170	14	84	7.1
	3	14H614–*	14HF614–*	3½	4	7/16	7/32	3	11-9	254	22	132	11.2
16	3	16H610–*	16HF610–*	3½	4	5/16	5/32	3	11-9	228	19	120	10.0
▲	3	16H614–*	16HF614–*	4	4½	7/16	7/32	3	11-9	285	24	154	11.7
18 ▲	3	18H610–*	18HF610–*	3½	4	5/16	5/32	3	11-9	282	24	167	13.9

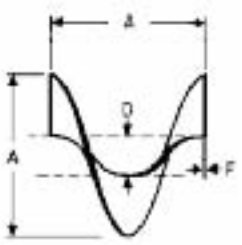
–* R For Right Hand
–* L For Left Hand

▲ Offered only in full pitch helicoid flighting.

Conveyor Screws (Sectional)



Sectional Conveyor Screw

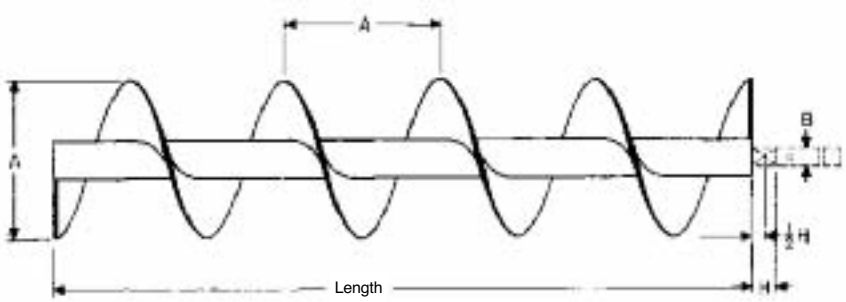


Flight

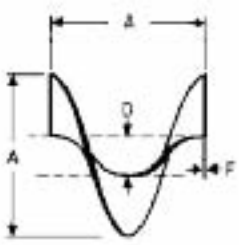
A	B	Size Part No. Mounted Conveyor	Size Part No. Flighting Only	Pipe Size		F	H	Standard Length Feet-Inches	Average Weight			Approx. Flights Per Foot
Screw Diameter	---Coupling Diameter			Nominal Inside	D Outside	Flight Thickness	Coupling Bearing Length		Standard Length	Per Foot	Flight Each	
6	1½	6S312–*	6SF312–*	2	2⅜	3/16	2	9-10	75	7.5	1.7	2.0
	1½	6S316–*	6SF316–*	2	2⅜	¼	2	9-10	90	8.0	2.2	2.0
9	1½	9S312–*	9SF312–*	2	2⅜	3/16	2	9-10	95	9.5	4.3	1.33
	1½	9S316–*	9SF316–*	2	2⅜	¼	2	9-10	130	13.0	5.5	1.33
	1½	9S324–*	9SF324–*	2	2⅜	⅜	2	9-10	160	16.0	7.9	1.33
	2	9S412–*	9SF412–*	2½	2⅞	3/16	2	9-10	115	11.5	4.3	1.33
	2	9S416–*	9SF416–*	2½	2⅞	¼	2	9-10	130	13.0	5.5	1.33
	2	9S424–*	9SF424–*	2½	2⅞	⅜	2	9-10	160	16.0	7.9	1.33
10	1½	10S312–*	10SF312–*	2	2⅜	3/16	2	9-10	120	12.0	5.0	1.2
	1½	10S316–*	10SF316–*	2	2⅜	¼	2	9-10	135	13.5	6.7	1.2
	1½	10S324–*	10SF324–*	2	2⅜	⅜	2	9-10	165	16.5	8.7	1.2
	2	10S412–*	10SF412–*	2½	2⅞	3/16	2	9-10	120	12.0	5.0	1.2
	2	10S416–*	10SF416–*	2½	2⅞	¼	2	9-10	135	13.5	6.7	1.2
	2	10S424–*	10SF424–*	2½	2⅞	⅜	2	9-10	165	16.5	8.7	1.2
12	2	12S412–*	12SF412–*	2½	2⅞	3/16	2	11-10	156	13.0	7.2	1.0
	2	12S416–*	12SF416–*	2½	2⅞	¼	2	11-10	204	17.0	9.7	1.0
	2	12S424–*	12SF424–*	2½	2⅞	⅜	2	11-10	268	22.3	12.7	1.0
	2 7/16	12S509–*	12SF509–*	3	3½	10 Ga.	3	11-9	160	14.0	5.7	1.0
	2 7/16	12S512–*	12SF512–*	3	3½	3/16	3	11-9	178	14.8	7.2	1.0
	2 7/16	12S516–*	12SF516–*	3	3½	¼	3	11-9	210	17.5	9.7	1.0
	2 7/16	12S524–*	12SF524–*	3	3½	⅜	3	11-9	274	22.5	12.7	1.0
	3	12S612–*	12SF612–*	3½	4	3/16	3	11-9	198	16.5	7.2	1.0
	3	12S616–*	12SF616–*	3½	4	¼	3	11-9	216	18.0	9.7	1.0
	3	12S624–*	12SF624–*	3½	4	⅜	3	11-9	280	24.0	12.7	1.0

–* R For Right Hand
–* L For Left Hand

Conveyor Screws (Sectional)



Sectional Conveyor Screw



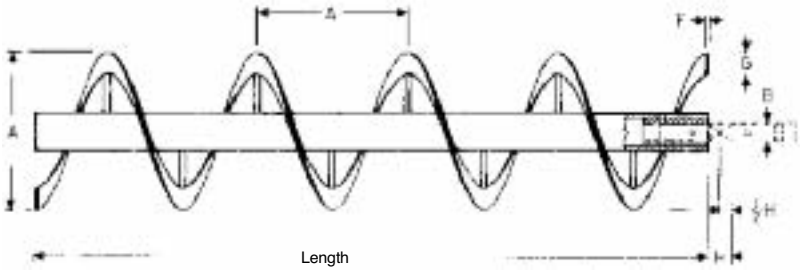
Flight

A	B	Size Part No. Mounted Conveyor	Size Part No. Flighting Only	Pipe Size		F	H	Standard Length Feet-Inches	Average Weight			Approx. Flights Per Foot
Screw Diameter	Coupling Diameter			Inside	D Outside	Flight Thickness	Coupling Bearing Length		Standard Length	Per Foot	Flight Each	
14	2 7/16	14S512–*	14SF512–*	3	3½	3/16	3	11-9	214	18.0	9.9	.86
	2 7/16	14S516–*	14SF516–*	3	3½	¼	3	11-9	240	20.0	13.2	.86
	2 7/16	14S524–*	14SF524–*	3	3½	⅜	3	11-9	330	27.5	19.8	.86
	3	14S612–*	14SF612–*	3½	4	3/16	3	11-9	222	19.0	9.9	.86
	3	14S616–*	14SF616–*	3½	4	¼	3	11-9	246	21.0	13.2	.86
	3	14S624–*	14SF624–*	3½	4	⅜	3	11-9	342	29.0	19.8	.86
16	3	16S612–*	16SF612–*	3½	4	3/16	3	11-9	234	20.0	14.0	.75
	3	16S616–*	16SF616–*	3½	4	¼	3	11-9	282	24.0	18.0	.75
	3	16S624–*	16SF624–*	3½	4	⅜	3	11-9	365	31.0	25.5	.75
	3	16S632–*	16SF632–*	3½	4	½	3	11-9	402	33.5	36.0	.75
18	3	18S612–*	18SF612–*	3½	4	3/16	3	11-9	246	21.0	18.0	.67
	3	18S616–*	18SF616–*	3½	4	¼	3	11-9	294	25.0	24.0	.67
	3	18S624–*	18SF624–*	3½	4	⅜	3	11-9	425	36.0	34.5	.67
	3	18S632–*	18SF632–*	3½	4	½	3	11-9	530	44.0	46.0	.67
	3 7/16	18S712–*	18SF712–*	4	4½	3/16	4	11-8	293	24.4	18.0	.67
	3 7/16	18S716–*	18SF716–*	4	4½	¼	4	11-8	345	28.8	24.0	.67
	3 7/16	18S724–*	18SF724–*	4	4½	⅜	4	11-8	470	39.2	34.5	.67
	3 7/16	18S732–*	18SF732–*	4	4½	½	4	11-8	570	47.5	46.0	.67
20	3	20S612–*	20SF612–*	3½	4	3/16	3	11-9	300	26.0	20.0	.60
	3	20S616–*	20SF616–*	3½	4	¼	3	11-9	360	31.0	28.0	.60
	3	20S624–*	20SF624–*	3½	4	⅜	3	11-9	410	33.4	40.0	.60
	3	20S632–*	20SF632–*	3½	4	½	3	11-9	506	42.2	56.0	.60
	3 7/16	20S712–*	20SF712–*	4	4½	3/16	4	11-8	310	27.0	20.0	.60
	3 7/16	20S716–*	20SF716–*	4	4½	¼	4	11-8	370	32.0	28.0	.60
	3 7/16	20S724–*	20SF724–*	4	4½	⅜	4	11-8	475	40.0	40.0	.60
	3 7/16	20S732–*	20SF732–*	4	4½	½	4	11-8	525	45.0	56.0	.60
24	3 7/16	24S712–*	24SF712–*	4	4½	3/16	4	11-8	440	37.0	32.0	.50
	3 7/16	24S716–*	24SF716–*	4	4½	¼	4	11-8	510	43.0	42.0	.50
	3 7/16	24S724–*	24SF724–*	4	4½	⅜	4	11-8	595	50.0	63.0	.50
	3 7/16	24S732–*	24SF732–*	4	4½	½	4	11-8	690	60.0	84.0	.50

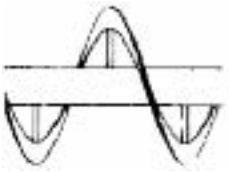
–* R For Right Hand
–* L For Left Hand

Conveyor Screws (Ribbon)

Ribbon flight conveyor screws consist of sectional flights, buttwelded together to form a continuous helix. Flights are secured to the pipe by supporting legs. Both ends of the pipe are prepared with internal collars and drilling to accept couplings, drive shafts, and end shafts. They are used to convey sticky, gummy, or viscous substances, or where the material tends to adhere to flighting and pipe.

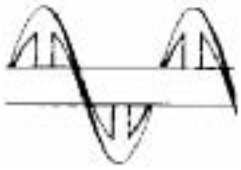


Ribbon Conveyor Screw



Post

Integral (Int) Leg

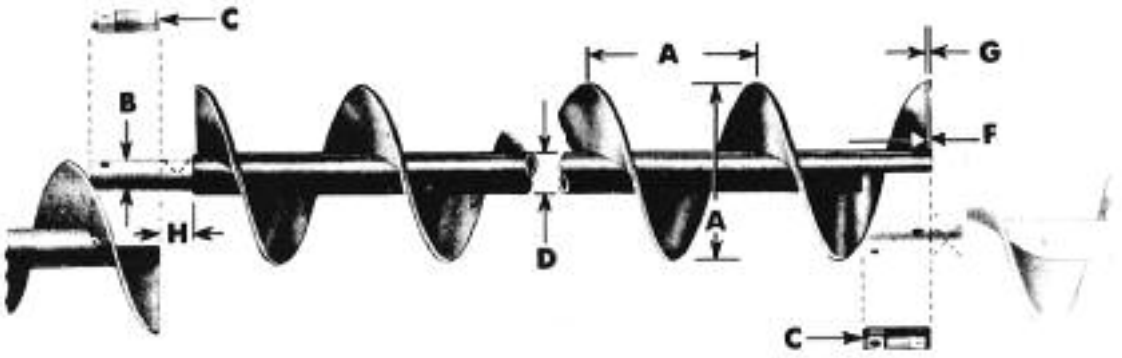


A Screw Diameter	B Coupling Diameter	Size Part No. Mounted Conveyor	Pipe Size		Flight Size		H Coupling Bearing Length	Standard Length Feet-Inches	Weight	
									Complete Screw	
			Inside	Outside	F Thickness	G Width			Standard Length	Per Foot
6	1½	6R312–*	2	2⅜	3/16	1	2	9-10	65	6.5
9	1½	9R316–*	2	2⅜	¼	1½	2	9-10	100	10
10	1½	10R316–*	2	2⅜	¼	1½	2	9-10	110	11
12	2	12R416–*	2½	2⅞	¼	2	2	11-10	180	15
	2	12R424–*	2½	2⅞	⅜	2½	2	11-10	216	19
	2 7/16	12R524–*	3	3½	⅜	2½	3	11-9	240	21
14	2 7/16	14R516–*	3	3½	¼	2½	3	11-9	228	19
	2 7/16	14R524–*	3	3½	⅜	2½	3	11-9	264	22
	3	14R624–*	3½	4	⅜	2½	3	11-9	288	25
16	3	16R616–*	3½	4	¼	2½	3	11-9	276	24
	3	16R624–*	3½	4	⅜	2½	3	11-9	324	28
18	3	18R624–*	3½	4	⅜	3	3	11-9	384	33
20	3 7/16	20R724–*	4	4½	⅜	3	4	11-8	408	35
24	3 7/16	24R724–*	4	4½	⅜	3	4	11-8	424	36

–* R For Right Hand
–* L For Left Hand

Quick Detachable (QD) Helicoid Conveyor

Q.D. — Quick Detachable conveyor screws are designed for convenient removal from the conveyor assembly. Each section of screw has a Q.D. cap at one end of the pipe. By removing this cap, a conveyor screw section can quickly and easily be removed and returned to the conveyor assembly without disturbing the other screw sections. Quick Detachable conveyor can be furnished both in helicoid and buttweld construction.

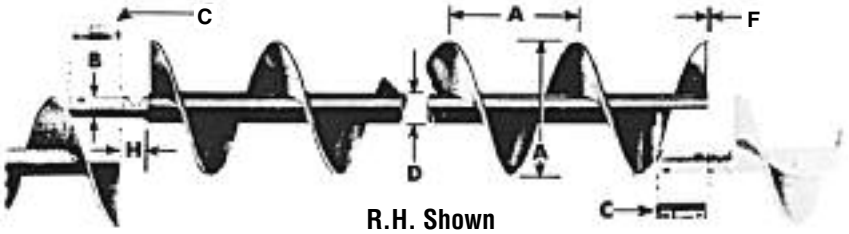


R.H. Shown

A	Size Part No. Mounted Conveyor	B	Standard-Length Feet-Inches	C	D Pipe Size		Flight Thickness Ft.-In.		H	Average Weight	
Nominal Conveyor Diameter		Coupling Diameter	End to End of Pipe	Cap Part Number	Inside	Outside	F Inside	G Outside	Coupling Bearing Length	Standard Length	Per Foot
6	6HQ304–*	1½	9′-10	3QDC2	2	2⅜	⅛	1/16	2	52	5
	6HQ308–*						¼	⅛	2	62	6
	6HQ312–*						⅜	3/16	2	72	7
9	9HQ306–*	1½	9′-10	3QDC2	2	2⅜	3/16	3/32	2	70	7
	9HQ312–*						⅜	3/16	2	101	10
	9HQ406–*	2	9′-10				3/16	3/32	2	91	9
	9HQ412–*			4QDC25	2½	2⅞	⅜	3/16	2	121	12
	9HQ414–*						7/16	7/32	2	131	13
10	10HQ306–*	1½	9′-10	3QDC2	2	2⅜	3/16	3/32	2	81	8
	10HQ412–*	2	9′-10	4QDC25	2½	2⅞	⅜	3/16	2	130	13
12	12HQ408–*	2	11′-10	4QDC25	2½	2⅞	¼	⅛	2	140	12
	12HQ412–*						⅜	3/16	2	180	15
	12HQ508–*	2 7/16	11′-9	5QDC3	3	3½	¼	⅛	3	168	14
	12HQ512–*						⅜	3/16	3	198	17
	12HQ614–*	3	11′-9	6QDC35	3½	4	7/16	7/32	3	220	18
14	14HQ508–*	2 7/16	11′-9	5QDC3	3	3½	¼	⅛	3	170	14
	14HQ614–*	3	11′-9	6QDC35	3½	4	7/16	7/32	3	254	22
16	16HQ610–*	3	11′-9	6QDC35	3½	4	5/16	5/32	3	228	19
	16HQ614–*	3	11′-9	6QDC4	4	4½	7/16	7/32	3	285	23.8

Note: Q.D. caps are not recommended on the drive shaft end.
–* R For Right Hand
–* L For Left Hand

Quick Detachable (QD) Sectional Spiral Conveyors



R.H. Shown

A	Size Part No. Mounted Conveyor	B	Standard Length Feet-Inches	C	D		F	H	Average Weight	
Nominal Conveyor Diameter		Coupling Diameter	End to End of Pipe	Cap Part Number	Pipe Size		Flight Thickness	Coupling Bearing Length	Standard Length	Per Foot
					Inside	Outside				
6	6SQ307–*	1½	9′-10	3QDC2	2	2⅜	12	2	62	6.2
	6SQ309–*						10		65	6.5
	6SQ312–*						3/16	2	75	7.5
	6SQ316–*						¼		90	8.0
9	9SQ307–*	1½	9′-10	3QDC2	2	2⅜	12		73	7.3
	9SQ309–*						10		80	8.0
	9SQ312–*						3/16	2	95	9.5
	9SQ316–*						¼		120	13
	9SQ407–*	2	9′-10	4QDC25	2½	2⅞	12		90	9
	9SQ409–*						10		100	10
	9SQ412–*						3/16	2	115	11.5
	9SQ416–*						¼		130	13.0
	9SQ424–*						⅜		160	16
	10SQ309–*	1½	9′-10	3QDC2	2	2⅜	10	2	85	8.5
10	10SQ412–*	2	9′-10	4QDC25	2½	2⅞	3/16	2	120	12.0
	10SQ416–*						¼		135	13.5
12	12SQ409–*	2	11′-10	4QDC25	2½	2⅞	10	2	140	12.0
	12SQ412–*						3/16		156	13.0
	12SQ416–*						¼		204	17
	12SQ509–*	2 7/16	11′-9	5QDC3	3	3½	10	3	160	14
	12SQ512–*						3/16		178	15
	12SQ612–*	3	11′-9	6QDC35	3½	4	3/16		191	16.5
	12SQ616–*						¼	3	216	18.0
	12SQ624–*						⅜		280	24
14	14SQ509–*	2 7/16	11′-9	5QDC3	3	3½	10	3	185	16
	14SQ512–*						3/16		214	18
	14SQ612–*	3	11′-9	6QDC35	3½	4	3/16	3	222	19
	14SQ616–*						¼		246	21
	14SQ624–*						⅜		342	29
16	16SQ609–*	3	11′-9	6QDC35	3½	4	10	3	210	18
	16SQ612–*						3/16		234	20
	16SQ616–*						¼		282	24
	16SQ624–*						⅜		365	31
18	18SQ612–*	3	11′-9	6QDC35	3½	4	3/16	3	246	21
	18SQ616–*						¼		294	25
	18SQ624–*						⅜		425	36
20	20SQ612–*	3	11′-9	6QDC35	3½	4	3/16	3	300	26
	20SQ616–*						¼		360	31
	20SQ724–*	3 7/16	11′-8	7QDC4	4	4½	⅜	4	475	40
24	24SQ712–*	3 7/16	11′-8	7QDC4	4	4½	3/16	4	410	37
	24SQ716–*						¼		510	43
	24SQ724–*						⅜		595	50

–* R For Right Hand
–* L For Left Hand

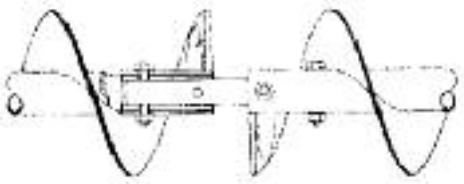
Conveyor Screw (Components)

Coupling Bolts

Conveyor coupling bolts are manufactured from special analysis high-torque steel. Close tolerance for a minimum of wear. Lock nuts are furnished with each bolt.

Coupling Diameter	Outside Pipe Diameter	Bolt Size	Part Number Standard	Weight Each Lbs.
1	1⅝	⅜ × 2 1/16	CCB2	.13
1½	2⅜	½ × 3	CCB3	.2
2	2⅞	⅝ × 3⅝	CCB4	.45
2 7/16	3½	⅝ × 4⅜	CCB5	.5
3	4	¾ × 5	CCB6	.85
3	4½	¾ × 5½	CCB6A	.9
3 7/16	4½	⅞ × 5½	CCB7	1.29

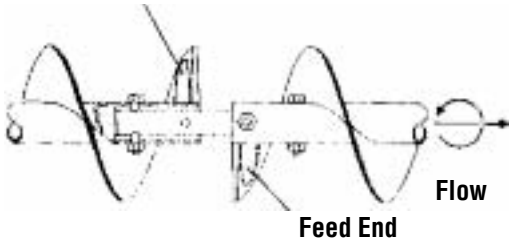
Internal Collar



Internal collars are made from seamless tubing machined for a press fit in the conveyor pipe. When installed at the factory collars are jig drilled and plug welded into the pipe. No drilling in replacement collars is furnished allowing for field drilling to match existing bolt holes.

Coupling Diameter	Inside Pipe Diameter	Part Number Standard	Weight Each Lbs.
1	1¼	CIC2	.58
1½	2	CIC3	2.06
2	2½	CIC4	2.16
2 7/16	3	CIC5	3.72
3	3½	CIC6	4.03
3	4	CIC6A	8.03
3 7/16	4	CIC7	6.52

Discharge End — End Lugs



End lugs are welded opposite the carrying side of the conveyor flight and provide maximum support with minimum obstruction of material flow.

Conveyor Diameter	Part Number		Weight Each Lbs.
	Intake End Standard	Discharge End Standard	
6	6CELI–*	6CELD–*	.06
9	9CELI–*	9CELD–*	.15
10	9CELI–*	9CELD–*	.15
12	12CELI–*	12CELD–*	.2
14	12CELI–*	12CELD–*	.2
16	16CELI–*	16CELD–*	.4
18	16CELI–*	16CELD–*	.4
20	16CELI–*	16CELD–*	.4
24	16CELI–*	16CELD–*	.4

–* R For Right Hand Flight
–* L For Left Hand Flight

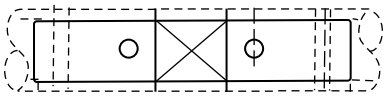
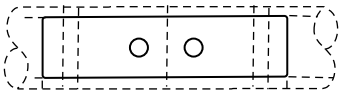
Coupling Shafts

CC | 5

Coupling Part
CC — Coupling Shaft Std.*
CCC — Close Coupling Shaft
CHE — Hanger End Shaft*

Coupling Diameter
2 — 1"
3 — 1-1/2"
4 — 2"
5 — 2-7/16"
6 — 3"
7 —3-7/16"

* Add suffix H if Hardened

COUPLING		Conveyor couplings are used to join individual lengths of conveyor screws and allow for rotation within the hanger bearing. C-1045 steel couplings are normally furnished; however couplings with hardened bearing surfaces may be furnished where highly abrasive materials are being conveyed. Jig drilling allows for ease of installation.
CLOSE		Close couplings are used to adjoin conveyor screws where no hanger is required. Jig drilling allows for ease of installation.

Drive & End Shafts

1 | CD | 5 | BB | W

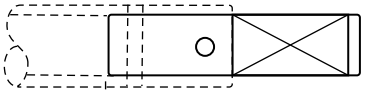
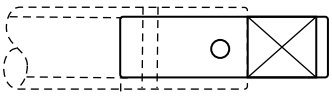
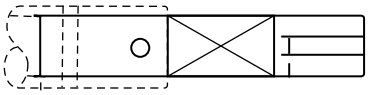
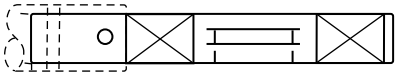
Drive Shaft Number
Drive Shaft Only
1 — #1
2 — #2 Single Bearing Pedestal
3 — #3 Double Bearing Pedestal

Type
CD — Drive Shaft
CE — End Shaft

Coupling Diameter
2 — 1"
3 — 1-1/2"
4 — 2"
5 — 2-7/16"
6 — 3"
7 — 3-7/16"

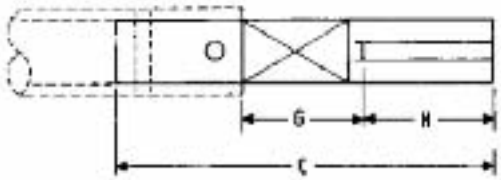
Bearing Type
BB — Ball
RB — Roller

Seal Type
(Delete if without seal)
P — Plate
W — Waste Pack

END		End shafts serve only to support the end conveyor section and are therefore usually supplied in cold rolled steel. End shafts are jig drilled for ease of assembly and close diametral tolerances are held for proper bearing operation.
HANGER END		Hanger end shafts are designed to connect only one conveyor section to a hanger bearing. These shafts may also be used in pairs to divide an excessively long conveyor assembly between two drives.
#1 DRIVE		No. 1 drive shafts are normally used where standard end plates are furnished. Jig drilling allows for ease of installation.
SPECIAL DRIVE		Length, bearing location, seals and keyway location and size as required.

No. 1
Drive Shaft

No. 1 drive shafts are normally used where standard end plates are furnished. Jig drilling allows for ease of installation.



No. 1 Drive Shaft Used Without Seal*

Bronze Bearing

Shaft Diameter	Part Number	C	G	H	Weight
1	1CD2B	9½	3½	3	2.0
1½	1CD3B	12¾	4¾	3¼	6.3
2	1CD4B	15	5¾	4½	13.3
2 7/16	1CD5B	17⅜	7	5½	21.0
3	1CD6B	19⅛	8⅛	6	37.0
3 7/16	1CD7B	23	9	7¼	60.4

Ball Bearing

Shaft Diameter	Part Number	C	G	H	Weight
1	1CD2BB	9	3	3	1.8
1½	1CD3BB	11½	3½	3¼	5.6
2	1CD4BB	13⅛	3⅜	4½	11.5
2 7/16	1CD5BB	15⅛	4¾	5½	18.0
3	1CD6BB	16⅝	5⅝	6	32.0
3 7/16	1CD7BB	20⅝	6⅝	7¼	52.5

**Consult Factory

No. 1 Drive Shaft Used With Plate or Product Drop Out Seals*

Bronze Bearing

Shaft Diameter	Part Number	C	G	H	Weight
1	1CD2B-P	10	4	3	2.1
1½	1CD3B-P	13¼	5¼	3¼	6.6
2	1CD4B-P	15¼	6¼	4½	14.1
2 7/16	1CD5B-P	18⅜	8	5½	24.3
3	1CD6B-P	19⅝	8⅝	6	38.0
3 7/16	1CD7B-P	24⅛	10⅛	7¼	61.0

Ball Bearing

Shaft Diameter	Part Number	C	G	H	Weight
1	1CD2BB-P	9½	3½	3	2.0
1½	1CD3BB-P	12⅜	4⅜	3¼	6.2
2	1CD4BB-P	14	4¾	4½	12.5
2 7/16	1CD5BB-P	15⅞	5½	5½	21
3	1CD6BB-P	17½	6½	6	35
3 7/16	1CD7BB-P	21½	7½	7¼	56.5

**Consult Factory

No. 1 Drive Shaft Used With Waste Pack Seal*

Bronze Bearing

Shaft Diameter	Part Number	C	G	H	Weight
1	1CD2B-W	11	4¼	3	2.2
1½	1CD3B-W	14½	6½	3¼	7.2
2	1CD4B-W	16¾	7½	4½	14.9
2 7/16	1CD5B-W	19⅛	8¾	5½	23.3
3	1CD6B-W	20⅞	9⅞	6	40.5
3 7/16	1CD7B-W	25⅞	11⅞	7¼	66.3

Ball Bearing

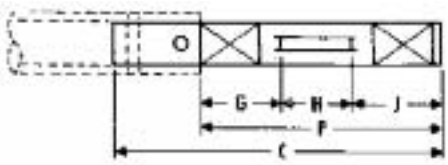
Shaft Diameter	Part Number	C	G	H	Weight
1	1CD2BB-W	10½	3¾	3	2.0
1½	1CD3BB-W	13¼	5¼	3¼	6.4
2	1CD4BB-W	14⅞	5⅝	4½	13.0
2 7/16	1CD5BB-W	16⅞	6½	5½	20.5
3	1CD6BB-W	18⅜	7⅜	6	35.5
3 7/16	1CD7BB-W	22⅞	8⅞	7¼	58.4

*Shaft length allows for ½ hanger bearing length as clearance between end plate and screw
**Consult Factory

No. 2 and No. 3 Drive Shafts

No. 2 Drive Shaft

No. 2 drive shafts are used where pedestal type trough ends with single bearing are furnished. Jig drilling allows for ease of installation.



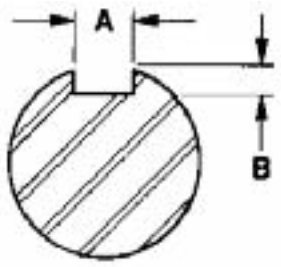
Shaft Diameter	Part Number	C	G	H	J	P	Weight
1	2CD2	11	3¼	2¼	2½	8	2.5
1½	2CD3	16½	5	3¼	3½	11¾	8.3
2	2CD4	18¾	5¼	4¼	4½	14	17.0
2 7/16	2CD5	21⅞	6	5½	5½	17	29.0
3	2CD6	23½	6½	5½	6½	18½	49.0
3 7/16	2CD7	27	6¾	6	7½	20¼	75.0

No. 3 Drive Shaft

No. 3 drive shafts are used where pedestal type trough ends with double bearings are furnished. Jig drilling allows for ease of installation.

Shaft Diameter	Part Number	C	G	H	P	Weight
1	3CD2	15½	9¼	3	12¼	3
1½	3CD3	20¼	12½	3¼	15¾	10
2	3CD4	22	12¾	4½	17¼	21
2 7/16	3CD5	24⅝	14¼	5½	19¾	36
3	3CD6	25⅞	14¾	6	20¾	62
3 7/16	3CD7	29⅞	15⅞	7¼	23⅛	95

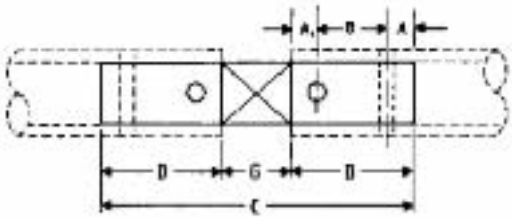
Drive Shaft Keyways



Shaft Diameter	A	B
1	¼	⅛
1½	⅜	3/16
2	½	¼
2 7/16	⅝	5/16
3	¾	⅜
3 7/16	⅞	7/16

Coupling

Conveyor couplings are used to join individual lengths of conveyor screws and allow for rotation within the hanger bearing. Mild steel couplings are normally furnished; however induction hardened bearing area couplings may be furnished where highly abrasive materials are being conveyed. Jig drilling allows for ease of installation.



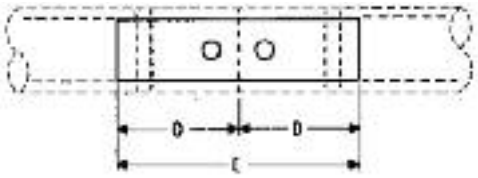
Shaft Diameter	Part Number*	A_1	A	B	C	D	G	Weight
1	CC2	½	½	2	7½	3	1½	1.5
1½	CC3	⅞	⅞	3	11½	4¾	2	5.6
2	CC4	⅞	⅞	3	11½	4¾	2	9.8
2⁷⁄₁₆	CC5	¹⁵⁄₁₆	¹⁵⁄₁₆	3	12¾	4⅞	3	15.4
3	CC6	1	1	3	13	5	3	23.8
3⁷⁄₁₆	CC7	1½	1¼	4	17½	6¾	4	44.5

*Add — H for Hardened Shaft.

Shaft is induction hardened in bearing area only to 40-50 RC.

Close Coupling

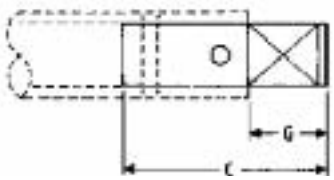
Close couplings are used to adjoin conveyor screws where no hanger is required. Jig drilling allows for ease of installation.



Shaft Diameter	Part Number	C	D	Weight
1	CCC2	6	3	1.3
1½	CCC3	9½	4¾	4.8
2	CCC4	9½	4¾	8.5
2⁷⁄₁₆	CCC5	9¾	4⅞	12.9
3	CCC6	10	5	20.0
3⁷⁄₁₆	CCC7	13½	6¾	37.0

Hanger End

Hanger end shafts are designed to connect only one conveyor section to a hanger bearing. These shafts may also be used in pairs to divide an excessively long conveyor assembly beween two drives.

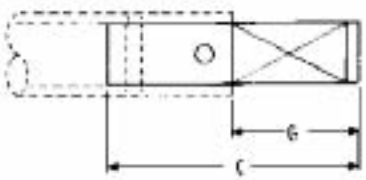


Shaft Diameter	Part Number*	C	G	Weight
1	CHE2	4⅝	1⅝	1.0
1½	CHE3	6⅞	2⅛	3.5
2	CHE4	6⅞	2⅛	6.2
2⁷⁄₁₆	CHE5	8⅛	3¼	10.6
3	CHE6	8¼	3¼	16.5
3⁷⁄₁₆	CHE7	11¼	4¼	29.7

*Add — H for Hardened Shaft
Shaft is induction hardened in bearing area only to 40-50 RC.

End Shaft

End shafts serve only to support the end conveyor section and are therefore usually supplied in cold rolled steel. End shafts are jig drilled for ease of assembly and close diametrical tolerances are held for proper bearing operation.



End Shaft Used Without Seal**

Bronze Bearing

Shaft Diameter	Part Number*	C	G	Weight
1	CE2B	6½	3½	1.4
1½	CE3B	9¼	4½	4.5
2	CE4B	10¼	5½	9.0
2 7/16	CE5B	11⅞	7	15.4
3	CE6B	13⅛	8⅛	25.6
3 7/16	CE7B	16⅜	9⅝	42.4

Ball Bearing

Shaft Diameter	Part Number*	C	G	Weight
1	CE2BB	6	3	1.2
1½	CE3BB	8¼	3½	3.8
2	CE4BB	8⅝	3⅞	7.5
2 7/16	CE5BB	9⅝	4¾	12.4
3	CE6BB	10⅝	5⅝	20.8
3 7/16	CE7BB	13⅜	6⅝	34.4

***Consult Factory

End Shaft Used With Plate or Product Drop Out Seal**

Bronze Bearing

Shaft Diameter	Part Number*	C	G	Weight
1	CE2B-P	7	4	1.5
1½	CE3B-P	10¼	5½	5.1
2	CE4B-P	11¼	6½	10.0
2 7/16	CE5B-P	12⅞	8	17.0
3	CE6B-P	13⅝	8⅝	29.8
3 7/16	CE7B-P	16⅞	10⅛	44.0

Ball Bearing

Shaft Diameter	Part Number*	C	G	Weight
1	CE2BB-P	6½	3½	1.4
1½	CE3BB-P	9	4¼	4.5
2	CE4BB-P	9⅜	4⅝	8.3
2 7/16	CE5BB-P	10⅛	5¼	13.1
3	CE6BB-P	11½	6½	23.0
3 7/16	CE7BB-P	14⅛	7⅜	37.1

***Consult Factory

End Shaft Used With Waste Pack Seal**

Bronze Bearing

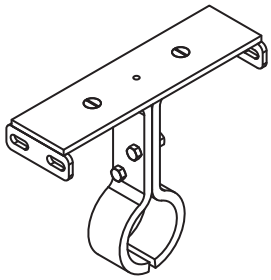
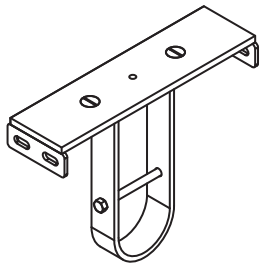
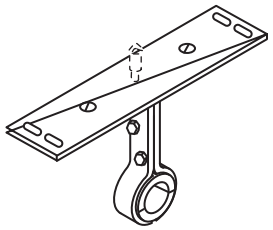
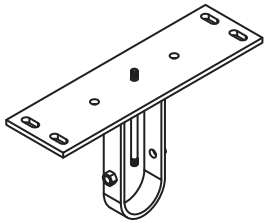
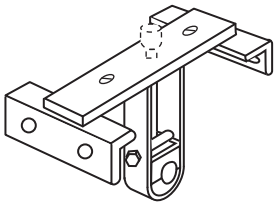
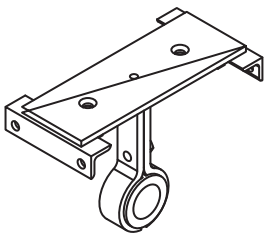
Shaft Diameter	Part Number*	C	G	Weight
1	CE2B-W	8	4¼	1.6
1½	CE3B-W	11	6¼	5.2
2	CE4B-W	12	7¼	10.4
2 7/16	CE5B-W	13⅝	8¾	17.6
3	CE6B-W	14⅞	9⅞	28.2
3 7/16	CE7B-W	18⅝	11⅞	48.0

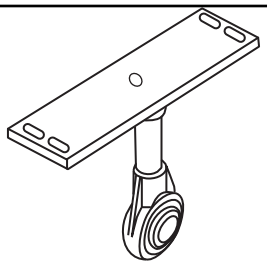
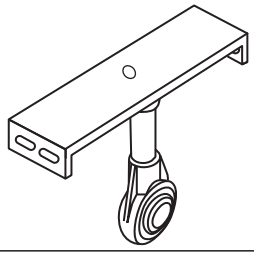
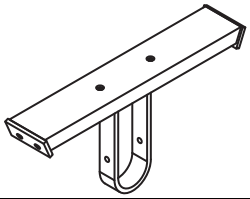
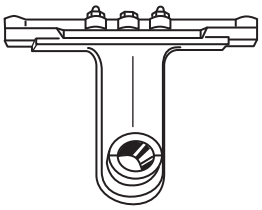
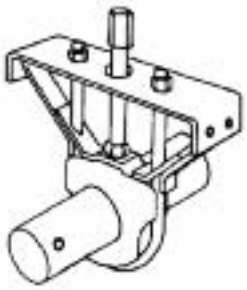
Ball Bearing

Shaft Diameter	Part Number*	C	G	Weight
1	CE2BB-W	7½	3¾	1.4
1½	CE3BB-W	10	5¼	4.8
2	CE4BB-W	10⅜	5⅝	9.0
2 7/16	CE5BB-W	11⅜	6½	14.8
3	CE6BB-W	12⅜	7⅜	24.0
3 7/16	CE7BB-W	15⅝	8⅞	40.2

*Add – H for Hardened Shaft.
**Shaft length allows for ½ hanger bearing length, clearance between end plate and screw.
***Consult Factory

Hangers

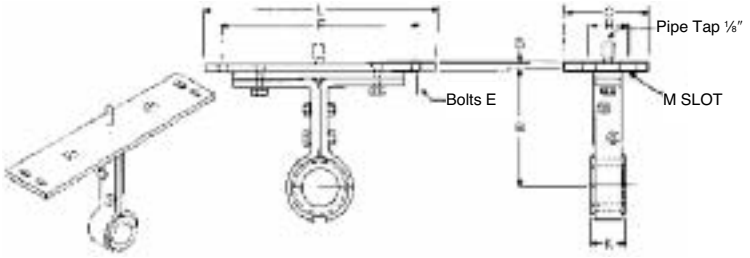
Style 226		No. 226 hangers are designed for flush mounting inside the trough permitting dust-tight or weather-proof operation. This type hanger allows for minimum obstruction of material flow in high capacity conveyors. Available with friction type bearing.
Style 216		No. 216 hangers are designed for heavy duty applications. This hanger is flush mounted inside the trough permitting dust tight or weather proof operation. Hard iron or bronze bearings are normally furnished; however, the hanger can be furnished with other bearings.
Style 220		No. 220 hangers are designed for mount on top of the trough flanges and may be used where dust-tight or weather proof operation is not required. This type hanger allows for minimum obstruction of material flow in high capacity conveyors. Available with friction type bearing.
Style 230		No. 230 hangers are designed for heavy duty applications where mounting on top of the trough flanges is required. Hard iron or bronze bearings are normally furnished; however, other bearings are available.
Style 316		No. 316 hangers are designed for heavy duty use in conveyors where abnormal heat requires unequal expansion between the screw and conveyor trough. Hard iron or bronze bearings are normally furnished; however, this hanger can be furnished with other bearings.
Style 326		No. 326 hangers are designed to permit minimum obstruction of material flow and are used in conveyors where abnormal heat requires unequal expansion between the screw and the conveyor trough. Hard iron or bronze bearings are normally furnished, but other type bearings are available.

Style 60		No. 60 hangers are furnished with a heavy duty, permanently lubricated and sealed, self aligning ball bearing which permits temperatures up to 245º F. and will allow for up to 4º shaft misalignment. This hanger is mounted on top of the trough flanges. Grease fitting can be furnished if specified.
Style 70		No. 70 hangers are furnished with a heavy duty, permanently lubricated and sealed, self aligning ball bearing which permit temperatures up to 245º F. and will allow for up to 4º shaft misalignment. This hanger is mounted inside the trough. Grease fittings can be furnished if specified.
Style 30		No. 30 hangers are designed for side mounting within the conveyor trough on the noncarrying side and permit a minimum of obstruction of material flow. Available with friction type bearing.
Style 216F		No. 216F hangers are designed for heavy duty applications and are mounted inside of flared trough. Hard iron or bronze bearings are normally furnished; however, other bearings are available.
Style 19B		The No. 19B hanger is similar in construction to the No. 18B except they are mounted on top of the trough angles. Built-in ledges provide supports for the ends of the cover. They are streamline in design and permit free passage of the material. They are regularly furnished with Arguto oil impregnated wood, hard iron, bronze, or other special caps can be furnished.
Air Purged Hanger		Air purged hangers are recommended when handling dusty and abrasive materials which contribute to shutdowns and hanger bearing failures. Air-swept hangers are available for 9"-24" conveyors. They should not be used when handling hot materials (over 250º F) or wet sticky materials or when handling non abrasive materials when an inexpensive hanger will do the job satisfactorily. In service, air-purged hangers deliver relatively trouble-free operation. They help solve noise nuisance problems, and they help reduce power requirement because of the low coefficient of fraction. Maximum trough loading should not exceed 15%. The air, at approximately 1-1/4 PSI enters the housing at the top, passes over and around the bearing, and is dissipated around the coupling shaft on both sides of the housing. Thus the bearing is protected from dust and the material in the trough at all times. Only 3 to 7 cu. ft. of air per minute is required to keep each hanger bearing clean.

Hangers

Style 220

No. 220 hangers are designed for mounting on top of the trough flanges and may be used where dust-tight or weather proof operation is not required. This type hanger allows for minimum obstruction of material flow in high capacity conveyors. Available with friction type bearing.

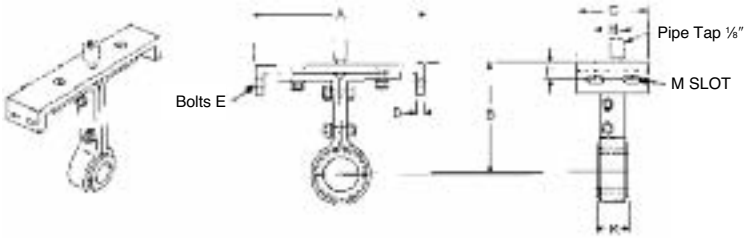


Conveyor Diameter	Coupling Size	Part Number*	B	C	D	E	F	H	K	L	M Slot	Weight Each
4	1	4CH2202	3 13/16	3½	3/16	¼	6½	2	1½	7¼	5/16 × ¾	5
6	1½	6CH2203	4½	4½	3/16	⅜	8¾	2½	2	9¾	7/16 × 1 1/16	7
9	1½	9CH2203	6⅛	4½	¼	⅜	12¼	2½	2	13½	7/16 × 1 1/16	9
	2	9CH2204	6⅛	4½	¼	⅜	12¼	2½	2	13½		11
10	1½	10CH2203	6⅜	4½	¼	⅜	13¼	2½	2	14½	7/16 × 1 1/16	10
	2	10CH2204	6⅜	4½	¼	⅜	13¼	2½	2	14½		12
12	2	12CH2204	7¾	5	⅜	½	15¾	2½	2	17½	9/16 × 1 5/16	16
	2 7/16	12CH2205	7¾	5	⅜	½	15¾	2½	3	17½		21
	3	12CH2206	7¾	5	⅜	½	15¾	2½	3	17½		28
14	2 7/16	14CH2205	9¼	5	½	½	17¾	2½	3	19½	9/16 × 1 5/16	26
	3	14CH2206	9¼	5	½	½	17¾	2½	3	19½		33
16	3	16CH2206	10⅝	5	½	½	19¾	2½	3	21½	9/16 × 1 5/16	39
18	3	18CH2206	12⅛	6	½	⅝	22¼	3½	3	24½	11/16 × 1 11/16	41
	3 7/16	18CH2207	12⅛	6	½	⅝	22¼	3½	4	24½		49
20	3	20CH2206	13½	6	½	⅝	24¼	3½	3	26½	11/16 × 1 11/16	43
	3 7/16	20CH2207	13½	6	½	⅝	24¼	3½	4	26½		51
24	3 7/16	24CH2207	16½	6	½	⅝	28¼	3½	4	30½	11/16 × 1 11/16	57

*Refer to Page H-100 for bearings
NOTE: For hangers with oil pipe add –0 to part number

Style 226

No. 226 hangers are designed for flush mounting inside the trough permitting dust-tight or weather-proof operation. This type hanger allows for minimum obstruction of material flow in high capacity conveyors. Also available with friction type bearing.

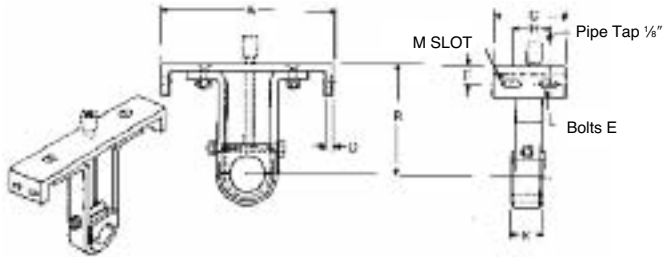


Conveyor Diameter	Coupling Size	Part Number*	A	B	C	D	E	F	H	K	M Slot	Weight Each
4	1	4CH2262	5	3⅝	3½	3/16	¼	11/16	2	1½	5/16 × ¾	5
6	1½	6CH2263	7	4½	4½	3/16	⅜	¾	2½	2	7/16 × 1 1/16	7
9	1½	9CH2263	10	6⅛	4½	¼	⅜	1	2½	2	7/16 × 1 1/16	9
	2	9CH2264	10	6⅛	4½	¼	⅜	1	2½	2		11
10	1½	10CH2263	11	6⅜	4½	¼	⅜	1	2½	2	7/16 × 1 1/16	10
	2	10CH2264	11	6⅜	4½	¼	⅜	1	2½	2		12
12	2	12CH2264	13	7¾	5	⅜	½	1¼	2½	2	9/16 × 1 5/16	16
	2 7/16	12CH2265	13	7¾	5	⅜	½	1¼	2½	3		21
	3	12CH2266	13	7¾	5	⅜	½	1¼	2½	3		28
14	2 7/16	14CH2265	15	9¼	5	½	½	1⅜	2½	3	9/16 × 1 5/16	26
	3	14CH2266	15	9¼	5	½	½	1⅜	2½	3		33
16	3	16CH2266	17	10⅝	5	½	½	1⅜	2½	3	9/16 × 1 5/16	39
18	3	18CH2266	19	12⅛	6	½	⅝	1½	3½	3	11/16 × 1 11/16	41
	3 7/16	18CH2267	19	12⅛	6	½	⅝	1½	3½	4		49
20	3	20CH2266	21	13½	6	½	⅝	1½	3½	3	11/16 × 1 11/16	43
	3 7/16	20CH2267	21	13½	6	½	⅝	1½	3½	4		51
24	3 7/16	24CH2267	25	16½	6	⅝	⅝	1⅝	3½	4	11/16 × 1 11/16	57

*Refer to Page H-100 for bearings *For hangers with oil pipe add –0 to part number

Style 216

No. 216 hangers are designed for heavy duty applications. This hanger is flush mounted inside the trough permitting dust tight or weather proof operation. Hard iron or bronze bearings are normally furnished; however, the hanger can be furnished with other bearings.

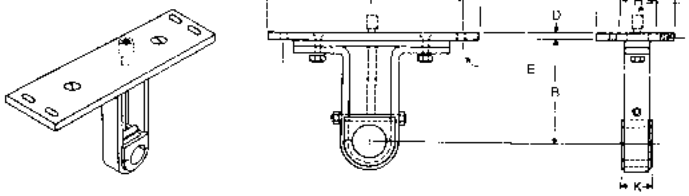


Conveyor Diameter	Coupling Size	Part Number*	A	B	C	D	E	F	H	K	M Slot	Weight Each
6	1½	6CH2163	7	4½	4½	3/16	⅜	¾	2½	2	7/16 × 1 1/16	5
9	1½	9CH2163	10	6⅛	4½	¼	⅜	1	2½	2	7/16 × 1 1/16	7
	2	9CH2164	10	6⅛	4½	¼	⅜	1	2½	2		9
10	1½	10CH2163	11	6⅜	4½	¼	⅜	1	2½	2	7/16 × 1 1/16	8
	2	10CH2164	11	6⅜	4½	¼	⅜	1	2½	2		10
12	2	12CH2164	13	7¾	5	⅜	½	1¼	2½	2	9/16 × 1 5/16	14
	2 7/16	12CH2165	13	7¾	5	⅜	½	1¼	2½	3		18
	3	12CH2166	13	7¾	5	⅜	½	1¼	2½	3		21
14	2 7/16	14CH2165	15	9¼	5	½	½	1⅜	2½	3	9/16 × 1 5/16	23
	3	14CH2166	15	9¼	5	½	½	1⅜	2½	3		25
16	3	16CH2166	17	10⅝	5	½	½	1⅜	2½	3	9/16 × 1 5/16	28
18	3	18CH2166	19	12⅛	6	½	⅝	1½	3½	3	11/16 × 1 11/16	34
	3 7/16	18CH2167	19	12⅛	6	½	⅝	1½	3½	4		44
20	3	20CH2166	21	13½	6	½	⅝	1½	3½	3	11/16 × 1 11/16	36
	3 7/16	20CH2167	21	13½	6	½	⅝	1½	3½	4		47
24	3 7/16	24CH2167	25	16½	6	⅝	⅝	1⅝	3½	4	11/16 × 1 11/16	53

*Refer to Page H-100 for bearings *For hangers with oil pipe add –0 to part number

Style 230

No. 230 hangers are designed for heavy duty applications where mounting on top of the trough flange is required. Hard iron or bronze bearings are normally furnished; however, other bearings are available.



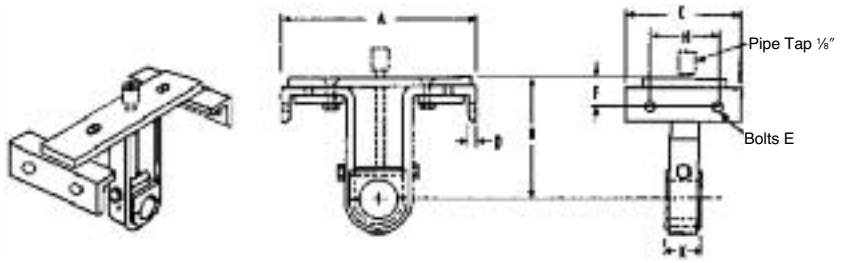
Conveyor Diameter	Coupling Size	Part Number*	B	C	D	E	F	H	K	L	M Slot	Weight Each
6	1½	6CH2303	4½	4½	¼	⅜	8¾	2½	2	9¾	7/16 × 1 1/16	6
9	1½	9CH2303	6⅛	4½	¼	⅜	12¼	2½	2	13½	7/16 × 1 1/16	8
	2	9CH2304	6⅛	4½	¼	⅜	12¼	2½	2	13½		10
10	1½	10CH2303	6⅜	4½	¼	⅜	13¼	2½	2	14½	7/16 × 1 1/16	9
	2	10CH2304	6⅜	4½	¼	⅜	13¼	2½	2	14½		11
12	2	12CH2304	7¾	5	⅜	½	15¾	2½	2	17½	9/16 × 1 5/16	15
	2 7/16	12CH2305	7¾	5	⅜	½	15¾	2½	3	17½		20
	3	12CH2306	7¾	5	⅜	½	15¾	2½	3	17½		25
14	2 7/16	14CH2305	9¼	5	⅜	½	17¾	2½	3	19½	9/16 × 1 5/16	24
	3	14CH2306	9¼	5	⅜	½	17¾	2½	3	19½		29
16	3	16CH2306	10⅝	5	⅜	½	19¾	2½	3	21½	9/16 × 1 5/16	35
18	3	18CH2306	12⅛	6	½	⅝	22¼	3½	3	24½	11/16 × 1 11/16	34
	3 7/16	18CH2307	12⅛	6	½	⅝	22¼	3½	4	24½		47
20	3	20CH2306	13½	6	½	⅝	24¼	3½	3	26½	11/16 × 1 11/16	40
	3 7/16	20CH2307	13½	6	½	⅝	24¼	3½	4	26½		49
24	3 7/16	24CH2307	16½	6	⅝	⅝	28¼	3¾	4	30½	11/16 × 1 11/16	55

*Refer to Page H-100 for bearings *For hangers with oil pipe add –0 to part number

Hangers

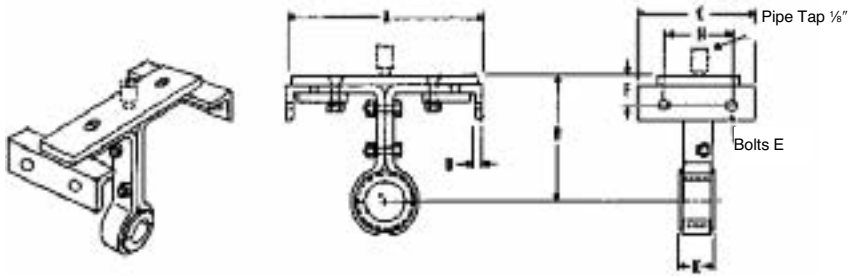
Style 316

No. 316 hangers are designed for heavy duty use in conveyors where abnormal heat requires unequal expansion between the screw and conveyor trough. Hard iron or bronze bearings are normally used; however, this hanger can be furnished with other bearings.



Style 326

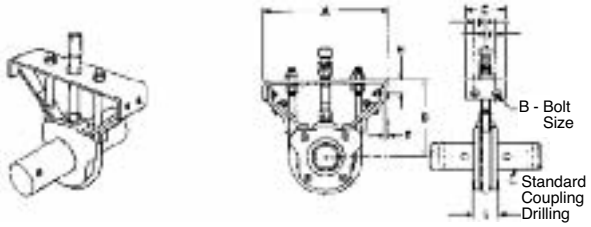
No. 326 hangers are designed to permit minimum obstruction of material flow and are used in conveyors where abnormal heat requires unequal expansion between the screw and the conveyor trough. Hard iron or bronze bearings are normally used, but other type bearings are available.



Conveyor Diameter	Coupling Size	Part Number		A	B	C	D	E	F	H	K
		Style 316*	Style 326*								
6	1½	6CH3163	6CH3263	7	4½	6	3/16	3/8	3/4	4½	2
9	1½ 2	9CH3163 9CH3164	9CH3263 9CH3264	10 10	6⅛ 6⅛	6 6	3/16 3/16	3/8 3/8	1 1	4½ 4½	2 2
10	1½ 2	10CH3163 10CH3164	10CH3263 10CH3264	11 11	6⅜ 6⅜	6 6	3/16 3/16	3/8 3/8	1 1	4½ 4½	2 2
12	2 2 7/16 3	12CH3164 12CH3165 12CH3166	12CH3264 12CH3265 12CH3266	13 13 13	7¾ 7¾ 7¾	6½ 6½ 6½	¼ ¼ ¼	½ ½ ½	1¼ 1¼ 1¼	5 5 5	2 3 3
14	2 7/16 3	14CH3165 14CH3166	14CH3265 14CH3266	15 15	9¼ 9¼	6½ 6½	¼ ¼	½ ½	1⅜ 1⅜	5 5	3 3
16	3	16CH3166	16CH3266	17	10⅝	6½	¼	½	1⅜	5	3
18	3 3 7/16	18CH3166 18CH3167	18CH3266 18CH3267	19 19	12⅛ 12⅛	6½ 7	¼ ¼	⅝ ⅝	1⅝ 1⅝	5¼ 5¼	3 4
20	3 3 7/16	20CH3166 20CH3167	20CH3266 20CH3267	21 21	13½ 13½	7 7	¼ ¼	⅝ ⅝	1⅝ 1⅝	5¼ 5¼	3 4
24	3 7/16	24CH3167	24CH3267	25	16½	7	¼	⅝	1¾	5¼	4

*Refer to Page H-100 for bearings

*For hangers with oil pipe add –0 to part number



Air Purged Hanger

Air purged hangers are recommended when handling dusty and abrasive materials which contribute to shut-downs and hanger bearing failures. They should not be used when handling hot materials (over 250°F) or wet sticky materials or when handling nonabrasive materials when an inexpensive hanger will do the job satisfactorily. Maximum trough loading should not exceed 15%. The air, at approximately 1¼ PSI, enters the housing at the top, passes over and around the bearing, and is dissipated around the coupling shaft on both sides of the housing. Only 3 to 7 cu. ft. of air per minute is required to keep each hanger bearing clean.

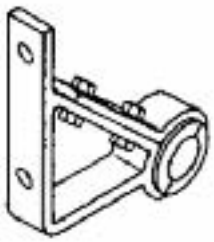
Screw Diameter	Part Number	Shaft Dia.	Weight Each	A	B	C	D	F	H	L	T
9	9CHAPH3 9CHAPH4	1½ 2	15 20	10	3/8 3/8	4½	6⅛	1¼	1	2	¼
12	12CHAPH4 12CHAPH5 12CHAPH6	2 2 7/16 3	30 52 68	13	½	5	7¼	1¼	1¼	2 3 3	¼
14	14CHAPH5 14CHAPH6	2 7/16 3	60 74	15	½	5	9¼	1¼	1⅜	3	⅜
16	16CHAPH6	3	77	17	½	5	10⅝	1¼	1⅜	3	⅛
18	18CHAPH6	3	91	19	⅝	6	12⅛	1¾	1⅝	3	½
20	20CHAPH6 20CHAPH7	3 3 7/16	105 140	21	⅝	6	13½	1¾	1⅜	3 4	½
24	24CHAPH7	3 7/16	155	25	⅝	6	16½	1¾	1⅜	4	½

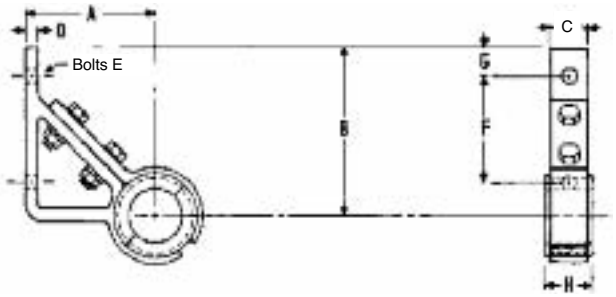
Space required on coupling for hanger.
Air supply should be clean and dry.

Dimensions in inches.
Weight in pounds.

Style 30

No. 30 hangers are designed for side mounting within the conveyor trough on the non-carrying side and permit a minimum of obstruction of material flow. Available with friction type bearing.



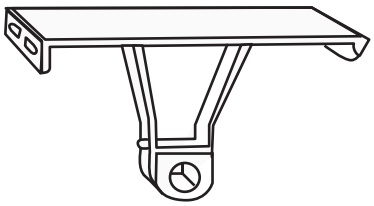


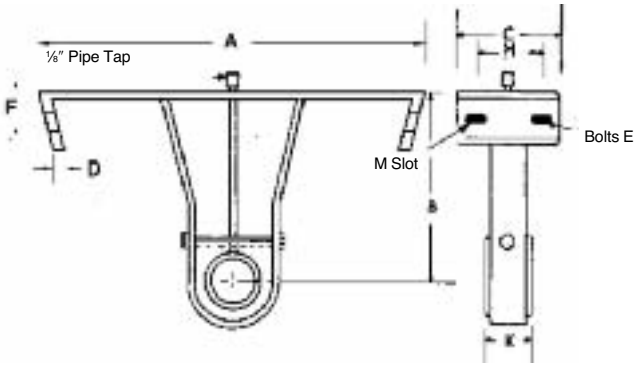
Conveyor Diameter	Coupling Diameter	Part Number*	A	B	C	D	E	F	G	H	Weight Each
6	1½	6CH303	3½	4¼	1½	⅜	5/16	3⅜	½	2	3
9	1½	9CH303	5	5⅞	1½	⅜	⅜	4¼	½	2	6
	2	9CH304	5	5⅞	1½	½	⅜	4¼	½	2	8
10	1½	10CH303	5½	6⅜	1½	⅜	½	4⅜	¾	2	8
	2	10CH304	5½	6⅜	1½	½	½	4⅜	¾	2	9
12	2	12CH304	6½	7½	1½	½	½	5½	¾	2	12
	2 7/16	12CH305	6½	7½	2	½	½	5½	¾	3	18
	3	12CH306	6½	7½	2	½	½	5½	¾	3	20
14	2 7/16	14CH305	7½	9	2	½	⅝	6⅞	⅞	3	20
	3	14CH306	7½	9	2	½	⅝	6⅞	⅞	3	22
16	3	16CH306	8½	10⅜	2	⅝	⅝	8	1	3	32
18	3	18CH306	9½	11⅞	2	¾	⅝	9	1¼	3	30
	3 7/16	18CH307	9½	11⅞	3	¾	⅝	9	1¼	4	33
20	3	20CH306	10½	13¼	2	¾	⅝	10¼	1¼	3	32
	3 7/16	20CH307	10½	13¼	3	¾	⅝	10¼	1¼	4	38
24	3 7/16	24CH307	12½	16¼	3	¾	¾	12¾	1½	4	46

*Refer to Page H-100 for bearings
NOTE: For hangers with oil pipe add –0 to part number

Style 216F

No. 216F hangers are designed for heavy duty applications and are mounted inside of flared trough. Hard iron or bronze bearings are normally furnished; however, other bearings are available.





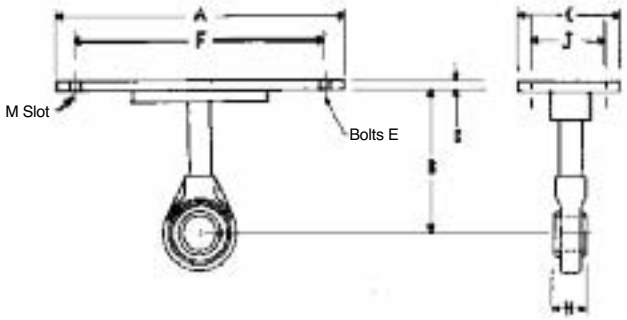
Conveyor Diameter	Coupling Diameter	Part Number*	A	B	C	D	E	F	H	K	Weight Each	M Slot
6	1½	6CH216F3	14	7	4	3/16	⅜	⅞	2½	2	9	7/16 × ¾
9	1½	9CH216F3	18	9	4	3/16	⅜	⅞	2½	2	14	7/16 × ¾
	2	9CH216F4									17	
12	2	12CH216F4	22	10	5	⅜	½	1⅛	2½	2	24	9/16 × ¾
	2 7/16	12CH216F5								3	28	
	3	12CH216F6									32	
14	2 7/16	14CH216F5	24	11	5	⅜	½	1⅛	2½	3	31	9/16 × ¾
	3	14CH216F6									34	
16	3	16CH216F6	28	11½	5	⅜	½	1⅛	2½	3	38	9/16 × ¾
18	3	18CH216F6	31	12⅛	5	½	⅝	1½	3½	3	52	11/16 × ⅞
	3 7/16	18CH216F7								4	61	
20	3	20CH216F6	34	13½	5	½	⅝	1½	3½	3	55	11/16 × ⅞
	3 7/16	20CH216F7								4	64	
24	3 7/16	24CH216F7	40	16½	5	½	⅝	1½	3½	4	71	11/16 × ⅞

*Refer to Page H-100 for bearings
NOTE: For hangers with oil pipe add –0 to part number

Hangers

Style 60

No. 60 hangers are furnished with a heavy duty, permanently lubricated and sealed, self-aligning ball bearing which permits temperatures up to 245° F. and will allow for up to 4° shaft misalignment. This hanger is mounted on top of the trough flanges. Grease fitting can be furnished if specified.

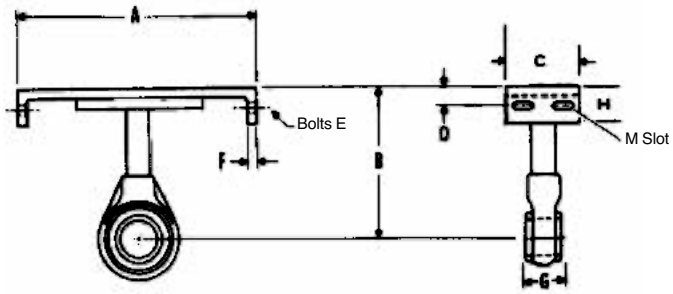


Conveyor Diameter	Coupling Size	Part Number*	A	B	C	D	E	F	H	J	Weight Each	M Slot
6	1½	6CH603	9¾	4½	4	3/16	3/8	8¾	1 11/16	2	7	7/16 × 1 1/16
9	1½	9CH603	13½	6⅛	4	¼	3/8	12¼	1 11/16	2	8	7/16 × 1 1/16
	2	9CH604	13½	6⅛	4	¼	3/8	12¼	1¾	2	9	7/16 × 1 1/16
10	1½	10CH603	14½	6⅜	4	¼	3/8	13¼	1 11/16	2	9	7/16 × 1 5/16
	2	10CH604	14½	6⅜	4	¼	3/8	13¼	1¾	2	10	7/16 × 1 5/16
12	2	12CH604	17½	7¾	5	3/8	½	15¾	1¾	2½	12	9/16 × 1 5/16
	2 7/16	12CH605	17½	7¾	5	3/8	½	15¾	1 63/64	2½	20	9/16 × 1 5/16
	3	12CH606	17½	7¾	5	3/8	½	15¾	2 11/16	2½	30	9/16 × 1 5/16
14	2 7/16	14CH605	19½	9¼	5	½	½	17¾	1 63/64	2½	21	9/16 × 1 5/16
	3	14CH606	19½	9¼	5	½	½	17¾	2 11/32	2½	32	9/16 × 1 5/16
16	3	16CH606	21½	10⅝	5	½	½	19¾	2 11/32	2½	35	9/16 × 1 5/16
18	3	18CH606	24½	12⅛	6	½	⅝	22¼	2 11/32	3½	40	1 1/16 × 1 1 1/16
20	3	20CH606	26½	13½	6	½	⅝	24¼	2 11/32	3½	45	1 1/16 × 1 1 1/16
24	3 7/16	24CH607	30½	16½	6	⅝	⅝	28¼	2 31/64	3¾	58	1 1/16 × 1 1 1/16

*For hangers with oil pipe add –0 to part number

Style 70

No. 70 hangers are furnished with a heavy duty, permanently lubricated and sealed, self aligning ball bearing which permits temperatures up to 245° F. and will allow for up to 4° shaft misalignment. This hanger is mounted inside the trough. Grease fitting can be furnished if specified.



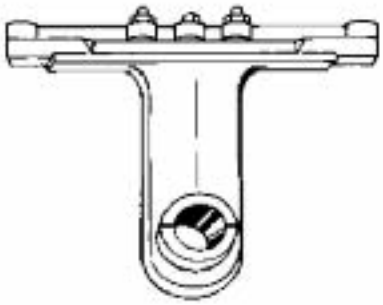
Conveyor Diameter	Coupling Size	Part Number*	A	B	C	D	E	F	G	H	Weight Each	M Slot
6	1½	6CH703	7	4½	4½	¾	3/8	3/16	1 11/16	1½	7	7/16 × 1 1/16
9	1½	9CH703	10	6⅛	4½	1	3/8	¼	1 11/16	1¾	8	7/16 × 1 1/16
	2	9CH704	10	6⅛	4½	1	3/8	¼	1¾	1¾	9	
10	1½	10CH703	11	6⅜	4½	1	3/8	¼	1 11/16	1¾	9	7/16 × 1 1/16
	2	10CH704	11	6⅜	4½	1	3/8	¼	1¾	1¾	10	
12	2	12CH704	13	7¾	5	1¼	½	3/8	1¾	2⅛	12	9/16 × 1 5/16
	2 7/16	12CH705	13	7¾	5	1¼	½	3/8	1 63/64	2⅛	20	
	3	12CH706	13	7¾	5	1¼	½	3/8	2 11/32	2⅛	30	
14	2 7/16	14CH705	15	9¼	5	1⅜	½	½	1 63/64	2¼	21	9/16 × 1 5/16
	3	14CH706	15	9¼	5	1⅜	½	½	2 11/32	2¼	32	
16	3	16CH706	17	10⅝	5	1⅜	½	½	2 11/32	2¼	35	9/16 × 1 5/16
18	3	18CH706	19	12⅛	6	1½	⅝	½	2 11/32	2½	40	1 1/16 × 1 1 1/16
20	3	20CH706	21	13½	6	1½	⅝	½	2 11/32	2½	45	1 1/16 × 1 1 1/16
24	3 7/16	24CH707	25	16½	6	1⅝	⅝	⅝	2 11/32	2⅝	58	1 1/16 × 1 1 1/16

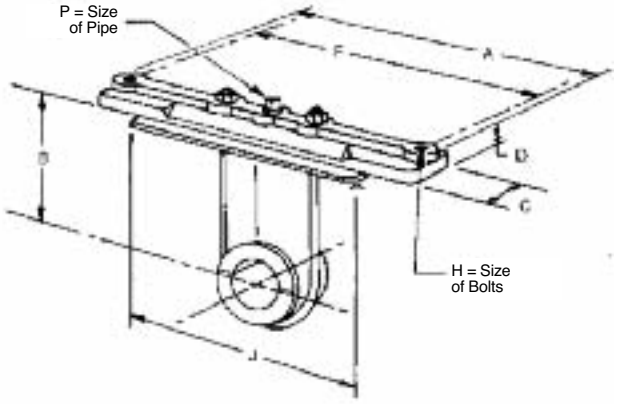
*For hangers with oil pipe add –0 to part number

Style 19B

The No. 19-B Hanger is similar in construction to the No. 18-B except they are mounted on top of the trough angles. Built-in ledges provide supports for the ends of the cover. They are streamlined in design and permit free passage of the material.

Top half is furnished with bronze bearing. Bottom half can be supplied in oil impregnated wood, hard iron, or other special caps may be furnished on request.





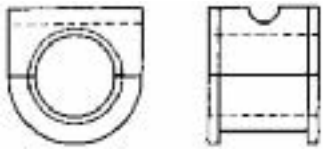
Conveyor Diameter	Bearing Bore	Part Number	Weight	A	B	C	D	F	H Bolt	J	P Pipe
6	1½	6CH19B3	8.5	9⅞	4½	1⁵⁄₁₆	⅞	8¾	½	6½	¼
9	1½ 2	9CH19B3 9CH19B4	13 15.5	13½ 13½	6⅛ 6⅛	1¾ 1¾	1 1	12¼ 12¼	½ ½	9½ 9½	¼ ¼
10	1½ 2	10CH19B3 10CH19B4	14	14½	6⅜	1¾	1	13¼	½	10½ 10½	¼
12	2 2⁷⁄₁₆ 3	12CH19B4 12CH19B5 12CH19B6	24 24.5	17 17	7¾ 7¾	2 2¾	1¼ 1½	15¾ 15¾	½ ½	12½ 12½ 12½	¼ ¼
14	2⁷⁄₁₆ 3	14CH19B5 14CH19B6	37	19¼	9¼	2¾	1¾	17¾	½	14½ 14¼	¼
16	3	16CH19B6	45	21¼	10⅝	3	1¾	19¾	⅝	16½	¼
18	3	18CH19B6	48.5	23¾	12⅛	3	1⅝	22¼	⅝	18½	¼
20	3⁷⁄₁₆	20CH19B7	60.0	26¼	13½	4	1¹³⁄₁₆	24¼	¾	20	¼

Screw Conveyor Hanger Bearing Selection Application

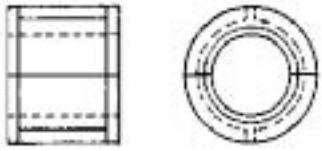
BEARING MATERIAL	MAXIMUM OPERATING TEMP. (°F)	STYLES AVAILABLE	MATERIAL FDA COMPLIANT	SELF LUBE	SOME SUGGESTED USES	COMMENTS
Martin MSB	300°	220, 216	Yes		Food	Engineered PTFE
Ertalyte®	200°	220, 216	Yes		Food	Registered Trademark of Quadrant Engineering Products
Gatke	400°	220, 216			Chemical	Fiberglass fabric. Good for higher speeds.
Martin HARD IRON	500°	220		Yes	Chemical, Cement, Aggregate	Requires Hardened Shaft
CAST HARD IRON	500°	220, 216, 19B			Liime, Cement, Salt, Gypsum	Requires hardened shaft. Can be noisy. Lubrication required in some applications.
WOOD	160°	220, 216, 19B		Yes	Grain, Feed, Fertilizer	Good general purpose.
Martin BRONZE	850°	220		Yes	Grain, Feed, Processing	High quality bearings. High load capacity.
NYLON 101	250°	220	Yes	Yes	Food and Grain	For dry applications.
NYLATRON GS	250°	220, 19B		Yes	Chemical, Handling, Grain, Feed	Very low load capacity.
UHMW	225°	220, 216	Yes	Yes	Food	Material USDA approved. Does not swell in water.
STELLITE	1000°	220, 216			Chemical, Cement, Aggregate	Requires Stellite insert in shaft.
INDUSTRIAL GRADE ENGINEERED NYLON	160°	220		Yes	Grain, Feed, Fertilizer	Economical replacement for wood.
WHITE MELAMINE	190°	220	Yes		Food	Suitable for repeat use in food contact applications at temps not exceeding 190°F.
FOOD GRADE ENGI-NEERED NYLON	300°	220	Yes	Yes	Food, Grain, Fertilizer	For dry application.
BALL BEARING	180°	60, 70			Non-abrasive applications	General purpose use.
Martin HDPE	200°	220	Yes	Yes	Grain, Feed, Chemical Handling	Recommended for non-abrasive applications
CERAMIC 1	1,000°	220, 216	Yes		Chemical, Cement, Food	Requires hardened shafts.
Martin URETHANE	200°	220		YES	Grain, Chemical, Fertilizer	Good general purpose.

[1] Higher temperature ceramics are available.

Hanger Bearings

Hanger Type	Shaft Diameter	Part Number	Bearing
216	1½	CHB2163*	
	2	CHB2164*	
230	2 7/16	CHB2165*	
	3	CHB2166*	
316	3 7/16	CHB2167*	

*H—Hard Iron *W—Wood *BR – Bronze *U—UHMW *G—Gatke *ER – Ertalyte® *C—Ceramic * St—Stellite * UR - Urethane
* Oil hole is furnished on hard iron and bronze standard.

Hanger Type	Shaft Diameter	Part Number	Bearing
220	1½	CHB2203*	
	2	CHB2204*	
226	2 7/16	CHB2205*	
326	3	CHB2206*	
30	3 7/16	CHB2207*	

*H — Cast Hard Iron with oil hole *W — Wood *N — Nylatron *P – HDPE *G—Gatke *ER – Ertalyte®

MHI — Martin Hard iron (oil impregnated) *MCB — Melamine (Furnished Less Flanges) *C – Ceramic *WN – White Nylon

*MBR — Martin Bronze (oil impregnated) *U — UHMW *UR – Urethane * MSB-PTFE — 1-1/2" through 2-7/16"

Hanger Type	Shaft Diameter	Part Number	Bearing
60 Ball Bearing	1½	CHB603	
	2	CHB604	
70 Ball Bearing	2 7/16	CHB605	
	3	CHB606	
	3 7/16	CHB607	

Note: New style bearings are available with slinger shield one side.

Hanger Type	Shaft Diameter	Part Number	Bearing
18B	1½	CHB18B3*	
	2	CHB18B4*	
	2 7/16	CHB18B5*	
19B	3	CHB18B6*	
	3 7/16	CHB18B7*	

*W—Wood *H—Hard Iron *N—Nylatron *G—Gatke

Note: Furnished as bottom cap only

Ertalyte® is a Registered Trademark of Quadrant.

Trough Covers

Trough Cover

14	TCP	14	-12

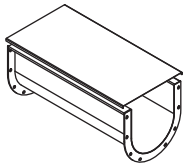
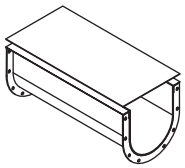
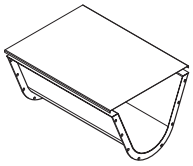
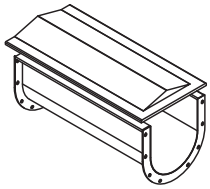
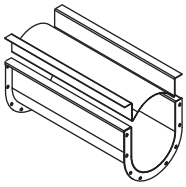
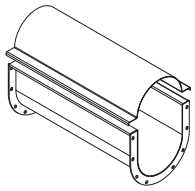
— Length of Cover

Conveyor Diameter

Type
TCP — Plain
TCS — Semi Flanged
TCF — Flanged
TCH — Hip Roof
TSC — Shroud

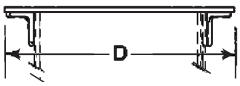
Cover Thickness
16 — 16 GA.
14 — 14 GA.
12 — 12 GA
10 — 10 GA.

It is the responsibility of the contractor, installer, owner and user to install, maintain and operate the conveyor components and conveyor assemblies manufactured and supplied by Martin in such a manner as to comply with the Williams-Steiger Occupational Safety and Health Act and with all state and local laws and ordinances and the American National Standard Institute Safety Code.

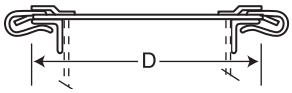
Flanged Covers		Most commonly used. Can be supplied with gaskets and butt straps for dust tight applications. Semi-flanged must be furnished if spring clamps are used.
Flat Covers		Usually used only to cover conveyor for safety.
Flared Trough Covers		Usually flanged type and heavier gauges because of span.
Hip Roof Covers		Hip roof covers are similar to conventional flanged covers except they are peaked slightly to form a ridge along the center of the cover. A welded end plate closes the peaked section at each end of the trough while intermediate joints are usually buttstrap connected. Hip roof covers are usually recommended for outdoor installations to prevent accumulation of moisture. They are also often used in applications where a more rigid cover is required.
Shroud Covers		Used to approximate tubular cross section for inclined or feeder applications.
Domed Covers		Domed covers are half circle domes rolled to the same inside diameter as the trough bottom and are flanged for bolting to the trough top rails. They are used where venting of fumes or heat from the material being conveyed is required. End sections have a welded end plate and intermediate joints are buttstrap connected. Vent pipes or suction lines can be attached to the cover.
Feeder Shrouds		Shrouds are used in trough sections of screw feeders to decrease the clearance between the cover and feeder screw to obtain proper feed regulation. Lengths are sufficient to prevent flushing of the majority of materials being handled and gauges are proportioned to trough size and gauge.

Trough Cover

Plain Cover

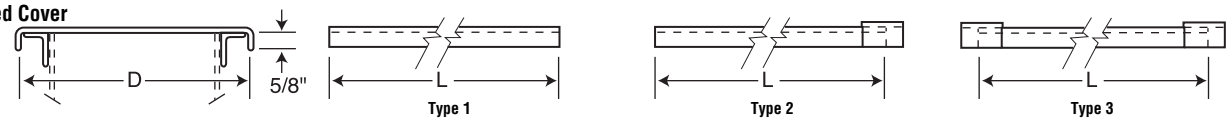


Semi-flanged Cover

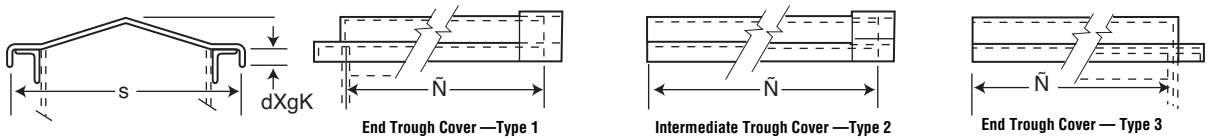


All conveyor troughs should have some type of cover not only to keep material inside the trough and to protect material in the trough from outside elements, **but trough definitely should be covered as a safety measure,** preventing injuries by keeping workers clear of the moving parts inside the conveyor trough. See H-122, Safety.

Flanged Cover



Hip Roof Cover



Conveyor Diameter	Plain Cover				Plain Semi-Flanged Cover				Flanged Cover				Hip Roof Cover			
	Part Number	Thick-ness Ga.	Wt. Per Ft.	D	Part Number	Thick-ness Ga.	Wt. Per Ft.	D	Part Number	Thick-ness Ga.	Wt. Per Ft.	D	Part Number	Thick-ness Ga.	Wt. Per Ft.	D
4 *	4TCP16	16	1.5	8	4TCS16 4TCS14	□ 16 14	2.1 2.6	7¼	4TCF16 4TCF14	□ 16 14	1.9 2.4	8⅜	4TCH16 4TCH14	□ 16 14	2.0 2.5	8⅜
6 *	6TCP16	16	2.0	9¾	6TCS16 6TCS14	□ 16 14	2.3 3.8	9¾	6TCF16 6TCF14	□ 16 14	2.1 2.6	10⅜	6TCH16 6TCH14	□ 16 14	2.3 2.8	10⅜
9 *	9TCP14	14	3.5	13⅜	9TCS14 9TCS12 9TCS10	□ 14 12 10	4.1 5.7 7.3	13⅜	9TCF16 9TCF14 9TCF12 9TCF10	16 □ 14 12 10	3.2 3.9 5.5 7.1	14	9TCH16 9TCH14	16 □ 14	3.3 4.1	14
10 *	10TCP14	14	3.8	14⅜	10TCS14 10TCS12 10TCS10	□ 14 12 10	4.4 6.1 7.8	14⅜	10TCF16 10TCF14 10TCF12 10TCF10	16 □ 14 12 10	3.4 4.2 5.9 7.6	15	10TCH16 10TCH14	16 □ 14	3.5 4.3	15
12 **	12TCP14	14	4.6	17½	12TCS14 12TCS12 12TCS10	□ 14 12 10	5.1 7.1 9.0	17⅜	12TCF14 12TCF12 12TCF10	□ 14 12 10	4.9 6.9 8.8	18	12TCH14 12TCH12	□ 14 12	5.0 7.1	18
14 **	14TCP14	14	5.1	19½	14TCS14 14TCS12 14TCS10	□ 14 12 10	5.6 7.8 9.9	19⅜	14TCF14 14TCF12 14TCF10	□ 14 12 10	5.4 7.6 9.7	19⅞	14TCH14 14TCH12	□ 14 12	5.5 7.7	19⅞
16 **	16TCP14	14	5.6	21½	16TCS14 16TCS12 16TCS10	□ 14 12 10	6.1 8.5 10.8	21⅜	16TCF14 16TCF12 16TCF10	□ 14 12 10	5.9 8.3 10.6	21⅞	16TCH14 16TCH12	□ 14 12	6.1 8.5	21⅞
18 **	18TCP12	12	8.9	24½	18TCS12 18TCS10	□ 12 10	9.6 12.3	24½	18TCF14 18TCF12 18TCF10	14 □ 12 10	6.7 9.4 12.1	25	18TCH14 18TCH12	14 □ 12	6.8 9.5	25
20 **	20TCP12	12	9.7	26½	20TCS12 20TCS10	□ 12 10	10.3 13.3	26½	20TCF14 20TCF12 20TCF10	14 □ 12 10	7.2 10.1 13.1	27	20TCH14 20TCH12	14 □ 12	7.4 10.4	27
24 **	24TCP12	12	11.1	30½	24TCS12 24TCS10	□ 12 10	11.8 15.1	30½	24TCF14 24TCF12 24TCF10	14 □ 12 10	8.3 11.6 14.9	31	24TCH14 24TCH12	14 □ 12	8.4 11.8	31

For average applications where dust confinement is not a problem, 2´-0″ centers or 10 fasteners per 10´-0″ section are generally satisfactory. For commercially dust tight 1´-0″ centers or 20 fasteners per 10´-0″ section are suggested.

*L — Standard lengths are 5´-0″ & 10´-0″

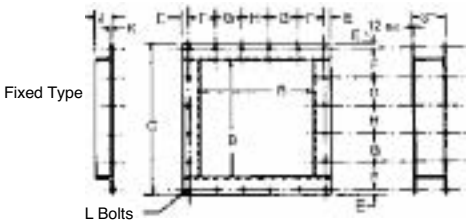
**L — Standard lengths are 5´, 6´, 10´ & 12´-0″

□ — Standard gauge

Cover Accessories

Flanged Conveyor Inlets

The two styles of flanged conveyor inlets are designed for either bolting or welding to flat or flanged conveyor trough cover. The inlet size and bolt arrangement is the same as the standard conveyor discharge spout.



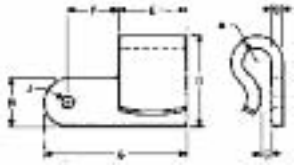
Conveyor Diameter	Part Number		Weight	B	C		E		F	G	H	J	K	L
	Fixed Inlet	Detachable Inlet			Fixed Inlet	Detachable Inlet	Fixed Inlet	Detachable Inlet						
4	4CIF	4CID	1.8	5	7½	7½	⅜	⅜	2¼	—	2¼	1¼	3/16	¼
6	6CIF	6CID	5.0	7	10	10	11/16	11/16	2 13/16	—	3	1½	3/16	⅜
9	9CIF	9CID	6.8	10	13	13	½	½	4	—	4	1½	3/16	⅜
10	10CIF	10CID	7.4	11	14¼	14¼	½	½	4 5/16	—	4⅜	1½	3/16	⅜
12	12CIF	12CID	12.1	13	17¼	17¼	¾	⅞	5⅛	—	5¼	2	3/16	⅜
14	14CIF	14CID	13.7	15	19¼	19¼	¾	⅞	3½	3½	3½	2	3/16	⅜
16	16CIF	16CID	15.8	17	21¼	21¼	¾	⅞	3¾	4	4	2	3/16	⅜
18	18CIF	18CID	29.0	19	24¼	24¼	1	1⅛	4 7/16	4⅜	4⅜	2½	3/16	½
20	20CIF	20CID	31.8	21	26¼	26¼	1	1⅛	4⅞	4¾	4¾	2½	3/16	½
24	24CIF	24CID	37.2	25	30¼	30¼	1	1⅛	5⅝	5⅝	5½	2½	3/16	½

Spring Clamps

Spring Clamps are used to attach plain and semi-flanged covers to trough. These clamps are normally riveted to the trough flange and will pivot to allow removal of cover.

Spring Clamp

Clamp No.	A	B	C	D	E	F	G	H	J	Wt.
SPC—1	5/16	3/16	¼	1¾	1⅜	1⅛	3	1	9/32	.38



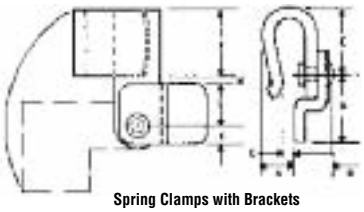
Spring Clamps

Spring Clamps with Cover Bracket

Spring Clamps with cover brackets are designed to attach to the top side of semi-flanged and plain covers.

Spring Clamp with Cover Bracket

Clamp No.	A	B	C	D	E	F	G	H	J	Wt.
SPCA—1	1 1/16	⅜	3/16	1¼	1 3/16	⅜	⅞	⅜	1¼	.50



Spring Clamps with Brackets

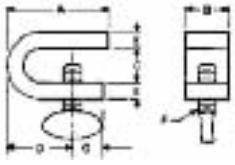
Screw Clamps

Screw Clamps are a simple and effective means of attaching flanged or flat covers to trough.

Screw Clamps available in mild steel, stainless steel and zinc plated.

Screw Clamp

Clamp No.	A	B	C	D	E	F	G	Wt.
CSC—2	2¼	1	1 3/16	1¼	5/16	⅜	⅝	.42



Screw Clamps

Cover Gaskets

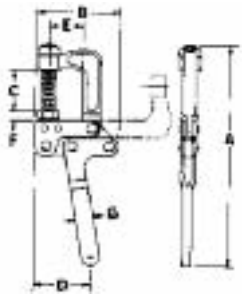
	Red Rubber	Sponge Rubber	*White Rubber
Conv. Dia.	Size	Size	Size
4.6	RR125 ⅛X 1¼	SP75 ⅛X ¾	WN125 ⅛X 1¼
9,10	RR150 ⅛X 1½	SP100 ⅛X 1	WN150 ⅛X 1½
12, 14, 16	RR200 ⅛X 2	SP150 ⅛X 1½	WN250 ⅛X 2
18, 20, 24	RR250 ⅛X 2½	SP200 ⅛X 2	WN250 ⅛X 2½

* FDA Approved

Toggle Clamps

Quick acting toggle clamps are used to attach covers for quick accessibility. Normally this type clamp is attached by welding the front or top of clamp to the trough and can be adjusted to fit all sizes of trough, while allowing 90° to clear working area.

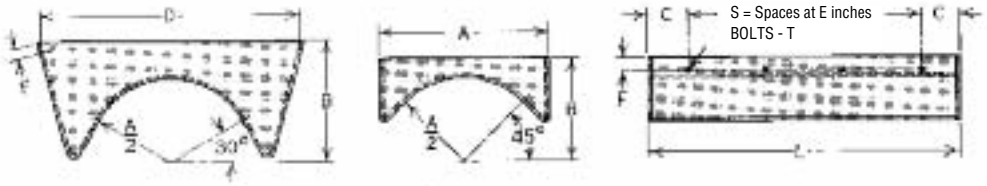
Conveyor	Part Number	No. Required per 10´ Section	A	B	C	D	E	F	G
4—24	QTC	6 to 8	7 13/16	2 15/16	1 25/32	2	1¼	5/16	⅝



Toggle Clamps

Feeder Shrouds

Shrouds are used in trough sections of screw feeders to decrease the clearance between the cover and feeder screw to obtain proper feed regulation. Lengths are sufficient to prevent flushing of the majority of materials being handled and gauges are proportioned to trough size and gauge.



Flared trough U-trough

Screw Diameter Inches	Part No.		Shroud Thickness	A	B		C	D	E	F		L	T	S
	U	Flared			U	Flared				U	Flared			
4	4TFS14	4FFS14	14 Ga.	5	3⅝	—	2	—	4	⅝	—	8	¼	1
6	6TFS14	6FFS14	14 Ga.	7	4½	7	3	14	6	¾	¾	12	5/16	1
	6TFS12	6FFS12	12 Ga.	7	4½	7	3	14	6	¾	¾	12	5/16	1
9	9TFS14	9FFS14	14 Ga.	10	6⅛	9	3	18	6	⅞	¾	18	⅜	2
	9TFS7	9FFS7	3/16″	10	6⅛	9	3	18	6	⅞	¾	18	⅜	2
10	10TFS14	10FFS14	14 Ga.	11	6⅜	—	2½	—	5	⅞	—	20	⅜	3
	10TFS7	10FFS7	3/16″	11	6⅜	—	2½	—	5	⅞	—	20	⅜	3
12	12TFS12	12FFS12	12 Ga.	13	7¾	10	3	22	6	1⅛	1	24	⅜	3
	12TFS7	12FFS7	3/16″	13	7¾	10	3	22	6	1⅛	1	24	⅜	3
14	14TFS12	14FFS12	12 Ga.	15	9¼	11	3½	24	7	1⅛	1	28	⅜	3
	14TFS7	14FFS7	3/16″	15	9¼	11	3½	24	7	1⅛	1	28	⅜	3
16	16TFS12	16FFS12	12 Ga.	17	10⅝	11½	4	28	8	1⅛	1	32	⅜	3
	16TFS7	16FFS7	3/16″	17	10⅝	11½	4	28	8	1⅛	1	32	⅜	3
18	18TFS12	18FFS12	12 Ga.	19	12⅛	12⅛	4½	31	9	1⅜	1⅜	36	⅜	3
	18TFS7	18FFS7	3/16″	19	12⅛	12⅛	4½	31	9	1⅜	1⅛	36	⅜	3
20	20TFS10	20FFS10	10 Ga.	21	13½	13½	4	34	8	1⅜	1⅜	40	⅜	4
	20TFS7	20FFS7	3/16″	21	13½	13½	4	34	8	1⅜	1⅜	40	⅜	4
24	24TFS10	24FFS10	10 Ga.	25	16½	16½	4	40	8	1⅜	1⅜	48	⅜	5
	24TFS7	24FFS7	3/16″	25	16½	16½	4	40	8	1⅜	1⅜	48	⅜	5

Conveyor Shrouds

Conveyor shroud covers are used to form a tubular cross section within the conveyor trough. This arrangement gives the features of a tubular housing while allowing removal of the shroud for easy access and cleaning. Flat or flanged covers can be used over the shroud cover when it is objectionable for the recess in the shroud to be exposed to dust or weather. Various types of shrouds are furnished to fit various applications. These types are described below.

Type 1

Type 1 Shroud cover has flanged sides over top rail and flanged ends at both ends. This type is used when shroud is full length of trough or between hangers.

Type 2

Type 2 Shroud cover has flanged sides over top rails and flanged ends on one end over trough end; other end is plain. This type shroud is used at an inlet opening or next to a hanger at the plain end.

Type 3

Type 3 Shroud cover has flanged sides over top rail and both ends closed and no flanges over ends. This type shroud is used between hangers.

Type 4

Type 4 Shroud cover has no flanges at sides or ends. Bolt holes are provided along sides, for bolting through side of trough. This allows flush mounting with top of trough and a cover may be used over the shroud. This shroud is used mostly for short lengths when installed ahead of an inlet opening.

SECTION IV

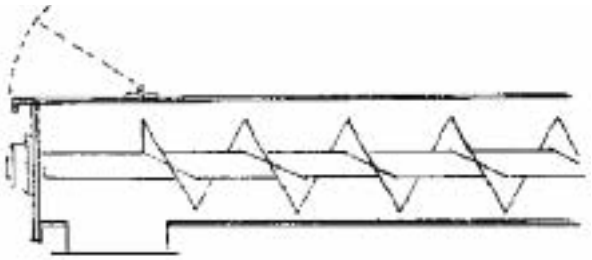
SPECIAL FEATURES SECTION IV

Special Features

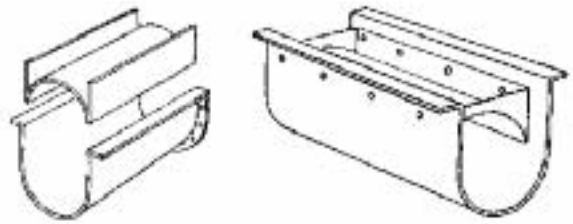
The information presented in this section gives descriptions and functions of the most commonly used special features available in the design of conveyor systems.

These special features will greatly broaden the range of uses for screw conveyor when added to the many standard features available. Standard features and components are always more desirable and practical in the design of a screw conveyor system; however, one or more of these special features may sometimes be required in special applications for a workable or more efficient system.

Covers



OVERFLOW COVER sections are used as a safety relief to handle overflow over the discharge in cases where the discharge may become plugged. It is a short section of flanged or flat cover hinged across the width to the adjoining cover. The cover is not attached to the trough in order that it can be raised by pressure from within the trough.



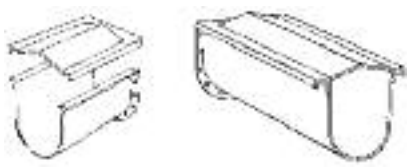
SHROUD COVERS are designed to fit inside a standard conveyor trough of a Screw Feeder or inclined conveyor, and create a tubular trough effect. This cover has an advantage over tubular trough in that ease of access is combined with the convenience of using standard hangers and accessories. An additional flat cover may be required over the shroud to prevent accumulation of dust or water in the recessed portion of the shroud cover.

EXPANDED METAL COVERS can be furnished where cover is required for safety but constant visual inspection is required. STANDARD COVERS of any design can be furnished in heavier gauges, when needed to support weight.

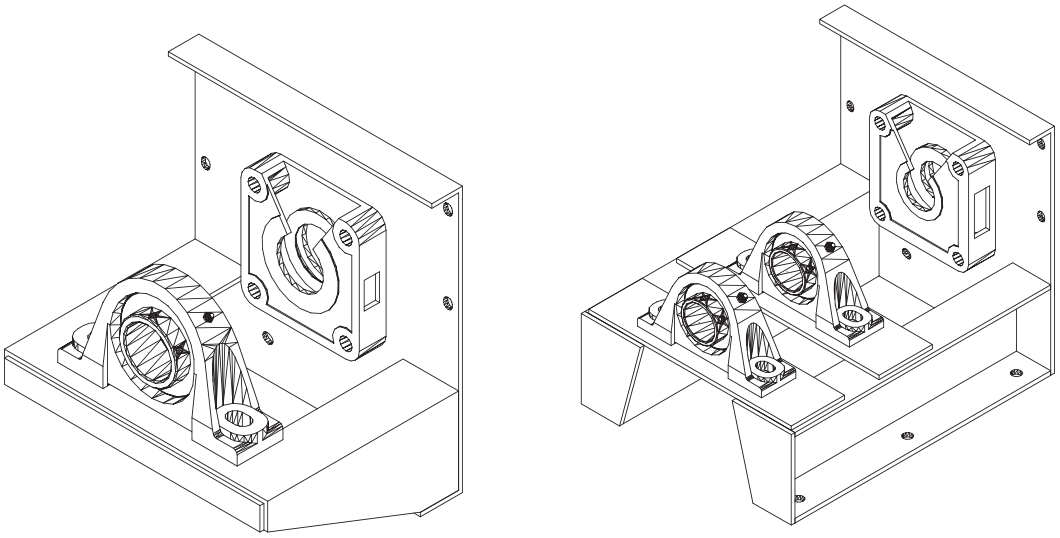
DOME COVERS are half circle domes rolled to the same inside diameter as the trough bottom and are flanged for bolting to the trough top rails. They are used where venting of fumes or heat from the material being conveyed is required. End sections have a welded end plate and intermediate joints are buttstrap connected. Vent pipes or suction lines can be attached to the cover.

DUST SEAL COVERS are flanged down on all four sides to match channel sections fabricated on the sides, ends, and cross channels of special dust seal troughs. The length of the cover should not exceed one-half the length of the trough section.

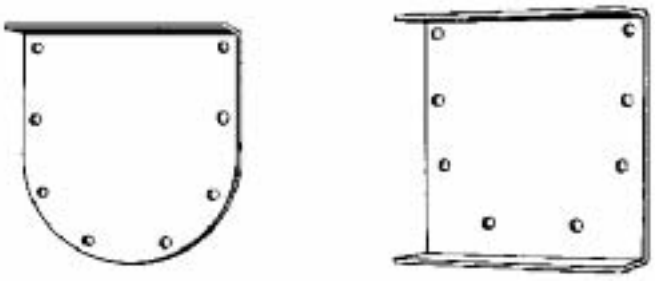
HINGED COVERS may be constructed from conventional flat covers or most special covers. They are equipped with a hinge on one side for attaching to the trough and are bolted or clamped to the trough on the other side. Hinged covers are used in applications where it is not desirable to have a loose cover, such as in high areas above walkways where the cover might fall.



HIP ROOF COVERS are similar to conventional flanged covers except they are peaked slightly to form a ridge along the center of the cover. A welded end plate closes the peaked section at each end of the trough while intermediate joints are usually buttstrap connected. Hip roof covers are usually recommended for outdoor installations to prevent accumulation of moisture. They are also often used in applications where a more rigid cover is required.



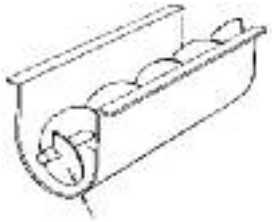
SHELF-TYPE TROUGH ENDS are furnished with outboard bearing pedestals for mounting pillow block bearings. The bearings are mounted away from the trough end plate allowing ample room to protect the bearing when handling abrasive or hot materials. This arrangement allows the use of most any type shaft seal desired. Either one or two bearings can be used.



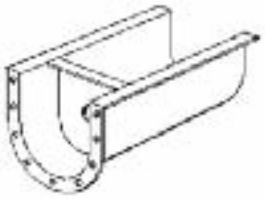
BLIND TROUGH ENDS are used on the tail end (normally the inlet end) of a conveyor, when sealing the end shaft is extremely difficult. A hanger is used inside the trough to support the tail shaft without the shaft projecting through the trough end.

A blind trough end plate can also be furnished with a dead shaft welded to the end plate. For this type the screw is bushed with an antifriction bearing to carry the radial load of the screw. When required, a grease fitting can be furnished through the dead shaft for lubricating the bearing.

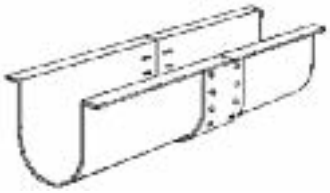
Trough



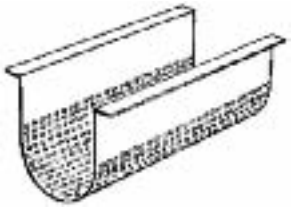
WIDE CLEARANCE TROUGH is of conventional construction except with a wider clearance between the outside of the conveyor screw and the inside of the trough. This type trough is used when it is desirable to form a layer of conveyed material in the trough. The material thus moves on itself, protecting the trough from undue wear. By using a wide clearance or oversize trough, a greater capacity than using a standard conveyor screw can be obtained for some materials that travel as a mass. When wide clearance trough is required, it is more economical to use a standard conveyor screw and the next larger size standard trough.



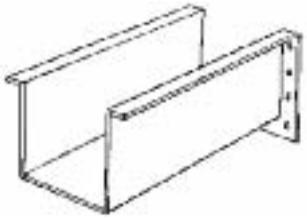
BULK HEAD is a plate or baffle shaped to the contour of the inside of the trough and is normally welded or bolted six to twelve inches from the trough end. The bulk head protects the end bearing and drive unit from heat while handling hot materials, when the pocket formed is filled with packing or insulation. The bulk head can be used in the same manner to prevent damage to seals and bearings when handling extremely abrasive materials.



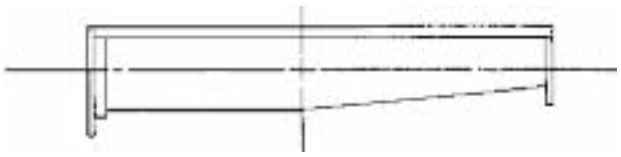
EXPANSION JOINT is a connection within a length of trough to allow for expansion caused by hot materials being conveyed. The expansion joint is constructed with bolts fastened in slots to allow for expansion or with a telescoping type slip joint. The number of joints and amount of expansion will depend on the application.



PERFORATED BOTTOM TROUGH is equipped with a perforated bottom, and is used as a screening operation or drain section when liquids are present in the conveyed material. The size of the perforations in the trough will vary depending on the material and application.



RECTANGULAR TROUGH is made with a flat bottom and can be formed from a single sheet or with sides and bottom of separate pieces. This type trough is frequently used in handling abrasive materials capable of forming a layer of material on the bottom of the trough. The material thus moves on itself, protecting the trough from undue wear. Also in handling hot materials, the material will form its own internal insulation with this type trough.

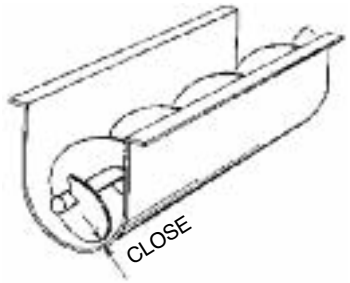


TAPERED BOTTOM TROUGH is used to prevent a dead space in the trough at the small end of a tapered conveyor screw. With some materials the tapered trough is necessary to prevent bridging in the trough, or contamination of the material.

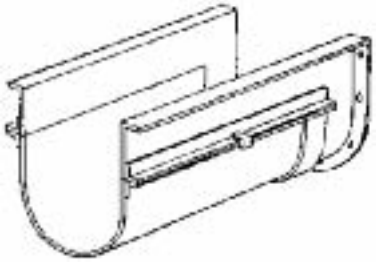
TUBULAR TROUGH is furnished in either solid tube construction or split tube construction with flanges for bolting or clamping the two halves together. This trough is a complete tube enclosure and is used for weather-tight applications, for loading to full cross sections, and for inclined or vertical applications where fall back necessitates the housing to operate at a full loading.

*Conveyors shown without cover for illustration purposes only. Please follow manufacturing safety guidelines when operating conveyors.

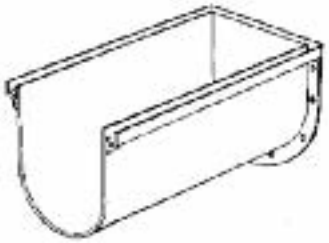
Trough



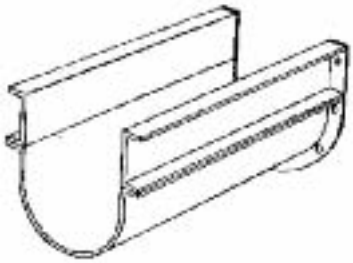
CLOSE CLEARANCE TROUGH is of conventional construction except with a closer clearance between the outside of the conveyor screw and the inside of the trough. This type trough leaves less material in the trough and is often used when a greater clean-out of conveyed material is required. This type trough also minimizes fall back of certain materials in an inclined conveyor.



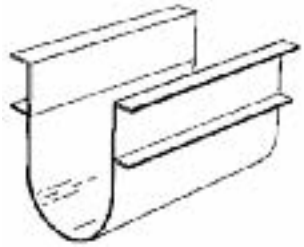
DROP BOTTOM TROUGH is equipped with either a bolted or clamped and completely removable drop bottom, or hinged on one side with bolts or clamps on the opposite side. This design offers ease in cleaning of the trough and screw conveyor, and is often used when handling food products where internal inspection and cleaning of the screw conveyor is necessary.



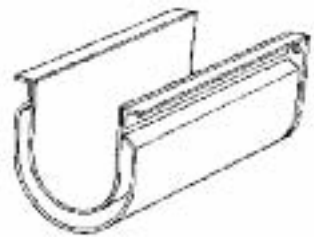
DUST SEAL TROUGH (Sometimes referred to as SAND SEAL TROUGH) has Z-bar top flanges and formed channel cross members making a continuous channel pocket around the top of the trough into which a special flanged cover is set. The channel is filled with sand or dust of the product being conveyed, thus creating an effective seal against the escape of dust from within the conveyor.



CHANNEL SIDE TROUGH is made with separate detachable trough bottoms, bolted or clamped to formed or rolled steel channels. The channels may be of any reasonable length to span widely spaced supports. This type of trough is occasionally used for easy replacement of trough bottoms, and to facilitate repairs when conveyor screw and hangers are not accessible from the top. The channel side trough can also be used without a bottom for filling bins and hoppers.

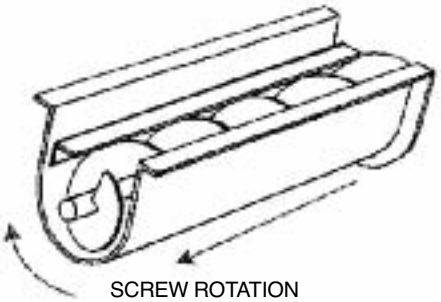


HIGH SIDE TROUGH is of conventional construction except that the trough sides extend higher than standard from the center line to the top of the trough. This type trough is frequently used in conveying materials which mat together and travel as a mass on top of the conveyor screw. High side trough will confine this type material in the trough, but still affords the necessary expansion room.



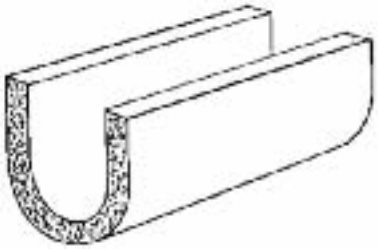
JACKETED TROUGH consists of a formed jacket continuously welded to the trough. This type trough is widely used for heating, drying or cooling of materials. Pipe connections are provided for supply and discharge of the heating or cooling media. Special construction must be provided for higher pressures.

*Conveyors shown without cover for illustration purposes only. Please follow manufacturing safety guidelines when operating conveyors.

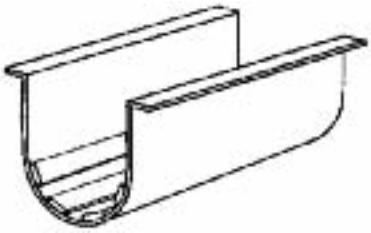


SCREW ROTATION

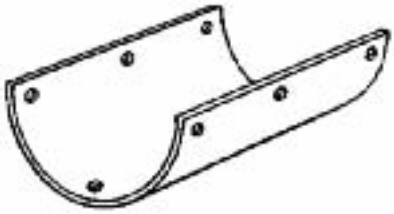
HOLD DOWN ANGLES are used to hold the conveyor screw in the trough when the conveyor is operated without intermediate hangers or when chunks of material may tend to ride under the conveyor screw and push it up. The angle is constructed of formed or regular angle iron and is attached to one side of the full length of trough far enough above the conveyor screw to allow approximately one-half inch clearance between the bottom angle and the conveyor screw.



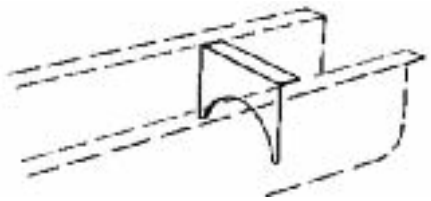
INSULATED CONVEYOR TROUGH is used when handling hot or cold materials. There are many types of insulation materials and arrangements that can be used.



RIDER BARS are flat bars one to one and one-half inches in width running part of length or full length of the trough. Two or four bars are normally used and are spaced an equal distance apart along the curved bottom of the trough. The bars are used to support the conveyor screw to prevent wear on the trough when internal hanger bearings are not used. Rider bars are sometimes referred to as Rifling Bars when they are used to assist in conveying materials that tend to stick to the conveyor screw and rotate with it.

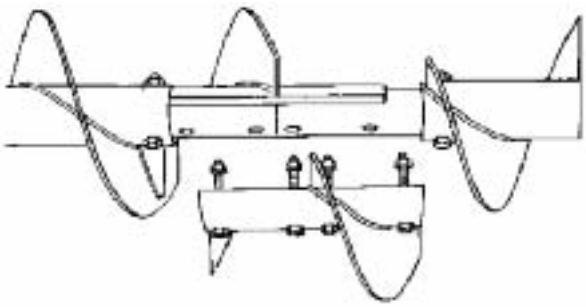


SADDLE TYPE WEAR PLATES are plates curved to the contour of the inside of the trough and of slightly less thickness than the clearance between the conveyor screw and trough. The plates are made in lengths of approximately one and one-half times the pitch of the conveyor screw and are normally spaced at intervals equal to the distance between hangers. They are used to support the conveyor screw to prevent damage to the trough when internal hanger bearings are not used.



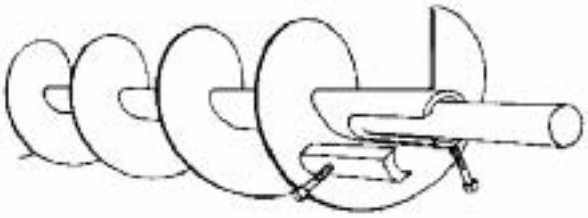
STRIKE OFF PLATE (Shroud Baffle) is a single plate bolted vertically to the upper portion of the trough and is cut out to the contour of the screw. This plate is used to regulate the flow of material from an inlet by preventing flooding across the top of the conveyor screw.

*Conveyors shown without cover for illustration purposes only. Please follow manufacturing safety guidelines when operating conveyors.



SPLIT FLIGHT COUPLINGS permit installation or removal of individual sections of conveyor screw without disturbing adjoining sections. When they are installed on both sides of each hanger, sections of screw can be removed without disturbing the hangers. These must be furnished complete with matching shafts.

WEAR FLIGHTS, or wearing shoes, attached with countersunk bolts to the carrying side of conveyor screw flights are used for handling highly abrasive materials and are easily replaceable.



QUICK DETACHABLE KEY CONVEYOR SCREW is designed for easy removal from the conveyor trough. Each section of screw is provided with a removable key located at one end of the pipe. By removing this key, a conveyor screw section and coupling with a hanger can be quickly removed without disturbing other components.

Width of Application Chart

Screw Diameter	Standard Width of Application
6	1
9	1½
12	2
14	2
16	2½
18	2½
20	3
24	3

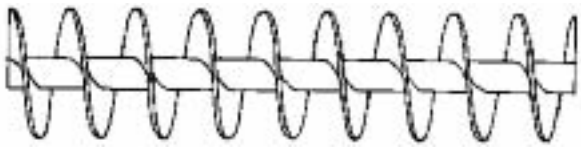
Helicoid

Sectional

NOTE: Weld-on type normally 1/16″ thick.

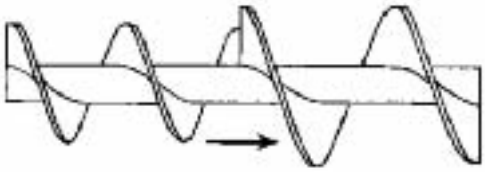
HARD SURFACED FLIGHTS sometimes called abrasive resistant conveyors can be furnished using one of many hardsurfacing processes. The hard surfaced area is normally an outer portion of the face of the flight on the carrying side of the conveyor screw. This process is applied to the conveyor screw to resist wear when handling highly abrasive materials.

Conveyor Screws

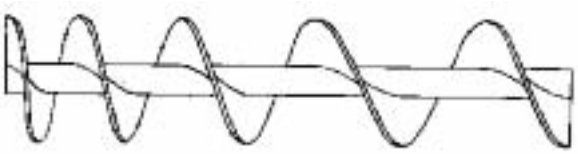


SHORT PITCH CONVEYOR SCREWS are of regular construction except that the pitch of the flights is reduced. They are recommended for use in inclined conveyors of 20 degrees slope and over, and are extensively used as feeder screws, and for controlling cross sectional loading in the balance of a conveyor when short pitch is used at the inlet opening.

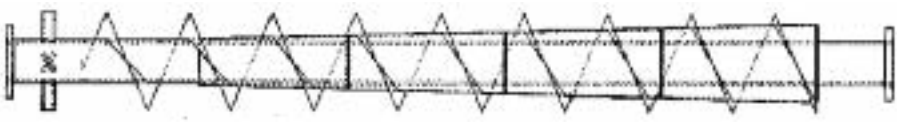
TAPERING FLIGHT CONVEYOR SCREWS are frequently used as feeder screws for handling friable lumpy material from bins or hoppers and also to draw the material uniformly from the entire length of the feed opening.



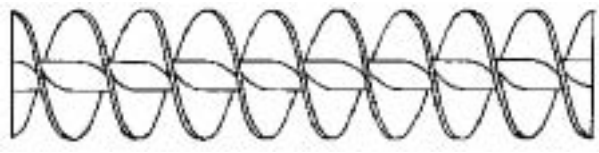
STEPPED DIAMETER CONVEYOR SCREWS consist of flights of different diameters, each with its regular pitch, mounted in tandem on one pipe or shaft. They are frequently used as feeder screws, with the smaller diameter located under bins or hoppers to regulate the flow of material.



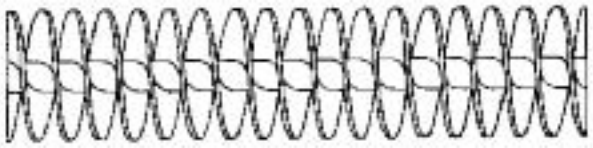
STEPPED PITCH CONVEYOR SCREWS are screws with succeeding single or groups of flights increasing in pitch and are used as feeder screws to draw free-flowing materials uniformly from the entire length of the feed opening.



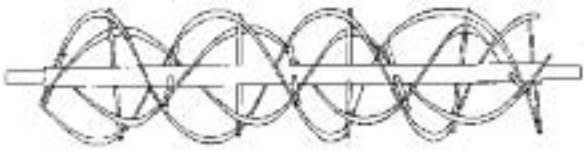
CONE SCREW to withdraw material evenly from a hopper or bin. Constant pitch reduces bridging. Requires less start-up horsepower.



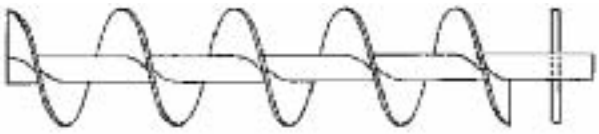
DOUBLE FLIGHT CONVEYOR SCREWS of regular pitch promote a smooth gentle flow and discharge of certain materials. Double flight can be used at hanger points only, for smooth flow past hangers.



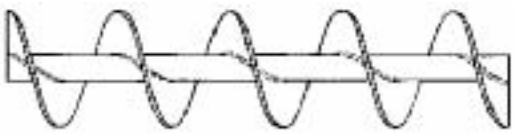
DOUBLE FLIGHT SHORT PITCH CONVEYOR SCREWS assure more accurate regulation of feed and flow in screw feeders and effectively deter flushing action of fluid materials.



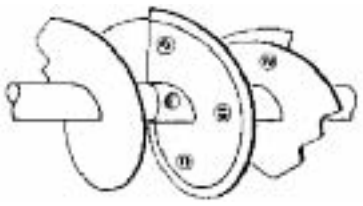
MULTIPLE RIBBON FLIGHT CONVEYOR SCREWS. This type of screw consists of two or more ribbon flights of different diameters and opposite hand, mounted one within the other on the same pipe or shaft by rigid supporting lugs. Material is moved forward by one flight and backward by the other, thereby inducing positive and thorough mixing. (Made per customer specifications.)



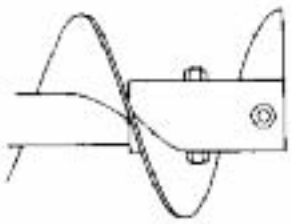
BREAKER PINS. The breaker pin is a rod approximately the same in length as the diameter of the conveyor screw and is inserted through the diameter of the pipe over the discharge to help break up lump materials.



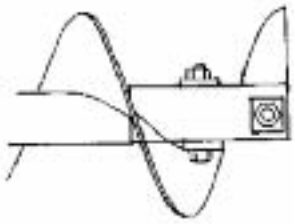
CONTINUOUS WELDING of the conveyor screw flight to the pipe can be furnished with welding one side or both sides. This welding is added to prevent stripping of flight from the pipe under extreme loads. The continuous welding can also be added to fill the slight crack between the flight and pipe for sanitary purposes.



BEARING SHOES (Nylon, Teflon, Brass, and other bearing type materials.) Bearing shoes are used in place of internal bearings and are bolted to the conveyor screw. They are made from bearing type material, and when attached to the conveyor screw flight, the bearing shoe projects beyond the outer edge of flighting and rotates with the screw thereby preventing metal to metal contact between the conveyor screw and the trough. The bearing shoes extend around the helix slightly more than one pitch and are spaced along the screw at approximately the same intervals as internal bearings.

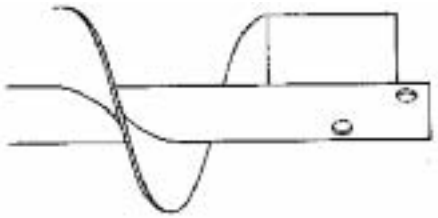


External Sleeves

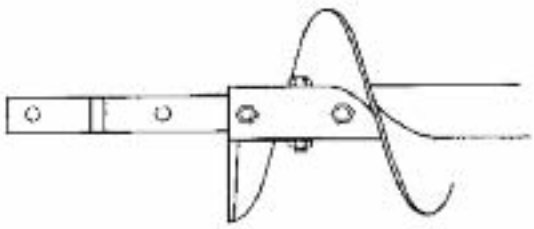


Bolt Pads

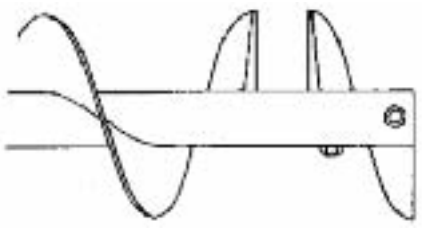
EXTERNAL SLEEVES OR BOLT PADS are added to the outside diameter of conveyor screw pipe at the end where the couplings are attached to reinforce the pipe at the bolt area.



KICKER BARS are flat bars projecting from the conveyor screw pipe extending to the outside diameter of the screw over the discharge spout and are used to assist the discharge of materials.



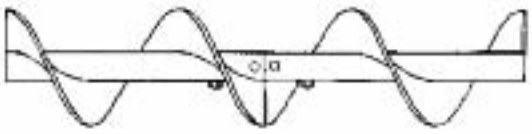
MULTIPLE HOLE DRILLING of the conveyor screw pipe and shafts will increase the torque rating of the bolted sections.



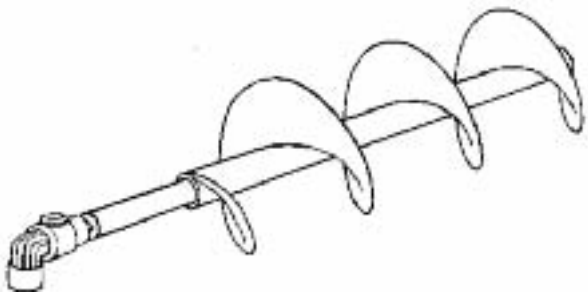
OPPOSITE HAND FLIGHTS are short sections (approximately one-half pitch) of flight added to the conveyor screw beyond the discharge point and are the opposite hand of the rest of the screw. This flight opposes the flow of material that tends to carry past the discharge spout and pack at the end plate and forces the material back to the spout for discharge.

ODD DIAMETER CONVEYOR SCREW is of conventional construction except oversize or undersize in diameter. This type conveyor screw is used to provide a close clearance or wide clearance between the screw and trough and enable the use of standard component parts.

END DISC ON CONVEYOR SCREW. This disc is welded flush with the end of the conveyor screw pipe and is the same diameter as the screw. It rotates with the conveyor screw and assists in relieving the thrust of the conveyed material against the end plate shaft seal.



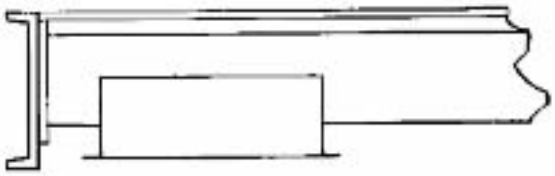
CLOSE COUPLED CONVEYOR SCREW. This type screw forms a continuous helix when two or more conveyor screws are close coupled by drilling the shaft of each to align the connecting flight.



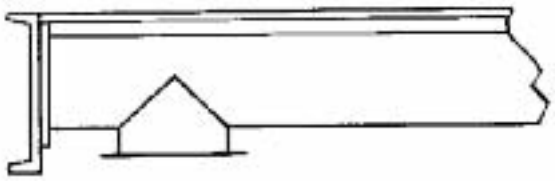
ROTARY JOINTS FOR COOLING AND HEATING are attached to one or both end shafts to provide a flow of heating or cooling media through the conveyor screw pipe.

Discharges

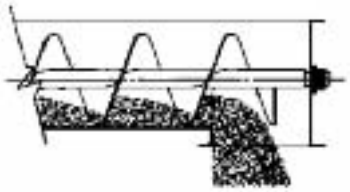
ANGULAR DISCHARGES can be furnished when necessary for certain applications. This type discharge is normally used on inclined conveyors when it is necessary that the discharge be parallel to ground level, or at other times when material must be discharged to one side.



LONGER THAN STANDARD DISCHARGE SPOUTS are approximately one and one-half times the length of the standard discharge spouts. This discharge is used with materials hard to discharge due to the material trying to convey past the discharge opening. This discharge is also used when operating high speed conveyors.

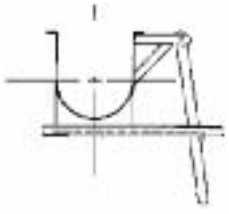


ROUND DISCHARGE SPOUTS are furnished where required for attaching tubular attachments, or when one conveyor discharges into another conveyor at an angle other than a right angle. By using a round discharge and round inlet the connection is easily made.

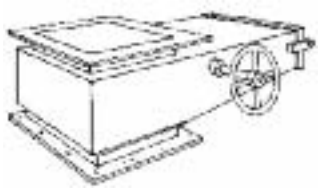


FLUSH END DISCHARGE SPOUTS are furnished with a special trough end plate constructed on trough end side of the spout. This type spout offers a complete discharge without a ledge at the end plate for material build up. It is used primarily in handling food products, where infestation may occur.

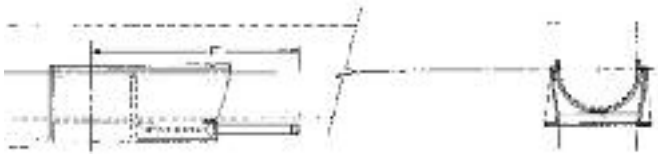
AIR OPERATED FLAT SLIDE GATES are similar in action and purpose to rack and pinion gates. The gate movement is accomplished by an air cylinder. These gates are usually employed when remote control and automatic operation is desired.



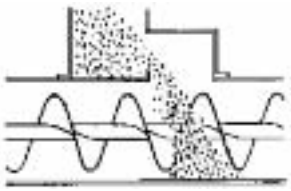
LEVER OPERATED GATES are a modification of standard slide discharges with a lever attached for opening and closing the gates. This attachment provides a leverage for ease of operation and a convenient means for quick opening and closing.



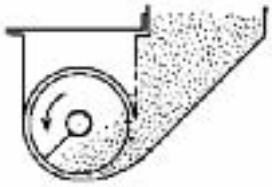
ENCLOSED DUST-TIGHT OR WEATHER-PROOF rack and pinion discharge spouts can be furnished in either flat or curved slide and are similar in construction to conventional rack and pinion slide gates except that the slide, rack, and pinion are fully enclosed in a housing.



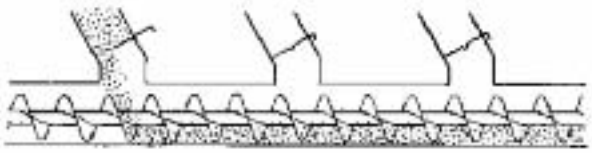
AIR OPERATED CURVED SLIDE GATES are similar to standard rack and pinion gates except they are operated with an air cylinder. The air operated gate is usually used for remote control and automatic operation. These gates can also be furnished in dust-tight or weather-proof construction with the cylinder and gate fully enclosed in the housing.



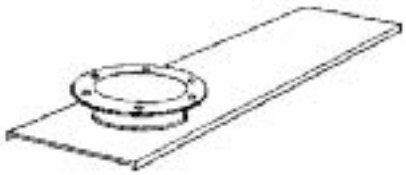
CUSHION CHAMBER INLETS (DEAD BED INLETS) serve the same purpose as the deflector plate inlet, but are constructed with a ledge that forms a cushion for materials fed into the conveyor.



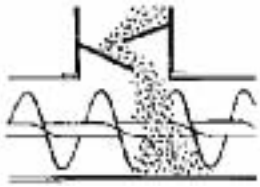
SIDE INLETS are equipped with a gate to furnish a means of regulating or stopping the inlet flow to relieve the conveyor screw from excessive material pressures. When using the side inlet, the screw rotation should be toward the inlet opening to assure a constant flow rate.



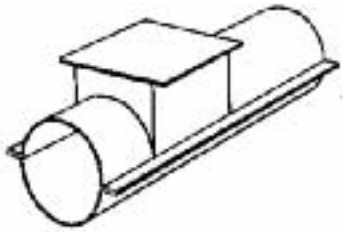
HAND SLIDE INLET GATES are normally used when multiple inlets are required. These inlets must be adjusted or closed manually to assure proper feed to the conveyor.



ROUND INLET SPOUTS are used for tubular attachments or when connecting the discharge of one conveyor to the inlet of another at other than a right angle. This type connection is easily made with round discharges and inlets.



DEFLECTOR PLATE INLETS are used when materials fall vertically into the inlet creating the possibility of impact damage or abrasion to the conveyor screw. The rectangular inlet is equipped with deflector plates, or baffles, that dampen the impact of the material in order to feed the conveyor more gently.



HANGER POCKETS are used with tubular trough, mounted on top of the tubular trough at hanger bearing points. The hanger pocket forms a U-shape section for a short length, allowing the use of standard conveyor hangers and providing easy access to the hanger.

Installation & Maintenance

INSTALLATION AND MAINTENANCE SECTION V

SECTION V
General

All standard screw conveyor components are manufactured in conformity with Industry Standards. Special components are usually designed and manufactured to the particular job specifications.

Screw conveyors may be ordered either as complete units or by individual components. Complete units are normally shop assembled and then match marked and disassembled for shipment and field re-assembly. When components only are ordered, shipment is made as ordered, and these components must be sorted out and aligned in field assembly.

Because shop assembled screw conveyors are pre-aligned and match marked at the factory, they are easier to assemble in the field and require the minimum installation time. When individual components are ordered, more careful alignment and assembly are required. More time is required for field installation. Assembly bolts are not included with parts orders but are included with pre-assembled units.

Caution: All Martin Conveyors must be assembled and maintained in accordance with this section. Failure to follow these instructions may result in serious personal injury or property damage.

Installation

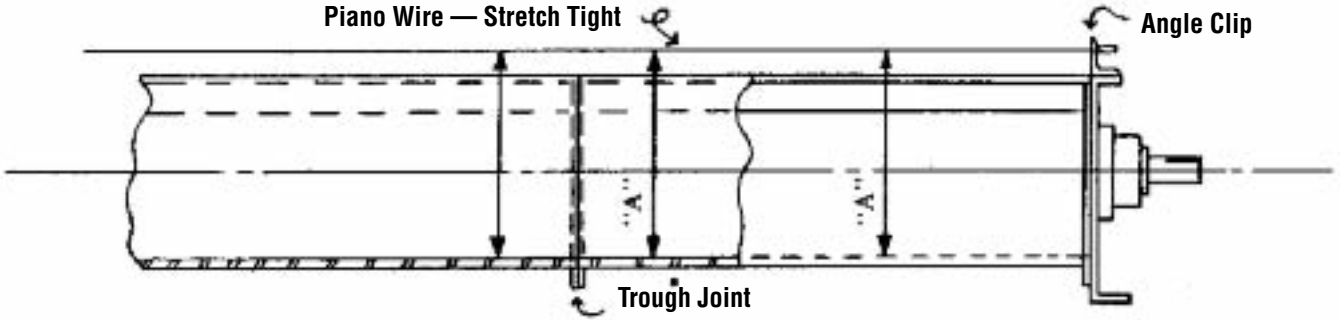
Receiving

Check all assemblies or parts with shipping papers and inspect for damage. Specifically check for dented or bent trough, bent flanges, bent flighting, bent pipe or hangers or damaged bearings. If any components are severely damaged in shipment, claims should be filed immediately with the carrier. NOTE: Handle Carefully! Fork lifts should have spreader bars to lift max. 24' lengths of assembled conveyors. Lift points should not exceed 10 - 12 feet.

Erection

For shop assembled conveyors, units are match marked and shipped in longest sections practical for shipment. Field assembly can be accomplished by connecting match marked joints, and in accordance with packing list, and/or drawing if applicable. In field erection, the mounting surfaces for supporting the conveyor must be level and true so there is no distortion in the conveyor. Shims or grout should be used when required. Check for straightness as assembly is made.

For conveyor assemblies purchased as parts or merchandise, assemble as follows: Place conveyor troughs in proper sequence with inlet and discharge spout properly located. Connect the trough flanges loosely. Do not tighten bolts. Align the trough bottom center-lines perfectly using piano wire (or equivalent) then tighten flange bolts. Tighten all anchor bolts.



Assembly of conveyor screws should always begin at the thrust end. If the unit does not require a thrust unit, assembly should begin at the drive end. If a thrust end is designated, assemble trough end and thrust bearing. Insert the end, or drive shaft, in the end bearing. Do not tighten set screws until conveyor assembly is completed.

Place the first screw section in the trough, slipping the end, or drive shaft, into the pipe end. Secure tightly with coupling bolts. Install so that conveyor end lugs are opposite the carrying side of the flight.

Place a coupling shaft into the opposite end of conveyor pipe. Tighten coupling bolts.

Insert coupling shaft into hanger bearing and clamp hanger to trough.

Assemble alternately, conveyor screws, couplings and hangers until all screws are installed.

1) **With Hangers:** Assemble screw section so that flighting at each end is approximately 180° from ends of flighting of adjacent sections. Also, adjust conveyor screw and thrust unit so that hangers are equally spaced between adjacent screws.
2) **Without Hangers:** (close coupled) Assemble screws so that flighting at adjoining ends of screw sections align to produce a continuous helix surface. (Note coupling holes have been drilled in assembly to allow for flight alignment.)

Remove hanger clamps and bolt hanger to trough with the bearing centered between conveyor screws.

Install trough covers in proper sequence. Properly locate inlet openings. Handle covers with reasonable care to avoid warping or bending.

Attach covers to trough with fasteners provided.

Install drive at proper location and in accordance with separate instructions or drawing provided.

Check screw rotation for proper direction of material travel after electrical connections have been made but before attempting to handle material. Incorrect screw rotation can result in serious damage to the conveyor and to related conveying and drive equipment.

If necessary, reconnect electrical leads to reverse rotation of conveyor and direction of material flow.

Operation

Lubricate all bearings and drives per service instructions. Gear reducers are normally shipped without lubricant. Refer to service instructions for lubrication.

In start-up of the conveyor, operate several hours empty as a break in period. Observe for bearing heat up, unusual noises or drive misalignment. Should any of these occur, check the following and take necessary corrective steps. (Non-lubricated hanger bearings may cause some noise.)

1) When anti-friction bearings are used, check for proper lubrication. Insufficient or excess lubricant will cause high operating temperatures.
2) Misalignment of trough ends, screws, hangers and trough end can cause excessive maintenance and poor life expectancy.
3) Check assembly and mounting bolts; tighten if necessary.

Do not overload conveyor. Do not exceed conveyor speed, capacity, material density or rate of flow for which the conveyor and drive were designed.

If the conveyor is to be inoperative for a prolonged period of time, operate conveyor until cleared of all material. This is particularly important when the material conveyed tends to harden or become more viscous or sticky if allowed to stand for a period of time.

It may be necessary to recenter hanger bearings after running material in conveyor.

Maintenance

Practice good housekeeping. Keep the area around the conveyor and drive clean and free of obstacles to provide easy access and to avoid interference with the function of the conveyor and drive.

Establish routine periodic inspections of the entire conveyor to ensure continuous maximum operating performance.

To replace conveyor screw section, proceed as follows:

1) Removal of a section, or sections, usually must proceed from the end opposite the drive. Make sure drive and electrical power are disconnected before starting to disassemble.
2) Remove the trough end, sections of screws, coupling shafts and hangers until all sections have been removed or until the damaged or worn section is reached and removed.
3) To reassemble follow the above steps in reverse order.
4) Quick detachable conveyor screws can be removed at intermediate locations without first removing adjacent sections.

Replacement parts can be identified from a copy of the original packing list or invoice.

The coupling bolt contains a lock nut that may become damaged when removed. It is recommended practice to replace them rather than re-use them when changing conveyor screw sections.

Hazardous Operations

Screw conveyors are not normally manufactured or designed to operate handling hazardous materials or in a hazardous environment.

Hazardous materials can be those that are explosive, flammable, toxic or otherwise dangerous to personnel if they are not completely and thoroughly contained in the conveyor housing. Special construction of screw and conveyor housing with gaskets and special bolted covers can sometimes be used for handling this type of material.

Special conveyors are not made or designed to comply with local, state or federal codes for unfired pressure vessels.

Warning & Safety Reminder

WARNING AND SAFETY REMINDERS FOR SCREW , DRAG , AND BUCKET ELEVATOR CONVEYORS

APPROVED FOR DISTRIBUTION BY THE SCREW CONVEYOR SECTION OF THE CONVEYOR EQUIPMENT MANUFACTURERS ASSOCIATION (CEMA)

It is the responsibility of the contractor, installer, owner and user to install, maintain and operate the conveyor, components and, conveyor assemblies in such a manner as to comply with the Williams-Steiger Occupational Safety and Health Act and with all state and local laws and ordinances and the American National Standards Institute (ANSI) B20.1 Safety Code.

In order to avoid an unsafe or hazardous condition, the assemblies or parts must be installed and operated in accordance with the following minimum provisions.

1. Conveyors shall not be operated unless all covers and/or guards for the conveyor and drive unit are in place. If the conveyor is to be opened for inspection cleaning, maintenance or observation, the electric power to the motor driving the conveyor must be LOCKED OUT in such a manner that the conveyor cannot be restarted by anyone; however remote from the area, until conveyor cover or guards and drive guards have been properly replaced.

2. If the conveyor must have an open housing as a condition of its use and application, the entire conveyor is then to be guarded by a railing or fence in accordance with ANSI standard B20.1.(Request current edition and addenda)

3. Feed openings for shovel, front loaders or other manual or mechanical equipment shall be constructed in such a way that the conveyor opening is covered by a grating. If the nature of the material is such that a grating cannot be used, then the exposed section of the conveyor is to be guarded by a railing or fence and there shall be a warning sign posted.

4. Do not attempt any maintenance or repairs of the conveyor until power has been LOCKED OUT.

5. Always operate conveyor in accordance with these instructions and those contained on the caution labels affixed to the equipment.

6. Do not place hands, feet, or any part of your body, in the conveyor.

7. Never walk on conveyor covers, grating or guards.

8. Do not use conveyor for any purpose other than that for which it was intended.

9. Do not poke or prod material into the conveyor with a bar or stick inserted through the openings.

10. Keep area around conveyor drive and control station free of debris and obstacles.

11. Eliminate all sources of stored energy (materials or devices that could cause conveyor components to move without power applied) before opening the conveyor.

12. Do not attempt to clear a jammed conveyor until power has been LOCKED OUT.

13. Do not attempt field modification of conveyor or components.

14. Conveyors are not normally manufactured or designed to handle materials that are hazardous to personnel. These materials which are hazardous include those that are explosive, flammable, toxic or otherwise dangerous to personnel. Conveyors may be designed to handle these materials. Conveyors are not manufactured or designed to comply with local, state or federal codes for unfired pressure vessels. If hazardous materials are to be conveyed or if the conveyor is to be subjected to internal or external pressure, manufacturer should be consulted prior to any modifications.

CEMA insists that disconnecting and locking out the power to the motor driving the unit provides the only real protection against injury. Secondary safety devices are available; however, the decision as to their need and the type required must be made by the owner-assembler as we have no information regarding plant wiring, plant environment, the interlocking of the screw conveyor with other equipment, extent of plant automation, etc. Other devices should not be used as a substitute for locking out the power prior to removing guards or covers. We caution that use of the secondary devices may cause employees to develop a false sense of security and fail to lock out power before removing covers or guards. This could result in a serious injury should the secondary device fail or malfunction.

There are many kinds of electrical devices for interlocking of conveyors and conveyor systems such that if one conveyor in a system or process is stopped other equipment feeding it, or following it can also be automatically stopped.

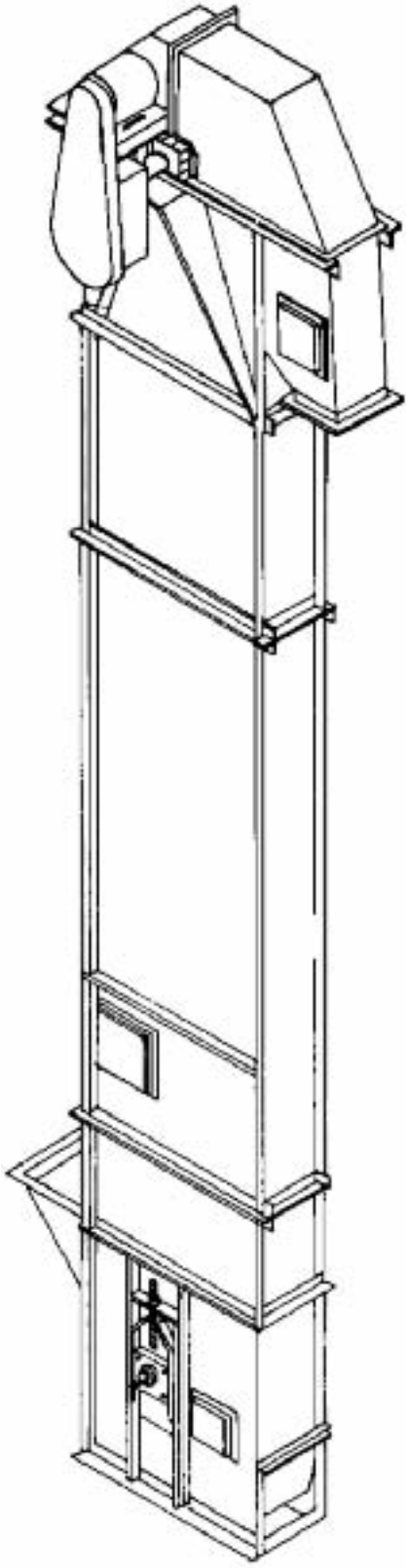
Electrical controls, machinery guards, railings, walkways, arrangement of installation, training of personnel, etc., are necessary ingredients for a safe working place. It is the responsibility of the contractor, installer, owner and user to supplement the materials and services furnished with these necessary items to make the conveyor installation comply with the law and accepted standards.

Conveyor inlet and discharge openings are designed to connect to other equipment or machinery so that the flow of material into and out of the conveyor is completely enclosed.

One or more warning labels should be visible on conveyor housings, conveyor covers and elevator housings. If the labels attached to the equipment become illegible, please order replacement warning labels from the OEM or CEMA.

The Conveyor Equipment Manufacturers Association (CEMA) has produced an audio-visual presentation entitled “Safe Operation of Screw Conveyors, Drag Conveyors, and Bucket Elevators.” CEMA encourages acquisition and use of this source of safety information to supplement your safety program.

PROMINENTLY DISPLAY THESE SAFETY LABELS ON INSTALLED EQUIPMENT



SECTION VI

Click on the page number to go to the section

BUCKET ELEVATORS SECTION VI

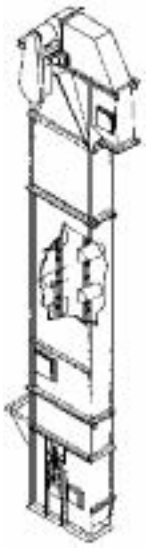
Introduction

Martin designs and manufactures various types of bucket elevators to efficiently handle most varieties of dry, free-flowing bulk materials. High design standards, quality manufacturing, the best possible service through many branch locations and an excellent distributor network assure many years of economical, trouble-free service.

This catalog is designed to make a preliminary selection of a bucket elevator. It shows the variety of elevators manufactured by Martin. Contact your local Martin Service Center or Martin distributor for a recommendation.

Types

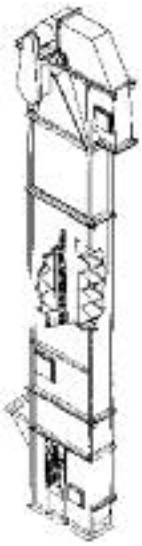
Centrifugal Discharge



Centrifugal discharge type elevators are offered as: Series 100 (boot take up) and Series 200 (head take up). Either series is available with buckets mounted on chain or belt and will handle free-flowing materials with small to medium size lumps. The standard inlet chute and standard curved bottom plate direct the material into the buckets and reduce the "digging" action. The speed of the elevator is sufficient to discharge the material by centrifugal force.

Many types of drives and elevator materials of construction are available.

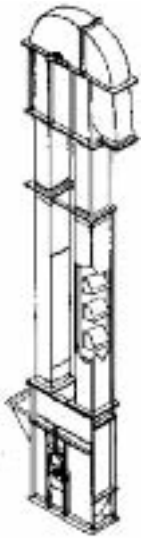
Continuous Discharge



Continuous discharge elevators are offered as: Series 700 (boot take up) and Series 800 (head take up). Either series is available with buckets mounted on chain or belt and will handle free-flowing material, sluggish material or materials that are abrasive. The closely spaced fabricated buckets, with extended sides, form a "chute" to direct material into the bucket. At the discharge, the bucket configuration allows the material to discharge by gravity over the back of the proceeding bucket.

Various materials of construction and thicknesses are available.

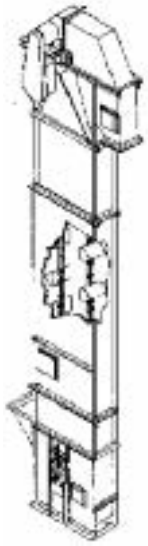
High-Speed Centrifugal Grain



Series 500 (double leg) and Series 400 (single leg) high-speed centrifugal discharge bucket elevators are specially designed to economically handle grain and other free-flowing materials. These elevators are *not* self-supporting; therefore, intermediate supports must be provided by others.

Although the charts in this catalog are based on one type of bucket, many other styles are available. For specific recommendations contact your local Martin Service Center or Martin Conveyor Division distributor for a recommendation.

Centrifugal Discharge - Mill Duty

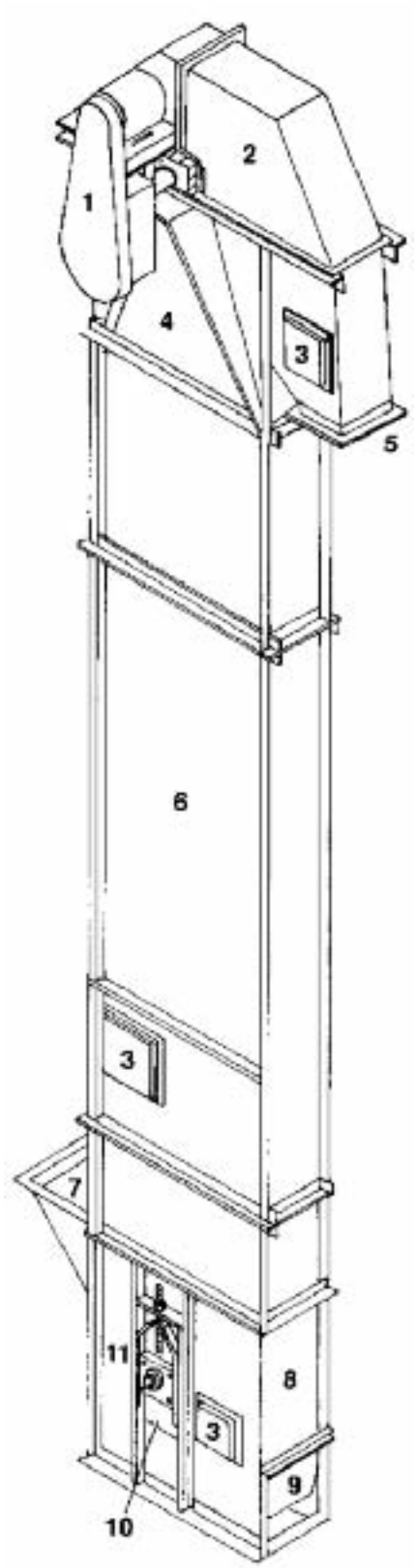


Centrifugal Mill Duty type elevators are offered with style "AC" centrifugal discharge buckets mounted on a single strand of chain, or on a belt. Chain units have a single row of buckets mounted on a single strand of chain. Belt type units may have a single or double row of buckets bolted to heavy duty rubber covered belting. Product is centrifugally discharged as material passes over the head wheel or pulley. A head mounted traction wheel is utilized in the chain type units, where practical. Lagged pulleys are standard for belt type units. Housing construction is heavy duty for severe service.

Continuous Discharge - Super Capacity

Continuous Discharge Super Capacity type elevators are offered with style "SC" continuous discharge buckets mounted between two strands of chain. These units are used where higher capacities, severe duty, or higher shaft centers are required. Housing construction is heavy duty for severe service.

Standard Features
Series 100 and Series 700



1. Shaft Mount Type Drive	Furnished as standard. Other types available. Backstops are required to prevent reverse rotation. Various types are available.
2. Split Hood	14 gauge
3. Inspection Door	Near side
4. Head Section	Fabricated of 12 gauge steel with bearing pedestal structurally reinforced
5. Discharge Spout (Style 1 shown)	Fabricated of 10 gauge plate steel with externally adjustable 4-ply belting throat lip (not shown). Style 2 (45°) available. Wear liners available.
6. Intermediate Section	Fixture welded 12 gauge casing continuously welded for dust tight construction. Sides are cross crimped for additional stiffness. Vertical corner angles are full length.
7. Inlet	Fabricated of 3/16 inch thick plate steel
8. Clean Out Door	Bolted for easy removal
9. Curved Bottom Plate	Reduces build-up in boot
10. Take-Up Ball Bearing Screw Type	For positive take-up tension. Available with roller bearings. Internal gravity type also available.
11. Boot	Fabricated of 3/16 inch thick plate steel.

Elevator Number 100 thru 800 Series

Example — B43-139

Mounting	Bucket Size	Series	Unit No.
B	43	1	39
B = Belt C = Chain	43 = 4 × 3 64 = 6 × 4 85 = 8 × 5 106 = 10 × 6 Etc.	1 = 100 2 = 200 5 = 500 7 = 700 8 = 800	Unit 39

B43-139 is a belt (B) elevator with 4″ × 3″ (43) buckets, centrifugal discharge type with boot take up (Series 100), Unit 39. Specifications may be found on pages H-129.

Elevator Selection

General

To properly select a bucket elevator, the following factors must be determined:

1. **Volumetric Capacity** — in cubic feet per hour. Bucket elevators must be uniformly and continuously fed. The volumetric capacity used for selection must be the maximum the elevator will experience. Use Table 1-1 for conversions if necessary.
2. **Centers or Lift** — in feet
3. **Lump Size and Lump Class** — Lump size is the largest particle dimension, and lump class is the percentage these lumps represent of the whole.
4. **Material Characteristics** — See Material Classification Code Chart.
5. **Operating Conditions** — Conditions affecting operation include location (indoors, outdoors), number of hours per day operation, etc.

TABLE 1-1

To convert	To cubic feet per hour (CF or FT^3/HR)
Tons per hour (short) TPH	$CFH = \frac{TPH \times 2000}{\text{Density (in pounds per cubic foot; PCF or LBS/FT}^3\text{)}}$
Pounds per hour Lbs/hour	$CFH = \frac{\text{Pounds per hour}}{\text{Density (in pounds per cubic foot; PCF or LBS/FT}^3\text{)}}$
Bushels per hour BPH	$CFH = BPH \times 1.24$

Procedure

The following steps should be followed to select an elevator:

1. **Determine proper elevator series** — See material table for recommendation.
2. **Select Elevator Number** — For the series selected, refer to the Capacity chart, and select an elevator number for which the capacity in cubic feet per hour listed equals or exceeds the required volumetric capacity. If the required volumetric capacity of centers exceed those listed, contact the Martin for a recommendation.
3. **Check Lump Size/Lump Class** — Check actual lump size/lump class against that listed for the elevator number selected. If the actual lump size/lump class is larger than that listed, choose a larger elevator where the actual is equal to or less than that listed.
4. **Determine Horsepower Requirements** — Consult Martin.
5. **List Specifications** — Refer to capacity, horsepower and dimension charts for the elevator number selected. List the specifications for the preliminary selection of the elevator.

Contact your local Martin Service Center or Martin, distributor for a recommendation.

Material Classification Code Chart

Major Class	Material Characteristics Included		Code Description
Density	**Bulk Density, Loose**		**Actual Lbs/CF**
Size	Very Fine	No. 200 Sieve (.0029″) and Under	A_{200}
		No. 100 Sieve (.0059″) and Under	A_{100}
		No. 40 Sieve (.016″) and Under	A_{40}
	Fine	No. 6 Sieve (.132″) and Under	B_6
	Granular	½″ and Under (6 Sieve to ½″)	$C_{1/2}$
		3″ and Under (½ to 3″)	D_3
		7″ and Under (3″ to 7″)	D_7
	Lumpy	16″ and Under (0″ to 16″)	D_{16}
		Over 16″ To Be Specified X = Actual Maximum Size	D_X
	Irregular	Stringy, Fibrous, Cylindrical, Slabs, Etc.	E
Flowability	Very Free Flowing		1
	Free Flowing		2
	Average Flowability		3
	Sluggish		4
Abrasiveness	Mildly Abrasive		5
	Moderately Abrasive		6
	Extremely Abrasive		7
Miscellaneous Properties or Hazards	Builds Up and Hardens		F
	Generates Static Electricity		G
	Decomposes — Deteriorates in Storage		H
	Flammability		J
	Becomes Plastic or Tends to Soften		K
	Very Dusty		L
	Aerates and Becomes a Fluid		M
	Explosiveness		N
	Stickiness — Adhesion		O
	Contaminable, Affecting Use		P
	Degradable, Affecting Use		Q
	Gives Off Harmful or Toxic Gas or Fumes		R
	Highly Corrosive		S
	Mildly Corrosive		T
	Hygroscopic		U
	Interlocks, Mats or Agglomerates		V
	Oils Present		W
	Very Light and Fluffy — May Be Windswept		Y
	Elevated Temperature		Z

Materials Table

Material	Density LBS/FT³	Material Code	Recommended Elevator Series*
Alfalfa Meal	14-22	B6-45WY	F, H
Almonds, Broken	27-30	C½-35Q	C, F, H
Almonds, Whole Shelled	28-30	C½-35Q	F
Alum, Fine	45-50	B6-35U	A, F
Alum, Lumpy	50-60	B6-25	A, F
Alumina	55-65	B6-27MY	G
Aluminum Chips, Dry	7-15	E-45V	F
Aluminum Oxide	60-120	A100-17M	F
Ashes, Coal, Dry — 3″	35-40	D3-46T	C
Asphalt, Crushed — ½″	45	C½-45	A, C, F
Bakelite, Fine	30-45	B6-25	F
Baking Powder	40-55	A100-35	F
Bauxite, Crushed — 3″	75-85	D3-36	A, C, F
Beans, Castor, Whole Shelled	36	C½-15W	A, C, F, H
Beans, Navy, Dry	48	C½-15	A, C, F, H
Bentonite, Crude	34-40	D3-45X	A, C
Bentonite — 100 Mesh	50-60	A100-25MXY	A, C
Boneblack	20-25	A100-25Y	F
Bonemeal	50-60	B6-35	A, C
Bones, Crushed	35-50	D3-45	A, C, F, H
Bones, Ground	50	B6-35	A, C, F, H
Borax, Fine	45-55	B6-25T	A, C
Bran, Rice-Rye-Wheat	16-20	B6-35NY	A, C
Brewer's Grain, spent, dry	14-30	C½-45	A, C
Brewer's Grain, spent, wet	55-60	C½-45T	A, C
Buckwheat	37-42	B6-25N	E
Calcium Oxide (See Lime, unslaked)	—	—	—
Cast Iron, Chips	130-200	C½-45	F
Cement, Clinker	75-95	D3-36	A, F
Cement, Portland	94	A100-26M	A, F
Chalk, Crushed	75-95	D3-25	A, F
Chalk, Pulverized	67-75	A100-25MXY	A, F
Charcoal, Lumps	18-28	D3-45Q	F
Cinders, Coal	40	D3-36T	A, F
Clay, Brick, Dry, Fines	100-120	C½-36	B
Coal, Anthracite, Sized — ½″	49-61	C½-25	A, F
Coal, Bituminous, Mined, Slack	43-50	C½-45T	A, F
Coffee, Green Bean	25-32	C½-25PQ	A, F
Coffee, Roasted Bean	20-30	C½-25PQ	A, F
Coke, Breeze	25-35	C½-37	B, D
Coke, Loose	23-35	D7-37	D
Coke, Petrol, Calcined	35-45	D7-37	D
Copra, Cake, Ground	40-45	B6-45HW	A, C, F, G
Copra, Cake, Lumpy	25-30	D3-35HW	A, C, F
Copra, Lumpy	22	E-35HW	A, C, F
Copra, Meal	40-45	B6-35HW	A, C, F, G
Cork, Granulated	12-15	C½-35JY	F, H
Corn, Cracked	40-50	B6-25P	F, H
Corn Germ	21	B6-35PY	A, C
Corn Grits	40-45	B6-35P	A, C
Cornmeal	32-40	B6-35P	A, C
Corn Shelled	45	C½-25	E
Corn Sugar	30-35	B6-35PU	A, C
Cottonseed, Cake, Lumpy	40-45	D7-45HW	A, C
Cottonseed, Dry, Delinted	22-40	C½-25X	B, D
Cottonseed, Dry, Not Delinted	18-25	C½-45XY	B, D
Cottonseed, Hulls	12	B6-35Y	F, G
Cottonseed, Meal, Extracted	35-40	B6-45HW	A, C
Cottonseed, Meats, Dry	40	B6-35HW	A, C
Distiller's Grain, Spent Dry	30	B6-35	A, C
Dolomite, Crushed	80-100	C½-36	A, F
Ebonite, Crushed	63-70	C½-35	F
Feldspar, Ground	65-80	A100-37	A, C, F,

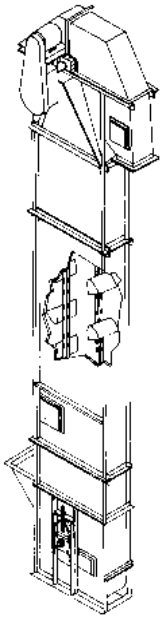
Material	Density LBS/FT³	Material Code	Recommended Elevator Series*
Feldspar, Powder	100	A200-36	F, H
Flaxseed	43-45	B6-35X	E
Flaxseed Cake (Linseed Cake)	48-50	D7-45W	C
Flaxseed Meal (Linseed Meal)	25-45	B6-45W	A, C
Fuller's Earth, Dry, Raw	30-40	A40-25	B, D
Fuller's Earth, Oily, Spent	60-65	C½-450W	B, D
Glass, Batch	80-100	C½-37	B, D
Granite, Fine	80-90	C½-27	F
Gypsum, Calcined	55-60	B6-35U	A, C, F, H
Gypsum, Calcined, Powdered	60-80	A100-35U	A, F
Gypsum, Raw — 1″	70-80	D3-25	F
Hops, Spent, Dry	35	D3-35	A, C
Hops, Spent, Wet	50-55	D3-45V	A, C
Ice, Crushed	35-45	D3-35Q	A, F
Ilmenite Ore	140-160	D3-37	A, C, F, G
Lime, Ground, Unslaked	60-65	B6-35U	A, C, F, G
Lime, Hydrated	40	B6-35LM	F
Lime, Pebble	53-56	C½-25HU	A, F
Limestone, Agricultural	68	B6-35	A, C, F, H
Limestone, Crushed	85-90	DX-36	F, H
Malt, Dry, Ground	20-30	B6-35NP	A, C
Malt, Meal	36-40	B6-25P	A, C
Malt, Dry Whole	20-30	C½-35N	A, C
Marble, Crushed	80-95	B6-37	F
Milk, Malted	27-30	A40-45PX	A
Oats	26	C½-25MN	E
Oats, Rolled	19-24	C½-35NY	A, C
Oxalic Acid Crystals — Ethane Diacid Crystals	60	B6-35QS	B, D
Phosphate Rock, Broken	75-85	DX-36	A, C, F, H
Phosphate Rock, Pulverized	60	B6-36	A, C, F, H
Potash (Muriate) Dry	70	B6-37	A, C, F
Pumice — ⅛″	42-48	B6-46	F
Rice, Bran	20	B6-35NY	E
Rice, Grits	42-45	B6-35P	A, C
Rice, Hulled	45-49	C½-25P	E
Rye	42-48	B6-15N	E
Salt Cake, Dry Coarse	85	B6-36TU	A, C, F, H
Salt, Dry Fine	70-80	B6-36TU	F, H
Sand Dry Bank (Damp)	110-130	B6-47	B, G
Sand Dry Bank (Dry)	90-110	B6-37	B, G
Sand Foundry (Shake Out)	90-100	D3-37Z	B, G
Shale, Crushed	85-90	C½-36	B, H
Slag, Blast Furnace Crushed	130-180	D3-37Y	F
Slate, Crushed — ½″	80-90	C½-36	F
Soda Ash, Heavy	55-65	B6-36	A, C
Soda Ash, Light	20-35	A40-36Y	F, H
Sodium Phosphate	50-60	A-35	A, F
Soybean, Cake	40-43	D3-35W	C
Soybean, Cracked	30-40	C½-36NW	A
Soybean, Flake, Raw	18-25	C½-35Y	A, C
Soybean, Flour	27-30	A40-35Mn	B, D
Soybean Meal, Cold	40	B6-35	A, C
Soybean Meal, Hot	40	B6-35T	A, C
Soybeans, Whole	45-50	C½-26NW	E
Sugar Beet, Pulp, Dry	12-15	C½-26	F, H
Sugar Beet, Pulp, Wet	25-45	C½-35X	F, H
Sugar, Raw	55-65	B6-35PX	A, C
Trisodium Phosphate, Granular	60	B6-36	A, F
Wheat	45-48	C½-25N	E
Wheat, Cracked	40-45	B6-25N	A, C
Wheat, Germ	18, 28	B6-25	A, C
Wood Chips, Screened	10-30	D3-45VY	B, D

***Elevator Series Designation**

A = Series 100 Chain
B = Series 100 Belt
C = Series 200 Chain
D = Series 200 Belt
E = Series 500 Belt
F = Series 700 Chain
G = Series 700 Belt
H = Series 800 Chain

Centrifugal Discharge Chain

Series 100 Chain (Series 200 is for Head Take-up)



Centrifugal discharge chain type elevators handle a variety of relatively free-flowing dry materials with small to medium lump sizes that are mildly to moderately abrasive.

Buckets

Capacities and horsepower listed are for style “AA” buckets. Style “A”, “AA-RB” and “Salem” can be furnished. Style “C” may also be used to handle wet or sticky materials. Consult the factory for a specific recommendation.

Chain

Centrifugal discharge chain type elevators are furnished with either combination chain for light to medium service or all steel (steel knuckle) chain for medium to severe service or when a higher chain working load is required.

#100 Chain Centrifugal Discharge Bucket Elevator

ELEVATOR	CAPACITY	BUCKETS				CHAIN			MAX. LUMP SIZE		NOM. CASING SIZE		HEAD SPROCKET			BOOT SPROCKET		
Number	Max. C.F.H.	Width	Proj.	Depth	Spacing	No.	Pitch	F.P.M.	100%	10%	Width	Depth	Number Teeth	Pitch Dia.	RPM	Number Te.eth	Pitch Diameter	Shaft Diameter
C43-101	73	4	2 3/4	3	9.25	977	2.308	125	1/2	1	8	18	10	7.50	63.7	10	7.50	1.5000
C64-102	280	6	4	4 1/4	13	C188	2.609	225	1/2	2 1/2	9 3/4	35	24	20.00	43	18	15.00	1.5000
C85-103	473	8	5	5 1/2	16	N102B	4.000	200	3/4	3	11 3/4	35	14	18.00	42.4	10	13.00	1.5000
C85-104	532	8	5	5 1/2	16	N102B	4.000	225	3/4	3	11 3/4	39	16	20.50	41.9	10	13.00	1.5000
C85-105	532	8	5	5 1/2	16	HSB102B	4.000	225	3/4	3	11 3/4	39	16	20.50	41.9	10	13.00	1.5000
C85-107	591	8	5	5 1/2	16	N102B	4.000	250	3/4	3	11 3/4	42	19	24.25	39.4	14	18.00	2.0000
C85-108	591	8	5	5 1/2	16	HSB102B	4.000	250	3/4	3	11 3/4	42	19	24.25	39.4	14	18.00	2.0000
C106-110	891	10	6	6 1/4	16	N102B	4.000	220	1	3 1/2	13 3/4	42	16	20.50	41	12	15.50	2.0000
C106-111	891	10	6	6 1/4	16	HSB102B	4.000	220	1	3 1/2	13 3/4	42	16	20.50	41	12	15.50	2.0000
C106-112	900	10	6	6 1/4	18	N110	6.000	250	1	3 1/2	13 3/4	48	13	25.00	38.2	11	21.25	2.0000
C106-113	900	10	6	6 1/4	18	HSB110	6.000	250	1	3 1/2	13 3/4	48	13	25.00	38.2	11	21.25	2.0000
C106-116	1013	10	6	6 1/4	16	N102B	4.000	250	1	3 1/2	13 3/4	48	19	24.25	39.4	16	20.50	2.0000
C127-117	1425	12	7	7 1/4	18	HSB110	6.000	250	1 1/4	4	15 3/4	48	13	25.00	38.2	9	17.50	2.0000
C127-120	1568	12	7	7 1/4	18	HSB110	6.000	275	1 1/4	4	15 3/4	54	16	30.75	34.2	12	23.25	2.4375
C147-123	1569	14	7	7 1/4	19	N111	4.760	240	1 1/4	4	17 3/4	48	16	24.50	37.4	12	18.25	2.4375
C127-119	1603	12	7	7 1/4	16	N102B	4.000	250	1 1/4	4	15 3/4	48	19	24.25	39.4	14	18.00	2.0000
C147-124	1656	14	7	7 1/4	18	HSB110	6.000	240	1 1/4	4	17 3/4	48	13	25.00	36.7	9	17.50	2.4375
C127-122	1763	12	7	7 1/4	16	N102B	4.000	275	1 1/4	4	15 3/4	54	24	30.50	34.4	19	24.25	2.4375
C147-127	1798	14	7	7 1/4	19	N111	4.760	275	1 1/4	4	17 3/4	54	20	30.50	34.4	16	24.25	2.4375
C147-126	1863	14	7	7 1/4	16	N102B	4.000	240	1 1/4	4	17 3/4	48	19	24.25	37.8	14	18.00	2.4375
C147-128	1898	14	7	7 1/4	18	HSB110	6.000	275	1 1/4	4	17 3/4	54	16	30.75	34.2	12	23.25	2.4375
C147-130	2135	14	7	7 1/4	16	N102B	4.000	275	1 1/4	4	17 3/4	54	24	30.50	34.4	19	24.25	2.4375
C168-131	2319	16	8	8 1/2	19	N111	4.760	240	1 1/2	4 1/2	19 3/4	48	16	24.50	37.4	11	17.00	2.4375
C168-132	2448	16	8	8 1/2	18	HSB110	6.000	240	1 1/2	4 1/2	19 3/4	48	12	23.00	39.9	9	17.50	2.4375
C168-133	2657	16	8	8 1/2	19	N111	4.760	275	1 1/2	4 1/2	19 3/4	54	20	30.50	34.4	14	21.25	2.4375
C168-134	2805	16	8	8 1/2	18	HSB110	6.000	275	1 1/2	4 1/2	19 3/4	54	16	30.75	34.2	11	21.25	2.4375
C188-136	2808	18	8	8 1/2	18	HSB110	6.000	240	1 1/2	4 1/2	21 3/4	48	12	23.00	39.9	9	17.50	2.4375
C188-138	3218	18	8	8 1/2	18	HSB110	6.000	275	1 1/2	4 1/2	21 3/4	54	16	30.75	34.2	11	21.25	2.4375
C208-140	3024	20	8	8 1/2	18	HSB110	6.000	240	1 1/2	4 1/2	23 3/4	48	12	23.00	39.9	9	17.50	2.4375
C208-142	3465	20	8	8 1/2	18	HSB110	6.000	275	1 1/2	4 1/2	23 3/4	54	16	30.75	34.2	11	21.25	2.4375
C248-146	4703	24	8	8 1/2	18	HSB833	6.000	275	1 1/2	4 1/2	28 3/4	54	16	30.75	34.2	11	21.25	2.437
C2410-150	6518	24	10	10 1/2	18	HSB833	6.000	275	2	4 1/2	30 3/4	60	16	30.75	34.2	11	21.25	2.4375

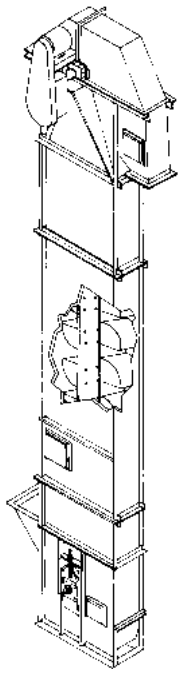
All Dimensions in inches.

Max. CFH capacity is at 75% bucket load.

Consult Martin for head shaft size and horsepower requirements.

Other chain may be substituted based on chain pull requirements.

Centrifugal Discharge Belt



Series 100 Belt (Series 200 is for Head Take-up)

Centrifugal discharge belt type elevators handle a variety of relatively free-flowing dry materials with small to medium lump sizes that are mildly, moderately or extremely abrasive.

Buckets

Capacities listed are for style “AA” buckets. Style “A”, “AA-RB” and “Salem” can be furnished. Style “C” may also be used to handle wet or sticky materials. Consult the factory for a specific recommendation.

Belt

Centrifugal discharge belt type elevators are furnished with 100% polyester carcass PVC belting or rubber covered ply belts specifically designed for elevator service. Many other types of belts and covers are available.

#100 Belt Centrifugal Discharge Bucket Elevator

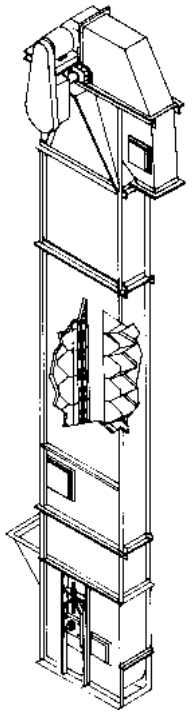
ELEVATOR	CAPACITY	BUCKETS				BELT		MAX. LUMP SIZE		NOM. CASING SIZE		HEAD PULLEY		BOOT PULLEY	
Number	Max.C.F.H.	Width	Proj.	Depth	Spacing	Width	F.P.M.	100%	10%	Width	Depth	Diameter	RPM	Diameter	Shaft Dia.
B43-139	95	4	2-3/4	3	8	5	140	1/4	1	8	18	8.00	62.9	8.00	1.5000
B64-141	293	6	4	4.25	13	7	235	1/4	2-1/2	11-3/4	35	20.00	43.8	16.00	1.5000
B64-140	324	6	4	4.25	13	7	260	1/2	2-1/2	11-3/4	39	24.00	40.5	16.00	1.5000
B85-142	543	8	5	5.5	16	9	230	3/4	3	13-3/4	39	20.00	42.9	14.00	2.0000
B85-143	591	8	5	5.5	16	9	250	3/4	3	13-3/4	42	24.00	39	16.00	2.0000
B106-144	911	10	6	6.25	16	11	225	1	3-1/2	15-3/4	42	20.00	41.9	16.00	2.0000
B106-145	1,013	10	6	6.25	16	11	250	1	3-1/2	15-3/4	48	24.00	39	20.00	2.0000
B127-146	1,425	12	7	7.25	18	13	250	1-1/4	4	17-3/4	48	24.00	39	20.00	2.4375
B127-147	1,596	12	7	7.25	18	13	280	1-1/4	4	17-3/4	54	30.00	35.1	24.00	2.4375
B147-148	1,691	14	7	7.25	18	15	245	1-1/4	4	19-3/4	48	24.00	38.2	20.00	2.4375
B147-149	1,932	14	7	7.25	18	15	280	1-1/4	4	19-3/4	54	30.00	35.1	24.00	2.4375
B168-150	2,550	16	8	8.5	18	17	250	1-1/2	4-1/2	22-3/4	48	24.00	39	20.00	2.4375
B168-152	2,856	16	8	8.5	18	17	280	1-1/2	4-1/2	22-3/4	54	30.00	35.1	24.00	2.4375
B188-160	2,925	18	8	8.5	18	19	250	1-1/2	4-1/2	24-3/4	48	24.00	39	20.00	2.4375
B208-164	3,150	20	8	8.5	18	21	250	1-1/2	4-1/2	26-3/4	48	24.00	39	20.00	2.4375
B188-162	3,276	18	8	8.5	18	19	280	1-1/2	4-1/2	24-3/4	54	30.00	35.1	24.00	2.4375
B208-166	3,528	20	8	8.5	18	21	280	1-1/2	4-1/2	26-3/4	54	30.00	35.1	24.00	2.4375
B127-146S	4,489	12	7	7.25	16	24	350	1-1/4	4	28	66	42.00	31.5	30.00	2.4375
B248-168	4,788	24	8	8.5	18	25	280	1-1/2	4-1/2	30-3/4	54	30.00	35.1	24.00	2.4375
B2410-170	6,636	24	10	10.5	18	25	280	1-1/2	4-1/2	30-3/4	60	30.00	35.1	24.00	2.4375

All Dimensions in inches.

Max. CFH capacity is at 75% bucket load.

Consult Martin for head shaft size and horsepower requirements.

Continuous Discharge Chain



Series 700 Chain (Series 800 is for Head Take-up)

Continuous discharge chain type elevators will handle various free-flowing dry or sluggish materials which contain medium to large lumps and are mildly, moderately, or extremely abrasive.

Buckets

Capacities listed are for a medium-front, non-overlapping style fabricated steel bucket. High front style buckets are available. Consult the factory for a specific recommendation.

Chain

Continuous discharge chain type elevators are furnished with combination chain for mild to moderate service or all steel (steel knuckle) chain for moderate to severe service or when a higher chain working load is required.

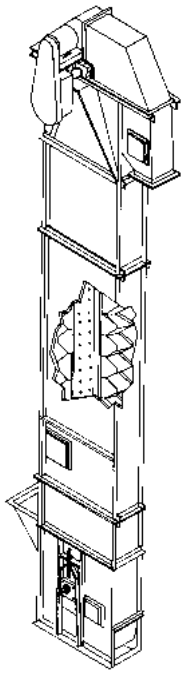
#700 Chain Continuous Discharge Bucket Elevator

ELEVATOR	CAPACITY	BUCKETS				CHAIN			MAX. LUMP SIZE		NOM. CASING SIZE		HEAD SPROCKET			BOOT SPROCKET		
Number	Max. C.F.H.	Width	Proj.	Depth	Spacing	No.	Pitch	F.P.M.	100%	10%	Width	Depth	Number Teeth	Pitch Dia.	RPM	Number Teeth	Pitch Diameter	Shaft Diameter
C85-766	567	8	5	7-3/4	8	N102B	4.000	120	3/4	2-1/2	11-3/4	39	16	20.50	22.4	11	14.25	1.5000
C85-767	567	8	5	7-3/4	8	HSB102B	4.000	120	3/4	2-1/2	11-3/4	39	16	20.50	22.4	11	14.25	1.5000
C105-768	729	10	5	7-3/4	8	N102B	4.000	120	3/4	2-1/2	13-3/4	39	16	20.50	22.4	11	14.25	2.0000
C105-769	729	10	5	7-3/4	8	HSB102B	4.000	120	3/4	2-1/2	13-3/4	39	16	20.50	22.4	11	14.25	2.0000
C107-770	1013	10	7	11-5/8	12	N110	6.000	125	1	3	13-3/4	48	13	25.00	19.1	10	19.50	2.0000
C107-771	1013	10	7	11-5/8	12	HSB110	6.000	125	1	3	13-3/4	48	13	25.00	19.1	10	19.50	2.0000
C127-772	1226	12	7	11-5/8	12	N110	6.000	125	1	3	15-3/4	48	13	25.00	19.1	10	19.50	2.4375
C127-773	1226	12	7	11-5/8	12	HSB110	6.000	125	1	3	15-3/4	48	13	25.00	19.1	10	19.50	2.4375
C147-774	1423	14	7	11-5/8	12	N110	6.000	125	1	3	17-3/4	48	13	25.00	19.1	10	19.50	2.4375
C147-775	1423	14	7	11-5/8	12	HSB110	6.000	125	1	3	17-3/4	48	13	25.00	19.1	10	19.50	2.4375
C128-776	1547	12	8	11-5/8	12	N110	6.000	125	1-1/4	4	15-3/4	48	13	25.00	19.1	9	17.50	2.4375
C128-777	1547	12	8	11-5/8	12	HSB110	6.000	125	1-1/4	4	15-3/4	48	13	25.00	19.1	9	17.50	2.4375
C148-778	1828	14	8	11-5/8	12	N110	6.000	125	1-1/4	4	17-3/4	48	13	25.00	19.1	9	17.50	2.4375
C148-779	1828	14	8	11-5/8	12	HSB110	6.000	125	1-1/4	4	17-3/4	48	13	25.00	19.1	9	17.50	2.4375
C168-781	2109	16	8	11-5/8	12	HSB110	6.000	125	1-1/2	4-1/2	19-3/4	48	13	25.00	19.1	9	17.50	2.4375
C188-783	2363	18	8	11-5/8	12	HSB110	6.000	125	1-1/2	4-1/2	22-3/4	48	13	25.00	19.1	9	17.50	2.4375
C208-785	2784	20	8	11-5/8	12	HSB833	6.000	125	1-1/2	4-1/2	24-3/4	48	13	25.00	19.1	9	17.50	2.4375
C248-787	3375	24	8	11-5/8	12	HSB833	6.000	125	1-1/2	4-1/2	28-3/4	48	13	25.00	19.1	9	17.50	2.4375
C2010-786	3881	20	10	11-5/8	12	HSB833	6.000	125	2	4-1/2	24-3/4	54	13	25.00	19.1	9	17.50	2.4375
C2410-788	4669	24	10	11-5/8	12	HSB833	6.000	125	2	4-1/2	28-3/4	54	13	25.00	19.1	9	17.50	2.4375

All Dimensions in inches.
Max. CFH capacity is at 75% bucket load.
Consult Martin for head shaft size and horsepower requirements.
Other chain may be substituted based on chain pull requirements.

Continuous Discharge Belt

Series 700 Belt (Series 800 is for Head Take-up)



Continuous discharge belt type elevators will handle various free-flowing dry or sluggish materials which contain medium to large lumps and are mildly, moderately, or extremely abrasive.

Buckets

Capacities listed are for a medium front, non-overlapping style fabricated steel bucket. High front style buckets are available. Consult the factory for a specific recommendation.

Belt

Continuous discharge belt type elevators are furnished with 100% polyester carcass PVC belting or rubber covered ply belts specifically designed for elevator service. Many other types of belt and covers are available.

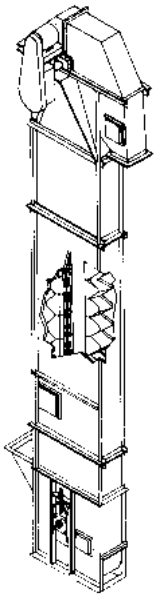
#700 Belt Continuous Discharge Bucket Elevator

ELEVATOR	CAPACITY	BUCKETS			BELT			MAX. LUMP SIZE		NOM. CASING SIZE		HEAD PULLEY		BOOT PULLEY	
Number	Max.C.F.H.	Width	Proj.	Depth	Spacing	Width	F.P.M.	100%	10%	Width	Depth	Diameter	RPM	Diameter	Shaft Dia.
B85-790	756	8	5	7-3/4	8	9	160	3/4	2-1/2	11-3/4	39	20.00	29.8	14.00	1.5000
B105-791	972	10	5	7-3/4	8	11	160	3/4	2-1/2	13-3/4	39	20.00	29.8	14.00	1.5000
B107-792	1296	10	7	11-5/8	12	11	160	1	3	13-3/4	48	24.00	24.9	20.00	2.0000
B127-793	1570	12	7	11-5/8	12	13	160	1	3	15-3/4	48	24.00	24.9	20.00	2.0000
B147-794	1822	14	7	11-5/8	12	15	160	1	3	17-3/4	48	24.00	24.9	20.00	2.0000
B128-795	1980	12	8	11-5/8	12	13	160	1-1/4	4	15-3/4	48	24.00	24.9	20.00	2.0000
B148-796	2340	14	8	11-5/8	12	15	160	1-1/4	4	17-3/4	48	24.00	24.9	20.00	2.4375
B168-797	2700	16	8	11-5/8	12	17	160	1-1/2	4-1/2	19-3/4	48	24.00	24.9	20.00	2.4375
B188-798	3024	18	8	11-5/8	12	19	160	1-1/2	4-1/2	22-3/4	48	24.00	24.9	20.00	2.4375
B208-720	3564	20	8	11-5/8	12	21	160	1-1/2	4-1/2	24-3/4	48	24.00	24.9	20.00	2.4375
B248-722	4320	24	8	11-5/8	12	25	160	1-1/2	4-1/2	28-3/4	48	24.00	24.9	20.00	2.4375
B2010-724	4968	20	10	11-5/8	12	21	160	1-1/2	4-1/2	24-3/4	54	24.00	24.9	20.00	2.4375
B2410-726	5976	24	10	11-5/8	12	25	160	1-1/2	4-1/2	28-3/4	54	24.00	24.9	20.00	2.4375

All Dimensions in inches.
Max. CFH capacity is at 75% bucket load.
Consult Martin for head shaft size and horsepower requirements.

Mill Duty Centrifugal Discharge Chain

Series MDC26 & MDC30 Chain



Mill Duty centrifugal discharge chain type bucket elevators handle a variety of relatively free flowing dry materials with small to medium lump sizes that are mildly to moderately abrasive. Extensively used in the cement industry.

Buckets

Capacities listed are for style “AC” buckets. Buckets may be vented for handling light, fluffy materials.

Chain

Mill Duty centrifugal discharge chain type bucket elevators are furnished with heavy duty steel knuckle chain for medium to severe service, selected for required work loads.

Mill Duty Chain Centrifugal Discharge Bucket Elevator

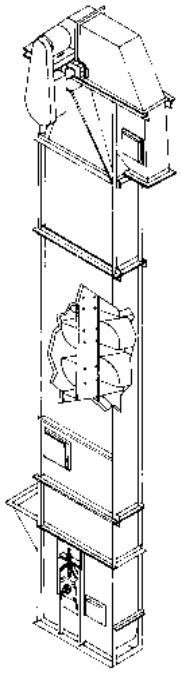
ELEVATOR	CAPACITY	BUCKETS				CHAIN			MAX. LUMP SIZE		NOM. CASING SIZE		HEAD SPROCKET			BOOT SPROCKET		
Number	Max. C.F.H.	Width	Proj.	Depth	Spacing	No.	Pitch	F.P.M.	100%	10%	Width	Depth	Number Teeth	Pitch Dia.	RPM	Number Teeth	Pitch Diameter	Shaft Diameter
MDC26 -128A	2226	12	8	8-1/2	18	HSB833	6.000	265	1-1/2	4	20	56	26	27.00	37.5	13	25.03	3.000
MDC26 -148A	2624	14	8	8-1/2	18	HSB833	6.000	265	1-1/2	4	22	56	26	27.00	37.5	13	25.03	3.000
MDC26 -168A	3021	16	8	8-1/2	18	HSB833	6.000	265	1-3/4	4-1/2	24	56	26	27.00	37.5	13	25.03	3.000
MDC26 -128B	3339	12	8	8-1/2	12	HSB833	6.000	265	1-1/2	4	20	56	26	27.00	37.5	13	25.03	3.000
MDC26 -148B	3935	14	8	8-1/2	12	HSB833	6.000	265	1-1/2	4	22	56	26	27.00	37.5	13	25.03	3.000
MDC26 -168B	4532	16	8	8-1/2	12	HSB833	6.000	265	1-3/4	4-1/2	24	56	26	27.00	37.5	13	25.03	3.000
MDC26-1810A	4929	18	10	10-1/2	18	HSB856	6.000	265	2	5	26	64	26	27.25	37.1	13	25.05	3.000
MDC30 - 168B	5387	16	8	8-1/2	12	HSB833	6.000	315	1-3/4	4-1/2	24	60	30	31.00	38.8	15	28.81	3.000
MDC26-2010A	5470	20	10	10-1/2	18	HSB856	6.000	265	2	5	28	64	26	27.25	37.1	13	25.05	3.000
MDC30-1810A	5859	18	10	10-1/2	18	HSB856	6.000	315	2	5	26	68	30	31.25	38.5	15	28.82	3.000
MDC30-2010A	6502	20	10	10-1/2	18	HSB856	6.000	315	2	5	28	68	30	31.25	38.5	15	28.82	3.000
MDC26-2410A	6758	24	10	10-1/2	18	HSB856	6.000	265	2	5	32	64	26	27.25	37.1	13	25.05	3.000
MDC26-1810B	7394	18	10	10-1/2	12	HSB859	6.000	265	2	5	26	64	26	28.00	36.2	13	25.05	3.000
MDC30-2410A	8033	24	10	10-1/2	18	HSB856	6.000	315	2	5	32	68	30	31.25	38.5	15	28.82	3.000
MDC26-2010B	8204	20	10	10-1/2	12	HSB859	6.000	265	2	5	28	64	26	28.00	36.2	13	25.05	3.000
MDC30-1810B	8789	18	10	10-1/2	12	HSB859	6.000	315	2	5	26	68	30	32.00	37.6	15	28.82	3.000
MDC30-2010B	9752	20	10	10-1/2	12	HSB859	6.000	315	2	5	28	68	30	32.00	37.6	15	28.82	3.000
MDC26-2410B	10136	24	10	10-1/2	12	HSB859	6.000	265	2	5	32	64	26	28.00	36.2	13	25.05	3.000
MDC30-2410B	12049	24	10	10-1/2	12	HSB859	6.000	315	2	5	32	68	30	32.00	37.6	15	28.82	3.000

All Dimensions in inches.
Max. CFH capacity is at 75% bucket load.
Consult Martin for head shaft size and horsepower requirements.
Other chain may be substituted based on chain pull requirements.
Internal gravity take-ups are standard.

Mill Duty Centrifugal Discharge Belt

Series MDB30 Belt

Mill Duty centrifugal discharge belt type bucket elevators handle high capacities of various relatively free flowing dry materials with small to medium lump sizes that are mildly to moderately abrasive.



Buckets

Capacities listed listed are for style “AC” buckets. Buckets may be vented for handling light, fluffy materials.

Belt

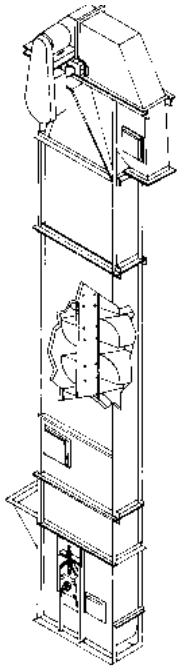
Mill Duty centrifugal discharge belt type bucket elevators are furnished with heavy duty rubber covered ply belts or 100% polyester carcass PVC belts specifically selected for elevator service.

Mill Duty Belt Centrifugal Discharge Bucket Elevator

ELEVATOR	CAPACITY	BUCKETS			BELT			MAX. LUMP SIZE		NOM. CASING SIZE		HEAD PULLEY		BOOT PULLEY	
Number	Max.C.F.H.	Width	Proj.	Depth	Spacing	Width	F.P.M.	100%	10%	Width	Depth	Diameter	RPM	Diameter	Shaft Dia.
MDB30-128A	2520	12	8	8-1/2	18	14	300	1-1/2	4	22	58	30.00	37.6	24.00	3.0000
MDB30-148A	2970	14	8	8-1/2	18	16	300	1-1/2	4	24	58	30.00	37.6	24.00	3.0000
MDB30-168A	3420	16	8	8-1/2	18	18	300	1-3/4	4-1/2	26	58	30.00	37.6	24.00	3.0000
MDB30-128B	3780	12	8	8-1/2	12	14	300	1-1/2	4	22	58	30.00	37.6	24.00	3.0000
MDB30-148B	4455	14	8	8-1/2	12	16	300	1-1/2	4	24	58	30.00	37.6	24.00	3.0000
MDB30-168B	5130	16	8	8-1/2	12	18	300	1-3/4	4-1/2	26	58	30.00	37.6	24.00	3.0000
MDB30-1810A	5580	18	10	10-1/2	18	20	300	2	5	28	64	30.00	37.6	24.00	3.0000
MDB30-2010A	6192	20	10	10-1/2	18	22	300	2	5	30	64	30.00	37.6	24.00	3.0000
MDB30-2410A	7650	24	10	10-1/2	18	26	300	2	5	34	64	30.00	37.6	24.00	3.0000
MDB30-1810B	8370	18	10	10-1/2	12	20	300	2	5	28	64	30.00	37.6	24.00	3.0000
MDB30-2010B	9288	20	10	10-1/2	12	22	300	2	5	30	64	30.00	37.6	24.00	3.0000
MDB30-2410B	11475	24	10	10-1/2	12	26	300	2	5	34	64	30.00	37.6	24.00	3.0000

All Dimensions in inches.
Max. CFH capacity is at 75% bucket load.
Consult Martin for head shaft size and horsepower requirements.
Screw take-ups are standard.

Double Row Mill Duty Centrifugal Discharge Belt



Series DRB30 Belt

Double Row Mill Duty centrifugal discharge belt type bucket elevators handle high capacities of various relatively free flowing dry materials with small to medium lump sizes that are mildly to moderately abrasive.

Buckets

Capacities listed are for a double row of style “AC” buckets. Buckets may be vented for handling light, fluffy materials.

Belt

Double Row Mill Duty centrifugal discharge belt type bucket elevators are furnished with heavy duty rubber covered ply belts or 100% polyester carcass PVC belts specifically selected for elevator service.

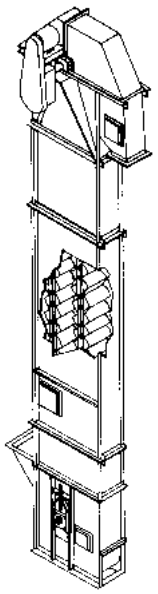
Double Row Mill Duty Belt Centrifugal Discharge Bucket Elevator

ELEVATOR	CAPACITY	BUCKETS			BELT			MAX. LUMP SIZE		NOM. CASING SIZE		HEAD PULLEY		BOOT PULLEY	
Number	Max.C.F.H.	Width	Proj.	Depth	Spacing	Width	F.P.M.	100%	10%	Width	Depth	Diameter	RPM	Diameter	Shaft Dia.
DRB30-128A	8316	12	8	8-1/2	10	26	275	1-1/2	4	34	58	30.00	34.4	30.00	3.000
DRB30-1210A	9207	12	10	10-1/2	12	26	275	1-1/2	4	34	62	30.00	34.4	30.00	3.000
DRB30-148A	9801	14	8	8-1/2	10	30	275	1-1/2	4	38	58	30.00	34.4	30.00	3.000
DRB30-1410A	10841	14	10	10-1/2	12	30	275	1-1/2	4	38	62	30.00	34.4	30.00	3.000
DRB30-168A	11286	16	8	8-1/2	10	34	275	1-3/4	4-1/2	42	58	30.00	34.4	30.00	3.000
DRB30-1610A	12499	16	10	10-1/2	12	34	275	1-3/4	4-1/2	42	62	30.00	34.4	30.00	3.000
DRB30-1810A	15345	18	10	10-1/2	12	38	275	2	4-1/2	46	62	30.00	34.4	30.00	3.000
DRB30-2010A	17028	20	10	10-1/2	12	42	275	2-1/4	4-3/4	50	62	30.00	34.4	30.00	3.000
DRB30-2410A	21038	24	10	10-1/2	12	50	275	2-1/2	5	58	62	30.00	34.4	30.00	3.000

All Dimensions in inches.
Max. CFH capacity is at 75% bucket load.
Consult Martin for head shaft size and horsepower requirements.
Screw take-ups are standard.

Super Capacity Continuous Discharge Chain

Series SC700 Chain



Super Capacity continuous discharge chain type bucket elevators handle high capacities of various free flowing dry materials ranging from fines to lumps, moderate to extremely abrasive, and those that tend to pack.

Buckets

Capacities listed are for style “SC” continuous fabricated steel buckets, mounted between two strands of chain.

Chain

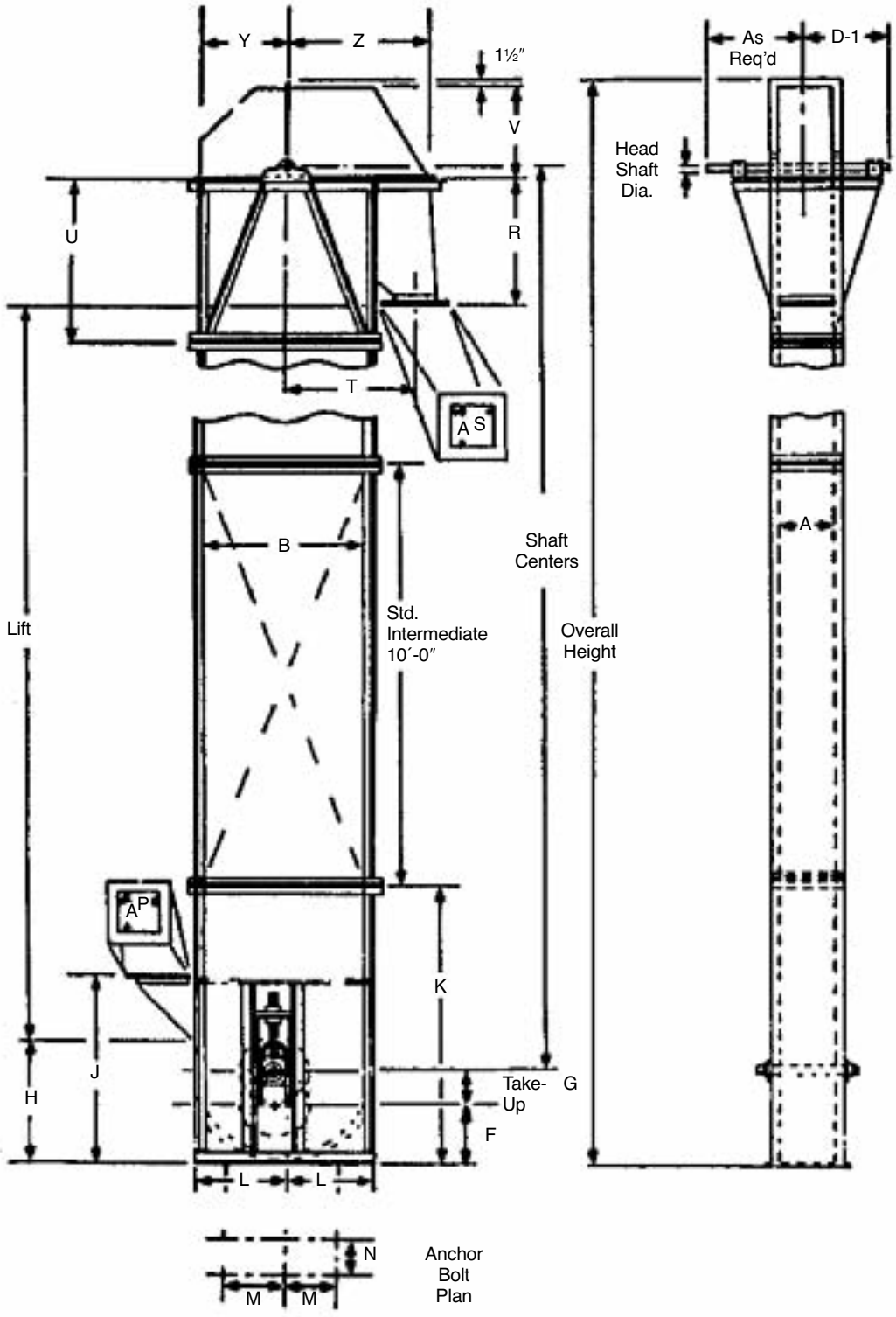
Super Capacity continuous discharge chain type bucket elevators are furnished with two strands of heavy duty steel knuckle chain for moderate to severe service, selected for required work loads.

Super Capacity Continuous Discharge Bucket Elevator

ELEVATOR	CAPACITY	BUCKETS				CHAIN			MAX. LUMP SIZE		NOM. CASING SIZE		HEAD SPROCKET			BOOT SPROCKET		
Number	Max. C.F.H.	Width	Proj.	Depth	Spacing	No.	Pitch	F.P.M.	100%	10%	Width	Depth	Number Teeth	Pitch Dia.	RPM	Number Teeth	Pitch Diameter	Shaft Diameter
SC700-128	2250	12	8.75	11.625	12	6102-1/2	12	100	2	4	26	56	8	31.36	12.2	6	23.96	2.4375
SC700-148	2700	14	8.75	11.625	12	6102-1/2	12	100	2	4	28	56	8	31.36	12.2	6	23.96	2.4375
SC700-168	3150	16	8.75	11.625	12	6102-1/2	12	100	2-1/2	6	30	56	8	31.36	12.2	6	23.96	3.0000
SC700-188	3600	18	8.75	11.625	12	6102-1/2	12	100	2-1/2	6	32	56	8	31.36	12.2	6	23.96	3.0000
SC700-208	4050	20	8.75	11.625	12	6102-1/2	12	100	2-1/2	6	34	56	8	31.36	12.2	6	23.96	3.0000
SC700-1612	5625	16	12.75	17.625	18	9124	9	125	3-1/2	8	33	68	12	34.77	13.7	12	34.77	3.0000
SC700-2012	7125	20	12.75	17.625	18	9124	9	125	3-1/2	8	37	68	12	34.77	13.7	12	34.77	3.0000
SC700-2412	8250	24	12.75	17.625	18	9124	9	125	3-1/2	8	41	68	12	34.77	13.7	12	34.77	3.0000
SC700-3012	10500	30	12.75	17.625	18	9124	9	125	3-1/2	8	47	68	12	34.77	13.7	12	34.77	3.0000
SC700-3612	12375	36	12.75	17.625	18	9124	9	125	3-1/2	8	53	68	12	34.77	13.7	12	34.77	3.4375
SC700-4212	14437.5	42	12.75	17.625	18	9150	9	125	3-1/2	8	60	68	12	34.77	13.7	12	34.77	3.4375
SC700-4812	16500	48	12.75	17.625	18	9150	9	125	3-1/2	8	66	68	12	34.77	13.7	12	34.77	3.4375

All Dimensions in inches.
Max. CFH capacity is at 75% bucket load.
Consult Martin for head shaft size and horsepower requirements.
Internal gravity take-ups are standard.

Bucket Elevator Dimensions



Bucket Elevator Dimensions

100 & 700 Belt & Chain

Elevator Number Chain	Elevator Number Belt	Elevator Number Belt	Elevator Number Chain	Dimensions[1] (In Inches)																			
				Casing		Boot									Head								
				A	B	F	G	H	J	K	L	M	N	P	R	S	T	U	V	Y	Z	D-1[2]
C43-101		B43-139		8	18	9	6	27¼	36¾	42	9	6	10	6	15	8	17½	36	14	9	20¼	13
C64-102				9¾	35	13	9	26½	43	72	17½	14½	13½	13	29¾	10	28½	42	19½	17½	30½	13
		B64-140		11¾	39	14	9	26½	43	72	19½	16½	15½	13	31½	10	30½	42	21½	19½	32½	14
C85-103		B64-141		11¾	35	13	9	26½	43	72	17½	14½	15½	13	29¾	10	28½	42	19½	17½	30½	14
C85-104 C85-105	B85-790		C85-766 C85-767	11¾	39	14	9	26½	43	72	19½	16½	15½	13	31½	10	30½	42	21½	19½	32½	14
C85-107 C85-108				11¾	42	16	9	32½	50	72	21	18	15½	13	32¾	10	33¼	42	24	21	36¼	14½
	B105-791	B85-142	C105-768 C105-769	13¾	39	14	9	26½	43	72	19½	16½	17½	13	31½	10	30½	42	21½	19½	32½	15
C106-110 C106-111		B85-143		13¾	42	16	9	32½	50	72	21	18	17½	13	32¾	10	33¼	42	24	21	36¼	15½
C106-112 C106-113 C106-116	B107-792		C107-770 C107-771	13¾	48	19	9	40½	60	72	24	21	17½	15	35⅝	13	36½	48	27½	24	40⅝	16
		B106-144		15¾	42	16	9	32½	50	72	21	18	19½	13	32¼	10	33¼	42	24	21	36¼	17
C127-117 C127-119	B127-793 B128-795	B106-145	C127-772 C127-773 C128-776 C128-777	15¾	48	19	9	40½	60	72	24	21	19½	15	35⅝	13	36½	48	27½	24	40⅝	17
C127-120 C127-122				15¾	54	21	10	39	60½	72	27	24	19½	17	38¼	17	41½	48	31	27	45	18¼
		B127-146S		28	64	26	10	29¾	60½	72	32	29	30½	26¼	36	17	46½	48	36½	32	53	24
C147-123 C147-124 C147-126	B147-794 B148-796	B127-146	C147-774 C147-775 C148-778 C148-779	17¾	48	19	10	40½	60	72	24	21	21½	15	35⅝	13	36½	48	27½	24	40⅝	18
C147-127 C147-128 C147-130		B127-147		17¾	54	21	10	39	60½	72	27	24	21½	17	38¼	17	41½	48	31	27	45	19¼
C168-131 C168-132	B168-797	B147-148	C168-780 C168-781	19¾	48	20	10	40½	60	72	24	21	23½	15	35⅝	13	36½	48	27½	24	40⅝	19
C168-133 C168-134		B147-149		19¾	54	21	10	39	60½	72	27	24	23½	17	38¼	17	41½	48	31	27	45	20
	B188-798	B168-150	C188-782 C188-783	22¾	48	19	10	40½	60	72	24	21	26½	15	35⅝	13	36½	48	27½	24	40⅝	21
		B168-152		22¾	54	21	10	39	60½	72	27	24	26½	17	38¼	17	41½	48	31	27	45	22

[1]NOT certified for construction.

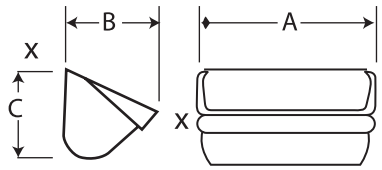
[2]Normal maximum for largest headshaft listed.

For units not shown, contact Martin.

Buckets and Chain

Style AA

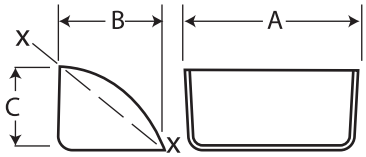
Ductile iron buckets for general use with most types of relatively free flowing material in centrifugal discharge elevators. Can be mounted on chain or belt and furnished in various plastic materials.



Bucket Size			Weight Lbs.	Capacity cu. ft. X — X
A	B	C		
4	2¾	3	1.0	.01
6	4	4¼	2.7	.03
8	5	5½	4.8	.07
10	6	6¼	7.7	.12
12	7	7¼	12.0	.19
14	7	7¼	13.9	.23
16	8	8½	21.8	.34

Style C

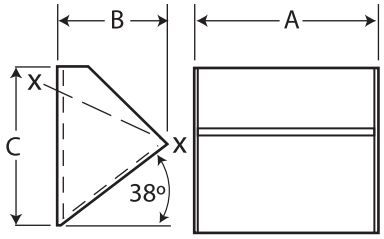
Fabricated buckets are used in centrifugal discharge elevators to handle materials that tend to pack or stick, such as sugar, clay, salt or wet grains.



Bucket Size			Weight Lbs.	Capacity cu. ft. X — X
A	B	C		
6	4½	4	2.0	.026
8	4½	4	2.8	.035
10	5	4	4.0	.052
12	5	4	4.8	.061
14	7	5½	8.5	.138
16	7	5½	10.5	.158

Continuous

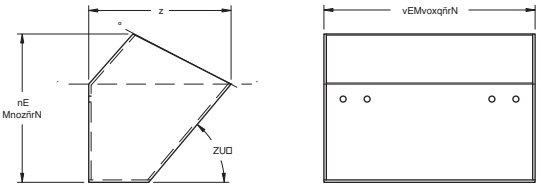
Medium front non-overlapping fabricated steel buckets are used in continuous discharge elevators for general service. Heavier gauges should be used when handling abrasive materials. Available fabricated from various materials. High front continuous buckets are available also. Plastic buckets available in most sizes.



Bucket Size			Weight Lbs.				Capacity cu. ft.
A	B	C	12 Ga.	10 Ga.	3⁄16″	1⁄4″	X — X
8	5	7¾	5.1	6.3	8.7	—	.070
10	5	7¾	5.9	7.4	10.2	—	.090
10	7	11⅛	9.3	11.9	16.5	—	.180
12	7	11⅛	10.4	13.4	18.6	—	.218
14	7	11⅛	11.6	14.9	20.7	—	.253
12	8	11⅛	11.2	14.4	20.0	26.1	.275
14	8	11⅛	12.4	16.0	22.2	29.1	.325
16	8	11⅛	13.7	17.6	24.5	32.0	.375
18	8	11⅛	14.9	19.2	26.7	35.0	.420

AC Welded Steel

High front for greater capacity. Hooded back for closer spacing. Typical in cement, gypsum powder or other powdery materials. Venting available for clean filling and discharge. Mounted on chain or belt.

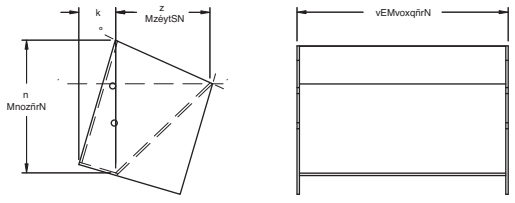


^Weights do not include bolt reinforcing plates. Bolt reinforcing plates are recommended if less than 8 bolts are used. Vent holes in bottom are optional in style "AC" buckets.

Bucket Size, Inches			Weight		Cap. Cu. Feet^	
L Length	P Proj.	D Depth	3/16" Steel	1/4" Steel	Filled to Line X-X	Filled to Line X-Y
12	8	8½	18.25	24.30	.231	.303
14	8	8½	20.30	27.00	.271	.356
16	8	8½	22.48	29.98	.311	.408
18	10	10½	31.15	38.95	.488	.691
20	10	10½	33.68	42.10	.542	.768
24	10	10½	39.67	52.69	.651	.921
27	12	12 ½	53.84	71.46	1.072	1.474

SC Welded Steel

Mounted between two strands of chain. Suitable for the heaviest materials. Designed for super capacity elevators. Typical in asphalt and concrete applications. Design offers increased capacity.



*Note: Actual capacity depends on angle of repose of material handled and inclination of elevator.

Bucket Size, Inches				Weight				Cap. Cu. Feet*	
L Length	P Proj.	D Depth	A Inches	10 Gauge Steel	3/16" Steel	1/4" Steel	5/16" Steel	Filled to Line X-X	Filled to Line X-Y
12	8¾	11⅝	4⁹⁄₁₆	22	29	39	49	.35	.54
14	8¾	11⅝	4⁹⁄₁₆	23	31	41	51	.41	.63
16	8¾	11⅝	4⁹⁄₁₆	25	34	45	56	.46	.72
16	12	17⅝	6½	43	58	76	95	1.11	1.55
18	8¾	11⅝	4⁹⁄₁₆	27	36	48	60	.52	.81
20	8¾	11⅝	4⁹⁄₁₆	29	39	52	65	.58	.90
20	12	17⅝	6½	49	67	88	110	1.40	1.94
24	12	17⅝	6½	55	75	104	130	1.68	2.33
30	12	17⅝	6½	65	88	117	146	2.11	2.91
36	12	17⅝	6½	73	99	132	165	2.53	3.49

Chain

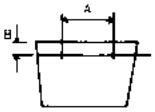
Combination chains, C-, have cast block links and steel connecting side bars. All steel (steel knuckle), SS, are fabricated of steel. Attachments are available either on the connecting side bars or block link.

Chain No.	Pitch in Inches	Average Ultimate Strength Lbs.	Rated Working Value Lbs.	Wt. Per Ft. Lbs Attachment Every Other Pitch	Attachment Number	Dimension in Inches		
						Pin Diameter	Side Bar	Barrel or Knuckle Dia.
C-977	2.308	11,000	1830	2.2	K-1	7⁄16	3⁄16 × 7⁄8	7⁄8
C-188	2.609	14,000	1950	4.8	K-2	½	¼ × 1⅛	7⁄8
C-102B	4.0	24,000	4000	7.8	K-2	5⁄8	3⁄8 × 1½	1 1⁄32
C-110	6.0	24,000	4000	7.3	K-2	5⁄8	3⁄8 × 1½	1 5⁄16
C-111	4.76	36,000	5,950	10.7	K-2	¾	3⁄8 × 1¾	1 15⁄32
SS-102B	4.0	40,000	6,290	9.0	K-2	5⁄8	3⁄8 × 1½	1
SS-110	6.0	40,000	6290	8.6	K-2	5⁄8	3⁄8 × 1½	1¼

NOTE: All dimensions are inside to inside of bucket.

Bucket Punching (Belt)

CEMA Standard (Formerly P1 thru P9)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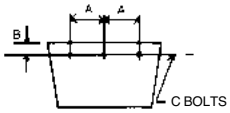

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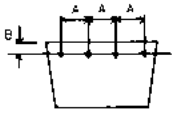
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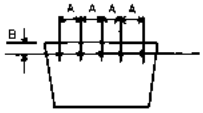
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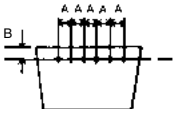
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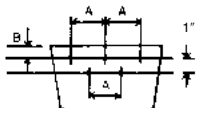

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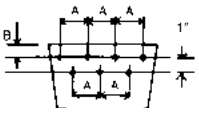
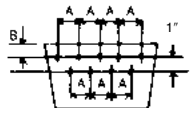


B7

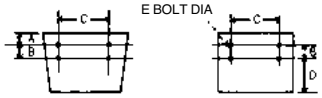


B8

Bucket Length	Salem and Other Similar Light Buckets				M.I. & Steel Buckets Style A, AA, AA-RB, B, C, etc.				Continuous Buckets			
	Punch	A	B	C*	Punch	A	B	C*	Punch	A	B	C*
6	B-1	4⅜	⅝	¼	B-1	4-⅜	1	¼	—	—	—	—
8	B-2	3 1/16	⅞	¼-5/16	B-6	3	⅞	¼ -5/16	B-6	3	B = DEPTH – 1 2	¼-5/16
10	B-2	4⅛	⅞	¼-5/16	B-6	3½	⅞	¼ -5/16	B-6	3½		¼-5/16
12	B-3	3⅜	⅞	¼-5/16	B-6	4½	⅞	¼ -5/16	B-6	4½		¼-5/16
14	B-4	3	⅞	¼-5/16	B-7	4	⅞	5/16	B-7	4		5/16
16	B-5	2⅞	⅞	¼-5/16	B-7	4½	⅞	5/16	B-7	4½		5/16
18	—	—	—	—	—	—	—	—	B-7	5		5/16

*C = Bolt Diameter. See Chart on Page H-140.

Bucket Punching — Chain

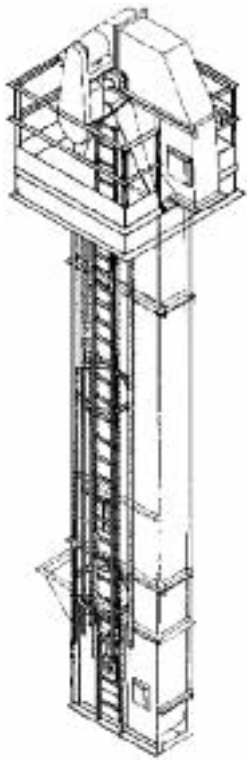


Style AA, C, SC, etc. Continuous

Chain Number	Attachment Number	A	B	C	D	E
C-977	K-1	1	—	3	—	⅜
C-188	K-2	1	1¼	4 3/16	2¾	⅜
C-102B	K-2	¾	1¾	5 5/16	2	⅜
C-110	K-2	⅞	1¾	5 5/16	3⅜	⅜
C-111	K-2	¾	2 5/16	6¼	2⅛	⅜
SS-102B	K-2	¾	1¾	5 5/16	2	⅜
SS-110	K-2	⅞	1¾	5 5/16	3⅜	⅜

Bucket Size	High Speed Grain			
	Punch	A	B	C
7 × 5	B2	2 1/16	1¾	¼
9 × 5	B2	3⅝	1¾	¼
9 × 6	B2	3⅝	2	¼
11 × 6	B3	3	2	¼
12 × 6	B3	3⅜	2	¼
14 × 7	B4	3	2	5/16

Consult Martin for "AC" and "SC" Bucket Punching.



Platforms

Head section service platforms are of structural steel, angle hand rails and heavy non-skid grating. The platform mounts securely to the elevator head section. Various sizes and configurations are available. Rest platforms are also available and required at 30´ intervals.

Ladders/Safety Cages

Ladders with safety cages are available. They are constructed of heavy gauge steel and sized to provide easy access to platforms. Ladders with safety cage are easily bolted to the elevator casings.

Formulas for Calculating Number of Buckets, Bucket Bolts, Washers and Length of Chain or Belt

Centrifugal Discharge Chain Series 100

Number of Buckets, Bucket Bolts, Washers and Length of Chain.

Elevator Number	Buckets Style AA Malleable			Bucket Bolts and Lock Washers Hex Head Cap Screws		Chain		
	Size (Inches)	Spacing (Inches)	☆ Quantity	Size (Inches)	Quantity	Number	Attachment Every _ Link	Length (Feet)
C43-101	4 × 3	9¼	1.5 + (2.58 × Shaft Ctrs)	¼ × 1	2 × (No. of Buckets)	C-77	K1- 4th	2.31′ + (2 × Shaft Ctrs)
C64-102	6 × 4	13	4.4 + (1.85 × Shaft Ctrs)	¼ × 1	2 × (No. of Buckets)	C-188	K1-5th	4.79′ + (2 × Shaft Ctrs)
C85-103	8 × 5	16	2.75 + (1.5 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	C-102B	K2-4th	3.66′ + (2 × Shaft Ctrs)
C85-104	8 × 5	16	3.5 + (1.5 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	C-102B	K2-4th	4.66′ + (2 × Shaft Ctrs)
C85-105	8 × 5	16	3.5 + (1.5 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	SS-102B	K2-4th	4.66′ + (2 × Shaft Ctrs)
C85-107	8 × 5	16	4.25 + (1.5 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	C-102B	K2 - 4th	5.66′ + (2 × Shaft Ctrs)
C85-108	8 × 5	16	4.25 + (1.5 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	SS-102B	K2 - 4th	5.66′ + (2 × Shaft Ctrs)
C106-110	10 × 6	16	3.75 + (1.5 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	C-102B	K2 - 4th	5.0′ + (2 × Shaft Ctrs)
C106-111	10 × 6	16	3.75 + (1.5 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	SS-102B	K2 - 4th	5.0′ + (2 × Shaft Ctrs)
C106-112	10 × 6	18	4.33 + (1.33 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	C-110	K2 - 3rd	6.5′ + (2 × Shaft Ctrs)
C106-113	10 × 6	18	4.33 + (1.33 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	SS-110	K2 - 3rd	6.5′ + (2 × Shaft Ctrs)
C106-116	10 × 6	16	4.5 + (1.5 × Shaft Ctrs)	⅜× 1¼	4 × (No. of Buckets)	C-102B	K2 - 4th	6.0′ + (2 × Shaft Ctrs)
C127-117	12 × 7	18	4.0 + (1.33 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	SS-110	K2 - 3rd	6.0′ + (2 × Shaft Ctrs)
C127-119	12 × 7	16	4.25 + (1.5 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	C-102B	K2 - 4th	5.66′ + (2 × Shaft Ctrs)
C127-120	12 × 7	18	5.0 + (1.33 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	SS-110	K2 - 3rd	7.5′ + (2 × Shaft Ctrs)
C127-122	12 × 7	16	5.5 + (1.5 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	C-102B	K2 - 4th	7.33′ + (2 × Shaft Ctrs)
C147-123	14 × 7	19	3.79 + (1.26 × Shaft Ctrs)	½ × 1½	4 × (No. of Buckets)	C-111	K2 - 4th	6.0′ + (2 × Shaft Ctrs)
C147-124	14 × 7	18	4.0 + (1.33 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	SS-110	K2 - 3rd	6.0′ + (2 × Shaft Ctrs)
C147-126	14 × 7	16	4.25 + (1.5 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	C-102B	K2 - 4th	5.66′ + (2 × Shaft Ctrs)
C147-127	14 × 7	19	4.74 + (1.26 × Shaft Ctrs)	½ × 1½	4 × (No. of Buckets)	C-111	K2 - 4th	7.5′ + (2 × Shaft Ctrs)
C147-128	14 × 7	18	5.0 + (1.33 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	SS-110	K2 - 3rd	7.5′ + (2 × Shaft Ctrs)
C147-130	14 × 7	16	5.5 + (1.5 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	C-102B	K2 - 4th	7.33′ + (2 × Shaft Ctrs)
C168-131	16 × 8	19	3.48 + (1.26 × Shaft Ctrs)	½ × 1½	4 × (No. of Buckets)	C-111	K2 - 4th	5.55′ + (2 × Shaft Ctrs)
C168-132	16 × 8	18	3.66 + (1.33 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	SS-110	K2 - 3rd	5.5′ + (2 × Shaft Ctrs)
C168-133	16 × 8	19	4.51 + (1.26 × Shaft Ctrs)	½ × 1½	4 × (No. of Buckets)	C-111	K2 - 4th	7.13′ + (2 × Shaft Ctrs)
C168-134	16 × 8	18	4.66 + (1.33 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	SS-110	K2 - 3rd	7.0′ + (2 × Shaft Ctrs)

Centrifugal Discharge Belt Series 100

Number of Buckets, Bucket Bolts, Washers and Length of Belt.

Elevator Number	Buckets Style AA Malleable			Bucket Bolts and Lock Washers (Norway Elevator Bolts)		Belt (Including 3 Buckets Overlap)	
	Size (Inches)	Spacing (Inches)	☆ Quantity	Size (Inches)	Quantity	No. of Holes to be Punched in Belt	Length (Feet)
B43-139	4 × 3	8	3.12 + (3 × Shaft Ctrs)	¼ × 1	2 × (No. of Buckets)	6 + (No. of Bolts)	5′ + (2 × Shaft Ctrs)
B64-140	6 × 4	13	4.85 + (1.85 × Shaft Ctrs)	¼ × 1	2 × (No. of Buckets)	6 + (No. of Bolts)	9′ + (2 × Shaft Ctrs)
B64-141	6 × 4	13	4.34 + (1.85 × Shaft Ctrs)	¼ × 1	2 × (No. of Buckets)	6 + (No. of Bolts)	9′ + (2 × Shaft Ctrs)
B85-142	8 × 5	16	3.34 + (1.5 × Shaft Ctrs)	¼ × 1¼	5 × (No. of Buckets)	15 + (No. of Bolts)	9′ + (2 × Shaft Ctrs)
B85-143	8 × 5	16	4.13 + (1.5 × Shaft Ctrs)	¼ × 1¼	5 × (No. of Buckets)	15 + (No. of Bolts)	10′ + (2 × Shaft Ctrs)
B106-144	10 × 6	16	3.53 + (1.5 × Shaft Ctrs)	5⁄16 × 1¼	5 × (No. of Buckets)	15 + (No. of Bolts)	9′ + (2 × Shaft Ctrs)
B106-145	10 × 6	16	4.34 + (1.5 × Shaft Ctrs)	5⁄16 × 1¼	5 × (No. of Buckets)	15 + (No. of Bolts)	10′ + (2 × Shaft Ctrs)
B127-146	12 × 7 Staggered	18	3.86 + (1.33 × Shaft Ctrs)	5⁄16 × 1½	5 × (No. of Buckets)	15 + (No. of Bolts)	11′ + (2 × Shaft Ctrs)
B127S-146S	12 × 7	16	6.28 + (3 × Shaft Ctrs)	5⁄16 × 1½	5 × (No. of Buckets)	15 + (No. of Bolts)	15′ + (2 × Shaft Ctrs)
B127-147	12 × 7	18	4.72 + (1.33 × Shaft Ctrs)	5⁄16 × 1½	5 × (No. of Buckets)	15 + (No. of Bolts)	13′ + (2 × Shaft Ctrs)
B147-148	14 × 7	18	3.86 + (1.33 × Shaft Ctrs)	5⁄16 × 1½	7 × (No. of Buckets)	21 + (No. of Bolts)	11′ + (2 × Shaft Ctrs)
B147-149	14 × 7	18	4.72 + (1.33 × Shaft Ctrs)	5⁄16 × 1½	7 × (No. of Buckets)	21 + (No. of Bolts)	13′ + (2 × Shaft Ctrs)
B168-150	16 × 8	18	3.31 + (1.33 × Shaft Ctrs)	5⁄16 × 1½	7 × (No. of Buckets)	21 + (No. of Bolts)	10′ + (2 × Shaft Ctrs)
B168-152	16 × 8	18	4.72 + (1.33 × Shaft Ctrs)	5⁄16 × 1½	7 × (No. of Buckets)	21 + (No. of Bolts)	13′ + (2 × Shaft Ctrs)

Continuous Discharge Chain Series 700

Number of Buckets, Bucket Bolts, Washers and Length of Chain.

Elevator Number	Buckets Medium Front Continuous Steel Buckets			Bucket Bolts and Lock Washers Hex Head Cap Screws		Chain		
	Size (Inches)	Spacing (Inches)	☆ Quantity	Size (Inches)	Quantity	Number	Attachment Every _ Link	Length (Feet)
C85-766	8 × 5 × 7¾	8	6.57 + (3 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	C-102B	K2 - 2nd	4.66′ + (2 × Shaft Ctrs)
C85-767	8 × 5 × 7¾	8	6.57 + (3 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	SS-102B	K2 - 2nd	4.66′ + (2 × Shaft Ctrs)
C105-768	10 × 5 × 7¾	8	8.25 + (3 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	C-102B	K2 - 2nd	5.0′ + (2 × Shaft Ctrs)
C105-769	10 × 5 × 7¾	8	8.25 + (3 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	SS-102B	K2 - 2nd	5.0′ + (2 × Shaft Ctrs)
C107-770	10 × 7 × 11⅝	12	6.06 + (2 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	C-110	K2 - 2nd	6.5′ + (2 × Shaft Ctrs)
C107-771	10 × 7 × 11⅝	12	6.06 + (2 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	SS-110	K2 - 2nd	6.5′ + (2 × Shaft Ctrs)
C127-772	12 × 7 × 11⅝	12	5.60 + (2 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	C-110	K2 - 2nd	6.0′ + (2 × Shaft Ctrs)
C127-773	12 × 7 × 11⅝	12	5.60 + (2 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	SS-110	K2 - 2nd	6.0′ + (2 × Shaft Ctrs)
C147-774	14 × 7 × 11⅝	12	5.60 + (2 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	C-110	K2 - 2nd	6.0′ + (2 × Shaft Ctrs)
C147-775	14 × 7 × 11⅝	12	5.60 + (2 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	SS-110	K2 - 2nd	6.0′ + (2 × Shaft Ctrs)
C128-776	12 × 8 × 11⅝	12	5.60 + (2 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	C-110	K2 - 2nd	6.0′ + (2 × Shaft Ctrs)
C128-777	12 × 8 × 11⅝	12	5.60 + (2 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	SS-110	K2 - 2nd	6.0′ + (2 × Shaft Ctrs)
C148-778	14 × 8 × 11⅝	12	5.60 + (2 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	C-110	K2 - 2nd	6.0′ + (2 × Shaft Ctrs)
C148-779	14 × 8 × 11⅝	12	5.60 + (2 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	SS-110	K2 - 2nd	6.0′ + (2 × Shaft Ctrs)
C168-781	16 × 8 × 11⅝	12	5.33 + (2 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	SS-110	K2 - 2nd	5.5′ + (2 × Shaft Ctrs)
C168-783	18 × 8 × 11⅝	12	5.33 + (2 × Shaft Ctrs)	⅜ × 1¼	4 × (No. of Buckets)	SS-110	K2 - 2nd	5.5′ + (2 × Shaft Ctrs)

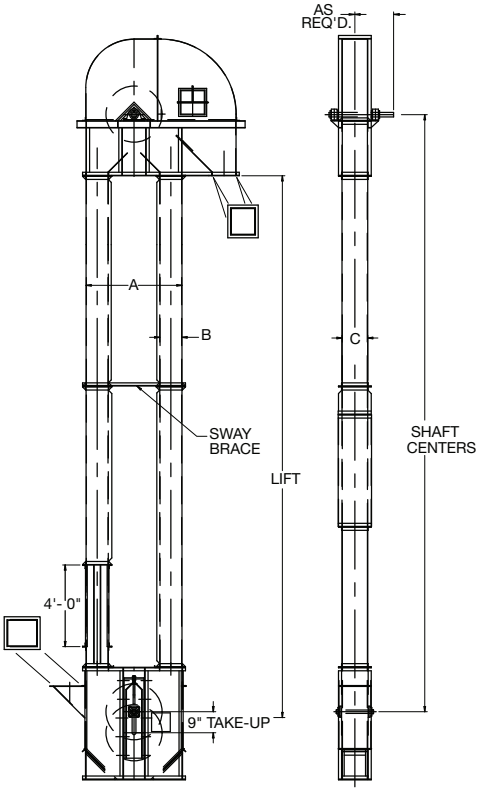
Continuous Discharge Belt Series 700

Number of Buckets, Bucket Bolts, Washers and Length of Chain.

Elevator Number	Buckets Medium Front Continuous Steel Buckets			Bucket Bolts and Lock Washers (Norway Elevator Bolts)		Belt (Including 3 Buckets Overlap)		
	Size (Inches)	Spacing (Inches)	☆ Quantity	Size (Inches)	Quantity	Width (Inches)	No. of Holes to be Punched in Belt	Length (Feet)
B85-790	8 × 5 × 7¾	8	7.88 + (3 × Shaft Ctrs)	¼ × ¾	5 × (No. of Buckets)	9	15 + (No. of Bolts)	8′ + (2 × Shaft Ctrs)
B105-791	10 × 5 × 7¾	8	6.5 + (3 × Shaft Ctrs)	5⁄16 × 1	5 × (No. of Buckets)	11	15 + (No. of Bolts)	7′ + (2 × Shaft Ctrs)
B107-792	10 × 7 × 11⅝	12	5.75 + (2 × Shaft Ctrs)	5⁄16 × 1	5 × (No. of Buckets)	11	15 + (No. of Bolts)	10′ + (2 × Shaft Ctrs)
B127-793	12 × 7 × 11⅝	12	5.75 + (2 × Shaft Ctrs)	5⁄16 × 1¼	5 × (No. of Buckets)	13	15 + (No. of Bolts)	10′ + (2 × Shaft Ctrs)
B147-794	14 × 7 × 11⅝	12	5.75 + (2 × Shaft Ctrs)	5⁄16 × 1¼	7 × (No. of Buckets)	15	21 + (No. of Bolts)	10′ + (2 × Shaft Ctrs)
B128-795	12 × 8 × 11⅝	12	5.75 + (2 × Shaft Ctrs)	5⁄16 × 1¼	5 × (No. of Buckets)	13	15 + (No. of Bolts)	10′ + (2 × Shaft Ctrs)
B148-796	14 × 8 × 11⅝	12	5.75 + (2 × Shaft Ctrs)	5⁄16 × 1¼	7 × (No. of Buckets)	15	21 + (No. of Bolts)	10′ + (2 × Shaft Ctrs)
B168-797	16 × 8 × 11⅝	12	5.75 + (2 × Shaft Ctrs)	5⁄16 × 1¼	7 × (No. of Buckets)	17	21 + (No. of Bolts)	10′ + (2 × Shaft Ctrs)
B183-798	18 × 8 × 11⅝	12	4.96 + (2 × Shaft Ctrs)	5⁄16 × 1¼	7 × (No. of Buckets)	19	21 + (No. of Bolts)	9′ + (2 × Shaft Ctrs)

☆ If answer is a fraction, go to next whole number. Consult Martin for units not shown.

High Speed Grain Centrifugal Discharge Belt Series 500



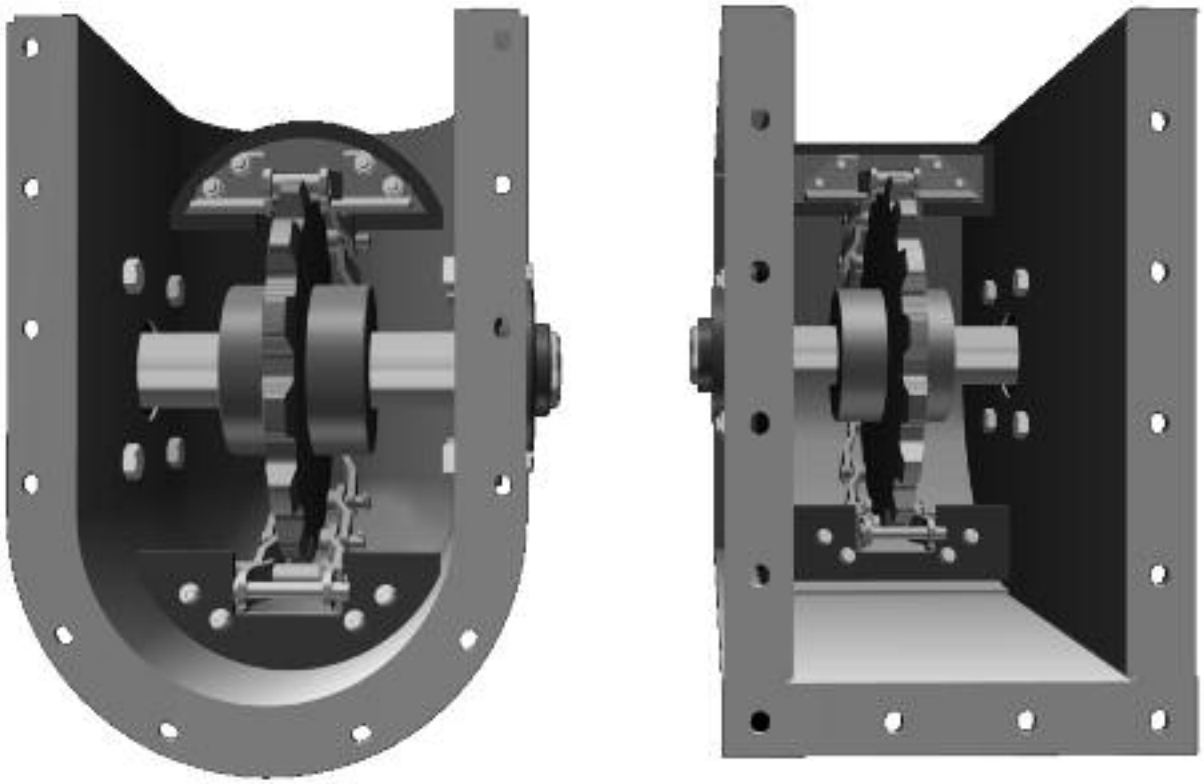
Martin Model No.	No. Bucket Rows	Capacity				Buckets Standard Duty Plastic				Belt Width	Pulley Width	Head Pulley	Boot Pulley	Boot Shaft	Hd. & Bt. Casing Dimensions		Intermediate Casing Dimensions		Casing Thicknesses			Inlet Height
		C.F.H.		at Speed																		
		@ "Y-Y +5 Deg." Max. Useable	@ "Y - Y" (W.L.)	Belt FPM	H.S. RPM	Typical Style	Width In.	Proj. In.	Spacing In.	Inches	Inches	Dia. In.	Dia. In.	Dia. In.	Depth "C" In.	Width "A" In.	Depth "C" In.	Width "B" In.	Head	Boot	Int.	Dia. In.
B64-508 *	1	782	697	265	119	HD-MAX	6.250	4.500	7	7	7	8	8	1 3/16	8	20	8	20 *	12 ga.	12 ga.	12 ga.	30
B65-512A	1	1,079	980	350	107	HD-MAX	6.250	5.625	10	7	8	12	12	1 7/16	9	27	9	8	12 ga.	12 ga.	12 ga.	32
B65-512B	1	1,541	1,400	350	107	HD-MAX	6.250	5.625	7	7	8	12	12	1 7/16	9	27	9	8	12 ga.	12 ga.	12 ga.	32
B95-518A	1	1,853	1,640	440	90	HD-MAX	9.375	5.625	12	10	11	18	18	1 7/16	12	34	12	9	12 ga.	10 ga.	12 ga.	39
B95-518B	1	2,470	2,187	440	90	HD-MAX	9.375	5.625	9	10	11	18	18	1 7/16	12	34	12	9	12 ga.	10 ga.	12 ga.	39
B95-518C	1	3,176	2,812	440	90	HD-MAX	9.375	5.625	7	10	11	18	18	1 7/16	12	34	12	9	12 ga.	10 ga.	12 ga.	39
B96-524	1	3,974	3,600	460	70	HD-MAX	9.375	6.625	8	10	11	24	24	1 15/16	13	42	13	10	10 ga.	10 ga.	12 ga.	44
B96-530	1	4,406	3,991	510	63	HD-MAX	9.375	6.625	8	10	11	30	30	1 15/16	15	48	15	10	10 ga.	3/16"	12 ga.	48
B106-530	1	4,931	4,534	510	63	HD-MAX	10.375	6.625	8	11	12	30	30	1 15/16	15	48	15	10	10 ga.	3/16"	12 ga.	48
B136-530	1	6,388	5,864	510	63	HD-MAX	13.375	6.625	8	14	15	30	30	1 15/16	18	48	18	10	10 ga.	3/16"	12 ga.	48
B127-536	1	8,879	8,123	600	62	HD-MAX	12.500	7.750	9	13	15	36	36	2 7/16	18	56	18	11	10 ga.	3/16"	12 ga.	56
B147-536	1	10,747	9,900	600	62	HD-MAX	14.500	7.750	9	15	16	36	36	2 7/16	21	56	21	11	10 ga.	3/16"	12 ga.	56
B167-536	1	12,000	11,289	600	62	HD-MAX	16.500	7.750	9	17	19	36	36	2 7/16	21	56	21	11	10 ga.	3/16"	12 ga.	56
B168-542	1	14,751	13,798	620	55	HD-MAX	16.500	8.750	10	17	19	42	42	2 7/16	23	68	23	14	3/16"	3/16"	12 ga.	72
B188-542	1	16,740	15,764	620	55	HD-MAX	18.500	8.750	10	20	22	42	42	2 7/16	26	68	26	14	3/16"	3/16"	12 ga.	72
B2108-548	2	20,648	19,164	700	55	HD-MAX	10.500	8.750	10	22	24	48	48	2 15/16	28	74	28	14	3/16"	1/4"	10 ga.	76
B2138-548	2	26,412	23,706	700	55	HD-MAX	13.500	8.750	10	28	30	48	48	2 15/16	34	74	34	14	3/16"	1/4"	10 ga.	76
B2168-548	2	33,314	31,681	700	55	HD-MAX	16.500	8.750	10	34	36	48	48	2 15/16	40	74	40	14	3/16"	1/4"	10 ga.	76
B2188-548	2	37,800	35,595	700	55	HD-MAX	18.500	8.750	10	38	40	48	48	3 7/16	44	74	44	14	3/16"	1/4"	10 ga.	76
B3168-548	3	49,971	47,521	700	55	HD-MAX	16.500	8.750	10	50	52	48	48	3 7/16	56	74	56	14	3/16"	1/4"	10 ga.	76
B4158-548	4	63,222	59,652	700	55	HD-MAX	15.500	8.750	10	62	64	48	48	3 7/16	68	74	68	14	3/16"	1/4"	10 ga.	76
B4188-548	4	75,600	71,190	700	55	HD-MAX	18.500	8.750	10	74	76	48	48	3 7/16	80	74	80	14	3/16"	1/4"	10 ga.	76

* Single Leg intermediate casing; 50' maximum height.

Head shaft diameter to be determined by customer's application and specifications.

Plastic buckets are available as Nylon, HDP, or Urethane. Steel is available on special request.

Drag Conveyors Section VII



SECTION VII

DRAG CONVEYOR SECTION VII

Click on the page number to go to the page

*Conveyors shown without cover for illustration purposes only. Please follow manufacturing safety guidelines when operating conveyors.

WARNING AND SAFETY REMINDERS FOR SCREW , DRAG , AND BUCKET ELEVATOR CONVEYORS

APPROVED FOR DISTRIBUTION BY THE SCREW CONVEYOR SECTION OF THE CONVEYOR EQUIPMENT MANUFACTURERS ASSOCIATION (CEMA)

It is the responsibility of the contractor, installer, owner and user to install, maintain and operate the conveyor, components and, conveyor assemblies in such a manner as to comply with the Williams-Steiger Occupational Safety and Health Act and with all state and local laws and ordinances and the American National Standards Institute (ANSI) B20.1 Safety Code.

In order to avoid an unsafe or hazardous condition, the assemblies or parts must be installed and operated in accordance with the following minimum provisions.

1. Conveyors shall not be operated unless all covers and/or guards for the conveyor and drive unit are in place. If the conveyor is to be opened for inspection cleaning, maintenance or observation, the electric power to the motor driving the conveyor must be LOCKED OUT in such a manner that the conveyor cannot be restarted by anyone; however remote from the area, until conveyor cover or guards and drive guards have been properly replaced.

2. If the conveyor must have an open housing as a condition of its use and application, the entire conveyor is then to be guarded by a railing or fence in accordance with ANSI standard B20.1.(Request current edition and addenda)

3. Feed openings for shovel, front loaders or other manual or mechanical equipment shall be constructed in such a way that the conveyor opening is covered by a grating. If the nature of the material is such that a grating cannot be used, then the exposed section of the conveyor is to be guarded by a railing or fence and there shall be a warning sign posted.

4. Do not attempt any maintenance or repairs of the conveyor until power has been LOCKED OUT.

5. Always operate conveyor in accordance with these instructions and those contained on the caution labels affixed to the equipment.

6. Do not place hands, feet, or any part of your body, in the conveyor.

7. Never walk on conveyor covers, grating or guards.

8. Do not use conveyor for any purpose other than that for which it was intended.

9. Do not poke or prod material into the conveyor with a bar or stick inserted through the openings.

10. Keep area around conveyor drive and control station free of debris and obstacles.

11. Eliminate all sources of stored energy (materials or devices that could cause conveyor components to move without power applied) before opening the conveyor.

12. Do not attempt to clear a jammed conveyor until power has been LOCKED OUT.

13. Do not attempt field modification of conveyor or components.

14. Conveyors are not normally manufactured or designed to handle materials that are hazardous to personnel. These materials which are hazardous include those that are explosive, flammable, toxic or otherwise dangerous to personnel. Conveyors may be designed to handle these materials. Conveyors are not manufactured or designed to comply with local, state or federal codes for unfired pressure vessels. If hazardous materials are to be conveyed or if the conveyor is to be subjected to internal or external pressure, manufacturer should be consulted prior to any modifications.

CEMA insists that disconnecting and locking out the power to the motor driving the unit provides the only real protection against injury. Secondary safety devices are available; however, the decision as to their need and the type required must be made by the owner-assembler as we have no information regarding plant wiring, plant environment, the interlocking of the screw conveyor with other equipment, extent of plant automation, etc. Other devices should not be used as a substitute for locking out the power prior to removing guards or covers. We caution that use of the secondary devices may cause employees to develop a false sense of security and fail to lock out power before removing covers or guards. This could result in a serious injury should the secondary device fail or malfunction.

There are many kinds of electrical devices for interlocking of conveyors and conveyor systems such that if one conveyor in a system or process is stopped other equipment feeding it, or following it can also be automatically stopped.

Electrical controls, machinery guards, railings, walkways, arrangement of installation, training of personnel, etc., are necessary ingredients for a safe working place. It is the responsibility of the contractor, installer, owner and user to supplement the materials and services furnished with these necessary items to make the conveyor installation comply with the law and accepted standards.

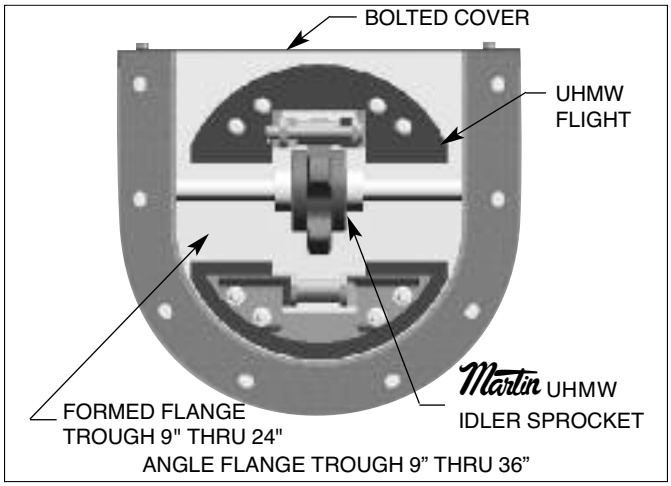
Conveyor inlet and discharge openings are designed to connect to other equipment or machinery so that the flow of material into and out of the conveyor is completely enclosed.

One or more warning labels should be visible on conveyor housings, conveyor covers and elevator housings. If the labels attached to the equipment become illegible, please order replacement warning labels from the OEM or CEMA.

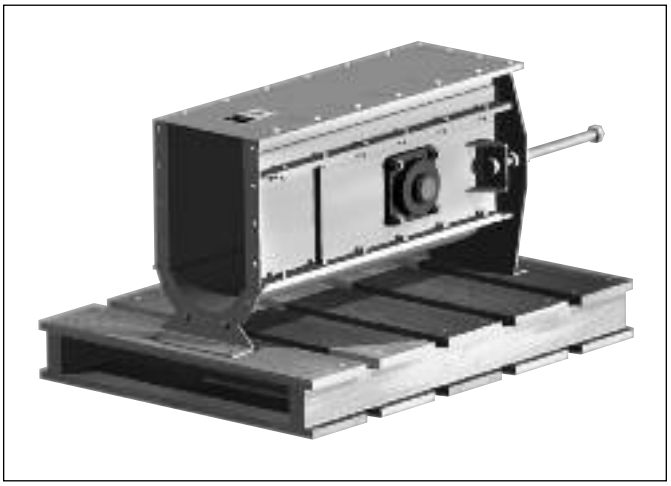
The Conveyor Equipment Manufacturers Association (CEMA) has produced an audio-visual presentation entitled “Safe Operation of Screw Conveyors, Drag Conveyors, and Bucket Elevators.” CEMA encourages acquisition and use of this source of safety information to supplement your safety program.

PROMINENTLY DISPLAY THESE SAFETY LABELS ON INSTALLED EQUIPMENT

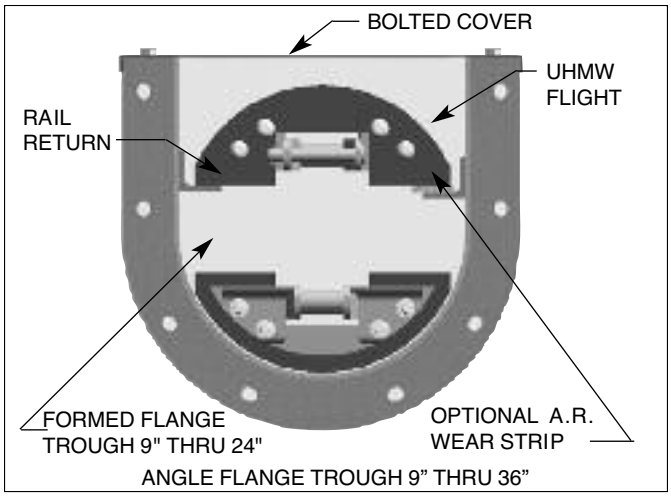
Round Bottom Drag Conveyor



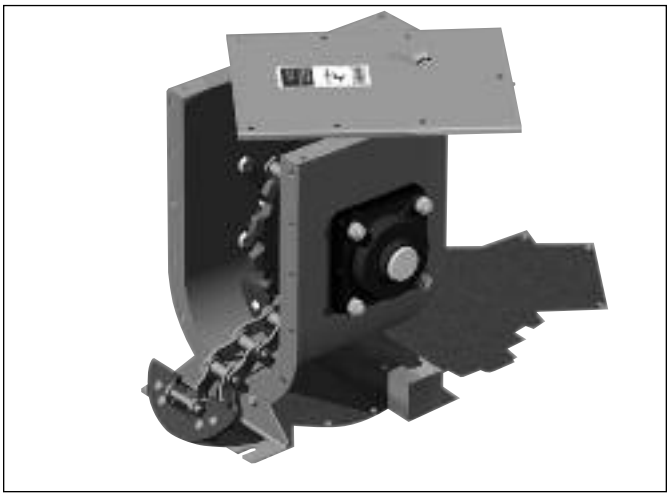
Idler Return



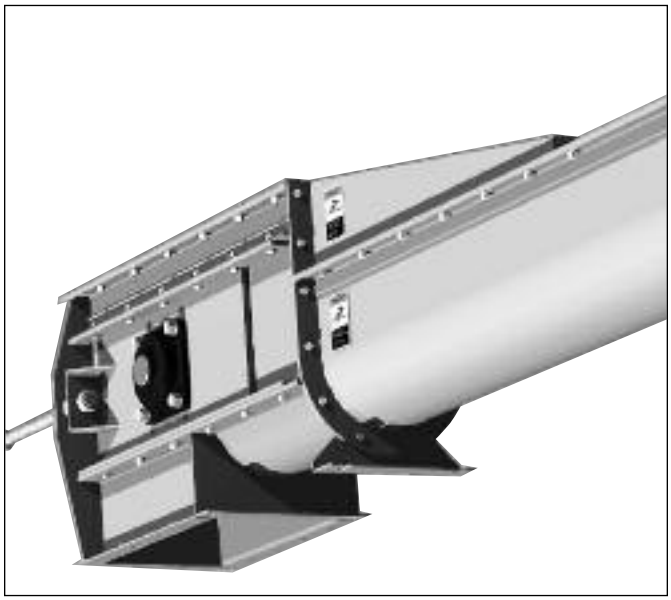
Round Bottom Tail Take-up



Rail Return



Self-Cleaning Tail



Head Take-up

Standard Features

- Bolted Flanged Covers
- Welded Steel Chain
- Jig Welded Flight Attachment
- UHMW Flights
- Heavy Duty Form Flange Trough
- Heat Treated Sprockets
- Rail Return System
- Flow Through Inlets
- Heavy Duty Backing Plate

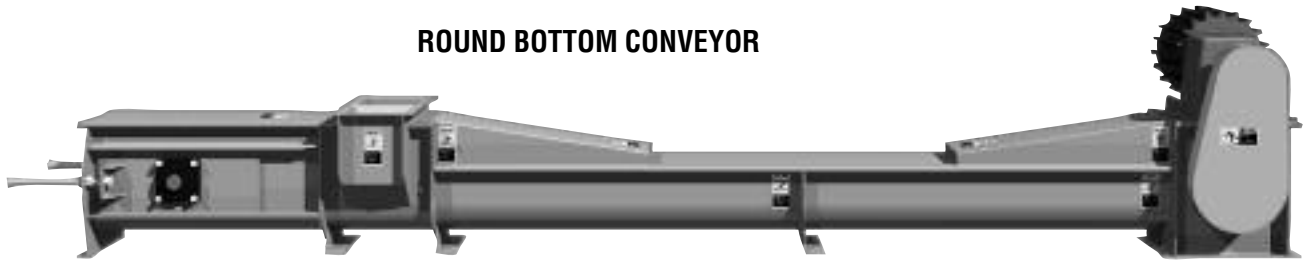
Popular Options

- By-Pass Inlets
- Hip Roof Cover
- Self-Cleaning Tail Section
- Intermediate Discharge
- Bend Section
- Flight Saver Idler Return System
- Optional A.R. Wear Strip
- Split Sprockets

*Conveyors shown without cover for illustration purposes only. Please follow manufacturing safety guidelines when operating conveyors.

Round Bottom Drag Conveyor

ROUND BOTTOM CONVEYOR



Capacity FPM/RPM

Series	Size	100 FPM		125 FPM		150 FPM		175 FPM		200FPM	
		CFH	RPM	CFH	RPM	CFH	RPM	CFH	RPM	CFH	RPM
900	9″	2040	33	2600	41	3050	50	3500	58	4080	66
1200	12″	3475	33	4300	41	5200	50	6075	58	6950	66
1400	14″	4750	33	5900	40	7100	50	8300	58	9500	66
1600	16″	6050	32	7600	40	9150	48	10600	56	12100	64
1800	18″	8100	32	10150	40	12300	48	14300	56	16200	64
2000	20″	10500	23	13000	29	15650	35	18200	40	21000	46
2400	24″	14800	23	18150	29	22000	35	25750	40	29600	46

Note: Dimensions not certified for construction.

NOTES:

1. *Capacities are based on 100% loading with free-flowing grains at 48 pounds per cubic foot.*
2. *Selection of conveyors should be based upon material characteristics.*
3. *Capacities and speeds will vary for other types of materials and for materials conveyed at an incline.*

Please consult Martin if you have any questions concerning your application.

Material Thickness and Approximate Shipping Weights

Series	Adj. Tail	Weight[1]	Bypass	Weight	Fixed Head	Weight	Intermediate				Cover
							Standard Duty	Weight[2]	Specific Duty	Weight[3]	
900	3/16	367	3/16	89	3/16″	187	14 ga.	185	3/16	255	14 ga.
1200	3/16	394	3/16	127	3/16″	210	12 ga.	285	3/16	420	14 ga.
1400	3/16	412	3/16	140	3/16″	221	12 ga.	310	3/16	460	14 ga.
1600	3/16	475	3/16	160	3/16″	257	12 ga.	365	3/16	520	14 ga.
1800	3/16	575	3/16	238	3/16″	281	10 ga.	507	3/16	640	12 ga.
2000	1/4	856	3/16	295	3/16″	486	10 ga.	578	3/16	705	12 ga.
2400	1/4	899	3/16	370	3/16″	665	10 ga.	742	3/16	870	12 ga.

NOTES:

1. *Tail and head weights shown include bearings, shafts, and standard sprockets.*
2. *Intermediate weights include return rails and bolted covers.*

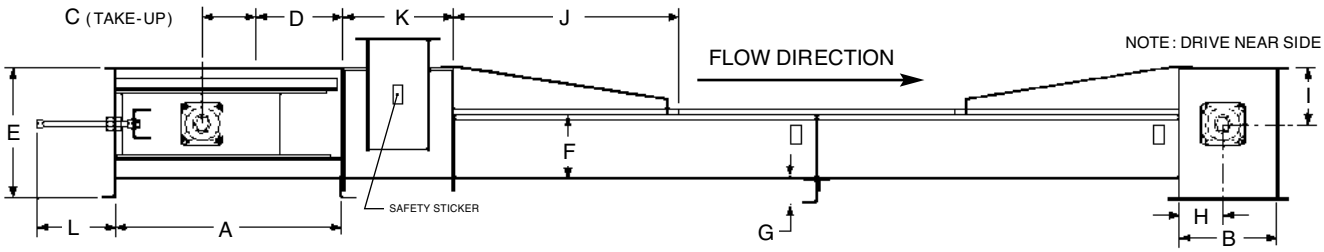
6", 30", and 36" Drag conveyors are also available upon request. Please contact Martin for quote.

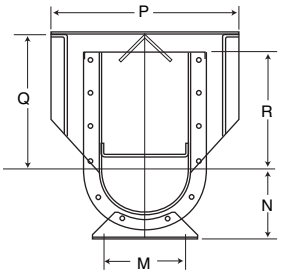
Martin has designed its Round Bottom with the user in mind. We have incorporated larger heat-treated sprockets into our designs to reduce noise, vibration and chordal action while increasing chain and sprocket life. Our goal is to reduce maintenance and operating costs for the user.

We offer the Martin Round Bottom Drag with either a rail return or optional Flight Saver Idler return system. Both systems assure long life and quiet operation.

All drag flights are a (food safe) white UHMW polyethylene material attached to welded steel chain, with exception of the 6" drag conveyor which uses combination chain.

Round Bottom Drag Conveyor



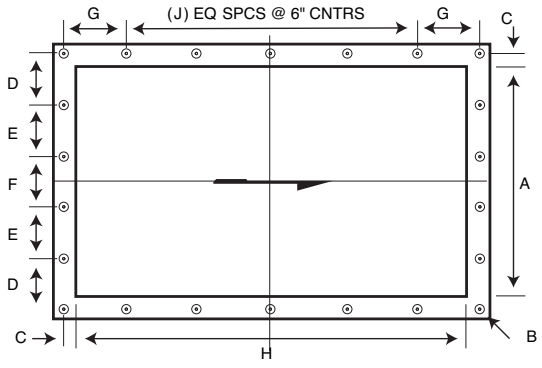


BY-PASS INLET

SERIES	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	R
900	38	18	9	14¼	21⅝	11⅛	3³⁄₁₆	9	9⁵⁄₁₆	36	18	13	9⅜	8⅜	20⅞	15⅓	13⁵⁄₁₆
1200	38	20	9	14¼	23¾	14¼	2¹⁵⁄₁₆	10	9¹³⁄₁₆	36	21	13	12¼	9½	24⅜	15⅓	13⁵⁄₁₆
1400	38	20	9	14¼	24	16¾	3³⁄₁₆	10	10⁵⁄₁₆	36	23	13	13½	10¾	24⅜	15⅓	13⁵⁄₁₆
1600	38	24	9	14¼	26	19⅛	3⁵⁄₁₆	12	11⁵⁄₁₆	36	25	13	14⅞	11⅞	28⅜	16¼	14¼
1800	38	24	9	14¼	27½	21⅝	3¹¹⁄₁₆	22	11¹³⁄₁₆	24	27	13	16	13¼	29	16	14¼
2000	41	29	12	16	33¼	24	4¼	14½	14⅞	24	29	16	19¼	14⅞	34	20½	18½
2400	41	34	12	16	36½	29	5⁷⁄₁₆	17	15¹³⁄₁₆	24	33	16	20	18¹⁄₁₆	39	20⅝	18⅝

SERIES	A	B	C	D	E	F	G	H	J
900	10	7⁄16	1	4	—	4	4	18	2
1200	13	7⁄16	1¼	5⅛	—	5¼	5¼	20	2
1400	15	7⁄16	1¼	3½	3½	3½	5¼	20	2
1600	17	7⁄16	1¼	3¾	4	4	3⅝	24	2
1800	19	7⁄16	1¼	4³⁄₁₆	4⅜	4⅜	3⅝	24	2
2000	21	9⁄16	1½	4⅞	4¾	4¾	4	29	4
2400	25	9⁄16	1½	5⅝	5⅝	5½	6½	34	4

NOTE: Dimensions not certified for construction.



BY-PASS INLET, HEAD & INTERMEDIATE DISCHARGE

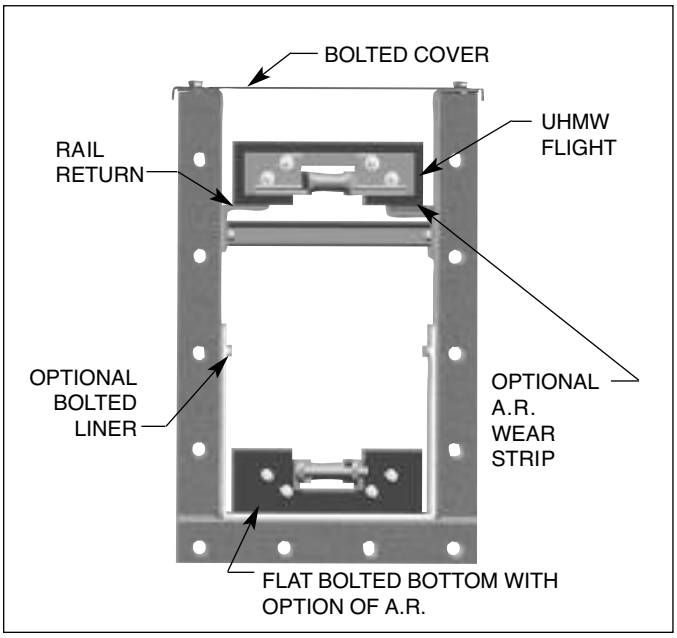
WARNING AND SAFETY REMINDER

LOCK OUT POWER before removing covers, guards or before servicing. Exposed moving parts can cause severe injury.

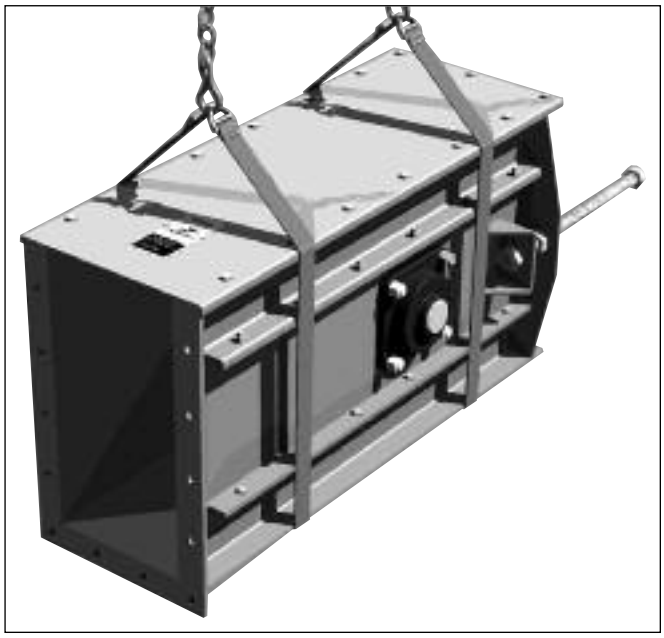
Note: Dimensions not certified for construction.

*Conveyors shown without cover for illustration purposes only. Please follow manufacturing safety guidelines when operating conveyors.

Flat Bottom Drag Conveyor



Rail Return



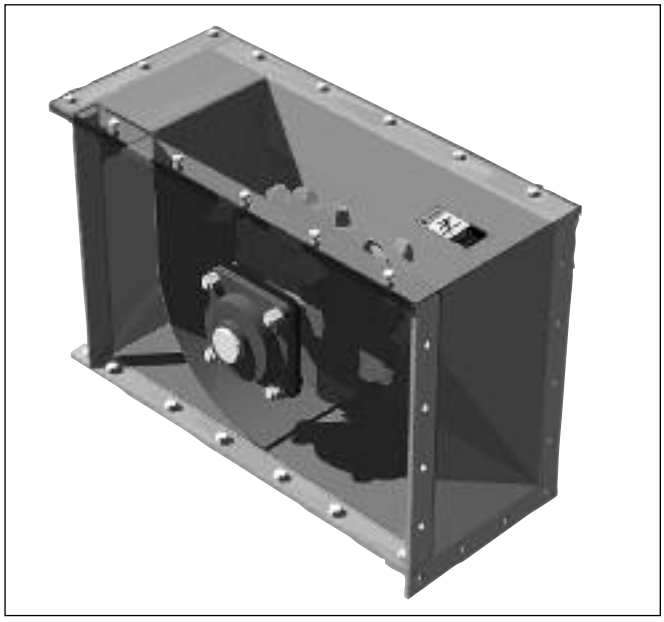
Flat Bottom Tail Take-Up

Standard Features

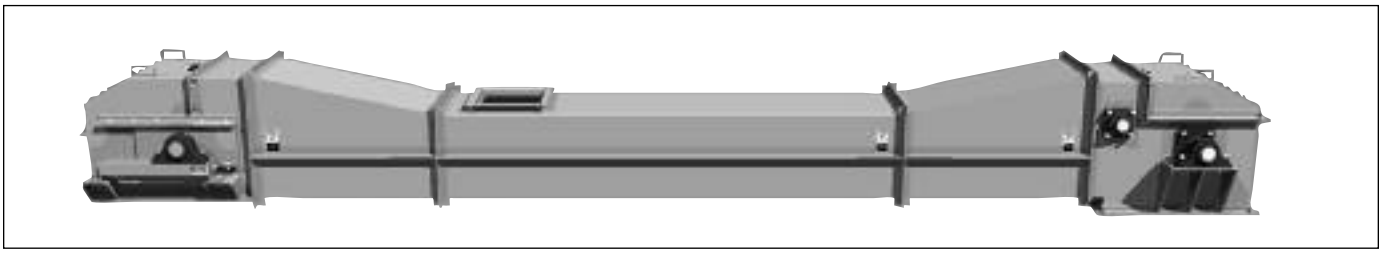
- Bolted Replaceable Bottom
- Bolted Flanged Covers
- Jig Welded Flight Attachment
- UHMW Flights
- Heat Treated Sprockets
- Rail Return System
- Flow Through Inlets
- Heavy Duty Backing Plate

Popular Options

- Intermediate Discharge
- Liners of Various Materials
- A.R. Steel Bottom Plate
- Controlled Feed Inlets
- Split Sprockets



Self-Cleaning Tail



Super Duty Conveyor

*Conveyors shown without cover for illustration purposes only. Please follow manufacturing safety guidelines when operating conveyors.

Flat Bottom Drag Conveyor

Flat Bottom Conveyor

SERIES	1 FPM	100 FPM		125 FPM		150 FPM		175 FPM		200 FPM	
	CFH	CFH	RPM	CFH	RPM	CFH	RPM	CFH	RPM	CFH	RPM
1809	28.13	2,813	37	3,516	46	4,220	55	4,923	65	5,626	74
2409	54.38	5,438	27	6,798	34	8,157	40	9,517	47	10,876	54
2412	68.25	6,825	27	8,531	34	10,238	40	11,944	47	13,650	54
2414	78.75	7,875	27	9,844	34	11,813	40	13,781	47	15,750	54
2416	89.25	8,925	27	11,156	34	13,388	40	15,619	47	17,850	54
2418	96.19	9,619	27	12,024	34	14,429	40	16,833	47	19,238	54
3016	111.56	11,156	23	13,945	29	16,734	34	19,523	40	22,312	46
3018	121.13	12,113	23	15,141	29	18,170	34	21,198	40	24,226	46
3020	133.88	13,388	23	16,735	29	20,082	34	23,429	40	26,776	46
3024	159.38	15,938	23	19,923	29	23,907	34	27,892	40	31,876	46

NOTES:

1. *Capacities are based on 90% loading with free-flowing grains at 48 pounds per cubic foot.*
2. *Selection of conveyors should be based upon material characteristics.*
3. *Capacities and speeds will vary for other types of materials and for materials conveyed at an incline.*
4. *Capacities at 90% bed depth.*

Please consult Martin if you have any questions concerning your application.

MATERIAL THICKNESS & APPROXIMATE SHIPPING WEIGHTS							
SERIES	ADJ. TAIL	WGT.	HEAD	WGT.	INTERMEDIATE		COVER
					STD. DUTY	WGT.	
1809	10 GA.	333	10 GA.	206	10 GA.	403	14 GA.
2409	10 GA.	432	10 GA.	277	10 GA.	460	14 GA.
2412	10 GA.	454	10 GA.	306	10 GA.	492	14 GA.
2414	10 GA.	467	10 GA.	315	10 GA.	514	14 GA.
2416	10 GA.	482	10 GA.	322	10 GA.	532	14 GA.
2418	10 GA.	497	10 GA.	335	10 GA.	544	12 GA.
3016	3/16	642	3/16	438	10 GA.	655	12 GA.
3018	3/16	655	3/16	452	10 GA.	679	12 GA.
3020	3/16	690	3/16	485	10 GA.	703	12 GA.
3024	3/16	749	3/16	613	10 GA.	745	12 GA.

NOTES:

1. *Tail and head weights shown include bearings, shafts and standard sprockets.*
2. *Intermediate weights include return rails, and bolted covers.*

Warning And Safety Reminder

LOCK OUT POWER before removing covers, guards or before servicing. Exposed moving parts can cause severe injury.

Martin offers a complete line of standard Flat Bottom Drags to handle capacities up to 31,876 CFH.

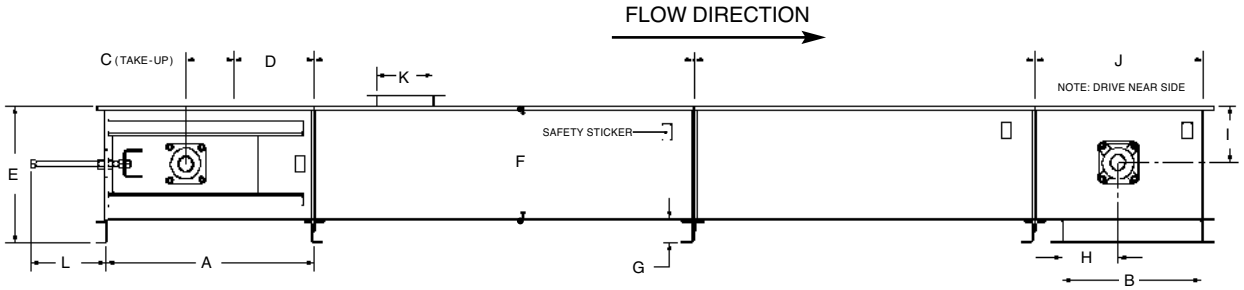
Martin Super Duty Flat Bottom drags have been successfully used in applications with conveyors reaching lengths of over 660 feet and large capacities.

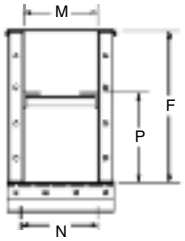
The Martin Flat Bottom drag conveyor is constructed with heavy-duty formed channel sides, with replaceable bolted bottoms and covers. The replaceable rail return system is offered with an optional rail liner when wear is a concern.

The Martin Flat Bottom drag conveyor is especially suited for handling free flowing grains. When heavier abrasive materials need to be conveyed, contact Martin about our Mill Duty Drag conveyor with Forged Chain.

Note: Dimensions not certified for construction.

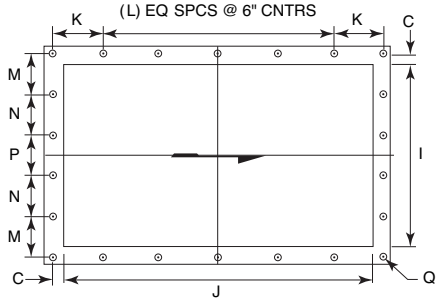
Flat Bottom Drag Conveyor



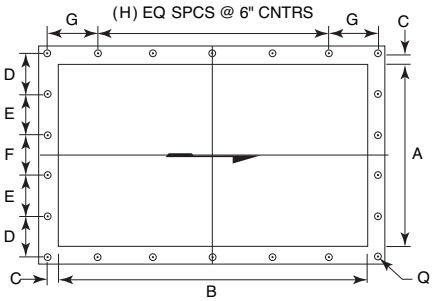


Flat Intermediate

SERIES	A	B	C	E	F	G	H	I	J	K	L	M	N	P
1809	37	25	9	18½	14¼	4	17¾	7¼	30	16	13	10	9⅜	9
2409	37	25	9	24½	20¼	4	15	10⅛	30	16	13	10	9⅜	16
2412	37	30	9	24½	20¼	4	17½	10⅛	35	18	13	13	12¼	16
2414	37	30	9	24½	20¼	4	17½	10⅛	35	20	13	15	13½	16
2416	37	30	9	24½	20¼	4	17½	10⅛	35	22	13	17	14⅞	16
2418	37	30	9	24½	20¼	4	17½	10⅛	35	25	13	19	16	16
3016	37	36	9	29½	25¼	4	20½	12⅝	41	22	13	17	14⅞	19½
3018	37	36	9	29½	25¼	4	20½	12⅝	41	25	13	19	16	19½
3020	37	36	9	29½	25¼	4	20½	12⅝	41	27	13	21	19¼	19½
3024	37	36	9	29½	25¼	4	20½	12⅝	41	31	13	25	20	19½



Head & Intermediate Discharge

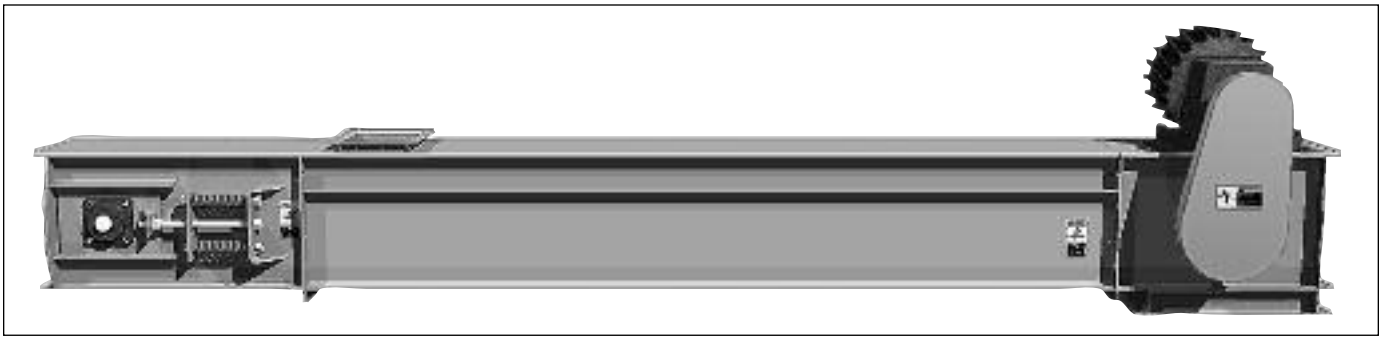


Standard Inlet

SERIES	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q
1809	7	16	1	4½	***	***	3	2	10	25	3½	3	4	***	4	7/16
2409	7	16	1	4½	***	***	3	2	10	25	3½	3	4	***	4	7/16
2412	10	18	1¼	4	***	***	4¼	2	13	30	4¼	4	5⅛	***	5¼	7/16
2414	12	20	1¼	4½	***	***	5¼	2	15	30	4¼	4	3½	3½	3½	7/16
2416	14	22	1¼	3¼	3¼	3¼	3¼	3	17	30	4¼	4	3¾	4	4	7/16
2418	15	25	1½	3½	3½	3½	5	3	19	30	4¼	4	4 7/16	4⅜	4⅜	9/16
3016	14	22	1½	3¼	3¼	3¼	3¼	3	17	36	4½	5	3¾	4	4	7/16
3018	15	25	1½	3½	3½	3½	5	3	19	36	4½	5	4 7/16	4⅜	4⅜	9/16
3020	17	27	1½	4	4	4	6	3	21	36	4½	5	4⅞	4¾	4¾	9/16
3024	21	31	1½	3¾	3¾	3¾	5	4	25	36	4½	5	5⅝	5½	5½	9/16

Note: Dimensions not certified for construction.

Flat Bottom Drag Conveyor



Mill Duty Conveyor

Standard Features

- Forged Chain and Steel Flights
- A.R. Steel Return Tray or Rail Return System
- Spring Loaded Take-up
- Split Sprockets

Popular Options

- A.R. Steel Side Liners
- By-pass Inlet
- Self-cleaning Tail

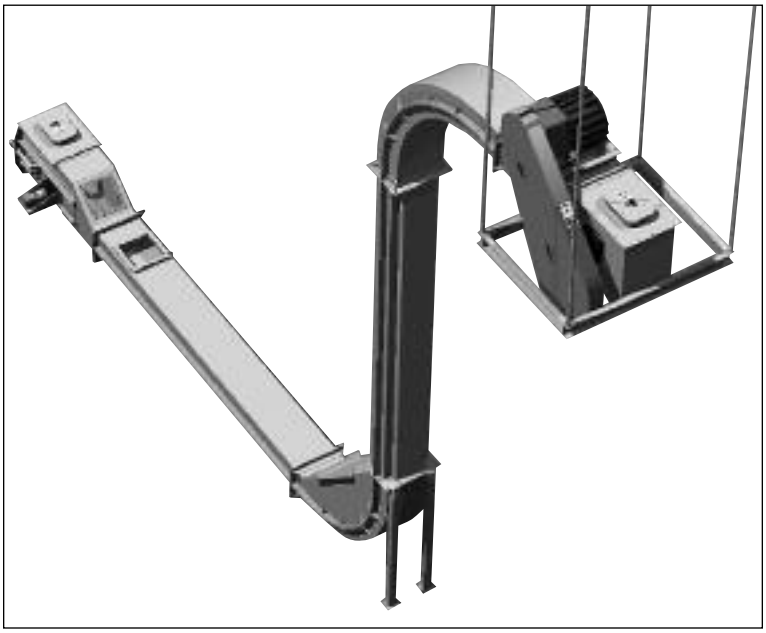
The Martin Mill Duty Drag is designed for handling heavy and abrasive materials, such as limestone, aggregate, and sand.

Please consult Martin if you have any questions concerning your application.

Capacities and Speeds					
SERIES	FPM	25 FPM		50 FPM	
	CFH	CFH	RPM	CFH	RPM
1200 MD	58	1400	8	2800	16
1600 MD	96	2400	7.5	4800	15
2000 MD	130	3250	5	6500	10
2400 MD	192	4800	5	9600	10

Warning And Safety Reminder

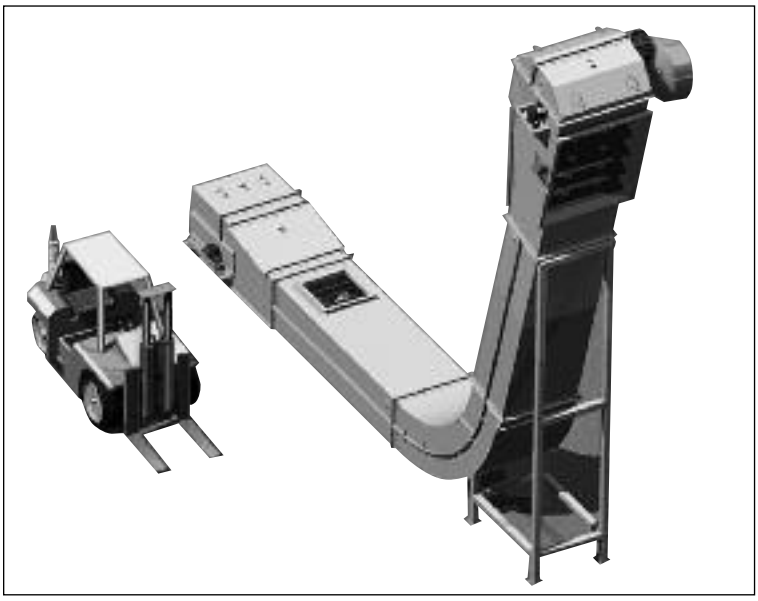
LOCK OUT POWER before removing covers, guards or before servicing. Exposed moving parts can cause severe injury.



Special Application Drag

Martin-Built Take-up

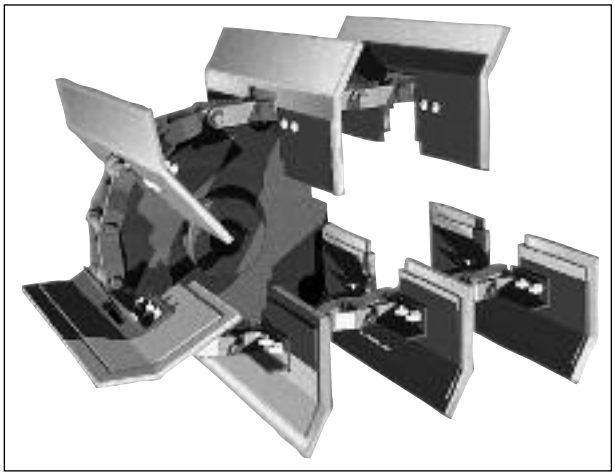
L-Path Drag Conveyor



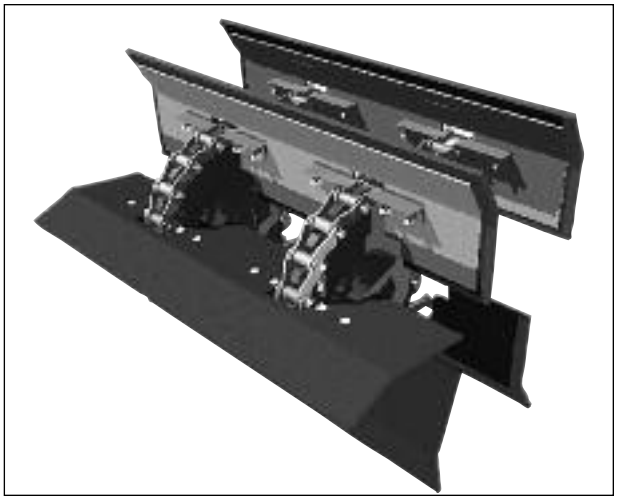
L-Path Conveyor

S-Path Conveyor

Series	1FPM	50 FPM		75 FPM		100 FPM	
	CFH	CFH	RPM	CFH	RPM	CFH	RPM
57	12	600	17	900	26	1200	35
610	20	1000	11	1500	16-1/2	2000	22
913	35	1750	8	2625	12	3500	16
1020	58	2900	11	4350	16-1/2	5800	22
1224	87	4350	11	6525	16-1/2	8700	22
1236	129	6450	10	9675	15	12900	20
1342	150	7500	10	11250	15	15000	20



Single Chain Configuration



Double Chain Configuration

NOTES:

1. Capacities are based on the handling of non-abrasive materials (as listed).

- *Cotton Seed Hulls • Cotton Seed Meal • Delinted Cotton Seed*
- *Ground Feed • Whole Soybeans • Hot Soybean Meal*
- *Whole Corn • Whole Rice*

2. ***CAUTION*** *should be observed when handling fine granular materials (as listed).*

- *Wheat Flour • Sugar • Powdered Lime • Starch*
- *Carbon Black • Soda Ash*

CHAIN FEATURES

- Welded Steel or Forged Chain
- UHMW Flights
- Jig Welded Attachments
- Heavy Duty Backing Plates

Please consult Martin if you have any questions concerning your application.

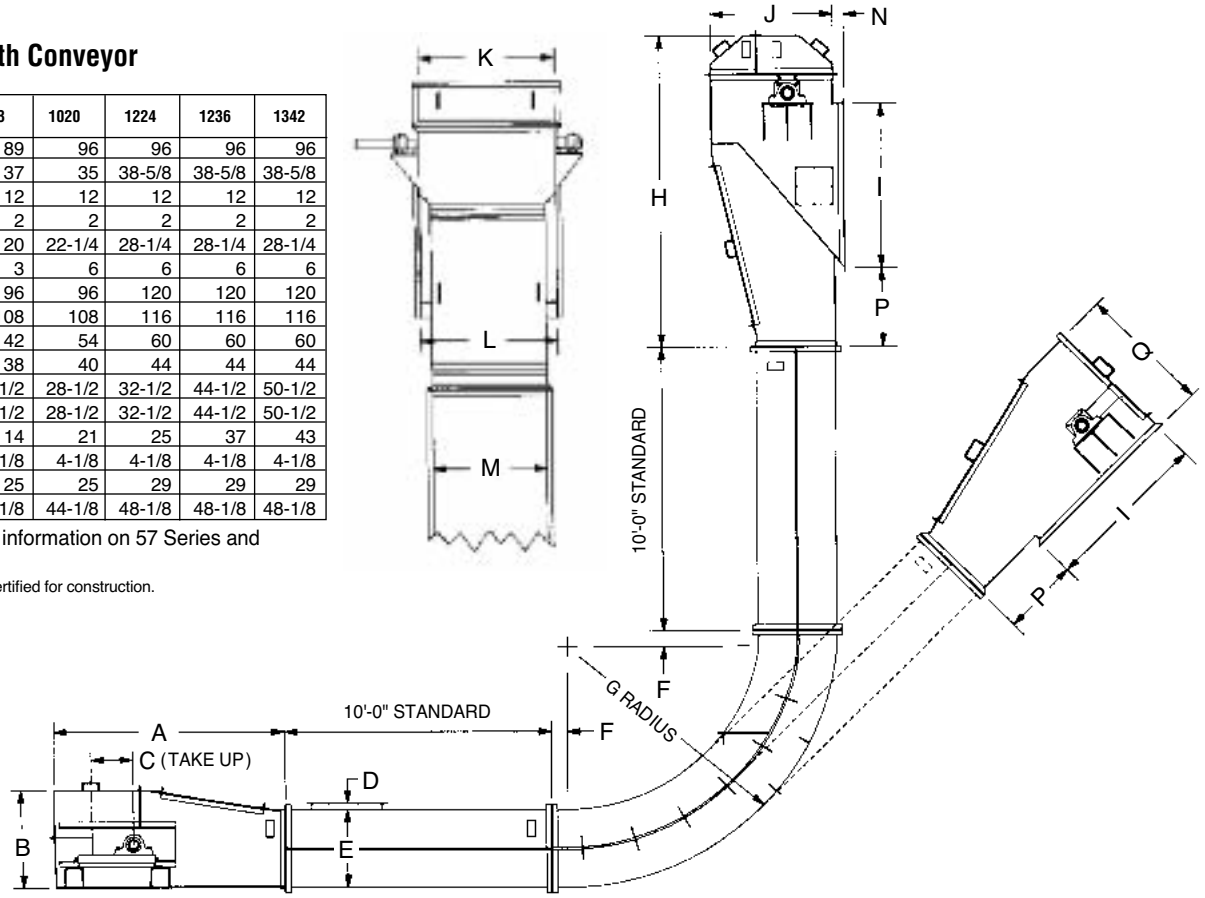
L-Path
Drag Conveyor

L-Path Conveyor

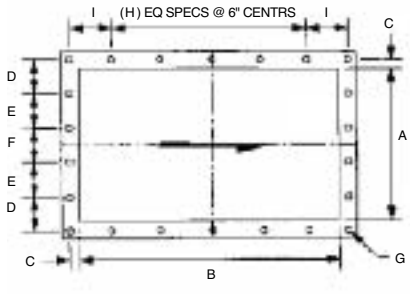
Series	610	913	1020	1224	1236	1342
A	68	89	96	96	96	96
B	29	37	35	38-5/8	38-5/8	38-5/8
C	12	12	12	12	12	12
D	2	2	2	2	2	2
E	14-1/2	20	22-1/4	28-1/4	28-1/4	28-1/4
F	3	3	6	6	6	6
G	96	96	96	120	120	120
H	82	108	108	116	116	116
I	36	42	54	60	60	60
J	32	38	40	44	44	44
K	18-3/4	22-1/2	28-1/2	32-1/2	44-1/2	50-1/2
L	18-3/4	22-1/2	28-1/2	32-1/2	44-1/2	50-1/2
M	11	14	21	25	37	43
N	4-1/8	4-1/8	4-1/8	4-1/8	4-1/8	4-1/8
P	21-1/2	25	25	29	29	29
Q	36-1/8	42-1/8	44-1/8	48-1/8	48-1/8	48-1/8

Consult factory for information on 57 Series and other sizes.

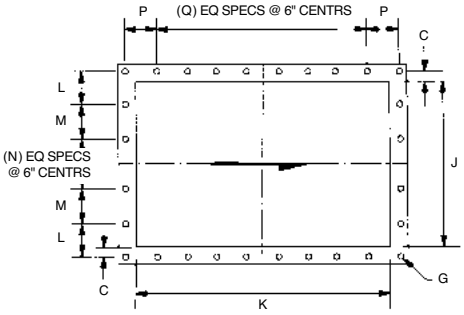
Note: Dimensions not certified for construction.



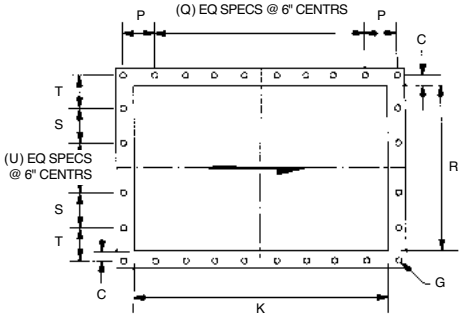
Standard Inlet



Head Discharge 45º–90º

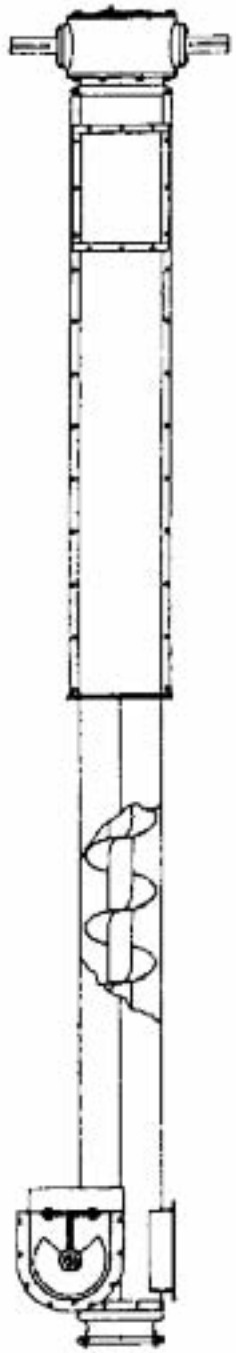


Head Discharge 0º–45º



SERIES	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	R	S	T	U
610	7	16	1	4½	***	***	7/16	2	3	18¾	36	4⅜	***	2	4	5	11	***	3½	3½
913	10	18	1¼	4	***	4½	7/16	2	4¼	22½	42	4⅜	4¾	1	4¼	6	14	4¾	3½	1
1020	17	27	1½	4	4	4	9/16	3	6	29	54	4	***	4	4½	8	21	4½	4½	1
1224	21	31	1½	4¾	4¾	5	9/16	4	5	33	60	***	***	6	4½	9	25	***	5	3
1236	33	43	1½	4½	6	6	9/16	6	5	45	60	***	***	8	4½	9	37	***	5	5
1342	38	48	1½	5½	6	6	9/16	7	4½	51	60	4½	4½	6	4½	9	43	4	4	5

Note: Dimensions not certified for construction.



Standard Screw Elevator

SECTION VIII

VERTICAL SCREW ELEVATOR SECTION VIII

Click on the page number to go to the page

Warning & Safety Reminder

WARNING AND SAFETY REMINDERS FOR SCREW , DRAG , AND BUCKET ELEVATOR CONVEYORS

APPROVED FOR DISTRIBUTION BY THE SCREW CONVEYOR SECTION OF THE CONVEYOR EQUIPMENT MANUFACTURERS ASSOCIATION (CEMA)

It is the responsibility of the contractor, installer, owner and user to install, maintain and operate the conveyor, components and, conveyor assemblies in such a manner as to comply with the Williams-Steiger Occupational Safety and Health Act and with all state and local laws and ordinances and the American National Standards Institute (ANSI) B20.1 Safety Code.

In order to avoid an unsafe or hazardous condition, the assemblies or parts must be installed and operated in accordance with the following minimum provisions.

1. Conveyors shall not be operated unless all covers and/or guards for the conveyor and drive unit are in place. If the conveyor is to be opened for inspection cleaning, maintenance or observation, the electric power to the motor driving the conveyor must be LOCKED OUT in such a manner that the conveyor cannot be restarted by anyone; however remote from the area, until conveyor cover or guards and drive guards have been properly replaced.

2. If the conveyor must have an open housing as a condition of its use and application, the entire conveyor is then to be guarded by a railing or fence in accordance with ANSI standard B20.1.(Request current edition and addenda)

3. Feed openings for shovel, front loaders or other manual or mechanical equipment shall be constructed in such a way that the conveyor opening is covered by a grating. If the nature of the material is such that a grating cannot be used, then the exposed section of the conveyor is to be guarded by a railing or fence and there shall be a warning sign posted.

4. Do not attempt any maintenance or repairs of the conveyor until power has been LOCKED OUT.

5. Always operate conveyor in accordance with these instructions and those contained on the caution labels affixed to the equipment.

6. Do not place hands, feet, or any part of your body, in the conveyor.

7. Never walk on conveyor covers, grating or guards.

8. Do not use conveyor for any purpose other than that for which it was intended.

9. Do not poke or prod material into the conveyor with a bar or stick inserted through the openings.

10. Keep area around conveyor drive and control station free of debris and obstacles.

11. Eliminate all sources of stored energy (materials or devices that could cause conveyor components to move without power applied) before opening the conveyor.

12. Do not attempt to clear a jammed conveyor until power has been LOCKED OUT.

13. Do not attempt field modification of conveyor or components.

14. Conveyors are not normally manufactured or designed to handle materials that are hazardous to personnel. These materials which are hazardous include those that are explosive, flammable, toxic or otherwise dangerous to personnel. Conveyors may be designed to handle these materials. Conveyors are not manufactured or designed to comply with local, state or federal codes for unfired pressure vessels. If hazardous materials are to be conveyed or if the conveyor is to be subjected to internal or external pressure, manufacturer should be consulted prior to any modifications.

CEMA insists that disconnecting and locking out the power to the motor driving the unit provides the only real protection against injury. Secondary safety devices are available; however, the decision as to their need and the type required must be made by the owner-assembler as we have no information regarding plant wiring, plant environment, the interlocking of the screw conveyor with other equipment, extent of plant automation, etc. Other devices should not be used as a substitute for locking out the power prior to removing guards or covers. We caution that use of the secondary devices may cause employees to develop a false sense of security and fail to lock out power before removing covers or guards. This could result in a serious injury should the secondary device fail or malfunction.

There are many kinds of electrical devices for interlocking of conveyors and conveyor systems such that if one conveyor in a system or process is stopped other equipment feeding it, or following it can also be automatically stopped.

Electrical controls, machinery guards, railings, walkways, arrangement of installation, training of personnel, etc., are necessary ingredients for a safe working place. It is the responsibility of the contractor, installer, owner and user to supplement the materials and services furnished with these necessary items to make the conveyor installation comply with the law and accepted standards.

Conveyor inlet and discharge openings are designed to connect to other equipment or machinery so that the flow of material into and out of the conveyor is completely enclosed.

One or more warning labels should be visible on conveyor housings, conveyor covers and elevator housings. If the labels attached to the equipment become illegible, please order replacement warning labels from the OEM or CEMA.

The Conveyor Equipment Manufacturers Association (CEMA) has produced an audio-visual presentation entitled “Safe Operation of Screw Conveyors, Drag Conveyors, and Bucket Elevators.” CEMA encourages acquisition and use of this source of safety information to supplement your safety program.

PROMINENTLY DISPLAY THESE SAFETY LABELS ON INSTALLED EQUIPMENT

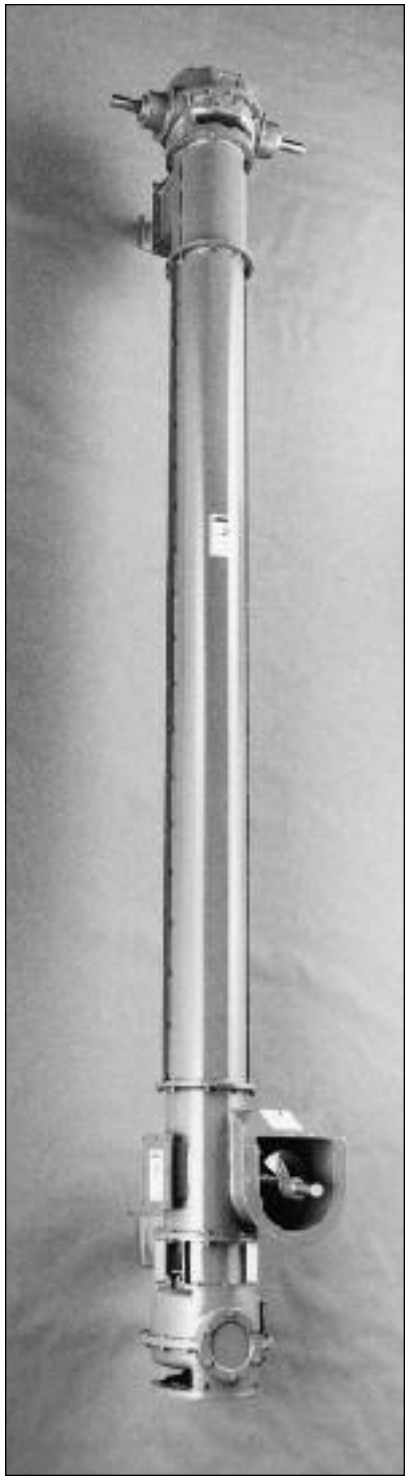
Martin Screw Elevators

For over fifty years, Martin Standard Screw Elevators have been successfully elevating a wide range of materials. In 1956, we added the heavier duty Superscrew Elevator, giving our customers the ability to elevate larger capacities to greater heights.

The Martin Screw Elevator is ideally suited to elevate a wide range of bulk materials in a relatively small space. If a material can be classified as very free flowing or free flowing, it can probably be elevated in a Screw Elevator.

We offer both our Standard and Superscrew Elevators with several different drive arrangements to meet our customers' individual requirements. Martin has an experienced staff in over twenty locations throughout the U.S.A. and Canada that can help you design the right screw elevator for your application. We have the capability of manufacturing our screw elevators in six locations in the U.S.A.

Contact your nearest Martin facility with your application information and we will design the right elevator for your needs.



Type 4
Superscrew Elevator

Partial Material List

Alfalfa Meal	Mixed Feeds
Barley, Malted	Mustard Seed
Bone Meal	Oats
Cement	Paper Pulp
Coffee	Peanuts
Corn Meal	Resin
Cotton Seed	Rubber, Ground
Cryolite	Salt
Flours	Sawdust
Grains	Screened Wood Chips
Hops	Shellac, Powder
Ice	Soda Ash
Kaolin Clay	Soybean Meal
Lead Oxide	Sugar
Lime	Sunflower Seeds
Malt	Tobacco
Mica	Wheat
Milk, Dried	Wood Flour

*Conveyors shown without cover for illustration purposes only. Please follow manufacturing safety guidelines when operating conveyors.

Martin Screw Elevators

To help better meet the needs of our customers, we offer both the Martin Standard and Superscrew Elevators in sixteen different types. The different types allow us to vary the drive location, discharge location and feed arrangement. We are also able to drive the feeder or take-away conveyor by the screw elevator drive.

The Martin Screw Elevators are easy to install because they are factory assembled, match-marked and disassembled prior to shipment. All Martin Screw Elevators are of a sturdy self-supporting design and only need lateral support when installed.

The drives for the Martin Standard and Superscrew Elevators are manufactured by Martin and are specifically designed for use with our screw elevators. We can also offer a Screw Conveyor Drive arrangement for lighter duty applications.

Standard Screw Elevator Types

Type B
Straight Inlet
Top Drive,
Pedestal Base

Type BO
Offset Inlet
Top Drive,
Pedestal Base

Type AF1
Straight Inlet Top
Drive, Bottom P.T.O.
w/4′-0″ Feeder
And Drive

Type AF2
Offset Inlet
Top Drive,
Bottom P.T.O.
With Drive

Type EAF1
Straight Inlet
Bottom Drive,
Thrust Head

Type HAF2
Offset Inlet
Bottom Drive,
Thrust Head
With Drive

Type GAF1
Straight Inlet
Bottom Drive,
Thrust Head w/4′-0″
Feeder And Drive

Type IAF-2
Offset Inlet
Bottom Drive,
Thrust Head

SuperScrew Elevator Types

Type 1
Straight Inlet
Top Drive,
Pedestal Base

Type 2
Offset Inlet
Top Drive,
Pedestal Base

Type 3
Straight Inlet Top
Drive, Bottom P.T.O.
w/4′-0″ Feeder
And Drive

Type 4
Offset Inlet
Top Drive,
Bottom P.T.O.
With Drive

Type 5
Straight Inlet
Bottom Drive,
Thrust Head

Type 6
Offset Inlet
Bottom Drive,
Thrust Head

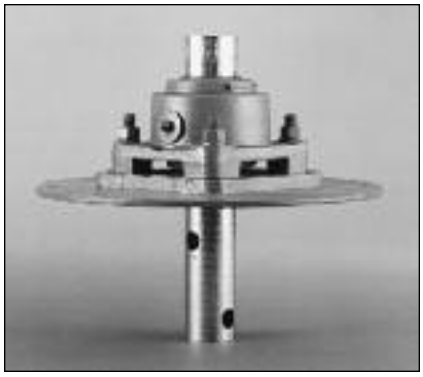
Type 7
Straight Inlet
Bottom Drive,
Thrust Head w/4′-0″
Feeder And Drive

Type 8
Offset Inlet
Bottom Drive,
Thrust Head
With Drive

NOTE: All elevators are furnished less feeder and/or feeder drive unless otherwise specified.

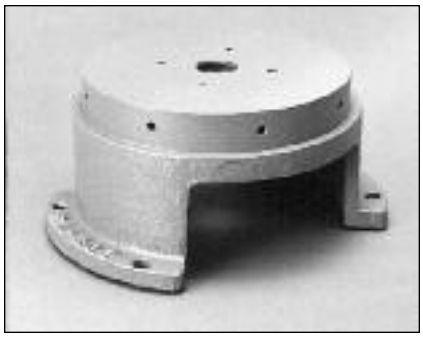
CAUTION: Never operate without covers and guards. Always LOCKOUT/TAGOUT electrical power when working on equipment for inspection, cleaning, maintenance, or other purposes.

Screw Elevator



Standard Screw Thrust Unit

Stabilizer Bearing Used on Standard Screw Elevator



Standard Screw Pedestal Base

Standard Screw Thrust Head

All Martin Screw Elevators come with heavy duty helicoid or sectional screws which are checked for straightness and run-out to ensure a smooth running elevator. When handling free flowing material, we add stabilizers as needed, as the height of the elevator increases. The stabilizer bearings are available in a wide range of bearing materials to meet our customers' requirements, including wood, hard iron, bronze, UHMW, and others.

Both the Martin Standard Screw and Superscrew Elevators are supplied with split intermediate housing to allow easier maintenance.

Martin's specially engineered inlet/bottom section assures a smooth transfer to conveyed material from the horizontal to vertical with a minimum of back-up and product degradation.

The bottom inspection panel is bolted to minimize any product leakage. It also has a shroud to assure that the conveyed material is moving smoothly through the area.

The drives for both the Standard Screw and the Superscrew Elevator are manufactured by Martin to guarantee their quality and availability.

Clearance Between Screw and Housing

Size	Type of Housing	Clearance	Standard Elevator			Super Screw Elevator		
			Intermediate	Top and Bottom Sectons	Screw	Intermediate	Top and Bottom Sectons	Screw
6	Standard Clearance	1/2	14	14	6H304	14	10	6H304
	Close Fitting Clearance	1/4	14	14	6.5S312*	14	10	6.5S312*
9	Standard Clearance	1/2	12	12	9H306	12	3/16	9H306
	Close Fitting Clearance	1/4	12	12	9.5S312*	12	3/16	9.5S312*
12	Standard Clearance	1/2	10	10	12H408	10	3/16	12H408
	Close Fitting Clearance	1/4	10	10	12.5S412*	10	3/16	12.5S412*
16	Standard Clearance	1/2				10	3/16	16H610
	Close Fitting Clearance	1/4				10	3/16	16.5S612*

* Close clearance sectional screws supplied as required.

Standard Screw Elevator

The Martin Standard Screw Elevator is designed to handle under normal conditions, capacities ranging from 360 CFH to 3600 CFH in 6″ dia., 9″ dia., and 12″ dia. sizes. With complete information, Martin engineering staff can help you design the right Screw Elevator for your application.

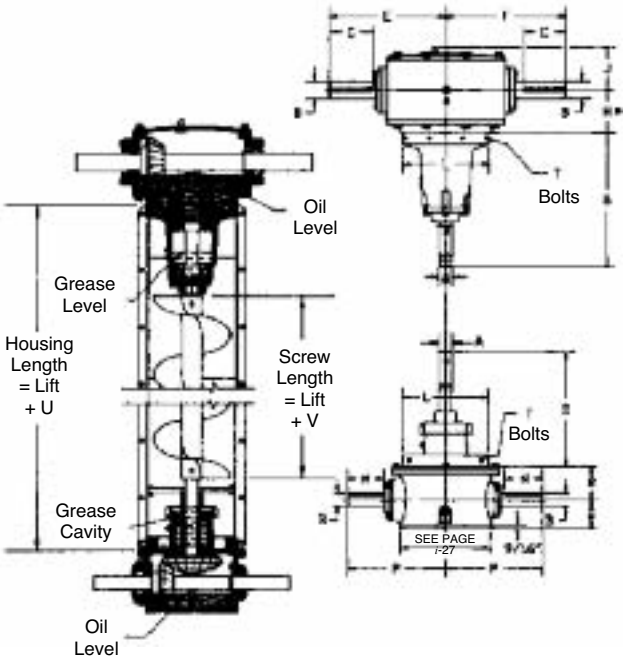
Martin Standard Screw Elevator Speed / Capacity

Size	Vertical Shaft Diameter	Ratio Top Drive	Ratio Bottom Drive	▲ Recommended Minimum and Maximum Speeds			RPM Horizontal Feeder Screw 45 Percent Loading	Capacity Cubic Foot per Hour
				Vertical Screw	Input Top Drive	Input Bottom Drive		
6	1½	2:1	1.4:1	200	400	280	165	360
				215	430	301	177	400
				275	550	385	226	500
9	1½	2:1	1.4:1	170	340	238	139	1100
				200	400	280	163	1300
				230	460	322	187	1500
12	2	2:1	2:1	155	310	310	147	2700
				165	330	330	156	3000
				200	400	400	189	3600

▲ For speeds in excess or less than shown, consult Martin.

The Standard Screw Elevator drive unit will function efficiently with the elevator erected at any angle of incline from horizontal to vertical. The input shaft can be driven in either direction, and the input shaft extension may be used to drive a horizontal feeder or discharge conveyor.

Both top and bottom drives are required when the elevator, feeder and discharge conveyor are all driven from one power source. A top drive and pedestal base are used when the elevator and discharge conveyor are driven from one source. A bottom drive and thrust unit are necessary if the elevator and feeder are driven from one power source. The drives are designed and constructed to withstand all radial and thrust loads and support the entire weight of a fully loaded elevator.



Dimensions in Inches

Size	Ratio		A	B		C	E	F	G	H	J	L	M	N	P	Q	R	S	T Bolts		U		V
	Top Drive	Bottom Drive		Top Drive	Bottom Drive														No. Rec'd	Size	B & BO	All Other Types	All Types
6*	2:1	1.4:1	1½	2	1½	5	13½	14	15¼	7⅞	4 15/16	7	4¼	4½	11 11/32	3⅜	3 13/16	13¼	4	⅜-16 NC	16⅞	23⅛	6⅝
9	2:1	1.4:1	1½	2	1½	5	13½	14	15¼	5	4 15/16	10	4¼	4½	11 11/32	3⅜	3 13/16	13¼	8	⅜-16 NC	21½	27¾	8¾
12	2:1	2:1	2	2	2	5	13½	14	15¼	4⅞	4 15/16	13	5	5 9/16	14 7/16	3⅜	4 9/16	13¼	8	½-13 NC	26	31¾	12¾

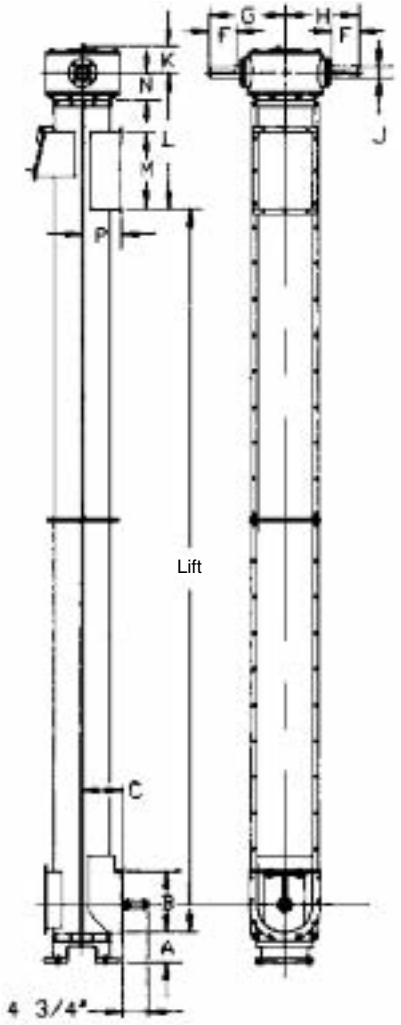
*2⅝″ lg. adapter for 6″ head not illustrated

CAUTION: Never operate without covers and guards. Always LOCKOUT/TAGOUT electrical power when working on equipment for inspection, cleaning, maintenance, or other purposes.

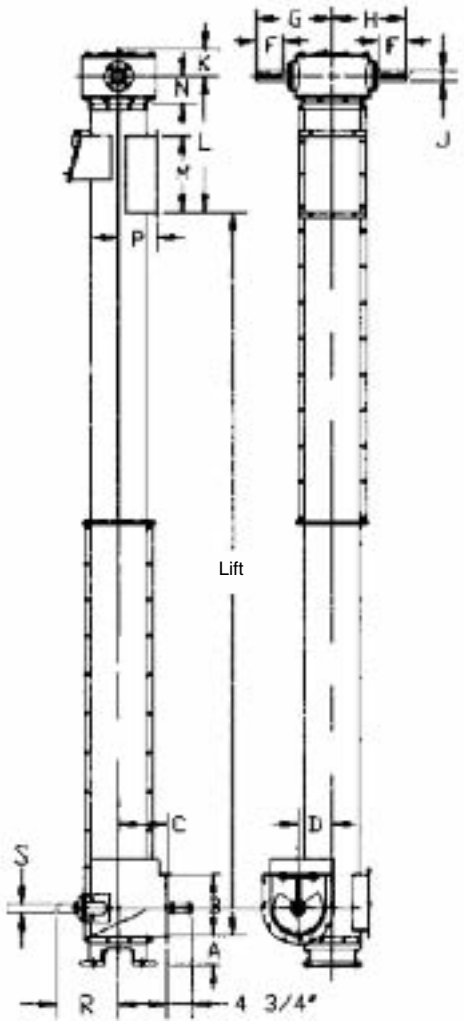
Note: Dimensions not certified for construction.

Standard Screw Elevator

Type B



Type BO



Screw elevator shown is offset to right for illustration purpose only. This elevator will normally be furnished offset to left, unless otherwise specified. See page H-156 for typical elevator arrangements.

Type BO

Size of Elevator	A	B	C	D	F	G	H	J	K	L	M	N	P	R	S
6	6	8	9	4¾	5	13½	14	2	4 15/16	23	12	7⅝	5½	11⅜	1½
9	5½	11⅛	9	6¼	5	13½	14	2	4 15/16	25	14	5	7⅛	11⅜	1½
12	8	14¼	15	8	5	13½	14	2	4 15/16	29	18	4⅞	8¾	14 7/16	2

Type B

Size of Elevator	A	B	C	F	G	H	J	K	L	M	N	P
6	6	8	9	5	13½	14	2	4 15/16	23	12	7⅝	5½
9	5½	11⅛	9	5	13½	14	2	4 15/16	25	14	5	7⅛
12	8	14¼	15	5	13½	14	2	4 15/16	29	18	4⅞	8¾

Dimensions in Inches

Note: Dimensions not certified for construction.

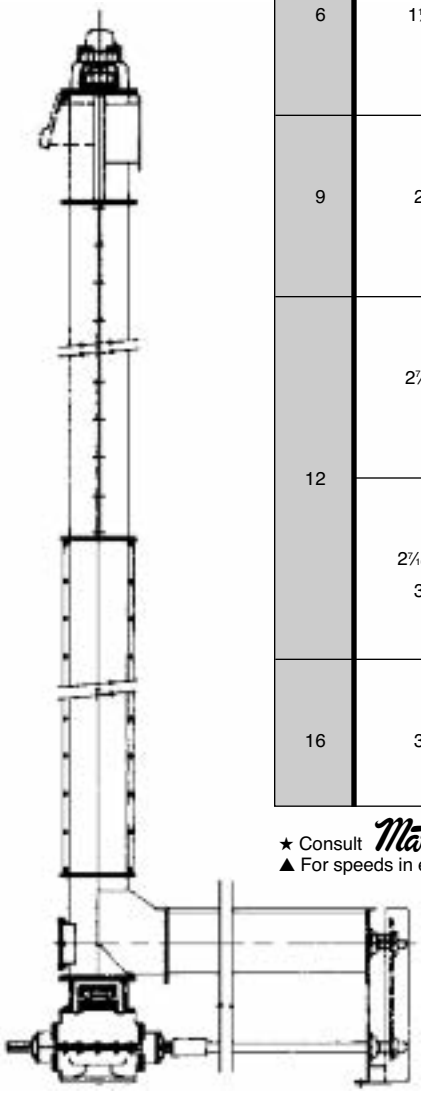
Super Screw Elevator

The Martin Superscrew Elevator is designed to handle capacities ranging from 360 CFH to 7000 CFH in 6″ dia., 9″ dia., 12″ dia., and 16″ dia. sizes.

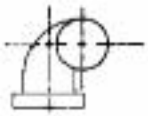
Martin SuperScrew Elevator Speed / Capacity

Size	Vertical Shaft Diameter	Ratio Top Drive	Ratio Bottom Drive	▲ Recommended Minimum and Maximum Speeds			RPM Horizontal Feeder Screw 45 Percent Loading	Capacity Cubic Foot per Hour
				Vertical Screw	Input Top Drive	Input Bottom Drive		
1	2	3	4	5	6	7	8	9
6	1½	2:1	2:1	200	400	400	165	360
				215	430	430	177	400
				275	550	550	226	500
				330	660	660	272	600
				Up to 425	Up to 850	Up to 850	★	★
9	2	2:1	2:1	170	340	340	139	1100
				200	400	400	163	1300
				230	460	460	187	1500
				240	480	480	196	1600
				Up to 425	Up to 850	Up to 850	★	★
12	2 7/16	2:1	2:1	155	310	310	147	2800
				165	330	330	156	3000
				200	400	400	189	3600
				210	420	420	199	3800
				Up to 425	Up to 850	Up to 850	★	★
	2 7/16★ 3	2.06:1	2.06:1	155	319	319	151	2800
				165	340	340	161	3000
				200	412	412	195	3600
				210	433	433	205	3800
				Up to 425	Up to 876	Up to 876	★	★
16	3	2.06:1	2.06:1	138	284	284	132	6000
				150	309	309	144	6500
				161	332	332	155	7000
				Up to 425	Up to 876	Up to 876	★	★

★ Consult Martin.
▲ For speeds in excess or less than those shown, consult Martin.

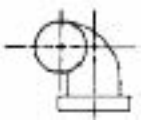


Type 7 Superscrew Elevator



Elevator Offset to the Right of Inlet

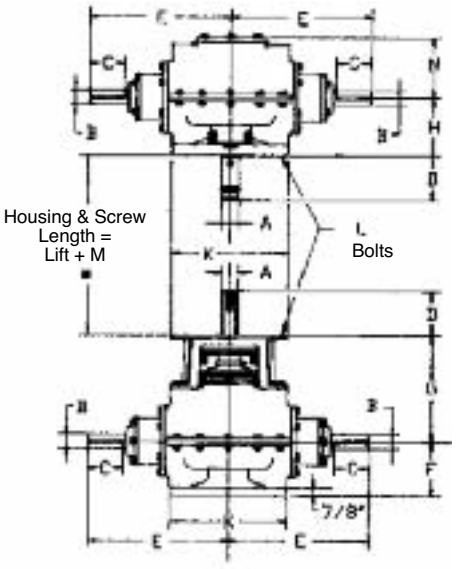
Straight Inlet



Elevator Offset to the Left of Inlet

CAUTION: Never operate without covers and guards. Always LOCKOUT/TAGOUT electrical power when working on equipment for inspection, cleaning, maintenance, or other purposes.

Super Screw Elevator D.S.D. (Dry Shaft Drive)



DSD (Dry Shaft Drive) is a completely new design and construction concept especially developed to enable the SuperScrew Elevator to broaden the application of screw elevators.

The DSD unit is designed to meet special conditions encountered in vertical installations and may be installed in the range of 70° to 90° incline. If a smaller angle of incline is required, special units may be furnished.

A patented lubrication system precisely “meters” the proper amount of lubricant to those points where needed with no danger of damaging seals.

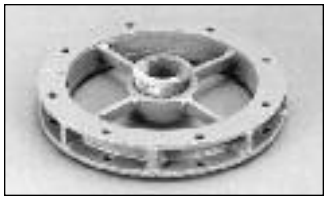
DSD units may be furnished at both the top and the bottom of the elevator. The top drive incorporates special design features to assure that no lubricant may pass into the elevator to contaminate the material being elevated. In the bottom drive unit other special features prevent entrance of foreign material into lubricant.

DSD units may also be furnished at the top only with a pedestal base or at the bottom only with a thrust head.

The compactness of the DSD requires a minimum of head room providing maximum lift with minimum overall elevator height.

DSD units are sturdily constructed to withstand all radial and thrust loads encountered and to support the entire weight of elevators and materials handled.

Size	Ratio	A	B	C	D		E	F	G	H	K	L		M
					Top	Bottom						No.	Size	
6	2:1	1½	1⅝	4	4¾	5	16	6⅛	12	7½	10⅛	8	⅜	12¼
9	2:1	2	1⅝	4	4¾	5	16	6⅛	12	7½	13¼	8	⅜	13¼
12	2:1	2 7/16	1⅝	4	4⅞	5	16	6⅛	12	7½	16¼	8	½	18¼
	2.06:1	2 7/16	1⅝	4¼	4⅞	5	18.1	6⅞	12⅝	7¼	17¼	8	½	18¼
	2.06:1	3	2 3/16	4¼	5	5	18.1	6⅞	12⅝	7¼	17⅜	8	½	18¼
16	2.06:1	3	2 3/16	4¼	5	5	18.1	6⅞	12⅝	7¼	20¼	12	½	24¼



Spider Type Stabilizer
Used on SuperScrew

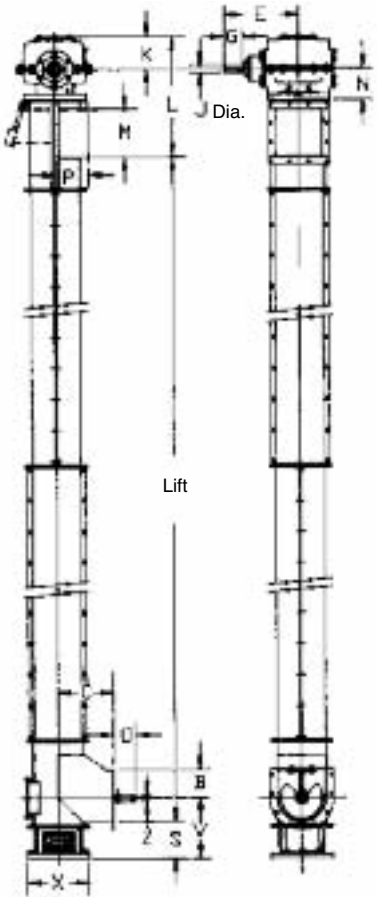
SuperScrew
Thrust Head

SuperScrew
Pedestal Base

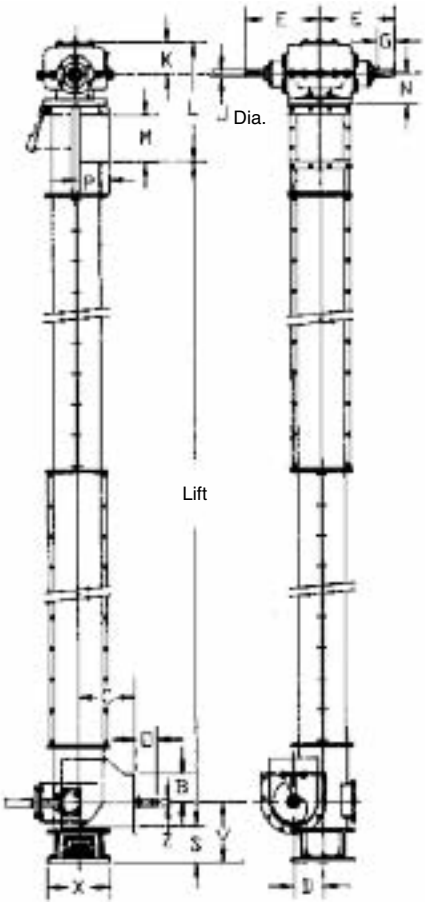
Note: Dimensions not certified for construction.

Super Screw Elevator Dimensions

Type 1



Type 2



Normally Furnished Offset to the Left

Type 1

Size of Elevator	Vert. Shaft Dia.	Ratio	B	C	E	G	J	K	L	M	N	O	P	S	V	X	Z ◇
6	1½	2:1	4½	10½	16	4	1⅝	6¾	26¾	7	6½	4¾	5	8⅜	11⅞	13¼	1½
9	2	2:1	6⅛	12	16	4	1⅝	6¾	28¼	10	6½	4¾	7⅛	7⅞	12⅞	13¼	1½
12	2 7/16	2:1	7¾	15	16	4	1⅝	6¾	32¼	13	6½	4¾	8⅞	8⅞	15⅝	13¼	2
	○ 2 7/16	2.06:1	7¾	15	18.1	4¼	2 5/16	7 15/16	34⅜	13	7¼	4¾	8⅞	9	15½	17⅜	2
	3	2.06:1	7¾	15	18.1	4¼	2 3/16	7 15/16	34⅜	13	7¼	4¾	8⅞	9	15½	17⅜	2
16	3	2.06:1	10⅝	20	18.1	4¼	2 3/16	7 15/16	39⅞	17	7¼	5	11⅛	9½	18	17⅜	3

Type 2

Size of Elevator	Vert. Shaft Dia.	Ratio	B	C	D	E	G	J	K	L	M	N	O	P	S	V	X	Z ◇
6	1½	2:1	4½	10½	4¾	16	4	1⅝	6¾	23¾	7	6½	4¾	5	8⅜	11⅞	13¼	1½
9	2	2:1	6⅛	12	6¼	16	4	1⅝	6¾	25¼	10	6½	4¾	7⅛	7⅞	12⅞	13¼	1½
12	2 7/16	2:1	7¾	15	8	16	4	1⅝	6¾	29¼	13	6½	4¾	8⅞	8⅞	15⅝	13¼	2
	○ 2 7/16	2.06:1	7¾	15	8	18.1	4¼	2 5/16	7 15/16	31⅜	13	7¼	4¾	8⅞	9	15½	17⅜	2
	3	2.06:1	7¾	15	8	18.1	4¼	2 3/16	7 15/16	31⅜	13	7¼	4¾	8⅞	9	15½	17⅜	2
16	3	2.06:1	10⅝	20	10½	18.1	4¼	2 3/16	7 15/16	36¾	17	7¼	5	11⅛	9½	18	17⅜	3

Dimensions in Inches

◇ Horizontal coupling diameter may vary upon length of feeder.

○ Consult Martin before using.

CAUTION: Never operate without covers and guards. Always LOCKOUT/TAGOUT electrical power when working on equipment for inspection, cleaning, maintenance, or other purposes.

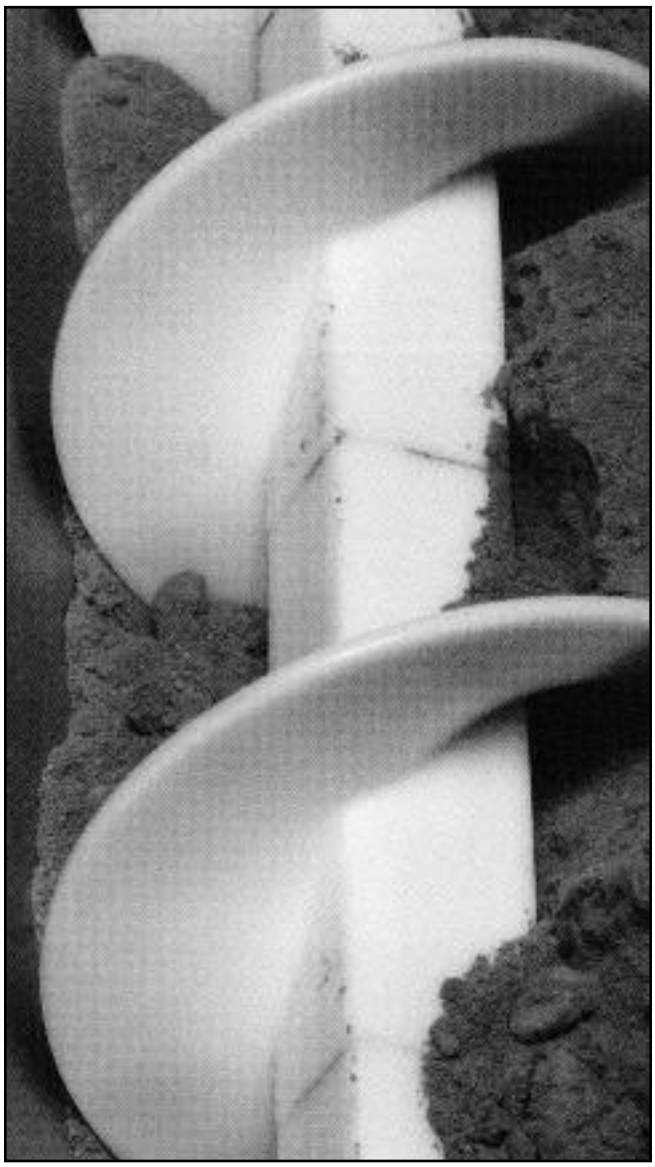
Note: Dimensions not certified for construction.

SECTION IX

MODULAR PLASTIC SCREW SECTION IX

Click on page number to go to page

Another Martin patented Innovation. We'll give your customers another reason to give you their business.



- Plastic modules consist of a helical flight spiraling once around a hollow square hub.
- Eliminates need to spot or continuously weld metal flights to shaft.
- Polyurethane - used where impact/abrasive wear is a problem. Lab tests show it up to 3 times more wear resistant than carbon or stainless steel in certain applications.
- All-plastic material does not corrode, is impervious to acids, caustics and other chemicals.
- Durable, lightweight injection-molded modules stack on square tube.
- Polypropylene - general purpose material for high temperature service.
- FDA approved for food contact.
- Highly resistant to corrosion.
- Modules are individually replaceable without welding or burning.
- Assembled conveyor is comparatively lightweight, easier to handle, and bearing life is prolonged.
- Polyethylene - general purpose material. FDA approved for food contact.
- Good abrasive and excellent corrosion resistance in a wide temperature range.
- Slick surface simplifies cleaning.

*Conveyors shown without cover for illustration purposes only. Please follow manufacturing safety guidelines when operating conveyors.

Warning & Safety Reminder

WARNING & SAFETY REMINDER

Safety must be considered a basic factor in machinery operation at all time. *Most accidents are the results of carelessness or negligence.* All rotating power transmission products are potentially dangerous and must be guarded by the contractor, installer, purchaser, owner, and user as required by applicable laws, regulations, standards, and good safety practice. Additionally specific information must be obtained from other sources including the latest editions of American Society of Mechanical Engineers; (ANSI) Safety Code. A copy of this standard may be obtained from the American Society of Mechanical Engineers at 345 East 47th Street, New York, NY 10017 (212-705-7722).

It is the responsibility of the contractor, installer, purchaser, owner, and user to install, maintain, and operate the parts or components manufactured and supplied by Martin Sprocket & Gear, Inc., in such a manner as to comply with the Williams-Steiger Occupational Safety Act and with all state and local laws, ordinances, regulations, and the American National Standard Institute Safety Code.

CAUTION

Guards, access doors, and covers must be securley fastened before operating any equipment.

If parts are to be inspected, cleaned, observed, or general maintenance performed, **the motor driving the part or components is to be locked out electrically in such a manner that it cannot be started by anyone**, however remote from the area. Failure to follow these instructions may result in personal injury or property damage.

WARNING

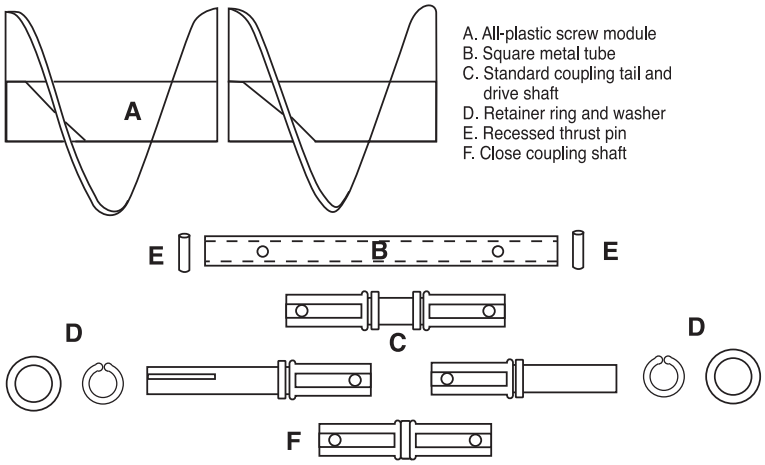
Warning: Static Electricity

Static Electricity may accumulate on modular plastic conveyor screws which carry non-conductive materials and may produce an electrical spark. **Do Not Use to Convey Non-Conductive Materials in a Combustible Environment.**

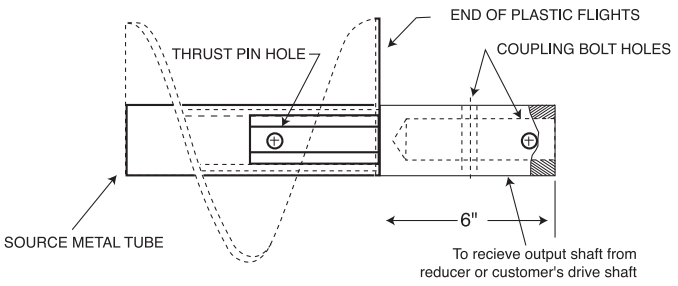
Modular Plastic Screw Conveyors - Design Data

Martin Solutions to Screw Conveyor Problems

- Currently available in 6", 9" and 12" diameters, in right hand only.
- Assembled conveyors compatible with CEMA standards; easily retrofitted.
- Flight modules available in polyethylene, polypropylene, and polyurethane, each with characteristics to fill specific needs (see Technical Data).
- Flights and hubs are integrally molded, resulting in consistent diameter, pitch and thickness with a uniform, smooth finish.
- Plastic modules eliminate metal contamination to food.
- Assembled conveyor is light in weight, is safe and easy to handle; bearing life is prolonged.
- Plastic flights may operate at close clearances, or when conveying many materials, directly on the trough without danger of metal contamination.
- Modules are individually replaceable.
- Balance is excellent allowing high speed operation.

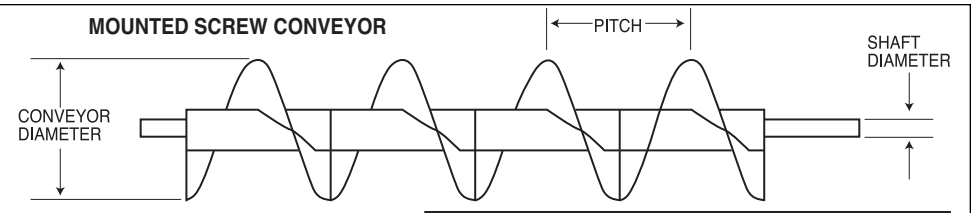


The Martin Screw Conveyor System consists of plastic modules stacked on a square metal tube. A shaft is inserted at each tube end and secured by a recessed pin. Modules are secured at tube ends by retainer rings and washers.

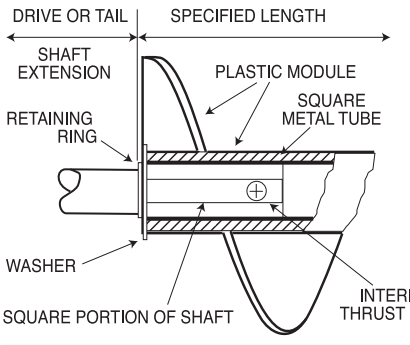


EXTERNAL ADAPTOR FOR STANDARD INDUSTRIAL CONSTRUCTION

MOUNTED SCREW CONVEYOR



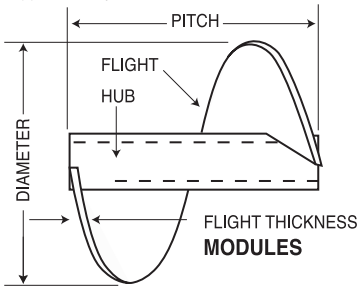
END CONSTRUCTION



DIAMETER	AVAILABLE SHAFTS	WEIGHT PER FOOT FULL PITCH	WEIGHT PER FOOT SHORT PITCH
6"	1-1/2", 2"	4.1 lb	4.3 lb
9"	1-1/2", 2"	4.5 lb	5.2 lb
12"	2", 2-7/16"	8.0 lb	9.5 lb
14"	NOT CURRENTLY AVAILABLE		
16"	NOT CURRENTLY AVAILABLE		

Weights shown as for polyethylene or polypropylene on stainless steel tube, polyurethane approximately 10% heavier.

DIAMETER	FULL PITCH	SHORT PITCH	FLIGHT THICKNESS	OUTSIDE HUB	INSIDE HUB
6"	9.05"	4.53"	.25"	2.51"	2.03"
9"	9.05"	4.53"	.25"	2.51"	2.03"
12"	11.72"	5.86"	.34"	3.17"	2.53"
14"	NOT CURRENTLY AVAILABLE				
16"	NOT CURRENTLY AVAILABLE				



MODULES

Technical & Design Data

Screw Conveyor Capacities

CUBIC FEET PER HOUR PER R.P.M. FULL PITCH HORIZONTAL				
DIAMETER	PITCH	CONVEYOR LOAD		
		FULL	45%	30%
6"	9"	5.72	2.75	1.72
9"	9"	16.73	7.53	5.02
12"	12"	39.27	17.67	11.78
14"	14"	NOT CURRENTLY AVAILABLE		
16"	16"	NOT CURRENTLY AVAILABLE		

Maximum Recommended Conveyor Speed / Horizontal Operation / R.P.M.

DIA.	SHAFT	TYPE OF INTERMEDIATE BEARING	
		WOOD, NYLATRON, BRONZE	CLOSE COUPLED*
6"	1-1/2"	165	90
9"	1-1/2"	165	80
9"	2"	150	80
12"	2"	145	70
12"	2-7/16"	140	70
14"	2-7/16"	NOT CURRENTLY AVAILABLE	
14"	3"	NOT CURRENTLY AVAILABLE	
16"	3"	NOT CURRENTLY AVAILABLE	

* Close coupled limitations apply to screw lengths over 12 ft. (for 6" and 9" dia.) or 15 ft. (for 12" dia). For longer lengths or units without intermediate bearing supports, locate end bearing no more than 3-1/8" (for 6" size); 4-5/8" (for 9" size); or 6-1/8" (for 12" size); centers above the inside bottom of the conveyor trough.

Horsepower Ratings

DIA.	SHAFT	RATINGS FOR CARBON STEEL SHAFT AND TUBE			
		50 R.P. M.	75 R.P.M.	100 R.P.M.	150 R.P.M.
6"-9"	1-1/2"	3.4	5.1	6.8	10.1
6"-9"	2"	5.6	8.4	11.2	16.8
12"	2"	8.0	12.0	16.0	24.0
12"	2-7/16"	9.1	13.6	18.2	27.3
14"	2-7/16"	NOT CURRENTLY AVAILABLE			
14"	3"	NOT CURRENTLY AVAILABLE			
16"	3"	NOT CURRENTLY AVAILABLE			

NOTE: The above limitations are based on Martin modular plastic construction throughout. The use of coupling bolts, as required for an external adaptor, may reduce horsepower capacity.

Materials of Construction

	POLYETHYLENE	POLYPROPYLENE	POLYURETHANE
FDA Approved	Yes	Yes	No
Abrasive Resistance	Good	Fair	Excellent
Corrosive Resistance	Excellent	Excellent	Good
Impact Resistance	Good	Fair	Excellent
Temperature Limit	-60° to +150° F	+40° to +220° F	-20° to +150°
Release	Excellent	Good	Good

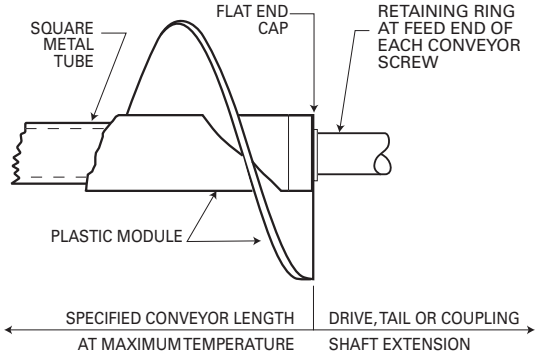
Note: Release pertains to the capability of conveying “sticky” products.

Design Data for Bonded Construction

Bonded Construction is used in the handling of a finished food product or for the conveying of any product in which it is necessary to guard against material entering the internal clearances between the modules or into the inside of the square tube.

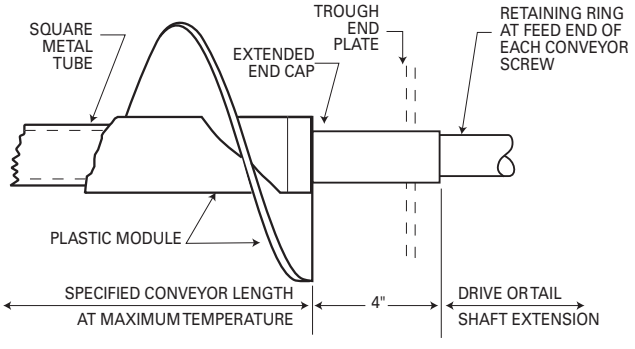
The hubs of the individual modules are heat fused together, the ends of the flights may be fused or may be cut to create a “clean out” gap, usually 1/8" to 1/4" wide. The ends are capped and fitted with an “O” ring to seal around the shaft. The cap may be of alternate construction as detailed below.

Bonded Construction has USDA acceptance for use as a component part of food processing equipment in federally inspected meat and poultry processing plants.



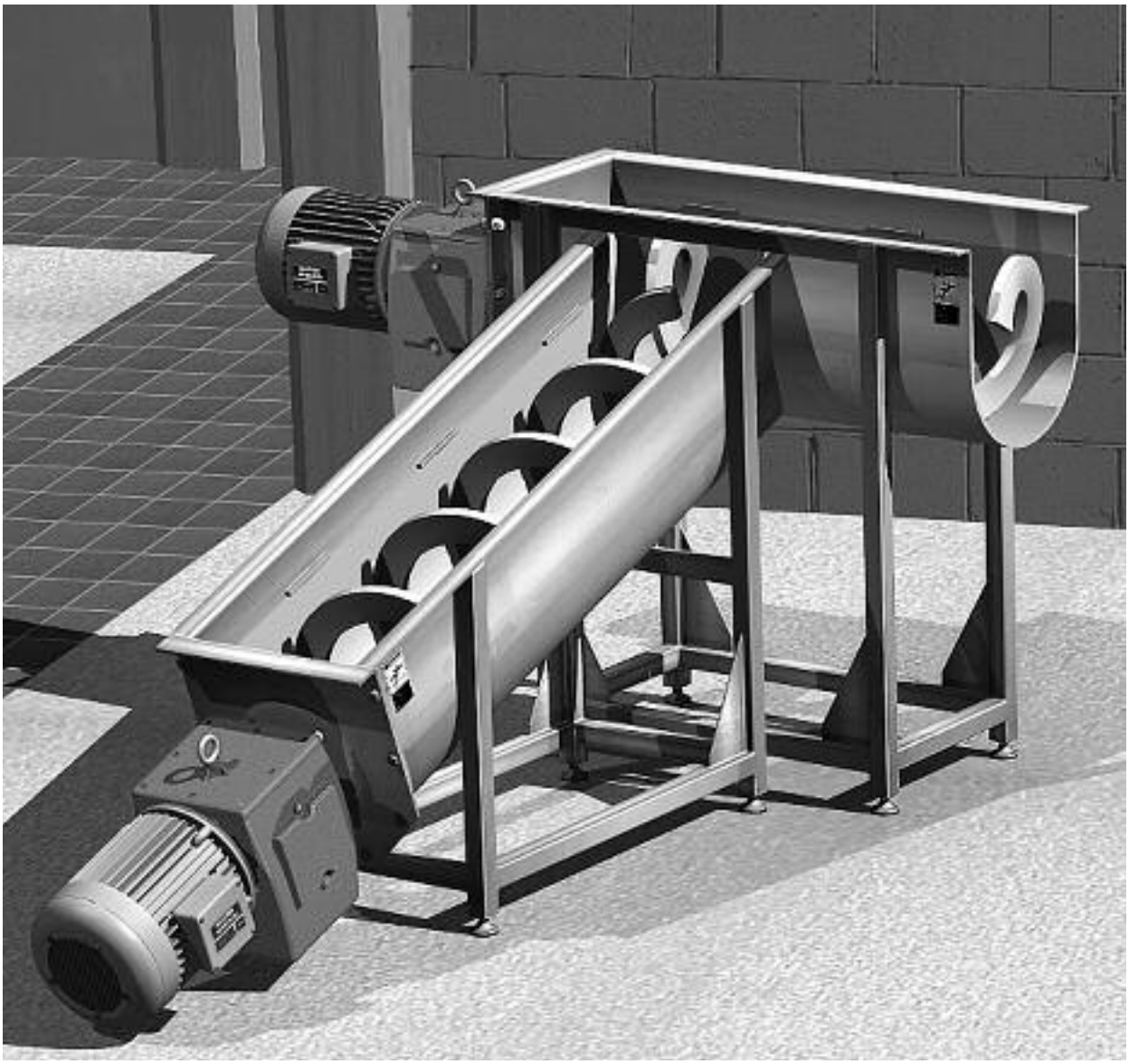
FLAT END CAPS

Flat End Caps are the basic construction for conveying finished food products. Drive and Tail End Shafts are shipped factory installed. If used with coupling shafts, the thrust bearing must be at the feed end of the conveyor assembly. Retaining ring may be eliminated in some applications depending upon length and temperature involved.



EXTENDED END CAPS

Extended End Caps are used in the handling of products which require a total elimination of cracks and crevices on the conveyor screw. This precludes the use of coupling shafts and therefore limits the unit to one conveyor length, a maximum of 20 feet. Retainer rings and shafts are entirely outside the product area. Drive and Tail End Shafts are shipped factory installed.



SECTION X

SHAFTLESS SCREW CONVEYORS SECTION X

Click on page number to go to page

*Conveyors shown without cover for illustration purposes only. Please follow manufacturing safety guidelines when operating conveyors.

Shaftless Screw Conveyors

Typical Applications

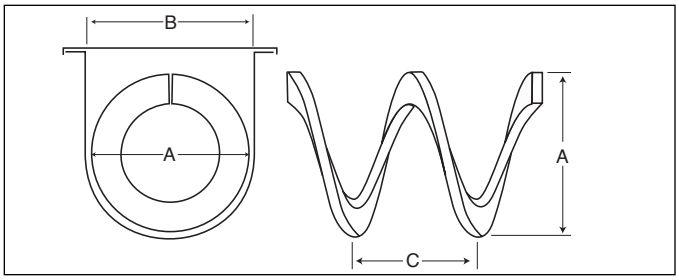
- **Rendering**
  Poultry Processing • Meat Processing • Fish Processing
  • Chicken Feathers • Whole Carcasses • Animal Waste • Fish/Animal Bones
- **Pulp & Paper, Gypsum Board, Particle Board**
  • Lime Mud • Oversized Wood Chips • Hogged Bark • Shavings
- **Agriculture**
  • Fertilizer • Corn Gluten • Sugar Beets/Cane Processing • Chopped Hay
- **Hospital Waste Processing, Recycle Plants**
  • Shredded Cans • Bottles • Paper • Medical Disposables
- **Wine & Beverage Industries**
  • Grape Skins • Stems • Pumice • Fruit Peels
- **Waste Water • Solid Waste Treatment**
  • Sludge • Grit • Screenings • Solids Removal
- **Chemical & Heavy Industrial**
  • Ash • Recycle Batteries • Shredded Tires

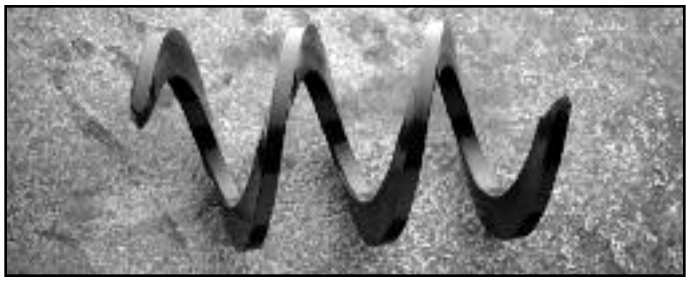
FEATURE	FUNCTION	BENEFIT
Continuous Flight	Eliminate Hangers	Reduces Maintenance Costs
3/4”-1" Flight	Long Lasting	Increases Uptime
No Tail Seals or Tail Bearings	Use Blind End Plate	Reduces Maintenance Costs
Cold Formed Flight	High Brinell	Longer Life
No Center Pipe Required	Eliminate Buildup On Pipe	Lower Maintenance/ Operation Costs
	Can Handle Particle Sizes Up To 90% Of Spiral O.D.	Increases Screw Capacity
	Allows Higher Trough Loading (45%-95%)	
Side Inlet Feeding	No Vertical Transition Necessary	Lower Installation Cost Reduces Headroom

Size and Capacity

Specifications:

Type of Steel	Carbon Steel • High Brinell Carbon Steel • Stainless Steel
Capacity	Up to 17,000 CFH
Diameter	6" to 30" (and Larger)
Pitches	Full, 2/3, 1/2
Trough	CEMA Standards
Options	UHMW Liners, AR Liners, Rider Bars, Drive End Seals
Advantages	Spanning longer distances without intermediate bearings. Transport sticky products and large lumps.





45% Trough Loading

NOM. DIA.	A Dia.	B Inside	C Pitch	CFH* Full Pitch	CFH* 2/3 Pitch	CFH* 1/2 Pitch	MAX RPM
6	6	7	6	65	43	33	25
9	9	10	9	224	149	112	25
10	10	11	10	307	205	154	25
12	12	13	12	530	353	265	25
14	14	15	14	842	561	421	25
16	16	17	16	1256	837	628	25
18	18	19	18	1789	1193	895	25
20	20	21	20	2455	1637	1228	25
24	24	25	24	4240	2827	2120	25
30	30	31	30	8283	5522	4142	25

95% Trough Loading

NOM. DIA.	A Dia.	B Inside	C Pitch	CFH* Full Pitch	CFH* 2/3 Pitch	CFH* 1/2 Pitch	MAX RPM
6	6	7	6	140	93	70	25
9	9	10	9	472	315	236	25
10	10	11	10	648	432	324	25
12	12	13	12	1119	746	560	25
14	14	15	14	1777	1185	889	25
16	16	17	16	2652	1766	1326	25
18	18	19	18	3776	2517	1888	25
20	20	21	20	5180	3453	2590	25
24	24	25	24	8950	5967	4475	25
30	30	31	30	17485	11657	8743	25

*CFH = Cubic Feet per hour. -**ALL DIMENSIONS SHOWN IN INCHES.

Warning & Safety Reminder

WARNING AND SAFETY REMINDERS FOR SCREW , DRAG , AND BUCKET ELEVATOR CONVEYORS

APPROVED FOR DISTRIBUTION BY THE SCREW CONVEYOR SECTION OF THE CONVEYOR EQUIPMENT MANUFACTURERS ASSOCIATION (CEMA)

It is the responsibility of the contractor, installer, owner and user to install, maintain and operate the conveyor, components and, conveyor assemblies in such a manner as to comply with the Williams-Steiger Occupational Safety and Health Act and with all state and local laws and ordinances and the American National Standards Institute (ANSI) B20.1 Safety Code.

In order to avoid an unsafe or hazardous condition, the assemblies or parts must be installed and operated in accordance with the following minimum provisions.

1. Conveyors shall not be operated unless all covers and/or guards for the conveyor and drive unit are in place. If the conveyor is to be opened for inspection cleaning, maintenance or observation, the electric power to the motor driving the conveyor must be LOCKED OUT in such a manner that the conveyor cannot be restarted by anyone; however remote from the area, until conveyor cover or guards and drive guards have been properly replaced.

2. If the conveyor must have an open housing as a condition of its use and application, the entire conveyor is then to be guarded by a railing or fence in accordance with ANSI standard B20.1.(Request current edition and addenda)

3. Feed openings for shovel, front loaders or other manual or mechanical equipment shall be constructed in such a way that the conveyor opening is covered by a grating. If the nature of the material is such that a grating cannot be used, then the exposed section of the conveyor is to be guarded by a railing or fence and there shall be a warning sign posted.

4. Do not attempt any maintenance or repairs of the conveyor until power has been LOCKED OUT.

5. Always operate conveyor in accordance with these instructions and those contained on the caution labels affixed to the equipment.

6. Do not place hands, feet, or any part of your body, in the conveyor.

7. Never walk on conveyor covers, grating or guards.

8. Do not use conveyor for any purpose other than that for which it was intended.

9. Do not poke or prod material into the conveyor with a bar or stick inserted through the openings.

10. Keep area around conveyor drive and control station free of debris and obstacles.

11. Eliminate all sources of stored energy (materials or devices that could cause conveyor components to move without power applied) before opening the conveyor.

12. Do not attempt to clear a jammed conveyor until power has been LOCKED OUT.

13. Do not attempt field modification of conveyor or components.

14. Conveyors are not normally manufactured or designed to handle materials that are hazardous to personnel. These materials which are hazardous include those that are explosive, flammable, toxic or otherwise dangerous to personnel. Conveyors may be designed to handle these materials. Conveyors are not manufactured or designed to comply with local, state or federal codes for unfired pressure vessels. If hazardous materials are to be conveyed or if the conveyor is to be subjected to internal or external pressure, manufacturer should be consulted prior to any modifications.

CEMA insists that disconnecting and locking out the power to the motor driving the unit provides the only real protection against injury. Secondary safety devices are available; however, the decision as to their need and the type required must be made by the owner-assembler as we have no information regarding plant wiring, plant environment, the interlocking of the screw conveyor with other equipment, extent of plant automation, etc. Other devices should not be used as a substitute for locking out the power prior to removing guards or covers. We caution that use of the secondary devices may cause employees to develop a false sense of security and fail to lock out power before removing covers or guards. This could result in a serious injury should the secondary device fail or malfunction.

There are many kinds of electrical devices for interlocking of conveyors and conveyor systems such that if one conveyor in a system or process is stopped other equipment feeding it, or following it can also be automatically stopped.

Electrical controls, machinery guards, railings, walkways, arrangement of installation, training of personnel, etc., are necessary ingredients for a safe working place. It is the responsibility of the contractor, installer, owner and user to supplement the materials and services furnished with these necessary items to make the conveyor installation comply with the law and accepted standards.

Conveyor inlet and discharge openings are designed to connect to other equipment or machinery so that the flow of material into and out of the conveyor is completely enclosed.

One or more warning labels should be visible on conveyor housings, conveyor covers and elevator housings. If the labels attached to the equipment become illegible, please order replacement warning labels from the OEM or CEMA.

The Conveyor Equipment Manufacturers Association (CEMA) has produced an audio-visual presentation entitled “Safe Operation of Screw Conveyors, Drag Conveyors, and Bucket Elevators.” CEMA encourages acquisition and use of this source of safety information to supplement your safety program.

PROMINENTLY DISPLAY THESE SAFETY LABELS ON INSTALLED EQUIPMENT

CONVEYOR PULLEYS - HEAVY DUTY

ITEM **PAGE**

Heavy Duty Conveyor Pulleys

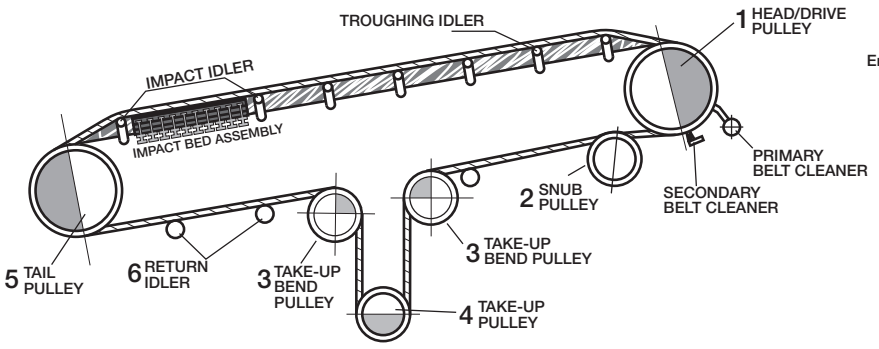
Martin now offers a comprehensive line of conveyor pulleys for your bulk material handling needs. Broadening our offering without compromising quality on:

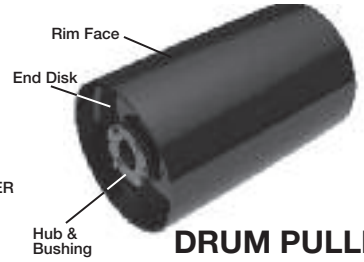
- Drum Pulleys — Lagged and Plain
- Wing Pulleys
- Shafts
- Take-up Frames
- Bushings
- Wear Items
- Specialty Pulleys

Seeing is believing — The Martin difference

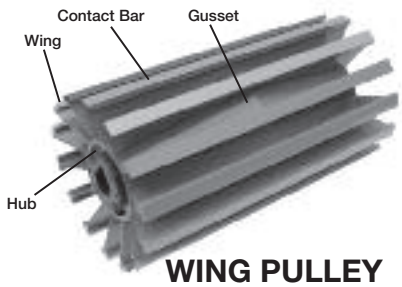
All of Martin's conveyor pulleys meet or exceed CEMA standards for construction. Our pulleys are the heaviest, most durable in the industry.

Conveyor Components Locations and Terminology





DRUM PULLEY



WING PULLEY

1. **Head Pulley** The pulley at the discharge end of a conveyor belt; may be either an idler or a drive pulley. Usually it has a larger diameter than other pulleys in the system and is often lagged to increase traction and pulley life.
2. **Snub Pulley** Mounted close to the drive pulley on the return side of the belt, the snub pulley's primary job is to increase the angle of wrap around the drive pulley, thereby increasing traction. Its secondary purpose is reducing belt tension, which is important in maximizing conveyor component life. May be lagged for longer wear life.
3. **Take-Up Bend Pulley** The bend pulley is used for changing the direction of the belt running to the gravity take-up. May be lagged for longer wear life.
4. **Take-Up Pulley** An adjustable idler pulley to accommodate changes in the length of a conveyor belt to maintain proper tension.
5. **Tail Pulley** A pulley at the tail of the belt conveyor opposite the normal discharge end; may be a drive pulley or an idler pulley.
6. **Return Idler** The idler or roller on which the conveyor belt rides after the load which it was carrying has been dumped.

Martin Sales and Engineering will work with you to completely solve your belt conveying needs. The following pages will assist you in selecting most of the components for your conveyor. Since there are infinite amounts of conveying possibilities and configurations our sales and engineering staff are prepared to assist you with each of them.

See Page H-200 for Part Nomenclature

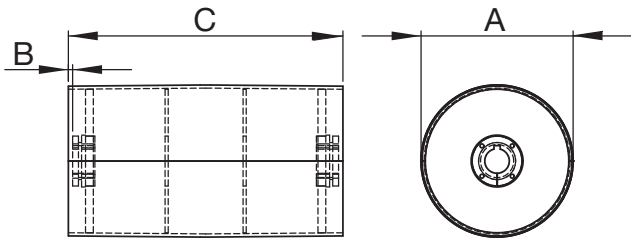
Drum Pulleys

Machined Drum Pulleys — Crowned or Flat

Martin's Machined Drum Pulleys are manufactured from thick wall pipe or tubing, then machined on a lathe to form the crown and ensure minimum runout in operation.

Our Machined Drum Pulleys are the heaviest in the business, featuring a 3/8" minimum end disc, or 3/4" thick integral hub and end discs, minimum 1/4" rims and 1/4" center plates. Because each pulley has been machined, the pulley is the thickest in the center where the load is the highest.

Our Machined Drum Pulleys run more concentric than pulleys made by the "expansion" method. This ensures better belt tracking and less vibration transferred to the bearings.



FEATURES:

- 4 to 10-3/4" Diameter
- 3/8" minimum End Disc
- 1/4" minimum Center Plates
- Several Hub/Bushing systems available

OPTIONS:

- Lagging
- Shafting
- Bearing Assemblies
- Take-Up Systems

Estimated Machined Drum Pulley Weights

Diameter (A)	Hub	Max Bore	Setback (B)•	Face Width (C)									
				8	14	20	26	32	38	44	51	57	63
4	XT15	1-7/16	3/4	9	13	18	22	32	37	43	49	54	59
4-1/2*	XT15	1-7/16	3/4	15	21	27	33	39	45	51	58	64	70
4-1/2*	XT20	1-15/16	3/4	16	22	28	34	40	46	52	59	65	71
5	XT15	1-7/16	3/4	17	24	31	37	44	51	58	63	72	79
5	XT20	1-15/16	3/4	18	25	32	38	45	52	59	64	73	80
5-1/2*	XT15	1-7/16	3/4	19	26	33	41	48	56	63	72	79	87
5-1/2*	XT20	1-15/16	3/4	21	28	35	43	50	58	65	74	81	89
6	XT20	1-15/16	3/4	23	31	39	47	55	63	71	81	89	97
6	XT25	2-7/16	3/4	26	34	42	50	58	66	74	84	92	100
6-1/2*	XT20	1-15/16	3/4	27	38	49	60	70	81	92	105	115	126
6-1/2*	XT25	2-7/16	3/4	29	40	51	62	72	83	94	107	117	128
8	XT25	2-7/16	3/4	36	47	58	70	81	92	104	117	128	140
8	XT30	2-15/16	7/8	38	49	66	72	83	94	106	119	130	142
8-1/2*	XT25	2-7/16	3/4	43	58	73	87	102	117	131	149	163	178
8-1/2*	XT30	2-15/16	7/8	45	60	75	89	104	119	133	151	165	180
10	XT25	2-7/16	3/4	50	64	79	93	107	122	136	153	167	182
10	XT30	2-15/16	7/8	52	66	81	95	109	124	138	155	169	184
10	XT35	3-7/16	7/8	58	72	87	101	115	130	144	161	175	190
10-3/4*	XT25	2-7/16	3/4	66	76	93	111	130	148	167	188	207	226
10-3/4*	XT30	2-15/16	7/8	69	79	96	114	133	151	170	191	210	229
10-3/4*	XT35	3-7/16	7/8	75	85	101	120	139	157	176	197	216	235

*Nominal

• General position for bushing face – for position per application consult engineering.

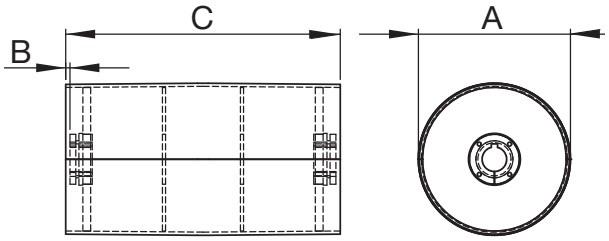
Consult Factory for dimensional and weight specifications of sizes not shown.

Drum Pulleys

Standard Duty Drum Pulleys

Martin offers Standard Duty Drum Pulleys using a minimum 1/4" rim, 3/8" end discs and 1/4" center discs. Each Standard Drum Pulley features a two piece rolled rim, which has been fabricated on either of our flat or custom crowned roll machines. The rims are trimmed and hydraulically seated around the heavy end discs to ensure maximum concentricity. Once the pulley is formed, Martin utilizes a submerged arc weldment to ensure optimum connection of its individual components.

Our trademark Standard Duty Pulley is the heaviest off the shelf CEMA grade pulley in the industry. The thicker materials used in our Standard Duty pulleys yield longer life and better resistance to wear and stress that are present in every conveying application.



FEATURES:

- 12" to 60" Diameter
- 3/8" minimum End Disc
- 1/4" minimum Center Plates
- Several Hub/Bushing systems available

OPTIONS:

- Lagging
- Shafting
- Bearing Assemblies
- Take-Up Systems

Estimated Standard Duty Drum Pulley Weights

Diameter (A)	Hub	Max Bore	Setback (B)•	Face Width (C)							
				20	26	32	38	44	51	57	63
12	XT25	2-7/16	3/4	81	100	119	138	157	204	242	280
12	XT30	2-15/16	7/8	84	103	122	141	160	207	245	283
14	XT25	2-7/16	3/4	99	122	145	168	191	245	291	336
14	XT30	2-15/16	7/8	102	125	148	171	194	248	294	339
16	XT25	2-7/16	3/4	118	145	172	199	226	289	342	394
16	XT30	2-15/16	7/8	121	148	175	202	229	292	345	397
16	XT35	3-7/16	7/8	126	153	180	207	234	297	350	402
18	XT25	2-7/16	3/4	138	169	201	232	263	336	396	456
18	XT30	2-15/16	7/8	141	172	204	235	266	339	399	459
18	XT35	3-7/16	7/8	146	177	209	240	271	344	404	464
20	XT30	2-15/16	7/8	162	198	234	270	306	465	506	548
20	XT35	3-7/16	7/8	167	203	239	275	311	470	511	553
20	XT40	3-15/16	1	174	210	246	282	318	477	518	560
24	XT35	3-7/16	7/8	245	291	336	382	427	605	662	719
24	XT40	3-15/16	1	252	298	343	389	434	612	669	726
24	XT45	4-7/16	1	261	307	352	398	443	621	678	735
30	XT40	3-15/16	1	413	494	575	656	737	824	899	973
30	XT45	4-7/16	1	422	501	582	663	744	831	906	982
30	XT50	4-15/16	1	445	526	607	688	769	856	931	1005
36	XT40	3-15/16	1	541	644	746	849	952	1061	1155	1249
36	XT45	4-7/16	1	550	653	755	858	961	1070	1164	1258
36	XT50	4-15/16	1	573	676	778	881	984	1093	1187	1281

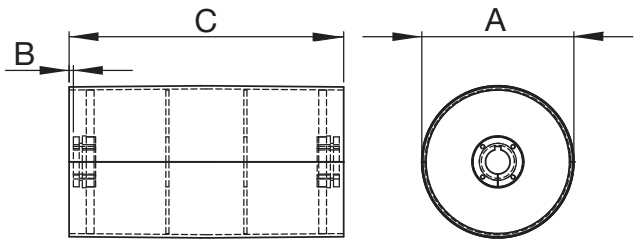
• General position for bushing face - for position per application consult engineering.

Consult Factory for dimensional and weight specifications of sizes not shown.

Mine Duty Drum Pulleys

Martin offers Mine Duty Drum Pulleys using a minimum 3/8" rim (up to 20" diameter), 1/2" minimum rim on 24" and larger diameter, 1" minimum end discs and 3/8" center discs. Each Mine Duty Drum Pulley features a two piece rolled rim, which has been fabricated on either of our flat or custom crowned roll machines. The rims are trimmed and hydraulically seated around the heavy end discs to ensure maximum concentricity. Once the pulley is formed, Martin utilizes a double or triple pass submerged arc weldment to ensure optimum connection of its individual components.

The Martin Mine Duty Pulley is available in either Flat Face or Crown Face construction.



FEATURES:

- 10" to 60" Diameter
- 3/8" thru 1" Rims
- 1", 1-1/4" and Heavier End Discs
- 3/8" Center Plates
- Several Hub/Bushing Systems Available
- Double Sub-Arc Weldments

Estimated Mine Duty Drum Pulley Weights

Diameter (A)	Hub	Max Bore	Setback (B)•	Face Width (C)						
				26	32	38	44	51	57	63
12	XT25	2-7/16	3/4	153	179	205	231	261	288	314
12	XT30	2-15/16	7/8	156	182	208	234	264	291	317
12	XT35	3-7/16	7/8	161	187	213	239	269	296	322
14	XT30	2-15/16	7/8	210	242	273	304	340	371	402
14	XT35	3-7/16	7/8	215	247	278	309	345	376	407
16	XT30	2-15/16	7/8	255	292	328	364	407	443	479
16	XT35	3-7/16	7/8	260	297	333	369	412	448	484
16	XT40	3-15/16	1	267	304	340	376	419	455	491
18	XT35	3-7/16	7/8	308	350	392	434	483	524	566
18	XT40	3-15/16	1	315	357	399	441	490	531	573
20	XT35	3-7/16	7/8	361	408	456	503	558	606	653
20	XT40	3-15/16	1	368	415	463	510	565	613	660
20	XT45	4-7/16	1	377	424	472	519	574	622	669
24	XT35	3-7/16	7/8	597	671	745	820	906	981	1055
24	XT40	3-15/16	1	604	678	752	827	913	988	1062
24	XT45	4-7/16	1	613	687	761	836	922	997	1071
30	XT40	3-15/16	1	857	954	1051	1148	1261	1359	1456
30	XT45	4-7/16	1	866	963	1060	1157	1270	1368	1465
30	XT50	4-15/16	1	889	986	1083	1180	1293	1391	1488
36	XT40	3-15/16	1	1152	1274	1395	1516	1658	1780	1901
36	XT45	4-7/16	1	1161	1283	1404	1525	1667	1789	1910
36	XT50	4-15/16	1	1184	1306	1427	1548	1690	1812	1933

• General position for bushing face - for position per application consult engineering.

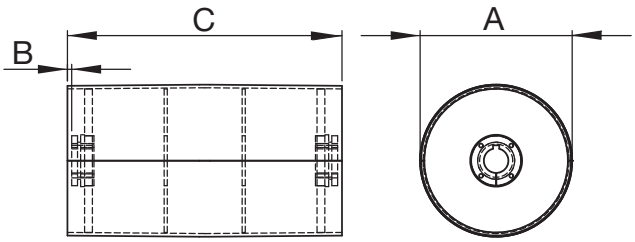
Consult Factory for dimensional and weight specifications of sizes not shown.

Drum Pulleys

Quarry Duty Drum Pulleys

Martin offers Quarry Duty Drum Pulleys using a minimum 1/2" rim, 1-1/4" end discs, and 1/2" center discs, as well as an additional center disc. Each Quarry Duty Drum Pulley features a two piece rolled rim, which has been fabricated on either of our flat or custom crowned roll machines. The rims are trimmed and hydraulically seated around the heavy end discs to ensure maximum concentricity. Once the pulley is formed, Martin utilizes a double or triple pass submerged arc weldment to ensure optimum connection of its individual components.

Martin 's Quarry Duty Drum Pulley is available in either Flat Face or Crown Face construction.



FEATURES:

- 12" to 60" Diameter
- 1/2" thru 1" Rims
- 1-1/4" and Heavier End Discs
- 1/2" Center Plates
- Full Depth Key Bushings
- Double Sub-Arc Weldments

Estimated Quarry Duty Drum Pulley Weights

Diameter (A)	Hub	Max Bore	Setback (B)•	Face Width (C)						
				26	32	38	44	51	57	63
12	XT35	3-7/16	7/8	229	264	298	332	372	406	441
14	XT35	3-7/16	7/8	285	326	367	408	456	497	538
16	XT35	3-7/16	7/8	346	394	442	490	546	594	642
16	XT40	3-15/16	1	353	401	449	497	553	601	649
18	XT35	3-7/16	7/8	412	468	523	578	643	698	753
18	XT40	3-15/16	1	419	475	530	585	650	705	760
20	XT35	3-7/16	7/8	486	549	611	674	746	809	871
20	XT40	3-15/16	1	493	556	618	681	453	816	878
20	XT45	4-7/16	1	502	565	627	690	462	825	887
24	XT35	3-7/16	7/8	646	725	803	881	972	1050	1128
24	XT40	3-15/16	1	653	732	810	888	979	1057	1135
24	XT45	4-7/16	1	662	741	819	897	988	1066	1144
30	XT40	3-15/16	1	935	1039	1142	1245	1365	1469	1572
30	XT45	4-7/16	1	944	1048	1151	1254	1374	1478	1581
30	XT50	4-15/16	1	967	1071	1174	1277	1397	1501	1604
36	XT40	3-15/16	1	1267	1397	1527	1658	1810	1940	2070
36	XT45	4-7/16	1	1276	1406	1536	1667	1819	1949	2079
36	XT50	4-15/16	1	1299	1429	1559	1690	1842	1972	2102

•General position for bushing face - for position per application consult engineering.

Consult Factory for dimensional and weight specifications of sizes not shown.

Drum Pulleys

Engineering Class Drum Pulleys

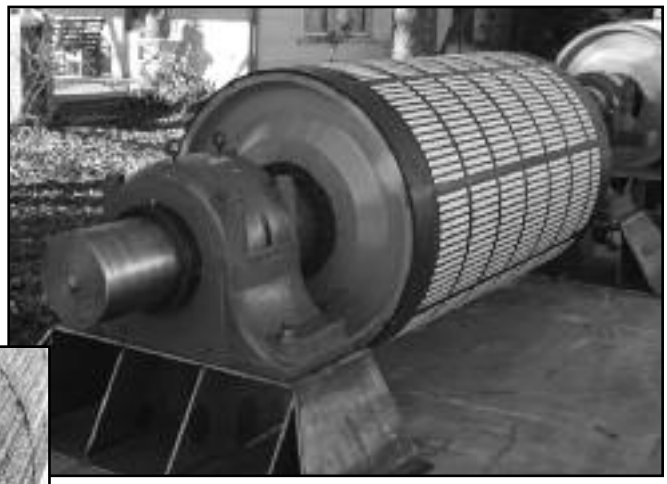
Engineering Class Pulley with FEA Mesh

Martin's Engineering Class Drum Pulleys feature our heaviest construction available. Unlike other manufacturers, whose Engineering Class Pulleys may actually feature material construction lighter than their Mine Duty Pulley, our Engineering Class Pulleys are constructed with materials even more aggressive than the Quarry Duty product. Our Engineering Class Pulleys generally feature extra manufacturing steps such as; machining, balancing, NDT weld tests, magnetic particle tested welds and thermally stress relieving to ensure that our pulley will stand up to the most rugged application.

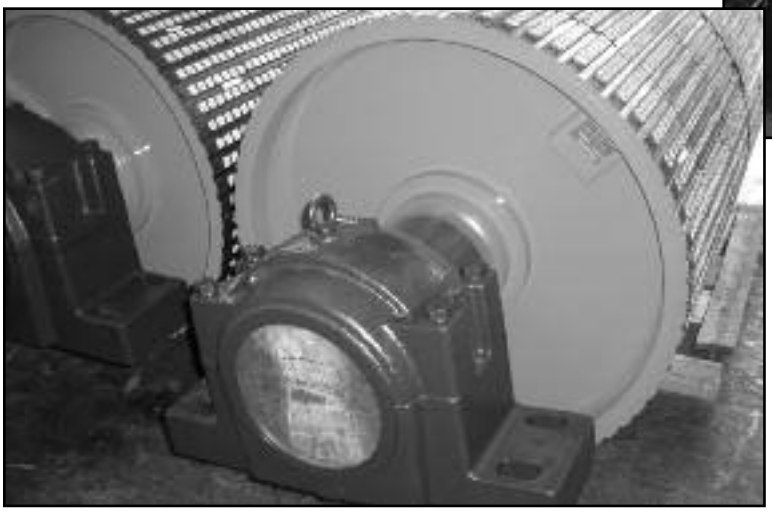
The Martin Engineering Class Drum Pulley can be manufactured in many designs; from rigid end disc bushed construction to turbine end disc with keyless compression hubs. The Martin Engineering Class Pulley is typically used in extremely high tension applications where performance is critical. Steel cable and high modulus fabric belt conveyors are perfect applications for the Martin Engineering Class Pulley.

FEATURES:

- Available in Any Diameter
- End Disc Profile is Engineered per Application
- Several Shaft Locking Mechanism Systems Available
- Balancing, Stress Relieving, Weld Testing & Additional Operations are Available.



Turbine End Disc Drum assembly with keyless locking device. Ceramic Lagging.



Engineering Drum Pulley assembly with keyless locking device. Ceramic Lagging.

OPTIONS:

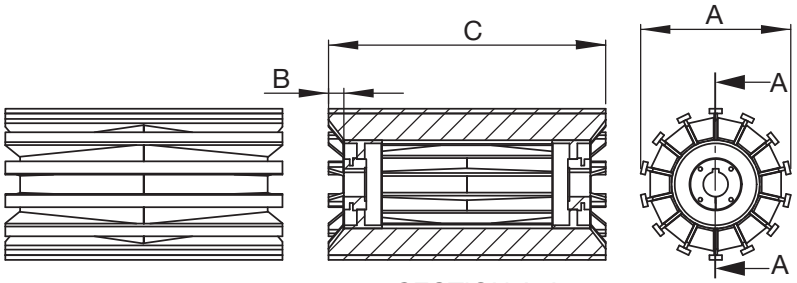
- Vulcanized Lagging
- Shafting
- Bearing Assemblies
- Take-Up Frames

Call Martin for fast turn around times on Made-To-Order Engineering Pulleys!

Wing Pulleys

Standard Duty Wing Pulleys

Martin's Standard Duty Wing Pulleys are constructed from extremely heavy materials and are recognized in the industry as the most aggressive CEMA grade stock pulley on the shelf. All Martin wing pulleys utilize the unique 'end-pipe' design, which offers ultimate protection against wing folding and hub-weld fatigue. Our minimum 3/8" thick contact bar yields additional life in abrasive applications where our competitors thinner bar does not. Additionally, our ¼" thick wing offers greater structural support in aggressive applications.



SECTION A-A

FEATURES:

- Available in 6" thru 60" Diameter
- Minimum 3/8" x 1-1/4" Contact Bars
- Minimum 1/4" Thick Wings
- Minimum 10 ga. Gussets
- Features Unique Martin 'End Pipe' Design
  - Better Protection Against Wing Folding
  - Better Protection Against Hub-Weld Fatigue
- Several Hub/Bushing Systems Available

Estimated Standard Duty Wing Pulley Weights

Diameter (A)*	Hub	Max Bore	Setback (B)•	Face Width (C)							
				20	26	32	38	44	51	57	63
12	XT25	2-7/16	3/4	105	130	154	179	203	232	256	281
12	XT30	2-15/16	7/8	111	136	160	185	209	238	262	287
14	XT25	2-7/16	3/4	120	147	175	203	230	263	290	318
14	XT30	2-15/16	7/8	126	153	181	209	236	269	296	324
16	XT25	2-7/16	3/4	136	168	201	233	265	303	336	368
16	XT30	2-15/16	7/8	142	174	207	239	272	309	342	374
16	XT35	3-7/16	7/8	153	186	218	250	283	320	353	385
18	XT25	2-7/16	3/4	183	230	277	323	370	425	471	518
18	XT30	2-15/16	7/8	189	236	283	329	376	431	477	524
18	XT35	3-7/16	7/8	201	248	294	341	388	442	489	536
20	XT30	2-15/16	7/8	203	250	300	350	400	458	508	558
20	XT35	3-7/16	7/8	212	262	311	361	411	470	519	569
20	XT40	3-15/16	1	226	276	326	376	425	484	534	584
24	XT35	3-7/16	7/8	254	314	373	432	492	561	621	680
24	XT40	3-15/16	1	268	328	387	447	506	575	635	694
24	XT45	4-7/16	1	286	346	405	465	524	593	653	712
30	XT40	3-15/16	1	310	374	438	503	567	642	706	771
30	XT45	4-7/16	1	328	392	456	521	585	660	724	789
30	XT50	4-15/16	1	373	437	501	566	630	705	769	834
36	XT40	3-15/16	1	401	493	584	676	767	874	966	1057
36	XT45	4-7/16	1	419	511	602	694	785	892	984	1075
36	XT50	4-15/16	1	464	556	647	739	830	937	1029	1120

* Nominal

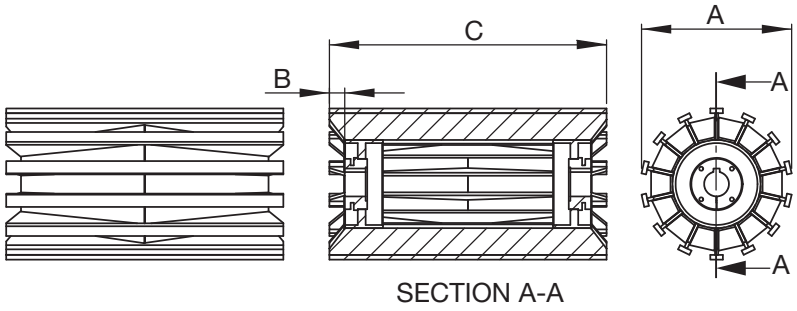
• General position for bushing face - for position per application consult engineering.

Consult Factory for dimensional and weight specifications of sizes not shown.

Wing Pulleys

Mine Duty Wing Pulleys

Martin 's Mine Duty Wing Pulleys are constructed from extremely heavy materials and are recognized in the industry as the most aggressive 'Mine Duty' stock pulley on the shelf. All Martin wing pulleys utilize the unique 'end-pipe' design, which offers ultimate protection against wing folding and hub-weld fatigue. Our minimum 5/8" thick contact bar yields additional life in abrasive applications where our competitors thinner bar does not. Additionally, our 3/8" thick wing and 1/4" gussets offer greater structural support in aggressive applications.



SECTION A-A

FEATURES:

- Available in 8" thru 60" Diameter
- Minimum 5/8" x 1-1/2" Contact Bars
- Minimum 3/8" Thick Wings
- Minimum 1/4" Gussets
- Features Unique Martin 'End Pipe' design
  - Better Protection Against Wing Folding
  - Better Protection Against Hub-Weld Fatigue
- Several Hub/Bushing Systems Available

Estimated Mine Duty Wing Pulley Weights

Diameter (A)*	Hub	Max Bore	Setback (B)•	Face Width (C)						
				26	32	38	44	51	57	63
12	XT25	2-7/16	3/4	193	232	272	311	356	396	435
12	XT30	2-15/16	7/8	199	239	278	317	363	402	441
12	XT35	3-7/16	7/8	211	250	289	329	374	413	453
14	XT25	2-7/16	3/4	221	266	311	356	408	453	497
14	XT30	2-15/16	7/8	228	272	317	362	414	459	507
14	XT35	3-7/16	7/8	239	284	329	373	426	470	515
16	XT25	2-7/16	3/4	255	307	360	412	473	526	578
16	XT30	2-15/16	7/8	261	313	366	418	479	532	584
16	XT35	3-7/16	7/8	272	325	377	430	491	543	596
16	XT40	3-15/16	1	287	339	392	444	505	558	610
18	XT35	3-7/16	7/8	345	414	483	553	633	702	772
18	XT40	3-15/16	1	359	428	498	567	647	717	786
20	XT35	3-7/16	7/8	384	462	540	618	709	787	865
20	XT40	3-15/16	1	398	476	554	632	723	802	880
20	XT45	4-7/16	1	416	494	572	650	741	820	898
24	XT35	3-7/16	7/8	462	556	649	743	852	946	1040
24	XT40	3-15/16	1	476	570	664	757	867	960	1054
24	XT45	4-7/16	1	494	588	682	775	885	978	1072
30	XT40	3-15/16	1	522	620	718	816	931	1029	1127
30	XT45	4-7/16	1	540	638	736	834	949	1047	1145
30	XT50	4-15/16	1	585	683	781	879	994	1092	1190
36	XT40	3-15/16	1	699	838	977	1116	1279	1418	1557
36	XT45	4-7/16	1	717	856	995	1134	1297	1436	1575
36	XT50	4-15/16	1	762	901	1040	1179	1342	1481	1620

* Nominal
• General position for bushing face - for position per application consult engineering.

Consult Factory for dimensional and weight specifications of sizes not shown.

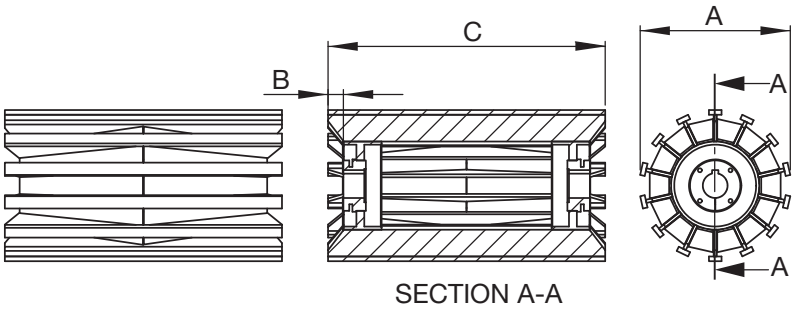
Wing Pulleys

Quarry Duty Wing Pulleys

Martin's Quarry Duty Wing Pulleys are constructed from extremely heavy materials and are recognized in the industry as the most aggressive wing pulley in the business. All Martin wing pulleys utilize the unique 'end-pipe' design, which offers ultimate protection against wing folding and hub-weld fatigue. Our minimum 3/4" thick contact bar yields additional life in abrasive applications where our competitors thinner bar does not. Additionally, our 3/8" thick wing and 5/16" gussets offer higher structural support in aggressive applications.

All Martin Quarry Duty Wing Pulleys utilize full depth keyed bushings which offer maximum clamping force on the shaft and minimize "pulley walking." The Quarry Duty Wing Pulley has changed the industry and has spawned many 'knock-offs,' but none have been able to reproduce the original!

For the most aggressive applications, specify the best, specify the Martin Quarry Duty Wing Pulley!



SECTION A-A

FEATURES:

- Available in 10" thru 60" Diameter
- Minimum 3/4" x 2" Contact Bars
- Minimum 3/8" Thick Wings
- Minimum 5/16" Gussets
- Several Hub/Bushing Systems Available
- Features Unique Martin 'End Pipe' Design
  - Better Protection Against Wing Folding
  - Better Protection Against Hub-Weld Fatigue
- Features Full Depth Keyed Bushings for Higher Clamping to Shaft

Estimated Quarry Duty Wing Pulley Weights

Diameter (A)*	Hub	Max Bore	Setback (B)•	Face Width (C)						
				26	32	38	44	51	57	63
12	XT35	3-7/16	7/8	229	264	298	332	372	406	441
14	XT35	3-7/16	7/8	285	326	367	408	456	497	538
16	XT35	3-7/16	7/8	346	394	442	490	546	594	642
16	XT40	3-15/16	1	353	401	449	497	553	601	649
18	XT35	3-7/16	7/8	412	468	523	578	643	698	753
18	XT40	3-15/16	1	419	475	530	585	650	705	760
20	XT35	3-7/16	7/8	486	549	611	674	746	809	871
20	XT40	3-15/16	1	493	556	618	681	753	816	878
20	XT45	4-7/16	1	502	565	627	690	762	825	887
24	XT35	3-7/16	7/8	646	725	803	881	972	1050	1128
24	XT40	3-15/16	1	653	732	810	888	979	1057	1135
24	XT45	4-7/16	1	662	741	819	897	988	1066	1144
30	XT40	3-15/16	1	935	1039	1142	1245	1365	1469	1572
30	XT45	4-7/16	1	944	1048	1151	1254	1374	1478	1581
30	XT50	4-15/16	1	967	1071	1174	1277	1397	1501	1604
36	XT40	3-15/16	1	1267	1397	1527	1658	1810	1940	2070
36	XT45	4-7/16	1	1276	1406	1536	1667	1819	1949	2079
36	XT50	4-15/16	1	1299	1429	1559	1690	1842	1972	2102

* Nominal

• General position for bushing face - for position per application consult engineering.

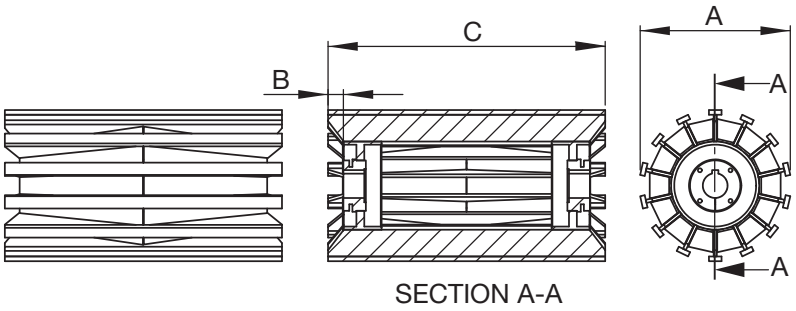
Consult Factory for dimensional and weight specifications of sizes not shown.

Wing Pulleys

Quarry Duty "AR" Wing Pulleys

Martin Quarry Duty “AR” (abrasive resistant) Wing Pulleys are constructed with AR400 3/4" x 2" heavy contact bars and are recognized in the industry as a true problem solving pulley. All Martin Quarry Duty “AR” Wing Pulleys utilize the unique ‘end-pipe’ design, which offers ultimate protection against wing folding and hub-weld fatigue. Our 3/4" AR400 contact bar yields maximum life in super abrasive applications where our competitors thinner A36 mild steel bar does not. Additionally, our 1/2" thick wing and 5/16" gussets offer higher structural support in aggressive applications.

All Martin Quarry Duty “AR” Wing Pulleys utilize full depth keyed bushings which offer maximum clamping force on the shaft and minimize “pulley walking.” The Quarry Duty “AR” wing pulley has changed the industry and solved the problem of premature bar wear plaguing users in some of the most aggressive applications.



SECTION A-A

FEATURES:

- Available in 10" thru 60" Diameter
- Minimum 3/4" x 2" Contact Bars “AR400” Abrasive Resistant Steel
- Minimum 1/2" Thick Wings
- Minimum 5/16" Gussets
- Features Unique Martin ‘End Pipe’ Design
  - Better Protection Against Wing Folding
  - Better Protection Against Hub-Weld Fatigue
- Features Full Depth Keyed Bushings for Higher Clamping to Shaft
- Several Hub/Bushing Systems Available

Estimated Quarry Duty "AR" Wing Pulley Weights

Diameter (A)*	Hub	Max Bore	Setback (B)•	Face Width (C)						
				26	32	38	44	51	57	63
12	XT35	3-7/16	7/8	271	324	377	430	492	545	597
14	XT35	3-7/16	7/8	335	402	470	538	617	685	752
16	XT35	3-7/16	7/8	362	434	507	580	665	738	810
16	XT40	3-15/16	1	376	449	521	594	679	752	825
18	XT35	3-7/16	7/8	462	558	654	750	862	958	1054
18	XT40	3-15/16	1	476	572	668	764	876	972	1068
20	XT35	3-7/16	7/8	512	619	727	834	960	1067	1175
20	XT40	3-15/16	1	526	634	741	848	974	1081	1189
20	XT45	4-7/16	1	544	652	759	866	992	1099	1207
24	XT35	3-7/16	7/8	613	741	870	998	1148	1277	1405
24	XT40	3-15/16	1	627	756	884	1012	1162	1291	1419
24	XT45	4-7/16	1	645	774	902	1030	1180	1309	1437
30	XT40	3-15/16	1	711	853	995	1137	1303	1444	1586
30	XT45	4-7/16	1	729	871	1013	1155	1321	1462	1604
30	XT50	4-15/16	1	774	916	1058	1200	1366	1507	1649
36	XT40	3-15/16	1	920	1109	1299	1489	1710	1900	2089
36	XT45	4-7/16	1	938	1127	1317	1507	1728	1918	2107
36	XT50	4-15/16	1	983	1172	1362	1552	1773	1963	2152

* Nominal

• General position for bushing face - for position per application consult engineering.

Consult Factory for dimensional and weight specifications of sizes not shown.

Lagging - Vulcanized

Nomenclature

VRL
Vulcanized Rubber Lagging

HBL
Herringbone Lagging

DGL
Diamond Grooved Lagging

In any conveying application, conveyor belt slippage can be a problem. There are basically three different factors that can cause slippage between a conveyor belt and a drive pulley.

1. The coefficient of friction might be too low.

2. The wrap angle of the belt on the conveyor pulley might be too small.

3. The tension on the belt might be too low.

The most cost efficient way to reduce the risk of slippage is to install the right type of pulley lagging on the drive pulley. The use of lagging on the conveyor pulley performs two functions:

1. Its primary function is to aid in gripping the conveyor belt, thus helping transmit torque from the drive to the pulley in order to carry the load on the conveyor belt.

2. Lagging also prolongs the wear life of the pulley.

Vulcanized lagging is a rubber compound that has been cured in an autoclave, which typically results in a 60-70 durometer material. After curing, the lagging can be grooved and/or machined.

Martin offers vulcanized rubber lagging on all of our drum pulleys. We apply rubber directly to the face of our pulleys by extrusion. Our lagging department has perfected the process and can apply rubber in any thickness to any diameter core pulley ranging from 4" to 72". We extrude rubber in the specified thickness, wrap the uncured rubber pulley in Teflon® impregnated curing tape and bake the pulley in one of our large diameter autoclaves under high pressure at a very high temperature for a set period of time until the rubber is fully cured.

We offer several grooving patterns in the cured rubber, but among the most popular are Herringbone and Diamond Groove.

The standard hardness for pulley lagging ranges from 60-70, but other durometers are available upon request.

Vulcanized Lagging - Plain

Plain vulcanized lagging is suitable for any pulley in the conveyor system where watershed is not necessary. It provides additional protection against belt wear and increases the life of the pulley.

Vulcanized Lagging - Herringbone

Herringbone Grooved Lagging offers superior tractive properties and is desired on all drive pulley applications. Each groove offers a path for water and other liquids to escape between the pulley face and the conveyor belt. Herringbone grooved pulleys are directional and should be applied to the conveyor in a manner in which the grooves point toward the direction of belt travel.

Vulcanized Lagging - Diamond Grooved

Diamond Grooved Lagging also offers superior tractive properties and should be specified on all reversing conveyor applications.

Lagging - Ceramic

MSHA- Mine & Safety Hazard Approved

Mine & Safety Hazard Approved Lagging (MSHA) should be used in all underground coal mining applications and any application where fire safety is imperative. Martin's MSHA lagging compound has been approved by the United States Federal Government to apply on all pulleys in mining applications where fire safety is required. The MSHA compound is clearly labeled on each pulley and stamped with our government ID in several places on each pulley. Minimum required thickness for MSHA lagging is 1/2".

The MSHA compound can be shipped as plain, herringbone or diamond grooved

AR- Abrasive Resistant

Abrasive Resistant Lagging is a very popular compound in the most rugged applications where protection against highly abrasive conveyed materials is required. Martin's AR (abrasive resistant) compound was developed with the engineering support and technical experience of chemists from the tire industry. The AR compound mimics the substance used in the tires of the giant "quarry loaders" where resistance to puncture, wear and chunking has been essential. Our suppliers have learned through the years that the same technology can be applied to our rubber lagging compounds.

For maximum protection against premature lagging failure, specify Martin's AR Lagging!

Ceramic (Cold bond and Vulcanized)

Vulcanized Ceramic Lagging by Martin has proven to be the best in the industry. Martin has worked closely with independent testing labs to study adhesion strengths of several bonding methods. Our studies found that the Martin VC Lagg yield an 83% higher bonding strength than conventional cold bonding methods for ceramic lagging compounds.

Lagging - Other

Weld On Strip Lagging

Weld on Strip Lagging is available from Martin's stock and is easily installed on drum pulleys either in our facilities or in the field. We stock 72" long strips with retainers in diameters from 10" to 48". Not only do we have standard 60 durometer SBR available, but we can provide special compounds like; 40 durometer rubber, EPDM and SOF (Static Conductive Oil & Fire resistant).

Cold Bond

Cold Bond Lagging is another product available from Martin. We stock full rolls of pre-cured rubber suitable for installation directly to the face of the pulley. Our Cold Bond rubber is available in plain or diamond grooved pattern. This product is typically used when pulleys on the conveyor must be re-lagged while still in operation, and can reduce the change-out time required to install a complete new assembly.

Simply tell us the diameter and face width of the pulley on which you would like to install our Cold Bond Lagging, and we will generate a quote for a “Cold Bond Kit” which will include all necessary materials required to lag the subject pulley.

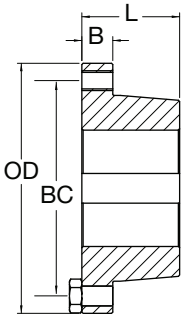
Molded Urethane

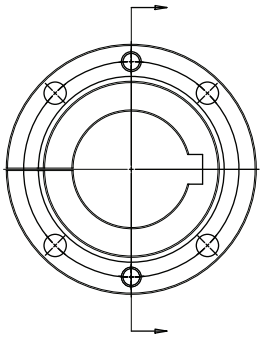
Molded Urethane Lagging is yet another product offered by Martin which will protect pulleys from extreme abrasion. Our Urethane lagging is actually poured in a liquid state into a fabricated form, which encases the pulley. Once the urethane is cured and hardened, we machine the outside diameter to a concentric OD. We can additionally alter the urethane lagging to either a herringbone or diamond grooved pattern.

SOF (Static Conductive Oil & Fire resistant)

SOF (Static Conductive/Oil Resistant/Flame Resistant): Static Conductive, Oil Resistant, and Flame Resistant properties are combined to reduce the risk of explosion, and fire or oil related lagging failures. The static reducing qualities allow the accumulation of static to dissipate through the lagging to ground (in a grounded system). Oil resistance is appropriate for moderately oily conditions involving hydrocarbons, fats, oils, greases, hydraulic fluids, solvents, and other moderate chemicals. The self extinguishing characteristics of SOF make it ideal for use in grain and fertilizer applications.

Conveyor Bushings





QD Short Bushings & Taper Bushings also Available. Please See General Catalog, Section B For More Information.

Martin's MXT & CXT Bushings are available from stock to fit all popular pulley sizes. Martin stocks both MXT & CXT Bushings in a wide range of bore sizes per hub. Both the MXT & CXT Bushing offers a 2" per foot taper, which reduces end disc pre-stressing, as well as increasing clamping force.

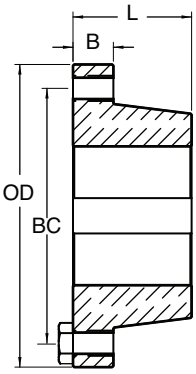
All bushings size 50 and larger feature full depth keys.

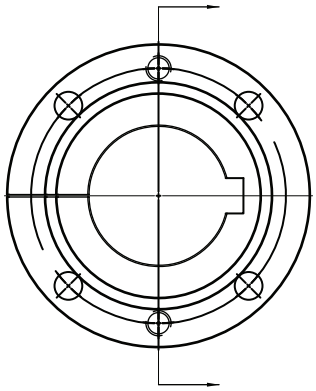
MXT™/ CXT™ Bushing Dimensions

Part Number		Max. Bore (In.)	Dimensions				Cap Screws		Wt. Lbs. (Approx)	Standard Stock Bores		Wrench Torque (Ft./Lbs.)
Cast / Ductile	Steel		Length thru Bore (L)	Flange Width (B)	Flange O.D. (OD)	Bolt Circle (BC)	No.	Size		Stock Bore (Inches)	Keyway*	
MXT15	CXT15	1-1/2	1-1/8	3/8	2-7/8	2-7/16	4	1/4 x 1	0.7	5/8, 3/4, 7/8	3/16 x 3/32	8
										1, 1-1/8, 1-3/16, 1-1/4	1/4 x 1/8	
										1-7/16, 1-1/2	3/8 x 1/8*	
MXT20	CXT20	2	1-13/32	15/32	3-3/4	3-3/16	4	5/16 x 1-1/4	1.5	3/4	3/16 x 3/32	17
										1, 1-3/16, 1-1/4	1/4 x 1/8	
										1-7/16, 1-1/2, 1-11/16	3/8 x 3/16	
										1-15/16, 2	1/2 x 3/16*	
MXT25	CXT25	2-1/2	1-7/8	5/8	4-7/16	3-3/4	4	3/8 x 1-3/4	2.6	1, 1-3/16, 1-1/4	1/4 x 1/8	29
										1-7/16, 1-1/2, 1-11/16	3/8 x 3/16	
										1-15/16, 2, 2-3/16	1/2 x 1/4	
										2-7/16	5/8 x 1/8*	
MXT30	CXT30	3	2-1/16	11/16	5-5/16	4-9/16	4	7/16 x 1-1/2	4.2	1-7/16, 1-1/2	3/8 x 3/16	46
										1-15/16, 2-3/16	1/2 x 1/4	
										2-7/16, 2-11/16	5/8 x 5/16	
										2-15/16	3/4 x 3/16*	
MXT35	CXT35	3-1/2	2-15/32	25/32	6-5/16	5-7/16	4	1/2 x 1-3/4	7.4	1-15/16, 2-3/16	1/2 x 1/4	70
										2-7/16, 2-11/16	5/8 x 5/16	
										2-15/16	3/4 x 3/8	
										3-7/16	7/8 x 5/16*	
MXT40	CXT40	4	2-13/16	7/8	7-1/8	6-1/8	4	9/16 x 2	10.5	2-7/16	5/8 x 5/16	100
										2-15/16	3/4 x 3/8	
										3-7/16	7/8 x 7/16	
										3-15/16	1 x 3/8*	
MXT45	CXT45	4-1/2	3-5/16	15/16	8	6-7/8	4	5/8 x 2-1/4	14.8	3-7/16	7/8 x 7/16	140
										3-15/16	1 x 1/2	
										4-7/16	1 x 3/8*	
MXT50	CXT50	5	3-3/4	1	10-1/8	8-5/16	4	3/4 x 2-1/2	27.8	3-15/16, 4-7/16	1 x 1/2	250
										4-15/16	1-1/4 x 5/8	
MXT60	CXT60	6	4-1/8	1-1/8	11-15/16	9-7/8	4	7/8 x 2-1/2	42.8	5-7/16, 5-1/2	1-1/4 x 5/8	400
										5-15/16, 6	1-1/2 x 3/4	
MXT70	CXT70	7	4-11/16	1-5/16	13-15/16	11-9/16	4	1x 3	66.3	6-7/16, 6-1/2	1-1/2 x 3/4	600
										6-15/16, 7	1-3/4 x 3/4	
MXT80	CXT80	8	5-1/8	1-3/8	15-5/8	12-7/8	4	1-1/8 x 3-1/2	85.7	7-1/2	1-3/4 x 3/4	750
										7-15/16, 8	2 x 3/4	
MXT100	CXT100	10	6-3/16	1-9/16	17-15/16	15-9/16	6	1-1/8 x 3-1/2	146.0	8-1/2, 9	2 x 3/4	750
										9-7/16, 9-1/2, 10	2-1/2 x 7/8	
MXT120	CXT120	12	7-1/16	1-3/4	20-5/8	18-3/16	8	1-1/8 x 3-1/2	216.0	10-1/2, 11	2-1/2 x 7/8	750
										11-1/2, 12	3 x 1	

* Keystock provided for non-standard keyways.

Conveyor Bushings





QD Short Bushings & Taper Bushings also Available. Please See General Catalog, Section B For More Information.

Martin's M-HE Bushings are available from stock to fit all popular pulley sizes. Martin stocks M-HE Bushings in a wide range of bore sizes per hub. The M-HE Bushing offers a 3" per foot taper, which reduces end disc pre-stressing, as well as increasing clamping force.

M-HE™ Bushing Dimensions

Part Number	Dimensions					Cap Screws		Wt. Lbs. (Approx)	Standard Stock Bores		Wrench Torque (Ft./Lbs.)
	Max. Bore (In.)	Length thru Bore (L)	Flange Width (B)	Flange O.D. (OD)	Bolt Circle (BC)	No. Bolts	Size		Stock Bore	Keyway*	
M-HE25	2-1/2	2-1/4	3/4	4-5/8	3-15/16	4	3/8 x 1-1/2	3	1, 1-1/8, 1-3/16, 1-1/4	1/4 X 1/8	30
									1-5/16, 1-3/8	5/16 X 5/32	
									1-7/16, 1-1/2, 1-11/16, 1-3/4	3/8 X 3/16	
									1-13/16, 1-7/8, 1-15/16, 2, 2-1/8, 2-3/16, 2-1/4	1/2 X 1/4	
									2-5/16, 2-3/8, 2-7/16, 2-1/2	5/8 X 3/16	
M-HE30	3	2-3/4	7/8	5-5/8	4-11/16	4	1/2 x 1-3/4	6	1-3/8	5/16 X 5/32	60
									1-7/16, 1-1/2, 1-11/16, 1-3/4	3/8 X 3/16	
									1-15/16, 2, 2-3/16	1/2 X 1/4	
									2-7/16, 2-1/2, 2-9/16, 2-11/16, 2-3/4	5/8 X 5/16	
									2-13/16, 2-7/8, 2-15/16, 3	3/4 X 1/8	
M-HE35	3-1/2	3	7/8	6-5/8	5-9/16	4	9/16 x 2	8	1-3/16	1/4 X 1/2	90
									1-7/16, 1-1/2, 1-11/16, 1-3/4	3/8 X 3/16	
									1-15/16, 2, 2-3/16, 2-1/4	1/2 X 1/4	
									2-3/8, 2-7/16, 2-1/2, 2-11/16, 2-3/4	5/8 X 5/16	
									2-7/8, 2-15/16, 3, 3-3/16	3/4 X 3/8	
									3-3/8, 3-7/16, 3-1/2	7/8 X 3/16	
M-HE40	4	3-1/2	1	7-1/2	6-5/16	4	5/8 x 2-1/2	13	1-15/16, 2-3/16	1/2 X 1/4	140
									2-7/16, 2-1/2, 2-11/16	5/8 X 5/16	
									2-15/16, 3-3/16	3/4 X 3/8	
									3-7/16, 3-11/16	7/8 X 7/16	
									3-7/8, 3-15/16, 4	1 X 1/4	
M-HE45	4-1/2	4	1-1/4	8-3/4	7-5/16	6	5/8 x 2-1/2	22	1-15/16	1/2 X 1/4	140
									2-7/16	5/8 X 5/16	
									2-15/16	3/4 X 3/8	
									3-7/16, 3-1/2	7/8 X 7/16	
									3-15/16	1 X 1/2	
									4-3/16, 4-7/16, 4-1/2	1 X 1/4	
M-HE50	5	4-1/2	1-1/2	9-5/8	8	6	3/4 x 3	40	2-15/16	3/4 X 3/8	200
									3-7/16	7/8 X 7/16	
									3-15/16, 4-7/16	1 X 1/2	
									4-15/16, 5	1-1/4 X 1/4	
M-HE60	6	5-1/4	1-3/4	11-1/8	9-1/4	6	7/8 x 3-1/2	50	3-15/16, 4-1/4, 4-7/16	1 X 1/2	350
									4-15/16, 5-7/16, 5-1/2	1-1/4 X 5/8	
									5-15/16, 6	1-1/2 X 1/4	

* Keystock provided for non-standard keyways.

Shafting

Martin offers a wide variety of solutions for your shafting needs. We offer a number of materials from cold finish ½" diameter to hot roll material in excess of 15" diameter. Stock shafting material is available in several grades including 1144, 1045, 4140 and stainless steel. Our machining capabilities are virtually unlimited featuring CNC lathes, as well as engine lathes, vertical milling machines, horizontal milling machines and more to modify every shaft exactly to your specifications for your unique application.

Diameters shown in table are standard sizes recommended for general use. Standard bushings, bearings, couplings, pulleys, sheaves, clutches, backstops, and other conveyor items are commonly found in these diameters.

Shaft Keyseats
Shaft keyseats are commonly used beneath pulley bushings and with a drive. Pulley keyseats for standard pulleys start 1/2" inside the face and are keyed through the bushing. Location of drive keyseats are standard and the size is determined by the shaft diameter. Additional keyseats or non-standard sizes can be manufactured per request.

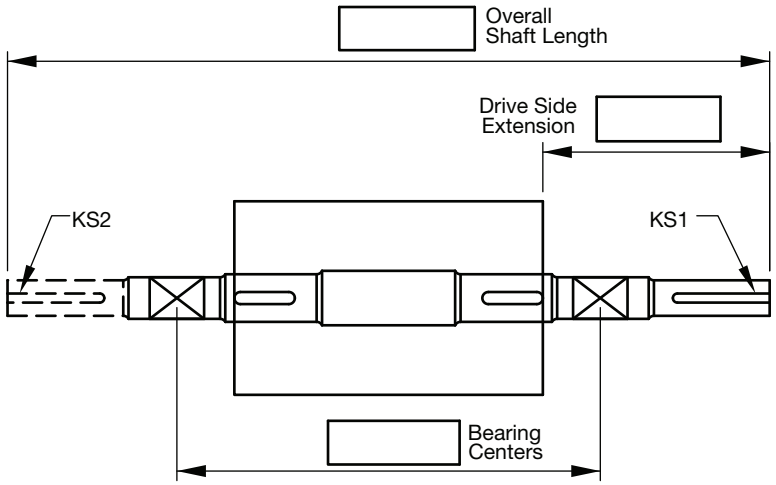
Shaft Turn Downs (Stepped Shafts)
For larger shafting it is common to turn the shaft down for a more economical selection of bearings and drives. The turndown is generally less than 25% of the original diameter and the two different diameters should be joined with a generous and smooth fillet to reduce stress concentrations.

Conveyor Shafting should be selected to keep deflection to a minimum and maintain the integrity of the pulley assembly core. Call your Martin representative to properly select the shaft for your pulley and conveying needs.

Standard Shaft Diameters
15/16
1-3/16
1-7/16
1-11/16
1-15/16
2-3/16
2-7/16
2-11/16
2-15/16
3-7/16
3-15/16
4-7/16
4-15/16
5-7/16
6
6-1/2
7
7-1/2

*Tolerances for shafing diameters are as follows:		
	Plus	Minus
Up to 1 1/2"	0.000	0.002
Over 1 1/2" to 2 1/2"	0.000	0.003
Over 2 1/2" to 4"	0.000	0.004
Over 4" to 6"	0.000	0.005
Over 6" to 8"	0.000	0.006
Over 8" to 9"	0.000	0.007
Over 9"	0.000	0.008

* Special tolerances available upon request.



_____ Major Shaft Diameter

_____ Shaft Diameter at Hub

_____ Shaft Diameter at Bearing

_____ Shaft Diameter at KS1

_____ Shaft Diameter at KS2

Keyseat 1 _____ x _____ x _____

Keyseat 2 _____ x _____ x _____

Direction of Rotation From Drive End _____

Thickness _____

Lagging

Type _____

Wear Items

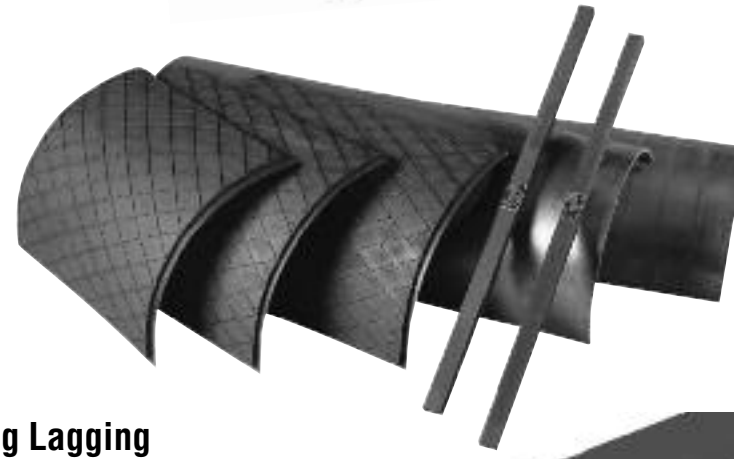
Shell Lagging

Shell Lagging is one product offered by Martin that allows our customers to Relag drum pulleys while they are still on the conveyor. Our field installable shell lagging kits are available in 3 piece, 4 piece and 5 piece construction depending upon the diameter of the core pulley to which the shells will be applied. Each shell is available in either flat construction or crowned construction.

Pulley Diameter	# Shells
12	3
14	3
16	4
18	4
20	4
24	4
30	4
36	5

Wear Rims

The Martin Steel Wear Rims are an additional item offered by Martin that allows the pulley to be patched while it is on the conveyor. Each rim is available in a 2 piece shell in ¼", 5/16", 3/8" or ½" thick material.

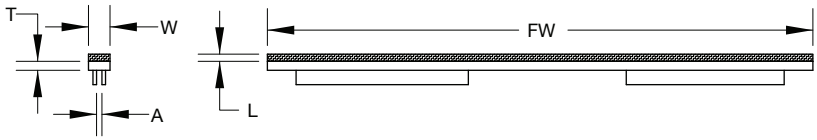


Wing Lagging

Martin Wing Lagging is designed to slide over the Martin wing pulley contact bars and is available in sizes suitable for all duties of our wing pulleys. Wing lagging is an excellent method of extending life on wing pulleys contact bars where belt abrasion typically causes premature wear. The Martin Wing Lagging product is easily installed either in the shop or in the field and can be supplied in either 72" long strips for your inventory, or in cut to length sizes for immediate installation.

Lagged Replacement Contact Bars

The Martin Replacement contact bars are intended for use on all manufacturer's wing pulleys and are field installable as well as shop installable. This product features vulcanized lagging on flatbars which have ¼" x 1" clips on the bottom side designed to slide over the vertical wing flights on wing pulleys that have worn contact bars. It is imperative that the specific wing flight thickness be specified at the time of order so that our fabrication team can space the clips properly to slip over the existing wings.



Must be approved by customer:

FW _____ W _____

T _____ A _____

L _____

Frequently Asked Questions

Once Again, Martin has the answer when it comes to offering a solution to field replacements on conveyor pulleys; Steel Wear Rims, Shell Lagging, Wing Lagging and Lagged Replacement Bars. There are many applications that require a simple fix in the field while the pulley is still on the conveyor structure. The Martin Wear Item line up addresses these types of situations. We offer replacement parts for both drum pulleys and wing pulleys; each intended for installation on an existing pulley in the field.

Some common questions to address regarding the Martin Wear Parts are:

Q: When does it make sense to install the Martin Shell Lagging on a drum pulley?

A: If the conveyor belt has worn through the rubber lagging on a pulley but not had time to wear into the drum pulley shell, the Martin Shell Lagging may be a good solution.

Q: Can I install the Martin Shell Lagging on new pulleys?

A: Absolutely! However it is not recommended that the shell lagging be used in drive pulley applications where tensions are extreme. The Martin Shell Lagging is primarily intended for field installation as a means of avoiding down time caused by belt slippage from worn lagging.

Q: Does the Martin Wing Lagging fit on all manufacturers wings pulleys?

A: No, the Martin Wing Lagging product is intended for application on flatbar of dimensions equal to what is supplied on the Martin Wing Pulley.

Q: Does the Martin Wing Lagging Require any tools to install?

A: Yes, but very few. (Dead Blow Hammer & a Welder) Each wing lagging strip is installed by gently pounding it over the existing contact bar on each individual wing. Once the wing has been rotated on the conveyor to a point where the inside wings are exposed; then the cut-to-length strips are positioned and pounded on with a Martin dead-blow hammer. The product will essentially "self-seat" itself when it hits the crown of the pulley, but should be driven on the balance of the distance across the face of the pulley. Once the Lagged Wing is properly positioned, a stitch weld should be placed along the bottom side of the bar, while watching for delamination of lagging from too much heat.

Q: Do the Martin Lagged Replacement Contact Bars fit all manufacturers' wing pulleys?

A: Yes they will. However, it is imperative that the wing flight thickness be submitted to our factory prior to manufacturing the replacement bars. Most pulley manufacturers utilize different thickness materials on their wing flights and in order to ensure a tight fit of our bar onto the wing, we must know that dimension. Please ask one of our Martin factory representatives for a Lagged Replaceable Contact Bar sheet.

Q: Do the Martin Steel Wear Rims fit on all manufacturers pulleys?

A: Yes, however we need to know the outside diameter and face width of the drum pulley on which it will be installed. We typically manufacture the Steel Wear Rims in 2 halves which need to be clamped to the core pulley. Each half-shell is trimmed ¼" short of the core face so that there is room to run a weld to fasten the Wear Rim to the pulley. It is also important that the core is clean and free of debris prior to installation for maximum operating performance.

**** MANUFACTURERS NOTE ****

Martin Wear Rims, Shell Lagging, Wing Lagging and Replacement Lagged Contact bars are intended for wear and tractive properties only, and NOT intended for structural enhancement of the underlying conveyor pulley.

Take-Up Frames Cross Reference

A properly designed belt conveyor will require the use of a take-up device. This device will take up the stretch in the conveyor belt and keep proper tension at the drive pulley to reduce slippage. A dynamic type, like a gravity take-up, is generally preferred but not always practical due to space or cost. Martin Screw Take-Up Frames are a good solution for these applications. Martin offers several types of frames that accommodate most bearings, mounting positions, and travel. Martin Take-Up Frames are available in stock or made-to-order for all of your mechanical take-up needs.

Martin's Take-Up Frames are fabricated from steel, offering superior strength and durability in the most rugged conditions.

- Available in Top Angle, Heavy Duty, Center Pull, Wide Slot, Tube Take-Up & Light Duty
- Accommodate bearing shafts sizes from 1" to 5-15/16"
- Available in standard travel lengths from 9" to 60"
- Stainless Steel, ACME thread & MTO lengths available
- Suitable for most manufacturers' housing styles including center pull wide slot, pillow block and top angle protected screw

CROSS REFERENCE

Top Angle Take-Up Frames (CTA)

Martin	Dodge	Precision
CTA10	TP10	PTA200
CTA20	TP20	PTA203
CTA30	TP30	PTA208
CTA40	TP40	PTA300
CTA50	TP50	PTA308
CTA60	TP60	PTA400

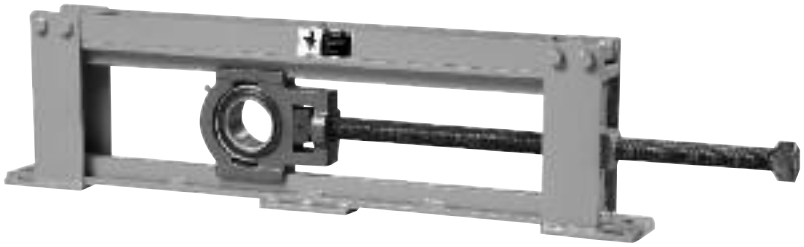
Heavy Duty Take-Up Frames (CHD)

Martin	Dodge	Precision	Linkbelt	Browning	SKF
CHD200	HD200	PHD200	LHD20	T2000 A/B/C	TFT01
CHD250	HD250	PHD250	LHD25	T2000 D/E	TFT03, TFT43
CHD300	HD300	PHD300	LHD30	T2000 F/G	TFT04/5, TFT34/44
CHD350	HD350	PHD350	LHD35	T2000 H/J	TFT06, TFT46
CHD400	HD400	PHD400	LHD40	T2000 K	TFT37
CHD500	HD500	PHD500	LHD50	T2000 M/N	TFT38, TFT48

Take-Up Frames

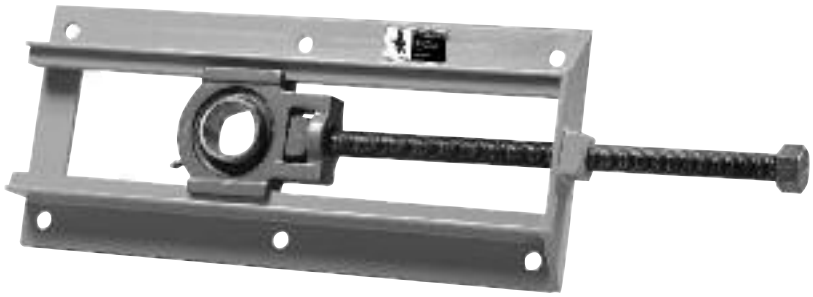
Center Pulley Take-Up Frames (CCP)

Martin	Dodge	Precision	Rexnord	Browning
CCP308	CP308	PCP108	ZHT6	T1000D
CCP400	CP400	PCP200	ZHT7	T1000EL
CCP408	CP408	PCP203	ZHT7	T1000EH
CCP502	CP502	PCP208	ZHT8	T1000F
CCP515	CP515	PCP300	ZHT9	T1000GL,GH
CCP613	CP613	PCP308	ZHT10	T1000JL,JH
CCP810	CP810	PCP400	ZHT11	T1000K



Wide Slot Take-Up Frames (CWS)

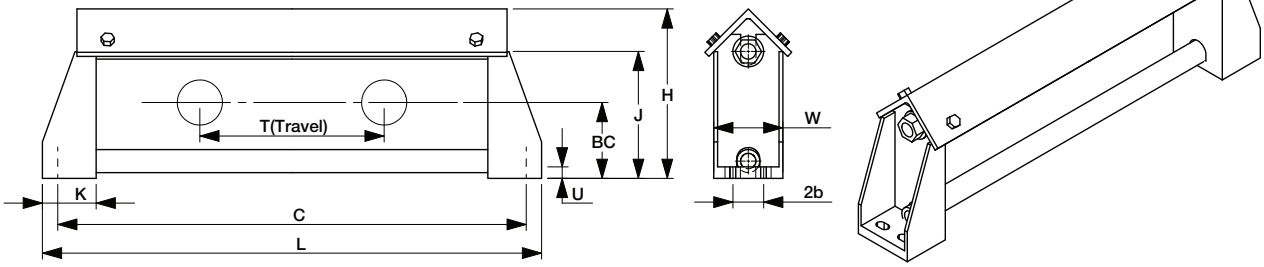
Martin	Dodge	Precision
CWS300	WS300	PWS100
CWS308	WS308	PWS108
CWS400	WS400	PWS200
CWS502	WS502	PWS208
CWS515	WS515	PWS300
CWS608	WS608	PWS308



Tube Take-Up Frames (TTU)

Martin	Precision	Bryant	Link-Belt
TTU10	PST100	100	100
TTU25	PST200	250	250
TTU30	PST208	300	300
TTU35	PST208HD	350	-
TTU40	PST300	400	400
TTU50	PST308	500	-

Take-Up Frames

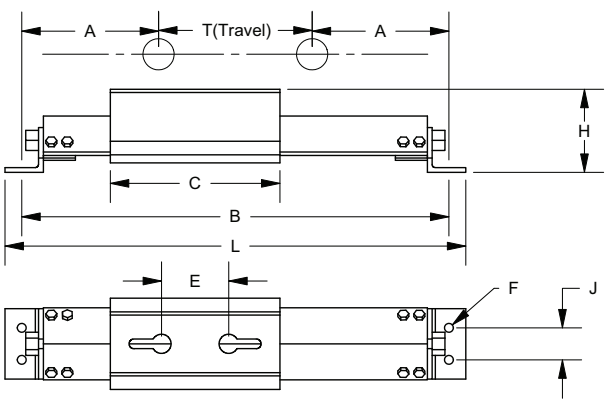


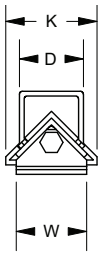
Top Angle Take-Up Frames (CTA)

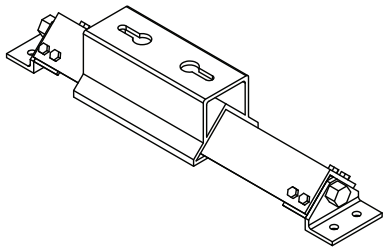
Frame Size	Nominal Travel (T)	Part Number	Weight	BC	C	H	J	K	L	U	2b	W
CTA10	12	CTA10-12	32	3-15/16	26-1/2	8-1/2	6-9/32	3	28-1/2	3/4	-	3-1/2
	18	CTA10-18	36		32-1/2				34-1/2			
	24	CTA10-24	40		38-1/2				40-1/2			
CTA20	12	CTA20-12	34	4-3/16	27-1/2	9-1/8	6-3/4	3	29-1/2	3/4	-	3-1/2
	18	CTA20-18	39		33-1/2				35-1/2			
	24	CTA20-24	43		39-1/2				41-1/2			
CTA30	12	CTA30-12	50	4 3/8	28-1/2	10-1/8	7-1/4	3-1/2	30-1/2	3/4	-	4
	18	CTA30-18	58		34-1/2				36-1/2			
	24	CTA30-24	66		40-1/2				42-1/2			
	30	CTA30-30	74		46-1/2				48-1/2			
	36	CTA30-36	82		52-1/2				54-1/2			
	48	CTA30-48	97		64-1/2				66-1/2			
CTA40	12	CTA40-12	56	4-15/16	30-1/2	11-1/16	8-3/32	3-1/2	32-1/2	3/4	2	4-1/2
	18	CTA40-18	63		36-1/2				38-1/2			
	24	CTA40-24	70		42-1/2				44-1/2			
	30	CTA40-30	77		48-1/2				50-1/2			
	36	CTA40-36	84		54-1/2				56-1/2			
	48	CTA40-48	98		66-1/2				68-1/2			
CTA50	12	CTA50-12	68	5-7/16	32	12-1/2	9-1/4	4	34-1/2	3/4	2	4-1/2
	18	CTA50-18	76		38				40-1/2			
	24	CTA50-24	84		44				46-1/2			
	30	CTA50-30	92		50				52-1/2			
	36	CTA50-36	100		56				58-1/2			
	48	CTA50-40	116		68				70-1/2			
CTA60	12	CTA60-12	96	7	36	14-1/4	11-3/32	4-1/2	38-1/2	3/4	2-1/2	5-1/2
	18	CTA60-18	106		42				44-1/2			
	24	CTA60-24	116		48				50-1/2			
	30	CTA60-30	126		54				56-1/2			
	36	CTA60-36	136		60				62-1/2			
	48	CTA60-48	156		72				74-1/2			

MTO Frames available upon request.

Take-Up Frames





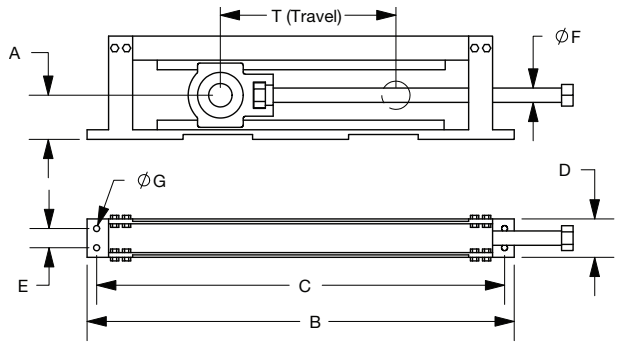


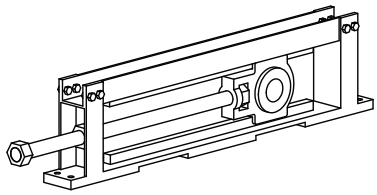
Heavy Duty Take-Up Frames (CHD)

Frame Size	Nominal Travel (T)	Part Number	Weight	A	B	C	D	E	F	H	J	K	L	W
CHD200	12	CHD200-12	50	8-1/2	29	11	4	Drilled To Order	5/8	5-1/4	2-1/2	6-1/8	31	5
	18	CHD200-18	53		35								37	
	24	CHD200-24	56		41								43	
	30	CHD200-30	60		47								49	
	36	CHD200-36	64		53								55	
CHD250	12	CHD250-12	84	10-3/8	32 3/4	13-1/4	5	Drilled To Order	5/8	6-1/4	3	7-1/8	35-1/4	5-1/2
	18	CHD250-18	89		38 3/4								41-1/4	
	24	CHD250-24	95		44 3/4								47-1/4	
	30	CHD250-30	100		50 3/4								53-1/4	
	36	CHD250-36	106		56 3/4								59-1/4	
CHD300	12	CHD300-12	140	11-3/4	35 1/2	14-1/4	6	Drilled To Order	3/4	7	3	8-3/4	38-1/4	6-1/2
	18	CHD300-18	147		41 1/2								44-1/4	
	24	CHD300-24	155		47 1/2								50-1/4	
	30	CHD300-30	165		53 1/2								56-1/4	
	36	CHD300-36	175		59 1/2								62-1/4	
	42	CHD300-42	186		65 1/2								68-1/4	
	48	CHD300-48	196		71 1/2								74-1/4	
CHD350	12	CHD350-12	150	12-5/8	37 1/4	16	6	Drilled To Order	3/4	7	3	8-3/4	40	6-1/2
	18	CHD350-18	160		43 1/4								46	
	24	CHD350-24	170		49 1/4								52	
	30	CHD350-30	180		55 1/4								58	
	36	CHD350-36	190		61 1/4								64	
	42	CHD350-42	200		67 1/4								70	
	48	CHD350-48	210		73 1/4								76	
CHD400	12	CHD400-12	179	14-5/8	41 1/4	20	7	Drilled To Order	3/4	7	3	8-3/4	44	6-1/2
	18	CHD400-18	189		47 1/4								50	
	24	CHD400-24	199		53 1/4								56	
	30	CHD400-30	209		59 1/4								62	
	36	CHD400-36	219		65 1/4								68	
	42	CHD400-42	230		71 1/4								74	
	48	CHD400-48	240		77 1/4								80	
CHD500	12	CHD500-12	305	17-1/2	47	23-1/2	8-1/2	Drilled To Order	7/8	7-3/4	4	11-1/4	49-1/2	7
	18	CHD500-18	322		53								55-1/2	
	24	CHD500-24	340		59								61-1/2	
	30	CHD500-30	355		65								67-1/2	
	36	CHD500-36	370		71								73-1/2	
	42	CHD500-42	386		77								79-1/2	
	48	CHD500-48	401		83								85-1/2	

MTO Frames available upon request.

Take-Up Frames

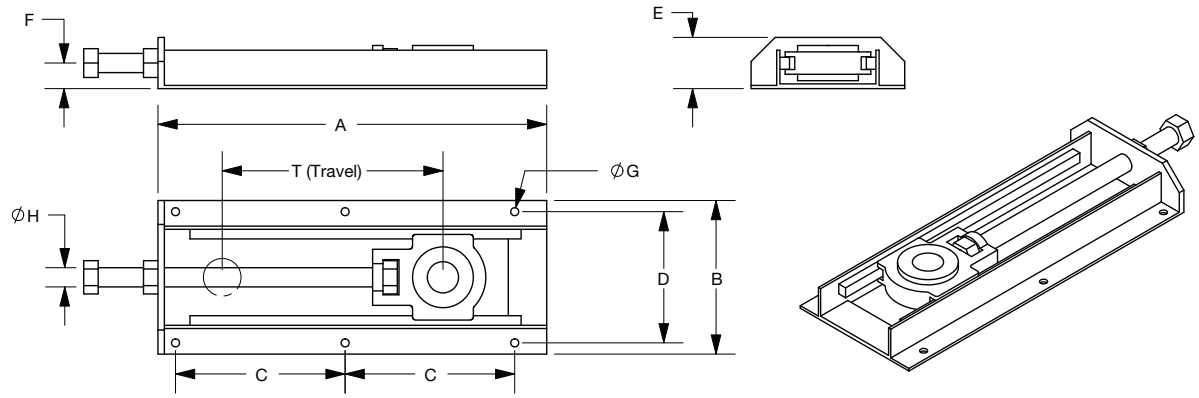




Center Pulley Take-Up Frames (CCP)

Frame Size	Nominal Travel (T)	Part Number	Weight	A	B	C	D	E	F	G	
										Qty	Dia
CCP308	12	CCP308-12	30	3-7/16	28	26	3	NA	3/4	2	1/2
	18	CCP308-18	36		34	32					
	24	CCP308-24	40		40	38					
	30	CCP308-30	45		46	44					
	36	CCP308-36	50		52	50					
CCP400	12	CCP400-12	57	3-15/16	29-1/2	27-1/2	4	NA	1	2	5/8
	18	CCP400-18	66		35-1/2	33-1/2					
	24	CCP400-24	75		41-1/2	39-1/2					
	30	CCP400-30	85		47-1/2	45-1/2					
	36	CCP400-36	93		53-1/2	51-1/2					
CCP408	12	CCP408-12	62	4-7/16	29-1/2	27-1/2	4	NA	1-1/8	2	5/8
	18	CCP408-18	71		35-1/2	33-1/2					
	24	CCP408-24	82		41-1/2	39-1/2					
	30	CCP408-30	91		47-1/2	45-1/2					
	36	CCP408-36	102		53-1/2	51-1/2					
CCP502	12	CCP502-12	68	4-3/8	30-1/2	28-1/2	4	NA	1-1/4	2	3/4
	18	CCP502-18	79		36-1/2	34-1/2					
	24	CCP502-24	89		42-1/2	40-1/2					
	30	CCP502-30	101		48-1/2	46-1/2					
	36	CCP502-36	110		54-1/2	52-1/2					
CCP515	12	CCP515-12	112	5-1/8	32-1/2	30-1/2	5	2	1-1/2	4	5/8
	18	CCP515-18	134		38-1/2	36-1/2					
	24	CCP515-24	152		44-1/2	42-1/2					
	30	CCP515-30	166		50-1/2	48-1/2					
	36	CCP515-36	186		56-1/2	54-1/2					
CCP613	12	CCP613-12	128	5-5/8	34-1/4	32	5	2	1-3/4	4	3/4
	18	CCP613-18	146		40-1/4	38					
	24	CCP613-24	165		46-1/4	44					
	30	CCP613-30	184		52-1/4	50					
	36	CCP613-36	202		58-1/4	56					
CCP810	12	CCP810-12	200	7	38-1/2	36	6	2-1/2	2	4	3/4
	18	CCP810-18	242		44-1/2	42					
	24	CCP810-24	252		50-1/2	48					
	30	CCP810-30	278		56-1/2	54					
	36	CCP810-36	304		62-1/2	60					

MTO Frames available upon request.

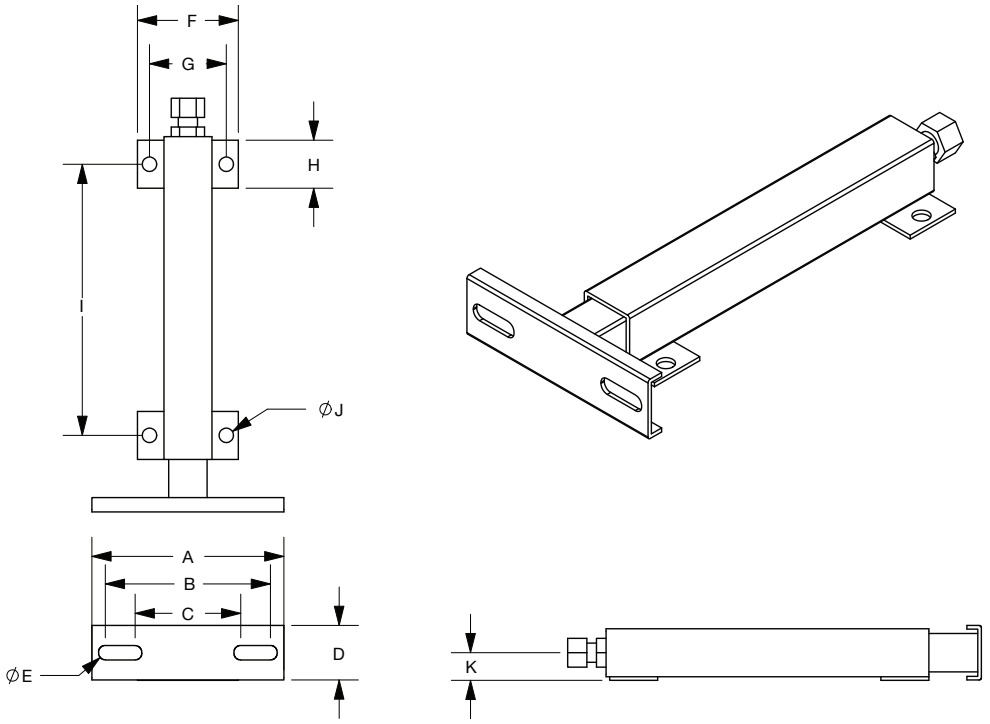


Wide Slot Take-Up Frames (CWS)

Frame Size	Nominal Travel (T)	Part Number	Weight	A	B	C	D	E	F	G		H
										Qty	Dia	
CWS 300	6	CWS300-6	7	12	6-9/16	4-15/16	5-9/16	1-3/4	1-1/16	6	7/16	5/8
	9	CWS300-9	8.5	15		6-7/16				6		
	12	CWS300-12	10	18		7-15/16				6		
	18	CWS300-18	13	24		10-15/16				6		
	24	CWS300-24	16	30		13-15/16				6		
CWS308	6	CWS308-6	9	12	7-1/16	9-7/16	6-1/16	2	1-1/4	4	7/16	3/4
	9	CWS308-9	10.5	15		6-1/4				6		
	12	CWS308-12	12	18		7-3/4				6		
	18	CWS308-18	15	24		10-3/4				6		
	24	CWS308-24	18	30		13-3/4				6		
CWS400	6	CWS400-6	14	13-3/4	8-13/16	11-1/2	7-5/16	2-1/4	1-7/16	4	1/2	1
	9	CWS400-9	16.5	16-3/4		7-1/4				6		
	12	CWS400-12	19	19-3/4		8-3/4				6		
	18	CWS400-18	24	25-3/4		11-3/4				6		
	24	CWS400-24	29	31-3/4		14-3/4				6		
	30	CWS400-30	34	37-3/4		17-3/4				6		
CWS502	6	CWS502-6	20	14-3/4	10-7/16	12-1/2	8 5/8	2-1/2	1-1/2	4	9/16	1-1/4
	9	CWS502-9	23.5	17-3/4		15-1/2				4		
	12	CWS502-12	27	20-3/4		9-1/4				6		
	18	CWS502-18	34	26-3/4		12-1/4				6		
	24	CWS502-24	41	32-3/4		15-1/4				6		
	30	CWS502-30	48	38-3/4		18-1/4				6		
CWS515	6	CWS515-6	31	17-7/8	12	14-1/2	10-1/4	3	2	4	5/8	1-1/2
	9	CWS515-9	36	20-7/8		17-1/2				4		
	12	CWS515-12	41	23-7/8		10-1/4				6		
	18	CWS515-18	51	29-7/8		13-1/4				6		
	24	CWS515-24	61	35-7/8		16-1/4				6		
	30	CWS515-30	71	41-7/8		19-1/4				6		
CWS608	6	CWS608-6	31	17-7/8	12-9/16	14-1/2	10-13/16	3	2	4	5/8	1-1/2
	9	CWS608-9	36	20-7/8		17-1/2				4		
	12	CWS608-12	41	23-7/8		10-1/4				6		
	18	CWS608-18	51	29-7/8		13-1/4				6		
	24	CWS608-24	61	35-7/8		16-1/4				6		
	30	CWS608-30	71	41-7/8		19-1/4				6		

MTO Frames available upon request.

Take-Up Frames



Tube Take-Up Frames (TTU)

Frame Size	Stroke	Part Number	A	B	C	D	E	F	G	H	I	J	K	Tube Size		Threaded
							Bolt					Bolt		Outer	Inner	Rod
TTU10	3	TTU10-3	5-1/4	4-3/8	2-7/8	1-1/2	3/8	3-3/4	2-5/8	1-1/2	3-9/16	1/2	7/8	1-1/4	1	5/8—11
	6	TTU10-6									7-1/16					
	9	TTU10-9									11-1/16					
	12	TTU10-12									15-1/16					
TTU25	6	TTU25-6	7	5-3/4	3-3/4	2	1/2	4	3	2	4-3/8	1/2	1-1/8	1-3/4	1-1/2	3/4—10
	9	TTU25-9									7-3/8					
	12	TTU25-12									10-3/8					
	18	TTU25-18									13-3/8					
TTU30	9	TTU30-9	10	8-3/4	5-1/2	2-7/8	5/8	5-1/4	4	2-1/2	10-1/8	5/8	1-1/2	2-1/2	2-1/4	7/8—9
	12	TTU30-12									14-1/8					
	18	TTU30-18									21-1/8					
	24	TTU30-24									28-1/8					
TTU35	9	TTU35-9	10	8-3/4	5-1/2	3	5/8	5-3/4	4-1/2	2-1/2	13	5/8	1-3/4	3	2-1/2	7/8—6 ACME
	12	TTU35-12									16					
	18	TTU35-18									22					
	24	TTU35-24									28					
TTU40	12	TTU40-12	14	11-3/4	8-1/2	3-1/2	3/4	7-1/2	5-1/2	3-1/2	20	3/4	2-1/8	3-1/2	3	1-1/4—5 ACME
	18	TTU40-18									26					
	24	TTU40-24									32					
	36	TTU40-36									44					
	48	TTU40-48									56					
TTU50	12	TTU50-12	Made to Order Per Bearing Specification					11-1/2	9	5	31	1	3-1/2	6	5	2-1/4—4 ACME
	18	TTU50-18									37					
	24	TTU50-24									49					
	36	TTU50-36									61					
	48	TTU50-48									73					

MTO Frames available upon request.

Special Construction Pulleys

Special manufacturing processes require special pulleys. Whether the equipment is used in mining, chemical, waste processing, or any other demanding application Martin has the experience to solve your problem.

With regional manufacturing facilities and knowledgeable sales teams strategically located across North America, Martin can meet your needs. Martin is the ONE you can rely on for manufacturing expertise, application experience, and a quick delivery to get you what you need, when you need it.

Martin routinely manufactures special construction pulleys to provide exceptional wear in even the roughest conditions. Below is a sample of some of the more common specialty pulleys Martin can manufacture.

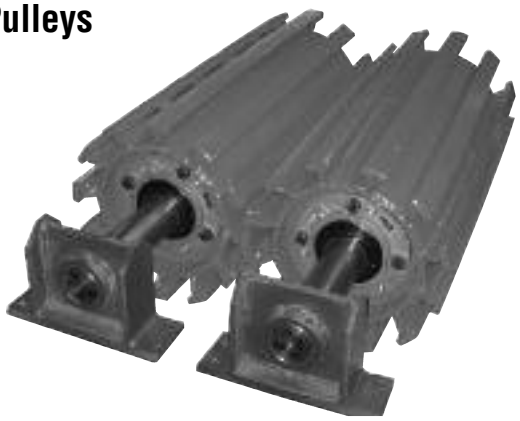
- Available in Wide Variety of MTO Sizes
- Meet or Exceed CEMA Standards
- Superior Strength
- Pulleys for Any Industry
- Fast Reliable Service

DSP Dead Shaft Pulleys

The Martin Dead Shaft Pulley (DSP) is designed to withstand the most rugged applications in any harsh environment. The DSP has been used in the industry to help reduce damage to conventional externally mounted pillow block bearings. The DSP features an internal bearing, tucked back close to the pulley where falling material is less likely to damage the bearings and seals. The Martin DSP features an off-the-shelf piloted flange cartridge (interchangeable with multiple bearing manufacturers) suited with harsh environment seals and external end caps for maximum protection against material contamination.

Each Martin DSP Pulley is shipped with an aggressively constructed pedestal which is fabricated to drop into the same dimensional footprint of the pillow block which it is replacing (this must be specified at the time of order).

The DSP is available as either wing or drum pulleys.



DSP Wing Pulley with Martin Pedestals

DSP Drum Pulley

DSP Wing Pulley

Special Construction Pulleys

Spiral Pulleys

The Martin Spiral pulley is manufactured with two reverse helix flights wrapped around the pulley core. The spiral material can vary in thickness and width and is subject to customer specification. The spiral pulley is very effective in cleaning the belt while suppressing noise.

Spiral Wing Pulley

Spiral Drum Pulley with 1/2" x 1/2" Flight

Spiral Drum Pulley with 1" x 1" Flight

Spiral Drum Pulley with 1/2" x 1" Flight

Special Construction Pulleys

Sprocket Rollers for Engineered Class Chain

Martin Sprocket & Gear Manufactures Sprocket Rollers for engineered class chain. Our rollers are manufactured per customer specification and can be fabricated with bushings, keyless locking devices and through shafts, or with stub shafts and welded construction. Each Sprocket Roller features Martin Accu-Torch® Sprocket(s) of specification, and is affixed to the roller OD at any interval with our high tech sub-arc welding process.

Multi-Strand Sprocket Roller for Paper Mill Application

Sprocket Roller for Truck Dump in Sugar Mill Application

Gudgeon Rollers

Martin Sprocket & Gear offers gudgeon rollers, fabricated from thick wall pipe or tube and fitted with a specially designed end assembly that eliminates shaft and end disc weld fatigue. Each of these rollers is designed to convey bulk product without a conveyor belt directly over the roller face. Industries such as logging, lumber mills, steel mills and palletized product applications are perfect for the Martin Gudgeon Roll.

Cage Rollers

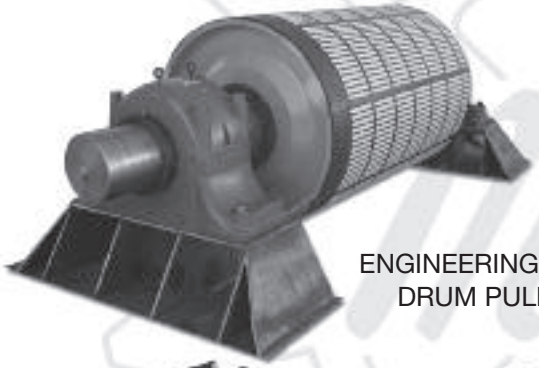
Martin Sprocket & Gear manufactures cage rollers for belt conveyors in almost any custom size requested. Cage rollers are very effective in allowing material to fall through the pulley. The roller is also known as a “beater roll” and actually shakes the material loose from the belt as it passes over the pulley.

Martin HEAVY DUTY CONVEYOR PULLEYS

STANDARD DUTY
DRUM PULLEYS

QUARRY DUTY
DRUM PULLEYS

MINE DUTY
DRUM PULLEYS

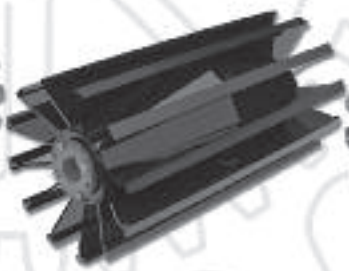


ENGINEERING CLASS
DRUM PULLEYS

MACHINED
DRUM PULLEYS

STANDARD DUTY
WING PULLEY

QUARRY DUTY
WING PULLEY



MINE DUTY
WING PULLEY

QUARRY DUTY "AR"
WING PULLEY

PART NOMENCLATURE

C S D 120 26 X25 L 3 H B

Face
C - Crown
F - Flat

Pulley Type
S - Standard Duty
M - Mine Duty
Q - Quarry Duty
QAR - Quarry Duty AR
E - Engineered Class

Pulley Style
D - Drum
W - Wing

Diameter
Example:
120=12.0″
060=6.0″

Face Width
In Inches

Bushing Part No.
X - CXT (Steel)
MXT (Cast)
SF, E, F, J, etc. - QD Bushing
K - (25, 30, 35 etc.) TB Bushing
H - MHE Bushing
Note: "short" bushings are used in conveyor pulleys

Lagging
No Suffix
- No Lagging

Lagging Thickness
2 - 1/4"
3 - 3/8"
4 - 1/2"
5 - 5/8"
6 - 3/4"

Lagging Style
H - Herringbone
D - Diamond Groove
If no letter, Lagging is Smooth

Bushing
No "B"
no bushing

SPECIALS

Also available: • Spiral Pulleys • "DSP" Dead Shaft Pulleys • V-Guide Pulleys
• "VC" Vulcanized Ceramic Lagging • Ceramic Lagging
• Take-Up Frames

Conveyor Pulley and Shaft Engineering

This information can be used for Martin pulleys with rigid end plate design. That includes the Standard Duty, Mine Duty, and Quarry Duty products that are designed using CEMA/ANSI standards. The foundation of that design is accomplished by designing around a maximum designated shaft deflection. Any questions in design should be run through Martin Engineering.

1. Calculate effective tension, T_e

$$T_e = \frac{HP \times 33{,}000}{FPM}$$

2. Calculate belt slack side tension, T_2

$$T_2 = K \times T_e$$

Table 1: K-factor

Single Drive	Auto TU		Manual/Screw TU	
Belt Wrap	Bare	Lagged	Bare	Lagged
180	0.84	0.5	1.2	0.8
190	0.77	0.46	1.1	0.8
200	0.72	0.42	1.1	0.7
210	0.67	0.38	1	0.7
220	0.62	0.35	0.9	0.6
230	0.58	0.33	0.9	0.6
240	0.54	0.3	0.8	0.6

3. Calculate belt tight side tension, T_1

$$T_1 = T_2 + T_e$$

4. Calculate resultant load for each non-drive pulley, R

$$R = T_2 \times \text{Wrap Factor}$$

Table 2: Non Drive Wrap Factor

Belt Wrap	Factor	Belt Wrap	Factor
10°	0.174	130°	1.813
15°	0.261	135°	1.848
20°	0.347	140°	1.879
25°	0.433	145°	1.907
30°	0.518	150°	1.932
35°	0.601	155°	1.953
40°	0.684	160°	1.97
45°	0.765	165°	1.983
50°	0.845	170°	1.992
55°	0.923	175°	1.998
60°	1	180°	2
65°	1.075	185°	1.998
70°	1.147	190°	1.992
75°	1.218	195°	1.983
80°	1.286	200°	1.97
85°	1.351	205°	1.953
90°	1.414	210°	1.932
95°	1.475	215°	1.907
100°	1.532	220°	1.879
105°	1.587	225°	1.848
110°	1.638	230°	1.813
115°	1.687	235°	1.774
120°	1.732	240°	1.732

5. Calculate resultant load for the drive pulley.

Divide T_1 by T_2 $\left(\frac{T_1}{T_2}\right)$ to look up in table 4:

Then calculate drive R:

$R = T_2 \times \text{Factor}$

6. Belt and Pulley width relationship

PW = BW + 2 (Belting < 48")

PW = BW + 3 (Belting >=48")

7. Determine minimum shaft size by using Table 5. Subtract the face width from the bearing centers. Using the face width column go down and across from the proper bearing center minus face (interpolate if necessary) until a shaft load rating shows higher than the calculated resultant load from above.

8. Pulley diameters are recommended by the belt manufacturer and generally have greater impact on pulley diameter selection than the load itself. Table 3 is used to compare the recommended diameter from the belt manufacturer to the PIW ratings for standard duty pulleys.

Table 3: Pulley PIW Rating

Arc of Contact	Pulley Diameter (inches)													
	8	10	12	14	16	18	20	24	30	36	42	48	54	60
10	65	80	95	120	145	175	205	260	345	430	520	605	690	775
20	50	60	75	95	115	135	160	200	265	335	400	465	535	600
30	45	55	65	80	100	115	140	175	230	290	345	405	460	520
40	35	45	55	70	85	100	120	150	200	245	295	345	395	445
50	30	40	45	60	70	85	100	130	170	215	255	300	340	385
60	30	40	45	60	70	85	100	125	165	205	250	290	330	375
70	30	40	50	60	75	85	105	130	175	220	260	305	350	395
80	30	45	50	65	80	95	115	140	190	235	285	330	375	425
90	35	45	55	70	85	100	120	150	200	255	305	355	405	455
100	40	50	60	75	90	110	130	160	215	270	325	380	430	485
110	45	55	65	80	100	115	140	175	230	290	345	405	460	520
120	45	55	65	85	105	120	145	185	245	305	365	425	490	550
130	50	60	75	95	115	135	160	200	265	335	400	465	535	600
140	55	70	80	105	125	150	180	225	300	375	450	525	600	675
150	60	75	90	115	140	170	200	250	335	420	505	590	670	755
160	70	85	100	130	160	185	225	280	375	465	560	650	745	840
170	75	95	115	145	175	205	250	310	415	520	620	725	830	930
180	85	105	125	160	195	230	275	345	460	575	690	805	920	1035
190	75	95	115	145	175	205	250	310	415	520	620	725	930	930
200	70	85	100	130	160	185	225	280	375	465	560	650	745	840
210	60	75	90	115	140	170	200	250	335	420	505	590	670	755
220	55	70	80	105	125	150	180	225	300	375	450	525	600	675
230	50	60	75	95	115	135	160	200	265	335	400	465	535	600
240	45	55	65	85	105	120	145	185	245	305	365	425	490	550

Table 4: Resultant Load Factor, Drive Pulleys

T1/T2	Angle of Wrap												
	180	185	190	195	200	205	210	215	220	225	230	235	240
1.8	2.8	2.798	2.79	2.778	2.761	2.739	2.713	2.681	2.645	2.605	2.56	2.511	2.458
2	3	2.998	2.99	2.977	2.96	2.937	2.909	2.887	2.84	2.798	2.752	2.701	2.646
2.2	3.2	3.197	3.19	3.177	3.158	3.135	3.107	3.073	3.035	2.992	2.944	2.892	2.836
2.4	3.4	3.394	3.389	3.376	3.357	3.333	3.304	2.27	3.231	3.187	3.138	3.085	3.027
2.6	3.6	3.597	3.589	3.575	3.556	3.532	3.502	3.467	3.427	3.382	3.332	3.278	3.219
2.8	3.8	3.797	3.789	3.775	3.755	3.73	3.7	3.664	3.624	3.578	3.527	3.472	3.412
3	4	3.997	3.989	3.974	3.955	3.929	3.898	3.862	3.821	3.774	3.723	3.667	3.606
3.2	4.2	4.197	4.188	4.174	4.154	4.128	4.097	4.06	4.018	3.971	3.919	3.862	3.8
3.4	4.4	4.397	4.388	4.374	4.353	4.327	4.295	4.258	4.215	4.168	4.115	4.057	3.995
3.6	4.6	4.597	4.588	4.573	4.553	4.526	4.494	4.456	4.413	4.365	4.312	4.253	4.191
3.8	4.8	4.797	4.788	4.773	4.752	4.725	4.693	4.655	4.611	4.562	4.509	4.45	4.387
4	5	4.997	4.988	4.973	4.952	4.925	4.892	4.853	4.809	4.76	4.706	4.647	4.583
4.2	5.2	5.197	5.188	5.172	5.151	5.124	5.091	5.052	5.008	4.958	4.903	4.844	4.779
4.4	5.4	5.397	5.388	5.372	5.351	5.323	5.29	5.251	5.206	5.156	5.101	5.041	4.976

Conveyor Pulley and Shaft Engineering

Table 5: Allowable Shaft Loads (pounds) for Pulleys

Shaft Diameter	Bearing Centers Minus Face	Pulley Face Width (inches)													
		12	14	16	18	20	22	26	32	38	44	51	57	63	66
1-3/16	2	1000	920	780	670	590	530	440	350	290	240	210	180	170	160
	6	570	520	440	380	340	300	250	200	160	140	120	100	94	90
	10	400	370	310	270	230	210	170	140	110	96	82	73	66	63
	14	300	280	240	200	180	160	130	110	87	74	63	56	51	48
1-7/16	3	1500		1400	1200	1100	950	790	620	510	440	370	330	300	290
	6	1000		950	820	720	640	530	420	350	300	250	220	200	190
	10	700		660	570	500	450	370	290	240	210	180	160	140	130
	14	540		510	440	390	350	290	230	190	160	140	120	110	100
1-11/16	3	2400			2300	2000	1800	1500	1200	980	830	710	630	570	540
	6	1600			1600	1400	1200	1000	800	660	560	480	430	380	370
	10	1100			1100	960	850	700	560	460	390	340	300	270	260
	16	780			750	660	590	490	380	320	270	230	210	180	180
1-15/16	3	3700				3500	3100	2600	2100	1700	1400	1200	1100	990	940
	6	2500				2400	2100	1800	1400	1100	980	840	740	670	640
	10	1700				1700	1500	1200	970	800	680	580	520	470	440
	16	1200				1100	1000	840	670	550	470	400	360	320	310
2 -3/16	3	5300					5100	4200	3300	2800	2400	2000	1800	1600	1500
	8	2900					2800	2300	1900	1500	1300	1100	990	890	850
	12	2200					2100	1700	1400	1100	970	820	730	660	630
	18	1500					1500	1200	980	810	690	590	530	470	450
2 -7/16	4	6300						5600	4400	3700	3100	2700	2400	2100	2000
	8	4000						3600	2900	2400	2000	1700	1500	1400	1300
	12	3000						2700	2100	1700	1500	1300	1100	1000	970
	18	2100						1900	1500	1300	1100	910	810	730	690
2-11/16	4	8100							6400	5300	4500	3800	3400	3100	2900
	8	5300							4200	3400	2900	2500	2200	2000	1900
	12	3900							3100	2600	2200	1900	1600	1500	1400
	18	2800							2200	1800	1600	1300	1200	1100	1000
2-15/16	4	10600							9100	7500	6400	5500	4900	4400	4200
	8	6900							6000	4900	4200	3600	3200	2900	2700
	14	4600							3900	3200	2800	2300	2100	1900	1800
	20	3400							2900	2400	2000	1700	1600	1400	1300
3 -7/16	6	11600								10100	8500	7200	6400	5700	5500
	10	8500								7400	6300	5300	4700	4200	4000
	14	6700								5800	4900	4200	3700	3300	3200
	20	5100								4400	3800	3200	2800	2500	2400
3-15/16	6	16700									14200	12000	10600	9500	9000
	10	12400									10600	8900	7900	7100	6700
	14	9800									8400	7100	6300	5600	5300
	20	7500									6400	5400	4800	4300	4100
4 -7/16	8	19600									19100	16100	14200	12700	12100
	12	15300									14800	12500	11100	9900	9400
	16	12500									12100	10300	9100	8100	7700
	22	9800									9500	8100	7100	6400	6000
4-15/16	8	25200										23600	20800	18500	17600
	12	19900										18600	16400	14600	13900
	16	16400										15400	13500	12100	11500
	22	13000										12200	10700	9600	9100
5 -7/16	10	26600											25100	22300	21100
	14	22000											20700	18400	17500
	18	18700											17700	15700	14900
	24	15300											14500	12800	12200
6	10	35700												33100	31300
	14	29500												27300	25900
	18	25100												23300	22100
	24	20600												19000	19000
6-1/2	12	39200													38000
	16	33200													32100
	20	28800													27800
	26	24000													23200
7	12	49000													
	16	41400													
	20	35900													
	26	29900													
7-1/2	14	54100													
	18	46500													
	22	40800													
	28	34400													

Based on SAE 1018 shaft material, using either a maximum shaft bending stress of 8000 psi induced by resultant load (no torque), or a maximum free shaft deflection slope at the hub of 0.0023 inches per inch (tangent of 8 minutes), whichever governs.

Belt Conveyor Data Sheet

Date: _____ By: _____

Company Name: _____

Contact: _____

Conveyor ID: _____ Project: _____

Required Capacity: _____ TPH

Length: _____ ft.

Lift: _____ ft. or angle of incline

Material Conveyed: _____ Density: _____ lb/cu.ft. Repose Angle: _____

Belt Speed: _____

Belt Width: _____

Belt Construction: _____

Carrying Idler Angle: _____ Spacing: _____ Return Spacing: _____

Number of Plows: _____

Number of Scrapers: _____

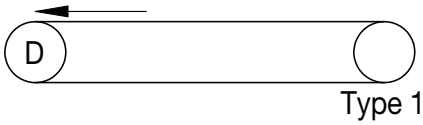
Skirtboard Length: _____ Height of Material on Skirtboard: _____

Horsepower: _____

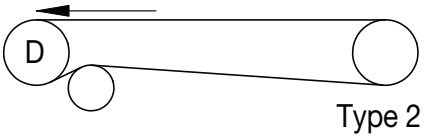
Soft Start Type: _____ (electronic, fluid, etc.)

Bearing Centers: _____ inches

Conveyor Type: _____ (See Diagrams)



Type 1



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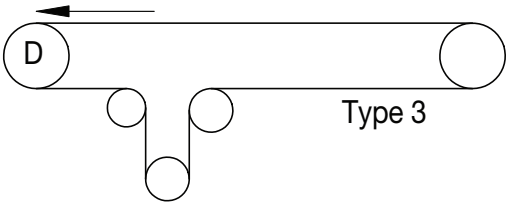

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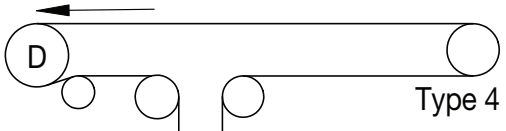

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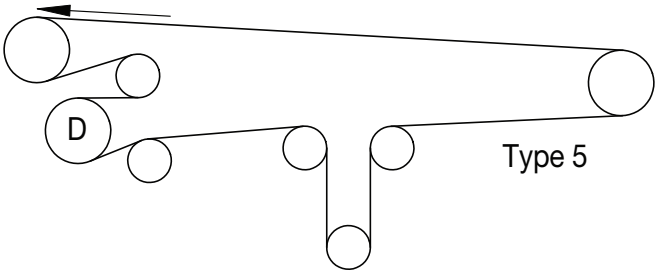


Type 5

HD Pulley Data Sheet

Salesperson: _____ Date: _____

Customer: _____ Contact: _____

Address: _____

Phone: _____ E-Mail: _____

Pulley Tag/Callout: _____ Quantity: _____

1. Type of Pulley: Drum Wing
2. Crown or Flat Face: Crown Flat
3. Duty of Pulley: Standard Mine Quarry Quarry AR (Wing) Engineered
4. Diameter (inches): 4 6 8 10 12 14 16 18 20 24 30 36
   42 48 Other_____
5. Face Width (inches): 12 14 16 20 26 32 38 44 51 57 63 75
   Other_____ (Standard face is belt width +2" up to and including 42" belt and belt width +3" above 42")
6. Hub Style: MXT QD TL MHE Keyless Locker _____
7. Pulley Bushing Bore: _____
8. Lagging (Drum): Vulcanized SBR (select thickness and pattern below)
   Thickness (inches): 1/4 3/8 1/2 3/4 1 _____
   Pattern: Smooth Herringbone Diamond _____
   * If used underground please specify MSHA and call for assistance.
   * If used in a grain handling application and/or explosive air born particulate application specify SOF and call for assistance.

   Weld On Replaceable

   Urethane

   Ceramic Cold Bond Vulcanized
9. Lagging (Wing): Slide on Replaceable Weld on (with tabs)
   Vulcanized SBR Urethane
10. Shafting (Basic): Diameter_____ x Length_____ Bearing Centers: _____
    Drive Side Extension Right Hand Left Hand
11. Shafting (More Detail - A sketch or drawing may be required before manufacturing)
    _____ Major Shaft Diameter (inside pulley) _____ Shaft Diameter at Drive
    _____ Shaft Diameter at Bushing _____ Drive Key Length
    _____ Shaft Diameter at Bearing _____ Drive Key Details
12. Bearing and Drive Information Include with Quote For Information Only

    _____

    _____
13. Notes: _____

    _____

Vertical Screw Data Sheet

CUSTOMER:_____ DATE QUOTE DUE:_____

ADDRESS:_____

CONTACT: _____ PHONE # _____

VERTICAL SCREW: LIFT _____ DISCH. HEIGHT. _____

_____

_____

INLET CONFIGURATION

(Indicate One): ☐ **Elevator Offset to Left** ☐ **Straight Inlet** ☐ **Elevator Offset to Right**

CAPACITY: _____ (CFH) (LBS/HR) (TPH) (MTPH) (BPH)

MATERIAL:_____ DENSITY _____ LBS/FT^3 TEMP _____°F MOISTURE _____%

LUMPS: MAX SIZE _____ IN LUMP CLASS: (Lump % of Total; I - 10%, II - 25%, III - 95%)

FED BY: _____DISCHARGES TO: _____

MAT'L OF CONSTR: ☐ MILD STEEL ☐ T304 ☐ T316 ☐ H.D. GALV. ☐ OTHER

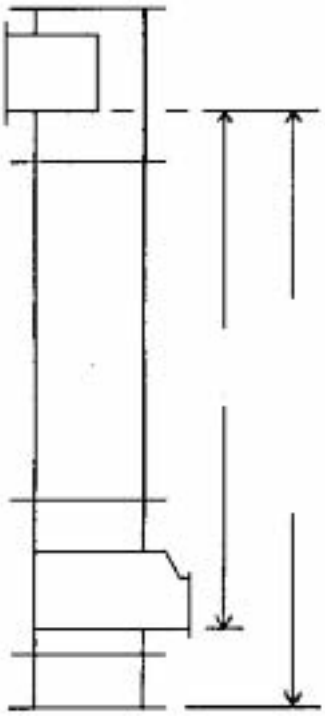
INSTALLATION: ☐ NEW ☐ REPLACEMENT ☐ INDOORS ☐ OUTDOORS

DRIVE: (DIRECT) (SCREW CONVEYOR DRIVE) (OTHER): _____ ☐ V-BELTS ☐ CHAIN ☐ GUARD

MOTOR: ☐ TEFC ☐ X-PROOF ☐ MAC ☐ OTHER _____ NOTES _____

NOTES: _____

_____



TROUGH: _____

SCREW: _____

SHAFT DIA: _____

HANGERS: _____

HRG. BRG.: _____

BOTTOM BRG.: _____

BOTTOM SEAL: _____

GASKETS: _____

DRIVE: _____ HP AT _____ RPM

REDUCER: _____

PAINT: _____

NOTES: _____

_____

_____

PAGE _____ OF _____ PREPARED BY_____ DATE _____

Screw Conveyor Data Sheet

CUSTOMER:_____ DATE PROPOSAL DUE: _____

ADDRESS:_____

CONTACT: _____ PHONE # _____

SCREW DESCR: ____ QTY. _____ ″ DIA. × _____ LONG (C INLET TO C DISCH.) (OVERALL) ☐ HORIZ. ☐ INCL. _____° ☐ DECL. _____°

CAPACITY: _____ (CFH) (LBS/HR) (TPH) (MTPH) (BPH)

MATERIAL:_____ DENSITY _____ LBS/FT^3 TEMP _____°F MOISTURE _____%

LUMPS: MAX SIZE _____ IN LUMP CLASS: (Lump % of Total; I - 10%, II - 25%, III - 95%)

INSTALLATION: ☐ INDOORS ☐ OUTDOORS ☐ NEW ☐ REPLACEMENT ☐ MAT'L OF CONSTR.: ☐ MILD STEEL ☐ T304 ☐ T316 ☐ HD GALV ☐ OTHER _____

IS IT? ☐ FEEDER ☐ CONVEYOR IS FEED? ☐ FLOOD LOAD ☐ UNIFORM

FED BY: _____ INLET SIZE: _____ DISCHARGES TO:_____

DRIVE: (SCREW CONVEYOR DRIVE) (SHAFT MOUNT) (OTHER):_____

NOTES: _____

_____

TROUGH: STYLE _____ THK._____

DISCHARGE: TYPE _____ QTY._____

GATES: TYPE_____ QTY._____

TROUGH END TYPE: TAIL _____

TROUGH END TYPE: HEAD _____

BEARING TYPE: TAIL_____ HEAD_____

SEAL TYPE: TAIL _____ HEAD_____

SCREW: DIA. _____ (RH) (LH) PITCH _____ THK. _____

_____

_____

_____

COUPL. BOLTS: _____

HANGER: STYLE _____

HANGER BRG.: TYPE _____

COVER: STYLE _____ THK._____

COVER FASTENERS: TYPE _____

INLETS: STYLE _____ QTY._____

GASKETS: TYPE _____ THK. _____

DRIVE _____ HP AT _____ RPM

MOTOR: _____ MOTOR MOUNT _____

REDUCER: _____

V-BELT/CHAIN: _____

NOTES: _____

_____

SKETCH — (SHOW FEEDER INLET SIZE AND LOCATION, DRIVE LOCATION, ETC.)

PAGE _____ OF _____ PREPARED BY_____ DATE _____

Sample Work Sheet

Client: _____ Date Quote Due: _____

Conveyor No.: _____ Inquiry No.: _____

Table 1-2

_____ Dia. × Length **L** = _____ Recommended % Trough Loading: _____

Material: _____ Materal HP Factor: F_M = _____

Capacity: _____ Component Series: _____

Density: **W** = _____ Lbs/Ft³ Intermediate Hanger Bearing Series: _____

Lumps: Max. Size _____ in. Class (I) (II) (III) ____ Notes: _____

Required Capacity = **C** = _____ CFH (cubic feet per hour)

$$CFH = \frac{TPH \times 2000}{W}$$

$$CFH = \frac{\text{Pounds per Hour}}{W}$$

CFH = Bushels per Hour × 1.24

Tables 1-3, 1-4, 1-5

Equivalent Capacity = Req'd Capacity _____ × CF_1 _____ × CF_2 _____ × CF_3 _____ = _____ CFH Equivalent Capacity

Table 1-6

Screw Diameter = _____ Select Diameter from 'at max RPM' column where capacity listed equals or exceeds equivalent capacity

Screw RPM = **N** = _____ = $\frac{\text{Equivalent Capacity}}{\text{Capacity 'at one RPM' for diameter selected}}$

Table 1-7

Check lump size and lump class for diameter selected. If larger screw diameter recommended, recalculate RPM per instructions above for selected diameter.

Tables 1-12, 1-13, 1-14, 1-15, 1-16, 1-17

Values to be substituted in formula: _____ _____ _____ _____ _____

Fd **Fb** **Ff** **Fp** **e**

$$HPf = \frac{(L)(N)(Fd)(Fb)}{1{,}000{,}000} = \_\_\_\_\_$$

$$HPm = \frac{(C)(L)(W)(Ff)(Fm)(Fp)}{1{,}000{,}000} = \_\_\_\_\_$$

NOTE: Consult factory for feeder horsepower

If HPf + HPm is less than 5.2, select overload factor F_O = _____ (If HPf + HPm is greater than 5.2, F_O = 1.0)

$$\text{Total HP} = \frac{(HPf + HPm)\ Fo}{e} = \_\_\_\_\_ = \_\_\_\_\_$$

DRIVE: Use _____ HP motor with AGMA Class (I) (II) (III) Drive at _____ Screw RPM

Tables 1-18, 1-19

$$\text{Torque} = \frac{\text{Motor HP} \times 63{,}025}{\text{Screw RPM}} = \_\_\_\_\_ \text{ in.-lbs.}$$

List Minimum Size: Shaft Dia. _____ Pipe _____ Bolt/Shear _____ Bolt/Bearing _____

Tables 1-8, 1-9, 1-10, 1-11

Select Components:

Trough _____ Screw _____ Hanger Style _____ Hanger Bearing _____ Cover _____

Bucket Elevator Data Sheet

CUSTOMER:_____ DATE QUOTE DUE:_____

ADDRESS:_____

CONTACT: _____ PHONE # _____

BUCKET ELEVATOR: (CTRS/LIFT) _____ DESCR. _____

_____

CAPACITY: _____ (CFH) (LBS/HR) (TPH) (MTPH) (BPH)

MATERIAL:_____ DENSITY _____ LBS/FT^3 TEMP _____°F MOISTURE _____%

LUMPS: MAX SIZE _____ IN LUMP CLASS: (Lump % of Total; I - 10%, II - 25%, III - 95%)

FED BY: _____DISCHARGES TO: _____

MAT'L OF CONSTR: ☐ MILD STEEL ☐ T304 ☐ T316 ☐ H.D. GALV. ☐ OTHER

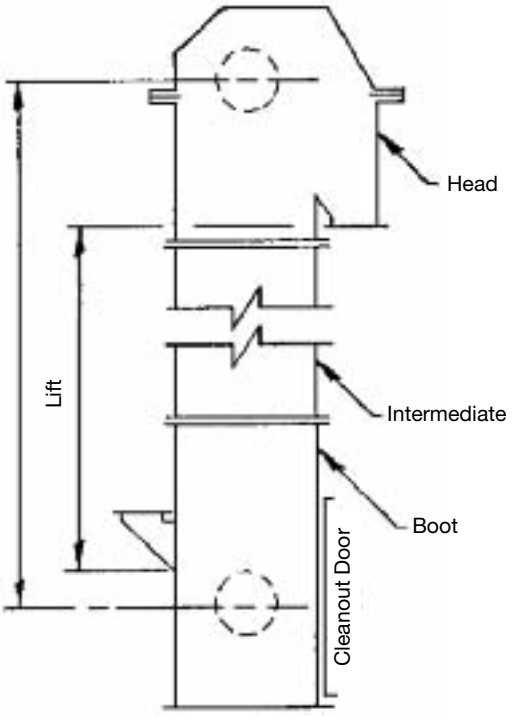
INSTALLATION: ☐ NEW ☐ REPLACEMENT ☐ INDOORS ☐ OUTDOORS

DRIVE: (SHAFT MOUNT) (FOOT MOUNTED GEAR REDUCER) (OTHER): _____ ☐ V-BELTS ☐ CHAIN ☐ GUARD

_____MOTOR: ☐ TEFC ☐ X-PROOF ☐ MAC ☐ OTHER _____BACKSTOP: ☐ SHAFT ☐ INTEGRAL TO REDUCER ☐ OTHER

_____NOTES: _____

_____



TYPE: ☐ CENTRIFUGAL ☐ CONTINUOUS ☐ GRAIN TYPE ☐ OTHER_____

☐ CHAIN ☐ BELT SPECS. _____

DRIVE: _____ HP AT _____ RPM REDUCER _____

SPKTS/SHEAVES _____ CHAIN/V-BELTS _____

_____ BACKSTOP _____

INLET: ☐ STANDARD ☐ SPECIAL _____

DISCHARGE: ☐ STANDARD ☐ 45°

SAFETY CAGE: ☐ YES ☐ NO LADDER: LGTH _____

HEAD PLATFORM: ☐ STANDARD SIZE ☐ SPECIAL _____

INT. PLATFORM ☐ STANDARD SIZE ☐ SPECIAL _____

THICKNESS: HEAD _____ BOOT _____ INT. _____

TAKEUP: ☐ HEAD ☐ BOOT ☐ SCREW ☐ GRAVITY

SEALS: ☐ STANDARD ☐ SPECIAL _____ VENTS: SIZE _____ QTY _____

_____PAINT: _____

PAGE _____ OF _____ PREPARED BY_____ DATE _____

Martin

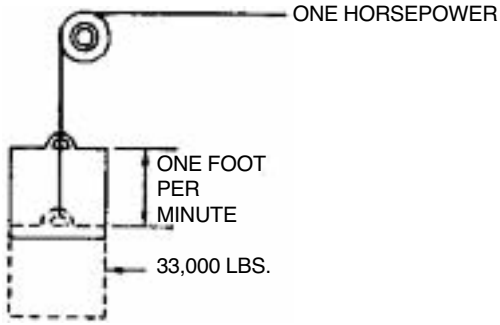
Appendix

GENERAL ENGINEERING INFORMATION

Horsepower/Torque

Horsepower

One HP is the rate of work required to raise 33,000 pounds one foot in one minute.



$$HP = \frac{\text{Force x FPM}}{33{,}000}$$

$$HP = \frac{\text{Torque (in Pound-Inches) x RPM}}{63{,}025}$$

$$HP = \frac{\text{Torque (in Pound-Feet) x RPM}}{5{,}252}$$

Torque: The twisting or turning effort around a shaft tending to cause rotation. Torque is determined by multiplying the applied force times the distance from the point where force is applied to the shaft center.

TQ = F (force) x R (radius)

$$\text{Torque (in Pound-Inches)} = \frac{63{,}025 \times HP}{RPM}$$

= Force x Lever Arm (in Inches)

$$\text{Torque (in Pound-Feet)} = \frac{5{,}252 \times HP}{RPM}$$

= Force x Lever Arm (in Feet)

Torque Calculation Example

20 HP at 100 RPM = 12,605 Pound-Inches Torque

2.0 HP at 10 RPM = 12,605 Pound-Inches Torque

Force = Working Loads in Pounds
FPM = Feet per Minute
RPM = Revolutions per Minute
Lever Arm = Distance from the Force to the center of rotation on Inches or Feet

Overhung Loads

An overhung load is a bending force imposed on a shaft due to the torque transmitted by V-drives, chain drives, and other power transmission devices, other than flexible couplings.

Most motor and reducer manufacturers list the maximum values allowable for overhung loads. It is desirable that these figures be compared with the load actually imposed by the connected drive.

Overhung loads may be calculated as follows:

$$O.H.L. = \frac{63{,}000 \times HP \times F}{N \times R}$$

Where: HP = Transmitted HP x Service Factor
N = RPM of shaft
R = Radius of sprocket, pulley, etc.
F = Factor

Weights of the drive components are usually negligible. The formula is based on the assumption that the load is applied at a point equal to one shaft diameter from the bearing face. Factor F depends on the type of drive used:

F = 1.00 for single chain drives
1.10 for TIMING belt drives
1.25 for spur or helical gear or double chain drives
1.50 for V-belt drives
2.50 for flat belt drives

Example: Find the overhung load imposed on a reducer by a double chain drive transmitting 7 HP @ 30 RPM. The pitch diameter of the sprocket is 10″; service factor is 1.3.

Solution:

$$O.H.L = \frac{(63{,}000)(7 \times 1.3)\ (1.25)}{(30)\qquad\quad(5)} = 4{,}780 \text{ lbs.}$$

Horsepower/Speed/Torque Relationships

HP	Speed (RPM)	Torque
Constant	Increases	Decreases
Constant	Decreases	Increases
Increases	Constant	Increases
Decreases	Constant	Decreases
Increases	Increases	Constant
Decreases	Decreases	Constant

Torque (in Pound-Inches) For Horsepower/RPM

Torque for 1-50 HP @ 50-220 RPM

	Revolutions per Minute																	
HP	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220
1	1261	1050	900	788	700	630	573	525	485	450	420	394	371	350	332	315	300	286
2	2521	2101	1801	1576	1401	1260	1145	1050	969	900	840	787	741	700	663	630	600	572
3	3782	3151	2701	2363	2101	1890	1718	1575	1454	1350	1260	1181	1112	1050	995	945	900	859
4	5042	4202	3601	3151	2801	2521	2291	2100	1939	1800	1680	1575	1482	1400	1326	1260	1200	1145
5	6303	5252	4502	3939	3501	3151	2864	2626	2424	2250	2100	1969	1853	1750	1658	1575	1500	1432
6	7563	6303	5402	4727	4202	3781	3437	3151	2908	2701	2521	2363	2224	2100	1990	1890	1800	1718
7	8824	7353	6302	5515	4902	4411	4010	3676	3393	3151	2941	2757	2595	2450	2321	2205	2100	2005
8	10084	8403	7203	6303	5602	5042	4583	4201	3878	3601	3361	3151	2965	2801	2653	2521	2400	2291
9	11345	9454	8103	7090	6303	5672	5156	4726	4363	4051	3781	3545	3336	3151	2985	2836	2701	2578
10	12605	10504	9004	7878	7003	6302	5729	5252	4848	4501	4201	3939	3707	3501	3317	3151	3001	2864
11	13866	11555	9904	8666	7703	6932	6302	5777	5332	4951	4621	4332	4078	3851	3648	3466	3301	3151
12	15126	12605	10804	9454	8403	7563	6875	6302	5817	5402	5042	4726	4448	4201	3980	3781	3601	3437
13	16387	13655	11705	10242	9104	8193	7448	6827	6302	5852	5462	5120	4819	4551	4312	4096	3901	3724
14	17647	14706	12605	11029	9804	8823	8021	7352	6787	6302	5882	5514	5190	4901	4643	4411	4201	4010
15	18908	15756	13505	11817	10504	9453	8594	7878	7272	6752	6302	5908	5561	5252	4975	4726	4501	4297
16	20168	16807	14406	12605	11204	10084	9167	8403	7756	7202	6722	6302	5931	5602	5307	5042	4801	4583
17	21429	17857	15306	13393	11905	10714	9740	8928	8241	7653	7142	6696	6302	5952	5639	5357	5102	4870
18	22689	18908	16206	14181	12605	11344	10313	9453	8726	8103	7563	7090	6673	6302	5970	5672	5402	5156
19	23950	19958	17107	14968	13305	11974	10886	9979	9211	8553	7983	7484	7044	6652	6302	5987	5702	5443
20	25210	21008	18007	15756	14006	12605	11459	10504	9696	9003	8403	7878	7414	7002	6634	6302	6002	5729
21	26471	22059	18907	16544	14706	13235	12032	11029	10181	9453	8823	8272	7785	7352	6965	6617	6302	6016
22	27731	23109	19808	17332	15406	13865	12605	11554	10665	9903	9243	8665	8156	7703	7297	6932	6602	6302
23	28992	24160	20708	18120	16106	14495	13178	12079	11150	10354	9663	9059	8526	8053	7629	7247	6902	6588
24	30252	25210	21609	18908	16807	15126	13750	12605	11635	10804	10084	9453	8897	8403	7961	7563	7202	6875
25	31513	26260	22509	19695	17507	15756	14323	13130	12120	11254	10504	9847	9268	8753	8292	7878	7503	7161
26	32773	27311	23409	20483	18207	16386	14896	13655	12605	11704	10924	10241	9639	9103	8624	8193	7803	7448
27	34034	28361	24310	21271	18908	17016	15469	14180	13089	12154	11344	10635	10009	9453	8956	8508	8103	7734
28	35294	29412	25210	22059	19608	17647	16042	14705	13574	12605	11764	11029	10380	9803	9287	8823	8403	8021
29	36555	30462	26110	22847	20308	18277	16615	15231	14059	13055	12184	11423	10751	10154	9619	9138	8703	8307
30	37815	31513	27011	23634	21008	18907	17188	15756	14544	13505	12605	11817	11122	10504	9951	9453	9003	8594
31	39076	32563	27911	24422	21709	19537	17761	16281	15029	13955	13025	12211	11492	10854	10283	9768	9303	8880
32	40336	33613	28811	25210	22409	20168	18334	16806	15513	14405	13445	12605	11863	11204	10614	10084	9603	9167
33	41597	34664	29712	25998	23109	20798	18907	17331	15998	14855	13865	12998	12234	11554	10946	10399	9903	9453
34	42857	35714	30612	26786	23809	21428	19480	17857	16483	15306	14285	13392	12605	11904	11278	10714	10204	9740
35	44118	36767	31512	27573	24510	22058	20053	18382	16968	15756	14705	13786	12975	12254	11609	11029	10504	10026
36	45378	37815	32413	28361	25210	22689	20626	18907	17453	16206	15126	14180	13346	12605	11941	11344	10804	10313
37	46639	38865	33313	29149	25910	23319	21199	19432	17937	16656	15546	14574	13717	12955	12273	11659	11104	10599
38	47889	39916	34214	29937	26611	23949	21772	19958	18422	17106	15966	14968	14088	13305	12605	11974	11404	10886
39	49160	40996	35114	30725	27311	24579	22345	20483	18907	17557	16386	15362	14458	13655	12936	12289	11704	11172
40	50420	42017	36014	31513	28011	25210	22918	21008	19392	18007	16806	15756	14829	14005	13268	12605	12004	11459
41	51681	43067	36915	32300	28711	25840	23491	21533	19877	18457	17226	16150	15200	14355	13600	12920	12304	11745
42	52941	44118	37815	33088	29412	26470	24064	22058	20362	18907	17647	16544	15570	14705	13931	13235	12605	12032
43	54202	45168	38715	33876	30112	27100	24637	22584	20846	19357	18067	16938	15941	15056	14263	13550	12905	12318
44	55462	46218	39616	34664	30812	27731	25210	23109	21331	19807	18487	17331	16312	15406	14595	13865	13205	12605
45	56723	47269	40516	35452	31513	28361	25783	23634	21816	20258	18907	17725	16683	15756	14927	14180	13505	12891
46	57383	48319	41416	36239	32213	28991	26356	24159	22301	20708	19327	18119	17053	16106	15258	14495	13805	13177
47	59244	49370	42317	37027	32913	29621	26928	24684	22786	21158	19747	18513	17424	16456	15590	14810	14105	13464
48	60504	50420	43217	37815	33613	30252	27501	25210	23270	21608	20168	18907	17795	16806	14922	15126	14405	13750
49	61764	51470	44117	38603	34314	30882	28074	25735	23755	22058	20588	19301	18166	17156	16253	15441	14705	14037
50	63025	52521	45018	39319	35014	31512	28647	26260	24240	22509	21008	19695	18536	17507	16585	15756	15006	14323

Torque (in Pound-Inches) For Horsepower/RPM

Torque for 1-50 HP @ 230-1000 RPM

	Revolutions per Minute																		
HP	230	240	250	260	270	280	290	300	350	400	450	500	550	600	650	700	800	900	1000
1	274	263	252	242	233	225	217	210	180	157	140	126	114	105	96	90	78	70	63
2	548	525	504	484	466	450	434	420	360	315	280	252	229	210	193	180	157	140	126
3	822	787	756	727	700	675	651	630	540	472	420	378	343	315	290	270	236	210	189
4	1096	1050	1008	969	933	900	869	840	720	630	560	504	458	420	387	360	315	280	252
5	1370	1313	1260	1212	1167	1125	1087	1050	900	787	700	630	572	525	484	450	393	350	315
6	1644	1575	1512	1454	1401	1350	1303	1260	1080	945	840	756	687	630	581	540	472	420	378
7	1918	1838	1764	1696	1633	1575	1521	1470	1260	1102	980	882	802	735	678	630	551	490	441
8	2192	2100	2016	1939	1867	1800	1738	1680	1440	1260	1120	1008	916	840	775	720	630	560	504
9	2466	2363	2268	2181	2100	2025	1955	1890	1620	1418	1260	1134	1031	945	872	810	709	630	567
10	2740	2626	2521	2424	2334	2250	2173	2100	1800	1575	1400	1260	1145	1050	969	900	787	700	630
11	3014	2888	2773	2666	2567	2475	2390	2310	1980	1733	1540	1386	1260	1155	1066	990	866	770	693
12	3288	3151	3025	2908	2801	2701	2607	2521	2160	1890	1680	1512	1375	1260	1163	1080	945	840	756
13	3562	3413	3277	3151	3034	2926	2825	2731	2340	2048	1820	1638	1489	1365	1260	1170	1024	910	819
14	3836	3676	3529	3393	3267	3151	3042	2941	2521	2205	1960	1764	1604	1470	1357	1260	1102	980	882
15	4110	3939	3781	3636	3501	3376	3259	3151	2701	2363	2100	1890	1718	1575	1454	1350	1181	1050	945
16	4384	4201	4033	3878	3734	3601	3477	3361	2881	2521	2240	2016	1833	1680	1551	1440	1260	1120	1008
17	4658	4464	4285	4120	3968	3826	3694	3571	3061	2678	2380	2142	1948	1785	1648	1530	1339	1190	1071
18	4932	4726	4537	4363	4201	4051	3911	3781	3241	2836	2521	2268	2062	1890	1745	1620	1418	1260	1134
19	5206	4989	4789	4605	4435	4276	4129	3991	3421	2993	2661	2394	2177	1995	1842	1710	1496	1330	1197
20	5480	5252	5042	4848	4668	4501	4346	4201	3601	3151	2801	2521	2291	2100	1939	1800	1575	1400	1260
21	5754	5514	5294	5090	4901	4726	4563	4411	3781	3308	2941	2647	2406	2205	2036	1890	1654	1470	1323
22	6028	5777	5546	5332	5135	4951	4781	4621	3961	3466	3081	2773	2521	2310	2133	1980	1733	1540	1386
23	6302	6039	5798	5575	5368	5177	4998	4831	4141	3623	3221	2899	2635	2415	2230	2070	1811	1610	1449
24	6576	6302	6050	5817	5602	5402	5215	5042	4321	3781	3361	3025	2750	2521	2327	2160	1890	1680	1512
25	6850	6565	6302	6060	5835	5627	5433	5252	4501	3939	3501	3151	2864	2626	2424	2250	1969	1750	1575
26	7124	6827	6554	6302	6069	5852	5650	5462	4681	4096	3641	3277	2979	2731	2521	2340	2048	1820	1638
27	7398	7090	6806	6544	6302	6077	5867	5672	4861	4254	3781	3403	3093	2836	2617	2430	2127	1890	1701
28	7672	7352	7058	6787	6535	6302	6085	5882	5042	4411	3921	3529	3208	2941	2714	2521	2205	1960	1764
29	7946	7615	7310	7029	6769	6527	6302	6092	5222	4569	4061	3655	3323	3046	2811	2611	2284	2030	1827
30	8220	7878	7563	7272	7002	6752	6519	6302	5402	4726	4201	3781	3437	3151	2908	2701	2363	2100	1890
31	8494	8140	7815	7514	7236	6977	6737	6512	5582	4884	4341	3907	3552	3256	3005	2791	2442	2170	1953
32	8768	8403	8067	7756	7469	7202	6954	6722	5762	5042	4481	4033	3666	3361	3102	2881	2520	2240	2016
33	9042	8665	8319	7999	7703	7427	7171	6932	5942	5199	4621	4159	3781	3466	3199	2971	2599	2310	2079
34	9316	8928	8571	8241	7936	7653	7389	7142	6122	5357	4761	4285	3896	3571	3296	3061	2678	2380	2142
35	9590	9191	8823	8484	8169	7878	7606	7352	6302	5514	4901	4411	4010	3676	3393	3151	2757	2450	2205
36	9864	9453	9075	8726	8403	8103	7823	7563	6482	5672	5042	4537	4125	3781	3490	3241	2836	2521	2268
37	10138	9716	9327	8968	8636	8328	8041	7773	6662	5829	5182	4663	4239	3886	3587	3331	2913	2591	2331
38	10412	9978	9579	9211	8870	8553	8258	7983	6842	5987	5322	4789	4354	3991	3684	3421	2993	2661	2394
39	10686	10241	9831	9453	9103	8778	8475	8193	7022	6144	5462	4915	4469	4096	3781	3511	3072	2731	2457
40	10960	10504	10084	9696	9337	9003	8693	8403	7202	6302	5602	5042	4583	4201	3878	3601	3151	2801	2521
41	11234	10766	10336	9938	9570	9228	8910	8613	7382	6460	5742	5168	4698	4306	3975	3691	3230	2871	2584
42	11508	11029	10588	10181	9803	9453	9127	8823	7563	6617	5882	5294	4812	4411	4072	3781	3308	2941	2647
43	11782	11292	10840	10423	10037	9678	9345	9033	7743	6775	6022	5420	4927	4516	4169	3871	3387	3011	2710
44	12057	11554	11092	10665	10270	9903	9562	9243	7923	6932	6162	5546	5042	4621	4266	3961	3466	3081	2773
45	12331	11817	11344	10908	10504	10129	9779	9453	8103	7090	6302	5672	5156	4726	4363	4051	3545	3151	2836
46	12605	12079	11596	11150	10737	10354	9997	9963	8283	7247	6442	5798	5271	4831	4460	4141	3623	3221	2899
47	12879	12342	11848	11393	10971	10579	10214	9873	8463	7405	6582	5924	5385	4936	4557	4231	3702	3291	2962
48	13153	12605	12100	11635	11204	10804	10431	10084	8643	7563	6722	6050	5500	5042	4654	4321	3781	3361	3025
49	13427	12867	12352	11877	11437	11029	10649	10294	8823	7720	6862	6176	5614	5147	4751	4411	3860	3431	3088
50	13701	13130	12605	12120	11671	11254	10866	10504	9003	7878	7002	6302	5729	5252	4848	4501	3939	3501	3151

Torque (in Pound-Inches) For Horsepower/RPM

Torque for 51-100 HP @ 50-220 RPM

	Revolutions per Minute																	
HP	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220
51	64286	53571	45918	40178	35714	32142	29220	26785	24725	22959	21428	20089	18907	17857	16917	16071	15306	14610
52	65546	54622	46819	40966	36414	32773	29793	27310	25210	23409	21848	20483	19278	18207	17249	16386	15606	14896
53	66807	55672	47719	41754	37115	33403	30366	27836	25694	23859	22268	20877	19649	18557	17580	16701	15906	15183
54	68067	56723	48619	42542	37815	34033	30939	28361	26179	24309	22689	21271	20019	18907	17912	17016	16206	15469
55	69328	57773	49520	43330	38515	34663	31512	28886	26664	24760	23109	21664	20390	19257	18244	17331	16506	15756
56	70588	58823	50420	44118	39216	35294	32085	29411	27149	25210	23529	22058	20761	19607	18575	17647	16806	16042
57	71849	59874	51320	44905	39916	35924	32658	29937	27634	25660	23950	22452	21132	19957	18907	17962	17106	16329
58	73109	60924	52221	45693	40616	36554	33231	30462	28118	26110	24370	22846	21502	20308	19239	18277	17406	16615
59	74370	61975	53121	46481	41316	37184	33804	30987	28603	26560	24790	23240	21873	20658	19571	18592	17707	16902
60	75630	63025	54021	47269	42017	37815	34377	31512	29088	27010	25210	23634	22244	21008	19902	18907	18007	17188
61	76891	64075	54922	48057	42717	38445	34950	32037	29573	27461	25630	24028	22614	21358	20234	19222	18307	17475
62	78151	65126	55822	48844	43417	39075	35523	32563	30058	27911	26050	24422	22985	21708	20566	19537	18607	17761
63	79412	66176	56722	49632	44118	39705	36096	33088	30543	28361	26470	24816	23356	22058	20897	19852	18907	18048
64	80672	67227	57623	50420	44818	40336	36669	33613	31027	28811	26890	25210	23727	22408	21229	20168	19207	18334
65	81933	68277	58523	51208	45518	40966	37242	34138	31512	29261	27310	25604	24097	22759	21561	20483	19507	18621
66	83193	69328	59423	51996	46218	41596	37815	34663	31997	29711	27731	25997	24468	23109	21892	20798	19807	18907
67	84454	70378	60324	52783	46919	42226	38388	35189	32482	30162	28151	26391	24839	23459	22224	21113	20108	19194
68	85714	71428	61224	53571	47619	42857	38961	35714	32967	30612	28571	26785	25210	23809	22556	21428	20408	19480
69	86975	72479	72125	54359	48319	43487	39534	36239	33451	31062	28991	27179	25580	24159	22888	21743	20708	19766
70	88235	73529	63025	55147	49019	44117	40106	36764	33936	31512	29411	27573	25951	24509	23219	22058	21008	20053
71	89496	74580	63925	55935	49720	44747	40679	37289	34421	31962	29831	27967	26322	24859	23551	22373	21308	20339
72	90756	75630	64826	56723	50420	45378	41252	37815	34906	32413	30252	28361	26693	25210	23883	22689	21608	20626
73	92017	76680	65726	57510	51120	46008	41825	38340	35391	32863	30672	28755	27063	25560	24214	23004	21908	20912
74	93277	77731	66626	58298	51821	46638	42398	38865	35875	33313	31092	29149	27434	25910	24546	23319	22208	21199
75	94538	78781	67527	59086	52521	47268	42971	39390	36360	33763	31512	29543	27805	26260	24878	23634	22509	21485
76	95798	79832	68427	59874	53221	47899	43544	39916	36845	34213	31932	29937	28176	26610	25210	23949	22809	21772
77	97059	80882	69327	60662	53921	48529	44117	40441	37330	34663	32353	30330	28546	26960	25541	24264	23109	22058
78	98319	81933	70228	61449	54622	49159	44690	40966	37815	35114	32773	30724	28917	27310	25873	24579	23409	22345
79	99580	82983	71128	62237	55322	49789	45263	41491	38299	35564	33193	31118	29288	27661	26205	24894	23709	22631
80	100804	84033	72029	63024	56022	50420	45836	42016	38784	36014	33613	31512	29658	28011	26536	25210	24009	22918
81	102101	85084	72929	63813	56722	51050	46409	42542	39269	36464	34033	31906	30029	28361	26868	25525	24309	23204
82	103361	86134	73829	64601	57423	51680	46982	43067	39754	36914	34453	32300	30400	28711	27200	25840	24609	23491
83	104622	87185	74730	65388	58123	52310	47555	43592	40239	37365	34874	32694	30771	29061	27532	26155	24909	23777
84	105882	88235	75630	66176	58823	52941	48128	44117	40724	37815	35294	33088	31141	29411	27863	26470	25210	24064
85	107143	89285	76530	66964	59524	53571	48701	44642	41208	38265	35714	33482	31512	29761	28195	26785	25510	24350
86	108403	90336	77430	67752	60224	54201	49274	45168	41693	38715	36134	33876	31883	30112	28527	27100	25810	24637
87	109664	91386	78331	68540	60924	54831	49847	45693	42178	39165	36554	34269	32254	30462	28858	27415	26110	24923
88	110924	92437	79231	69328	61624	55462	50420	46218	42663	39615	36974	34663	32624	30812	29190	27731	26410	25210
89	112185	93487	80132	70115	62325	56092	50993	46743	43148	40066	37395	35057	32995	31163	29522	28046	26710	25496
90	113445	94538	81032	70903	63025	56722	51566	47268	43632	40516	37815	35451	33366	31512	29854	28361	27010	25783
91	114706	95588	81932	71691	63725	57352	52139	47794	44117	40966	38235	35845	33737	31862	30185	28676	27310	26069
92	115967	96638	82833	72479	64426	57983	52712	48319	44602	41416	38655	36239	34107	32212	30517	28991	27611	26355
93	117227	97689	83733	73267	65126	58613	53285	48844	45087	41866	39075	36633	34478	32563	30849	29306	27911	26642
94	118487	98739	84634	74054	65826	59243	53857	49369	45572	42317	39495	37027	34849	32913	31180	29621	28211	26928
95	119748	99790	85534	74842	66526	59873	54430	49895	46056	42767	39916	37421	35220	33263	31512	29936	28511	27215
96	121008	100840	86434	75630	67227	60504	55003	50420	46541	43217	40336	37815	35590	33613	31844	30252	28811	27501
97	122269	101890	87335	76418	67927	61134	55576	50945	47026	43667	40756	38209	35961	33963	32176	30567	29111	27788
98	123529	102941	88235	77206	68627	61764	56149	51470	47511	44117	41176	38602	36332	34313	32507	30882	29411	28074
99	124780	103991	89135	77993	69328	62394	56722	51995	47996	44567	41596	38996	36702	34663	32839	31197	29711	28361
100	126050	105042	90036	78781	70028	63025	57295	52521	48481	45018	42016	39390	37073	35014	33171	31512	30012	28647

Torque (in Pound-Inches) For Horsepower/RPM

Torque for 51-100 HP @ 230-1000 RPM

	Revolutions per Minute																		
HP	230	240	250	260	270	280	290	300	350	400	450	500	550	600	650	700	800	900	1000
51	13975	13392	12857	12362	11904	11479	11083	10714	9183	8035	7141	6428	5844	5357	4945	4591	4017	3571	3314
52	14249	13655	13109	12605	12138	11704	11301	10924	9363	8193	7282	6554	5958	5462	5042	4681	4096	3641	3277
53	14523	13918	13361	12847	12371	11929	11518	11134	9543	8350	7422	6680	6073	5567	5138	4771	4175	3711	3340
54	14797	14180	13613	13089	12605	12154	11735	11344	9723	8508	7563	6806	6187	5672	5235	4861	4254	3781	3403
55	15071	14443	13865	13332	12838	12379	11953	11554	9903	8665	7703	6932	6302	5777	5332	4951	4332	3851	3466
56	15345	14705	14117	13574	13071	12605	12170	11764	10084	8823	7843	7058	6417	5882	5429	5042	4411	3921	3529
57	15619	14968	14369	13817	13305	12830	12387	11974	10264	8981	7983	7184	6531	5987	5526	5132	4490	3991	3592
58	15893	15231	14621	14059	13538	13055	12605	12184	10444	9138	8123	7310	6646	6092	5623	5222	4569	4061	3655
59	16167	15493	14873	14301	13772	13280	12822	12394	10624	9296	9263	7436	6760	6197	5720	5312	4648	4131	3718
60	16441	15756	15126	14544	14055	13505	13039	12605	10804	9453	8403	7563	6875	6302	5817	5402	4726	4201	3781
61	16715	16018	15378	14786	14239	13730	13257	12815	10984	9611	8543	7689	6990	6407	5914	5492	4805	4271	3844
62	16989	16281	15630	15029	14472	13955	13474	13025	11164	9768	8683	7815	7104	6512	6011	5582	4884	4341	3907
63	17263	16544	15882	15271	14705	14180	13691	13235	11344	9926	8823	7941	7219	6617	6108	5672	4963	4411	3970
64	17537	16806	16134	15513	14939	14405	13908	13445	11524	10084	8963	8067	7333	6722	6205	5762	5041	4481	4033
65	17811	17069	16386	15756	15172	14630	14126	13655	11704	10241	9103	8193	7448	6827	6302	5852	5120	4551	4096
66	18085	17331	16638	15998	15406	14855	14343	13865	11884	10399	9243	8319	7563	6932	6399	5942	5199	4621	4159
67	18359	17594	16890	16241	15639	15081	14560	14075	12064	10556	9383	8445	7677	7037	6496	6032	5278	4691	4222
68	18633	17857	17142	16483	15873	15306	14778	14285	12244	10714	9523	8571	7792	7142	6593	6122	5357	4761	4285
69	18907	18119	17394	16725	16106	15531	14995	14495	12424	10871	9663	8697	7906	7247	6690	6212	5435	4831	4348
70	19181	18382	17647	16968	16339	15756	15212	14705	12605	11029	9803	8823	8021	7352	6787	6302	5514	4901	4411
71	19455	18644	17899	17210	16573	15981	15430	14915	12785	11186	9943	8949	8135	7457	6884	6392	5593	4971	4474
72	19729	18907	18151	17453	16806	16206	15647	15126	12965	11344	10084	9075	8250	7563	6981	6482	5672	5042	4537
73	20003	19170	18403	17695	17040	16431	15864	15336	13145	11502	10224	9201	8365	7668	7078	6572	5751	5112	4600
74	20277	19432	18655	17937	17273	16656	16082	15546	13325	11659	10364	9327	8479	7773	7175	6662	5829	5182	4663
75	20551	19695	18907	18180	17507	16881	16299	15756	13505	11817	10504	9453	8594	7878	7272	6752	5908	5252	4726
76	20825	19957	19159	18422	17740	17106	16516	15966	13685	11974	10644	9579	8708	7983	7369	6842	5987	5322	4789
77	21099	20220	19411	18665	17973	17331	16734	16176	13865	12132	10784	9705	8823	8088	7466	6932	6066	5392	4852
78	21373	20483	19663	18907	18207	17557	16951	16386	14045	12289	10924	9831	8938	8193	7563	7022	6144	5462	4915
79	21647	20745	19915	19149	18440	17782	17168	16596	14225	12447	11064	9957	9052	8298	7659	7112	6223	5532	4978
80	21921	21008	20168	19392	18674	18007	17386	16806	14405	12605	11204	10084	9167	8403	7756	7202	6302	5602	5042
81	22195	21271	20420	19634	18907	18232	17603	17016	14585	12762	11344	10210	9281	8508	7853	7292	6381	5672	5105
82	22469	21533	20672	19877	19141	18457	17820	17226	14765	12920	11484	10336	9396	8613	7950	7382	6460	5742	5168
83	22743	21796	20924	20119	19374	18682	18038	17436	14945	13077	11624	10462	9511	8718	8047	7472	6538	5812	5231
84	23017	22058	21176	20362	19607	18907	18255	17647	15126	13235	11764	10588	9625	8823	8144	7563	6617	5882	5294
85	23291	22321	21428	20604	19841	19132	18472	17857	15306	13392	11904	10714	9740	8928	8241	7653	6696	5952	5357
86	23565	22584	21680	20846	20074	19357	18690	18067	15486	13550	12044	10840	9854	9033	8338	7743	6775	6022	5420
87	23840	22846	21932	21089	20308	19582	18907	18277	15666	13707	12184	10966	9969	9138	8435	7833	6853	6092	5483
88	24114	23109	22184	21331	20541	19807	19124	18487	15846	13865	12324	11092	10084	9243	8532	7923	6932	6162	5546
89	24388	23371	22436	21574	20775	20033	19342	18697	16026	14023	12464	11218	10198	9348	8629	8013	7011	6232	5609
90	24662	23634	22689	21816	21008	20258	19559	18907	16206	14180	12605	11344	10313	9453	8726	8103	7090	6302	5672
91	24936	23897	22941	22058	21241	20483	19776	19117	16386	14338	12745	11470	10427	9558	8823	8193	7169	6372	5735
92	25210	24159	23193	22301	21475	20708	19994	19327	16566	14495	12885	11596	10542	9663	8920	8283	7247	6442	5798
93	25484	24422	23445	22543	21708	20933	20211	19537	16746	14653	13025	11722	10656	9768	9017	8373	7326	6512	5861
94	25758	24684	23697	22786	21942	21158	20428	19747	16926	14810	13165	11848	10771	9873	9114	8463	7405	6582	5924
95	26032	24947	23949	23028	22175	21383	20646	19957	17106	14968	13305	11974	10886	9978	9211	8553	7484	6652	5987
96	26306	25210	24201	23270	22408	21608	20863	20168	17286	15126	13445	12100	11000	10084	9308	8643	7562	6722	6050
97	26580	25472	24453	23513	22642	21833	21080	20378	17466	15383	13585	12226	11115	10189	9405	8733	7641	6792	6113
98	26854	25735	24705	23755	22875	22058	21298	20588	17647	15441	13725	12352	11229	10294	9502	8823	7720	6862	6176
99	27128	25997	24957	23998	23109	22283	21515	20798	17827	15598	13865	12478	11344	10399	9599	8913	7799	6932	6239
100	27402	26260	25210	24240	23342	22509	21732	21008	18007	15756	14005	12605	11459	10504	9696	9003	7878	7002	6302

Electrical Formulas

To Find	Alternating Current		To Find	Alternating or Direct Current
	Single-Phase	Three-Phase		
Amperes when horsepower is known	$\frac{HP \times 746}{E \times Eff. \times pf}$	$\frac{HP \times 746}{1.73 \times E \times Eff. \times pf}$	Amperes when voltage and resistance is known	$\frac{E}{R}$
Amperes when kilowatts are known	$\frac{Kw \times 1000}{E \times pf}$	$\frac{Kw \times 1000}{1.73 \times E \times pf}$	Voltage when resistance and current are known	IR
Amperes when Kva are known	$\frac{Kva \times 1000}{E}$	$\frac{Kva \times 1000}{1.73 \times E}$	Resistance when voltage and current are known	$\frac{E}{I}$
Kilowatts	$\frac{I \times E \times pf}{1000}$	$\frac{1.73 \times I \times E \times pf}{1000}$		
Kva	$\frac{I \times E}{1000}$	$\frac{1.73 \times I \times E}{1000}$		
Horsepower = (Output)	$\frac{I \times E \times Eff. \times pf}{746}$	$\frac{1.73 \times I \times E \times Eff. \times pf}{746}$		

I = Amperes; E = Volts; Eff. = Efficiency; pf = power factor;
Kva = Kilovolt amperes; Kw = Kilowatts; R = Ohms

General Information (Approximation)

All Values At 100% Load

- At 1800 RPM, a motor develops 36 lb.-in. per hp
- At 1200 RPM, a motor develops 54 lb.-in. per hp
- At 575 volts, a 3-phase motor draws 1 amp per hp
- At 460 volts, a 3-phase motor draws 1.25 amp per hp
- At 230 volts, a 3-phase motor draws 2.5 amp per hp
- At 230 volts, a single-phase motor draws 5 amp per hp
- At 115 volts, a single-phase motor draws 10 amp per hp

Temperature Conversion:

Deg C = (Deg F - 32) x ⅝
Deg F = (Deg C x ⅝) + 32

Motor Amps @ Full Load †

HP	Alternating Current		DC	HP	Alternating Current		DC	HP	Alternating Current		DC	HP	Alternating Current		DC
	Single Phase	3-Phase			Single Phase	3-Phase			Single Phase	3-Phase			Single Phase	3-Phase	
½	4.9	2.0	2.7	5	28	14.4	20	25	....	60	92	75	....	180	268
1	8.0	3.4	4.8	7½	40	21.0	29	30	....	75	110	100	....	240	355
1½	10.0	4.8	6.6	10	50	26.0	38	40	....	100	146	125	....	300	443
2	12.0	6.2	8.5	15	....	38.0	56	50	....	120	180	150	....	360	534
3	17.0	8.6	12.5	20	....	50.0	74	60	....	150	215	200	....	480	712

† Values are for all speeds and frequencies @ 230 volts.
Amperage other than 230 volts can be figured:

$$V = \frac{230 \times \text{Amp from Table}}{\text{New Voltage}}$$

Example:

For 60 HP, 3 phase @ 550 volts: $\frac{(230 \times 150)}{550} = 62$ amps.

Power Factor estimated @ 80% for most motors. Efficiency is usually 80-90%.

NEMA Electrical Enclosure Types

Type	Description	Type	Description
NEMA Type 1 (General Purpose)	For indoor use wherever oil, dust, or water is not a problem	NEMA Type 5 Dust Tight (Non-Hazardous)	Used for excluding dust (All NEMA 12 and JIC enclosures are usually suitable for NEMA 5 use)
NEMA Type 2 (Driptight)	Used indoors to exclude falling moisture and dirt	NEMA Type 9 Dust Tight (Hazardous)*	For locations where combustible dusts are present
NEMA Type 3 (Weatherproof)	Provides protection against rain, sleet, and snow	NEMA Type 12 (Industrial Use)	Used for excluding oil, coolant, flying dust, lint, etc
NEMA Type 4 (Watertight)†	Needed when subject to great amounts of water from any angle — such as areas which are repeatedly hosed down		

NOTE: Joint Industry Conference (JIC) enclosures are similar in design to NEMA 12's.
For more complete details see NEMA or JIC Standards for enclosures.
† Not designed to be submerged.
* Class II Groups E, F, and G.

NEMA Frame Designation

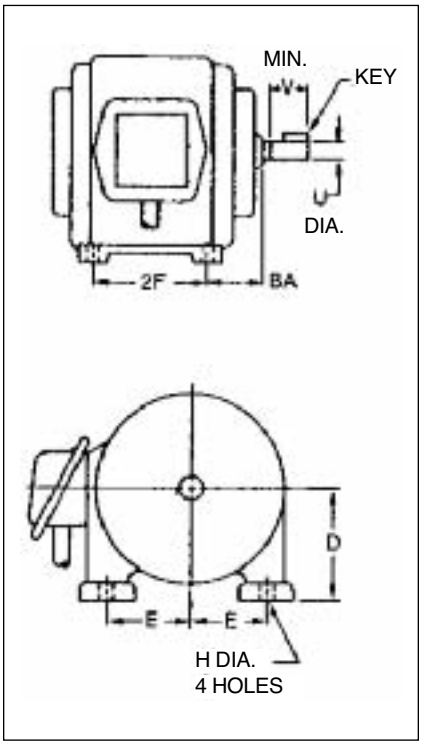
NEMA Frame Designation

Frame Assignments

HP	Motor Speed, RPM				HP	Motor Speed, RPM			
	3600	1800	1200	900		3600	1800	1200	900
⅛-⅓	—	48	—	—	15	215T, 256U	254T, 284U	284T, 324U	286T, 326U
⅛-½	48	—	56	—	20	254T, 284U	256T, 286U	286T, 326U	324T, 364U
⅛	—	—	48	—	25	256T, 286U	284T, 324U	324T, 364U	326T, 365U
½- 1	—	56	—	—	30	284TS, 324S	286T, 326U	326T, 365U	364T, 404U
¾- 1	56	—	—	—	40	286TS, 326S	324T, 364U	364T, 404U	365T, 405U
½	—	—	—	143T	50	324TS, 364US	326T, 365U, 365US	365T, 405U	404T, 444U
¾	—	—	143T	145T	60	326TS, 365US	364TS▲, 404U, 404US	404T, 444U	405T, 445U
1	—	143T	145T	182T	75	364TS, 404US	365TS▲, 405U, 405US	405T, 445U	444T
1½	143T	145T	182T	184T	100	365TS, 405US	404TS▲, 444US	444T	445T
2	145T	145T	184T	213T	125	404TS, 444US	405TS▲, 445US	445T	—
3	145T	182T	213T	215T, 254U	150	405TS, 445US	444TS▲	—	—
5	182T	184T	215T, 254U	254T, 256U	200	444TS	445TS▲	—	—
7½	184T	213T, 254U	254T, 256U	256T, 284U	250	445TS	—	—	—
10	213T, 254U	215T, 256U	256T, 284U	284T, 286U	—	—	—	—	—

Motor Frame Dimensions

Frame Size	D	E	2F	H Dia. (4) Holes	U Dia.	BA	V Min.	Key
48	3	2⅛	2¾	11/32	½	2½	...	3/64 FLAT
56	3½	2 7/16	3	11/32	⅝	2¾	...	3/16x3/16x 1⅜
143T	3½	2¾	4	11/32	⅞	2¼	2	3/16x3/16x1⅜
145T	3½	2¾	5	11/32	⅞	2¼	2	3/16x3/16x1⅜
182T	4½	3¾	4½	13/32	1⅛	2¾	2½	¼x¼x1¾
184T	4½	3¾	5½	13/32	1⅛	2¾	2½	¼x¼x1¾
213T	5¼	4¼	5½	13/32	1⅜	3½	3⅛	5/16x5/16x2⅜
215T	5¼	4¼	7	13/32	1⅜	3½	3⅛	5/16x5/16x2⅜
254U	6¼	5	8¼	17/32	1⅜	4¼	3½	5/16x5/16x2¾
254T	6¼	5	8¼	17/32	1⅝	4¼	3¾	⅜x⅜x2⅞
256U	6¼	5	10	17/32	1⅜	4¼	3½	5/16x5/16x2¾
256T	6¼	5	10	17/32	1⅝	4¼	3¾	⅜x⅜x2⅞
284U	7	5½	9½	17/32	1⅝	4¾	4⅝	⅜x⅜x3¾
284T	7	5½	9½	17/32	1⅞	4¾	4⅜	½x½x3¼
284TS	7	5½	9½	17/32	1⅝	4¾	3	⅜x⅜x1⅞
286U	7	5½	11	17/32	1⅝	4¾	4⅝	⅜x⅜x3¾
286T	7	5½	11	17/32	1⅞	4¾	4⅜	½x½x3¼
286TS	7	5½	11	17/32	1⅝	4¾	3	⅜x⅜x1⅞
324U	8	6¼	10½	21/32	1⅞	5¼	5⅜	½x½x4¼
324T	8	6¼	10½	21/32	2⅛	5¼	5	½x½x3⅞
324TS	8	6¼	10½	21/32	1⅞	5¼	3½	½x½x2
326U	8	6¼	12	21/32	1⅞	5¼	5⅜	½x½x4¼
326T	8	6¼	12	21/32	2⅛	5¼	5	½x½x3⅞
326TS	8	6¼	12	21/32	1⅞	5¼	3½	½x½x2
364U	9	7	11¼	21/32	2⅛	5⅞	6⅛	½x½x5
364US	9	7	11¼	21/32	1⅞	5⅞	3½	½x½x2
364T	9	7	11¼	21/32	2⅜	5⅞	5⅝	⅝x⅝x4¼
364TS	9	7	11¼	21/32	1⅞	5⅞	3½	½x½x2
365U	9	7	12¼	21/32	2⅛	5⅞	6⅛	½x½x5
365US	9	7	12¼	21/32	1⅞	5⅞	3½	½x½x2
365T	9	7	12¼	21/32	2⅜	5⅞	5⅝	⅝x⅝x4¼
365TS	9	7	12¼	21/32	1⅞	5⅞	3½	½x½x2
404U	10	8	12¼	13/16	2⅜	6⅝	6⅞	⅝x⅝x5½
404US	10	8	12¼	13/16	2⅛	6⅝	4	½x½x2¾
404T	10	8	12¼	13/16	2⅞	6⅝	7	¾x¾x5⅝
404TS	10	8	12¼	13/16	2⅛	6⅝	4	½x½x2¾
405U	10	8	13¾	13/16	2⅜	6⅝	6⅞	⅝x⅝x5½
405US	10	8	13¾	13/16	2⅛	6⅝	4	½x½x2¾
405T	10	8	13¾	13/16	2⅞	6⅝	7	¾x¾x5⅝
405TS	10	8	13¾	13/16	2⅛	6⅝	4	½x½x2¾
444U	11	9	14½	13/16	2⅞	7½	8⅜	¾x¾x7
444US	11	9	14½	13/16	2⅛	7½	4	½x½x2¾
444T	11	9	14½	13/16	3⅜	7½	8¼	⅞x⅞x6⅞
444TS	11	9	14½	13/16	2⅜	7½	4½	⅝x⅝x3
445U	11	9	16½	13/16	2⅞	7½	8⅜	¾x¾x7
445US	11	9	16½	13/16	2⅛	7½	4	½x½x2¾
445T	11	9	16½	13/16	3⅜	7½	8¼	⅞x⅞x6⅞
445TS	11	9	16½	13/16	2⅜	7½	4½	⅝x⅝x3



Shaded area indicates typical single phase standard squirreM-cage, open type, a-c motors. Balance of table same except three phase, design A and B.

▲ When these motors are used with V-belt or chain drives, the correct frame size is the one with the suffix "S" omitted — consult manufacturer.

Shaft Selection

Important factors to consider when calculating shaft size

(a) shafting is subject to a **bending moment** and a **torsional moment.**

(b) bending moment is that force which tends to **bend** a shaft.

(c) torsional moment is that force which tends to **twist** a shaft.

(d) shaft size is determined by the **combined action** of the bending and torsional moments.

Refer to Shaft Selection Charts 2 and 3 developed by the American Society of Mechanical Engineers to simplify selection. The charts should be used in conjunction with Service Factors (Table 1) to modify the selection for conditions under which the shaft will operate.

Selection Procedure

1. compute the Bending Moment from the above formula.
2. determine the Service Factor for bending that will suit conditions from Table 1.
3. compute the Torsional Moment from the above formula.
4. determine the Service Factor for torsion that will suit conditions from Table 1.
5. draw a horizontal line across Selection Chart 2 or 3 on pages M-10 and M-11, from the point where the **torsional moment intersects** its selected Service Factor line.
6. draw a vertical lineup Selection Chart 2 or 3 from the point where the **bending moment intersects** its selected factor line.
7. intersection of above lines will give required shaft size.
8. for shafts not weakened by keyways, multiply the shaft size obtained by .91 for the corrected shaft size. See note at the bottom of Selection Chart 3.

Horsepower required may be computed directly from the right-hand side of Selection Charts by correcting the figure in line with the horizontal torsional moment line by the speed in RPM.

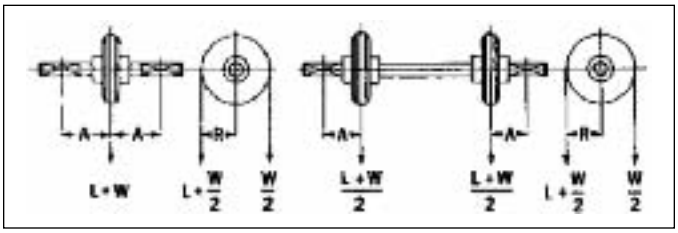
Table 1 • Service Factors

Type of Loading	Service Factor	
	For Bending	For Torsion
Stationary Shafts –		
Gradually applied loads	1.0	1.0
Suddenly applied loads	1.5 to 2.0	1.5 to 2.0
Rotating Shafts –		
Gradually applied or steady loads	1.5	1.0
Suddenly applied loads –		
Minor shock only	1.5 to 2.0	1.0 to 1.5
Suddenly applied loads –		
Heavy shock	2.0 to 2.5	1.5 to 2.5

A = Shaft length from center of bearing to center of load
L = Unbalanced load in pounds
W = Suspended weight of elevator (chain, buckets, etc.) in pounds
R = Radius of wheel in inches
B = Bending moment
T = Torsional moment

$B = A \frac{L + W}{2}$ inch pounds

T = R x L inch pounds



Selection Example:

Select shaft size for head shaft of chain conveyor subject to following requirements:

(a) Torsion (inch/lbs) — 20,500
(b) Bending moment (inch/lbs) — 13,300
(c) Service Factors:
torsion — 1.0
bending — 1.5

At the extreme left on Selection Chart 2, the torsion moment may be found for the Service Factor of 1.0. Draw a horizontal line to the right from the 20,500 point. The bending moment is given at the bottom of the chart. Find the 13,300 point; draw a line from this point to the right on the diagonal until it intersects the 1.5 Service Factor line, then project the line upward vertically until it intersects the horizontal line drawn from the 20,500 torsion point. At this intersection point, it is found that a shaft of approximately $2^{13}/_{16}$″ diameter is required.

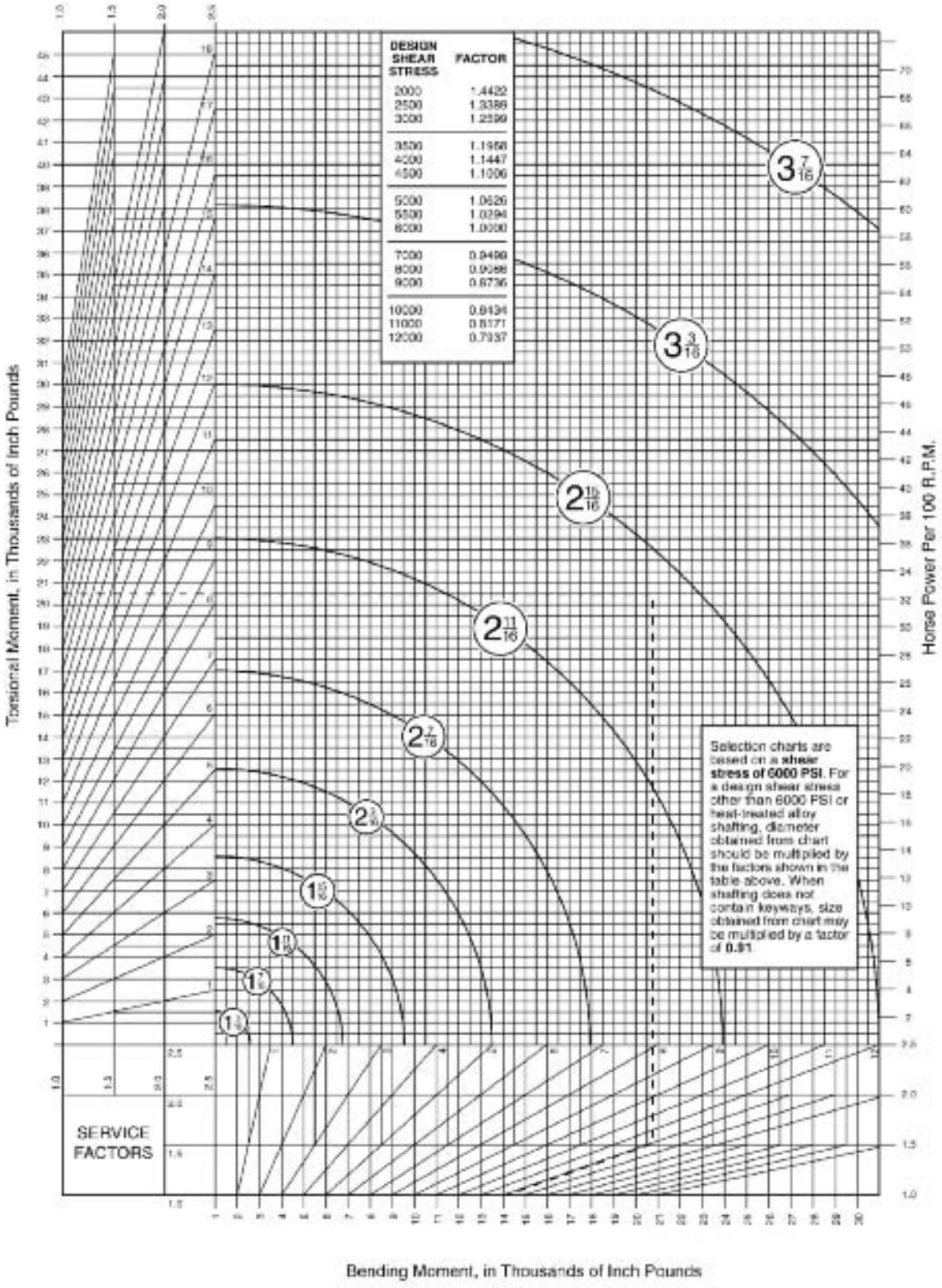
Select the nearest standard size shaft which is $2^{15}/_{16}$″.

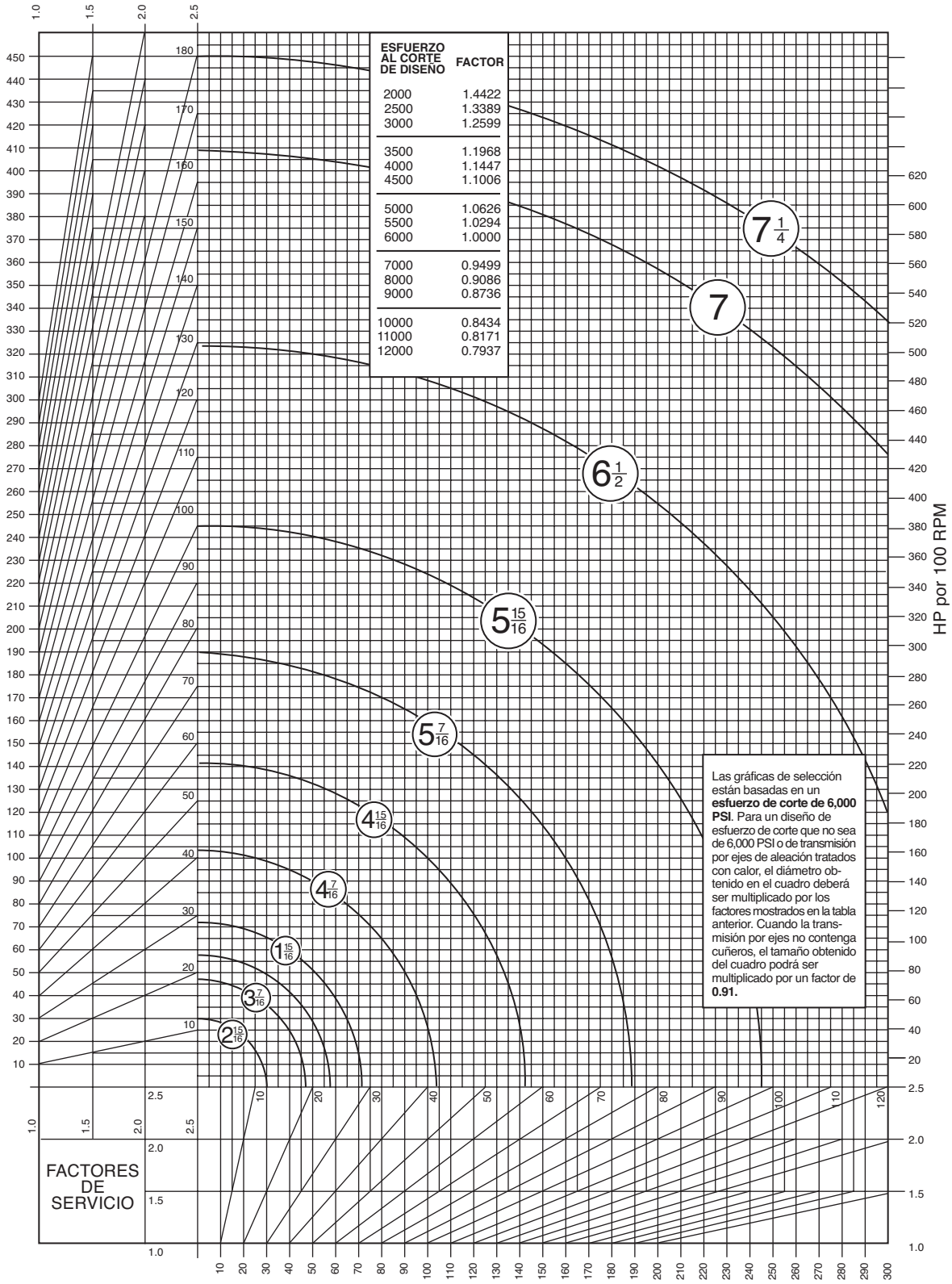
For a shaft subjected to the same conditions, but not weakened by keyways, the size of the shaft required would be (.91 x 2.8125) or 2.56 ($2^{9}/_{16}$″). See note at the bottom of the charts.

On this same chart at the right, the horsepower ratings at 100 RPM are given based on the formula:

$HP = \frac{TS}{63{,}000}$

T = Torque in inch-pounds
S = Speed in RPM
The horsepower is directly proportional to the speed of the shaft in RPM.


DESIGN SHEAR STRESS
FACTOR
2000 1.4422
2500 1.3388
3000 1.2599
3500 1.1958
4000 1.1447
4500 1.1006
5000 1.0626
5500 1.0294
6000 1.0000
7000 0.9498
8000 0.9088
9000 0.8736
10000 0.8434
11000 0.8171
12000 0.7937
Selection charts are based on a shear stress of 6000 PSI. For a design shear stress other than 6000 PSI or heat-treated alloy shafting, diameter obtained from chart should be multiplied by the factors shown in the table above. When shafting does not contain keyways, size obtained from chart may be multiplied by a factor of 0.91.
SERVICE FACTORS
Torsional Moment, in Thousands of Inch Pounds
Horse Power Per 100 R.P.M.
Bending Moment, in Thousands of Inch Pounds


ESFUERZO AL CORTE DE DISEÑO
FACTOR
2000 1.4422
2500 1.3389
3000 1.2599
3500 1.1968
4000 1.1447
4500 1.1006
5000 1.0626
5500 1.0294
6000 1.0000
7000 0.9499
8000 0.9086
9000 0.8736
10000 0.8434
11000 0.8171
12000 0.7937
Las gráficas de selección están basadas en un **esfuerzo de corte de 6,000 PSI**. Para un diseño de esfuerzo de corte que no sea de 6,000 PSI o de transmisión por ejes de aleación tratados con calor, el diámetro obtenido en el cuadro deberá ser multiplicado por los factores mostrados en la tabla anterior. Cuando la transmisión por ejes no contenga cuñeros, el tamaño obtenido del cuadro podrá ser multiplicado por un factor de **0.91.**
7 1/4
7
6 1/2
5 15/16
5 7/16
4 15/16
4 7/16
1 15/16
3 7/16
2 15/16
HP por 100 RPM
FACTORES DE SERVICIO
Momento de Flexión en Miles de Libras Pulgada

Flywheel Formulas

Flywheels are occasionally used on a few machines, such as air compressors, to even out load pulsations. These formulas are useful in designing entire flywheel rims. It is also possible to use V-Belt sheaves as a flywheel thus eliminating the need for a separate flywheel in the system. Consult Martin with specific requirements.

Formulas for Entire Flywheel

W = weight (pounds)
R = radius of gyration (feet)
N = speed (RPM)
t = time to change from N_1 to N_2 (seconds)
F = face of rim (inches)
D = outside diameter of rim (inches)
d = inside diameter of rim (inches)
P = weight per cubic inch of material (pounds)

Kinetic energy of rotation of a flywheel (foot pounds) = $.0001705\ N^2(WR^2)^*$.

Torque to accelerate or decelerate a flywheel uniformly (pound inches) $= \dfrac{.03908(N_2 - N_1)(WR^2)^*}{t}$,

where N_2 = final RPM and N_1 = initial RPM
Velocity at outside diameter (feet per minute) = 0.2618 ND

*WR^2 = flywheel effect (pounds x feet^2). See table below for WR^2 of rims. Ordinarily the WR^2 of the rim only is considered. In unusual instances the relatively small WR^2 values of the hub and arms or web can be added directly to the WR^2 of the rim if desired. To find the WR^2 of a hub or web use the WR^2 formula for rims, substituting the hub or web outside diameter, inside diameter, and width for D, d, and F respectively. When arms are used instead of a web an approximate WR^2 value of the arms is the total weight of the arms in pounds times the square of the radius in feet from the shaft center line to the mid-point of the arms between hub and rim.

Formulas for Flywheel Rims

Property	Cast Iron Rim (Based on .26 lbs per cubic inch)	Steel Rim Rim (Based on .283 lbs per cubic inch)	Rim of any Material Weighing P Pounds per cubic inch
Volume (Cubic Inches)	$.7854F(D^2 - d^2)$	$.7854F(D^2 - d^2)$	$.7854F(D^2 - d^2)$
W Weight (Pounds)	$.2042F(D^2 - d^2)$	$.2223F(D^2 - d^2)$	$.7854FP(D^2 - d^2)$
R Radius of Gyration (Feet)	$\sqrt{\frac{.8681(D^2 + d^2)}{1000}}$	$\sqrt{\frac{.8681(D^2 + d^2)}{1000}}$	$\sqrt{\frac{.8681(D^2 + d^2)}{1000}}$
WR^2 Wt. x Sq. of Radius of Gyration (Lbs. x Ft.^{2})	$\frac{.1773F(D^4 - d^4)}{1000}$	$\frac{.1929F(D^4 - d^4)}{1000}$	$\frac{.6818FP(D^4 - d^4)}{1000}$
Ts Tensile Load in Rim (Lbs.)	$\frac{.3078FN^2(D^3 - d^3)}{1,000,000}$	$\frac{.3350FN^2(D^3 - d^3)}{1,000,000}$	$\frac{1.184PFN^2(D^3 - d^3)}{1,000,000}$

▲ Centrifugal force causes this tensile load at each and every section of the rim. Thus on rims split into two or more sections, the fastening at each joint should be designed to take the full load as calculated from the formula below.

Centrifugal Force

R = Distance from the axis of rotation to the center of gravity of the body (feet)

N = Revolutions per minute (RPM)

v = Velocity of the center of gravity of the body (feet per second)

g = Acceleration due to gravity (32.16 commonly)

$$F = \frac{Wv^2}{gR} = \frac{WRN^2}{2933} = .000341\ WRN^2$$

F = Centrifugal force tending to move the body outward from the axis of rotation (pounds)

W = Weight of body (pounds)

Weights of Steel

NOTE: The steel weights in this section are nominal and are based on an approximate weight of 40.80 pounds per square foot, one inch thick. There may be differences between nominal weights and actual scale weights because of variation in manufacturing practices.

Hot Rolled and Cold Finished Steel Products Nominal Weight

Product	Thickness	Width	Length	Formulas
Plates, Strip and Flats	Inches	Inches	Inches	.2833 x T x W x L
	Inches	Inches	Feet	3.4 x T x W x L
	Inches	Feet	Feet	40.8 x T x W x L
	USS. Ga No.	Feet	Feet	Wt./Sq. Ft. x W x L
	Wt. per Sq. Ft.	Feet	Feet	Wt./Sq. Ft. x W x L
Hot and C.R. Sheets	Inches	Inches	Inches	.2904 x T x W x L
	Inches	Inches	Feet	3.485 x T x W x L
	Inches	Feet	Feet	41.82 x T x W x L
	USS. Ga No.	Feet	Feet	Wt./Sq. Ft. x W x L
	Wt. per Sq. Ft.	Feet	Feet	Wt./Sq. Ft. x W x L

		Thickness	Diameter	
Plate Circles		Inches	Inches	$.2225 \times T \times D^2$
		Inches	Feet	$32.05 \times T \times D^2$
Sheet Circles		Inches	Inches	$.228 \times T \times D^2$
		Inches	Feet	$32.85 \times T \times D^2$
		Diameter	Length	
Bars	Square	Inches	Feet	$3.4 \times D^2 \times L$
	Round	Inches	Feet	$2.67 \times D^2 \times L$
	Hexagon	Inches	Feet	$2.945 \times D^2 \times L$
	Octagon	Inches	Feet	$2.817 \times D^2 \times L$

T = thickness L = length W = width D = diameter

Steel Rounds

Size in Inches	Pounds Per Foot	Size in Inches	Pounds Per Foot
7/8	2.04	2 15/16	23.04
15/16	2.35	3	24.03
1	2.67	3 1/16	25.05
1 1/16	3.01	3 1/8	26.08
1 1/8	3.38	3 3/16	27.13
1 3/16	3.77	3 1/4	28.20
1 1/4	4.17	3 5/16	29.30
1 5/16	4.60	3 3/8	30.42
1 3/8	5.05	3 7/16	31.55
1 7/16	5.52	3 1/2	32.71
1 1/2	6.01	3 9/16	33.89
1 9/16	6.52	3 5/8	35.09
1 5/8	7.05	3 11/16	36.31
1 11/16	7.60	3 3/4	37.55
1 3/4	8.18	3 15/16	38.81
1 13/16	8.77	3 7/8	40.10
1 7/8	9.39	3 15/16	41.40
1 15/16	10.02	4	42.73
2	10.68	4 1/16	44.07
2 1/16	11.36	4 1/8	45.44
2 1/8	12.06	4 3/16	46.83
2 3/16	12.78	4 1/4	48.23
2 1/4	13.52	4 5/16	49.66
2 3/16	14.28	4 3/8	51.11
2 3/8	15.06	4 7/16	52.58
2 7/16	15.87	4 1/2	54.08
2 1/2	16.69	4 9/16	55.59
2 9/16	17.53	4 5/8	57.12
2 5/8	18.40	4 11/16	58.68
2 11/16	19.29	4 3/4	60.25
2 3/4	20.19	4 13/16	61.85
2 15/16	21.12	4 7/8	63.46
3 7/8	22.07	4 15/16	65.10

Standard Sheet Weights

Ga. Number	Thickness in Inches	Weight Per Square Foot in Pounds
	Over 3/16" are plates	
7	.1793	7.500
8	.1644	6.875
9	.1494	6.250
10	.1345	5.625
11	.1196	5.000
12	.1046	4.375
13	.0897	3.750
14	.0747	3.125
15	.0673	2.812
16	.0598	2.500

Carbon Steel Plates

Size in Inches	Weight Per Square Foot in Pounds
3/16	7.76
1/4	10.20
5/16	12.75
3/8	15.30
7/16	17.85
1/2	20.40
9/16	22.95
5/8	25.50
3/4	30.60
13/16	33.15
7/8	35.70
1	40.80
1 1/8	45.90
1 1/4	51.00
1 3/8	56.10
1 1/2	61.20

NOTE: Stainless Steel Weights approximately 10% more than Carbon Steel.

Steel Properties

Properties of Steel

The information shown below is offered as a general guide to physical properties of steel in common use. Lower tensile properties are to be expected in large sections; the values of strength decrease as the size of the section increases. These values are not guaranteed and must **NOT** be used in specifying the raw materials or as a basis for acceptance or rejection of material. It must not be assumed that these properties will be obtained in all cases as they vary widely with permissible variations in analysis, size of section, rolling conditions, grain size and methods of heat treatment. Dependable physical properties can only be obtained through carefully controlled analysis and heat treatment.

Average Properties of Standard Steels

AISI Number	SAE Number	Condition of Steel	Strength in1000 PSI		% Elong. in 2″	% Red. of Area	Hardness		Machinability % of B1112 CD
			Tensile	Yield			Brinell	Rockwell	
B1112	1112	COLD DRAWN BESSEMER	75-90	60-70	12-16	40-50	170-185	80-95B	100
C1018	1018	NATURAL HOT ROLLED	55-70	40-50	25-35	50-65	120-140	.....	55
		COLD DRAWN	70-85	50-70	18-25	45-55	160-180	80-90B	65
		1″ RD.CARBURIZED AT 1700°F., COOLED IN BOX, REHEATED, QUENCHED – CORE PROPERTIES	90-100	60-80	10-22	35-50	200-230	93-98B	.....
C1020	1020	NATURAL HOT ROLLED	60-80	40-50	25-35	50-65	120-145	60-98B	50
		COLD DRAWN	70-80	45-70	15-25	45-60	120-160	70-85B	60
C1117	1117	NATURAL HOT ROLLED	60-70	37-47	20-30	45-60	135-150	.....	80
		COLD DRAWN	80-90	60-75	15-20	40-50	160-190	80-90B	90
		1″ RD.CARBURIZED AT 1700°F., COOLED IN BOX, REHEATED, QUENCHED – CORE PROPERTIES	95-110	60-85	10-25	35-50	210-240	15-22C	.....
C1035	1035	NATURAL HOT ROLLED	75-85	40-55	18-25	40-55	155-175	.....	60
		COLD DRAWN	85-95	65-80	15-25	40-50	170-200	85-95B	65
		1″ RD. QUENCHED, TEMPERED 1000°F	95-105	70-80	20-25	55-60	195-220	93-98B	55
C1040	1040	NATURAL HOT ROLLED	80-90	45-55	18-25	35-50	165-185	.....	60
		COLD DRAWN	90-100	70-85	14-20	35-50	190-215	91-98B	62
		1″ RD. QUENCHED, TEMPERED 1000°F	100-110	75-85	15-25	45-60	210-240	17-23C	52
C1042	1042	NATURAL HOT ROLLED	85-95	50-60	15-25	35-50	175-205	.....	58
		COLD DRAWN	90-105	75-90	12-20	30-45	185-215	.....	60
		1″ RD. QUENCHED, TEMPERED 1000°F	105-120	80-90	15-25	40-60	215-250	.....	.....
C1045	1045	NATURAL HOT ROLLED	85-105	50-65	15-25	35-45	175-215	.....	55
		COLD DRAWN	90-110	75-90	12-20	30-45	195-230	95-99B	58
		1″ RD. QUENCHED, TEMPERED 1000°F	110-130	80-95	12-25	40-55	235-260	22-26C	47
C1141	1141	NATURAL HOT ROLLED	90-110	60-80	15-25	25-45	180-220	.....	65
		COLD DRAWN	100-120	85-105	8-18	20-50	195-230	.....	70
		1″ RD. QUENCHED, TEMPERED 1000°F	120-145	100-130	10-20	35-50	270-310	.....	.....
C1144	1144	NATURAL HOT ROLLED	95-110	60-85	15-25	30-45	200-240	.....	75
		COLD DRAWN	100-120	90-115	7-17	20-45	210-245	17-23C	85
		1″ RD. QUENCHED, TEMPERED 1000°F	130-150	110-130	15	45	286-302	29-31C	.....
C1050	1050	NATURAL HOT ROLLED	95-110	55-70	15-20	25-40	210-325	.....	50
		1″ RD. QUENCHED, TEMPERED 1000°F	115-135	85-100	10-22	35-50	240-265	23-27C	.....
4140	4140	HOT ROLLED, ANNEALED	90-100	60-70	20-30	50-60	185-210	91-95B	55
		COLD DRAWN, ANNEALED	110-120	85-95	15-25	45-55	230-250	20-25C	65
		HEAT TREATED, COLD DRAWN	140-155	125-140	12-20	45-55	270-300	26-30C	45
		1″ RD. QUENCHED, TEMPERED 1000°F	150-160	130-140	15-20	50-60	320-350	34-37C	.....
		2″ RD. QUENCHED, TEMPERED 1000°F	145-155	125-135	15-20	50-60	320-345	33-36C	.....
		3″ RD. QUENCHED, TEMPERED 1000°F	130-145	115-125	15-20	55-65	280-310	28-32C	.....
E52100	52100	HOT ROLLED, ANNEALED	100-110	75-85	20-25	50-60	210-235	.....	45
		1″ RD. QUENCHED, TEMPERED 1000°F	180-195	65-80	10-15	35-45	375-415	40-43C	.....
8620	8620	NATURAL HOT ROLLED	90-95	55-65	18-25	45-60	160-200	85-95B	55
		COLD DRAWN	90-105	65-80	15-25	40-50	185-215	90-96B	60-70
		1″ RD. CARBURIZED 1700°F., COOLED IN BOX, REHEATED, QUENCHED – CORE PROPERTIES	120-135	90-110	15-20	40-50	285-350	28-40C	.....
8645	8645	NATURAL HOT ROLLED	105-125	55-75	15-25	35-50	220-270	20-28C	48-55
		HOT ROLLED, ANNEALED	100-110	50-60	20-25	40-55	210-230	17-21C	54
		2″ RD. QUENCHED, TEMPERED 1000°F	140-150	110-125	15-20	45-55	300-320	30-34C	.....
		3″ RD. QUENCHED, TEMPERED 1000°F	130-140	105-115	15-20	50-60	285-310	29-32C	.....
8742	8742	NATURAL HOT ROLLED	110-125	50-70	15-25	35-50	230-270	22-28C	45-50
		COLD DRAWN, ANNEALED	105-120	95-105	10-18	35-45	210-235	95-99B	60
		1″ RD. QUENCHED, TEMPERED 1000°F	155-165	135-145	15-20	45-52	330-335	35-38C	.....
		2″ RD. QUENCHED, TEMPERED 1000°F	135-145	110-120	15-20	50-60	290-320	30-33C	.....

Physical Properties of Various Metals

Metals and Alloys	Stress in Thousands of Pounds per Square Inch				Modulus of Elasticity 1,000,000 Lbs.	Elongation %
	Tension Ultimate	Tension Yield Point	Compression Ultimate	Shear Ultimate		
ALUMINUM, TYPE 3003-0, ANNEALED	16	6	.....	11	10	40
ALUMINUM, TYPE 3003-H18, HARD	29	27	.....	16	10	10
ALUMINUM, TYPE 5052-0, ANNEALED	28	13	.....	18	10.2	30
ALUMINUM, TYPE 5052-H38, HARD	42	37	.....	24	10.2	8
ALUMINUM, TYPE 5056-0, ANNEALED	42	22	.....	26	10.3	35
ALUMINUM, TYPE 2014-0, ANNEALED	27	14	.....	18	10.6	18
ALUMINUM, TYPE 2014-T4, HEAT TREATED	62	42	.....	38	10.6	20
ALUMINUM, TYPE C4A, CASTING, SOLUTION HEAT TREAT	32	16	16▲	24	.....	8.5
ALUMINUM, TYPE S5C, AS DIE CAST	30	16	16▲	19	.....	9
BRASS, ALUMINUM, ANNEALED	60	27	.....	.....	16	55
BRASS, RED, 15% ZN, ANNEALED	39	10	.....	31	17	48
BRASS, RED, 15% ZN, HARD	70	57	.....	42	17	5
BRASS, RED, LEADED, CAST, GRADE 4A	33-46	17-24	10-12▲	.....	9.1-14.8	20-35
BRASS, RED, LEADED, CAST, GRADE 4B	30-38	12-17	11-12▲	.....	.....	15-27
BRASS, YELLOW, 35% ZN, ANNEALED	46	14	.....	32	15	65
BRASS, YELLOW, 35% ZN, HARD	74	60	.....	43	15	8
BRONZE, ALUMINUM, AS CAST	67-95	27-45	.....	.....	15-18	5-35
BRONZE, COMMERCIAL, 10% ZN, ANNEALED	37†	10†	.....	28†	17	45†
BRONZE, MANGANESE, ANNEALED	65†	30†	.....	42†	15	33†
BRONZE, PHOSPHOR, ANNEALED	40-66	14-24	.....	.....	16-17	48-70
BRONZE, TIN, HIGH LEADED, CAST	23-38	11-22	12-16▲	.....	8.5-13	7-20
BRONZE, TIN, LEADED, CAST	33-48	16-26	9-15▲	.....	10.6-16	15-40
COPPER, BERYLLIUM, ANNEALED	60-80†	25-35†	.....	50-60†	19	35-50†
INCONEL, CAST	65-90	.....	.....	.....	23	10-20
INCONEL, S, CAST	90-120	80-100	.....	.....	25	1-3
IRON, CAST, CLASS 30	30-34	.....	115	44	15	.....
IRON, CAST, CLASS 35	35-40	.....	125	43	16	.....
IRON, MALLEABLE, CLASS 32510	50	33	90	46	25	10-18
IRON, MALLEABLE, CLASS 35018	55	37	90	51	25	18-25
IRON, NODULAR (DUCTILE) CLASS 60-45-10	60	45	120	.....	22-25	10-25
IRON, NODULAR (DUCTILE) CLASS 80-60-3	80	60	160	.....	22-25	3-10
IRON, PEARLITIC, MALLEABLE	60-90	40-70	.....	.....	28	3-12
IRON, WROUGHT, HOT ROLLED	34-47	23-24	.....	.....	29	7-35
LEAD, HARD, ROLLED	4.0-4.6	.....	.....	.....	.....	31-48
MONEL, CAST	65-90	32-45	.....	.....	23	20-50
MONEL, S, CAST	120-145	80-130	.....	.....	24.2	1-4
MONEL, SHAPES, PLATE, ETC., ANNEALED	70-85†	25-45†	.....	.....	26	35-50†
NICKEL, CAST	50-65	15-30	.....	.....	21.5	15-30
NICKEL, SILVER, ANNEALED	49-63†	18-30†	.....	.....	17-18	35-60†
STEEL, CAST CARBON, CLASS 70,000 NORMALIZED	70	38	.....	.....	30	28
STEEL, CAST LOW ALLOY, CLASS 100,000, NORMALIZE & TEMPERED	100	68	.....	.....	29-30	20
STEEL, CAST LOW ALLOY, CLASS 120,000, QUENCHED AND TEMPERED	120	95	.....	.....	29-30	16
STEEL, CAST LOW ALLOY, CLASS 200,000, QUENCHED AND TEMPERED	200	170	.....	.....	29-30	5
STEEL, SHEETS	48	25	.....	.....	29-30	18-27
STEEL, STAINLESS, AUSTENITIC, TYPES 304, 316	85	35	.....	.....	28	55-60
STEEL, STAINLESS, MARTENSITIC, TYPE 416	75	40	.....	.....	29	30
STEEL, STRUCTURAL, BRIDGE AND BUILDING, ASTM A7	60-72	33	33▲	45-54	29-30	21
STEEL, STRUCTURAL, HIGH STRENGTH, LOW ALLOY, ASTM A242	63-72	42-50	42-50▲	47-53	29-30	18-24
ZINC, DIE CAST ALLOY, XXIII	41	.....	60▲	31	.....	10

† When hardened, strength values are higher, elongation less.
▲ Compression yield point.

Hardness Conversion Chart

Brinell, Rockwell, and Scleroscope Hardness Numbers with Corresponding Tensile Strength

Brinell 10 MM Ball 3000 Kg.	Rockwell "C" 120 Cone 150 Kg.	Scleroscope Shore Model C	Tensile Strength 1000 Pound Per Square Inch
745	68	100	368
712	66	95	352
682	64	91	337
653	62	87	324
627	60	84	311
601	58	81	298
578	57	78	287
555	55	75	276
534	53	72	266
514	52	70	256
495	50	67	247
477	49	65	238
461	47	63	229
444	46	61	220
429	45	59	212
415	44	57	204
401	42	55	196
388	41	54	189
375	40	52	182
362	38	51	176
351	37	49	170
341	36	48	165
331	35	46	160
321	34	45	155
311	33	44	150
302	32	43	146
293	31	42	142
285	30	40	138
277	29	39	134
269	28	38	131
262	26	37	128
255	25	37	125
248	24	36	122
241	23	35	119
235	22	34	116
229	21	33	113
223	20	32	110
	Rockwell "B" 1/16" Ball 100 Kg.		
217	97	31	107
212	96	31	104
207	95	30	101
202	94	30	99
197	93	29	97
192	92	28	95
187	91	28	93
183	90	27	91
179	89	27	89
174	88	26	87

Decimal Equivalent Table

Decimal and Millimeter Equivalents of Fractions

Inches			Inches			Inches		
Fractions	Decimals	Millimeters	Fractions	Decimals	Millimeters	Fractions	Decimals	Millimeters
1/64	.015625	.397	11/32	.34375	8.731	1 1/16	.6875	17.463
1/32	.03125	.794	23/64	.359375	9.128	45/64	.703125	17.859
3/64	.406875	1.191	3/8	.375	9.525	23/32	.71875	18.256
1/16	.0625	1.588	25/64	.390625	9.922	47/64	.734375	18.653
5/64	.078125	1.984	13/32	.40625	10.319	3/4	.750	19.050
3/32	.09375	2.381	27/64	.421875	10.716	49/64	.765625	19.447
7/64	.109375	2.778	7/16	.4375	11.113	25/32	.78125	19.844
1/8	.125	3.175	29/64	.453125	11.509	51/64	.796875	20.241
9/64	.140625	3.572	15/32	.46875	11.906	13/16	.8125	20.638
5/32	.15625	3.969	31/64	.484375	12.303	53/64	.828125	21.034
11/64	.171875	4.366	1/2	.500	12.700	27/32	.84375	21.431
3/16	.1875	4.763	33/64	.515625	13.097	55/64	.859375	21.828
13/64	.203125	5.159	17/32	.53125	13.494	7/8	.875	22.225
7/32	.21875	5.556	35/64	.546875	13.891	57/64	.890625	22.622
15/64	.234375	5.953	9/16	.5625	14.288	29/32	.90625	23.019
1/4	.250	6.350	37/64	.578125	14.684	59/64	.921875	23.416
17/64	.265625	6.747	19/32	.59375	15.081	15/16	.9375	23.813
9/32	.28125	7.144	39/64	.609375	15.478	61/64	.953125	24.209
19/64	.296875	7.541	5/8	.625	15.875	31/32	.96875	24.606
5/16	.3125	7.938	41/64	.640625	16.272	63/64	.984375	25.003
21/64	.328125	8.334	21/32	.65625	16.669	1	1.000	25.400
			43/64	.671875	17.066			

Decimal Equivalents of Millimeters

MM	Inches	MM	Inches	MM	Inches	MM	Inches	MM	Inches	MM	Inches	MM	Inches	MM	Inches
.1	.00394	9.5	.37401	22.5	.88582	35.5	1.39763	48.5	1.90944	61.5	2.42125	74.5	2.93306	87.5	3.44487
.2	.00787	10.	.39370	23.	.90551	36.	1.41732	49.	1.92913	62.	2.44094	75.	2.95275	88.	3.46456
.3	.01181	10.5	.41338	23.5	.92519	36.5	1.43700	49.5	1.94881	62.5	2.46062	75.5	2.97243	88.5	3.48424
.4	.01575	11.	.43307	24.	.94488	37.	1.45669	50.	1.96850	63.	2.48031	76.	2.99212	89.	3.50393
.5	.01968	11.5	45275	24.5	.96456	37.5	1.47637	50.5	1.98818	63.5	2.49999	76.5	3.01180	89.5	3.52361
.6	.02362	12.	.47244	25.	.98425	38.	1.49606	51.	2.00787	64.	2.51968	77.	3.03149	90.	3.54330
.7	.02756	12.5	.49212	25.5	1.00393	38.5	1.51574	51.5	2.02755	64.5	2.53936	77.5	3.05117	90.5	3.56298
.8	.03149	13.	.51181	26.	1.02362	39.	1.53543	52.	2.04724	65.	2.55905	78.	3.07086	91.	3.58267
.9	.03543	13.5	.53149	26.5	1.04330	39.5	1.55511	52.5	2.06692	65.5	2.57873	78.5	3.09054	91.5	3.60235
1.	.03937	14.	.55118	27.	1.06299	40.	1.57480	53.	2.08661	66.	2.59842	79.	3.11023	92.	3.62204
1.5	.05905	14.5	.57086	27.5	1.08267	40.5	1.59488	53.5	2.10629	66.5	2.61810	79.5	3.12991	92.5	3.64172
2.	.07874	15.	.59055	28.	1.10236	41.	1.61417	54.	2.12598	67.	2.63779	80.	3.14960	93.	3.66141
2.5	.09842	15.5	.61023	28.5	1.12204	41.5	1.63385	54.5	2.14566	67.5	2.65747	80.5	3.16928	93.5	3.68109
3.	.11811	16.	.62992	29.	1.14173	42.	1.65354	55.	2.16535	68.	2.67716	81.	3.18897	94.	3.70078
3.5	.13779	16.5	.64960	29.5	1.16141	42.5	1.67322	55.5	2.18503	68.5	2.69684	81.5	3.20865	94.5	3.72046
4.	.15748	17.	.66929	30.	1.18110	43.	1.69291	56.	2.20472	69.	2.71653	82.	3.22834	95.	3.74015
4.5	.17716	17.5	.68897	30.5	1.20078	43.5	1.71259	56.5	2.22440	69.5	2.73621	82.5	3.24802	95.5	3.75983
5.	.19685	18.	.70866	31.	1.22047	44.	1.73228	57.	2.24409	70.	2.75590	83.	3.26771	96.	3.77952
5.5	.21653	18.5	.72834	31.5	1.24015	44.5	1.75196	57.5	2.26377	70.5	2.77558	83.5	3.28739	96.5	3.79920
6.	.23622	19.	.74803	32.	1.25984	45.	1.77165	58.	2.28346	71.	2.79527	84.	3.30708	97.	3.81889
6.5	.25590	19.5	.76771	32.5	1.27952	45.5	1.79133	58.5	2.30314	71.5	2.81495	84.5	3.32676	97.5	3.83857
7.	.27559	20.	.78740	33.	1.29921	46.	1.81102	59.	2.32283	72.	2.83464	85.	3.34645	98.	3.85826
7.5	.29527	20.5	.80708	33.5	1.31889	46.5	1.83070	59.5	2.34251	72.5	2.85432	85.5	3.36613	98.5	3.87794
8.	.31496	21.	.82677	34.	1.33858	47.	1.85039	60.	2.36220	73.	2.87401	86.	3.38682	99.	3.89763
8.5	.34464	21.5	.84645	34.5	1.35826	47.5	1.87007	60.5	2.38188	73.5	2.89369	86.5	3.40550	99.5	3.91731
9.	.35433	22.	.86614	35.	1.37795	48.	1.88976	61.	2.40157	74.	2.91338	87.	3.42519	100.	3.93700

English Metric System Equivalents

Length Equivalents

Unit	Millimeters	Centimeters	Inches	Feet	Yards	Meters
1 MILLIMETER =	1	.1	.03937	.003281	.001094	.001
1 CENTIMETER =	10	1	.3937	.032808	.010936	.01
1 INCH =	25.4001	2.54001	1	.083333	.027778	.025400
1 FOOT =	304.801	30.4801	12	1	.333333	.304801
1 YARD =	914.402	91.4402	36	3	1	.914402
1 METER =	1000	100	39.37	3.28083	1.09361	1

Unit	Feet	Yards	Meters	Rods	Furlongs	Miles (Statute)
1 ROD =	16.5	5.5	5.02921	1	.025 (1/40)	.003125 (1/320)
1 FURLONG =	660	220	201.168	40	1	.125 (1/8)
1 KILOMETER =	3280.8	1093.6	1000	199	4.971	.62137
1 MILE (STATUTE) =	5280	1760	1609.35	320	8	1

1 NAUTICAL MILE = 6080.2 FEET = 1.15155 STATUTE MILES = 1/3 LEAGUE.
1 LIGHT YEAR = 5.879 TRILLION MILES = 9.46 TRILLION KILOMETERS.

Weight Equivalents

Unit	Grains	Grams	Ounces (Troy)	Ounces (Avoir.)	Pounds (Troy)	Pounds (Avoir.)	Kilograms
1 GRAIN =	1	.064799	.002083	.002286	.000174	.000143	.000065
1 GRAM =	15.4324	1	.032151	.035274	.002679	.002205	.001
1 OUNCE (TROY) =	480	31.1035	1	1.09714	.083333	.068571	.031104
1 OUNCE (AVOIR.) =	437.5	28.3495	.911458	1	.075955	.0625	.028350
1 POUND (TROY) =	5760	373.242	12	13.1657	1	.822857	.373242
1 POUND (AVOIR.) =	7000	453.592	14.5833	16	1.21528	1	.453592
1 KILOGRAM =	15432.4	1000	32.1507	35.2740	2.67923	2.20462	1

Unit	Kilograms	Pounds (Troy)	Pounds (Avoir.)	Metric Tons	Net (Short) Tons	Gross (Long) Tons
1 METRIC TON =	1000	2679.23	2204.62	1	1.10231	.984206
1 NET (SHORT) TON =	907.185	2430.56	2000	.907185	1	.892857
1 GROSS (LONG) TON =	1016.05	2722.22	2240	1.01605	1.12	1

Volume and Capacity Equivalents

Unit	Cubic Centimeters	Cubic Inches	Liters	Quarts (Liquid)	Quarts (Dry)	Gallons (Liquid)	Gallons (Dry)	Cubic Feet
1 CU. CENTIMETER =	1	.06102	.001	.00106	.00091	.00026	.00023	.00004
1 CU. INCH =	16.387	1	.01639	.01732	.01488	.00433	.00372	.00058
1 GILL =	118.29	7.2188	.11829	.125	.10742	.03125	.02686	.00418
1 PINT (LIQUID) =	473.18	28.875	.47318	.5	.42968	.125	.10742	.01671
1 PINT (DRY) =	550.62	33.600	.55062	.58182	.5	.14546	.125	.01945
1 LITER =	1000	61.023	1	1.0567	.90808	.26417	.22702	.03531
1 QUART (LIQUID) =	946.36	57.75	.94636	1	.85937	.25	.21484	.03342
1 QUART (DRY) =	1101.2	67.201	1.1012	1.1637	1	.29091	.25	.03889
1 GALLON (LIQUID) =	3785.4	231	3.7854	4	3.4375	1	.85937	.13368
1 GALLON (DRY) =	4404.9	268.80	4.4049	4.6546	4	1.1636	1	.15556
1 PECK =	8809.8	537.61	8.8098	9.3092	8	2.3273	2	.31111
1 CU. FOOT =	28317.0	1728	28.317	29.922	25.714	7.4805	6.4285	1
1 BUSHEL =	35239.3	2150.4	35.239	37.237	32	9.3092	8	1.2445
1 BARREL =	119241.2	7276.5	119.24	126	108.28	31.5	27.070	4.2109
1 CU. YARD =	764559.4	46656	764.56	807.90	694.28	201.97	173.57	27
1 CU. METER =	1000000	61023.4	1000	1056.7	908.08	264.17	227.02	35.314

English Metric System Equivalents

Area Equivalents

Unit	Square Inches	Square Feet	Square Yards	Square Meters
1 SQUARE FOOT =	144	1	.1111	.09290
1 SQUARE YARD =	1296	9	1	.83613
1 SQUARE METER =	1550	10.7639	1.19599	1
1 SQUARE ROD =	39204	272.25	30.25	25.293
1 ARE =	155000	1076.39	119.599	100
1 ACRE =	6272640	43560	4840	4046.86
1 SQUARE MILE (640 ACRES) =	–	27878400	3097600	2589999
1 SQUARE KILOMETER =	–	10763867	1195985	1000000

Power Equivalents

Unit	BTU/Hour	Foot-Pound/Hour	Foot-Pound/Minute	HP	HP (Metric)	Watt	Kilowatt
1 BTU/HR. =	1	778.1688	12.96948	.000393	.000398	.293071	.000293
1 FT.LB./HR. =	.001285	1	–	$5.05x10^{-7}$	$5.12x10^{-7}$	.0003766	$3.766x10^{-7}$
1 FT.LB./MIN. =	.077104	–	1	$3.0303x10^{-5}$	$3.072x10^{-7}$	.022597	$2.26x10^{-5}$
1 HP =	2544.43	1980000	33000	1	1.01387	745.699	.7457
1 HP MET. =	2509.622	1952914	32548.56	.986320	1	735.499	.735499
1 WATT =	3.41214	2655.224	44.2537	.0013410	.0013596	1	.001

NOTE: Foot-Pounds indicates energy.
Pound-Feet indicates torque (Page M-2).

Metric System

Length

1 meter (m) = { 10 decimeters(dm); 100 centimeters(cm); 1,000 millimeters(mm)
1 dekameter (dkm) = 10 meters (m)
1 hectometer (hm) = 100 meters (m)
1 kilometer (km) = 1,000 meters (m)

Weight

1 gram (g) = { 10 decigrams (dg); 100 centigrams (cg); 1,000 milligrams (mg)
1 dekagram (dkg) = 10 grams (g)
1 hectogram (hg) = 100 grams (g)
1 kilogram (kg) = 1000 grams (g)
1 metric ton = { 1000 kilograms (kg); 1,000,000 grams (g)

Volume & Capacity

1 liter (l) = { 1 cubic decimeter(dm^3); 10 deciliters (dl); 100 centiliters(cl); 1,000 milliliters (ml); 1,000 cubic centimeters (cm^3or cc)
1 dekaliter (dkl) = 10 liters (l)
1 hectoliter (hl) = 100 liters (l)
1 kiloliter (kl) = { 1 cubic meter (m^3); 1 stere (s); 1,000 liters (l)

Area

1 centare (ca) = { 1 square meter (m^2); 100 square decimeters (dm^2); 10,000 square centameters (cm^2); 1,000,000 square millimeters (mm^2)
1 are (a) = { 1 square dekameter (dkm^2); 100 square meters (m^2)
1 hectare (ha) = { 100 ares (a); 10,000 square meters (m^2)
1 square kilometer (km^2) = 1,000,000 square meters (m^2)

Other prefixes commonly used:

micro — one millionth
deca — 10 times (same as deka)
myria — 10,000 times
mega — 1,000,000 times

Engineering Formulas and Constants

Circle
Area = Square of Diameter x .7854
or square of Radius x 3.1416
Circumference = Diameter x 3.1416
Diameter = Circumference x .3183

Doubling diameter increases area four times; tripling diameter increases area nine times, etc.

Square
Area = Square of Side
Diagonal = Side x 1.4142
Side = Diagonal x .7071

Square Inscribed in Circle
Side of Square = Diameter of Circle x .7071
or Circumference of Circle x .2251
Diameter of Circle = Side of Square x 1.4142
Circumference of Circle = Side of Square x 4.4429

Square and Circle with Equal Area
Side of Square = Diameter of Circle x .8862
Diameter of Circle = Side of Square x 1.128
Circumference of Circle = Side of Square x 3.545

Rectangle
Area = Length x Width
Diagonal = Square root of sum of squares of Width and Length

Triangle
Area = Base x ½ of Perpendicular Height

Sphere
Area of Surface = Square of Diameter x 3.1416
Volume = Cube of Diameter x .5236

Cube
Area of Surface = Square of Side x 6
Volume = Cube of Side
Diagonal = Side x 1.732

Cylinder
Area of Curved Surface = Diameter x Length x 3.1416
Volume = Square of Diameter x Length x .7854

Cone
Area of Curved Surface = Diameter of Base x Slant Height x 1.5708
Volume = Diameter of Base Squared x Perpindicular Height x .2618 or Area of Base x ⅓ Perpendicular Height

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1 HP = 33,000 Foot-pounds of work per minute.
1 BTU = Heat required to raise 1 pound of water °F.
1 Kilowatt Hour = 3415 BTU
1 Radian = 57.296 degrees.
1 Register Ton = 100 cubic feet
1 U.S. Shipping Ton = 40 cubic feet
1 British Shipping Ton = 42 cubic feet
1 Cubic Foot/Minute = 471.9474 cubic cm/second
1 Cubic Foot/Minute = .1246753 gallons (U.S.)/second
1 Cubic Foot/Second = 2.2222 cubic yards/minute
1 Gallon (U.S.)/Minute = 8.020834 cubic feet/hour
1 Gallon (U.S.)/Minute = 3.785412 liter/minute
1 Liter/Minute = 2.118880 cubic feet/hour
1 Cubic Mitre/Minute = 264.1720 Gallons (U.S.)/Minute
1 Pound/Gallon (U.S.) = 7.480519 pound/cubic feet
1 Mile/Hour = 88 feet/minute
1 Foot/Minute = .01136364 miles/hour

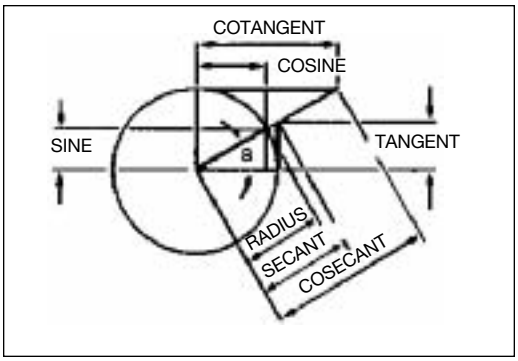
1 Pound per Square Inch Pressure (PSI) = 144 pounds/square foot = 2.3095 feet fresh water at 62°F = 2.0355 inches mercury at 32°F = 2.0416 inches mercury at 62°F = .068 atmospheres.
Water Pressure (pounds per square inch) = .433 x height of water in feet (Fresh water at 62°F).
Weight of 1 cubic foot of fresh water = 62.355 pounds at 62°F = 59.76 pounds at 212°F.
Weight of 1 gallon (U.S.) water = 8.34 pounds
Weight of 1 cubic foot of Air at 14.7 lbs per square inch Pressure = .07608 pounds at 62°F = .08703 pounds at 32°F.
Watts = Amperes x Volts
1 Watt-Hour = 3.41214 BTU = 859.845 Calorie = 3600 Joule.
g = Acceleration due to gravity at Sea Level, Latitude 45° = 32.1726 Feet/Second squared.
1 pound-foot (torque) = 1.355818 Newton-Metre.

Area/Circumference Table

Circumferences and Areas of Circles (1 — 31⅞ Diameters)

Diameter	Circumference	Area	Diameter	Circumference	Area	Diameter	Circumference	Area	Diameter	Circumference	Area
1	3.1416	0.7854	½	17.2788	23.758	14	43.9823	153.94	23	72.2566	415.48
1/16	3.3379	0.8866	9/16	17.4751	24.301	⅛	44.3750	156.70	⅛	72.6493	420.00
⅛	3.5343	0.9940	⅝	17.6715	24.850	¼	44.7677	159.48	¼	73.0420	424.56
3/16	3.7306	1.1075	11/16	17.8678	25.406	⅜	45.1604	162.30	⅜	73.4347	429.13
¼	3.9270	1.2272	¾	18.0642	25.967	½	45.5531	165.13	½	73.8274	433.74
5/16	4.1233	1.3530	13/16	18.2605	26.535	⅝	45.9458	167.99	⅝	74.2201	438.36
⅜	4.3197	1.4849	⅞	18.4569	27.100	¾	46.3385	170.87	¾	74.6128	443.01
7/16	4.5160	1.6230	15/16	18.6532	27.688	⅞	46.7312	173.78	⅞	75.0055	447.69
½	4.7124	1.7671	6	18.8496	28.274	15	47.1239	176.71	24	75.3982	452.39
9/16	4.9087	1.9175	⅛	19.2423	29.465	⅛	47.5166	179.67	⅛	75.7909	457.11
⅝	5.1051	2.0739	¼	19.6350	30.680	¼	47.9093	182.65	¼	76.1836	461.86
11/16	5.3014	2.2365	⅜	20.0277	31.919	⅜	48.3020	185.66	⅜	76.5763	466.64
¾	5.4978	2.4053	½	20.4204	33.183	½	48.6947	188.69	½	76.9690	471.44
13/16	5.6941	2.5802	⅝	20.8131	34.472	⅝	49.0874	191.75	⅝	77.3617	476.26
⅞	5.8905	2.7612	¾	21.2058	35.785	¾	49.4801	194.83	¾	77.7544	481.11
15/16	6.0868	2.9483	⅞	21.5984	37.122	⅞	49.8728	197.93	⅞	78.1471	485.98
2	6.2832	3.1416	7	21.9911	38.485	16	50.2655	201.06	25	78.5398	490.87
1/16	6.4795	3.3410	⅛	22.3838	39.871	⅛	50.6582	204.22	⅛	78.9325	495.79
⅛	6.6759	3.5466	¼	22.7765	41.282	¼	51.0509	207.39	¼	79.3252	500.74
3/16	6.8722	3.7583	⅜	23.1692	42.718	⅜	51.4436	210.60	⅜	79.7179	505.71
¼	7.0686	3.9761	½	23.5619	44.179	½	51.8363	213.82	½	80.1106	510.71
5/16	7.2649	4.2000	⅝	23.9546	45.664	⅝	52.2290	217.08	⅝	80.5033	515.72
⅜	7.4613	4.4301	¾	24.3473	47.173	¾	52.6217	220.35	¾	80.9060	520.77
7/16	7.6576	4.6664	⅞	24.7400	48.707	⅞	53.0144	223.65	⅞	81.2887	525.84
½	7.8540	4.9087	8	25.1327	50.265	17	53.4071	226.98	26	81.6814	530.93
9/16	8.0503	5.1572	⅛	25.5254	51.849	⅛	53.7998	230.33	⅛	82.0741	536.05
⅝	8.2467	5.4119	¼	25.9181	53.456	¼	54.1925	233.71	¼	82.4668	541.19
11/16	8.4430	5.6727	⅜	26.3108	55.088	⅜	54.5852	237.10	⅜	82.8595	546.35
¾	8.6394	5.9396	½	26.7035	56.745	½	54.9779	240.53	½	83.2522	551.55
13/16	8.8357	6.2126	⅝	27.0962	58.426	⅝	55.3706	243.98	⅝	83.6449	556.76
⅞	9.0321	6.4918	¾	27.4889	60.132	¾	55.7633	247.45	¾	84.0376	562.00
15/16	9.2284	6.7771	⅞	27.8816	61.862	⅞	56.1560	250.95	⅞	84.4303	567.27
3	9.4248	7.0686	9	28.2743	63.617	18	56.5487	254.47	27	84.8230	572.56
1/16	9.6211	7.3662	⅛	28.6670	65.397	⅛	56.9414	258.02	⅛	85.2157	577.87
⅛	9.8175	7.6699	¼	29.0597	67.201	¼	57.3341	261.59	¼	85.6084	583.21
3/16	10.0138	7.9798	⅜	29.4524	69.029	⅜	57.7268	265.18	⅜	86.0011	588.57
¼	10.2102	8.2958	½	29.8451	70.882	½	58.1195	268.80	½	86.3938	593.96
5/16	10.4065	8.6179	⅝	30.2378	72.760	⅝	58.5122	272.45	⅝	86.7865	599.37
⅜	10.6029	8.9462	¾	30.6305	74.662	¾	58.9049	276.12	¾	87.1792	604.81
7/16	10.7992	9.2806	⅞	31.0232	76.589	⅞	59.2976	279.81	⅞	87.5719	610.27
½	10.9956	9.6211	10	31.4159	78.540	19	59.6903	283.53	28	87.965	615.75
9/16	11.1919	9.9678	⅛	31.8086	80.516	⅛	60.0830	287.27	⅛	88.357	621.26
⅝	11.3883	10.321	¼	32.2013	82.516	¼	60.4757	291.04	¼	88.750	626.80
11/16	11.5846	10.680	⅜	32.5940	84.541	⅜	60.8684	294.83	⅜	89.143	632.36
¾	11.7810	11.045	½	32.9867	86.590	½	61.2611	298.65	½	89.535	637.94
13/16	11.9773	11.416	⅝	33.3794	88.664	⅝	61.6538	302.49	⅝	89.928	643.55
⅞	12.1737	11.793	¾	33.7721	90.763	¾	62.0465	306.35	¾	90.321	649.18
15/16	12.3700	12.177	⅞	34.1648	92.886	⅞	62.4392	310.24	⅞	90.713	654.84
4	12.5664	12.566	11	34.5575	95.033	20	62.8319	314.16	29	91.106	660.52
1/16	12.7627	12.962	⅛	34.9502	97.205	⅛	63.2246	318.10	⅛	91.499	666.23
⅛	12.9591	13.364	¼	35.3429	99.402	¼	63.6173	322.06	¼	91.892	671.96
3/16	13.1554	13.772	⅜	35.7356	101.62	⅜	64.0100	326.05	⅜	92.284	677.71
¼	13.3518	14.185	½	36.1283	103.87	½	64.4026	330.06	½	92.677	683.49
5/16	13.5481	14.607	⅝	36.5210	106.14	⅝	64.7953	334.10	⅝	93.070	689.30
⅜	13.7445	15.033	¾	36.9137	108.43	¾	65.1880	338.16	¾	93.462	695.13
7/16	13.9408	15.466	⅞	37.3064	110.75	⅞	65.5807	342.25	⅞	93.855	700.98
½	14.1372	15.904	12	37.6991	113.10	21	65.9734	346.36	30	94.248	706.86
9/16	14.3335	16.349	⅛	38.0918	115.47	⅛	66.3661	350.50	⅛	94.640	712.70
⅝	14.5299	16.800	¼	38.4845	117.86	¼	66.7588	354.66	¼	95.033	718.69
11/16	14.7262	17.257	⅜	38.8772	120.28	⅜	67.1515	358.84	⅜	95.426	724.64
¾	14.9226	17.721	½	39.2699	122.72	½	67.5442	363.05	½	95.819	730.62
13/16	15.1189	18.190	⅝	39.6626	125.19	⅝	67.9369	367.28	⅝	96.211	736.62
⅞	15.3153	18.665	¾	40.0553	127.68	¾	68.3296	371.54	¾	96.604	742.64
15/16	15.5116	19.147	⅞	40.4480	130.19	⅞	68.7223	375.83	⅞	96.997	748.69
5	15.7080	19.635	13	40.8407	132.73	22	69.1150	380.13	31	97.389	754.77
1/16	15.9043	20.129	⅛	41.2334	135.30	⅛	69.5077	384.46	⅛	97.782	760.87
⅛	16.1007	20.629	¼	41.6261	137.89	¼	69.9004	388.82	¼	98.175	766.99
3/16	16.2970	21.135	⅜	42.0188	140.50	⅜	70.2931	393.20	⅜	98.567	773.14
¼	16.4934	21.648	½	42.4115	143.14	½	70.6858	397.61	½	98.960	779.31
5/16	16.6897	22.166	⅝	42.8042	145.80	⅝	71.0785	402.04	⅝	99.353	785.51
⅜	16.8861	22.691	¾	43.1969	148.49	¾	71.4712	406.49	¾	99.746	791.73
7/16	17.0824	23.221	⅞	43.5896	151.20	⅞	71.8639	410.97	⅞	100.138	797.98

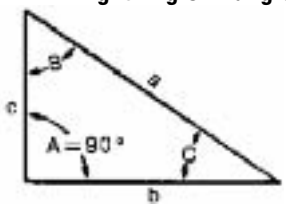
Trigonometric Functions



Trigonometric Formulas

(See pages that follow for functions)

Right Angle Triangle



Formulas for Finding Functions of Angles

$\frac{\text{Side Opposite}}{\text{Hypotenuse}}$ = Sine

$\frac{\text{Side Adjacent}}{\text{Hypotenuse}}$ = Cosine

$\frac{\text{Side Opposite}}{\text{Side Adjacent}}$ = Tangent

$\frac{\text{Side Adjacent}}{\text{Side Opposite}}$ = Cotangent

$\frac{\text{Hypotenuse}}{\text{Side Adjacent}}$ = Secant

$\frac{\text{Hypotenuse}}{\text{Side Opposite}}$ = Cosecant

Formulas for Finding Sides of Right Angle Triangles with an Angle and Side Known

To Find: Length of side opposite
- Hypotenuse x Sine
- Hypotenuse ÷ Cosecant
- Side Adjacent x Tangent
- Side Adjacent ÷ Cotangent

To Find: Length of side adjacent
- Hypotenuse x Cosine
- Hypotenuse ÷ Secant
- Side Opposite x Cotangent
- Side Opposite ÷ Tangent

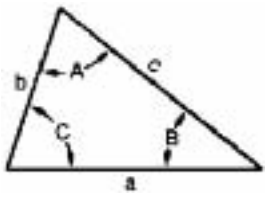
To Find: Length of hypotenuse
- Side Opposite x Cosecant
- Side Opposite ÷ Sine
- Side Adjacent x Secant
- Side Adjacent ÷ Cosine

To Find Angles and Sides of Right Angle Triangles

To Find Angles		To Find Sides		
To Find:	Formulas	To Find:	Formulas	
C	$\frac{c}{a}$ = Sine C	a	$\sqrt{b^2 + c^2}$	—
C	$\frac{b}{a}$ = Cosine C	a	c x Cosec. C	$\frac{c}{\text{Sine C}}$
C	$\frac{c}{b}$ = Tan. C	a	c x Secante B	$\frac{c}{\text{Cosine B}}$
C	$\frac{b}{c}$ = Cotan. C	a	b x Cosec. B	$\frac{b}{\text{Sine B}}$
C	$\frac{a}{b}$ = Secant C	a	b x Secante C	$\frac{b}{\text{Cosine C}}$
C	$\frac{a}{c}$ = Cosec. C	b	$\sqrt{a^2 - c^2}$	—
B	$\frac{b}{a}$ = Sine B	b	a x Sine B	$\frac{a}{\text{Cosecant B}}$
B	$\frac{c}{a}$ = Cosine B	b	a x Cos. C	$\frac{a}{\text{Secant C}}$
B	$\frac{b}{c}$ = Tan. B	b	c x Tan. B	$\frac{c}{\text{Cotan. B}}$
B	$\frac{c}{b}$ = Cotan. B	b	c x Cot. C	$\frac{c}{\text{Tangent C}}$
B	$\frac{a}{c}$ = Secant B	c	$\sqrt{a^2 - b^2}$	—
B	$\frac{a}{b}$ = Cosec. B	c	a x Cos. B	$\frac{a}{\text{Secant B}}$
		c	a x Sine C	$\frac{a}{\text{Cosecant C}}$
		c	b x Cot. B	$\frac{b}{\text{Tangent B}}$
		c	b x Tan. C	$\frac{b}{\text{Cotan. C}}$

To Find Angles and Sides of Oblique Angle Triangles

Oblique Angle Triangle



To Find	Known	Formulas	To Find	Known	Formulas
C	A, B	180° – (A +B)	A	B, C	180° – (B + C)
b	a, B, A	$\frac{a \times \text{Sin. B}}{\text{Sin. A}}$	Cos. A	a, b, c	$\frac{b^2 + c^2 - a^2}{2bc}$
c	a, A, C	$\frac{a \times \text{Sin. C}}{\text{Sin. A}}$	Sin. C	c, A, a	$\frac{c \times \text{Sin. A}}{a}$
Tan. A	a, C, b	$\frac{a \times \text{Sin. C}}{b - (a \times \text{Cos. C})}$	Cot. B	a, C, b	$\frac{a \times \text{Cosec. C}}{b}$ – Cot. C
B	A, C	180° – (A + C)	c	b, C, B	b x Sin. C x Cosec. B
Sin. B	b, A, a	$\frac{b \times \text{Sin. A}}{a}$	—	—	—

Trigonometric Functions

°	′	Sine	Tan.	Cotan.	Cosine	′	°	°	′	Sine	Tan.	Cotan.	Cosine	′	°
0	0	.000000	.000000	INFINITE	1.000000	0	90	11	0	.190809	.194380	5.1445540	.981627	0	79
	10	.002909	.002909	343.77371	.999996	50			10	.913664	.197401	5.0658352	.981068	50	
	20	.005818	.005818	171.88540	.999983	40			20	.196517	.200425	4.9894027	.980500	40	
	30	.008727	.008727	114.58865	.999962	30			30	.199368	.203452	4.9151570	.979925	30	
	40	.011635	.011636	85.939791	.999932	20			40	.202218	.206483	4.8430045	.979341	20	
	50	.014544	.014545	68.750087	.999894	10			50	.205065	.209518	4.7728568	.978748	10	
1	0	.017452	.017455	57.289962	.999848	0	89	12	0	.207912	.212557	4.7046301	.978148	0	78
	10	.020361	.020365	49.103881	.999793	50			10	.210756	.215599	4.6382457	.977539	50	
	20	.023269	.023275	42.964077	.999729	40			20	.213599	.218645	4.5736287	.976921	40	
	30	.026177	.026186	38.188459	.999657	30			30	.216440	.221695	4.5107085	.976296	30	
	40	.029085	.029097	34.367771	.999577	20			40	.219279	.224748	4.4494181	.975662	20	
	50	.031992	.032009	31.241577	.999488	10			50	.222116	.227806	4.3896940	.975020	10	
2	0	.034899	.034921	28.636253	.999391	0	88	13	0	.224951	.230868	4.3314759	.974370	0	77
	10	.037806	.037834	26.431600	.999285	50			10	.227784	.233934	4.2747066	.973712	50	
	20	.040713	.040747	24.541758	.999171	40			20	.230616	.237004	4.2193318	.973045	40	
	30	.043619	.043661	22.903766	.999048	30			30	.233445	.240079	4.1652998	.927370	30	
	40	.046525	.046576	21.470401	.998917	20			40	.236273	.243158	4.1125614	.971687	20	
	50	.049431	.049491	20.205553	.998778	10			50	.239098	.246241	4.0610700	.970995	10	
3	0	.052336	.052408	19.081137	.998630	0	87	14	0	.241922	.249328	4.0107809	.970296	0	76
	10	.055241	.055325	18.074977	.998473	50			10	.244743	.252420	3.9616518	.969588	50	
	20	.058145	.058243	17.169337	.998308	40			20	.247563	.255517	3.9136420	.968872	40	
	30	.061049	.061163	16.349855	.998135	30			30	.250380	.258618	3.8667131	.968148	30	
	40	.063952	.064083	15.604784	.997957	20			40	.253195	.261723	3.8208281	.967415	20	
	50	.066854	.067004	14.924417	.997763	10			50	.256008	.264834	3.7759519	.966675	10	
4	0	.069756	.069927	14.300666	.997564	0	86	15	0	.258819	.267949	3.7320508	.965926	0	75
	10	.072658	.072851	13.726738	.997357	50			10	.261628	.271069	3.6890927	.965169	50	
	20	.075559	.075776	13.196888	.997141	40			20	.264434	.274195	3.6470467	.964404	40	
	30	.078459	.078702	12.706205	.996917	30			30	.267238	.277325	3.6058835	.963630	30	
	40	.081359	.081629	12.250505	.996685	20			40	.270040	.280460	3.5655749	.962849	20	
	50	.084258	.084558	11.826167	.996444	10			50	.272840	.283600	3.5260938	.962059	10	
5	0	.087156	.087489	11.430052	.996195	0	85	16	0	.275637	.286745	3.4874144	.961262	0	74
	10	.090053	.090421	11.059431	.995937	50			10	.278432	.289896	3.4495120	.960456	50	
	20	.092950	.093354	10.711913	.995671	40			20	.281225	.293052	3.4123626	.959642	40	
	30	.095846	.096289	10.385397	.995396	30			30	.284015	.296214	3.3759434	.958820	30	
	40	.098741	.099226	10.078031	.995113	20			40	.286803	.299380	3.3402326	.957990	20	
	50	.101635	.102164	9.7881732	.994822	10			50	.289589	.302553	3.3052091	.957151	10	
6	0	.104528	.105104	9.5143645	.994522	0	84	17	0	.292372	.305731	3.2708526	.956305	0	73
	10	.107421	.108046	9.2553035	.994214	50			10	.295152	.308914	3.2371438	.955450	50	
	20	.110313	.110990	9.0098261	.993897	40			20	.297930	.312104	3.2040638	.954588	40	
	30	.113203	.113936	8.7768874	.993572	30			30	.300706	.315299	3.1715948	.953717	30	
	40	.116093	.116883	8.5555468	.993238	20			40	.303479	.318500	3.1397194	.952838	20	
	50	.118982	.119833	8.3449558	.922896	10			50	.306249	.321707	3.1084210	.951951	10	
7	0	.121869	.122785	8.1443464	.992546	0	83	18	0	.309017	.324920	3.0776835	.951057	0	72
	10	.124756	.125738	7.9530224	.992187	50			10	.311782	.328139	3.0474915	.950154	50	
	20	.127642	.128694	7.7703506	.991820	40			20	.314545	.331364	3.0178301	.949243	40	
	30	.130526	.131653	7.5957541	.991445	30			30	.317305	.334595	2.9886850	.948324	30	
	40	.133410	.134613	7.4287064	.991061	20			40	.320062	.337833	2.9600422	.947397	20	
	50	.136292	.137576	7.2687255	.990669	10			50	.322816	.341077	2.9318885	.946462	10	
8	0	.139173	.140541	7.1153697	.990268	0	82	19	0	.325568	.344328	2.9042109	.945519	0	71
	10	.142053	.143508	6.9682335	.989859	50			10	.328317	.347585	2.8769970	.944568	50	
	20	.144932	.146478	6.8269437	.989442	40			20	.331063	.350848	2.8502349	.943609	40	
	30	.147809	.149451	6.6911562	.959016	30			30	.333807	.354119	2.8239129	.942641	30	
	40	.150686	.152426	6.5605538	.988582	20			40	.336547	.357396	2.7980198	.941666	20	
	50	.153561	.155404	6.4348428	.988139	10			50	.339285	.360680	2.7725448	.940684	10	
9	0	.156434	.158384	6.3137515	.987688	0	81	20	0	.342020	.363970	2.7474774	.939693	0	70
	10	.159307	.161368	6.1970279	.987229	50			10	.344752	.367268	2.7228076	.938694	50	
	20	.162178	.164354	6.0844381	.986762	40			20	.347481	.370573	2.6985254	.937687	40	
	30	.165048	.167343	5.9757644	.986286	30			30	.350207	.373885	2.6746215	.936672	30	
	40	.167916	.170334	5.8708042	.985801	20			40	.352931	.377204	2.6510867	.935650	20	
	50	.170783	.173329	5.7693688	.985309	10			50	.355651	.380530	2.6279121	.934619	10	
10	0	.173648	.176327	5.6712818	.984808	0	80	21	0	.358368	.383864	2.6050891	.933580	0	69
	10	.176512	.179328	5.5763786	.984298	50			10	.361082	.387205	2.5826094	.932534	50	
	20	.179375	.182332	5.4845052	.983781	40			20	.363793	.390554	2.5604649	.931480	40	
	30	.182236	.185339	5.3955172	.983255	30			30	.366501	.393911	2.5386479	.930418	30	
	40	.185095	.188359	5.3092793	.982721	20			40	.369206	.397275	2.5171507	.929348	20	
	50	.187953	.191363	5.2256647	.982178	10	79		50	.371908	.400647	2.4959661	.928270	10	68
°	′	Cosine	Cotan.	Tan.	Sine	′	°	°	′	Cosine	Cotan.	Tan.	Sine	′	°

NOTE: For functions from 45°-0′ to 68° read from bottom of table upward.

Trigonometric Tables

Trigonometric Functions

°	′	Sine	Tan.	Cotan.	Cosine	′	°	°	′	Sine	Tan.	Cotan.	Cosine	′	°
22	0	.374607	.404026	2.4750869	.927184	0	68	34	0	.559193	.674509	1.4825610	.829038	0	56
	10	.377302	.407414	2.4545061	.926090	50			10	.561602	.678749	1.4732983	.827407	50	
	20	.379994	.410810	2.4342172	.924980	40			20	.564007	.683007	1.4641147	.825770	40	
	30	.382683	.414214	2.4142136	.923880	30			30	.566406	.687281	1.4550090	.824126	30	
	40	.385369	.417626	2.3944889	.922762	20			40	.568801	.691573	1.4459801	.822475	20	
	50	.388052	.421046	2.3750372	.921638	10			50	.571191	.695881	1.4370268	.820817	10	
23	0	.390731	.424475	2.3558524	.920505	0	67	35	0	.573576	.700208	1.4281480	.819152	0	55
	10	.393407	.427912	2.3369287	.919364	50			10	.575957	.704552	1.4193427	.817480	50	
	20	.396080	.431358	2.3182606	.918216	40			20	.578332	.708913	1.4106098	.815801	40	
	30	.398749	.434812	2.2998425	.917060	30			30	.580703	.713293	1.4019483	.814116	30	
	40	.401415	.438276	2.2816693	.915896	20			40	.583069	.717691	1.3933571	.812423	20	
	50	.404078	.441748	2.2637357	.914725	10			50	.585429	.722108	1.3848355	.810723	10	
24	0	.406737	.445229	2.2460368	.913545	0	66	36	0	.587785	.726543	1.3763810	.809017	0	54
	10	.409392	.448719	2.2285676	.912358	50			10	.590136	.730996	1.3679959	.807304	50	
	20	.412045	.452218	2.2113234	.911164	40			20	.592482	.735469	1.3596764	.805584	40	
	30	.414693	.455726	2.1942997	.909961	30			30	.594823	.739961	1.3514224	.803857	30	
	40	.417338	.459244	2.1774920	.908751	20			40	.597159	.744472	1.3432331	.802123	20	
	50	.419980	.462771	2.1608958	.907533	10			50	.599489	.749003	1.3351075	.800383	10	
25	0	.422618	.466308	2.1445069	.906308	0	65	37	0	.601815	.753554	1.3270448	.798636	0	53
	10	.425253	.469854	2.1283213	.905075	50			10	.604136	.758125	1.3190441	.796882	50	
	20	.427884	.473410	2.1123348	.903834	40			20	.606451	.762716	1.3111046	.795121	40	
	30	.430511	.476976	2.0965436	.902585	30			30	.608761	.767327	1.3032254	.793353	30	
	40	.433125	.480551	2.0809438	.901329	20			40	.611067	.771959	1.2954057	.791579	20	
	50	.435755	.484137	2.0655318	.900065	10			50	.613367	.776612	1.2876447	.789798	10	
26	0	.438371	.487733	2.0503038	.898794	0	64	38	0	.615661	.781286	1.2799416	.788011	0	52
	10	.440984	.491339	2.0352565	.897515	50			10	.617951	.785981	1.2722957	.786217	50	
	20	.443593	.494955	2.0203862	.896229	40			20	.620235	.790698	1.2647062	.784416	40	
	30	.446197	.498582	2.0056897	.894934	30			30	.622515	.795436	1.2571723	.782608	30	
	40	.448799	.502219	1.9911637	.893633	20			40	.624789	.800196	1.2496933	.780794	20	
	50	.451397	.505867	1.9768050	.892323	10			50	.627057	.804980	1.2422685	.778973	10	
27	0	.453990	.509525	1.9626105	.891007	0	63	39	0	.692320	.809784	1.2348972	.777146	0	51
	10	.456580	.513195	1.9485772	.889682	50			10	.631578	.814612	1.2275786	.775312	50	
	20	.459166	.516876	1.9347020	.888350	40			20	.633831	.819463	1.2203121	.773472	40	
	30	.461749	.520567	1.9209821	.887011	30			30	.636078	.824336	1.2130970	.771625	30	
	40	.464327	.524270	1.9074147	.885664	20			40	.638320	.829234	1.2059327	.769771	20	
	50	.466901	.527984	1.8939971	.884309	10			50	.640557	.834155	1.1988184	.767911	10	
28	0	.469472	.531709	1.8807265	.882948	0	62	40	0	.642788	.839100	1.1917536	.766044	0	50
	10	.472038	.535547	1.8676003	.881578	50			10	.645013	.844069	1.1847376	.764171	50	
	20	.474600	.539195	1.8546159	.880201	40			20	.647233	.849062	1.1777698	.762292	40	
	30	.477149	.542956	1.8417709	.878817	30			30	.649448	.854081	1.1708496	.760406	30	
	40	.479713	.546728	1.8290628	.877425	20			40	.651657	.859124	1.1639763	.758514	20	
	50	.482263	.550515	1.8164892	.876026	10			50	.653861	.864193	1.1571495	.756615	10	
29	0	.484810	.554309	1.8040478	.874620	0	61	41	0	.656059	.869287	1.1503684	.754710	0	49
	10	.487352	.558118	1.7917362	.873206	50			10	.658252	.874407	1.1436326	.752798	50	
	20	.489890	.561939	1.7795524	.871784	40			20	.660439	.879553	1.1369414	.750880	40	
	30	.492424	.565773	1.7674940	.870356	30			30	.662620	.884725	1.1302944	.748956	30	
	40	.494953	.569619	1.7555590	.868920	20			40	.664796	.889924	1.1236909	.747025	20	
	50	.497479	.573478	1.7437453	.867476	10			50	.666966	.895151	1.1171305	.745088	10	
30	0	.500000	.577350	1.7320508	.866025	0	60	42	0	.669131	.900404	1.1106125	.743145	0	48
	10	.502517	.581235	1.7204736	.864567	50			10	.671289	.905685	1.1041365	.741195	50	
	20	.505030	.585134	1.7090116	.863102	40			20	.673443	.910994	1.0977020	.739239	40	
	30	.507538	.589045	1.6976631	.861629	30			30	.675590	.916331	1.0913085	.737277	30	
	40	.510043	.592970	1.6864261	.860149	20			40	.677732	.921697	1.0849554	.735309	20	
	50	.512543	.596908	1.6752988	.858662	10			50	.679868	.927021	1.0786423	.733335	10	
31	0	.515038	.600861	1.6642795	.857167	0	59	43	0	.681998	.932515	1.0723687	.731354	0	47
	10	.517529	.604827	1.6533663	.855665	50			10	.684123	.937968	1.0661341	.729367	50	
	20	.520016	.608807	1.6425576	.854156	40			20	.686242	.943451	1.0599381	.727374	40	
	30	.522499	.612801	1.6318517	.852640	30			30	.688355	.948965	1.0537801	.725374	30	
	40	.524977	.616809	1.6212469	.851117	20			40	.690462	.954508	1.0476598	.723369	20	
	50	.527450	.620832	1.6107417	.849586	10			50	.692563	.960083	1.0415767	.721357	10	
32	0	.529919	.624869	1.6003345	.848048	0	58	44	0	.694658	.965689	1.0355303	.719340	0	46
	10	.532384	.628921	1.5900238	.846503	50			10	.696748	.971326	1.0295203	.717316	50	
	20	.534844	.632988	1.5798079	.844951	40			20	.698832	.976996	1.0235461	.715286	40	
	30	.537300	.637079	1.5696856	.843391	30			30	.700909	.982697	1.0176074	.713251	30	
	40	.539751	.641167	1.5596552	.841825	20			40	.702981	.988432	1.0117088	.711209	20	
	50	.542197	.645280	1.4597155	.840251	10			50	.705047	.994199	1.0058348	.709161	10	
33	0	.544639	.649408	1.5398650	.838671	0	57	45	0	.707107	1.000000	1.0000000	.707107	0	45
	10	.547076	.653551	1.5301025	.837083	50			—	—	—	—	—	—	
	20	.549509	.657710	1.5204261	.835488	40			—	—	—	—	—	—	
	30	.551937	.661886	1.5108352	.833886	30			—	—	—	—	—	—	
	40	.554360	.666077	1.5013282	.832277	20			—	—	—	—	—	—	
	50	.556769	.670285	1.4919039	.830661	10	56	—	—	—	—	—	—		
°	′	Cosine	Cotan.	Tan.	Sine	′	°	°	′	Cosine	Cotan.	Tan.	Sine	′	°

NOTE: For functions from 45°-0′ to 68° read from bottom of table upward.

Conversion Tables

Given	Multiply By	To Find
ABAMPERE	10	AMPERE
ACRES	0.4046856	HECTARE
ACRES	43560	SQUARE FEET
ACRES	4046.8564	SQUARE METERS
ACRES	1.562×10^{-3}	SQUARE MILES
ARE	1076.391	SQUARE FEET
ATMOSPHERES	76	CMS. OF MERCURY
ATMOSPHERES	33.89854	FEET OF WATER
ATMOSPHERES	29.92	INCHES OF MERCURY
ATMOSPHERES	14.69595	POUNDS/SQUARE INCH
BAGS – CEMENT	94	POUNDS – CEMENT
BARRELS – OIL	5.614583	CUBIC FOOT
BARRELS – OIL	158.9873	LITER
BARRELS – OIL	42	GALLONS – OIL
BARRELS (US DRY)	3.281219	BUSHELS (US)
BARRELS (US DRY)	4.083333	CUBIC FEET
BARRELS (US DRY)	115.6271	LITER
BARRELS (US LIQ.)	4.2109375	CUBIC FEET
BARRELS (US LIQ.)	0.1192405	CUBIC METERS
BARRELS (US LIQ.)	26.22925	GALLONS (BRIT.)
BARRELS (US LIQ.)	31.5	GALLONS (US)
BARRELS – CEMENT	376	POUNDS – CEMENT
BTU	251.996	CALORIE
BTU	778.169	FOOT – POUNDS – FORCE
BTU	3.9302×10^{-4}	HORSEPOWER – HOURS
BTU	0.252	KILOGRAM – CALORIES
BTU	107.586	KILOGRAM – METERS
BTU	2.9307×10^{-4}	KILOWATT – HOURS
BTU	1055.056	JOULE
BTU/MIN.	12.96	FOOT – POUNDS/SEC.
BTU/MIN.	0.0235809	HORSEPOWER
BTU/MIN.	0.0175843	KILOWATTS
BTU/MIN.	17.5796	WATTS
BUSHELS (BRIT.)	1.032057	BUSHELS (US)
BUSHELS (BRIT.)	8	GALLONS (BRIT.)
BUSHELS (US)	0.3047647	BARRELS (US DRY)
BUSHELS (US)	1.244456	CUBIC FEET
BUSHELS (US)	9.309177	GALLONS (US LIQ.)
CALORIE	4.1868	JOULE
CALORIE	3.96832×10^{-3}	BTU
CALORIE	3.08803	FOOT – POUND – FORCE
CENTARES (CENTIARES)	1	SQUARE METERS
CENTIMETERS	0.3937008	INCHES
CENTIMETERS	.3937008	INCH
CENTIMETERS	0.01	METERS
CENTIMETERS	10	MILLIMETERS
CENTIMTRS. OF MERCURY	0.01316	ATMOSPHERES
CENTIMTRS. OF MERCURY	0.4461	FEET OF WATER
CENTIMTRS. OF MERCURY	136	KGS./SQUARE METER
CENTIMTRS. OF MERCURY	27.85	POUNDS/SQUARE FT.
CENTIMTRS. OF MERCURY	0.1934	POUNDS/SQUARE INCH
CENTIPOISE	0.001	PASCAL – SECOND
CHAIN (RAMSDEN'S)	100	FEET
CHAIN (GUNTER'S)	66	FEET
CORD	128	CUBIC FEET
CORD	3.624	STERE
COULOMB	1	AMPERE – SECOND
CUBIC CENTIMETER	0.06102	CUBIC INCHES
CUBIC CENTIMETER	0.001	LITER
CUBIC CENTIMETER	1	MILLILETER
CUBIC DECIMETER	0.0353	CUBIC FEET
CUBIC FEET	12	BOARD FEET
CUBIC FEET	0.803564	BUSHELS (US)
CUBIC FEET	1728	CUBIC INCHES
CUBIC FEET	0.0283168	CUBIC METERS
CUBIC FEET	28.317	CUBIC DECIMETERS
CUBIC FEET	0.037037	CUBIC YARD
CUBIC FEET	6.228835	GALLONS (BRIT.)
CUBIC FEET	7.480519	GALLONS (US)
CUBIC FEET	28.316847	LITERS
CUBIC FEET	25.71405	QUARTS (US DRY)
CUBIC FEET/HOUR	7.865791	CUBIC CM./SEC.
CUBIC FEET/HOUR	0.4719474	LITER/MIN.
CUBIC FEET/MIN.	0.1246753	GALLONS (US)/SEC.
CUBIC FEET/POUND	0.0624279	CUBIC METER/KILOGRAM
CUBIC METER	8.64849	BARREL (US DRY)

Given	Multiply By	To Find
CUBIC METER	8.386414	BARREL (US LIQ.)
CUBIC METER	35.31467	CUBIC FEET
CUBIC METER	1.307951	CUBIC YARDS
CUBIC METER	264.1721	GALLONS (US)
CUBIC METER	1000	LITER
CUBIC YARDS	27	CUBIC FEET
CUBIC YARDS	0.7645548	CUBIC METER
CUBIC YARDS	201.974	GALLONS (US)
CUBIC YARDS/MIN.	0.45	CUBIC FEET/SEC.
CUBIC YARDS/MIN.	3.366234	GALLONS (US)/SEC.
CUBIT	18	INCH
CUP	236.588	MILLILITER
CUP (METRIC)	200	MILLILITER
DEGREE	0.017453	RADIAN
DEGREE/SEC.	0.166667	REVOLUTION/MIN.
DENIER	0.11111(⅑)	TEX
DRACHM (BRIT. FLUID)	0.9607599	DRAM (U.S. FLUID)
DRAM (APOTH)	60	GRAINS
DRAM (AVOIR)	27.34375	GRAINS
DRAM (U.S. FLUID)	0.2255859	CUBIC INCHES
ELL	45	INCH
ERG	1×10^{-7}	JOULE
FATHOM	6	FEET
FEET OF WATER	0.0295	ATMOSPHERES
FEET OF WATER	0.8826	INCHES OF MERCURY
FEET OF WATER	304.8	KGS./SQUARE METER
FEET OF WATER	62.43	POUNDS/SQUARE FT.
FEET OF WATER	0.4335	POUNDS/SQUARE INCH
FEET/MIN.	0.508	CENTIMETERS/SEC.
FEET/MIN.	0.01667	FEET/SEC.
FEET/MIN.	0.01829	KILOMETERS/HOUR
FEET/MIN.	0.3048	METERS/MIN
FEET/MIN.	0.01136	MILES/HOUR
FEET/SEC.	30.48	CENTIMETERS/SEC.
FEET/SEC.	1.097	KILOMETERS/HOUR
FEET/SEC.	0.5921	KNOTS
FEET/SEC.	18.29	METERS/MIN.
FEET/SEC.	0.6818	MILES/HOUR
FEET/SEC.	0.01136	MILES/MIN.
FERKIN (US)	9	GALLONS (US) DRY
FOOT	30.48	CENTIMETER
FOOT	12	INCH
FOOT/MINUTE	0.3048	METER
FOOT/MINUTE	0.018288	KILOMETER/HOUR
FOOT/SECOND	0.01136364	MILE/HOUR
FOOT/SECOND	0.3048	METER/SECOND
FOOT – POUNDS – FORCE	0.6818182	MILE/HOUR
FOOT – POUNDS – FORCE	5.050×10^{-7}	HORSEPOWER – HOURS
FOOT – POUNDS – FORCE	1.35582	JOULES
FOOT – POUNDS – FORCE	3.241×10^{-4}	KILOGRAM – CALORIES
FOOT – POUNDS – FORCE	0.1383	KILOGRAM – METERS
FOOT – POUNDS – FORCE	$.766 \times 10^{-5}$	KILOWATT – HOURS
FOOT – POUNDS – FORCE	1.286×10^{-3}	BTU
FOOT – POUNDS/MIN.	1.286×10^{-3}	BTU/MIN.
FOOT – POUNDS/MIN.	0.01667	FOOT – POUNDS/SEC.
FOOT – POUNDS/MIN.	3.030×10^{-4}	HORSEPOWER
FOOT – POUNDS/MIN.	3.241×10^{-4}	KG. – CALORIES/MIN.
FOOT – POUNDS/MIN.	2.260×10^{-5}	KILOWATTS
FOOT – POUNDS/SEC.	7.717×10^{-2}	BTU/MIN.
FOOT – POUNDS/SEC.	1.818×10^{-3}	HORSEPOWER
FOOT – POUNDS/SEC.	1.945×10^{-2}	KG. – CALORIES/MIN.
FOOT – POUNDS/SEC.	1.355818	WATTS
FURLONG	660	FEET
FURLONG	10	CHAIN
GALLON (BRIT.)	9.632619	CUBIC FT./HOUR
GALLON (BRIT.)	0.2727654	CUBIC METER/HOUR
GALLONS (US)/MIN.	8.020834	CUBIC FEET/HOUR
GALLONS (US)/MIN.	0.2271247	CUBIC METER/HOUR
GALLON (DRY)	268.8025	CUBIC INCH
GALLONS (LIQ.)	3785.412	CUBIC CENTIMETERS
GALLONS (LIQ.)	0.1336805	CUBIC FEET
GALLONS (LIQ.)	231	CUBIC INCHES
GALLONS (LIQ.)	3.785×10^{-3}	CUBIC METERS
GALLONS (LIQ.)	4.951×10^{-3}	CUBIC YARDS
GALLONS (LIQ.)	0.8326742	GALLONS (BRIT.)
GALLONS (LIQ.)	3.785412	LITERS

Conversion Tables

Given	Multiply By	To Find
GALLONS (LIQ.)	8	PINTS (LIQ.)
GALLONS (LIQ.)	4	QUARTS (LIQ.)
GALLONS WATER	8.3453	POUNDS OF WATER
GALLONS WATER/MIN.	6.0086	TONS WATER/24 HOURS
GALLONS – IMPERIAL	1.20095	U.S. GALLONS
GALLONS – U.S.	0.83267	IMPERIAL GALLONS
GALLONS (US)/MIN.	2.228×10^{-3}	CUBIC FEET/SEC.
GALLONS (US)/MIN.	8.020834	CUBIC FEET/HOUR
GALLONS (US)/MIN.	0.06308	Litros/SEC.
GILL	7.21875	CUBIC INCH
GILL	4	OUNCE (U.S.)
GILL (BRIT.)	1.20095	GILL (U.S.)
GRAINS (TROY)	0.0648	GRAMS
GRAINS/U.S. GAL.	17.118	PARTS/MILLION
GRAINS/U.S. GAL.	142.86	POUNDS/MILLION GAL.
GRAINS/U.S. GAL.	14.254	PARTS/MILLION
GRAMS	980.7	DYNES
GRAMS	15.432358	GRAINS
GRAMS	10^{-3}	KILOGRAMS
GRAMS	10^{3}	MILLIGRAMS
GRAMS	0.0352739	OUNCES
GRAMS	0.03215	OUNCES (TROY)
GRAMS	2.205×10^{-3}	POUNDS
GRAMS	0.7716179	SCRUPLE
GRAMS (TROY)	2.0833×10^{-3}	OUNCES (TROY)
GRAMS/CM.	5.600×10^{-3}	POUNDS/INCH
GRAMS/CU. CM.	62.43	POUNDS/CUBIC FOOT
GRAMS/CU. CM.	0.03613	POUNDS/CUBIC INCH
GRAMS/LITER	58.417	GRAINS/GAL.
GRAMS/LITER	8.345	POUNDS/1000 GALS.
GRAMS/LITER	0.062427	POUNDS/CUBIC FOOT
GRAMS/LITER	1000	PARTS/MILLION
GROSS	12	DOZEN
HAND	4	INCH
HECTARE	2.471054	ACRE
HECTARE	107639.1	SQUARE FT.
HOGSHEAD	63	GALLONS
HORSEPOWER	42.4072	BTU/MIN.
HORSEPOWER	33000	FOOT – POUNDS/MIN.
HORSEPOWER	550	FOOT – POUNDS/SEC.
HORSEPOWER	1.014	HORSEPOWER (METRIC)
HORSEPOWER	10.7	KG. – CALORIES/MIN.
HORSEPOWER	0.7457	KILOWATTS
HORSEPOWER	745.7	WATTS
HORSEPOWER (BOILER)	33479	BTU/HOUR
HORSEPOWER (BOILER)	9.8095	KILOWATT
HORSEPOWER – HOURS	2547	BTU
HORSEPOWER – HOURS	1.98×10^{6}	FOOT – POUNDS
HORSEPOWER – HOURS	641.7	KILOGRAM – CALORIES
HORSEPOWER – HOURS	2.737×10^{5}	KILOGRAM – METERS
HORSEPOWER – HOURS	0.7457	KILOWATT – HOURS
INCH	1000	MILS
INCH	25.4	MILLIMETERS
INCHES OF MERCURY	0.03342	ATMOSPHERES
INCHES OF MERCURY	1.133	FEET OF WATER
INCHES OF MERCURY	345.3	KGS./SQUARE METER
INCHES OF MERCURY	70.73	LBS./SQUARE FT.
INCHES OF MERCURY	0.4912	LBS./SQUARE INCH
INCHES OF WATER	0.002458	ATMOSPHERES
INCHES OF WATER	0.07355	INCHES OF MERCURY
INCHES OF WATER	25.4	KGS./SQUARE METER
INCHES OF WATER	0.5781	OUNCES/SQUARE INCH
INCHES OF WATER	5.202	POUNDS/SQUARE FOOT
INCHES OF WATER	0.03613	POUNDS/SQUARE INCH
JOULE	0.000948	BTU
JOULE	0.238846	CALORIE
KILOGRAMS	980665	DYNES
KILOGRAMS	2.2046226	POUNDS
KILOGRAMS	1.102×10^{-3}	TONS (SHORT)
KILOGRAMS	10^{3}	GRAMS
KILOGRAMS – CALORIES	3.968	BTU
KILOGRAMS – CALORIES	3086	FOOT – POUNDS
KILOGRAMS – CALORIES	1.558×10^{-3}	HORSEPOWER – HOURS
KILOGRAMS – CALORIES	1.162×10^{-3}	KILOWATT – HOURS
KILOMETERS	10^{5}	CENTIMETERS
KILOMETERS	3280.84	FEET

Given	Multiply By	To Find
KILOMETERS	10^{3}	METERS
KILOMETERS	0.6213712	MILES
KILOMETROS	1094	YARDS
KILOMETERS/HOUR	27.78	CENTIMETERS/SEC.
KILOMETERS/HOUR	54.68	FEET/MIN.
KILOMETERS/HOUR	0.9113	FEET/SEC.
KILOMETERS/HOUR	0.5396	KNOTS
KILOMETERS/HOUR	16.67	METERS/MIN.
KILOMETROS/HOUR	0.6214	MILES/HOUR
KILOWATT – HOURS	3415	BTU
KILOWATT – HOURS	2.655×106	FOOT – POUNDS
KILOWATT – HOURS	1.341	HORSEPOWER – HOURS
KILOWATT – HOURS	3.6×10^{6}	JOULE
KILOWATT – HOURS	860.5	KILOGRAM – CALORIES
KILOWATT – HOURS	3.671×10^{5}	KILOGRAM – METERS
KILOWATTS	56.869	BTU/MIN.
KILOWATTS	44253.7	FOOT – POUNDS/MIN.
KILOWATTS	737.6	FOOT – POUNDS/SEC.
KILOWATTS	1.34102	HORSEPOWER
KILOWATTS	14.3308	KG. – CALORIES/MIN.
KILOWATTS	10^{-3}	WATTS
KNOTS	1.150779	MILES (STATUTE)/HOUR
LEAGUE (STATUTE)	3	MILES (STATUTE)
LIGHT YEAR	5.8785×10^{12}	MILES
LINK	0.01	CHAIN
LINK	7.92	INCHES
LITERS	10^{3}	CUBIC CENTIMETERS
LITERS	0.03531	CUBIC FEET
LITERS	61.02	CUBIC INCHES
LITERS	10^{-3}	CUBIC METERS
LITERS	1.308×10^{-3}	CUBIC YARDS
LITERS	0.2642	GALLONS
LITERS	2.113	PINTS (LIQ.)
LITERS	0.908	QUARTS (DRY)
LITERS	1.0567	QUARTS (LIQ.)
LITERS/MIN.	5.886×10^{-4}	CUBIC FT./SEC.
LITERS/MIN.	13.19815	GALLON (BRIT.)/HOUR
LITERS/MIN.	4.403×10^{-3}	GALLONS/SEC.
LITERS/SEC.	2.11888	CUBIC FT./MIN.
METERS	100	CENTIMETERS
METERS	3.2808399	FEET
METERS	39.37	INCHES
METERS	10^{-3}	KILOMETROS
METERS	10^{3}	MILLIMETERS
METERS	1.093613	YARDS
METERS/MIN.	1.667	CENTIMETERS/SEC.
METERS/MIN.	3.281	FEET/MIN.
METERS/MIN.	0.05468	FEET/SEC.
METERS/MIN.	0.06	KILOMETROS/HOUR
METERS/MIN.	0.03728	MILES/HOUR
METERS/SEC.	196.8	FEET/MIN.
METERS/SEC.	3.281	FEET/SEC.
METERS/SEC.	3.6	KILOMETER/HOUR
METERS/SEC.	0.06	KILOMETROS/MIN.
METERS/SEC.	2.236936	MILES/HOUR
METERS/SEC.	0.03728	MILES/MIN.
MIL	0.001	INCH
MIL	0.0254	MILLIMETER
MILES	320	ROD
MILES	1.609×10^{5}	CENTIMETERS
MILES	5280	FEET
MILES	1.609	KILOMETROS
MILES	1760	YARDS
MILES/HOUR	44.7	CENTIMETERS/SEC.
MILES/HOUR	88	FEET/MIN.
MILES/HOUR	1.467	FEET/SEC.
MILES/HOUR	1.609	KILOMETROS/HOUR
MILES/HOUR	0.8684	KNOTS
MILES/HOUR	26.82	Metros/MIN.
MILES/HOUR	1.609344	KILOMETROS/HOUR
MILES/HOUR	0.8689762	KNOTS
MILES/MIN.	2682	CENTIMETERS/SEC.
MILES/MIN.	88	FEET/SEC.
MILES/MIN.	1.609	KILOMETROS/MIN.
MILES/MIN.	60	MILES/HOUR
MILLIGRAMS	10^{-3}	GRAMS

Conversion Tables

Given	Multiply By	To Find
MILLIGRAMS/LITER	1	PARTS/MILLION
MILLILITERS	0.0610237	CUBIC INCH
MILLILITERS	0.0338142	FLUID OUNCES
MILLILITERS	10^{-3}	LITERS
MILLIMETERS	0.1	CENTIMETERS
MILLIMETERS	0.03937	INCHES
MILLION GALS./DAY	1.54723	CUBIC FT./SEC.
MINER'S INCHES	1.5	CUBIC FT./MIN.
MINUTES (ANGLE)	2.909×10^{-4}	RADIANS
NEWTON – METER	0.737562	FOOT – POUNDS – FORCE
OUNCES	16	DRAMS
OUNCES	437.5	GRAINS
OUNCES	0.0625	POUNDS
OUNCES	28.349527	GRAMS
OUNCES	0.9115	OUNCES (TROY)
OUNCES	2.790×10^{-5}	TONS (LONG)
OUNCES	2.835×10^{-5}	TONS (METRIC)
OUNCES (FLUID)	1.805	CUBIC INCHES
OUNCES (FLUID)	0.02957	LITERS
OUNCES (FLUID)	30	MILLILITERS
OUNCES (FLUID)	1.040843	OUNCES (BRIT. FLUID)
OUNCES (TROY)	480	GRAINS
OUNCES (TROY)	20	PENNYWEIGHTS (TROY)
OUNCES (TROY)	0.08333	POUNDS (TROY)
OUNCES (TROY)	31.103481	GRAMS
OUNCES (TROY)	1.09714	OUNCES (AVOIR.)
OUNCES/SQUARE INCH	0.0625	POUNDS/SQUARE INCH
PACE	2.5	FEET
PALM	3	INCH
PARTS/MILLION	0.0584	GRAINS/U.S. GAL.
PARTS/MILLION	0.07016	GRAINS/IMP. GAL.
PARTS/MILLION	8.345	POUNDS/MILLION GAL.
PASCAL	0.0208854	POUNDS – FORCE/SQ. FT.
PECK (BRIT.)	2	GALLON (BRIT)
PECKS (US)	8	QUARTS (US DRY)
PENNYWEIGHTS (TROY)	24	GRAINS
PENNYWEIGHTS (TROY)	1.55517	GRAMS
PENNYWEIGHTS (TROY)	0.05	OUNCES (TROY)
PENNYWEIGHTS (TROY)	4.1667×10^{-3}	POUNDS (TROY)
PERCH (MASONRY)	24.75	CUBIC FEET
POINT (U.S.-PRINT)	0.013837	INCH
POLE (BRIT.)	16.5	FEET
POTTLE (BRIT.)	.5	GALLONS
POUNDS	16	OUNCES
POUNDS	256	DRAMS
POUNDS	7000	GRAINS
POUNDS	0.0005	TONS (SHORT)
POUNDS	453.5924	GRAMS
POUNDS	1.21528	POUNDS (TROY)
POUNDS	14.5833	OUNCES (TROY)
POUNDS OF WATER	0.01602	CUBIC FEET
POUNDS OF WATER	27.68	CUBIC INCHES
POUNDS OF WATER	0.1198	GALLONS
POUNDS OF WATER/MIN.	2.670×10^{-4}	CUBIC FT./SEC.
POUNDS (TROY)	5760	GRAINS
POUNDS (TROY)	140	PENNYWEIGHTS (TROY)
POUNDS (TROY)	12	OUNCES (TROY)
POUNDS (TROY)	373.24177	GRAMS
POUNDS (TROY)	0.822857	POUNDS (AVOIR.)
POUNDS (TROY)	13.1657	OUNCES (AVOIR.)
POUNDS (TROY)	3.6735×10^{-4}	TONS (LONG)
POUNDS (TROY)	4.1143×10^{-4}	TONS (SHORT)
POUNDS (TROY)	4.1667×10^{-3}	TONS (METRIC)
POUNDS/CUBIC FOOT	0.01602	GRAMS/CUBIC CM.
POUNDS/CUBIC FOOT	16.02	KGS./CUBIC METERS
POUNDS/CUBIC FOOT	5.787×10^{-4}	POUNDS/CUBIC INCH
POUNDS/CUBIC INCH	27.68	GRAMS/CUBIC CM.
POUNDS/CUBIC INCH	2.768×10^{4}	KGS./CUBIC METER
POUNDS/CUBIC INCH	1728	POUNDS/CUBIC FOOT
POUNDS/FOOT	1.488	KGS./METER
POUNDS/INCH	178.6	GRAMS/CM.
POUNDS/SQUARE FOOT	0.01602	FEET OF WATER
POUNDS/SQUARE FOOT	4.883	KGS./SQUARE METER
POUNDS/SQUARE FOOT	6.945×10^{-3}	POUNDS/SQUARE INCH
POUNDS/SQUARE INCH	0.068046	ATMOSPHERES
POUNDS/SQUARE INCH	2.307	FEET OF WATER

Given	Multiply By	To Find
POUNDS/SQUARE INCH	2.03602	INCHES OF MERCURY
POUNDS/SQUARE INCH	703.1	KGS./SQUARE METER
PSI	1	POUND – FORCE/SQ. IN.
PUNCHEON	84	GALLONS
PUNCHEON (BRIT.)	70	GALLON (BRIT.)
QUARTS (DRY)	0.03125	BUSHEL
QUARTS (DRY)	67.200625	CUBIC INCHES
QUARTS (DRY)	1.101	LITERS
QUARTS (LIQ)	57.75	CUBIC INCHES
QUARTS (LIQ)	0.9463	LITER
QUARTS (LIQ)	0.8326742	QUART (BRIT.)
QUARTS (LIQ)	0.859367	QUART (DRY)
QUINTAL, ARGENTINE	101.28	POUNDS
QUINTAL, BRAZIL	129.54	POUNDS
QUINTAL, CASTILE, PERU	101.43	POUNDS
QUINTAL, CHILE	101.41	POUNDS
QUINTAL, METRIC	220.46	POUNDS
QUINTAL, MEXICO	101.47	POUNDS
RADIANS	57.29578	DEGREES
RADIANS	3437.747	MINUTES
RADIANS	0.63662	QUADRANTS
RADIANS/SEC.	57.3	DEGREES/SEC.
RADIANS/SEC.	0.1592	REVOLUTIONS/SEC.
RADIANS/SEC.	9.549297	REVOLUTIONS/MIN.
REAMS	500	SHEETS
REVOLUTIONS	360	DEGREES
REVOLUTIONS	4	QUADRANTS
REVOLUTIONS	6.283	RADIANS
REVOLUTIONS/MIN.	6	DEGREES/SEC.
REVOLUTIONS/MIN.	0.1047	RADIANS/SEC.
REVOLUTIONS/MIN.	0.01667	REVOLUTIONS/SEC.
REVOLUTIONS/SEC.	360	DEGREES/SEC.
REVOLUTIONS/SEC.	6.283	RADIANS/SEC.
REVOLUTIONS/SEC.	60	REVOLUTIONS/MIN.
RODS	16.5	FEET
ROPE	20	FEET
SCRUPLE	20	GRAINS
SEAM (BRIT.)	64	GALLON (BRIT.)
SLUG	14.5939	KILOGRAMS
SPAN	9	INCHES
SQUARE CM.	10^{-4}	SQUARE METERS
SQUARE CM.	100	SQUARE MILLIMETERS
SQUARE FEET	2.296×10^{-5}	ACRES
SQUARE FEET	929	SQUARE CENTIMETERS
SQUARE FEET	144	SQUARE INCHES
SQUARE FEET	0.0929	SQUARE METERS
SQUARE FEET	3.587×10^{-3}	SQUARE MILES
SQUARE FEET	⅑	SQUARE YARDS
SQUARE INCHES	6.452	SQUARE CENTIMETERS
SQUARE INCHES	6.944×10^{-3}	SQUARE FEET
SQUARE INCHES	645.2	SQUARE MILLIMETERS
SQUARE KILOMETERS	247.1	ACRES
SQUARE KILOMETERS	10.76×10^{6}	SQUARE FEET
SQUARE KILOME	10^{6}	SQUARE METERS
SQUARE KILOMETERS	0.3861	SQUARE MILES
SQUARE KILOMETERS	1.196×10^{6}	SQUARE YARDS
SQUARE METERS	2.471×10^{-4}	ACRES
SQUARE METERS	10.76	SQUARE FEET
SQUARE METERS	3.861×10^{-7}	SQUARE MILES
SQUARE METERS	1.196	SQUARE YARDS
SQUARE MILES	640	ACRES
SQUARE MILES	27.88×10^{6}	SQUARE FEET
SQUARE MILES	2.59	SQUARE KILOMETERS
SQUARE MILES	3.098×10^{6}	SQUARE YARDS
SQUARE MILLIMETERS	0.01	SQUARE CENTIMETERS
SQUARE MILLIMETERS	1.550×10^{-3}	SQUARE INCHES
SQUARE YARDS	2.066×10^{-4}	ACRES
SQUARE YARDS	9	SQUARE FEET
SQUARE YARDS	0.8361	SQUARE METERS
SQUARE YARDS	3.228×10^{-7}	SQUARE MILES
STERE	1	CUBIC METER
STERE	0.2759	CORD
STONE	14	POUNDS
TABLESPOON	14.79	MILLILITERS
TEASPOON	5	MILLILITERS
TEMP.(oC.)+17.78	1.8	TEMP.(oF.)

Conversion Tables

Given	Multiply By	To Find
TEMP.(oF)-32	5/9	TEMP.(oC.)
THERM	100,000	BTU
TONS OF WATER/24 HRS.	83.333	POUNDS WATER/HOUR
TONS OF WATER/24 HRS.	0.16643	GALLONS/MIN.
TONS OF WATER/24 HRS.	1.3349	CUBIC FT./HOUR
TONS (LONG)	1016.0469	KILOGRAMS
TONS (LONG)	1.016047	TONS (METRIC)
TONS (LONG)	2240	POUNDS
TONS (LONG)	1.12	TONS (SHORT)
TONS (METRIC)	10^3	KILOGRAMS
TONS (METRIC)	2205	POUNDS
TONS (SHORT)	2000	POUNDS
TONS (SHORT)	32000	OUNCES
TONS (SHORT)	907.18486	KILOGRAMS
TONS (SHORT)	2430.56	POUNDS (TROY)
TONS (SHORT)	0.89287	TONS (LONG)
TONS (SHORT)	29166	OUNCES (TROY)
TONS (SHORT)	0.90718	TONS (METRIC)

Given	Multiply By	To Find
WATT – HOUR	3600	JOULE
WATTS	0.05692	BTU/MIN.
WATTS	44.26	FOOT – POUNDS/MIN.
WATTS	0.7376	FOOT – POUNDS/SEC.
WATTS	1.341×10^{-3}	HORSEPOWER
WATTS	0.01434	KG. – CALORIES/MIN.
WATTS	10^{-3}	KILOWATTS
WATTS – HOURS	3.41214	BTU
WATTS – HOURS	2655	FOOT – POUNDS – FORCE
WATTS – HOURS	1.341×10^{-3}	HORSEPOWER – HOURS
WATTS – HOURS	3600	JOULES
WATTS – HOURS	0.8605	KILOGRAM – CALORIES
WATTS – HOURS	367.1	KILOGRAM – Metros
WATTS – HOURS	10^{-3}	KILOWATT – HOURS
YARDS	91.44	CENTIMETERS
YARDS	36	INCHES
YARDS	0.9144	Metros

Worldwide Locations

Through steady, planned expansion, Martin has developed a network of modern manufacturing and service centers.

The ever increasing demand for high quality Martin products from many industries and markets has been met by continuous modernization and expansion of manufacturing and marketing facilities. With plants located in key industrial areas throughout the world, Martin is able to produce and deliver quality products to best serve the needs of every market in virtually any quantity. Distributors are located in all fifty states and throughout the world to provide total product availability.

It's through this manufacturing and marketing organization that Martin makes good its claim of serving industry "wherever machinery is in motion and materials are on the move."

HEADQUARTERS - ARLINGTON, TX

ABILENE, TX

ALBEMARLE, NC

ARLINGTON, TX

ATLANTA, GA

BOSTON, MA

BURLESON, TX

CHARLOTTE, NC

CHICAGO, IL

CLARKSVILLE, TX

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DANIELSVILLE, PA

DENVER, CO

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KANSAS CITY, MO

LOS ANGELES, CA

MANSFIELD, TX

MINNEAPOLIS, MN

MONTPELIER, OH

NASHVILLE, TN

PARAGOULD, AR

PORTLAND, OR

SACRAMENTO, CA

TAMPA, FL

TIGARD, OR

WAYNE, NJ

AYR, ONTARIO, CANADA

EDMONTON, ALBERTA, CANADA

MISSISSAUGA, ONTARIO, CANADA

GUADALAJARA, JAL., MÉXICO

MONTERREY NL, MÉXICO

TOLUCA, EDO. DE MÉXICO

SÃO PAULO,BRAZIL, SOUTH AMERICA

CHANGZHOU, JP, CHINA

FUZHOU, CHINA

SHANGHAI, CHINA (China Headquarters)

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Sacramento, CA 95814-0426
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Portland, OR 97224
503-443-1527 (FAX 503-443-1507)

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Milford, MA 01757
508-634-3990 (FAX 508-634-3998)

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3901 Scott Futrell Drive
Charlotte, NC 28208-3539
704-394-9111 (FAX 704-394-9122)

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Des Plaines, IL 60018-3001
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Denver CO 80239
303-371-8466 (FAX 303-371-7116)

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Nashville, Tennessee 37210

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Houston, TX 77040
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Kansas City, MO 64120-4961
816-231-5575 (FAX 816-231-1959)

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Commerce, CA 90040-3639
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Bloomington, MN 55438-2395
952-829-0623 (FAX 952-944-9385)

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Dallas, TX • Mansfield, TX
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Fuzhou

Changzhou

Chengdu

Tianjin

Appendix

CONDITION OF SALE

CANCELLATION OR SUSPENSION: Cancellation or suspension of manufacturing or shipping date of any order will be accepted only on terms which will indemnify us against loss.

MADE-TO-ORDER SIZES AND OVERRUNS: Because in manufacturing it is necessary to make slightly more of any article than the exact amount specified, in order to offset losses and ensure the required number of parts being produced, made-to-order items are subject to having a run of plus or minus 5% of the total order and may be shipped and invoiced without prior notice. The foregoing is not applicable to standard stock merchandise.

TAXES: Any sales, use, consumption, or other similar tax applicable to the sale, purchase, or use of product is not included in these prices and shall be paid by the purchaser.

"LIMITED WARRANTY": Subject to the limitation expressed in subsequent paragraphs, Martin Sprocket & Gear, Inc. and Martin Sprocket & Gear Canada Inc., make the following warranties: We warrant that each of our products of manufacture will be free from defects in material and workmanship under normal use and service for twelve months from the date of delivery to the original user. We will correct any such defects in material or workmanship by repair or replacement of the product F.O.B. our plant. Tools will carry the following lifetime warranty: If a Martin tool fails to satisfactorily perform its designated use, it may be returned to the Martin distributor from which such tool was purchased and will be repaired or replaced without cost.

THE FOREGOING WARRANTIES ARE EXPRESSLY IN LIEU OF ANY AND ALL REPRESENTATIONS, WARRANTIES AND CONDITIONS EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WHETHER ARISING FROM STATUTE, COMMON LAW, CUSTOM, OR OTHERWISE. THE REMEDY OF REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT OR TOOL SET FORTH IN THE FOREGOING WARRANTIES SHALL BE THE EXCLUSIVE REMEDY AVAILABLE TO ANY PERSON.

Charges for correcting defects will not be allowed, nor can we accept goods returned to us for repair or replacement, unless we are previously notified of the defect in writing and the return or correction is authorized by us in writing. All warranty claims alleging defects of materials or workmanship must be submitted in writing within thirty days of the discovery of a defect or such claim shall be considered waived. (This paragraph is subject to the provisions of the Consumer Protection laws of Mexico.)

The foregoing warranties shall not apply to any products or tools which have been subjected to misuse, neglect or accident, or have been altered or tampered with, or have been used beyond their normal useful or expected life, or which have had corrective work done thereon without our written consent. WE SHALL NOT BE LIABLE FOR ANY LOSS, INJURY, EXPENSE, OR DAMAGE, WHETHER DIRECT, CONSEQUENTIAL, INCIDENTAL, OR OTHERWISE, RESULTING FROM THE USE OF OUR PRODUCTS OR TOOLS OR CAUSED BY ANY DEFECT, FAILURE, OR MALFUNCTION OF ANY PRODUCT OR TOOL, WHETHER A CLAIM FOR SUCH DAMAGES IS BASED UPON WARRANTY, CONTRACT, NEGLIGENCE, OR OTHERWISE. Equipment manufactured by others, and included in our proposal, is not warranted in any way by us but carries only the manufacturer's warranty, if any. No person has the authority to bind us to any representation or warranty other than the foregoing limited warranties as disclaimed.

The provisions of the United Nations Convention on Contracts for the International Sale of Goods or any local statute declaring it to have the force of law in the jurisdiction of one of the parties shall not apply to Products supplied hereunder.

"YOU ARE HEREBY NOTIFIED THAT ANY ADDITIONAL OR DIFFERENT TERMS FROM THOSE CONTAINED IN THIS LIMITED WARRANTY ARE OBJECTIONABLE. NO ADDITIONS OR CHANGES ARE BINDING ON Martin UNLESS THEY ARE IN WRITING AND SIGNED BY AN AUTHORIZED OFFICER."

NOTE: All past due invoices shall be payable to Martin Sprocket & Gear, Inc., at P.O. Box 91588, Arlington, Tarrant County, Texas 76015-0088. All past due invoices of Martin Sprocket & Gear Canada Inc., shall be payable at 896 Meyerside Drive, Mississauga, Ontario, Canada L5T 1R9. Reasonable attorneys' fees will be added if collection is forced.

RETURNED MATERIAL: When it is desired to return material for credit or exchange, it is necessary that permission in writing first be obtained from the nearest office.

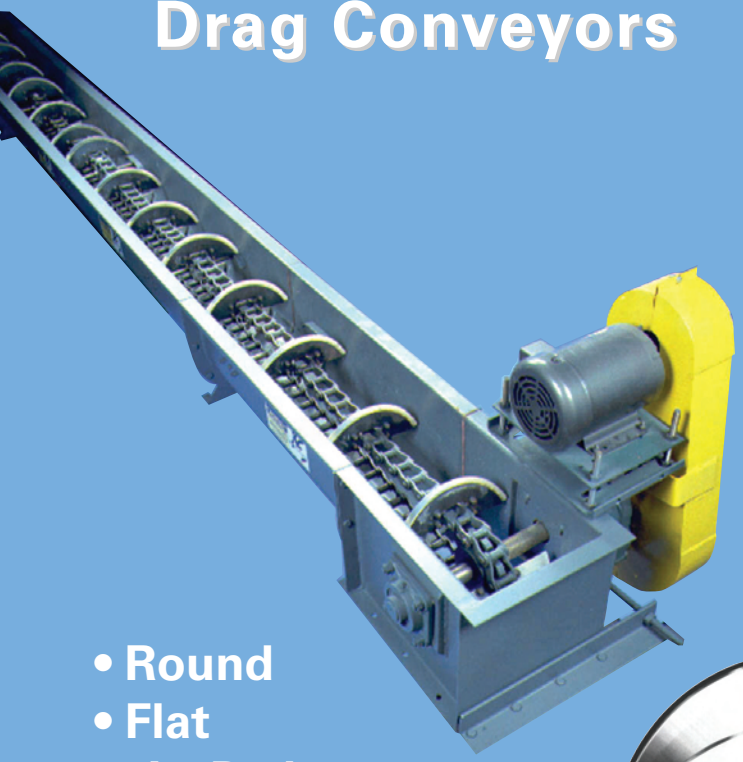
SHIPMENTS: If we are not able to meet your shipment requirements and/or our expected dates of shipment, we will not accept liability for delays beyond our control, nor will we accept cancellations unless a settlement has been agreed upon between us.

FREIGHT ALLOWANCE: Freight allowances are shown on the different product discount sheets. In cases where a specific routing of any order is more costly than the routing selected by us, the excess charges will be added to the net amount of the invoice. Weights shown in catalog are approximate, and may not be used to determine qualifications for freight allowance.

CASH DISCOUNT: 1% 10th and 25th Net 30 Days. A 1% cash discount will be allowed on invoices dated the 1st through the 15th if paid by the 25th of the same month and on invoices dated the 16th through the end of the month if payment is made by the 10th of the next month. All invoices are due in 30 days. Cash discount does not apply to other charges such as freight, postage, or delivery charges.

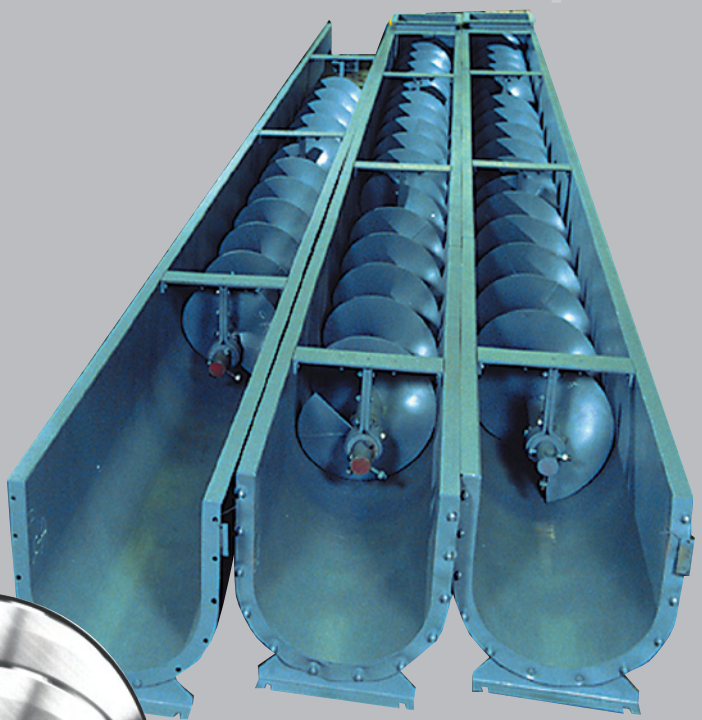
This catalog supersedes all previous editions. Every effort has been put forward to produce what we feel is the best power transmission catalog in the industry. However, due to changes in engineering and manufacturing processes and procedures, it becomes necessary, from time to time, to make alterations to products, and such alterations may not be reflected in this catalog. Therefore, if dimensions, specifications or appearances represented by pictures or drawings or tables are critical in their applications, please consult the factory for clarification or certified drawings.

Drag Conveyors



- Round
- Flat
- "L" Path
- "S" Path

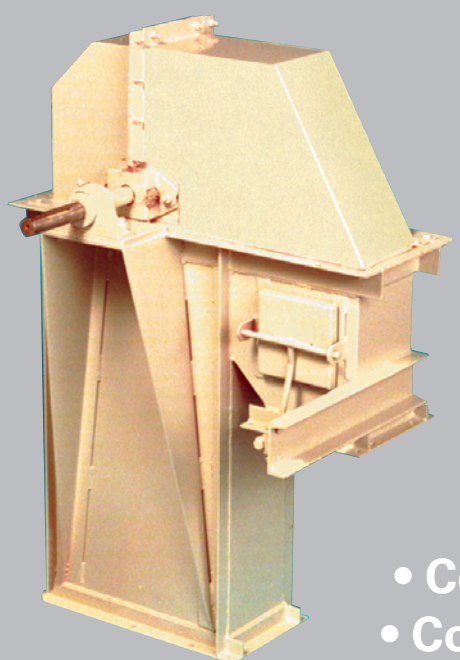
Screw Conveyors



Standard & MTO •
Plastic •
Vertical •

Martin

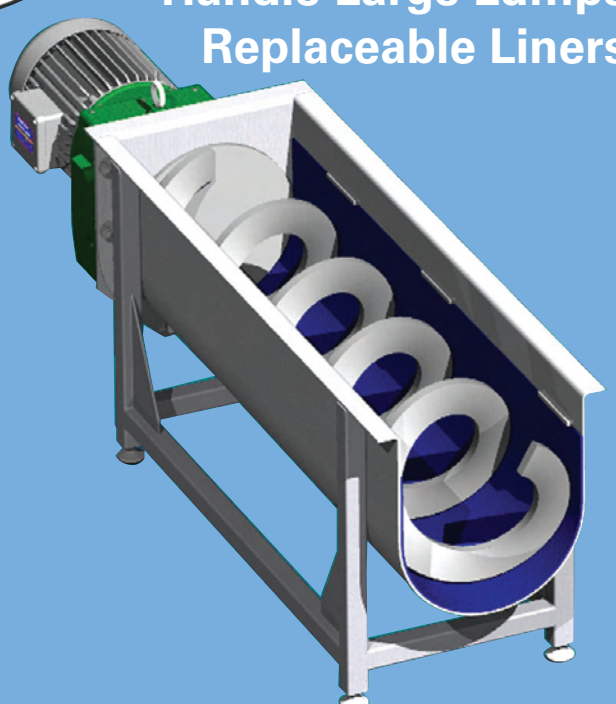
Elevators



- Centrifugal
- Continuous
- Mill Duty
- Super Capacity

Shaftless Conveyors

Eliminate Hangers •
Handle Large Lumps •
Replaceable Liners •



INVENTORY: Martin delivers with incredible fill rates from one of its many facilities strategically located across North America.

SERVICE: Martin ships rebores and other alterations within hours - not days... MTO's in days - not weeks.

PEOPLE: When you call Martin you get a person, not voice mail. We are ready, able and willing to help...Now!

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