

Electronic Metal Halide

Architectural Downlighting



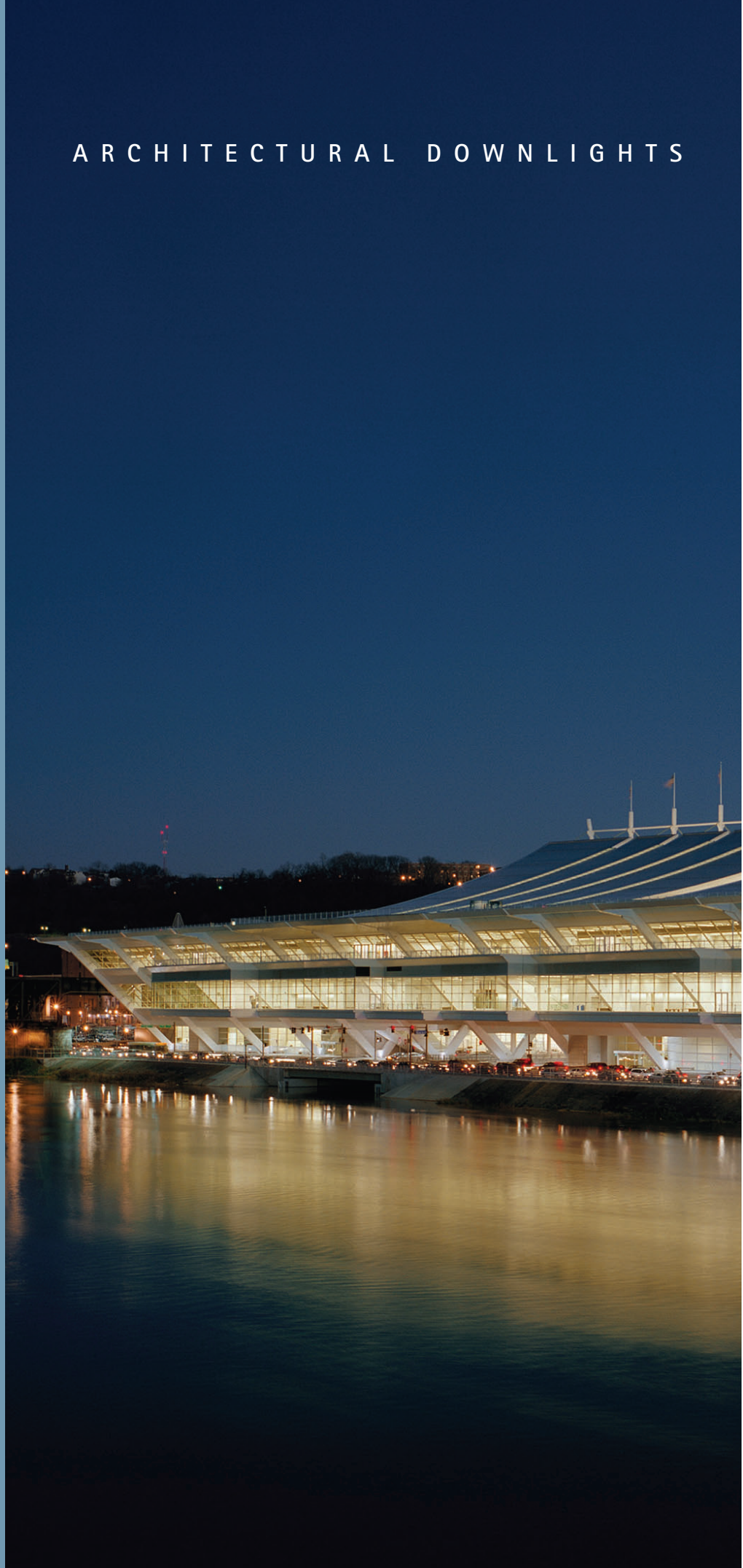
ARCHITECTURAL DOWNLIGHTS

USING LIGHT TO DEFINE AND ENHANCE AN ARCHITECTURAL ENVIRONMENT

Light defines an architectural setting by means of light and shadow. It develops ones perception of solid geometry and open space. Light also highlights architectural detail, guides one through a site and enhances our experience of the built environment. In a well designed space, these effects are applied with just the right balance of science and artistry.

Portfolio applies a similar balance of art and science to the design and engineering of its downlighting luminaires. Portfolio mingles color, scale and features into a quality product that provides comfort and efficiency.

Portfolio Metal Halide Downlights are among the highest efficiency luminaires available that can be utilized to create a sustainable lighted environment.





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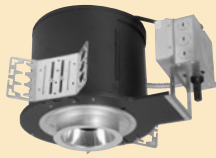
Metal halide and ceramic metal halide fixtures are engineered with quality construction details. Die-cast plaster frames create rigid mounting platforms. Positive attachment of trims to stilt-style socket supports provide snug integration at the ceiling line without sagging and light leaks. Die-cast vented socket caps provide maximum heat dissipation and rigid mounting while maintaining an integral relationship between the lamp and its optical components. Small electronic ballasts allow for lighter construction and easier installation as well as a smaller overall footprint and faster restrike capability.

From the designers aspect, Portfolio metal halide features include open and lensed downlight trims, open and lensed wall wash trims, and open and lensed adjustable accent light trims. Many trims can be interchanged within the same housing. Center beam optics on adjustable fixtures feature a tilt mechanism that keeps the center of the beam aligned with the center of the aperture at all tilt angles. Trim finishes include low iridescent finishes in specular and semi-specular Alzak® surfaces in 8 standard Portfolio colors from clear to chocolate.

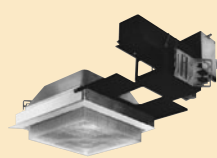
Lamp options include a range from 20 to 315 watts and utilize lamp envelopes from PAR and AR reflectorized lamps, T4, T6 and T9 tubular lamps to ED17 screw base lamps. The wide variety of lamp options gives way to the largest offering of matching aperture products in the industry.



Metal Halide Downlight



Metal Halide Directional



Square Lensed

4" APERTURE

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The Portfolio Story

Portfolio offers the most complete vocabulary of recessed and surface mount downlights in the industry. Housings utilizing various lamp sources with coordinated round and square apertures can be combined within a facility creating a common appearance. Many housings are modular accepting a wide range of optics including open, open with baffle, open wall wash, lens wall wash, and lens trims.

Designing the finest luminaire requires a careful blending of optical design, thermal management, lamp control and construction features to achieve balanced performance. Peripheral vision is extremely sensitive to brightness caused by high angle light and is perceived as glare. Glare reduces visual acuity and diminishes the viewer's ability to see in an otherwise well lit space. Glare control is the single most important design factor when developing downlighting luminaires.

Unlike outdoor luminaires indoor lighting does not have industry standards for measuring glare control forcing optical engineers to depend on long-standing practices that are ultimately subjective. The cutoff angle of a lamp or physical cutoff in a luminaire is defined as the angle between nadir and the line that first conceals the direct view of the lamp (FIG. 1a). Cutoff to the lamp image or optical cutoff is the angle from nadir in which the light redirected from the reflective surfaces is just concealed (FIG. 1b).

The total output of a downlight optical system is the combination of light directly from the lamp and light reflected from the reflector surfaces. When the optical cutoff is greater than the physical cutoff the reflector is considered incongruent. Although incongruent optics may have high measured efficiency the high angle light is not directed to the work plane reducing useful light in the beam (FIG. 2a). It also produces glare that reduces visual acuity.

If the reflector is designed so the outline of both the direct and the reflected beam coincide the reflector is considered congruent. This is the most effective type of reflector because spill light has been eliminated and all the light is utilized with the beam (FIG. 2b). Comparing published efficiency and cutoff data without knowing if the optic is congruent can result in calculation errors during the specification process. To achieve brightness control while maintaining efficiency Portfolio pioneered the use of equal cutoff to lamp and lamp image within its optical systems (FIG 3).

Directional luminaires pose further challenges to the optical engineer. Portfolio also pioneered the use of center beam optics that ensures maximum output and glare free performance at all adjustment angles. As the source is tilted from nadir to the maximum aiming angle the dual track tilt adjustment mechanism moves the source closer to the aperture while simultaneously keeping the lamp beam centered in the aperture (FIG. 4). All Portfolio directional downlights have greater than 360° rotation and 30° tilt and locks into any aiming position. Many directional housings accept optional beam modifying lens and filters.

Portfolio takes great care transitioning optical designs into high quality reflector systems. Only the highest purity 3002 aluminum alloy is used resulting in better reflectance, deeper and longer lasting color and spectral consistency. All reflector finishes use the Alzak® process that provides a consistent durable finish over the lifetime of the fixture. Portfolio reflectors are offered in a wide range of standard colors that integrate into any décor.

Portfolio reflectors are offered in up to four trim ring styles including self-flanged, polymer trim ring, metal trim ring, and rimless. self-flanged and removable metal or polymer trim rings provide a 5/8" nominal overlap accommodating commercial construction variations while providing a gap free appearance around the flange or visible cut edge of the ceiling tile.

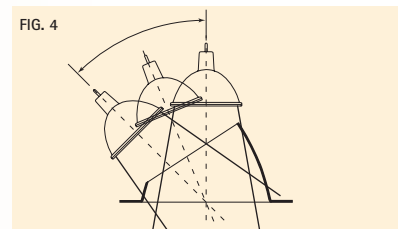
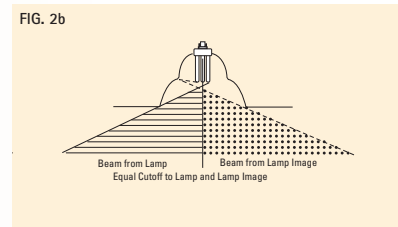
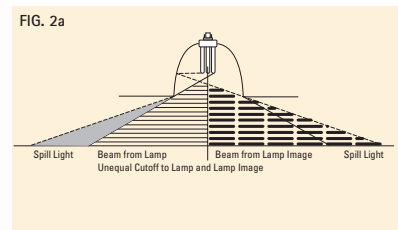
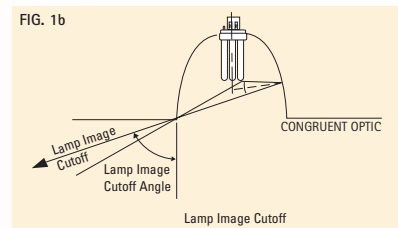
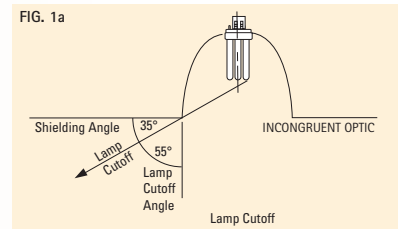


FIG. 5



FIG. 6

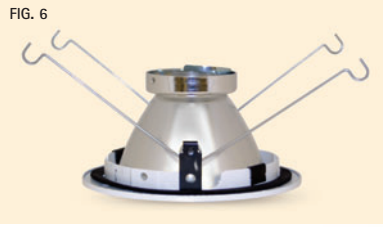
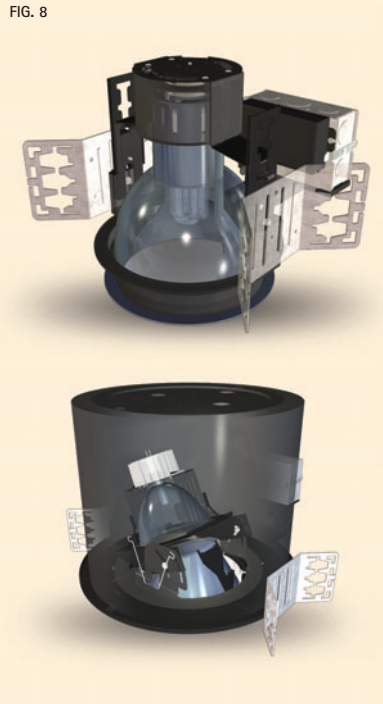


FIG. 7



FIG. 8



Downlight and directional reflectors use positive trim retention that holds the trim ring tight to the ceiling preventing gaps and light leaks around the flange (FIG 5 and 6). This method is superior to traditional friction springs that loosen over time.

To increase the versatility of the product line many of the Portfolio housings accept a wide variety of lamps, reflector types, and accessories. A field adjustable lamp socket support mechanism allows for rapid and accurate height adjustment maintaining proper focus for all lamp and reflector combinations. Once the reflector is installed normal fixture maintenance will not cause repositioning of the lamp.

Proper thermal management is essential to achieve rated lamp life and lumen output. This is especially critical for compact fluorescent fixtures using amalgam type lamps (FIG. 7). All Portfolio fixtures are tested in our UL certified lab and are UL listed and CSA certified under UL standard 1598. In addition to agency compliance testing Portfolio products are also rigorously tested to insure reliability and performance. These tests include acoustical, electrical, long-term aging, and photometric testing.

Portfolio uses both open frame and enclosed housing styles to best meet application requirements. All housings feature corrosion resistant die cast plaster frames or plaster grounds with extra deep collars allowing installation in thicker ceilings and assuring the unit is leveled properly. Junction box feature separate 1/2" and 3/4" trade size pry outs and are listed for eight #12 AWG 90° rated conductors. Universal mounting brackets allow for five inches of adjustment and accept 1/2" EMT, C-channels, bar hangers and T-bar fasteners to simplify and speed installation. Brackets and junction boxes are galvanized or painted after fabrication. Hardware and fasteners are brass, stainless steel, or zinc plated to resist corrosion. Housings are painted optical flat black to reduce stray light inside the fixture (FIG. 8).

Proper ballasts are essential for driving discharge lamps and achieving peak performance. Most Portfolio metal halide recessed downlights use universal voltage input electronic ballasts. Electronic metal halide ballasts provide optimum lamp control, low energy consumption, allow more fixtures per branch circuit and are easier to install due to compact size and lower weight.

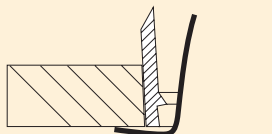
TRIM RING SELECTION

Portfolio offers the widest range of trim ring options in the industry including self-flanged, polymer and metal trim rings, and rimless. The self-flanged versions are available with an optional white painted flange. The metal trim rings are available in a wide range of painted and plated finishes and in most cases can be removed from the optic and field painted to match any décor.



SELF-FLANGED TRIM RING

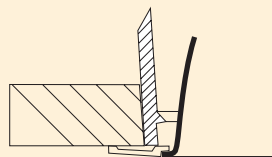
Self-flanged trims feature a one-piece optical system with the flange formed from the downlight cone. This construction eliminates gaps and light leaks between the reflector cone and trim ring. The flange has a 3-degree taper providing a tight fit to the ceiling surface eliminating gaps between the trim ring and ceiling. A self-flanged trim ring is not available with baffle option.



WMH (Warm Haze) with Self-Flanged

POLYMER TRIM RING

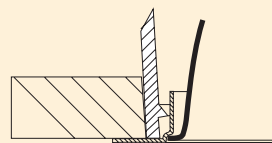
The polymer trim ring is available in matte white and matches most white ceiling finishes. It drops over the reflector cone and is captured between the reflector cone and ceiling surface. The polymer trim ring has some flex and can accommodate subtle variations in ceiling flatness.



Standard LI Reflector with White Polymer Trim

METAL TRIM RING

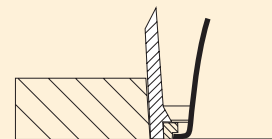
An optional 4, 6, or 7-inch nominal diameter formed metal trim can be ordered as an accessory. The metal trim ring replaces the polymer trim ring. The metal trim ring accessory is available in many painted and plated finishes and can be painted in the field.



Standard LI Reflector with Metal Trim Ring

RIMLESS TRIM RING

Rimless offers a clean contemporary appearance with the flange of the reflector cone flush with the finished ceiling. Rimless trim rings are ordered separately as an accessory and replace the polymer trim ring shipped with the optic.



Standard LI Reflector with TRR6 (Rimless) option





SCALABLE APERTURES

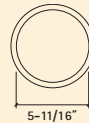
To meet the challenges of today's commercial spaces, Portfolio offers scalable apertures providing consistent visual appearance across lamp types and optical distributions.



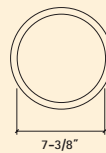
The 3-inch nominal aperture downlights feature low voltage MR16 type lamps with precise beam control and are suitable for both ambient and accent lighting. Includes a 1-1/4" pinhole providing minimal visual impact.



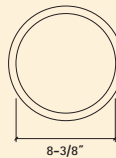
The 4-inch nominal aperture is the smallest downlight series supporting all optical distributions and lamp types including incandescent, compact fluorescent, and metal halide. Use for accent and task lighting and with lower ceiling heights.



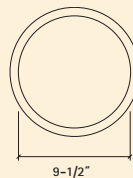
The 6-inch nominal aperture is the most versatile and popular downlight series meeting all optical distribution needs and is available with all lamp types including incandescent, compact fluorescent, and metal halide.



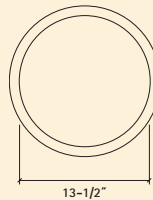
The 7-inch nominal aperture downlight series provides greater efficiency for average ceiling heights or for longer throws in higher ceilings. Available in all optical distributions and lamp types including incandescent, compact fluorescent, and metal halide.



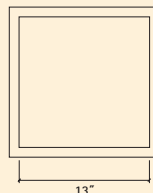
The 8-inch nominal aperture downlights are used for higher ceiling applications when high efficiency, high output, and long throws are required.



The 9-inch nominal aperture series is used with high wattage compact fluorescent and high output metal halide lamps, providing increased lumen output for higher ceiling applications.



The 13-inch nominal aperture features lensed trims combined with metal halide lamps providing wide distribution and high levels of illumination.



The 13-inch square aperture downlights feature lensed optical elements combined with metal halide lamps to provide wide distribution and high levels of illumination.

ACCESSORIES - ELEMENT FINISH & FLANGE OPTIONS

Portfolio offers more finish choices than any manufacturer, giving you the ability to match any color scheme imaginable. The use of finish multipliers provide factors to adjust our published photometrics for accurate prediction of the installed fixture performance.

STANDARD REFLECTOR COLORS

CLEAR LOW IRIDESCENT (LI)



A clear specular Alzak® finish which delivers full light output with low iridescence.

GOLD (G)



A champagne gold specular Alzak® finish which provide visual warmth.

WHEAT (WH)



A more robust version of gold in a specular Alzak® finish that adds significant visual warmth.

COGNAC (K)



A warm copper color in a specular Alzak® finish. A good choice for wood ceiling or anywhere that a rich look is desired. Similar to 'Bronze' by other manufacturers.

CHOCOLATE (CC)



A warm dark color similar to architectural bronze in a specular Alzak® finish.

GRAPHITE (GP)



A gunmetal gray in a specular Alzak® finish. An alternative for Black Alzak® and does not show dust as much.

BLACK (B)



A specular Alzak® finish providing maximum aperture darkness.

WHITE BAFFLE (WB)



A painted white rolled baffled lower cone to provide visual identity.

HAZE (H)



A clear semi-specular Alzak® finish to provide visual identity.

WARM HAZE (WMH)



A clear semi-specular Alzak® finish to provide visual identity, with a hint of gold for added warmth.

WHEAT HAZE (WHH)



Same as wheat in a semi-specular Alzak® finish.

COGNAC HAZE (KH)



Same as Cognac in a semi-specular Alzak® finish.

CHOCOLATE HAZE (CCH)



Same as Chocolate in a semi-specular Alzak® finish.

GRAPHITE HAZE (GPH)



Same as Graphite in a semi-specular Alzak® finish.

BLACK BAFFLE (BB)



A painted black rolled baffled lower cone to provide visual identity.

Alzak® finishes can be ordered with trim ring choices on page 6. Please note that colors are representations only and due to printing variables, may differ slightly from actual product. Please consult your local Portfolio representative for actual color samples.



REFLECTOR COLOR FINISH MULTIPLIERS

The finish of a reflector has a greater effect on non-directional lamps like ED and T lamps than it does on directional lamps such as PARs and ARs. Finish multipliers listed for each finish should be used to modify the published photometrics of our low iridescent clear Alzak® reflectors when using another finish.

DESCRIPTION	CAT #	NON-DIRECTIONAL LAMPS	DIRECTIONAL LAMPS
CLEAR LOW IRIDESCENT	LI	100.0	100.0
BLACK	B	24.0	93.0
CHOCOLATE	CC	38.0	94.0
CHOCOLATE HAZE	CCH	31.0	93.0
COGNAC	K	58.0	95.0
COGNAC HAZE	KH	44.0	95.0
GRAPHITE	GP	46.0	95.0
GRAPHITE HAZE	GPH	44.0	94.0
CLEAR HAZE	H	96.0	99.0
GOLD	G	99.0	100.0
WARM HAZE	.WMH	90.0	98.0
WHEAT	.WH	95.0	99.0
WHEAT HAZE	.WHH	88.0	99.0

CONTROLLING LIGHT

CONTROL—THE KEY TO EFFECTIVE LIGHTING

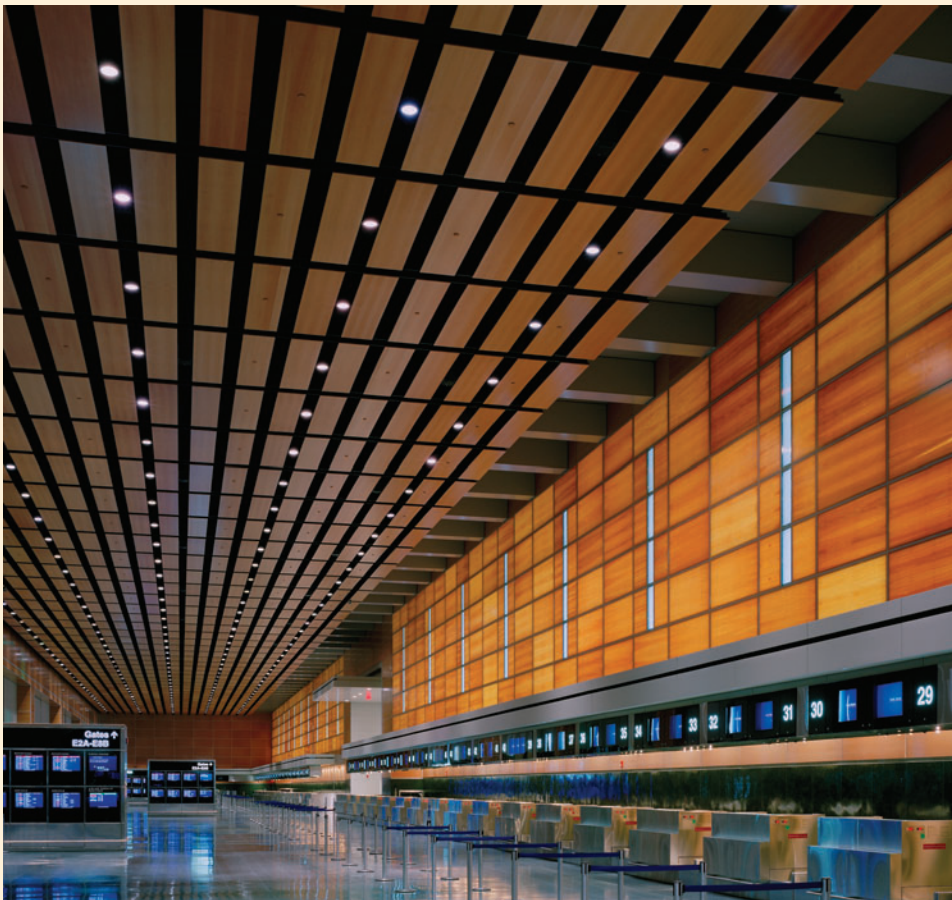
Portfolio employs state-of-the-art optical design and high purity materials for luminaires that provide predictable controlled downlight distribution.

Portfolio quality optics efficiently direct light into useful zones. Portfolio pioneered optics that provide equal visual cutoff to lamp and lamp image. Narrow, medium, and wide full cutoff optics are offered. The importance of cutoff in a downlight optic is to minimize glare and produce low ceiling brightness.

Controlled illumination creates the highlights and shadows needed to enhance dimensional qualities of objects. For example the use of grazing light dramatizes textures and makes them exciting. Combinations of general ambient and accent lighting adds detail and expression to three-dimensional objects and works of art.

PROPERTIES OF CONTROL:

- LightEffect
- QuantityVisibility and Intensity
- ColorTone and Mood
- Beam Distribution ...Form and Composition
- Directional Angle ...Visual Interest and Sparkle



Downlighting creates inviting environments that people enjoy.

THE RENDERING OF COLOR

Shade. Tone. Intensity. Hue. The full color spectrum can come alive with the magic of light.

Portfolio reflectors enhance color balance, creating an atmosphere of comfort and ease. The color rendering qualities of the lamp source and the luminaire's reflector finish influence the color of light. Portfolio offers a wide palette of reflector finishes to enhance color of light and coordinate with interior design.

EFFECTIVE LIGHT PUTS LIGHT WHERE IT'S NEEDED

In most situations, people take lighting for granted—and, that's good. Lighting that draws attention to itself isn't doing an effective job. An inviting space needs to be seen free of glare and discomfort of any kind—and that's where Portfolio excels.

LIGHT VARIATION ENHANCES ARCHITECTURE

Uniform light levels can be static. They never satisfy the needs of a changing space. Vitality is an integral part of light's magic. Highlights and shadows define that vitality.

Portfolio luminaires offer the flexibility needed to vary light intensity. They enhance depth and detail which makes space inviting.



A combination of ambient and accent downlighting adds warmth and movement to showcase a special area.



Quality illumination has the right balance of general ambient, accent and wall washing to enhance visual comfort.

OPTICAL DESIGN – MAXIMIZING EFFICIENCY AND QUALITY

With Portfolio luminaires maximum rated lamp output is utilized. There is very little wasted energy. The reflectors, diffusers and baffles control the light so that spaces and objects are seen with proper highlights and shadows.

Portfolio optics offer a high degree of visual comfort. This comfort stems from controlling the illumination while maximizing its effect.

OPEN REFLECTORS

Portfolio polished Alzak® aluminum reflectors utilize a one piece spun macro focal parabolic contour specifically designed for the compact fluorescent lamp. This optical design controls the lamp output by distributing the illumination into useful zones.

Open reflector units are used mainly for general lighting. Use these for their even distribution and their high efficiency factors. They provide the specifier with highly controlled 45° - 55° cutoff to lamp and lamp image, and maximum spacing ratios.

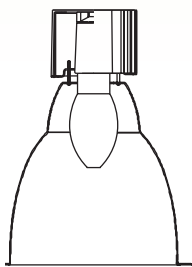
ELLIPSOIDAL REFLECTORS

Ellipsoidal optics use point source lamps including high intensity discharge lamps. HID lamps are recommended for high ceiling applications.

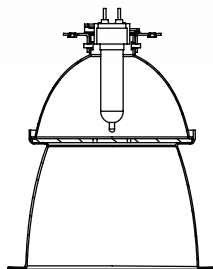
A small ceiling aperture and narrow, medium and wide beam distribution patterns are typical of ellipsoidal units. With the precision engineered Portfolio ellipsoidal optic the light beam is focused at the ceiling plane aperture permitting a high lumen output from a small aperture.

OPEN REFLECTORS AND BAFFLES

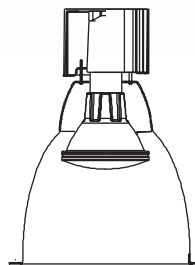
Maximize lumen output and beam control by capturing high angle light and directing it into useful zones. Portfolio open reflectors utilize ED17 and PAR lamps. The precisely formed non-imaging polished Alzak® reflectors offer 45° and 55° visual cut-off to the lamp and lamp image. This eliminates glare and produces low brightness at normal viewing angles. Open baffles trap and shape light to minimize glare and reduce aperture brightness. Baffles narrow the focus of the downlight beam and provide control for reflector style lamps.



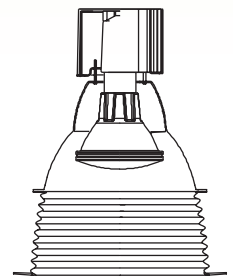
Open Reflector
ED17 Metal Halide



Ellipsoidal Reflector
T4/T6 Metal Halide



Open Reflector PAR30



Open Baffle PAR30



LENSES

Lenses are designed to collect light and more effectively distribute the illumination for general lighting. Lenses also provide a sealed lamp compartment that help reduce dirt depreciation and in select models offer wet location listing.

Lenses are made from glass materials and are available in clear, diffuse, prismatic, and fresnel finishes. The light source, location and desired lighting effect will determine the desired lens material and finish.

GRUVI™ OPEN WALL WASH

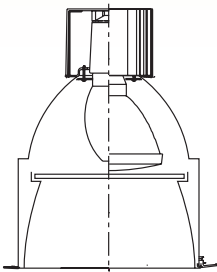
The Geometric Reflector for Uniform Vertical Illumination or GRUVI™ is a patented optical element used in combination with a standard Portfolio downlight cone providing high angle illumination to the top of the wall along with a strong downlight component. The GRUVI™ open wall wash offers an economical solution on projects where one housing is installed to accommodate all downlighting needs including wall washing.

GRUVI™ employs a complex series of tiered reflector elements that are vacuum metalized for precise optical control and coated with polysiloxane protective finish for durability.

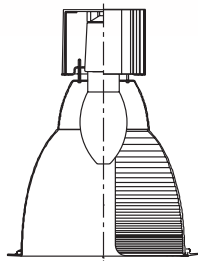
LENSED WALL WASH

Portfolio lensed wall wash trims use lens optics to redirect light from the bare lamp and upper reflector providing high angle wall illumination with minimal downlight component. The vertical surface becomes the source of light increasing the perception of space. Lensed wall wash trims can also be used to accent architectural details and provide effective display lighting.

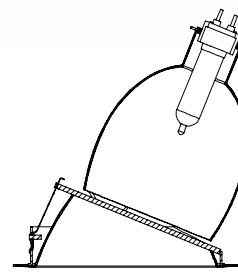
Fixtures utilizing lensed wall wash trims are wet location listed and can be used outdoors in covered ceiling.



Glass Fresnel Lens
ED-17 Metal Halide



GRUVI™ Open Wall Wash
ED17 Metal Halide



Lensed Wall Wash
T6 G12 Metal Halide



High Intensity Discharge

COMMON HOUSING FEATURES



FRAME: 1-1/2" deep die-cast collar accommodates varying dimensions of ceiling materials.

HOUSING: Directional fixtures feature full housings to protect optical assemblies and are painted optical flat black to minimize stray light.

REFLECTOR: Industry leading optics with equal cutoff to lamp and lamp image provide excellent brightness control with good efficiency. Available in a variety of standard finishes. Positive mounting pulls trim tight to ceiling eliminating light leaks.

MOUNTING BRACKET: Provides up to 5" of vertical adjustment and accepts 1/2" EMT, C Channel or bar hangers suitable for suspended or wood framed ceilings.

TRIM RINGS: Most trims are available with metal, polymer, self-flanged, or rimless trim rings.

ADJUSTMENT MECHANISM: Directional fixtures feature locking rotation and tilt with center beam optics providing full output with no flash back.

SOCKET ASSEMBLY: Pulse rated lamp sockets use premium materials including porcelain and nickel-plated brass to insure long life. Many fixtures use die-cast socket housings removing heat from lamp base increasing lamp life.

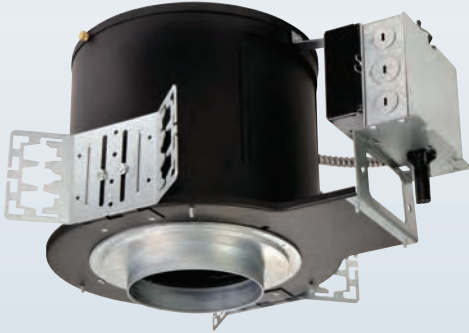
ELECTRONIC BALLAST: Provides optimum lamp control for metal halide lamps, lower energy consumption, more fixtures per branch circuit and are easier to install due to compact size and lower weight.

4" APERTURE

MEDIUM BEAM DOWNLIGHT 20W, 39W, 70W, 150W T6

METAL HALIDE LENS DOWNLIGHT/LENS WALL WASH T6 LAMP TO 150W

Medium beam lens downlight for general and task lighting from a single vertically mounted T6 ceramic metal halide lamp. Lens wall wash provides smooth illumination on vertical surfaces. The housing system supports interchangeable optics. Provided with soft focus lens providing lamp containment and a smoother beam. Integral electronic ballast with UNV 120/277V (except 150W) input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	16-1/16"	14-7/16"	9-11/16"	5-1/8"
Chicago Plenum	16-1/16"	14-7/16"	9-11/16"	5-1/8"

Catalog Number

HOUSING

M4 = 4" Universal CMH Housing
M4CP = 4" Universal CMH Housing, CCEA Listed for City of Chicago Plenum Requirements

LAMP TYPE / WATTAGE

20T4G12 = 20W T4 G12 CMH Lamp
39T6G12 = 39W T6 G12 CMH Lamp
70T6G12 = 70W T6 G12 CMH Lamp
150T6G12 = 150W T6 G12 CMH Lamp

BALLAST

E = Electronic, UNV 120/277V 50/60Hz¹
1E = Electronic, 120V 50/60Hz²
2E = Electronic, 277V 50/60Hz²

ACCESSORIES

HB26 = Bar Hanger, 26" Long, Pair
HB50 = Bar Hanger, 50" Long, Pair
RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
HSA4* = Slope Adapter for 4" Aperture, Specify Slope
H347 = 347V Stepdown Transformer, 75VA
H347200 = 347V Stepdown Transformer, 200VA

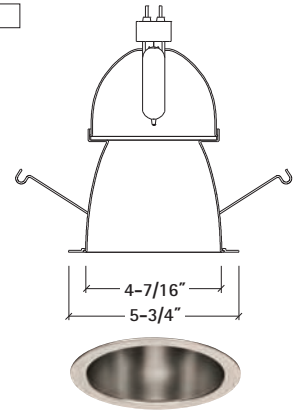
* See accessories section for ordering details.
Order housing, trim, lamp and accessories separately.

NOTE: 1. Not available with 150W 2. Available with 150W only

Catalog Number

TRIM _____
4950 = 4" Medium Beam Reflector, White Polymer Trim Ring
4951 = 4" Medium Beam Reflector, Self Flanged

FINISH _____
LI = Specular Clear, Low Iridescent
H = Semi specular Clear
WMH = Warm Haze
G = Gold
WH = Wheat
WHH = Wheat Haze
GP = Graphite
GPH = Graphite Haze
K = Cognac
KH = Cognac Haze
CC = Chocolate
CCH = Chocolate Haze
B = Black
OPTIONS _____
WF = White Painted Flange (Self Flanged only)

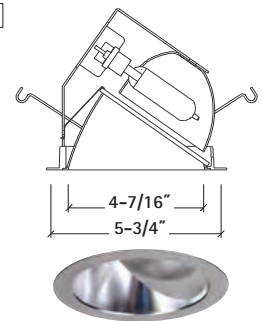


LENS WALL WASH 20W, 39W, 70W, 150W T6

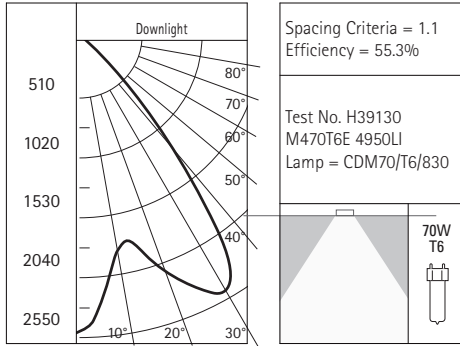
Catalog Number

TRIM _____
4981 = 4" Lens Wall Wash, Self Flanged
4983 = 4" Lens Wall Wash, White Painted Die Cast Aluminum Trim Ring

FINISH _____
LI = Specular Clear, Low Iridescent
H = Semi specular Clear
WMH = Warm Haze
G = Gold
WH = Wheat
WHH = Wheat Haze
GP = Graphite
GPH = Graphite Haze
K = Cognac
KH = Cognac Haze
CC = Chocolate
CCH = Chocolate Haze
B = Black
OPTIONS _____
WF = White Painted Flange (Self Flanged only)



Candlepower Distribution Curve



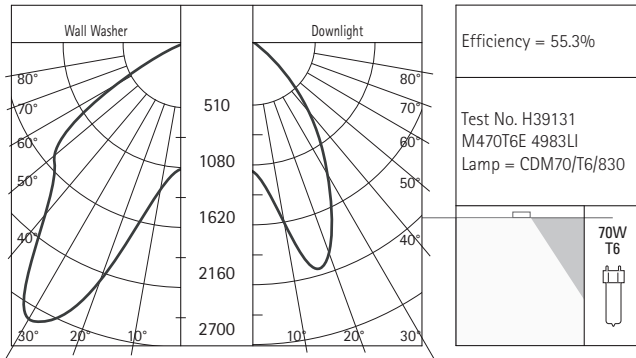
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
5' 6"	82	6' 0"
6' 6"	59	7' 0"
8' 0"	39	9' 0"
10' 0"	25	11' 0"
12' 0"	17	13' 0"
14' 0"	13	15' 6"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	66	66	66	66	64	64	64	61	61
1	62	61	59	58	59	58	57	57	55
2	59	56	53	51	55	53	51	53	49
3	55	51	48	46	51	48	45	49	45
4	52	47	44	41	47	43	41	45	40
5	49	44	40	37	43	40	37	42	37
6	46	40	37	34	40	36	34	39	34
7	43	37	34	31	37	33	31	36	31
8	41	35	31	28	34	31	28	34	28
9	38	32	29	26	32	28	26	31	26
10	36	30	26	24	30	26	24	29	24

Candlepower Distribution Curve



Single Unit Footcandles

Multiple Unit Footcandles

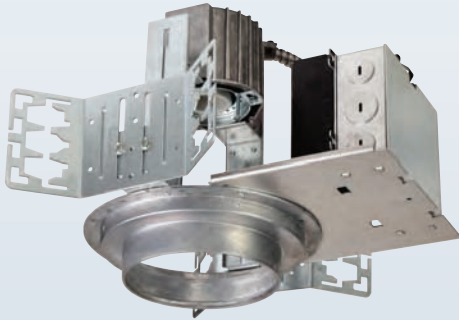
DD	2' 6" from wall (distance from fixture along wall)							2' from wall (spacing between fixtures)					3' from wall (spacing between fixtures)						
	1'	2'	3'	4'	5'	6'	6'	2'	3'	3'	3'	3'	3'	4'	6'	6'	6'	6'	6'
1	59	39	13	4	1	0	0	134	137	134	121	70	121	34	35	34	32	22	32
2	123	80	34	13	4	1	0	196	221	196	174	134	174	95	88	95	87	60	87
3	94	74	43	17	8	4	2	167	173	167	138	128	138	87	98	87	79	73	79
4	69	56	35	21	10	5	3	95	102	95	81	82	81	82	86	82	71	70	71
5	40	35	25	17	10	5	3	51	55	51	44	48	44	63	66	63	56	55	56
6	23	21	17	12	9	6	3	29	30	29	25	28	25	42	45	42	38	39	38
7	13	13	11	9	7	5	4	17	18	17	16	17	16	28	30	28	25	27	25
8	8	8	8	7	5	4	4	11	11	11	10	11	10	18	20	18	17	19	17
9	6	6	6	5	4	4	3	7	7	7	7	7	7	13	14	13	12	13	12
10	4	4	4	4	4	3	3	5	5	5	5	5	5	9	9	9	8	9	8

4" APERTURE

METAL HALIDE OPEN/OPEN WALL WASH/LENS DOWNLIGHT PAR20, PAR30L, ED17P LAMPS TO 70W

Wide beam downlight for general lighting from a single vertically mounted ED17P metal halide lamp or PAR lamp downlight for general and task lighting. Adjustable socket position maintains focus for varied reflector types.

Medium base extended husk socket accepts lamps suitable for open fixture use only. Integral electronic ballast with UNV 120/277V input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	12-13/16"	13-5/8"	H	5-1/8"
Chicago Plenum	12-13/16"	13-5/8"	H	

Height varies with socket position; see reflector data for fixture height. Add 1/2" height for Chicago Plenum option.

Catalog Number _____

HOUSING _____
 MD4 = 4" Universal MH Housing
 MD4CP = 4" Universal MH Housing, CCEA Listed for City of Chicago Plenum Requirements

WATTAGE _____
 20 = 20W MH Lamp
 39 = 39W MH Lamp
 50 = 50W MH Lamp
 70 = 70W MH Lamp

BALLAST _____
 E = Electronic, UNV 120/277V 50/60Hz

- ACCESSORIES**
- HB26 = Bar Hanger, 26" Long, Pair
 - HB50 = Bar Hanger, 50" Long, Pair
 - RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
 - HSA4* = Slope Adapter for 4" Aperture, Specify Slope
 - TRM4 = Metal Trim Ring, Specify Finish
 - TRR4 = Rimless Trim Ring
 - H347 = 347V Stepdown Transformer, 75VA
 - H347200 = 347V Stepdown Transformer, 200VA

* See accessories section for ordering details. Order housing, trim, lamp and accessories separately.

WIDE BEAM DOWNLIGHT

50W, 70W ED17P

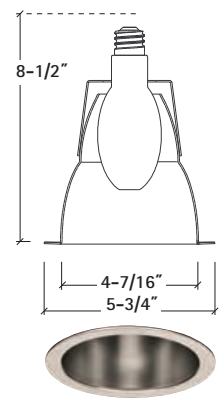
Catalog Number _____

TRIM _____
 4750 = 4" Wide Beam Reflector, White Polymer Trim Ring
 4751 = 4" Wide Beam Reflector, Self Flanged

FINISH _____
 LI = Specular Clear, Low Iridescent
 H = Semi Specular Clear
 WMH = Warm Haze
 G = Gold
 WH = Wheat
 WHH = Wheat Haze

GP = Graphite
 GPH = Graphite Haze
 K = Cognac
 KH = Cognac Haze
 CC = Chocolate
 CCH = Chocolate Haze
 B = Black

OPTIONS _____
 WF = White Painted Flange (Self Flanged only)



GRUVI™ OPEN WALL WASH

50W, 70W ED17P

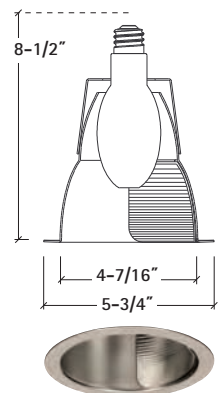
Catalog Number _____

TRIM _____
 4710 = 4" Single Open Wall Wash, White Polymer Trim Ring
 4711 = 4" Single Open Wall Wash, Self Flanged
 4720 = 4" Double Open Wall Wash, White Polymer Trim Ring
 4721 = 4" Double Open Wall Wash, Self Flanged
 4730 = 4" Corner Open Wall Wash, White Polymer Trim Ring
 4731 = 4" Corner Open Wall Wash, Self Flanged

FINISH _____
 LI = Specular Clear, Low Iridescent
 H = Semi Specular Clear
 WMH = Warm Haze
 G = Gold
 WH = Wheat
 WHH = Wheat Haze

GP = Graphite
 GPH = Graphite Haze
 K = Cognac
 KH = Cognac Haze
 CC = Chocolate
 CCH = Chocolate Haze
 B = Black

OPTIONS _____
 WF = White Painted Flange (Self Flanged only)



LENS DOWNLIGHT

70W MAX ED17P, PAR20, PAR30L

Catalog Number _____

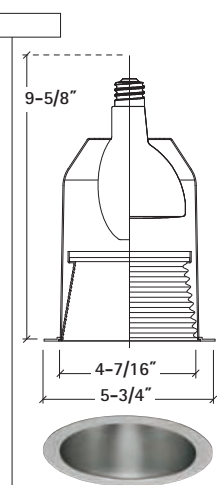
TRIM _____
 4780 = 4" Lens, White Polymer Trim Ring
 4781 = 4" Lens, Self Flanged

FINISH _____
 LI = Specular Clear, Low Iridescent
 H = Semi Specular Clear
 WMH = Warm Haze
 G = Gold
 WH = Wheat
 WHH = Wheat Haze
 GP = Graphite
 GPH = Graphite Haze

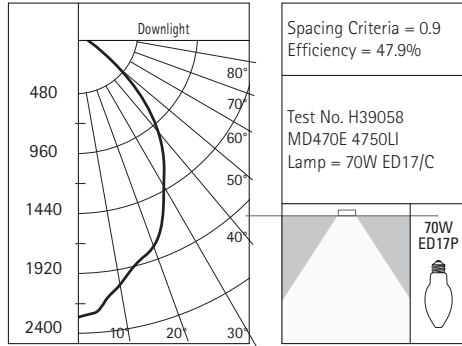
K = Cognac
 KH = Cognac Haze
 CC = Chocolate
 CCH = Chocolate Haze
 B = Black
 BB = Black Baffle (Polymer Trim Ring Only)
 WB = White Baffle (Polymer Trim Ring Only)

LENS _____
 1G = Prismatic Glass
 2G = Diffuse Glass
 3G = Clear Glass
 4G = Fresnel Glass

OPTIONS _____
 WF = White Painted Flange (Self Flanged only)



Candlepower Distribution Curve



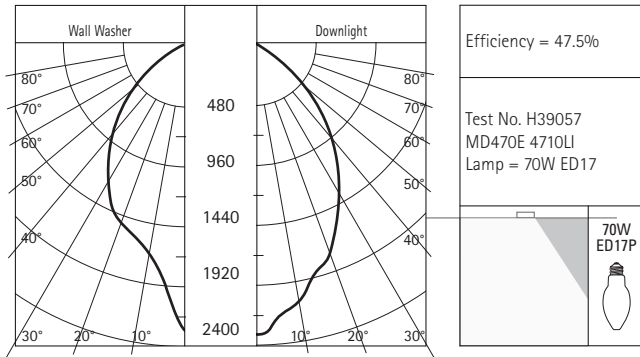
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
5' 6"	77	5' 0"
6' 6"	55	6' 0"
8' 0"	36	7' 6"
10' 0"	23	9' 0"
12' 0"	16	11' 0"
14' 0"	12	12' 6"

Coefficients of Utilization

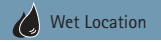
Ceiling Wall % RCR	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
0	57	57	57	57	56	56	56	53	53
1	54	53	52	51	52	51	50	50	48
2	52	49	47	46	48	47	45	47	44
3	49	46	43	42	45	43	41	44	41
4	46	43	40	38	42	40	38	41	37
5	44	40	37	35	39	37	35	38	34
6	41	37	34	32	37	34	32	36	31
7	39	34	31	29	34	31	29	33	29
8	36	32	29	26	31	28	26	31	26
9	34	29	26	24	29	26	24	28	24
10	32	27	24	22	27	24	22	26	22

Candlepower Distribution Curve

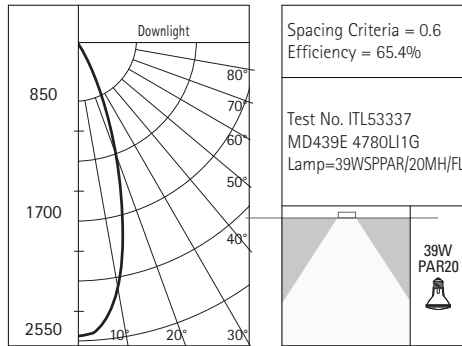


Single Unit Footcandles

DD	2' 6" from wall (distance from fixture along wall)						2' from wall (spacing between fixtures)				3' from wall (spacing between fixtures)							
	1'	2'	3'	4'	5'	6'	2'	4'	3'	4'	3'	4'						
1	16	11	4	1	1	0	38	37	38	31	8	31	11	10	11	10	6	10
2	30	20	8	3	1	0	75	75	75	57	19	57	23	21	23	19	14	19
3	35	28	15	5	2	1	83	83	83	48	38	48	34	34	34	28	23	28
4	27	23	16	9	4	1	65	67	65	36	33	36	38	38	38	29	29	29
5	19	17	13	9	5	2	48	49	48	28	27	28	36	36	36	27	27	27
6	13	12	10	7	5	3	35	36	35	20	22	20	30	31	30	23	24	23
7	9	9	8	6	4	3	25	26	25	15	17	15	24	25	24	19	20	19
8	6	6	6	5	4	3	18	19	18	12	13	12	20	20	20	16	17	16
9	5	5	4	4	3	2	14	14	14	10	10	10	16	16	16	13	14	13
10	4	3	3	3	3	2	11	11	11	8	8	8	13	13	13	11	11	11



Candlepower Distribution Curve



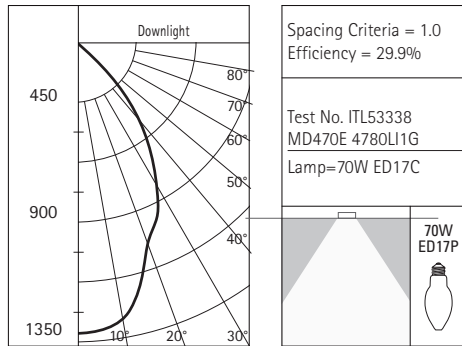
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
7' 0"	51	4' 4"
8' 0"	39	5' 0"
9' 0"	31	5' 6"
10' 0"	25	6' 2"
12' 6"	16	7' 8"
15' 0"	11	9' 4"

Coefficients of Utilization

Ceiling Wall % RCR	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
0	78	78	78	78	76	76	76	73	73
1	74	73	71	70	71	70	69	69	67
2	71	68	66	64	67	65	63	65	62
3	68	64	61	59	63	60	58	61	57
4	65	60	57	54	60	56	54	58	53
5	62	57	53	51	56	52	51	55	50
6	59	54	50	48	53	50	48	52	47
7	57	51	48	45	51	47	45	50	45
8	54	49	45	43	48	45	42	48	42
9	52	46	43	40	46	43	40	45	40
10	50	44	41	38	44	41	38	43	38

Candlepower Distribution Curve



Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
7'	26	7' 2"
8'	20	8' 2"
9'	16	9' 2"
10'	13	10' 2"
12' 6"	8	12' 8"
15'	6	15' 4"

Coefficients of Utilization

Ceiling Wall % RCR	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
0	36	36	36	36	35	35	35	33	33
1	34	33	32	31	32	31	31	31	30
2	32	30	29	27	29	28	27	29	27
3	30	28	26	24	27	26	24	26	24
4	28	25	23	22	25	23	22	24	22
5	26	23	21	20	23	21	20	22	20
6	25	21	19	18	21	19	18	21	18
7	23	20	18	16	20	18	16	19	16
8	22	18	16	15	18	16	15	18	15
9	20	17	15	14	17	15	14	17	14
10	19	16	14	13	16	14	13	16	13

4" APERTURE

METAL HALIDE OPEN/OPEN WALL WASH/LENS DOWNLIGHT PAR20, PAR30L, ED17P LAMPS TO 70W

PAR lamp downlight for general and task lighting or wide beam downlight for general lighting from a single vertically mounted ED17P metal halide lamp. Adjustable socket position maintains focus for varied reflector types. Medium base extended husk socket accepts lamps suitable for open fixture use only. Integral electronic ballast with UNV 120/277V input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	12-13/16"	13-5/8"	H	5-1/8"
Chicago Plenum	12-13/16"	13-5/8"	H	

Height varies with socket position; see reflector data for fixture height. Add 1/2" height for Chicago Plenum option.

Catalog Number

HOUSING

MD4 = 4" Universal MH Housing
MD4CP = 4" Universal MH Housing, CCEA Listed for City of Chicago Plenum Requirements

WATTAGE

20 = 20W MH Lamp
39 = 39W MH Lamp
70 = 70W MH Lamp

BALLAST

E = Electronic, UNV 120/277V 50/60Hz

ACCESSORIES

HB26 = Bar Hanger, 26" Long, Pair
HB50 = Bar Hanger, 50" Long, Pair
RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
HSA4* = Slope Adapter for 4" Aperture, Specify Slope
TRM4 = Metal Trim Ring, Specify Finish
TRR4 = Rimless Trim Ring
H347 = 347V Stepdown Transformer, 75VA
H347200 = 347V Stepdown Transformer, 200VA

* See accessories section for ordering details. Order housing, trim, lamp and accessories separately.

PAR DOWNLIGHT

20W, 39W PAR20

Catalog Number

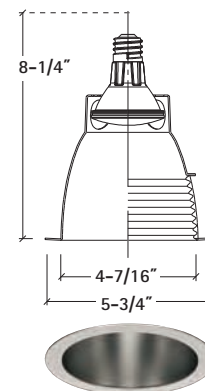
TRIM _____
4200 = 4" PAR20 Reflector, White Polymer Trim Ring
4201 = 4" PAR20 Reflector, Self Flanged

FINISH

LI = Specular Clear, Low Iridescent
H = Semi Specular Clear
WMH = Warm Haze
G = Gold
WH = Wheat
WHH = Wheat Haze
GP = Graphite
GPH = Graphite Haze
K = Cognac
KH = Cognac Haze
CC = Chocolate
CCH = Chocolate Haze
B = Black
BB = Black Baffle (Polymer Trim Ring Only)
WB = White Baffle (Polymer Trim Ring Only)

OPTIONS

WF = White Painted Flange (Self Flanged only)



PAR DOWNLIGHT

20W, 39W, 70W PAR30L

Catalog Number

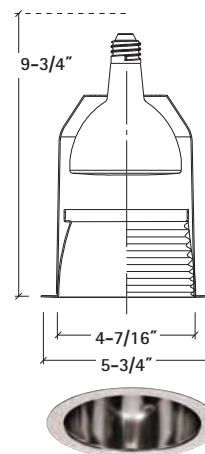
TRIM _____
4300 = 4" PAR30L Reflector, White Polymer Trim Ring
4301 = 4" PAR30L Reflector, Self Flanged

FINISH

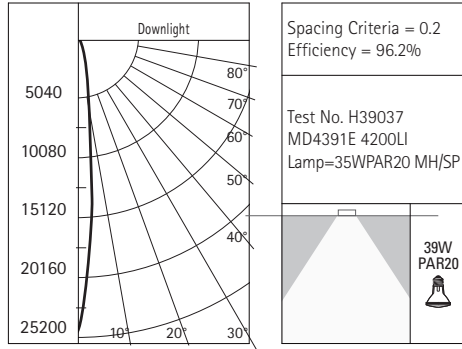
LI = Specular Clear, Low Iridescent
H = Semi Specular Clear
WMH = Warm Haze
G = Gold
WH = Wheat
WHH = Wheat Haze
GP = Graphite
GPH = Graphite Haze
K = Cognac
KH = Cognac Haze
CC = Chocolate
CCH = Chocolate Haze
B = Black
BB = Black Baffle (Polymer Trim Ring Only)
WB = White Baffle (Polymer Trim Ring Only)

OPTIONS

WF = White Painted Flange (Self Flanged only)



Candlepower Distribution Curve



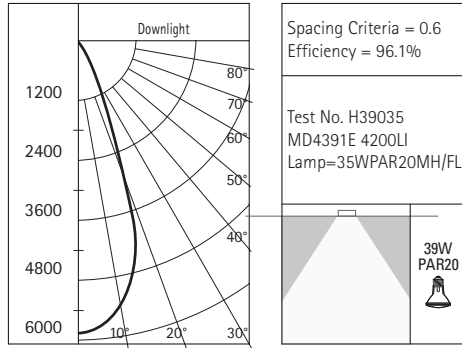
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
6' 6"	596	1' 0"
8'	393	1' 6"
10'	252	1' 6"
12'	175	2' 0"
14'	128	2' 6"
16'	98	2' 6"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	115	115	115	115	112	112	112	107	107
1	112	110	108	107	108	106	105	104	102
2	109	106	104	102	104	102	101	102	99
3	107	103	100	98	102	99	97	100	96
4	104	100	97	95	99	97	95	98	94
5	102	98	95	93	97	94	92	96	91
6	100	96	93	91	95	93	90	94	90
7	98	94	91	89	93	90	88	92	88
8	97	92	89	87	92	89	87	91	86
9	95	90	87	85	90	87	85	89	85
10	93	89	86	84	88	86	84	88	84

Candlepower Distribution Curve



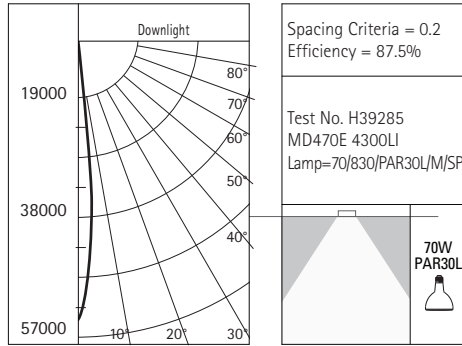
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
5' 6"	186	3' 6"
6' 6"	133	4' 0"
8' 0"	88	5' 0"
10' 0"	56	6' 0"
12' 0"	39	7' 6"
14' 0"	29	8' 6"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	114	114	114	114	112	112	112	107	107
1	111	109	107	106	107	106	104	103	101
2	108	105	102	100	103	101	99	100	97
3	105	101	98	96	100	97	95	98	94
4	103	98	95	92	97	94	92	95	91
5	100	95	91	89	94	91	89	93	88
6	98	93	89	87	92	89	86	91	86
7	95	90	86	84	89	86	84	88	83
8	93	87	84	81	87	84	81	86	81
9	91	85	82	79	85	81	79	84	79
10	89	83	79	77	83	79	77	82	77

Candlepower Distribution Curve



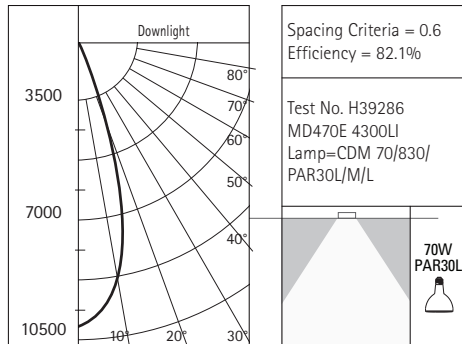
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
10'	557	3.5'
12.5'	357	4.5'
15'	248	5.5'
17.5'	182	6.5'
20'	139	7.5'
25'	89	9.5'

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	104	104	104	104	102	102	102	97	97
1	101	99	98	97	98	96	95	94	92
2	98	96	93	91	94	92	90	90	88
3	96	92	89	87	91	89	87	87	85
4	93	89	86	84	88	86	84	87	83
5	91	87	84	81	86	83	81	85	80
6	89	85	82	79	84	81	79	83	79
7	87	83	80	77	82	79	77	81	77
8	86	81	78	76	81	78	76	80	75
9	84	79	76	75	79	76	74	78	74
10	83	78	75	73	78	75	73	77	73

Candlepower Distribution Curve



Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
8' 0"	163	6' 6"
9' 0"	129	7' 6"
10' 0"	104	8' 6"
12' 6"	67	10' 6"
15' 0"	46	12' 6"
20' 0"	26	16' 6"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	98	98	98	98	95	95	95	91	91
1	94	92	90	89	90	89	87	87	85
2	90	87	84	82	86	83	81	83	79
3	87	83	79	77	82	79	76	80	75
4	84	79	75	72	78	74	72	76	71
5	81	75	71	68	74	71	68	73	68
6	78	72	68	65	71	68	65	70	65
7	75	69	65	62	69	65	62	68	62
8	73	66	62	60	66	62	60	65	59
9	70	64	60	57	64	60	57	63	57
10	68	62	58	55	61	58	55	61	55

METAL HALIDE DIRECTIONAL PAR20 LAMP TO 39W

Open directional downlight using a single PAR20 ceramic metal halide lamp. Use for vertical downlighting in sloped ceiling or for accent/display lighting. Lockable 365° rotation and 35° tilt with center beam optics providing full output with no flashback. Medium base extended husk socket accepts lamps suitable for open fixture use only. Integral electronic ballast with UNV 120/277V input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	16-1/16"	14-7/16"	9-11/16"	5-1/8"
Chicago Plenum	16-1/16"	14-7/16"	9-11/16"	

Catalog Number

HOUSING

MA4 = 4" MH Directional / Slope Housing
 MA4CP = 4" MH Directional / Slope Housing,
 CCEA Listed for City of Chicago
 Plenum Requirements

WATTAGE

20 = 20W MH Lamp
 39 = 39W MH Lamp

BALLAST

E = Electronic, UNV 120/277V 50/60Hz

ACCESSORIES

HB26 = Bar Hanger, 26" Long, Pair
 HB50 = Bar Hanger, 50" Long, Pair
 RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
 LC20 = Lens Clip for PAR20 Lamps
 H347 = 347V Stepdown Transformer, 75VA

See accessories section for ordering details.
 Order housing, trim, lamp and accessories separately.

Catalog Number

TRIM

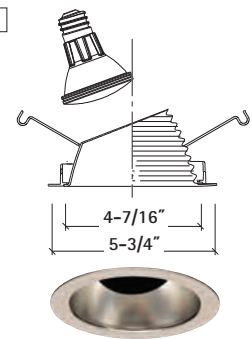
9471 = 4" Angle Cut Reflector, Self Flanged
 9473 = 4" Angle Cut Reflector, White Painted
 Die Cast Aluminum Trim Ring

FINISH

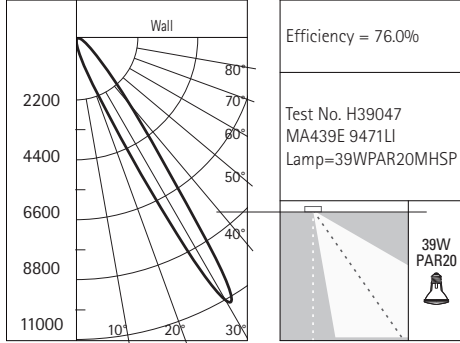
LJ = Specular Clear, Low Iridescent
 H = Semi Specular Clear
 WMH = Warm Haze
 G = Gold
 WH = Wheat
 WHH = Wheat Haze
 GP = Graphite
 GPH = Graphite Haze
 K = Cognac
 KH = Cognac Haze
 CC = Chocolate
 CCH = Chocolate Haze
 B = Black
 BB = Black Baffle (Polymer Trim Ring Only)
 WB = White Baffle (Polymer Trim Ring Only)

OPTIONS

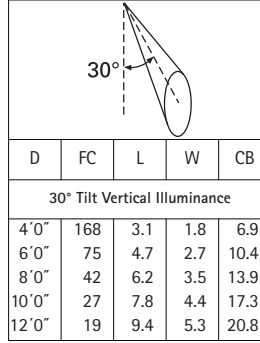
WF = White Painted Flange (Self Flanged only)



Candlepower Distribution Curve



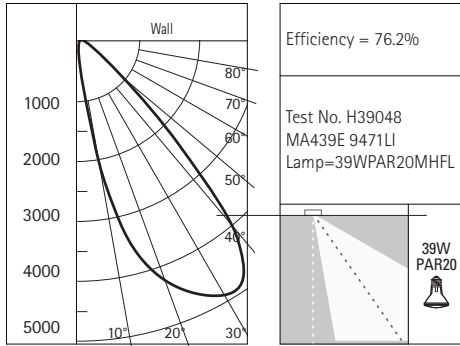
Cone of Light



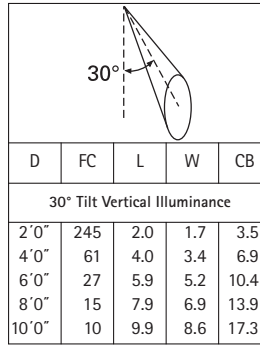
Single Unit Footcandles

		Single fixture 3' from wall - 30° aim (distance from fixture along wall)					
DD	■	1'	2'	3'	4'	5'	6'
1	4	0	0	0	0	0	0
2	16	6	1	0	0	0	0
3	89	30	6	0	0	0	0
4	215	58	12	2	1	0	0
5	278	64	15	4	1	0	0
6	141	40	12	5	2	0	0
7	41	19	8	4	2	1	0
8	10	9	5	3	2	1	0
9	6	5	3	2	2	1	1
10	5	3	2	1	1	1	1

Candlepower Distribution Curve



Cone of Light



Single Unit Footcandles

		Single fixture 3' from wall - 30° aim (distance from fixture along wall)					
DD	■	1'	2'	3'	4'	5'	6'
1	0	0	0	0	0	0	0
2	10	4	1	0	0	0	0
3	68	29	5	1	0	0	0
4	108	61	14	2	0	0	0
5	78	62	22	4	1	0	0
6	50	44	22	6	2	0	0
7	33	30	18	6	2	1	0
8	22	20	13	6	2	1	0
9	16	14	10	5	2	1	0
10	11	10	7	4	2	1	1





METAL HALIDE DOWNLIGHT T4 AND T6 LAMPS TO 150W

Recessed lens downlight with 6" aperture with vertical T4/T6 G12 ceramic metal halide lamp. Available in narrow, medium and wide distributions. Fixture is suitable for commercial construction. Installation must be kept 3" from top and sides of housing. Two stage reflector system produces smooth distributions with excellent light control and low aperture brightness. Integral electronic ballast with UNV 120/277V (except 150W) input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	16-1/16"	14-1/16"	10-3/16"	6-3/8"
Chicago Plenum	16-1/16"	14-1/16"	10-3/16"	

Catalog Number

HOUSING

MD6 = 6" MH Housing
 MD6CP = 6" MH Housing, CCEA Listed for City of Chicago Plenum Requirements

WATTAGE

20T4G12 = 20W T4 G12 CMH
 39T6G12 = 39W T6 G12 CMH
 70T6G12 = 70W T6 G12 CMH
 150T6G12 = 150W T6 G12 CMH
 20T4G65 = 20W T4 GU6.5 CMH LAMP
 39T4G65 = 39W T4 GU6.5 CMH LAMP
 20T4G85 = 20W T4 G8.5 CMH LAMP
 39T4G85 = 39W T4 G8.5 CMH LAMP
 70T4G85 = 70W T4 G8.5 CMH LAMP

BALLAST

E = Electronic, UNV 120/277V 50/60Hz¹
 1E = Electronic, 120V 50/60Hz³
 2E = Electronic, 277V 50/60Hz³

OPTION

Q = Quartz Re-strike System²
 X = Emergency Circuit Lamp

ACCESSORIES

HB26 = Bar Hanger, 26" Long, Pair
 HB50 = Bar Hanger, 50" Long, Pair
 RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
 HSA6* = Slope Adapter for 6" Aperture, Specify Slope
 TRM6* = Metal Trim Ring, Specify Finish
 TRR6 = Rimless Trim Ring
 FK = Field Installed Fuse Kit, Specify Amperage

* See accessories section for ordering details.

Order housing, trim, lamp and accessories separately.

NOTE: 1. Available with 39 and 70W only 2. Not available with 20W, must use 1E or 2E option with 50 and 150W 3. Available with 150w only

Catalog Number

TRIM

6950 = 6" Reflector, White Polymer Trim Ring
 6950X = 6" Reflector, White Polymer Trim Ring, Standby Lamp
 6951 = 6" Reflector, Self Flanged
 6951X = 6" Reflector, Self Flanged, Standby Lamp

DISTRIBUTION

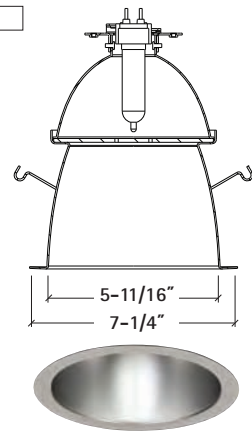
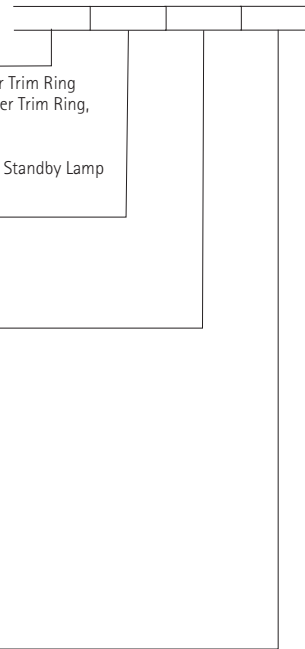
N= Narrow
 M= Medium
 W= Wide

FINISH

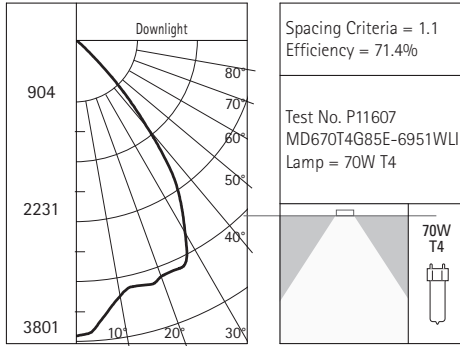
LI = Specular Clear, Low Iridescent
 H = Semi specular Clear
 WMH = Warm Haze
 G = Gold
 WH = Wheat
 WHH = Wheat Haze
 GP = Graphite
 GPH = Graphite Haze
 K = Cognac
 KH = Cognac Haze
 CC = Chocolate
 CCH = Chocolate Haze
 B = Black

OPTIONS

WF = White Painted Flange (Self Flanged Only)



Candlepower Distribution Curve



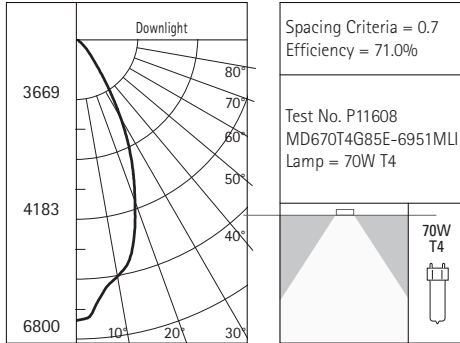
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
8' 0"	59	9' 0"
10' 0"	38	11' 0"
12' 0"	26	13' 6"
15' 0"	17	17' 0"
20' 0"	10	22' 6"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	85	85	85	85	83	83	83	79	79
1	81	79	77	75	77	76	74	74	72
2	77	73	70	67	72	69	67	69	65
3	72	67	64	61	66	63	60	65	59
4	68	63	58	55	62	58	55	60	54
5	64	58	54	50	57	53	50	56	50
6	61	54	49	46	53	49	46	52	46
7	57	50	46	43	50	45	42	49	42
8	54	47	42	39	47	42	39	46	39
9	51	44	39	36	44	39	36	43	36
10	49	41	37	34	41	37	34	40	34

Candlepower Distribution Curve



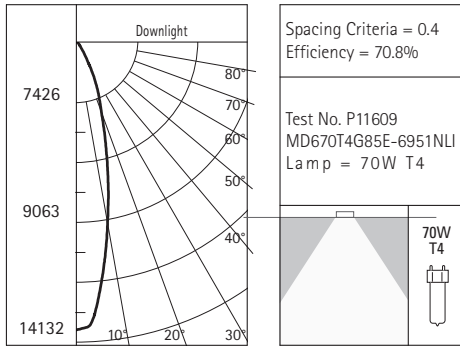
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
8' 0"	106	6' 0"
10' 0"	68	7' 6"
12' 0"	47	9' 0"
15' 0"	30	11' 0"
20' 0"	17	15' 0"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	85	85	85	85	83	83	83	79	79
1	81	79	77	76	77	76	75	75	72
2	77	74	71	69	73	70	68	70	67
3	74	69	66	63	68	65	63	67	62
4	70	65	61	59	64	61	58	63	58
5	67	61	57	55	61	57	54	59	54
6	64	58	54	51	57	54	51	56	51
7	61	55	51	48	54	50	48	53	48
8	58	52	48	45	51	48	45	51	45
9	56	49	45	43	49	45	43	48	42
10	53	47	43	40	46	43	40	46	40

Candlepower Distribution Curve



Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
12' 0"	98	5' 0"
15' 0"	63	6' 6"
20' 0"	35	8' 6"
25' 0"	23	11' 0"
30' 0"	16	13' 0"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	84	84	84	84	82	82	82	79	79
1	81	79	78	77	78	77	75	75	73
2	78	75	73	71	74	72	70	72	68
3	75	71	68	66	70	67	65	68	64
4	72	68	64	62	67	64	62	65	61
5	69	64	61	59	64	61	58	63	58
6	67	62	58	56	61	58	55	60	55
7	64	59	56	53	59	55	53	58	53
8	62	57	53	51	56	53	51	55	50
9	60	54	51	49	54	51	49	53	48
10	58	52	49	47	52	49	47	52	47

6" APERTURE

METAL HALIDE OPEN/OPEN WALL WASH/LENS DOWNLIGHTED17P AND PAR LAMPS TO 150W

Medium and wide beam downlight for general lighting from a single vertically mounted ED17P metal halide lamp or PAR lamp downlight for general and task lighting. Adjustable socket position maintains focus for varied reflector types. Medium base extended husk socket accepts lamps suitable for open fixture use only (except housings designated for PAR38 only). Optional quartz standby lamp installs through designated trim versions. Integral electronic ballast with UNV 120/277V (except 150W) input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	12-13/16"	13-5/8"	H	6-3/8"
Chicago Plenum	12-13/16"	13-5/8"	H	

Height varies with socket position; see reflector data for fixture height. Add 1/2" height for Chicago Plenum option.

Catalog Number	HOUSING	WATTAGE	BALLAST	OPTION
MD6	6" Universal MH Housing	20 = 20W MH Lamp	E = Electronic, UNV 120/277V 50/60Hz ¹	Q = Quartz Re-strike System ³
MD6CP	6" Universal MH Housing, CCEA Listed for City of Chicago Plenum Requirements	39 = 39W MH Lamp	1E = Electronic, 120V 50/60Hz ²	
		50 = 50W MH Lamp	2E = Electronic, 277V 50/60Hz ²	
		70 = 70W MH Lamp		
		100 = 100W MH Lamp		
		150 = 150W MH Lamp		

- ACCESSORIES**
- HB26 = Bar Hanger, 26" Long, Pair
 - HB50 = Bar Hanger, 50" Long, Pair
 - RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
 - HSAG* = Slope Adapter for 6" Aperture, Specify Slope
 - TRM6* = Metal Trim Ring, Specify Finish
 - TRR6 = Rimless Trim Ring
 - ECL = Emergency Circuit Lamp—Accessible Ceilings Only
 - H347 = 347V Stepdown Transformer, 75VA
 - H347200 = 347V Stepdown Transformer, 200VA

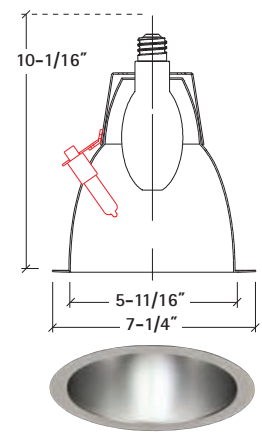
* See accessories section for ordering details. Order housing, trim, lamp and accessories separately.

NOTE: 1. Not available with 150W **2.** Available with 150W only **3.** Not available in 20W, must use 1E or 2E option with 50 and 150W, accessible ceilings only

MEDIUM BEAM DOWNLIGHT

150W MAX ED17P

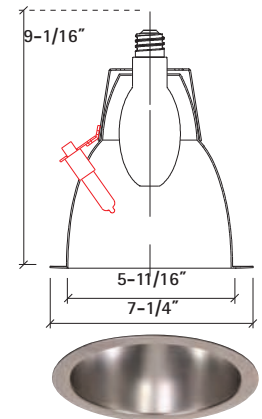
Catalog Number	TRIM	FINISH	OPTIONS
6700	6" Medium Beam Reflector, White Polymer Trim Ring	LI = Specular Clear, Low Iridescent	WF = White Painted Flange (Self Flanged Only)
6700X	6" Medium Beam Reflector, White Polymer Trim Ring, Standby Lamp	H = Semi Specular Clear Haze	
6701	6" Medium Beam Reflector, Self Flanged	WMH = Warm Haze	
6701X	6" Medium Beam Reflector, Self Flanged, Standby Lamp	G = Gold	
		WH = Wheat	
		WHH = Wheat Haze	
		GP = Graphite	
		GPH = Graphite Haze	
		K = Cognac	
		KH = Cognac Haze	
		CC = Chocolate	
		CCH = Chocolate Haze	
		B = Black	
		BB = Black Baffle (Polymer Trim Ring Only)	
		WB = White Baffle (Polymer Trim Ring Only)	



WIDE BEAM DOWNLIGHT

150W MAX ED17P

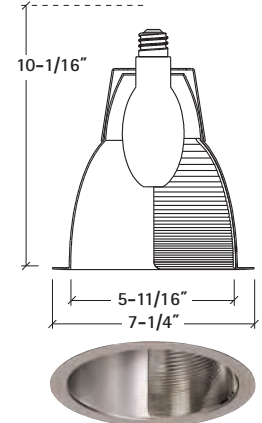
Catalog Number	TRIM	FINISH	OPTIONS
6750	6" Wide Beam Reflector, White Polymer Trim Ring	LI = Specular Clear, Low Iridescent	WF = White Painted Flange (Self Flanged Only)
6750X	6" Wide Beam Reflector, White Polymer Trim Ring, Standby Lamp	H = Semi Specular Clear Haze	
6751	6" Wide Beam Reflector, Self Flanged	WMH = Warm Haze	
6751X	6" Wide Beam Reflector, Self Flanged, Standby Lamp	G = Gold	
		WH = Wheat	
		WHH = Wheat Haze	
		GP = Graphite	
		GPH = Graphite Haze	
		K = Cognac	
		KH = Cognac Haze	
		CC = Chocolate	
		CCH = Chocolate Haze	
		B = Black	



GRUVI™ OPEN WALL WASH

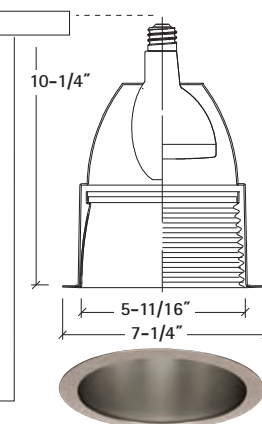
150W MAX ED17P

Catalog Number	TRIM	FINISH	OPTIONS
6710	6" Single Open Wall Wash, White Polymer Trim Ring	LI = Specular Clear, Low Iridescent	WF = White Painted Flange (Self Flanged Only)
6711	6" Single Open Wall Wash, Self Flanged	H = Semi Specular Clear Haze	
6720	6" Double Open Wall Wash, White Polymer Trim Ring	WMH = Warm Haze	
6721	6" Double Open Wall Wash, Self Flanged	G = Gold	
6730	6" Corner Open Wall Wash, White Polymer Trim Ring	WH = Wheat	
6731	6" Corner Open Wall Wash, Self Flanged	WHH = Wheat Haze	
		GP = Graphite	
		GPH = Graphite Haze	
		K = Cognac	
		KH = Cognac Haze	
		CC = Chocolate	
		CCH = Chocolate Haze	
		B = Black	

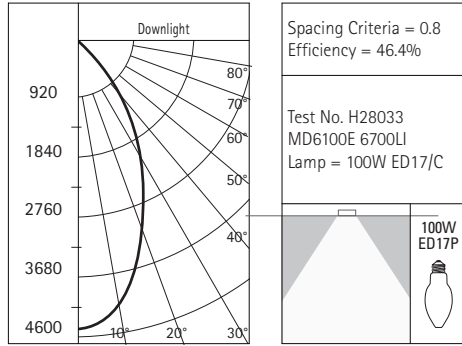


LENS DOWNLIGHT 100W MAX ED17P or 39W, 70W PAR30L

Catalog Number	TRIM	FINISH	LENS	OPTIONS
6780	6" Lens, White Polymer Trim Ring	LI = Specular Clear, Low Iridescent	1G = Prismatic Glass	WF = White Painted Flange (Self Flanged Only)
6781	6" Lens, Self Flanged	H = Semi Specular Clear Haze	2G = Diffuse Glass	
		WMH = Warm Haze	3G = Clear Glass	
		G = Gold	4G = Fresnel Glass	
		WH = Wheat		
		WHH = Wheat Haze		
		GP = Graphite		
		GPH = Graphite Haze		
		K = Cognac		
		KH = Cognac Haze		
		CC = Chocolate		
		CCH = Chocolate Haze		
		B = Black		
		BB = Black Baffle (Polymer Trim Ring Only)		
		WB = White Baffle (Polymer Trim Ring Only)		



Candlepower Distribution Curve



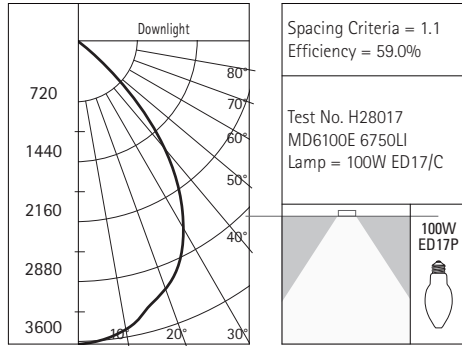
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
5' 6"	150	4' 6"
6' 6"	108	5' 6"
8' 0"	71	6' 6"
10' 0"	45	8' 6"
12' 0"	32	10' 0"
14' 0"	23	11' 6"

Coefficients of Utilization

Ceiling Wall % RCR	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
0	55	55	55	55	54	54	54	52	52
1	53	52	51	50	51	50	49	49	48
2	51	49	47	46	48	47	46	47	45
3	49	46	44	43	46	44	42	45	42
4	47	44	42	40	43	41	40	42	39
5	45	41	39	37	41	39	37	40	37
6	43	39	37	35	39	37	35	38	35
7	41	37	35	33	37	35	33	36	33
8	39	35	33	31	35	32	31	34	3
9	37	33	31	29	33	30	29	32	29
10	35	31	29	27	31	29	27	31	27

Candlepower Distribution Curve



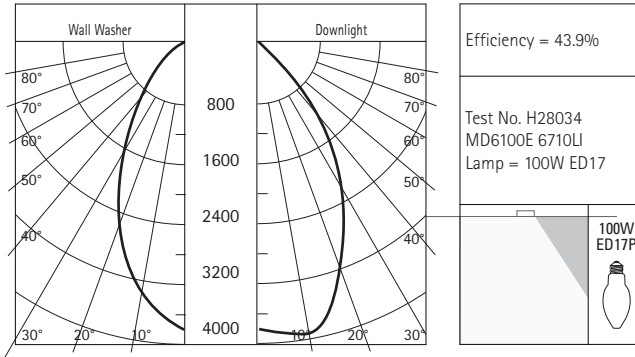
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
5' 6"	120	6' 0"
6' 6"	86	7' 0"
8' 0"	57	8' 6"
10' 0"	36	11' 0"
12' 0"	25	13' 0"
14' 0"	18	15' 6"

Coefficients of Utilization

Ceiling Wall % RCR	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
0	70	70	70	70	69	69	69	66	66
1	67	65	64	63	64	63	62	62	60
2	64	61	59	57	60	58	56	58	55
3	61	57	54	52	56	53	51	54	50
4	57	53	50	47	52	49	47	51	47
5	54	49	46	43	49	46	43	48	43
6	51	46	42	40	46	42	40	45	40
7	48	43	39	36	42	39	36	42	36
8	45	40	36	33	39	36	33	39	33
9	43	37	33	30	36	33	30	36	30
10	40	34	30	28	34	30	28	33	28

Candlepower Distribution Curve



Single Unit Footcandles

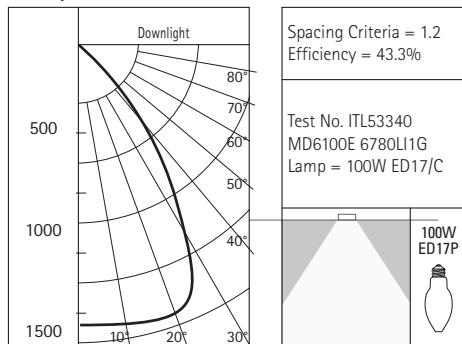
DD	2' 6" from wall (distance from fixture along wall)					
	1'	2'	3'	4'	5'	6'
1	20	15	6	2	1	0
2	29	23	10	4	1	0
3	34	24	10	5	2	1
4	33	27	14	5	2	1
5	27	24	16	8	3	1
6	21	19	14	9	4	2
7	15	14	11	8	5	3
8	12	11	9	7	5	3
9	9	8	7	6	4	3
10	7	7	6	5	4	3

Multiple Unit Footcandles

DD	2' 6" from wall (spacing between fixtures)			3' from wall (spacing between fixtures)								
	3'	4'	6'	4'	6'	6'						
1	25	20	25	22	13	22	16	16	16	13	10	13
2	37	34	37	32	21	32	28	28	28	23	18	23
3	43	35	43	38	22	38	31	30	31	25	21	25
4	45	44	45	37	30	37	35	34	35	29	23	29
5	43	44	43	33	33	33	37	37	37	29	28	29
6	39	39	39	30	29	30	36	36	36	28	28	28
7	33	33	33	25	25	25	33	33	33	25	25	25
8	27	28	27	21	22	21	28	29	28	23	23	22
9	22	23	22	18	18	18	24	25	24	19	20	19
10	19	19	19	15	16	15	20	21	20	17	17	17



Candlepower Distribution Curve



Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
7' 0"	28	9' 0"
8' 0"	22	10' 3"
9' 0"	17	11' 6"
10' 0"	14	12' 9"
12' 6"	9	16' 1"
15' 0"	6	19' 4"

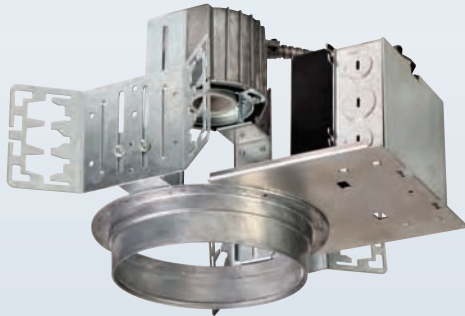
Coefficients of Utilization

Ceiling Wall % RCR	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
0	52	52	52	52	50	50	50	48	48
1	49	47	46	45	46	45	44	44	43
2	45	43	41	39	42	40	38	41	37
3	42	39	36	34	38	36	34	37	33
4	39	35	32	30	35	32	30	34	30
5	37	32	29	27	32	29	27	31	26
6	34	30	26	24	29	26	24	29	24
7	32	27	24	22	27	24	22	26	22
8	30	25	22	20	25	22	20	24	20
9	28	23	20	18	23	20	18	23	18
10	27	22	19	17	21	19	17	21	16

6" APERTURE

METAL HALIDE OPEN/OPEN WALL WASH/LENS DOWNLIGHT ED17P AND PAR LAMPS TO 150W

Medium and wide beam downlight for general lighting from a single vertically mounted ED17P metal halide lamp or PAR lamp downlight for general and task lighting. Adjustable socket position maintains focus for varied reflector types. Medium base extended husk socket accepts lamps suitable for open fixture use only (except housings designated for PAR38 only). Optional quartz standby lamp installs through designated trim versions. Integral electronic ballast with UNV 120/277V (except 150W) input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	12-13/16"	13-5/8"	H	6-3/8"
Chicago Plenum	12-13/16"	13-5/8"	H	

Height varies with socket position; see reflector data for fixture height. Add 1/2" height for Chicago Plenum option.

Catalog Number

HOUSING

MD6 = 6" Universal MH Housing
MD6CP = 6" Universal MH Housing, CCEA Listed for City of Chicago Plenum Requirements

WATTAGE

20 = 20W MH Lamp
39 = 39W MH Lamp
70 = 70W MH Lamp
70P38 = 70W PAR38 MH Lamp
100P38 = 100W PAR38 MH Lamp
150P38 = 150W PAR38 MH Lamp

BALLAST

E = Electronic, UNV 120/277V 50/60Hz¹
1E = Electronic, 120V 50/60Hz²
2E = Electronic, 277V 50/60Hz²

OPTION

Q = Quartz Re-strike System³

ACCESSORIES

HB26 = Bar Hanger, 26" Long, Pair
HB50 = Bar Hanger, 50" Long, Pair
RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
HSA6* = Slope Adapter for 6" Aperture, Specify Slope
TRM6* = Metal Trim Ring, Specify Finish
TRR6 = Rimless Trim Ring
ECL = Emergency Circuit Lamp—Accessible Ceilings Only
H347 = 347V Stepdown Transformer, 75VA
H347200 = 347V Stepdown Transformer, 200VA

* See accessories section for ordering details.
Order housing, trim, lamp and accessories separately.

NOTE: 1. Not available with 150W 2. Available with 50 and 150W only 3. Not available in 20W, must use 1E or 2E option with 50 and 150W, accessible ceilings only

PAR DOWNLIGHT

20W, 39W, 70W PAR30L

Catalog Number

TRIM

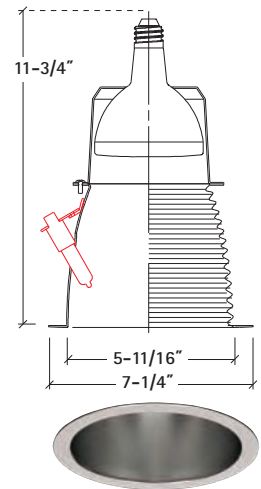
6500 = 6" PAR30L Reflector, White Polymer Trim Ring
6500X = 6" PAR30L Reflector, White Polymer Trim Ring, Standby Lamp
6501 = 6" PAR30L Reflector, Self Flanged
6501X = 6" PAR30L Reflector, Self Flanged, Standby Lamp

FINISH

LI = Specular Clear, Low Iridescent
H = Semi Specular Clear Haze
WMH = Warm Haze
G = Gold
WH = Wheat
WHH = Wheat Haze
GP = Graphite
GPH = Graphite Haze
K = Cognac
KH = Cognac Haze
CC = Chocolate
CCH = Chocolate Haze
B = Black
BB = Black Baffle (Polymer Trim Ring Only)
WB = White Baffle (Polymer Trim Ring Only)

OPTIONS

WF = White Painted Flange (Self Flanged Only)



PAR DOWNLIGHT

70W, 100W, 150W

Catalog Number

TRIM

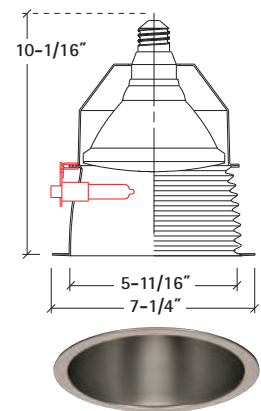
6600 = 6" PAR38 Reflector, White Polymer Trim Ring
6600X = 6" PAR38 Reflector, White Polymer Trim Ring, Standby Lamp
6601 = 6" PAR38 Reflector, Self Flanged
6601X = 6" PAR38 Reflector, Self Flanged, Standby Lamp

FINISH

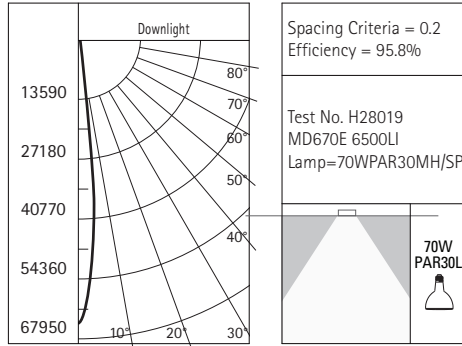
LI = Specular Clear, Low Iridescent
H = Semi Specular Clear Haze
WMH = Warm Haze
G = Gold
WH = Wheat
WHH = Wheat Haze
GP = Graphite
GPH = Graphite Haze
K = Cognac
KH = Cognac Haze
CC = Chocolate
CCH = Chocolate Haze
B = Black
BB = Black Baffle (Polymer Trim Ring Only)
WB = White Baffle (Polymer Trim Ring Only)

OPTIONS

WF = White Painted Flange (Self Flanged Only)



Candlepower Distribution Curve



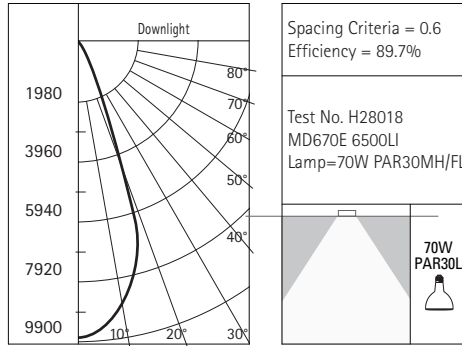
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
6' 6"	1599	1' 0"
8'	1055	1' 6"
10'	675	2' 0"
12'	469	2' 0"
14'	345	2' 6"
16'	264	3' 0"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	114	114	114	114	111	111	111	106	106
1	111	110	108	107	108	106	105	104	102
2	109	106	104	102	105	103	101	102	99
3	107	104	101	99	102	100	98	100	97
4	105	101	98	96	100	98	96	98	95
5	103	99	96	94	98	96	94	97	93
6	102	97	95	93	97	94	93	96	92
7	100	96	93	91	95	93	91	94	91
8	99	94	92	90	94	91	90	93	89
9	97	93	91	89	93	90	89	92	88
10	96	92	89	88	92	89	88	91	87

Candlepower Distribution Curve



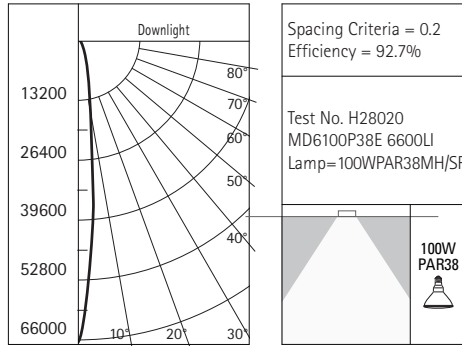
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
5' 6"	325	3' 6"
6' 6"	233	4' 0"
8' 0"	154	5' 0"
10' 0"	98	6' 6"
12' 0"	68	8' 0"
14' 0"	50	9' 0"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	107	107	107	107	104	104	104	103	100
1	104	102	100	99	100	99	97	96	94
2	101	98	95	93	96	94	92	94	90
3	98	95	92	89	93	91	89	91	87
4	96	91	88	86	91	88	85	89	85
5	93	88	85	83	88	85	82	86	82
6	91	86	83	81	86	82	80	84	80
7	89	84	80	78	83	80	78	82	77
8	86	81	78	76	81	78	75	80	75
9	84	79	76	73	79	75	73	78	73
10	82	77	74	72	77	74	71	76	71

Candlepower Distribution Curve



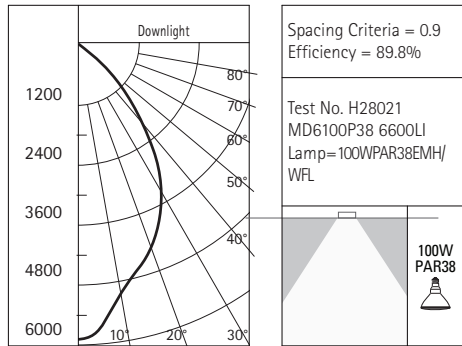
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
6' 6"	1566	1' 6"
8' 0"	1034	1' 6"
10' 0"	662	2' 0"
12' 0"	459	2' 6"
14' 0"	338	3' 0"
16' 0"	258	3' 0"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	110	110	110	110	108	108	108	103	103
1	107	106	104	103	104	103	102	100	98
2	105	102	100	98	101	99	97	98	95
3	103	100	97	95	98	96	94	96	93
4	101	97	94	92	96	94	92	94	91
5	99	95	92	90	94	91	89	93	89
6	97	93	90	88	92	90	88	91	87
7	95	91	88	86	91	88	86	90	86
8	94	89	87	85	89	86	85	88	84
9	92	88	85	83	88	85	83	87	83
10	91	87	84	82	86	84	82	86	82

Candlepower Distribution Curve



Cone of Light

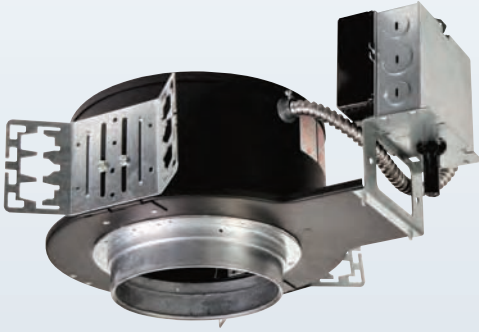
Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
5' 6"	196	5' 0"
6' 6"	140	6' 0"
8' 0"	92	7' 6"
10' 0"	59	9' 6"
12' 0"	41	11' 0"
14' 0"	30	13' 0"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	107	107	107	107	104	104	104	100	100
1	102	100	98	96	98	96	94	94	91
2	98	94	90	88	92	89	87	89	85
3	93	88	84	80	87	83	80	84	79
4	89	83	78	74	82	77	74	80	73
5	84	77	72	69	77	72	68	75	68
6	80	73	68	64	72	67	64	71	63
7	76	68	63	59	67	62	59	66	59
8	72	64	58	55	63	58	55	62	54
9	68	59	54	50	59	54	50	58	50
10	64	55	50	47	55	50	47	54	46

METAL HALIDE SHALLOW DOWNLIGHT ED17 LAMP TO 70W

Wide beam downlight for general lighting from a single horizontally mounted ED17 metal halide lamp. Low profile allows use where vertical clearance is limited. Use with lamps suitable for enclosed fixtures. Integral electronic ballast with UNV 120/277V input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	18-5/8"	18"	9-7/8"	6-3/8"

Catalog Number

HOUSING
 MD6S = 6" Shallow MH Housing
 MD6SCP = 6" Shallow MH Housing,
 CCEA Listed for City of Chicago
 Plenum Requirements

WATTAGE
 50 = 50W MH Lamp
 70 = 70W MH Lamp

BALLAST
 E = Electronic, UNV 120/277V 50/60Hz

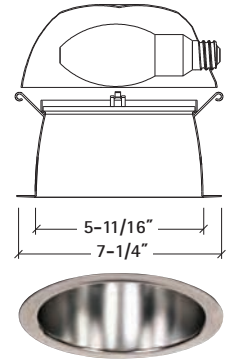
ACCESSORIES
 HB26 = Bar Hanger, 26" Long, Pair
 HB50 = Bar Hanger, 50" Long, Pair
 RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
 HSA6* = Slope Adapter for 6" Aperture, Specify Slope
 TRM6* = Metal Trim Ring, Specify Finish
 TRR6 = Rimless Trim Ring
 H347 = 347V Stepdown Transformer, 75VA
 H347200 = 347V Stepdown Transformer, 200VA

* See accessories section for ordering details.
 Order housing, trim, lamp and accessories separately.

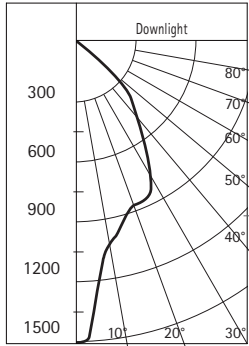
Catalog Number

TRIM
 6140 = 6" Wide Beam Reflector, White Polymer Trim Ring
 6141 = 6" Wide Beam Reflector, Self Flanged

FINISH
 LI = Specular Clear, Low Iridescent
 H = Semi specular Clear
 WMH = Warm Haze
 G = Gold
 WH = Wheat
 WHH = Wheat Haze
 GP = Graphite
 GPH = Graphite Haze
 K = Cognac
 KH = Cognac Haze
 CC = Chocolate
 CCH = Chocolate Haze
 B = Black
OPTIONS
 WF = White Painted Flange (Self Flanged only)



Candlepower Distribution Curve



Spacing Criteria = 0.7
Efficiency = 53.0%

Test No. H28068
MD6S50E 6141LI
Lamp = MP50/CU/U/MED

50W
ED17

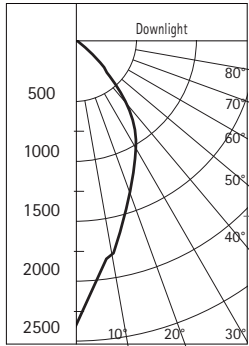
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
4' 0"	93	2' 6"
6' 0"	41	4' 0"
8' 0"	23	5' 0"
10' 0"	15	6' 6"
12' 0"	10	8' 0"
14' 0"	8	9' 0"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	63	63	63	63	62	62	62	59	59
1	60	58	56	55	57	55	54	55	52
2	56	53	50	48	52	49	47	50	46
3	52	48	45	42	47	44	42	46	41
4	49	44	40	38	43	40	37	42	37
5	46	40	37	34	40	36	34	39	33
6	43	37	33	30	37	33	30	36	30
7	40	34	30	28	34	30	28	33	27
8	38	32	28	25	31	28	25	31	25
9	35	29	26	23	29	26	23	29	23
10	34	27	24	21	27	24	21	27	21

Candlepower Distribution Curve



Spacing Criteria = 0.6
Efficiency = 48.8%

Test No. H28075
MD6S70E 6141LI
Lamp = M70/C/U

70W
ED17

Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
4' 0"	139	3' 6"
6' 0"	62	5' 0"
8' 0"	35	6' 6"
10' 0"	22	8' 6"
12' 0"	15	10' 0"
14' 0"	11	11' 6"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	58	58	58	58	57	57	57	54	54
1	55	53	52	50	52	51	49	50	48
2	51	48	46	44	47	45	43	46	42
3	48	44	41	39	43	40	38	42	38
4	45	40	37	34	40	36	34	38	34
5	42	37	33	31	36	33	31	35	30
6	39	34	30	28	33	30	28	33	27
7	37	31	28	25	31	28	25	30	25
8	34	29	25	23	29	25	23	28	23
9	32	27	24	21	27	23	21	26	21
10	31	25	22	20	25	22	20	24	20

METAL HALIDE WALL WASH T4, T6 G12 LAMPS TO 150W

Recessed 6" aperture lens wall wash for T4/T6 G12 ceramic metal halide lamp. Fixture is suitable for commercial construction. Two stage reflector system produces smooth vertical illumination with a minimal downlight component. Integral electronic ballast available in UNV 120/277V (except 150W) input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	16-1/16"	14-3/8"	10-3/16"	6-3/8"
Chicago Plenum	16-1/16"	14-3/8"	10-3/16"	

Catalog Number

HOUSING

MLW6 = 6" CMH Lens Wall Wash
 MLW6CP = 6" CMH Lens Wall Wash, CCEA Listed for City of Chicago Plenum Requirements

WATTAGE

20T4G12 = 20W T4 G12 CMH
 39T6G12 = 39W T6 G12 CMH
 70T6G12 = 70W T6 G12 CMH
 150T6G12 = 150W T6 G12 CMH
 20T4G65 = 20W T4 GU6.5 CMH LAMP
 39T4G65 = 39W T4 GU6.5 CMH LAMP
 20T4G85 = 20W T4 G8.5 CMH LAMP
 39T4G85 = 20W T4 G8.5 CMH LAMP
 70T4G85 = 70W T4 G8.5 CMH LAMP

BALLAST

E = Electronic, UNV 120/277V 50/60Hz¹
 1E = Electronic, 120V 50/60Hz²
 2E = Electronic, 277V 50/60Hz²

OPTION

Q = Quartz Re-strike System³
 X = Emergency Circuit Lamp

ACCESSORIES

HB26 = Bar Hanger, 26" Long, Pair
 HB50 = Bar Hanger, 50" Long, Pair
 RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
 FK = Field Installed Fuse Kit, Specify Amperage

See accessories section for ordering details.
 Order housing, trim, lamp and accessories separately.

NOTE: 1. Not available with 150W 2. Available with 150W only
 3. Not available in 20W, must use 1E or 2E option with 50 and 150W

Catalog Number

TRIM

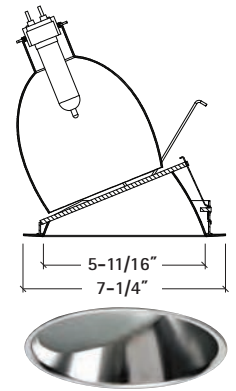
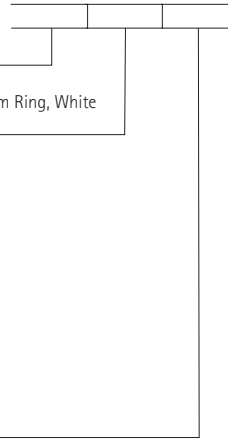
6487 = 6" Lens Wall Wash, Self Flanged
 6489 = 6" Lens Wall Wash, Die-Cast Metal Trim Ring, White

FINISH

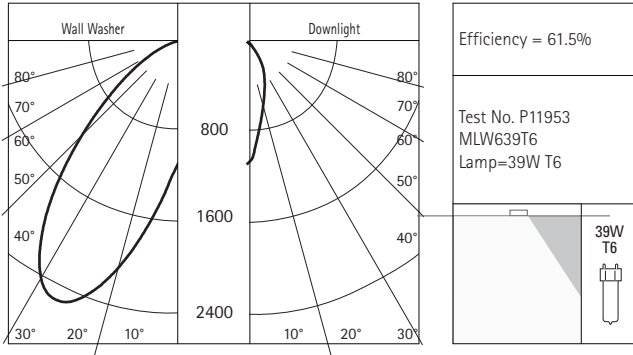
LI = Specular Clear, Low Iridescent
 H = Semi specular Clear
 WMH = Warm Haze
 G = Gold
 WH = Wheat
 WHH = Wheat Haze
 GP = Graphite
 GPH = Graphite Haze
 K = Cognac
 KH = Cognac Haze
 CC = Chocolate
 CCH = Chocolate Haze
 B = Black

OPTIONS

WF = White Painted Flange (Self Flanged only)



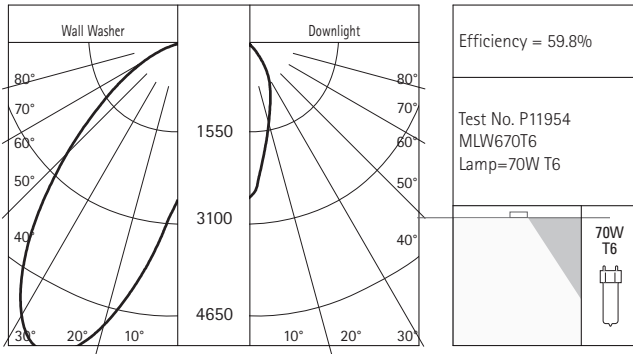
Candlepower Distribution Curve



Single Unit Footcandles

DD	3' from wall (distance from fixture along wall)				3' from wall (spacing between fixtures)			4' from wall (spacing between fixtures)								
	1'	2'	3'	4'	3'	4'	5'	4'	5'							
1	8	6	2	0	9	7	9	3	9	2	1	2	1	2		
2	34	26	13	4	43	39	43	37	25	37	14	12	14	13	9	13
3	49	39	22	10	69	65	69	57	44	57	29	26	29	25	19	25
4	47	40	25	13	75	73	75	59	52	59	39	37	39	33	28	33
5	36	32	22	13	65	65	65	50	48	50	42	41	42	35	31	35
6	25	23	17	11	52	52	52	40	39	40	40	40	40	33	31	33
7	17	16	13	9	40	40	40	31	30	31	35	35	35	28	28	28
8	12	11	9	7	31	31	31	24	24	24	29	29	29	24	23	24
9	8	8	7	5	24	24	24	18	18	18	24	24	24	20	19	20
10	6	6	5	4	19	19	19	14	15	14	20	20	20	16	16	16

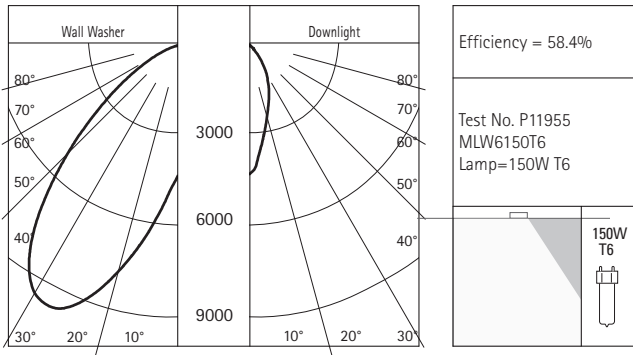
Candlepower Distribution Curve



Single Unit Footcandles

DD	3' from wall (distance from fixture along wall)				3' from wall (spacing between fixtures)			4' from wall (spacing between fixtures)								
	1'	2'	3'	4'	3'	4'	5'	4'	5'							
1	17	11	3	1	18	13	18	17	7	17	4	3	4	4	2	4
2	67	51	25	9	86	77	85	73	50	73	29	25	29	26	17	26
3	94	75	42	19	133	125	133	109	85	109	56	52	56	49	39	49
4	90	75	47	24	143	140	143	113	99	113	75	71	75	64	53	54
5	69	61	42	25	126	125	126	97	92	97	81	78	81	67	60	67
6	49	45	34	22	102	102	102	78	76	78	77	76	77	63	59	63
7	34	32	25	18	80	80	80	61	61	61	68	67	68	55	53	55
8	24	22	19	14	62	63	62	48	48	48	58	57	58	47	46	47
9	17	16	14	12	49	49	49	38	38	38	48	48	48	39	39	39
10	12	12	10	9	38	39	38	30	30	30	40	40	40	32	32	32

Candlepower Distribution Curve

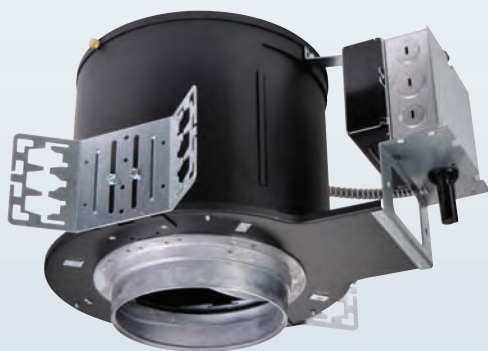


Single Unit Footcandles

DD	3' from wall (distance from fixture along wall)				3' from wall (spacing between fixtures)			4' from wall (spacing between fixtures)								
	1'	2'	3'	4'	3'	4'	5'	4'	5'							
1	27	18	6	1	29	22	29	28	12	28	6	4	6	6	2	6
2	125	94	43	15	155	138	155	133	88	133	48	42	48	44	28	44
3	190	147	49	34	256	239	256	211	161	211	106	96	106	92	69	92
4	172	144	88	44	267	260	267	213	183	213	144	135	144	123	100	123
5	125	110	76	44	225	223	225	174	163	174	153	147	153	128	112	129
6	85	77	58	38	174	174	174	133	130	133	140	138	140	115	107	115
7	57	53	42	30	133	133	133	101	100	101	119	119	119	97	94	97
8	39	36	31	23	101	102	101	78	78	78	98	98	98	80	78	80
9	27	26	22	18	78	78	78	60	61	60	80	80	80	65	64	65
10	19	18	17	14	61	61	61	48	48	48	65	65	65	53	53	53

METAL HALIDE LENS WALL WASH PAR LAMP TO 150W

Lens wall wash provides smooth illumination on vertical surfaces. Optical assembly rotates 365° and locks in position to maintain setting. Housing has top access for lamp replacement above the ceiling. Integral electronic ballast with UNV 120/277V (except 150W) input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	16-1/16"	14-7/16"	10-1/8"	6-3/8"
Chicago Plenum	16-1/16"	14-7/16"	10-1/8"	

Catalog Number

HOUSING

MLW6 = 6" Lens Wall Wash Housing
MLW6CP = 6" Lens Wall Wash Housing,
CCEA Listed for City of Chicago
Plenum Requirements

WATTAGE

39 = 39W MH Lamp
70 = 70W MH Lamp
100 = 100W MH Lamp
150 = 150W MH Lamp

BALLAST

E = Electronic, UNV 120/277V 50/60Hz¹
1E = Electronic, 120V 50/60Hz²
2E = Electronic, 277V 50/60Hz²

ACCESSORIES

HB26 = Bar Hanger, 26" Long, Pair
HB50 = Bar Hanger, 50" Long, Pair
RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
H347 = 347V Stepdown Transformer, 75VA
H347200 = 347V Stepdown Transformer, 200VA

See accessories section for ordering details.
Order housing, trim, lamp and accessories separately.

NOTE: 1. Not available with 150W **2.** Available with 150W only

Catalog Number

TRIM

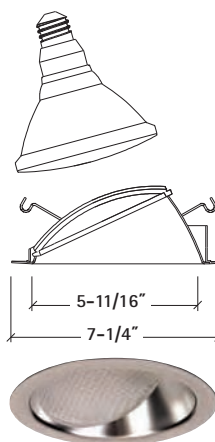
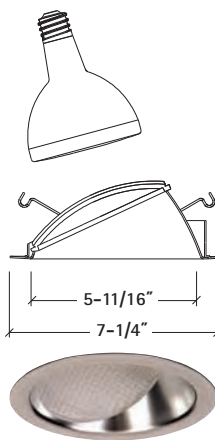
6481 = 6" Lens Wall Wash Reflector, Self Flanged
6483 = 6" Lens Wall Wash Reflector, White Painted Die Cast
Metal Trim Ring

FINISH

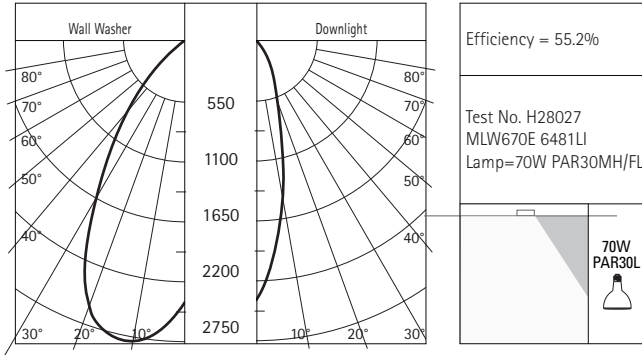
LI = Specular Clear, Low Iridescent
H = Semi specular Clear
WMH = Warm Haze
G = Gold
WH = Wheat
WHH = Wheat Haze
GP = Graphite
GPH = Graphite Haze
K = Cognac
KH = Cognac Haze
CC = Chocolate
CCH = Chocolate Haze
B = Black

OPTIONS

WF = White Painted Flange (Self Flanged only)



Candlepower Distribution Curve

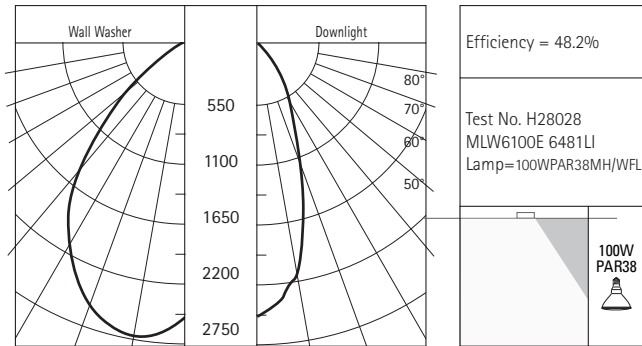


Single Unit Footcandles

Multiple Unit Footcandles

DD	2'6" from wall <i>(distance from fixture along wall)</i>						2'6" from wall <i>(spacing between fixtures)</i>			3' from wall <i>(spacing between fixtures)</i>		
	1'	2'	3'	4'	5'	6'	3'	4'	6'	4'	6'	6'
1	14	9	3	1	0	0	16	11	16	15	6	15
2	26	19	9	3	1	0	33	29	33	28	18	28
3	33	26	15	6	2	1	46	44	46	38	31	38
4	33	27	18	9	4	1	52	50	52	41	37	41
5	28	24	17	11	6	3	50	50	50	40	37	40
6	22	19	15	10	6	4	43	44	43	34	33	34
7	16	14	11	8	6	4	35	36	35	28	27	28
8	12	11	9	7	5	4	28	28	28	23	23	23
9	8	8	7	5	4	3	22	23	22	18	18	18
10	6	6	5	4	4	3	17	18	17	15	15	15

Candlepower Distribution Curve



Single Unit Footcandles

Multiple Unit Footcandles

DD	2'6" from wall <i>(distance from fixture along wall)</i>						2'6" from wall <i>(spacing between fixtures)</i>			3' from wall <i>(spacing between fixtures)</i>		
	1'	2'	3'	4'	5'	6'	3'	4'	6'	4'	6'	6'
1	19	12	4	1	1	0	21	15	21	20	8	20
2	47	35	15	5	2	1	57	51	57	50	31	50
3	62	20	29	12	4	1	86	84	86	70	59	70
4	48	42	28	15	7	3	80	79	80	63	58	63
5	33	29	22	15	8	4	64	64	64	49	49	49
6	22	20	17	12	8	5	49	50	49	38	38	38
7	16	15	12	9	7	4	37	38	37	30	30	30
8	11	11	9	7	6	4	28	29	28	24	24	24
9	8	8	7	6	5	3	22	23	22	19	19	19
10	6	6	5	5	4	3	18	18	18	15	15	15

CERAMIC METAL HALIDE DIRECTIONAL /SLOPE T4 AND T6 G12 LAMPS TO 150W

Recessed 6" aperture directional / slope for T4/T6 G12 ceramic metal halide lamp. Available in narrow spot, spot, narrow flood and flood distributions. Fixture is suitable for commercial construction. Two stage reflector system produces smooth distribution with excellent light control and low aperture brightness. Integral electronic ballast available in UNV 120/277V (except 150W) input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	19-13/16"	18"	11-3/16"	6-3/8"
Chicago Plenum	19-13/16"	18"	11-3/16"	

Catalog Number

HOUSING

MA6 = 6" CMH Directional / Slope
 MA6CP = 6" CMH Directional / Slope, CCEA Listed for City of Chicago Plenum Requirements

DISTRIBUTION

N=Narrow, M=Medium, W=Wide

WATTAGE

20T4G12 = 20W T4 G12 CMH
 39T6G12 = 39W T6 G12 CMH
 70T6G12 = 70W T6 G12 CMH
 150T6G12 = 150W T6 G12 CMH
 20T4G65 = 20W T4 GU6.5 CMH LAMP
 39T4G65 = 39W T4 GU6.5 CMH LAMP
 20T4G85 = 20W T4 G8.5 CMH LAMP
 39T4G85 = 20W T4 G8.5 CMH LAMP
 70T4G85 = 70W T4 G8.5 CMH LAMP

BALLAST

E = Electronic, UNV 120/277V 50/60Hz¹
 1E = Electronic, 120V 50/60Hz²
 2E = Electronic, 277V 50/60Hz²

OPTION

Q = Quartz Re-strike System³
 X = Emergency Circuit Lamp

ACCESSORIES

HB26 = Bar Hanger, 26" Long, Pair
 HB50 = Bar Hanger, 50" Long, Pair
 RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
 TRM6* = Metal Trim Ring, Specify Finish
 TRR6 = Rimless Trim Ring
 RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
 FK = Field Installed Fuse Kit, Specify Amperage
 LSPOT = Selectively Frosted Lens for 13° Spot

* See accessories section for ordering details.

Order housing, trim, lamp and accessories separately.

NOTE: 1. Not available with 150W 2. Available with 150W only
 3. Not available in 20W, must use 1E or 2E option with 50 and 150W

Catalog Number

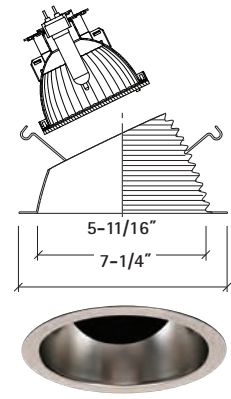
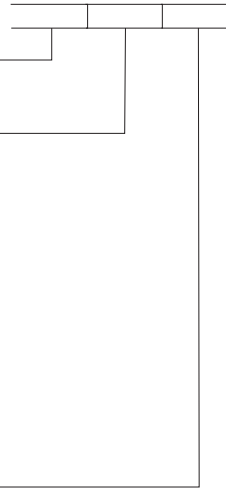
TRIM _____
 6470 = 6" Angle Cut Reflector, White
 6471 = 6" Angle Cut Reflector, Self Flanged

FINISH

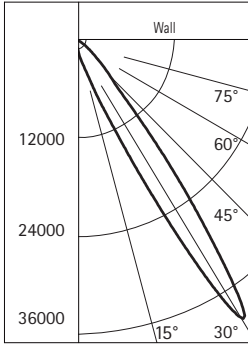
LI = Specular Clear, Low Iridescent
 H = Semi specular Clear
 WMH = Warm Haze
 G = Gold
 WH = Wheat
 WHH = Wheat Haze
 GP = Graphite
 GPH = Graphite Haze
 K = Cognac
 KH = Cognac Haze
 CC = Chocolate
 CCH = Chocolate Haze
 B = Black
 BB = Black Baffle (Polymer Trim Ring Only)
 WB = White Baffle (Polymer Trim Ring Only)

OPTIONS

WF = White Painted Flange (Self Flanged only)



Candlepower Distribution Curve



Efficiency=56.7%

Narrow Spot
Test No. P12230, P12232
MA6N70T6E-6471LI with
LSPOT accessory lens
T6 G12
30° Beam
Lumens=7300

Cone of Light

0° Aiming Angle
Horizontal Luminaire

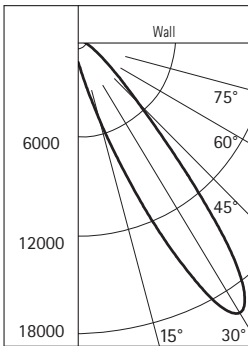
D	FC	Dia
13	224	2.9
15	168	3.4
17.5	124	3.4
20	95	4.5
25	61	5.6

30° Aiming Angle
Horizontal Luminaire

D	FC	L	W	CB
13	149	3.5	3.1	7.5
15	112	4.1	3.6	8.7
17.5	82	4.8	4.2	10.1
20	63	5.4	4.8	11.5
25	40	6.8	6.0	14.5

30° Aiming Angle
Vertical Luminaire

D	FC	L	W	CB
5	215	3.6	2.0	8.7
6	150	4.3	2.4	10.4
8	84	5.7	3.2	13.9
10	54	7.1	4.0	17.3
12	37	8.5	4.8	20.8



Efficiency=56.7%

Spot
Test No. P12229, P12231
MA6N70T6E-6471LI
T6 G12
30° Beam
Lumens=7300

0° Aiming Angle
Horizontal Luminaire

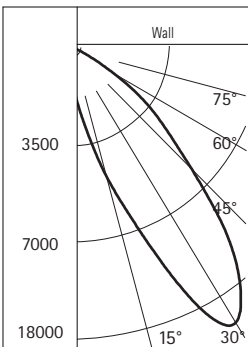
D	FC	Dia
13	110	4.8
15	83	5.6
17.5	61	6.5
20	47	7.5
25	30	9.3

30° Aiming Angle
Horizontal Luminaire

D	FC	L	W	CB
13	78	5.9	5.1	7.5
15	59	6.8	5.9	8.7
17.5	43	7.9	6.9	10.1
20	33	9.0	7.9	11.5
25	21	11.3	9.9	14.5

30° Aiming Angle
Vertical Luminaire

D	FC	L	W	CB
5	122	5.0	3.0	8.7
6	84	6.1	3.6	10.4
8	47	8.1	4.8	13.9
10	30	10.1	6.0	17.3
12	21	12.1	7.2	20.8



Efficiency=63.2%

Narrow Flood
Test No. P12226, P12225
MA6M70T6E-6471LI
T6 G12
30° Beam
Lumens=7300

0° Aiming Angle
Horizontal Luminaire

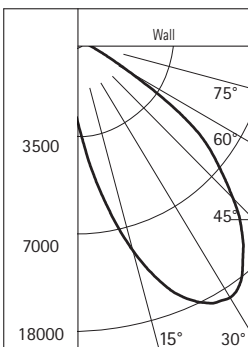
D	FC	Dia
13	69	7.0
15	52	8.0
17.5	38	9.4
20	29	10.7
25	19	13.4

30° Aiming Angle
Horizontal Luminaire

D	FC	L	W	CB
13	46	7.9	7.6	7.5
15	34	9.1	8.7	8.7
17.5	25	10.6	10.2	10.1
20	19	12.2	11.6	11.5
25	12	15.2	14.5	14.5

30° Aiming Angle
Vertical Luminaire

D	FC	L	W	CB
5	92	6.3	4.2	8.7
6	64	7.5	5.1	10.4
8	36	10.0	6.8	13.9
10	23	12.5	8.5	17.3
12	16	15.0	10.2	20.8



Efficiency=63.6%

Flood
Test No. P12227, P12228
MA6W70T6E-6471LI
T6 G12
30° Beam
Lumens=7300

0° Aiming Angle
Horizontal Luminaire

D	FC	Dia
13	45	9.6
15	34	11.1
17.5	25	12.9
20	19	14.8
25	12	18.5

30° Aiming Angle
Horizontal Luminaire

D	FC	L	W	CB
13	29	10.2	10.9	7.5
15	22	11.8	12.5	8.7
17.5	16	13.8	14.6	10.1
20	12	15.8	16.7	11.5
25	8	19.7	20.9	14.5

30° Aiming Angle
Vertical Luminaire

D	FC	L	W	CB
5	71	5.3	5.6	8.7
6	49	6.4	6.7	10.4
8	28	8.6	9.0	13.9
10	18	10.7	11.2	17.3
12	12	12.8	13.5	20.8

METAL HALIDE DIRECTIONAL CDM-R111 LAMP TO 39W

Open directional with smooth precise beam control from CDM-R111 lamp. Locking 35° tilt and 365° rotation holds aiming angle. Optics allow the lamp axis to pivot about the center of the aperture at the ceiling line, allowing maximum light output. Integral electronic ballast with UNV 120/277V input provides superior lamp control and performance. Housing has top access for lamp replacement above the ceiling.



Dimensions	Length	Width	Height	Cutout
Standard Housing	18-5/8"	18-1/8"	9-3/16"	6-3/8"
Chicago Plenum	18-5/8"	18-1/8"	9-3/16"	

Catalog Number

HOUSING

MA6 = 6" AR MH Directional / Slope
 MA6CP = 6" AR MH Directional / Slope,
 CCEA Listed for City of Chicago
 Plenum Requirements

WATTAGE

20AR = 20W CDM-R111 Lamp
 39AR = 39W CDM-R111 Lamp

BALLAST

E = Electronic, UNV 120/277V 50/60Hz

ACCESSORIES

HB26 = Bar Hanger, 26" Long, Pair
 HB50 = Bar Hanger, 50" Long, Pair
 RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
 TRM6* = Metal Trim Ring, Specify Finish
 TRR6 = Rimless Trim Ring
 L200* = Lenses and Filters
 H347 = 347V Stepdown Transformer, 75VA

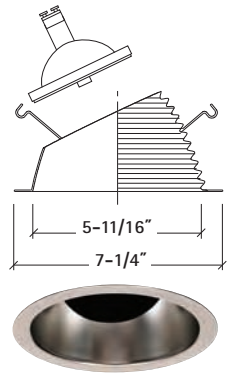
* See accessories section for ordering details.
 Order housing, trim, lamp and accessories separately.

Catalog Number

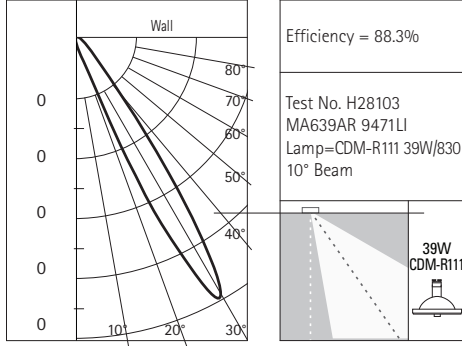
TRIM _____
 6470 = 6" Angle Cut Reflector, White Polymer Trim Ring
 6471 = 6" Angle Cut Reflector, Self Flanged

FINISH _____
 LI = Specular Clear, Low Iridescent
 H = Semi specular Clear
 WMH = Warm Haze
 G = Gold
 WH = Wheat
 WHH = Wheat Haze
 GP = Graphite
 GPH = Graphite Haze
 K = Cognac
 KH = Cognac Haze
 CC = Chocolate
 CCH = Chocolate Haze
 B = Black
 BB = Black Baffle (Polymer Trim Ring Only)
 WB = White Baffle (Polymer Trim Ring Only)

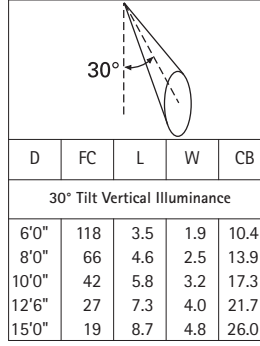
OPTIONS _____
 WF = White Painted Flange (Self Flanged only)



Candlepower Distribution Curve



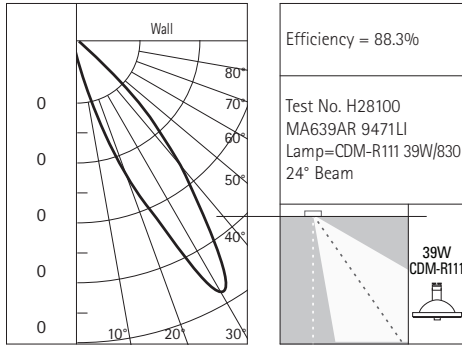
Cone of Light



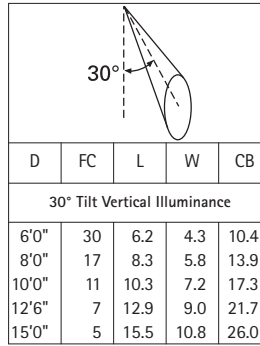
Single Unit Footcandles

		Single fixture 3' from wall – 30° aim (distance from fixture along wall)					
DD	■	1'	2'	3'	4'	5'	6'
1	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0

Candlepower Distribution Curve



Cone of Light



Single Unit Footcandles

		Single fixture 3' from wall – 30° aim (distance from fixture along wall)					
DD	■	1'	2'	3'	4'	5'	6'
1	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0

METAL HALIDE DIRECTIONAL PAR LAMP TO 150W

Open directional downlight using a single PAR20, PAR30L, or PAR38 ceramic metal halide lamp. Use for vertical downlighting in sloped ceiling or for accent/display lighting. Lockable 365° rotation and 35° tilt with center beam optics providing full output with no flashback. Medium base socket accepts lamps suitable for open fixture use only. Housing has top access for lamp replacement above the ceiling. Integral electronic ballast with UNV 120/277V input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	18-5/8"	18"	13-3/8"	6-3/8"
Chicago Plenum	18-5/8"	18"	13-3/8"	

Catalog Number

HOUSING

MA6 = 6" PAR MH Directional / Slope
 MA6CP = 6" PAR MH Directional / Slope,
 CCEA Listed for City of Chicago
 Plenum Requirements

WATTAGE

20 = 20W MH Lamp
 39 = 39W MH Lamp
 70 = 70W MH Lamp
 100 = 100W MH Lamp
 150 = 150W MH Lamp

BALLAST

E = Electronic, UNV 120/277V 50/60Hz¹
 1E = Electronic, 120V 50/60Hz²
 2E = Electronic, 277V 50/60Hz²

ACCESSORIES

HB26 = Bar Hanger, 26" Long, Pair
 HB50 = Bar Hanger, 50" Long, Pair
 RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
 TRM6* = Metal Trim Ring, Specify Finish
 TRR6 = Rimless Trim Ring
 LC30 = Lens Clip for PAR30L Lamps
 LC38 = Lens Clip for PAR38 Lamps
 H347 = 347V Stepdown Transformer, 75VA
 H347200 = 347V Stepdown Transformer, 200VA

* See accessories section for ordering details.
 Order housing, trim, lamp and accessories separately.

NOTE: 1. Not available with 150W 2. Available with 150W only

Catalog Number

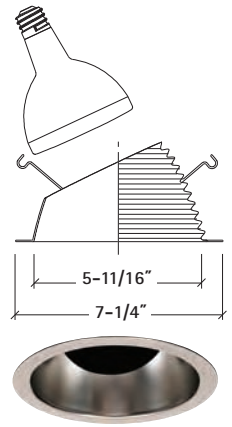
TRIM _____
 6470 = 6" Angle Cut Reflector, White Polymer Trim Ring
 6471 = 6" Angle Cut Reflector, Self Flanged

FINISH

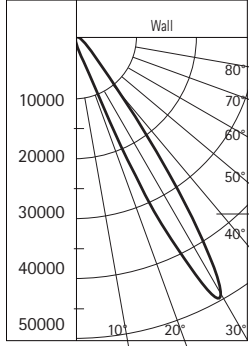
LI = Specular Clear, Low Iridescent
 H = Semi specular Clear
 WMH = Warm Haze
 G = Gold
 WH = Wheat
 WHH = Wheat Haze
 GP = Graphite
 GPH = Graphite Haze
 K = Cognac
 KH = Cognac Haze
 CC = Chocolate
 CCH = Chocolate Haze
 B = Black
 BB = Black Baffle (Polymer Trim Ring Only)
 WB = White Baffle (Polymer Trim Ring Only)

OPTIONS

WF = White Painted Flange (Self Flanged only)



Candlepower Distribution Curve

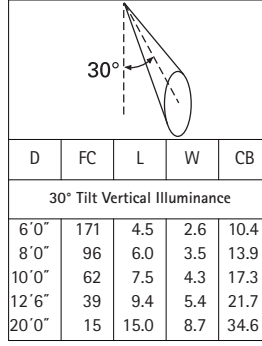


Efficiency = 74.4%

Test No. H28022
MA670E 6470LI
Lamp=70W PAR30MHSP
30° Aiming Angle

70W PAR30LH

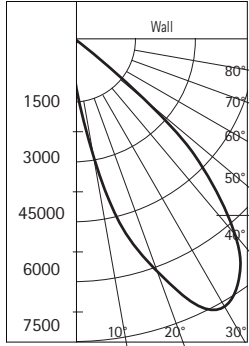
Cone of Light



Single Unit Footcandles

Single fixture 3' from wall - 30° aim (distance from fixture along wall)							
DD	1'	2'	3'	4'	5'	6'	
1	4	1	0	0	0	0	0
2	16	5	2	0	0	0	0
3	124	38	4	2	1	0	0
4	434	95	12	1	1	0	0
5	647	132	18	3	1	0	0
6	365	91	18	4	1	1	0
7	127	45	13	4	1	1	1
8	37	21	9	3	1	1	0
9	15	11	6	3	1	1	0
10	10	6	3	2	1	1	0

Candlepower Distribution Curve

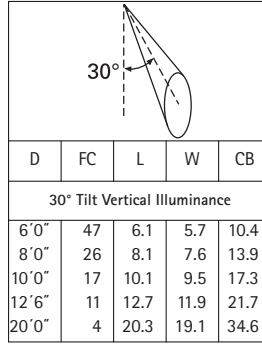


Efficiency = 70.9%

Test No. H28023
MA670E 6471LI
Lamp=70W PAR30MHFL
30° Aiming Angle

70W PAR30LH

Cone of Light

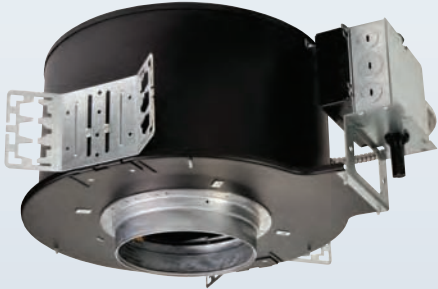


Single Unit Footcandles

Single fixture 3' from wall - 30° aim (distance from fixture along wall)							
DD	1'	2'	3'	4'	5'	6'	
1	0	0	0	0	0	0	0
2	31	8	1	0	0	0	0
3	180	95	13	1	0	0	0
4	163	122	39	5	1	0	0
5	112	90	45	10	2	0	0
6	72	61	38	14	3	1	0
7	46	40	28	15	5	1	0
8	30	27	21	13	6	2	1
9	20	19	15	10	5	2	1
10	14	13	11	8	5	2	1

METAL HALIDE SHALLOW DIRECTIONAL PAR20 LAMP TO 39W

Open directional downlight using a single PAR20 ceramic metal halide lamp. Low profile allows use where vertical clearance is limited. Use for vertical downlighting in sloped ceiling or for accent/display lighting. Lockable 365° rotation and 35° tilt with center beam optics providing full output with no flashback. Medium base extended husk socket accepts lamps suitable for open fixture use only. Housing has top access for lamp replacement above the ceiling. Integral electronic ballast with UNV 120/277V input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	18-5/8"	18"	9-3/16"	6-3/8"
Chicago Plenum	18-5/8"	18"	9-3/16"	

Catalog Number

HOUSING

MA6S = 6" Shallow MH Directional / Slope
 MA6SCP = 6" Shallow MH Directional / Slope,
 CCEA Listed for City of Chicago
 Plenum Requirements

WATTAGE

20 = 20W MH Lamp
 39 = 39W MH Lamp

BALLAST

E = Electronic, UNV 120/277V 50/60Hz

ACCESSORIES

HB26 = Bar Hanger, 26" Long, Pair
 HB50 = Bar Hanger, 50" Long, Pair
 RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
 TRM6* = Metal Trim Ring, Specify Finish
 TRR6 = Rimless Trim Ring
 LC20 = Lens Clip for PAR20 Lamps
 H347 = 347V Stepdown Transformer, 75VA

* See accessories section for ordering details.
 Order housing, trim, lamp and accessories separately.

Catalog Number

TRIM

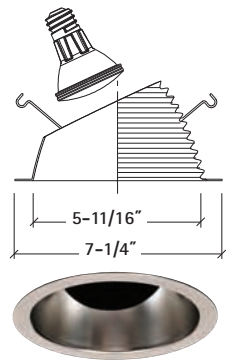
6470 = 6" Angle Cut Reflector, White Polymer Trim Ring
 6471 = 6" Angle Cut Reflector, Self Flanged

FINISH

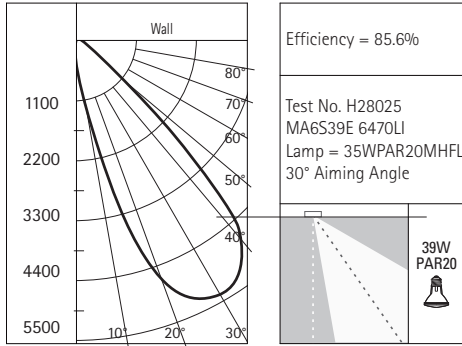
LI = Specular Clear, Low Iridescent
 H = Semi specular Clear
 WMH = Warm Haze
 G = Gold
 WH = Wheat
 WHH = Wheat Haze
 GP = Graphite
 GPH = Graphite Haze
 K = Cognac
 KH = Cognac Haze
 CC = Chocolate
 CCH = Chocolate Haze
 B = Black
 BB = Black Baffle (Polymer Trim Ring Only)
 WB = White Baffle (Polymer Trim Ring Only)

OPTIONS

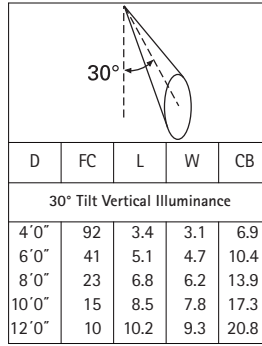
WF = White Painted Flange (Self Flanged only)



Candlepower Distribution Curve



Cone of Light



Single Unit Footcandles

		Single fixture 3' from wall – 30° aim (distance from fixture along wall)					
DD	■	1'	2'	3'	4'	5'	6'
1	1	0	0	0	0	0	0
2	19	5	0	0	0	0	0
3	155	59	7	0	0	0	0
4	128	89	21	2	0	0	0
5	82	69	26	4	1	0	0
6	53	45	22	4	2	0	0
7	33	28	16	5	2	1	0
8	20	18	11	5	2	1	0
9	12	11	7	4	2	1	0
10	8	7	5	3	2	1	1

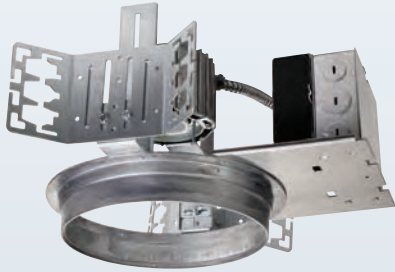




7" APERTURE

METAL HALIDE OPEN/OPEN WALL WASH/ LENS DOWNLIGHT ED17P AND PAR LAMP TO 150W

Medium and wide beam downlight for general lighting from a single vertically mounted ED17P metal halide lamp or PAR lamp downlight for general and task lighting. Adjustable socket position maintains focus for varied reflector types. Medium base extended husk socket accepts lamps suitable for open fixture use only (except housings designated for PAR38 only). Optional quartz standby lamp installs through designated trim versions. Integral electronic ballast with UNV 120/277V (except 150W) input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	14-1/2"	15-3/8"	H	8-1/8"
Chicago Plenum	14-1/2"	15-3/8"	H	

Height varies with socket position; see reflector data for fixture height. Add 1/2" height for Chicago Plenum option.

Catalog Number

HOUSING

MD7 = 7" Universal MH Housing
MD7CP = 7" Universal MH Housing, CCEA Listed for City of Chicago Plenum Requirements

WATTAGE

20 = 20W MH Lamp
39 = 39W MH Lamp
50 = 50W MH Lamp
70 = 70W MH Lamp
70P38 = 70W PAR38 MH Lamp
100 = 100W MH Lamp
100P38 = 100W PAR38 MH Lamp
150 = 150W MH Lamp
150P38 = 150W PAR38 MH Lamp

BALLAST

E = Electronic, UNV 120/277V 50/60Hz¹
1E = Electronic, 120V 50/60Hz²
2E = Electronic, 277V 50/60Hz²

OPTION

Q = Quartz Re-strike System³

ACCESSORIES

HB26 = Bar Hanger, 26" Long, Pair
HB50 = Bar Hanger, 50" Long, Pair
RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
HSA7* = Slope Adapter for 7" Aperture, Specify Slope
TRM7* = Metal Trim Ring, Specify Finish
TRR7 = Rimless Trim Ring
ECL = Emergency Circuit Lamp
H347 = 347V Stepdown Transformer, 75VA
H347200 = 347V Stepdown Transformer, 200VA

* See accessories section for ordering details.
Order housing, trim, lamp and accessories separately.

NOTE: 1. Not available with 150W 2. Available with 150W only
3. Not available in 20W, must use with 1E or 2E option with 50 and 150W

MEDIUM BEAM DOWNLIGHT

150W MAX ED17P

Catalog Number

TRIM
7700 = 7" Medium Beam Reflector, White Polymer Trim Ring
7700X = 7" Medium Beam Reflector, White Polymer Trim Ring, Standby Lamp
7701 = 7" Medium Beam Reflector, Self Flanged
7701X = 7" Medium Beam Reflector, Self Flanged, Standby Lamp

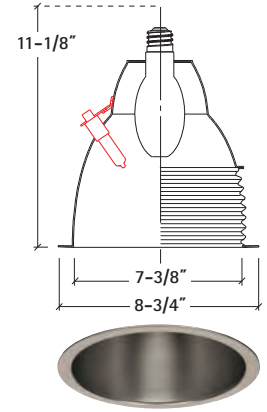
FINISH

LI = Specular Clear, Low Iridescent
H = Semi Specular Clear Haze
WMH = Warm Haze
G = Gold
WH = Wheat
WHH = Wheat Haze
GP = Graphite
GPH = Graphite Haze

K = Cognac
KH = Cognac Haze
CC = Chocolate
CCH = Chocolate Haze
B = Black
BB = Black Baffle (Polymer Trim Ring Only)
WB = White Baffle (Polymer Trim Ring Only)

OPTIONS

WF = White Painted Flange (Self Flanged Only)



WIDE BEAM DOWNLIGHT

150W MAX ED17P

Catalog Number

TRIM
7750 = 7" Wide Beam Reflector, White Polymer Trim Ring
7750X = 7" Wide Beam Reflector, White Polymer Trim Ring, Standby Lamp
7751 = 7" Wide Beam Reflector, Self Flanged
7751X = 7" Wide Beam Reflector, Self Flanged, Standby Lamp

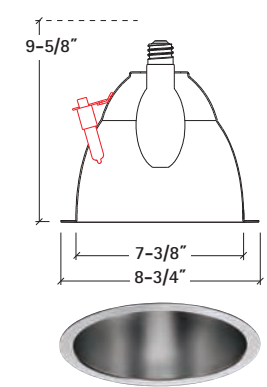
FINISH

LI = Specular Clear, Low Iridescent
H = Semi Specular Clear Haze
WMH = Warm Haze
G = Gold
WH = Wheat
WHH = Wheat Haze
GP = Graphite
GPH = Graphite Haze

K = Cognac
KH = Cognac Haze
CC = Chocolate
CCH = Chocolate Haze
B = Black

OPTIONS

WF = White Painted Flange (Self Flanged Only)



GRUVI™ OPEN WALL WASH

150W MAX ED17P

Catalog Number

TRIM
7710 = 7" Single Open Wall Wash, White Polymer Trim Ring
7711 = 7" Single Open Wall Wash, Self Flanged
7720 = 7" Double Open Wall Wash, White Polymer Trim Ring
7721 = 7" Double Open Wall Wash, Self Flanged
7730 = 7" Corner Open Wall Wash, White Polymer Trim Ring
7731 = 7" Corner Open Wall Wash, Self Flanged

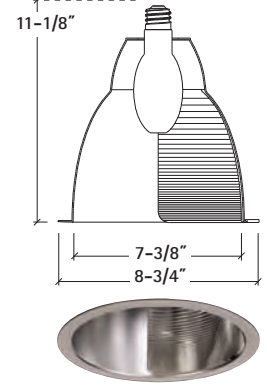
FINISH

LI = Specular Clear, Low Iridescent
H = Semi Specular Clear Haze
WMH = Warm Haze
G = Gold
WH = Wheat
WHH = Wheat Haze
GP = Graphite
GPH = Graphite Haze

K = Cognac
KH = Cognac Haze
CC = Chocolate
CCH = Chocolate Haze
B = Black

OPTIONS

WF = White Painted Flange (Self Flanged Only)



LENS DOWNLIGHT 100W MAX ED17P, PAR38 or 70W PAR30L

Catalog Number

TRIM
7780 = 7" Vertical Lens, White Polymer Trim Ring
7781 = 7" Vertical Lens, Self Flanged

FINISH

LI = Specular Clear, Low Iridescent
H = Semi Specular Clear Haze
WMH = Warm Haze
G = Gold
WH = Wheat
WHH = Wheat Haze
GP = Graphite
GPH = Graphite Haze

K = Cognac
KH = Cognac Haze
CC = Chocolate
CCH = Chocolate Haze
B = Black
BB = Black Baffle (Polymer Trim Ring Only)
WB = White Baffle (Polymer Trim Ring Only)

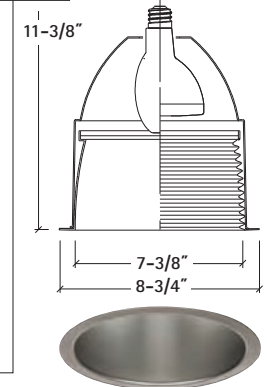
LENS

1G = Prismatic Glass
2G = Diffuse Glass

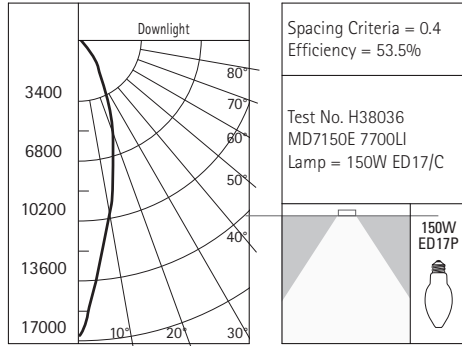
3G = Clear Glass
4G = Fresnel Glass

OPTIONS

WF = White Painted Flange (Self Flanged Only)



Candlepower Distribution Curve



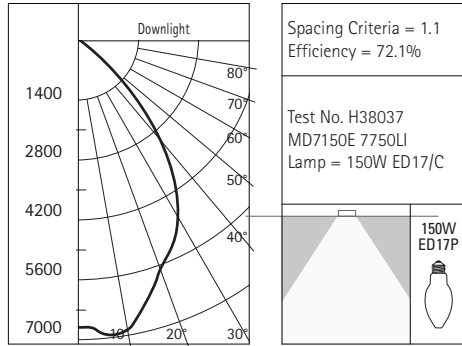
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
5' 6"	546	2' 6"
6' 6"	391	3' 0"
8' 0"	258	3' 6"
10' 0"	165	4' 6"
12' 0"	115	5' 0"
14' 0"	84	6' 0"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	64	64	64	64	62	62	62	59	59
1	61	60	59	58	59	58	57	57	56
2	59	57	56	54	56	55	54	55	52
3	57	55	53	51	54	52	51	53	50
4	55	52	50	48	52	50	48	51	47
5	53	50	47	46	49	47	45	48	45
6	51	48	45	44	47	45	44	47	43
7	50	46	43	42	45	43	41	45	41
8	48	44	41	40	43	41	39	43	39
9	46	42	39	38	42	39	38	41	38
10	44	40	38	36	40	38	36	40	36

Candlepower Distribution Curve



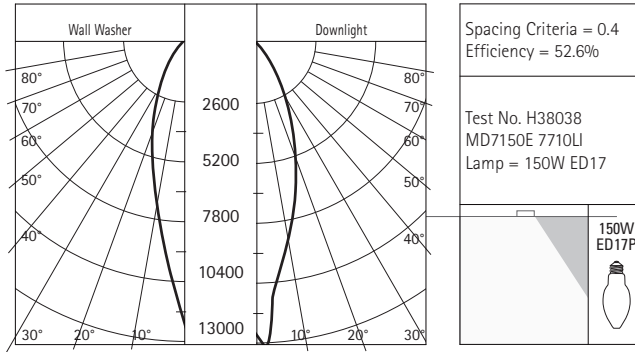
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
5' 6"	218	6' 0"
6' 6"	156	7' 0"
8' 0"	103	8' 6"
10' 0"	66	10' 0"
12' 0"	46	12' 6"
14' 0"	34	15' 6"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	86	86	86	86	84	84	84	80	80
1	82	80	78	77	78	77	75	75	73
2	78	75	72	70	73	71	69	71	67
3	74	70	66	63	69	66	63	67	62
4	70	65	61	58	64	61	58	63	57
5	67	61	57	54	60	56	53	59	53
6	63	57	52	49	56	52	49	55	49
7	60	53	48	45	52	48	45	51	45
8	56	49	45	41	49	44	41	48	41
9	53	45	41	38	45	41	38	44	38
10	50	42	38	35	42	38	35	41	35

Candlepower Distribution Curve



Single Unit Footcandles

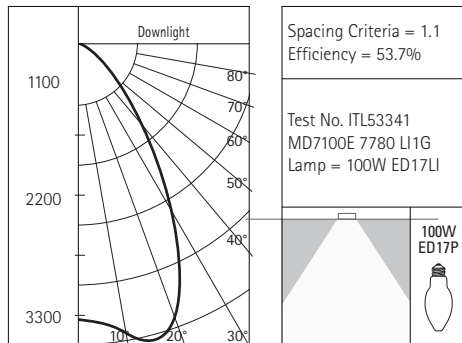
DD	2' 6" from wall (distance from fixture along wall)					
	1'	2'	3'	4'	5'	6'
1	33	23	10	4	1	1
2	51	39	18	6	2	1
3	53	40	20	8	3	1
4	47	37	21	9	3	1
5	41	34	20	10	4	1
6	34	30	19	11	6	2
7	28	25	17	11	6	3
8	22	20	15	10	6	4
9	18	16	13	9	6	4
10	15	14	11	8	5	3

Multiple Unit Footcandles

DD	2' 6" from wall (spacing between fixtures)			4' from wall (spacing between fixtures)		
	3'	4'	6'	4'	6'	6'
1	41	32	41	35	21	35
2	63	58	63	54	36	54
3	69	61	69	58	39	58
4	65	62	65	53	44	53
5	62	58	62	49	42	49
6	56	56	56	45	40	45
7	50	51	50	40	38	40
8	44	45	44	35	34	35
9	38	39	38	30	30	30
10	33	34	33	26	26	26



Candlepower Distribution Curve



Cone of Light

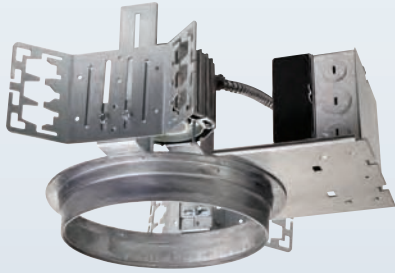
Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
7' 0"	62	8' 0"
8' 0"	47	9' 6"
9' 0"	37	10' 6"
10' 0"	30	12' 0"
12' 6"	19	14' 6"
15' 0"	13	17' 6"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	64	64	64	64	62	62	62	60	60
1	60	59	57	56	58	56	55	55	53
2	57	54	51	49	53	51	49	51	48
3	53	49	46	44	48	46	43	47	43
4	50	45	42	39	45	41	39	43	38
5	47	42	38	35	41	38	35	40	35
6	44	38	35	32	38	34	32	37	32
7	41	36	32	29	35	32	29	34	29
8	39	33	29	27	33	29	27	32	27
9	37	31	27	25	30	27	25	30	24
10	35	29	25	23	28	25	23	28	23

METAL HALIDE OPEN/OPEN WALL WASH/LENS DOWNLIGHT ED17P AND PAR LAMP TO 150W

Medium and wide beam downlight for general lighting from a single vertically mounted ED17P metal halide lamp or PAR lamp downlight for general and task lighting. Adjustable socket position maintains focus for varied reflector types. Medium base extended husk socket accepts lamps suitable for open fixture use only (except housings designated for PAR38 only). Optional quartz standby lamp installs through designated trim versions. Integral electronic ballast with UNV 120/277V (except 150W) input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	14-1/2"	15-3/8"	H	8-1/8"
Chicago Plenum	14-1/2"	15-3/8"	H	

Height varies with socket position; see reflector data for fixture height. Add 1/2" height for Chicago Plenum option.

Catalog Number

HOUSING

MD7 = 7" PAR MH Housing
 MD7CP = 7" PAR MH Housing, CCEA Listed for City of Chicago Plenum Requirements

WATTAGE

20 = 20W MH Lamp
 39 = 39W MH Lamp
 50 = 50W MH Lamp
 70 = 70W MH Lamp
 70P38 = 70W PAR38 MH Lamp
 100 = 100W MH Lamp
 100P38 = 100W PAR38 MH Lamp
 150 = 150W MH Lamp
 150P38 = 150W PAR38 MH Lamp

BALLAST

E = Electronic, UNV 120/277V 50/60Hz¹
 1E = Electronic, 120V 50/60Hz²
 2E = Electronic, 277V 50/60Hz²

OPTION

Q = Quartz Re-strike System³

ACCESSORIES

HB26 = Bar Hanger, 26" Long, Pair
 HB50 = Bar Hanger, 50" Long, Pair
 RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
 HSA7* = Slope Adapter for 7" Aperture, Specify Slope
 TRM7* = Metal Trim Ring, Specify Finish
 TRR7 = Rimless Trim Ring
 ECL = Emergency Circuit Lamp
 H347 = 347V Stepdown Transformer, 75VA
 H347200 = 347V Stepdown Transformer, 200VA

* See accessories section for ordering details.

Order housing, trim, lamp and accessories separately.

NOTE: 1. Not available with 150W **2.** Available with 150W only
3. Not available in 20W, must use with 1E or 2E option with 50 and 150W

Catalog Number

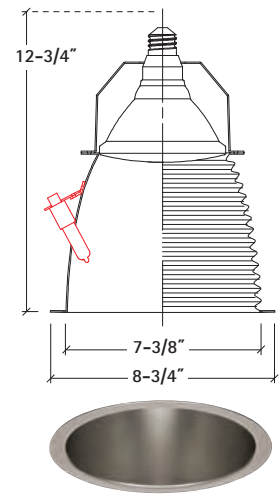
TRIM
 7600 = 7" PAR38 Reflector, White Polymer Trim Ring
 7600X = 7" PAR38 Reflector, White Polymer Trim Ring, Standby Lamp
 7601 = 7" PAR38 Reflector, Self Flanged
 7601X = 7" PAR38 Reflector, Self Flanged, Standby Lamp

FINISH

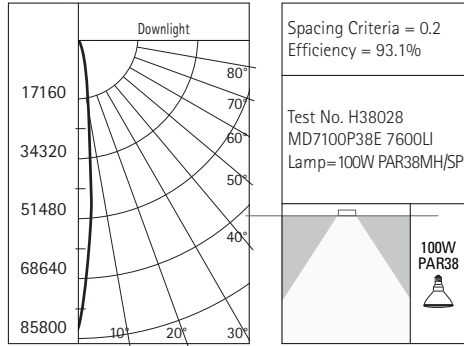
LI = Specular Clear, Low Iridescent
 H = Semi Specular Clear Haze
 WMH = Warm Haze
 G = Gold
 WH = Wheat
 WHH = Wheat Haze
 GP = Graphite
 GPH = Graphite Haze
 K = Cognac
 KH = Cognac Haze
 CC = Chocolate
 CCH = Chocolate Haze
 B = Black
 BB = Black Baffle (Polymer Trim Ring Only)
 WB = White Baffle (Polymer Trim Ring Only)

OPTIONS

WF = White Painted Flange (Self Flanged only)



Candlepower Distribution Curve



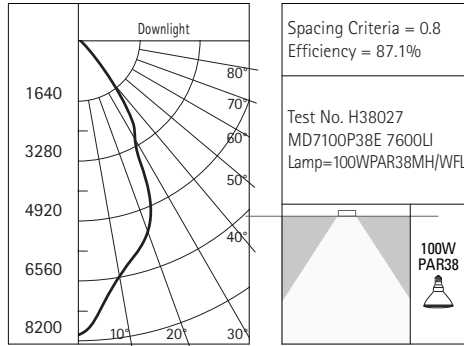
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
6' 6"	2024	1' 6"
8'	1336	2' 0"
10'	855	2' 6"
12'	594	2' 6"
14'	436	3' 0"
16'	334	3' 6"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	111	111	111	111	108	108	108	103	103
1	108	107	105	104	105	104	103	101	99
2	106	104	102	100	102	100	99	99	97
3	104	101	99	97	100	98	96	98	95
4	103	99	97	95	98	96	94	97	93
5	101	97	95	93	97	94	92	95	92
6	100	96	93	92	95	93	91	94	91
7	98	95	92	90	94	92	90	93	90
8	97	93	91	89	93	91	89	92	89
9	96	92	90	88	92	90	88	91	88
10	95	91	89	87	91	89	87	90	87

Candlepower Distribution Curve



Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
5' 6"	266	4' 6"
6' 6"	190	5' 6"
8' 0"	126	6' 6"
10' 0"	80	8' 6"
12' 0"	56	10' 0"
14' 0"	41	11' 6"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	104	104	104	104	101	101	101	97	97
1	100	98	96	94	96	94	93	92	90
2	96	93	90	88	91	89	87	89	85
3	93	88	85	82	87	84	82	85	80
4	89	84	81	78	83	80	77	82	76
5	86	80	76	73	79	76	73	78	72
6	83	77	73	70	76	72	69	75	69
7	79	73	69	66	72	68	66	71	65
8	76	70	65	62	69	65	62	68	62
9	73	66	62	59	66	62	59	65	59
10	70	63	59	56	63	59	56	62	56

METAL HALIDE SHALLOW DOWNLIGHT ED17 LAMP TO 100W

Wide beam downlight for general lighting from a single horizontally mounted ED17 metal halide lamp. Low profile allows use where vertical clearance is limited. Use with lamps suitable for enclosed fixtures. Trims have integral safety glass providing lamp containment. Integral electronic ballast with UNV 120/277V input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	18-5/8"	18"	9-1/4"	8-1/8"

Catalog Number _____

HOUSING _____
 MD7S = 7" Shallow MH Housing
 MD7SCP = 7" Shallow MH Housing,
 CCEA Listed for City of Chicago
 Plenum Requirements

WATTAGE _____
 50 = 50W MH Lamp
 70 = 70W MH Lamp
 100 = 100W MH Lamp

BALLAST _____
 E = Electronic, UNV 120/277V 50/60Hz

ACCESSORIES

- HB26 = Bar Hanger, 26" Long, Pair
- HB50 = Bar Hanger, 50" Long, Pair
- RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
- HSA7* = Slope Adapter for 7" Aperture, Specify Slope
- TRM7* = Metal Trim Ring, Specify Finish
- TRR7 = Rimless Trim Ring
- H347 = 347V Stepdown Transformer, 75VA
- H347200 = 347V Stepdown Transformer, 200VA

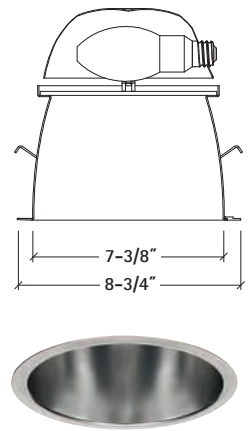
* See accessories section for ordering details.
 Order housing, trim, lamp and accessories separately.

Catalog Number _____

TRIM _____
 7740 = 7" Wide Beam Reflector, White Polymer Trim Ring
 7741 = 7" Wide Beam Reflector, Self Flanged

FINISH _____
 LI = Specular Clear, Low Iridescent K = Cognac
 H = Semi Specular Clear Haze KH = Cognac Haze
 WMH = Warm Haze CC = Chocolate
 G = Gold CCH = Chocolate Haze
 WH = Wheat B = Black
 WHH = Wheat Haze
 GP = Graphite
 GPH = Graphite Haze

OPTIONS _____
 WF = White Painted Flange (Self Flanged Only)



GRUVI™ OPEN WALL WASH

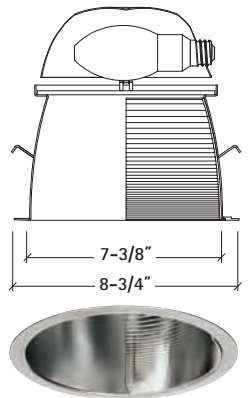
50W, 70W, 100W ED17

Catalog Number _____

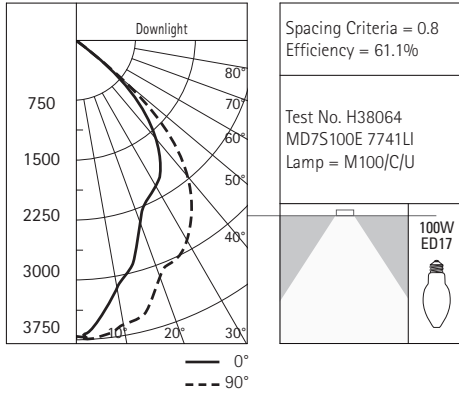
TRIM _____
 7740WW = 7" Single Wall Wash, White Polymer Trim Ring
 7741WW = 7" Single Wall Wash, Self Flanged

FINISH _____
 LI = Specular Clear, Low Iridescent K = Cognac
 H = Semi Specular Clear Haze KH = Cognac Haze
 WMH = Warm Haze CC = Chocolate
 G = Gold CCH = Chocolate Haze
 WH = Wheat B = Black
 WHH = Wheat Haze
 GP = Graphite
 GPH = Graphite Haze

OPTIONS _____
 WF = White Painted Flange (Self Flanged Only)



Candlepower Distribution Curve



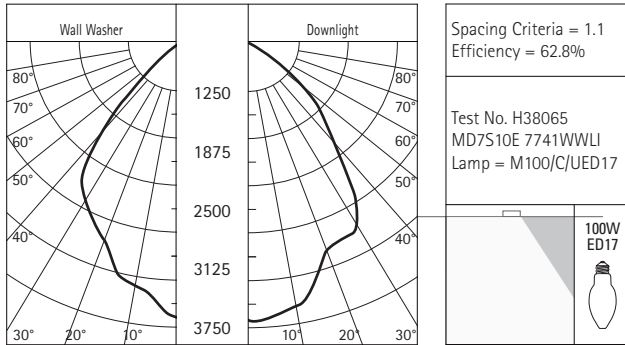
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
4' 6"	177	4' 6"
5' 6"	118	5' 5"
6' 6"	85	6' 6"
8' 0"	56	8' 0"
10' 0"	36	10' 6"
12' 0"	25	12' 0"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	73	73	73	73	71	71	71	68	65
1	69	67	65	63	65	64	62	63	60
2	64	61	58	55	60	57	55	58	54
3	60	55	52	49	55	51	48	53	48
4	56	51	47	43	50	46	43	49	43
5	53	46	42	39	46	42	39	45	38
6	49	43	38	35	42	38	35	41	35
7	46	39	35	32	39	35	32	38	32
8	43	36	32	29	36	32	29	35	29
9	41	34	29	27	33	29	27	33	26
10	38	31	27	24	31	27	24	31	24

Candlepower Distribution Curve



Single Unit Footcandles

DD	2' 6" from wall (distance from fixture along wall)						2' from wall (spacing between fixtures)				3' from wall (spacing between fixtures)								
	1'	2'	3'	4'	5'	6'	2'	4'	3'	4'	3'	4'							
1	44	32	13	4	1	1	0	98	103	98	82	34	82	29	29	29	27	19	27
2	67	49	24	11	4	2	1	168	170	168	142	58	142	48	53	48	42	40	42
3	87	70	36	15	6	3	1	144	159	144	106	85	106	75	76	75	68	54	68
4	59	51	35	19	9	4	2	94	101	94	69	67	69	71	81	71	62	66	62
5	38	34	26	18	10	6	3	60	63	60	45	48	45	56	61	56	48	52	48
6	25	23	19	14	10	6	4	40	42	40	32	32	32	41	45	41	37	40	37
7	18	16	13	11	8	6	4	29	31	29	24	24	24	31	32	31	28	30	28
8	13	12	10	8	7	5	4	21	23	21	18	19	18	23	24	23	21	22	21
9	10	9	8	7	6	5	4	16	17	16	14	15	14	18	18	18	16	17	16
10	8	8	7	6	5	4	4	13	13	13	11	12	11	14	15	14	13	14	13

METAL HALIDE LENS WALL WASH PAR LAMP TO 150W

Lens wall wash provides smooth illumination on vertical surfaces. Optical assembly rotates 365° and locks in position to maintain setting. Can be relamped from above or below. Integral electronic ballast with UNV 120/277V (except 150W) input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	18-5/8"	18"	11-1/4"	8-1/8"
Chicago Plenum	18-5/8"	18"	11-1/4"	

Catalog Number

HOUSING

MLW7 = 7" Lens Wall Wash Housing
MLW7CP = 7" Lens Wall Wash Housing,
CCEA Listed for City of Chicago
Plenum Requirements

WATTAGE

39 = 39W MH Lamp
70 = 70W MH Lamp
100 = 100W MH Lamp
150 = 150W MH Lamp

BALLAST

E = Electronic, UNV 120/277V 50/60Hz¹
1E = Electronic, 120V 50/60Hz²
2E = Electronic, 277V 50/60Hz²

ACCESSORIES

HB26 = Bar Hanger, 26" Long, Pair
HB50 = Bar Hanger, 50" Long, Pair
RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
H347 = 347V Stepdown Transformer, 75VA
H347200 = 347V Stepdown Transformer, 200VA

See accessories section for ordering details.

Order housing, trim, lamp and accessories separately.

NOTE: 1. Not available with 150W **2.** Available with 150W only

Catalog Number

TRIM

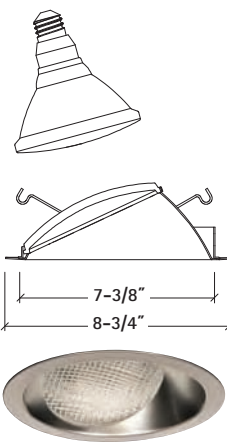
7481 = 7" Lens Wall Wash Reflector, Self Flanged
7483 = 7" Lens Wall Wash Reflector, White Painted Die Cast
Metal Trim Ring

FINISH

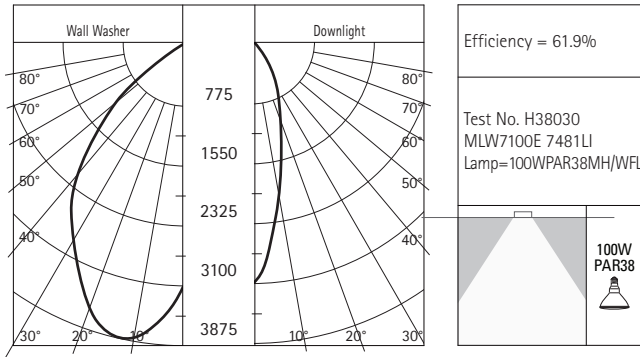
LI = Specular Clear, Low Iridescent
H = Semi Specular Clear Haze
WMH = Warm Haze
G = Gold
WH = Wheat
WHH = Wheat Haze
GP = Graphite
GPH = Graphite Haze
K = Cognac
KH = Cognac Haze
CC = Chocolate
CCH = Chocolate Haze
B = Black
BB = Black Baffle (Polymer Trim Ring Only)
WB = White Baffle (Polymer Trim Ring Only)

OPTIONS

WF = White Painted Flange (Self Flanged only)



Candlepower Distribution Curve



Single Unit Footcandles

Multiple Unit Footcandles

DD	2'6" from wall <i>(distance from fixture along wall)</i>						2'6" from wall <i>(spacing between fixtures)</i>				3' from wall <i>(spacing between fixtures)</i>							
	1'	2'	3'	4'	5'	6'	3'	4'	4'	6'	4'	6'	6'	6'				
1	23	15	5	1	1	0	26	19	26	24	10	24	15	13	15	13	8	13
2	73	57	25	6	2	1	86	83	86	76	50	76	49	50	49	42	32	42
3	84	71	41	18	6	2	120	118	120	96	83	96	92	92	92	71	67	71
4	64	56	38	21	10	4	108	108	108	84	79	84	99	100	99	76	74	76
5	44	40	30	19	11	6	85	86	85	66	65	66	86	87	86	67	66	67
6	30	28	22	16	10	6	65	66	65	51	51	51	69	70	69	55	55	55
7	21	20	16	12	9	6	50	51	50	40	40	40	54	56	54	44	44	44
8	16	15	12	10	7	5	38	39	38	32	32	32	43	44	43	35	36	35
9	12	11	10	8	6	4	30	31	30	25	25	25	34	35	34	29	29	29
10	9	8	7	6	5	4	24	25	24	20	20	20	28	28	28	23	24	23

METAL HALIDE DIRECTIONAL PAR LAMP TO 150W

Open directional downlight using a single PAR30L, or PAR38 ceramic metal halide lamp. Use for vertical downlighting in sloped ceiling or for accent/display lighting. Lockable 365° rotation and 35° tilt with center beam optics providing full output with no flashback. Medium base socket accepts lamps suitable for open fixture use only. Housing has top access for lamp replacement above the ceiling. Integral electronic ballast with UNV 120/277V (except 150W) input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	18-5/8"	18"	13-3/8"	8-1/8"
Chicago Plenum	18-5/8"	18"	13-3/8"	

Catalog Number

HOUSING

MA7 = 7" PAR MH Directional / Slope
 MA7CP = 7" PAR MH Directional / Slope,
 CCEA Listed for City of Chicago
 Plenum Requirements

WATTAGE

20 = 20W MH Lamp
 39 = 39W MH Lamp
 70 = 70W MH Lamp
 100 = 100W MH Lamp
 150 = 150W MH Lamp

BALLAST

E = Electronic, UNV 120/277V 50/60Hz¹
 1E = Electronic, 120V 50/60Hz²
 2E = Electronic, 277V 50/60Hz²

ACCESSORIES

HB26 = Bar Hanger, 26" Long, Pair
 HB50 = Bar Hanger, 50" Long, Pair
 RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
 TRM7* = Metal Trim Ring, Specify Finish
 TRR7 = Rimless Trim Ring
 H347 = 347V Stepdown Transformer, 75VA
 H347200 = 347V Stepdown Transformer, 200VA

See accessories section for ordering details.
 Order housing, trim, lamp and accessories separately.

NOTE: 1. Not available with 150W **2.** Available with 150W only

Catalog Number

TRIM

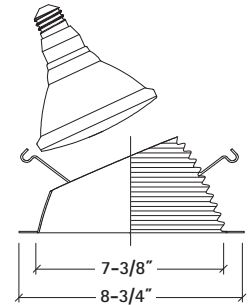
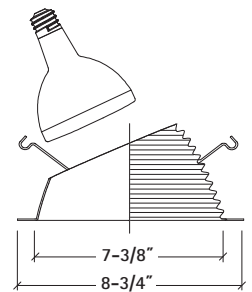
7470 = 7" Angle Cut Reflector, White Polymer Trim Ring
 7471 = 7" Angle Cut Reflector, Self Flanged

FINISH

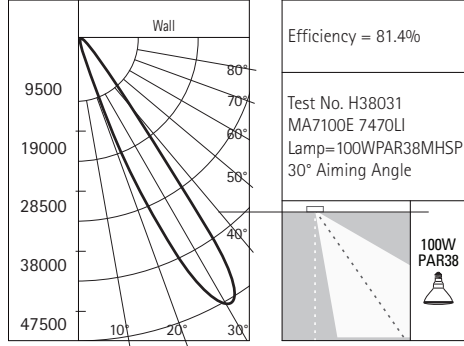
LI = Specular Clear, Low Iridescent
 H = Semi specular Clear
 WMH = Warm Haze
 G = Gold
 WH = Wheat
 WHH = Wheat Haze
 GP = Graphite
 GPH = Graphite Haze
 K = Cognac
 KH = Cognac Haze
 CC = Chocolate
 CCH = Chocolate Haze
 B = Black
 BB = Black Baffle (Polymer Trim Ring Only)
 WB = White Baffle (Polymer Trim Ring Only)

OPTIONS

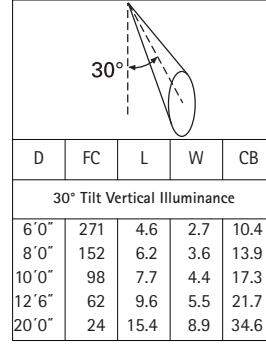
WF = White Painted Flange (Self Flanged only)



Candlepower Distribution Curve



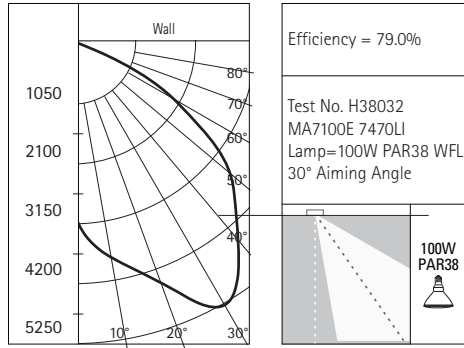
Cone of Light



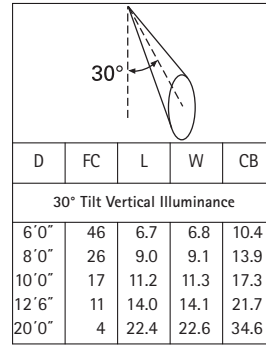
Single Unit Footcandles

		Single fixture 3' from wall – 30° aim (distance from fixture along wall)					
DD	■	1'	2'	3'	4'	5'	6'
1	8	1	0	0	0	0	0
2	15	10	1	0	0	0	0
3	190	53	10	1	0	0	0
4	809	145	21	5	1	0	0
5	943	208	25	7	2	0	0
6	502	151	28	6	3	1	0
7	190	79	24	6	3	1	0
8	67	38	17	6	3	2	1
9	28	19	11	5	3	2	1
10	15	10	7	4	3	2	1

Candlepower Distribution Curve



Cone of Light



Single Unit Footcandles

		Single fixture 3' from wall – 30° aim (distance from fixture along wall)					
DD	■	1'	2'	3'	4'	5'	6'
1	14	2	0	0	0	0	0
2	174	127	42	4	0	0	0
3	162	127	69	24	5	0	0
4	119	96	64	32	11	2	0
5	82	68	50	32	14	5	1
6	53	46	36	26	15	6	2
7	34	31	25	20	14	7	3
8	23	21	18	15	12	7	4
9	16	15	14	12	10	7	4
10	12	11	10	9	8	6	4

METAL HALIDE PULL DOWN DIRECTIONAL PAR38 MH LAMP TO 100W

Pull down adjustable offers the flexibility of highlighting from a recessed PARA38 metal halide source. Integral electronic ballast with UNV 120/277V input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	13-1/4"	14"	10-1/2"	8-1/8"
Chicago Plenum	13-1/4"	14"	10-1/2"	

Catalog Number

--	--	--

HOUSING

MAP7 = 7" MH Pull Down Directional
 MAP7CP = 7" MH Pull Down Directional,
 CCEA Listed for City of Chicago
 Plenum Requirements

WATTAGE

70P38 = 70W PAR38 MH Lamp
 100P38 = 100W PAR38 MH Lamp

BALLAST

E = Electronic, UNV 120/277V 50/60Hz

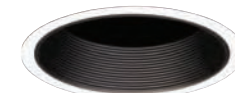
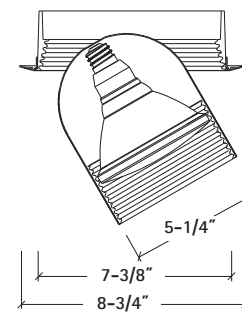
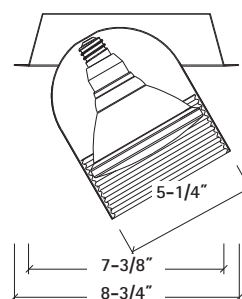
ACCESSORIES

HB26 = Bar Hanger, 26" Long, Pair
 HB50 = Bar Hanger, 50" Long, Pair
 RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
 TRM7* = Metal Trim Ring, Specify Finish
 TRR7 = Rimless Trim Ring
 H347200 = 347V Stepdown Transformer, 200VA

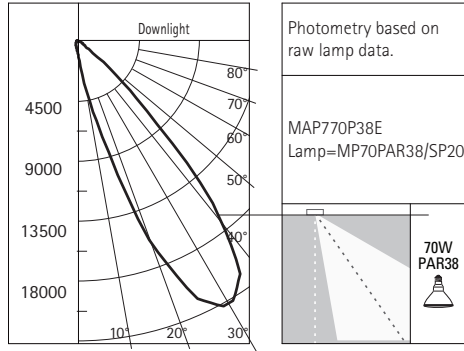
* See accessories section for ordering details.
 Order housing, trim, lamp and accessories separately.

Catalog Number

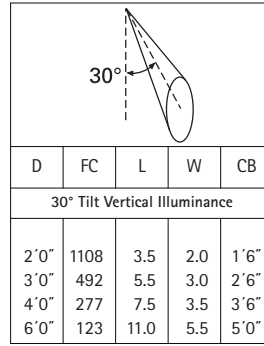
TRIM _____
 6870P = 7" White Painted Self Flanged Splay
 6880BA = 7" Black Coilex™ Baffle, White Polymer Trim Ring



Candlepower Distribution Curve



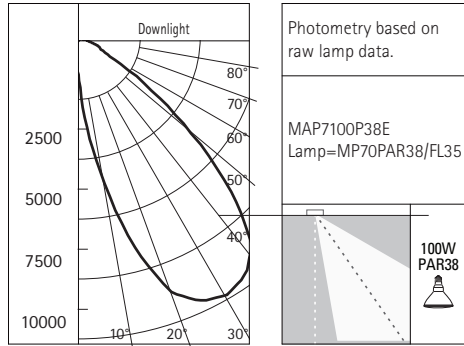
Cone of Light



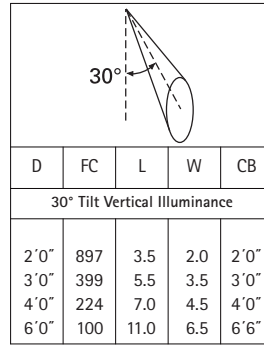
Single Unit Footcandles

		2'6" from wall - 30° Aim (distance from fixture along wall)					
DD	■	1'	2'	3'	4'	5'	6'
1	26	17	5	5	0	0	0
2	46	28	13	13	5	1	0
3	232	95	16	16	7	3	1
4	367	181	24	24	7	3	2
5	272	185	41	41	7	3	2
6	12	128	38	38	7	3	2
7	104	83	29	39	7	3	2
8	63	49	21	22	7	2	1
9	36	29	15	15	6	2	1
10	21	17	11	11	5	2	1

Candlepower Distribution Curve



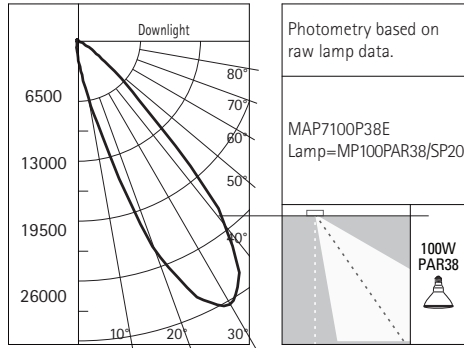
Cone of Light



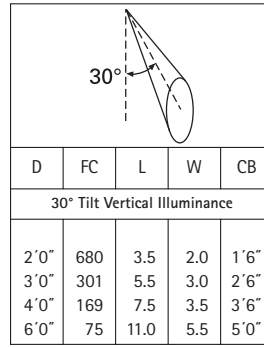
Single Unit Footcandles

		2'6" from wall - 30° Aim (distance from fixture along wall)					
DD	■	1'	2'	3'	4'	5'	6'
1	61	43	17	17	7	2	1
2	164	77	31	31	13	5	2
3	287	181	27	47	16	7	3
4	229	180	73	73	17	8	4
5	151	132	70	70	24	7	4
6	98	89	56	56	25	8	4
7	65	60	42	42	22	9	4
8	44	40	30	30	18	9	4
9	30	28	22	22	14	8	3
10	21	20	16	16	11	7	3

Candlepower Distribution Curve



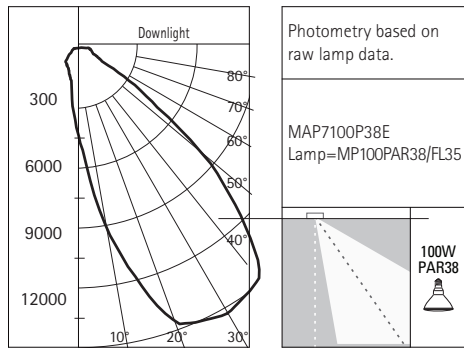
Cone of Light



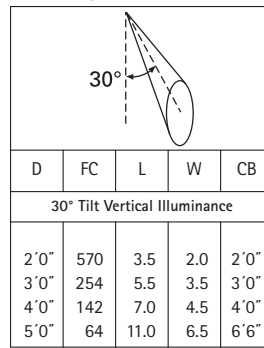
Single Unit Footcandles

		2'6" from wall - 30° Aim (distance from fixture along wall)					
DD	■	1'	2'	3'	4'	5'	6'
1	6	2	0	0	0	0	0
2	114	48	5	0	0	0	0
3	352	165	30	3	0	0	0
4	537	284	54	8	1	0	0
5	391	279	66	16	2	1	0
6	246	190	58	17	4	1	0
7	149	123	44	16	5	1	0
8	92	72	32	13	6	2	0
9	53	42	22	11	5	2	0
10	30	25	16	9	5	2	1

Candlepower Distribution Curve

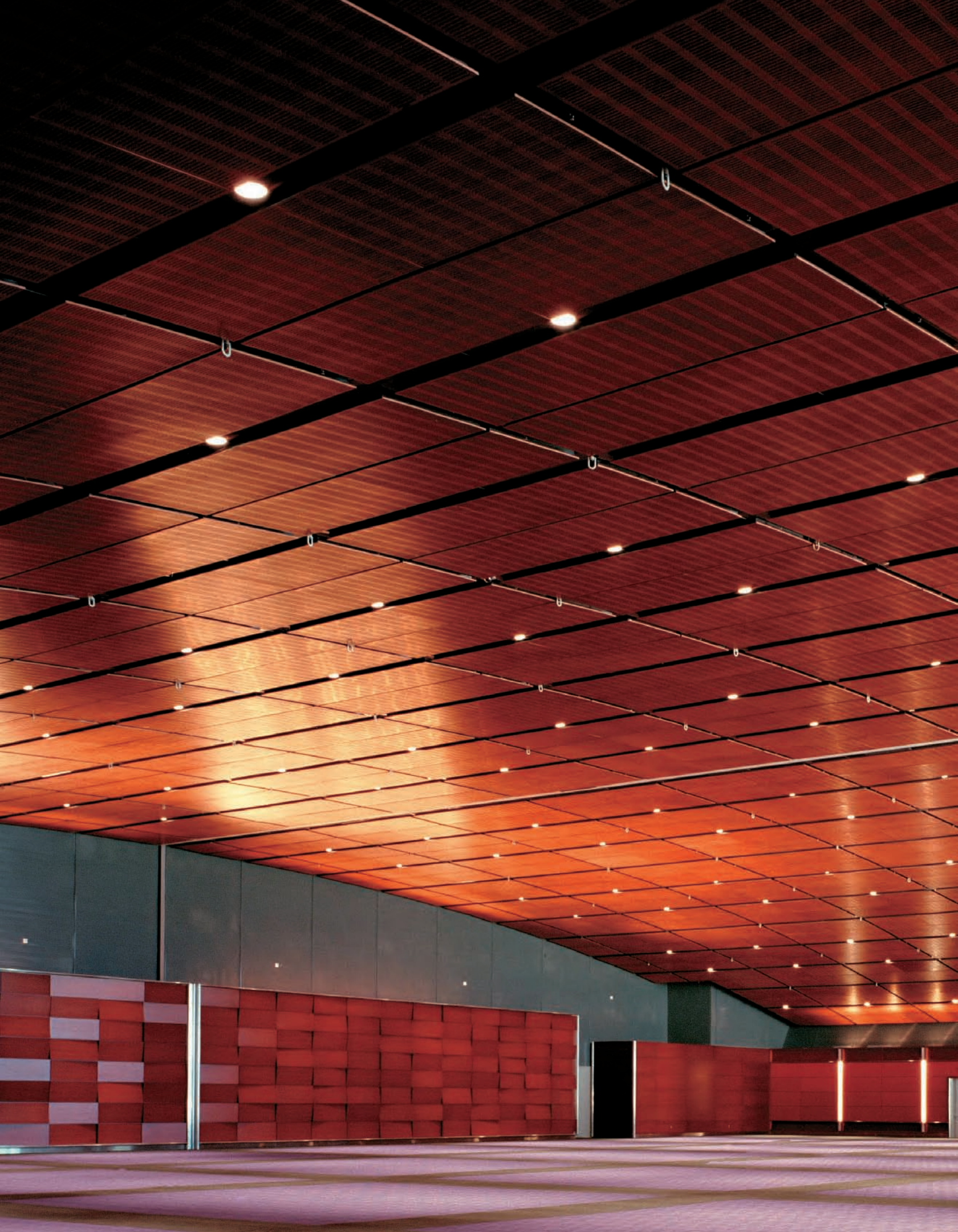


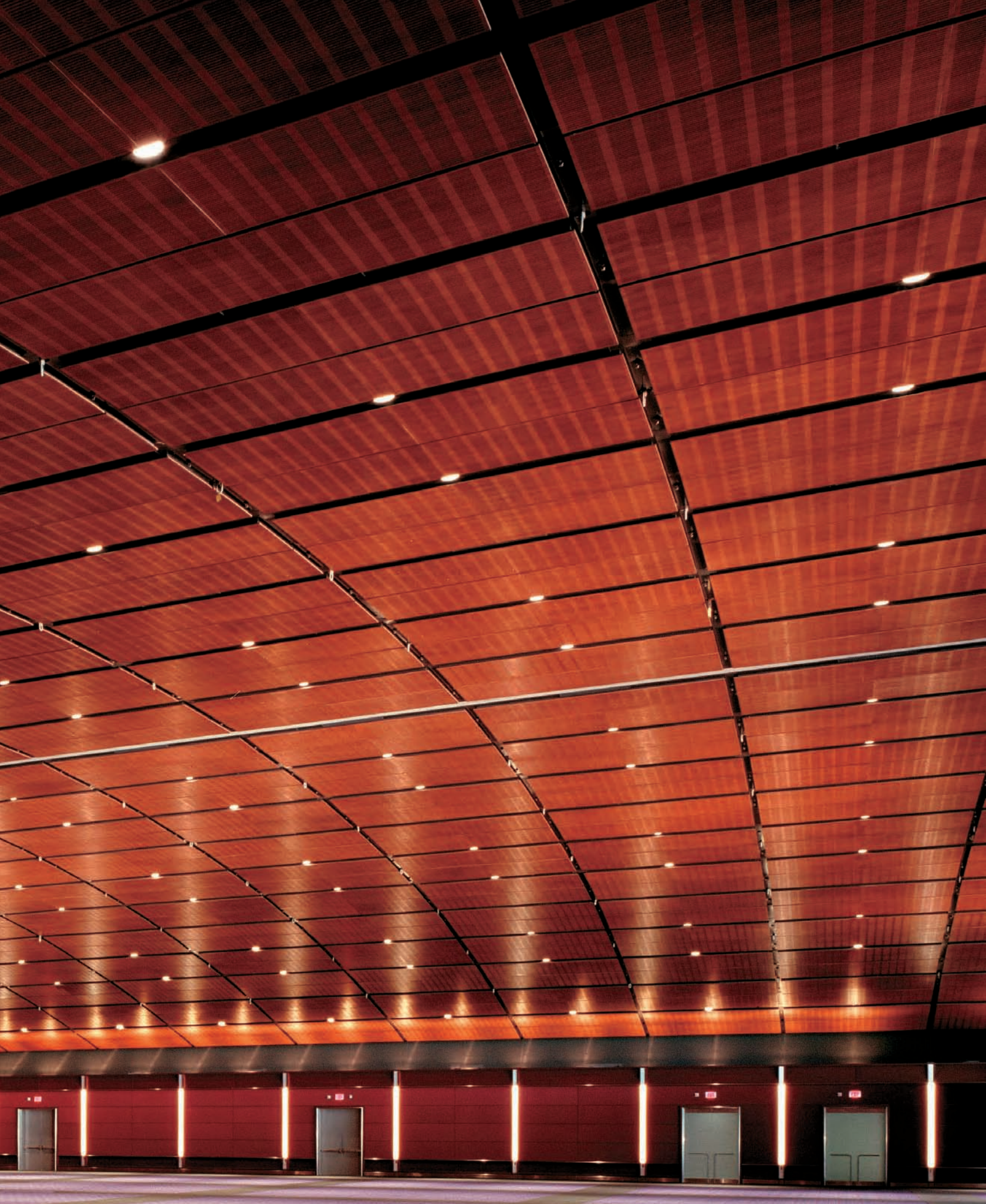
Cone of Light



Single Unit Footcandles

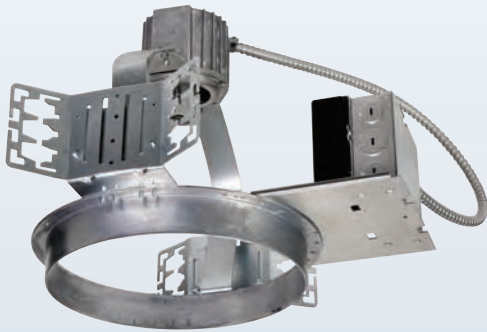
		2'6" from wall - 30° Aim (distance from fixture along wall)					
DD	■	1'	2'	3'	4'	5'	6'
1	89	68	42	24	14	4	1
2	231	143	47	23	13	8	5
3	363	259	83	24	12	8	5
4	281	230	105	33	12	7	5
5	181	166	97	36	12	7	4
6	118	111	74	34	15	6	4
7	79	75	54	31	14	6	4
8	55	51	39	25	13	7	3
9	38	35	28	20	11	6	3
10	26	25	21	16	9	6	3





METAL HALIDE DOWNLIGHT ED17 MH LAMP TO 150W

Medium beam downlight for general lighting from a single vertically mounted ED17 metal halide lamp. Optional quartz standby lamp installs through designated trim versions. Adjustable medium base extended husk socket locks into two positions providing different distributions. Integral electronic ballast with UNV 120/277V (except 150W) input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	28-3/4"	19-5/16"	13-1/2"	10-1/4"
Chicago Plenum	28-3/4"	19-5/16"	14"	

Catalog Number _____

HOUSING _____
 MD9 = 9" MH Housing
 MD9CP = 9" MH Housing, CCEA Listed for City of Chicago Plenum Requirements

WATTAGE _____
 50 = 50W MH Lamp
 70 = 70W MH Lamp
 100 = 100W MH Lamp
 150 = 150W MH Lamp

BALLAST _____
 E = Electronic, UNV 120/277V 50/60Hz¹
 1E = Electronic, 120V 50/60Hz²
 2E = Electronic, 277V 50/60Hz²

OPTION _____
 Q = Quartz Re-strike System³

- ACCESSORIES**
- HB26 = Bar Hanger, 26" Long, Pair
 - HB50 = Bar Hanger, 50" Long, Pair
 - RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
 - HSA9* = Slope Adapter for 9" Aperture, Specify Slope
 - ECL = Emergency Circuit Lamp
 - H347 = 347V Stepdown Transformer, 75VA
 - H347200 = 347V Stepdown Transformer, 200VA

* See accessories section for ordering details.
 Order housing, trim, lamp and accessories separately.

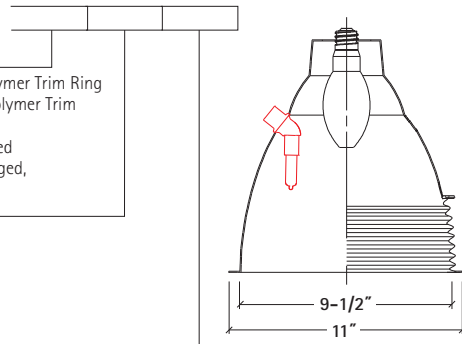
NOTE: 1. Not available with 150W 2. Available with 150W only
 3. Must use with 1E or 2E option with 50 and 150W

Catalog Number _____

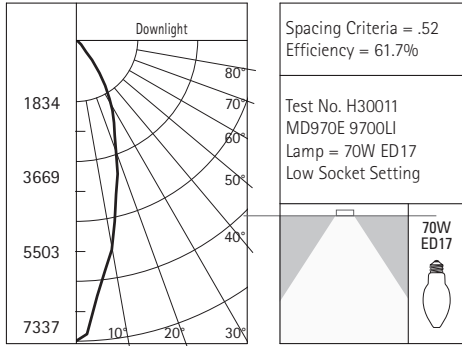
- TRIM** _____
 9700 = 9" Medium Beam Reflector, White Polymer Trim Ring
 9700X = 9" Medium Beam Reflector, White Polymer Trim Ring, Standby Lamp
 9701 = 9" Medium Beam Reflector, Self Flanged
 9701X = 9" Medium Beam Reflector, Self Flanged, Standby Lamp

- FINISH** _____
 LI = Specular Clear, Low Iridescent
 H = Semi Specular Clear Haze
 WMH = Warm Haze
 G = Gold
 WH = Wheat
 WHH = Wheat Haze
 GP = Graphite
 GPH = Graphite Haze
 K = Cognac
 KH = Cognac Haze
 CC = Chocolate
 CCH = Chocolate Haze
 B = Black
 BB = Black Baffle (Polymer Trim Ring Only)
 WB = White Baffle (Polymer Trim Ring Only)

- OPTIONS** _____
 WF = White Painted Flange (Self Flanged only)



Candlepower Distribution Curve



Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
7'6"	130	4'0"
9'0"	91	5'0"
10'0"	73	5'6"
13'0"	43	7'0"
16'0"	29	8'6"
18'0"	23	9'6"

Coefficients of Utilization

Ceiling Wall % RCR	80%				70%			50%	
	Zonal cavity method -- floor reflectance = 20%								
0	73	73	73	73	72	72	72	69	69
1	70	69	67	66	67	66	65	65	63
2	67	64	62	60	63	61	60	61	58
3	64	61	58	56	60	57	55	58	54
4	61	57	54	52	56	54	51	55	51
5	59	54	51	48	53	50	48	52	48
6	56	51	48	45	51	47	45	50	45
7	54	48	45	43	48	45	43	47	42
8	51	46	43	40	46	42	40	45	40
9	49	44	40	38	43	40	38	43	38
10	47	42	38	36	41	38	36	41	36

METAL HALIDE LENS DOWNLIGHT ED17 MH LAMP TO 100W

Lens downlight for general lighting when wet location listing is required from a single vertically mounted ED17 metal halide lamps. Optional quartz standby lamp is factory installed to upper reflector. Integral electronic ballast with UNV 120/277V input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	29-5/8"	16-1/2"	11"	10-1/4"

Catalog Number _____

HOUSING _____
 ML9 = 9" MH Lens Housing
 ML9CP = 9" MH Lens Housing, CCEA Listed for City of Chicago Plenum Requirements

WATTAGE _____
 50 = 50W MH Lamp
 70 = 70W MH Lamp
 100 = 100W MH Lamp

BALLAST _____
 E = Electronic, UNV 120/277V 50/60Hz
 1E = Electronic, 120V 50/60Hz
 2E = Electronic, 277V 50/60Hz

OPTIONS _____
 Q = Quartz Re-Strike System ¹
 X = Emergency Circuit Lamp

- ACCESSORIES**
- HB26 = Bar Hanger, 26" Long, Pair
 - HB50 = Bar Hanger, 50" Long, Pair
 - RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
 - HSA9* = Slope Adapter for 9" Aperture, Specify Slope
 - H347 = 347V Stepdown Transformer, 75VA
 - H347200 = 347V Stepdown Transformer, 200VA

* See accessories section for ordering details. Order housing, trim, lamp and accessories separately.

NOTE: 1. Must use with 1E or 2E option with 50W

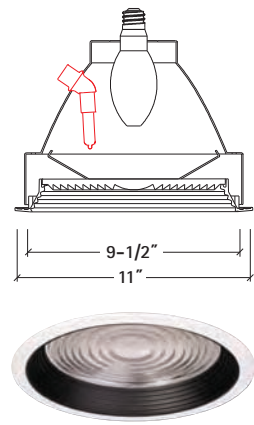
REGRESSED FRESNEL LENS

100W MAX ED17 MH

Catalog Number _____

TRIM _____
 10002 = 9" Regressed Fresnel Lens, Die Cast Step Baffle

OPTIONS _____
 P = White Trim Ring, Black Baffle
 PWH = White Trim Ring, White Baffle



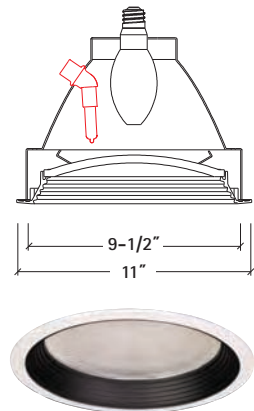
CONCAVE PRISMATIC LENS

100W MAX ED17 MH

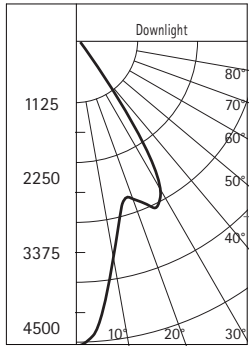
Catalog Number _____

TRIM _____
 10012 = 9" Concave Prismatic Lens, Die Cast Step Baffle

OPTIONS _____
 P = White Trim Ring, Black Baffle
 PWH = White Trim Ring, White Baffle



Candlepower Distribution Curve



Spacing Criteria = 0.6
Efficiency = 47.6%

Test No. E428-327
ML9100E 10002P
Lamp = M100/C MH

100W
ED17

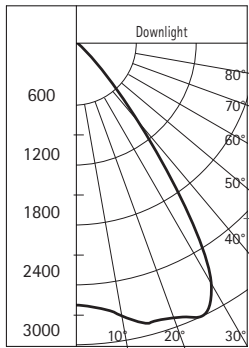
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
5' 6"	148	3' 0"
6' 6"	106	3' 6"
8' 0"	70	4' 6"
10' 0"	45	5' 6"
12' 0"	31	7' 0"
14' 0"	23	8' 0"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	57	57	57	57	55	55	55	53	53
1	54	53	52	51	52	51	50	50	48
2	52	50	48	46	49	47	46	47	45
3	49	46	44	42	46	44	42	44	41
4	47	44	41	39	43	41	39	42	38
5	45	41	38	36	40	38	36	40	36
6	42	38	36	34	38	35	34	37	33
7	40	36	33	31	36	33	31	35	31
8	38	34	31	29	33	31	29	33	29
9	36	32	29	27	31	29	27	31	27
10	34	30	27	25	29	27	25	29	25

Candlepower Distribution Curve



Spacing Criteria = 1.1
Efficiency = 52.1%

Test No. E428-328
ML9100E 10012P
Lamp = M100/C MH

100W
ED17

Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
5' 6"	85	7' 0"
6' 6"	61	8' 6"
8' 0"	40	10' 6"
10' 0"	26	13' 0"
12' 0"	18	16' 0"
14' 0"	13	18' 6"

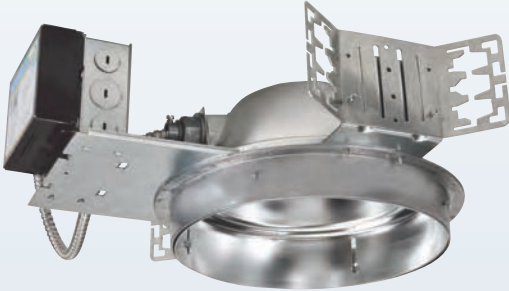
Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	62	62	62	62	61	61	61	58	58
1	59	58	56	55	57	55	54	54	53
2	56	54	52	50	53	51	50	51	48
3	54	50	48	46	50	47	45	48	45
4	51	47	44	42	46	44	42	45	41
5	48	44	41	39	43	41	38	42	38
6	46	41	38	36	41	38	36	40	35
7	43	38	35	33	38	35	33	37	33
8	41	36	32	30	35	32	30	35	30
9	38	33	30	28	33	30	28	32	28
10	36	31	28	26	31	28	26	30	25

9" APERTURE

METAL HALIDE SHALLOW LENS DOWNLIGHT ED17 MH LAMP TO 100W

Wide beam downlight for general lighting from a single horizontally mounted ED17 metal halide lamps. Available with wet location listed fresnel or concave prismatic glass lens trims. Optional quartz standby lamp is factory installed to upper reflector. Integral electronic ballast available in UNV 120/277V (except 150W) input provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	24-7/16"	18"	6"	10-1/4"

Catalog Number _____

HOUSING _____
 ML9S = 9" MH Lens Shallow Housing
 ML9SCP = 9" MH Lens Shallow Housing, CCEA Listed for City of Chicago Plenum Requirements

WATTAGE _____
 50 = 50W MH Lamp
 70 = 70W MH Lamp
 100 = 100W MH Lamp

BALLAST _____
 E = Electronic, UNV 120/277V 50/60Hz
 1E = Electronic, 120V 50/60Hz
 2E = Electronic, 277V 50/60Hz

OPTIONS _____
 Q = Quartz Re-Strike System ¹
 X = Emergency Circuit Lamp

ACCESSORIES
 HB26 = Bar Hanger, 26" Long, Pair
 HB50 = Bar Hanger, 50" Long, Pair
 RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
 HSA9* = Slope Adapter for 9" Aperture, Specify Slope
 H347 = 347V Stepdown Transformer, 75VA
 H347200 = 347V Stepdown Transformer, 200VA

* See accessories section for ordering details.
 Order housing, trim, lamp and accessories separately.

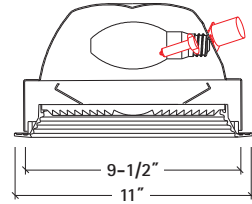
NOTE: 1 Must use with 1E or 2E option with 50W.

REGRESSED FRESNEL LENS

100W MAX ED17 MH

Catalog Number _____

TRIM _____
 10002 = 9" Regressed Fresnel Lens, Die Cast Step Baffle
OPTIONS _____
 P = White Trim Ring, Black Baffle
 PWH = White Trim Ring, White Baffle

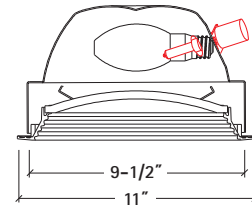


CONCAVE PRISMATIC LENS

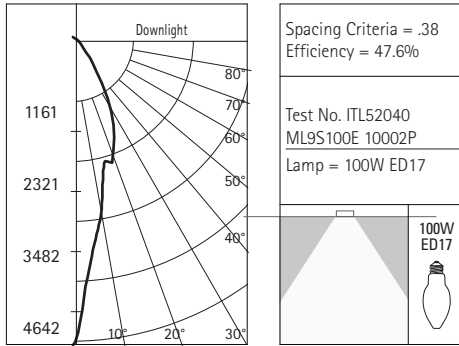
100W MAX ED17 MH

Catalog Number _____

TRIM _____
 10012 = 9" Concave Prismatic Lens, Die Cast Step Baffle
OPTIONS _____
 P = White Trim Ring, Black Baffle
 PWH = White Trim Ring, White Baffle



Candlepower Distribution Curve



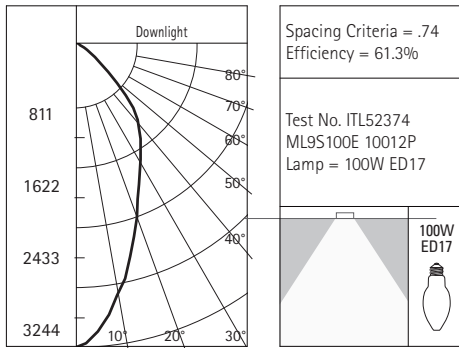
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
7' 6"	83	3' 0"
8' 0"	73	3' 6"
9' 0"	57	4' 0"
10' 0"	46	4' 6"
13' 0"	27	5' 6"
16' 0"	18	7' 0"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	57	57	57	57	55	55	55	53	53
1	53	52	50	49	51	49	48	49	47
2	50	47	45	43	46	44	42	45	41
3	47	43	40	38	42	39	37	41	37
4	44	39	36	33	39	36	33	37	33
5	41	36	33	30	35	32	30	35	30
6	38	33	30	27	33	30	27	32	27
7	36	31	27	25	30	27	25	30	25
8	34	29	25	23	28	25	23	28	23
9	32	27	23	21	26	23	21	26	21
10	30	25	22	20	25	22	20	24	20

Candlepower Distribution Curve



Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
4' 0"	203	3' 6"
6' 0"	90	5' 0"
7' 0"	66	5' 6"
8' 0"	51	6' 6"
9' 0"	40	7' 0"
10' 0"	32	8' 0"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	73	73	73	73	71	71	71	68	68
1	69	66	64	63	65	63	62	62	60
2	64	60	57	54	59	56	53	57	52
3	59	54	50	47	53	50	47	52	46
4	55	49	45	42	49	44	41	47	41
5	51	45	40	37	44	40	37	43	36
6	48	41	37	33	41	36	33	40	33
7	45	38	33	30	37	33	30	37	30
8	42	35	30	27	35	30	27	34	27
9	40	32	28	25	32	28	25	32	25
10	37	30	26	23	30	26	23	29	23

CERAMIC METAL HALIDE DOWNLIGHT T9 LAMP TO 315W

Recessed lens downlight with 9" aperture with vertical T9 PGZ18 ceramic metal halide lamp. Available in narrow, medium and wide distributions. Fixture is suitable for commercial construction. Two stage reflector system produces smooth distribution with excellent light control.



Dimensions	Length	Width	Height	Cutout
Standard Housing	28-2/16"	18"	15-13/16"	10-4/16"

Catalog Number _____

HOUSING

MD9 = 9" Aperture
MD9CP = 9" Aperture, CCEA Listed for City of Chicago Plenum Requirements

DISTRIBUTION

N=Narrow, M=Medium, W=Wide

WATTAGE

210T9 = 210W T9 PGZ18 CMH Lamp
315T9 = 315W T9 PGZ18 CMH Lamp

BALLAST

2E = Electronic, 200-277V 50/60Hz

OPTIONS

Q = Quartz Re-Strike System
X = Emergency Circuit Lamp

ACCESSORIES

HB26 = Bar Hanger, 26" Long, Pair
HB50 = Bar Hanger, 50" Long, Pair
HSA9* = Slope Adapter for 9" Aperture, Specify Slope

* See accessories section for ordering details.
Order housing, trim, lamp and accessories separately.

Catalog Number _____

TRIM

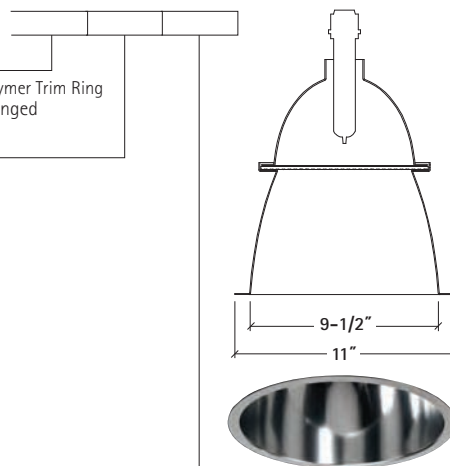
9780 = 9" Medium Beam Reflector, White Polymer Trim Ring
9781 = 9" Medium Beam Reflector, Self Flanged

FINISH

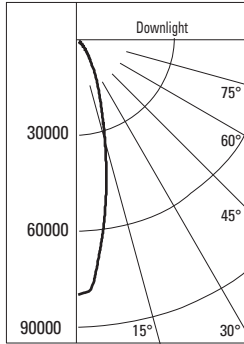
LI = Specular Clear, Low Iridescent
H = Semi specular Clear
WMH = Warm Haze
G = Gold
WH = Wheat
WHH = Wheat Haze
GP = Graphite
GPH = Graphite Haze
K = Cognac
KH = Cognac Haze
CC = Chocolate
CCH = Chocolate Haze
B = Black

OPTIONS

WF = White Painted Flange (Self Flanged only)

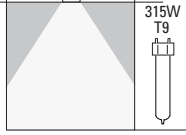


Candlepower Distribution Curve



Spacing Criteria = .4
Efficiency = 71.0%

Test No. P12279
MD9N315T92E
Lamp = CDM-T9-
315W-930/U/E



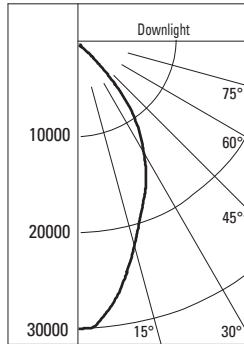
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
20'0"	201	9'0"
25'0"	128	11'0"
30'0"	89	13'0"
35'0"	66	15'0"
40'0"	50	17'0"

Coefficients of Utilization

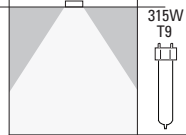
Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	84	84	84	84	83	83	83	79	79
1	81	79	78	76	78	76	75	75	73
2	78	75	72	70	73	71	69	71	68
3	74	70	67	65	69	67	64	68	63
4	71	67	63	61	66	63	60	64	60
5	68	63	60	57	63	59	57	61	56
6	66	60	57	54	60	56	54	59	53
7	63	57	54	51	57	54	51	56	51
8	61	55	51	49	55	51	49	54	49
9	58	53	49	47	52	49	47	52	46
10	56	51	47	45	50	47	45	50	44

Candlepower Distribution Curve



Spacing Criteria = .8
Efficiency = 70.5%

Test No. p12281
MD9M315T92E
Lamp = CDM-T9-
315W-930/U/E



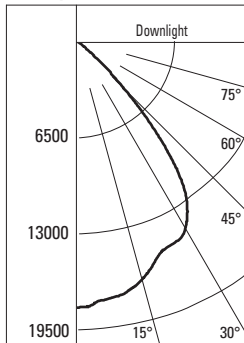
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
15'0"	133	12'0"
20'0"	75	16'0"
25'0"	48	20'0"
30'0"	33	23'0"
35'0"	24	27'0"

Coefficients of Utilization

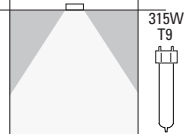
Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	84	84	84	84	82	82	82	78	78
1	80	78	76	74	76	75	73	73	71
2	76	72	69	67	71	68	66	69	65
3	72	67	63	60	66	63	60	64	59
4	68	62	58	55	61	58	55	60	54
5	64	58	54	50	57	53	50	56	50
6	61	54	50	46	54	49	46	52	46
7	57	51	46	43	50	46	43	49	43
8	54	47	43	40	47	43	40	46	40
9	52	45	40	37	44	40	37	44	37
10	49	42	38	35	42	38	35	41	35

Candlepower Distribution Curve



Spacing Criteria = 1.2
Efficiency = 67.4%

Test No. p12280
MD9W315T92E
Lamp = CDM-T9-
315W-930/U/E



Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
12'6"	116	15'0"
15'0"	81	18'0"
20'0"	45	24'0"
25'0"	29	30'0"
30'0"	20	36'0"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	80	80	80	80	78	78	78	75	75
1	76	74	72	71	73	71	69	70	67
2	72	68	65	63	67	64	62	65	61
3	68	63	59	56	62	58	56	60	55
4	64	58	54	51	57	53	50	56	50
5	60	53	49	46	53	49	46	52	45
6	56	49	45	42	49	45	42	48	41
7	53	46	41	38	45	41	38	44	38
8	50	43	38	35	42	38	35	41	35
9	47	40	35	32	39	35	32	39	32
10	44	37	33	30	37	33	30	36	30





13" APERTURE

METAL HALIDE LENS DOWNLIGHT ED17 MH LAMP 150W

Wide beam lens downlight for general lighting from a single vertically mounted ED17 metal halide lamp. Optional quartz standby lamp is factory installed to upper reflector. Integral electronic ballast provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	33-3/16"	19-5/16"	15"	13-7/8"

Catalog Number _____

HOUSING _____
 ML13 = 13" MH Lens Housing
 ML13CP = 13" MH Lens Housing, CCEA Listed for City of Chicago Plenum Requirements

WATTAGE _____
 150 = 150W MH Lamp

BALLAST _____
 1E = Electronic, UNV 120V 50/60Hz
 2E = Electronic, UNV 277V 50/60Hz

OPTION _____
 Q = Quartz Re-Strike System
 X = Emergency Circuit Lamp

- ACCESSORIES**
- HB26 = Bar Hanger, 26" Long, Pair
 - HB50 = Bar Hanger, 50" Long, Pair
 - RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
 - H347200 = 347V Stepdown Transformer, 200VA

See accessories section for ordering details.
 Order housing, trim, lamp and accessories separately.

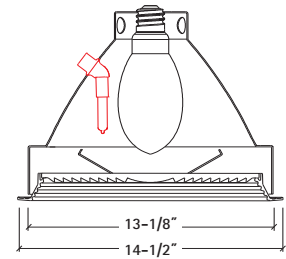
REGRESSED FRESNEL LENS

150W ED17 MH

Catalog Number _____

TRIM _____
 10202 = 13" Regressed Fresnel Lens

OPTIONS _____
 P = White Trim Ring, Black Baffle
 PWH = White Trim Ring, White Baffle



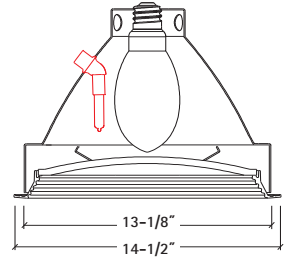
CONCAVE PRISMATIC LENS

150W ED17 MH

Catalog Number _____

TRIM _____
 10212 = 13" Concave Prismatic Lens

OPTIONS _____
 P = White Trim Ring, Black Baffle
 PWH = White Trim Ring, White Baffle



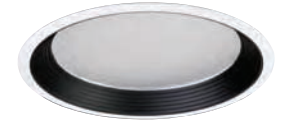
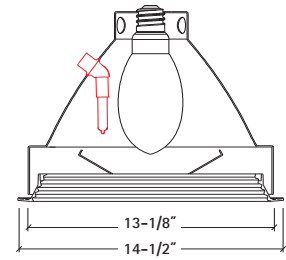
REGRESSED PRISMATIC LENS

150W ED17 MH

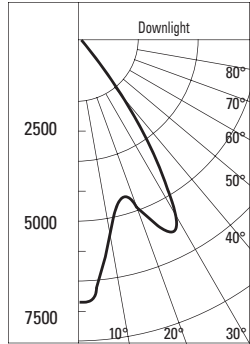
Catalog Number _____

TRIM _____
 10222 = 13" Regressed Prismatic Lens

OPTIONS _____
 P = White Trim Ring, Black Baffle
 PWH = White Trim Ring, White Baffle



Candlepower Distribution Curve



Spacing Criteria = 1.0
Efficiency = 58.2%

Test No. P12078
ML13150 10202P
Lamp = MH150/C/U/M
150 Watts

150W ED17

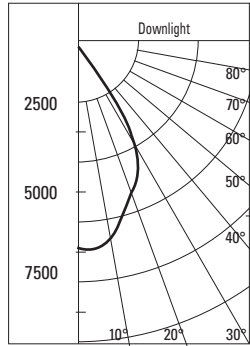
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
10' 0"	71	11' 0"
13' 0"	42	14' 0"
16' 0"	28	17' 0"
20' 0"	18	22' 0"
25' 0"	11	27' 0"

Coefficients of Utilization

Ceiling Wall % RCR	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
Zonal cavity method -- floor reflectance = 20%									
0	69	69	69	69	68	68	68	65	65
1	66	64	62	61	63	61	60	60	58
2	62	59	56	54	58	55	53	56	52
3	58	54	51	48	53	50	48	52	47
4	55	50	47	44	49	46	44	48	43
5	52	47	43	40	46	42	40	45	39
6	49	43	39	37	43	39	37	42	36
7	46	40	36	34	40	36	34	39	33
8	44	38	34	31	37	34	31	37	31
9	41	35	31	29	35	31	29	34	29
10	39	33	29	27	33	29	27	32	27

Candlepower Distribution Curve



Spacing Criteria = 0.7
Efficiency = 53.0%

Test No. P12077
ML13150 10212P
Lamp = MH150/C/U/M
150 Watts

150W ED17

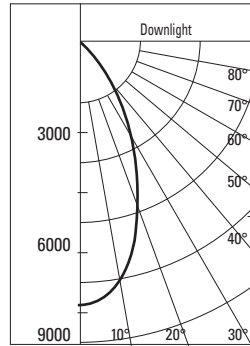
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
10' 0"	65	11' 0"
13' 0"	39	14' 0"
16' 0"	26	17' 0"
20' 0"	16	21' 5"
25' 0"	10	27' 0"

Coefficients of Utilization

Ceiling Wall % RCR	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
Zonal cavity method -- floor reflectance = 20%									
0	75	75	75	75	74	74	74	70	70
1	72	70	68	66	68	67	65	66	63
2	68	64	61	59	63	60	58	61	57
3	64	59	56	53	58	55	53	57	52
4	60	55	51	48	54	51	48	53	47
5	57	51	47	44	50	46	44	49	43
6	54	47	43	40	47	43	40	46	40
7	51	44	40	37	44	40	37	43	37
8	48	41	37	34	41	37	34	40	34
9	45	39	35	32	38	34	32	38	32
10	43	36	32	30	36	32	30	36	30

Candlepower Distribution Curve



Spacing Criteria = 0.8
Efficiency = 60.3%

Test No. P12079
ML13150 10222P
Lamp = MH150/C/U/M
150 Watts

150W ED17

Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
10' 0"	78	8' 0"
13' 0"	46	10' 5"
16' 0"	30	13' 0"
20' 0"	19	16' 5"
25' 0"	12	20' 5"

Coefficients of Utilization

Ceiling Wall % RCR	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
Zonal cavity method -- floor reflectance = 20%									
0	72	72	72	72	70	70	70	67	67
1	68	66	64	62	64	63	61	62	60
2	64	60	57	55	59	57	54	57	53
3	60	55	52	49	54	51	49	53	48
4	56	51	47	44	50	47	44	49	43
5	53	47	43	40	47	43	40	46	40
6	50	44	40	37	43	40	37	43	37
7	47	41	37	34	41	37	34	40	34
8	45	38	34	32	38	34	32	37	31
9	43	36	32	30	36	32	29	35	29
10	40	34	30	28	34	30	28	33	28

13" APERTURE

METAL HALIDE SQUARE LENS DOWNLIGHT ED17 MH LAMP TO 150W

Square aperture downlight available with five different lens trims providing a number of light distributions from a single horizontally mounted ED17 metal halide lamp. Optional quartz standby lamp is factory installed in upper reflector. Integral electronic ballast with UNV 120/277V (except 150W) provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	27-1/2"	14-3/4"	9-1/2"	14"

Catalog Number _____

HOUSING _____
 MLS13 = 13" Square Lens MH Housing
 MLS13CP = 13" Square Lens MH Housing, CCEA Listed for City of Chicago Plenum Requirements

WATTAGE _____
 50 = 50W MH Lamp
 70 = 70W MH Lamp
 100 = 100W MH Lamp
 150 = 150W MH Lamp

BALLAST _____
 E = Electronic, UNV 120/277V 50/60Hz¹
 1E = Electronic, UNV 120V 50/60Hz²
 2E = Electronic, UNV 277V 50/60Hz²

OPTION _____
 Q = Quartz Re-Strike System³
 X = Emergency Circuit Lamp

- ACCESSORIES
- HB26 = Bar Hanger, 26" Long, Pair
 - HB50 = Bar Hanger, 50" Long, Pair
 - RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
 - H347 = 347V Stepdown Transformer, 75VA
 - H347200 = 347V Stepdown Transformer, 200VA

See accessories section for ordering details.
 Order housing, trim, lamp and accessories separately.

NOTE: 1. Not available with 150W 2. Available with 150W only
 3. Must use 1E or 2E options with 50 and 150W

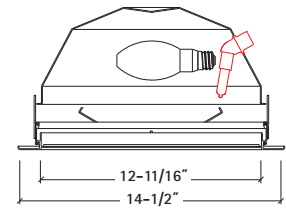
FRESNEL LENS

150W MAX ED17 MH

Catalog Number _____

TRIM _____
 11300 = 13" Fresnel Lens

OPTIONS _____
 P = White Trim Ring



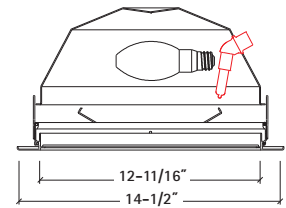
REGRESSED FRESNEL LENS

150W MAX ED17 MH

Catalog Number _____

TRIM _____
 11302 = 13" Regressed Fresnel Lens

OPTIONS _____
 P = White Trim Ring, Black Baffle



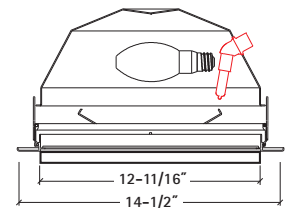
DROP PRISMATIC LENS

150W MAX ED17 MH

Catalog Number _____

TRIM _____
 11311 = 13" Drop Prismatic Lens

OPTIONS _____
 P = White Trim Ring



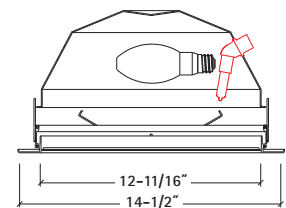
REGRESSED FRESNEL LENS

150W MAX ED17 MH

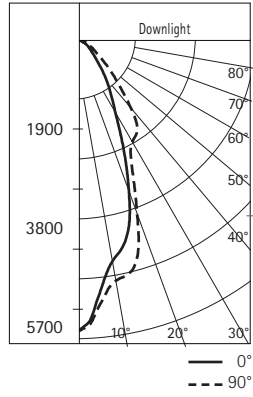
Catalog Number _____

TRIM _____
 11313 = 13" Regressed Fresnel Lens

OPTIONS _____
 P = White Trim Ring, Black Baffle



Candlepower Distribution Curve



Spacing Criteria = 0.7
Efficiency = 63.6%

Test No. H32002
MLS13100E 11300P
Lamp = M100/C/U

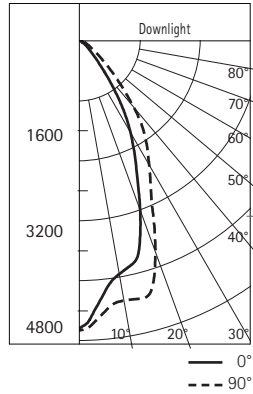
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
8' 0"	88	6' 6"
9' 0"	70	7' 0"
10' 0"	56	8' 0"
12' 6"	36	10' 0"
15' 0"	25	12' 0"
20' 0"	14	16' 0"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	76	76	76	76	74	74	74	71	71
1	71	68	66	64	67	65	63	64	61
2	66	62	59	56	61	58	55	59	54
3	62	56	52	49	56	52	49	54	48
4	58	52	47	44	51	47	44	50	43
5	54	48	43	40	47	43	40	46	39
6	51	44	40	36	44	39	36	43	36
7	48	41	37	34	41	37	34	40	33
8	46	39	34	31	38	34	31	38	31
9	43	36	32	29	36	32	29	35	29
10	41	34	30	27	34	30	27	33	27

Candlepower Distribution Curve



Spacing Criteria = 0.8
Efficiency = 63.7%

Test No. H32003
MLS13100E 11302P
Lamp = M100/C/U

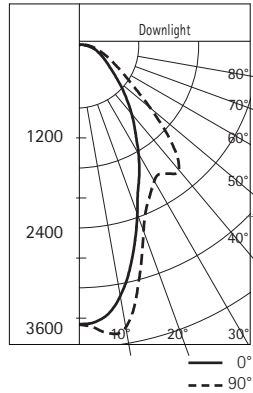
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
8' 0"	74	6' 6"
9' 0"	59	7' 0"
10' 0"	48	8' 0"
12' 6"	30	10' 0"
15' 0"	21	12' 0"
20' 0"	12	16' 0"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	75	75	75	75	74	74	74	71	71
1	71	69	67	66	68	66	65	65	63
2	67	63	60	57	62	59	57	60	55
3	63	58	54	51	57	53	50	55	50
4	59	53	49	46	52	48	45	51	45
5	55	49	45	41	48	44	41	47	41
6	52	45	41	38	45	41	38	44	37
7	49	42	38	35	42	38	35	41	34
8	46	39	35	32	39	35	32	38	32
9	44	37	33	30	37	32	30	36	30
10	42	35	31	28	34	30	28	34	28

Candlepower Distribution Curve



Spacing Criteria = 0.8
Efficiency = 63.5%

Test No. H32004
MLS13100E 11311P
Lamp = M100/C/U

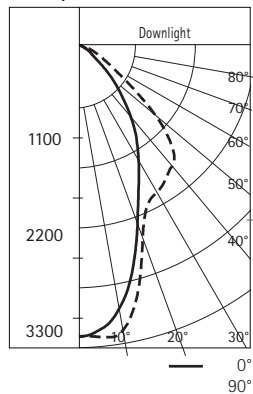
Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
6' 0"	94	9' 0"
8' 0"	53	12' 0"
9' 0"	42	13' 6"
10' 0"	34	15' 0"
12' 6"	22	19' 0"
15' 0"	15	22' 6"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	75	75	75	75	74	74	74	70	70
1	69	66	64	62	65	63	60	62	58
2	64	59	55	52	58	54	51	55	50
3	59	53	49	45	52	48	44	50	43
4	55	48	43	39	47	43	39	46	38
5	51	44	39	35	43	38	35	42	34
6	48	40	35	32	40	35	31	38	31
7	45	37	32	29	37	32	28	36	28
8	42	34	30	26	34	29	26	33	26
9	40	32	27	24	32	27	24	31	24
10	38	30	25	22	30	25	22	29	22

Candlepower Distribution Curve



Spacing Criteria = 0.8
Efficiency = 56.4%

Test No. H32005
MLS13100E 11313P
Lamp = M100/C/U

Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
6' 0"	96	8' 0"
8' 0"	54	10' 6"
9' 0"	43	11' 6"
10' 0"	35	13' 0"
12' 6"	22	16' 6"
15' 0"	15	19' 6"

Coefficients of Utilization

Ceiling Wall %	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
RCR	Zonal cavity method -- floor reflectance = 20%								
0	67	67	67	67	66	66	66	63	63
1	63	60	58	57	59	57	56	57	54
2	58	54	51	49	53	50	48	51	47
3	54	49	45	42	48	45	42	47	41
4	50	45	41	37	44	40	37	43	37
5	47	41	37	34	40	36	33	39	33
6	44	38	33	30	37	33	30	36	30
7	41	35	31	28	34	30	27	34	27
8	39	32	28	25	32	28	25	31	25
9	37	30	26	23	30	26	23	29	23
10	35	28	24	22	28	24	22	27	21

Consult specification sheets for additional photometry.

METAL HALIDE SQUARE LENS DOWNLIGHT ED17 MH LAMP TO 150W

Square aperture downlight available with five different lens trims providing a number of light distributions from a single horizontally mounted ED17 metal halide lamp. Optional quartz standby lamp is factory installed to upper reflector. Integral electronic ballast with UNV 120/277V (except 150W) provides superior lamp control and performance.



Dimensions	Length	Width	Height	Cutout
Standard Housing	27-1/2"	14-3/4"	9-1/2"	14"

Catalog Number

HOUSING

MLS13 = 13" Square Lens
MH Housing

MLS13CP = 13" Square Lens
MH Housing,
CCEA Listed for City of
Chicago Plenum
Requirements

WATTAGE

50 = 50W MH Lamp
70 = 70W MH Lamp
100 = 100W MH Lamp
150 = 150W MH Lamp

BALLAST

E = Electronic, UNV 120/277V 50/60Hz ¹
1E = Electronic, UNV 120V 50/60Hz ²
2E = Electronic, UNV 277V 50/60Hz ²

OPTION

Q = Quartz Re-Strike System ³
X = Emergency Circuit Lamp

ACCESSORIES

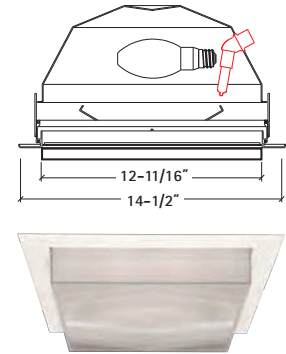
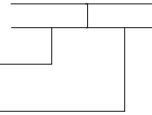
HB26 = Bar Hanger, 26" Long, Pair
HB50 = Bar Hanger, 50" Long, Pair
RMB22 = Bar Hanger for Wooden Joists, 22" Long, Pair
H347 = 347V Stepdown Transformer, 75VA
H347200 = 347V Stepdown Transformer, 200VA

See accessories section for ordering details.
Order housing, trim, lamp and accessories separately.

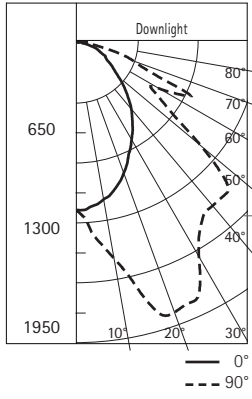
NOTE: 1. Not available with 150W **2.** Available with 150W only
3. Must use 1E or 2E options with 50 and 150W

Catalog Number

TRIM _____
11321 = 13" Drop Asymmetric Lens
OPTIONS _____
P = White Trim Ring



Candlepower Distribution Curve



Spacing Criteria = 1.0
Efficiency = 52.6%

Test No. H32006
MLS13100E 11321P
Lamp = M100/C/U

100W
ED17

Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
6' 0"	45	12' 6"
7' 0"	33	14' 6"
8' 0"	25	17' 0"
9' 0"	20	19' 0"
10' 0"	16	21' 0"
12' 6"	10	26' 6"

Coefficients of Utilization

Ceiling Wall % RCR	80%				70%			50%	
	70	50	30	10	50	30	10	50	10
Zonal cavity method -- floor reflectance = 20%									
0	62	62	62	62	61	61	61	58	58
1	57	55	53	51	54	52	50	51	48
2	52	48	45	42	47	44	42	45	40
3	48	43	39	35	42	38	35	40	34
4	44	38	34	30	37	33	30	36	30
5	41	34	30	26	34	29	26	32	26
6	38	31	26	23	30	26	23	29	23
7	35	28	24	21	28	23	20	27	20
8	33	26	21	18	25	21	18	25	18
9	31	24	19	17	23	19	17	23	16
10	29	22	18	15	21	18	15	21	15





PLEASE
DO NOT
LEAVE
VEHICLES
UNATTENDED

*Justice, mercy, and peace, and do not
of such is the kingdom of God.
Lk 16*

ACCESSORIES-DECO TRIMS

DECO Trims are visually exciting accessories used with the 6" and 7" Portfolio housings. They enliven the appearance of any space and provide a subtle glow at the ceiling. DECO Trims are designed to replace the removable trim ring on open Portfolio reflectors. These complimentary accessories are not an option with Self-Flanged or Lensed Reflectors.



SPECIAL FEATURES

ALUMINUM

Aluminum ring is 0.09" thick, with satin surface. Rings are available in either satin clear or satin gold and are anodized to retain appearance over life.

GLASS

Cast glass funnel, 0.250" thick, has etched finish on both surfaces to diffuse the light and glow. Crisp edge details provide an architectural appearance over normal slumped glass. Glass available in a choice of colors.

ACRYLIC

Acrylic rings are 0.250" thick, with upper surface frosted to diffuse the light. Edge of ring is polished to impart a clean look to the finished element. Rings available in a choice of colors.

HARDWARE

Four satin finish aluminum posts and decorative knobs are anodized clear to retain appearance over life.

MOUNTING FLANGE

Precision die formed steel with matte white finish, matches metal trim rings in the Portfolio family. Four steel threaded studs support weight of decorative element. Four hex head bolts tighten the flange securely and quickly to the recessed die cast plaster flange via pre installed mounting hardware. For use in ceilings up to 2" thick.

LABELS

UL listed and C.S.A. certified. To be used with Portfolio product only, other installations will void warranty.



ACCESSORIES-DECO TRIMS

DISC/LENS



DT6DISC, DT7DISC
Cut and polished glass disc with etched center to diffuse the light.



DT6LO, DT7LO
Lensed frosted glass
UL listed for wet location applications

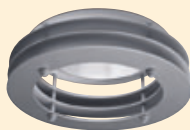
ANODIZED RINGS



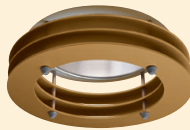
DT6RC, DT7RC
Single ring, matte anodized aluminum



DT6RG, DT7RG
Single ring, gold anodized aluminum



DT63RC, DT73RC
Triple ring, clear anodized aluminum



DT63RG, DT73RG
Triple ring, gold anodized aluminum

TRANSLUCENT RINGS



DT6R0, DT7R0
Single ring, matte acrylic



DT6R1, DT7R1
Single ring, cobalt blue acrylic



DT6R8, DT7R8
Single ring, ruby red acrylic



DT6R2, DT7R2
Single ring, aqua blue acrylic



DT63R0, DT73R0
Triple ring, matte acrylic



DT63R2, DT73R2
Triple ring, aqua blue acrylic

SOFT SQUARES



DT6SC0, DT7SC0
Soft square, matte acrylic



DT6SC1, DT7SC1
Soft square, cobalt blue acrylic



DT6SC8, DT7SC8
Soft square, ruby red acrylic



DT6SC2, DT7SC2
Soft square, aqua blue acrylic

GLASS FUNNELS



DT6LF1, DT7LF1
Cobalt blue glass funnel



DT6LFO, DT7LFO
Frosted glass funnel

SOFT SQUARES WITH FUNNELS



DT6SC2F1, DT7SC2F1
Soft square, aqua blue acrylic with cobalt blue glass funnel



DT6SC8F1, DT7SC8F1
Soft square, ruby red acrylic with cobalt blue glass funnel



DT6SC8F0, DT7SC8F0
Soft square, ruby red acrylic with frosted glass funnel



DT6SC0F1, DT7SC0F1
Soft square, matte acrylic with cobalt blue glass funnel



DT6SC0F0, DT7SC0F0
Soft square, matte acrylic with frosted glass funnel



DT6SC1F0, DT7SC1F0
Soft square, cobalt blue acrylic with frosted glass funnel



DT6SC2F0, DT7SC2F0
Soft square, aqua blue acrylic with frosted glass funnel



DT6SC0SS1F0, DT7SC0SS1F0
Stacked soft square, matte/cobalt blue acrylic with frosted glass funnel



DT6SC0SS8F0, DT7SC0SS8F0
Stacked soft square, matte/ruby red acrylic with frosted glass funnel



DT6SC0SS2F0, DT7SC0SS2F0
Stacked soft square, matte/aqua blue acrylic with frosted glass funnel

TRANSLUCENT RINGS WITH FUNNELS



DT6R0F0, DT7R0F0
Matte acrylic with frosted glass funnel



DT6R1F0, DT7R1F0
Cobalt blue acrylic with frosted glass funnel



DT6R2F0, DT7R2F0
Aqua blue acrylic with frosted glass funnel



DT6R8F1, DT7R8F1
Red acrylic with cobalt blue glass funnel



DT6R8F0, DT7R8F0
Ruby red acrylic with frosted glass funnel



DT6R0F1, DT7R0F1
Matte acrylic with cobalt blue glass funnel



DT6R2F1, DT7R2F1
Aqua blue acrylic with cobalt blue glass funnel

ACCESSORIES—MISCELLANEOUS



White (P)



Black (MB)



Polished Brass (PB)



Chrome (C)



Silver (SL)



Satin Nickel (SN)

METAL TRIM RINGS

- TRM4P = 4" White
- TRM4MB = 4" Black
- TRM6P = 6" White
- TRM6MB = 6" Black
- TRM6PB = 6" Polished Brass
- TRM6C = 6" Chrome
- TRM6SL = 6" Silver
- TRM6SN = 6" Satin Nickel
- TRM7P = 7" White
- TRM7MB = 7" Black

Metal Trim Rings of .050 die formed aluminum for recessed fixtures. Provides strength and durability. Not for use with self flanged reflectors.



Standard LI Reflector with TRR6 (Rimless) option

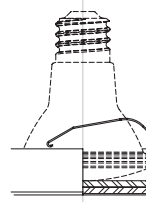
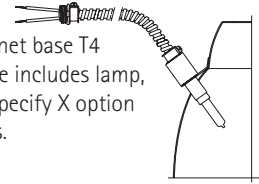
RIMLESS TRIM RINGS

- TRR4 = 4" White
- TRR6 = 6" White
- TRR7 = 7" White

High impact polymer for use with recessed fixtures being installed without standard trim rings in plaster ceilings. Provides a clean, uncluttered look. Not for use with self flanged reflectors.

ECL = EMERGENCY CIRCUIT LAMP MODULE

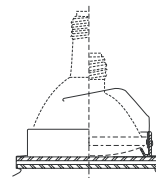
Emergency circuit lamp module for operation and control of 100W D.C. bayonet base T4 quartz lamp by emergency circuit. Module includes lamp, socket, wiring and necessary hardware. Specify X option on reflector as noted on individual sheets.



LC20

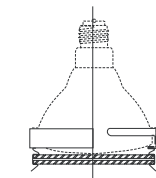
LENS CLIPS

LC20= Deep drawn steel collar attaches to PAR 20 lamp with spring clip. Accepts one or two color lens, louvers or beam modifying filters. Painted matte black to reduce stray light.



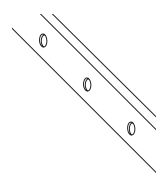
LC30

LC30= Deep drawn steel collar attaches to PAR30 lamp with spring clip. Accepts one or two color lens, louvers or beam modifying filters. Painted matte black to reduce stray light.



LC38

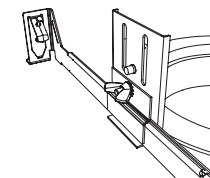
LC38= Deep drawn steel collar attaches to PAR38 lamp with spring clip. Accepts one or two color lens, louvers or beam modifying filters. Painted matte black to reduce stray light.



C-CHANNEL BAR HANGERS

- HB26 = 1-1/2" C-Channel 26" long
- HB50 = 1-1/2" C-Channel 50" long

For use with any recessed fixture with Universal Mounting Brackets. (2 per set)



WOOD JOIST BAR HANGERS

- RMB22=22" long wood joist mounting bars

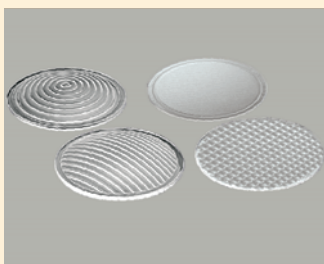
For use with any recessed fixture with Universal Mounting Brackets.

H347200 AND H347 = 347V STEP DOWN TRANSFORMER

Transformer steps 347V line voltage down to 120V fixture operating voltage. Can be secured to 1/2" knockout of fixture junction box. H347200 rated 200VA maximum. H347 rated 75VA maximum.



COLOR FILTERS	Use with LCD120	Use with LCD130	Use with LCD138
Color	Size		
	2 1/2" (65mm)	3 3/4" (95mm)	4 11/16" (119mm)
Medium Pink	-	L411	L211
Warm Red	-	L412	L212
Daylight Blue	-	L420	L220
Medium Blue	F33-20	L421	L221
Medium Amber	-	L431	L231
Medium Green	F44-20	L441	L241
UV Filter	-	L414	L214
Mercury	F66-20	-	-



L210 Linear Spread Lens

Spreads PAR38 lamp light beam 55° - 27 1/2° each side of center. It produces a wider, even illumination for wall washing or display lighting. 4 11/16" (119mm)

L215 Radial Spread Lens

Spreads PAR38 lamp light beam 30° in all directions, 15° on all sides of center. Smooths the beam pattern and reduces glare. 4 11/16" (119mm)

L250 Linear Spread Lens

Spreads light beam in one direction. 4 11/16" (119mm)

L265 Prismatic Spread Lens

Spreads light beam in all directions. 4 11/16" (119mm)

LSL-20 PAR20 Spread Lens

Spreads light beam in all directions. 2 1/2" (65mm)

OSL-20 Overall Spread Lens

Spreads light beam in all directions. 2 1/2" (65mm)

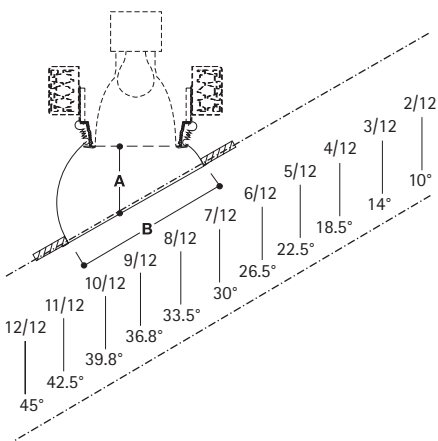
DIF-20 Diffused Lens

Spreads light beam in all directions. 2 1/2" (65mm)

LVR-20 Hex Cell Louver

For PAR20

PITCH TO DEGREE CONVERSION



SLOPE ADAPTERS

CATALOG NO. HSA	Height of Plaster Slope	Ceiling Opening 'A'	Ceiling Opening 'B'
APERTURE			
4 = 4" Nominal housings	4-1/6"	10-3/8"	
6 = 6" Nominal housings	4-5/16"	11-5/8"	
7 = 7" Nominal housings	4-7/8"	13-1/2"	
9 = 9" Nominal housings	5-7/16"	15-7/8"	
SLOPE			
05 = 5°	20 = 20°	35 = 35°	
10 = 10°	25 = 25°	40 = 40°	
15 = 15°	30 = 30°	45 = 45°	

ACCESSORIES – MWS

Low Cost Wiring Option For Portfolio Fixtures

THE CHALLENGE

Construction schedules for commercial and industrial projects are constantly being compressed. New building technology utilizing access flooring, demountable partition systems and lighting controls creates a demanding situation for the electrical contractor.

THE SOLUTION

Branch circuit wiring for lighting and power is particularly affected by fast track construction schedules, late startups and changes in the building design. Even simple construction projects require rigorous attention to detail in coordinating material and labor. Especially when traditional wiring methods are used!

MWS MAKES OTHER ALTERNATIVES OBSOLETE

MWS offers a strategic advantage in only requiring a minimal amount of material and labor during the rough-in phase; MWS is actually installed during the finish phase, at the same time as the lighting fixtures. Without cutting, bending or assembling and using a minimum of skilled labor resources. And because MWS can be installed late in a project, most design changes have little impact and as a result, costly rework and delays are typically avoided.

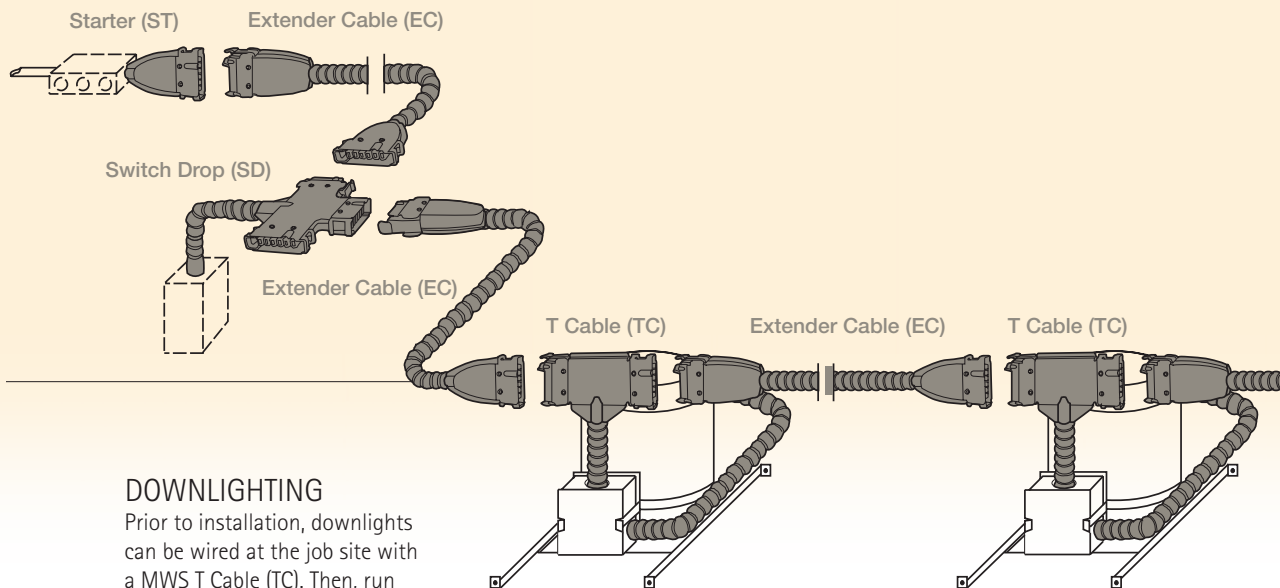
With today's modularity in office and industrial space there is a constant need to adapt to change. MWS offers future flexibility. Fixtures, switches and convenience outlets wired with MWS components can be disconnected, reconfigured and reconnected as often as necessary.

MWS is a simple and cost effective modular wiring system consisting of factory assembled components.

MWS arrives at the job site ready to be snapped together into a complete branch circuit wiring system.

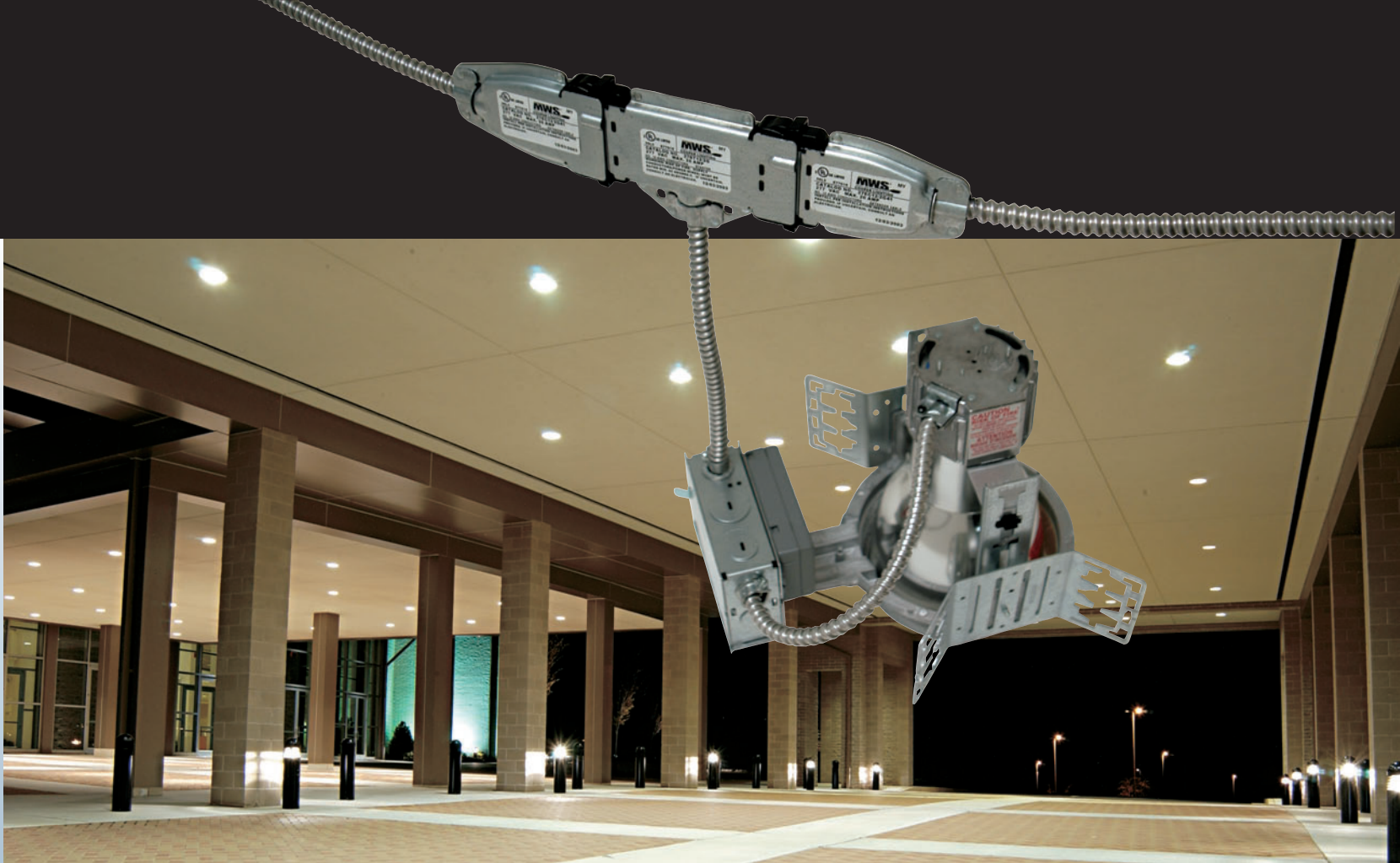
With MWS, branch circuit wiring for lighting and power can be installed in minutes instead of hours.

Wire downlighting fixtures
in 6 minutes with MWS



DOWNLIGHTING

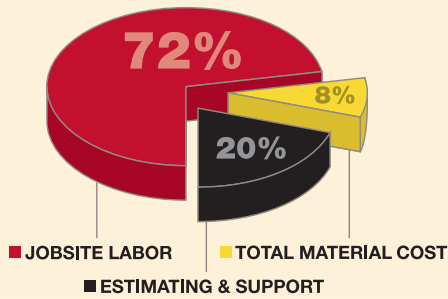
Prior to installation, downlights can be wired at the job site with a MWS T Cable (TC). Then, run MWS Extender Cables (EC) from a MWS Starter (ST) or Switch Drop (SD) to the first fixture to start the circuit. Continue the circuit by installing MWS Extender Cables between the remaining downlights.



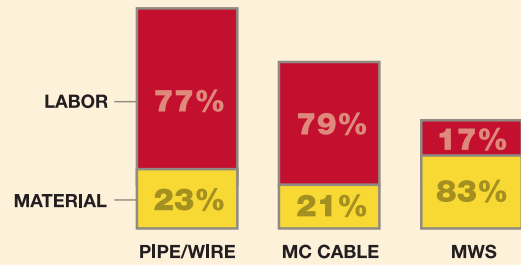
Any reduction in installation time can positively impact total project cost and overall profitability.

By reducing labor by 70%, MWS can provide a 30% lower total installed cost

TYPICAL ELECTRICAL BID



TOTAL INSTALLED COST COMMERCIAL FLUORESCENT FIXTURES



HOW TO ORDER MWS

For 277V Single Circuit/Single Level "SL"

For a Complete MWS System

8' CenterMWTC12/2G/8DW
 10' CenterMWTC12/2G/10DW
 12' CenterMWTC12/2G/12DW

To Order TC Separately

<u>Volt</u>	<u>Field Installed</u>	<u>Factory Attached</u>
277V27TC12/2G01MW27TC2G01SL
120V12TC12/2G01MW12TC2G01SL



Technical

SPECIFIC TECHNICAL INFORMATION

SPECIFIC INFORMATION

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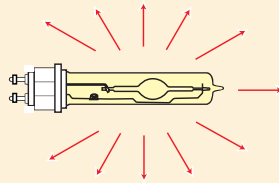
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LIGHTING TERMS

LUMINOUS FLUX (LUMENS)

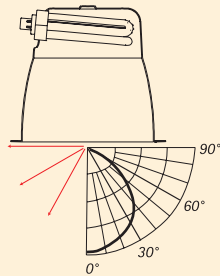
Luminous flux (lumens) is the measure of the total light producing power of the light source. It is the amount of light leaving the source without regards to direction. A 70WT6 has 6900 lumens. An incandescent 100 watt inside frosted lamp has 1720 lamp lumens. A compact fluorescent 26 watt triple lamp has 1800 lamp lumens. The luminous flux is provided by the lamp manufacturers in a listing of common lamp and lumen values.



Units: Lumens (lm) Symbol: ϕ

LUMINOUS INTENSITY (CANDELA)

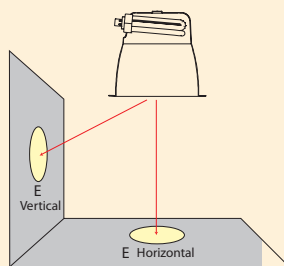
The luminous intensity (candelas) is the strength of the light produced in a specific direction. The luminous intensity of an optical system is compiled graphically into diagrams known as candela or candlepower distribution curves. Both polar and cartesian graphs are used within the lighting industry for this purpose. This information is also available in numeric tabular form.



Units: Candela (cd) Symbol: I

ILLUMINANCE (FOOTCANDLES)

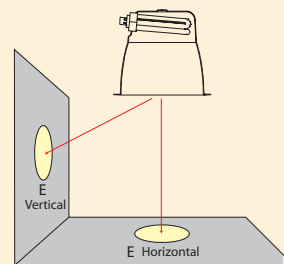
Illuminance is the measure of the quantity of luminous flux that arrives on a surface. Illuminance is affected by the luminous intensity from the fixture in the direction of the lighted surface, the distance from the luminaire to the surface, and the angle of incidence of the arriving light. Although illuminance cannot be detected by the eye, it is the most often used criteria in specifying lighting designs.



Units: Footcandles (fc) Symbol: E

LUMINANCE (CANDELAS/METER²)

Luminance is the measure of light leaving a surface in a given direction. It is what the eye perceives. Typically, luminance reveals more about the quality and comfort of a lighting system than just illuminance alone.

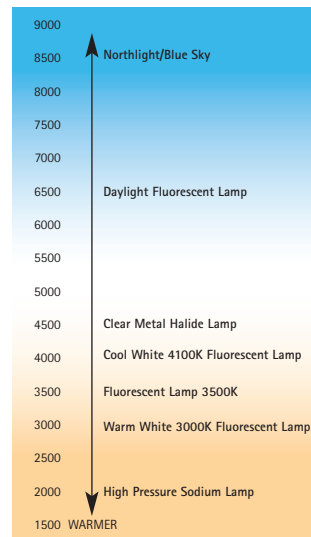


Units: Candelas per Square Meter (cd/m²) Symbol: L

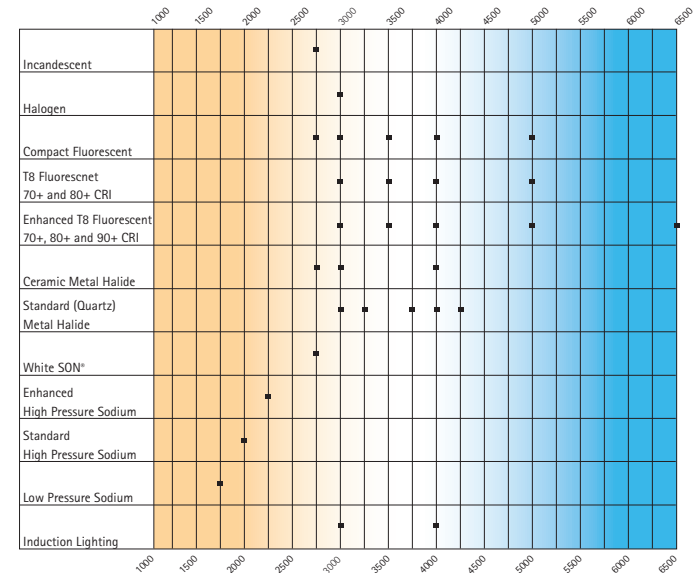
COLOR TEMPERATURE

The color temperature (chromaticity) of a light source describes the actual color appearance of the light produced with regard to its warmth or coolness. Measured on the temperature scale of Kelvin, it is defined with the use of a reference light source termed a blackbody radiator. This reference is completely black when cold, and as it is heated begins to glow, taking on a reddish orange appearance. Heated further, its color appearance shifts

towards yellow, then white and eventually bluish white at the high end of the scale. An orange red color light has a lower color temperature than a blue white light. Psychologically, the lower Kelvin temperatures are perceived as "warm", the higher as "cool", the opposite of what might be expected. With discharge sources such as compact fluorescent and HID, light is produced by methods other than heating a filament and the color is measured by its correlated color temperature (CCT). It is the measure of the color of the light, not the actual operating temperature of the lamp.



COLOR TEMPERATURE OF SELECTED LAMP TYPES



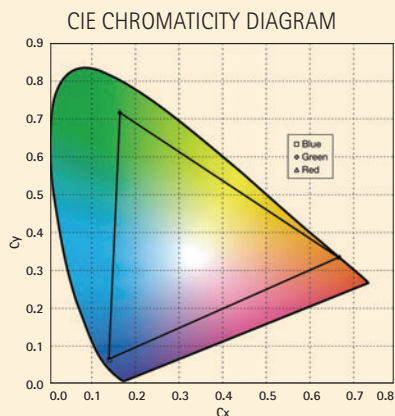
COLOR TEMPERATURE AND EFFECTS OF LIGHTING

Color Temp.	WARM	WHITE	NEUTRAL	COOL	DAYLIGHT
Kelvin Range	2700K	3000K	3500K	4100K	5000K
Effects	Warm Cozy Open	Friendly Intimate Personal	Friendly Safe Neutral	Neat Clean Efficient	Bright Alert Crisp
Typical Applications	Restaurants Hotels Boutiques Homes	Libraries Office Areas Retail Stores	Public Areas Showrooms Bookstores Office Areas	Office Areas Conference Rooms Classrooms Hospitals	Museum Displays Jewelry Displays Medical Exam Areas Printing Companies

COLOR RENDERING INDEX

The color rendering index (CRI) of a light source describes the influence of light on the color appearance of objects being illuminated. CRI describes the apparent color shift undergone by a standard set of test colors illuminated by a source as compared to their appearance under the blackbody reference source. The apparent shift in colors is measured and averaged on the CIE chromaticity diagram, and the higher the number, the closer the apparent match. Since CRI is an average it is not possible to predict the effect on one particular color, and consequently, different lamps with the same CRI may not render colors alike. CRI is only a valid comparison when comparing lamps of the same color temperature since the appearance of the test colors vary as the reference blackbody radiator varies.

Units: CRI (on a scale up to 100)



EFFICACY

Efficiency is the ratio of the luminous flux (lumens) produced by a source in relation to the energy (watts) it consumes. While efficiency is a comparison of like terms, efficacy is a comparison of unlike terms -- the lumen and the watt. It is analogous to the miles per gallon rating of automobiles. It compares how a light source converts power into light. For example:

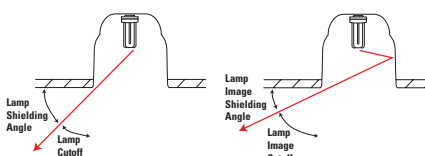
100W "A" Lamp 1720 lm/100W=17.2 LPW

26W CFL with electronic ballast 1800 lm/28W=64.2 LPW

Units: Lumens per watt (LPW or lm/W)

CUTOFF AND SHIELDING ANGLE

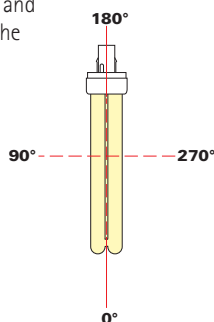
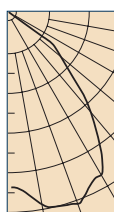
The lamp cutoff angle of a luminaire is the angle between the vertical axis (nadir) and the first line of sight when the bare source is no longer visible. Lamp image cutoff is measured the same way as lamp cutoff, but it occurs when the image of the lamp is no longer visible in the reflector. The shielding angle is the compliment of the cutoff angle. When both the lamp cutoff and lamp image cutoff are equal, the optical system has no spill light and uses all of the light in the useful beam. Equal cutoff to lamp and lamp image also provide higher visual comfort for the end users of the space.



CANDELA DIAGRAMS (Candle Power Distribution)

Candela diagrams provide an illustration of the intensity and distribution of light. This allows quick estimates on how useful a particular fixture would be in an application. Polar graphs provide a visual indication on how narrow or wide a beam a fixture produces. Two sets of angles are referenced, vertical and horizontal angles. Vertical angles range from 0° at nadir to 90° along the ceiling line. The number of horizontal angles referenced depends on the rotational shape and symmetry of the light distribution. Sections, or planes of data, are cut at various intervals to describe the intensity changes at the same elevation angles. The 0°-180° plane slices the luminaire along the axis of the lamp, the 90°-270° plane cuts across the lamp axis. Additional planes are supplied every 22.5° where the light distribution becomes more asymmetric.

In general, numerical data instead of small polar diagrams should be used for calculations, since the diagrams become difficult to read at the higher elevation angles and at angles surrounding the fixture cutoff.

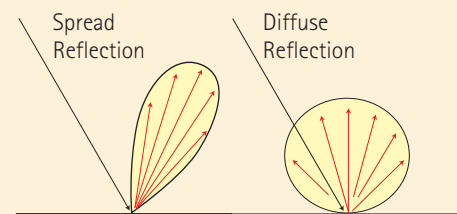
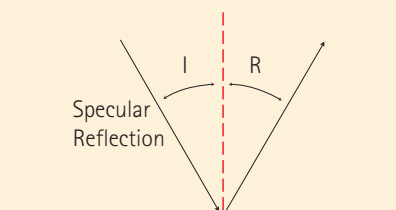


REFLECTANCE

Reflectance is the ratio of luminous flux (lumens) reflected from a surface in relation to luminous flux (lumens) incident onto the surface. Types of surface reflectance range from the specular to the diffuse (lambertian), with many objects exhibiting combinations. Typically, reflectance becomes more specular with larger incident angles. Reflectances of room surfaces are important consideration when calculating illuminances using the "Lumen Method."

$$\text{Reflectance \%} = \frac{\text{Reflected Lumens}}{\text{Incident Lumens}}$$

Units: Percentage % Symbol: p



LUMINAIRE EFFICIENCY

Luminaire efficiency is the ratio of lumens emitted by a luminaire in relation to lumens produced initially by the lamps contained within. It includes both the optical and thermal characteristics of the luminaire and is measured under controlled ambient conditions of 77°F (25°C). Luminaire efficiency does not indicate any information on the direction of the light leaving the fixture or its visual appearance.

Units: Percentage %

$$\text{Efficiency \%} = \frac{\text{Luminaire Lumens}}{\text{Lamp Lumens}}$$



Efficiency is a comparison of like terms; in the case of a lighting fixture, lumens from the luminaire vs. from the lamp. This measure of efficiency is concerned with the amount of light a luminaire can provide given the specific light source it employs.

LIGHTING TYPES

QUALITY LIGHTING— KEY TO GOOD LIGHTING DESIGN

A quality lighting design offers well balanced illumination levels between ambient, wall washing, accent and task lighting.

Portfolio offers a complete line of coordinated aperture architectural lighting products. To create a balanced lighting system, choose from a wide selection of light distribution methods including downlights, wall washers and adjustable accents.

A BALANCED LIGHTING LAYOUT

A myriad of factors influence a lighting layout and need to be carefully analyzed.

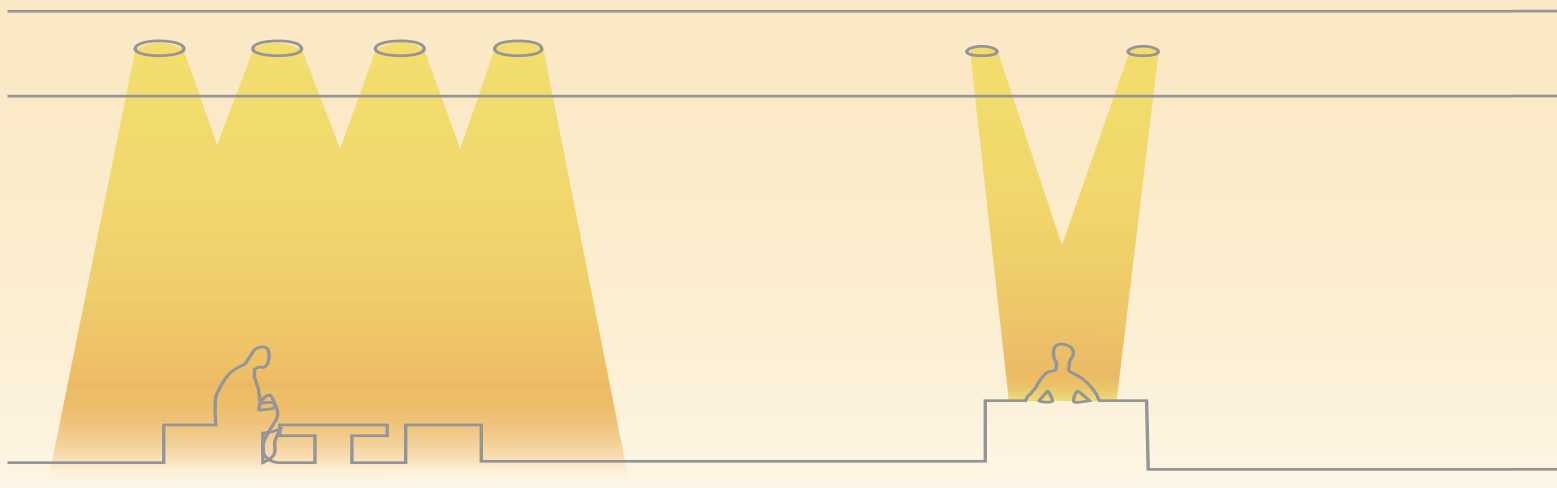
Portfolio recessed downlighting can help you achieve a balanced lighting layout. One that delineates tasks, enhances architecture and creates the desired ambience.

Of course, room size, ceiling height, wall, ceiling and floor colorings play an important role in determining footcandle levels, spacing ratios and number of luminaires.

Quality, balanced illumination is achieved when proper proportions of each type of lighting is blended in the space. Omitting one or more can result in seeing difficulty, eye strain and fatigue. General standard guidelines are established to reduce fatigue and increase productivity.

LUMINANCE RATIOS:

Recommended Ratios	Area	Effect
2 to 1	Task or accent to immediate surrounding	Subtle Low Contrast
5 to 1	Task to general surrounding	Appears Twice as Bright
10 to 1	Task to remote surrounding	Strong Focus High Contrast



AMBIENT LIGHTING

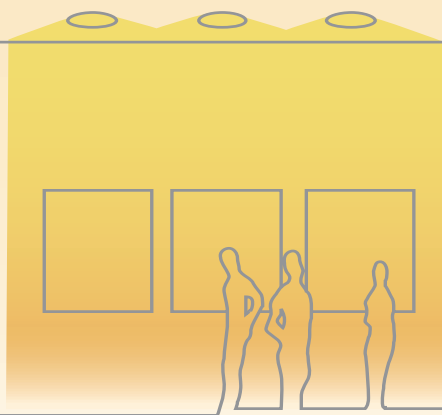
Lighting throughout an area which produces general illumination. The appropriate Portfolio recessed fixtures are available with compact fluorescent, incandescent or HID lamps to provide wide patterns of light distribution for this purpose.

Portfolio 55° reflector optics provide a wide even distribution of light directed downward through low brightness apertures to give uniform illumination. These units direct light in specific patterns to illuminate areas without drawing attention to the fixtures themselves.

TASK LIGHTING

Lighting directed to a specific area to perform a specific task. Use Portfolio luminaires with narrower beam patterns and high illumination levels.

TASK-AMBIENT LIGHTING—The combination of task and ambient lighting should provide a level of ambient lighting that is lower than the task yet is designed so the ambient complements the task lighting. Here luminance ratio should be considered. Luminance ratio is the measure of task or accent to surrounding ambient lighting. For example, retail stores may use 5-to-1 task-to-ambient lighting on cash registers for transactions and 10-to-1 accent-to-ambient lighting on displays to draw maximum attention to the products.



WALL WASHING

Lighting of vertical surfaces defines form, space and texture. It can visually increase the apparent size of a room while improving visual comfort. Portfolio has skillfully engineered fixtures designed to direct a broad spread of uniform illumination on these surfaces. Incandescent, compact fluorescent or high intensity discharge sources can be used based on the size of the space, the level of illumination and intensity desired, energy efficiency and controllability.



ACCENT LIGHTING

Directional lighting used to focus attention on a particular object or surface. Its intensity levels vary according to ambient illumination levels. Higher ambient levels require higher accent illumination to provide the necessary contrast (luminance ratio). This requires adjustable fixtures which can deliver higher illumination levels and precise beam distributions. Portfolio has the products to fit these specifications.

Portfolio adjustable recessed fixtures are most often used in accent lighting. Incandescent and tungsten halogen R and PAR lamps; low voltage MR16, PAR36 and AR111 lamps; and PAR Metal Halide lamps offer the range of intensities and beam spreads necessary for controlled quality lighting.

ILLUMINATION DATA—PHOTOMETRICS FOR LIGHTING DESIGN

Each lighting system is unique. The lighting design must correlate lamp and luminaire performance with the design intent, illumination and space requirements.

Portfolio Architectural Lighting products provide the desired combinations of lamp type and luminaire that maximize efficiency and create the desired lighting effect. Portfolio photometric data is the result of accredited laboratory testing.

Illumination data may be used by the lighting designer in the following formats:

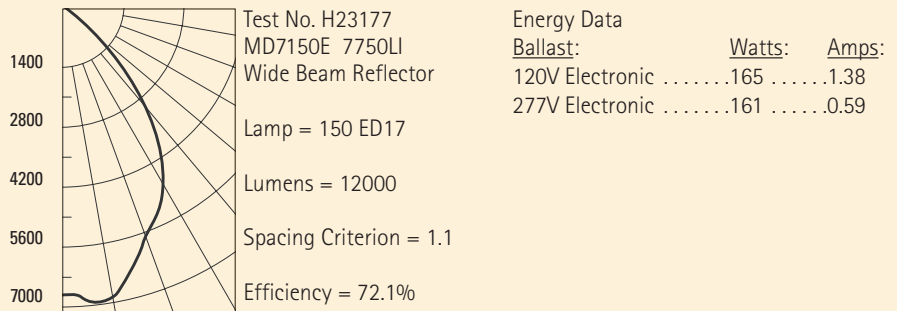
- Candlepower Distribution Curves
- Luminaire Efficacy and Efficiency
- Spacing Criterion
- Cones of Light
- Wall Wash Illumination Tables
- Adjustable Accent Illumination Tables
 - Horizontal and Vertical Surfaces
 - Beam Aiming Estimation
- Lumen Method Calculations
- Point Method Calculations



CANDLEPOWER DISTRIBUTION CURVES AND TEST DATA

The Candlepower Distribution Curve graphically illustrates the candlepower intensity and direction, vertical angles of 0 through 90 degrees, being emitted from the luminaire. The chart below shows that reflector trim 7750LI with a 150W ED17 lamp has candlepower distribution of 5600 at 20° from vertical.

SC (Spacing Criteria) indicates the center to center fixture spacing necessary to obtain even illumination. This number is expressed as a multiple of the mounting height of the fixtures. For example, fixtures in a 10' high ceiling with an SC value of 1.4 would be spaced 10' x 1.4 or 14' apart to obtain even illumination. If the fixture had an SC value of 1.1 (and ceiling height was still 10'), the fixtures would have to be placed 10' x 0.8 or 8' apart.



- **Test Number** identifies the luminaire and actual photometric test performed
- **Lamp Information** identifies the test lamp's designation and initial lumen output. Proration factors are supplied for other lamp's wattages and reflection finishes.
- **Luminaire Efficacy (LPW)**
 - LPW = Luminaire Lumens x Efficiency / Watts
 - Luminaire efficacy provides no indication of the quality or direction of light produced by the luminaire. Some luminaries with a lower LPW may produce a more desirable lighting effect than another with a higher LPW offering a different distribution.
- **Luminaire Efficiency (%)**
 - Efficiency = Luminaire Lumens / Total Lamp Lumens
 - Although it is desirable that a luminaire have as high an efficiency as possible, efficiency does not address the distribution of the fixture. Optical control and efficiency are often opposing characteristics. By designing reflectors with no spill light, unwanted glare can be eliminated and efficiency maximized.
- **Spacing Criterion (SC)**
 - Maximum Fixture Spacing = SC x Height to Lighted Plane
 - The spacing Criterion mathematically classifies the direct component of light from a luminaire and indicates the maximum spacing allowed in order to maintain reasonable uniform illuminance.
 - Typical beam distributions based upon SC values are:
 - Wide = 1.2 plus
 - Medium = 0.7 to 1.1
 - Narrow = 0.6 or less
- **Energy Data**
 - Ballast type and voltage, total wattage consumption, and current input (amps) are documented.

CONES OF LIGHT

Useful tools for rapid lighting comparisons and calculations, cones of light calculate initial footcandle levels for a single unit based upon point calculation techniques. Beam diameters are rounded to the nearest half-foot.

Cone of Light

Distance to Illuminated Plane	Initial Nadir Footcandles	Beam Diameter
4.5	27	5.0
5.5	18	6.5
6.5	13	7.5
8.0	8	9.5
10.0	5	11.5
12.0	4	14.0

Beam diameter is to 50% of maximum footcandles.

Downlight: These cones of light provide single-unit performance with no inter-reflections from surfaces. Data listed is for mounting height, footcandle values at nadir, and resulting beam diameter. Please note:

1. Mounting heights are from the fixture plane to the illuminated work plane (task).
2. Footcandle values are at nadir (0°).
3. Beam diameter is defined as 50% maximum footcandle values. This allows rapid spacing of units for uniform illumination, allowing overlapping of 50% levels.
4. Maximum footcandle values may not always occur at nadir; batwing distributions produce maximum values surrounding nadir.
5. Cone color finish multipliers should be used to modify footcandle values when using finishes other than "LI" low iridescent clear.

WALL WASH ILLUMINATION

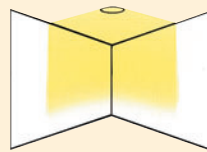
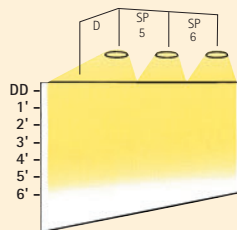
Illumination data shows footcandle levels directly below the fixtures and in between fixtures to determine uniformity.

To read this chart, read the tables for illumination levels, distance setback from the wall and the spacing distance.

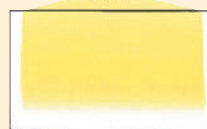
For example, at a distance (D) of 2 feet from a wall and with fixtures spaced 4 feet apart (SP) and 4 feet down from the ceiling (DD), the footcandle reading is 9. The illumination level halfway between the fixtures is 10 footcandles.

Multiple Unit Footcandles

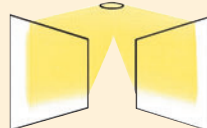
DD	D=Units 2 feet from wall								
	-2'-		-3'-		-4'-				
1	30	27	30	25	14	24	23	7	23
2	33	32	33	20	24	20	17	16	17
3	25	25	25	17	17	17	12	13	12
4	19	18	19	12	13	12	9	10	9
5	14	14	14	10	9	10	7	8	7
6	11	11	11	8	7	8	6	6	6



Corner Wall Washer



Single Wall Washer



Double Wall Washer

CHANGING FIXTURE SPACING

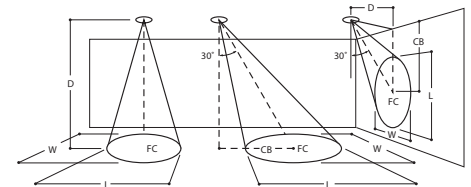
$$\text{New FC} = \frac{\text{Existing Spacing} \times \text{Average Table FC Level}}{\text{New Spacing}}$$

ADJUSTABLE ACCENT ILLUMINATION LEVEL

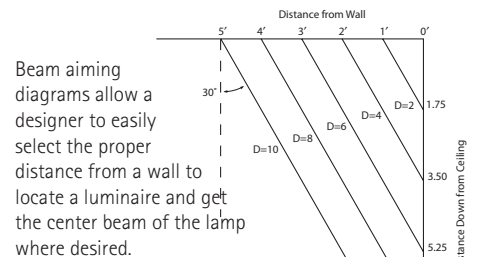
Accent: Patterns of light from adjustable accent luminaires are dependent upon the lamp type, wattage, lamp tilt and location of illuminated plane. Single-unit performance data is provided for horizontal and vertical planes, with the lamp tilted at either 0°, 30°, or 45° aiming.

Please note:

1. Aiming angle is measured from nadir.
2. D is distance from the floor or wall.
3. Footcandle values are maximum values.
4. Effective Visual Beam (EVB) is determined by 50% of the maximum footcandle level.
5. Beam length and width based upon the EVB.
6. CB is the distance at which center beam of the lamp occurs either from the ceiling or nadir.



BEAM ANGLE



Beam aiming diagrams allow a designer to easily select the proper distance from a wall to locate a luminaire and get the center beam of the lamp where desired.

For lighting art objects on a wall, the 30° aiming is preferred. At this angle, 1/3 of the beam's length will be above the CB point, and 2/3 will be below it. Thus, if a painting is three feet tall, plan for the CB to be aimed 1 foot below the top of the painting.

For increased modeling of three-dimensional objects, two lights are typically used, a key light and fill light. Both are aimed at least 30° elevation and are located 45° off axis.

ILLUMINATION DATA—PHOTOMETRICS FOR LIGHTING DESIGN

LUMEN METHOD CALCULATIONS

Lumen Method Calculation determines average horizontal illumination. Average illumination is based on the definition of the footcandle: 1 lumen per sq. ft. is 1 footcandle.

The Basic Formula is:

$$FC = \frac{\text{Fixtures} \times \text{Fixture Lumens} \times \text{CU} \times \text{LLF}}{\text{Area (L} \times \text{W of room)}}$$

Other useful forms are:

$$\text{Area Per Fixture} = \frac{\text{Fixtures Lumens} \times \text{CU} \times \text{LLF}}{\text{Required FC}}$$

$$\# \text{ Fixtures Required} = \frac{\text{Required FC} \times \text{Area}}{\text{Fixture Lumens} \times \text{CU} \times \text{LLF}}$$

The Lumen Method calculation assumes an empty rectangular room with horizontal task plane. The Lumen Method assumes a uniform lighting layout and accounts for both direct and inter-reflected light. The accuracy is reduced when obstructions are introduced, or in spaces with non-rectangular boundaries or sloped ceilings.

COEFFICIENT OF UTILIZATION (CU)

The Coefficient of Utilization (CU) is the factor used in the Lumen method calculations to account for the losses from room surface, room size and shape.

The CU chart can be entered to find the required value. For example: For a RCR of 2, and ceiling reflectance of 80%, walls reflectance of 30% and floor cavity of 20% the CU is determined to be 0.6 (60%).

rc	80%		50%	
	50	30	50	30
0	71	71	64	64
1	67	65	61	60
2	63	60	58	57
3	59	56	55	53
4	55	52	52	50
5	52	49	50	47
6	49	46	47	45
7	46	43	44	42
8	43	40	42	39
9	40	37	39	36
10	38	34	37	34

rc = Ceiling Reflectance
rw = Wall Reflectance
RCR = Room Cavity Ratio

CU data based upon 20% effective floor cavity reflectance.

$$RCR = \frac{5 (\text{Mounting height of fixture}) (L + W \text{ of room})}{(L \times W \text{ of Room})}$$

LIGHT LOSS FACTORS (LLF)

Light loss factors account for the reduction in light output after installation. The two greatest factors for indoor applications are—Lamp Lumen Depreciation (LLD) and Luminaire Dirt Depreciation (LDD).

The Lamp Lumen

Depreciation (LLD) Factor accounts for the loss in the lumen output that all lamps experience as they age. Typical factors are listed in the chart at right. (Typical Lumen maintenance at 70% of rated lamp life).

Source	Lamp	LLD
Incandescent	Standard	0.87
	Tungsten-Halogen	0.95
Fluorescent	Triphosphor	0.95
	Standard Phosphor	0.80
H.P.S.	All	0.90
Metal Halide	Ceramic	0.75
	Quartz	0.60

The Luminaire Dirt

Depreciation (LDD) Factor accounts for the accumulation of dirt on the surfaces of a luminaire, reducing its light output. Factors that determine the LDD are: distribution, cleanliness of the room, and its cleaning cycle.

LDD	Luminaire Type	
	Recessed Open	Recessed With Lens
Very Clean	0.97	0.85
Clean	0.85	0.79
Medium	0.62	0.75
Dirty	0.53	0.68
Very Dirty	0.45	0.61

Based on three year cleaning

All of the light loss factors to be considered in the "Lumen Method" calculation are multiplied together to yield the total **Light Loss Factor (LLF)**.

$$LLF = LLD \times LDD$$

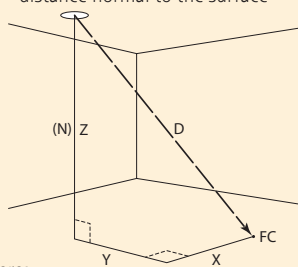
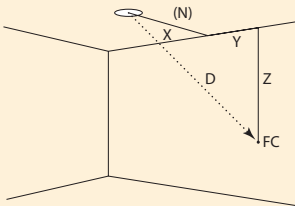
POINT-TO-POINT CALCULATIONS

The calculation of footcandles at a point, no matter if it is on a horizontal, vertical or tilted surface, can be accomplished with the inverse square law. The law states that the illuminance is proportional to the candlepower of the source in the given direction and inversely proportional to the square of the distance from the source. In addition, as a surface is tilted away from the source, illuminance will decrease in a ratio equal to the cosine of the angle of incidence.

The inverse square law formula can be expressed in various ways; the two most useful follow. Version 1 is ideal for the complexities of three-dimensional space--no trigonometry (cosine) is needed, just the simple X, Y and Z coordinates of the layout. It is also very useful in calculating footcandles from the CBCP of accent lights. Version 2 is useful for calculations that can be laid out in two dimensions, and when it is easy to find the cosine of the aiming angle. Insert your data into either easy-to-use formula to calculate the initial footcandle level at a point.

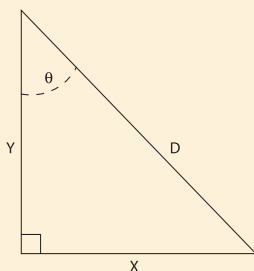
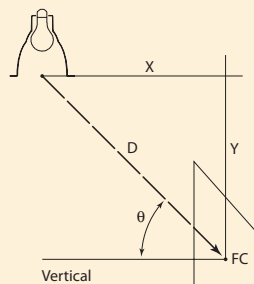
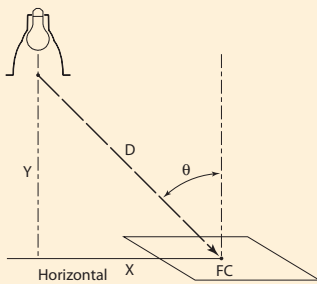
Version 1: $FC = \frac{I \times N}{D^3}$

Where:
 I = cd towards point
 D = distance to point
 (the square root of $X^2 + Y^2 + Z^2$)
 N = distance normal to the surface



Version 2: $FC = \frac{I \times \cos \theta}{D^2}$

Where:
 I = cd towards point
 D = distance to point
 (the square root of $X^2 + Y^2$)
 θ = angle between incident light ray and normal to the surface



θ	$\cos \theta$	TAN θ
0°	1.0	0.0
5°	.996	.087
10°	.985	.176
15°	.966	.268
20°	.940	.364
25°	.906	.466
30°	.866	.577
35°	.819	.700
40°	.766	.839
45°	.707	1.0

To find distance D: $D = \sqrt{X^2 + Y^2}$ or $D = \frac{Y}{\cos \theta}$ To find aiming angle θ : $TAN \theta = \frac{X}{Y}$ or $\cos \theta = \frac{Y}{D}$



LUMINANCE RATIOS

BRIGHTNESS IS THE PERCEPTION OF LUMINANCE BY THE BRAIN.

The Illuminating Engineering Society of North America (IESNA) published luminance ratios serve as guidelines for designing brightness patterns. These three photos illustrate ratios commonly seen in retail applications.

Perceived brightness is a function of the light arriving upon a surface and the reflectance of the material. Applying the reflectance percentages from the chart (below) to the application footcandles (See the "Cone of Light" data found on the Portfolio specification sheets), will approximate the amount of light reflected from the surface. e.g. A white plaster wall will appear brighter than a brick wall with equal footcandles on each.

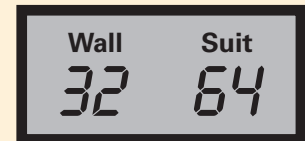
REFLECTANCE OF SOME COMMON MATERIALS ¹

Material	Reflectance %
Aluminum (Brushed)	.55
Aluminum (Polished)	.60-70
Brick (Dark Buff)	.40
Brick (Dark Red Glazed)	.30
Brick (Light Buff)	.48
Concrete	.25-40
Fabric (Dark Colored)	.30 or less
Fabric (Light Colored)	.70 or less
Glass	.15
Limestone	.50
Pastel Colors	.50-70
Sandstone	.18
Slate	.8
Specular Silver	.94
Stainless Steel	.60
White Ceiling Tile	.70 max.
White Marble	.45
White Paint (Flat)	.75-90
White Paint (Gloss)	.89
White Plaster (Unpainted)	.90
White Porcelain Enamel	.65-90
White Terra-Cotta	.75

¹ Source: the IESNA Lighting Handbook, Ninth Edition

LUMINANCE RATIO 2:1

Barely Noticeable Difference
While twice the footcandles are on the mannequin as on the surrounding background, the mannequin is not noticeably highlighted.



Paul Bandagaj Photography

LUMINANCE RATIO 5:1

Appears To Be Twice As Bright

With five times the footcandles on the mannequin, it appears twice as bright as its surroundings.

Wall	Suit
32	164



Paul Bandagly Photography

LUMINANCE RATIO 10:1

High Contrast With Strong Focus

To create eye-catching displays, at least ten times the footcandles are needed on the mannequin as on its surroundings.

Wall	Suit
33	349



Paul Bandagly Photography

ELECTRONIC METAL HAILIDE

ELECTRONIC BALLASTS

Superior Output Regulation vs. Input Voltage: With input variations of +/- 10%, output voltage will vary less than 0.5% while magnetic ballasts will vary up to 19%.

This prevents lumen drop-off with lower input voltages.

Superior Color Uniformity and CRI at Lower

Input Voltages: With regulated output voltages, color and CRI shifts are virtually eliminated vs. the 4000 K and 10 point CRI shifts experienced with magnetic ballasts.

Superior Output Regulation Of Arc Tube Voltage: Lamp voltage can vary 20-40 volts over its life. The electronic ballast constantly senses the arc tube voltage and adjusts to keep it within +/- 3% of accepted ANSI lamp voltages to ensure consistent performance between different lamps. A magnetic ballast does not possess this ability allowing wide variations in color and output between lamps.

Active Safety Features: Ballast shuts-off if it senses end of lamp life, an open socket or low lamp voltage due to a slow leak. Automatically resets when power to ballast is switched off.

Lower Power Consumption: >95% power Factor is up to 17% more efficient than magnetic ballasts.

POWER CONSUMPTION at 120v

Lamp Wattage	Magnetic	Electronic	Savings
39W	53W	48W	17%
70W	94W	86W	17%
100W	129W	115W	14%

More Fixtures Per Branch Circuit: Lower Maximum Input Current Rating allows 2 to 3 times the number of fixtures on a circuit vs. magnetic ballasts.

Lamp	120V Ballast	Maximum Input Current Rating	# Fixtures 16A Loading
39W	Magnetic	0.75 A	21
	Electronic	0.45 A	35
70W	Magnetic	1.7 A	9
	Electronic	0.72 A	22
100W	Magnetic	2.4 A	6
	Electronic	0.96 A	16

Extended "Brown-Out" Survival: For abrupt voltage drops of 50% or more, the ballast can sustain lamp operation up to 50 times longer than magnetic ballasts.

Quicker Restrike: Senses when lamp has cooled enough to ignite rather than immediately pounding the lamp with ignition voltage while it is still hot.

Smaller and Lighter: Allowing for easier installation and a smaller fixture footprint. Ballast ships with fixture.

3 Year Ballast Warranty

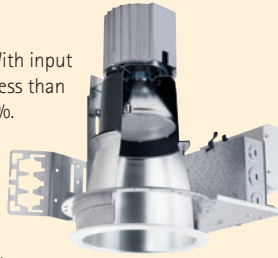
Sound Rated "A" for quiet operation

Built-in thermal protection

Total harmonic Distortion (THD) <10%

FCC Compliant: Meets FCC regulation "47 CFR Part 18, non-consumer limits" to prevent any EMI/RFI interference.

cULus Listed



MISCELLANEOUS

PRODUCT DEVIATION REQUEST

Projects with their individual requirements may require items not found within this catalog. Please consult with your Portfolio representative for a discussion of your specific project.

SPECIFICATION SHEETS

Individual specification sheets are available at www.cooperlighting.com or www.portfolio-lighting.com. Sheets contain detailed scaled line drawings, critical dimensions, construction features and photometric information.

CODES AND LABELS

All fixtures are thermally protected per the National Electric Code and are in compliance with or exceed UL requirements 1598. In addition, fixtures are cULus listed and carry the IP label for specific municipalities.

PHOTOMETRIC INFORMATION

All photometric information provided is based upon "initial" conditions. To use this data in real-life conditions, the appropriate light loss factors must be applied. It is the designer's responsibility to understand and apply the proper light loss factors for each application.

PHOTOMETRIC REPORTS

For data within the catalog, its photometric test number is identified. All photometric reports are based upon IES formulas and recommended test practices. Testing temperature is 77° F (25° C ± 1°).

IES FILES

IES files can be obtained by visiting www.cooperlighting.com or www.portfolio-lighting.com. Files are "smart named" by fixture and reflector catalog number.

INSTRUCTION SHEETS

Instruction sheets are provided with each product for proper installation. For a copy please visit www.cooperlighting.com or www.portfolio-lighting.com.

BARE LAMP INFORMATION

CERAMIC METAL HALIDE LAMPS

E26 Base Ceramic Metal Halide Elliptical Lamps—for use in open fixtures

Nominal Lamp Watts	Bulb	Base	ANSI Code Ballast Ref	Manufacturer and ordering code	Average Rated Life	Color Temp. °K	Approx Lumens		
							Initial	Mean	CRI
50	ED17P	E26	M148	MCP50/C/U/MED/830PB	12,000	2,900	3,800	2,640	88
70	ED17P	E26	M139	MCP70/C/U/MED/830PB	16,000	3,000	5,500	3,900	88
70	ED17P	E26	M139	MCP70/C/U/MED/940PB	12,000	3,800	5,600	4,480	93
100	ED17P	E26	M140	MCP100/C/U/MED/830PB	16,000	3,000	8,100	5,994	88
100	ED17P	E26	M140	MCP100/C/U/MED/940PB	20,000	4,000	7,500	5,625	90
150	ED17P	E26	M102	MCP150/C/U/MED/830PB	12,000	3,000	12,000	10,000	88

E26 Base Ceramic Metal Halide PAR Lamps—for use in open fixtures

Nominal Lamp Watts	Bulb	Base	ANSI Code Ballast Ref	Manufacturer and ordering code	Average Rated Life	Color Temp. °K	Approx Lumens	CRI
							Initial	
20	PAR20	E26	M156	CMH20/PAR20	7,500	3,000	1,000	81
39	PAR20	E26	M130	CMH39/U/PAR20	10,000	3,000	2,100	86
20	PAR30L	E26	M156	CMH20/PAR30L	7,500	3,000	1,200	81
39	PAR30L	E26	M130	CMH39/PAR30L	10,000	3,000	2,400	81
70	PAR30L	E26	M139	CMH70/PAR30L	13,000	3,000	4,700	82
70	PAR38	E26	M139	CMH70/PAR38/830	10,000	3,000	4,800	82
100	PAR38	E26	M140	CMH100/PAR38/830	10,000	3,000	6,500	81
150	PAR38	E26	M142	CMH150/PAR38/U/830	12,000	3,000	9,100	88

GX8.5 Base Ceramic Metal Halide Reflector Lamps—High CRI with excellent beam control

Nominal Lamp Watts	Bulb	Base	ANSI Code Ballast Ref	Manufacturer and ordering code	Average Rated Life	Color Temp. °K	Approx Lumens		
							Initial	Mean	CRI
22	R111	GX8.5	C175/0	CDM-R111/20W/830	9,000	3,000	750	500	85
38	R111	GX8.5	M130/0	CDM-R111/35W/830	11,000	3,000	1600	1,040	81

GU6.5 Base Ceramic Metal Halide Tubular Lamps—Improved CRI and lumen maintenance

Nominal Lamp Watts	Bulb	Base	ANSI Code Ballast Ref	Manufacturer and ordering code	Average Rated Life	Color Temp. °K	Approx Lumens		
							Initial	Mean	CRI
20	T4	GU6.5	M156	CMH20T/U830/GU6.5	12,000	3,000	1,615	1,066	81
39	T4	GU6.5	M130	CMH39T/U930/GU6.5	10,000	3,000	3,400	2,300	88
39	T4	GU6.5	M130	CMH39T/U942/GU6.5	12,000	4,000	3,400	2,600	90

BARE LAMP INFORMATION

CERAMIC METAL HALIDE LAMPS

GU8.5 Base Ceramic Metal Halide Tubular Lamps—Improved CRI and lumen maintenance

Nominal Lamp Watts	Bulb	Base	ANSI Code Ballast Ref	Manufacturer and ordering code	Average Rated Life	Color Temp. °K	Approx Lumens		
							Initial	Mean	CRI
20	T4.5	G8.5	M156E	CMH20/TC/U/830/G8.5	12,000	3,000	1,650	1,090	81
39	T4.5	G8.5	M130	CMH39/TC/U/830/G8.5	15,000	3,000	3,400	2,300	84
39	T4.5	G8.5	M130	CMH39/TC/U/942/G8.5	12,000	4,200	3,150	2,700	88
70	T4.5	G8.5	M139	CMH70/TC/U/830/G8.5	15,000	3,000	6,200	4,400	83
70	T4.5	G8.5	M139	CMH70/TC/U/942/G8.5	15,000	4,200	6,000	4,600	90
70	T4.5	G8.5	M139	CMH70/U/930/G8.5/ULR	15,000	3,000	6,200	5,400	88








GU12 Base Ceramic Metal Halide Tubular Lamps—Improved CRI and lumen maintenance

Nominal Lamp Watts	Bulb	Base	ANSI Code Ballast Ref	Manufacturer and ordering code	Average Rated Life	Color Temp. °K	Approx Lumens		
							Initial	Mean	CRI
20	T6	G12	M156E	CMH20/TC/U/830/G12	12,000	3,000	1,600	1,060	81
39	T6	G12	M130	CMH39/TC/U/830/G12	15,000	3,000	3,400	2,300	84
39	T6	G12	M130	CMH39/TC/U/842/G12	12,000	4,200	3,150	2,700	88
70	T6	G12	M139	CMH70/TC/U/830/G12	15,000	3,000	6,200	4,700	83
70	T6	G12	M139	CMH70/U/930/G12/ULR	15,000	3,000	6,400	5,600	87
70	T6	G12	M139	CMH70/TC/U/942/G12	15,000	4,200	6,000	4,600	93
150	T6	G12	M142	CMH150/TC/U/830/G12	12,000	3,000	14,000	11,000	82
150	T6	G12	M142	CMH150/TC/U/942/G12	12,000	4,200	13,000	11,000	94




PGZ18 Base Ceramic Metal Halide Tubular Lamps—80% Lumen maintenance @ 20,000 hours

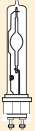
Nominal Lamp Watts	Bulb	Base	ANSI Code Ballast Ref	Manufacturer and ordering code	Average Rated Life	Color Temp. °K	Approx Lumens		
							Initial	Mean	CRI
210	T9	PGZ18	-	Elite MW 210W/930	20,000	3,000	24,700	21,700	90
210	T9	PGZ18	-	Elite MW 210W/942	20,000	4,200	23,100	20,790	90
315	T9	PGZ18	-	Elite MW 315W/930	20,000	3,000	37,800	34,000	90
315	T9	PGZ18	-	Elite MW 315W/942	20,000	4,200	36,225	32,900	90

DIRECTIONAL LAMP INFORMATION

		0° Aiming Angle				30° Aiming Angle					30° Aiming Angle					45° Aiming Angle				
		Horizontal Footcandles				Horizontal Footcandles					Vertical Footcandles					Vertical Footcandles				
		D	FC	L	W	D	FC	L	W	CB	D	FC	L	W	CB	D	FC	L	W	CB
 <p>CDM100 /PAR38 /SP /3K Beam Spread = 15° x 15° CBCP = 639747 Rated Life = 10,000 Hrs.</p>	PHI	15	284	3.8	3.8	15	185	4.8	4.3	8.7	6	234	5.1	2.9	10.4	10	226	4.7	3.4	10.0
		20	160	5.1	5.1	20	104	6.4	5.7	11.5	8	132	6.8	3.9	13.9	12	157	5.6	4.1	12.0
		25	102	6.3	6.3	25	66	7.9	7.1	14.4	10	84	8.5	4.9	17.3	14	115	6.5	4.8	14.0
		30	71	7.6	7.6	30	46	9.5	8.5	17.3	12	58	10.3	5.8	20.8	16	88	7.5	5.5	16.0
		9	279	4.1	4.1	9	187	5.0	4.6	5.2	4	259	4.2	2.9	6.9	6	253	4.4	4.8	6.0
 <p>CDM100 /PAR38 /FL /3K Beam Spread = 25° x 25° CBCP = 22614 Rated Life = 10,000 Hrs.</p>	PHI	13	134	5.9	5.9	13	90	7.3	6.6	7.5	5	166	5.3	3.7	8.7	8	142	5.9	6.4	8.0
		17	78	7.7	7.7	17	52	9.5	8.6	9.8	7	85	7.4	5.1	12.1	10	91	7.3	8.0	10.0
		20	57	9.0	9.0	20	38	11.2	10.1	11.5	9	51	9.5	6.6	15.6	12	63	8.8	9.6	12.0
		5	274	3.8	3.8	5	195	4.7	4.5	2.9	3	233	3.7	3.4	5.2	3	353	3.4	4.5	3.0
		7	140	5.3	5.3	7	100	6.5	6.3	4.0	4	131	5.0	4.6	6.9	4	198	4.5	6.0	4.0
 <p>CDM100 /PAR38 /WFL /3K Beam Spread = 60° x 60° CBCP = 6862 Rated Life = 10,000 Hrs.</p>	PHI	9	85	6.8	6.8	9	60	8.4	8.1	5.2	5	84	6.2	5.7	8.7	5	127	5.7	7.5	5.0
		11	57	8.3	8.3	11	40	10.2	9.9	6.4	6	58	7.4	6.9	10.4	6	88	6.8	9.0	6.0
		9	80	10.9	10.9	9	82	7.9	10.1	5.2	5	151	4.2	5.7	8.7	5	223	3.8	5.5	5.0
		10	65	12.1	12.1	10	66	8.7	11.2	5.8	6	105	5.0	6.8	10.4	6	155	4.6	6.6	6.0
		13	38	15.7	15.7	13	39	11.3	14.5	7.5	8	59	6.7	9.1	13.9	8	87	6.2	8.8	8.0
 <p>MCP 150PAR38/WFL Beam Spread = 65° x 65° CBCP = 6,500 Rated Life = 9,000 Hrs.</p>	OS	15	29	18.1	18.1	15	29	13.1	10.1	8.7	10	38	8.4	11.4	17.3	10	56	7.7	11.0	10.0
		12.5	179	5.3	5.3	12.5	123	6.6	5.9	7.2	5	202	5.4	3.5	8.7	5	458	3.5	2.7	5.0
		15	124	6.3	6.3	15	85	7.9	7.1	7.5	6	140	6.5	4.2	10.4	6	318	4.3	3.3	6.0
		20	70	8.5	8.5	20	48	10.5	9.4	11.5	8	79	8.7	5.6	13.9	8	179	5.7	4.4	8.0
		25	45	10.6	10.6	25	31	13.2	11.8	14.4	10	50	10.9	6.9	17.3	10	115	7.1	5.5	10.0
 <p>MCP 150PAR38/FL Beam Spread = 25° x 25° CBCP = 28,000 Rated Life = 9,100 Hrs.</p>	OS	20	50	2.9	2.9	20	32	4.2	3.4	11.5	8	41	4.6	2.4	13.9	8	110	2.5	1.8	6.0
		25	32	3.6	3.6	25	21	5.3	4.3	14.4	10	28	5.8	3.0	17.3	10	71	3.1	2.3	10.0
		5	341	1.8	1.8	5	222	2.5	2.1	2.9	3	151	3.4	2.1	5.2	4	207	2.7	2.0	4.0
		7	174	2.6	2.6	7	113	3.5	2.9	4.0	4	85	4.6	2.7	6.9	5	132	3.4	2.5	5.0
		9	105	3.3	3.3	9	68	4.4	3.8	5.2	5	54	5.7	3.4	8.7	6	92	4.1	3.0	6.0
 <p>CDM111 35W/830 10DG Beam Spread = 10° MBCP = 8500 Rated Life = 9,000 Hrs.</p>	GE	11	71	4.0	4.0	11	46	5.4	4.6	6.4	6	38	6.9	4.1	10.4	7	68	4.8	3.5	7.0
		15	156	2.2	2.2	15	101	3.1	2.5	8.7	5	186	2.8	1.5	8.7	8	193	2.5	1.8	8.0
		20	88	2.9	2.9	20	57	4.1	3.3	11.5	6	129	3.4	1.8	10.4	10	124	3.1	2.2	10.0
		25	56	3.6	3.6	25	36	5.1	4.2	14.4	7	95	4.0	2.1	12.1	12	86	3.7	2.6	12.0
		30	39	4.4	4.4	30	25	6.1	5.0	17.3	8	73	4.6	2.4	13.9	14	63	4.3	3.1	14.0
 <p>CDM111 35W/830 24DG Beam Spread = 24° MBCP = 8500 Rated Life = 9,000 Hrs.</p>	GE	30	39	4.4	4.4	30	25	6.1	5.0	17.3	8	73	4.6	2.4	13.9	14	63	4.3	3.1	14.0

LAMP ORDERING INFORMATION

	Lamp Wattage	Generic Description	Base	Catalog Number
	39	PAR20 Ceramic Metal Halide, Spot	E26	Z160
	39	PAR20 Ceramic Metal Halide, Flood	E26	Z161
	39	PAR30L Ceramic Metal Halide, Spot	E26	Z163
	39	PAR30L Ceramic Metal Halide, Flood	E26	Z164
	70	PAR30L Ceramic Metal Halide, Spot	E26	Z166
	70	PAR30L Ceramic Metal Halide, Flood	E26	Z167
	70	PAR38 Ceramic Metal Halide, Spot	E26	Z169
	70	PAR38 Ceramic Metal Halide, Flood	E26	Z170
	70	PAR38 Ceramic Metal Halide, Wide Flood	E26	Z171
	100	PAR38 Ceramic Metal Halide, Spot	E26	Z172
	100	PAR38 Ceramic Metal Halide, Flood	E26	Z173
	100	PAR38 Ceramic Metal Halide, Wide Flood	E26	Z174

	Lamp Wattage	Generic Description	Base	Catalog Number
	210	T9 Ceramic Metal Halide- 3,000k	PGZ18	Z210T9930
	210	T9 Ceramic Metal Halide-4,200k	PGZ18	Z210T9940
	315	T9 Ceramic Metal Halide-3,000k	PGZ18	Z315T9930
	315	T9 Ceramic Metal Halide-4,200k	PGZ18	Z2315T9940

COOPER LIGHTING BRAND FAMILY

AMETRIX >

A complete vocabulary of point source indirect luminaires including ceiling, suspended, semi-recessed and cove versions available with compact fluorescent, tungsten-halogen, and metal halide light sources.



< HALO

Quality recessed, track and surface products serve a wide range of commercial, residential, institutional and industrial applications.



NEO-RAY >

If yours is a never-ending quest to transform architectural spaces into dynamic environments, look to Neo-Ray for lighting products that offer a distinctive combination of high quality and aesthetics.



< METALUX

Single source fluorescent lighting for commercial, industrial, institutional, retail and residential markets.



LUMARK >

A full-line of quality commercial and industrial products to satisfy virtually every indoor or outdoor HID lighting need.



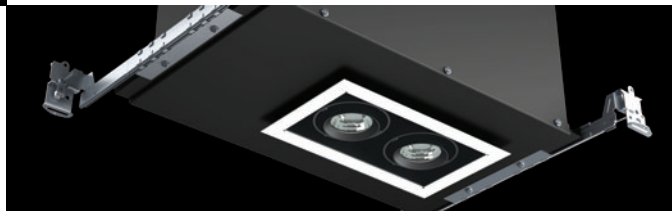
< CORELITE

Corelite offers a unique line of affordable architectural fluorescent luminaires perfectly suited to the creation of task-friendly environments.



RSA >

RSA is recognized as the leader in the development of cutting-edge, architectural lighting systems. As innovators in the design and manufacture of multi-lamp recessed, track and linear lighting, RSA products emphasize unique and functional design.



McGRAW-EDISON >

Durable, efficient HID fixtures illuminate a complete range of outdoor industrial, utility and commercial applications.



SURE-LITES

Dependable emergency and exit lighting for commercial, residential, upscale architectural and hazardous industrial markets.



INVUE >

Establishing a new benchmark in specification grade architectural site lighting, INVUE Lighting Systems bring together leading edge form and unmatched performance.



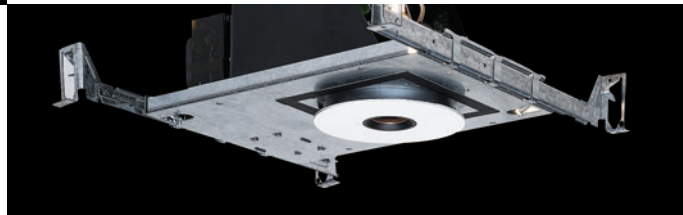
FAIL-SAFE

Security fixtures, control systems and specialty hardware built to withstand the rigors of correctional facilities, clean rooms, public access areas, hospitals and other high abuse environments.



IRIS >

Aesthetics and performance combine for highly flexible architectural, residential and commercial lighting designs.



LUMIERE

Innovative solutions for complex landscape, area/accent and special application illumination.



SHAPER >

Shaper's standard product line includes interior ceiling mounted and pendant luminaires, interior and exterior, wet listed wall mounted fixtures, a selection of exterior bollard designs and the "Starter Collection," geared to budget oriented projects.



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