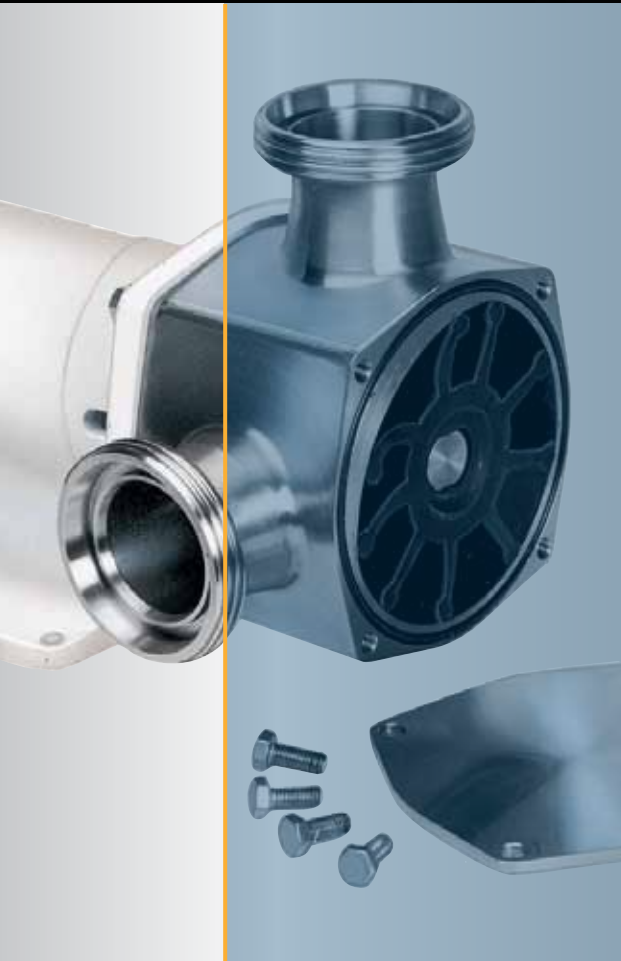




# ITT

A Global Leader in Pump & Valve Solutions

Flojet | Jabsco | Rule | Alcon  
Industrial Pumps and Valves



*Engineered for life*



## THE BRANDS



**Welcome to our brands.**  
Flojet. Jabsco. Rule. Alcon.

The driving force throughout ITT is to provide innovative and quality products that fulfill the expressed needs of our customers. With four highly regarded brands— Alcon, Flojet, Jabsco and Rule — ITT is the leader in the small pump market offering the most versatile range of industrial pumps available. The pumps represented in this catalog are the result of ITT's close collaboration with its customers to provide application-specific products.

ITT creates a unified culture centered on doing essential things in extraordinary ways, uses values as a compass, and makes our customers central to everything we do. ITT provides solutions integral to performance and safety in the markets ITT serves.

**FLOJET**<sup>®</sup>



**rule**<sup>®</sup>

**alcon**

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The first step toward selecting the right pump is to develop the specifications for the pump. This involves knowledge of the application and the chemical solution for pumping. The following tips will be helpful in determining the right pump for any specific application. Please refer to the Engineering Data and Tables at the end of this catalog to assist you in this process.

### **Flow**

"Flow" is defined as the rate at which you want the liquid pumped. Several factors dictate the flow requirements in an application. Some of these are the size of the nozzle for spraying, cycle time for transferring and volume of the liquid per cycle for dispensing applications. In case there is a choice, it is always advisable to choose a lower flow rate which will increase the life and reliability of the pump.

### **Head/Pressure**

Head or pressure in combination with the flow rate determine the power of a pump needed for a given application. This is a simple calculation in cases where the discharge is at a higher level than suction, and is determined by the differential height between the liquid level on the suction and discharge side. The pressure needed may also be controlled by the flow required through a nozzle, or other restrictions in the delivery line such as a long or narrow tube. The frictional loss through the tube and the fitting dictates the pressure required at a certain flow. The required pressure also includes difference in the pressure of the suction and the discharge vessel when pumping into a higher-pressured vessel or from a vacuum. As always when pumping at pressure, make sure you choose a pump for the pressure needed in the system. It is also worth noting that high pressure requires pressure-rated tubing and fittings adding to the cost of your overall system as well as the increased risk of leakage.

### **Control**

What turns the pump on and off is an important consideration since running the pump longer than required reduces pump life. For applications where there is a closed valve or a spray wand with a trigger, it is advisable to use a demand pump with a pressure switch to shut the pump off when the valve is closed. Running a positive displacement pump against a dead head could cause immediate failure. For other applications, it is useful to have a bypass system to prevent failure. More complicated pump controls may involve sensors and electronics.

### **Pump Driver**

The decision to choose the right driving source is generally dictated by availability. If the pump is to be motor or solenoid driven, you will need to know the voltage and the frequency of the power source. AC or DC governs the kind of motor needed. The oscillating pumps that run on the cycling of the AC supply cannot work with DC voltages. If you have air available and choose an air driven pump, you need to know the pressure and means of regulating the incoming air to the pumps. In flammable atmospheres, ITT recommends using an air driven pump properly grounded to prevent the potential of explosion.

### **Chemical Compatibility**

It is essential to get all the details including the exact composition, temperatures and the concentration of the chemicals to be pumped. This information helps you choose the material of construction for the pumps for chemical compatibility. Corrosion causes leakage and failure. Refer to the chemical compatibility sheet in the back of the catalog as a guide. However, an actual soak test of the materials is strongly recommended before applying the pump.

### **Priming**

The pump needs to be primed when it is located above the level of the liquid or where a flooded suction can not be provided. Most positive displacement pumps can self-prime as long as you stay within the limit of its priming capability. If that limit is exceeded, the pump will not prime and hence will not pump. This will lead to a condition where the pump runs without any liquid. This dry running will lead to early failure of the pump if it happens frequently and over extended periods of time.

### **Viscosity**

Viscosity is the internal property of fluid that offers a resistance to flow as it is placed under sheer or extensional stress. In general, it is the measure of the thickness of the fluid or of the fluid friction when trying to flow. For example water is considered thin, it has low viscosity and can be pumped at higher volumes and speeds in positive displacement pumps whereas oils are higher in viscosity and therefore the pump used or the volumes or pressures possible are lower. Apart from the type of liquid many other factors can either reduce or increase the effect of a viscous fluid. Pump orientation, pump speed, port size, system pipe work dimensions and length can all have an effect.

It is worth noting that viscosity in fluid is also highly temperature dependant. For better pumping, high viscosity fluids can be pumped with certain agitation of the material. Agitation could be as simple as a slight stirring or heating of the medium, but care should be exercised if attempting to alter the viscosity for pumping. Each product to be transferred needs to be considered on its own design characteristics to agitation.

*Other important considerations, such as the duty cycle, plumbing and ambient temperature all have a direct bearing on the performance of a pump and need to be clearly understood and defined.*

The Ideal Pump for Your Industry	This table will help you to identify the products which are most commonly used in your sector. Don't forget to look at the other pages too, as you may find something which meets your specific requirements.	Industrial Flexible Impeller Pumps	Bronze Flexible Impeller Pumps	Drum Emptying Pumps	Hygienic Flexible Impeller Pumps	Rotary Lobe Pumps	Sliding Vane Pumps	Diaphragm Pumps	Centrifugal Pumps	Solenoid Valves
		PAGE	52	60	49	82	114	124	22	12
Chemical suppliers and users	✓	✓	✓			✓		✓	✓	
General industry, factory plant	✓	✓	✓			✓	✓	✓	✓	
Water treatment & utilities	✓	✓	✓				✓	✓	✓	
Food processing			✓	✓	✓					
Cosmetics & Pharmaceuticals			✓	✓	✓					
Dairy, beverage and soft drinks			✓	✓	✓			✓		
Construction equipment		✓	✓				✓	✓	✓	
Agricultural equipment		✓	✓				✓	✓	✓	



The CE marking is a mandatory conformity mark on many products placed on the single market in the European Economic Area (EEA). The CE marking certifies that a product has met EU health, safety, and environmental requirements, which ensure consumer safety.

By affixing the CE marking, ITT Corporation, its authorized representative, or person placing the product on the market or putting it into service asserts that the item meets all the essential requirements of the relevant European Directive(s).

Products identified in this book as "CE", meet all the relevant requirements and have gone through either internal or external testing to evaluate the product and its documentation.

## ICONOGRAPHY

The industry-specific icons shown here serve the same purpose as road signs: They are designed to help navigate through this catalog. The signs help to give direction and, hopefully, a better understanding of the products ITT offers.



### Primary Markets



#### AGRICULTURAL SPRAYING

Many applications around the farm that require spraying; from crop/tree spraying to teat spraying. Product groups with this icon are designed to have the pressure and flow required for such applications.



#### CARWASH

Pumps designed for car washes are ideally suited for pumping both water and chemicals.



#### AUTOMOTIVE

Pumps used in this application are perfect for the garage and also on for washing car brakes, transmission fluid transfer, brake fluid change out and windscreen washing.



#### CHEMICAL TRANSFER

Products with this symbol are designed specifically for the harshness of a chemical transfer and to handle full range of chemicals.



#### ASPHALT PAVING & SWEEPING

Product types with this icon generally have specific products that are designed for the harsh environment and long duty of these applications.



#### CONSTRUCTION

This icon represents products for the asphalt street sweepers, asphalt paving machines, chemical injection in to concrete pouring system and concrete cutting machines



## DIESEL REFUELING\OIL & GAS

Products with this logo have been specifically designed for diesel refueling where durability and speed are key.



## FLOOR CARE

Pumps shown with this icon are used in commercial & consumer rental carpet cleaning machines, self-propelled hard surface scrubbers, water dumping systems and carpet pre-treat sprayers.



## FOOD & BEVERAGE

Specific products in this group are designed for food grade materials and range in applications from dispensing beer to pumping food over large distances.



## PHARMACEUTICAL

Products with this symbol have options designed specifically for the high grade of cleanliness necessary in the pharmaceutical world.



## FORESTRY

Refuelling pumps are used on forestry machines (Harvesters and Forwarders) where environmental considerations are important. Pumps with this icon offer valves and auto shut off devices.



## ROAD COMPACTION

Product in this category are particularly suited to road compaction vehicles where liquid spraying is required.



## GENERAL PURPOSE

These products have a large range of attributes from high volume water transfer to pumping chemicals.



## WATER

This symbol represents certain products for use with water transfer, water spraying or water systems.



## PERSONAL CARE

Hygienic processing pumps are designed to comply with the stringent requirements of the personal care/cosmetic industry . These pumps are ideal for processing cosmetics, creams, lotions and certain dietary products.

## Secondary Markets



HVAC



HAZARDOUS AREA ENVIRONMENTS



ROBOTICS



STEAM



PROCESS APPLICATIONS



CRYOGENICS

## Centrifugal

Centrifugal pumps handle high volumes with a smooth and non-pulsating flow. The flow rate can be regulated from maximum output to no flow with no damage to the pump. An excellent pump for general transfer applications.

**Low Maintenance:** Few moving parts mean that wear due to operation is minimal.

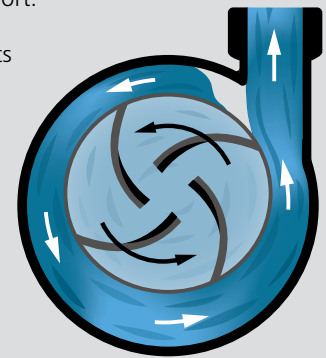
**Easy Installation:** Compact size for flow rate. Option of port positions simplifies pipe runs.

**Versatility:** Centrifugal pumps can be built in submersible form.

**Low Power Consumption:** Electric centrifugal pumps consume less power than most other pump types.

### How do they work?

1. The rotating impeller gives velocity energy to the liquid moving it to the periphery of the volute casing and towards the discharge port.
2. The volute casing discharge arrangement converts velocity energy into static pressure.
3. Centrifugal pumps must be either initially primed or mounted in such a way that liquid is permanently available at the inlet port (eg. submersible pumps).



## Mag Drive Centrifugal

Magnetically Driven Pumps handle products where leak free transfer is a must, where high reliability is paramount and purity of the pumped medium must be maintained. The operation is identical to any centrifugal pump except that the need for the shaft seal is eliminated. This is accomplished by driving the impeller with a magnetic coupling rather than directly with the motor shaft. An excellent pump for chemical transfer applications.

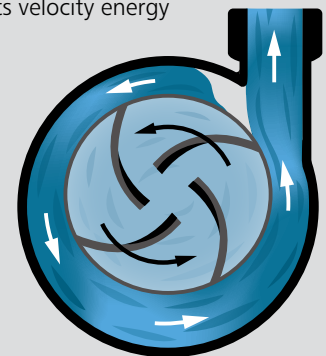
**Low Maintenance:** Few moving parts mean that wear due to operation is minimal.

**No Shaft Seal:** Removes the leak path to and leak path from the medium being pumped.

**Easy Installation:** Compact size for flow rate.

### How do they work?

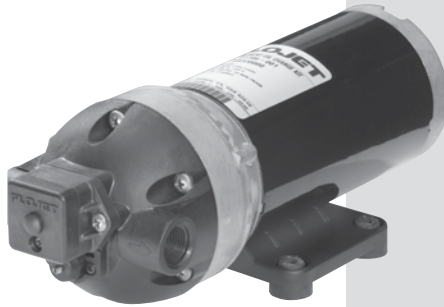
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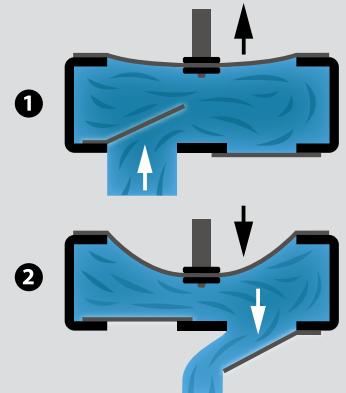
## Diaphragm

ITT Flojet Diaphragm pumps can be found in applications such as spraying, misting, carpet cleaning, water systems, chemical transfer, car wash and many other unique functions. Diaphragm pumps tend to be more robust as they can run dry for extended periods and also do not need a shaft seal so there is less maintenance. ITT Flojet Diaphragm pumps come in two ranges- air/gas powered and electrically powered. Air/gas powered diaphragm pumps offer great life and superb flow with a small footprint. Electric diaphragm pumps are compact and have a huge range of options for wetted materials, voltage, pressure switch setting and flow. Diaphragm pumps must be used with a coarse strainer to avoid blocking the check valves.



### How do they work?

1. The diaphragm, pulled by the movements of a piston or a handle causes a partial vacuum, opening the inlet port and closing the outlet, drawing in liquid.
2. Downward movement of the diaphragm pressurizes the liquid, closing the inlet valve and opening the outlet valve through which liquid is expelled by pressure.



## Flexible Impeller

The flexible impeller pump combines the priming features of positive displacement type pumps with the general transfer ability of centrifugals. It will pump either thin or viscous liquids and can handle more solids in suspension than other types of rotary pumps. The pump can be mounted at any angle and will pump in either direction with equal efficiency.

**Self-Priming:** Pumps instantly with dry suction lifts up to 10ft (3m) and up to 25ft (8m) when wetted.

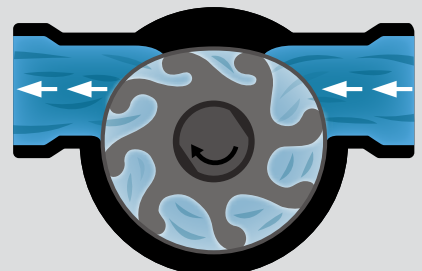
**Simplicity:** One moving part - a tough, long-life, wear-resistant flexible impeller.

**Flexibility:** The flexible impeller pump offers both high flow and high pressure according to motor and impeller design.



### How do they work?

1. As the flexible impeller blades contact the offset cam they bend with a squeezing action that provides a continuous and uniform flow.
2. As the impeller rotates, each successive blade draws in liquid and carries it from intake to outlet port.
3. Flexible impeller blades create a nearly perfect vacuum for instant self-priming.



## Rotary Lobe



ITT Jabsco lobe pumps use two counter-rotating rotors that creates a steady, positive pumping action. But, as the rotors never touch each other or the pump case, Jabsco hygienic lobe pumps will not contaminate or degrade the fluid. What comes out is what goes in; no more, no less.

### Features:

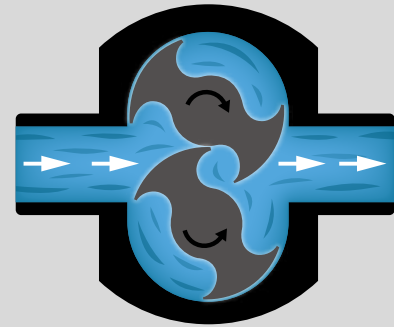
**Hygiene Standards:** Crevice-free designs, external gears & bearings, together with all-stainless-steel contact parts & high surface finishes, surpass users' hygiene and cleanability expectations.

**Reliability:** Lobe pumps offer long-term dependability with minimal cost of servicing and replacement parts.

**Application Capability:** Lobe pumps generate the highest pressures and flow rates delivered by any of the ITT Jabsco product range. Highly viscous, shear-sensitive liquids and suspended soft solids will not be degraded.

### How do they work?

1. Fluid is drawn into the pump and completely fills the space between the rotors.
2. Held between the rotor lobes and the pump case, closed cells of fluid are carried smoothly through the pump.
3. The intermeshing rotor lobes positively displace the fluid volume, generating flow and overcoming the discharge pressure.



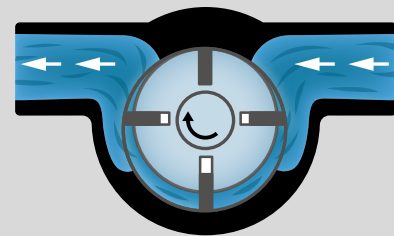
## Sliding Vane



Sliding Vane pumps are designed for the transfer of diesel fuel and light oils. Many have excellent priming capabilities that enable them to be mounted high on construction machines and prime through strainers and check valves. See details.

### How do they work?

1. The rotor is eccentric to the rotor bore and the vanes slide outwards by the centrifugal force induced by the turning rotor.
2. As the rotor turns from the top to the bottom of the body bore a partial vacuum is created by the increasing volume of the cell. This allows atmospheric pressure to push liquid into the pump.
3. The liquid is then transferred to the discharge side of the pump. As the rotor turns from the bottom to the top of the body bore, pressure is created by the reducing volume of the cell and forces the liquid out of the discharge port.

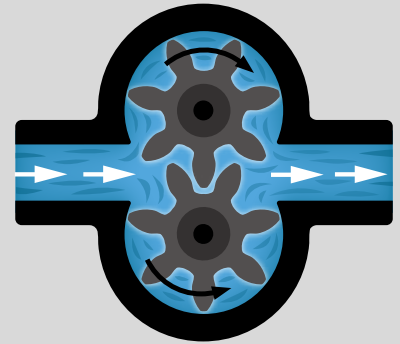


## Gear

**Gear pumps are ideal for the transfer of hydraulic and light oils, water and diesel fuel. They are 12 or 24V DC powered making them suitable in automotive, bus and truck applications.**

### How do they work?

1. One gear is driven by an external power source (the driver) and this meshes with the driver gear. The gears are enclosed in a close fitting casing and the radial and axial clearance is controlled.
2. As the gears rotate, a partial vacuum is created in the suction port allowing atmospheric pressure to push liquid into the pump.
3. Liquid is transferred around the periphery between the gear teeth and discharged into the discharge port.



## Drum Pump

**Electric or compressed air powered container emptying pumps are designed to handle both aggressive and non aggressive liquids. This is catered for by selecting the appropriate tube set for the liquid being pumped. These are available in Polypropylene, Stainless steel, or PVDF (Kynar). Also in lengths from 0.7 metres to 1.2 metres to suit the various size containers.**

### How do they work?

1. The motor drives the tube set shaft via a coupling, which rotates the centrifugal impeller at the bottom of the tube.
2. This forces the liquid up the outer tube and into the discharge port.
3. A hose of compatible material, often with a trigger nozzle, is attached to the discharge port.

