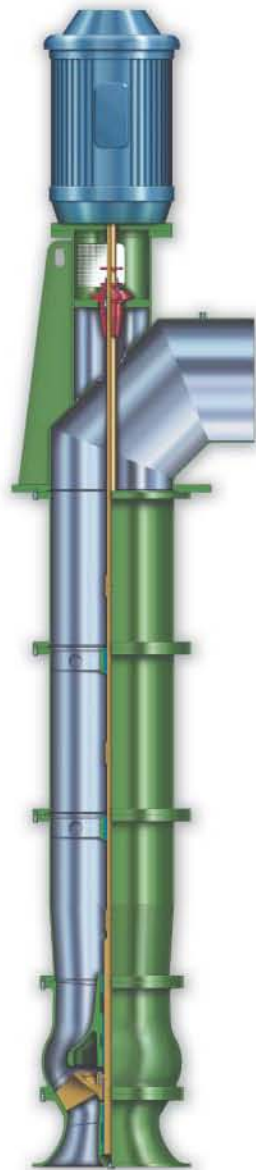


## JM Vertical Mixed Flow Pumps



# Sulzer Pumps

Sulzer Pumps combines more than 135 years of experience in pump development and manufacturing with a deep commitment to fully understand the needs of our customers.

Our detailed process and application knowledge has allowed us to develop innovative pumping

solutions for our focus segments including tailor made systems if required. Our active research & development supports this customer-oriented approach.

Sulzer Pumps has sales and service facilities in all the major markets of the world to provide fast and flexible response and support.

## Extensive Product Range

Sulzer pumps has a long history of providing innovative pumping solutions to business partners in the following industries:

- Oil & Gas
- Hydrocarbon Processing
- Pulp & Paper
- Power Generation
- Water & Wastewater
- Food, Metals & Fertilizers

### Vertical Mixed Flow Pumps

The vertical mixed flow pump was initially developed in the late 1800's for agricultural pumping. Since then, continuous improvements, special designs and new materials have made it ideal for municipal water supply, drainage, flood control, power plant intake and industrial uses of all types. There is an ever increasing demand for the efficient management of the world's water resources. A better understanding of water application problems, increased production demands and sophisticated facility and equipment design have created the need for superior high capacity – medium head pumping capabilities.

### Applications

Vertical mixed flow pumps are typically used wherever a liquid needs to be pumped upward at moderate pressure from open bodies of liquid such as oceans, rivers, lakes, cooling ponds, tanks and sumps.

### Advantages

- Minimum use of floor space.
- The NPSH available can be the lowest level to satisfy the NPSH requirements of the pump.
- No priming required, the pump bowl assembly is submerged in the fluid being pumped.

- The variety of materials and construction possibilities to meet special requirements (such as corrosion resistance) is virtually unlimited.
- The vertical mixed flow pump is adaptable to various design codes.
- Easily modified for changing hydraulic conditions.
- Less wear due to low operating speeds.
- Sulzer hydraulics deliver high pump efficiencies.
- Standard motors of all makes are easily matched and supported on all Sulzer discharge heads.





## Design

The Sulzer JM mixed flow pump has a capacity range up to 40,000 m<sup>3</sup>/h (175,000 USGPM) with a total maximum single stage head up to 28 m (90 ft) in sizes ranging from 200 to 1,500 mm (8 to 60 inches) in bowl diameter.

JM pumps are high capacity, low to medium head units widely used for raw water supply to process plants or refineries, condenser circulating service in nuclear or conventional power plants, finished water booster pumps and large irrigation projects including numerous other applications. Common types of fluids handled

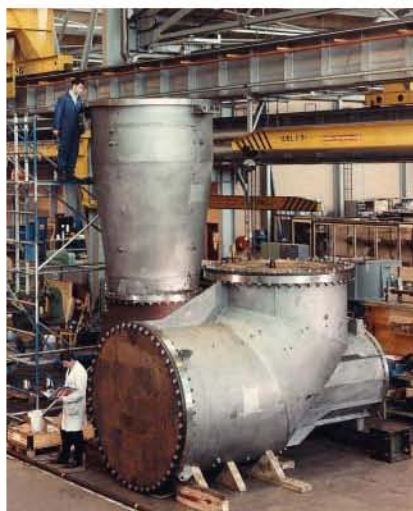
include water, service water, and waste water. Replaceable hardened liners help ensure long life and facilitate maintenance. A variety of design options such as weed cutting vanes, rifle and cross drilled shafts (for external lubrication at bearing journal), and hard-facing can be incorporated to best match the pump to the application to maximize equipment longevity. The JM can be manufactured from a variety of metallurgies to extend pump life and performance. Above and below base discharge connections are available to suit existing pipe design variants. Performance and hydro testing are

in accordance with the Hydraulic Institute Standards. The JM pump is engineered to balance high efficiency, low submergence and NPSH considerations.

## Materials

A wide range of standard materials are available including;

- Cast parts – cast iron, carbon steels, 316SS, duplex, super duplex and bronze
- Shafts – 316SS, 416SS, Monel, K-Monel and Nitronic 50
- Fabrications – carbon steel, duplex and 316SS
- Bearings – carbon, cast iron, epoxy, Nitronic 60, bronze and rubber



# Design Features and Benefits

## Driver

The pump is driven by electric motors, fixed or variable speed drives, diesel engines, right angle gear drives or steam turbines. Drives can be designed to carry the rotor weight and thrust loads plus rigid construction requirements to provide satisfactory operation.

## Seal

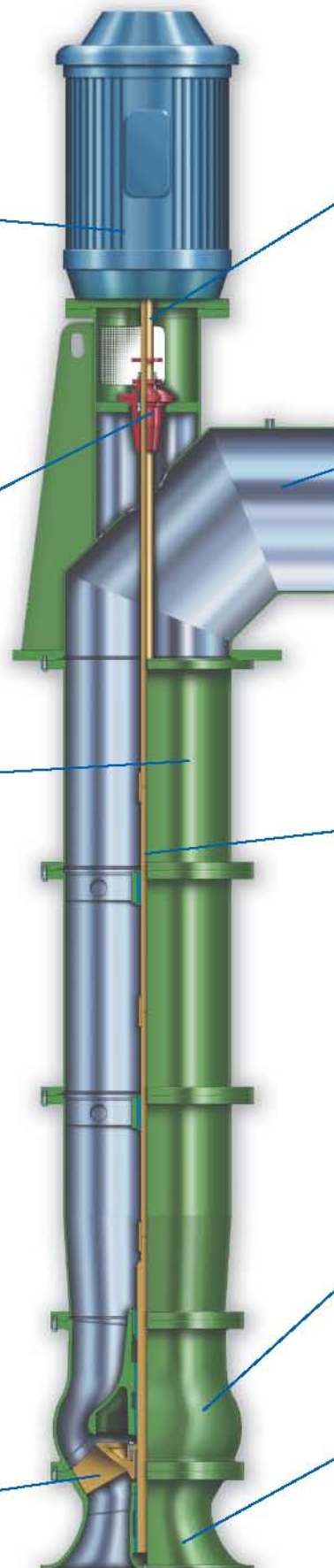
Various seal options are available including gland packing, shaft tube (oil), shaft tube (water flush), grease lubrication or internal/external balanced and non-balanced mechanical seals.

## Column Assembly

The pump column pipe is connected by flanges and supports the bowl plus any intermediate lineshaft bearings. Lubrication is by the pumped fluid or oil. Product lubricated bearing materials are selected to suit the application. Oil lubrication uses column pipe tubes to deliver oil direct to the bearings. Rubber spiders stabilize and support the column pipe tube.

## Impellers

The cast semi-open impellers are balanced to assure vibration free operation and hand-finished for maximum performance. The impeller is secured to the shaft by a collet or key with split thrust ring and retainer. It is part of the chamber/impeller/vane assembly designed to maximize both on axial and radial motion, providing greater head than the axial impeller alone. The design increases impeller life when operating with fluids containing stringy material.



## Headshaft

The headshaft can be supplied with a nut or flanged coupling for impeller adjustment to maximize sustained efficiency. Headshaft material is selected to suit the pumped fluid.

## Discharge Elbow

Elbows are available in both above or below base configuration. Both styles are three-section, full diameter elbows designed to obtain the smoothest flow from vertical to the horizontal plane with minimum possible losses. Elbows are manufactured from fabricated steel plate. The discharge opening can be either plain-end or flanged, Victaulic® grooves and couplings are also available.

## Pumpshaft

The shaft is manufactured from 416SS. Careful design and tight machining tolerances ensure the pump runs smoothly, with low levels of vibration. Shaft design complies with ANSI B58.1 and AWWA E101 standards.

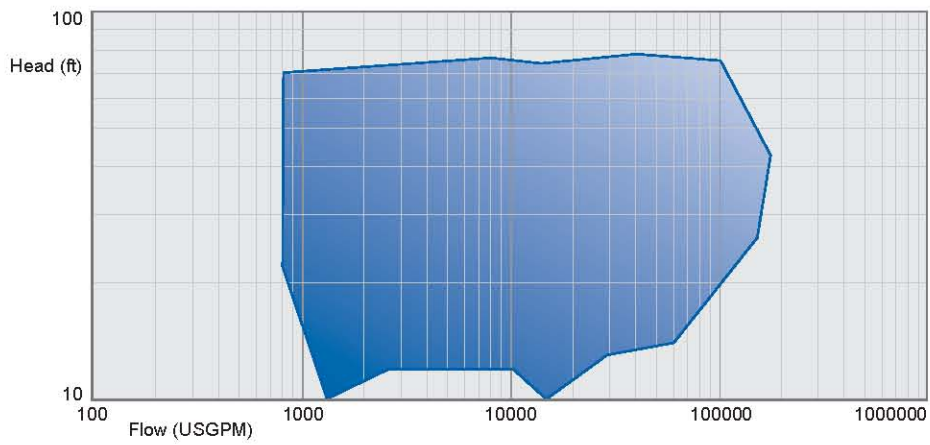
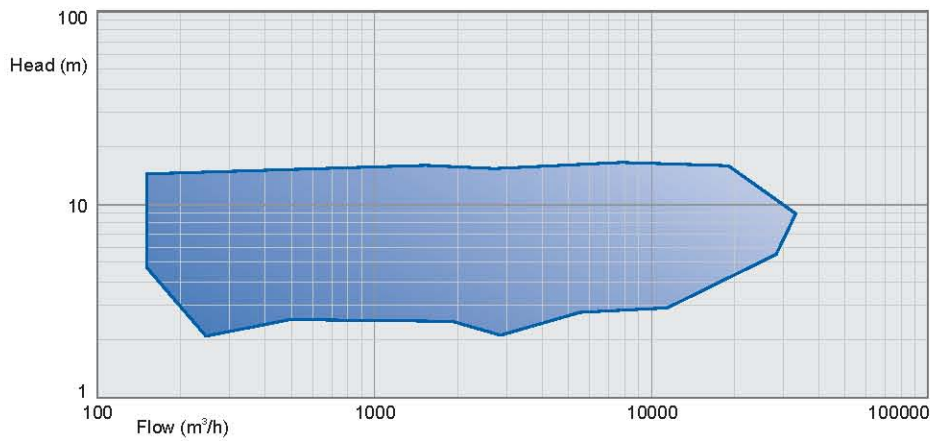
## Bowl

The bowl is flanged and bolts directly to the column pipe. The design combines the energy conversion and diffusion functions of the intermediate bowl and discharge case all in one casing. Bowl bearings are provided to extend bowl and shaft life. A replaceable liner mounted in the discharge bowl is also available to increase pump life.

## Suction Bell

Fluid enters through a suction bell that is reinforced by vanes, lending support to the bell while guiding the liquid flow parallel to the drive shaft for maximum efficiency. An optional strainer restricts entry of any foreign object during pump operation.

# Performance Range



# Operating Data

	JM 50 Hz	JM 60 Hz
Pump sizes	200 to 1,500 mm	8 to 60 inches
Capacity	182 to 39,725 m <sup>3</sup> /h	800 to 175,000 USGPM
Head	27 m	90 ft
Pressure (size dependant)	17 bar	250 psi
Temperature	-45,56 to 135 °C	-50 to 275 °F