



Pump Division

MF
Solids-Handling
Pumps



Pump Supplier To The World

Flowserve is the driving force in the global industrial pump marketplace. No other pump company in the world has the depth or breadth of expertise in the successful application of pre-engineered, engineered and special purpose pumps and systems.

Pumping Solutions

Flowserve is providing pumping solutions which permit customers to continuously improve productivity, profitability and pumping system reliability.

Market Focused Customer Support

Product and industry specialists develop effective proposals and solutions directed toward market and customer preferences. They offer technical advice and assistance throughout each stage of the product life cycle, beginning with the inquiry.



Dynamic Technologies

Flowserve is without peer in the development and application of pump technology, including:

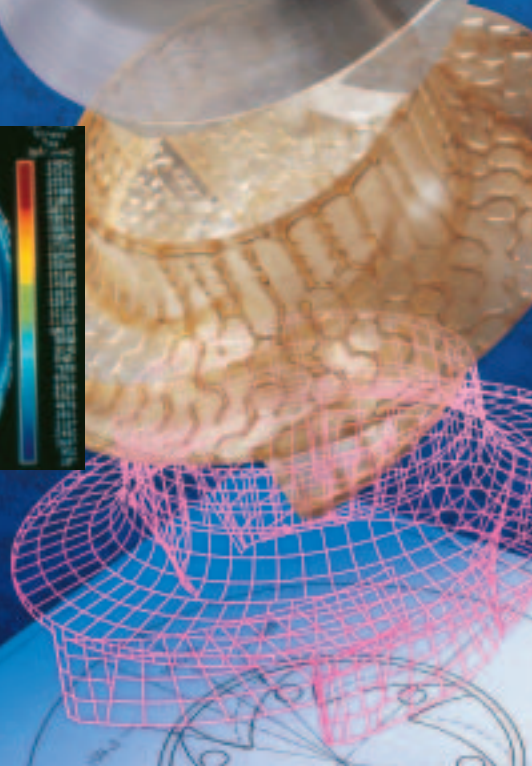
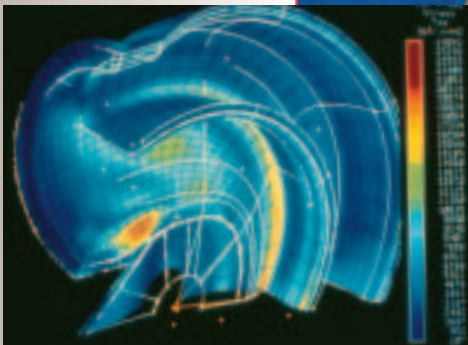
- Hydraulic engineering
- Mechanical design
- Materials science
- Intelligent pumping
- Manufacturing technology

Broad Product Lines

Flowserve offers a wide range of complementary pump types, from pre-engineered process pumps, to highly engineered and special purpose pumps and systems. Pumps are built to recognized global standards and customer specifications.

Pump designs include:

- Single stage process
- Between bearing single stage
- Between bearing multistage
- Vertical
- Submersible motor
- Rotary
- Reciprocating
- Nuclear
- Specialty



MF
Solids-Handling Pumps

Rugged and Efficient Design
Flowserve's MF is an end-suction, side-discharge, mixed-flow, non-clog pump. It is specifically engineered for reliability, low cost and long life in demanding sewage handling services or where solids in suspension are of particular concern. The rugged MF is designed, manufactured and tested in conformance with the Standards of the Hydraulic Institute.

Performance Benefits

- Flexibility
 - Configurations
 - Motor mounts
 - Nozzle orientation
- Reliability
 - Robust construction
 - Special materials
- Efficiency
 - Broad hydraulic range
 - Reduced power consumption
- Easy maintenance

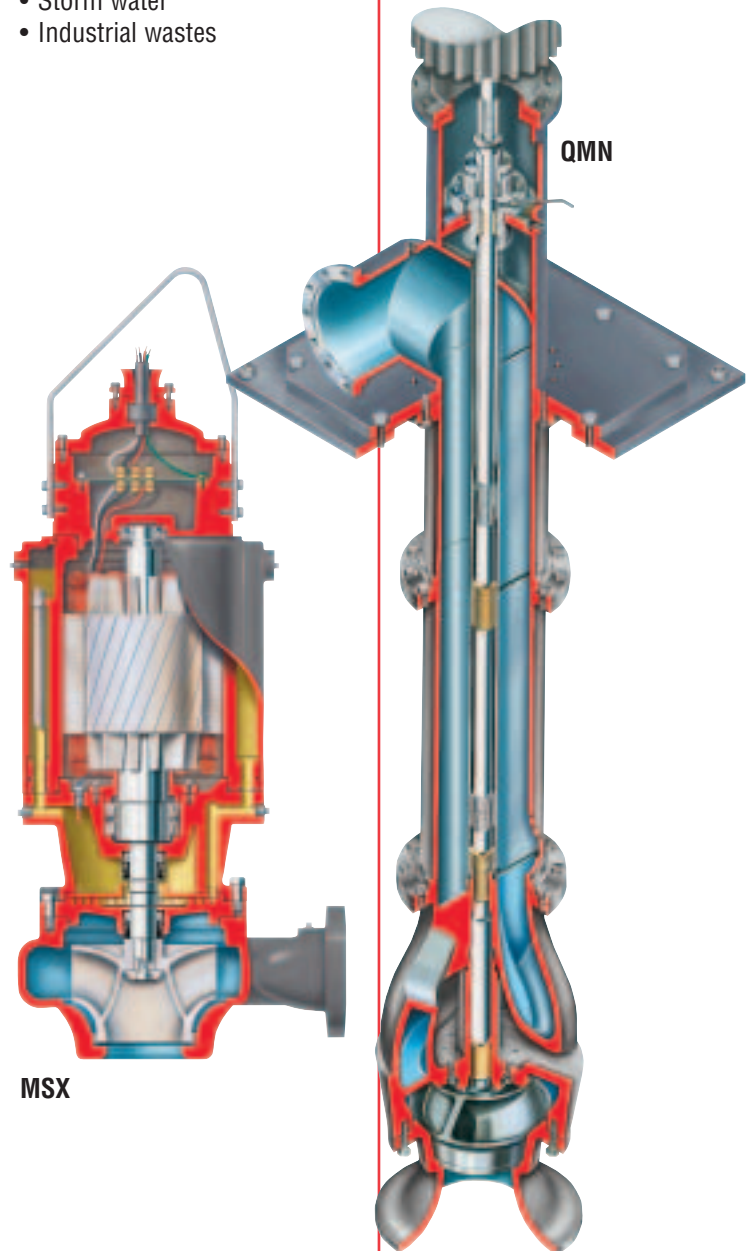
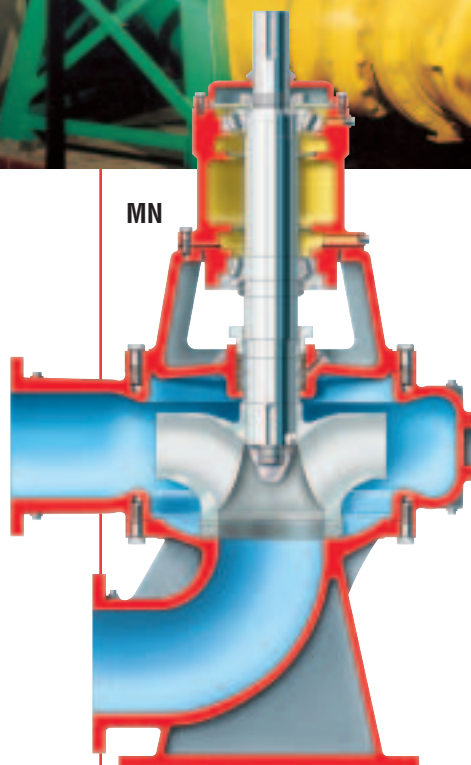
Typical Applications

- Sewage
- Storm water
- Industrial wastes

Complementary Pump Designs

Depending upon application requirements, Flowserve can also provide these pump designs:

- Dry-pit solids-handling
- Vertical, wet-pit
- Submersible non-clog



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Pumps

The MF reflects Flowserve's leadership and reputation in the design and manufacture of sewage and solids-handling pumps. Renowned for reliability, these rugged pumps offer extraordinary flexibility and cost efficiency. Versatile performers, medium-capacity MF pumps can be found throughout the collection-treatment-effluent municipal cycle and in industrial waste services.

Operating Parameters

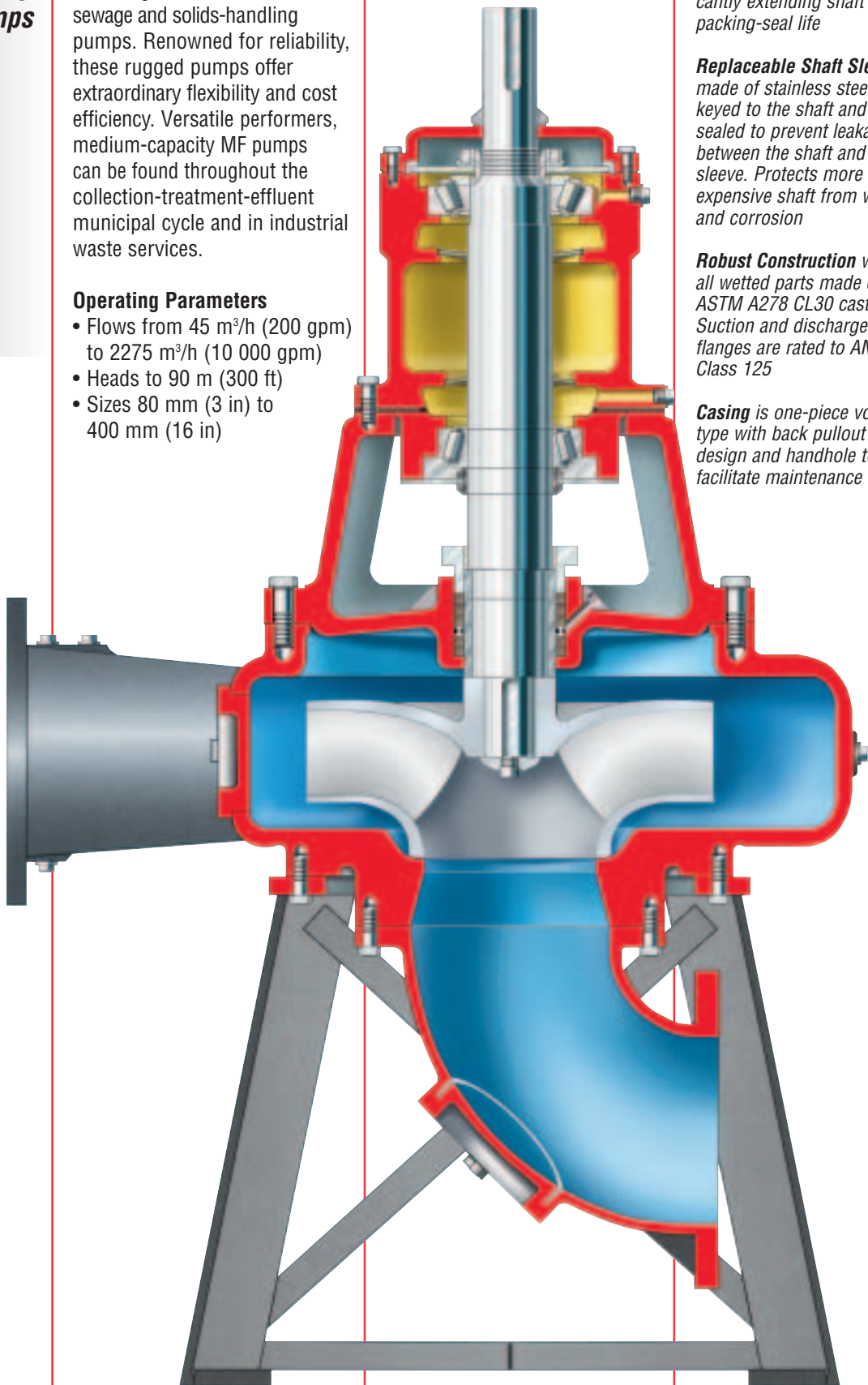
- Flows from 45 m³/h (200 gpm) to 2275 m³/h (10 000 gpm)
- Heads to 90 m (300 ft)
- Sizes 80 mm (3 in) to 400 mm (16 in)

Carbon Steel Shaft with oversized dimensions is robust and rigid, significantly extending shaft and packing-seal life

Replaceable Shaft Sleeve, made of stainless steel, is keyed to the shaft and sealed to prevent leakage between the shaft and sleeve. Protects more expensive shaft from wear and corrosion

Robust Construction with all wetted parts made of ASTM A278 CL30 cast iron. Suction and discharge flanges are rated to ANSI Class 125

Casing is one-piece volute type with back pullout design and handhole to facilitate maintenance





Suction Elbow is standard on vertical models; eccentric suction nozzle is available on horizontal models. Handhole access for inspection and cleaning is standard. Chrome steel wear rings are available

Non-Clog Impeller is key locked to the shaft to prevent loosening by torque from forward or reverse rotation. Chrome steel wear rings are available

Stuffing Box readily accommodates packing or mechanical seals per customer preference

Ball or Tapered Roller Bearings (grease lubricated) firmly support the shaft, virtually eliminate axial and radial thrust loads and are designed for a minimum of 40 000 hours B10 life

Bearing Housing With Integral Jacking Bolts permits axial adjustment of optional wear rings by the use of a shim pack between the bearing housing and back head

Design Features

Flexibility

- Horizontal and vertical models
- Variety of mounting arrangements
- Variety of nozzle positions to suit most piping arrangements without special or costly modifications
- Direct or independent motor mounting

Reliability

- Minimal shaft deflection with oversized shaft and reduced overhang virtually eliminating shaft failure and increasing packing or seal life
- Conservative bearing design arranged to eliminate all radial and axial play
- Hardened chrome steel shaft sleeve standard
- Supports to minimize vibration assure rigidity

Efficiency

- Maximum solids-handling capabilities
- Wide range of efficient operation and reduced power consumption



Ease of Maintenance

- Easy access to seal chamber through large openings in the bearing housing support
- Removable gland for easy packing adjustment or replacement
- Stuffing box arranged for either grease or water seal
- Wide variety of mechanical seal options

- Back pullout of entire rotating assembly without disturbing the casing or suction and discharge piping
- Readily accessible lubrication points in bearing housing

Technical Data and Options

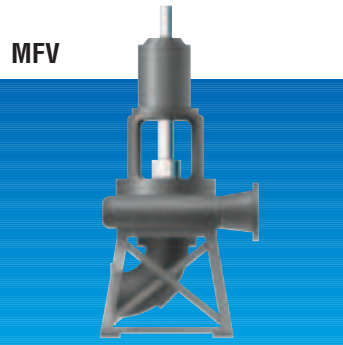
Available Options

- Chrome steel wear rings of varying hardness
- 316SS or hardened shaft sleeves
- Single, double, cartridge or split mechanical seals
- Bronze, nickel, cast iron or stainless steel castings
- Paint systems
- Baseplates
- Testing
 - Performance
 - Hydrostatic
 - Variable speed
- Coupling type
- Coupling guard

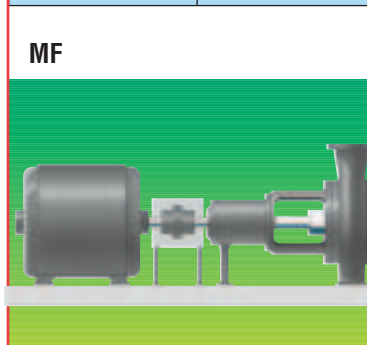
Materials of Construction

Port	Standard Fitted	Optional Material
Casing	Cast Iron	1 1/2% Ni. Cast Iron Ductile Iron
Impeller	Cast Iron	1 1/2% Ni. Cast Iron Bronze 11-14% Chr. Stl.
Impeller Wearing Ring	None	11-14% Chr. Stl. 250-300 BHN
Casing Wearing Ring	None	15-18% Chr. Stl. 300-350 BHN
Gland	Bronze	—
Shaft	Carbon Steel	Low Alloy Steel
Shaft Sleeve	11-14% Chr. Stl. 325-400 BHN	450-500 BHN
Line Bearing	Ball or Tapered Roller	—
Thrust Bearing	Ball or Tapered Roller	—
Stuffing Box Head	Cast Iron	1 1/2% Ni. Cast Iron Ductile Iron
Suction Head or Elbow	Cast Iron	1 1/2% Ni. Cast Iron Ductile Iron
Seal Cage	PTFE	Bronze
Packing	Non-Asbestos	Mechanical Seals
Adjusting Shims	Plastic	—
Grease Fittings	Alemite	—
Coupling	All Metal Flexible	Refer to Factory
Horizontal Baseplates	Fabricated Steel	—
Vertical Motor Pedestal	Fabricated Steel	—

Configurations



MFV
Vertical with Motor Mounted on Separate Floor

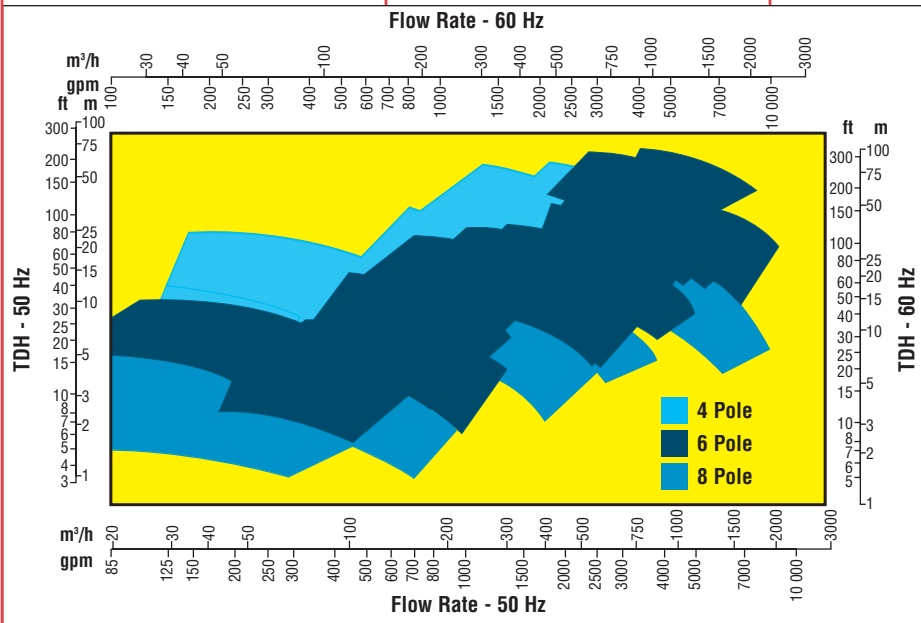


MF
Horizontal End-Suction



MFC
Vertical with Direct Connected Motor

MF Range Chart

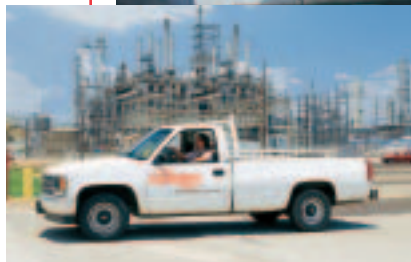
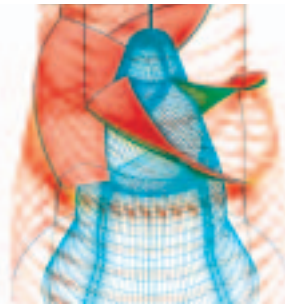


Global Service and Technical Support

Advanced Technologies

Few if any pump companies can match Flowserve's capabilities in hydraulic and mechanical design or in materials engineering. These capabilities include:

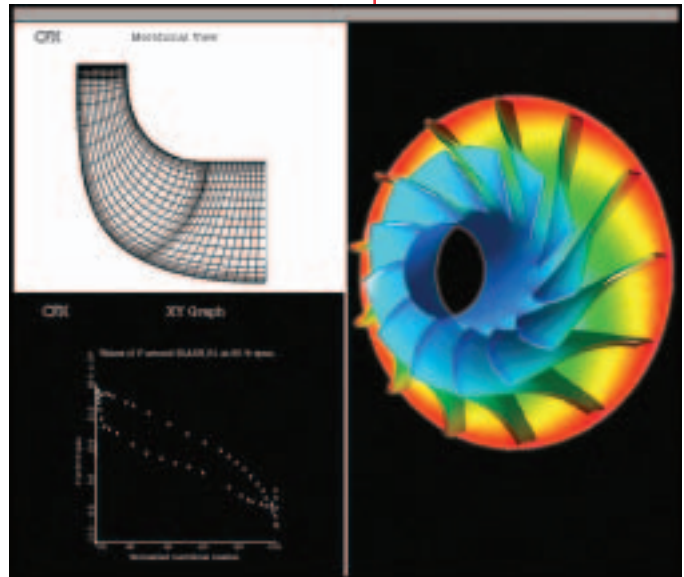
- Computational fluid dynamics
- Flow visualization
- Cavitation studies
- Efficiency optimization
- Finite element analysis
- Rapid prototyping
- Captive high nickel alloy and light reactive alloy foundries
- Non-metallic materials processing and manufacturing



Service and Repair Group

Flowserve's Service and Repair Group is dedicated to maximizing equipment performance and reliability-centered maintenance programs. Pump related services include:

- Startup and commissioning
- Diagnostics and prognostics
- Routine and repair maintenance
- ANSI and ISO power end exchange program
- Re-rates, upgrades and retrofits
- Spare parts inventory and management programs
- Training



Pump Improvement Engineering Services

Flowserve is committed to helping customers obtain the best possible return on their pump equipment investment. Engineering assistance and technological solutions for pumping problems are readily available.

These services include:

- Field performance testing
- Vibration analysis
- Design analysis and root-cause problem solving
- Material improvements
- Pump and system audit
- Advanced technology solutions
- PumpTrac™ remote pump monitoring and diagnostic services
- Instruction manual updates
- Training courses

**Flowserve... Supporting Our Customers
With The World's Leading
Pump Brands**



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