



Pump Division



***MN***  
***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:

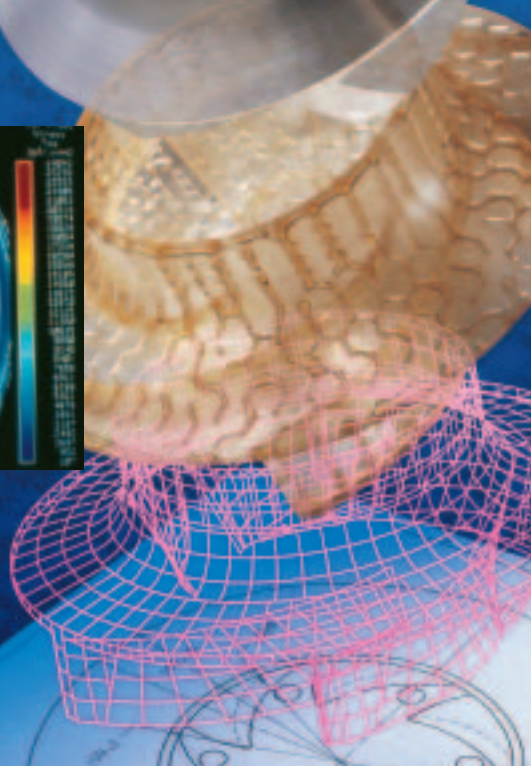
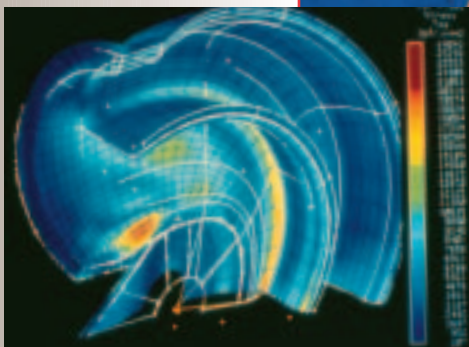
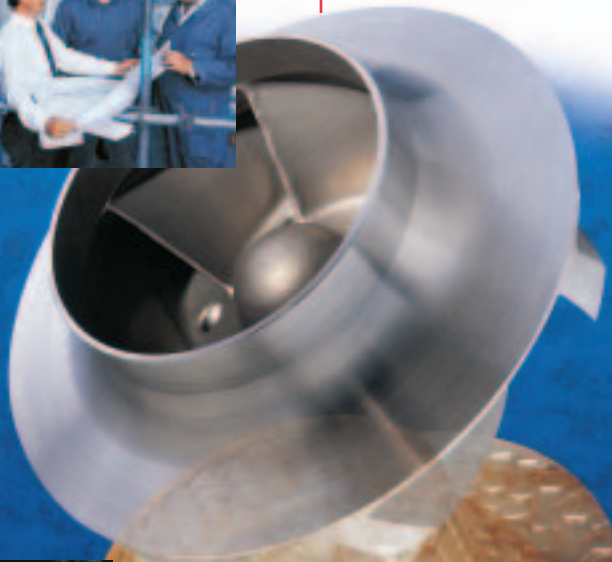
- Hydraulic engineering
- Mechanical design
- Materials science
- Intelligent pumping
- Manufacturing technology

### Broad Product Lines

Flowserve offers a wide range of complementary pump types, from pre-engineered pump types, 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



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**Rugged and Efficient Design**  
Flowserve's MN 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 heavy-duty MN 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

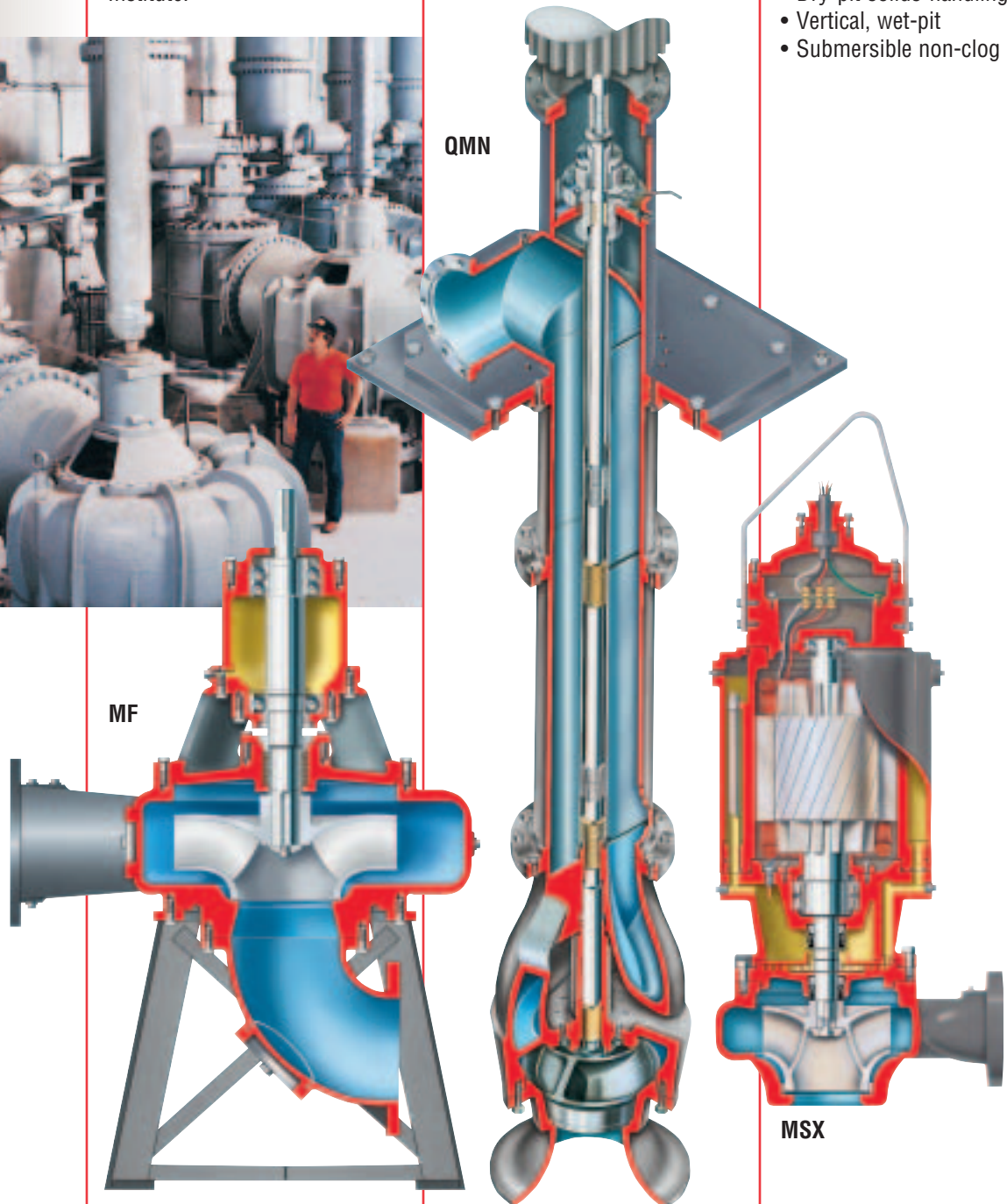
**Typical Application**

- Sewage
- Storm water
- Industrial wastes
- Dry dock

**Complementary Pump Designs**

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

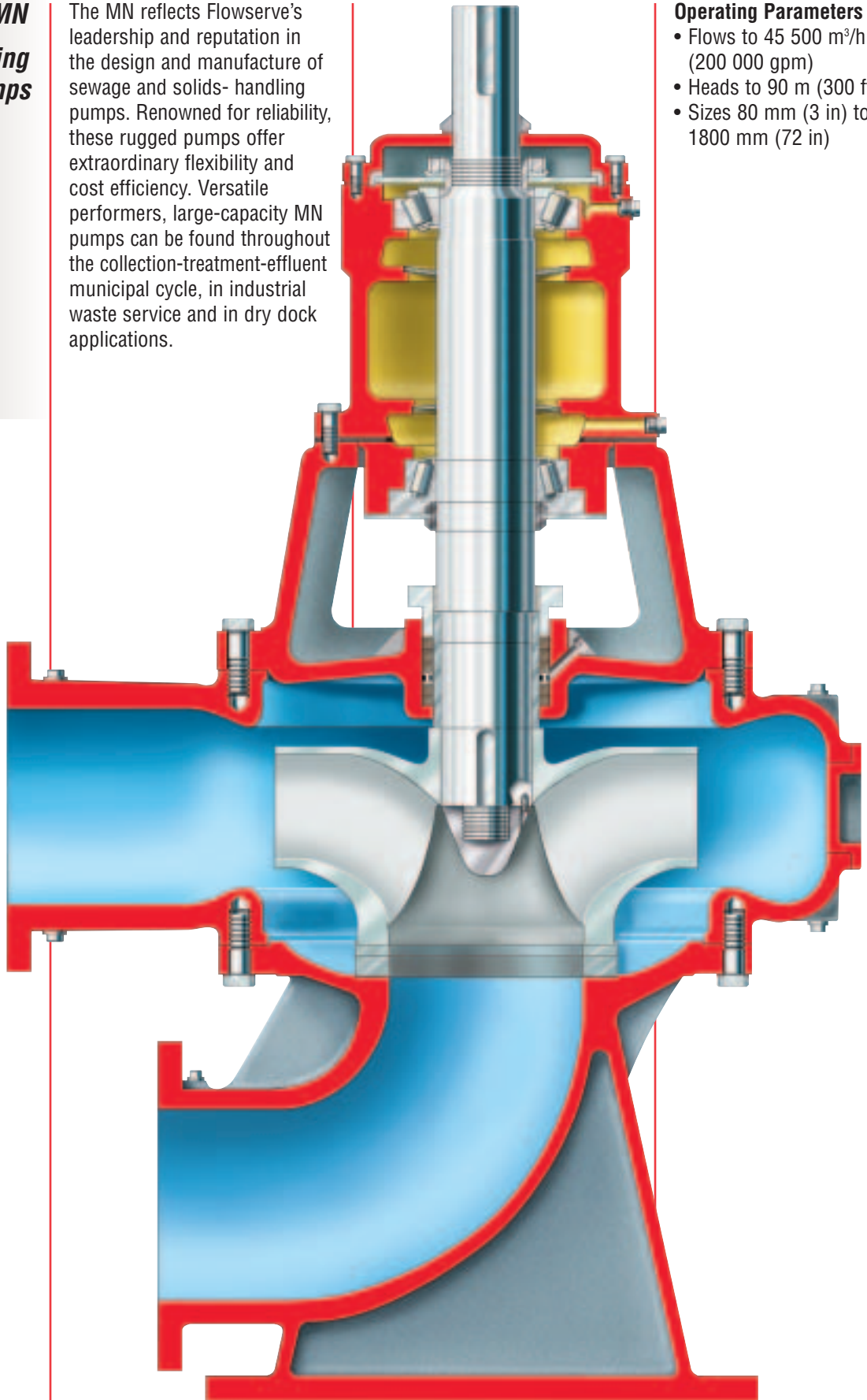
- Dry-pit solids-handling
- Vertical, wet-pit
- Submersible non-clog



**MN**  
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The MN 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, large-capacity MN pumps can be found throughout the collection-treatment-effluent municipal cycle, in industrial waste service and in dry dock applications.

- Operating Parameters**
- Flows to 45 500 m<sup>3</sup>/h (200 000 gpm)
  - Heads to 90 m (300 ft)
  - Sizes 80 mm (3 in) to 1800 mm (72 in)



**Carbon Steel Shaft** with oversized dimensions is robust and rigid, significantly extending shaft and packing or 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 nozzles are rated to ASME (ANSI) Class 125

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

**Separate Suction Head/Elbow** features adjustable, double chrome steel wear ring to maintain dimensional integrity and efficiency. Handhole access for inspection and cleaning is standard

**Non-Clog Impeller** is secured with a locking nut to prevent loosening by torque from forward or reverse rotation. Chrome steel wear ring is standard

**Stuffing Box** readily accommodates packing or mechanical seals per customer preference

**Opposed Tapered Roller Bearings** (grease lubricated) firmly support the shaft, virtually eliminate axial and radial thrust loads and are designed for a minimum of 100 000 hours B10 life

**Bearing Housing With Integral Jacking Bolts** permits axial adjustment of 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
- Replaceable hardened chrome steel wear rings on impeller and suction head to extend pump life
- 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
- Adjustable wear ring clearance for continued high efficiency

**Ease of Maintenance**

- Easy access to stuffing box 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

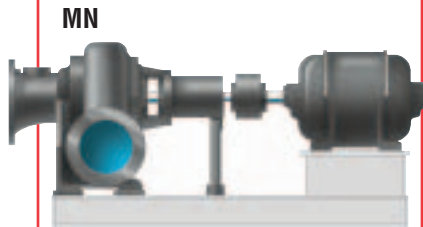
#### Available Options

- Extra hard chrome steel wear rings
- 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

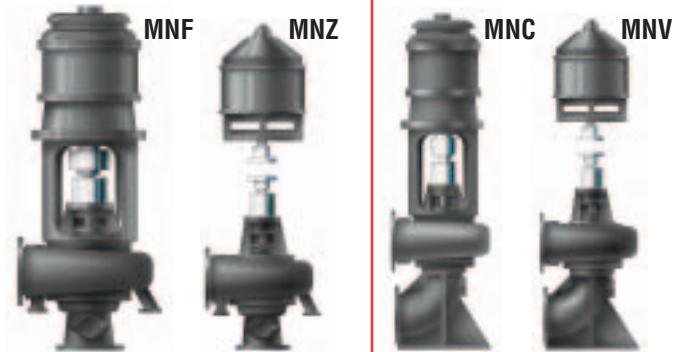
Port	Standard Fitted	Optional Material
Casing	Cast Iron	1 1/2% Ni. Cast Iron Ductile Iron
Impeller	Cast Iron	1 1/2% Ni. Cast Iron Bronze 11-14% Chr. Stl.
Impeller Wearing Ring	11-14% Chr. Stl. 250-300 BHN	325-350 BHN
Casing Wearing Ring	15-18% Chr. Stl. 300-350 BHN	400-450 BHN
Gland	Bronze	—
Shaft	Carbon Steel	Low Alloy Steel
Shaft Sleeve	11-14% Chr. Stl. 325-400 BHN	450-500 BHN
Line Bearing	Tapered Roller	—
Thrust Bearing	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



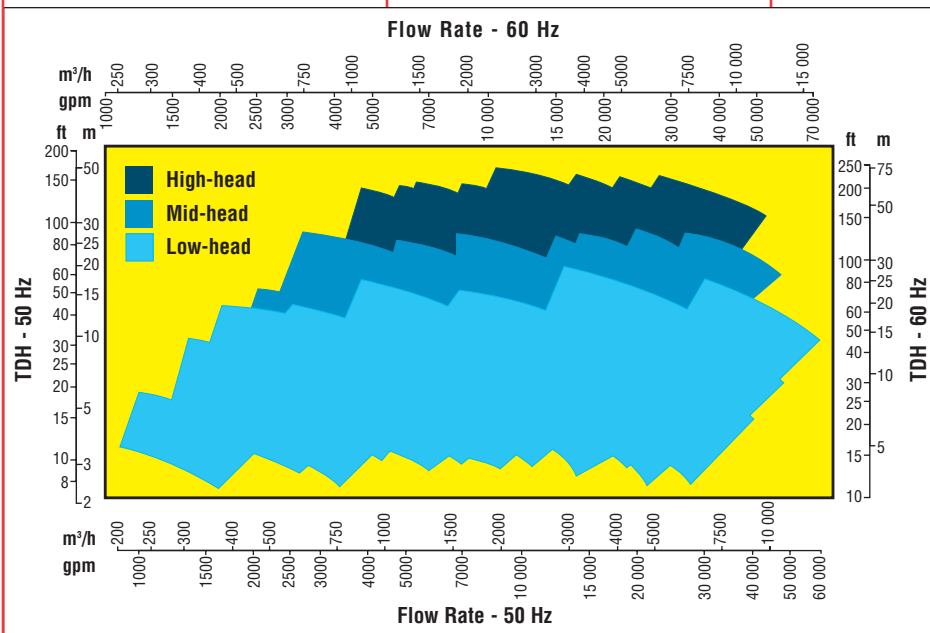
Horizontal End-Suction

MN Range Chart



Vertical with Bottom-Suction

Vertical with Supportive Base Elbow

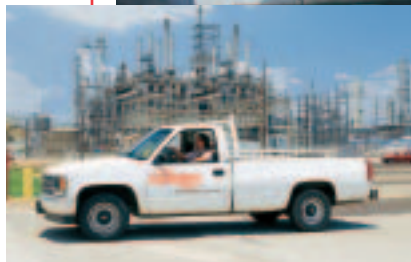
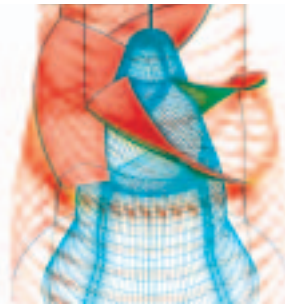


**Global Service and Technical Support**

**Advanced Technologies**

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

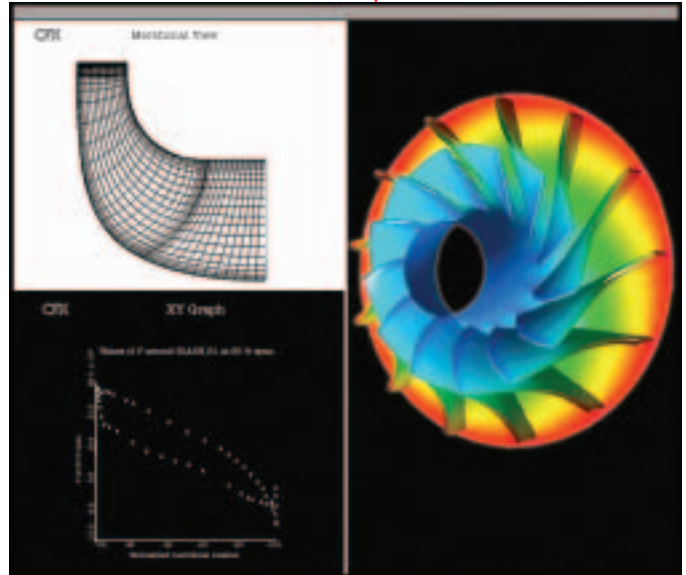
- Computational fluid dynamics
- Flow visualization
- Cavitation studies
- Efficiency optimization
- Finite element analysis
- Rapid prototyping
- Captive high nickel alloy and light reactive alloy foundries
- Non-metallic materials processing and manufacturing



**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**



**USA and Canada**

Flowserve Corporation  
Pump Division  
Millennium Center  
222 Las Colinas Blvd., 15th Floor  
Irving, Texas 75039-5421 USA  
Telephone: 1 972 443 6500  
Telefax: 1 972 443 6800

**Europe, Middle East, Africa**

Worthington S.P.A.  
Flowserve Corporation  
Via Rossini 90/92  
20033 Desio (Milan), Italy  
Telephone: 39 0362 6121  
Telefax: 39 0362 303396



**Pump Division**

*Your local Flowserve representative:*

**To find your local Flowserve representative  
please use the Sales Support Locator System  
found at [www.flowserve.com](http://www.flowserve.com)**

**Or call toll free: 1 800 728 PUMP**

**Latin America and Caribbean**

Flowserve Corporation  
Pump Division  
6840 Wynnwood Lane  
Houston, Texas 77008 USA  
Telephone: 1 713 803 4434  
Telefax: 1 713 803 4497

**Asia Pacific**

Flowserve Pte. Ltd.  
Pump Division  
200 Pandan Loop #06-03/04  
Pantech 21  
Singapore 128388  
Telephone: 65 6775 3003  
Telefax: 65 6779 4607