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
Rugged and Reliable
The Flowserve MSX family of solids-handling, submersible pumps is engineered to perform efficiently in the most challenging environments, from pumping raw sewage to moving industrial wastewater and solids laden liquids.

Operating and Cost Saving Benefits
MSX non-clog pumps reduce operating costs while providing long-life operation with minimal downtime.

• High efficiency
  – Superior hydraulic capability
  – Outstanding wire-to-water efficiency
  – EPACT rated high performance motors
  – Complete hydraulic and motor coverage

• Solid reliability
  – Long-lasting seal and bearing designs
  – Closed-loop cooling system for improved heat transfer
  – Spike-resistant windings for extended motor life
  – High-quality materials of construction

Broad Application
• Raw sewage
• Return-activated sludge
• Waste-activated sludge
• Mixed liquor
• Final effluent
• Filter backwash
• Dewatering
• Industrial process
• Industrial waste collection
• Flood protection

Complementary Pump Designs
Depending upon application requirements, Flowserve can also provide these pump designs:
• End-suction, side-discharge, mixed-flow, non-clog pumps
• Vertical, wet-pit pumps
Flowserve MSX pumps are expressly designed to handle sewage and wastes of almost every form and description including both solids in solution and solids in suspension. Absolute reliability is the most critical requirement for these pumps. MSX-Series 1 medium-capacity and MSX-Series 2/3 high-capacity pumps provide that assurance along with long life, cost-efficient performance.

Operating Parameters
- Flows to 4545 m³/h (20 000 gpm)
- Heads to 90 m (300 ft)
- Sizes 80 mm (3 in) to 500 mm (20 in)
- Motors to 300 kW (400 hp)
  - FM approved version available for explosion-proof service
  - Variable-speed drives available

Industries Served
- Water resources
- Mining
- Agriculture
- General industry

Accessories
- Control panels
- Lifting chains
- Access covers
- Guide rail assemblies
- Level control floats
- Telemetry devices
- Valves

MSX-Series 1 Design Features
- Solids-Handling Size to 80 mm (3 in) spherical
- EPACT Rated Motor* offers high-efficiency performance for impressive energy savings
- Shaft and Rotor are dynamically balanced for reduced vibration to assure smooth operation and long service life
- Class H Rated Insulation System significantly extends motor life

Watertight Cable Entry protects motor from moisture and contamination, thus extending its operating life

Impeller Wear Ring in stainless steel available as an option for extended impeller life

Spike-Resistant Windings are standard. In addition to smooth, consistent motor performance, this feature permits the handling of voltage spikes with variable frequency drive motor option

Long-Life, Angular Contact Bearings support axial and radial thrust loads for superior bearing and seal life

Sealing Fluid is environmentally friendly to eliminate media contamination concerns

Silicon Carbide Seal Faces in the lower mechanical seals provide durability and reliability. Upper mechanical seal faces are carbon/ceramic

High-Efficiency Hydraulics reduce energy consumption and operating cost while providing constant, predictable pumping performance

Extensive Hydraulic Coverage is achieved with discharge sizes of 80 mm (3 in) through 150 mm (6 in)

Higher Overall Wire-to-Water Efficiencies

* First motor to meet U.S. Energy Policy Act’s (EPACT) efficiency regulations
MSX-Series 2/3 Design Features

**Solids-Handling Size** to 80 mm (3 in) spherical

**Easy-Access Terminal Chamber** allows quick power connection-disconnection without entirely removing the pump from service

**EPACT Rated Motor** offers high efficiency performance for impressive energy savings

**Closed-Loop Cooling Design** avoids clogging and hot spots associated with pumped media cooling arrangements

**Spike-Resistant Windings** are standard. In addition to smooth, consistent motor performance, this feature permits the handling of voltage spikes with variable frequency drive motor option

**Shaft and Rotor** are dynamically balanced for reduced vibration to assure smooth operation and long service life

**Class H Rated Insulation System** significantly extends motor life

**Moisture-Protection Probe** provides constant monitoring and motor protection

**Long-Life, Tapered Roller Bearings** support axial and radial thrust loads for superior bearing and seal life

**Circulating Impeller** in the cooling system effectively transfers heat to keep the motor running smoothly and to lubricate the upper mechanical seal faces

**Sealing and Cooling Oil** are environmentally friendly to eliminate contamination concerns

**Heat Exchanger** in the closed loop cooling system provides additional motor cooling protection

**Impeller Wear Ring** supplied in hardened stainless steel as a standard for extended impeller life

**Silicon Carbide Seal Faces** in the lower mechanical seals provide durability and reliability. Upper mechanical seal faces are carbon/ceramic

**High-Efficiency Hydraulics** reduce energy consumption and operating costs while providing constant, predictable pumping efficiency

**High Overall Wire-to-Water Efficiencies**

*First motor to meet U.S. Energy Policy Act’s (EPACT) efficiency regulations*
Wet-Pit Mounting Option

Complementary Equipment
- Controls
- Level switches
- Valves
- Access covers
- Hoists
- Testing

Dry-Pit Mounting Option

Component | Standard Materials
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Pump Casing | Cast Iron, ASTM A48, CL30
Casing Wear Ring | Cast Iron, ASTM A48, CL30
Impeller | Cast Iron, ASTM A48, CL30
Impeller Wear Ring | Hardened SS - 8 in -14 in Discharge
Motor Housing | Cast Iron, ASTM A48, CL30
Cooling Jacket | Cast Iron, ASTM A48, CL30
Seal Plate | Cast Iron, ASTM A48, CL30
Bearing Plate | Cast Iron, ASTM A48, CL30
Cable Entry | Cast Iron, ASTM A48, CL30
Hardware | Type 316 SS
Shaft | Type 416 SS
O-Rings | Buna-N
Cable Entry Grommet | Neoprene
Seal Oil | Environmentally friendly
Exterior Coatings | Corrosion resistant paint
Impeller Key/Bolt | Type 416 SS/Type 316 SS

Transportable-Style Option

MSX Range Chart
Global Engineered Services and Support

Total Cost Reduction
Asset Management
Product Life Cycle
Performance Re-rates
Site Diagnostics
Repair Services
Energy Management
Spare Parts
Maintenance Contracts
Materials Upgrades
Turnkey Services
Field Repairs
Installation
Project Supervision
Commissioning
Equipment Upgrades
Condition Monitoring
Systems Analysis
Field Machining

Service Dedication
Flowserve Engineered Services is focused on providing customers with uncompromising service and support, where and when needed. Engineered Services is dedicated to delivering the highest quality support by integrating its extensive pump and materials engineering knowledge with creative service solutions. Engineered Services prides itself in understanding the business challenges facing customers and is prepared to manage solutions to succeed as a team.

A worldwide network of service and repair centers staffed by highly skilled engineers and technicians is available around the clock, seven days a week to respond to customer queries, to evaluate and troubleshoot problems and to provide reliable solutions.

Strength of Experience, Commitment to Excellence
Flowserve has long served industries requiring superior equipment performance and service life.
- Oil and gas production
- Hydrocarbon processing
- Chemical processing
- Water resources
- Power generation
- Nuclear
- Mining and mineral processing
- Pulp and paper
- General industry

Engineered Services is dedicated to maximizing equipment performance and providing reliability-centered maintenance programs for pumps and related equipment, regardless of manufacturer. Using the FlowStar™ asset management software, Engineered Services tracks performance and supports improvement programs using a service life cycle cost business approach. The results are improved reliability and increased profitability.

Your Business Partner
Flowserve partners with customers to respond to the dynamic business conditions that affect them. Flowserve will work with customers to drive efficiency, maximize throughput and control process quality. Whether your needs involve on-site technical assistance or broader project planning with full turnkey responsibility, you can rely on the strength of Flowserve Engineered Services to deliver professional, reliable results.

Low Frequency Pressure Pulsation

50% Flow