

Water Resources

*Source Water and
Water Transmission*



*Treatment and
Distribution*



Waste Water

Irrigation

*Flood Control, Dry Docks
and Drainage*



FLOWSERVE
Pump Division

***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.

Supplier of Choice for Water Resources

Throughout its history, Flowserve has been closely identified with pumping water resources. For more than a century and a half, Flowserve has been in the forefront of virtually every significant advancement in pumping technology to meet water-handling challenges. Today, Flowserve offers the world's most complete line of pumps and systems for water applications along with a full menu of technical and service support.

Heritage Names of Distinction

ACEC™ Centrifugal Pumps

Aldrich® Pumps

Byron Jackson® Pumps

Cameron® Pumps

Durco® Pumps

Flowserve® Pumps

IDP® Pumps

Jeumont-Schneider™ Pumps

Pacific® Pumps

Pleuger® Pumps

Scienco® Pumps

Sier-Bath® Rotary Pumps

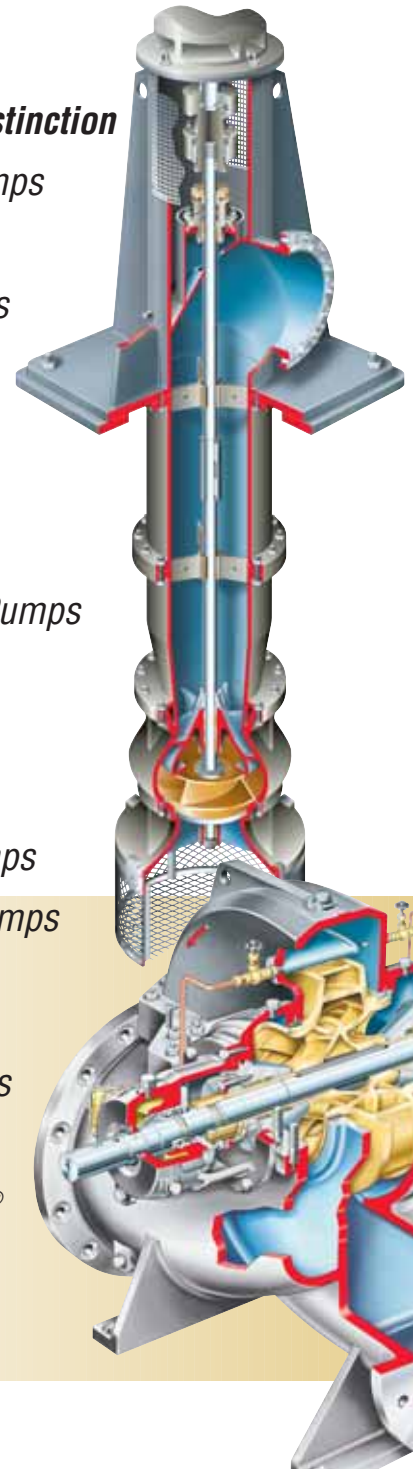
United® Centrifugal Pumps

*Western Land Roller®
Irrigation Pumps*

Wilson-Snyder® Pumps

Worthington® Pumps

*Worthington Simpson®
Pumps*



Pump Designs

Flowserve offers a wide range of complementary pump types, built to recognized global standards and customer specifications. These include:

- Single Stage Process
- Between Bearing Single Stage
- Between Bearing Multistage
- Vertical
- Submersible Motor
- Rotary
- Reciprocating
- Nuclear
- Specialty

Available Configurations

- Sealed and Sealless
- Axially and Radially Split
- Volute and Diffuser
- Close Coupled and Long Coupled
- Single and Double Casing

Dynamic Technologies

Few if any pump companies can match the capabilities in hydraulic and mechanical design or in materials engineering that Flowserve possesses.

Among these capabilities are:

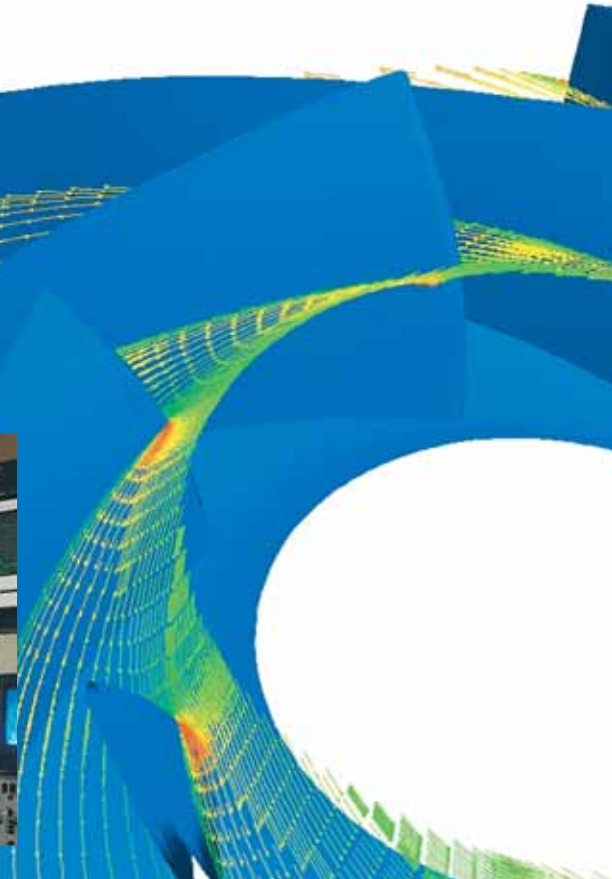
- Computational fluid dynamics
- Flow visualization
- Cavitation studies
- Efficiency optimization
- Finite element analysis
- Rapid prototyping
- Captive alloy foundries
- Non-metallic materials processing and manufacturing



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. This provides the following benefits:

- Advanced technology solutions
 - Order engineering
 - Hydraulic engineering
- Broad product reliability
- Worldwide service and support
- Competitive price and delivery
- Technology innovation
- Applications expertise



A vertical rectangular panel with a background of rippling blue water, positioned on the left side of the page.

***Source Water and
Water Transmission***

Moving water from its sources to treatment or distribution facilities requires dependable, high-volume pumps. Flowserve has long, proven performance in these vital operations.

Flowserve regularly supplies pumps capable of moving up to 160 000 m³/h (700 000 gpm) and offering up to 1060 m (3500 ft) of head. These dependable workhorses are the standards for efficiency and operating economy in an industry where these considerations are paramount.

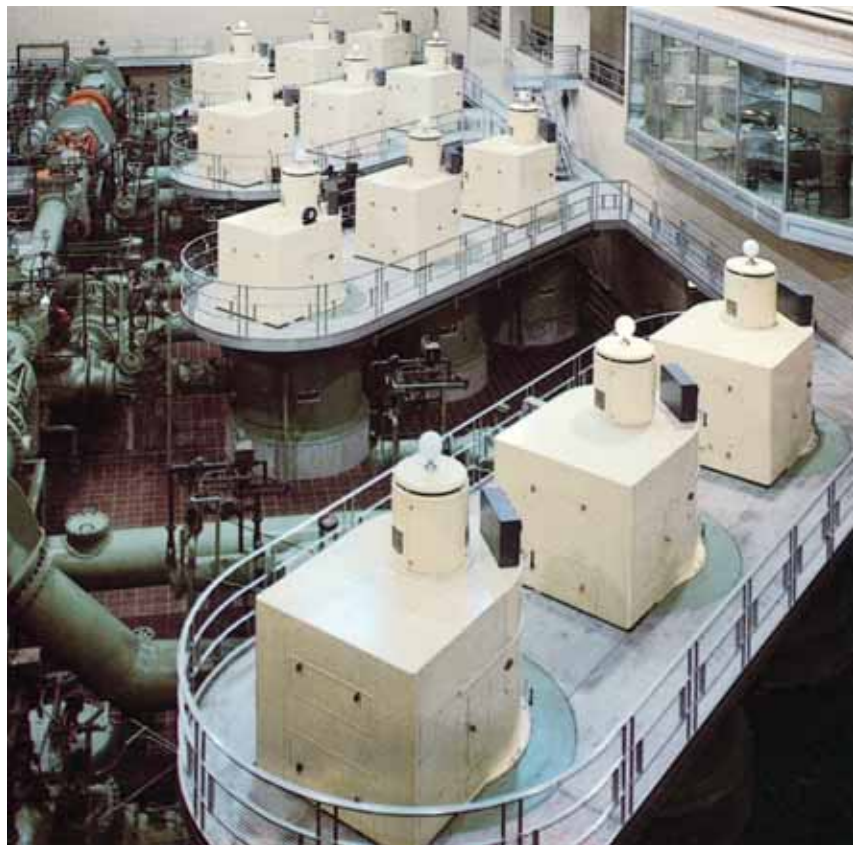


Source Water

- *Surface water* intake applications from streams, rivers, natural lakes and man-made reservoirs typically require a wide range of flows and pressures. Flowserve offers a complete line of vertical and horizontal type pumps for these services.
- *Groundwater* and deep well applications frequently present pumping challenges. No other company provides a broader selection of vertical turbine, line-shaft and submersible motor pump solutions than Flowserve.

Pump Types

- Short-coupled and deep well vertical turbine
- Double suction, wet-pit, vertical centrifugal
- Wet-pit, propeller and axial flow
- Bottom intake submersible motor pumps



Water Transmission

Transporting water to treatment plants is typically handled by horizontal split-case pumps and vertical turbine pumps. These proven, robust pumps are capable of continuous or intermittent operation over a wide range of flow and pressures required to meet system loads.

Pump Types

- Horizontal, axially split, centrifugal
- Standard, end-suction, centrifugal
- Overhung, ring section, multistage
- Ring section, multistage
- Deep well, vertical



A vertical rectangular inset image showing a close-up of blue water with ripples, serving as a background for the section header.

Water Treatment & Distribution

Contemporary water treatment entails filtration, chemical injection, and, in some parts of the world, desalination by reverse osmosis. Each of these, or combinations of these operations, requires special pumps with widely varying capacities and pressures. Flowserve can offer more equipment and provide the necessary expertise to select the right pumps and systems to meet exact service requirements.

Configurations from multistage centrifugal to vertical turbines are designed and built to help treat and move water efficiently and cost effectively. Capacities to 160 000 m³/h (700 000 gpm); heads to 1060 m (3500 ft).



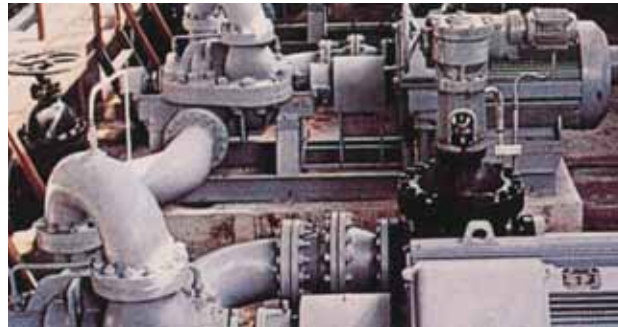
Water Treatment

These varied and demanding services require a broad array of pump designs and types. Flowserve pumps are offered for these applications:

- Low-lift
- Sampling
- Plant water
- Wash water
- High service

Pump Types

- Horizontal, axially split, centrifugal
- Standard, end-suction, centrifugal
- Vertical, wet-pit
- Overhung, ring section, multistage
- Ring section, multistage
- Auxiliary




Distribution

Flowserve offers a full complement of both vertical and horizontal pumps to maintain adequate distribution system pressures.

Pump Types

- Horizontal, axially split, centrifugal
- Standard, end-suction, centrifugal
- Ring section, multistage
- Overhung, ring section, multistage
- Submersible motor pump
- Short-coupled, vertical turbine



An aerial photograph of a wastewater treatment plant, showing several large circular aeration tanks and various industrial buildings. The water in the tanks appears slightly greenish.

Waste Water

There has been a significant increase in the number of waste water treatment plants around the world. Increased pressure from environmental agencies has elevated the importance of waste water collection and treatment.

Flowserve pumps play an important role in the treatment and purification of both municipal and industrial waste water. These robust, reliable pumps are used throughout the collection - treatment - effluent cycle.

Providing low maintenance, solids handling pumps for waste water applications continues to be a particular strength of Flowserve. In addition, increased attention to pretreatment of industrial waste water creates a need for dependable solids handling pumps, corrosion resistant process pumps and other specialized pumping equipment. Capacities to 45 400 m³/h (200 000 gpm); heads to 92 m (300 ft).



Collection

The collection and conveyance of spent water to a waste treatment plant presents an extremely difficult environment. Pumping station equipment must handle sewage and wastes of almost every form and description including both solids in suspension and in solution. Absolute reliability is the most critical requirement for these pumps.

Flowserve has an impressive record of performance in collection applications with a superior line of horizontal and vertical solids handling pumps.

Pump Types

- Standard, end-suction, centrifugal
- Wet-pit, submersible, solids handling
- Vertical, wet-pit, solids handling

Treatment

Flowserve is among the few companies who can supply the variety of pump types required by the many different kinds of waste water treatment facilities and processes. Applications include:

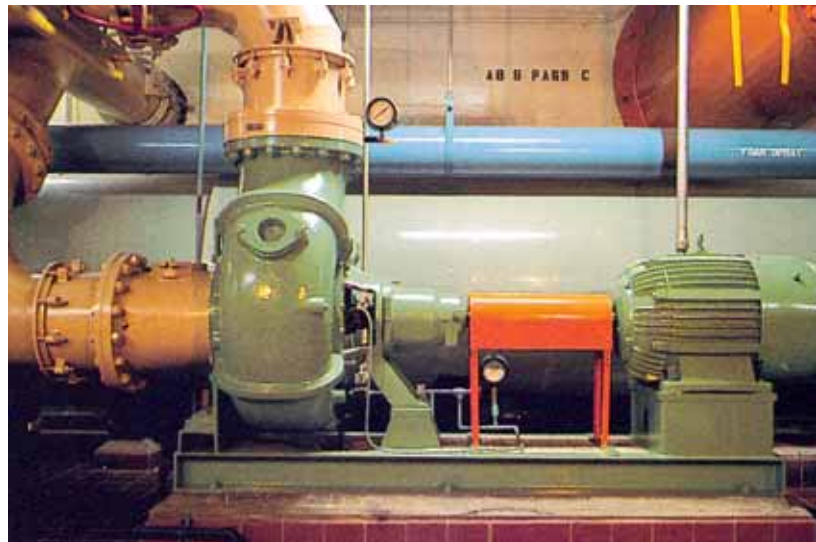
- Raw sewage
- Settled sewage
- Service water
- Return activated sludge
- Waste activated sludge
- Effluent

Disposal and Reuse

Flowserve pumps are used in effluent discharge and reuse throughout the treatment plant facility.

Pump Types

- Standard, end-suction, centrifugal
- End-suction, solids handling
- Horizontal, axially split, centrifugal
- Short-coupled, vertical, turbine
- Vertical, wet-pit, solids handling
- Wet-pit, propeller and axial flow



Irrigation

Irrigation pumps play an essential role in converting arid land into agriculturally productive farms, housing and recreation sites. Whether drawn from surface or subsurface sources or, more increasingly, from the effluent of sewage treatment plants, Flowserve has the pumps to effectively and reliably secure and distribute these essential waters.

Pump Types

Groundwater

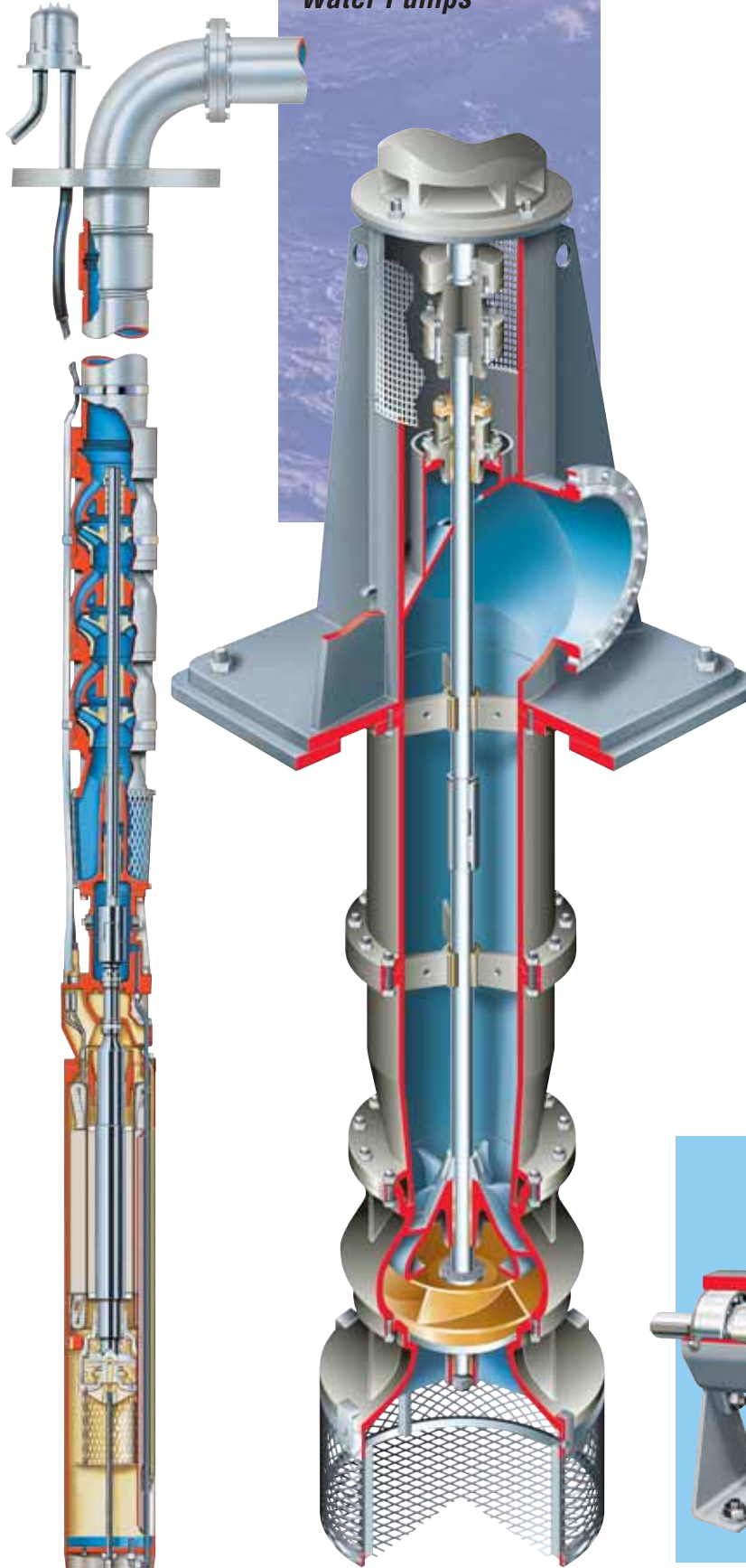
- Submersible motor pumps
- Vertical turbine
- Wet-pit and dry-pit, axial flow

Surface water

- Standard, end-suction, centrifugal
- Overhung, ring section, multistage
- Multistage, ring section
- Double suction, axially split
- Vertical, mixed flow



Water Pumps



Submersible Motor Pumps

Refined mineral oil (USDA approved) filled motor with internal force feed, filtered, cooled oil circulation

Certifications for potable water handling include:

- NSF 61 (USA)
- RVA, Dutch Council for Accreditation

Operating Parameters

- Flows to 4545 m³/h (20 000 gpm)
- Heads to 1060 m (3500 ft)
- Motor sizes to 1490 kW (2000 hp)

Vertical Turbine Pumps

Multistage with above or below ground discharge, enclosed or semi-open impellers, open or enclosed lineshafts, single or double casing

Operating Parameters

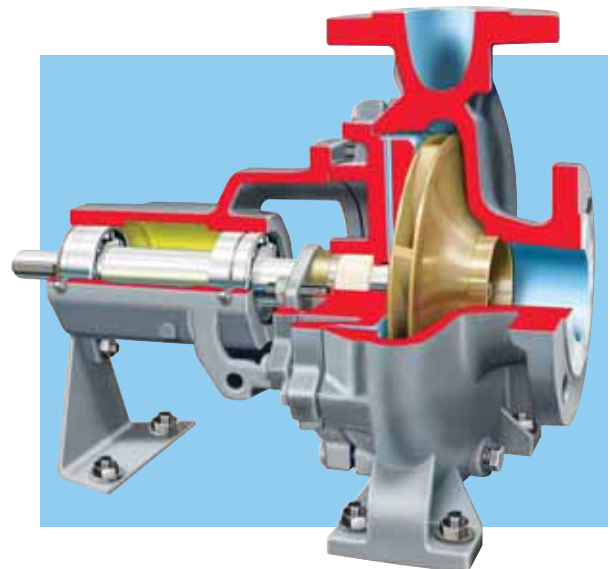
- Flows to 5680 m³/h (25 000 gpm)
- Heads to 700 m (2300 ft)
- Sizes 150 mm (6 in) to 1200 mm (48 in)
- Settings 365 m (1200 ft)

Overhung, Single Stage Pumps

Horizontal, overhung, end suction water pumps conforming to EN733 for flow to 600 m³/h (2650 gpm)

Operating Parameters

- Flows to 7000 m³/h (30 800 gpm)
- Heads to 140 m (470 ft)
- Sizes 32 mm (1.25 in) to 600 mm (24 in)



Deep Well, Submersible Motor Pumps

Designed to meet deep well or high pressure boosting need

Operating Parameters

- Flows to 68 180 m³/h (300 000 gpm)
- Heads to 790 m (2600 ft)
- Motor sizes to 5965 kW (8000 hp)

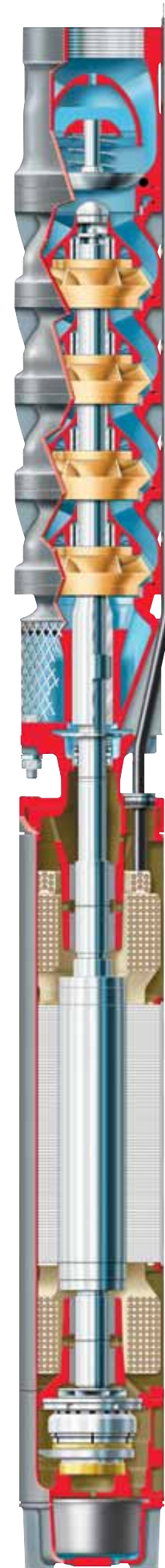
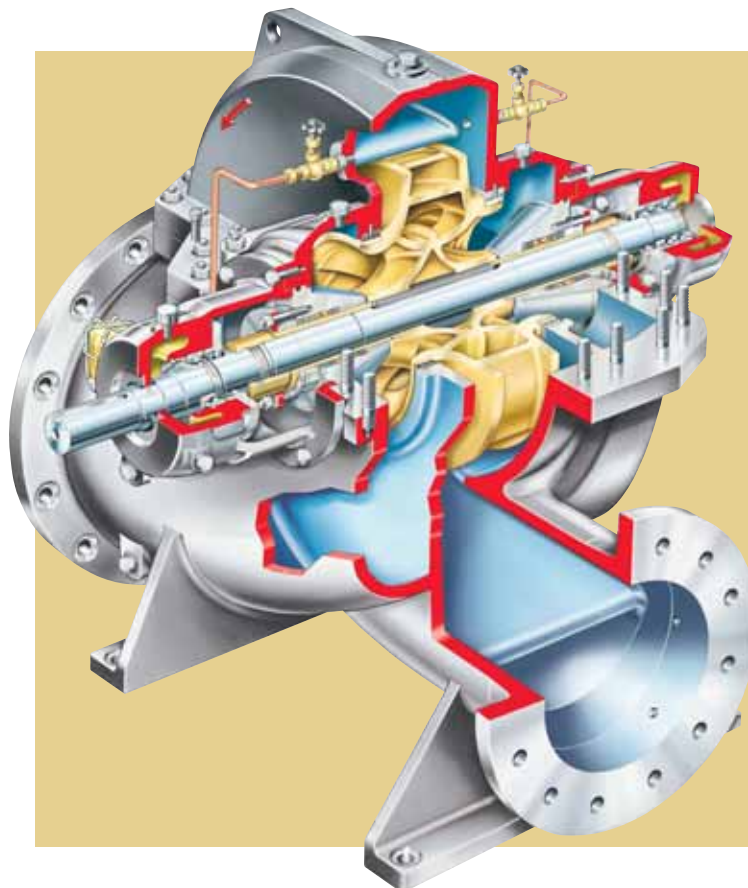
Between Bearing, Single Stage Pumps

Horizontal, axially split, single stage, double suction centrifugal pump. Pump configurations include a vertical mounted option and selected sizes of bottom suction models

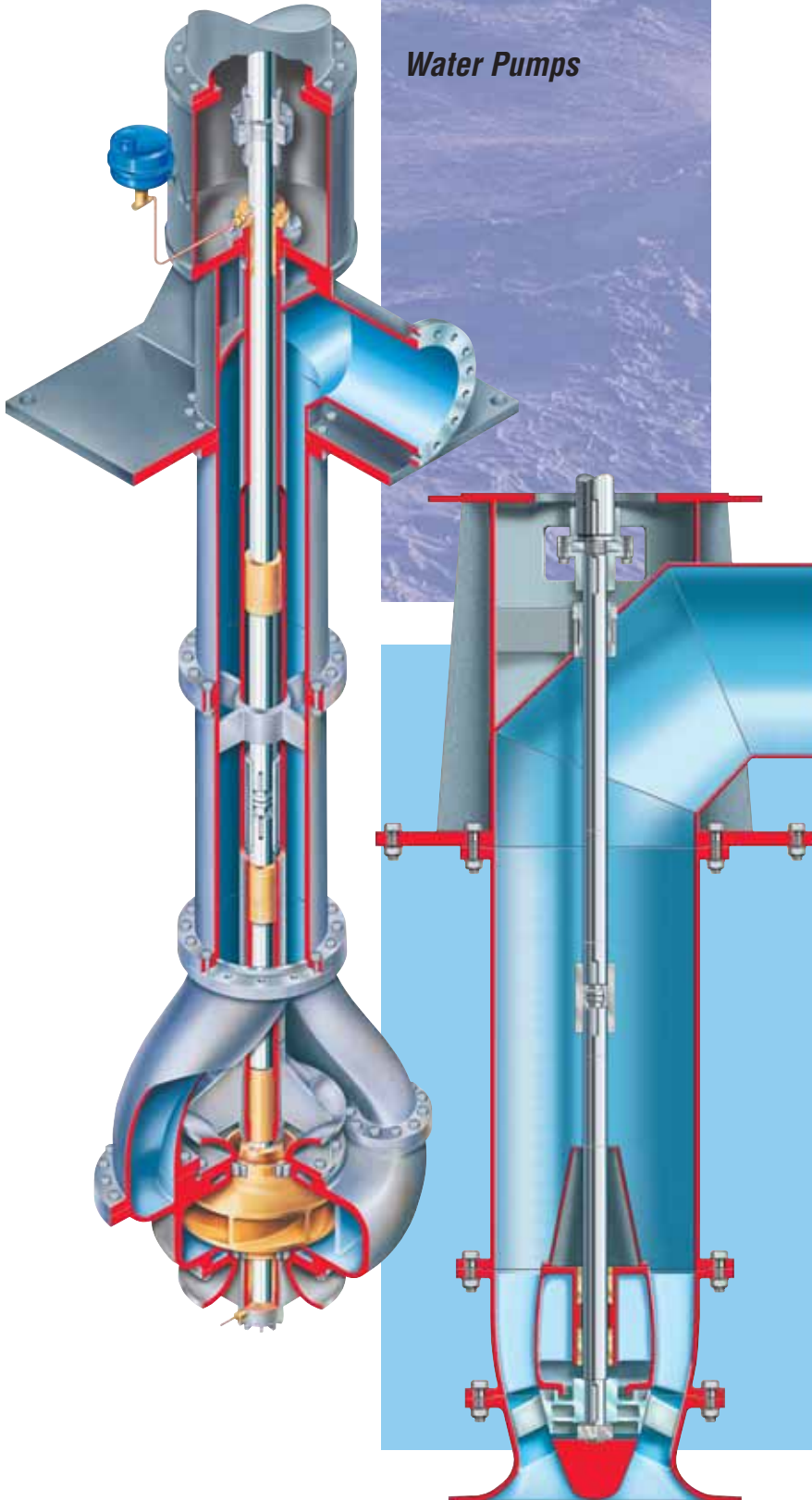
Operating Parameters

- Flows to 73 730 m³/h (320 000 gpm)
- Heads to 175 m (575 ft)
- Sizes 65 mm (2.5 in) to 1525 mm (60 in)

Water Pumps



Water Pumps



Wet-Pit, Vertical Pumps

Vertical, wet-pit, double suction impeller, between bearings, double volute centrifugal pump with enclosed or open lineshaft

Operating Parameters

- Flows to 80 000 m³/h (350 000 gpm)
- Heads to 610 m (2000 ft)
- Sizes 100 mm (4 in) to 3250 mm (128 in)

Wet-Pit, Propeller Pumps

Wet-pit, propeller with axial or mixed flow impeller, above or below ground discharge, open or enclosed lineshafts

Operating Parameters

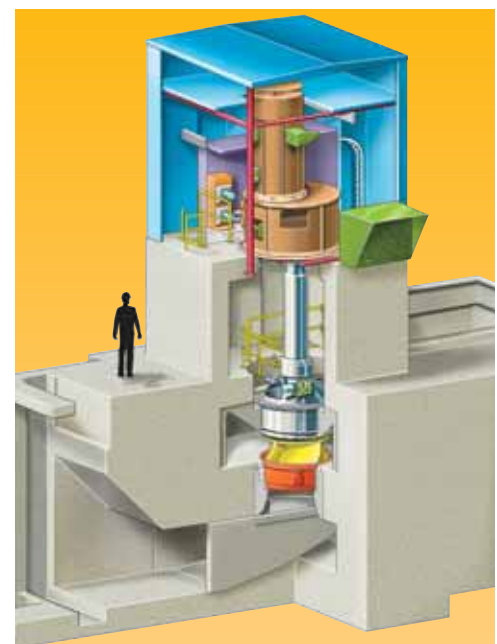
- Flows to 160 000 m³/h (700 000 gpm)
- Heads to 45 m (150 ft)
- Sizes 150 mm (6 in) to 3600 mm (144 in)

Concrete Volute Pumps

- Pump assembly integrated into civil construction
- Pre-fabricated concrete sections form intake structure for the pump
- Pump types
 - Mixed flow, open impeller
 - Mixed flow, closed impeller

Operating Parameters

- Flows to 115 000 m³/h (500 000 gpm)
- Heads to 30 m (100 ft)



Water Pumps

Multistage, Between Bearing Pumps

Horizontal or vertical, radial suction, multistage diffuser pumps with variable flange orientation

Operating Parameters

- Flows to 3000 m³/h (13 200 gpm)
- Heads to 500 m (1650 ft)
- Sizes 32 mm (1.25 in) to 150 mm (6 in)

Multistage, End Suction Pumps

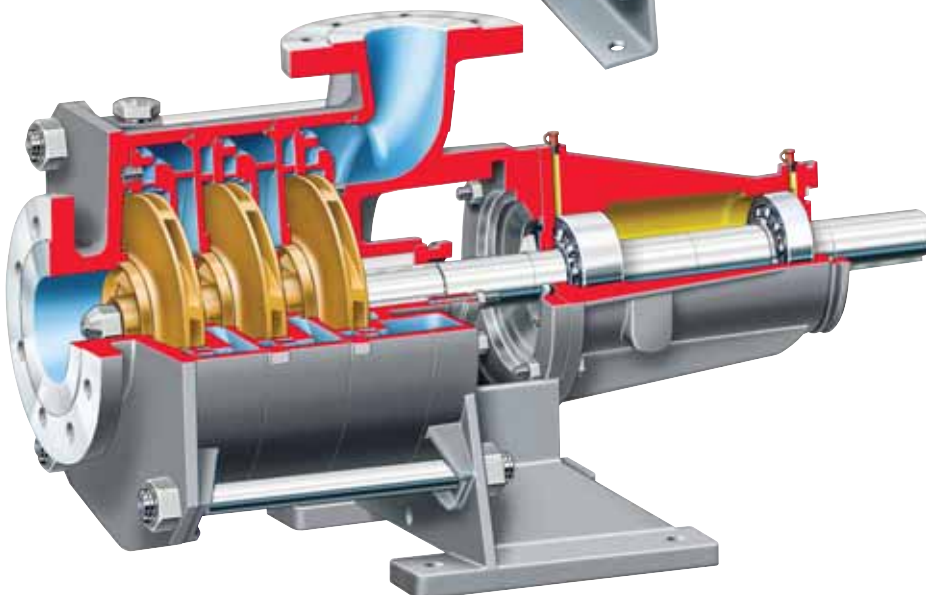
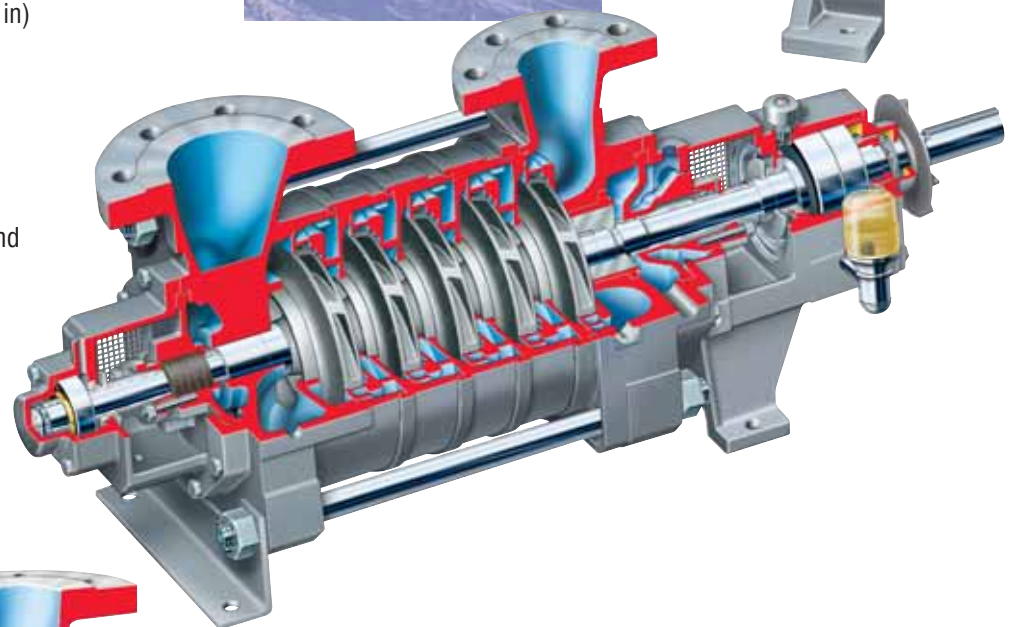
Horizontal, overhung, end suction, multistage diffuser pumps

Operating Parameters

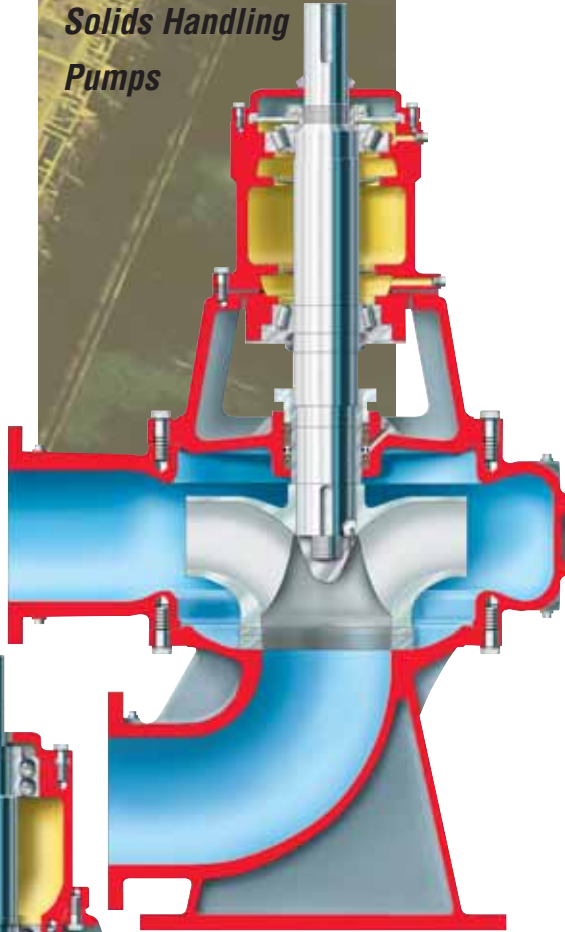
- Flows to 600 m³/h (2650 gpm)
- Heads to 250 m (820 ft)
- Sizes 32 mm (1.25 in) to 150 mm (6 in)

Additional Pump Types

- Horizontal
 - Single stage process with inducer for low NPSHR
 - Close coupled end suction
 - Single stage, axially split, single and double suction
 - Multistage, ring section
- In-line
 - Vertical end suction
 - Multistage, ring section



Solids Handling Pumps



End Suction, Side Discharge, Mixed-Flow, Non-Clog Pumps

Single stage, overhung, non-clogging impeller; horizontal, frame mounted, vertical frame mounted or independently mounted motor, including extended shafting

Operating Parameters

- Flows to 45 455 m³/h (200 000 gpm)
- Heads to 90 m (300 ft)
- Sizes 75 mm (3 in) to 1800 mm (72 in)

Additional Pump Types

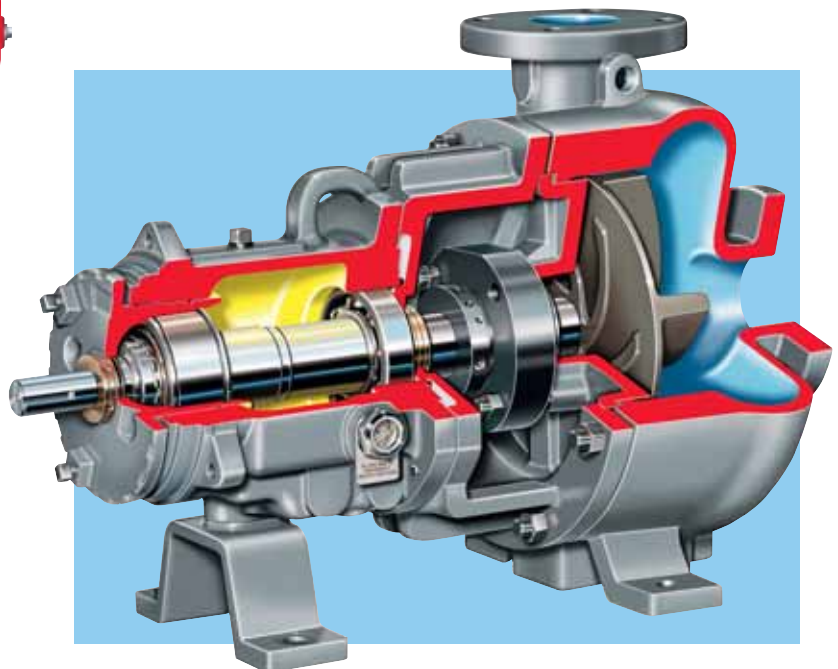
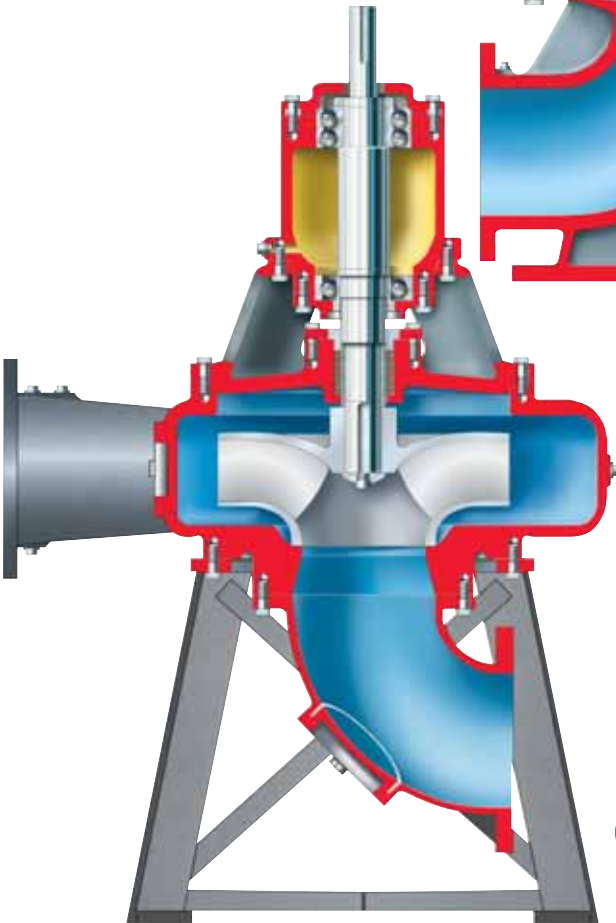
- Vertical
 - Short-coupled, turbine, single or double casing
 - Wet-pit, solids handling
 - Axial or mixed flow, wet-pit, propeller
- Concrete Volute
 - Open, mixed-flow impeller
 - Closed, mixed-flow impeller

Recessed Impeller Pumps

Vortex action of the recessed impeller for pumping solids, stringy or fibrous slurries

Operating Parameters

- Flows to 455 m³/h (2000 gpm)
- Heads to 120 m (400 ft)
- Sizes 25 mm (1 in) x 50 mm (2 in) -150 mm (6 in) to 50 mm (2 in) x 100 mm (4 in) - 325 mm (13 in)



Vertical, Wet-Pit Pumps

With enclosed impeller, above base discharge, enclosed lineshaft

Operating Parameters

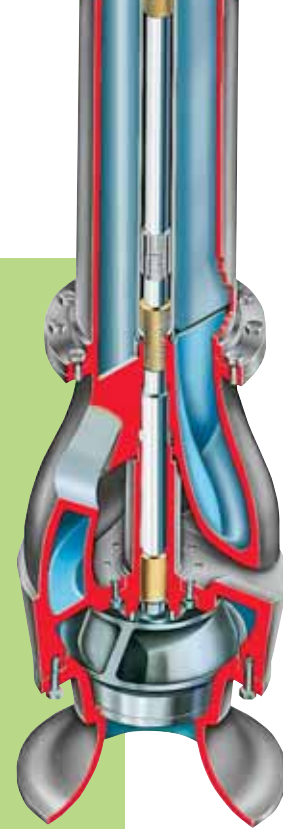
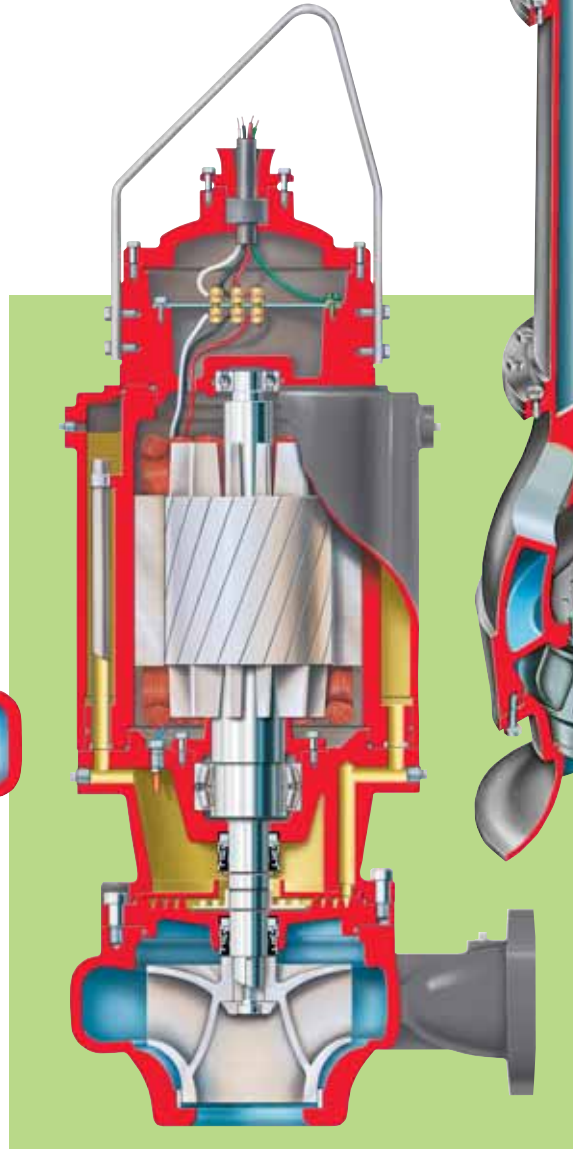
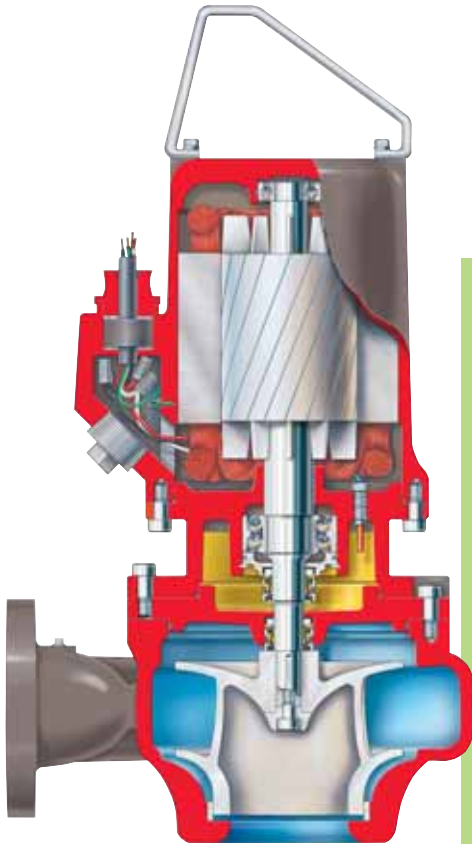
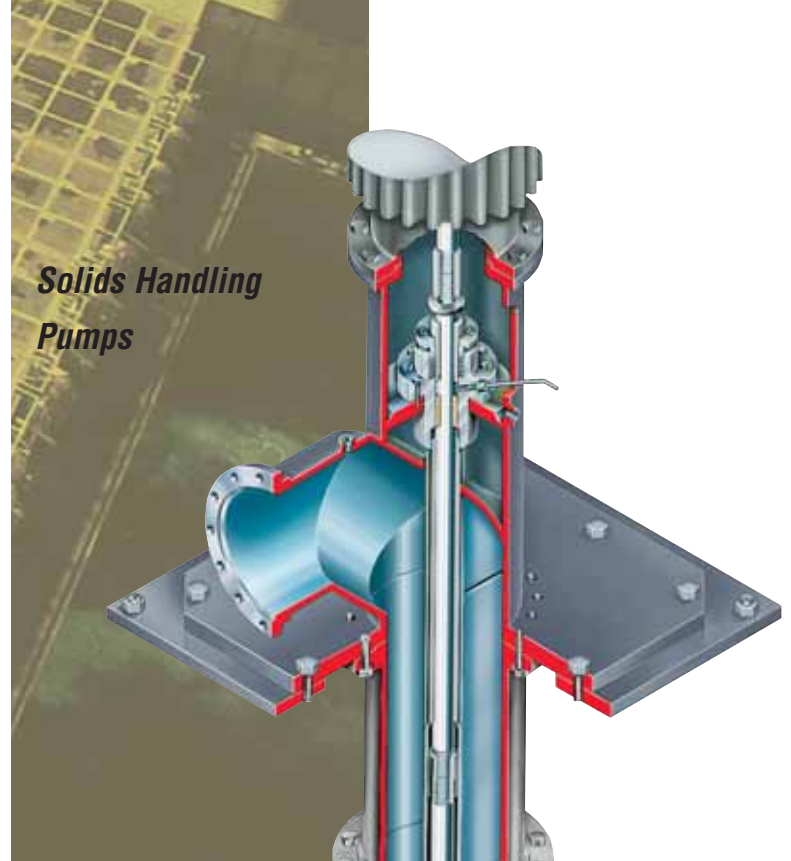
- Flows to 17 045 m³/h (75 000 gpm)
- Heads to 45 m (140 ft)
- Sizes 200 mm (8 in) to 1800 mm (72 in)

Submersible Non-Clog Pumps

With EPACT rated high efficiency motor, high overall wire-to-water efficiency and complete hydraulic coverage

Operating Parameters

- Flows to 4545 m³/h (20 000 gpm)
- Heads to 90 m (300 ft)
- Sizes 50 mm (2 in) to 500 mm (20 in)



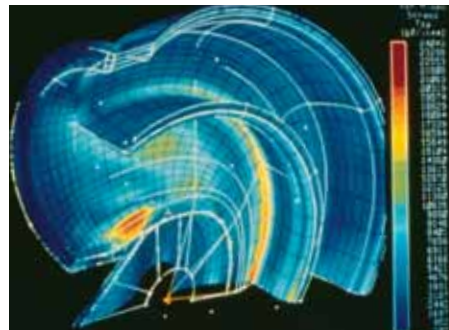
***Technology, Technical
Support and Service***

Innovation Through Dynamic Technology

Flowserve is without peer in the development, refinement and application of pump technology. This dynamic creativity is reflected in the strength of the company's commitment to:

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

All research and technology efforts are directed toward providing customers with greater total value for their investments in Flowserve products and systems. Further, these capabilities enable Flowserve to quickly and accurately provide the best possible solutions to customers' specific pumping problems.



Pump Improvement Engineering Services

The goal of this specialty service is to help plant technical personnel achieve optimal pumping solutions through engineering and technological assistance. Reducing the costs of operation and maintenance while improving overall equipment reliability is achieved through:

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

Parts and Service

Quality OEM parts are readily available from a worldwide network of Flowserve service and repair centers, fast response centers and regional parts services offices. All are computer networked to provide “as soon as possible” response to customers’ requests for assistance.

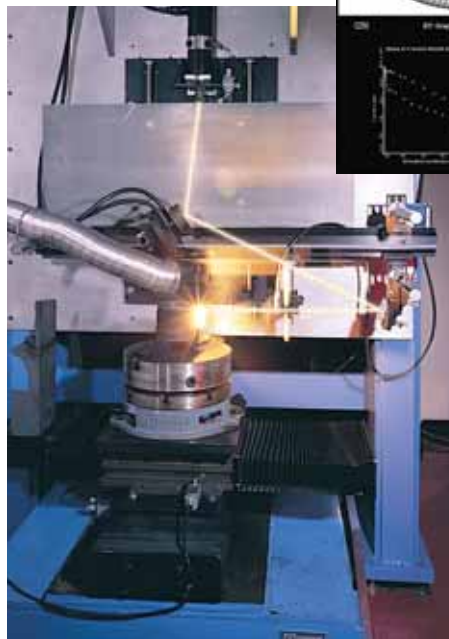
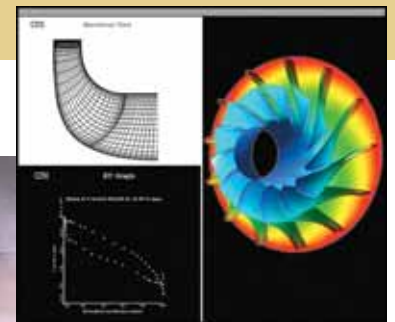
Customer service technicians are on call around the clock, seven days a week to respond to customer queries, to evaluate and troubleshoot reported pump problems and to provide reliable solutions.



Service and Repair Group

Flowserve Engineered Services is dedicated to maximizing equipment performance and reliability-centered maintenance programs. Pump related services include:

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



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



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Pump Division

Your local Flowserve representative:

**To find your local Flowserve representative
please use the Sales Support Locator System
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Or call toll free: 1 800 728 PUMP

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