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 that 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
- Positive displacement
- Nuclear
- Specialty
The Between Bearings Choice for General Industrial Pumping

The single-stage LR and LRV and the two-stage LLR family of pumps are part of a broad range of axially split, heavy-duty, between bearings pumps. These pumps complement the similarly designed LNN and LNNV. Together these products offer 150 impeller-volute combinations, the industry's largest array of efficient hydraulic solutions.

These time-tested pumps incorporate pre-engineered and packaged combinations of design features, as well as application-driven options which are superior to competitors' offerings. This leads to increased value in terms of lower maintenance requirements and higher efficiency.

Typical Industries Served
- Building trades
- Building services
- OEM
- Food and beverage
- Mining
- Steel
- Utility
- Pharmaceutical
- Water distribution
- Wastewater
- Agriculture
- Pulp and paper
- Rubber
- Petroleum

Complementary Pump Designs
Depending upon application requirements, Flowserve can also provide these pump designs:
- Vertical double-suction
- Vertical turbine
- High flow, axially split, double-suction
- End suction centrifugal
The LR, LRV and LLR family of pumps provides a broad range of hydraulic coverage and low total cost of ownership. With thousands of units installed over the years, these pumps provide reliable and efficient performance in applications ranging from water supply to circulation duties to petroleum distribution.

Designed for easy maintenance and maximum parts interchangeability, the superior engineering and construction of these pumps result in reduced downtime and minimized parts inventory for users.
- Rugged, heavy-duty construction
- Superior design features
- Low initial investment
- High efficiency

**LR (29 Sizes)**
- Operating Parameters
  - Standard flows to 2000 m³/h (8800 US gpm)
  - Heads to 170 m (560 ft)
  - Pressures to 21 bar (300 psi)
  - Temperatures from -30°C (-20°F) to 150°C (300°F)
Pump Division

LRV (20 Sizes)

Operating Parameters
• Flows to 2000 m³/h (8800 US gpm)
• Heads to 137 m (450 ft)
• Pressures to 21 bar (300 psi)
• Temperatures from -30°C (-20°F) to 150°C (300°F)

Ease of Maintenance Features
• Replaceable seal chamber bushings maintain proper packing and lantern ring location.
• Shaft sleeve nuts lock impeller and shaft sleeve in position.
• Short distance between bearings reduces shaft deflection and resultant wear to components.
• Removable bearing brackets allow bearing maintenance without disturbing upper casing.
• Rectangular cross-section gland packing permits quick and easy replacement.
• Optional component and cartridge mechanical seals provide leak-free operation.
• A range of corrosion-resistant materials reduces maintenance costs.

Standard Case Wear Rings
allow economical renewal of operating clearances. Special serrated groove designs are available.

LRV Vertical Shaft Design
• Small footprint reduces floor space requirement.
• Parts are interchangeable with LR design.
• Maintenance-free, product-lubricated bottom bearing eliminates the need for mechanical seal and ball bearing.

LRV (20 Sizes)
Operating Parameters
• Flows to 2000 m³/h (8800 US gpm)
• Heads to 137 m (450 ft)
• Pressures to 21 bar (300 psi)
• Temperatures from -30°C (-20°F) to 150°C (300°F)

LRV Two-Stage Design for High Head Applications
• Back-to-back mounted, single-suction impellers reduce axial thrust, prolonging bearing life.

LR (Six Sizes)
Operating Parameters
• Flows to 295 m³/h (1300 US gpm)
• Heads to 290 m (950 ft)
• Pressures to 31 bar (450 psi)
• Temperatures from -30°C (-20°F) to 150°C (300°F)

Ease of Maintenance Features
• Replaceable seal chamber bushings maintain proper packing and lantern ring location.
• Shaft sleeve nuts lock impeller and shaft sleeve in position.
• Short distance between bearings reduces shaft deflection and resultant wear to components.
• Removable bearing brackets allow bearing maintenance without disturbing upper casing.
• Rectangular cross-section gland packing permits quick and easy replacement.
• Optional component and cartridge mechanical seals provide leak-free operation.
• A range of corrosion-resistant materials reduces maintenance costs.

Heat-treated Steel Shaft limits deflection to 0.05 mm (0.002 in), prolonging seal life.

Shaft Sleeves are secured by external nuts and include O-rings to ensure reliable internal sealing.

Mounting Feet transmit pipe strain loads to the base and foundation, extending bearing life.

Dowel Bushing maintains concentricity between the bearing bracket and the casing.

Split Case Design with lifting lugs simplifies maintenance by allowing access to the rotating element without disturbing the piping or driver.

Low NPSH Enclosed Impellers provide high efficiency and optimum performance over a wide flow range. Most LR and LRV models feature double-suction impellers. The LLR incorporates back-to-back, single-suction impellers.

Radial and Thrust Bearings are available with oil or grease lubrication. Designs include single row, deep groove ball bearings or duplex thrust ball bearings. Typical L10 bearing life is 100,000 hours.

Standard Case Wear Rings
allow economical renewal of operating clearances. Special serrated groove designs are available.

LRV Vertical Shaft Design
• Small footprint reduces floor space requirement.
• Parts are interchangeable with LR design.
• Maintenance-free, product-lubricated bottom bearing eliminates the need for mechanical seal and ball bearing.

LRV (20 Sizes)
Operating Parameters
• Flows to 2000 m³/h (8800 US gpm)
• Heads to 137 m (450 ft)
• Pressures to 21 bar (300 psi)
• Temperatures from -30°C (-20°F) to 150°C (300°F)

Ease of Maintenance Features
• Replaceable seal chamber bushings maintain proper packing and lantern ring location.
• Shaft sleeve nuts lock impeller and shaft sleeve in position.
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Mounting Feet transmit pipe strain loads to the base and foundation, extending bearing life.

Dowel Bushing maintains concentricity between the bearing bracket and the casing.
Shaft Sealing
The seal chamber design readily accommodates component or
cartridge type mechanical seals
and graphite impregnated non-
asbestos packing with a lantern
ring. The user can choose or
convert to the sealing option
most appropriate to the service.

Optional Casing Materials
Erosion- and corrosion-resistant
materials are available to suit
service conditions.
- Cast iron
- Ductile iron
- Ductile Ni-Resist D2
- Bronze
- Nickel aluminum bronze
- Carbon steel
- 316 stainless steel
- Duplex stainless steel

Flange Designs
Suction and discharge flanges
are available in flat or raised face
and to the following standards:
- ASME (ANSI)
- DIN
- ISO

Baseplate Options
- Channel steel
- Folded steel
- Folded steel with drip rim
- Raised rim with grout holes

Optional Impeller
Wear Rings
Impeller wear rings are
available as an option or
may be retrofitted by
re-machining the impeller.

High Performance
Coatings
Performance-enhancing
coatings may be applied
to internal casing surfaces
to maximize pump
efficiency. Corrosion- and
erosion-resistant coatings
also are available.

Extended Motor Mount
LRV vertical pumps are
available with intermediate
shafting that enables the
motor to be mounted at
a high level, avoiding
potential flooding.
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. Dedicated to delivering the highest quality support, Engineered Services integrates its extensive pump and materials engineering knowledge with creative service solutions. Engineered Services fully understands 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, evaluate and troubleshoot problems and 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.

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 user needs involve on-site technical assistance or broader project planning with full turnkey responsibility, Flowserve Engineered Services will deliver professional, reliable results.