

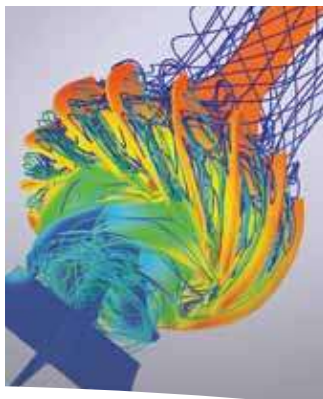


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Type R Rubber-Lined Slurry Pump



Experience In Motion



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.

Life Cycle Cost Solutions

Flowserve provides pumping solutions that permit customers to reduce total life cycle costs and 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 initial inquiry.

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 bearings single-stage
- Between bearings multistage
- Vertical
- Submersible motor
- Positive displacement
- Nuclear
- Specialty

Product Brands of Distinction

ACEC™ Centrifugal Pumps

Aldrich™ Pumps

Byron Jackson® Pumps

Calder™ Energy Recovery Devices

Cameron™ Pumps

Durco® Process Pumps

Flowserve® Pumps

IDP® Pumps

Lawrence Pumps®

Niigata Worthington™ Pumps

Pacific® Pumps

Pleuger® Pumps

Scienco™ Pumps

Sier-Bath® Rotary Pumps

TKL™ Pumps

United Centrifugal® Pumps

Western Land Roller™ Irrigation Pumps

Wilson-Snyder® Pumps

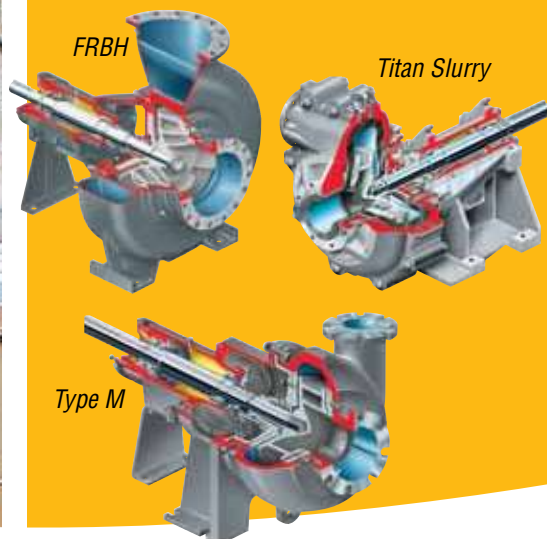
Worthington® Pumps

Worthington Simpson™ Pumps

Type R Rubber-Lined Slurry Pump



Complementary Pumps



Engineered to Handle the Toughest Duties

The type R rubber-lined slurry pump reflects a century-old commitment to combating the harshest applications in mining, pulp and paper, and pollution abatement. The pump's hydraulic design, materials of construction, and configuration versatility provide the necessary durability and site-specific fit required to handle the toughest duties.

With its corrosion- and abrasion-resistant elastomeric liners, the R pump complements the Flowserve type M hard metal slurry pump. Together, they form an extended product range that comprises 34 liquid ends and includes both horizontal and vertical designs. This versatility allows pumps to be well configured to site requirements and sized near peak efficiency.

Significant Benefits

- Versatility
 - Multiple configurations
 - Choice of materials
 - Parts interchangeability
 - Several shaft sealing options
- Reliability
 - Extra thick wear allowances
 - Oversized shaft and bearings
 - Stuffing box protector plate
- Ease of maintenance
 - Open stuffing box access
 - Cartridge style bearing frame
- Reduced operating costs via optimal hydraulic selection

Typical Applications

- Mineral processing
 - Acidic slurries
 - Fine tailings
 - Leaching
 - Electrolysis
- Pulp and paper
 - Lime and mud
 - CaCO_3 and TiO_2
- Air pollution
 - Gypsum slurries
 - Absorber pumps
- Water pollution
 - Mill effluent

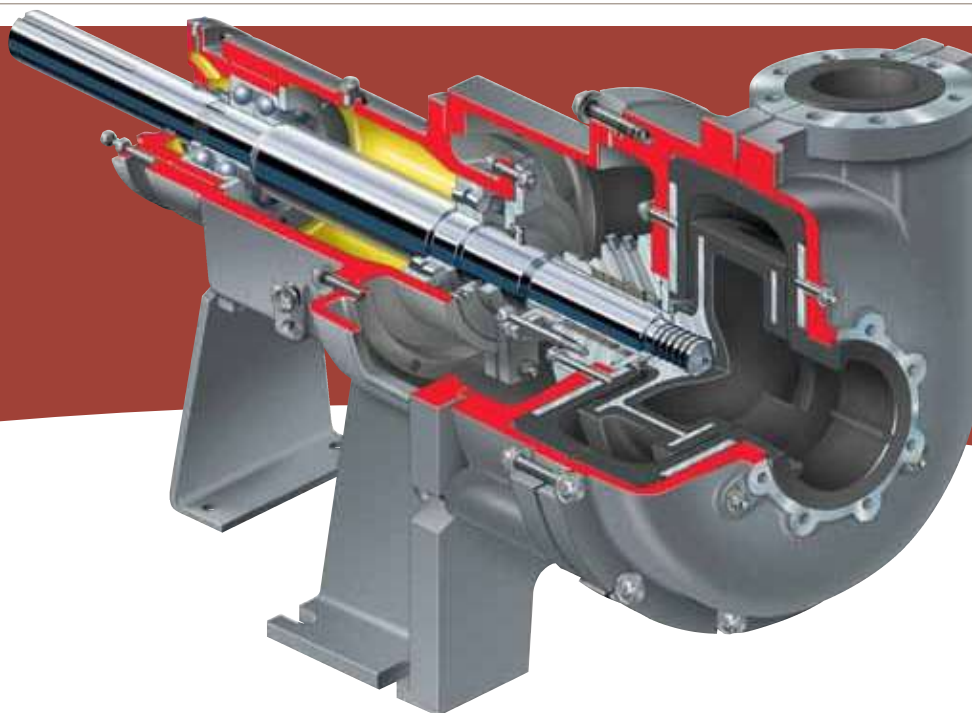


Complementary Pumps Designs

Flowserve can also provide the following pumps:

- Type M hard metal, abrasive slurry pump
- MJ and MJC vertical slurry pumps
- Titan™ Slurry heavy-duty, dual case, lined slurry pump
- Terra-Titan lined sump pump
- LC chemical slurry pump
- FRBH heavy-duty paper stock and process pump

Type R Rubber-Lined Slurry Pump



The type R rubber-lined slurry pump is a horizontal, single-stage, end suction design, with a tangential discharge nozzle. Engineered to handle high concentrations of fine abrasive solids in suspension or corrosive and abrasive mixtures, the R pump is a workhorse in solids handling industries.

Operating Parameters

- Flows to 10 000 m³/h (44 000 gpm)
- Heads to 50 m (160 ft)
- Pressures to 10 bar (150 psi) standard; 24 bar (350 psi) on high-pressure models
- Temperatures
 - Natural Rubber and Urethane: 65°C (150°F)
 - Neoprene: 100°C (200°F)
 - Chlorobutyl, Nitrile and Hypalon®: 110°C (225°F)
 - Viton®: 150°C (300°F)
- Solids from ppm to 70% by weight
- Specific gravities from 1.0 to 2.7
- Particle diameter to 3 mm (1/8 in), rounded corners

Features and Benefits

Casing Liners are pressure molded on steel backing plates and anchored with studs and nuts. Multiple materials for abrasion, corrosion and high temperature resistance are available. Squared corners minimize the chance of liner collapse under high vacuum.

Radially Split Casing provides easy access to liners.

The standard cast iron materials may be upgraded to high tensile strength steel for increased working pressures and temperatures. Raised bosses, or spacers on larger pumps, apply the proper compression on the liners.

Flanges are compatible with ASME (ANSI) Class 150 Flat Faced. Liners extend to form a gasket seal.

Anti Pre-rotation Vanes reduce suction pipe swirl and extend impeller life.

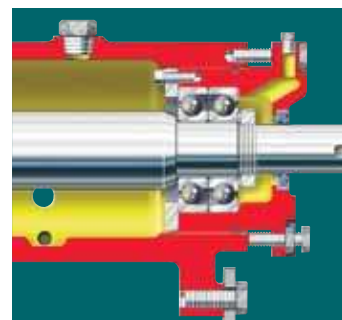
Enclosed Impeller is pressure-molded to ductile iron skeleton that can be dynamically balanced. Pumpout vanes on the front and rear shrouds reduce stuffing box pressure and suction recirculation while sweeping away solids.

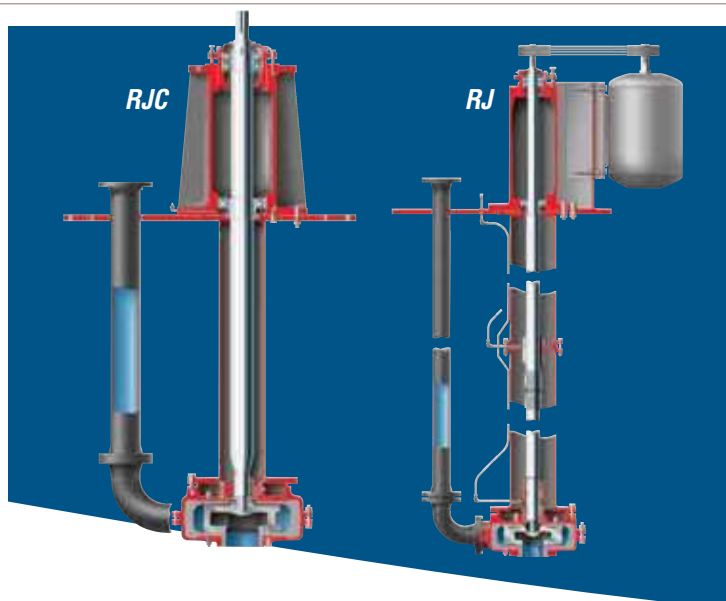
Heavy-duty Bearing Frame is generously sized to handle belt loads and can be easily removed in one piece for maintenance.

Three-point External End-clearance Adjustment restores impeller front clearance to optimize efficiency, without using shims.

Hook Sleeve and replaceable metallic impeller spacer have gasket seals to isolate shaft and impeller threads from slurry. This design extends component life and eases impeller removal.

Ample Stuffing Box Access via large side or top openings, depending on pump size, facilitates maintenance.





Vertical Rubber-Lined Configurations

To suit site requirements, the R pump is available in two vertical configurations: the RJ water lubricated lineshaft and RJC cantilever designs. Using the horizontal liquid end, the RJ and RJC are suitable for a broad range of wet-pit applications and may be directly coupled or V-belt driven.

RJC Cantilever Design

A true stiff-shaft cantilever design without bottom bearings, the RJC pump is particularly well suited for applications where flushing liquids are not available or cannot be tolerated.

RJ Lineshaft Design

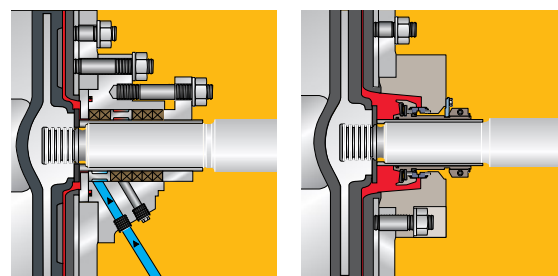
A vertical pump with bottom bearings, the line bearings and any spider bearings are submerged in the sump. Thrust bearings are mounted above the sump. The lower bearing housing is fitted with a rubber or graphite fluted bearing, which is contained in a rigid stainless steel shell and lubricated from an external clear liquid source.

RJC and RJ Operating Parameters

- Flows to 1350 m³/h (6000 gpm)
- Heads to 30 m (100 ft)

Interchangeability Among Designs

Interchangeability among the R pump's various configurations translates into reduced inventory requirements and reduced operating costs. This benefit also extends to the Flowserve type M pump, a hard metal slurry pump which shares many components with the R pump. Facilitating changes in service or operating conditions, the liquid end of these pumps can be converted to or from the rubber-lined design.



Shaft Sealing Options

The R pump is available with several shaft sealing options, including the following:

Flushed Packing (above left)

- Cylindrical bore, cast iron stuffing box standard
- Acid-resistant stuffing box kits available for services with pH less than 4.5. These include: 316 stainless steel, duplex stainless steel and Hastelloy® C276.
- Replaceable protector plate prevents wear on stuffing box and restricts solids from entering.
- High-flow flush option — Lantern ring followed by five rings of packing (L5)
- Standard flush option — Two rings of packing, the lantern ring and three more rings of packing (2L3)

Optional SLC Series Slurry Seal (above right)

- Heavy-duty, single cartridge seals built for the harshest slurry services found in mining, mineral and ore processing, and flue gas desulfurization.
- Unique non-clogging cone spring increases reliability and enables flushless operation for low operating costs.
- Tapered bore housing provides optimum circulation.

Options and
Technical Data



Standard Materials of Construction

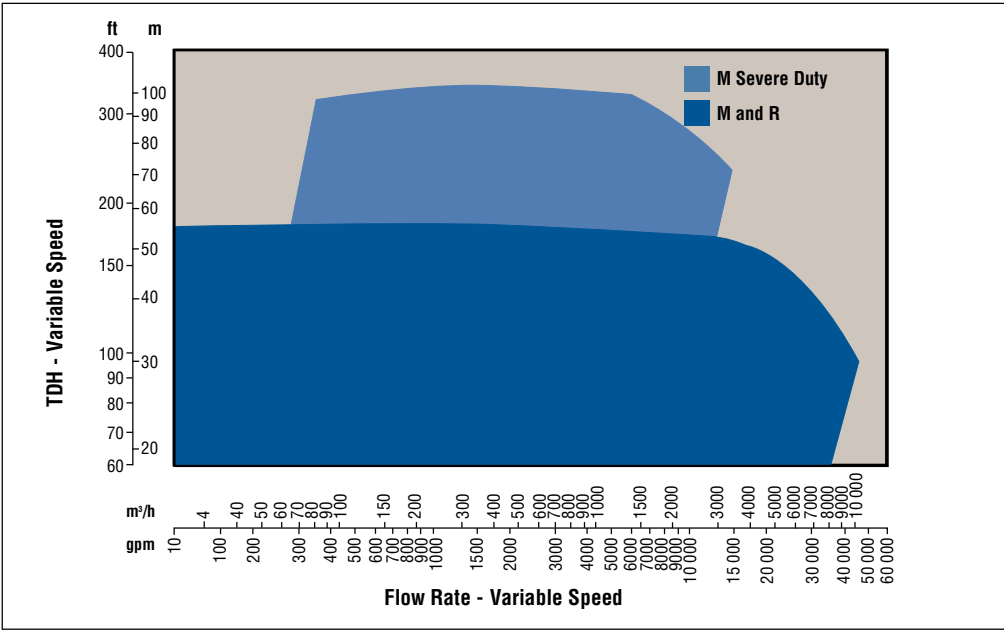
Component	Material
Casing Liners Impeller	Natural Rubber, Urethane, Neoprene, Chlorobutyl, Nitrile, Hypalon or Viton
Casing Halves Stuffing Box* Adapter Support Bearing Cartridge Thrust Bearing Cartridge Line Bearing Cover	Cast Iron
Shaft Sleeve*	Hard Faced 317L
Packing	Non-Asbestos Fiber
Shaft*	Steel
Gland (including studs and nuts) Seal Cage	Stainless Steel
Protector Plate*	Hard Steel

*Corrosion-resistant metallic alloys are available.

Multiple Drive Arrangements

- Direct coupled
 - Direct-drive, base-mounted
- Belt driven
 - Side-drive, base-mounted
 - Direct overhead motor mount
 - Reverse overhead motor mount
 - Side-drive, base-mounted with secondary bearings
 - Reverse overhead motor mount with secondary bearings

Type R Range Chart



**Global Service
and Technical
Support**



Life Cycle Cost Solutions

Typically, 90% of the total life cycle cost (LCC) of a pumping system is accumulated after the equipment is purchased and installed. Flowserve has developed a comprehensive suite of solutions aimed at providing customers with unprecedented value and cost savings throughout the life span of the pumping system. These solutions account for every facet of life cycle cost, including:

Capital Expenses

- Initial purchase
- Installation

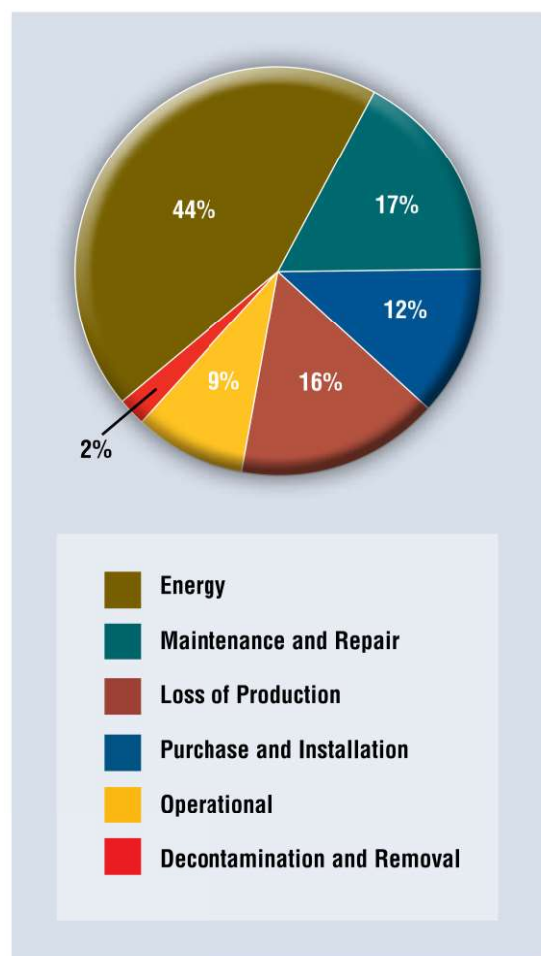
Operating Expenses

- Energy consumption
- Maintenance
- Production losses
- Environmental
- Inventory
- Operating
- Removal

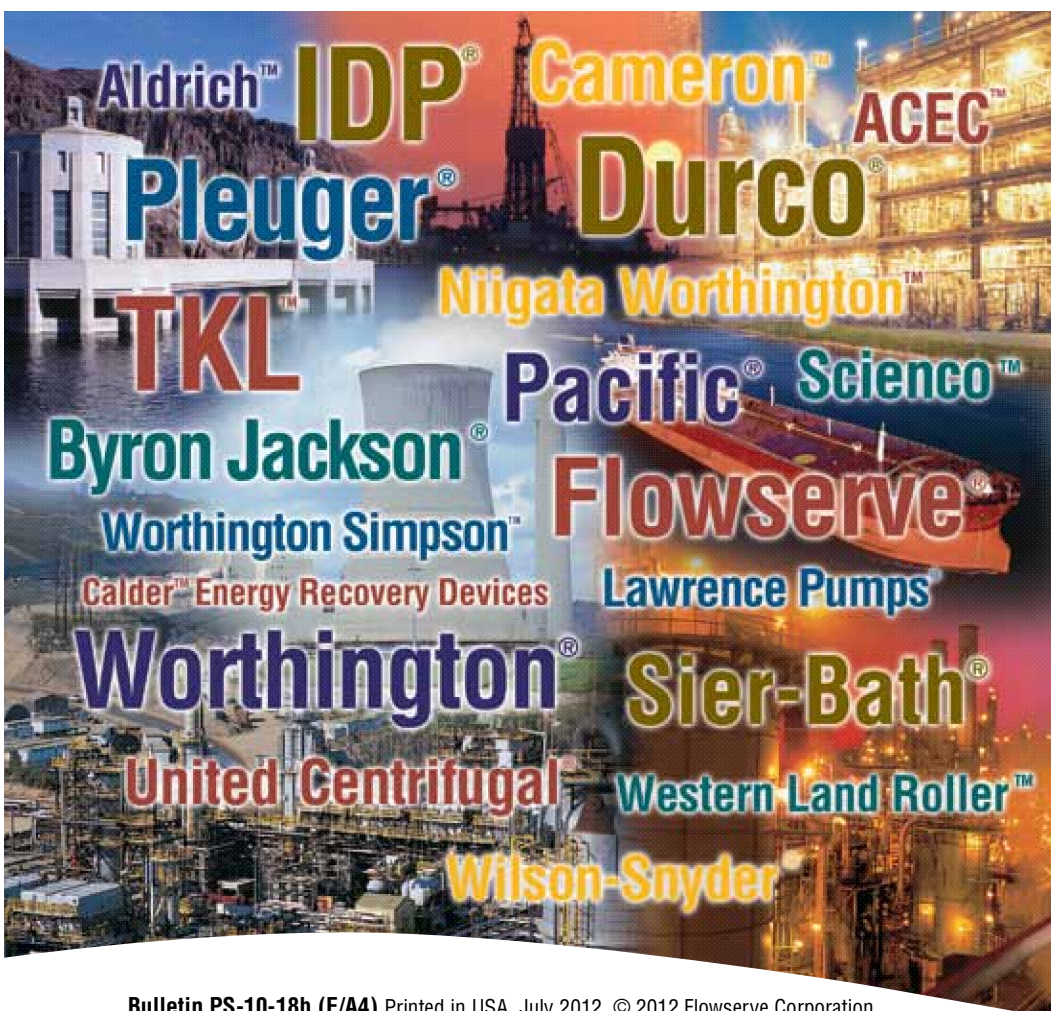
Innovative Life Cycle Cost Solutions

- New Pump Selection
- Turnkey Engineering and Field Service
- Energy Management
- Pump Availability
- Proactive Maintenance
- Inventory Management

Typical Pump Life Cycle Costs¹



¹ While exact values may differ, these percentages are consistent with those published by leading pump manufacturers and end users, as well as industry associations and government agencies worldwide.



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