Slurry pump program

metso
Expect results

Engineered for **today's operation**


506270-M1

Metso slurry pump ranges – Engineered for today's operation

At Metso, we provide our customers with world leading products and services built on technological excellence, experience and the highest safety standards. Our objective is to always provide a competitive edge that makes the big difference to our customer.

Metso has taken decisive action towards better serving the mining industry with a state-of-the-art slurry pump offering, which includes a full range of both horizontal and vertical slurry pumps. Metso's portfolio includes pumps from well-known manufactures Sala, Denver, Orion, Thomas, Marathon and Titan.

The Metso series of mill discharge pumps

The Metso MD series of MDM and MDR slurry pumps

The Metso "MD" Mill Discharge pump is designed for efficient operation and long wear life in grinding mill circuits where high density slurries are often encountered. The rugged wet-end parts are designed to feature heavy metal and rubber sections at points of extreme wear – the extra materials pays off in performance and low maintenance cost. The Metso global power frame features an oversized shaft and bearing assembly incorporated into a heavy duty base. Offering global commonality with the Metso Pump Technologies product line.

Large diameter, high efficiency, high chrome iron impeller designs deliver predictable performance over the life of the parts and ensures operations in the best efficiency range.

- Flow rates from 200 to 12 000 m^3/hr *– 880 to 52 800 USGPM*
- Heads up to 70 m - *230 ft*

Typical applications

- SAG/Ball mill discharge pumps
- Thickener under/overflow pumps
- Tailings pumps

The Thomas series of horizontal pumps

The Thomas series of heavy duty dredge pumps

The Thomas dredge pump is designed specifically for dredging large and abrasive materials. Its design features allow maximum particle size passage while maintaining high efficiency. The standard pumps can be configured for deck/hull mounting, or ladder/underwater mounting, and in either right hand or left hand rotation.

Years of experience have brought about design improvements that have resulted in a pump with the lowest cost of ownership in the industry when dredging abrasive material. The improvements include the Armor-lok seal, oversized bearing/shafts, Impeller release mechanism (knock out ring) and cantilever design which contribute to reduced downtime and low maintenance cost.

- Flow rates from 500 to 10 000 m^3/hr *– 2 200 to 44 000 USGPM*
- Heads to 75 m - *250 ft*

Typical applications

- Dredging:
  - Sand and gravel
  - Contract dredging
  - Tailings
- Booster pump
- Sand waste pump
- Material transfer pump

The Orion series of horizontal slurry pumps

The Orion series of heavy duty slurry pumps HR, HM and HH

The Orion series heavy duty, H-range slurry pumps are designed for the most arduous industrial slurry pumping applications. Available in hard metal HM, rubber lined HR or high head HH versions, the excellent hydraulic design guarantees maximum efficiency throughout the life of the wear parts. The wear materials used are the very best available providing both outstanding wear properties and corrosion resistance for a wide variety of applications. For high wearing applications the double adjust design permits total impeller wear clearance adjustment for continuous performance whilst the single adjust design is a cost-effective solution for general slurry handling. The front and back pull-out feature provides easy access for inspection and maintenance of the wet end wear components. Offering global commonality with the Metso Pump Technologies product line.

- Flow rates to 2 800 m^3/h *– 10 000 USGPM*
- Heads up to 100 m *– 330 ft*

Maintenance slide base available as an option.

The Orion series of mining duty slurry pumps MR and MM

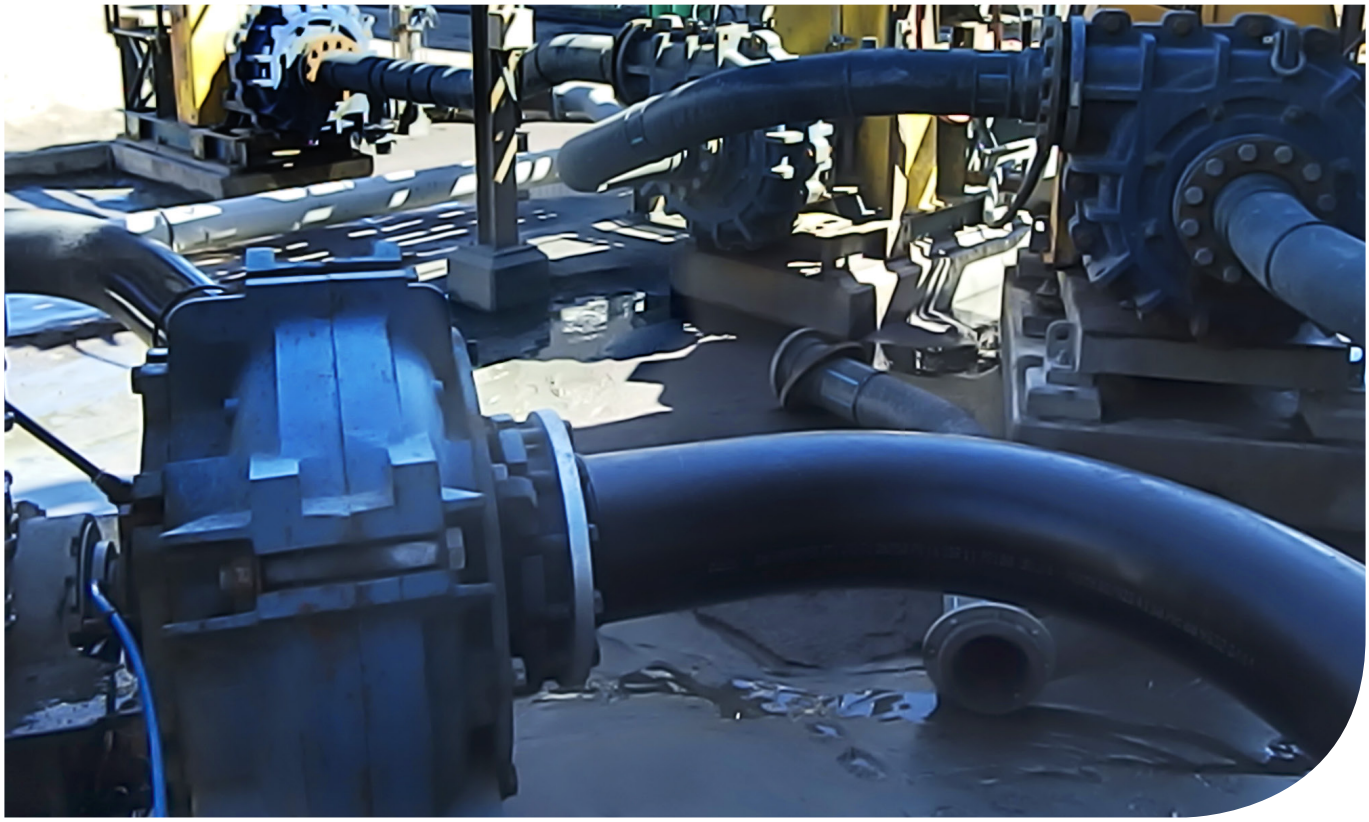
The Orion series mining duty, M-range slurry pumps are designed for abrasive duties and medium heads associated with general plant transfer applications. Available in hard metal MM or rubber lined MR, the excellent hydraulic design guarantees maximum efficiency throughout the life of the wear parts. The wear materials used are the very best available providing both outstanding wear properties and corrosion resistance for a wide variety of applications. For high wearing applications the double adjust design permits total impeller wear clearance adjustment for continuous performance whilst the single adjust design is a cost-effective solution for general slurry handling. The front and back pull-out feature provides easy access for inspection and maintenance of the wet end wear components. Offering global commonality with the Metso Pump Technologies product line.

- Flow rates to 5 000 m^3/h *– 20 000 USGPM*
- Heads up to 60 m *– 200 ft*

Maintenance slide base available as an option.

Typical applications

- Mining and mineral processing
- Extra heavy duty highly abrasive slurries
- SAG and AG mill discharge recirculation duties
- Cyclone feed
- Mine refuse and tailings
- Industrial processing
- Mill discharge
- Coal and power plant ash
- Sand and gravel
- Medium duty abrasive slurries
- In plant slurry transfer pumps



For the most aggressive industrial slurry pumping applications

Orion series of heavy duty gravel pumps HG

The Orion series heavy duty, HG gravel pumps are specifically designed to pass large solids typically found in the sand and gravel industry. The pump is able to pass an increased particle size due to a combination of a larger inlet diameter and impeller design. Offering global commonality with the Metso Pump Technologies product line. These pumps can be applied to any application that may encounter very large solids.

Typical applications

- Sand and Gravel
- Coal processing
- Wood chips

Orion series of high pressure pumps HP

The Orion series heavy duty, HP high pressure pumps are designed to operate at 40 bar (600psi). The casing incorporates extra thick ribbed sections to withstand the extreme pressures. Pumps are supplied as standard with double dry end bearings, high-pressure flanges and assembled on the double adjust frame to maintain high pump hydraulic efficiencies.

The HP casing can also be incorporated into applications that require longer wear life casings. Offering global commonality with the Metso Pump Technologies product line.

Typical applications

- Tailing lines
- Series pumping

Orion series of heavy duty tunneling pumps HT

The Orion series heavy duty, HT tunnel pumps are typically used in conjunction with large boring equipment. Designed to transfer freshly cut material from the face of the tunnel, the pump is specifically designed with a special casing incorporating a cast 90° elbow and a unique frame for a low-profile small footprint to fit into confined spaces. Combined with a direct coupled motor they can also be used in series to transfer material to the entrance of long tunnels. Offering global commonality with the Metso Pump Technologies product line.

Typical applications

- With large boring machines
- Material transfer in confined spaces

The Sala series of vertical pumps – Strong, tough and reliable

- Flow rates to 1 500 m^3/h *– 6 600 USGPM*
- Heads up to 45 m *– 150 ft*

Typical applications

- Floor sumps in process plants
- Mill scale pumping
- Pumping of machine tool cuttings
- Wood chips pumping

Vertical sump pumps VS

The Sala series vertical sump pumps are strong, tough and the most reliable pumps on the market. For this reason, this range is preferred throughout the world by most mining, aggregate and industrial industries.

The VS pumps is used in floor cleaning and process applications. With an extensive range of interchangeable impellers and casings in abrasion resistant rubber or hard metal, agitation of the slurry in the sump can be encouraged by a casing with spray holes or an extended shaft with a separate slurry agitator. The robust cantilever design without any submerged bearings or shaft seals, has already made this range well known and established in the slurry pump market. Offering global commonality with the Metso Pump Technologies product line.

Vertical sump pumps VSH and VSM

Metso has expanded its VS pump range with the introduction of the VSH and VSM models: a perfect marriage of the rugged Sala VS frame with our heavy-duty high efficiency Orion series horizontal pump hydraulics.

The VSH and VSM provide larger diameter impellers designed for slower speeds (lower wear rates) and higher head capability. The commonality of wet end parts for the horizontal and vertical slurry pumps allows for simplified maintenance with reduced spare parts inventory.

A special fully recessed Vortex impeller design is also available on several pump sizes for low slurry shear applications like gold carbon transfer.

Vertical tank pumps VT

The Sala series vertical tank pumps are designed for abrasive slurry service and feature simple maintenance and robust construction. The design of the pump has no shaft seal, which makes it extremely service friendly and easy to install.

Standard pumps are supplied with wet end parts in wear resistant rubber or hard metal. Parts in different materials are fully interchangeable and can be combined for optimum life. Offering global commonality with the Metso Pump Technologies product line.

- Flow rates to 1 000 m^3/h *– 4 400 USGPM*
- Heads up to 30 m *– 100 ft*

Typical applications VT

- Feed to dewatering cyclones in sand plants
- Screen underflow duties
- Sampling pumps in concentrators
- Permanent, mobile or semi-mobile installations
- in industrial applications
- Mixing/distribution units in applications for flocculent or lime in sewage plants or cement grouting in tunnels or mines

Vertical froth pumps VF

The Sala series vertical froth pump has been designed to increase the pumping ability of frothy slurries. The principle of operation is similar to that of hydrocyclone separation. Air is separated from the slurry in a vortex created by the impeller rotation and the tangential inlet to the pump's conical tank. This results in a more efficient pumping and a smooth operation, free from pulsation caused by air blocking.

Standard wear materials are in natural rubber or hard metal. Other wear materials include synthetic rubbers and polyurethane. Offering global commonality with the Metso Pump Technologies product line.

- Flow rates to 600 m^3/h *– 2 600 USGPM*
- Heads up to 20 m *– 65 ft*

Typical applications VF

- Ideal for all applications involving handling of air entrained slurries, such as flotation froth in base metal concentrators, phosphate and apatite washing plants and calcium carbonate upgrading plants
- Used as a mixing and distribution unit, where dry powder has to be mixed (and wetted) with water
- Can also be used with cement in ready mixed concrete and for grouting

Wet end conversions – Reduce your maintenance costs

Orion wet ends

Metso offers the Orion series pump hydraulics and shaft sealing options onto competitor's pump frames and bearing assemblies. These conversions can help overcomes traditional slurry pump problems such as low hydraulic efficiency, premature component failure, inconsistent performance, ineffective centrifugal seals and difficult maintenance.

The wet ends are the same as those used in the standard Orion series of pumps. They are 100% interchangeable with other Metso pumps that may be operating in the same installation. The double adjustment feature permits optimum impeller adjustment on both gland and suction sides of the casing, with clearances that result in vastly improved performance and longer pump life.

Thomas wet ends

The Thomas series hydraulics and shaft sealing options are available for conversion onto larger pumps. These conversions are typically installed into dredge and grinding mill discharge applications where wear rates are high and longer life is required. Metso has many standard hydraulic wet end designs that can move the duty point closer to the best efficiency line of the pump curve which will improve component wear life.

Features

- Prolongs pump life significantly
- Reduces maintenance costs
- Simple two step impeller adjustment for total wear clearance without dismantling
- Maintains optimum operating efficiency

Metso slurry pumps

Pump size – inlet flange

Inlet size (mm) (inch)	50 2	75 3	100 4	150 6	200 8	250 10	300 12	350 14	400 16	450 18	500 20	550 22	600 24	650 26	700 28	800 32
Metso MD series																
MDM						■	■	■	■	■	■	■		■	■	
MDR						■	■	■	■	■	■	■				
Orion series																
MM			■	■	■	■	■	■	■							
MM - WFR			■	■	■		■	■								
MR							■	■								
HM	■	■	■	■	■	■	■									
HM - WFR	■	■	■	■		■										
HR	■	■	■	■	■	■										
HH					■											
HG			■	■		■										
HG - WFR			■	■												
HP			■	■	■	■										
HT				■	■											
Thomas series																
MM											■					
MR											■					
XM								■	■		■		■		■	
XR							■	■	■							
Thomas Dredge				■	■	■	■	■	■	■	■		■			■
Marathon Dredge							■	■	■	■						
MA - Matrix											■					
Sala series																
VSMM			■	■	■	■	■	■	■							
VSMM - WFR			■	■	■		■	■								
VSHM	■	■	■	■	■	■										
VSHM - WFR	■	■	■	■		■										
VSHR	■	■	■	■	■	■										
VSHG			■	■		■										
VSHG - WFR			■	■												

Pump size – outlet flange

Outlet size (mm) (inch)	25 1	40 1,5	50 2	80 8	100 4	150 6	200 8	250 10	300 12	350 14
Sala series										
VS	■		■	■	■	■	■	■		
VT		■	■	■	■	■	■	■		
VF			■	■	■	■	■	■		■
VASA HD					■	■	■			

Metso slurry hose system for heavy-duty use

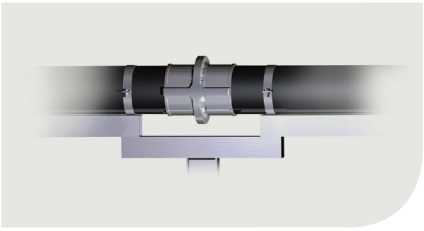
Metso slurry hose systems are based on easily exchangeable standard components: hoses, couplings and gaskets of varying diameters. The Metso Trellex® Hose system is the natural choice for handling materials in heavy-duty hydraulic or bulk transport system.

The system is designed on the basis of first-hand experience of transporting highly abrasive iron, copper and other metallic or nonmetallic ores in mineral processing plants.

Rubber offers superior wear resistance when handling abrasive rocks and sands, as well as slag and other materials.

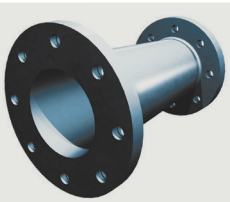
The Trellex hose system is used in sand, lime, and glass plants, in quarries, in coal preparation and power plants, as well as in steel and cement works.

Material handling hose



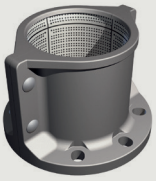
3xD bends

Reducers



Branch pipes

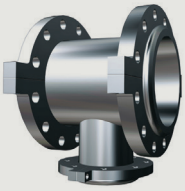
Couplings



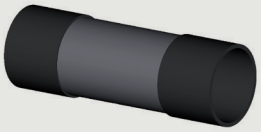
Gaskets

Sliding clamp

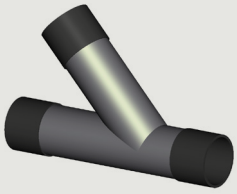
Branch T



Rubber lined steel pipe

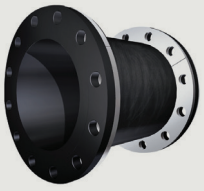


Branch K



Clamp

Compensator



Rubber absorbs energy

Rubber is an elastomer. While steel and ceramics present a rigid surface to the particles, rubber has the advantage of resilience. The kinetic energy of the slurry generates deformations and cracks on a rigid pipe.

In contrast, the Trellex hose absorbs the load by yielding, and then returning to its original form. Vibrations from a pump are dampened.

Appropriate conditions

The angle at which particles strike a surface is decisive for the process of wear. Both laboratory tests and practical experience show that rubber is more resistant than other materials when the impacting angle is less than 5°, or greater than 50°.

In slurry lines, the angle of incidence is close to 0°. Process water does not corrode rubber, but instead acts as a lubricant, further decreasing erosion. Trellex Hose are ideally suited for hydraulic transport of abrasive rocks and sands as well as for use in loops in tailing lines to compensate for thermal expansion and contraction of steel pipes.

Slurry Pump Program

Slurry Pipe System

The Metso slurry pipe system is based on swivel flange hoses, swivel flange rubber bends and rubber-lined steel pipes. The intended area of use is in conjunction with pumping abrasive materials for short and long distances, or at high pressure. It is especially well-suited for mill discharge pumps and in tailing applications. Hoses and bends are also available with ceramic lining for extra demanding applications.

The slurry pipe system is based on standard steel pipe dimensions and has an added wear resistant rubber lining. The rubber hoses and rubber bends are equipped with thick long-life wear rubber with a smooth surface and low flow resistance. Each end has a swivel flange designed for high dynamic loads and easy assembly.

The slurry pipe system has been developed for mill discharge pumps, high pressure pumps and tailing applications, and it is suitable for other demanding slurry applications as well as gravity pipes.

The system is dimensional and fully interchangeable with ordinary steel pipe lines. Swivel flange 5D bends can replace 5D steel bends where an extra-long lifetime is needed, and it releases tension in the pipe system.

The ceramic version of the slurry pipe system uses wear rubber with built-in hot-vulcanized ceramic, which is then combined with cord layers. It offers excellent wear resistance in applications with sliding wear and high material speeds with sharp particles.

Typical applications

- Mill discharge pump
- High pressure pumps
- Tailing
- Gravity flow

Knife gate and dart valves are ideal for shut off applications that involve abrasive slurries.

Knife gate valves

The SH-KG valve is a full bore valve suitable for the most abrasive and demanding slurries with total operational reliability. It is well suited for applications such as mineral processing concentrators, sand and gravel plants and tailing lines. This bi-directional valve ensures for 100% tightness.

The valve has an epoxy coated fully lugged body with integrated purge ports. Seats are flexible in an axial way. The solid top provides excellent stability during operation. For security reasons the valve is always supplied ready to be locked in either open or closed position. The seats also form a sealing face on the valve flange, eliminating the need for gaskets.

Typical applications

- For separation of sump tank when you have standby pumps.

Typical applications

- Mineral processing concentrators
- Sand and Gravel plants
- Tailing lines
- Abrasive slurries

Dart valves

The dart valve design prevents leakages and has an inside diameter matching the complete slurry hose system. They are often used for shut-off activities inside sump tanks with vertical outlets. The dart valves are equipped with natural rubber inner and outer linings.

The valve seats are made of rigid steel pipes. The valve seats plugs are both lined with wear-resistant rubber. Dart valves can be regulated with a pneumatic, hydraulic or electric actuator. Flange drilling can be carried out according to DIN 2501 PN10.

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