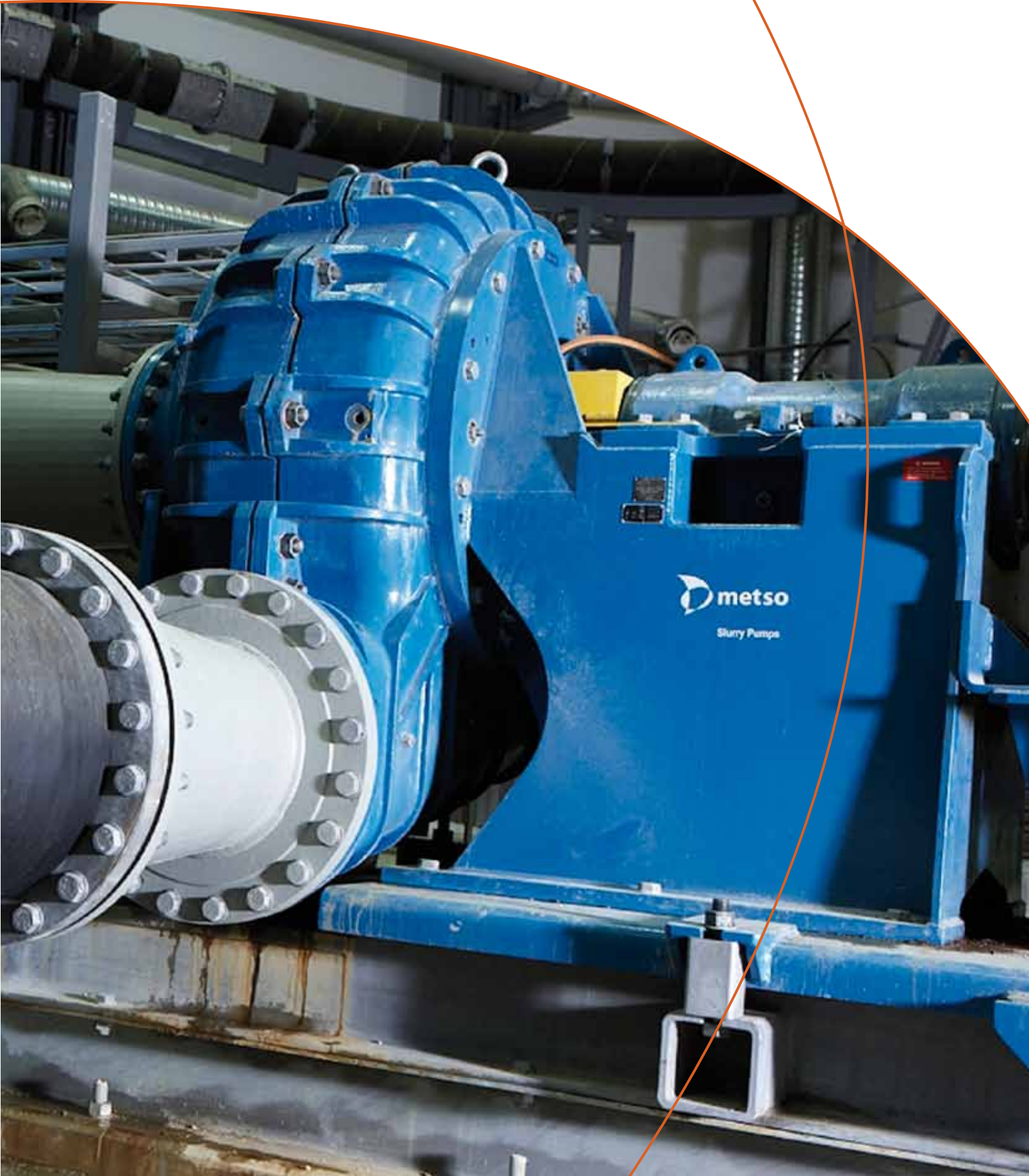


The slurry pump program



Metso slurry pump ranges

By acquiring Svedala Industri AB, Metso has added the well known pump manufacturers Sala, Denver, Orion, Thomas, Marathon, Titan and Amsco to their manufacturing range. Several years ago Metso decided to streamline and update its entire range of slurry pumps.

A step was taken to better serve the market with state-of-the-art slurry pumps and a totally new range of horizontal and vertical slurry pumps has since been launched.



– engineered for today's operation.



XM 600 with MM25 in the middle

The Thomas and Sala series of horizontal slurry pumps

XM and XR pumps with slide base

Foremost of the range is a group of extra heavy duty, large, slurry pumps known as the X range. These are available in an XM hard metal version and an XR rubber lined version. Maintenance slide base options are available for inlet sizes up to 400 mm (16").

The X range offers a large, heavy duty solids handling pump with excellent performance and low maintenance costs. The heavy duty design and robust construction combined with the highest quality of abrasion resistant wear materials is a guarantee for long life and trouble free operation in the toughest heavy duty applications, such as SAG & AG mill recirculation duties.

- Flow rates from 1 000 to 10 000 m³/h
– 4 400 to 44 000 USGPM
- Heads up to 75 m - 250 ft

VASA HD pumps with slide base

The traditional range of extra heavy duty pumps, VASA HD, are available in a smaller size range, but still at high efficiencies and specifically designed with maintenance slide bases which reduces maintenance time more than 50%! VASA HD pumps are available in both hard metal and rubber lined wear parts.

- Flow rates from 50 to 2 500 m³/h
– 220 to 11 000 USGPM
- Heads up to 50 m - 160 ft

Typical applications

- Mining and mineral processing
- Extra heavy duty highly abrasive slurries
- Cyclone feed
- Mine refuse and tailings
- Industrial processing
- Mill discharge
- Sand and gravel
- Medium duty abrasive slurries
- In plant slurry transfer pumps



– lowest operating cost in industry.

The Thomas series of heavy duty dredge pumps

The Thomas dredge pump is designed specifically for dredging of large materials. Its design features allow maximum particle size passage while maintaining high efficiency. The Pumps are available in both abrasion resistant and high impact materials for wear parts.

Years of operation and many design improvements have resulted in a pump with the lowest operating cost in the industry when dredging abrasive material. The improvements include the Armor-lok® Seal, oversized bearings/shaft and extra heavy metal sections for longer wear. The design and knock out ring features reduces time and maintenance costs.

- Flow rates from 500 to 10 000 m³/h
– **2 200 to 44 000 USGPM**
- Heads up to 75 m - **250 ft.**

Typical applications

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

The Metso MD series of mill discharge 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 extra heavy metal sections at points of extreme wear – the extra weight pays off in performance and low maintenance cost. The Metso Global power frame features an oversized shaft and bearing assembly and heavy fabricated frame and base offering global commonality with the Metso Pump Solutions product line.

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

Flow rates from 1000 to 10 000 m³/hr
– **4 400 to 44 000 USGPM**

Heads up to 70 meters – **230 ft.**

Typical applications

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



The Orion series of horizontal slurry pumps

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

The heavy duty, H-range slurry pumps are available in rubber lined HR, in hard metal HM and high head HH versions. They are designed for the most arduous industrial slurry pumping applications. The excellent hydraulic design guarantees maximum efficiency throughout the life of the generously proportioned wear parts.

The wear materials used are the very best available providing both outstanding wear properties and corrosion resistance for abrasive plant duty applications. The optional back pull-out feature provides easy access for inspection and maintenance of the wet end.

- Flow rates to 2 800 m³/h – 10 000 USGPM
- Heads up to 100 m – 330 ft

Maintenance slidebase available as an option.

The Orion series of mining duty slurry pumps MR and MM

Metso's mining duty slurry pumps is the M range. They are designed for medium abrasive solids, lower solids concentrations and medium heads. They are available in both hard metal MM and an elastomer version MR. The modular design and the optional back pull-out feature provides easy access for inspection and maintenance. The excellent hydraulic design ensures maximum efficiency, thereby reducing both the rate of wear and the power consumed.

The M range pumps are the preferred choice for abrasive duties such as general in-plant transfer pumps.

- Flow rates to 5 000 m³/h – 20 000 USGPM
- Heads up to 60 m – 200 ft

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

Gravel pumps are specifically designed to pass large solids typically found in the sand and gravel industry. The suction side of the pump is also opened up to accommodate large solid transfer. These pumps are built on the same heavy-duty frame as the HM pump. These pumps can be applied to any application that may encounter very large solids.

Typical applications:

- Sand and Gravel
- Coal processing
- Woodchips

Orion series of high pressure pumps HP

High-pressure hard metal pumps are designed to operate at 40 bar (600 psi) with test pressure at 1.5 times the design pressure. These pumps incorporate extra thick ribbed cases to withstand the extreme pressures. The pump comes standard with double dry end bearings, high-pressure flanges and Metso's patented double adjust frame to maintain high pump hydraulic efficiencies. The HP casing can also be incorporated into applications that require longer wear life casings.

Typical applications:

- Tailing lines
- Series pumping

Orion series of heavy duty tunneling pumps HT

Tunneling pumps are typically used in conjunction with large boring equipment. These pumps are specifically designed to transfer newly cut material from the face of the tunnel. They can also be used in series to transfer material to the entrance of long tunnels. The pump is specifically designed with a special casing and frame for a low-profile small footprint to fit into the confined spaces of a tunnel. A 90° elbow is cast into the casing to help achieve this small profile.



The Sala series of vertical pumps

Vertical sump pumps VS

The VS 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 heavy industries.

The VS pumps is used in floor cleaning and process applications. A number of different impeller and agitation options are available. Choose from closed, semi-open and induced flow impellers. Agitation can be accomplished with casing spray holes or extended shaft with a slurry agitator. The fully interchangeable wear parts are available in abrasion resistant rubber or hard metal. 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.

- Flow rates to 1 500m³/h – 6 600 USGPM
- Heads up to 45 m – 150 ft

Vertical sump pumps VSH and VSM

Metso has recently 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. Additionally, the customer now has the benefit of commonality of wet end parts for both its horizontal and vertical slurry pumps, reducing spare parts inventories while simplifying maintenance.

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

Typical applications

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



– strong, tough and reliable.

Vertical tank pumps VT

The VT Vertical Tank Pumps are designed for abrasive slurry service and feature simple maintenance and robust construction. The ingenious design of the pump with no shaft seal makes it exceptionally 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.

- Flow rates to 1 000 m³/h – **4 400 usgpm**
- Heads up to 30 m – **100 ft**

Vertical froth pumps VF

The VF Froth Pump has been designed to increase the pumpability 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.

- Flow rates to 600 m³/h – **2 600 USGPM**
- Heads up to 20 m – **65 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.

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 can offer the Orion series pump hydraulics and shaft sealing options onto competitor's pump frames and bearing assemblies. These conversions can help overcome 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. Duty point engineering is also available for the highest wear life potential improvement.

Features

- Prolongs pump life significantly
- Reduces maintenance costs
- Simple two step impeller adjustment for total wear clearance without dismantling
- Maintains optimum operating efficiency
- Sizes range from 50 x 32 to 350 x 300 mm for Orion and up to 700 x 600 mm for Thomas.

Metso slurry pumps

Pump size – inlet flange

Inlet size (mm) (Inch)	25 1	50 2	75 3	100 4	150 6	200 8	250 10	300 12	350 14	400 16	450 18	500 20	600 24	700 28	800 32
Orion series															
MM				•	•	•	•	•	•	•					
MM - WFR				•	•	•									
MR				•	•	•	•	•	•						
HM		•	•	•	•	•	•	•							
HM - WFR		•	•	•	•										
HR		•	•	•	•	•	•								
HH and HMP					•	•									
HG				•	•	•	•								
HG - WFR				•	•										
HP			•	•	•	•	•								
HT				•	•										
Thomas series															
MM												•	•		
MR												•			
XM									•	•		•	•	•	
XR								•	•	•					
XG							•		•						
MD								•	•	•	•	•	•	•	•
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 3	100 4	150 6	200 8	250 10	300 12	350 14					
Sala series															
VS	•		•	•	•	•	•	•							
VT		•	•	•	•	•	•	•							
VF			•	•	•	•	•	•		•					
VASA HD					•	•	•			•					



Trellex hose system for heavy-duty use.

The Trellex® Hose system is the natural choice for handling materials in heavy-duty hydraulic or pneumatic conveying systems.

The system is designed on the basis of firsthand 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.

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 e.g. 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 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.





Metso – a world leader in process design.

Metso is at the forefront in developing mining technology to meet modern requirements for high efficiency and low operating costs. We design and supply the following machines and systems:

Crushing and screening

- Primary gyratories
- Cone and jaw crushers
- Mobile crushers
- Screens

Grinding

- SAG/AG mills
- Ball mills
- Pebble mills
- Rod mills
- Stirred mills (Vertimills and SMD)

Pyroprocessing

- Rotary kilns
- Fluid beds
- Dryers and coolers
- Calciners

Process equipment

- Spiral classifiers
- Mixers
- Flotation machines
- Magnetic separators
- Conventional thickeners & clarifiers
- Inclined plate settlers
- Spiral dewaterers
- Pressure filters VPA
- Tube press filters

Bulk material handlings solutions

- Screens
- Feeders
- Conveyors

Wear, dust and noise protection solutions

- Conveyor accessories
- Dust sealing systems
- Mill linings & trommels
- Modular screening systems
- Panel systems
- Wear resistant sheeting
- Tailor-made linings
- Tension systems
- Wear plates
- Wire screening systems

Systems

- Process design
- Basic and detail engineering
- Plant control systems





- **Metso Minerals (Sweden) AB**
Norrängsgatan 2, SE-733 38 Sala, Sweden, Phone: +46 224 374 00, Fax: +46 224 169 50
- **Metso Minerals Industries Inc.**
621 South Sierra Madre, Suite #100, Colorado Springs, CO 80903, USA, Phone: +1 719 471 3443, Fax: +1 719 471 4469
- **Metso Minerals Industries Inc.**
P.O. Box 96, Birmingham, AL 35201, USA, Phone: +1 205 599 6600, Fax: +1 205 599 6623
- **Metso Minerals (South Africa) (Pty) Ltd.**
Private Bag X2006, Isando, Johannesburg, 1600, South Africa, Phone: +27 11 961 4000, Fax: +27 11 397 2050
- **Metso Minerals (Australia) Ltd.**
Level 2, 1110 Hay Street, West Perth, WA 6005, Australia, Phone: +61 8 9420 5555, Fax: +61 8 9320 2500
- **Metso Minerals (India) Pvt Ltd**
1th floor, DLF Building No. 10, Tower A, DLF Cyber City, Phase - III, Gurgaon - 122 002, India, Phone: +91 124 235 1541, Fax: +91 124 235 1601
- **Metso Perú S.A.**
Calle 5 Nro. 144, Urb. Industrial Vulcano, Ate, Lima 03, Peru, Phone: +51 1 313 4366, Fax: +51 1 349 0913
- **Metso Minerals (Chile) S.A.**
Av. Los Conquistadores 2758, - Piso 3, Providencia, Santiago, Chile, Phone: +56 2 370 2000, Fax: +56 2 370 2039
- **Metso Brasil Indústria e Comércio Ltda.**
Av. Independência, 2500 Éden, 18087-101 Sorocaba-SP - Brazil, Phone: +55 15 2102 1300



www.metso.com
E-mail: minerals.info@metso.com
Pumps information at
www.metso.com/pumps

Metso Corporation, Fabianinkatu 9 A, P.O. Box 1220, FI-00101 Helsinki, Finland, tel. +358 20 484 100, fax +358 20 484 101, www.metso.com