

Tube press – Booster range

A large industrial tube press machine is shown in operation. The machine is primarily blue and silver. It features a large cylindrical chamber where material is being processed. The material inside the chamber is a light-colored, fibrous or crystalline substance, possibly a mineral or polymer, which is being crushed or pressed into smaller pieces. The machine has a complex structure with various bolts, flanges, and a vertical rod extending from the top. The background is dark, making the machine stand out.

Superior
performance



High pressure mechanical dewatering

General

The tube press is a fully automated variable chamber, filter press designed in a cylindrical format and capable of operating at high filtration pressures up to 100 bar.

The use of these high pressures enables a higher degree of separation of the liquid and solid phases. The tube press is typically suitable for applications:

- Where protection of the environmental conditions are important
- Where energy consumption is significant i.e. thermal drying is used for the separation

- Where the product consists of very fine particles, difficult to dewater
- Where the process requires very low cake moisture
- Where cake handling ability is critical
- Where filtrate is a valued product
- Where cake transport costs are significant
- Where cake is to be disposed as landfills

Superior performance

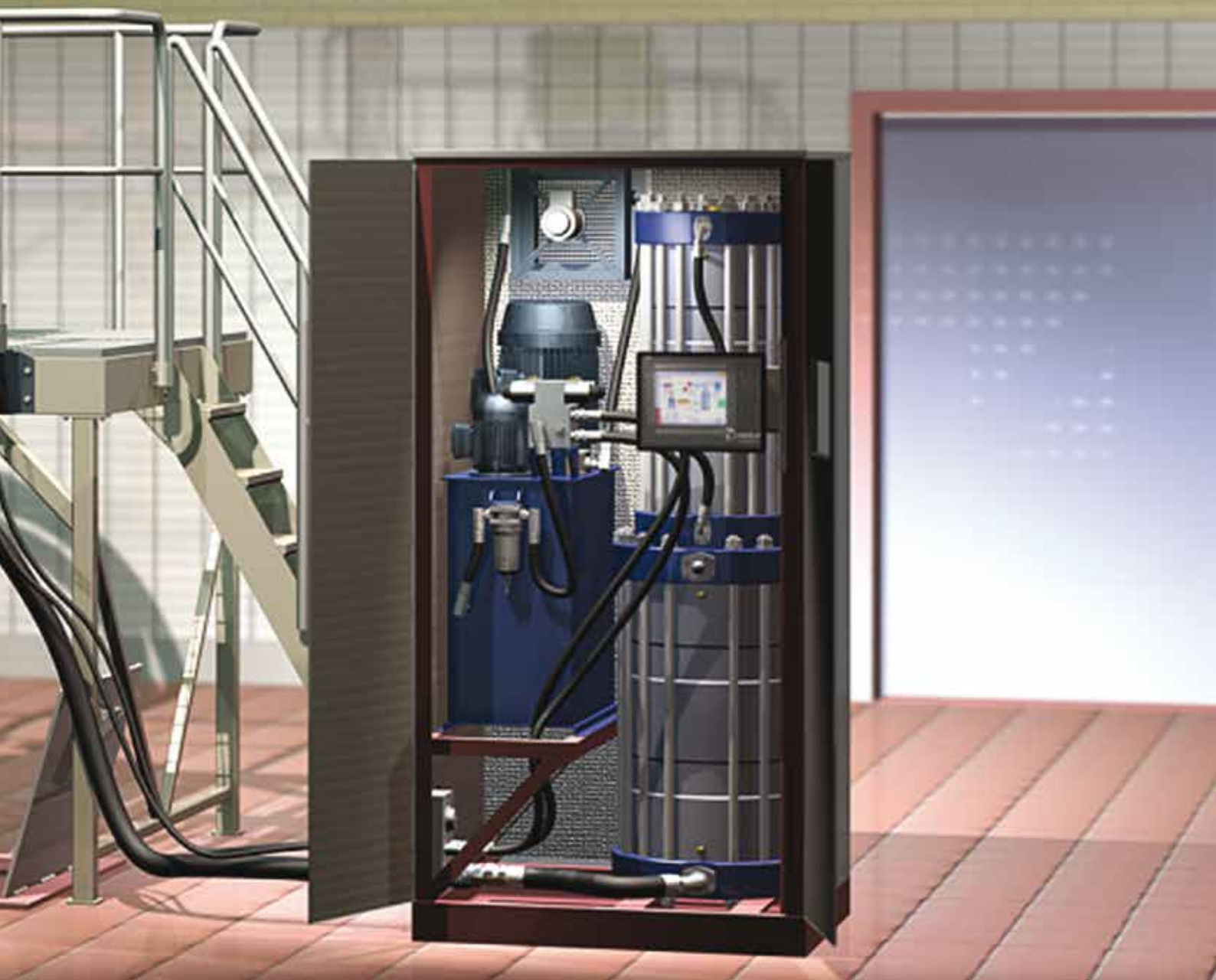
Porosity and cake moisture contents are significantly lower than those obtained with low pressure filters and consequently filtrate recovery is high.

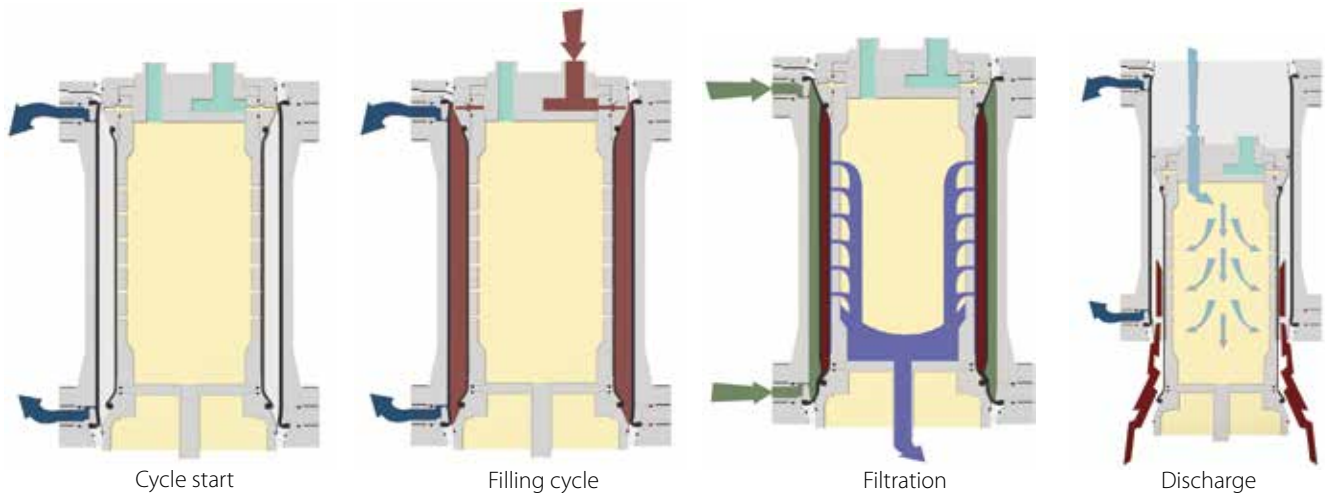
Filtration with extremely fine material can be conducted at a pressure level where the cake is produced as a hard surface dry, dust free lumpy solid.

The unique air through blow (Air purge) at high pressure gives exclusive advantage to extend the result to its utmost. Cake handling procedures are greatly simplified compared to alternative low pressure filter cakes, which are typically plastic or paste-like and often surface wet.

Available data indicates that Tube Press output rates, in terms of dry solids per unit filter area, are much higher than for either vacuum or plate filter presses. These are results are from the Tube Press' ability to match the target material's filtration rates and also operational flexibility.

Filtrate solids concentrations are generally close to zero, allowing immediate disposal or direct recovery.





Tube press – Booster range

A compact intelligent dewatering system for small scale applications in mineral, chemical and pharmaceutical industries.

The booster range of tube presses are generic for a new compact dewatering system. The Booster range includes three sizes of installations to suit the requirements of small to medium scale installations, laboratory and pilot scale installations.

Tube press “Compact filtration unit”/ Booster system

The booster is an individual drive system closely coupled with the tube press.

The installation is very compact combining one motor to generate the mechanical dewatering press force.

The unique system incorporates fully optimized control of the complete process, including feed back and statistical analysis of each press cycle.

Mechanical description

The booster filter range is assembled to work as a well balanced, integrated system with components selected to give maximum production and minimum of service stop. The design is especially suited to tough industrial environments.

The Tube press can be supplied in three different sizes, SC500 3m/200, SC500 1,5m/100 and SC500 1,2m/75. The operational pressure range can be up to 100 Bar for all sizes.

All exposed parts which come in contact with the slurry and/or product manufactured in corrosion resistant material compatible with most process pH.

The unique drive unit incorporates an oil hydraulic power pack and a volume booster. The oil driven hydraulic power pack provides the driving force, which is converted via the Booster unit into a water based pressure medium.

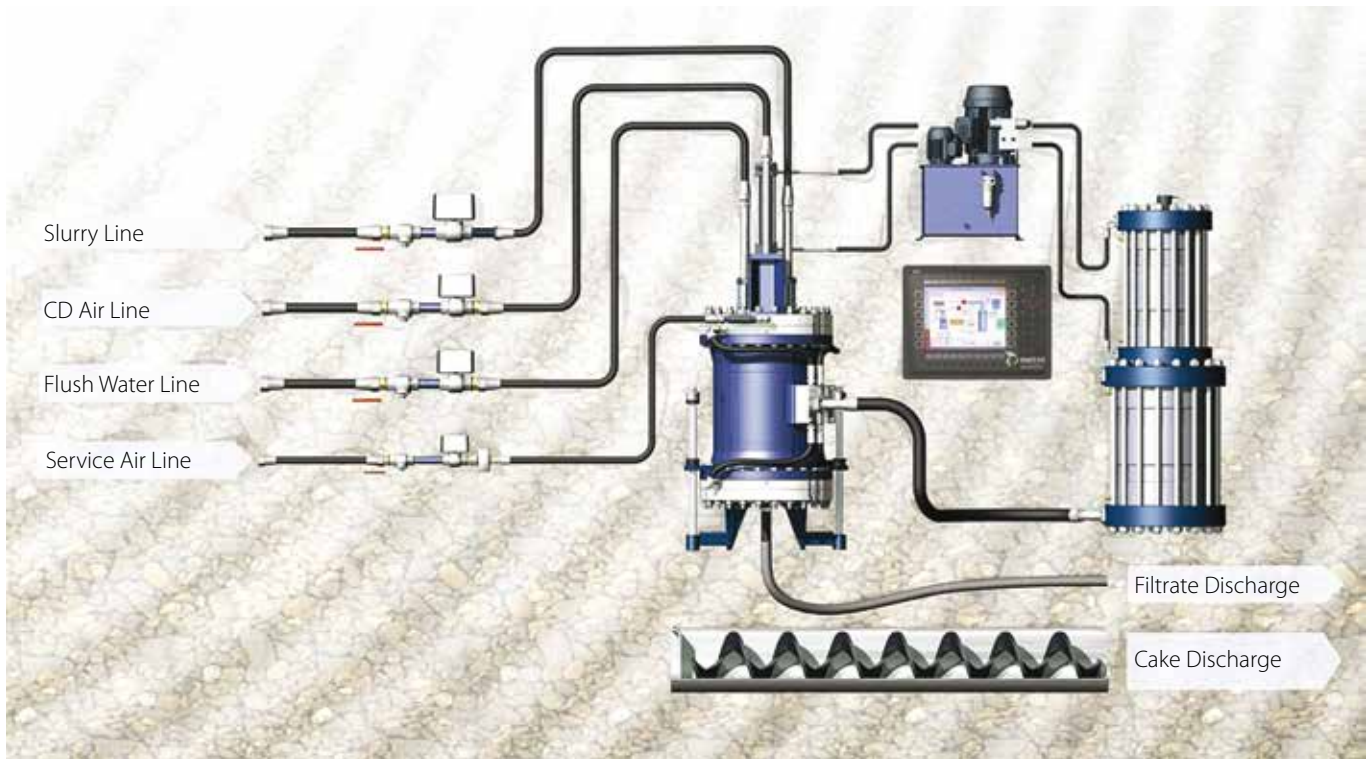
The pressure and dewatering speed is controlled via the control system, which is constantly receiving feed back from sensors and a positional valve. This results in the ability to continuously increase the pressures matching the dewatering curve of the material.

Principle of operation

Filtration takes place between two concentric cylinders. The outer cylinder is the casing, and the inner, is the candle. The process slurry is pumped into the annular space between the filter media and the bladder. Hydraulic fluid, usually water, is then pumped between the bladder and the casing pressurizing the slurry and causing filtration to take place.

When filtration is complete, the hydraulic fluid is withdrawn until the bladder is dilated against the casing. The candle is then lowered into the discharge position and a pulse of air is injected between the candle and the filter media. This causes the filter cloth to expand, and fracturing the cake which is discharged under gravity.

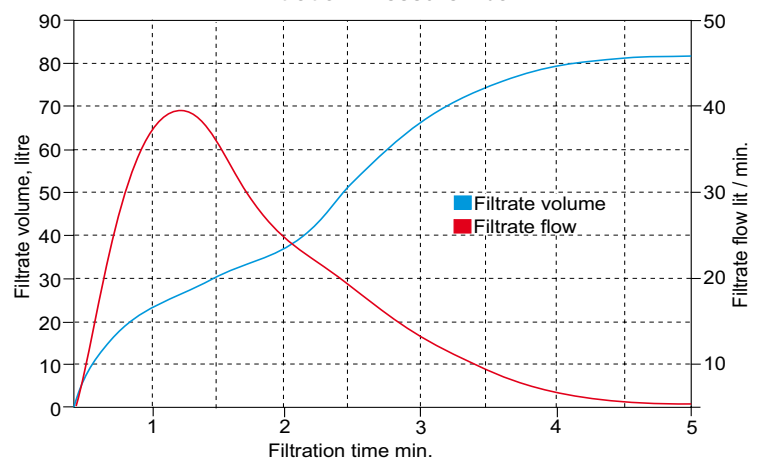
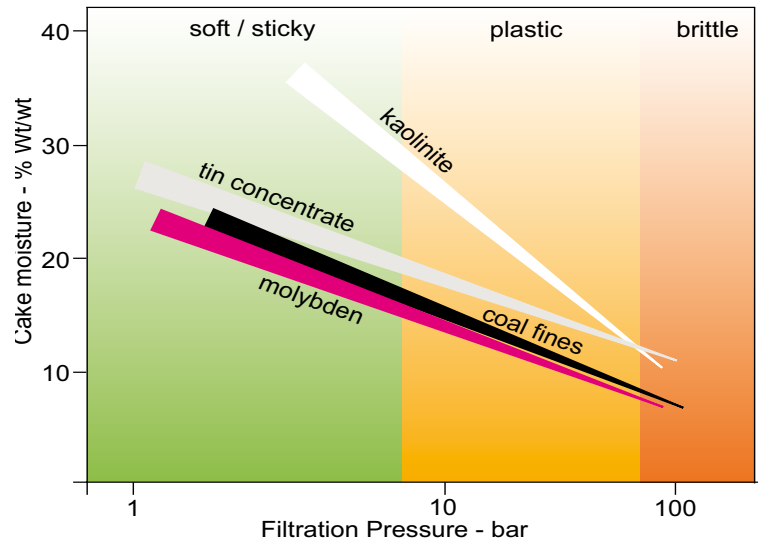
When complete, the candle is lifted into the slurry fill position to repeat the cycle. Air purge and/or cake wash can be incorporated into the cycle. At the completion of the filtration cycle, air or wash fluid is optionally pumped between the cake and the bladder which is then forced through the cake by a further application of hydraulic pressure to be incorporated into the cycle.



Applications

	* Typical filtercake moisture contents
• Coal Fines and Shales	15-20%
• Calcium Carbonate Precipitates	30%
• Gypsum Residues	14 -18%
• China Clay	15%
• Quarry Clay Slimes	15-20%
• Seawater Magnesia	25-30%
• Lead Chromate Retrieval	22%
• Zeolites	40%
• Furnace/Converter Dust	15-20%
• Ferrites	14 %
• Jarosite	20-26 %
• Titanium Dioxide	20%
• Magnesite	20-25 %
• Dyestuffs/Pigments	20%
• Para-goethite	27%
• Oxalates	14 %
• Molybdenum Fine	10-12%
• Zinc Concentrate Metallic	10-12%
• Copper Concentrate	10-12%
• Tin Concentrate	10-12%
• Gold Concentrate	10-12%
• Nickel Concentrate	10-12%
• Silica Dioxide	50%

*Typical "super fine" material (80% -5µm)





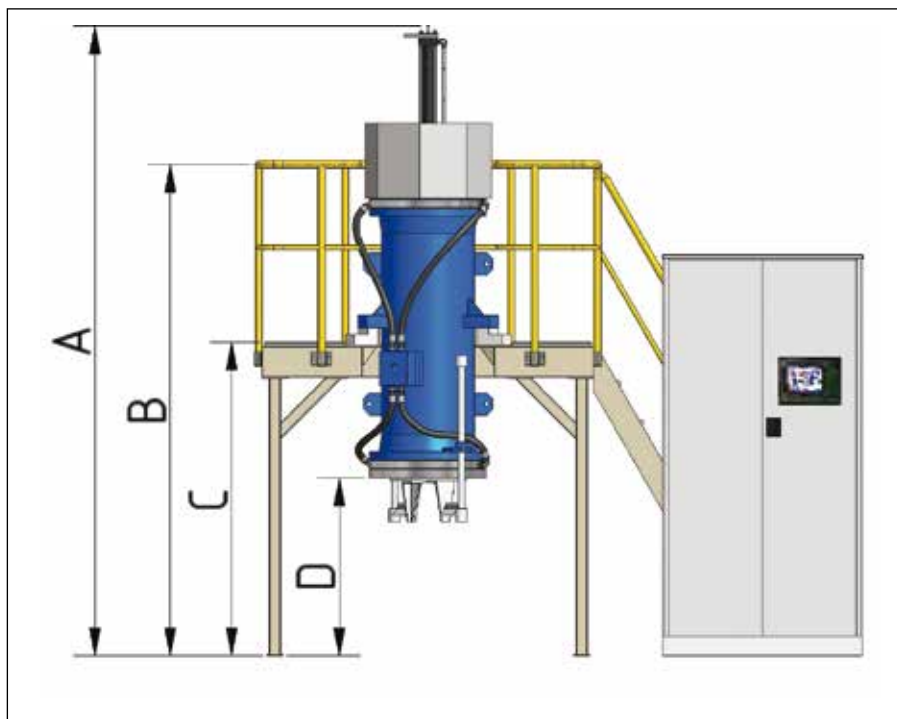
The Booster range is a compact design and easy to install, as shown here in a container to allow mobile and temporary production.



Booster drive unit

Features and benefits

- Low cake moisture
- Excellent liquid/solid separation
- The Tube Press Booster has a compact design and is easy to install.
- Fully optimized control
- Useful quality production information and data exchange
- Easy to expand
- Few moving parts
- Increased efficiency by on line process control
- Environmental advantage by high grade of recovery
- Maximum energy exchange
- Closed media circuit
- Low installed power
- Maintenance friendly
- Fully automated



Dimensions

SC500 1,2m/75

A	B	C	D*
3 500	2 700	1 600	1 100

SC500 1,5m/100

A	B	C	D*
3 800	3 000	1 900	1 100

SC500 3,0m/200

A	B	C	D*
5 200	4 400	3300	1 100

*Distance to discharge point, i.e. belt conveyor
Dimensions in mm

Control system

The tube press is operated from the operator's monitor located on the control panel. The monitor is connected to a PLC that handles the control logics and interlocking. All process specific data and parameters can be set and adjusted from the monitor in the settings menu.

Cycle time, press weight, etc., are presented on the monitor.

Alarm and fault handling is implemented on the alarm menu; each alarm will be displayed with text, status, date and time.

The tube press can be operated in a fully automatic sequence from the monitor or in manual mode by use of a handheld control device.

A number of sensors, pressure switches, inductive proximity switches etc. for control and supervision of the process are wired to the control panel.

A weighing system consisting of three load cells, connected to weight-transmitters, delivers the actual weight of the pressed material to the control system for process control and statistics.

Statistics and process data can easily be transferred into a PC document for record and/or print-out.

Optional function:

By monitoring relevant parameters it is possible to obtain a dynamic self-optimizing process where parameter values and settings are automatically adjusted on-line. This feature optimizes all process parameter settings to give maximum filtration performance regardless of variation in mechanical or feed conditions.

Technical data

SC500 1,2m/75:

75 Litre Tube chamber volume.
Filter area m²: 1,35
Maximum pressure 100 Bar
Installed power: 7,5kW

SC500 3m/200:

200 Litre Tube chamber volume
Filter area m²: 3,45
Maximum pressure 100 Bar
Installed power: 11kW

SC500 1,5m/100:

100 Litre Tube chamber volume
Filter area m²: 1,73
Maximum pressure 100 Bar
Installed power: 7,5kW



Typical operator interface

- **Metso Sweden AB**
Norrängsgatan 2, SE-733 38 Sala, Sweden, Phone: +46 224 570 00, Fax: +46 224 169 50
- **Metso Minerals Industries, Inc.**
2715 Pleasant Valley Road, York, PA 17402, USA, Phone: +1 717 843 8671
- **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