THE HAVER SCREENING GROUP

Information

HAVER & BOECKER

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THE SCREENING GROUP

THE HAVER SCREENING GROUP

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First class in classification

Company profile

THE HAVER SCREENING GROUP

- is a strong union between the subsidiary companies in Brazil, Canada and the Engineering Division in Münster
- is a global leader in the sector of mineral processing technology
- together they have the experience of delivering over 20 000 screening machines worldwide

We produce

- everything related to the screening process, from analyses to screen decks, screening machines and complete customer service
- premium quality equipment for the mining industry
- high pressure washing units for raw material mixes

Our employees

- include more than 300 experienced specialists
- have expert knowledge and continuous exchange information with scientific institutions and within THE HAVER SCREENING GROUP itself

Our target

- to bundle the strengths of the 3 locations
- to contribute to the success of our customers worldwide

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THE SCREENING CIRCLE

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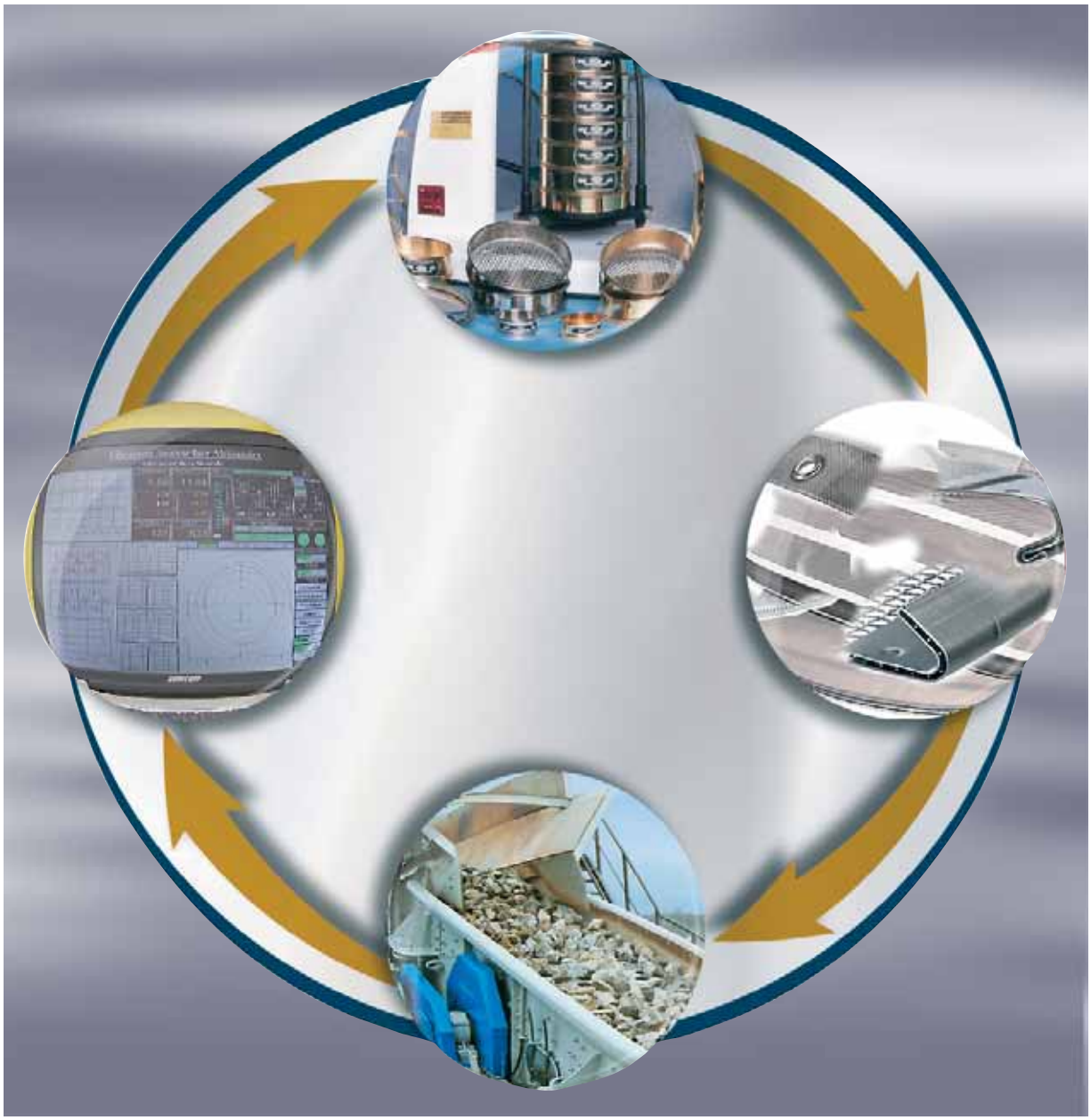
HAVER & BOECKER today is the only company that is able to offer all solutions within the so-called screening circle. THE SCREENING CIRCLE comprises the sequential process steps needed to form the complete screening process, and thus includes: material analysis, professional customer advising, screening machine size determination, screening media selection, system and design calculations, in-house testing prior to machine delivery, machine installation and start-up, and worldwide customer service.

The screening process incorporates:

- The particle analysis
- The screening medium
- The screening machine
- The service



THE SCREENING CIRCLE – wide ranging expertise throughout the entire screening process

THE SCREENING CIRCLE

The particle analysis

At the start and at the end of THE SCREENING CIRCLE you'll find the analysis of the screened material or the manufactured product with respect to particle size and shape. The analysis of the material serves as the basis for the layout and design of the screening decks, fully taking into consideration the required production rates and materials to be screened. It is thus the critical requirement for attaining a successful process. HAVER & BOECKER supplies analysis sieves and CPA measuring equipment for attaining rapid and repeatable norm-conforming on-site inspections.

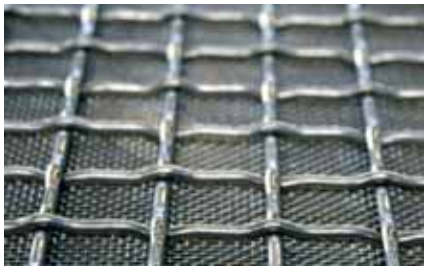
The HAVER CPA photo-optic particle analysis unit for performing particle size and shape analyses

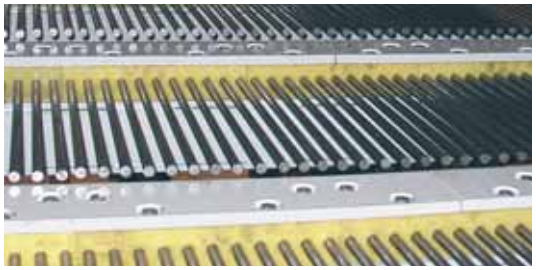
HAVER sieves for accurate sieve analyses

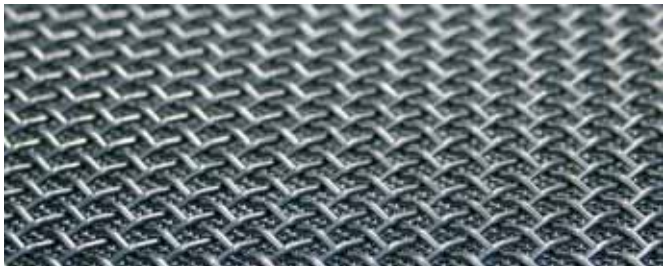
HAVER sieve analysis machines with 3-dimensional screening motion and amplitude control

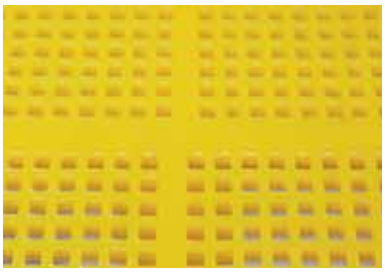
The screening medium

As design and layout of the screening medium and surface type are the components that determine the quality of all screening machines, it's critical the screen deck be properly addressed during design. Today at THE HAVER SCREENING GROUP all necessary screening media for cut sizes and applications of every type are available. Here the selection of the optimum screening medium depends on the results of the input material analysis, the required output products and the type of machine technology.









THE SCREENING CIRCLE

The screening machines

Only the right screening machine turns a job into a product. Here perfect harmony between the machine type, drive system and use is a requirement for long-lasting and efficient fulfilment of customer wishes. Ever since screening machines have been built in 1930 using the traditional eccentric drive system, HAVER & BOECKER has continuously expanded and improved its product range.

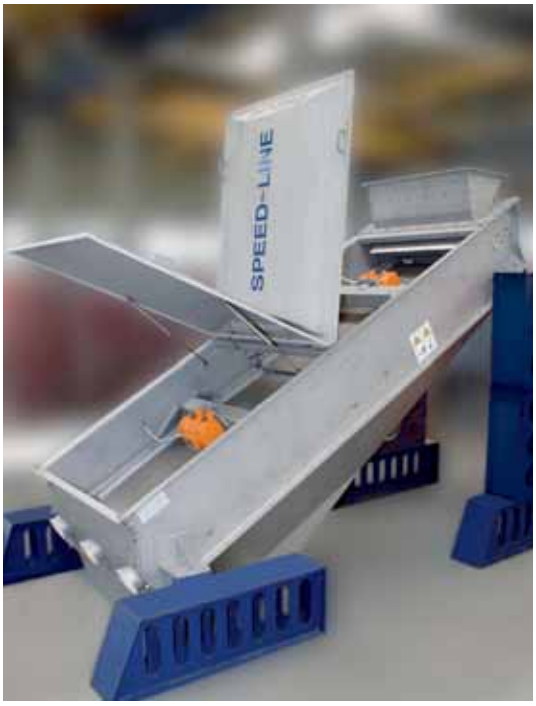
Today the company has available 5 different drive systems:
- Circular swingers with 4-bearing and eccentric shaft design
- Circular swingers with concentric shaft as free swingers
- Circular swingers as high frequency screening machines with vibrating screen frame
- Linear swingers with exciter, double shaft and imbalance motor drive and
- Screening machines with directly excited screen decks.

The demand for cut sizes ranging from very fine to very coarse is effectively covered by our wide variety of screening systems. Screening machines from the HAVER® group are in operation worldwide in various industrial sectors for pre-screening, classifying, de-watering, defillering and reject screening.

Special expertise and impressive references characterise the group with its construction of giant screening machines for the mining industry. Especially when designing large scale screening machines, critical stress zones are analysed using finite element analysis early during the design phase.

Our product range for the material processing industry has greatly expanded over the 75-year history of the screening machine. It now includes the innovative HAVER Hydro-Clean® high pressure washing system, which is used for cost-effective and low-wear washing of various raw materials. Giant pelletising plates for granulating iron ore are also another part of the product line, which is rounded out by a wide range of vibrating feeders and a screening control system.

NIAGARA® 4-bearing screening machine – a proven screening system for over 75 years



The result of continuous development and optimisation: A wide ranging product line for just about every possible requirement

THE SCREENING CIRCLE

The service

To secure quality standards over the long term, THE HAVER SCREENING GROUP has developed a vibration analysis that allows us to precisely measure the vibration characteristics of screening machines at any time, before delivery of the machine, after on-site start-up and during the entire operating time of the machine. By checking the vibration parameters, THE SCREENING CIRCLE is closed through our advising of customers on operational matters. Service locations all over the world assure reliable delivery of spare parts and the round-the-clock availability of service personnel, who are ready to act at our customers' request. Individual "full maintenance programs" are tailored by THE HAVER SCREENING GROUP to suit specific customer needs.

Before a screening machine leaves, it's tested "down to the bone" by using a vibration analysis and other quality control checks. The vibration analysis measuring system, which serves to check the functional capability of the screening machine, is an in-house development of THE HAVER SCREENING GROUP.

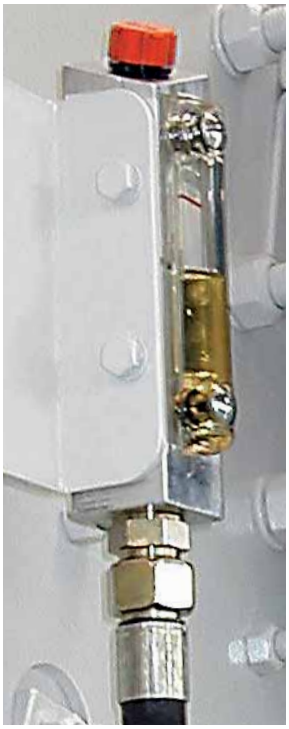
HAVER lubrication systems for screening machines

Grease and oil lubrication

Specific customer needs and surrounding parameters determine the choice of the lubrication system for the bearings of shaft driven screening machines.

As no general rule applies as to which system is better from a technical standpoint, HAVER & BOECKER offers its screening machines with either grease lubrication or oil lubrication systems. The type of lubrication system used with the NIAGARA® 4-bearing, free swinging and double shaft screening machines depends on the application and the customer's requirements, meaning the customer always gets the solution that's best for him. HAVER, the specialist for mineral processing, also offers the re-circulating oil lubrication as an alternative to the proven oil level lubrication, which allows an exact feeding of oil to the bearing. In addition, the temperature of the oil is kept constant, even under the most extreme conditions. Cleaning the oil in the external unit extends the time interval between maintenance, thus reducing maintenance costs.

Automatic grease lubrication pump



Viewing glass for easy checking of the oil level in the bearing

Design

Oil lubrication	Grease lubrication
• Lubrication from an oil sump	• Direct lubrication of rollers through the housing and outside ring
• Oil change on half or full year interval	• Lubrication by hand
• Airing and bleeding necessary	• Alternative lubrication by an automatic grease pump
• Sealing by ring gasket	• Lubrication with grease loss
• Protection of the lip seal by grease-filled labyrinth	• Sealing by labyrinth ring

Advantages

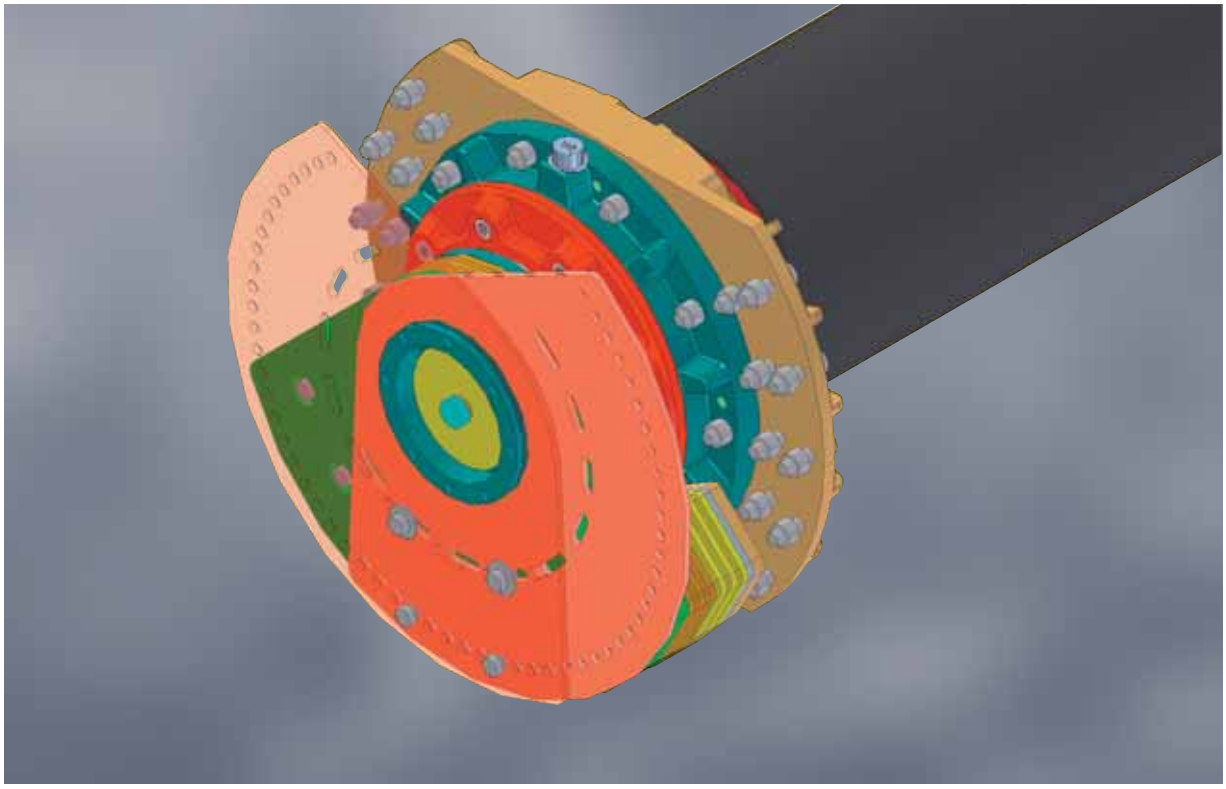
Oil lubrication	Grease lubrication
• High rotational speeds are possible compared to grease lubrication	• Easy recovering of used grease-lubricant
• No lubricant losses	• Contaminants are flushed out during lubrication
• Good heat transfer	
• Long mainenance intervals	
• No lubricant piping necessary	

Premium quality roller bearings for long lifetimes

New machine generation

Under the premise of creating a worldwide uniform concept for the benefit of the customer, THE HAVER SCREENING GROUP has developed an innovative machine generation that comprises all shaft-driven, inclined screening machines. The machine series include the T-Class (circular free swingers) and the F-Class screening machines (4-bearing screens).

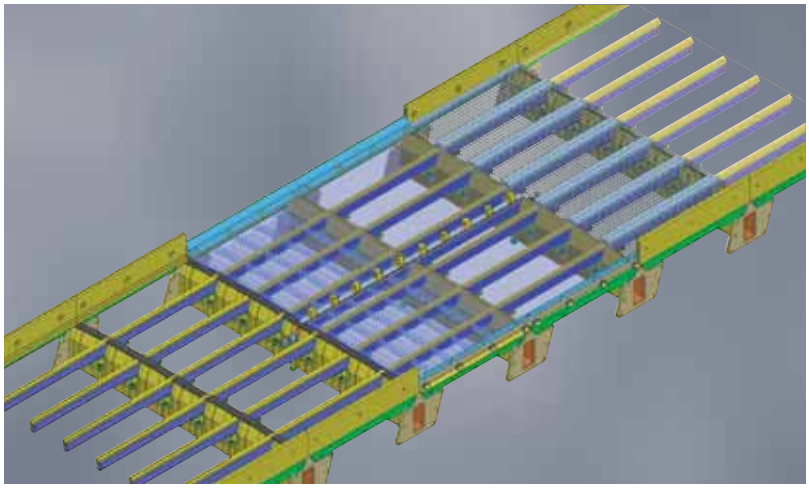
When compared to the conventional circular vibrating and 4-bearing screening machines available thus far, the major improvements are: the new type of screen box strengthening, the flexible drive system and the innovative media support system for various screen decks. Identical machine models may be easily produced in either the metric or imperial system. The basis for the screen box is a predetermined standardised frame for positioning all machine components together with the proven double-bevelled side walls. Unique thus far is the combination of the horizontal and vertical reinforcement braces. The cross-member design contributes to the stability, lifetime and operational reliability of the machine because, unlike other solutions available on the market for receiving the screen decks, the cross-members do not need to be worked on or prepared. Instead of screw holes and welds, adjustable mounting units perpendicular to the screening direction are used. The standard media support system for screen decks with optional knocking-ball devices, rubber and polyurethane screen panels and perforated plates offer the plant operator full flexibility for every application because easy changeovers to other screen types are possible. HAVER & BOECKER has applied for a patent for this new innovative media support system. Available standard mounting profiles allow polyurethane plates to be inserted and provide optimal wear protection for the cross members and other parts strained by the material flow. In addition to using standard worldwide components, which allows a high level of interchangeability and worldwide spare parts availability, there is also the innovative, very compactly designed drive system. Completely new on the market today is the possibility to change over from the oil to grease lubrication system, or vice versa. The easy adjustment of the vibration distance by adjusting the imbalance weights, for which a patent has also been applied, uses no additional weights and provides exact screening machine balancing. This is essential for assuring long opera-



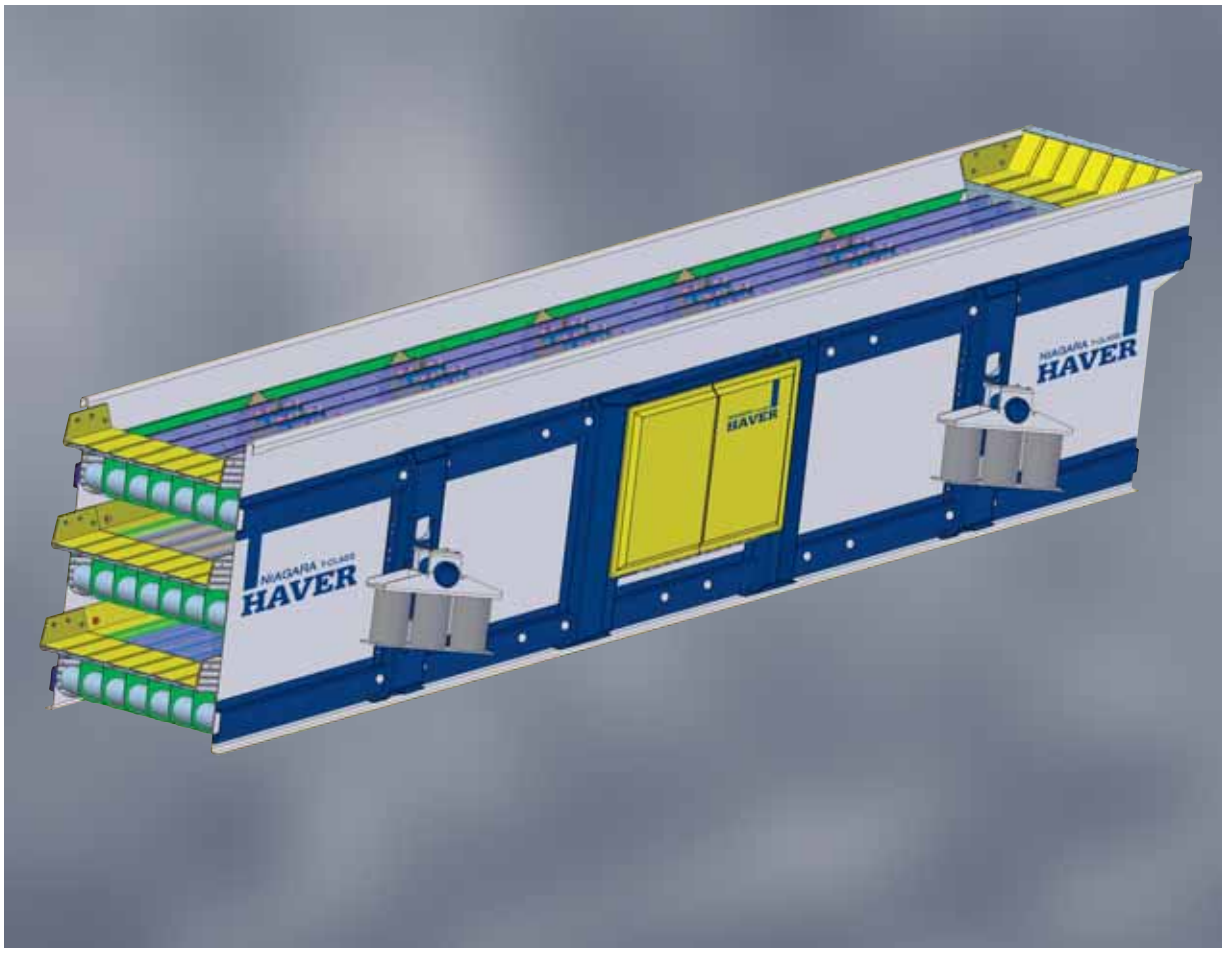
Stepless adjustable imbalance weight
for easy drive adjustment

tional lifetimes. Analogous to the capability to adjust the screening box and carrying system, the drive unit may also be flexibly designed with regards to various applications.

An appealing design completes the new, extremely versatile and adaptable machine generation.



Innovative, standard support system for receiving various screen decks



High degree of flexibility – the new NIAGARA® T-Class from THE HAVER SCREENING GROUP in a new design and with a worldwide uniform platform.

HAVER & BOECKER – Engineering Division Münster

Screening, washing and systems

Company profile

The Engineering Division Münster

- can look back at 75 years experience with the NIAGARA® screening machines

- has accommodated the Mineral Processing Technology business unit since 1991

- is a specialist for solutions to problems, customer advising, project management, optimisation, production, installation, start up and also overhauls and maintains screening machines and accessories

- sends service technicians worldwide, directly from Münster, for plant start-ups, service, vibration analyses and repair work

- is continuously expanding its global machine, plant and customer service program through an international engineering network

Product range

We produce

- NIAGARA® screening machines for classifying, scalping, de-watering, defillering and reject screening of loose, bulk material of every type for dry or wet processing:
  · circular swinging screening machines, as a free swinger or in 4-bearing design
  · linear vibrating screens
  · fine screening machines with directly excited screen decks
  · high frequency screening machines
  · vibrating feeders
  · screening machine control systems

- complete washing and classifying plants, primary crushing plants

- the HAVER Hydro-Clean® high pressure washing system for the sand and gravel industries, natural stone and recycling industry

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References: Basalt-Actien Gesellschaft • Carmeuse • Fels-Werke • Hermann Trollius • Holcim • Knauf Engineering • Lhoist • Plasser & Theurer • Odenwälder/Mitteldeutsche Hartstein-Industrie • Siam Mortar Cement

A strong team – The HAVER & BOECKER staff at the Engineering Division Münster

NIAGARA® Free-Line, 3 x MD 1800 x 5000, 1 MD 1500 x 4000, culm basin carbonate, 220 tons/hr

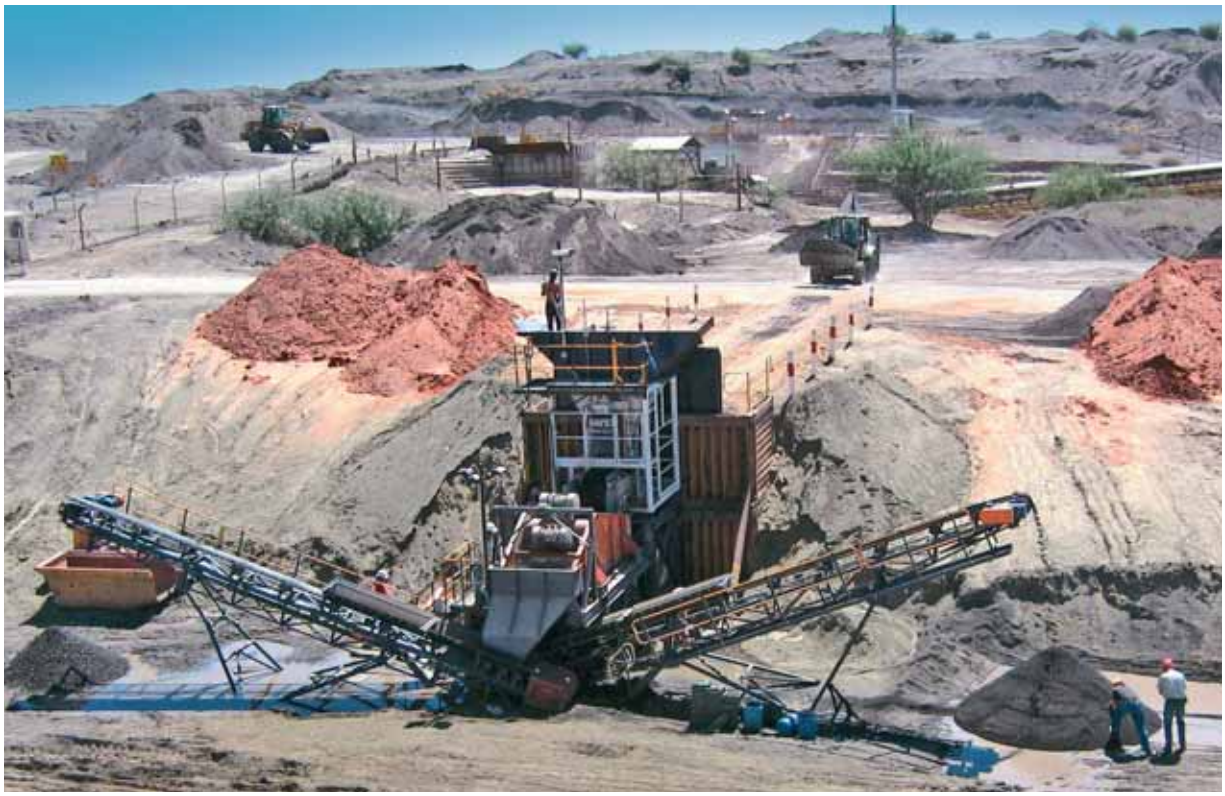
HAVER Fine-Line, HD 3000 x 2500, crushed sand, 35 tons/hr

HAVER Hydro-Clean®, HC 700/200, max. 100 tons/hr
Hydro-Clean® for rental, for washing various raw material mixtures

HAVER primary crushing plant with a NIAGARA® scalper
DSS 1600 x 4600/3000, Diabas, 500 tons/hr

Systems operating worldwide

HAVER washing and classifying plant equipped with a HAVER NIAGARA® Flat-Line FL-MD 1200 x 6500/2500 and HAVER Hydro-Clean®, HC 700/80, gravel and sand, 80 tons/hr



Semi mobile HAVER Hydro-Clean® pilot plant, HC 700/200, for kimberlite, 50 tons/hr

NIAGARA® 4-bearing screen
D 1500 x 6000 for natural sand, 200 tons/hr

HAVER NIAGARA® flat screen with spray bars
FL-MD 2000 x 6000, round gravel, 200 tons/hr

Dredging ship equipped with HAVER NIAGARA® flat and de-watering screening machines and HAVER vibrating feeders, gravel, 200 tons/hr

W.S. TYLER – Canada

Complete screening systems for mineral processing, from one source

Company profile

W.S. TYLER CANADA

- is committed to the vision of re-defining the screening process by using unique technology, and dedicates itself to pursue its mission of establishing strategic partnerships that bring together innovation and expertise
- is located in St. Catherines, ON and is the only company on the global market that offers its customers the complete screening circle. Here one single supplier offers everything from particle analysis to all types of screening cloths and machines, including its own self-developed services
- serves over 4 000 customers in the sector of mining (e.g. copper, iron ore, gold and silver, oil sand, nickel, etc.) industrial minerals, crushed stone, gravel and sand
- is a proud member of THE HAVER SCREENING GROUP
- also offers design and architectural solutions made of wire mesh
- develops technical solutions using wire cloth for industrial applications

Product range

We design, develop, produce and market

products for the screening process:
- particle analysis
  test sieves, laboratory devices, CPA technology
- screening media
  scalper, classifying and de-watering media
  self-cleaning screening media, finest screening media
- screening machines and cleaning systems
  customised screening machines for every application
- services for processing, e.g.
  standard spare parts service, overhaul programmes for old screening machines, logistics solutions for warehouse management of screen cloth, process planning and design of processing plants
- wire mesh solutions for design and architecture
  standard wire mesh, special wire mesh and support for installation
- wire cloth for industrial applications
  coiled packaging material, articles and products made of woven cloth for special customer applications

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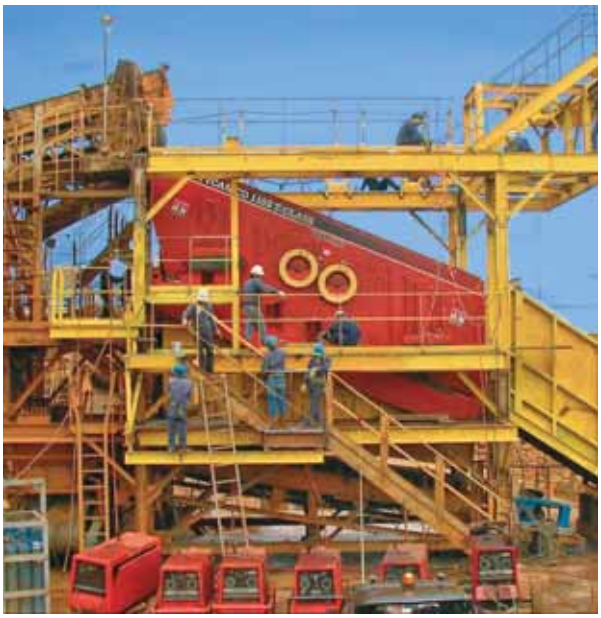
References: Grupo Mexico • CVG • INVISTA • Unimin • P. C. S. Mining • Martin Marietta • Lafarge Canada • Mosaic Canada • Kumtor Operating Company • Q. I. T. - Fer et Titane

The W.S. TYLER CANADA team



Free swinging scalper with double-shaft drive system
for processing nickel ores

Screening machine with double-shaft drive system
for the gravel industry

Screening machine with direct exciter drive for processing copper ores

Systems operating worldwide

TYCAN F-Class 4-bearing screening machine

TYCAN L-Class linear screening machine

TYCAN XL-Class linear screening machine with exciter drive

This salt plant in the city of Goderich Ontario is one of W.S. TYLER CANADA's 4000 customers

Free swinger for the crushed stone industry

Screen decks for every application

HAVER & BOECKER Latinoamericana – Brazil

Wide ranging expertise in South America

Company profile

HAVER & BOECKER Latinoamericana

- is located in Monte Mor, 20 km from Campinas, the second largest city in the state of São Paulo
- was founded in 1974 with another partner and has been a 100 percent subsidiary of HAVER & BOECKER since 1992
- sells through a national distribution network with offices in Belo Horizonte, São Paulo, Rio de Janeiro, Porto Alegre and Espírito Santo
- is responsible for sales in Argentina, Bolivia, Chile, Paraguay, Peru and Uruguay
- enjoys an active company culture, which has earned the dedication of its 103 employees

Product range

We

- market and service all machines from the Engineering Divisions in Münster and Oelde Germany, i.e. filling machines and screening machines
- represent the IBAU and FEIGE product lines
- have modified the product line to match the market needs and we are contributing to the country's position as a global market leader in iron ore production
- demonstrate our strength in building giant screening machines and huge pelletising plates
- are not only at home with processing iron ore, but also in the cement and building materials industries, as well as the chemical, starch and food industries, also in processing oil sand
- do production externally, but final assembly and quality control of the products is done in-house

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References: Group Votorantim • Group João Santos • Group Cimpor • Cemento Bio Bio • Alcoa Alumínio S.A. • Solvay • Corn Products • Dow • CVRD • Samarco • MBR

The HAVER & BOECKER Latinoamericana team

Banana vibrating screen with exciter drive unit for copper ore
Model RB-MD 3200 x 7315, 362 tons/hr

Giant pelletising plates
Model GR 7500, 122.3 tons/hr

Crushed stone plant, 2.46 million tons/yr

Performance as a team

NIAGARA® High performance screening machines in modular design, Type R-TE 4000 x

11000, total weight of 115 tons, 15000 tons of oil sand per hour

THE HAVER SCREENING GROUP

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