

HAVER & BOECKER NIAGARA

MINERAL PROCESS

SCREENING PROCESS WITHOUT WATER USE





Haver & Boecker

131 YEARS IN BUSINESS

5TH GENERATION

FAMILY OWNED

Headquarter

Oelde, Germany

Subsidiaries

50
Locations

Employees

2.898

Logo





Haver & Boecker Niagara

HAVER & BOECKER



NIAGARA

- Vendas e fabricação para Processamento Mineral
- Serviços – Pós vendas, Peças de Reposição, Modernização e Suporte ao Cliente
- Reforma e otimização de equipamentos
- Start-up
- Manutenção preventiva, preditiva e corretiva
- Assistência técnica, consultoria e treinamento
- Telas Industriais e Peças industriais: Poliuretano, Borracha, Híbridas, Metálicas e Chapas
- Equipamentos para Laboratórios
- Telas para Arquitetura



Monte Mor - SP



Pedro Leopoldo - MG



Pedro Leopoldo - MG

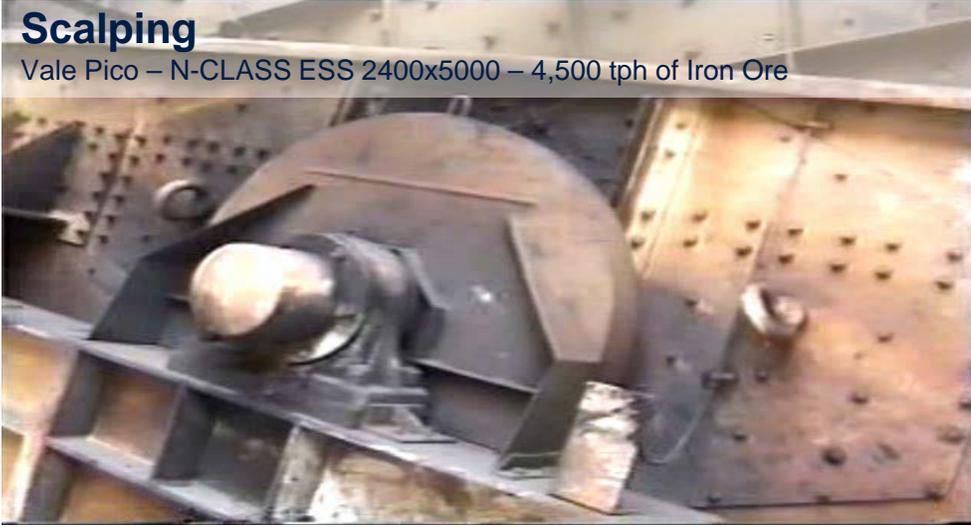




Engineered Processing Systems

Scalping

Vale Pico – N-CLASS ESS 2400x5000 – 4,500 tph of Iron Ore



Classification wet

Vale Paragominas – XL-CLASS MD 2440x6100 – 905 tph of Bauxite



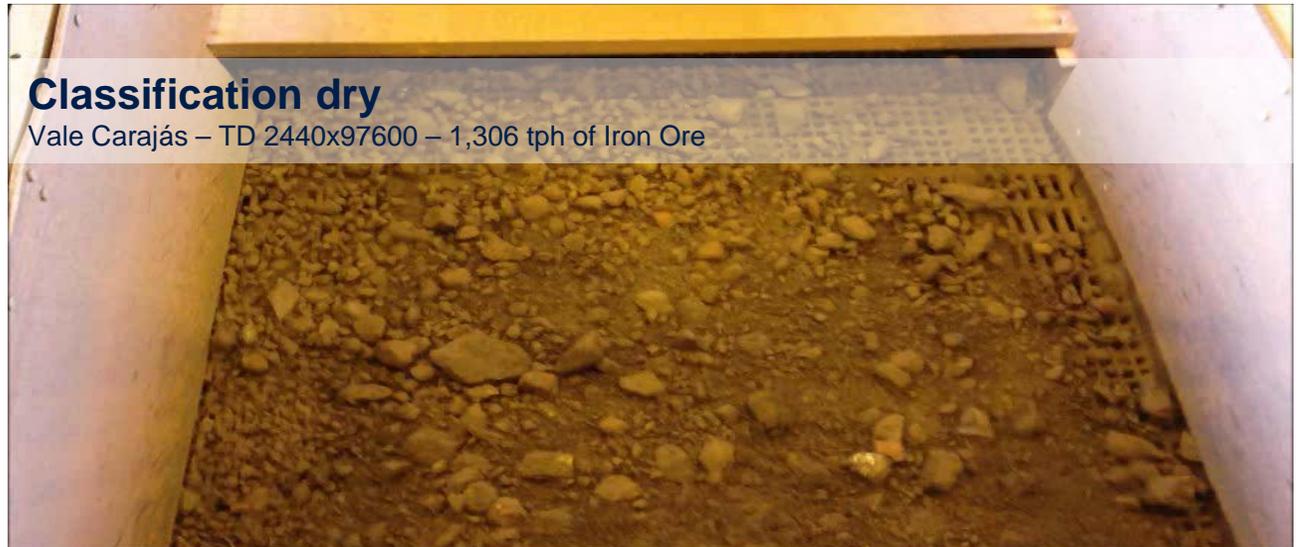
Protection & Reject

Syncrude – XL-CLASS MTE 4000x11000 – 15,000 tph of Oil Sand



Classification dry

Vale Carajás – TD 2440x97600 – 1,306 tph of Iron Ore





Engineered Processing Systems

HYDRO-CLEAN™

Washing Technology



CLASSIFICATION (Hot process)

Sinter screening



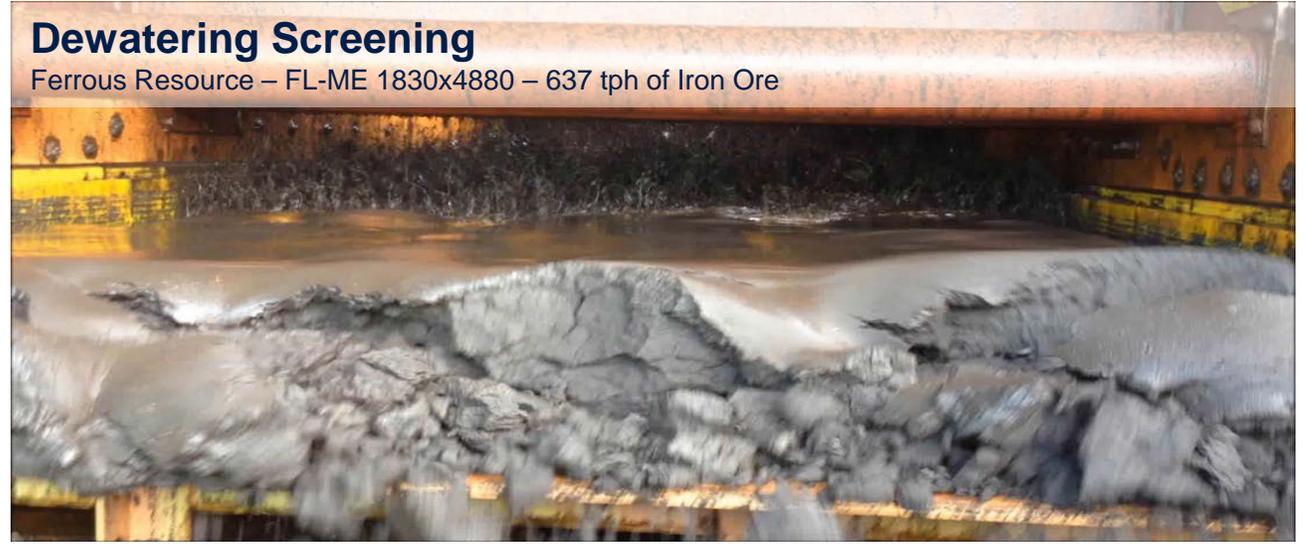
Pelletizing Disc

Pelletizing Technology



Dewatering Screening

Ferrous Resource – FL-ME 1830x4880 – 637 tph of Iron Ore





H&B High Capacity Screening History

15 years

Developing and Designing
High Capacity Vibrating Screens



HAVER & BOECKER



Haver & Boecker
Latinoamericana
Since 1974

350 machines

Equal and Over 2400 mm (8') Width
Vibrating Screens Supplied



150 machines

Between 3050 mm (10') and
4270 mm (14')





Expertise in Custom Screening Solutions

Capacity from 80 tph up to 15.000
tph



HAVER & BOECKER

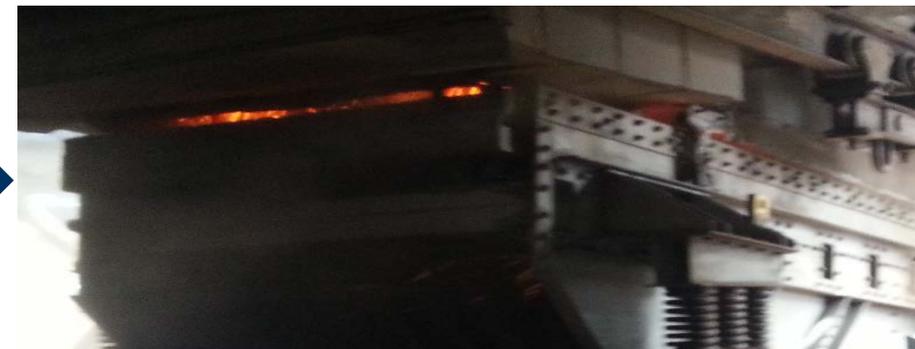


Haver & Boecker
Latinoamericana
Since 1974

Cut size from 0.3mm up to 250 mm



Temperature from -45°C up to
+800°C





NATURAL MOISTURE SCREENING





Natural Moisture Screening

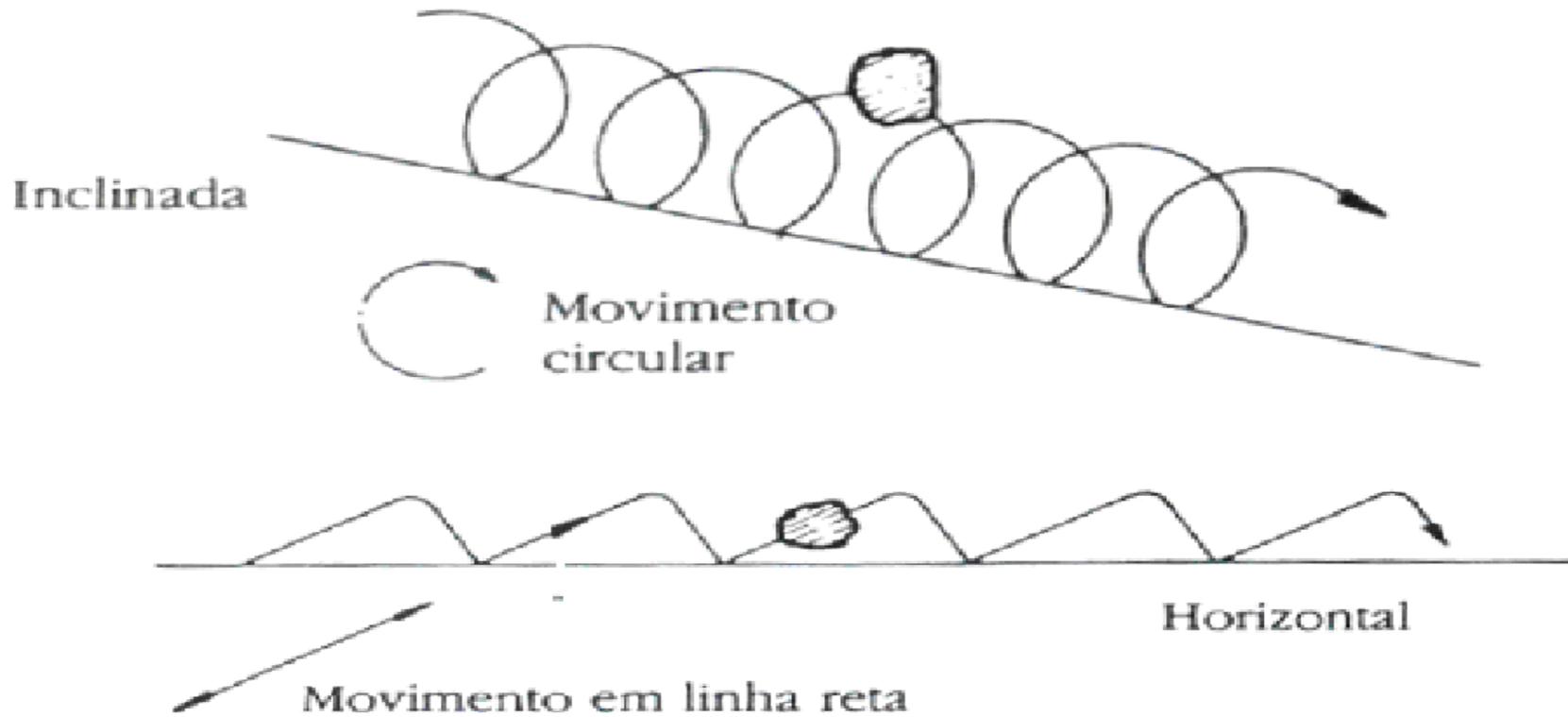
- Mining process change.
- The main consequence is the elimination of water in the process route and consequently the tailings dams.
- Lower investment in Capex and Opex;
- Easier to obtain environmental licensing





Basic Screening Theory

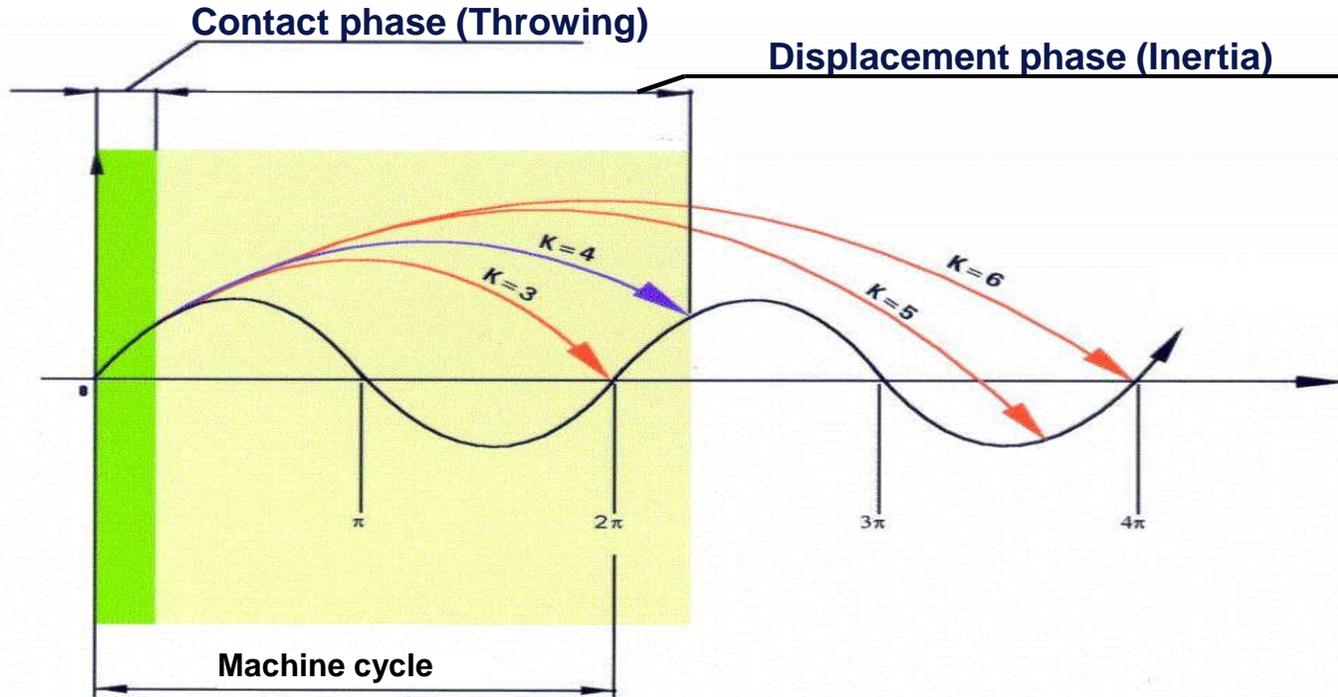
Types of Movement





Basic Screening Theory

Screen Factor (K)



Screening Factor

K = centrifugal force
gravity force

$$K = \frac{m \times a \times \omega^2}{m \times g}$$

$$\omega = \frac{\pi n}{30}$$

$$K = \frac{a \times n^2}{900000}$$

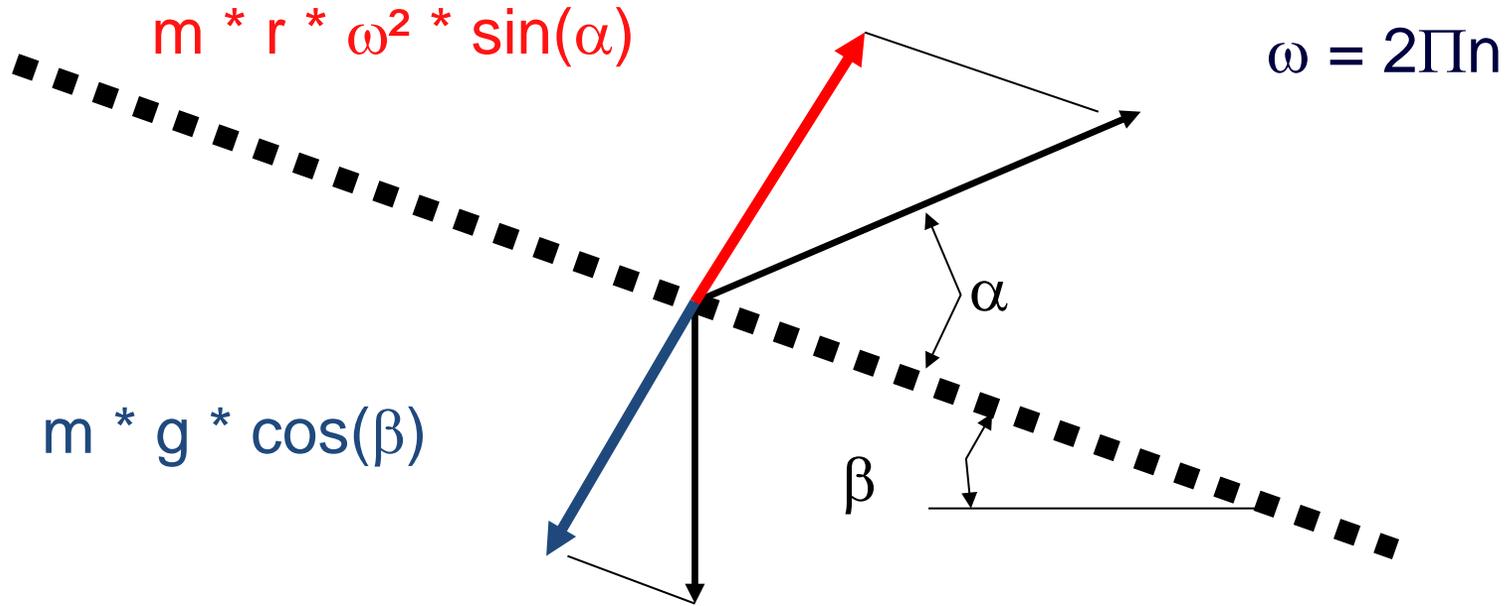
$$a = \frac{c}{2}$$

Where: a = amplitude (mm) c = course (mm)
 n = machine rotation (rpm) W = angular speed ($\frac{1}{s}$)
 K = screening factor (g)



Basic Screening Theory

Screen Index (K_v)



$$K_{v} = \frac{r * \omega^2 * \sin(\alpha)}{g * \cos(\beta)} = K \frac{\sin(\alpha)}{\cos(\beta)}$$





Basic Screening Theory

Screen Index (Kv)

Comparison between linear and circular movements with
5mm amplitude and 850 RPM (K = 4g)

**Fator de peneiramento
do material Kv
Amplitude 5mm e 850 rpm**

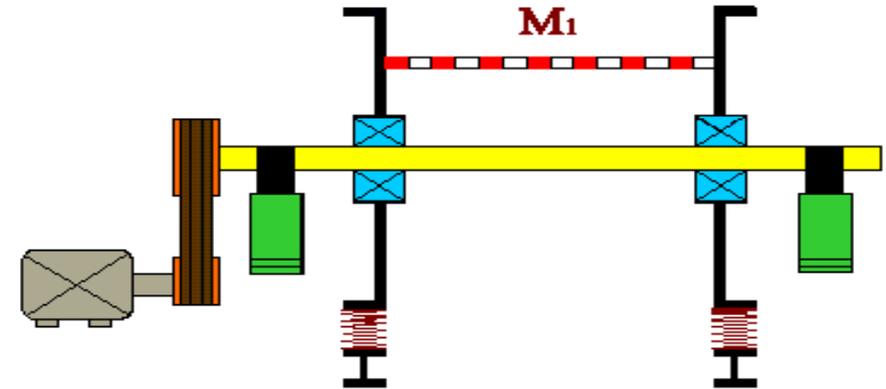
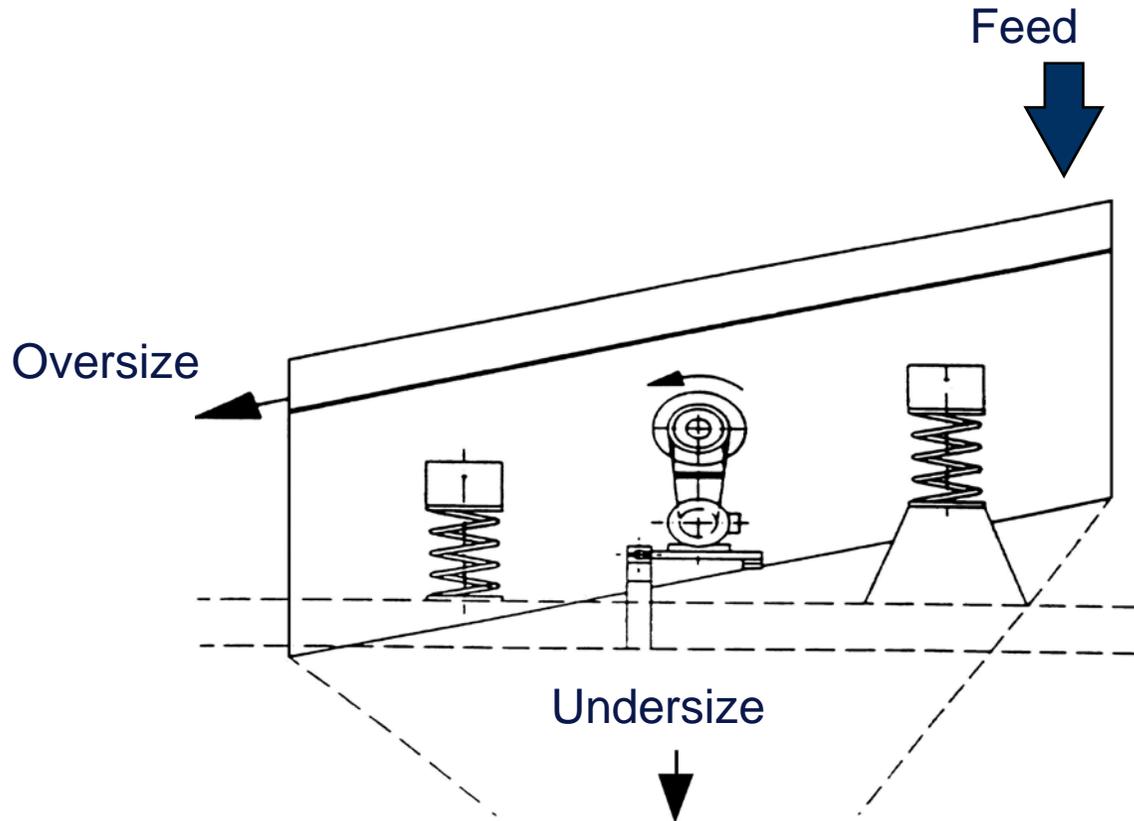
$$K_v = \frac{r * \omega^2 * \sin(\alpha)}{g * \cos(\beta)} = K \frac{\sin(\alpha)}{\cos(\beta)}$$

	INCLINAÇÃO	Kv
MOVIMENTO CIRCULAR	20°	4,26
	0°	2,83
MOVIMENTO LINEAR	5°	2,84
	10°	2,87



Basic Screening Theory

Free Circular Vibration



Characteristics:

- Variable amplitude
- Efficiency depends on the load
- Adjustable frequency and amplitude
- Cut sizes ~ 2,0- 150 mm
- Simple and versatile



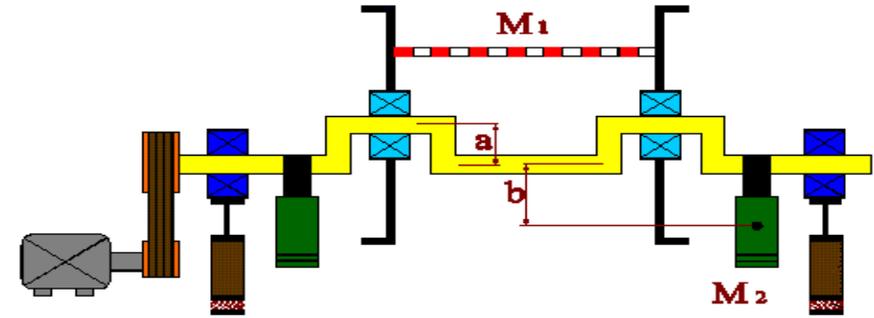
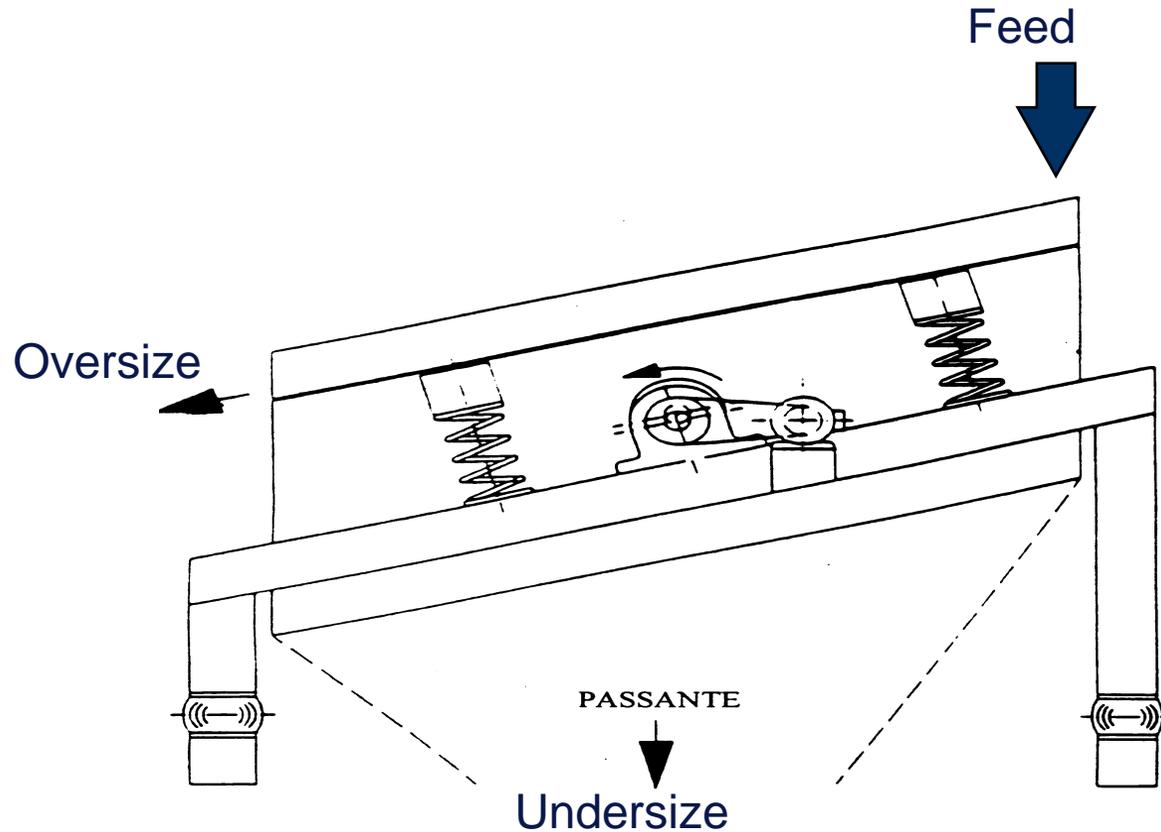
Basic Screening Theory

Free Circular Vibration



Basic Screening Theory

Eccentric Circular Vibration



Characteristics:

$$M_1 \cdot a = M_2 \cdot b$$

- Constant amplitude
- Independent load operation
- Clog free operation
- Minimal vibration transference to the frame
- Cut size until approx. 300 mm
- More efficient classification



Basic Screening Theory

Eccentric Circular Vibration

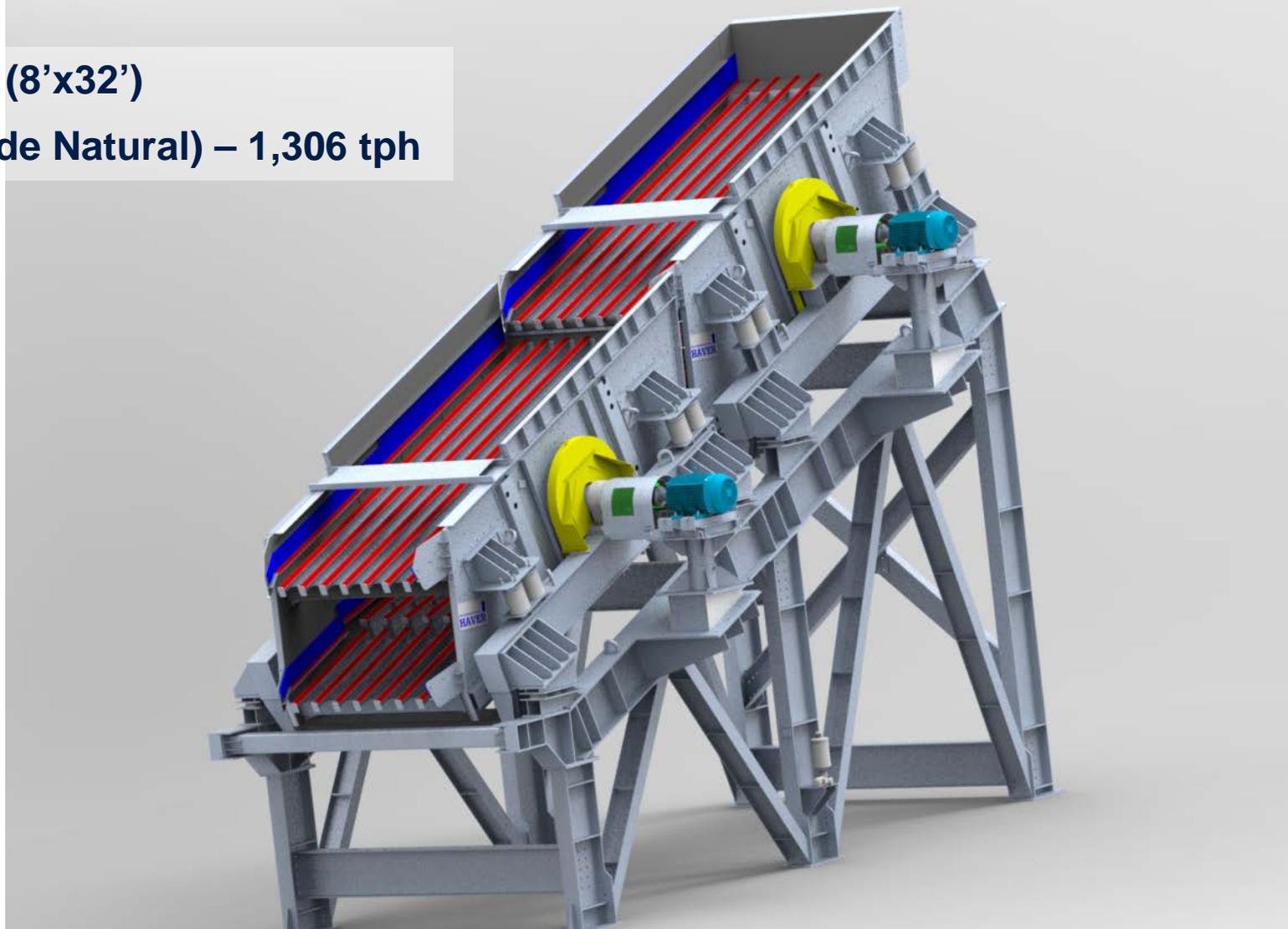




Natural Moisture Screening

F-CLASS T D 2440x9760 (8'x32')

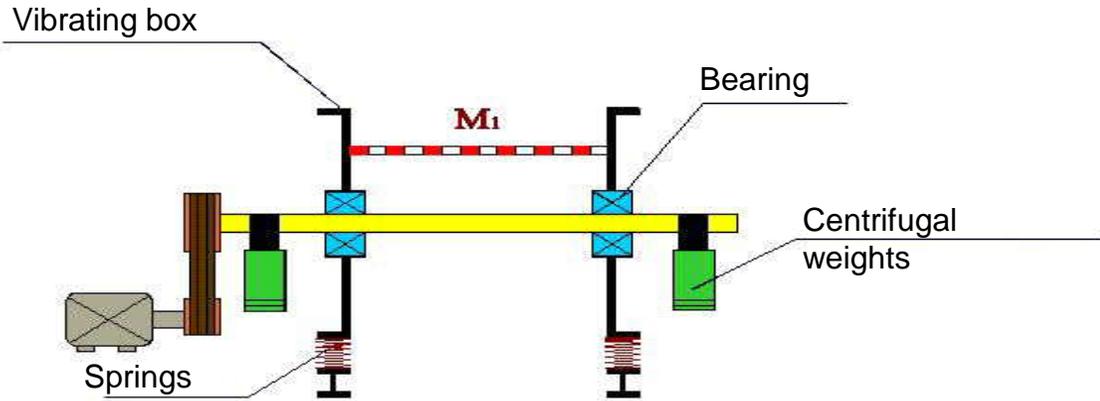
Minério de Ferro (Umididade Natural) – 1,306 tph



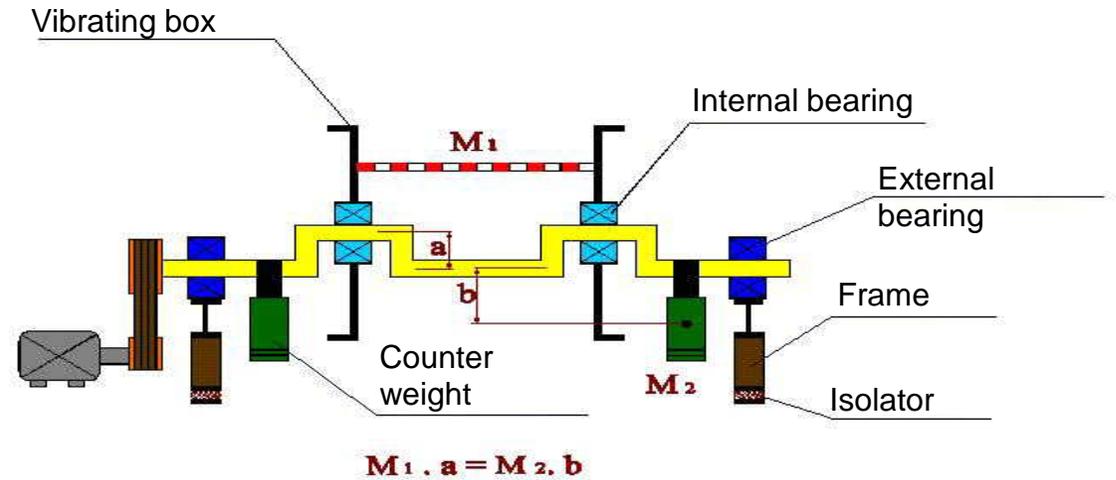
Natural Moisture Screening

Comparison between Free and Eccentric Circular Drives

Free Circular Drive



Eccentric Circular Drive





Natural Moisture Screening

Types of Movement





Natural Moisture Screening

MODULAR ECCENTRIC Vibrating Screens for NATURAL MOISTURE

F-CLASS TD 2440x9760 (8'x32')

Iron Ore with 12% moisture

+50 unidades



Peneira Excêntrica
2440 x 9760 mm





HAVER & BOECKER NIAGARA SCREENING MEDIA



Ty-Deck – Polyurethane Screen Media

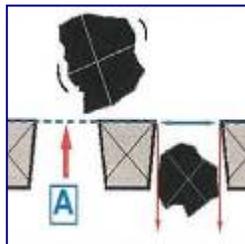
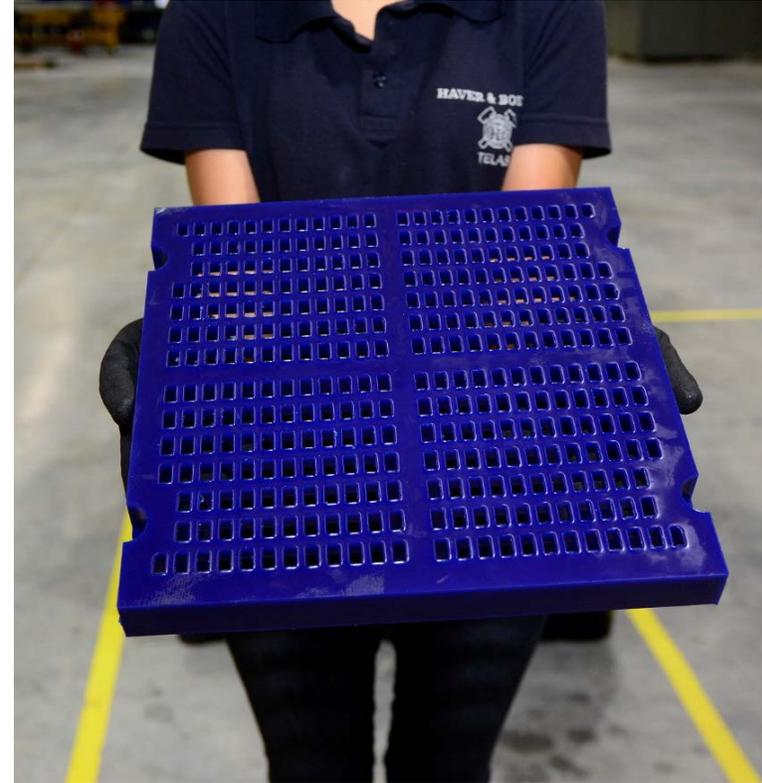
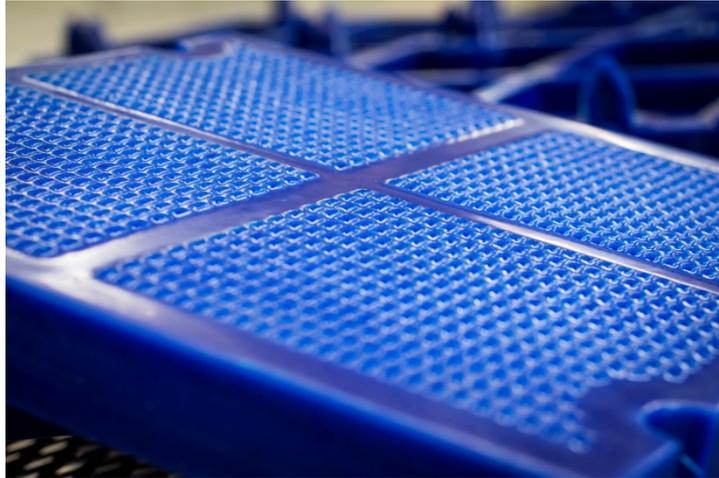




Ty-Deck – Polyurethane Screen Media

Productive Capacity

11.000 panels/month



SELF-CLEANING effect
due to conical opening

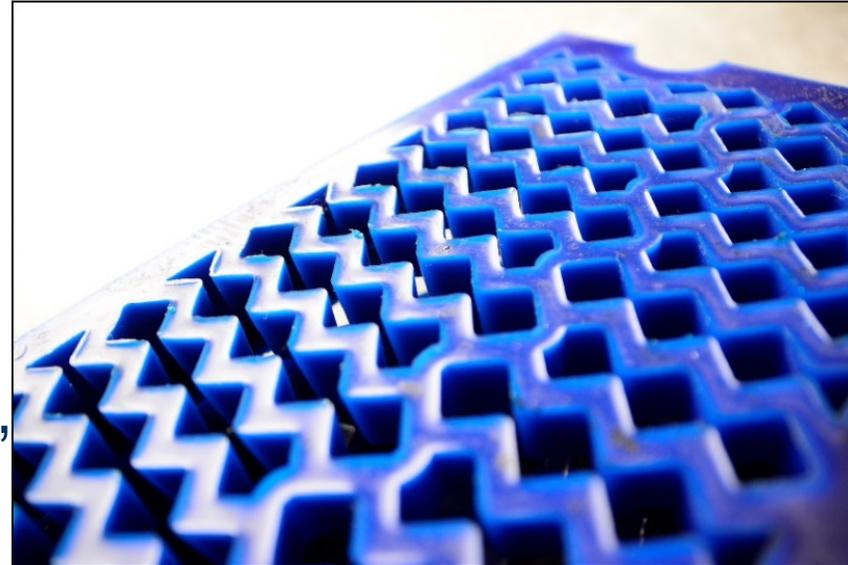
Different HARDNESS
Different fastening systems
Panels with high DURABILITY



Ty-Deck – Polyurethane Screen Media



- Hexagonal opening



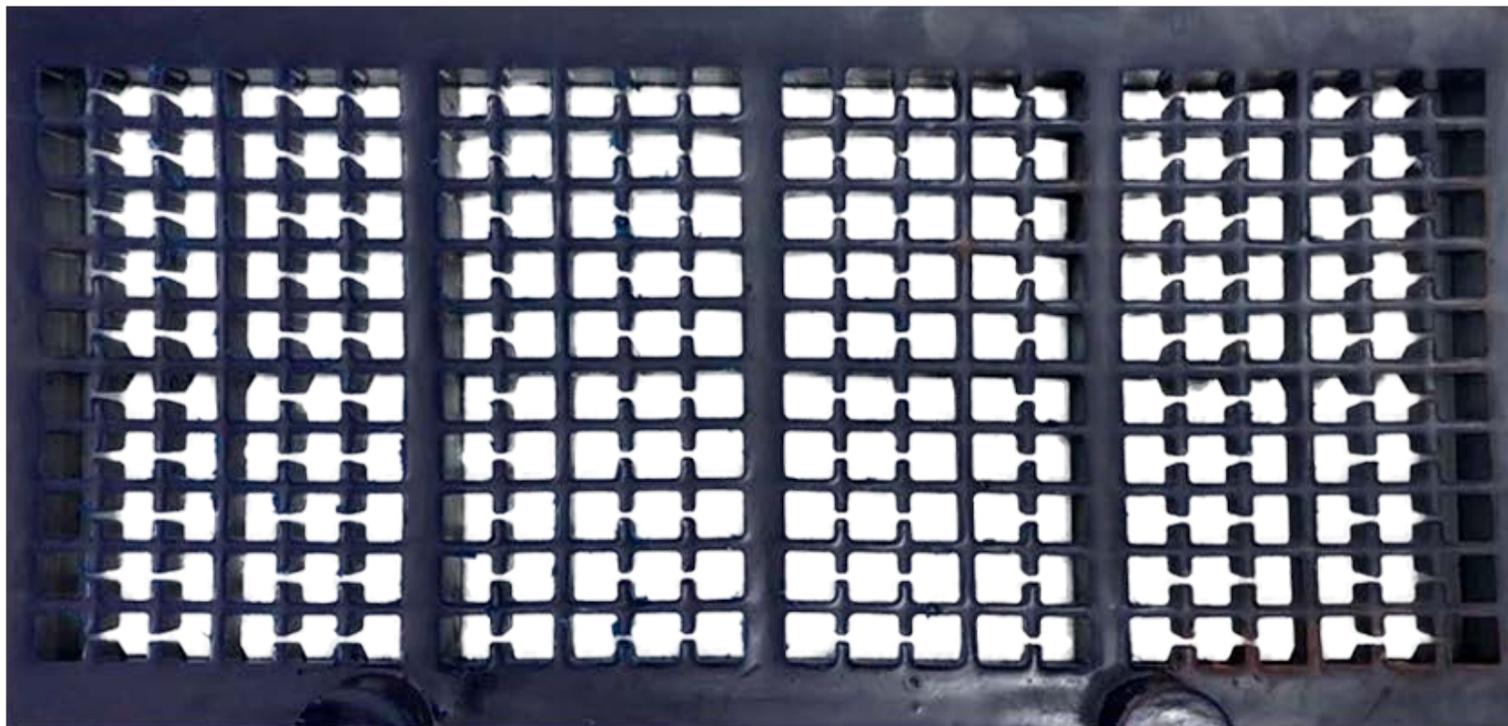
- Opening “Z”

SELF CLEANING SCREENING MEDIA



Ty-Deck Ultra

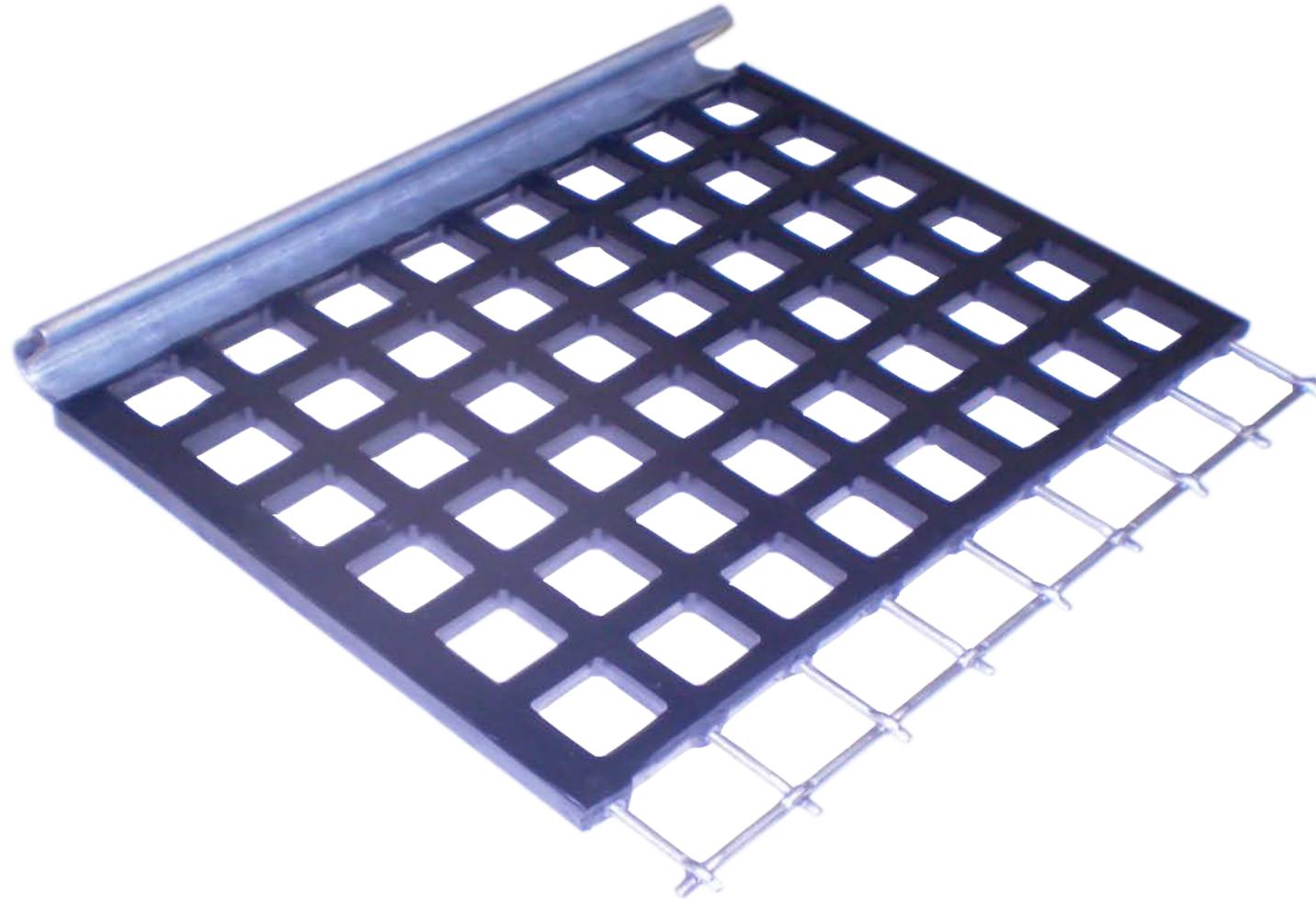
- Self Cleaning Screen Media
- Suitable for screening in Natural Moisture applications





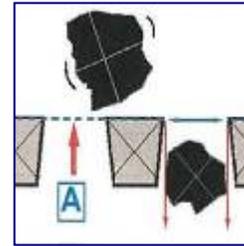
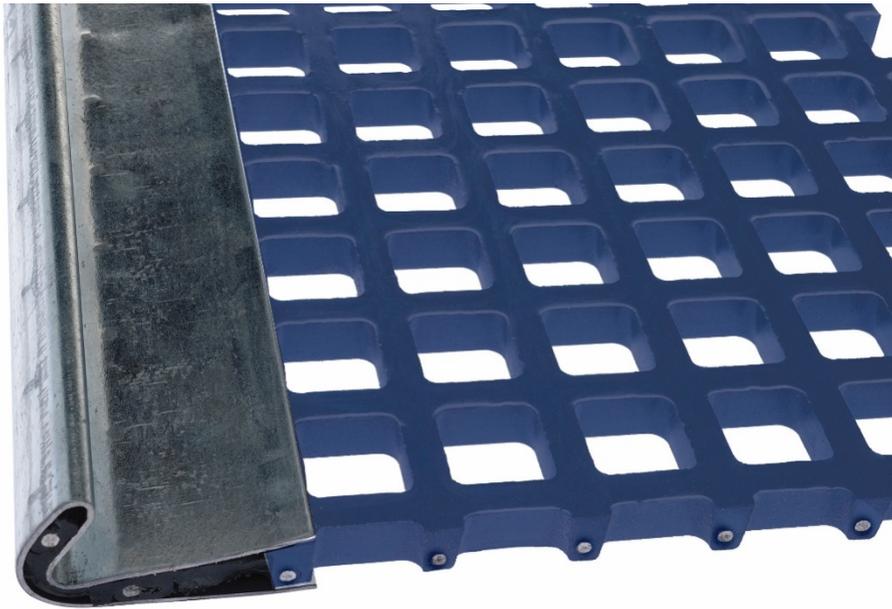
Ty-Wire® - Telas Híbridas

Screen Media developed for natural Moisture Applications





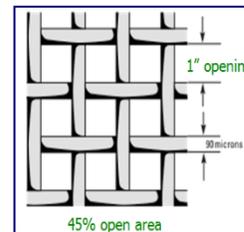
Ty-Wire® - Telas Híbridas



SELF CLEANING
effect due to conical
opening



Special formulation
of the polyurethane



Hybrid design offers
greater screening
efficiency



Ty-Wire® - Telas Híbridas

- Solution for Wear Problems
- Solution for BLINDING effect

Before



After





Ty-Finger

High-performance Self-Cleaning Screen Media





HAVER & BOECKER



Thank you!

HAVER & BOECKER

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