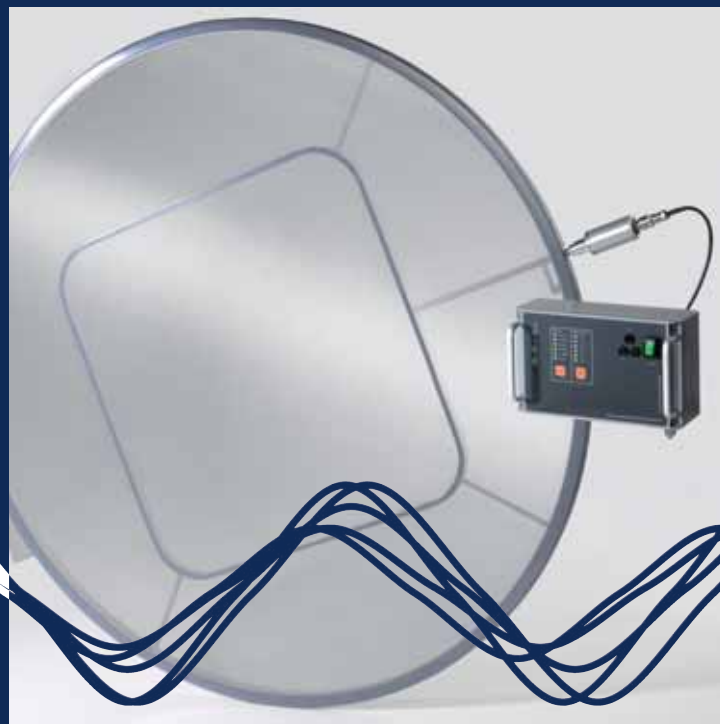


**HAYER & BOECKER**



**Information**



**HAYER**  
**Ultrasonic Screening Systems**  
**with Frequency Variation**

# Your one-stop resource for ultrasonic screening systems with frequency variation

**HAYER & BOECKER**, a leading manufacturer of high-precision wire cloth and screens and **ARTECH Ultrasonic Systems AG**, a subsidiary of Crest-Holding and specialist in ultrasound technology, are collaborating to provide custom-made ultrasonic screening systems with frequency variation.

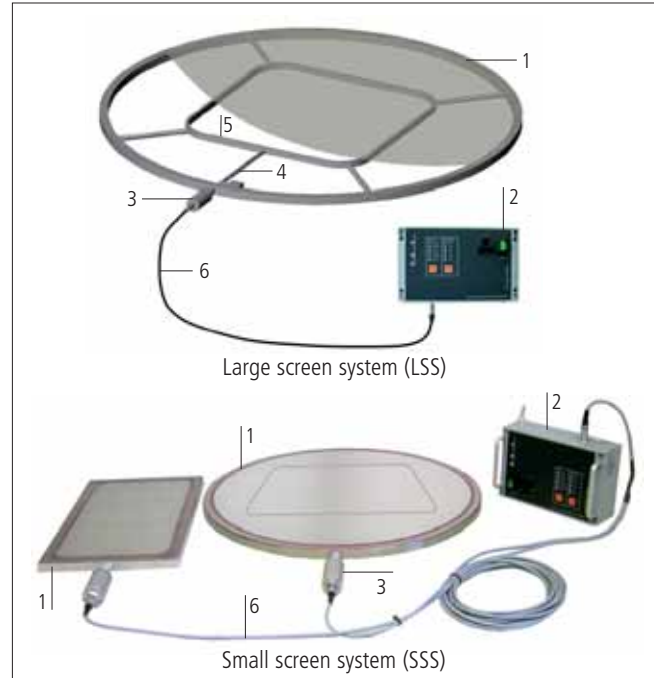
## HAYER-ARTECH-complete screening system

HAYER-ARTECH complete screening systems are custom-made for existing screening machines. They are conceived and designed as “large or small screening systems” (LSS or SSS). They consist of the following components:

- 1 Pre-tensioned screens
- 2 Generator
- 3 Ultrasonic converter
- 4 Feeding sound conductor
- 5 Screen sound conductor
- 6 Insulated HF cable, support elements if applicable

## Why ultrasonic screening?

- delivers efficient sifting of powders with split cuts of  $\leq 300 \mu\text{m}$
- improves throughput
- helps the breaking down of agglomerates
- reduces amount of excessive grain
- ensures long-term cleaning effect



## How do ultrasonic screens work?

The generator converts electrical energy into high-frequency energy which is then converted to mechanical energy by the converter.

The sound waves cause the screen frame or sound conductor to oscillate at high-frequencies. These oscillations are transferred to the screening cloth where they are evenly distributed.

The oscillations of the screening cloth reduce the frictional resistance between the grains and the screen. This reduces the tendency towards blockage, resulting in increased throughput.

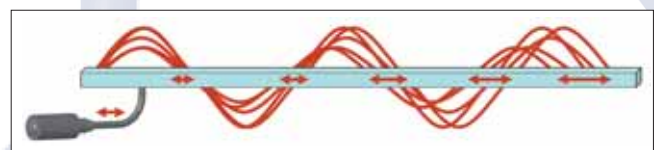
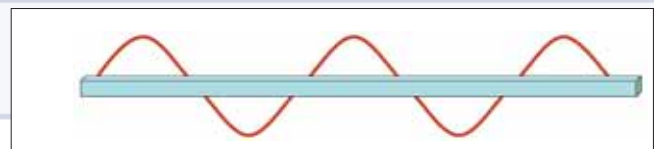
## Frequency variations make a difference!

### The stimulation principle

Unlike the resonance method, the ARTECH frequency variation method stimulates the connected screen frames with a continuously varying frequency. A continuous resonance stimulus with uninterrupted high resonance amplitudes is prevented. This leads to considerably less mechanical wear on the screens and significantly reduced heating (no hot spots). In contrast to resonance excitation, phase regulation is not used. Phase-regulated systems require sharp resonances with clear phase zero crossing.

ARTECH frequency variation ensures oscillations so that the converter also oscillates without touching parts or resonances.

ARTECH frequency variation – a robust and reliable method because it always oscillates – regardless of the mechanical setup



Excitation by means of Artech frequency variation

## Frequency Variation Generators

Frequency variation generators provide working frequencies in the range of 33 – 37 kHz, and they are perfectly suited to excite complex mechanical structures. The system automatically searches for the optimum working point. The frequency variation using the frequency bandwidth mentioned above does not require any individual adjustment to the mechanics (“Plug and play” concept).

Other features:

- Different power settings for excitation of diverse screen surfaces
- Simultaneous excitation of screens with a generator is possible
- Developed for operation in harsh and damp environments
- An external PC can be used for all operating functions and parameter settings
- Digital inputs and outputs
- Digital error coding
- Frequency analysis of the acoustic system is possible



Frequency variation generator DGS35

## Converter

The converters are developed for the excitation of mechanical structures of various shapes and sizes. The installation (incl. HF cable) is situated outside the powder flow and screen body, which eliminates material caking.

- ATEX-certified
- dust-proof
- IP 65



Converter C35-SD2

## Even ultrasound distribution by means of frequency variation

The excitation of the frequency range of a screen comes with an advantage in that not only the frequency range of the interior sound conductors but also the frequency range of the frame are excited, as the frame is connected to the interior sound conductor.

Even the coupling members between the square inner ring and the frame are oscillated by means of the multi-frequency excitation. This distributes the ultrasound evenly over the screens to the frame.



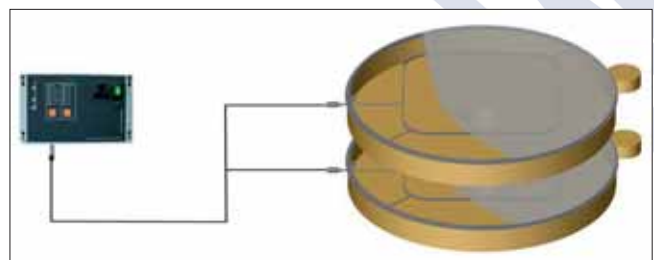
Screen with converter and rectangular cloth sound conductor

## Frequency Variation for Multi-systems

The economy of frequency variation becomes apparent with very large screens or screening machines with several screen decks. The process allows for the simultaneous excitation of several ultrasonic converters by a single generator.

The variation of the frequency ensures that the frequency range of every excited screen is covered.

This means that the inner rings or multiple connected inner rings of large screens can be fitted with several ultrasonic converters that are excited by a generator. It also means that separate screens, e.g. in screening machines with two or more decks, can be excited at the same time.



Multiscreen excitation for multiple screens, also suitable for multiconverter excitation of large frames or for using two screen decks.

## HAYER screens with ARTECH frequency variation

We deliver ready-to-install screening media for all types of vibrating screens equipped with individually configured ARTECH sound conductor systems precisely tensioned with HAYER stainless steel screens. We equip existing screens with the corresponding sound conductors.

- Round screens up to 2,650 mm
- Rectangular screens up to 2,650 x 3,100 mm

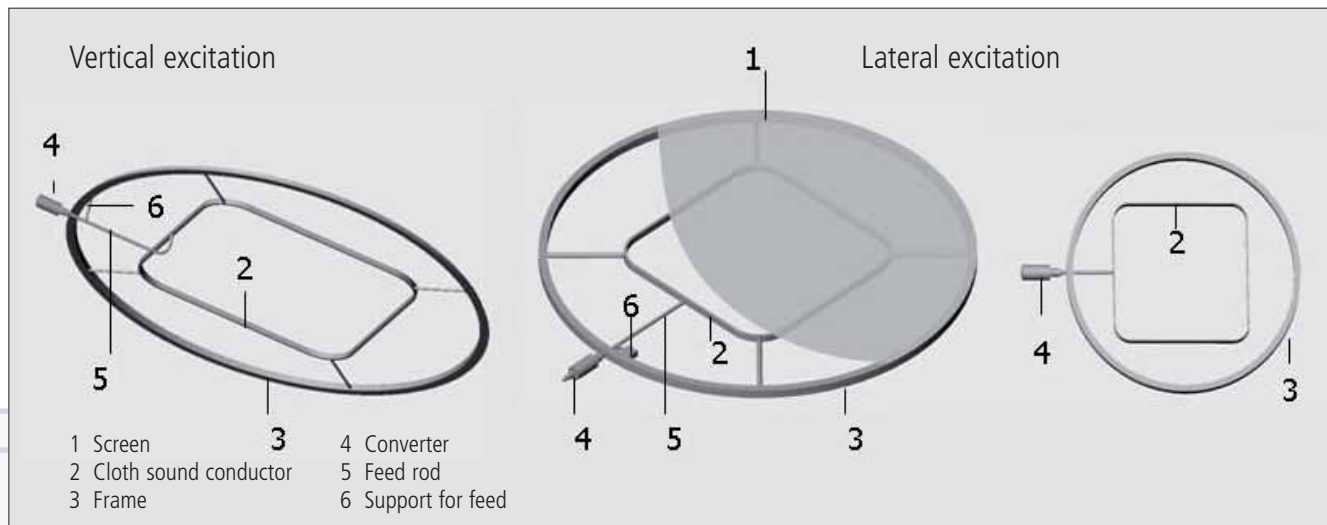
In addition we provide the HAYER re-screening service for your used screens. If you send your pre-cleaned screen to us, we will tension it as you require.

The optimum tensioning of the screen and an individual adaptation of the ultrasonic system to customer requirements are crucial for a maximum service life and the best possible effect of the screen and the screening machine. The tensioning devices we have developed guarantee a reliable, uniform tensioning of the wire screen. You can receive a test report showing the measured tension values of the screen.



## Adaptation to the installation situation

Depending on the type of screen, material, and screening machine, the ultrasonic system is individually connected to the screen so that optimum screening results combined with a high service life is achieved.



Vertical and lateral screen excitation with ARTECH frequency variation

## Ultrasonic Frequency Variation for HAYER Test Sieves

HAYER test sieves can be equipped with ARTECH frequency variation systems with a special quick-release fastener.

The test sieve frame is excited with the help of the clamping ring and the oscillations are distributed evenly over the test sieve cloth.



# HAYER Ultrasonic Screens with ARTECH Frequency Variation



## Your numerous advantages!

- No “hot spots” on the resonator or screen since the resonance frequencies are covered only briefly
- The caking on of powder is prevented with temperature-sensitive powders without loss of throughput
- Longer time periods between the screen’s cleaning cycles
- Longer service life times of the screen mechanics and screen
- No tuning of the ultrasonic mechanics necessary – the current screen mechanics can be retrofitted and tensioned with the ARTECH sound conductor system problem-free
- Frequency variation makes possible the excitation of several screens by a generator – this reduces the necessary investment
- Frequency variation excites the entire structure including the screen, which makes possible the distribution of the sound field over the entire surface, which allows for a high throughput
- Considerable process safety with forced oscillations without phase regulation, the mechanics always oscillate even without resonances – no possibility of generator overload
- Converter and HF cable are located outside the powder flow, no caking on the converter is possible
- ATEX certificate for ATEX Zone 20 inside the screening machine as well as for ATEX-Zone 22 outside the screening machine are available

**HAYER ultrasonic screens with ARTECH frequency variation:  
One System – Many Advantages!**

# HAVER & BOECKER

## Weaving Ideas – All over the World



### Belgium:

Haver Belgium S.A.  
Rue des Gaillettes 9  
B-4651 - BATTICE  
Tel.: +32-87-69 29 60, Fax: +32-87-69 29 61  
E-Mail: [hbsa@cybernet.be](mailto:hbsa@cybernet.be)

### France:

HAVER & BOECKER Toiles Métalliques  
7, Rue Sainte Catherine  
F-24100 BERGERAC  
Tel.: +33-5-53 24 93 13, Fax: +33-5-53 24 95 99  
E-Mail: [haver.toiles@wanadoo.fr](mailto:haver.toiles@wanadoo.fr)  
Internet: [www.les-tissus-metalliques.com](http://www.les-tissus-metalliques.com)

### Spain:

HAVER & BOECKER Telas Metalicas  
Avda. Les Bobiles, 7  
Casa 2  
E-08850 GAVA (Barcelona)  
Tel.: +34-93-6 62 63 55, Fax: +34-93-6 62 90 59  
E-Mail: [haverboecker@telefonica.net](mailto:haverboecker@telefonica.net)  
Internet: [www.tejerideas.com](http://www.tejerideas.com)

### Great Britain:

H & B Wire Fabrications Ltd.  
30-32 Tatton Court  
Kingsland Grange, Woolston  
GB-WARRINGTON, Cheshire WA1 4RR  
Tel.: +44-19 25-81 95 15, Fax: +44-19 25-83 17 73  
E-Mail: [sales@hbwf.co.uk](mailto:sales@hbwf.co.uk)  
Internet: [www.hbwf.co.uk](http://www.hbwf.co.uk)

### U.S.A.:

W.S. TYLER  
8570 Tyler Boulevard  
USA-MENTOR, OH 44060  
Tel.: +1-440-974-1047, Fax: +1-440-974-0921  
E-Mail: [wstyler@wstyler.com](mailto:wstyler@wstyler.com)  
Internet: [www.wstyler.com](http://www.wstyler.com)

### U.S.A.:

W.S. TYLER Screening Media  
Peach Orchard Road  
USA-SALISBURY  
NORTH CAROLINA 28144  
Tel.: +1-704-633-53 84, Fax: +1-704-633-5392  
E-Mail: [wstyler@wstyler.com](mailto:wstyler@wstyler.com)  
Internet: [www.wstyler.com](http://www.wstyler.com)

### Canada:

W.S. TYLER CANADA  
225 Ontario Street  
CAN-ST. CATHARINES, Ontario L2R 7B6  
Tel.: +1-905-688-2644, Fax: +1-905-688-4733  
E-Mail: [wstsales@wstyler.on.ca](mailto:wstsales@wstyler.on.ca)  
Internet: [www.wstyler.on.ca](http://www.wstyler.on.ca)

### Canada:

W.S. TYLER CANADA  
14436-121 A Avenue  
CAN-EDMONTON, Alberta T5L 4L2  
Tel.: +1-780-447-1528, Fax: +1-780-447-1925  
E-Mail: [wstsales@wstyler.on.ca](mailto:wstsales@wstyler.on.ca)  
Internet: [www.wstyler.on.ca](http://www.wstyler.on.ca)

# HAVER & BOECKER

WIRE WEAVING AND ENGINEERING WORKS

Ennigerloher Straße 64 • D-59302 OELDE • Germany

Phone: +49- 25 22-300 • Telefax: +49-25 22-30 404

E-Mail: [dw@haverboecker.com](mailto:dw@haverboecker.com) • Internet: [www.haverboecker.com](http://www.haverboecker.com)

Postal Address: HAVER & BOECKER • D-59299 OELDE • Germany