

MOBIREX MR EVO2 | **KLEEMANN** 



MOBIREX MR EVO2 | PERFORMANCE FEATURES

# **MOBIREX MR EVO2**

The powerful all-rounder.

The machines in the MOBIREX EVO2 line are powerful and versatile in use: both in natural stone as well as in the recycling of mineral raw materials, they guarantee first-class product quality and achieve impressive throughputs.

Whether in a quarry or on a building site - the MOBIREX EVO EVO2 plants crush stone so efficiently that the grain shape, grain size distribution and cleanness comply with the strict standards for concrete and asphalt aggregates.

In spite of their comparatively compact crusher inlet widths of 1,100 mm or 1,300 mm (MR 110(i) / 130 (i) EVO2), they achieve throughputs that were previously only possible with considerably larger crushing plants. This outstanding cost-

effectiveness and performance is achieved thanks to a multitude of technical highlights.

#### Mobile power packs

The plants excel with their simple transport, short set-up times for initial operation and maintenance, and high machine availability. The impact crushers from the EVO2 line are ideal for short-term applications at changing locations.



MOBIREX MR EVO2 | HIGHLIGHTS

# THE HIGHLIGHTS

Perfectly equipped.

#### 01 Feeding unit

> Large feeding unit, hydraulically foldable and self-locking

#### 02 Prescreening

> Effective primary screening through independent double-deck prescreen

#### 03 CFS (Continuous Feed System)

> Continuous crusher utilisation thanks to CFS

#### 04 Crusher unit

> Crusher unit with innovative C-shape rotor ledges for top product quality

#### 05 Drive

> Efficient and powerful D-DRIVE diesel-direct drive

#### 06 Operating concept

- > Easiest possible operation with the SPECTIVE operating concept
- > With SPECTIVE CONNECT: all important information is available directly on the smartphone

#### 07 Post screening unit

> High-performance post screening units (single/double deck) with extra-large screening surface

#### Material flow

- > Optimised material guidance for high throughput
- > Line coupling for process- and safety-related linking

#### > Transport

> Simple transportation and fast set-up

#### > Safety & ergonomics:

> Fast and ergonomic servicing thanks to excellent accessibility

#### > Environmentally friendly solutions

- > Reduced dust and noise
- > Low fuel consumption





KLEEMANN SUSTAINABILITY describes innovative technologies and solutions which are consistent with the sustainability objectives of the WIRTGEN GROUP.

MOBIREX MR EVO2 | **FEEDING UNIT** 

# **WELL THOUGHT-OUT FEEDING UNIT**

Generously dimensioned and extremely robust.

#### The plants in the MOBIREX EVO2 line have feeding units with large hopper volumes.

The hoppers are hydraulically foldable and lockable - simply and conveniently from the ground. Fast set-up and maximum operator safety are guaranteed. For a long service life,

the hopper walls are made of robust wear-resistant steel. The optional hopper extension enables concenient loading via a wheel loader.



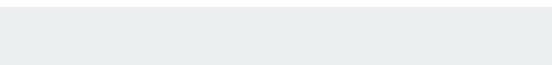




MR 110(i)/ 130(i) EVO2

up to 350 / 450 t/h Feed capacity approx. approx. 4.4/5 m<sup>3</sup>
Hopper volume

approx. 8/9 m<sup>3</sup>
Hopper volume with hopper extension





# Optimised output capacity - thanks to well-prepared feed material

The composition of the feed material and the feed size significantly influence the output capacity. To guarantee trouble-free and low-wear operation, the feed material should therefore be prepared as well as possible.

#### Tips on optimal loading

- > Take note of the size and edge length of the material
- > Select feed size depending on the final grain size and max. permissible crushing ratio
- > Sort out any uncrushable material, e.g. steel beams, cable, wood, films/foils
- > Guarantee uniform loading of the plant an overfilled feed hopper and a continuously empty feed hopper can lead to increased wear

#### **KLEEMANN >** PROCESS KNOWLEDGE

In many cases, feed capacity, crushing capacity and plant performance are treated synonymously or are mixed up. What's what?

#### Crushing capacity

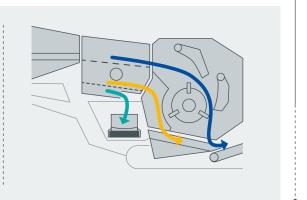
= quantity produced by the crusher \_\_\_\_

#### Feed capacity

- = crushing capacity + primary screening capacity -
- + bypass capacity —

#### Plant performance

= crushing capacity — + bypass capacity —



MOBIREX MR EVO2 | PRESCREENING + SIDE DISCHARGE CONVEYOR 10 | 11

# **EFFECTIVE PRESCREENING**

Better results and less wear.

For effective prescreening of the feed material, the MOBIREX EVO2 impact crushers are equipped with an independently vibrating double-deck prescreen.

Wear in the crushing chamber is reduced by diverting the medium grain directly onto the vibrating extractor.

The screen surfaces in the upper and lower deck can be changed easily and safely.



Powerful 11.2 kW Prescreen drive output









#### The advantages of active prescreening

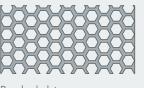
- > Increase in final product quality through discharge of content of fines via the side discharge conveyor
- > The feed material is largely freed of sticky or cohesive material and incrustation in the crusher or the vibrating extractor can be avoided
- > Effective reduction in wear and increase in output are achieved by redirecting medium grain through the large crusher bypass device

#### **KLEEMANN >** PROCESS KNOWLEDGE

#### Optimum set-up of prescreening

In order to tune the prescreening ideally to the material or application, the frequency of the prescreen can be adjusted steplessly. The correct selection of the screen surface is also important. Various punched plates or slotted grates are available to the upper deck; different clear mesh sizes are available for the lower deck.

The result: high product quality, maximum plant performance and less wear.

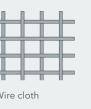


Punched plate



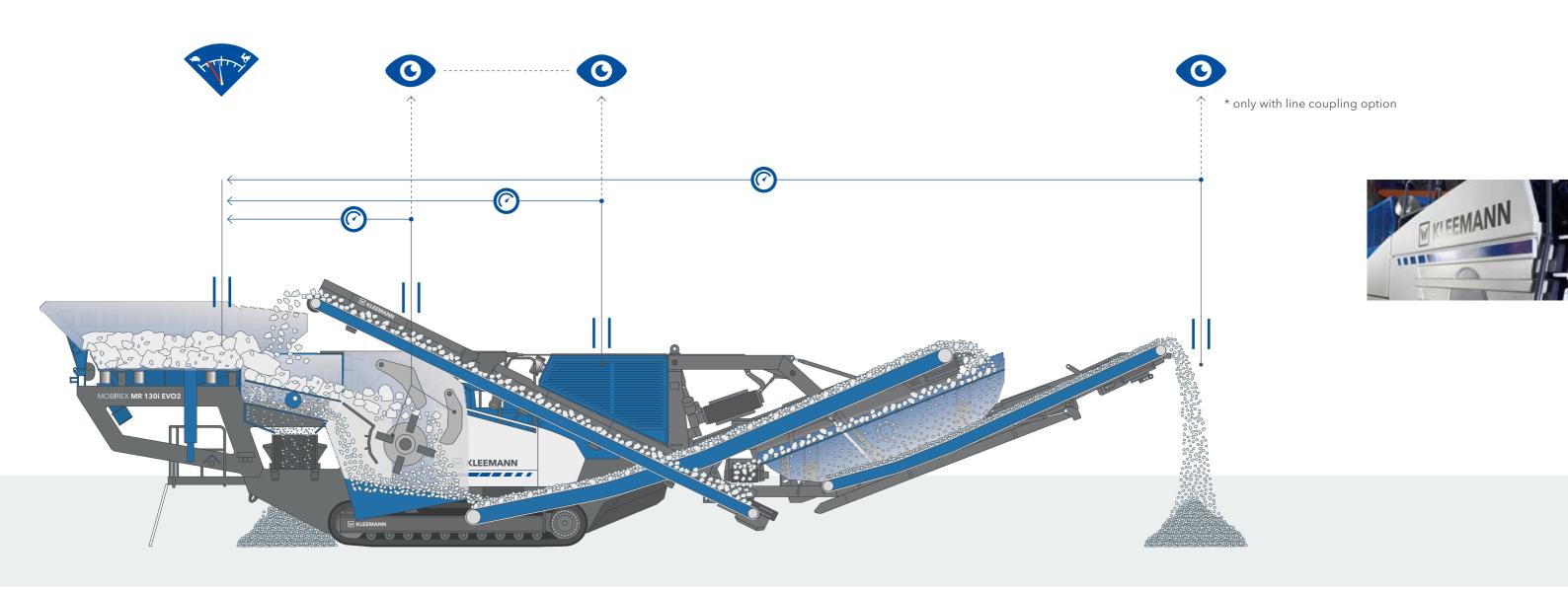


Slotted grate



# **CONTINUOUS FEED SYSTEM (CFS)**

For a continuous crusher feed.



#### Uniform loading is indispensable for a good final product, optimum throughput and low wear.

To ensure that the crushing chamber is always filled evenly, the continuous feed system (CFS) monitors the load on the rocker and rotor as well as engine utilisation.

The CFS independently regulates the frequency of the vibrating feeder and prescreen. A backlog on the prescreen is therefore avoided and crusher utilisation is optimised. When the

crushing chamber is free again after overloading, material transport can be continued without a delay.

The CFS facilitates the work of the operator because the machine automatically regulates a homogeneous material flow, therefore ensuring optimum loading of the crusher.

#### **KLEEMANN** > PROCESS KNOWLEDGE

The CFS controls the vibrating chute speed so that the material on the prescreen does not pile up too high. Fine content can be well screened out before it runs through the crushers.

**Result:** The crusher now only has to deal with the material that really needs to be crushed!

Optimal tuning to the application = high throughput + low wear

MOBIREX MR EVO2 | CRUSHER UNIT

# **POWERFUL CRUSHER UNIT**

The heart of the machine.

#### Powerful crusher unit for high crushing capacity and throughput.

The impact crusher's crusher unit is the core element of the machine. The inlet geometry guarantees optimum feed behaviour of the material and ensures high throughputs.





MOBIREX MR EVO2 | CRUSHER UNIT 16 | 17

#### **01 Crusher geometry**

Thanks to its special inlet geometry, the MOBIREX EVO2 plants' crusher unit can draw in the material perfectly and therefore guarantee high throughputs. The crusher inlet cover and the upper impact toggle in the inlet area can be lifted hydraulically by radio remote control - material bridging can therefore be effectively reduced.

Result: high throughput combined with high reliability.

#### **02 Rotor ledges**

Thanks to the cleverly devised rotor ledge clamping system and the innovative Lock & Turn safety system, rotor ledges can be conveniently removed by lifting out. Rotor ledge replacement is therefore extremely simple and safe.

Increased product quality thanks to C-shape rotor ledges for better impact over a long period.













#### 03 Gap setting

To make adaptations to the material or the desired final grain size, simple crushing gap adjustment is indispensable. On the MOBIREX EVO2 plants, the crushing gap adjustment can be made fully hydraulically via the touch panel from the ground even with the rotor running! A real bonus for efficiency and productivity.

Rule of thumb: The upper crushing gap should be approx. 30 % of the feed size and the lower one, approx. 80 % of the desired final grain size.

#### 04 Overload system

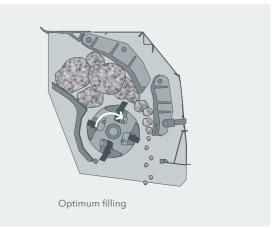
Overload situations at selected points arise due to hard material or uncrushable foreign materials in the feed material. Thanks to the effective overload system, the lower impact toggle opens in the evenof of uncrushable material and then moves back automatically to the preset value. As a final safety feature, a bursting disc is installed to protect the crusher.



#### **KLEEMANN > PROCESS KNOWLEDGE**

#### Correct loading ensures the best results:

- > The optimal fill level of the impact crusher should be guaranteed.
- > Continuous overfilling results in increased wear and can cause frequent activation of the overload protection, leading to material congestion.
- > The maximum feed size of 80 % of the feed opening needs to be observed.
- > The gap setting ratio of the impact toggles should be set correctly.



MOBIREX MR EVO2 | **DRIVE** 18 | 19

# **INNOVATIVE D-DRIVE CONCEPT**

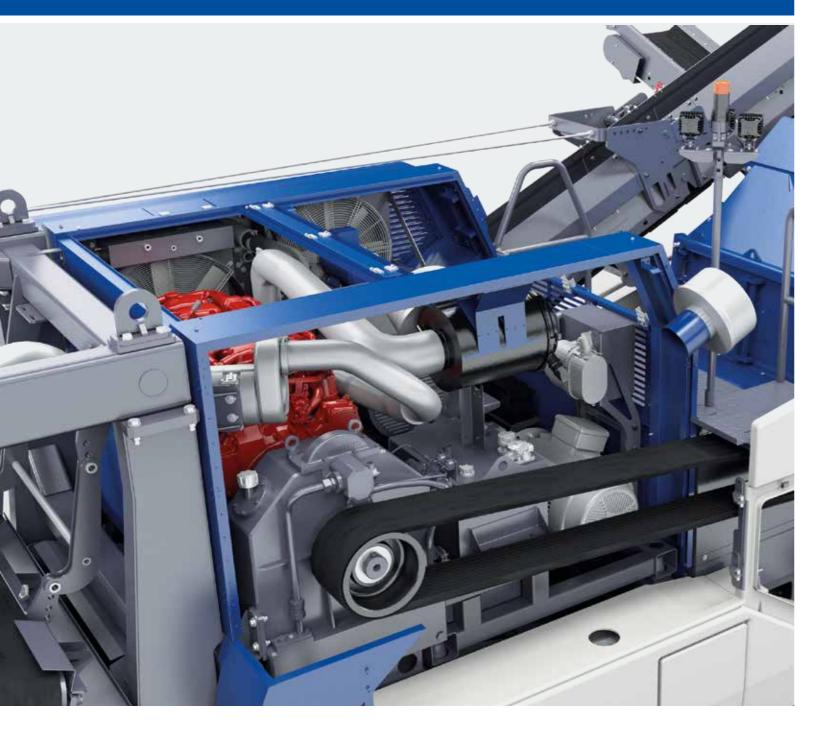
Impressive performance - with the best possible consumption values.

**Diesel-direct electric** 

up to 371 kW Output

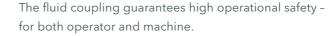


up to 30 % less consumption compared to hydraulic drives



#### The machines in the MR EVO2 line feature an innovative D-DRIVE diesel-direct electric drive concept and are both powerful and economical.

Equipped with an efficient, powerful diesel engine with fluid coupling, the jaw crushers from the EVO line impress with extremely low efficiency losses: the crusher direct drive provides maximum power directly at the crusher. All secondary drives - for example, for operation of the prescreen, vibrating chutes and conveyor belts - are driven electrically.









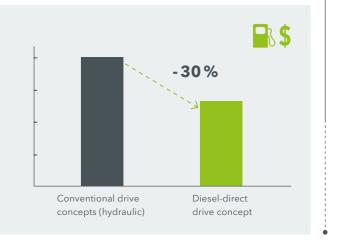


### KLEEMANN SUSTAINABILITY

#### Innovative concept: Economical, safe and resource-saving.

Diesel-electric drives have advantages over hydraulic drives not only with regard to lower fuel consumption. The machines also require significantly less hydraulic oil, which positively affects the costs of oil changes and saves resources. In the event of leaks, the risk of contamination and environmental pollution is also lower.

Furthermore, electrical components are significantly less susceptible to wear than hydraulic hoses - a further positive effect that results in longer service lives and lower running costs!



20 | 21 MOBIREX MR EVO2 | OPERATING CONCEPT

# **SPECTIVE INTUITIVE OPERATING CONCEPT**

For simple operation.

With the increasing demands that are placed on modern crushing plants, their complexity also increases. At the same time, the technology must be safe and as simple as possible to master - without requiring long training sessions. This is precisely where the strength of the SPECTIVE operating concept lies.

The MR 110(i) EVO2 and MR 130(i) EVO2 impact crushers can the touch panel and remotely using the SPECTIVE CONNECT be operated easily and intuitively - at the machine itself via

digital solution.







#### 01 SPECTIVE touch panel

- > The operator is guided step by step through the starting
- > The start screen provides a graphic view of the plant with all adjustable functions at a glance.
- > When the desired function is selected, clear instructions guide users through all operating steps.
- > If a fault occurs, a fault diagnosis appears on the display.

#### **02 SPECTIVE CONNECT**

With SPECTIVE CONNECT, users receive a display of the user interface via smartphone anywhere they may be working - for example, in the excavator or wheel loader. Apart from relevant data such as current speed, consumption value and fill levels, fault messages or warnings are also displayed. In addition, important process and machine data can be summarised in a report and conveniently transmitted.

#### **Everything at a glance with WITOS®**

The WITOS FleetView telematics system supports users with efficient fleet and service management. Information on the operating status of the machines is available independently of location and time. Even users with only one machine benefit from WITOS.

From support for maintenance and diagnostic processes to the targeted control of the machines: the range of services is diversified and ideally complements the WIRTGEN GROUP Smart Service agreements.

#### **KLEEMANN > PROCESS KNOWLEDGE**

#### Always in operation with "Quick Track"

In some applications - for example in road construction - relocation of the crushing plant several times a day is necessary. When this is done, the plant should remain in operating mode so that it is quickly ready for operation once it has been moved. The "Quick Track" option allows this to be controlled conveniently via the remote control - without leaving the operating mode.

Thanks to the time savings (excavator driver does not need to go to the display, change operating mode, machine operation is not interrupted and therefore does not need to be started up again), the machine can continue working fast and productively.



MOBIREX MR EVO2 | MAGNETIC SEPARATOR + POST SCREENING UNIT

# MAGNETIC SEPARATOR AND POST SCREENING UNIT

Effective for the final product.





**1,200/1,400 mm**Wide crusher discharge conveyor

Magnetic separator in two versions

**Classification** of 1 or 2 final grain sizes

Belt scale
Optional



# The crushed material is discharged via the wide crusher discharge conveyor.

To prevent contamination of the final product with ferrous elements, an optional electromagnet or permanent magnet can be installed. Both can be raised and lowered hydraulically by remote control. Material bridging can therefore be very simply broken up and the magnet can always be set to its optimum value.

#### Post screening unit - two versions available

An optional single-deck post screening unit can be used to screen a defined grain size. The large screening surface enables effective screening even at grain sizes below 20 mm. The discharge height is designed for very high stockpile volumes; the oversize grain return conveyor ensures a short material circuit.

The MR 110(i) EVO2 has an additional optional double-deck post screening unit for the production of two classified final grain sizes (with the MR 130(i) EVO2 upon request).

#### **KLEEMANN >** PROCESS KNOWLEDGE

The optional wind sifter guarantees increased material quality, particularly in recycling applications, due to the removal of contamination (e.g. wood and plastic). The air flow can be controlled depending on the material. Manual and sorting work can therefore be reduced. The wind sifter can only be used in conjunction with the post screening unit. With the doubledeck post screening unit, a second wind sifter can be used to sift the medium grain.

MOBIREX MR EVO2 | MATERIAL FLOW

# **OPTIMISED MATERIAL FLOW**

For improved utilisation and high productivity.



The MOBIREX EVO2 plants excel with numerous technical innovations - above all the unique material flow concept used throughout the machine: the system widths across the entire

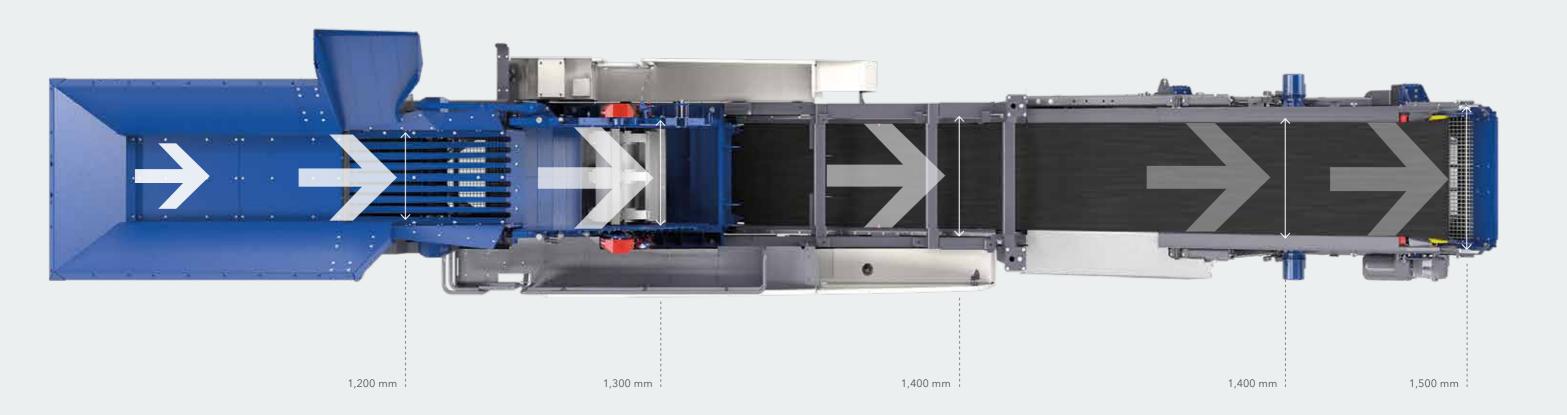
plant are extended in the direction of material flow. The material flow is therefore not narrowed and material bridging can also be effectively avoided.



#### The result:

Higher total throughput and longer service life thanks to reduced wear.

#### MOBIREX MR 130(i) EVO2



MOBIREX MR EVO2 | TRANSPORT

# **SIMPLE TRANSPORT**

For rapid deployment.



The EVO impact crushers are versatile in use and can also be used on narrow building sites, for example in town centres, with any problems. And even if the work location changes frequently, the machine is quick to assemble and disassemble and easily transportable to the next work site thanks to its compact structure and relatively light weight.

The impact crushers from the MOBIREX EVO2 lines demonstrate their advantages with short set-up times: hopper walls

and side discharge conveyors (depending on the configuration option) can be folded hydraulically into operating position.

The post screening units can be easily disassembled for individual transport.







MOBIREX MR EVO2 | SAFETY + ERGONOMICS

# **SAFETY AND ERGONOMICS**

For high operating comfort.

#### The MOBIREX EVO2 plants are easy to operate and convenient to maintain and service.

All machine components are especially easy to access to guarantee trouble-free production, simple operation and fast service. The superior equipment on the plants also increases operating comfort - a spray system at different transfer points and LED lighting of the plant are included in the basic plant configuration. Premium lighting is available as an option.

#### Lock & Turn - outstanding safety system

The "Lock & Turn" system provides the highest level of safety during rotor ledge change and releasing bridging. Special keys for service flaps and components guarantee that uncontrolled movements of dangerous components are not possible and the plant or crusher cannot be started when maintenance is being carried out.

A standard series rotating device also allows the rotor of the crusher to be turned and blocked manually in any position from the outside. This enables the simple and safe replacement of rotor ledges and removal of material bridging.

# W KLEEMANN | Solution | Solution

#### **LOCK AND TURN - STEP BY STEP**



> Trigger the "Lock rotor" command via SPECTIVE



> The rotor locking and turning device is enabled and can be moved with a crank.



> Insert control element in the enable station; the rotor is safely locked and the key is enabled for further steps.



> If keys are removed, the rotor remains safely locked.



> The crusher housing is opened with a special key. The key cannot be removed once opened and material can be cleared safely.



> The rotor is turned safely with the crank and moved into the optimum position for rotor ledge replacement.

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# **ENVIRONMENT-FRIENDLY SOLUTIONS**

For noise and dust reduction.





There are more and more demands for a reduction in dust and noise - not only in urban areas but also in quarries.

Local authorities are imposing increasingly stricter requirements in terms of adhering to thresholds. Regionally differing regulations prescribe how loud construction sites are permitted

to be in city areas or how much dust may be emitted. This is intended to protect the affected population and the environment as well as the workers on-site.





#### Solutions for effective noise reduction

Aside from the crushing process, the main cause of noise from mobile crushing plants is the power pack. The major cause of noise emissions is air flow, the radiator and air turbulence in the area of the exposed floor of the power pack.

A package option provides help here: it consists of ergonomic noise protection flaps that are mounted at engine height, which deflect the sound upwards. The flaps are folded into the plant for transport and therefore have no influence on the transport width. In addition, the exposed floor of the power pack is sealed.

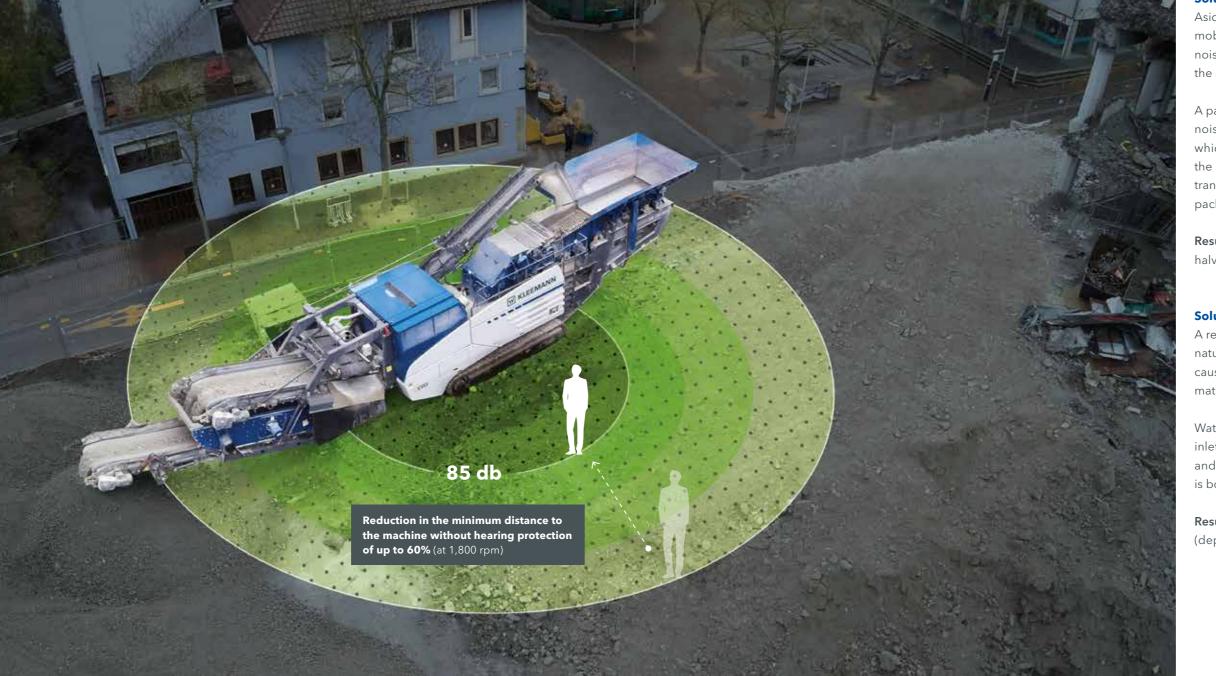
Result: Reduction in noise by 6 decibels (3 decibels amount to halving of the noise perception of the human ear)

#### Solutions for effective dust containment

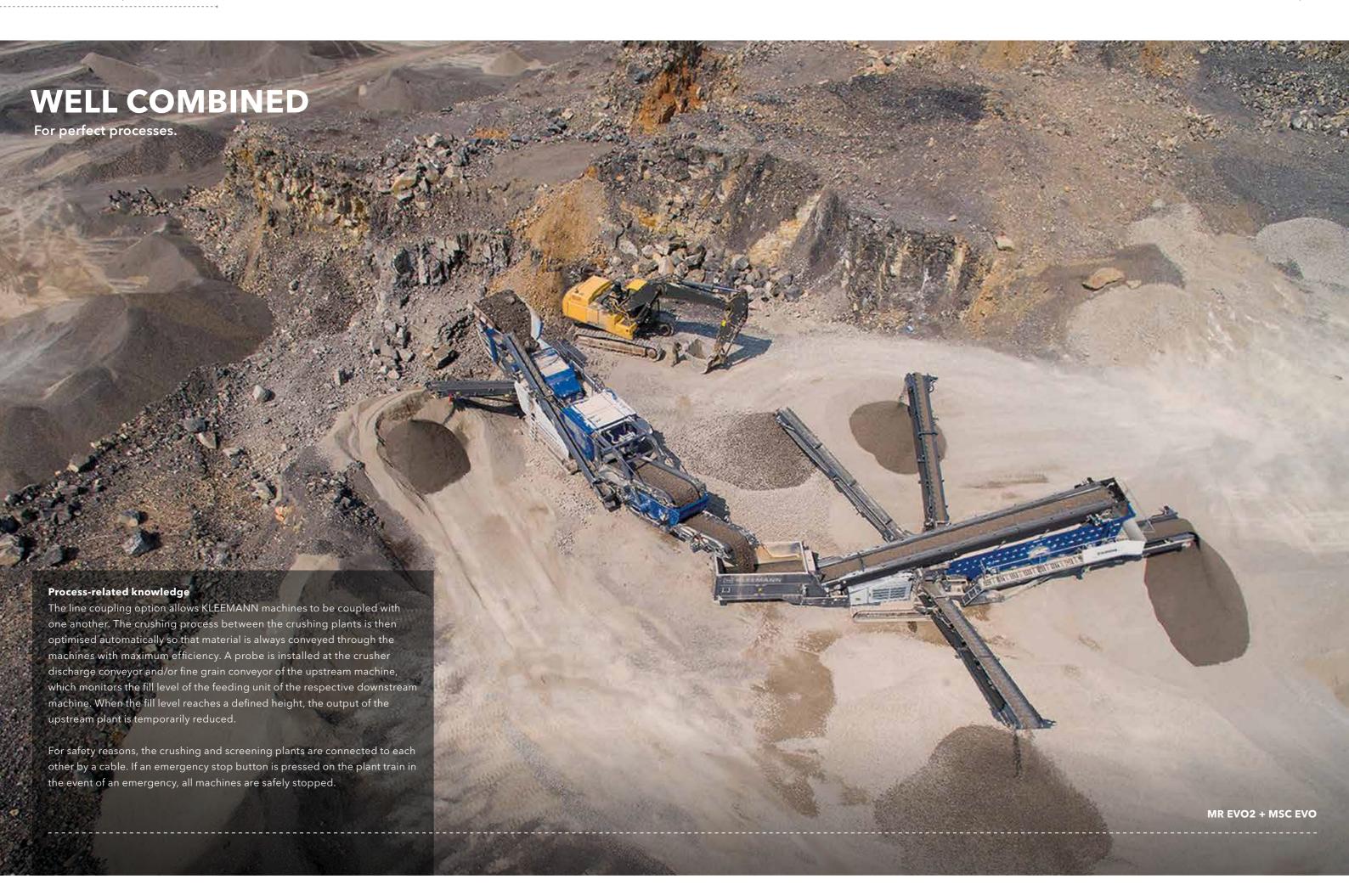
A relatively high dust build-up is caused during recycling and natural stone processing due to the process itself. The main cause of dust emissions here are the material discharge and material transfer positions as well as the crusher unit itself.

Water jets at strategically important points, such as the crusher inlet, crusher discharge conveyor, side discharge conveyor and the post screening unit, are the solution. Most of the dust is bound together in the process, preventing it from spreading.

**Result:** reduction of dust volume by up to 50 % (depending on the material)



MOBIREX MR EVO2 | LINE COUPLING



# **FORMULA FOR SUCCESS**

For perfect crushing results.

An optimum crushing result can only be achieved with plant components that are perfectly tuned to one another - and the correct settings that the operator can choose himself.

With these tips, it is possible to find the ideal settings for any task.

#### **Feed material**

- > Feed size: where possible, the maximum feed size should not exceed 80% of the specified crusher opening
- > Compressive strength: mineral materials can be used with a maximum compressive strength of 100 MPa in the 1st crushing stage and 150 MPa in the 2nd crushing stage
- > Type of mineral: impact crushers in the SHB series process soft to medium-hard natural stone, such as limestone, dolomite or sandstone, and are used for recycling of mineral raw materials such as rubble, bricks, asphalt and concrete.

#### Rotor speed and crushing gap

> With an increase in the rotor speed, the crushing curve moves upwards which results in an increase in the content of fines in the final product.

An increase in speed usually results in a higher throughput. A throughput reduction only results if the feed behaviour is impaired by the increased impact frequency.

#### **Crushing ratio**

> The maximum crushing ratio (ratio of feed grain size/grain output) largely depends on the physical properties of the feed material. The following standard values result:

CRUSHING RATIO STANDARD VALUES							
Feed material	Compressive strength [MPa]	Circuit	Crushing ratio				
Limestone, soft to medium-hard natural stone	<150	open	+= 10.1				
	<150	closed	up to 10:1				
Recycling (mixed rubble, asphalt, concrete)	<100	open	up to 15:1				
		closed					
Reinforced concrete (depending on	<100	open	45 4				
concrete quality and iron content)		closed	up to 15:1				

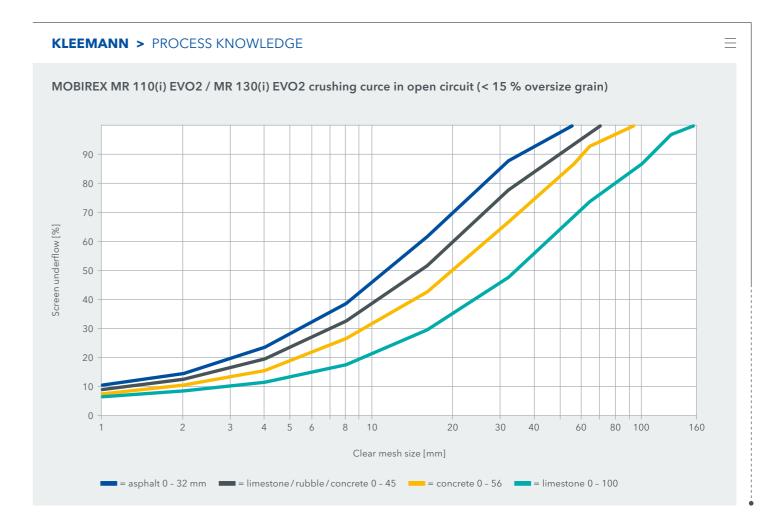
#### Impact crushing plant areas of application

#### NATURAL STONE -----

Coal / clay / marble / limestone	Sandstone, gritstone / greywacke	Gravel / granite	Basalt	Iron ore / gneiss / quartzite / diabase, gabbro	
Asphalt / reinforced demolished concrete	Demolished concrete / rubble		Blast furnace slag	Steel slag	

RECYCLING

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MOBIREX MR EVO2 | CUSTOMER SUPPORT 38 | 39

# **CRUSHING TECHNOLOGY**

The right wear parts for the best results.

The versatile application areas of a KLEEMANN impact crusher range from classic natural stone processing through the recycling of residual construction material and on to mining

applications. The focus here is mainly on two tasks: to increase the service life of the wear parts and, at the same time, to lower operating costs.

Rubber curtain

Chain curtain

Wear plates

Impact toggles

Rotor ledges

Impact plates

Support beams

#### **C-shape rotor ledges**

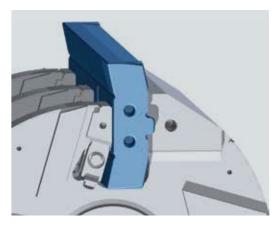
The C-shape rotor ledges are secured conveniently on the rotor via a lug on the rotor ledges. Depending on the application, they are available in different qualities.

#### **Monolithic rotor ledges**

- > Manganese C-TRON.Mn
- > Martensite C-TRON.M
- > Chrome C-TRON.C

#### Composite rotor ledges with ceramic inlays

- > Martensite-ceramic C-TRON.MC, C-TRON.MC+
- > Chrome-ceramic C-TRON.CC



Plates in the main wear zone

#### **Composite wear plates**

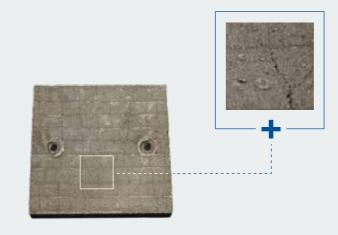
To protect the high-quality crusher housing against damage, it is entirely panelled with high wear-resistant plates. Depending on the feed material, material stress can vary considerably. In order to reduce change times and wear costs, KLEEMANN not only offers the standard plates (hardness: 400 HV or 500 HV) but also special deposition-welded plates which, once again, enable even longer service lives.

#### **Deposition welding**

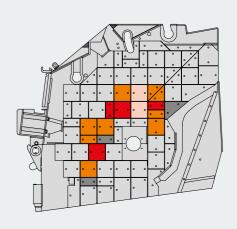
- > Chromium carbide special alloy
- > Hardness: approx. 740 HV 10, approx. 62 HR
- > Wear layer 10 mm

#### **Recommended use**

> For high abrasive wear



Surface of plates for inside of crusher. Cracks are a prerequisite for optimal hardness.



Plates in the main wear zone

MOBIREX MR EVO2 | CUSTOMER SUPPORT

# **ROTOR LEDGES**

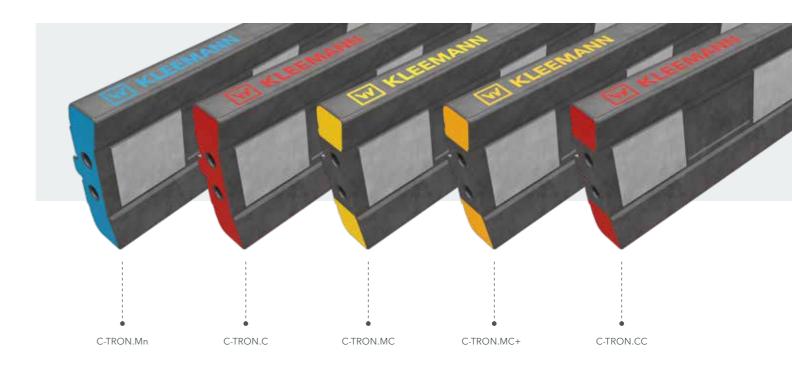
The originals.

The cost-effective use of rotor ledges is influenced by factors such as the feed material, the rotor speed, the moisture content of the material, the feed size and the reduction ratio. Depending on the area of application and material properties, different rotor ledges are available to achieve optimum results.

# Important questions related to the selection of rotor ledges suitable for the application

- > What type of material is being crushed?
- > Where can the feed size be classified?
- > What is the range of the abrasiveness?
- > Does the material contain uncrushable elements?





	E PORTFOLIO  Low abrasiveness		Medium abrasiveness		High abrasiveness	
Application	Limestone processing	Small share of uncrushable elements	Reinforced concrete		Asphalt	Natural stone
Good	C-TRON.Mn (max. feed size: 600 mm)	C-TRON.C (max. feed size: 400 mm)	-	C-TRON.C (max. feed size: 400 mm)		
Better	-	C-TRON.MC (max. feed size: 600 mm)			C-TRON.MC+ (max. feed size: 600 mm)	
Best	-	C-TRON.MC+ (max. feed size: 600 mm)			C-TRON.CC (max. feed size: 300 mm)	

MOBIREX MR EVO2 | **TECHNICAL DATA** 







#### **KLEEMANN GmbH**

Manfred-Wörner-Str. 160 73037 Göppingen Germany

T: +49 7161 206-0 M: info@kleemann.info

> www.kleemann.info