

RoadNews



WIRTGEN GROUP Machines
**Challenge accepted,
task mastered**

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TOP FEATURE



VÖGELE pavers pave steep bends with an extreme crossfall:
reliable technology, confident co-operation.





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Editorial

Mastering challenges together.

Close to our customers - the WIRTGEN GROUP value promise makes you, the customer and user, the focus of our activities. It is your constructive feedback which drives us when we are innovating and developing technologies.

The practical new features in the new VÖGELE MT 3000-3i Standard and Offset feeders, for example, were implemented on the back of suggestions from the field.

Another example is the SP 15i from WIRTGEN. Our smallest slipform paver can now pave concrete surfaces up to 2.2 m wide - over 40 cm more than before.

WITOS HCQ from HAMM demonstrates the potential customer proximity of even digital solutions: the system allows contractors to optimize compaction and track job sites remotely.

BENNINGHOVEN's retrofit program provides innovative components to allow straightforward modernization and enable changing requirements to

be met without the need to invest in a completely new asphalt mixing plant. This, too, is a solution requested by owner/operators.

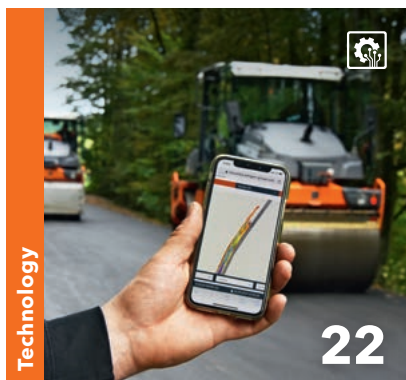
In addition to reliable machine technology and seamless provision with spare parts, the key foundations of worldwide service activities also include specialist expertise and intensive consulting services from our staff. This was demonstrated in the renovation of a Formula 1 racetrack with two steep bends, overseen locally by experts from the WIRTGEN GROUP.

We hope you enjoy this tenth edition of RoadNews!

Best wishes,

Frank Betzelt

Senior Vice President - Sales, Marketing,
Customer Support WIRTGEN GROUP





WIRTGEN SP 15i Offset Slipform Paver

Great width,
great flexibility



The SP 15i from WIRTGEN is attracting attention with a new working width.

The SP 15i is a versatile paver of monolithic profiles up to 1.3 m tall, making it the most popular slipform paver of its class in the world. In addition to producing kerb stone and gutter profiles, concrete safety walls, drains or channels, the smallest WIRTGEN slipform paver is also suitable for paving narrow tracks. Depending on configuration, a new offset mould allows the SP 15i to pave areas up to 2.2 m wide - in contrast to the 1.8 m possible up to now.

Projects in cramped conditions

On a job in Esterwegen near Papenburg, this compact paver gave an initial taste of its expanded range of applications when paving a 2 m-wide cycle track 750 m long on a country road. As the trees lining the road left only limited working space, a significant degree of manoeuvrability was required in addition to compact machine dimensions. The SP 15i scored here, among other things with its intelligent steering and control system. The Ackermann steering system, tried and tested in the field, delivered accurate driving characteristics, especially on bends.

The computer-supported steering system varied the speed of the individual crawler tracks, ensuring that the SP 15i always followed the specified references accurately to the millimetre. The steering angle of all crawler tracks is always adapted fully automatically, in each case as a function of concreting radius and machine geometry. This essentially allows profiles to be created on bends with minimum radii of just 500 mm. The slipform paver is furthermore easy to manoeuvre with the aid of two additional steering modes - Crab and Coordinated.

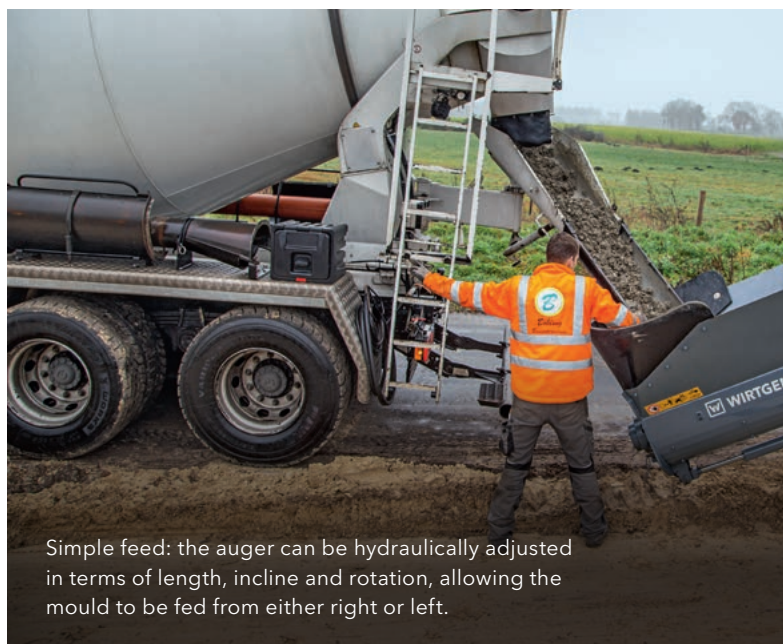
In Papenburg, the SP 15i was equipped with 2 steering sensors and 2 grade sensors which scanned the wire previously tensioned on the left-hand operating side, thus ensuring accurate levelling of the 12 cm-deep cycle path.

Continuous concrete paving

Traffic was able to continue running on one lane of this quiet road throughout the construction project. At the same time, the job site was always easily accessible for mixer trucks to unload concrete into the receiving hopper of the 4.6 m-long auger of the paver. The 2 m-wide mould was supplied by the auger, and the auger's high level of supply with concrete allowed paving to proceed uninterrupted, even when the mixer truck had to be changed. "The continuous paving process and the constant high average machine advance of 1.3 m/min enabled us to complete the works in just three days", says Franck Alberts, foreman with Böhling Bauunternehmen GmbH, pleased with the performance of the SP 15i.



The desired surface texture was created with a piece of fabric and manual brushing.



Simple feed: the auger can be hydraulically adjusted in terms of length, incline and rotation, allowing the mould to be fed from either right or left.



Classic levelling:
the position and level of slipform
pavers are controlled by mechan-
ically scanning tensioned wires.

VÖGELE PowerFeeders of the Dash 3 generation

As powerful as ever More convenient than ever



Tried and tested in the field: Dash 3 material feeders are already successfully in use on job sites; pictured here is the MT 3000-3i Offset with pivoting conveyor on a site near Karlsruhe in South-West Germany.



VÖGELE has continued to develop its two material feeders and bring them up to Dash 3 level. The MT 3000-3i Standard and the MT 3000-3i Offset are true power packs which speed up processes and increase quality on large construction projects. The new machines integrate the efficient, ergonomic Dash 3 machine concept and optimize the material feed concept, making the job even easier for operators.

MT 3000-3i

With its pivoting conveyor, the MT 3000-3i Offset opens up a huge range of applications. In addition, the MT 3000-3i Standard is available for high-performance inline material feed.



Experience the new
MT 3000-3i Offset in action!
Just use your smartphone or tablet
to scan the QR code.

Highlights of the VÖGELE MT 3000-3i Standard and MT 3000-3i Offset

- 1 | ErgoPlus 3 operating concept
- 2 | AutoSet Plus automatic functions
- 3 | PaveDock Assistant truck communication system
- 4 | More efficient belt heating
- 5 | Optimized maintenance concept
- 6 | Cost-effective and simple loading onto standard low-loaders
- 7 | Modern drive technology with 160 kW at 2,000 rpm and ECO stage



VÖGELE material feeders of the Dash 3 generation

VÖGELE has added value to both PowerFeeders, adding lots of new features. The development process also incorporated user feedback - with the aim of making operation even more user-friendly.

The logical consequence was for the developers to adapt ErgoPlus 3 for the material feeder. After all, this VÖGELE operating concept has been tried and tested thousands of times in the Premium Line pavers of the Dash 3 generation. ErgoPlus ensures greater convenience and reliability when working, as well as an outstanding overview of the job site.

ErgoPlus 3 includes a great many benefits

The ergonomic operating concept is a convincing feature, the streamlined consoles involving a new operating logic and including a colour display and on the MT 3000-3i Offset PowerFeeder model, a joystick for the pivoting conveyor. The concept includes many other practical details, such as plenty of stowage and protection from the weather at the sides.

The Dash 3 material feeders also increase operating convenience above and beyond ErgoPlus 3, for example with further measures to minimize noise.

The automatic functions of AutoSet Plus facilitate paving

Material feeders are machines which make a contribution to speeding up the processes of asphalt paving projects and to increasing paving quality. The key here is decoupling the transfer of material from the truck to the paver. AutoSet Plus is integrated in the new PowerFeeders for even greater process reliability. The automatic functions, already a familiar feature from Dash 3 pavers, will ensure that in future, material feeders are also ready for action quickly.

On the one hand, AutoSet Plus accelerates the process of repositioning the material feeder. The machine can be prepared for the "Pave", "Reposition" and "Transport" operations at the touch of a button.

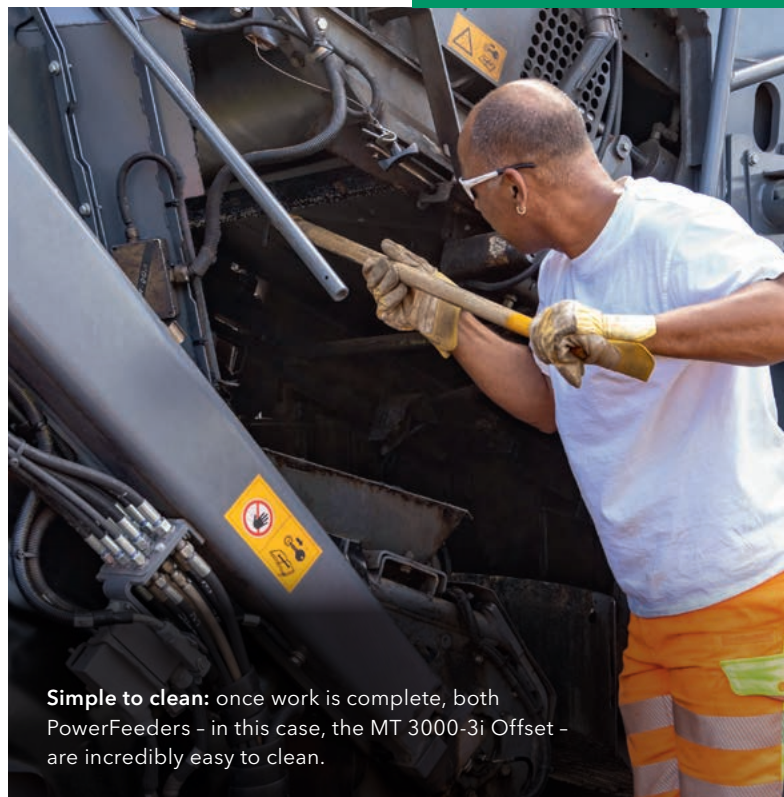
On the other hand, the operator can compile individual material feed programmes, saving set parameters such as conveyor and auger output, belt heating and distance control in AutoSet Plus so that these can be activated at any time.

- 1 | Full control for operators: ErgoPlus 3 is a new on-board feature offering a high level of operating convenience and reliability.
- 2 | Clear communication: PaveDock Assistant indicates to truck drivers whether they are to reset, unload or leave the job site area.





MT 3000-3i Offset: the Offset model of the VÖGELE material feeder has a flexible pivoting conveyor. The heating of the belt unit has been optimized.



Simple to clean: once work is complete, both PowerFeeders - in this case, the MT 3000-3i Offset - are incredibly easy to clean.

Conveying concept improves performance on the ground

Numerous ideas from users have been incorporated in the new conveying concept. This is particularly obvious from the material hopper, which has been redesigned to simplify unloading for mix truck drivers. The process is completed in one go, taking just 60 seconds.

Further measures, such as optimized belt running, ensure that only a minimum amount of material soils the machine. Improved control furthermore keeps the conveyor permanently centred, facilitating even awkward jobs on a crossfall whilst at the same time minimizing wear and increasing resistance to deformation.

Powerful heating now works even more efficiently

The diesel heating has been further developed and heats the conveyor reliably. VÖGELE has optimized control of the heating system to make it even more economical with fuel and more efficient in operation. This simultaneously improves temperature management,

making it easy to convey even critical materials such as those with a high bitumen content or asphalt with polymer-modified bitumen and low-temperature asphalt/temperature-reduced materials, for example.

Improved access to maintenance and adjustment points

The developers have thoroughly overhauled and improved the service and maintenance concept. All the adjustment points have been reduced, simplified and colour-coded, enabling them to be identified at a glance.

Overall, the Dash 3 material feeders can be cleaned much more quickly and easily, with VÖGELE having improved accessibility in many relevant areas. The transfer hopper of the MT 3000-3i Offset, for example, has a hinged design which, in combination with an extra step, allows asphalt residues to be removed conveniently and without any risk at all.



Enormous potential output, compact design: the new VÖGELE material feeders also make transport easier.

Simple transport on conventional low-loaders

Both PowerFeeders are also easy for users to transport. The generous angle of inclination of 15° makes it easier to load them onto standard low-loaders. Compared to previous models, the material hopper can be raised another 25 cm, which means it can be put down right at the front of the low-loader on the so-called goose-neck. As a result, the Offset model easily complies with maximum transport length.

MT 3000-3i Standard:

VÖGELE has brought the standard variant without a pivoting conveyor up to Dash 3 level, too.





Some projects are so specialist that hardly any construction companies have significant experience to draw on - which is another reason why it is so valuable to have a partner with the expertise and experience to take things forward. The rehabilitation and modification of the race track in Zandvoort was a project like this.

The aim here was to deliver absolute top quality and to create among other things two sloping bends with an extreme crossfall of up to 32%. Contractor Royal VolkerWessels N.V. solved this and other challenges in close collaboration with the WIRTGEN GROUP's Netherlands subsidiary and VÖGELE's consulting services.



Netherlands | **Zandvoort**



With the WIRTGEN GROUP at your back as a competent partner -
**challenge accepted and
an outstanding result delivered**



Legendary "rollercoaster in the dunes":
Circuit Zandvoort is being modernized
and provided with two sloping bends
for the return of Formula 1 to the
Netherlands.

WIRTGEN GROUP incorporated from the outset

How do you get hold of prescribed specialist mixes and then process them to satisfy the most stringent regulations of the FIA, motor sport's world governing body? How do you pave sloping bends with an incline of up to 32%? And how do you satisfy requirements which Filippo Piccoli, technical manager at experienced design firm Studio Dromo, describes as "the most extreme race track construction I have ever seen and been involved with"?

To get successful answers to these questions, construction manager Mark van Kessel from contractor Gebr. Van Kessel involved his contact Roel Vissers from the WIRTGEN GROUP's Netherlands subsidiary right from the outset. After all, construction and rehabilitation of race tracks are always a bit special. So it was for contractor Gebr. Van Kessel B.V. and KWS Infra B.V., too, both of them part of Royal VolkerWessels N.V.

Rehabilitation with some new construction demands top performance

The contract was to partly rebuild the track in the area of the two sloping bends and also to complete associated rehabilitation and modernization work.

The aim was for the two sloping bends to enable high-performance racing cars to achieve higher speeds on the bends and thus return to the straight more quickly. These modifications to the track layout

were intended to encourage overtaking and were implemented in line with plans from renowned Italian race track design firm Studio Dromo, whose experts also kept a close eye on the job site.

Dry run to prepare the paving team

It quickly became clear during initial discussions on the project with experts from the WIRTGEN GROUP that a trial paving run should be carried out to ensure everything went smoothly on the race track itself. After all, the two sloping curves with an incline of up to 32% are even steeper than the bends of high-speed oval tracks in the US. It was therefore important for success that the paving team knew exactly what mattered during the process and what settings to make to the machinery.

Compaction was just as demanding as paving. It was completed by HAMM rollers of the HW, HD, HD+ and HD CompactLine series.



- > **Opened:** 7 August 1948
- > **Formula 1 venue:** 1952 to 1985 and from 2021
- > **Track length:** 4.259 km
- > **Bends:** 15



Tolerance of just ± 2 mm: the three SUPER 1900-3i machines had to deliver precision work on the sloping bends, too, and were equipped with the Big MultiPlex Ski sensor system from VÖGELE for the purpose.



32% is the maximum crossfall of the two new sloping bends.

The “rollercoaster in the dunes”: Circuit Zandvoort

The most famous race track in the Netherlands hosted the Netherlands Formula 1 Grand Prix a total of 30 times between 1952 and 1985. This premium motor sport event is now returning to Zandvoort. The track on

the North Sea coast between the dunes and the sea in North Holland province is nicknamed the “rollercoaster in the dunes”.



We were perfectly aware that we can rely on VÖGELE technology, but paving would not have been possible without the consulting services and on-site support provided by the WIRTGEN GROUP.

Mark van Kessel, Construction Manager at Gebr. Van Kessel B.V. (on the right, with Roel Vissers and Ivo Lakerveld, both from WIRTGEN Netherlands, and André Felchner, Head of Application Technology at VÖGELE)



Three SUPER 1900-3i pavers and a perfectly-prepared paving team

Planned for the job site in Zandvoort were three VÖGELE SUPER 1900-3i-type pavers with an AB 500 TV Extending Screed. As is usually required on race track job sites, paving had to be performed by the “hot to hot” method.

André Felchner, head of application technology at VÖGELE, personally accompanied preparations and asphalt paving operations. “It’s for precisely these kinds of complex task that we are here. With such an extreme race track as this one, of course, there are a great many things to take into account to ensure that asphalt paving and compaction are successful,” says Felchner. “Which makes it all the better when you meet such competent and motivated paving teams as this one. The guys soon grasped what was important.”

Screed Assist which can be set separately - a factor in this success story

In spite of the spectacular profile, the VÖGELE machines needed only minor modifications to pave the sloping bends. “In order to achieve a high-quality, pre-compacted result at this extreme incline, we simply had to produce a slightly negative crown”, commented

André Felchner from VÖGELE, demonstrating one of the benefits of the AB 500 Extending Screed. In this process, the Screed Assist option (which can be separately adjusted electronically) ensured that there was sufficient pressure on the mix in the upper outside pave area. Screed Assist is one of the functions of the SUPER pavers which allows a high-quality result to be achieved even in complicated paving situations.

Drivers leave the new track with a smile

The fact that all those involved in the project were extremely pleased with the outcome of the asphalt work made it a complete success for the whole Royal VolkerWessels team. An even greater compliment was the smile on the faces of the drivers participating in the first race on the modernized Zandvoort track just a week after the acceptance inspection. “Everything worked exactly as we had anticipated in cooperation with our partners from the WIRTGEN GROUP. That makes us feel as if we can count on this kind of support when we next undertake a comparatively difficult project”, says construction manager Mark van Kessel.

Sloping bend, shallow screed planing angle: use of the Screed Assist function has the effect of making the screed planing angle of the AB 500 TV shallower at the edge of the screed on the outside of the bend, increasing the compaction effect.



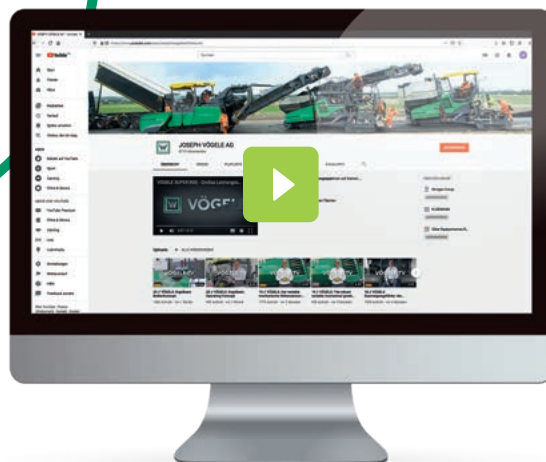
VÖGELE TV –
the informative video series for users

Explanations from experts, benefits for users

Ideas and top tips on everything associated with VÖGELE pavers and screeds, together with valuable information about technologies and operation – all with concrete benefits in the field: VÖGELE TV is the video series for paving teams and for everyone professionally involved in working with asphalt.

Go to
VÖGELE TV here

[www.youtube.com/
JosephVoegeleAG](https://www.youtube.com/JosephVoegeleAG)





... and action! Experienced product managers and product trainers from VÖGELE take a look at application technology issues.

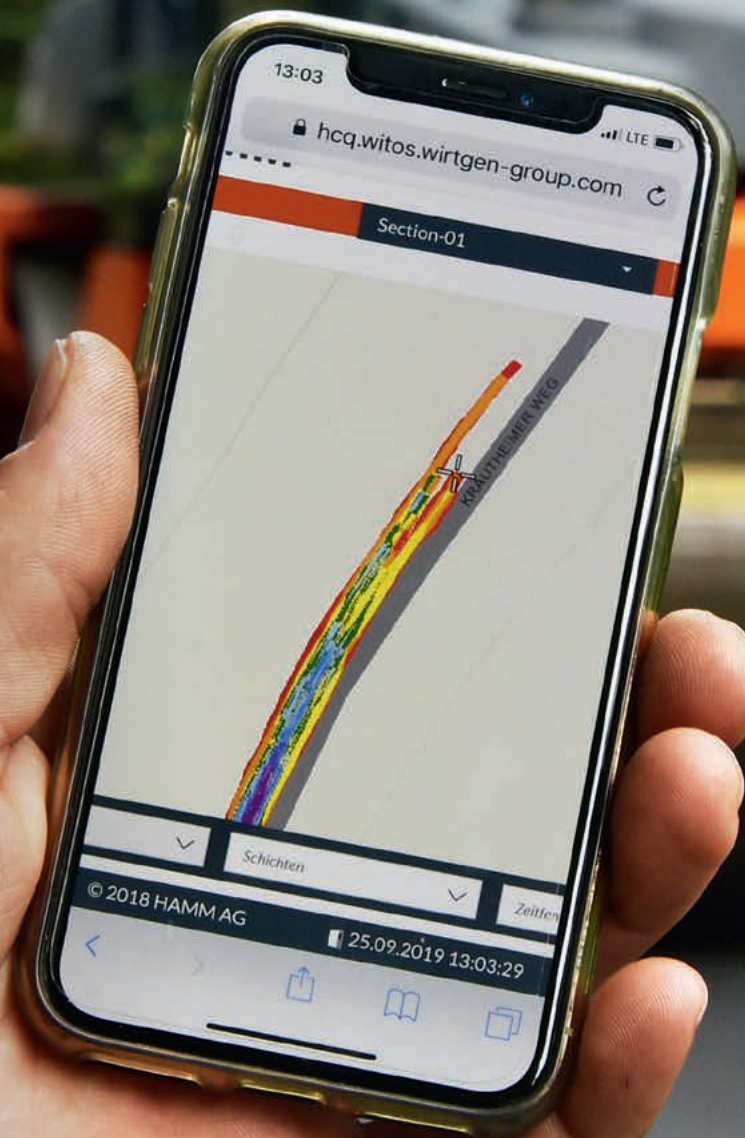


In the first VÖGELE TV programme, product manager Bastian Fleischer takes a look at the Niveltronic Plus System for Automated Grade and Slope Control and at VÖGELE sensors – in a clear, practical way with a lot of added value for users.



The second programme looks at ErgoBasic, presented by product trainer Michael Zorn. Turns out he's a fan of this straightforward operating system for the Classic Line pavers: "At last I can show how simple and clear it is!"

Compacting with WITOS HCO: those involved were able to call up all the data this DV+ 90i recorded during compaction anywhere in the world in real time via the WITOS portal - whether on the job site or on the office PC.





WITOS HCQ: For greater transparency in compaction

Optimize compaction, track job site progress remotely, always a sound basis for decision-making - these are the key benefits of WITOS HCQ. In combination with the tried and tested HCQ Navigator product, this module facilitates live tracking of the compaction process and a simple, transparent and seamless check on compaction.

Visualization of all process parameters

HCC Navigator from HAMM enables the number of passes to be reduced and the efficiency and quality of the compaction process to be increased. This is achieved by indicating to roller operators those points which have already been sufficiently compacted and those which still require further compaction, displaying the information live on a panel PC in the cabin. To do this, the system continuously determines the roller's key process parameters (position, speed, direction, type of compaction etc.) and its environment (asphalt temperature, rigidity etc.). All the data from the compaction process are then processed by HCC Navigator. The data can also be analysed and archived later.

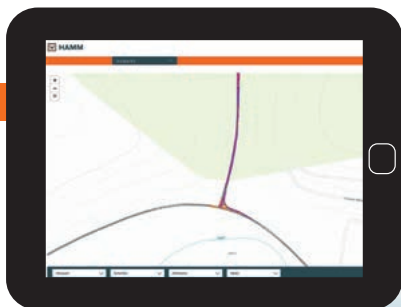
Tracking the compaction process in real time

"Using the WITOS HCC web application has enabled us to make HCC Navigator even more flexible: it is now even possible to track the entire compaction process live at any any location in the world", explains Dr Axel Römer, director of research and development at HAMM. To this end, data are transmitted wirelessly to the WIRTGEN GROUP's WITOS portal as compaction proceeds, with every roller equipped with a SIM card for this purpose.

The data are then available to users of WITOS HCC in real time via the portal. This also simplifies data backup, because project data for analyses and documentation are then available in the WITOS portal. Among other standards, the data format meets the VETA requirements demanded by authorities in the US.

Transparency on all levels

Users of WITOS HCC can also provide supervisory authorities or consultants with appropriate access – separate access entitlements can be assigned to different people for each sub-project, for example. It goes without saying that data security is assured. In short: WITOS HCC now enables professionals to control processes remotely and to make decisions on the basis of sound data and information. This saves both travel time and travel expenses, as well as delivering enhanced quality through early and informed intervention.



A look at the web application: in addition to geographical location, live mode also displays process data in different map views, e.g. the number of passes, asphalt temperature or HVM value (earthworks). These data can be called up for every point, for every machine and even for every drum.





On the panel PC, HCQ Navigator shows the roller operator where and how compaction has already been performed. Exactly the same data can be viewed by everyone with the corresponding access entitlement - on a mobile, laptop or PC - anywhere in the world.



WITOS HCQ

Successful on site

Construction companies and authorities have already successfully completed a huge range of construction projects in Europe and the US using WITOS HCQ.

From Helsinki to Tirschenreuth

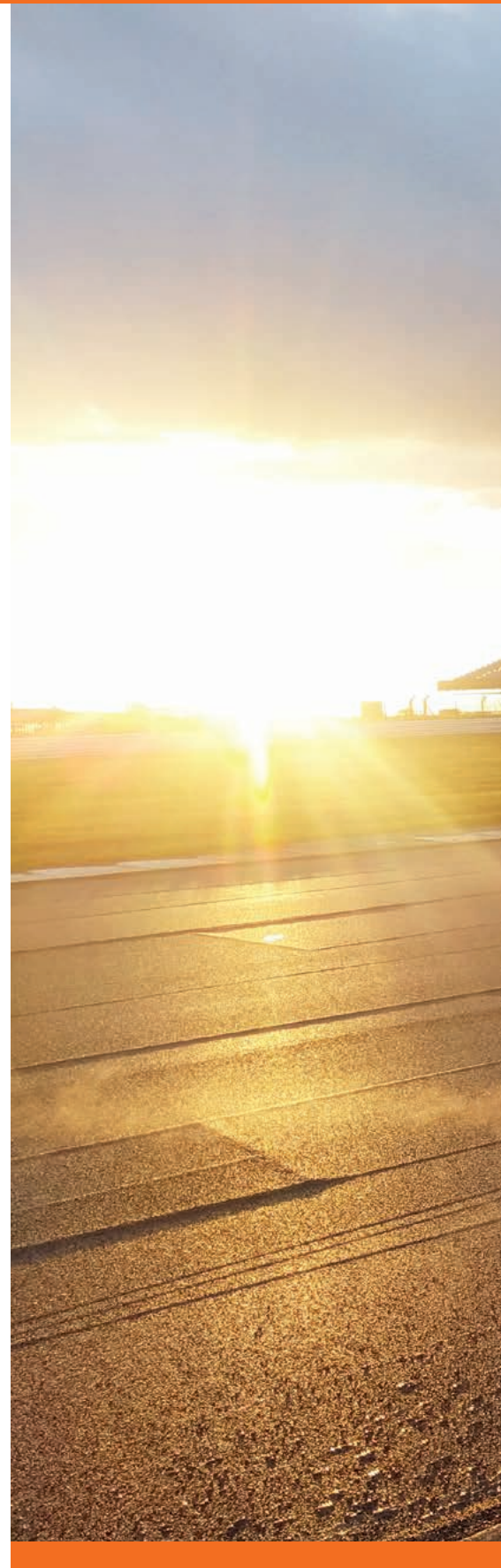
WITOS HCQ was tested for the first time in Europe on a Finnish Highways Authority project. Paving work on a country road just outside Helsinki was recorded by WITOS HCQ and tracked live – on site, in the office in Finland and by HAMM developers in Tirschenreuth. One HD+ 80i VV-S and one DV+ 90i VV-S were used, both of them tandem rollers equipped with double vibration and a split drum. HAMM managed to be doubly convincing here, as the HAMM rollers delivered an outstanding compaction result as well as transmitting data perfectly. The results of analysing the data transmitted by WITOS HCQ correlated with the results of random sample measurements on the job site.

Job sites in the USA

Successful construction projects using WITOS HCQ have already been completed in several states of the US, too, including in Sacramento, California, on Highway 50 in Michigan and in Palmyra, Missouri. The exchange of data between the GPS receiver of HCQ Navigator and the VRS system of the construction companies involved worked perfectly here, with construction companies and authorities able to track the progress of the respective projects remotely.

Silverstone race track

In the summer of 2019, WITOS HCQ was used to pave the race track at Silverstone. Here too, the live view function proved to be a convincing feature, facilitating a highly efficient compaction process – a key prerequisite for successful completion of the project which was under considerable time pressure. WITOS HCQ was an important element in this to ensure comprehensive high-quality compaction results. WITOS HCQ thus also made it possible to achieve the high surface quality which is a particular requirement for race tracks.





Silverstone, UK

Race track operators are particularly demanding, which was why contractor Tarmac insisted on compaction monitoring by HCQ Navigator. The rollers were monitored remotely by WITOS HCQ during the paving process.

WITOS HCQ

At 4.4 m, the H 7i is the shortest
7 t-class compactor in the world.



H 7i VIO compactor from HAMM

Compact shape – great climbing ability



It is often a challenge to deliver high-quality compaction on small, cramped job sites, which is why HAMM developed the super-compact H 7i compactor. Equipped with a high-performance compacting system and a modern, powerful drive unit with wheel motors, the Series H CompactLine compactors can manage inclines of up to 60% and compact efficiently in the process. Together with their 3-point articulation, they deliver outstanding all-terrain capability and driving stability. The version with the VIO drum also allows compaction with oscillation. These models are used for new construction, for widening or repairing roads and paths, for creating new access roads, in gardening and landscaping and in drain-building.



- 1 | Its 3-point articulation gives the H 7i outstanding all-terrain capability. Shocks are effectively damped. A further benefit is a high degree of stability to both tilt and direction.
- 2 | Low-shock compaction with oscillation mode also allows work to be conducted in the vicinity of buildings. This feature proved to be a significant benefit of the VIO drum on the Titisee-Neustadt job site.



H 7i VIO: in a nutshell

Bombardi Tiefbau GmbH had a contract to landscape the grounds of an industrial estate in the South German town of Titisee-Neustadt measuring approximately 1,000 m². The team used an H 7i VIO to compact a frost protection layer in two/three passes each 25 cm thick.

Even before the job started, the product's first plus point turned out to be its ease of transport: "The size of this compactor makes it really easy to transport on our small truck," reports Alexander Schäfer. During manoeuvring, we soon realized that "this compactor is good for cramped job sites because it's so short – which also means you have great visibility."

Impressive compacting power

Its compaction performance also impressed machine operator Michael Ücker: "This neat compactor really does compact very well indeed. We have tested various machines and now see that with the H 7i VIO from HAMM, we achieve better compaction than with other machines of this class."

It was also important to the team that this neat compactor is able to work in oscillation mode: "Then we don't take up water." This means high-quality compaction without the risk of demixing – a clear quality benefit compared to pure vibration compaction.




- 3 | Compacting an access with an incline and pavement fittings: the all-round visibility of this neat compactor is a convincing feature, especially on cramped or steep job sites.
- 4 | Michael Ücker (left) and Alexander Schäfer from Bombardi Tiefbau GmbH pose with the H 7i VIO.

H COMPACT LINE

**With the H 7i VIO from HAMM,
we achieve better compaction than
with other machines of this class.**

Michael Ücker, Machine Operator
Bombardi Tiefbau GmbH

A HAMM H 7i VIO roller is shown from a rear three-quarter view, working on a dirt road. The machine is orange and black, with the HAMM logo visible on the side of the drum. It is positioned on a dirt path that runs alongside a dense forest of green trees. The sky is overcast.

Using the H 7i VIO to construct a dam
on the banks of the Rhine to widen a trunk road.



**Although the H 7i so short,
you still have plenty of room inside.**

Philipp Zeiler, Machine Operator
Günter Alsdorf GmbH & Co. KG



Efficient on a cramped job site

An H 7i VIO prepared the sub-base for widening a busy trunk road in Leubsdorf am Rhein in Germany. The job site was squeezed in between the bank of the Rhine and one of the most important stretches of railway line in Germany.

Once the soil on the dam between the carriageway and the bank of the Rhine had been removed to a depth of approx. 1.5 m, construction company Günter Alsdorf GmbH & Co. KG used its new H 7i VIO to build up the coarse and mixed-grained soil in several mono-layers each 25 cm thick. Machine operator Philipp Zeiler was immediately enthusiastic about the very short, neat compactor: "The H 7i is very easy to handle and operation is perfect. Although it's so short, you still have plenty of room inside." In addition, visibility is excellent, made possible by a tapered crossbeam and an appropriately designed rear frame. Driving the compactor with drive wheels creates a great deal of clearance, and a small turning circle also results from a short wheelbase in combination with the 3-point articulation. In short: the best possible conditions for use on the bank of the Rhine.

Compaction in a sensitive environment

Low-vibration compaction was also important to create the dam right next to a road and a railway track, which was why the VIO compactor worked mainly in oscillation mode on this job site. As with all VIO compactors from HAMM, it is possible to switch from vibration to oscillation mode at the touch of a button on the operator's platform – even when driving.

This operator is familiar with yet more benefits of oscillation compaction: "I generally compact loose material by means of oscillation, thus avoiding taking up moisture. I also use oscillation if I want an especially even surface." Avoidance of demixing and production of even surfaces are two of the many benefits of oscillation compaction. The job site in Leubsdorf am Rhein also demonstrated "that HAMM compactors are quieter than other comparable models."



Cramped conditions, compaction right next to a road and a railway track: the H 7i VIO gave an impressive demonstration of its strengths on the job site at Leubsdorf am Rhein.



Control and
overload systems for crushing plants

One less thing to worry about

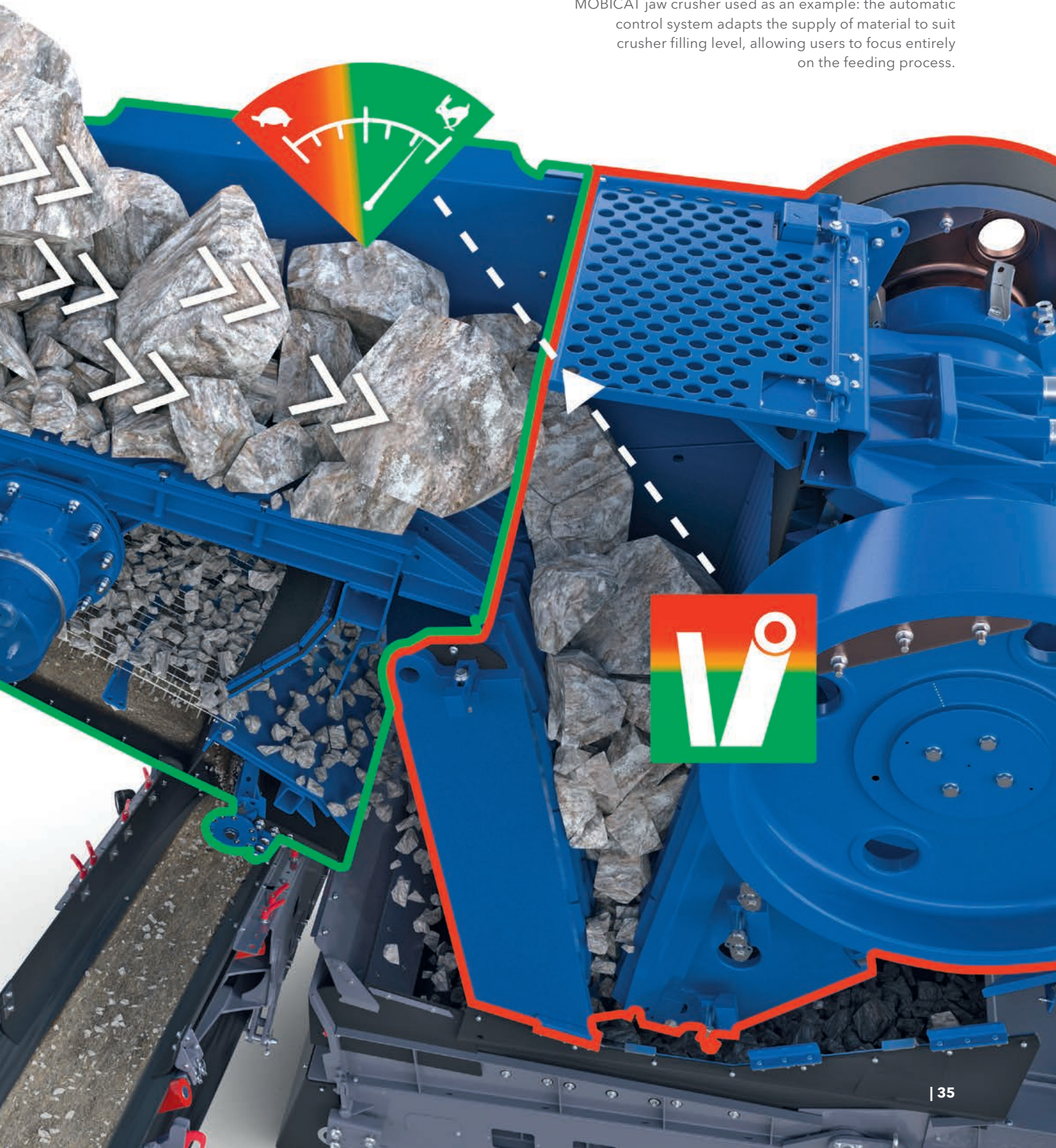
Continuous crusher feed is essential for a high-quality end-product and a correspondingly high production output by crushing plants. On KLEEMANN crushers, the Continuous Feed System (or CFS for short) monitors and controls a variety of plant parameters, including crusher feed, and always ensures an optimum supply of material.

This means that if crusher feed reaches a critical range, the conveying speed of the feed unit is reduced. In the reverse situation, speed is increased when crusher feed returns to normal. The key factor in all of this is that the CFS is infinitely adjustable, thus setting the ideal process automatically.

The combination of overload systems and other control systems, which vary depending on the type of plant, guarantees a high level of process reliability and thus a high level of plant availability. Overall, this delivers higher production output.



The principle of the Continuous Feed System with a MOBICAT jaw crusher used as an example: the automatic control system adapts the supply of material to suit crusher filling level, allowing users to focus entirely on the feeding process.



Intelligent automation systems from KLEEMANN

When processing rock and stone, the crushing process can result in various short or long-term overload situations. Intelligent automation systems protect KLEEMANN crushing plants from damage and breakdowns.

KLEEMANN makes a distinction between control systems and overload systems.

- > **Control systems** – called the Continuous Feed System at KLEEMANN, for example – are for intelligent process optimization for a continuous and efficient crushing process.
- > **Overload systems** are integrated for the inherent protection of the plant itself, to detect local or latent overloads, for example, and to counteract them. Overload systems differ by plant type.

Automatically beneficial: the CFS control system keeps on learning

The CFS is an intelligent system which keeps on learning independently. It reacts to an uneven flow of material, caused by delayed feed or mixed feed material, for example. The system automatically adapts feed speed and thus ensures that feed is constant.

Even in the case of uneven feed material, perhaps containing different-sized fines or too coarse a feed particle size, the system recognizes the modifications required and adapts the conveying speed of the feed unit, for example. This is important, as fines, for example, have a significant impact on the crushing process and thus on crusher load.

Overload system for MOBICAT jaw crushers: load reduction system secures plant availability

On MOBICAT plants, the interaction of the CFS and the load reduction system (LRS) ensures effective control of the crushing process. The LRS monitors the forces acting on the crusher and detects any operation outside the tolerance range. If this occurs several times, the system intervenes: it reduces feed quantity and





thus adapts the filling level of the crushing chamber, reducing the forces acting on the crusher's housing and jaw. Once the load on the crusher components drops again, maximum filling level automatically rises to the set specified value for optimum production output.

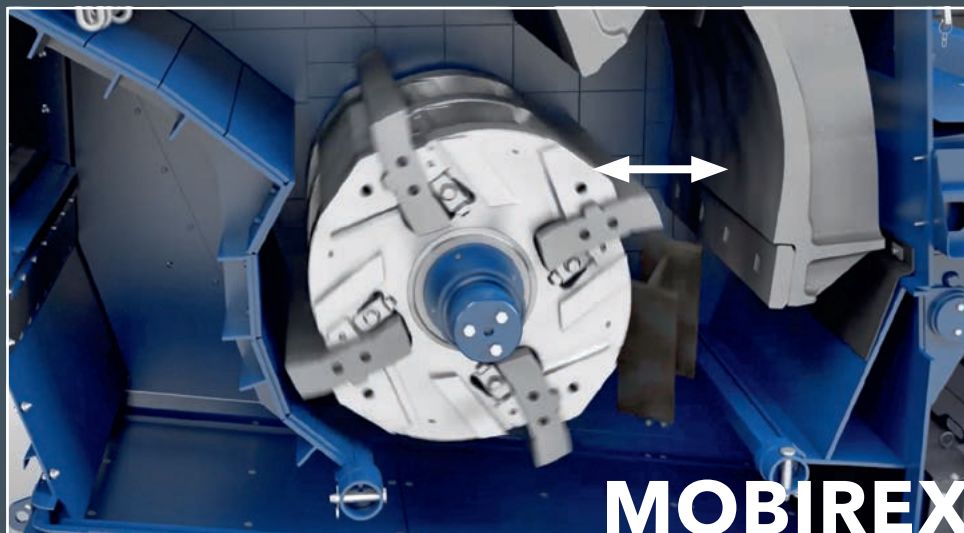
If there is a temporary severe or frequent overload due to uncrushable material – in recycling applications for example – the LRS increases the crushing gap to stop the crusher being damaged. This prevents the plant coming to a stop.

Overload system for MOBIREX impact crushers: intelligent impact toggle yields

The mobile MOBIREX MR EVO2 impact crushers are used as all-rounders in soft to medium-hard natural stone and recycling applications. As a result, there can be many causes of overload. The greatest fear on job sites are uncrushable foreign bodies, such as excavator teeth made of hardened steel.

If pieces of metal like this get into the crushing process, the crushing gap opens a previously-defined amount. Once the object has passed through the crusher chamber, the impact toggle automatically returns to the set crushing gap – similar to the process on MOBICAT jaw crushers.

KLEEMANN expertise: the opening of the crushing gap on MOBICAT jaw crushers and MOBIREX impact crushers stops the final protective stage having to be used. Installed on the MOBICAT and MOBIREX series as the final line of defence is a pressure plate with a predetermined break point; if the plate breaks, it brings the machine to a stop (like the fuse in an electrical circuit).



Overload systems for MOBICONE cone crushers 1/2:

Tramp release for optimum inherent protection

Used in the second or third crushing stage, MOBICONE cone crushers are designed for the precise recrushing of stone and rock. Output, product quality and wear need to be in equilibrium for optimum performance to be achieved.

If uncrushable material such as metal gets into the crusher and a brief overload situation results, the tramp release overload system reacts. This lifts the upper frame of the crushing unit, increasing the size of the gap and allowing the foreign body to pass through the crushing chamber without causing any damage.

Overload systems for MOBICONE cone crushers 2/2:

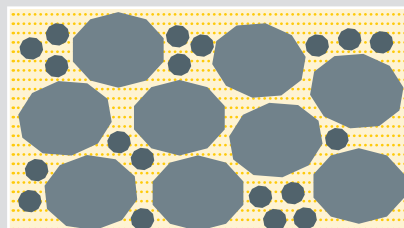
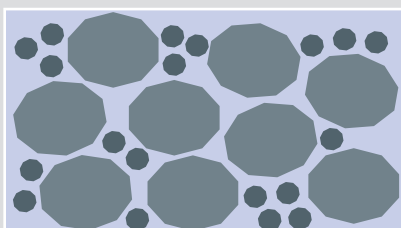
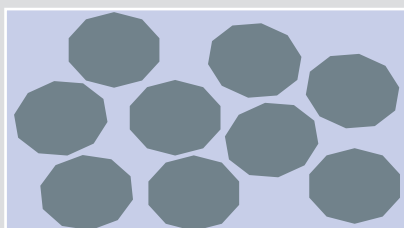
Ring bounce detection provides control when there is a high proportion of fines

Another overload scenario on cone crushers is so-called ring bounce. This is when too high a proportion of fines or material bound by moisture blocks the crushing gap. This is the “natural enemy”, as it were, of a continuous crushing process when operating cone crushers. The forces generated mean it is no longer possible to hold the top frame firmly on the bottom frame, so it starts to vibrate. It is important to prevent this.

The “ring bounce detection” overload detection feature performs this task on KLEEMANN cone crushers. The system continuously monitors the state of the crusher and if required, regulates the supply of material. In contrast to crushers from other manufacturers, which rely on mechanical overload protection, KLEEMANN users can decide for themselves how they would like to react to an overload situation.

KLEEMANN expertise: crushed stone and rock increases its volume. Enough space is provided for this in the crushing chamber of the cone crusher.

However, this space can become blocked if there is too high a proportion of fines, resulting in disruption to the crushing process and causing an overload situation.



Low proportion of fines = no overload reaction

High proportion of fines = overload reaction likely

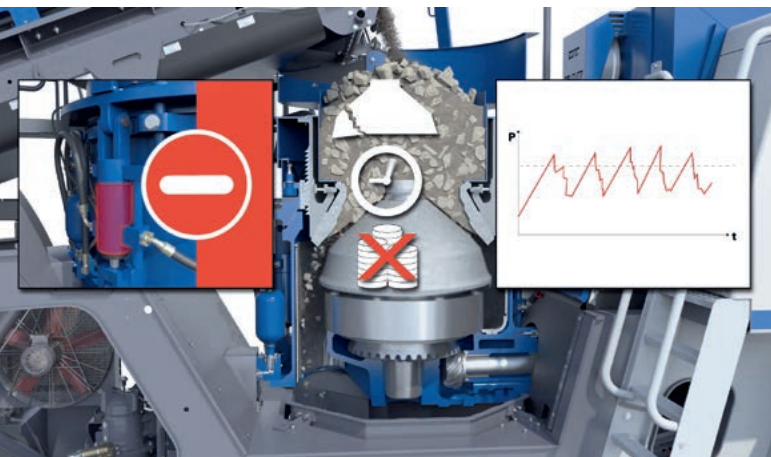


Ring bounce detection, solution 1: Precise mode for high quality

In Precise mode, the machine stops supplying material as soon as ring bounce is detected. The operator receives an error message and has to adapt the crushing process.

Benefit: no additional oversize grain forms and the plant is perfectly protected.

If MOBICONE cone crushers detect ring bounce, users can ...

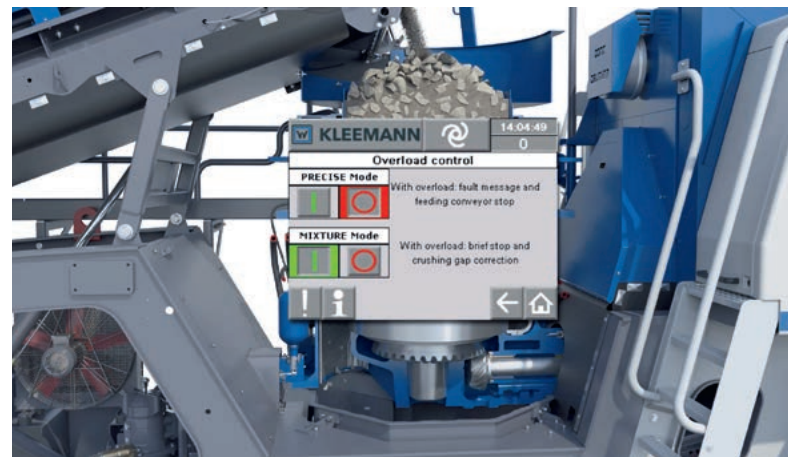


Ring bounce detection, solution 2: Mixture mode for a high level of process reliability

In Mixture mode, the machine adapts the crushing gap automatically in the event of a fault - without the machine operator having to intervene. After a defined period without ring bounce, the gap is closed again. Any oversize grain generated can be returned to the process.

Benefit: high level of plant feed and productivity.

... react to it with two solutions: either Precise mode or Mixture mode.



Control and overload systems from KLEEMANN - optimum protection for every kind of plant

Type of plant	MOBICAT	MOBIREX	MOBICONE
Control of intelligent material flow	Continuous Feed System (CFS)		
Overload due to	<ul style="list-style-type: none"> > excessive proportion of fines > particular components of feed material too large > uncrushable foreign bodies > excessively hard rock or stone 		<ul style="list-style-type: none"> > material too wet and sticky > excessive proportion of fines > particular components of feed material too large > recycling material (including random uncrushable constituents)
KLEEMANN overload system solution	<ul style="list-style-type: none"> > Overload system opens crushing gap 		<ul style="list-style-type: none"> > Ring bounce detection with two modes to choose from
Mechanical protection	<ul style="list-style-type: none"> > Pressure plate (predetermined break point) 		<ul style="list-style-type: none"> > Tramp release system

For optimized logistics

Use MOBIBELT stackers to speed up job sites

New stacker:
the MOBIBELT MBT 20 has a tracked chassis and a belt length of 20 m. KLEEMANN supplies another stacker with a tracked chassis and a 24-m conveyor belt - the MBT 24. The MBW 15 has a wheeled chassis and a 15-m conveyor belt.





KLEEMANN mobile crushing plants automatically control even non-homogeneous material flows within the plant. Nevertheless, machine operators have a significant impact on end-product quality and on daily output. Their shovel excavators and wheel loaders control input - or in other words, the supply of rock or recycled material. Operators also play the primary role in output, coordinating end-products by stockpiling, temporarily storing and transporting them. In future, they will be supported in these tasks by the new MOBIBELT stackers. These expand the effective range of crushing and screening plants, allowing bigger stockpiles and improving job site logistics.



A vertical sequence of seven geometric shapes, each defined by a blue outline. From top to bottom, the shapes are: a stepped L-shape, a U-shape, a double-arched shape, a horizontal bar, a double-arched shape, a circle, and a zigzag shape.

Greater flexibility in use

How MOBIBELT stackers improve job site logistics

Operation with wheel loader and mobile stacker

The arrangement

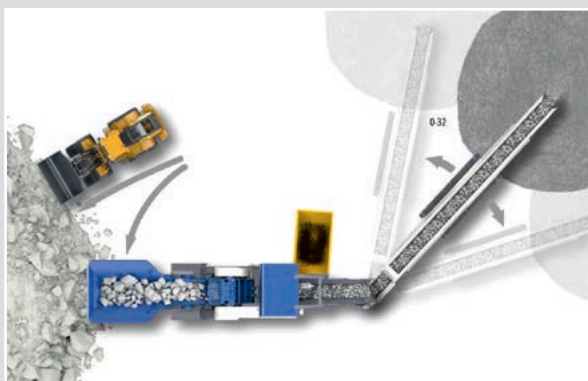
- > Feed material using wheel loader
- > Clear material using mobile stacker

Spheres of application

Suitable for various natural rock applications with a homogeneous feed material and for preparing crushed and milled asphalt. Condition: no trucks are to be loaded immediately after the crushing and screening process.

Benefit

Just one operator required, lean process.



Operation with backhoe excavator and mobile stacker

The arrangement

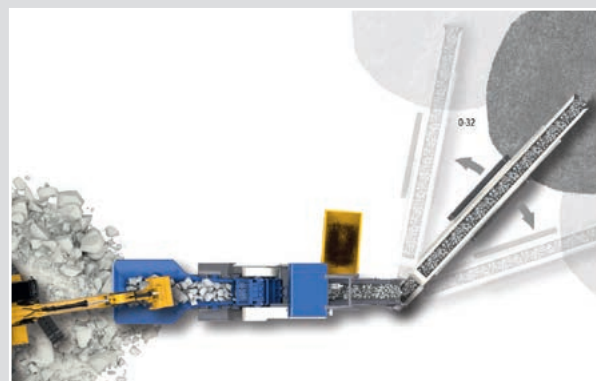
- > Feed material using backhoe excavator
- > Clear material using mobile stacker

Spheres of application

Allows maximum daily outputs. Highly suitable for all applications involving recycled material and natural rock; especially economical in the case of non-homogeneous feed materials such as rubble and crushed concrete.

Benefit

Most economical variant – assuming that no pre-screened material needs to be discharged and that no trucks are to be loaded immediately after the crushing and screening process.





Operation with backhoe excavator, wheel loader and stacker

The arrangement

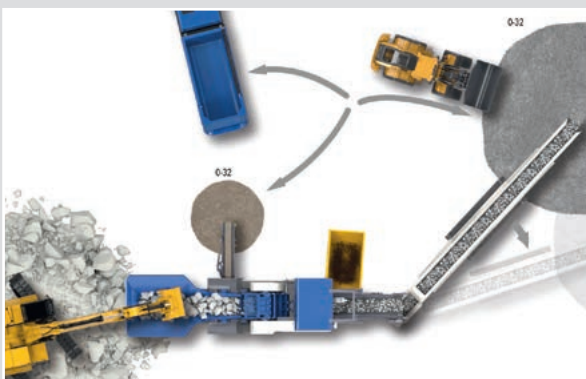
- > Feed material using backhoe excavator
- > Clear material using mobile stacker
- > Transport material using wheel loader

Spheres of application

Allows maximum daily outputs. Highly suitable for all applications involving recycled material and natural rock; especially economical in the case of non-homogeneous feed materials such as rubble and crushed concrete.

Benefit

Economical if trucks are to be loaded immediately after the crushing and screening process. Very high level of operational reliability.



Technical data

MOBIBELT MBT 24 stacker with tracked chassis

- > Conveyor belt length: 24 m
- > Conveyor belt width: 1 m
- > Feed capacity: 450 t/h
- > Hopper volume: 1.2 m³
- > Transport weight: 13,000 kg

MOBIBELT MBT 20 stacker with tracked chassis

- > Conveyor belt length: 20 m
- > Conveyor belt width: 1 m
- > Feed capacity: 450 t/h
- > Hopper volume: 1.2 m³
- > Transport weight: 10,500 kg

MOBIBELT MBW 15 stacker with wheeled chassis

- > Conveyor belt length: 15 m
- > Conveyor belt width: 0.8 m
- > Feed capacity: 350 t/h (hydraulic), 150 t/h (electric)
- > Hopper volume: 1.7 m³
- > Transport weight: 5,000 kg (max.)

MOBIBELT



Retrofit solutions from BENNINGHOVEN are developed in close collaboration with customers and users

Working in partnership to renew old technology.

The usual service life of asphalt mixing plants is easily twenty to thirty years - if not longer. Over this unbelievably long period, a lot can change in the world - requirements on formulas and qualities of mixes, for example, and often the official regulations operators have to comply with in order to get an operating licence. BENNINGHOVEN accompanies customers and users through all the challenges of modernization - with its very own retrofit division.



RETRO FIT



From discontinued model to driver for the future: a retrofit from BENNINGHOVEN not only replaces components; it also puts operators in a position where they can satisfy the requirements of the future.

Parameters which may change during the working life of an asphalt mixing plant

- > Customers demand new, higher-quality asphalts which require the plant to have specific dosing options.
- > Legislators tighten up emissions standards.
- > The proportion of RAP fed to the process is increased, reducing raw material costs – but only for operators with the appropriate technology.
- > Dust and noise protection regulations (Germany's "TA-Luft" and "TA-Lärm", for example) required to retain an operating licence are made stricter – often because residential areas expand right up to the asphalt mixing plant which used to be in an isolated position.
- > Alternative fuels are required for the mixing plant burner.



Towards a future-proof solution together: every BENNINGHOVEN project starts with listening. In this case, on site in Mintraching with Thomas Schnabel, technical manager of the asphalt mixing plant at Guggenberger GmbH and Markus Bühl of the WIRTGEN GROUP.

A retrofit from BENNINGHOVEN modernizes plants from all manufacturers

Retrofit solutions to modernize existing asphalt mixing plants make sense for lots of reasons – and are often more beneficial than investing in new equipment. In densely populated regions, a retrofit may well be more or less the only option, as getting new local authority consent would involve a complex process and the outcome would be uncertain. When an existing plant is renewed, on the other hand, new consent becomes completely superfluous in many countries.

BENNINGHOVEN is the partner for mixing plant operators in all retrofit projects – regardless of which manufacturer originally installed the old plant. In the process, customers benefit from the expertise and fairness which characterize BENNINGHOVEN.

RETROFIT



Seven good reasons for a BENNINGHOVEN retrofit

- 1 | State of the art:** bringing the asphalt mixing plant up to the current state of the art.
- 2 | Protecting your existing site:** ensuring that the site retains its operating licence.
- 3 | Sustainability and economy:** replacement of components and integration of recycling technologies pay for themselves.
- 4 | Optimization and efficiency:** modern control technology from BENNINGHOVEN improves plant performance.
- 5 | Win-win:** updating the plant can also be used as an opportunity to satisfy individual requirements - serial production solutions have already been developed from customer ideas.
- 6 | Improve instead of repair:** the recommendation from BENNINGHOVEN experts will leave plants in a better state after the retrofit than before it.
- 7 | All makes:** BENNINGHOVEN retrofit solutions are also possible for plants from other manufacturers.

Complete retrofit solution from a single source

From design to technical implementation to realization on site: BENNINGHOVEN experts from the WIRTGEN GROUP subsidiaries accompany the retrofit process all the way from establishment of contact to final acceptance. They also make direct contact with the main BENNINGHOVEN factory. This is of particular value to plant operators, because no two mixing plants are alike. A great many solutions have to be adapted individually or even worked out from scratch to make the plant future-proof. To make sure everything comes together perfectly at the end, the procedure is divided into three steps.

The procedure in 3 steps



Step 1

Development of a joint retrofit plan

Step 2

Technical investigation and implementation at the main BENNINGHOVEN factory

Step 3

Implementation of the new technology on site

What this means in reality is shown in a case history on the following pages.

1

Development of a joint plan



Approaching retrofit projects with a plan from the outset

Every BENNINGHOVEN retrofit project starts with an on-site meeting. A team from the WIRTGEN GROUP subsidiary which looks after the customer visits the customer with proven BENNINGHOVEN experts. A written record is made of the plant technology in situ and of all the desired changes, with BENNINGHOVEN planning manuals a helpful tool in this process. Photos of the plant and of the components to be renewed are also taken at this initial meeting.

Individual customer solutions – delivered in turnkey form

“A retrofit from BENNINGHOVEN is more or less a turnkey solution,” says Markus Bühl, area sales manager for BENNINGHOVEN products at the WIRTGEN GROUP subsidiary in Augsburg. A commission which supports this statement is the project to retrofit the asphalt mixing plant in Mintraching, owned by Guggenberger GmbH, where the aim was to renew a BENNINGHOVEN BA 4000-type plant.

The focus in this case was to increase the performance and efficiency of the plant, involving among other things replacement of the dryer drum and the burner. It soon became clear that a standard drum would not fit. Markus Bühl took this challenge back with him to the main BENNINGHOVEN factory to develop a solution with the Technical Office.

The Mintraching mixing plant before renewal: the desire for more mix per hour was the main driver behind the current retrofit project. Other components had already been modernized in the past.



The Guggenberger GmbH BA 4000 mixing plant in Mintraching: retrofit requirements

The plant

BENNINGHOVEN BA 4000 with the RA 200 parallel drum

The location

Mintraching on the Danube, just before the Regensburg motorway junction

Technical development

The first retrofit project took place in **2007**. The existing Guggenberger plant from another supplier was equipped with a dryer drum and burner from BENNINGHOVEN.

In **2013**, the site got a new BENNINGHOVEN plant of the BA 4000 type. The drying section, including burner and dryer drum, were taken from the old plant, whilst the complete mixing tower and the parallel drum for recycling were added new.

In **2016**, the plant was given a new cold feed system to improve performance.

In **2019**, the plan to replace the existing dryer drum and the burner finally came to fruition – and another retrofit project with BENNINGHOVEN began.



Current requirements for the retrofit project

Replace the dual-fuel burner for oil and coal dust with a larger triple-fuel burner, with gas as an additional fuel for more flexibility and less dependence on the energy market.

Increase the overall performance of the plant and thus the ability to compete in the supply of motorway job

sites, too, with stone mastic and mastic asphalts. These asphalts are made without RAP; the old plant was limited in this regard.

Technical investigation and implementation at BENNINGHOVEN

Working out an individual solution for the customer

Following on from the on-site meeting at the plant location in Mintraching, the WIRTGEN GROUP team discussed the requirements of Guggenberger GmbH at the main BENNINGHOVEN factory. "With this plant there was a whole range of requirements which off-the-peg solutions were unable to help with," says Jörg Genetsch, expert in drying and dust collection technology in BENNINGHOVEN's Technical Office. "However, we're used to that with retrofit projects and can implement even this kind of project economically for the customer." In developing the ideal solution, BENNINGHOVEN relies on swarm intelligence – or in concrete terms, on the expertise of the entire Technical Office paired with the experience of the fitters on site.

This is because the BENNINGHOVEN Technical Office is practised in getting more performance out of old technology and above all also in adapting existing technical components to suit new ones. "We look at the old components on site; these tell us what we need to take into account and what needs improving," says Jörg Genetsch. Once the design process is complete,

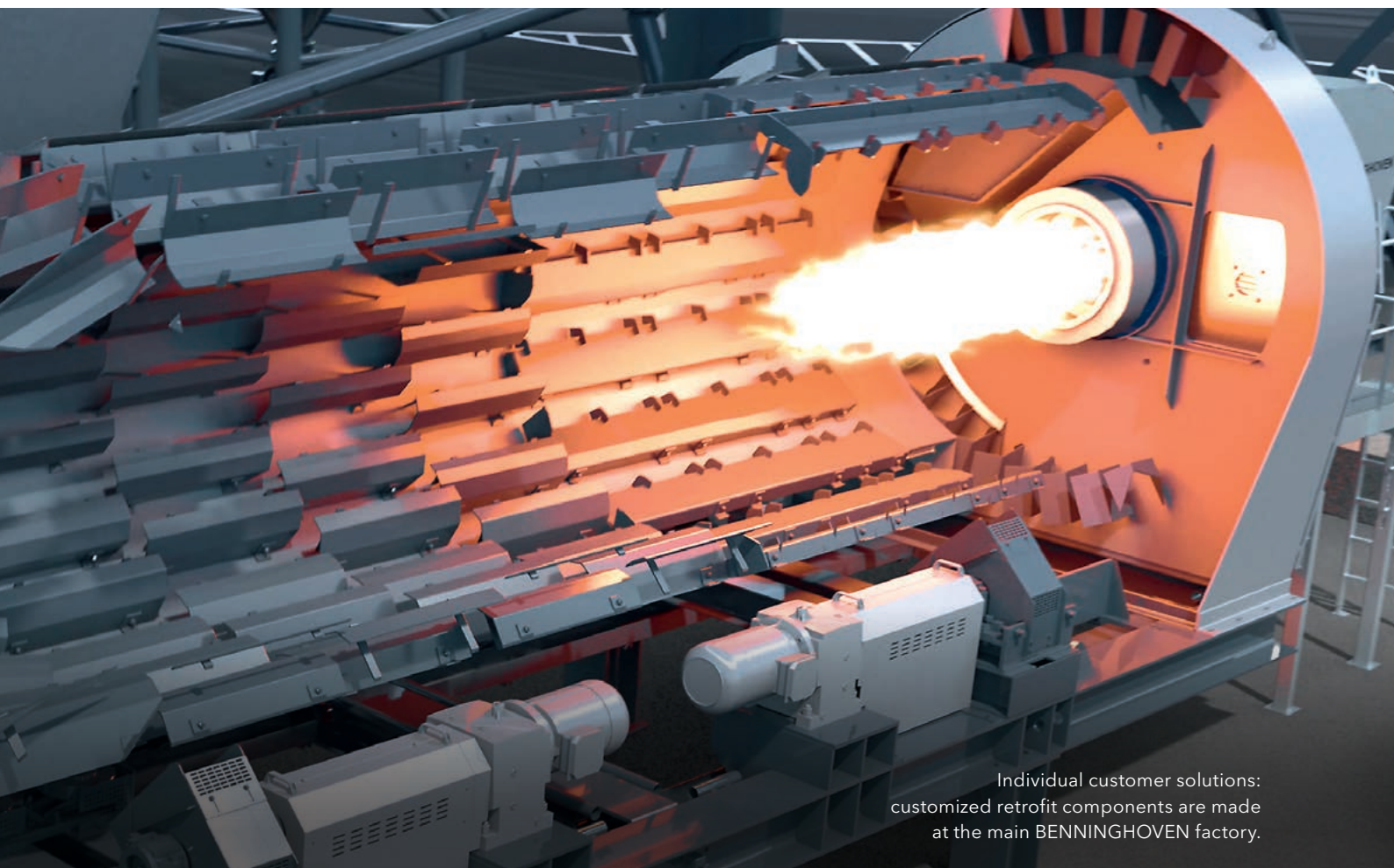


the engineers prepare technical specifications and layout drawings.

Presentation and agreement with the customer team

The WIRTGEN GROUP team presents this entire technical solution to customer representatives and discusses it with them until the project is approved. "Right back at the project planning stage, it was clear that the BENNINGHOVEN professionals know what they are talking about. Their expertise is considerable, so we felt we were getting good advice and were in good hands right from the outset," says Karl Weiss, mixing plant supervisor at the Guggenberger GmbH asphalt mixing plant in Mintraching.





Individual customer solutions: customized retrofit components are made at the main BENNINGHOVEN factory.

THREE QUESTIONS FOR MARKUS BÜHL

Area Sales Manager for
BENNINGHOVEN products at the
WIRTGEN GROUP in Augsburg

Mr Bühl, what do you do when you get an enquiry for a retrofit project?

In my initial contact with the plant operator, I make an appointment for an on-site meeting. I may be familiar with the plants of most customers, but it is still important that I understand precisely the objectives to be achieved – and which technologies will improve performance in the long term.

How important is this personal exchange of information?

From my point of view, it's very important, no question about it. It's incredibly important to get to know and understand one another. This is the only way to achieve perfect results. As experts in the field, we also have an obligation to look beyond the obvious and not just to replace components 1:1.

What role do plant staff play in this process?

... it's always quite involved. It's not just the opinion of the boss which matters, but that of the whole team. The team has to operate the plant and often brings good ideas to the table. What's more, when the new components are being fitted, these individuals frequently form part of the assembly team.



Teamwork: low-loaders transport the new dryer drum to its final position. The Guggenberger crew and the BENNINGHOVEN fitters complement one another perfectly in this process.

3

Implementation of the new technology on site

Let the teamwork begin!

Once the retrofit plan and all the new components have been approved, they are made in the main BENNINGHOVEN factory and transported to the job site. The customer's plant staff and BENNINGHOVEN service technicians often form a team, as was the case in the Mintraching retrofit project. "And it works so well!" says Thorsten Neidhöfer, one of the BENNINGHOVEN fitters on site.

New higher-performance EVO JET 3 triple-fuel burner

Modern BENNINGHOVEN technology was integrated in the existing asphalt mixing plant which will allow the plant to operate in an economical and environmentally friendly way for years. The heart of this equipment is made up of the burner and the dryer drum. With oil, liquid gas and coal dust, the new EVO JET 3 burner

can now fire three fuels instead of two, which will make Guggenberger more independent of fluctuating energy costs in future. A new coal dust dosing system has been fitted for this fuel; its overhauled design will bring key benefits for Guggenberger in terms of functionality, safety and fuel consumption. What is more, the burner is designed for higher performance and thus contributes to increasing plant performance as a whole. Drying performance increases significantly, especially in the production of mixes such as stone mastic and mastic asphalts which are made entirely from white mineral – in numerical terms, performance increases from 140 t/h to 190 t/h.

Experience the precision teamwork
in our video at
www.wirtgen-group.com/retrofit-dryer-drum-benninghoven





BENNINGHOVEN integrated the following in the Guggenberger GmbH asphalt mixing plant:

- > perfectly-fitting new frequency-controlled dryer drum. The existing foundations were reused.
- > triple-fuel burners of the EVO JET 3 type for firing oil, coal dust and gas. Its frequency-controlled burner output is 18.9 MW.
- > RAP formula generator to modify the quantity of RAP feed (cold and hot) in continuous operation.
- > new coal dust dosing system with massively improved control range increases efficiency.

You can find out all you need to know about the new coal dust dosing system at www.wirtgen-group.com/coal-dust-dosing-system-benninghoven



THREE QUESTIONS FOR KARL WEISS, Mixing Plant Supervisor at the Guggenberger GmbH asphalt mixing plant in Mintraching

Mr Weiss, what were the main reasons for giving your plant a substantial overhaul?

The desire for better plant performance was clearly the main driver. Specifically, we wanted to increase significantly the quantity of binder and surface course mix we are able to produce in an hour. To achieve this, the drum and the burner for the white mineral had to be dimensioned for a higher output.

What were your reasons for deciding to collaborate with BENNINGHOVEN?

Our plant comes from BENNINGHOVEN and we are happy with the plant – but we also work well together, so it seemed obvious to approach BENNINGHOVEN initially. The burner, in particular, is a fantastic device.

If it needs replacing, BENNINGHOVEN would always be our first port of call. Our new burner can even run on three fuels, which makes us much more flexible.

Hindsight is a wonderful thing, as we all know. How did you find the partnership? And how do you rate the economics of your investment?

The collaboration was great. We complemented one another perfectly in both the planning and assembly of the new components. Everything went so smoothly – we divided up the tasks between us, so there were jobs we did ourselves, whilst the BENNINGHOVEN team dealt with others. Here too, each of us was always prepared to help the other out.

As far as economics are concerned, we can mix more at a lower fuel cost, start earlier and finish earlier. This is really noticeable: we easily save half an hour's working time a day.

The need for speed is calling ...
... hairpin bend on the race track
in Shanghai.