

RoadNews

WIRTGEN KMA 240i, the efficient recycling solution
Permanently economical






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TOP FEATURE



Delivers 20 t of cold recycling mix every 5 minutes:
the new KMA 240i cold recycling mixing plant from WIRTGEN.




WIRTGEN

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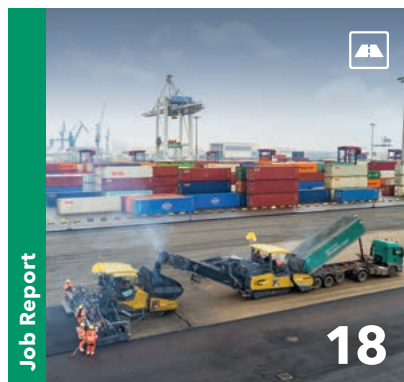
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Editorial

The future is well networked

The WIRTGEN GROUP is embracing digitalization to offer customers true added value. An example of this is SPECTIVE CONNECT from KLEEMANN. This app enables users to view all the relevant plant conditions conveniently on a smartphone in real time and create professional production reports to document the plants activity.

Our engineers also continue to create added value through calculated machine enhancements. HAMM has developed a vibration crusher drum that on a recent 15 m-high dam project, reduced costs by 40%. In Sochi on the Black Sea, a BENNINGHOVEN mixing plant of the TBA 3000 type is also making an important contribution to quality and efficiency. Among other things, it produces the very special mix required by the Russian Formula 1 circuit.

The WS 250 tractor-towed stabilizer is one of our smallest machines, but when paired with a John Deere tractor they produce big results. In an industrial area, John Deere tractors pulled the binding agent spreader for applying lime/cement, as well as the WS 250 to stabilize the ground for future building construction.

Also included in this issue is a first-hand account about what customers think of the new VÖGELE MT 3000-3i Offset material feeder.

We hope you enjoy this eleventh edition of RoadNews!

Best wishes from



Richard Buchignani
Managing Director
WIRTGEN INTERNATIONAL GmbH



Technologies from WIRTGEN and
John Deere on a soil stabilization project

A successful combination

WIRTGEN GROUP technologies are being used successfully all over the world to stabilize soil. Soil stabilization is an economical and resource-saving method of delivering load-bearing, easily compacted soil in preparation for underground or high-rise construction projects. In addition to self-driving soil stabilizers, WIRTGEN also supplies tractor-towed stabilizers, the WS 220 and WS 250. These are pulled and driven by a powerful machine tractor.





The tractor can be rapidly converted to allow operators to use it in many different ways - among other things for pulling dumpers or as soil stabilizers.



WS 250

Optimum mixing quality, optimum result



In combination with a WR 250i all-wheel-drive soil stabilizer, a Streumaster binding agent spreader and two HAMM compactors, the duo proved a well-drilled team - here opening up a new industrial area in North Rhine-Westphalia. The challenge for the machine

train was to raise this area of 80,000 m² by 10 m and to create a bearing substrate for the construction of large buildings. To achieve this, several hundred thousand cubic metres of earth had to be mixed with a lime/cement mixture in layers to stabilize it.



Pre-spreading of binding agent

First of all, the SW 10 TA towed spreader accurately distributed 10 kg/m² of the lime/cement mixture. Lime improves the ease with which the wet, cohesive ground can be paved and compacted, whilst cement increases its bearing capacity, among other things.

1

Homogeneous mixing of binding agent

The WS 250, also called a stabilizing or tractor-towed milling machine, and the WR 250i self-driving soil stabilizer then mixed in the mixing binder at a depth of 40 cm to create the desired high-quality homogeneous mixture of soil and stabilizing agent.



2



Profiling and compaction of the improved soil

As padfoot drum compactors are the most effective at compacting cohesive ground, an H 13i P initially took over. An H 13i with a smooth drum then took care of the final compaction stage.

3

20t



of cold recycling mix
every **5 minutes**





The new KMA 240i is the powerful WIRTGEN solution to environmentally-friendly and economical preparation of mix in the immediate vicinity of the project.



WIRTGEN KMA 240i cold recycling mixing plant

**Sustainable and
close to the job site**

Ecological, economical, versatile

With in-plant cold recycling, a mobile cold recycling mixing plant (Kaltrecycling-Mischanlage - KMA) is set up close to the job site. This saves time and truck capacity and is also extremely kind to the environment: 60% less CO₂ is emitted by cold recycling, construction times are reduced by 50% and this in turn results in a 50% reduction in construction costs.

The KMA 240i cold recycling mixing plant immediately generates mix which can be paved and is suitable for producing various different types of bonded base layer. This allows bitumen-bonded base layers (with emulsion or foamed bitumen), as well as cement-treated base layers (CTB) and roller-compacted concrete (or RCC for short), to be produced. The range of applications for the various mixes includes constructing motorways, making roads and paths and building car parks.

The new roads and industrial estate grounds constructed in this way are characterized by a high bearing capacity and deformation resistance, together with a long service life. WIRTGEN cold recycling technology accordingly represents maximum sustainability and, in addition to saving natural resources, also delivers economic benefits in the form of potential savings.

The percentages provided are to be understood as maximum possible values. Whether or not they can be achieved in day-to-day operations on the ground depends on actual site parameters.

On the main control panel, the operator can keep an eye on the material flow diagram, machine status and the whole production process at all times.



Application example

New CTB at Paderborn airport

With its 6-cylinder diesel engine, the new KMA 240i mobile cold recycling mixing plant can produce 240 t mix an hour from a variety of construction materials. In addition to needing a high-capacity mixing plant, the project to rehabilitate the apron and the refuelling and deicing area at Paderborn-Lippstadt airport also required the new cement-treated base layer (CTB) to have increased compression resistance. In one of its first test runs for paving the mix, the KMA 240i prepared 5,500 t material in 7 days. The contractor, Oevermann, had previously milled off the bituminous area of the site (which extended to 15,000 m²) using a WIRTGEN W 220i cold milling machine and then piled the excavated material in an adjacent car park together with crushed limestone 0/5 as the supplementary



material. A wheeled loader transferred both materials to the doser of the KMA in a ratio of 80% milled material to 20% limestone, where they were combined with the binding agents cement and water in a twin-shaft pugmill and processed into a high-quality mix.

Double the compression strength guaranteed

The single-axis compression strength of such mixes is generally 5-7 MPa. In this case, however, the CTB needed to meet more stringent requirements and achieve 12.5-15 MPa. As a result, the operator of the KMA 240i decided to add the higher proportion of 10% cement (instead of the usual 5-6%) to the construction

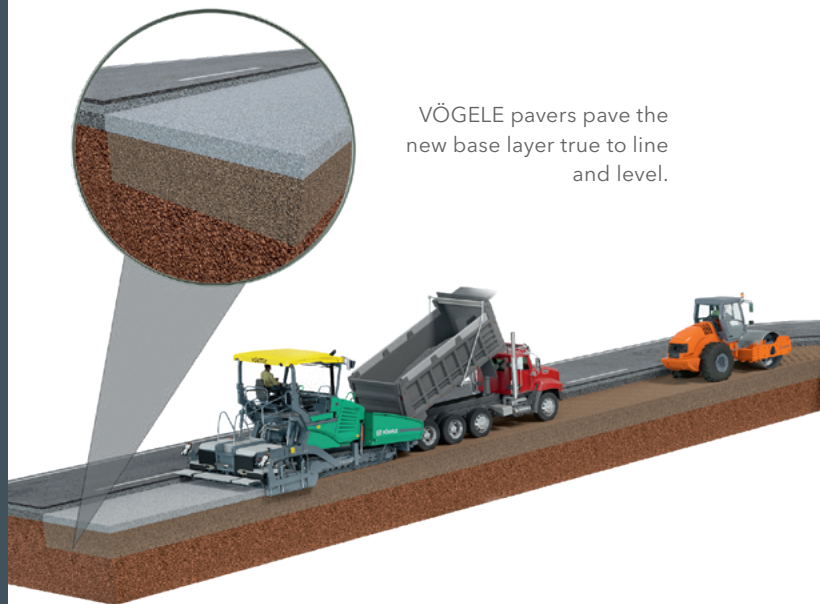
material, a mixture of milled granulate and limestone. Daily production of some 800 t cement mix kept the paving equipment downstream on continuous duty. After a grader had distributed the material evenly over the individual sections, two HAMM compactors of the 3412 type ensured that the new CTB was perfectly compacted.

Optimized dosing for quicker preparation of mix

Silos/tankers supply the cold recycling mixing plant with binding agents such as hot bitumen, bitumen emulsion and cement, for example. Precise dosing of the starting materials and binding agents, the ratio of which is ascertained by means of advance trials in the road construction laboratory, is monitored by a tried and tested microprocessor control unit. The KMA 240i ideally transfers the new, homogeneous mix of construction material straight onto the truck - or deposits it continuously on a pile.



Efficient technology: microprocessor-controlled plant management means the KMA 240i works with high precision.



VÖGELE pavers pave the new base layer true to line and level.

Trucks transport the mix prepared for the new base layer back to the job site.

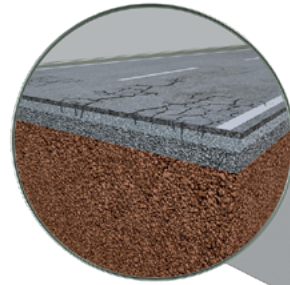


KMA

240i



WIRTGEN cold milling machines excavate the whole of the damaged asphalt pavement. A Streumaster binding agent spreader, WIRTGEN recycler and HAMM rollers then follow to stabilize the road base.



Paving process for a cement-treated base layer (CTB)



Trucks transport the milled material to the WIRTGEN KMA close to the job site and pile it up there.



The KMA prepares the milled material into high-quality mix by adding binding agents and transfers it straight onto trucks.

SP 154i

Dual-layer paving with exposed-aggregate concrete

SP 154i links Prague and Brno



Between Loket and Soutice | **Czech Republic**



A large pave train from WIRTGEN demonstrated its performance potential during the modernization of motorway D1 which links the two largest cities in the Czech Republic: two new SP 154i slipform pavers and a TCM 180i texture curing machine were linked to rehabilitate a 67 km section of motorway towards Prague. The pave train produced two layers in one pass, simultaneously widening both carriageways.

The SP 154i is equipped with four steerable pivoting crawler units which ensure a high level of manoeuvrability regardless of the sub-base. At average power, ECO mode significantly reduces fuel consumption and CO₂ emissions.



Two SP 154i machines on the project, one to pave the first layer and the other to pave the second

On motorway D1, contractors Eurovia CS used the pave train to create a top-quality carriageway in exposed-aggregate concrete. The dual-layer paving process is extremely economical, because only the second layer consists of the relatively expensive exposed-aggregate concrete, a construction material widely used in Europe. A cheaper mix can be used for the first layer.

Paving the second layer of concrete “wet on wet” allowed an outstanding bond to be achieved on the carriageways which are 11.5 m wide and 27 cm thick. Together, the 22 cm-thick first layer and the 5 cm-thick second layer form a road surface which has a very high bearing capacity and which also takes account of the steadily-rising axle weights of heavy goods traffic.

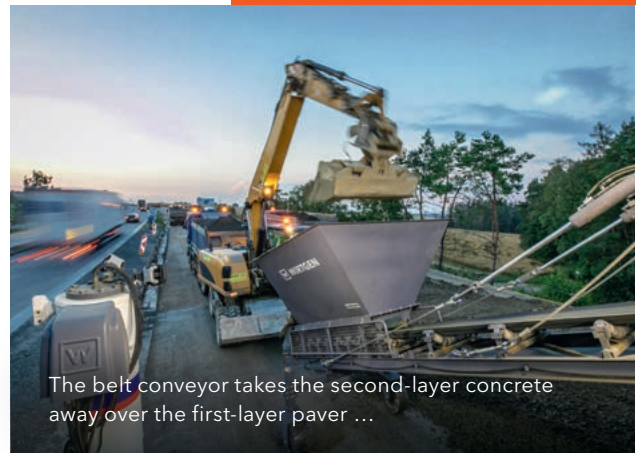
Uniform, intuitive control

This project, which has made a significant contribution to improving traffic flow and to securing the Czech infrastructure, required over 60,000 tonnes of concrete (equivalent to around 333 t per hour) over 20 days. Another factor in achieving continuous, accurate paving was that operators were able to control their new machines safely and intuitively at all times. The SP 154i makes it easy for operators in this regard, as the operating consoles fit seamlessly into the concept for operating the current fleet of WIRTGEN slipform pavers, so nothing new needs to be learned.



We are convinced by the new SP 154i. The surface quality it generates is remarkable.

Roman Pistek, Concrete Road Building Technology Specialist, EUROVIA CS, a.s.
(Centre of photo, here talking to Jaroslav Dostálek of Roads ČR s.r.o. and Martin Datzert from WIRTGEN GmbH)



The belt conveyor takes the second-layer concrete away over the first-layer paver ...



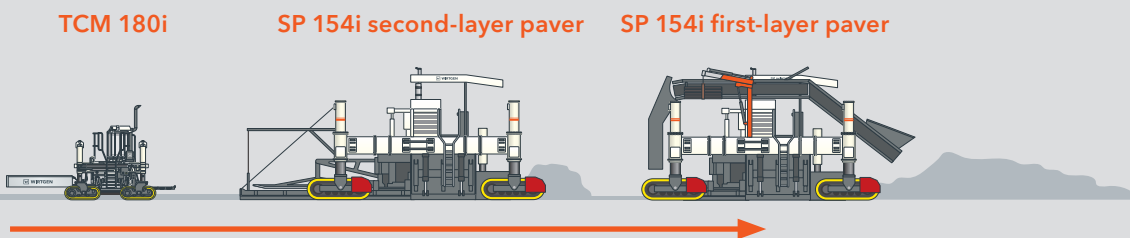
High-performance powerhouses:

the SP 154i slipform paver and the TCM 180i texture curing machine working in tandem.

WIRTGEN concrete pave trains consist of two slipform pavers and one texture curing machine - in this case, two SP 154i machines and a TCM 180i. The SP 154i can essentially be set up and used as a second-layer and a first-layer paver.

As a first-layer paver, the SP 154i is equipped with an automatic dowel bar inserter, up to three longitudinal tie bar inserters and a concrete transport unit to the second-layer paver. When the paver is used as a second-layer paver, a transverse smoother and a super smoother ensure a perfect concrete surface.

The final step is executed by texture curing machines such as the TCM 180i. These can create a variety of surface structures and spray a dispersion onto the fresh concrete surface to stop it drying out prematurely. When exposed-aggregate concrete is paved, however, a surface texture is not produced; instead, the topmost layer of slurry is brushed out to create the characteristic exposed-aggregate concrete surface with a texture depth of approx. 1 mm.



Technical data for SP 154i first-layer paver and SP 154i second-layer paver

Working width	5 m to 16 m
Paving height	max. 450 mm
Rated power	321 kW/436 hp
Exhaust emissions category	EU Stage V/US EPA Tier 4f

PAVE TRAIN





Road construction professionals on the new VÖGELE material feeder:

"The MT 3000-3i Offset makes our processes more efficient."

As powerful as ever, more convenient than ever: VÖGELE has continued to develop its material feeders and bring them up to Dash 3 level whilst staying true to this principle. For RoadNews, we joined two projects using the MT 3000-3i Offset in the port of Hamburg and in Schneeheide, North Germany - and took the opportunity to ask a contractor and a construction manager for their opinion. Having already worked intensively with the predecessor models, these two road construction professionals report on how the improvements made by development engineers have been received in the field.



Powerful performance against an impressive backdrop: the new VÖGELE MT 3000-3i Offset material feeder contributes to achieving significant laydown rates of outstanding quality, something demonstrated on a project in the port of Hamburg.

MT 3000-3i Offset

INTERVIEW



Personal details:

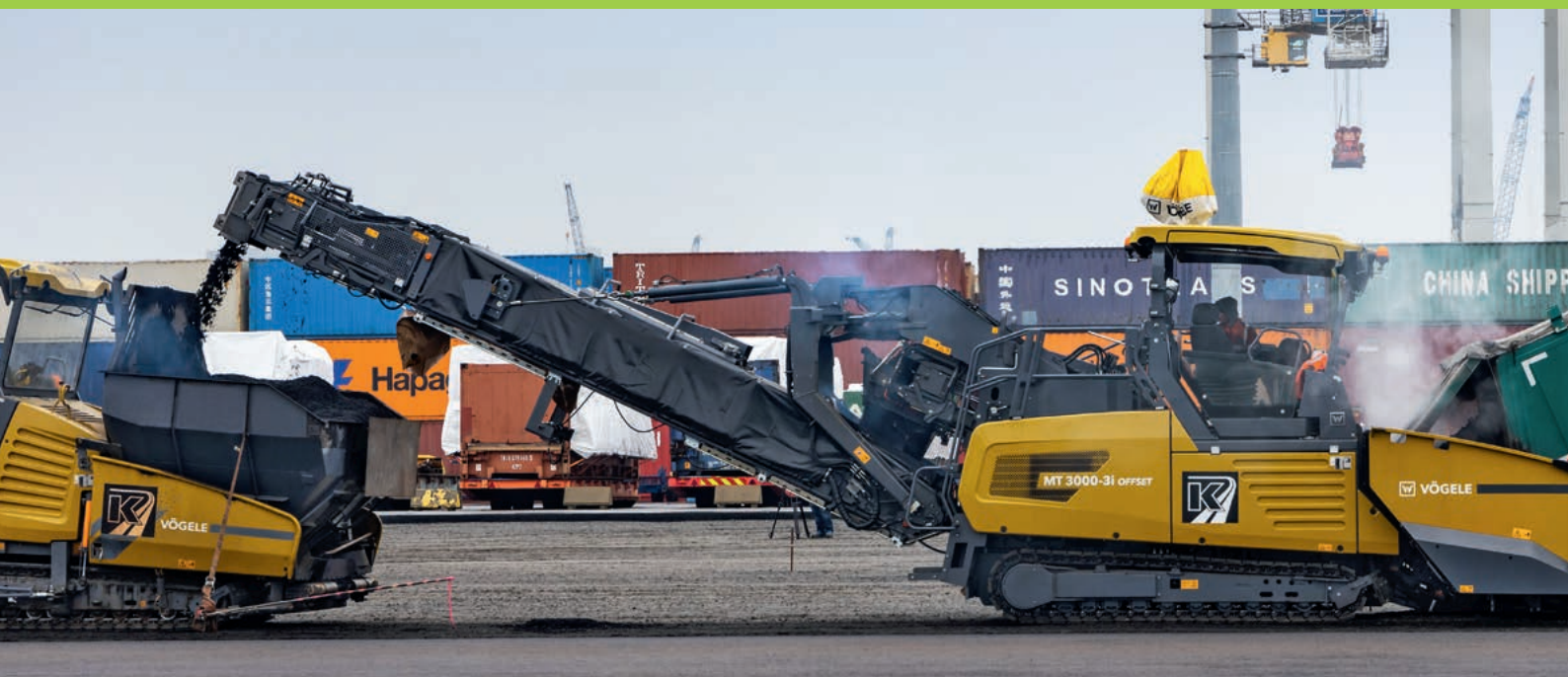
Ferdinand Kalinowsky is a junior partner in Ewald Kalinowsky GmbH & Co. KG. This traditional company from Bad Bevensen, in Lower Saxony, has specialized in civil engineering and road construction and relied on VÖGELE material feeders for a long time – and not just for large-scale projects.



The Dash 3 material feeder certainly delivers even greater convenience and technical improvements.

Mr Kalinowsky, what do you rate on the new Dash 3 material feeder?

The MT 3000-3i Offset is a real further development of its predecessor. Although our experiences with the Dash 2 material feeder were already good, the Dash 3 model certainly delivers even greater convenience and technical improvements. The new control for the heated conveyor, for example, ensures optimum temperature management and is even more economical than before. What is more, VÖGELE has adapted the transport components so that the machine hardly gets dirty at all. This then means less cleaning work for us.





And on which job sites are you using the new material feeder?

It varies a great deal. A lot of people see the benefits only in terms of large-scale job sites, but the Offset material feeder makes even smaller projects much more efficient. We use it when constructing cycle paths or footpaths, for example. Of course the material feeder really does come into its own on larger job sites such as Hamburg's container port, demonstrating its full power in combination with the SUPER 2100-3i and the SB 300 Fixed-Width Screed. This enables us to pave a pave width of up to 13 m without interruptions.

So would you say that range of application, performance and engineering were the key points?

Yes and no. Apart from the aspects and additional functions on the new material feeder already mentioned, our positive experience with both VÖGELE and the WIRTGEN GROUP was another key factor. We appreciate the constructive cooperation in service and development.

The project: port of Hamburg, expansion of the container terminal

The container terminal of Hamburger Hafen und Logistik AG is one of the most modern in the world. In future, recently filled-in docks will serve as extended storage space to allow large container ships to be processed quickly.

Here the VÖGELE SUPER 2100-3i paver, equipped with the SB 300 Fixed-Width Screed, paved the asphalt pavement in conjunction with the new MT 3000-3i Offset material feeder – a surface area of some 30,000 m².

The area was paved in sections 8 m to 10.5 m wide and 13 cm thick (base layer) and 3 cm (surface course). Average laydown rate was 450 t/h. "This is where the wheat is separated from the chaff" says Ferdinand Kalinowsky. So the MT 3000-3i passed its "stress test" with flying colours.

Experience the MT 3000-3i Offset in action at the port of Hamburg:
www.wirtgen-group.com/video-hamburg-voegele



More efficient belt heating: during further development, VÖGELE engineers successfully implemented user feedback in practical solutions.

INTERVIEW



Personal details:

Johannes Delventhal is construction manager at Matthäi Bauunternehmen GmbH & Co. KG based in Langenhagen, Lower Saxony. This road construction professional gives a high priority to process reliability when processing asphalt, so he finds user-friendly material feeders indispensable.



The entire operating concept just satisfies users' requirements really well.

Mr Delventhal, how has the new material feeder been doing on your job sites so far?

Very well. We use the material feeder for various projects - building major roads, trial sections or for smaller-scale projects, for example. Regardless of whether the job site is large or small, it makes processes more efficient, prevents demixing and thus increases the quality of the asphalt courses. As the construction manager, these are key factors for me.

So what does your paving crew have to say about the new machine?

The operators especially appreciate the user-friendly nature of the new Dash 3 generation, the ErgoPlus 3 concept. The clear operating console, intuitive operation and automatic functions save time and prevent errors, allowing my colleagues to concentrate



Powerful technology, ergonomic operation: the joystick for operating the conveyor allows it to be pivoted accurately to either side and handles very conveniently.

on transferring the mix. An especially practical feature is the automatic conveyor with its proportionally-controlled primary and secondary belts or the laser distance control which controls the speed of the material feeder automatically to suit the speed of the paver. The entire operating concept just satisfies users' requirements really well: the joystick for operating the conveyor allows it to be pivoted accurately to either side and handles conveniently. These kinds of details matter in the routine working day.

And what do machine technology and performance look like?

We have found these, too, to be convincing so far. The material feeder, for example, drives very well straight ahead and has a low-noise drive – important points for my paving team. With an output of up to 1,200 t/h, the material feeder is also a true workhorse.

The project: rehabilitating a minor road

Minor road K121 in Schneeheide (near Walsrode in Lower Saxony) was severely deformed and cracked. The carriageway was also too narrow for oncoming traffic, so the objective was to rehabilitate and widen the road.

Contractor Matthäi first paved the 10 cm-thick base layer 5.6 m to 6 m wide for 2.1 km using a SUPER 1800-3i SprayJet, then paved the 4 cm-thick surface course.

Supported by the VÖGELE MT 3000-3i Offset material paver, paving went very quickly and without any paving interruptions.

Experience the MT 3000-3i Offset
in action in Schneeheide:
www.wirtgen-group.com/video-schneeheide-voegele



Classic or Premium Line

Two machine concepts for every requirement

If you decide to get a VÖGELE road paver, you can select between five product classes and two lines: the Classic and the Premium Lines. But what does this actually mean? The SUPER 1000(i) Classic Line paver and the SUPER 1300-3(i) Premium Line paver, for example, are suitable for a similar range of applications, but the scope of their functions differs. The example of the two Compact Class pavers demonstrates which factors need to be taken into account when deciding on one machine or the other.

Experience the machines in action:

www.wirtgen-group.com/compact-class-comparison-voegele





Define performance spectrum and determine requirement for variety of functions

Both Compact Class pavers integrate VÖGELE technology which accepts no compromise in terms of quality. The material hopper and the whole of the material handling system are identical, for example. However, it is in the detail that differences are found between the SUPER 1000(i) and the SUPER 1300-3(i), which VÖGELE also supplies in a wheeled variant.

At 74 kW, the Premium Line paver has a engine 19 kW more powerful than the Classic Line representative. Its maximum laydown rate of 350 t/h is also 80 t/h above that of the SUPER 1000(i). Its higher performance data likewise make the maximum pave width of the SUPER 1300-3(i) somewhat larger, at 5 m compared to 3.9 m, although both pavers are equipped with the AB 340 Extending Screed.

The greatest differences between the Classic and Premium Lines are in the operating concept and in the associated scope of their functions. The SUPER 1300-3(i), for example, uses ErgoPlus 3, whilst the Classic Line paver uses ErgoBasic.

Both operating concepts are particularly user-friendly, ergonomic and intuitive. ErgoPlus 3, however, provides an extended scope of functions including numerous automatic functions which operators can activate on the high-contrast display.

The following pages summarize other differences between the two pavers.

- 1 | SUPER 1000(i) Classic Line paver: the functions of this particularly economical machine concentrate on the essential features required by paving crews.
- 2 | SUPER 1300-3(i) Premium Line paver: the Dash 3 generation machine satisfies the most exacting requirements for functionality and convenience.

PREMIUM LINE



SUPER 1000(i)

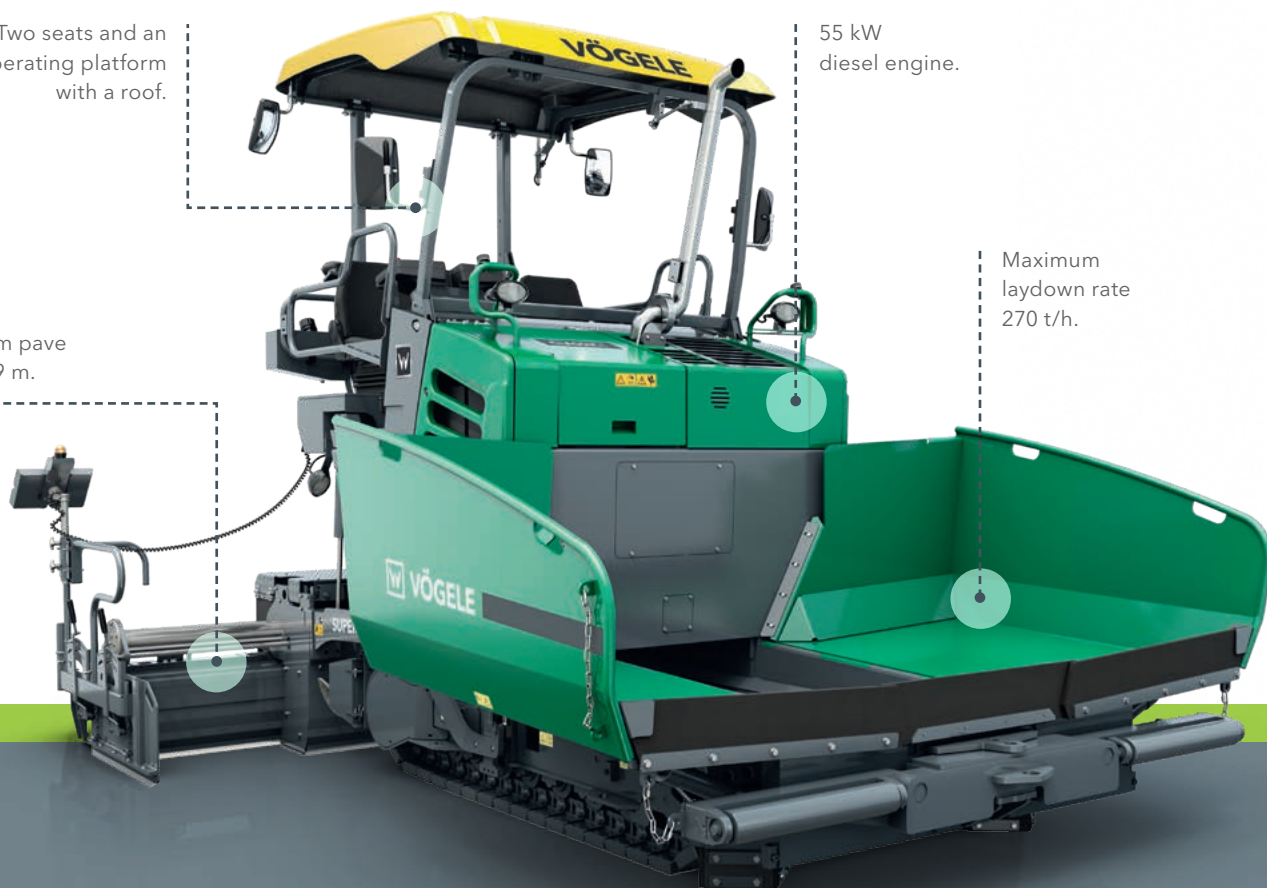
The differences at a glance

Two seats and an operating platform with a roof.

55 kW diesel engine.

Maximum laydown rate 270 t/h.

Maximum pave width 3.9 m.



ErgoBasic

Niveltronic Basic System for Automated Grade and Slope Control.

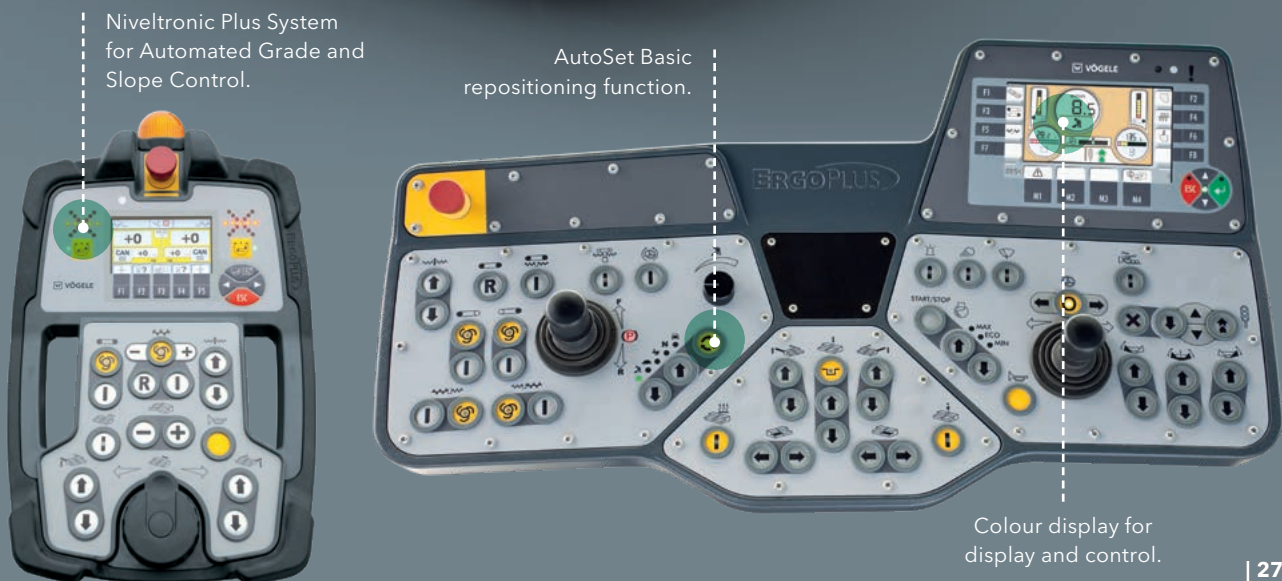




PREMIUM LINE SUPER 1300-3(i)



ErgoPlus 3



The “VC” in the machine’s name stands for “vibration crusher”. These compactors are true multi-tasking professionals: as they compact, they crush an enormous range of construction materials and minerals by means of vibration.



Bad Fredeburg | Germany



Layers of quality

Compactors with vibration crushers save time and money

At Bad Fredeburg, a village in the Sauerland in Germany's Mittelgebirge region, two HAMM H 25i VC-type compactors with their special vibration crusher drums crushed and simultaneously compacted slate to create a dam up to 15 m high for a new bypass. The main reason for using these compactors was that their vibration crushers allow the implementation of a highly efficient construction process; this process dispenses with separate stone crushers and the majority of transport operations, resulting in an accelerated process which simultaneously cuts costs.

Process parameter

Material for dam construction:	260,000 m ³
Of which slate:	180,000 m ³
Amount removed:	Up to 14 m
Superstructure:	Up to 15 m in layers
Depth of layers:	40 cm each
Max. grain size:	200 mm
Void content:	Optimum 6%, max. 10%

H 25i VC



Ideal project for the VC compactor

Michael Tillmann from Kirchhundem in the Sauerland in West Germany's Mittelgebirge region noticed the H 25i VC during Bauma 2019. "The compactor concept convinced us at once, but until now, we didn't have the right project for it," reports the construction manager at Straßen- und Tiefbau GmbH. But just a short time later, a dam made of local slate needed building for a bypass. "Looking at the stone, I suspected that the HAMM compactor would find this material easy to crush," says Tillmann. He was right.

The laminated stone is Fredeburg slate, also called greywacke. Originally, several jaw crushers were supposed to crush the material to a maximum grain size of 200 mm on the job site and excavators were to load it onto trucks which would transport it from there to the dam. Bulldozers were then to have distributed the stone to allow compactors to compact it in layers.

Simplified process, double the performance

The team from the Sauerland presented a simpler and more efficient alternative for this process - with no crushers and considerably fewer transport operations, but involving two H 25i VC compactors. A trial quickly showed that the HAMM VC compactors delivered the right crushing pattern for this application. Construction supervision officials were also satisfied with the quality of the crushed slate and with the degree of compaction achieved in the layers making up the dam. A depth of 40 cm per layer was subsequently specified in agreement with the soil experts. The ideal void content was determined to be 6%, with a maximum of 10%.

Each layer was also to be sprayed with water to ensure that the water content was correct, too. "After a few days' operation, it was obvious that we were working much more quickly this way than with crushers. The main reason is working in layers," explains Tillmann.



1



2



3

1 | During construction, each of the two VC compactors crushed and compacted some 2,250 m³ a day in layers 40 cm thick.

2 | The process when working with the VC compactor is as follows: trucks bring the stone straight from the quarry to the job site. A bulldozer then distributes the material in layers 40 cm deep. Finally the crusher/compactors crush the stone and simultaneously compact it.

3 | The H 25i VC crushed the slate to a maximum grain size of 200 mm.



Decoupling the process steps allowed us to achieve an output of approximately 4,500 m³ a day. This is almost double what we had envisaged in the original plan.

Michael Tillmann, Construction Manager
Straßen- und Tiefbau GmbH, Kirchhundem

VIBRATION CRUSHER



Crushing and compacting in a single step: the VC compactors impress with their high point loads of up to 50 t. A direct comparison makes the result clear.

Stone crusher and padfoot roller in one

150 quick-change toolholders are welded to the drum of VC compactors. These can hold two different tools: round-shank chisel stones or padfoot inserts. Fitted with round-shank chisel stones (also used in mining), the vibrating drum generates extremely high point loads of up to 50 t to crush the stone, compacting the ground at the same time. In this way, VC compactors can crush stone but also loosen rock.

The drum can be equipped with special padfoot inserts to compact cohesive ground. HAMM currently has two different round-shank chisel stones in its range for crushing or loosening stone: a classic round-shank chisel stone and a special mining chisel for projects involving hard stone. Their geometries, together with

their integral solid carbide tips, are specially designed for materials with different compressive strengths.

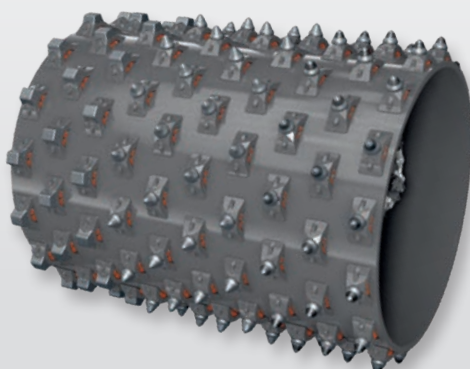
Reuse as a principle

The design of the quick-change toolholder is typical of HAMM: the shape of the holder means that the tools do not get especially soiled, making them easy to change. What is more, the chisels are not destroyed when changed, allowing them to be used several times until they reach their wear limit. When crushing the Bad Fredeburger slate, the chisels also impressed with their extremely low wear rate: "In the entire time, we only had to replace a few chisels," says machine operator Marvin Gallus.



The flexible quick-change toolholder makes the H 25i VC compactors suitable for an enormous variety of applications

- > Crushing basalt, granite and other minerals with comparable compressive strength
- > Crushing and compacting mixed soils with effect at a significant depth
- > Homogenizing stone
- > Compaction during cold recycling
- > Crushing when breaking up concrete
- > Initial crushing and loosening of rock
- > Preparing/maintaining access routes in quarries
- > Creating routes in tunnel construction and surface mining
- > Compacting cohesive ground
- > Compacting abrasive, fine-grained minerals



Standard



Heavy duty



Padfoot insert

The drum of the VC compactors is 2.22 m wide and fitted with 150 quick-change toolholders. It is extremely simple to fit and remove tools on HAMM's VC quick-change toolholder system.

Optimized process reduces costs by around 50%

On most comparable job sites, the job site process consists of the following steps: quarrying and loading, transport, feeding the crusher, crushing, loading, transport, distribution and compaction. The process can be shortened using VC compactors. The remaining steps are quarrying and loading, transport to the project site, distribution by bulldozers, crushing and compacting using the VC compactor.

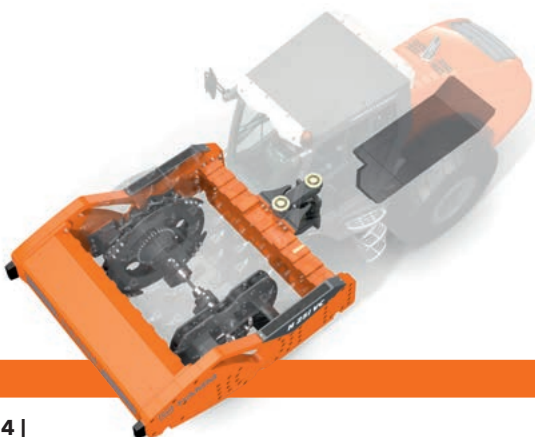
This makes it possible to complete projects a lot more economically. In Bad Fredeburg, the costs for crushing and compacting were cut by about 50%, as far fewer machines were required. Straßen- und Tiefbau GmbH needed just two VC compactors and one bulldozer. The original two crushers, two excavators and two dumpers for crushing the slate were not required, reducing staff and operating costs accordingly.

Another benefit: use of the VC compactors also made the CO₂ footprint of the entire job site much smaller.

Fit for maximum load with heavy-duty equipment

When crushing stone, the machine components are put under much greater load than in normal compaction, so HAMM designed the VC machines to be heavy-duty machines. Among other features, therefore, the 3-point articulation, underbody, front frame and drum suspension (including drive) for these machines are reinforced compared to normal compactors. In addition, all VC compactors run on especially sturdy earth-moving tyres and operators benefit from seats with an extra-tall backrest. The VC compactor is furthermore equipped as standard with Hammtronic machine control and the HAMM Compaction Meter.

Bulldozer operator Thomas Pape (left) and compactor operators Mohamed Khalil (centre) and Marvin Gallus are happy with HAMM technology and with the construction process.





Positive user feedback on the H 25i VC

Marvin Gallus and Mohamed Khalil were at the controls of the two H 25i VC compactors in Bad Fredeburg. They received induction training on the special features of the machine from a service engineer when the crusher/rollers were handed over. "Overall, everything was pretty clear and simple after that. The compactor

is fantastic to operate," says Marvin Gallus. In concrete terms, both operators praised the simple operation and comfort of the machines - above all the quality of the seat and the spacious cabin. The many details to make working a pleasant experience were also well-received - the provision of 12 V sockets, for example. "I use one of the two 12 V sockets for my mobile. It's very practical," says Mohamed Khalil.





KLEEMANN presents two new crushers of the brand new EVO2 generation: the MOBICAT MC 110 EVO2 jaw crusher and the MOBICONE MCO 90 EVO2 cone crusher. As a team, they are one of the most popular combinations of KLEEMANN products. The mobile plants are frequently used together in the first and second crushing stages. They were developed for projects in the mid-level performance segment in quarries or at recycling and toll manufacturing companies. KLEEMANN gave a high priority to intelligent user support for the new plants - as well as to digital innovations with added value.



High product quality and economy - achieved, among other things, by means of intelligent control technology: the new MOBICAT and MOBICONE crushers of the EVO2 generation.



New MOBICAT MC 110 EVO2 and new MOBICONE MCO 90 EVO2

**Economical team players,
new-generation technology**

The duo which is tried and tested all over the world

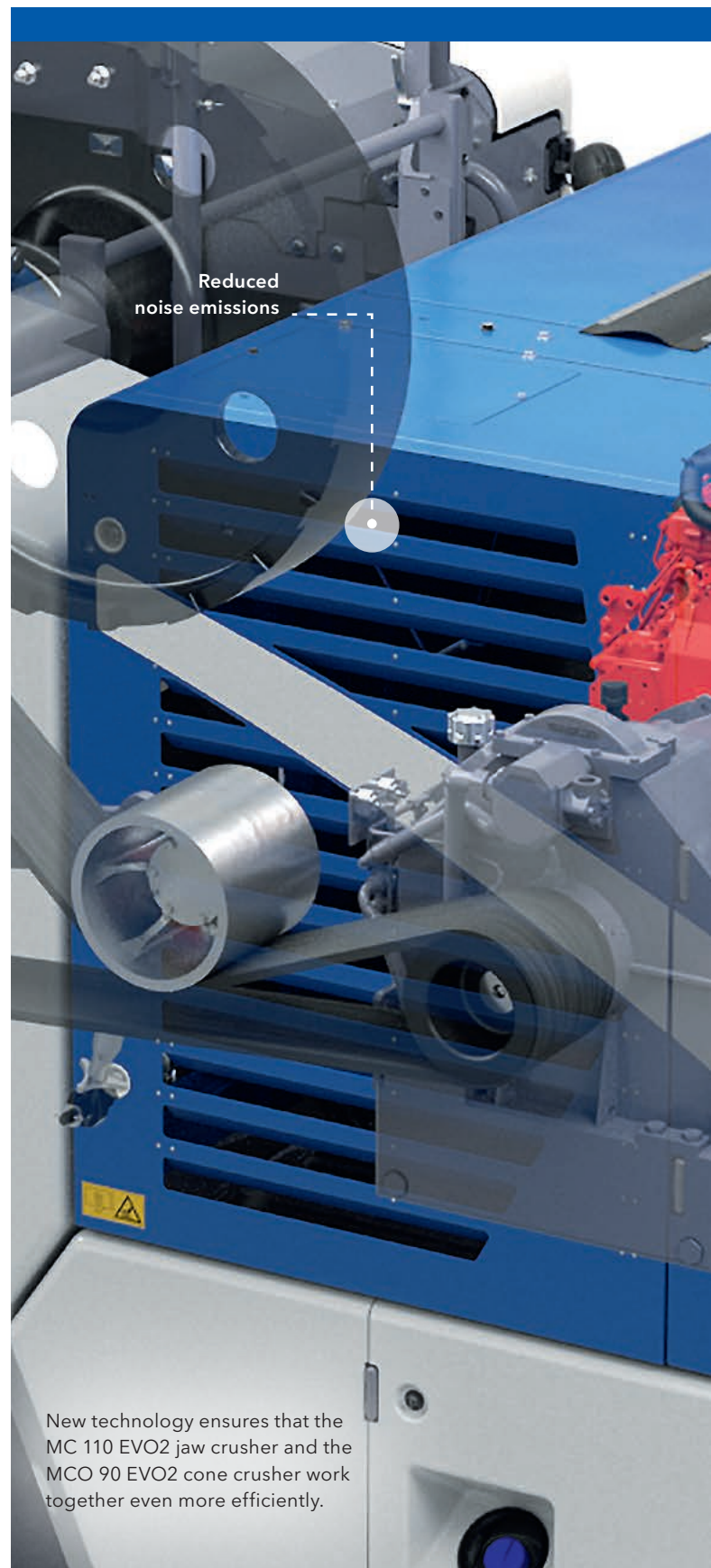
Where the aim is to be ready for use quickly, to crush efficiently and to be flexible in use - that's where you see the MC 110 EVO2 and the MCO 90 EVO2 playing to their strengths. There is a good reason why they are frequently part of the team in natural stone applications all over the world - primarily in applications involving medium-hard to hard abrasive rock: the option of linking them and matching performance level.

Using both machines together ensures that both plants deliver a largely smooth and continuous flow of material. The technology behind this is called Continuous Feed System (CFS). This monitors crusher filling level and other plant parameters by means of an ultrasonic probe to optimize performance - and linking the lines means this can be achieved for both plants simultaneously.

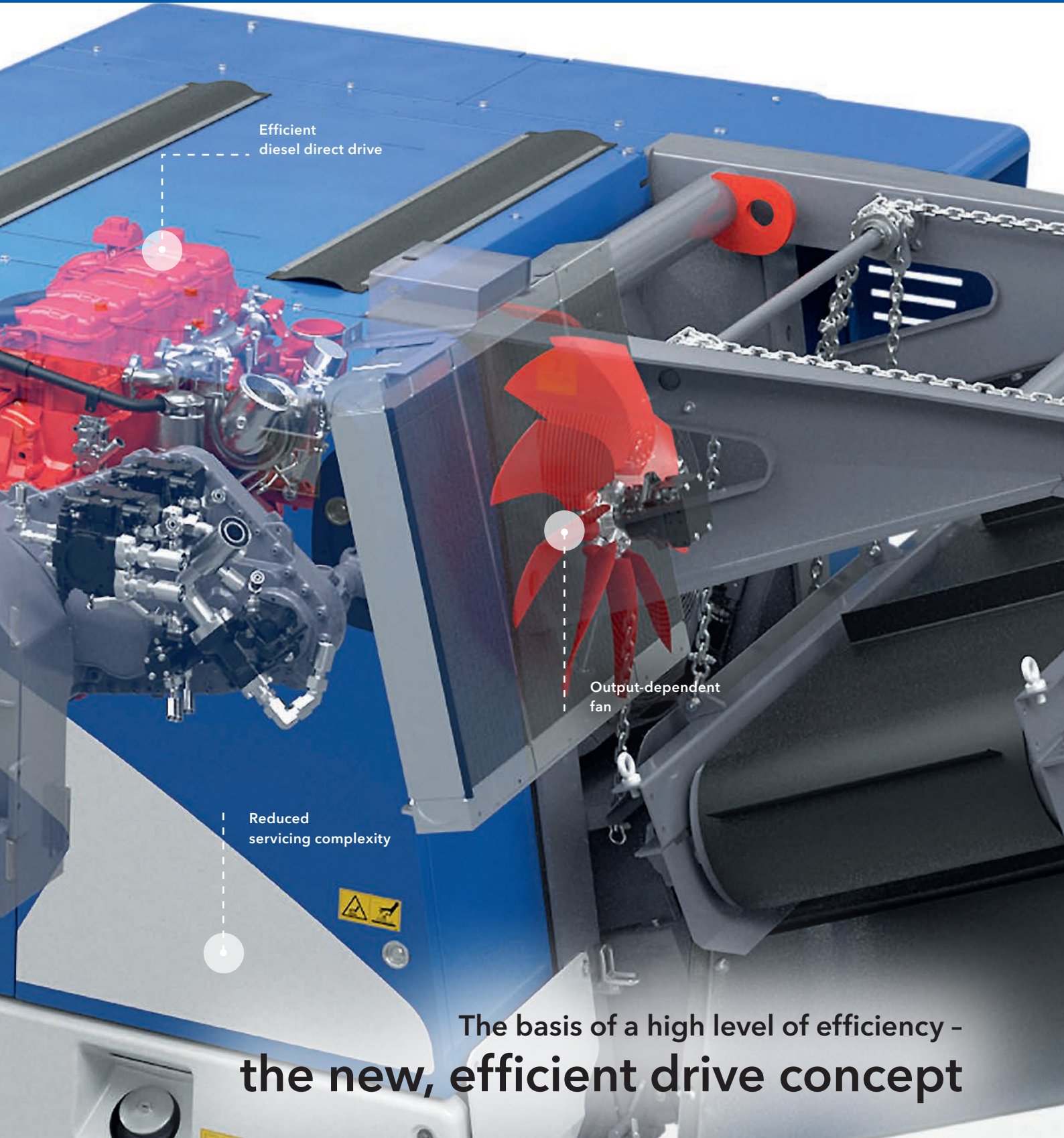
In addition to these tried and tested properties and the rugged design, KLEEMANN also incorporated a whole range of innovations in the new EVO2-generation crushers to make operation more economical and user-friendly.

Mobile plants from KLEEMANN have acquired a reputation for being particularly economical. Both new crushers, the MC 110 EVO2 and MCO 90 EVO2, raise the bar even higher in the key discipline, that of efficient use of fuel. This is achieved by an improved diesel-direct drive concept.

KLEEMANN engineers made users the focus of their development activities. Numerous improvements make work easier and more pleasant for users, with reduced noise emissions top of the list of measures.



New technology ensures that the MC 110 EVO2 jaw crusher and the MCO 90 EVO2 cone crusher work together even more efficiently.



Highlights of the new EVO2-generation jaw crushers and cone crushers



Summary of features MOBICAT MC 110 EVO2 jaw crusher

Feed capacity	400 t/h
Size of crusher inlet	1,100 x 700 mm
Feed size	990 x 620 mm
Drive	diesel-direct
Drive power	240-248 kW*

* Depending on the respective exhaust emission standard

There are different sizes to make the performance of crushers measurable. These include, for example, the overall costs per tonne of material, fuel consumption per hour or even a high level of flexibility for short job site routes. The MC 110 EVO2 and MCO 90 EVO2 score in all these disciplines: both plants are characterized by high cost-effectiveness.

Intelligent: new overload systems

Both crushers combine mechanical control and overload systems with control technology versions, thus offering increased protection from damage with reduced down times.

- > The mechanical overload system of the MC 110 EVO2 prevents damage caused by unbreakable material. Control systems furthermore ensure optimum utilization and feeding of the crusher.

- > The MCO 90 EVO2 cone crusher integrates tramp release, a mechanical overload system to protect the machine from unbreakable material. Ring bounce detection, the control technology overload system, also continuously prevents latent overloads and can be set to optimize performance or quality.



The intuitive SPECTIVE operating concept ensures outstanding controllability, whilst the expanded version, SPECTIVE CONNECT, collates all the important plant information on a smartphone.

NEW: SPECTIVE CONNECT

The new digital solution collates all the important plant information on a smartphone – you can read more about this important highlight on the following pages.



Summary of features
MOBICONE MCO 90 EVO2 cone crusher

Feed capacity	270 t/h
Crusher system size (average)	970 mm
Feed size	200 mm
Drive	diesel-direct
Drive power	287-289 kW*

* Depending on the respective exhaust emission standard

More economical: increased efficiency

There are several measures which contribute to a significant increase in availability and efficiency. In addition to the overload systems and the SPECTIVE CONNECT operating system, other measures such as an output-dependent fan ensure economical operation. This fan improves cooling performance, works only when required and reduces fuel consumption.

Digital: SPECTIVE operating concept

Digitalization with added value - the new generation of the operating concept is even more intuitive and simple, and is arranged more clearly, making operation safer and more efficient. KLEEMANN uses this to make it even easier to manage the increased variety of functions.

A new extra and handy remote control clearly arranges all functions for automatic mode, making operation easier. At the same time, work is safer, because operators don't need to leave the the cabin of the excavator as frequently.

The **MOBICAT MC 110 EVO2** and the **MOBICONE MCO 90 EVO2** are new-generation crusher plants. This is particularly clear from two innovative new features, the optimized **SPECTIVE** operating concept and the new overload systems.

1

Highlight innovation – optimized **SPECTIVE** operating concept

In **SPECTIVE**, KLEEMANN has set a high industry standard for user interfaces. The digital operating concept is intuitively structured and permanently simplifies plant operation. From the start process to troubleshooting to maintenance – on its 12" touch panel, **SPECTIVE** makes all the key plant information available to users in a clearly-structured way and allows all plant settings to be made in one place.

The further-developed version optimizes operating convenience by arranging the keys underneath the display, whilst the lockable mode selector switch also prevents faulty operation. User guidance and visualization of the operating process have been arranged even more clearly. KLEEMANN has likewise improved troubleshooting assistance, which leads to minimized down times.

Sophisticated operating concept extends all the way into the cabin

The new radio remote control (2) allows all the plant's functions, including the whole set-up and operating process, to be controlled from a safe distance. Once set and commissioned in automatic mode, operators now no longer need to go to the plant for most processes. With **SPECTIVE CONNECT** (4) and the small radio remote control (3), the operator always has everything in view from the cabin and can even intervene in process-related functions.

SPECTIVE

Intuitive and clear: operation is simple and safe.

- 1 | The plants are set to operating state using the 12" touch panel.
- 2 | The radio remote control is used to move the plants from the low-loader and then carry out the set-up process conveniently and safely.
- 3 | The small radio remote control is used to operate all the relevant functions of automatic mode conveniently from inside the cabin.
- 4 | **SPECTIVE CONNECT** collates all the important plant information on a smartphone and provides support for job site reporting.





2

Highlight innovation – effective overload systems

The new overload systems of EVO2 plants have an important aim: to increase the readiness for operation of the plant permanently by ensuring as continuous as possible a crushing process. KLEEMANN has introduced a variety of innovations to achieve this.

MC 110 EVO2: overload system intervenes in the event of unbreakable material

If the feed material contains unbreakable objects such as large metal parts, the overload system is activated to prevent damage to the plant. This thus counteracts a blockage without the operator having to intervene at all. During these short-term occasional overloads, the crushing gap (closed side setting, CSS) automatically opens within its adjustment range.

The active overload system available as an option ensures an even faster reaction, briefly opening the crushing gap at up to 40 times the speed.

MCO 90 EVO2: ring bounce detection protects the crusher from damage

The MCO 90 EVO2 cone crusher focuses on product quality, but operator and user can decide to allow more over-sized grain to encourage higher output. This is because the software-aided overload system has two modes - one for high output and one for best quality.

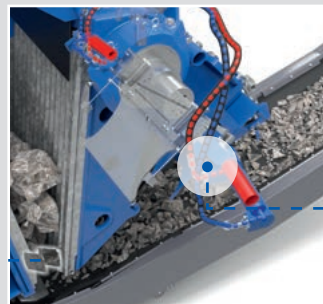
OVERLOAD SYSTEM



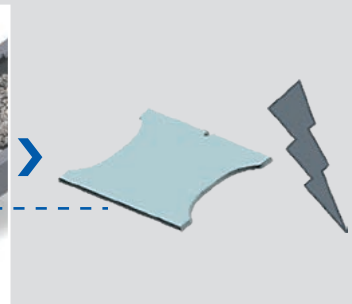
If unbreakable material gets into the crushing chamber of the jaw crusher ...



... the overload system opens the crushing gap twice as quickly as the predecessor plant.



The overload system which is active as an option is even as much as 40 times quicker.



The final backup system for preventing damage to the plant is a mechanical pressure plate.



Connecti

 **SPECTIVE**
CONNECT

MOBICAT

SPECTIVE CONNECT, the digital application
for crusher operators

More knowledge means more output



Simple access to relevant information: with SPECTIVE CONNECT, users are shown the user interface of the intuitive and clear SPECTIVE operating concept via smartphone wherever they are working - for example in an excavator or wheeled loader.



Fewer interruptions, more safety.

The operator doesn't need to leave the safe, protected cabin of the excavator or wheeled loader to obtain information about current operating states or about reports or faults which have occurred. This increases plant utilization and thus project efficiency.



Know exactly how much material to feed.

The more operators know, the better they can utilize their crusher to the full. This principle is realized by SPECTIVE CONNECT which displays parameters such as crusher filling level and degree of utilization, crushing gap opening (CSS) and - with an integrated belt scale - output, thus facilitating continuous process optimization.



Optimize processes easily.

Learn from today for tomorrow: documentation on crusher utilization - a report which the app can generate automatically like lightning - provides transparency and facilitates process optimization. Unclear paper reports are consigned to the past.

Expanding its SPECTIVE operating concept has enabled KLEEMANN to introduce a digital innovation which primarily represents real added value for crusher operators: SPECTIVE CONNECT is a digital application which makes all the relevant crusher data - from the filling level of the diesel tank to feed speed - available on a smartphone. SPECTIVE CONNECT is available for the new MOBICAT MC 110 EVO2 jaw crusher and the new MOBICONE MCO 90 EVO2 cone crusher for the first time. SPECTIVE CONNECT is available for iOS and Android smartphones and can display both crushers simultaneously if they are linked, for example.



A shift on site using SPECTIVE CONNECT.

The crusher is started using the SPECTIVE touch panel directly on the crusher. The operator makes the necessary settings. Once set, the crusher then runs in automatic mode. When the operator is using a crusher train, then following initial set-up, he can always connect straight to the complete crusher train – and not just to each individual crusher.



06:00 | Start of shift

It starts with the ordinary crusher start-up. On initial connection, a QR code appears in the SPECTIVE crusher display at the touch of a button. The operator scans this with a smartphone. The SPECTIVE CONNECT app is now connected to the crusher - automatically whenever the user is in the vicinity.

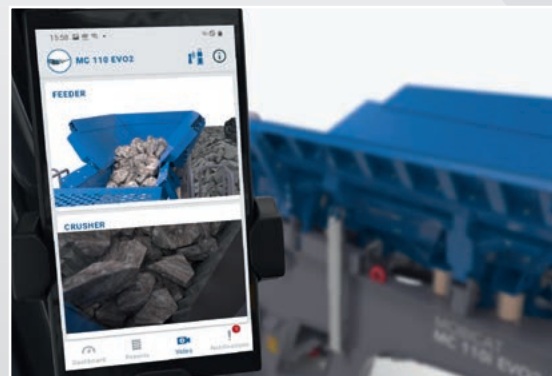
Benefit: all crusher data are always to hand on the smartphone.



06:15 | Work starts

In the cabin of the bucket excavator, the operator clips his smartphone into a bracket. He first uses the camera system to get an overview of the situation in the feed area and of the crusher as a whole. He then starts feeding.

Benefit: getting an overview without leaving the excavator cabin.



Some of the features of SPECTIVE CONNECT described here are not available yet.



08:45 | A fault occurs

The operator gets a message that the cooling system of the MC 110 EVO2 is not working properly. Without having to search, he goes to the specific component to be inspected and is immediately shown a description of how to eliminate the fault. He gets rid of the dust in the fan. Fault eliminated. Back to work.

Benefit: direct display of a fault without having to search for it.



11:30 | Request for fuel truck

The operator notices on the app dashboard that the diesel filling level in the MC 110 EVO2 is now only 27%. He phones to order the fuel truck - without interrupting the process and without exposing himself to danger by walking across the slippery pile of material in the rain.

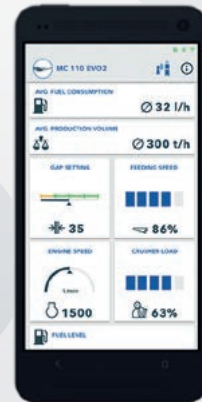
Benefit: messages mean that the work process does not need to be interrupted as often.



13:05 | Crusher train continues to be continuously utilized

Everything is running steadily: the operator can even see the filling level of the feed unit at a glance and thus always knows whether to feed more quickly or more slowly. He also knows the daily output already achieved compared to previous days - enabling him to challenge himself to achieve a new personal best every day.

Benefit: a high output is easy to achieve.

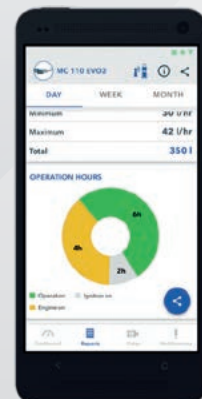
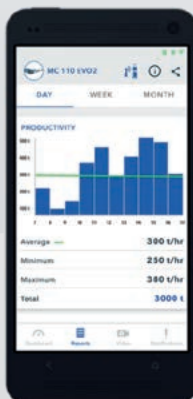



14:45 | End of shift and sending of report

At the end of the working day, the operator sends his superior evidence of the work completed - generated by the app in the form of a PDF. The automated report contains information such as mean consumption, production output and down time/operating time for the crusher/crusher train.

The operator is able to influence independently whether any additional information is added to the report and if so, what - for example, any tool change required. These daily, weekly or monthly reports also provide the option of analysing and optimizing the crushing process.

Benefit: automated, digital reports instead of time-consuming reports on paper.





TBA 3000 mixing plant produces asphalt for
Russia's Formula 1 racing circuit in Sochi

BENNINGHOVEN expertise for Russia's fastest road

Building a new racing circuit is enormous enough a challenge for paving crews and their machines, but working out the right asphalt formulas for precisely the location in question and producing the mix in consistent high quality is even more specific. This is clearly demonstrated by the requirements of the "Sochi Autodrom", Russia's venue for Formula 1. One of those responsible for the quality of the asphalt surface is contractor Tekhalyans, a long-standing confirmed customer of BENNINGHOVEN/WIRTGEN GROUP. In order to guarantee production of top-quality special mixes to maintain the circuit, Tekhalyans has invested in new BENNINGHOVEN technology - specifically in a TBA 3000-type asphalt mixing plant.



TBA 3000

Uncompromising quality for the premium class - the new BENNINGHOVEN TBA 3000-type plant produces asphalt mixes for the most stringent demands such as those of Formula 1.

Made for 320 km/h: the "Sochi Autodrom"

The asphalt structure

- > 4 cm asphalt base course
- > 5 cm binder course
- > 5 cm surface course

All the courses consist of formulas developed specifically for racing in collaboration with Hart Consult International GmbH.

Requirements profile for the surface

A surface texture which delivers the perfect compromise between smoothness and grip. Smoothness is especially relevant for racing action and overtaking manoeuvres, whilst grip is important for driving safety. In Sochi, Formula 1 drivers reach speeds of almost 320 km/h.

The result

The reward for the hi-tech asphalt works is a world-class circuit which has secured itself a permanent spot in the Formula 1 calendar. Extending to 5.85 km, with 12 right-hand bends, 6 left-hand bends and 61% straights, the "Sochi Autodrom" has entertained as many as 50,000 spectators since opening in 2014.



A really special racing track on the "Russian Riviera"

Sochi has been a major attraction to the population of Russia and beyond for a long time. In recent years, the upmarket spa town on the Black Sea – the "Russian Riviera" – has occupied another sphere in addition to tourism: premier sports. The town hosted the Winter Olympics in 2014, as well as some games of 2018's football World Cup.

The gigantic infrastructure created for these large-scale events included the "Sochi Autodrom". The Russian Grand Prix has been held at this circuit since 2014. This large-scale event guarantees the 444,000 inhabitants of this Caucasian city a regular annual premier sporting event on their doorsteps. When the town is not currently hosting Formula 1 or another racing series, 1.7 km of the 5.85 km circuit even form part of the public road network.

Surface course replaced every two years

Having been involved in the initial construction of the Autodrom, local contractor Tekhalyans then got a follow-up contract for maintaining and rehabilitating the circuit, as well as the feeder roads and main roads of the Olympic park. Extremely stringent requirements apply to the quality and surface quality of Formula 1 race tracks. Ahead of every race, an expert commission from FIA, the world motor sport federation, inspects the state of the course with the circuit operators and decides on the rehabilitation of the surface. The specification for the "Sochi Autodrom" is for the surface course to be replaced every two years.



Special mix defined in the laboratory

It goes without saying that the replacement uses a special mix, a formula developed specifically for the race track in Sochi. Hart Consult International GmbH is responsible for its composition of selected minerals, polymer-modified bitumen and hi-tech additives such as synthetic fibres. The renowned German engineering firm specializes in high-quality road surfaces such as test tracks and race tracks.

When developing formulas for requirements of this kind, the important thing is to subject all the materials involved in construction to comprehensive suitability tests and to determine the ideal combination of grip and speed in numerous variations. For the "Sochi Autodrom" mix, the subtropical climate of the Caucasus, with its high level of rainfall, also had to be taken into account.

Formula 1 racing cars subject the asphalt to a significant load

Of all sports vehicles, Formula 1 racing cars subject the asphalt to the most extreme loads. Although they are lightweight, they still generate stresses comparable to those of heavy goods traffic. This is because as they heat up, the tyres of these racing cars develop an adhesive action, dragging out the stones contained in the asphalt. There is also the vacuum they generate, which literally forces the vehicles down onto the road. "For the asphalt, it is as if you are hitting it with a hammer in front and then pushing a vacuum cleaner up behind it" – how Hermann Tilke once described the effects. This star race track architect also designed the Sochi circuit.

New TBA 3000 doubles efficiency

In order to satisfy the many specifications of the internationally-respected experts and to be able to produce the special mix in top quality using a reliable process, Tekhalyans commissioned a TBA 3000 straight from the factory. But there's a lot more to the plant: it meets many other requirements, including for higher mixing output and for recycling of excavated asphalt. The new TBA 3000 replaces an MBA 2000 asphalt mixing plant on wheels, also from BENNINGHOVEN, with convincing added value, doubling overall efficiency compared to the predecessor model.

Specifically, mixing output rises from 160 t/h to 240 t/h and grains are now separated by a 6x screening machine instead of a 4x machine. Tekhalyans is accordingly setting itself up for the future – the new GOST regulations, which demand more specific formulas for major roads, apply to lots of calls to tender in the public domain. 6x screening is a technical requirement to produce these formulas.

Multi-variable feed for 40% recycling quota

Above all, however, the option of adding recycled material ensures environmentally-friendly, sustainable and economical utilization of the TBA 3000: in many rehabilitation projects, Tekhalyans can now process up to 40% old asphalt into fresh mix. The predecessor plant was specifically not capable of this.

Cold feed is effected via multi-variable feed, a patented BENNINGHOVEN technology. Extremely accurate dosing is possible as a result of precision weighing technology which also allows bulk products to be fed in. As a result, the contractor has discovered an economical way of obtaining new raw material for a variety of rehabilitation projects from "road waste", saving cash and most especially saving resources. With the hot feed system recycling drum with hot gas

generator, it is even possible to recycle up to 80% with the TBA-type plant. Tekhalyans could retrofit this upgrade at any time.

EVO JET burner reduces consumption

The BENNINGHOVEN EVO JET 3 burner with a burner output of 18.9 MW makes an important contribution to efficiency. The combi-burner variant selected by the customer is suitable for burning two fuels, heating oil and natural gas, increasing both independence from raw material prices and availability. An even more important factor for Tekhalyans, however, was the much lower and extremely cost-effective energy consumption.

New weighing and mixing section guarantees process reliability

As far as the race track commission is concerned, other BENNINGHOVEN technologies are the focus. This is because the mix for the Autodrom is produced exclusively from precisely-defined white mineral and other carefully selected constituents.

The weighing and mixing section is a key factor in the mix achieving its high quality. In addition to the polymer-modified bitumen, mineral and filler, it fully automatically doses synthetic fibres straight into the mixer via two feed systems. These additives are what give the asphalt the specific properties required.

This puts the contractor in the perfect position to maintain or build new roads in and around Sochi, as well to rehabilitate the race track.

Contractor Tekhalyans was involved in the original building of the Formula 1 circuit in 2014 – using other WIRTGEN GROUP machines.





Get
all the background
on the TBA 3000 in Sochi
in the video at

[www.wirtgen-group.com/
tba3000-sotschi-benninghoven](http://www.wirtgen-group.com/tba3000-sotschi-benninghoven)



Top quality from the 94 t loading silo:
asphalt production in Sochi is
"state of the art" in every respect.

Mobile asphalt mixing plants of the iNOVA series from CIBER

Top performance all over the world



Provides short routes on road job sites: mobile plants for the continuous production of asphalt, mounted on low-loaders, have been a CIBER trademark for many years.



CIBER iNOVA
**READY FOR
EUROPE**

The latest technology for continuous asphalt production: iNOVA-series mobile mixing plants from CIBER feature outstanding mobility and versatility. An enormous range of mineral starting materials can be used and a wide variety of asphalt formulas can be implemented - in different project locations and always close to the job site.

CIBER has developed new technologies for the iNOVA plants in pursuit of a single goal: the highest possible productivity of high-quality asphalt. At the same time, the machines have been made kinder to the environment and operating costs have been reduced compared to predecessor models. The new-generation iNOVA plants have been given a special transport licence in Europe which makes the technology interesting to a great many new markets.





Maximum mobility from compact units

For its new iNOVA series, CIBER has further improved the outstanding mobility of its product. Depending on model, the plants consist of one or two units. The advantage of two units on the iNOVA 1502 and the flagship iNOVA 2000 is that the cold feed systems and the dryer drum are mounted on separate low-loaders, making transport operations perfectly easy to manage: simply connect semi-trailer and tractor unit and drive to the next job site.



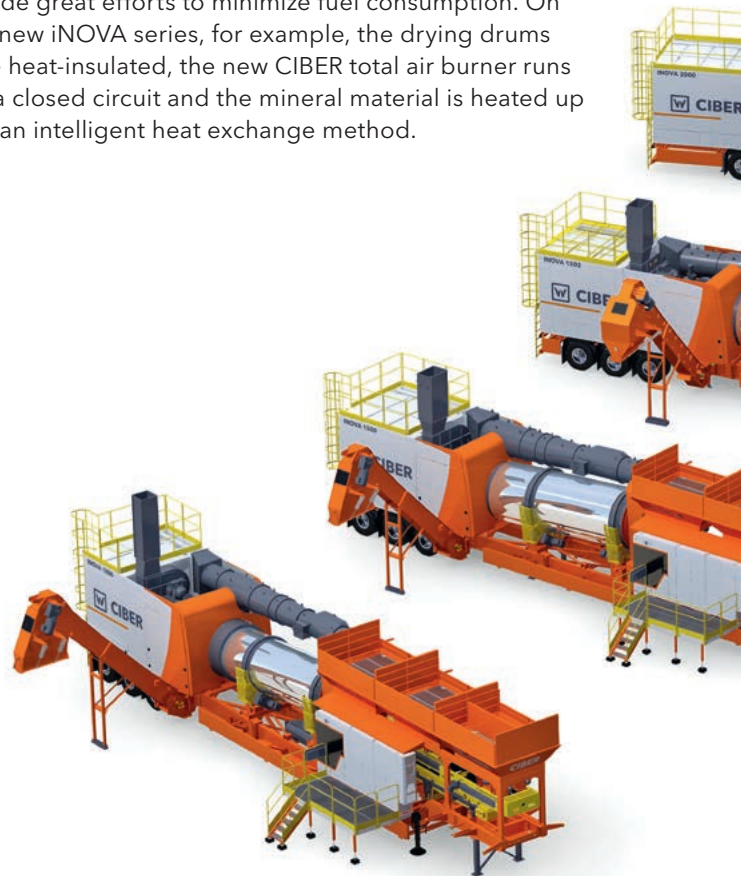
Innovative mixing process facilitates even complex kinds of asphalt

Traffic load on the roads, especially on motorways, is increasing all over the world. As a result, higher and higher-quality asphalt mixes including special constituents need to be produced, which was why CIBER developed the so-called continuous dry mixing system. This doses and mixes a variety of minerals, additives (such as fibres) and third-party and in-house fillers precisely and homogeneously, even before the hot bitumen is injected into the mixing process. This ensures that all the constituents of the mix are consistently coated with bitumen. This technology enables operators to produce even complex mixes such as stone mastic asphalt (SMA).



Efficient fuel consumption

Diesel fuel is usually the third-highest item of expenditure in the continuous production of asphalt. CIBER has made great efforts to minimize fuel consumption. On its new iNOVA series, for example, the drying drums are heat-insulated, the new CIBER total air burner runs in a closed circuit and the mineral material is heated up by an intelligent heat exchange method.



A portrait of CIBER - pioneering technical achievements and a passion for asphalt

Set up in Porto Alegre (South Brazil) in 1958, CIBER has been involved in the production of asphalt for over 60 years. Technical innovations such as the first mobile drying drum on the countercurrent principle made the company successful and led to its acquisition by WIRTGEN GROUP about 30 years ago.

Meanwhile, CIBER has become a local production facility for various WIRTGEN GROUP products, made here primarily for South American markets. This specialist in the mobile, continuous production of asphalt also

develops and manufactures the iNOVA series of plants and associated bitumen tanks.

CIBER satisfies high quality standards with a modern, certified factory which meets the WIRTGEN GROUP standard. CIBER also has access to the group's world-wide sales and service network for its sales and service operations.



Optimized maintenance

When developing the new iNOVA plants, CIBER engineers also took the opportunity of reducing maintenance complexity considerably. This aim was achieved on the one hand by means of outstanding accessibility and on the other, by means of forecasting control technology and an intelligent fault diagnosis system.

The mechanical load acting on steel parts has been reduced with a new mixer design and new mixing paddle geometry. In conjunction with highly wear-resistant materials, this increases the service life of components under severe strain.



iNOVA



Reduced transport costs, high production output - highlights of the iNOVA series

- > The plants consist of one or two mobile units and deliver 50 - 200 t asphalt per hour
- > Production close to the job site reduces logistics costs due to mix trucks
- > Small footprint and rapid commissioning

Successfully in use all over the world - the iNOVA series from CIBER



South Africa



Mexico

"We appreciate the reliability of CIBER engineering and what's more, production output has increased with the iNOVA 2000. That's an important point for us."

Rudi du Toit, Manager
Actop Asphalt

South Africa | **Lydenburg**



"Our iNOVA 1502 recovers an unbelievable 99.9% of our dust emissions to use as in-house filler. That makes for low-dust operation which is kind to the environment."

Javier Gutierrez, Foreman
Constructora Maiz Mier, SA de CV

Mexico | **Monterrey**





"It took our employees just two or three days to learn to configure our iNOVA 2000 and operate it reliably. That's a really important benefit. If we start up this plant 1,500 km from our head-quarters in Perth, we can be producing 200 t/h asphalt in just 48 hours."

Craig Hollingsworth, Managing Director
BGC Asphalt & Quarries
BGC Australia PTY Ltd.



Australia | **Hazelmere**



Australia



Brazil

"The option of decentralized production of asphalt is essential in our state, which is why the iNOVA 1000 complete mobile solution is perfect for us."

Marcio Bozetti, Director of Infrastructure
MTSUL Construções



Brazil | **Porto Velho**



Argentina

"We need just two tractor units to transport our iNOVA 2000 from one job site to another. Not needing a low-loader or a crane makes it very straightforward for us."

Gabriel Quantin,
Deputy Chairman of the Board
Vial Agro S.A.



Argentina | **Azul**



iNOVA

Online in future.

Look forward to the digital format
of the WIRTGEN GROUP magazine.
Find out more from
www.wirtgen-group.com/magazine

