

RoadNews

for new roads

The WIRTGEN GROUP User Magazine // N° 01



WIRTGEN



VÖGELE



HAMM



KLEEMANN



BENNINGHOVEN



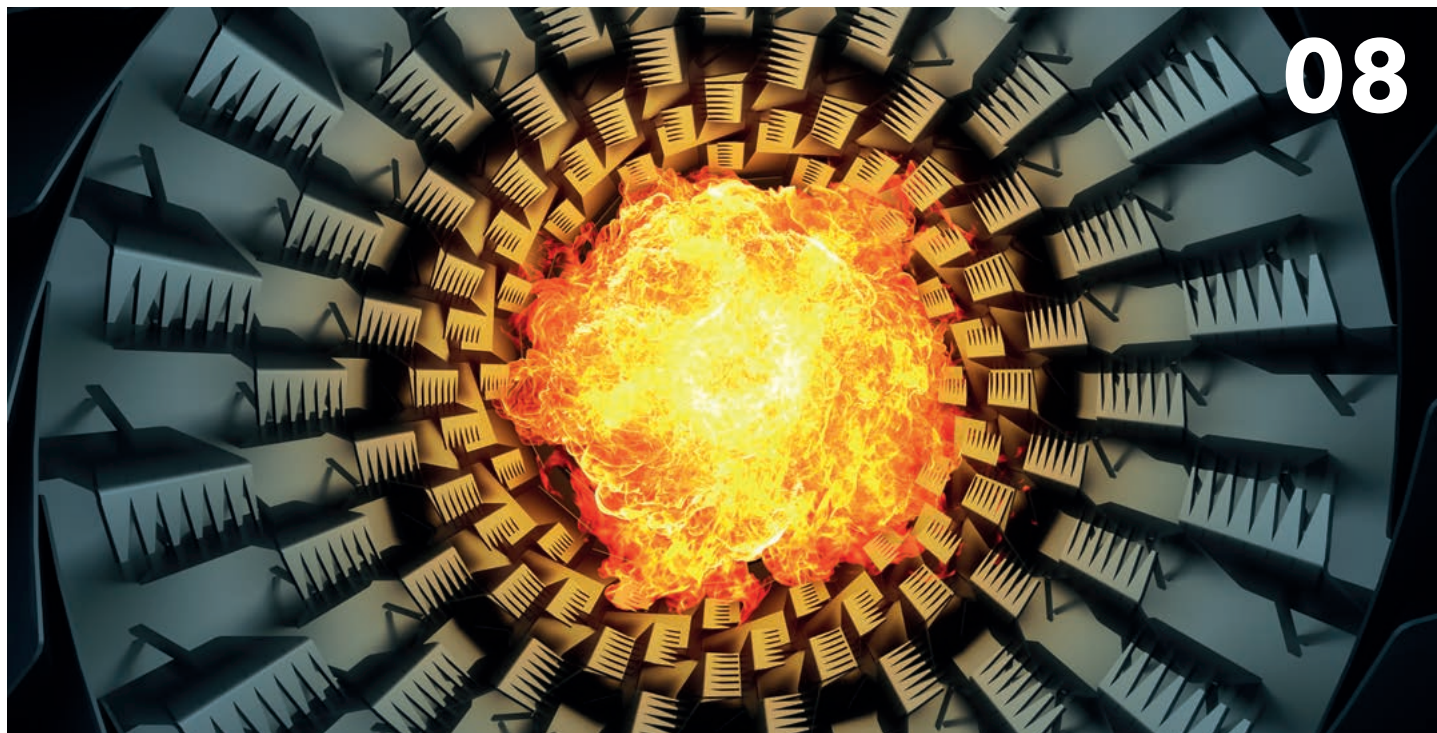
CIBER



Continuous mobile asphalt plants from CIBER:



**Precise dosing,
high mixing quality**

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Dear Reader,

This is the WIRTGEN GROUP RoadNews magazine for the Latin America, Africa, SouthEast Asia and Oceania markets. We are looking forward to keeping you abreast of fascinating technologies and innovations, providing information about applications technology and reporting on exciting job sites around the world. Whenever a project calls for quality and cost-efficiency, you can be sure that technologies from the WIRTGEN GROUP are somewhere on the scene. This is the case in Brazil, where an asphalt plant from CIBER played the leading role in the construction of a new major link between two highways in the south region of the country. In a second article, we describe the drying of aggregates. The complete removal of moisture from the aggregates and the final heating temperature are factors that influence the bond with the asphalt cement. With this in mind, we focus on some topics relating to combustion technology in asphalt plants. These two articles demonstrate that CIBER equipment is always ahead with new technologies for continuous mobile asphalt plants.

In this edition, you can also see the other WIRTGEN GROUP brands in action. For instance on a German air base, where machines from WIRTGEN, VÖGELE, HAMM and BENNINGHOVEN worked together, highlighting the synergies that our group of companies can offer its customers. When it comes to crushing and classifying rock and stone, our KLEEMANN brand is very much in its element.

We hope you enjoy reading this first issue of the WIRTGEN GROUP RoadNews Brazil!

Best wishes from
Your RoadNews Team

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CIBER is speeding up Santa Catarina

Improved traffic flow in the west of Santa Catarina state: the quality of the asphalt plant from CIBER Equipamentos Rodoviários has made a positive contribution to the project.



Job site details

New construction of the Contorno Leste highway in the city of Xanxerê in the state of Santa Catarina, Brazil

Length:	7.86km
Width:	10.5m wide as well as individual sections with a third lane (with a combined length of 3,580m)

Working parameters

Milling depth:	250mm
Milling width:	2,000mm

Material

Hot-milled asphalt mix with rubber bitumen: 15,535t

Equipment

CIBER UACF 17P2 asphalt plant

Brazil // Santa Catarina

Founded in the city of Cunha Porã, Santa Catarina state, in 1983, the Oliveira Group has operated in a variety of sectors, including civil engineering, precast structures, metal structures, earthworks, asphalt paving, asphalt and concrete plants, crushing plants, construction material as well as property development. As far as infrastructure operations are concerned, the group is responsible for key projects in Santa Catarina state, including the Contorno Leste highway in the municipality of Xanxerê, a construction project by the Department of Infrastructure of Santa Catarina, as well as Loteamento Pôr do Sol in Chapecó and the City Hall of Coronel Freitas – all using the CIBER UACF 17P2 asphalt plant. The plant has been in operation at the company since 10 June 2016. The high standing of CIBER Equipamentos Rodoviários in the asphalt plant market was a key factor in the decision to acquire a machine from this brand, as were the recommendations of other companies already using CIBER equipment. The UACF 17P2 model was selected on the basis of the production capacity the equipment delivers.

New construction of an approximately 8km link

The Advanced Series of continuous asphalt plants combines the ultramobility concept with leading-edge continuous production technology, generating a mix quality comparable to that of batch plants. The bitumen is not exposed to high temperatures, thus assuring the service life of the asphalt mix and, consequently, higher quality. Both versatile and reliable, the equipment can be adapted to cater to different materials and weather conditions. For the Contorno Leste project in Xanxerê, the plant was operated from September 2016 to January 2017 at a location 44km from the job site in the city of Cordilheira Alta. The R\$ 18-million Xanxerê project was aimed at improving traffic flow in the region, speeding up circulation and thus increasing productivity. Located between the SCT-480 and BR-282 highways, the 7.86km-long section was 10.5m wide, apart from individual sections with a combined length of 3,580m, which were constructed with a third lane. It was completed with subgrade compaction to 100% of the standard Proctor. The project extended over a total of 108,927m² and used 15,536t of hot-milled asphalt mix with rubber bitumen.

First-class equipment for top quality

For Claudia Regina Schegoschewski, Acquisitions Manager at Oliveira Construções, the asphalt plant made a positive contribution to the project: “Thanks to the superb quality of mixing and dosing, the CIBER plant played a key role, supplying us with top quality asphalt.” Schegoschewski rates both the equipment and the material it produces as excellent. ///

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**The accurate
dosing of
our CIBER
plant
increases
quality and
cost-
efficiency.**

**Claudiomiro da Rosa
Asphalt Plant Auxiliary
Oliveira Construções**

”





Combustion in asphalt

CIBER technologies
guarantee efficiency in
asphalt production.



system plants



Asphalt plants produce asphalt mixes in a hot process. Their main functions are dosing aggregates and asphalt, drying and heating aggregates, filtering combustion gases, recovering filler and mixing materials. One of the most important processes is the drying of aggregates. »»

Optimum quality and consumption

The complete removal of moisture from the aggregates and the final heating temperature are factors that influence the bond with the asphalt cement – a minimum criterion for asphalt mix quality. Influenced by the plant technology and the fuel used, the atomization and combustion processes that occur in the plant contribute to the success of this thermal system, producing a mix with the expected quality while optimizing fuel consumption.

CIBER combustion technology in asphalt plants

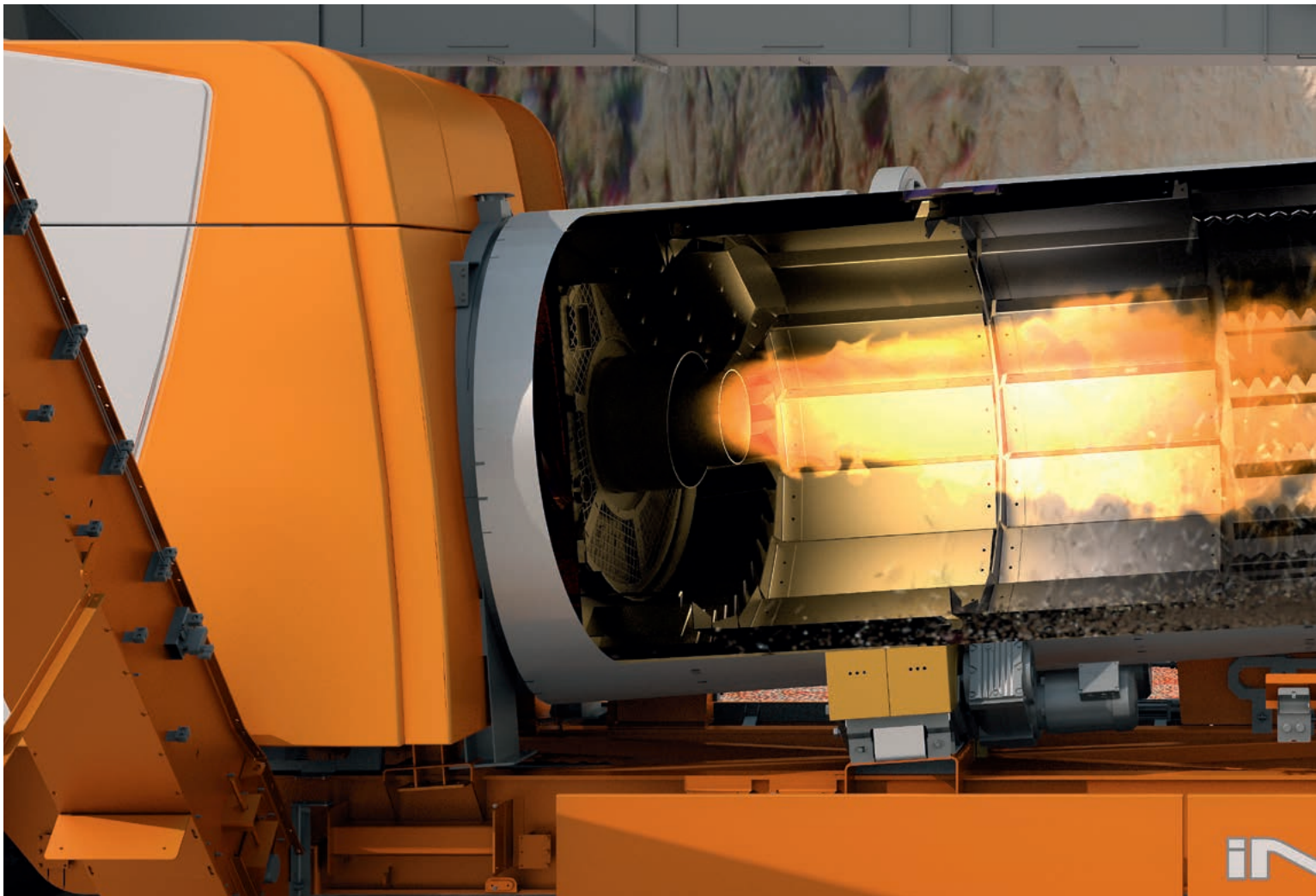
The aggregates are dried and heated in a drum with a burner on the opposite side of the aggregate inlet. The fuel injected into this CIBER burner is atomized (liquid fuels) prior to combustion. Atomization is the breaking down of liquid fuels into very small particles in order to increase their surface area. This process occurs when the fuel is mixed with oxygen inside the burner. According to Marcelo Zubaran, Product Specialist and Trainer at CIBER Equipamentos Rodoviários, “Atomization is influenced mainly by the fluid’s mass, by pressures and by the liquid fuel temperature. The gases are already vaporized and therefore do not require atomization.”

Fuel and oxygen react to generate heat

Combustion can be defined as a chemical reaction that releases a significant amount of energy in the form of heat. The components required for this reaction are oxygen and fuel. Thus, after atomization, a spark or pilot flame ignites the main flame. Once this reaction has been triggered, the flame must be self-sustained. This requires the injection of more oxygen, in addition to the quantity used for atomization, in order to comply with the stoichiometric ratio (13:1 mass ratio of air to fuel). The atomization air supplies about 30% of the air required for combustion. The remaining 70% can be drawn in from the environment by means of a fan (in what are known as open-fire burners) or it can be supplied mechanically by the plant without drawing air from the environment (total air technology).

Fuel parameters

The suitability of a fuel depends on a number of parameters, and this applies particularly to CIBER burners. The first of these is the atomization temperature in the case of liquid fuels. The fuel atomization temperature depends on the viscosity/temperature



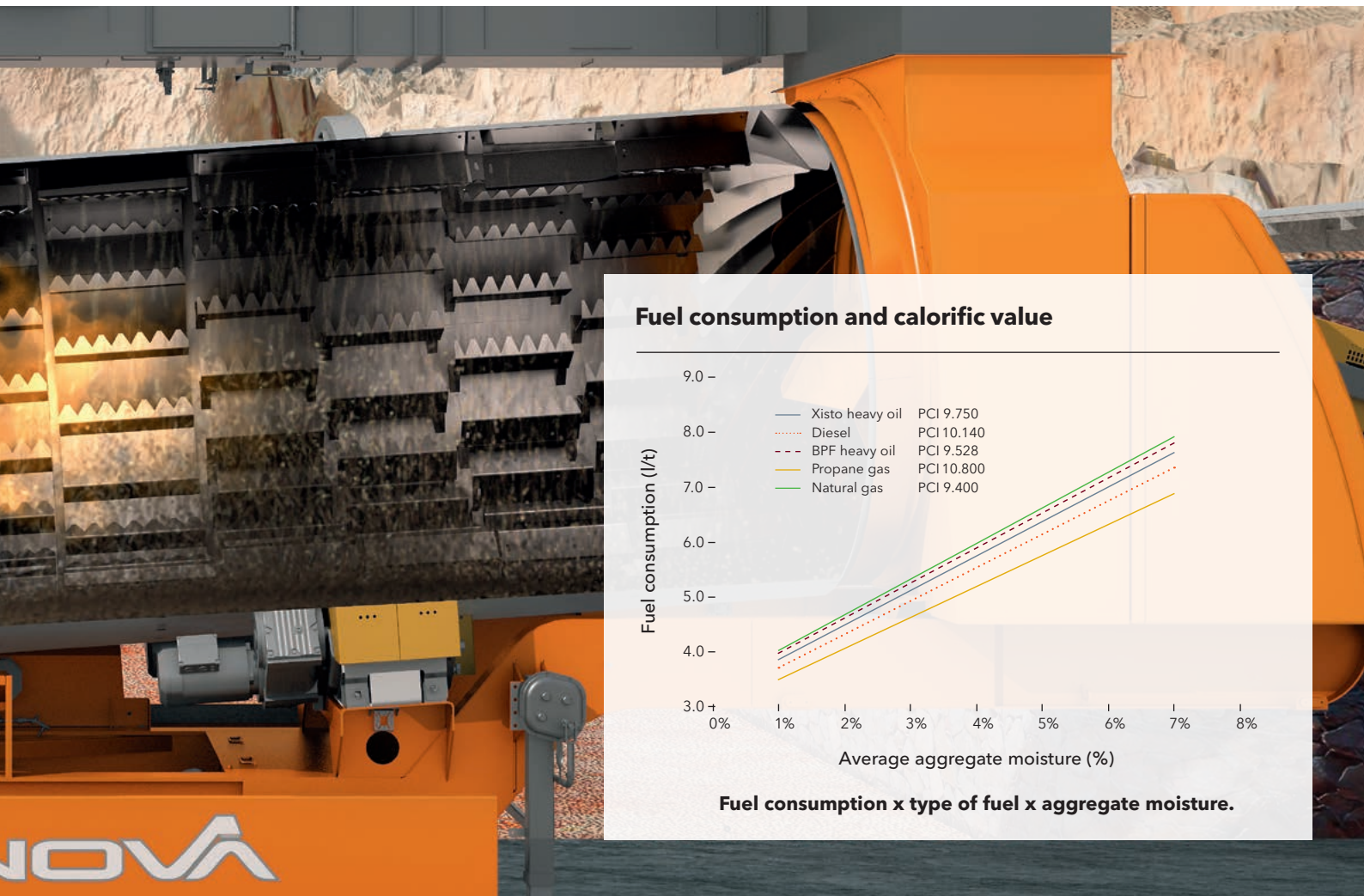
curve. The viscosity for burning should be below 21 cSt. The second parameter is the quantity of sulfur present in the fuel, since this determines the byproducts that result from burning, affecting the formation of pollutant gases. The third is the calorific value of the fuel, i.e. the sum of energy released in the form of heat during combustion. The higher this value, the greater the efficiency of the thermal system, and the lower the fuel consumption.

Relationship between fuels and consumption during production in the CIBER plant

The fuel used is a key cost factor in the production of asphalt mixes. This is because the calorific value of the fuel has the greatest impact on consumption. Meanwhile, in terms of the properties of the mix, the aggregate moisture content has a strong impact on consumption, since it determines the amount of water that must be evaporated in the dryer during the drying process. Graph 1 was created in order to analyze fuel consumption according to its calorific value and the average moisture content of the aggregates.

Various factors influence cost-efficiency

The absolute values presented are intended as a reference only and are subject to the characteristics of the aggregates (surface polarity, amount and type of clay minerals, water absorption in the pores, among other factors) as well as the combustion technology used by the asphalt plant manufacturer. Ultimately, when selecting the best fuel, local availability and cost also have a tangible impact. The relative consumption as shown in the graph is an important factor and should be considered along with the cost of fuel acquisition. ///





Developed by professionals for professionals:
the new generation of small and
compact milling machines from WIRTGEN.

Small, compact and tough

WIRTGEN launch a product and
innovations offensive: small and compact
milling machines reach the next level.



The market leader in cold milling machines has completely revamped its range of small and compact milling machines over the last two years. The latest generation of products integrates a wide array of innovations and improvements. The development focused on simple handling for the machine operator and process optimization during use of the machines. Both of these objectives are reflected in the innovations, which prioritized control technology and ergonomics: the more user-friendly the machines, the more productive and hence the more efficient the work. »»



There is an almost unlimited range of applications for the small milling machines. Typical examples include partial roadway repairs, cutting trenches and removing road markings.



WIRTGEN cold milling machines: Good reasons to opt for premium quality

1. The most comprehensive product range

WIRTGEN offer a total of 35 cold milling machines, 21 of them small and compact models – one for every application profile.

- › 13 small milling machines with milling widths of 0.35 to 1.3m
- › 8 milling machines in the compact class for milling widths of 1.0 to 1.5m
- › 14 large milling machines with milling widths of 1.2 to 4.4m

2. Focus on the user and job site practices

Product development focuses on the users and process optimization.

- › Practically oriented solutions actively support everyday work
- › Intuitive operation
- › Which in turn enables fast and efficient working
- › Preventively minimizes operating errors and enhances the quality of the milling result



The range of applications of the compact class even extends to removing complete road pavements, which is actually a domain of large milling machines.

WIRTGEN cold milling machines: Our only status symbol is know-how

Cold milling machines and WIRTGEN are two terms that simply belong together. After all, the market leader pioneered this technology and has been steadily advancing it ever since. Initially, it was with the aim of becoming a service provider in road construction. Today, the experience acquired over four decades is channelled into every enhancement. WIRTGEN customers across the world reap the benefits of this experience and the company's collected applications know-how. The pioneering spirit and passion for genuine progress are now a part of the DNA of the entire Group, so that the rehabilitation of roads is inseparably linked with the machines from Windhagen, Germany.

3. The most advanced fleet of small and compact milling machines

Totally new: no model is older than 24 months.

- › Manœuvrable small milling machines that are easy to reposition on the job site – all of them rear loaders – deliver flexibility and productivity on small jobs
- › The compact milling machines combine the advantages of the small models with the front loader design and the productivity of the large machines

4. Leading technology: One generation ahead

The latest generation is brimming with cutting-edge technologies and innovations.

- › Exemplary ergonomics thanks to the multifunctional armrest and the optimized visibility concept
- › Innovative control concept with many automated features for steering, positioning and milling
- › Precise and easy-to-understand levelling system: LEVEL PRO Plus

WIRTGEN innovations that make the difference when the going gets tough

Multifunctional armrest for small and compact milling machines: Keeping the job firmly in control.

One of the highlights of the new generation of small and compact milling machines is the standardized operating concept. The key component is the ergonomic multifunctional armrest. It features four "favourites" buttons that can be programmed with any of 20 different functions. The height of the machine can also be adjusted from the armrest. The control screen, meanwhile, shows the operator the position of the scraper and allows all job data such as lorry loads and total tonnage to be logged.



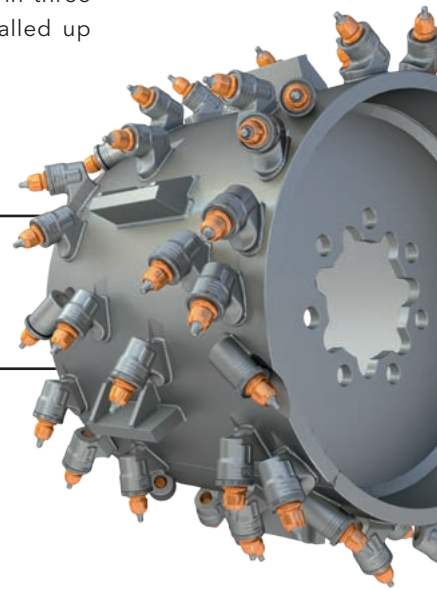
1 Automated functions of the milling unit: Intelligent self-protection

With the active floating position, the side plate is raised at intervals to keep it from sinking when the machine is working on loose ground. The scraper on the rear rotor plate also comes with new features: a sensor prevents the scraper from catching on edges. The scraper is then raised automatically. Furthermore, a sonic sensor picks up the distance between the scraper and the milled material during partial transfer, in order to regulate how wide the scraper should ideally be opened so that the material is deposited optimally behind the milling unit. The result? Greater output and less wear on the components, milling drum and cutting tools.

2 Automatic height adjustment of the crawler units: Convenient and smart, too

To support the levelling and milling process, the operator can make use of an automatic lowering function to position the machine in the milled cut. When the milling unit reaches the surface to be milled off, the lowering speed is adjusted automatically so that the milling drum slowly penetrates the material down to the set depth. The height of the crawler units can be adjusted in steps of 1mm or 5mm using a new millimetre height function to precisely set the milling depth. The most frequently used height settings can be stored in three height-adjustment memories and called up quickly at any time.

Automatic efficiency



3 Automated milling functions: Efficiency at the push of a button

A range of automated milling functions promotes maximum efficiency in the milling process. A load limiting controller integrated in the machine control system keeps the machine within an optimum performance range at all times. The anti-stall system prevents the engine from shutting off in the event of sudden overloads by automatically releasing the clutch in a fraction of a second. The amount of water required to cool the cutting tools and control dust is also regulated automatically as a function of the engine load. This permits long productive periods while reducing water consumption.

4 Automated steering and positioning functions: Simply versatile

In the 1-metre compact milling machine W 100 CF, for instance, the right rear support wheel is folded in automatically without lowering the milling drum or manually loosening a bolt. In addition to the "basic position", the right rear crawler track can also be put into the "outside" or "folded in" positions. In the "outside" position, the crawler unit is located within the cutting diameter of the drum, enabling the machine to be easily positioned along the right-hand milled cut. ///

150km of future-oriented road construction

Machines from VÖGELE and HAMM participate in
the biggest infrastructure project in Turkey.







Job site details

Constructing a 150km stretch of the new O-33 motorway from Gebze to Izmir, Turkey, with a total length of 427km

Length of section: 2 x 26km plus a 7km approach road
Width of section: 16m

Working parameters

Pave width: 2 x 8m "hot to hot"
Layer thickness: base course 12cm
binder course 11cm
surface course 4cm
Paved material quantity: base course 300,000t in total
binder course 270,000t in total
surface course 100,000t in total

Material

Base course: base course material (0/38)
Binder course: binder course material (0/25)
Surface course: surface course material (0/16)

Equipment

2 VÖGELE SUPER 2100-3 pavers with AB 600 TV screed
4 HAMM HD+ 110 VV rollers



Full steam ahead for the new O-33 motorway: VÖGELE pavers and HAMM rollers withstand extreme stresses.



Turkey

Turkey // Marmara

An exceptional road construction project is currently under way in Turkey. The new O-33 motorway linking the metropolitan area of Istanbul with Izmir on the Aegean coast is being constructed in a move to expand the country's infrastructure. In addition to 384km of motorway, approach roads with a total length of 43km are part of the project. The Turkish contractor Enerji İnşaat Taahhüt Ticaret ve Sanayi A.Ş., abbreviated as ENI, won the contract for 150km of motorway construction. First of all, the paving teams tackled a 26km stretch of the O-33, a task which saw the machines from VÖGELE and HAMM sprinting through a truly prodigious programme. >>>



”

It is a very demanding project, since the time allowed is very limited. That is why we are working in three shifts. The team can stop for breaks, but not the machines. Technology that functions reliably is very much of the essence. We trust our VÖGELE pavers and HAMM rollers 100%. They are not only absolutely reliable, but also produce a perfect paved result.

**Hilmi Özdemir, Site Manager
ENI (Enerji İnşaat Taahhüt Ticaret
ve Sanayi A.Ş.)**

”





The asphalt pavement is made up of three layers. A 12cm base course was placed first, followed by a binder course 11cm thick and a 4cm surface course. All layers were paved by two SUPER 2100-3 tracked pavers and compacted by four HAMM rollers of type HD+ 110. The large amounts of asphalt required highlight the sheer scale of this project: all in all, 670,000t of material - the equivalent of roughly 27,000 lorry loads - were paved and compacted to produce a 26km stretch of dual carriageway plus a 7km-long approach road.

VÖGELE pavers work "hot to hot"

The two SUPER 2100-3 pavers placed all three layers in a pave width of 8m, working "hot to hot" - in other words, alongside one another. This resulted in a quasi-jointless pavement of two 8m strips. With their powerful Cummins engine, the two Highway Class pavers still had reserve power in virtually all situations and could place up to 1,100t of material per hour.



Cutting-edge drive technology for perfect laydown rates

The modern drive concept is a typical feature of the "Dash 3" generation of pavers from VÖGELE. The SUPER 2100-3 is equipped with a modern, powerful and totally reliable 6-cylinder Cummins diesel engine. This drive concept ensures that the paver delivers perfect laydown rates at exactly the required pave speed. This precision had a significant impact on the cost-efficiency of this major project in Turkey. >>>

**Intensive project support and on-site service:
Mehmet Ali Serbest, Marketing and Sales Manager
at WIRTGEN Ankara (right) and Barbaros Yargıç,
Branch Sales Manager at WIRTGEN Istanbul (left) - here
together with Hilmi Özdemir, Site Manager for ENI.**



The motorway which is currently under construction from Gebze, southeast of Istanbul, to Izmir is the largest infrastructure project in Turkish history. Together with the approach roads, this new traffic artery will be 427km long and one of several future-oriented infrastructure projects to extend the Turkish motorway network from 2,200km today to 7,500km by the year 2023. The motorway also includes the world's fourth largest suspension bridge, with a length of roughly 3km, across the Gulf of Izmit. The construction project is being implemented as a public-private partnership for the Turkish state motorway directorate KGM (Karayollari Genel Müdürlüğü).





“ The HD+ drivers are overjoyed with the machines’ easy operation, spacious panoramic cabin and very bright lighting.

**Barbaros Yargıç, Branch Sales Manager
WIRTGEN Istanbul**

”



Asphalt compaction with the HD+ from HAMM - Quality is a must

Rapid high-quality final compaction of the asphalt was undertaken by four HAMM tandem rollers of type HD+ 110 VV. An efficient water system with large tanks and intelligent control is a major quality factor. It automatically adapts the water spray to the operating speed. A short glance at the drum is sufficient to verify whether the right amount of water has been selected, for the open design of the frame gives the operator a clear view of the drums and spray bars.

To ensure that the work is not only of high quality but also cost-efficient, HAMM equip their HD+ 110 rollers with the Hammtronic electronic engine management system as a standard feature. This system monitors the traction drive and vibratory drives as well as the engine speed, optimizes machine functions and adjusts the vibration and operating speed in line with the conditions on site. The result: economical operation combined with maximum performance. ///

More than just compaction

HAMM compactors with (VC) crusher drum
break and compact rock in a single pass.



Breaking and compacting rock in a single pass – this is just what HAMM developed the 3625 HT VC compactor with crusher drum for. The key component of the 25t machine is a 2.22m-wide VC drum (VC = vibration crusher) with 150 picks. They break up the hard rock material with extremely high point loads while it is compacted by the vibrating drum.

This heavy-duty compactor, which can even handle gradients of more than 60% with ease, can improve efficiency, for example when building dams of rock in several layers. Pre-crushing or loosening rock for routing work is another interesting application, as is processing concrete rubble for recycling. In all these cases, the VC compactors streamline processes by reducing the number of machines and transports required. This improves the ecological balance – and cuts costs, too. ///

3625 HT VC: Ready to take on tough jobs

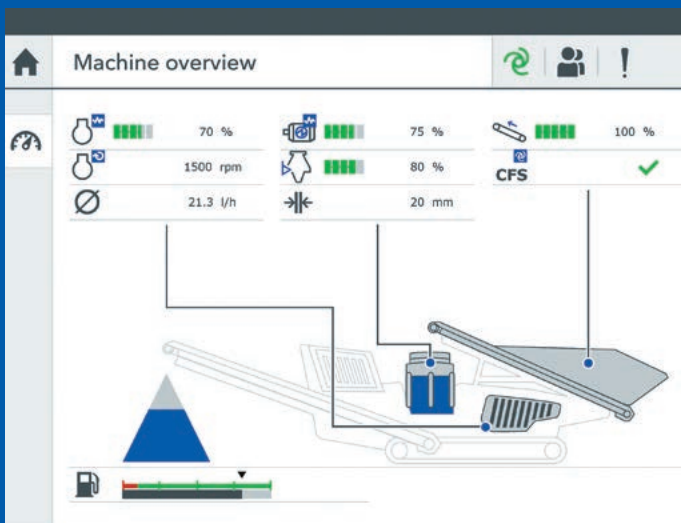
- › Excellent gradeability > 60%
- › Simple tool changes with VC quick-change toolholder system
- › Robust due to the use of heavy-duty components
- › Optimizes the crushing and compacting process
- › Can be used as a crushing or padfoot compactor



Simple control with SPECTIVE

KLEEMANN introduces SPECTIVE, a new, intuitive control system for crushing plants.

See how simply SPECTIVE functions:



The information area continually displays all current data on production.



The SPECTIVE philosophy: the more comprehensible the design of a control concept, the more effectively it supports operators in their work.

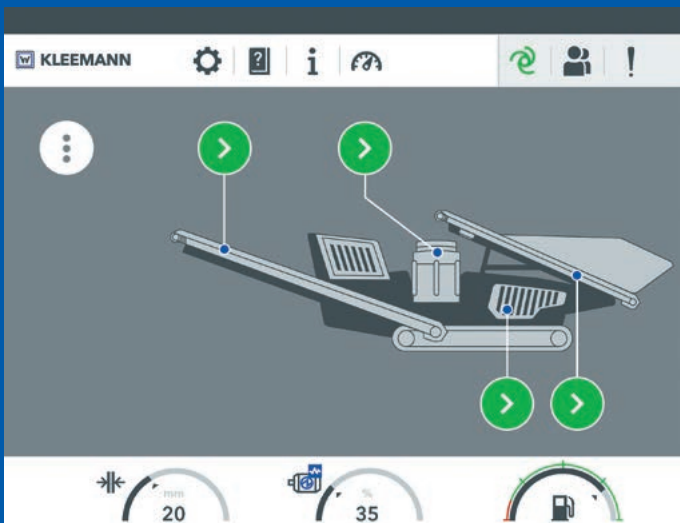


As the demands imposed on modern crushing plants rise, so does the system complexity. At the same time, the technology must be as safe and simple as possible to control, without any drawn-out training. The answer to all these issues is provided by SPECTIVE. With its new control system, KLEEMANN takes intuitive and clear-cut operation to a new level.

The special feature of SPECTIVE is that it displays only those functions that are really necessary. Thanks to clear symbols, all plant functions are identifiable at a glance and can be set in just a few steps. Like on a smartphone, the operator is guided intuitively

through the control system – a major plus in practice, because it significantly reduces operating errors. Data on machine operation can additionally be accessed via the control system, meaning that the diesel fuel and lube oil fill levels, for example, can be checked right from the plant cockpit, where the information is also documented. Thanks to these combined advantages, the crushing plant can be operated particularly efficiently.

The first plants to be equipped with SPECTIVE are the MCO 11 PRO mobile cone crusher and the latest MOBIREX EVO2 line of impact crushers. ///



A glance is all it takes to identify the selectable machine functions, thanks to clear symbols.

- › Users are supported from the outset in operating the touch panel, and guided step-by-step through the start process.
- › On the start screen, the operator sees the entire plant at a glance along with the adjustable functions.
- › The operator selects the required function and is guided by clear instructions through all operating steps.
- › If a malfunction occurs, an error diagnosis appears on the display with localization of the problem and tips for its correction – this minimizes plant downtime.
- › The sturdy 30.5cm touch panel can even be operated when wearing work gloves and is legible even in bright sunlight.



Tough machine - Strong performance

KLEEMANN presents the new MOBICONE MCO 11 PRO for quarry applications.



The mobile MOBICONE MCO 11 PRO cone crusher is the latest development from KLEEMANN for use in quarries. The machine features high performance, a robust design and good transportability. It can withstand the rough demands of processing natural stone, as demonstrated by four different applications. »»



The MOBICONE MCO 11 PRO at a glance

- › Maximum feed size: 240mm
- › Crusher system size d:
1,100mm in diameter
- › Drive concept: diesel-electric
- › Power rating
(Tier 4f/Stage IV): 368kW
- › Transport weight: 49,000kg
(approx.)

Ideally equipped for quarry applications

The machine design of the MOBICONE MCO 11 PRO has been fine-tuned down to the last detail. To achieve an optimum centre of gravity in the plant, the power unit is installed underneath the feed unit. The improved balance reduces both noise and vibrations. All components requiring maintenance can be accessed conveniently and safely by the plant operator either from the ground or via work platforms. The MCO 11 PRO comes with a powerful diesel-electric drive unit. It boasts particularly low consumption and can also be operated with power supplied from an external source. The plant is equipped with a Continuous Feed System that ensures an optimum material flow and consistent utilization of machine capacity. The MCO 11 PRO has ideal transport dimensions and can be transported without disassembling any machine parts. Even when equipped with the full complement of options, the MCO 11 PRO is ready for use within 30 minutes, thanks to its hydraulic fold-up functions.





Crushes even the hardest stone

Scandinavian stone is known for its hardness. But even in a granite application in Sweden, the MCO 11 PRO achieves an output of up to 470t/h. The cone crusher works together here with a MC 120 Z jaw crusher to crush blasted granite of 0–650mm down to a grain size of 0–200mm. Because granite is very abrasive, wear is an issue. To protect the feed hopper even during heavy loading, the plant has been equipped with replaceable wear plates inside the hopper. Service Technician Robert Johansson of the WIRTGEN GROUP subsidiary in Sweden finds the optional camera system for monitoring the crusher level and feed hopper, with its display screen on the control cabinet, to be very practical: “You can monitor the crusher level from the ground at any time and don’t have to climb up onto the plant.” What is more, the camera monitoring system can be installed by radio signal in the excavator, so that the operator always has a good view of the plant and can maintain an optimum feed of material to it. >>>



ite
n
ra
G

0-90mm
470t/h



Gravel
0-28mm
215t/h

Perfectly processed gravel for concrete production

The MCO 11 PRO can achieve a remarkable throughput even without a primary crusher, as shown by a gravel application in France. The pre-screened material with a grain size of 11-80mm is fed by a wheel loader to the MCO 11 PRO. The cone crusher crushes the gravel to 0-28mm achieving an average output per hour of 215t/h. Because most of the material is needed for producing concrete, it is very important to obtain a high-quality, cubic end product. To do so, the MCO 11 PRO crushes the gravel in the next stage to a finer grain size of 0-14mm. The cone crusher is controlled by the innovative SPECTIVE control system, which enables intuitive operation of the plant thanks to its clear symbols (see page 24).

For Service Technician Frédéric Pihet from the WIRTGEN GROUP subsidiary in France, the new control system offers a lot of advantages: "The touch panel shows a very good overview and clear presentation of the plant functions and components. If an error occurs, I can see the source of it at a glance and correct it right away." SPECTIVE also displays key information on machine operation.





Granite, basalt, gneiss

0-32mm
240t/h

Reliable performance with natural stone

An MCO 11 PRO is used in Germany to process highly abrasive granite. The blasted rock of 0-700mm is first charged to the MC 125 Z mobile jaw crusher. In the second crushing stage, the MCO 11 PRO crushes the rock from 0-200 to 0-56mm. This plant combination delivers 340t/h. The MCO 11 PRO likewise is used in the second crushing stage in Norway. The mix of granite, basalt and gneiss is pre-crushed by a mobile jaw crusher. The 0-150mm material is then fed to the MCO 11 PRO to obtain the final product of 0-32mm. An average output of 240t/h is achieved in the process. ///

0-56mm
210t/h
Granite

Turning RAP into black gold

Economical and environmentally friendly:
the BENNINGHOVEN granulator MBRG 2000
turns RAP into a resource for new mix.

Recycling technologies are on the advance around the world. This is mainly because the earth's resources are finite – but it is also due to the associated reduction in costs. In road construction especially, the advantages are obvious: when roads are being rehabilitated and resurfaced, cold milling machines remove asphalt layers. And this raw material can well be regarded as “black gold”. And recycling technologies from BENNINGHOVEN make this possible – particularly the granulator MBRG 2000. The mobile

plant breaks asphalt in blocks with an edge length of up to 1.8m down into its constituent parts without destroying the original grain structure. This careful crushing process ensures that almost 100% of the milled asphalt can be reused. Another great virtue of this crushing method is that it is associated with a much lower fines content. That means asphalt mixing plants from all manufacturers can process the granulated RAP without it sticking to the recycling drums and transport equipment. »»



Highlights of the BENNINGHOVEN granulator MBRG 2000:

- › Utilization of finite resources
- › Lower personnel costs
- › Minimal wear costs
- › Maximum cost-effectiveness
- › Minimal dust and noise emissions
- › Minimal fines content
- › Prevents blockage of the transport paths and the parallel drum to the greatest extent in the asphalt mixing plant
- › Can handle tramp iron



Saving money while protecting the environment

RAP that has been crushed with the BENNINGHOVEN granulator can be almost entirely processed to form new mix. That is because the gentle crushing technique produces no additional fines. And that in turn allows the MBRG 2000 to achieve high recycling rates, benefiting both operators and the environment – cutting white mineral, energy and emissions in one fell swoop. Recycling rates in Europe currently stand at around 30% – and this figure is rising around the world. Depending on the market and statutory requirements, granulated RAP is being reused in all layers of the road paving right up to the surface course. The requirements on quality, the grading curve and the asphalt formulas are met in full; only the formulas are adapted accordingly.

Incidentally, asphalt mixing plant specialist BENNINGHOVEN also offer a large number of systems for the cold and hot feeding of RAP into the mixing process, allowing RAP proportions of 25 - 90 + X% to be achieved. You can find out more in the next issues of RoadNews or beforehand at www.benninghoven.com ///

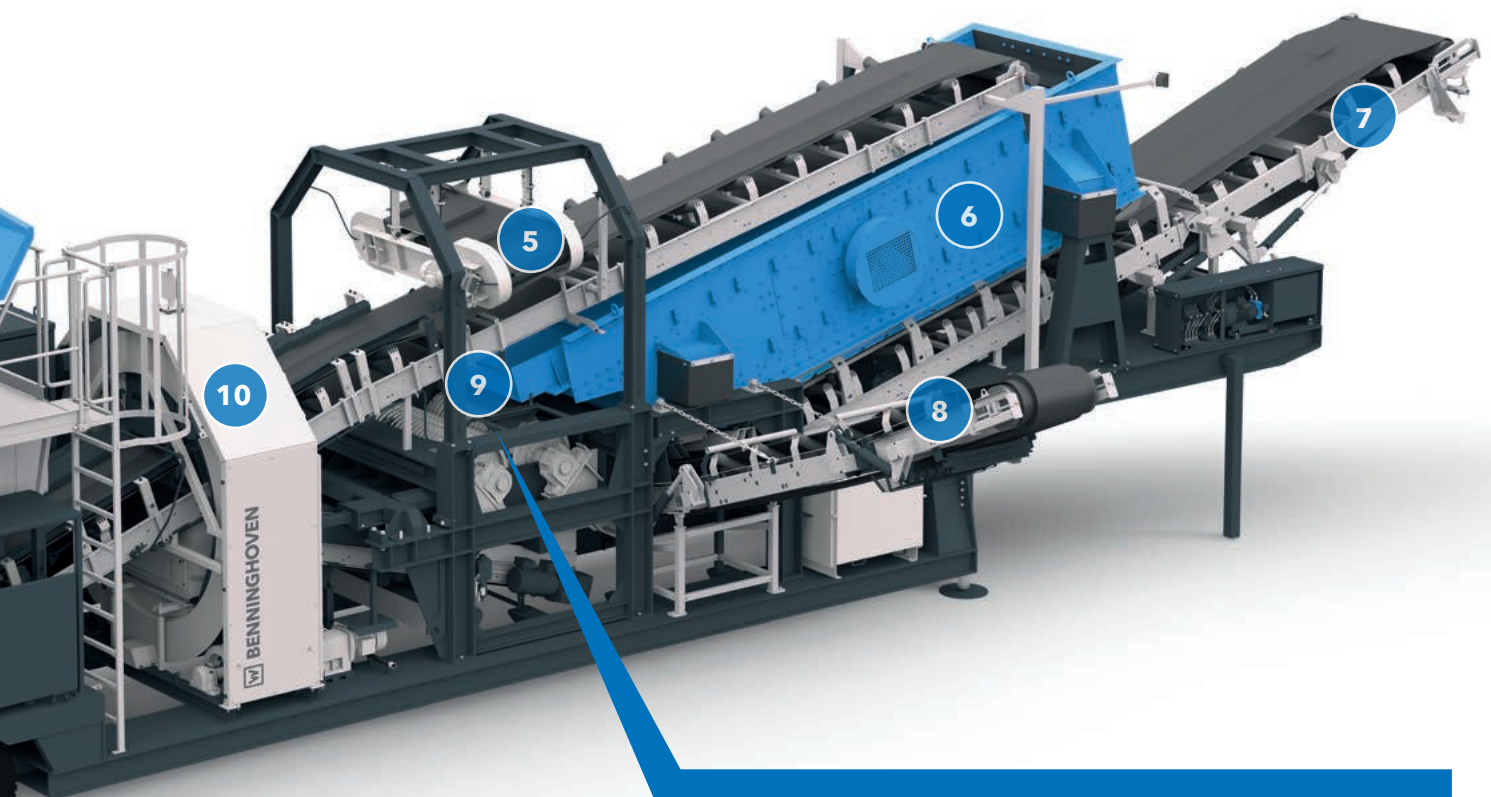
- 1 Power unit
- 2 Primary granulator
- 3 Pre-grinding of large slabs with reciprocating tampers
- 4 Primary granulator milling shaft
- 5 Magnetic separator
- 6 2-deck screen
- 7 Stockpile conveyor 1 (grain size 0-8mm)
- 8 Stockpile conveyor 2 (grain size: 8-22mm)
- 9 Secondary granulator milling shafts
- 10 Return of oversize aggregate



Primary granulator

A wheel loader loads the hopper of the granulator. Inside, tampers carefully push the RAP or asphalt blocks onto a milling shaft located underneath. This prevents bridges from forming and brings about speedy and reliable crushing in the range 0-70mm. The easily exchangeable milling shaft is absolutely reliable thanks to wear protection and special cutters.

The secret behind gentle crushing: Leading granulator technology




Screening unit and secondary granulator

The next stage of the journey through the granulator is the magnetic separator, where tramp iron is reliably separated. The pre-granulated material is then delivered onto an internal screening unit. Small grain sizes (0-8mm) are carried away directly by a stockpile conveyor. The fraction in the 8-22mm range, which already has the target size, is also transported away. The rest of the material goes into the variably adjustable secondary granulator, where it is crushed to grain sizes in a range $\leq 22\text{mm}$. The crushing process is carried out by the shafts of the secondary granulator with hard cast lug shells. The oversize grain still contained in the material is returned to the screening unit. This ensures that the output is free from oversize grain.







WIRTGEN GROUP prepares air base for take-off



Reconstruction of the surface course at Büchel Air Base using technologies developed by four WIRTGEN GROUP brands.

Germany // Büchel

Concentrated power of the WIRTGEN GROUP on the job at Büchel Air Base: together with asphalt mixing plants from BENNINGHOVEN, machines built by WIRTGEN, VÖGELE and HAMM successfully reconstructed the surface course and handed over a top quality runway right on schedule. The success was based on painstakingly planned site logistics, reliability and precision of machine technology and the commitment of the contractors involved. >>>

New asphalt surface course for Tornado jets

Every month, Tornado aircraft take off and land roughly 200 times at Büchel Air Base, set amid the uplands of the Eifel region. Large transport planes also take off and land here. After more than ten years of service and several harsh winters, signs began to emerge that there was a risk of “foreign object damage” (FOD) on the runway. FOD is the damage sustained by aircraft, for instance when they draw in mineral particles from the asphalt, which may destroy the jet engines as they start up. Such “foreign objects” are hence a bane for all airfield operators.

When loose particles measuring up to 5cm in diameter were occasionally found on the runway in Büchel, planning started immediately for reconstruction of the roughly 4.5cm-thick asphalt surface course with its 0.5cm overlay of anti-skid material. The Brenner engineering office in Hennef, Germany, considered several possibilities during the planning process. In the end, they decided to reconstruct the surface course with stone mastic asphalt. Compared to conventional materials, stone mastic asphalt offers much better non-skid properties, is durable and highly resistant to deformation. >>>





Job site details

Reconstructing the surface course of the Büchel Air Base runway, Germany

Length of section:	2,250m (approx.)
Width of section:	46m (approx.)
Total area:	103,000m ² (approx.)

Working parameters

Milling	
Milling depth, fine milling:	10mm
Milled material quantity:	2,100t (approx.)
Milling depth, standard milling:	3.5cm
Milled material quantity:	8,400t (approx.)
Total water consumption:	60,000 litres per day (approx.)

Pavers

Pave width, strips 1 and 4:	11.25m (approx.)
Pave width, strips 2 and 3:	2 x 11.5m "hot to hot"
Transverse slope:	1.4% (approx.)
Layer thickness:	4cm

Asphalt mixing plants

Mixing plant in Boppard:	140t/h
Mixing plant in Ürzig:	160t/h
Mixing plant in Niederwörresbach:	140t/h

Material

Surface course:	SMA 0/11 S with 25/55 PmB (polymer-modified bitumen) and 4kg of cellulose fibre per tonne
Paved material quantity:	10,000t in four days (approx.)

Machinery and plants

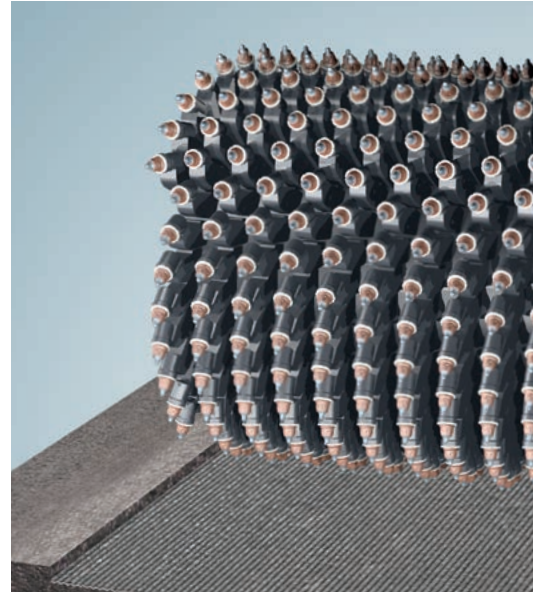
2 WIRTGEN W 210i cold milling machines with fine milling drum LA 6
1 WIRTGEN W 250 cold milling machine with 3.8m milling drum

1 VÖGELE SUPER 2100-3i paver with SB 250 TV screed
1 VÖGELE SUPER 2100-2 paver with SB 250 TV screed
1 VÖGELE MT 3000-2i Standard PowerFeeder
1 VÖGELE MT 1000-1 material feeder

2 HAMM HD+ 90 rollers
2 HAMM HD+ 110 rollers
2 HAMM HD+ 120 rollers
1 HAMM HD+ 120 OV roller
3 HAMM HD 90 OV rollers

1 BENNINGHOVEN BA 3000 asphalt mixing plant
2 BENNINGHOVEN BA 4000 asphalt mixing plant

The small tool spacing of the micro-fine milling drums produces surfaces featuring extremely low surface roughness and a fine surface texture.



The cabin can be displaced beyond the zero-clearance edge on both the right and the left-hand sides and, in all positions, pivots through 110° in either direction. This gives the operator of the W 210i a clear view of the working area, even when reversing.





“ When working at small milling depths, only one of the two engines installed in the machines is running. This reduces fuel consumption considerably. ”

**Dieter Klein, Managing Director
DKS Gesellschaft für Fahrbahnsanierungen
(Society for Road Pavement Rehabilitation)**

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Precision work by WIRTGEN milling machines with super-fine milling drum

The first step was to remove the damaged asphalt pavement with the aid of WIRTGEN cold milling machines, a job that was carried out in two passes. The first 5-10mm were interspersed with anti-skid material and had to be disposed of separately. For this reason, the top layer was removed to a depth of exactly 10mm by super-fine milling. This sufficed to remove the entire layer and at the same time minimize the volume of special waste. A perfect job for the two WIRTGEN milling machines of type W 210i, both fitted with a micro-fine milling drum with 1008 cutting tools distributed over a milling width of 2m.

Needless to say, accurate levelling is essential for such a precision job. On large milling machines, the modern automatic levelling system LEVEL PRO ensures that the milling depth is precisely adhered to. The height is adjusted via four lifting columns in the front and rear crawler tracks, all of which are interlinked hydraulically. As soon as one of the crawler tracks runs over an elevation or into a depression, the other tracks automatically balance out the resultant difference in height. This four-fold full floating axle system ensures that the machine always adapts to the base. >>>



Large W 250 milling machine with 3.8m working width

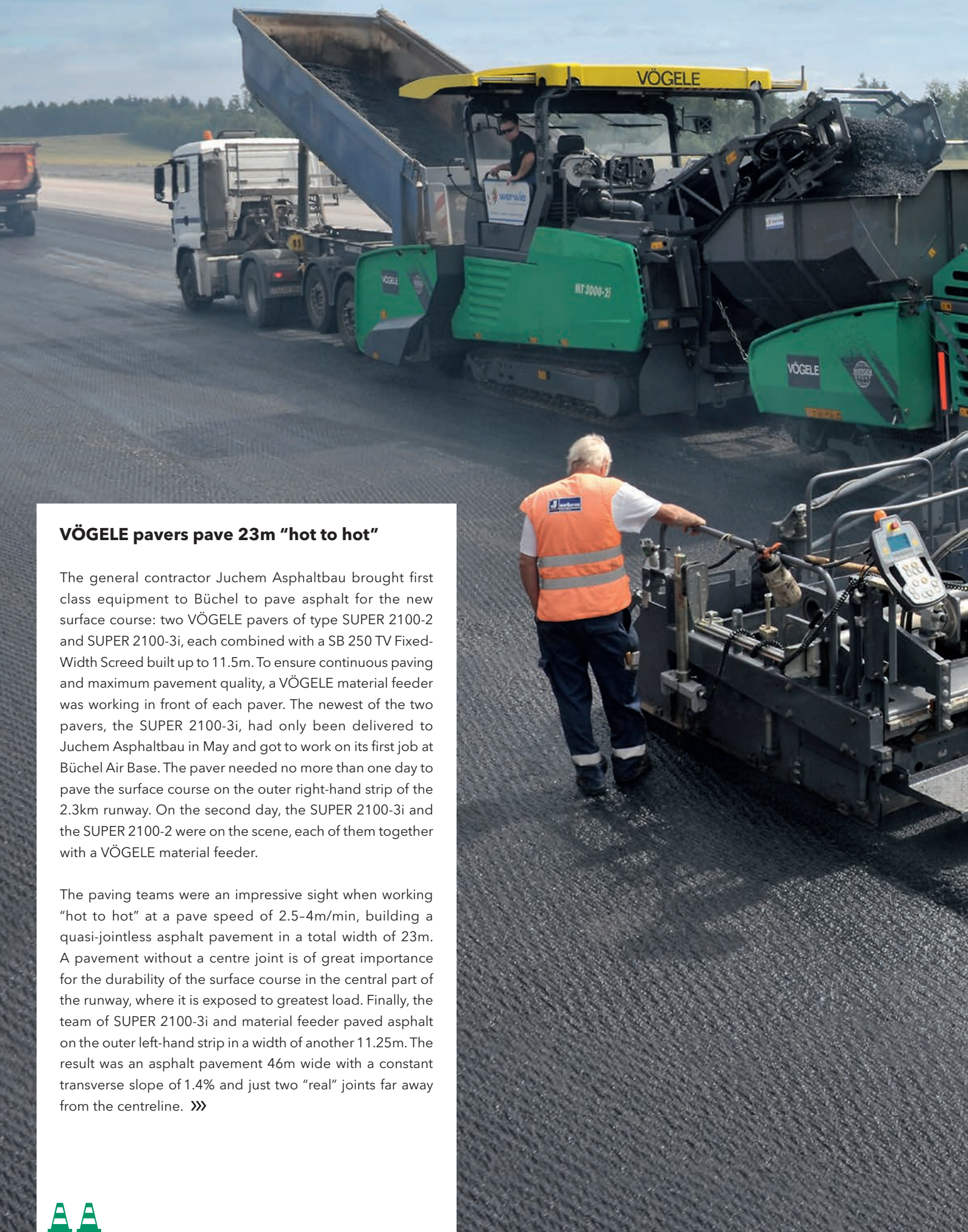
The two large milling machines, each with an on-board power rating of 537kW, work their way through the asphalt at an enormous operating speed of roughly 25m/min. An even larger cold milling machine followed hot on their heels, almost matching them for speed: a W 250 with a milling width of 3.8m. It removed the remaining asphalt surfacing to a depth of some 3.5cm in a second pass. Incidentally, two diesel engines are installed in each of the three cold milling machines. The principle: one engine is in operation all the time to provide a drive for all function groups, while the second engine is only activated when required.

One particular challenge was to ensure a sufficient supply of water. The water is injected into the milling chamber to bind dust and cool the cutting tools. Each of the large milling machines comes with two separate water spray bars. The water pressure adjusts as a function of load and the water quantity is infinitely variable for optimal cooling of the cutting tools. Around 60,000 litres of water were needed every day for the three milling machines – an exceptionally large amount. When all 103,000m² of asphalt surfacing had been removed after just four working days, the VÖGELE pavers and HAMM rollers appeared on the scene to pave and compact the new surface course. »»

**103,000m² in four days:
the large milling machines
from WIRTGEN did an
outstanding job of removing
the asphalt surfacing.**







VÖGELE pavers pave 23m "hot to hot"

The general contractor Juchem Asphaltbau brought first class equipment to Büchel to pave asphalt for the new surface course: two VÖGELE pavers of type SUPER 2100-2 and SUPER 2100-3i, each combined with a SB 250 TV Fixed-Width Screed built up to 11.5m. To ensure continuous paving and maximum pavement quality, a VÖGELE material feeder was working in front of each paver. The newest of the two pavers, the SUPER 2100-3i, had only been delivered to Juchem Asphaltbau in May and got to work on its first job at Büchel Air Base. The paver needed no more than one day to pave the surface course on the outer right-hand strip of the 2.3km runway. On the second day, the SUPER 2100-3i and the SUPER 2100-2 were on the scene, each of them together with a VÖGELE material feeder.

The paving teams were an impressive sight when working "hot to hot" at a pave speed of 2.5-4m/min, building a quasi-jointless asphalt pavement in a total width of 23m. A pavement without a centre joint is of great importance for the durability of the surface course in the central part of the runway, where it is exposed to greatest load. Finally, the team of SUPER 2100-3i and material feeder paved asphalt on the outer left-hand strip in a width of another 11.25m. The result was an asphalt pavement 46m wide with a constant transverse slope of 1.4% and just two "real" joints far away from the centreline. >>>





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Hydraulic bolt-on extensions help us achieve any intermediate width whatsoever, even with a fixed width screed – an extremely practical solution.

**Markus Stumm, Site Manager
Juchem Asphaltbau GmbH & Co. KG**



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Hydraulic bolt-on extensions from VÖGELE: Flexibility for fixed-width screeds

With hydraulic bolt-on extensions from VÖGELE, the pave width of fixed-width screeds, such as the SB 250 TV, can be extended hydraulically by up to 1.5m. This technology combines the advantages of a fixed-width screed with those of an extending screed. As a result, the particularly sturdy fixed-width screeds not only handle large widths, they also are variable.

- › Hydraulic bolt-on extension, left and right, for SB 250 and SB 300 Fixed-Width Screeds
- › Can be extended by 0.75m on either side (1.5m in total)
- › Available in the versions T (with tamper), TP1 (with tamper and one pressure bar) and TP2 (with tamper and two pressure bars)
- › Electric screed heating for screed plates, tamper bar and pressure bar(s)



Paver and material feeder: A dream team

The co-operation of paver and material feeder plays a crucial role in the success of paving projects where large asphalt quantities are involved. In addition to a VÖGELE MT 1000-1, an MT 3000-2i Standard PowerFeeder was used in Büchel, which had been brought to the job site by the Werwie rental company from Konz, Germany, together with a SUPER 2100-2. This heavy-duty material feeder has an impressively large holding capacity: together with the paver, up to 40t of material can be stored. Sturdy and reliable distance control between paver

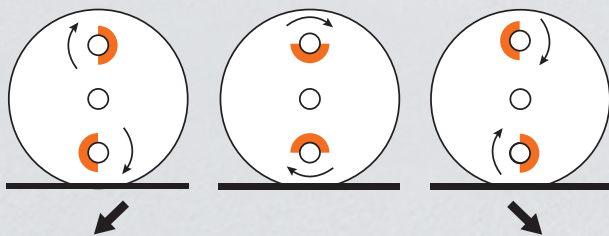
and material feeder is another significant feature for high pavement quality. The VÖGELE PowerFeeder is fitted with a system of three laser cells on the underside of the conveyor, ensuring that a constant distance between material feeder and paver is maintained at all times. An anti-collision system provides for additional safety. If there is any risk of the vehicles colliding, the paver is brought to a halt immediately, thus preventing an imminent collision. »»





Oscillation speeds up the work

One third of the rollers working on the Büchel project were equipped with oscillating drums. Developed by HAMM, this compaction technology is equally advantageous for compaction work on small areas, bridge decks or in multi-storey car parks, and for large areas, such as motorways or airport runways.



› The principle of oscillation

An excitation system inside the drums generates an oscillating movement. In contrast to vibratory compaction, however, oscillation does not introduce any vertical forces into the asphalt pavement. Instead, the drum performs a forward-backward movement, remaining in permanent contact with the asphalt while dynamic shear forces are additionally exerted. This takes place during both the forward and the backward movement. In other words, the roller actually operates with twice the compacting frequency.



HAMM rollers guarantee high output per unit area

Ten HAMM rollers behind the two VÖGELE pavers carried out high-quality compaction of the new surface course. For this job, Juchem and Werwie chose articulated rollers of the HD+ and HD series with operating weights between 9 and 12t, four of them equipped with oscillating drums. An outstanding feature of the HD+ series is the excellent view from the fully glazed cabin, nothing obstructs the operator's visibility. He always has a clear view of the job site, his working area and the drums. This significantly enhances the rollers' high safety standard.

› The advantages of oscillation

The result of oscillation, on the one hand, is a rapid increase in density. This is an advantage, above all, when compacting thin layers. Furthermore, oscillation prevents aggregate grains from being crushed and avoids over-compaction. And since the oscillating drums introduce constant shear forces into the asphalt instead of vertical forces, surfaces without any irregularities are achieved which meet the highest demands in terms of evenness.

"Outstanding visibility is one of the reasons why customers like to rent our HD+ series HAMM rollers," explains Matthias Beckmann, Rental Park Manager at Werwie. In addition, the large, heavy rollers from the HD and HD+ series used in Büchel are particularly appreciated for their high performance per unit area. It results from the combination of wide drums with large diameters, powerful drives and an intelligent automatic reversing function. The rollers, furthermore, feature amply dimensioned tanks for diesel fuel and water allowing to work throughout an entire shift without a need for refilling. This way, HAMM rollers are equipped with all it takes to achieve high productivity - one of the reasons why they were used for the Büchel Air Base project. >>>

High-quality compaction assured

Another key feature of the HD+ series is the very favourable weight and load distribution. It is due above all to the position of the articulated joint almost in the machine centre and its specific kinematic characteristics. This results in excellent driving stability. And thanks to their uniform weight distribution, HAMM rollers from the HD+ series are capable of producing surfaces of perfect evenness very rapidly, a circumstance of particular importance when it comes to compacting surface courses.

In addition to load distribution, the water sprinkling system is also crucial for compaction quality. This is why HAMM equip their HD+ series rollers with powerful pumps delivering the required amount of water precisely and reliably to the spray nozzles. The water sprinkling system can be easily monitored by the operator, who always has a clear view of the spray bars from his panoramic cabin due to the smart frame design. The amount of water applied is conveniently adjusted from the operator's station. Last but not least, storing the water in two separate tanks provides for uniform weight distribution in any operating situation. >>>

The driver's seat on the HD+ rollers can be moved right up to the outer edge of the cabin and pivoted through 90° in either direction.





EVO JET: Multi-fuel burner from BENNINGHOVEN for cost-saving operation

- › The Juchem Group's BENNINGHOVEN asphalt mixing plants are operated by EVO JET burners of the latest generation.
- › Various fuels can be used: heavy fuel oils, liquid gas, natural gas, solid fuels such as coal dust, or a combination of several fuels.
- › The plant can be switched from one fuel to another at the push of a button, with no need for mechanical conversion.
- › Depending on the current market prices, the operator can choose the cheapest fuel, thus boosting the plant's cost-efficiency.





Three asphalt mixing plants from a single source

On a project of this size, large amounts of asphalt need to be produced in a very short time. In Büchel, three BENNINGHOVEN mixing plants owned by the Juchem Group produced no less than 10,000t in four days. While the two pavers worked simultaneously, each of the mixing plants in Ürzig and Niederwörresbach prepared some 140t, and the plant in Boppard some 160t of stone mastic asphalt per hour. The three mixing plant supervisors were in contact with each other all the time throughout the four days in order to ensure that the two high-performance pavers were continuously supplied with the required quantities of mix. During these days, up to 50 lorries were in operation. The identical quality of the mix produced in each of the three mixing plants was an important requirement for the project's success.

With this in mind, Juchem used raw material from the same quarries at all three locations and carried out numerous checks. Not only the mixing plants' capacity, but also their technology was crucial for the asphalt quality. "We use modern BENNINGHOVEN control systems at all three locations. As a result, we were able to set up the plants precisely and produce exactly the desired mix. At the same time, the new control systems allowed energy-saving mixing, thus cutting the costs of consumables," explains Mixing Plant Supervisor Karl-Heinz Thiem. »»





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Once in operation, a BENNINGHOVEN burner keeps going and going. It's the Mercedes among burners!

**Karl-Heinz Thiem, Mixing Plant Supervisor in Ürzig
Juchem GmbH & Co. KG**

”

Ultra-modern mixing plant - Despite being built in 1986

Karl-Heinz Thiem monitors and controls the BENNINGHOVEN type BA 3000 asphalt mixing plant in Ürzig installed back in 1986. It was one of the first mixing plants built by BENNINGHOVEN. Even then, the youngest member of the WIRTGEN GROUP was coming up with visionary concepts characterized by their great flexibility. This consequently made it possible to modernize and enlarge the plant repeatedly with new technology, such as a new control system.

“Ready for take-off” after just two weeks

After two weeks of highly concentrated work with WIRTGEN GROUP machinery and plants, Juchem completed this demanding project, from milling through to paving and compaction, right on schedule. The customer's project manager, Uwe Müller from LBB (state-owned company for properties and construction supervision) in Rhineland-Palatinate, Germany, was fully satisfied with the project's punctual completion and outstanding result: “We are right on schedule and the quality of the asphalt pavement is impeccable.” After no more than two weeks in the hands of the construction machinery, the Air Base could be handed back to its operators. ///





Green light for perfect communication

Continuous transfer of mix on the B271: in the vicinity of a motorway exit on the B271 federal highway, a SUPER 1800-3i with PaveDock Assistant - one of VÖGELE's innovations for the current "Dash 3" generation that simplifies communication between paver operator and the driver of the feed vehicle - ensured uninterrupted paving.



Germany // Bad Dürkheim

Even in conventional paving there are some challenges to overcome. Working without interruptions, for instance, and avoiding the jolts caused by the feed lorries as they dock. Both of these criteria can now be met perfectly thanks to a current VÖGELE innovation: PaveDock Assistant. This is VÖGELE's name for one of the options offered for their "Dash 3" paver generation - operating on the principle of a signal light, it improves communication on the job site and actively supports the lorry driver when docking. The system excelled in every respect when paving the surface course for the modification of an exit on the B271 federal highway. »»



To see just how smoothly PaveDock Assistant works in practice, watch a video on the job site in Bad Dürkheim/Germany - go to:
www.voegel.info/pavedock_b271





Job site details

Roadworks at the Bad Dürkheim/Seebach exit on the B271 federal highway, Germany

Working parameters

Pave width:	2 x 4–4.5m
Pave speed:	3m/min
Required accuracy:	± 3mm
Layer thickness	
Surface course:	3.5cm

Material

Stone mastic asphalt	SMA 85 25/55/55
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Equipment

2 SUPER 1800-3i pavers with AB 600 TV Extending Screed
1 SUPER 800-3i paver with AB 220 TV Extending Screed
1 HAMM HD 12 tandem roller
1 HAMM HD+ 90 tandem roller with oscillation drum
1 HAMM GRW 280 rubber-wheeled roller

Milestone for greater process reliability during transfer of the mix

In practice, the procedure on the Bad Dürkheim job site was as follows: the SUPER 1800-3i used two signal lights to indicate clearly whether the feed lorry was to reverse, stop, dump mix or drive off again. The signal lights are positioned high up on the hardtop of the machine, where they are easily visible to the lorry driver at all times. One of the key advantages is that the PaveDock Assistant eliminates the need to use horns in job site traffic. This wide-spread practice is not only unreliable – particularly when paving with multiple pavers – but also annoys local residents and confuses vehicle drivers.

Easy handling from the paver operator's ErgoPlus 3 console

For the paver operator, changing signals to pass on instructions to the lorry driver is a simple and intuitive process from his ErgoPlus 3 console (see the information box). All functions of the SUPER pavers are integrated into the innovative, easy-to-learn operating concept from VÖGELE. Thanks to the PaveDock Assistant, docking feed lorries did not cause a single jolt on the B271 job site. Jolts are dreaded, because they affect the screed and can leave imprints on the freshly paved asphalt course. ///



Transfer of the mix is much faster and simpler with the PaveDock Assistant – and it puts a stop to all the beeping and gesticulating, too.

Dipl.-Ing. Karl Günther Gerst, Managing Director
Gerst Bau GmbH

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PaveDock Assistant – the signal light system for lorry drivers – works as follows:



1. Dock: This signal is activated on the paver operator's ErgoPlus 3 console for as long as the feed lorry is to reverse.



4. The down arrow means "Lower dump box". The mix has been unloaded.



2. Stop: As soon as the lorry docks onto the push-rollers, the driver is given the signal to stop.



5. The lorry can leave the job site and drive back to the asphalt mixing plant.



3. The up arrow means "Raise dump box". The mix can be transferred to the paver's material hopper.



100 miles day and night

In San José, in-situ cold recycling with a WIRTGEN 3800 CR recycler proves to be the most economical solution.

**ROAD
WORK
AHEAD**

One special challenge was that the job sites were spread over the entire downtown area of this highly-populated city.



USA // San José

Time is money, especially in road construction. When it comes to cost efficiency, being able to put all equipment to maximum use is a critical factor. Consequently, it is a major advantage when a machine can be used flexibly, like the 3800 CR recycler from WIRTGEN, which can use the up-cut and down-cut cold recycling processes or operate as a high-output milling machine. Thanks to its diverse application options, the recycler fulfils unique construction specifications as required by an application or invitation to tender.

In California, the Golden State, the 708kW powerhouse is resurfacing 100 miles of San José's main traffic arteries in situ (on the spot), together with a VÖGELE VISION 5200-2i tracked paver in a rear-load process. With this method, the 3800 CR travels in reverse, removing the damaged asphalt layers in a down-cut process and transferring the recycled material to the paver.

Down-cut method increases paving quality

The contractor, MCK Services Inc., elected to use the process for this job to achieve a particularly high level of paving quality. In the down-cut process developed by WIRTGEN, the milling drum rotates in the direction of travel, not against it as in the up-cut process. As a result, particle size can be precisely controlled when processing the material, especially on very brittle, thin, old asphalt roads.

New load-bearing capacity for the streets of San José

One illustrative example is W. Campbell Avenue, a main road in San José in the heart of Silicon Valley. The WIRTGEN cold recycler, with its usual reliability, first milled off a 10cm layer of damaged asphalt across a width of 3.8m, granulated it, and mixed in the 1% pre-spread cement. Two tank lorries supplied the recycler with



Washington, D.C.

USA



Job site details

Rehabilitation of main and secondary downtown roads in San José, California

Costs:	US\$ 13.7 million
Length of section:	100 mi.
Area of section:	224.000m ²

Working parameters

Width of section:	3.8-4.9m
Layer thickness:	10cm

Material

Quantity of mix:	50,545t
Percentage of foamed bitumen:	2.5%
Percentage of cement:	1%
Optimum moisture content:	5-7%

Equipment

WIRTGEN 3800 CR cold recycling machine
 VÖGELE VISION 5200-2i paver
 HAMM HD+ 110 VV-HF tandem roller
 HAMM GRW 280i-20 pneumatic tire roller

hot bitumen and water via connected hose lines. Added pressurized air generates foamed bitumen. Microprocessor-controlled injection bars ensure precision injection of the foamed bitumen - in this case 2.5% - into the mixing chamber, where it is optimally processed with the granulated material. Ejectors positioned on the rotor then transfer the mix to the 3800 CR's conveyor belt.

Meanwhile, traffic in front of the Starbright Theater, at the corner of Fulton Street, continued to flow by the recycling train apparently undisturbed, thanks to the fact that pavement rehabilitation is completed in a single pass, without the lorries having to weave in and out of the lane. This increases safety and is a tremendous relief to the traffic system. >>>



Recycling train with the 3800 CR in rear-load mode (down-cut)

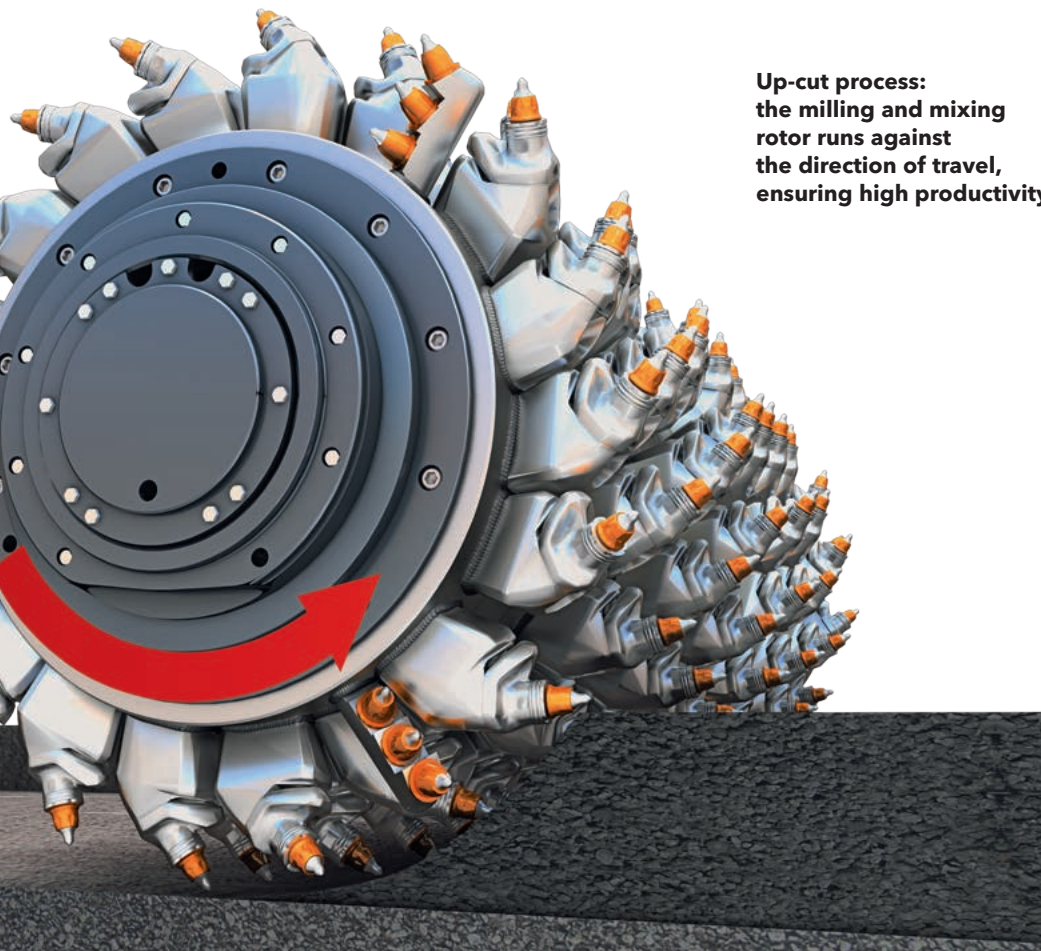
If necessary, a binder spreader first pre-spreads cement, followed by water and binder tank trucks. The milling and mixing rotor on the WIRTGEN cold recycler granulates the asphalt layers down to a depth of 18cm. At the same time, the cement is mixed in and the water and bitumen emulsion or foamed bitumen are injected into the mixing chamber by injection bars. The prepared material is fed directly from the discharge conveyor to the material hopper of the VÖGELE paver, which paves it true to line and level. HAMM rollers then take over compaction.

” Cold recycling in-situ fulfils exacting quality requirements, is extremely economical, environmentally-friendly, and has the least impact on the public.

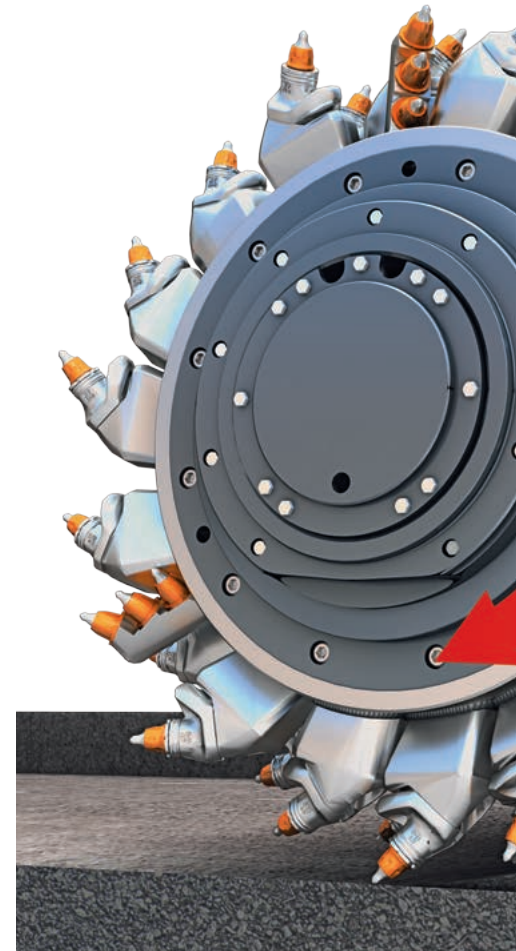
Frank Farshidi,
Project Manager for the City of San José

”

Up-cut process:
the milling and mixing
rotor runs against
the direction of travel,
ensuring high productivity.



Working direction >>>



Working direction >>>

Recycling train with the 3800 CR using the up-cut process

If necessary, a binder spreader first pre-spreads cement, followed by water and binder tank lorries. The milling and mixing rotor granulates the asphalt layers down to a depth of 15cm. At the same time, the cement is mixed in and the water and bitumen emulsion or foamed bitumen are injected into the mixing chamber by injection bars. After an auger spreads the prepared material across the entire

pave width, the VÖGELE extending screed paves it true to line and level. HAMM rollers then take over compaction.

When fitted with an extending screed, the 3800 CR can handle not only recycling in the conventional up-cut process, but also the down-cut process developed by WIRTGEN.



Down-cut process: the milling and mixing rotor rotates in the direction of travel. This prevents large chunks of pavement from breaking off.

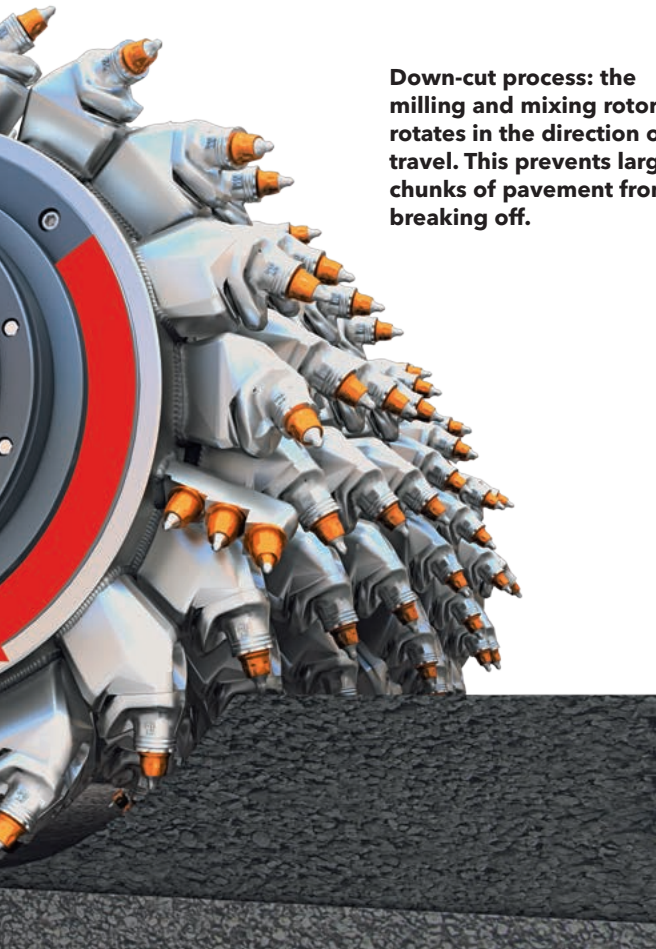


The WIRTGEN 3800 CR machine concept is geared to maximum output so that rehabilitation projects can be completed quickly. With this in mind, the conveyor system also has an extremely high conveying capacity. The slewing and height-adjustable conveyor rapidly transfers material to the material hopper on the tracked paver, which then places a 10cm layer and precompacts the surface. The HD+ 110 VV-HF tandem roller and GRW 280i pneumatic tire roller from HAMM perform final compaction, giving the road a closed, smooth surface texture.

Cost-efficient and eco-friendly

After 100 miles and - thanks to in-situ cold recycling - a short construction time, Bob Garrigan, Superintendent at MCK Services, is pleased: "Thanks to the WIRTGEN 3800 CR, we were able to fully comply with the traffic and budget requirements stipulated by the City of San José."

In the end, the results speak for themselves: some 9,600 fewer lorry hours significantly reduced CO₂ emissions, fuel consumption and construction traffic on streets that receive between 12,000 and 35,000 vehicles daily. In total, the city saved some US\$1.5 million. ///





The lure of freedom:
asphalt road through the vast expanse of Brazil