

RoadNews

for new roads

The WIRTGEN GROUP User Magazine // N° 01

 **WIRTGEN**

 **VÖGELE**

 **HAMM**

 **KLEEMANN**

 **BENNINGHOVEN**

Road and Mineral Technologies from the
WIRTGEN GROUP at Bauma 2016

INNOVATIONS
TO THE POWER OF



Road construction to the power of 5

The WIRTGEN GROUP is the world's first and only enterprise to cover the entire process chain in road construction with its own technologies and premium brands: from crushing and screening, through mixing, paving and compaction

to milling and recycling. All from a single source. Reason enough to present this concentrated competence in Road and Mineral Technologies in our RoadNews. In future, you will find our complete range of topics right here. For you, that

means more know-how, more variety and even more job site reports from the world of road construction all in one magazine. Welcome to the new WIRTGEN GROUP RoadNews magazine.

KLEEMANN

KLEEMANN are an innovative manufacturer of mobile crushers and screens. We combine cutting-edge technology with outstanding applications know-how and offer our customers cost-efficient solutions that meet the highest quality standards.

BENNINGHOVEN

BENNINGHOVEN build the world's leading asphalt mixing plants. From assistance with planning starting on day one all the way up to final commissioning, we reliably support our customers' projects, providing made-to-measure solutions on request. With us, an ideal mix is guaranteed.

VÖGELE

VÖGELE are the technological leader worldwide and the No. 1 for pavers. In the world's most modern paver production facility, VÖGELE build machines of the highest standards and quality. Our customers benefit from a complete product range that continually raises the bar when it comes to ease of use and innovations.

HAMM

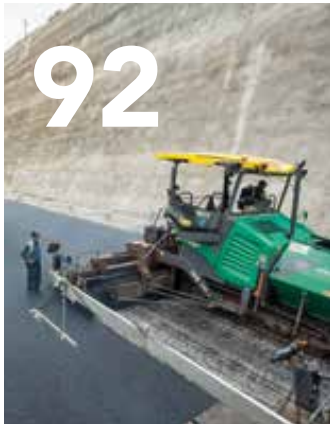
HAMM lead the world market for rollers and build innovative, high-quality compactors for road construction and earthworks. Our comprehensive product range includes the most advanced, intelligently designed, user-friendly products and solutions, meeting our customers' highest demands in terms of quality and cost-efficiency.

WIRTGEN

WIRTGEN not only lead the market for cold milling machines and recyclers used in road construction, they are also the quality and technological leader for slipform pavers and surface miners. Our mission is to deliver pioneering products and technologies, giving our customers a valuable competitive edge. And we gladly go the extra mile to achieve that aim.



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Dear Reader,

This is the first edition of the new WIRTGEN GROUP RoadNews magazine. We look forward to reporting on exciting new technologies and innovations, information from the field of applications technology and impressive job sites from around the world.

And from now on, all five WIRTGEN GROUP brands will be covered. Our editorial teams will be putting heart and soul into preparing professional reports and technical articles on WIRTGEN, VÖGELE, HAMM, KLEEMANN and BENNINGHOVEN. RoadNews will always keep you right up-to-date on state-of-the-art developments and all the most important themes affecting our industry.

This edition naturally focuses on Bauma 2016 in Munich, Germany. And how could it be otherwise? This year too, the WIRTGEN GROUP will once more be presenting a host of attractive novelties and pioneering technologies at the world's biggest trade fair. This edition of RoadNews provides an overview of our latest innovations.

We hope you enjoy reading this first edition of the WIRTGEN GROUP RoadNews.

Best wishes,

Stefan Wirtgen

Jürgen Wirtgen

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Close to our customers to the power of 5

More product brands, more innovations, higher performance:
The WIRTGEN GROUP at Bauma 2016.

At Bauma 2016, visitors can literally “feel” the WIRTGEN GROUP’s mission to always be close to their customers. The owner-run family business has once again enlarged its already exceedingly wide, high-performance product range.

WIRTGEN, VÖGELE, HAMM, KLEEMANN and BENNINGHOVEN – each of the five product brands in the two business sectors Road and Mineral Technologies is presenting genuine innovations in Munich, Germany, in the form of new machines, technologies and services. Their aim is the same: assuring the satisfaction of their customers. In this way, the WIRTGEN GROUP delivers on its fundamental pledge, everywhere and at all times: Close to our customers.

This pledge is also expressed in the exhibition motto: Close to our customers to the power of 5. “To the power of 5” has a special significance: for the first time, visitors to Bauma 2016 will also experience the new product brand BENNINGHOVEN in the WIRTGEN GROUP pavilion. This traditional manufacturer of technologically leading asphalt mixing plants ideally rounds off the Group’s product portfolio. As a result, the WIRTGEN GROUP can now offer its customers solutions for the complete road construction cycle from a single source: crushing, mixing, paving, compaction and then recycling.

The following pages present an overview of the most important exhibition highlights presented by the five product brands of the WIRTGEN GROUP.



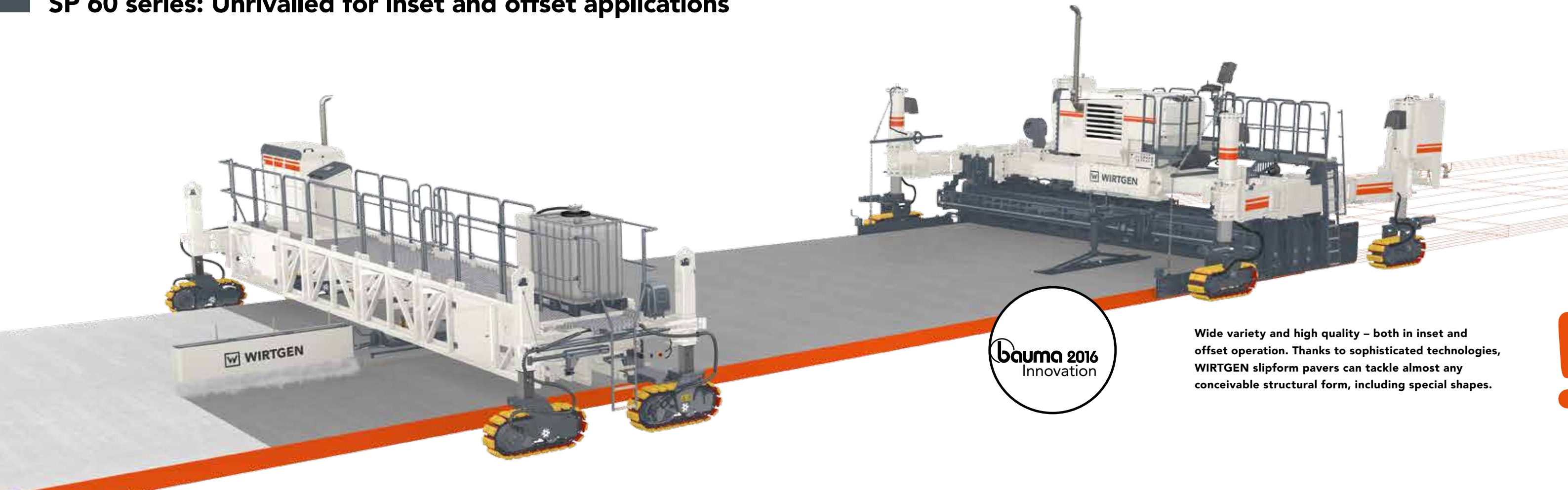


Precise and cost-efficient paving

With the SP 64i and SP 94i slipform pavers as well as the texture curing machine TCM 180i, WIRTGEN are presenting flexible solutions for high-grade concrete paving, both inset and offset.

The new SP 94i on the job at Memorial Airport Jefferson City, Missouri, USA.

SP 60 series: Unrivalled for inset and offset applications



Wide variety and high quality – both in inset and offset operation. Thanks to sophisticated technologies, WIRTGEN slipform pavers can tackle almost any conceivable structural form, including special shapes.

TCM 180i: A handy solution

Self-propelled curing units, such as the new TCM 180i from WIRTGEN, guarantee the success of professionally cured concrete pavements. As soon as concrete has been placed by the slipform paver it must be protected without delay to prevent drying out, as this causes tension which, in turn, leads to cracks.

The modular design of the TCM 180i permits working widths between 4m and 18m. The new engine meets the latest emission standards and can be fitted with an additional diesel particulate filter (DPF). Thanks to the new operating concept, operation is now intuitive, as on the WIRTGEN slipform pavers of the SP 90 and SP 60 series. The range of possible surface textures has likewise been enlarged.

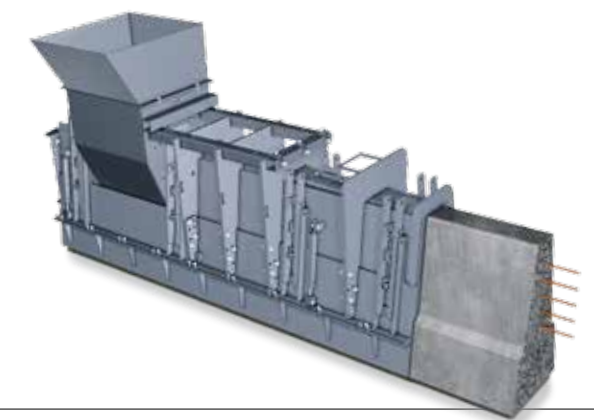
Together with the SP 61i and SP 62i models, the SP 64i makes up the new SP 60 series which will replace the SP 500 slipform paver in future. The SP 64i can optionally be fitted with four hydraulically operated swivel arms for the crawler tracks allowing it to change from travel mode to working mode even more rapidly than the SP 500. In combination with the Paving Plus package, also available as an option, the swivel arms can actively bypass obstacles during the paving process. A walkway, for the first time available across the full width of the machine, a central control system and four additional decentralized control systems provided as standard permit simple and at the same time flexible operation of the machine. Remote controls can be connected to each of the crawler tracks to speed up the process of setting up the slipform paver, such as positioning and zeroing the crawler tracks and swivel arms. Adding further machine components to cater to complex, customer-specific job requirements is a simple process, enabling the SP 60 series to handle a wide variety of applications. In addition to different mould systems for inset applications, offset moulds can

also be fitted with options typically required in offset paving, such as trimmers and a variety of conveyors and augers for feeding the offset mould.

Paving widths up to 7.5m

Inset slipforming allows the SP 64i (four crawler tracks on swivel arms) and SP 62i (track steering) to pave slabs up to 6m wide and, in the standard version, up to 350mm thick. Even widths of up to 7.5m can be paved when working with electric vibration (without a dowel bar inserter).

In offset operation, the SP 60 series and in particular the SP 61i in the versions with three or four crawler tracks can pave small to large monolithic profiles. Whether standard or customized, contours of almost any shape or size are produced cost-efficiently and in a high quality.



Offset applications: The right slipform for all profiles

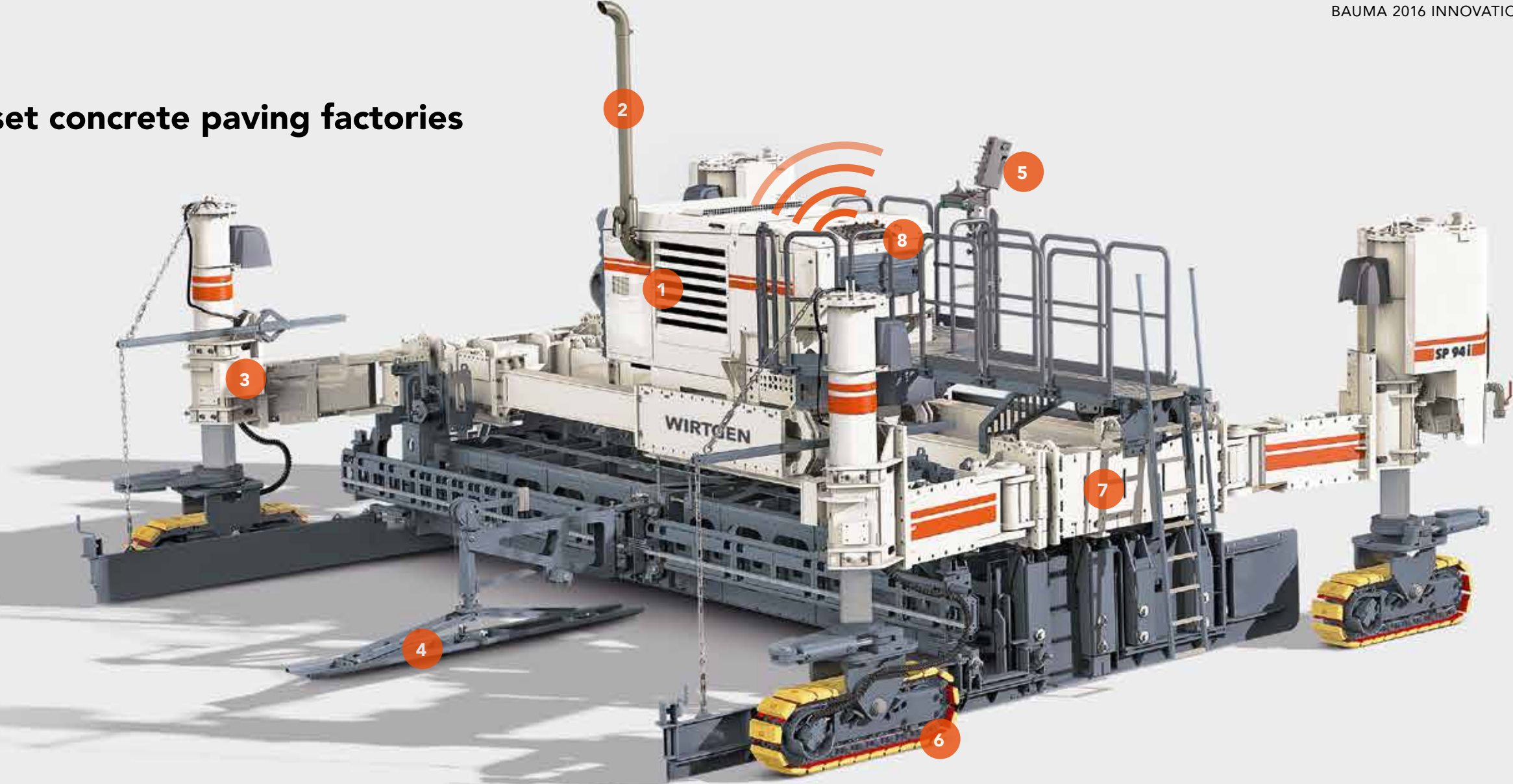
WIRTGEN supply a large variety of slipforms for monolithic concrete profiles, such as robust safety barriers and roadway edgings, water gulleys or narrow paths.

SP 90 series: Mobile inset concrete paving factories



EASY CONNECT – The future-proof 3D interface

A system that combines higher paving accuracy with greater cost-efficiency: the integrated standard interface makes it easy to combine EASY CONNECT with modern 3D systems from all leading suppliers.



Highlights of the SP 94i slipform paver

- 1

Cost-efficient engine management
Lower fuel consumption due to ECO mode.
- 2

Cutting-edge engine technology
Modern engine technology with 231kW/314PS reduces fuel consumption and complies with emissions standard EU Stage 4/US Tier 4f.
- 3

Completely modular design
Flexible conversion and simple retrofitting of options ensure perfect adaptation to the conditions prevailing on job sites.
- 4

Flexibility in concrete paving
The slipform paver produces concrete pavements between 3.5m and 9.5m wide and up to 450mm thick with absolute precision.
- 5

Perfect operation and ergonomics
Ergonomically designed workplace with user-friendly operating concept and optimum visibility for stress-free working.
- 6

High-precision steering and drive systems
Intelligent steering and control systems guarantee precision and extremely smooth running when paving concrete, even in tight bends.
- 7

Integrated devices for the insertion of reinforcements
A self-loading dowel bar inserter, central tie bar inserters and insertion units for lateral tie bars are available as options on request by the customer.
- 8

Ultra-modern machine control systems
A standardized interface for targeted quick diagnosis and the modern telematics system WITOS make everyday use even more efficient.

Inset slipform pavers are ideal for cost-efficient production of large concrete pavements, for instance on highly resilient motorways and runways. These mobile concrete paving factories from WIRTGEN can place concrete for roads and areas up to 18m wide between their crawler tracks.

The new SP 90 series comprises the SP 92i and the SP 94i, a completely modular inset version with four steerable and swivelling crawler tracks. It can produce concrete pavements between 3.5m and 9.5m wide and up to 450mm thick with great precision. Numerous options, such as dowel bar inserters (DBI), tie bar inserters or slipform systems tailored to the local requirements for inset applications in regions worldwide, allow the SP 94i to be configured for a whole range of applications.



High performance, compact size

WIRTGEN present the new
W 120 Ri and W 150 CFi cold milling machines.

As market leader, WIRTGEN offer their customers the largest range of cold milling machines industry-wide, with milling widths ranging from 14mm to 4.4m. Whether small, compact or large, the road rehabilitation specialist can supply a suitable cold milling machine for every application. The highlights of the 12 cold milling machines presented by WIRTGEN at Bauma 2016 include two world firsts, the W 120 Ri and the W 150 CFi.

W 120 Ri: A small milling machine that’s big news

With a milling width of 1.2m, the W 120 Ri is the first mobile rear loading machine on wheels; together with the W 100 Ri, it rounds off the new generation of small milling machines from WIRTGEN. The W 120 Ri features the same operating concept as the W 35 Ri, W 50 Ri and W 60 Ri – 50cm class machines which are already successfully established in the market. This includes the multifunctional armrest that is so highly appreciated by machine operators. Numerous automatic and driver assistant functions speed up the work processes and greatly relieve the machine operator in his everyday work. LEVEL PRO PLUS, the brand-new levelling system developed by WIRTGEN, has been completely integrated into the machine’s control system, where it ensures a precise, high-quality milled result thanks to its simple intuitive operation.

With its generously dimensioned conveyor system, the W 120 Ri can load the milled material quickly and continuously. An incredibly manoeuvrable, wheeled undercarriage and the optional dynamic package supporting speeds up to 7.5km/h ensure rapid relocation of the machine between job sites.

Highlights

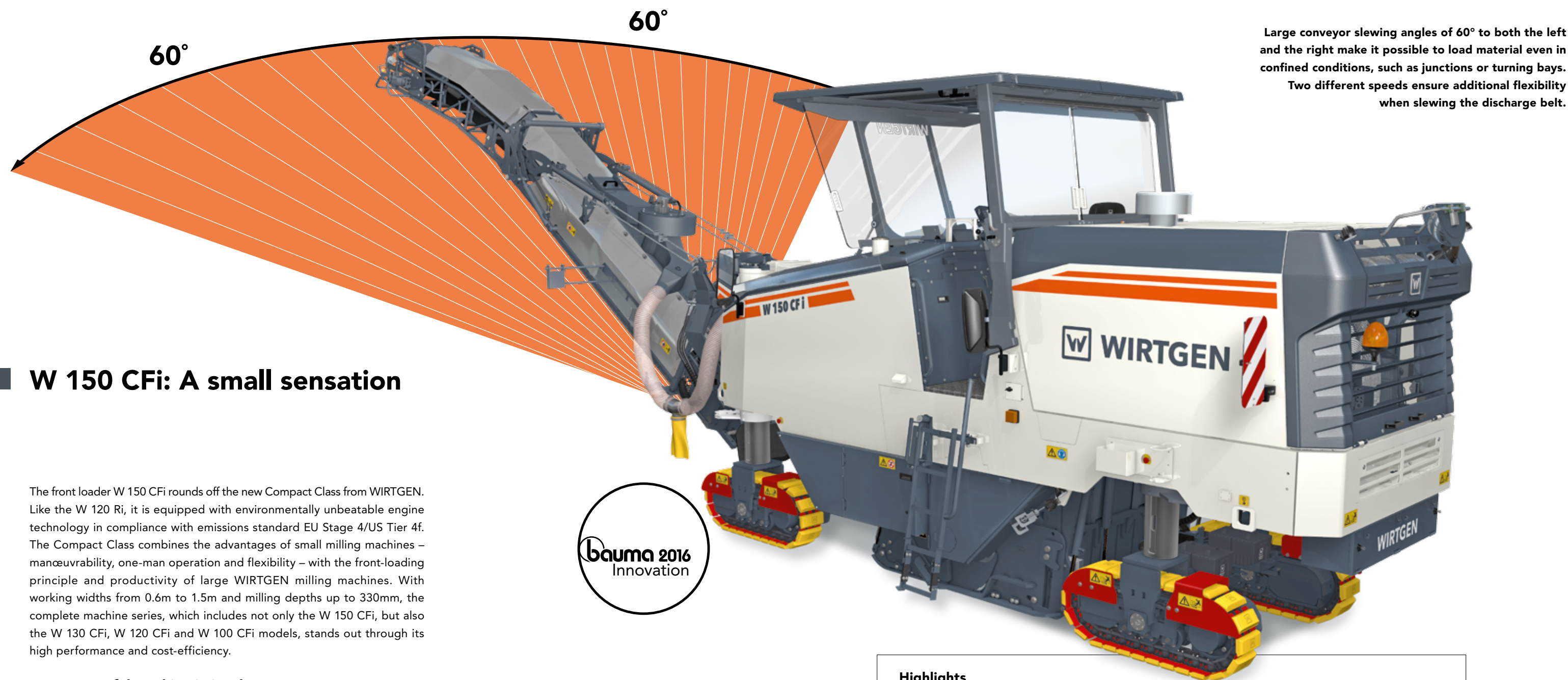
- › The eco-friendliest engine technology available in compliance with emissions standard EU Stage 4/US Tier 4f
- › Three different milling drum speeds
- › Optimum view for a precise milled result
- › Simple operation promotes the work process
- › High efficiency when driving/steering and milling/loading



LEVEL PRO PLUS:
The milling depth is precisely measured by robust displacement sensors in the hydraulic rams mounted on the side plates and indicated on the high-resolution operator display.



The machine operator can store up to three milling depths on each side (standard equipment) via the ergonomic multifunctional armrest.



W 150 CFi: A small sensation

The front loader W 150 CFi rounds off the new Compact Class from WIRTGEN. Like the W 120 Ri, it is equipped with environmentally unbeatable engine technology in compliance with emissions standard EU Stage 4/US Tier 4f. The Compact Class combines the advantages of small milling machines – manoeuvrability, one-man operation and flexibility – with the front-loading principle and productivity of large WIRTGEN milling machines. With working widths from 0.6m to 1.5m and milling depths up to 330mm, the complete machine series, which includes not only the W 150 CFi, but also the W 130 CFi, W 120 CFi and W 100 CFi models, stands out through its high performance and cost-efficiency.

Most powerful machine in its class

The most powerful machine in the Compact Class, namely the W 150 CFi, is ideal for larger job sites where space is limited, such as in town centres. Particularly in such conditions, the sophisticated vision system in combination with the camera systems help the machine operator to manoeuvre the cold milling machine. In the Compact Class too, the machine's simple and intuitive operation is based on a standardized operating concept, ensuring that all operators quickly feel at ease on every machine model. Perfect levelling is also assured, thanks to the LEVEL PRO PLUS system integrated into the compact milling machines. With an operating weight of 20.8t, the W 150 CFi can normally be transported without requiring a special permit – another important aspect for the logistics of both customers and service providers.

Large conveyor slewing angles of 60° to both the left and the right make it possible to load material even in confined conditions, such as junctions or turning bays.

Two different speeds ensure additional flexibility when slewing the discharge belt.

Highlights

- › As manoeuvrable and flexible as a small milling machine
- › As productive as a large milling machine
- › The eco-friendliest engine technology available in compliance with emissions standard EU Stage 4/US Tier 4f
- › Simple, intuitive operation
- › Extremely large conveyor slewing angle of 60° to the left and right
- › Three milling drum speeds ensure optimum adaptation to conditions on the job site

WIRTGEN cutting technology: Cost-efficient quality

Cutting technology is a core competence of WIRTGEN. A long service life and high machine output depend above all on optimum interaction between milling drum, toolholder and cutting tool. At Bauma 2016, WIRTGEN are presenting new developments specially designed to meet requirements in cold recycling, soil stabilization and cold milling.

Cold recycling and soil stabilization

WIRTGEN will be presenting two optimally matched innovations that meet the special requirements of cold recycling and soil stabilization: the point-attack cutting tools of GENERATION Z and the quick-change toolholder system HT22.

Next cutter generation for cold recycling and soil stabilization

The GENERATION Z point-attack cutting tools for WIRTGEN cold recyclers and soil stabilizers have been significantly revised to cater to current demands in the mixing and cutting process. For one thing, the reshaped carbide tip has been additionally reinforced and the quality of the carbide material precisely tailored to meet requirements. In addition, the steel body, wear plate and clamping sleeve have been optimized with regard to their wearing properties. All these features help to extend the tool life of the cutters and to prolong protection of the toolholder.

Stability demonstrated in over 15,000 test hours

Meanwhile, the beginning of the year saw the introduction of the newly developed quick-change toolholder system HT22 for the model series of WIRTGEN cold recyclers, soil stabilizers and tractor-towed stabilizers. Here too, a new geometrical design and enhanced steel quality significantly increase the wearing volume of such components as the base and the upper and lower parts of the toolholder. The resultant extension of service life and longer service intervals also increase machine availability.

The system as a whole has reliably passed its induction in exhaustive test runs and more than 15,000 hours on the job in a variety of applications. Thanks to the excellent interaction of the HT22 and GENERATION Z, customers are perfectly equipped to tackle a wide range of applications in both recycling and soil stabilization.



The WIRTGEN cold recyclers' and soil stabilizers' performance and cost-efficiency are improved by the quick-change toolholder system HT22 in combination with point-attack cutting tools of the new GENERATION Z.



For WIRTGEN cold milling machines: Diamond-tipped cutting tools

Customers are also ideally equipped with WIRTGEN's cutting tools for cold milling machines. As a pioneer in cutting technology, WIRTGEN have optimally matched the various components here too, supplying a large range of high-quality, cost-efficient solutions for cutting asphalt and concrete. As part of the special presentation of cutting technology, WIRTGEN are showcasing not only the complete range of point-attack cutting tools at Bauma 2016, but also the new cutters with a tip made from artificial (polycrystalline) diamond material (PCD) which produce an exceedingly uniform milled result.

Measurably better



The non-contacting temperature measuring system RoadScan, a pioneering innovation for documenting pavement quality, is being showcased by VÖGELE.

The temperature at which the material is paved and compacted is one of the decisive criteria determining the quality of an asphalt pavement. Customers are therefore increasingly demanding documentation showing the temperature of the freshly paved asphalt. With RoadScan, VÖGELE have developed a genuine innovation which is being presented to a large specialist audience for the very first time at Bauma 2016. The non-contacting temperature measuring system can be used with all VÖGELE pavers of the "Dash 3" generation and also in combination with WITOS Paving.



Highlights of VÖGELE RoadScan

- › Temperature measurement over the entire area
- › Real-time display on the paver operator's ErgoPlus 3 console to help the paving team produce a high-quality asphalt pavement
- › Easy installation of the measuring system
- › Calibration is not required (Plug & Play)
- › Robust hardware without moving parts (e.g. infrared camera instead of a movable pyrometer)
- › Measuring range 10m



Temperature measurement

An infrared camera scans a measuring range of 10m behind the screed. The scan grid measures 25 x 25cm over the complete width. The temperatures measured range from 0 to 250°C with a tolerance of only $\pm 2^\circ\text{C}$.



Temperature monitoring

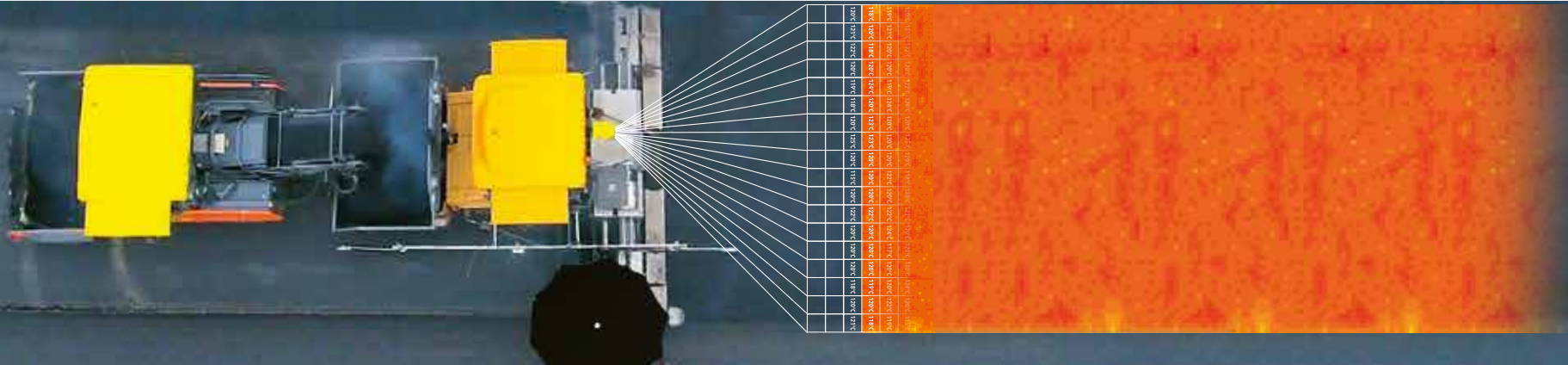
The surface temperature measured during the paving process can be monitored in real time on the display of the paver operator's ErgoPlus 3 console. This allows the paving team to react swiftly to fluctuations in temperature – usually a sign of segregation.



Analysis of the data

The measured values are stored in the paver operator's ErgoPlus 3 console and can be conveniently downloaded from there. After uploading the data in the office, they are analysed using the web application RoadScan Analysis.

RoadScan, VÖGELE's temperature documentation system, optimally meets the requirements specified by authorities inviting tenders in terms of temperature range, measured width, measurement density and analysis.



InLine Pave – Up to date

VÖGELE present machine technology of the “Dash 3” generation for building compact asphalt pavements.

For several years now, VÖGELE have been offering an innovative paving method – InLine Pave – that is particularly suitable for building compact asphalt pavements “hot on hot”. Binder and surface course are laid and intensively bonded in a single pass. The InLine Pave method uses standard machines from series production which are slightly modified for “hot on hot” paving. As a result, they can also be used for conventional paving projects.

“Dash 3” technology and a number of other innovations

With the introduction of the new “Dash 3” paver generation, VÖGELE have fundamentally revised the key component in InLine Pave technology – the SUPER 2100-3i IP with AB 600 TP2 Plus screed. In addition to the innovative features of the “Dash 3” paver generation, the paver for binder course now comes with a completely revised transfer module to convey the surface course material to the SUPER 1800-3i. The heated conveyor system has been extended by 1m and is particularly efficient. Two operator platforms and an insulated extra hopper to be placed into the paver’s regular material hopper are now provided as standard. Also new on the SUPER 1800-3i paver for the surface course is an optional camera to monitor the filling level in the paver’s extra material hopper.

InLine Pave is capable of handling a wide range of applications. When paving large quantities of mix at high pave speeds, the InLine Pave train can also be supplied with material from two MT 3000-2i Offset PowerFeeders operating simultaneously.



Highlights of the new VÖGELE InLine Pave train

- › The conveyor of the MT 3000-2i Offset material feeder has a particularly high discharge point so that mix is delivered to the transfer module or extra material hopper with maximum precision.
- › To increase machine utilization of the paver for binder course on conventional job sites, the transfer module of the SUPER 2100-3i IP can be removed easily and quickly at a predefined interface.
- › All service and maintenance points on the SUPER 1800-3i, the paver for the surface course, are optimally accessible. The water spraying system for the crawler tracks, for instance, can be refilled from the ground.



Highlights of WITOS Paving

- › Process planning, control and analysis – from the mixing plant through paving to compaction
- › Dynamically cycled supply of material according to the just-in-time principle
- › Rapid detection of discrepancies between the progress made and the required status
- › Inclusion of machine data, such as pave width and pave speed
- › Analysis and statistics tool to optimize process flows
- › Simple compilation of documentation for contractors and customers
- › Integration of VÖGELE RoadScan

Added value for contractors and customers:

- › Greater process stability
- › Lower operating costs
- › Higher quality
- › Reliable data for transparent accounting
- › Documentation provides proof of quality and sustainably improves the road construction process

Networked process optimization creates added value

VÖGELE WITOS Paving

The machine technology is just one of many parameters which affect the cost-efficiency of road construction projects. Of all these factors, the overall process chain from asphalt production and transport to compaction has the most significant impact. With WITOS Paving, VÖGELE now offer a solution that helps contractors to increase the transparency of their resource and job site planning and to react to disruptions in ongoing operations, significantly improving their overall cost-efficiency. What's more, WITOS Paving can also be used to compile the whole documentation for customers on completion of a project and to obtain findings which will be useful for future orders.



WITOS Paving makes it possible for contractors to plan and connect all operations and services on asphalt job sites. “This is possible because our IT solution includes all parties involved in the process,” explains Dr Stephan Weller, Head of Software Products at VÖGELE. For the contractor, this refers to planning, job site management, the paving team and roller operators. For the asphalt mixing plant, it includes the mixing plant’s supervisor and the lorry drivers transporting the mix. Support and service staff from the WIRTGEN GROUP and VÖGELE are always on hand in the background – be it for expert advice in advance, for providing solutions during operation or for analyses afterwards.

WITOS Paving: 5 modules for road construction in the future

- 1 | **Control module**
simplifies the planning of construction projects

2 | **Materials module**
for just-in-time delivery of asphalt to the job site

3 | **Transport module**
for cost-efficient management of the fleet of feed lorries

4 | **JobSite module**
for efficient process management during the construction process

5 | **Analysis module**
for documentation, analysis and sustainable improvement of future construction projects
- Advantage:**
A unique and totally integrated system

› As the manufacturer of road construction machinery and the developer of WITOS Paving, VÖGELE are the only supplier to offer a fully integrated overall system with perfectly matching components

› This means:

 - WITOS Paving can directly access all paver data as it is integrated in the paver operator’s ErgoPlus 3 console
 - Machine training by VÖGELE also includes menu control of WITOS Paving
 - Service for WITOS Paving software and machines from a single source

Value added by minimizing non-productive times and waste

When WITOS Paving is used to plan, monitor and control the process chain of a construction project, asphalt is produced and delivered according to a work cycle optimized in real time. No more than the required volume of mix is delivered and downtimes are minimized for the lorries, as are non-productive times for the workers. Meanwhile, the pavement quality increases, since paving continues without interruption and the asphalt is paved immediately, ensuring that it still hot. All parties involved in the

process are equipped with suitable tools – office staff, for instance, need nothing more than an internet-based software solution, while lorry drivers require a smartphone app with GPS function. For paver operators, the most important WITOS Paving functions are integrated into the paver operator’s ErgoPlus 3 console.

Teaming with innovations

Up front with leading-edge technology: SUPER 1800-3i SprayJet, the “Dash 3” generation paver for spraying as well as for standard paving jobs.



Unequalled – Highlights of the SUPER 1800-3i SprayJet

- › World's only spray paver for paving thin overlay as well as conventional surface and binder courses
- › Incorporates all the advantages of the “Dash 3” paver generation
- › Modular operating panel integrated into the ErgoPlus 3 operating concept
- › Ultramodern ErgoPlus 3 operating concept for paver and spray module
- › AutoSet Plus automatic functions for rapid relocation of the machine on the job site and storage of paving programs
- › Electrically heated tank for bitumen emulsion (2,100 litres as standard, can be increased to 7,100 litres with optional extra tank)
- › Emulsion sprayed at a rate of 0.3 to 1.6kg/m² in a clean and controlled process

The SUPER 1800-3i SprayJet is an efficient all-rounder that handles spraying and standard paving jobs with equal ease. This newly developed paver is bursting with impressive innovations, particularly when it comes to the SprayJet module, the spray technology and the operating concept. The development work focused on cost-efficiency. Application of the emulsion is exceedingly precise and hence efficient, while the VÖGELE EcoPlus low-emissions package – another “Dash 3” feature – saves fuel and reduces emissions. The new automatic AutoSet Plus functions are particularly practical in the paving process, for they store current machine data such as pave width and screed settings. As a result, work can resume rapidly following a break in paving or after relocating the machine on the job site.

Cost-effective surface course rehabilitation for a competitive edge

Paving thin asphalt overlay “hot on hot” on spray seal (DSH-V) is an established process in many markets and a low-cost method for rehabilitating or renewing surface courses, as it saves costly surface course material. VÖGELE have not only set standards here with their SprayJet technology, but have raised the bar again by launching their new SUPER 1800-3i SprayJet.





Pavers in the 10-foot class – Highlights of the SUPER 2000-3i and SUPER 2003-3i

- › High productivity due to the fast-running tracked (SUPER 2000-3i) or wheeled (SUPER 2003-3i) undercarriage
- › Maximum pave width 8.6m, laydown rate up to 1,400t/h
- › Powerful Cummins diesel engine of the latest engine generation, with a rated output of 186kW
- › Ultra-modern “Dash 3” machine generation, incorporating the enhanced ErgoPlus 3 operating system

bauma 2016
Innovation

New SUPER pavers for the US

The SUPER 2000-3i and SUPER 2003-3i have introduced the internationally successful VÖGELE SUPER series to new markets.

The tracked SUPER 2000-3i and the wheeled SUPER 2003-3i are designed specifically to meet the requirements of the US, Australian and New Zealand markets. These two pavers in the important 10-foot class (equivalent to roughly 3m) replace the VISION series previously marketed in the US. “SUPER pavers are the most advanced pavers available on the market. We are confident that these two models are first-rate products that set standards in many respects. The key features of pavers in the SUPER series

include an ergonomic design, high productivity and technology that is both innovative and high quality,” says Brodie Hutchins, Vice President Dealer Development at WIRTGEN AMERICA. The main difference between international models of the SUPER series and the SUPER 2000-3i and SUPER 2003-3i lies in their fast-running tracked or wheeled undercarriage. These are needed to attain the high pave speeds typically required on US job sites.

A compact machine that's big on performance

The new SUPER 800-3i from VÖGELE
is a small top-class paver.



The little giant – Highlights of the SUPER 800-3i

- › Large range of uses, from backfilling narrow trenches and the construction of small and medium-sized roads to surfacing open areas with asphalt.
- › ErgoBasic operating concept ensures perfect all-round view and super-simple handling of paver and screed.
- › Deutz diesel engine with high power output of 55.4kW and ECO mode.
- › AB 220 TV Extending Screed with tamper and vibrators for pave widths from 0.5m to 3.5m and high pre-compaction.

The immense range of applications is its hallmark. With an outer track gauge of just 1.14m, a clearance width of 1.4m and a height of 1.98m, the new SUPER 800-3i has access to areas beyond the reach of other pavers. As a paver of the "Dash 3" Mini Class, it is the ideal candidate for cycle paths, footpaths, farm tracks, central reservations, spaces between tram tracks, small squares, industrial halls, underground parking areas or low projecting roofs.

Thanks to its hydraulically adjustable, asymmetrical hopper wall, lorries have no trouble feeding the paver with mix even in the most confined conditions. The SUPER 800-3i features a maximum pave width of 3.5m when fitted with the AB 220 TV Extending Screed with tamper and vibrators, and a maximum pave speed of 30m/min. As a result, it is more than capable of handling larger projects, too. Thanks to the innovative ErgoBasic operating system and perfect all-round view, working with the machine is child's play.

Typical of the VÖGELE Mini Class: The new SUPER 800-3i is at home wherever confined conditions call for an extremely compact and manoeuvrable paver.

The innovative Easy Drive operating concept

User-friendly operation – identical for both soil compactors and asphalt rollers from HAMM.



Easy Drive is a completely new and innovative operating concept which HAMM is set to unveil at Bauma 2016. It can initially be found in three different roller series: in the tandem rollers of series DV+ and series HD+, as well as in the compactors of series H. With Easy Drive, HAMM have created a uniform operating logic for compactors and rollers used in both earthworks and asphalt road construction, adapted to the functionalities of each series. As a result, contractors can deploy their drivers on all roller types with great flexibility.



Compactor H series



Tandem roller DV+ series



Tandem roller HD+ series





The Easy Drive principle:
Same function group – same colour.

Developed in cooperation with scientists and roller operators

Easy Drive is the result of a multi-year research and development project for which HAMM enlisted the aid of universities and specialists in the field of ergonomics, as well as roller operators from various countries. The aim was to make compaction simpler, safer and generally better by offering a new quality of operation. HAMM have achieved this aim superbly, for Easy Drive permits quick and stress-free orientation, as well as confident and relaxed operation of the HAMM rollers.

Few operating elements, intelligently arranged

All Easy Drive machines are steered in the classical manner, via a steering wheel mounted on a steering column in front of the seat. The most important operating elements are located on the joystick and multifunction armrest. Everything else is subordinate to the joystick and follows a logical principle that no other manufacturer except HAMM

has put into practice to date: the more frequently an element is actuated, the closer it is located to the joystick. For this reason, rarely used push-buttons, status indicators and displays showing compaction parameters are located on the instrument panel beside the steering wheel. All buttons and displays are assigned to colour-coded function groups (water system, compaction, driving, chip spreader, etc.) which apply across all roller series.

Ergonomic and comfortable

However, Easy Drive rollers have more to offer. Above all, their outstanding ergonomic design and improved comfort. Ascending and descending from the machine is now safer and more comfortable than in the past, thanks to the wide ascent leading to the operator's station or cabin. Moreover, the seat and steering column can be adjusted so that every driver, no matter how tall, short, slim or broad, can sit in an ergonomically ideal position.

Easy Drive – The innovative and intuitive operating concept

- › Intuitive and therefore safe user guidance
- › Quick to learn, short training periods
- › Identical operating logic for all roller types
- › Ergonomically optimized operator's station, can be adapted to operators of almost any height and build
- › Energy-saving operation so that the driver's concentration is maintained for longer periods

Push-buttons for the most important functions are located on the joystick beside the multifunction armrest.



The premium asphalt compaction class

Pivot-steered tandem rollers from HAMM's DV+ series meet the highest quality demands in a very short space of time.



The large track offset almost doubles the working width of the DV+ series tandem rollers in relation to their drum width of 1.5m (DV+ 70i) and 1.68m (DV+ 90i).



DV+: Tandem rollers for top-quality compaction

- › High-precision pivot steering with large pivot angles, large track offset and four steering modes
- › Safe, intuitive operation and ergonomically optimized operator's station
- › Intelligent water system for uniform distribution of the weight
- › Optimum view of the machine and surrounding job site
- › Capacious fuel and water tanks for maximum productivity

HAMM are presenting the complete series of DV+ tandem rollers at Bauma 2016. All six models of these powerful, pivot-steered compactors are highly productive. Operators are thrilled with their excellent visibility as well as the easy-to-learn Easy Drive operating concept (find out more on page 36).

Comfortable and safe: The panoramic cabin

From his fully glazed panoramic cabin, the driver can keep a constant eye on the drum edges and on the edge pressing and cutting equipment. Glazed panels in the cabin floor additionally provide a clear view of the drums.

Uninterrupted compaction

The innovative tandem rollers are designed for maximum productivity. Large diesel and water tanks permit continuous compaction over long periods. HAMM has come up with a highly user-friendly solution for refilling and refuelling: diesel is conveniently refuelled from ground level while water is replenished safely and very rapidly via a pressure refilling function provided as standard.

Future-proof engine technology

The rollers of DV+ series are equipped with cutting-edge engines meeting the requirements of EU Stage IIIB/EPA Tier 4i (DV+ 90i) and EU Stage IIIB/EPA Tier 4 (DV+ 70i). To this end, HAMM use diesel particulate filters (DPF) allowing the machines to be operated even in the most restrictive markets, such as Switzerland or California.

High-grade asphalt pavements

The machines' ingenious design ensures homogeneous distribution of the roller weight at all times: a key factor for high-grade compaction. Pivot steering is another quality factor. It allows the DV+ series rollers to be steered precisely and flexibly in four different modes. On the rollers, all vibrating drums are split and a comfortable automatic reversing function ensures gentle braking, acceleration and reversing. As a result, the DV+ produces a perfectly level asphalt pavement without hollows or bumps, even in bends.

Compact climbers

HAMM present their H CompactLine,
a new series of powerful compact compactors.



The H 7i is only 4.4m long.
That makes it considerably smaller than all
comparable compactors on the market.

H CompactLine: Short and effective

- › Excellent gradeability > 60%
- › Very compact size
- › Largest slope angle available on the market
- › Optimum all-round view
- › ECO mode and automatic engine-off function reduce fuel consumption



H CompactLine is a completely new compactor series which HAMM are poised to unveil at Bauma 2016. The H 5i (4.8t) and H 7i (6.3t) models featuring engines compliant with EU Stage IIIB/ EPA Tier 4 are exceedingly short. HAMM have achieved this by using hydraulic wheel motors for the traction drive and dispensing with a rear axle. Both compactors owe their extraordinary gradeability and large ground clearance to this innovative drive concept. In combination with an unusually large slope angle, short wheelbase and 3-point swivel joint, this results in excellent driving and handling characteristics, making the machine ideal for use on confined, steep job sites.

Comfortable workplace – Easy operation

These compact machines offer an excellent view in all directions. The steering wheel is positioned for unobstructed visibility and easy access to the instrument panel; every move is immediately clear from the arrangement of the operating elements. Backlit buttons with clear symbols ensure unambiguous operation, even in the dark. In addition, the comfortable ascent, individually adjustable seat and the cabin with wide-opening split windows create a pleasant working environment.

Ideal for machine rentals

Among other things, HAMM supply a variety of options so that the H CompactLine can be tailored to the needs of equipment rental firms. These include a telematics interface, two-part padfoot shells, a special combination scraper for a smooth drum with or without padfoot shells, energy-saving LED lights and an automatic engine-off function to reduce fuel consumption.

H CompactLine compactors are available with
smooth drum, two-part padfoot shells or padfoot drum.
The H 7i is also available with VIO drum.



More than just compaction

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

A prototype version of the 25t H 25i VC compactor attracted a great deal of attention at Bauma 2013. Now it is ready for series production. Its key component is a 2.22m-wide VC (vibration crusher) drum with 150 picks. They break up the hard rock material with extremely high point loads before it is compacted by the vibrating roller drum.

With this heavy-duty compactor capable of handling even gradients of more than 60% with ease, the efficiency can be improved when building dams of rock in several layers. Pre-crushing or loosening rock for routing work is another interesting application. 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.



H 25i 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



Rubber-tyred all-rounders

HAMM extend their product range with the new GRW 180i rubber-tyred roller.

At Bauma 2016, the GRW 180i is HAMM's innovation in the field of rubber-tyred rollers. The new roller is identical with the GRW 280 and GRW 280i in terms of operation, functionality and design. The main difference, however, is engine and weight. The new rollers are powered by a 3.6-litre turbocharged diesel engine with DOC system. The engine has a rated output of 55.4kW and remains below the emission limits specified according to EU Stage IIIB/EPA Tier 4. The basic weight of 10 or 12t is adapted to the engine output and can be increased to a maximum of 18t by adding ballast.

For the GRW 180i and GRW 280/280i, HAMM supply pre-fabricated ballast packages of various materials which can simply be placed into the ballast compartment by a forklift. New special tanks from HAMM make for even greater freedom: they can be filled as desired. Unbeatable flexibility!

GRW 180i: Rubber-tyred roller with panoramic cabin

- › Excellent visibility
- › Large, comfortable cabin/operator's station
- › Simple, self-explanatory operation
- › Quick and convenient maintenance
- › Innovative, flexible ballasting concept



Tough design, strong performance

KLEEMANN are presenting the new MOBICONE MCO 11 PRO for use in quarries.



KLEEMANN are set to showcase the first model in their new generation of mobile cone crushers for use in quarries: the MOBICONE 11 PRO. The development work focused on high performance and a robust design, excellent transportability, easy access for maintenance, plus maximum occupational safety. As a result, the MCO 11 PRO is optimally equipped to stand up to the rough environment of natural stone quarrying.

Easy-to-service machine with low centre of gravity

The MCO 11 PRO is designed for a high level of user-friendliness. The power unit is now located under the feed unit – a completely new feature in this machine class. All maintenance points can be accessed from ground level, making servicing a great deal easier and increasing occupational safety, too. The resultant low centre of gravity not only improves the machine's overall balance, but also reduces the level of noise and vibrations. The large, lightweight hoods reliably protect all technically sensitive points without restricting access when servicing is required.

Powerful, low-consumption diesel-electric drive

The MCO 11 PRO comes with a powerful diesel-electric drive unit. It boasts a particularly low consumption and can also be operated with power supplied from an external source. Spacious working platforms ensure safe access for maintenance. The fuel and AdBlue®/DEF tanks are refilled at a comfortable height from ground level. A Continuous Feed System (CFS) ensures uninterrupted crusher feed and optimum utilization of machine capacity. In this way, the MCO 11 PRO can handle feed quantities up to 470t/h.

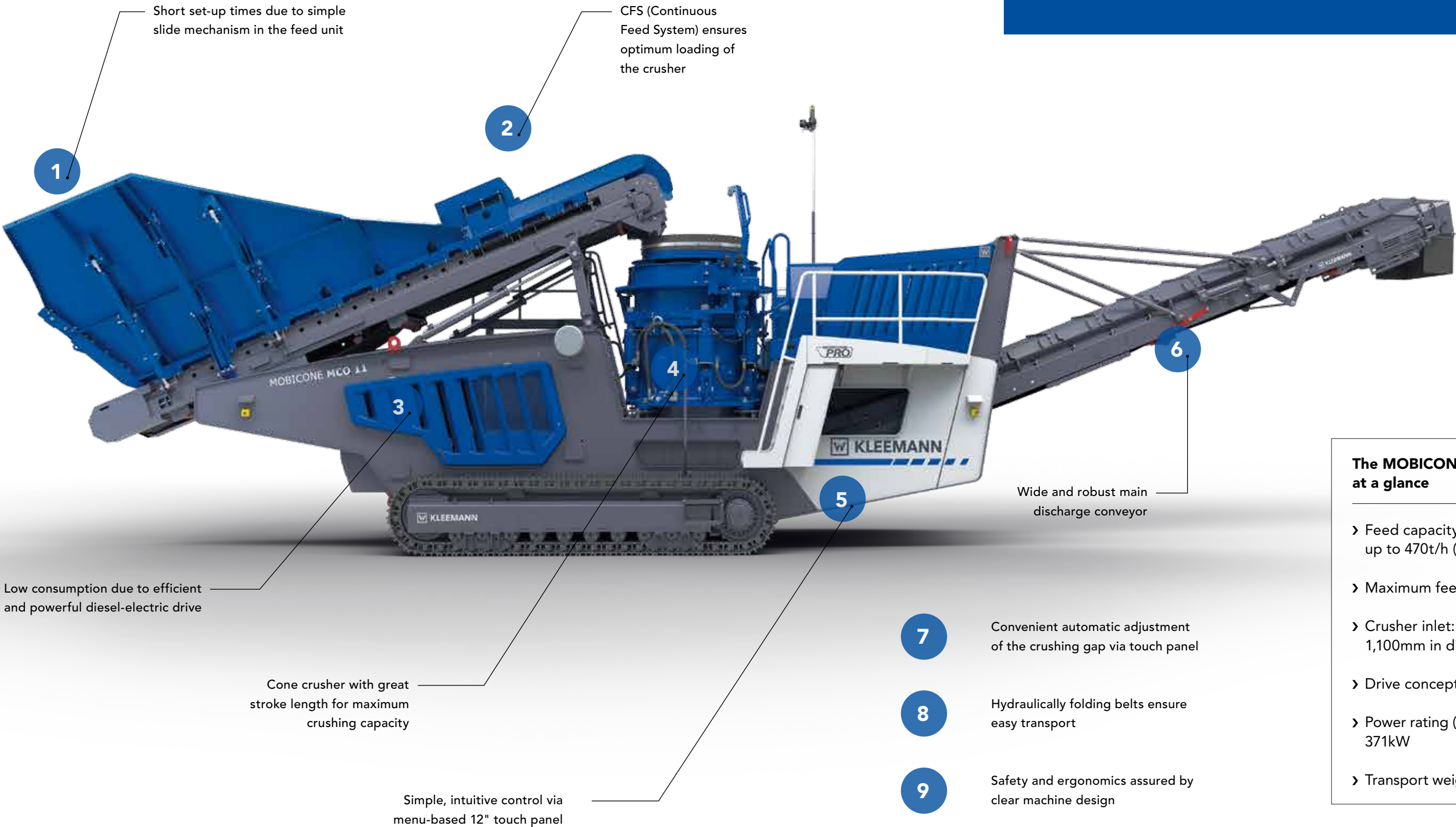
Easy to transport, quickly set up

For natural stone processing in quarries, the transportability of crushing plants is playing an ever greater role. Transport costs are consequently becoming an increasingly significant cost factor. The transport dimensions of the MOBICONE MCO 11 PRO are ideal. Nothing needs to be dismantled for transport. Even when equipped with the full complement of options, the MCO 11 PRO is ready for use within 30 minutes, due to its hydraulic fold-up functions.

MOBICONE MCO 11 PRO cone crusher: Impressive highlights

New KLEEMANN PRO series

When they launched their EVO generation, KLEEMANN introduced crushers for the contractor market which boasted a uniform operating concept, due to coupled plants and, of course, higher productivity and cost-efficiency. The innovative manufacturer of mobile crushers and screens has now gone one step further with introduction of the PRO generation. These machines are designed to meet the requirements of quarry operators and achieve high performance levels. The PRO series stands for new development of all plant components, in other words, for real progress. The first model in the new series is the mobile MOBICONE MCO 11 PRO cone crusher.



The MOBICONE MCO 11 PRO at a glance

- › Feed capacity: up to 470t/h (approx.)
- › Maximum feed size: 250mm
- › Crusher inlet: 1,100mm in diameter
- › Drive concept: diesel-electric
- › Power rating (Stage IIIA/Tier 3): 371kW
- › Transport weight: 48t (approx.)



The key to greater safety

Lock & Turn, the safety system from KLEEMANN, ensures that
MOBIREX EVO2 impact crushers can now be serviced without risk.





When using an impact crusher, the rotor must be easily accessible. Firstly, because the wearing parts are highly stressed and the rotor ledges, in particular, need to be replaced from time to time. Secondly, in the event of material accumulation, it is necessary to work directly on the rotor. In the past, access to the crusher unit was unsecured and involved a risk of accidents due to an uncontrolled start-up of the rotor. In response to this situation, KLEEMANN have introduced Lock & Turn, a safety system for the MOBIREX EVO2 impact crusher which minimizes the risk of such accidents by securely locking the 4t rotor in every position.

Superior safety concept

This system is superior to previous safety precautions, as the rotor can now be turned manually without the machine operator entering the hazard zone. Safety and convenience have improved as a result.

Innovative key transfer system prevents operator errors

The system is based on an innovative key transfer system, a safety mechanism that cannot be bypassed. Mechanical locking devices secure access to the hazard zones represented by the drive belt cover, crusher housing and service panel. In order to access these parts of the crusher, the following sequence of steps must be observed without fail.



1 // In order to secure the rotor, the operator first triggers the command “Lock rotor” on the touch panel for machine control.



2 // This releases the rotor lock & turn mechanism so that it can be moved towards the gear rim of the crusher belt pulley using a crank. The rotor is now securely locked.



3 // An auxiliary tool is then inserted in the system’s release station, thus unlocking the keys to open the hazard zones. When the keys are taken out, the auxiliary tool can no longer be removed. The locking mechanism reliably locks the rotor.



4 // One of the keys secures the crusher housing. It can only be opened by inserting the key. Once the housing is open, the key can no longer be withdrawn. Accumulated material can be removed safely, without a risk of the rotor turning inadvertently.



5 // The safety system also makes for added convenience. The operator can turn the rotor using the crank on the rotor lock & turn mechanism without endangering himself. He can optimally position the rotor for replacing the rotor ledges.



6 // After having replaced the rotor ledges or after removal of accumulated material from the crusher, the operator inserts all keys into the rotor lock & turn mechanism, turns it back to the starting position using the crank and removes the auxiliary tool. The crusher can now be restarted.

The future of mastic asphalt paving

GKL SILENT is an innovative product from BENNINGHOVEN, a mixer so quiet that it can even be run at night.

bauma 2016
Innovation

“The objectives were clear: we wanted to develop, design and manufacture a mastic asphalt mixer with horizontal agitator, direct electric drive, electric tilt function, electric cover for the filler port, electrically heated discharge chute and oil burner technology without any hydraulics.”

Heiko Steidl, Head of
Mastic Asphalt Technology
BENNINGHOVEN

”



Ever tighter requirements apply to mastic asphalt paving, particularly when it comes to occupational safety and noise levels. The GKL SILENT from BENNINGHOVEN is a genuine innovation and far ahead of its time. Equipped with a horizontal agitator and available in versions holding up to 10m³, the GKL (an abbreviation of “Gussasphaltkocher liegend”, the German for “mastic asphalt mixer in horizontal design”) can be installed on lorries, trailer beds or articulated trailers. The design is not its only winning feature; it also complies with all the points required by the Employer’s Liability Insurance Association, such as fall protection as well as ergonomic and ecological aspects.

No louder than a TV at moderate volume

Designed without hydraulic components and using an extremely quiet power generator as a direct, infinitely variable drive for the

agitator shaft, the sound pressure level of the GKL SILENT does not exceed 60dB at a distance of 7m. That is no more than the noise from a TV at moderate volume. As a result, the mixer can even be operated at night and in sensitive areas, such as on inner-city job sites, near hospitals or in residential areas. The mixer consequently spells the end for the dreaded clattering diesel generator so frequently associated with mastic asphalt technology – a field which has so far remained largely untouched by innovation.

Certification requirements are met

Yet the innovation from BENNINGHOVEN is much more than just quiet. With optional extras, such as electric cover for the filler port, central lubrication, electrically heated discharge chute and much more besides, the mastic asphalt mixer represents the height of excellence and is a real boon for its operator. Its highlights

also include a specially developed control cabinet concept. A multifunctional display showing all parameters of relevance to the process has been integrated for the control of the system. A receipt printer or Webfleet technology permits continuous retrieval of the live data. Data can be monitored in real time on the Webfleet Portal or stored and subsequently archived. Mastic asphalt transports are thus fully documented, ensuring compliance with future certification requirements for transport (already in force in Berlin, Germany).

Highlights of the mastic asphalt mixer GKL SILENT from BENNINGHOVEN

- › With the new GKL SILENT developed and patented by BENNINGHOVEN, mastic asphalt work can continue throughout the night.
- › Unwelcome noise is eliminated by the direct electrical drive.
- › The permanent monitoring permitted by innovative Webfleet technology maximizes product quality for the customer and meets future certification requirements (already in force in Berlin, Germany).



It is controlled by ultra-modern electronics.



The GKL SILENT is ideal for homogeneously processing mastic asphalt and ensures optimum mixing during transport.

Asphalt from 90 + X% RAP

The counterflow hot gas generator from BENNINGHOVEN already meets tomorrow's standards.

The efficient and responsible use of resources is an ever more important factor, particularly in road construction. And the importance of using reclaimed asphalt is also on the rise. A reclaimed asphalt content of over 90% is increasingly being targeted. The challenge is to heat the recycling material to the optimum processing temperature of 160°C while keeping emission levels within the standard range and taking care not to burn the bitumen contained in the RAP, particularly as increasingly stringent standards and limit values will apply in the future.

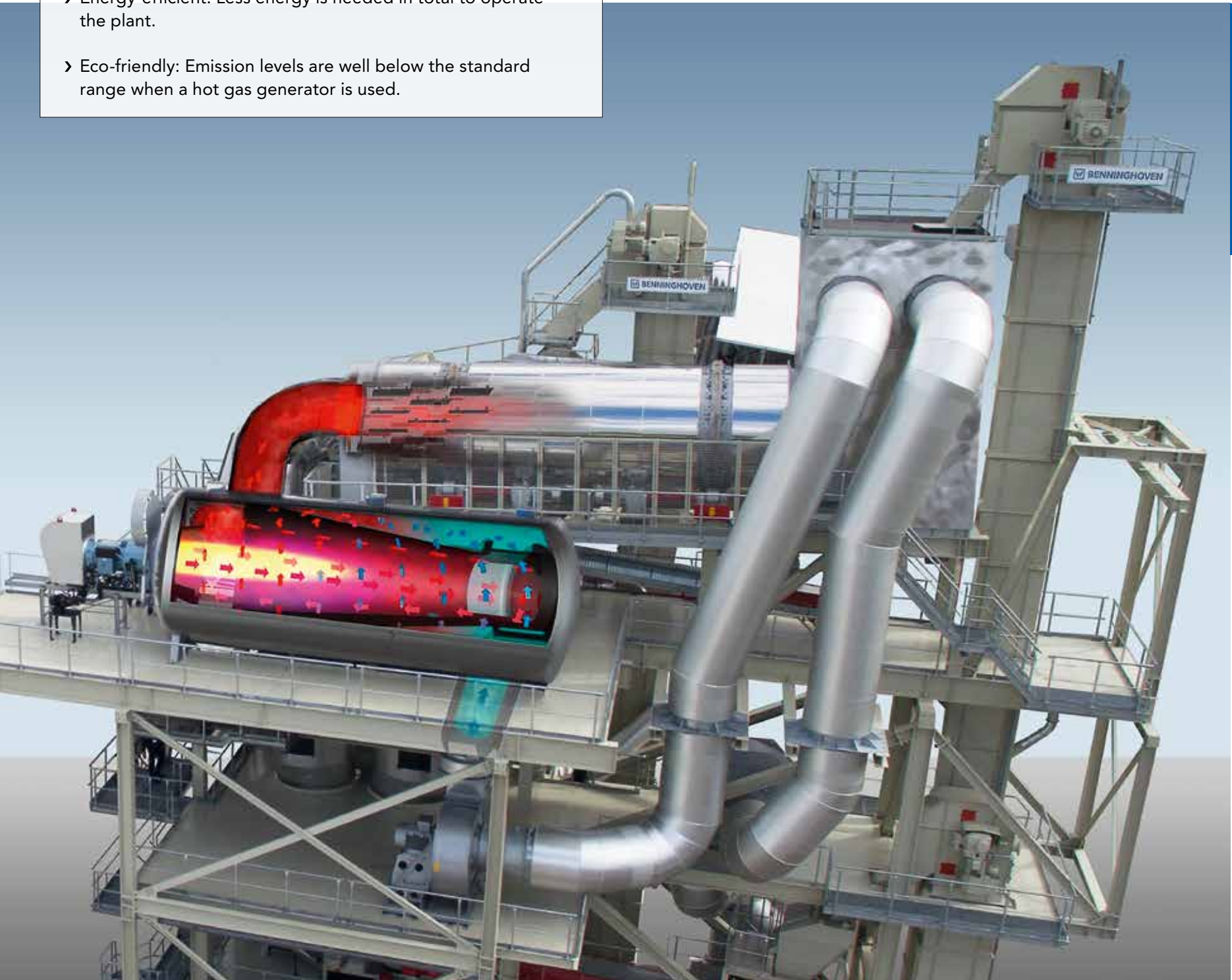
BENNINGHOVEN's answer to these seemingly conflicting objectives is the hot gas generator – an eco-friendly and future-proof solution that represents a safe investment. The recycling material, white mineral for instance, is also heated by an EVO JET burner, but indirectly in a counterflow parallel drum system. Depending on the quality of the RAP used, volumes of more than 90% can even be added.



Highlights of the BENNINGHOVEN hot gas generator

- › Cost-efficient: The volume of recycling material added can be increased considerably – to over 90 + X%, depending on quality. This represents genuine added value.
- › Energy-efficient: Less energy is needed in total to operate the plant.
- › Eco-friendly: Emission levels are well below the standard range when a hot gas generator is used.

The exhaust hood has a very large cross-section, ensuring that the rising exhaust gases flow off very slowly and entrain as few fine particles as possible.



Facts and Figures: Hot gas generator with counterflow parallel drum system

Heating of the recycling material:	160°C
Exhaust gas temperature:	100°C
Temperature of added white mineral:	160°C
Final mix temperature:	160°C
Volume of recycling material added:	90 + X%

Energy-efficient eco-friendly processing of reclaimed asphalt

Unlike the case with classic parallel recycling drums, the indirect heating of the hot gas calls for the use of counterflow parallel drums; with this system, the material flows in opposite direction to the heat source. As a result, the outflow temperature of 160°C corresponds to the processing temperature and the exhaust gas temperature is as low as 100°C, yet still above the dew point. This process offers key advantages to the operators of asphalt mixing plants. In the classic process, which involves adding RAP in a parallel flow, the resultant exhaust gas emissions limit the temperature to 130°C. For physical reasons, however, the exhaust gas temperature is higher, raising energy consumption and increasing the burden on the dust collection system. To obtain a mix temperature of 160°C, the white mineral must be overheated.

The EVO JET burner can be operated with different fuels as usual and delivers the thermal energy needed to dry and heat the recycling materials. The generated hot air is likewise intensively mixed with the circulating air in a counterflow process. Hydrocarbons ("Ctotal") from the circulating air are eliminated almost completely.

The hot gas generator from BENNINGHOVEN is thus an effective contribution to energy efficiency, cost-efficiency and active protection of the environment. ///



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

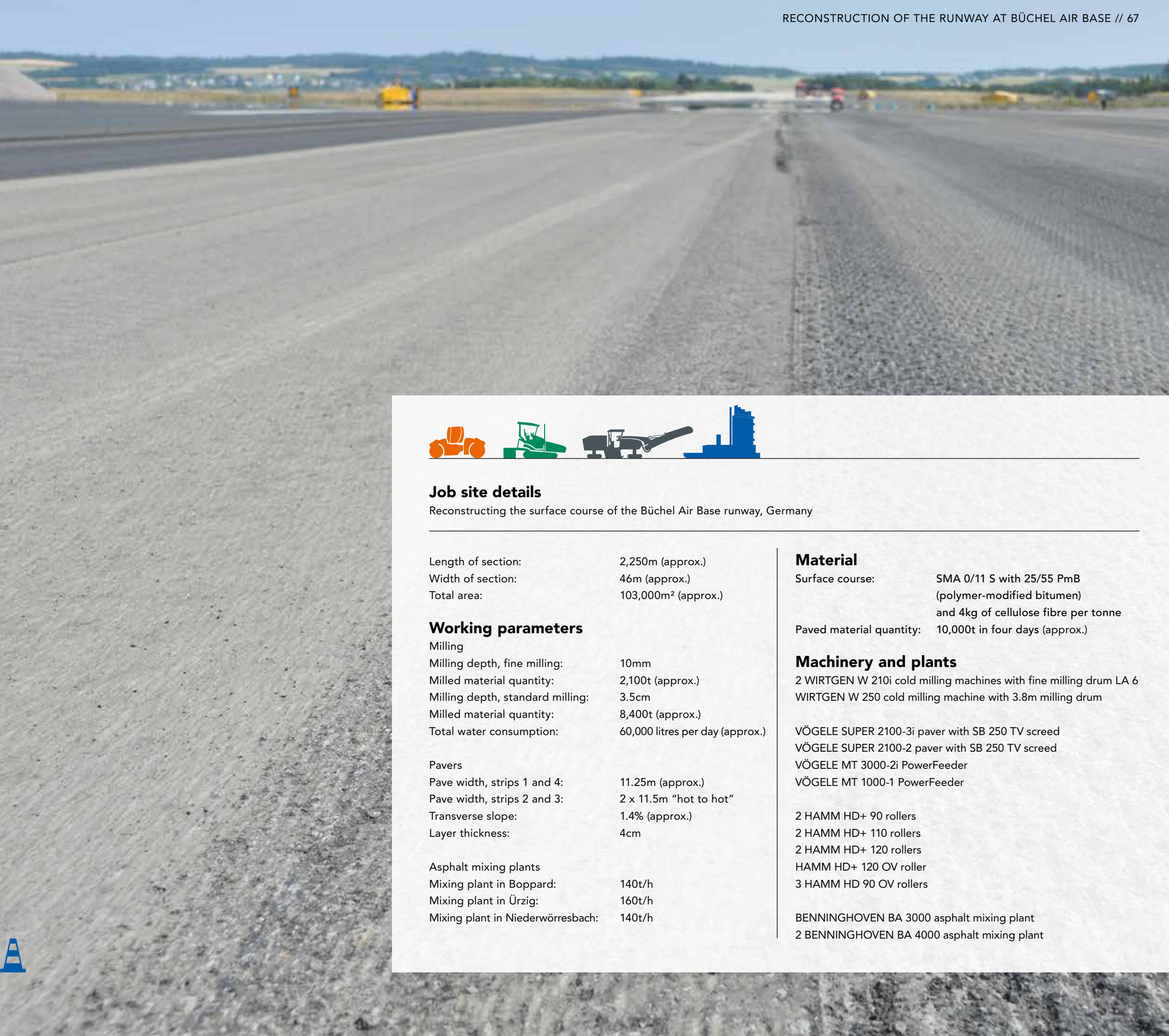
Concentrated power of the WIRTGEN GROUP on the job at Büchel Air Base: Together with asphalt mixing plants from BENNINGHOVEN, machines built by WIRTGEN, VÖGELE and HAMM successfully reconstructed the surface course and handed over a top quality runway right on schedule. The success was based on painstakingly 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:	103,000m² (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 WIRTGEN W 250 cold milling machine with 3.8m milling drum	
VÖGELE SUPER 2100-3i paver with SB 250 TV screed VÖGELE SUPER 2100-2 paver with SB 250 TV screed VÖGELE MT 3000-2i PowerFeeder VÖGELE MT 1000-1 PowerFeeder	
2 HAMM HD+ 90 rollers 2 HAMM HD+ 110 rollers 2 HAMM HD+ 120 rollers HAMM HD+ 120 OV roller 3 HAMM HD 90 OV rollers	
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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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, a MT 3000-2i 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. »»

**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 TV (with tamper and vibrators), TP1 (with tamper and one pressure bar), TP2 (with tamper and two pressure bars) and TVP2 (with tamper, vibrators and two pressure bars)
- › Electric screed heating for screed plates, tamper bar and pressure bar(s)





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.

“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. >>>

Oscillation speeds up the work

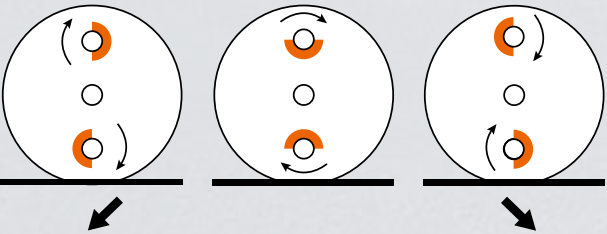
One third of the rollers working on the Büchel project were equipped with oscillating drums. Developed by HAMM, this compaction technology is equally advantageous for compaction work on small areas, bridge decks or in multi-storey car parks, and for large areas, such as motorways or airport runways.

> 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.

> 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.



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**

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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. ///



We've achieved a massive increase in productivity



The New Zealand company Simcox Construction switches to
KLEEMANN crushing and screening technology.





Job site details

Mineral processing at two quarries near Blenheim, New Zealand

Material

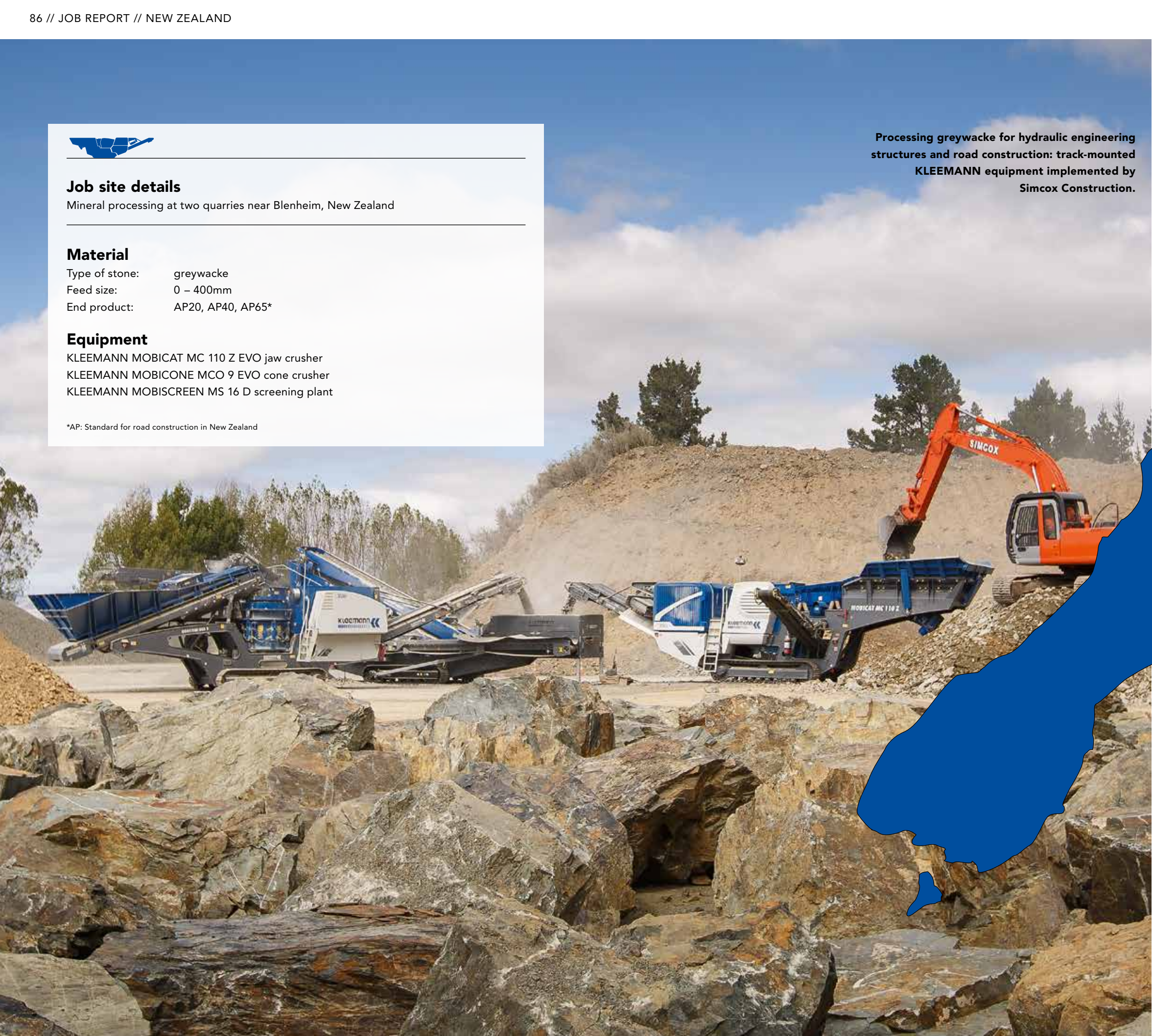
Type of stone: greywacke
Feed size: 0 – 400mm
End product: AP20, AP40, AP65*

Equipment

KLEEMANN MOBICAT MC 110 Z EVO jaw crusher
KLEEMANN MOBICONE MCO 9 EVO cone crusher
KLEEMANN MOBISCREEN MS 16 D screening plant

*AP: Standard for road construction in New Zealand

Processing greywacke for hydraulic engineering structures and road construction: track-mounted KLEEMANN equipment implemented by Simcox Construction.



New Zealand

New Zealand // Blenheim

Two KLEEMANN crushers and a KLEEMANN screening plant have commenced work in the quarries operated by the New Zealand construction contractor Simcox Construction in the Marlborough region located at the top end of the country’s South Island. Those responsible at Simcox were immediately impressed with the “Made in Germany” technology: “Everything is so much faster and there is far less downtime compared to our old machines,” concludes Antony Clark, General Manager at Simcox Construction. >>>



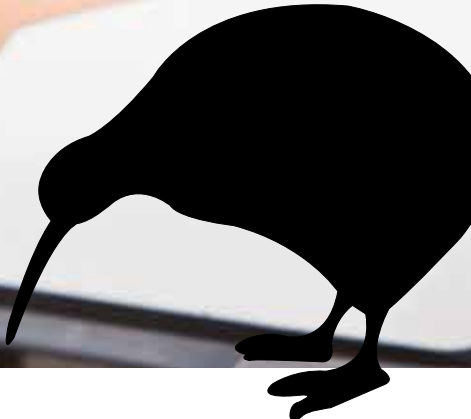
” Thanks to the **KLEEMANN** technologies we can produce a first-class product in next to no time.

Antony Clark, General Manager
Simcox Construction

Processing greywacke for armourstone used in hydraulic engineering structures and for road construction

The three KLEEMANN plants – the MOBICAT MC 110 Z EVO jaw crusher, MOBICONE MCO 9 EVO cone crusher and MOBISCREEN MS 16 D screening plant – are the first of their kind in New Zealand. Simcox produce two different products in the quarry described here. The first are blocks of rock with an edge length of more than 400mm which are used directly in hydraulic engineering. The second is used as base course material in road construction. For this product, the mineral material ranging in size from 0 to 400mm is processed as follows:

- › In the first crushing stage, material ranging from 0 to 400mm in size is fed into the MC 110 Z EVO. Pre-screening takes place using the independent double-deck pre-screen. The pre-screened material is transferred directly to the main discharge conveyor via the bypass.
- › In the next screening stage, the material is conveyed from the MC 110 Z EVO jaw crusher to the MS 16 D screening plant, where material measuring < 20mm is separated by screening and discharged.
- › Material measuring > 20mm is fed into the MCO 9 EVO cone crusher for the next processing stage.
- › In the second crushing stage, the MCO 9 EVO breaks the material down to 0–20mm. It is then returned to the screening plant for further screening in a closed cycle. »»



Outstanding performance from the outset:
The three KLEEMANN plants at work
producing AP20 base course material.



Three KLEEMANN plants
operating in a team

1. MOBICAT MC 110 Z EVO

Versatile mobile jaw crusher of the new EVO generation with a maximum feed capacity of 300t/h and effective pre-screening by independent double-deck pre-screen.

2. MOBISCREEN MS 16 D

Mobile triple-deck screening plant of sturdy design with a feed capacity up to 350t/h. Suitable for feed material with an edge length up to 150mm.

3. MOBICONE MCO 9 EVO

The cone crusher is used as a secondary or tertiary crushing unit. Among the plant's highlights are its excellent linking possibilities with other plants and a feed capacity up to 270t/h.

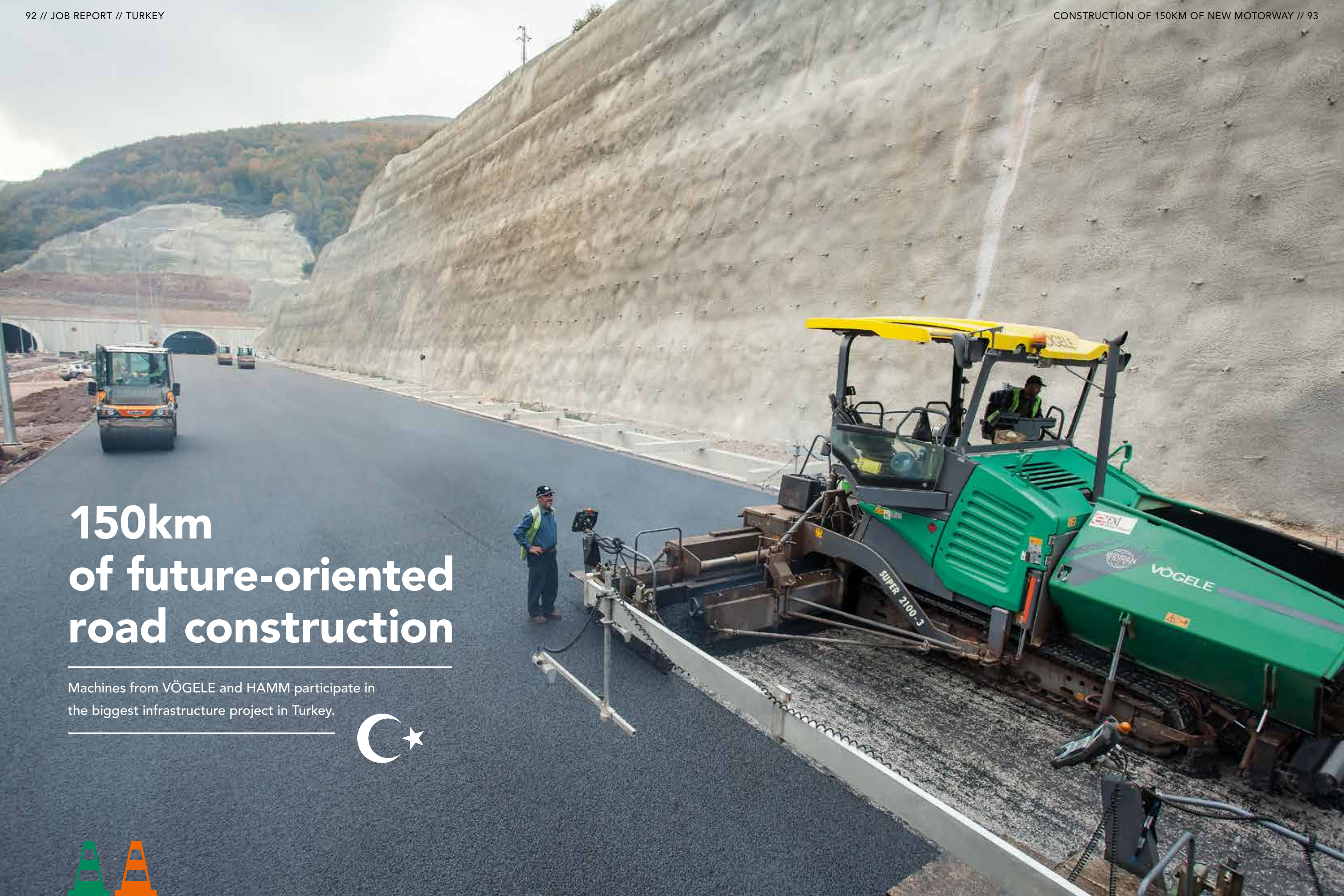
Increased productivity requires a larger excavator
and an additional wheeled loader

Once the decision to invest in KLEEMANN equipment had been made, Simcox wanted the plants to be commissioned as soon as possible. "Gary Payne from WIRTGEN New Zealand put the wheels in motion," says Clark, with the result that the crushing and screening plants were delivered within a few weeks. The general manager was also highly satisfied with commissioning: "Having the first machine on site right on time without disruptions to our schedules was crucial for us – and confirmed we had opted for the right partner." The plants' performance was also impressive: "Our biggest benefits are greater efficiency and increased production." Plant Operator Richard Price agrees: "I've been involved in the quarry industry for over 30 years and I'd never actually seen a KLEEMANN before our machines arrived, but now I am absolutely amazed. In the event of a material accumulation, the plants are all self-regulating. This kind of smart technology is great because it safeguards the plants' operational availability and

prolongs service life." Simcox now manage to process such large quantities that, for material feed, they had to change from a 12t to a 23t excavator in order to fully exploit the plants' capacity. Furthermore, an additional wheeled loader was needed to haul away the end products. Based on this experience it soon became clear that the investment in KLEEMANN equipment pays off. Antony Clark says: "The implementation of these technologies is a big step forward for us." ///

150km of future-oriented road construction

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





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



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



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.

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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.)**

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

Barbaros Yargıç, Branch Sales Manager
WIRTGEN Istanbul

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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. ///

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).





Panoramic road ER 103 from Funchal up the 1,810m-high Pico do Arieiro, the third highest mountain on the Portuguese island of Madeira.