

RoadNews

for new roads

The WIRTGEN GROUP User Magazine // N° 04

 WIRTGEN

 VÖGELE

 HAMM

 KLEEMANN

 BENNINGHOVEN

WIRTGEN GROUP technologies in action at airports around the world:

LEADING
TECHNOLOGY—
PERFECT
GROUND
CONTROL



Contents

06



24



30



48



38





Editorial






// Top Feature

- 04**  Maximum reliability and performance: WIRTGEN GROUP technologies on airport job sites.
- 06**  Working towards a world record in Turkey: Construction of Istanbul Airport for 150 million passengers per year.
- 18**  Modern infrastructure for Georgia: HAMM rollers modernize the airport in Tbilisi.
- 24**  Concrete runways: WIRTGEN slipform pavers take off in Mongolia.

// Technology

- 30**  Product offensive by KLEEMANN: Four new classifying screens in the MOBISCREEN EVO series.
- 38**  New VÖGELE InLine Pave train in the "Dash 3" generation: Innovations boost economic efficiency.

// Job Reports

- 44**  Strictly no beeping: VÖGELE's PaveDock Assistant simplifies the material transfer process.
- 48**  The first BENNINGHOVEN presence in Spain: Commissioning of an ECO asphalt mixing plant.
- 54**  PowerFeeders from VÖGELE: MT 3000-2i Offset shows just what it can do on a motorway job site.
- 58**  Legendary Sachsenring in Germany: Reprofilng of the race track with WIRTGEN cold milling machines.
- 66**  Full width, strong performance: SUPER 1900-3i with SB 250 TV Fixed-Width Screed in action in Dijon, France.

Dear Reader,

Time is money: construction and pavement rehabilitation projects on international airport runways are among the most challenging tasks of all. Every delay, every drop in performance has an immediate impact on countless processes, associated works and other parties involved in the project. This is why we are so proud of the fact that technologies from the entire WIRTGEN GROUP so frequently play the leading role in airport construction and runway rehabilitation projects all over the world. The top feature of this edition of RoadNews highlights the many reasons behind this, reporting on a number of different job sites.

Prized for their reliability and high performance capabilities, our technologies also stand for innovation and precision. And rightly so, as a job report from the German Sachsenring race track demonstrates. This project not only involved rehabilitating the surfacing, but reprofiling the track, too.

And we have an announcement to make: KLEEMANN have launched 4 new classifying screens in the MOBISCREEN EVO series, demonstrating their immense innovative capacity. Optimally tailored to crushers in the EVO series, the track mounted double and triple-deck screens boost economic efficiency in quarry operations.

Best wishes from
Your RoadNews Team

PUBLISHING DETAILS

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THE DRIVING FORCE AT AIRPORTS AROUND THE WORLD

Focus on airports:

WIRTGEN GROUP machines and plants play a leading role in the construction and rehabilitation of airports all over the world.

Working to tight deadlines, meeting extremely high demands on quality, producing and paving challenging materials: on airport construction sites all around the world, clients brook no compromises. And for good reason: the better the construction of traffic areas such as runways, the less frequently they need to be rehabilitated. Rehabilitation jobs, in particular, present airport operators with major challenges, since they need to minimize any restrictions on air traffic. It is hence vital for construction companies to plan the logistics in minute detail and to put their trust in reliable and first-class technologies: in machines and plants from the entire WIRTGEN GROUP. Technologies from the WIRTGEN GROUP are also involved in the construction of the biggest airport in the world - the "New Istanbul Airport". RoadNews reports on this on the following pages and will also feature other construction measures at international airports.

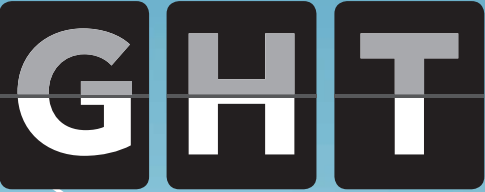




PROGRESS TAKES FLI

The power of the WIRTGEN GROUP is driving the construction of the biggest airport in the world: plants and machines from WIRTGEN, VÖGELE, HAMM and BENNINGHOVEN are playing a vital part in the construction of the "New Istanbul Airport".





Turkey // Istanbul

After just three years of construction, the world's biggest airport (measured by passenger numbers) is set to go into operation in 2018, initially with two runways, expanding to three by 2019 and, by the end of the project in 2028, to six. The İstanbul Yeni Havalimanı, to give the "New Istanbul Airport" its official name, is also the biggest infrastructure project in the history of Turkey. As so often on airport job sites, WIRTGEN GROUP technologies are on the radar. That is also the case with the developer İGA, a consortium of the five leading Turkish contractors Cengiz, MAPA, Limak, Kolin and Kalyon. The construction companies have opted for a WIRTGEN GROUP fleet comprising over 50 machines and plants. To be precise, BENNINGHOVEN asphalt mixing plants, VÖGELE road pavers as well as HAMM compactors and tandem rollers for soil and asphalt compaction will be responsible for getting the job site set for take-off. WIRTGEN slipform pavers will be used to build a number of concrete taxiways. >>>





Job site details

Construction of the "New Istanbul Airport", Turkey

Project parameters

Size of section: 9,000ha
Runways: 1 + 2 completed by 2018
(3,750m + 4,100m long, 75m wide)
3 completed by 2019
(3,750m long, 75m wide);
total of 6 completed by 2028
Terminals: 3
Passenger volume: 150-200 million passengers/year
Freight volume: around 6 million t



150
MILLION

Equipment

Earthworks:

- 10 HAMM 3516 compactors

Asphalt paving:

- 2 BENNINGHOVEN

TBA asphalt mixing plants
(1 TBA 3000, 1 TBA 4000)

- 4 BENNINGHOVEN

ECO asphalt mixing plants
(2 ECO 3000, 2 ECO 4000)

- 3 VÖGELE SUPER 2100-3 pavers

with SB 250 TV Fixed-Width Screed

- 3 VÖGELE SUPER 2100-2 pavers

with SB 250 TV Fixed-Width Screed

- 6 VÖGELE SUPER 1900-2 pavers

with AB 600 TV Extending Screed

- 9 HAMM HD+ 140 VV rollers

- 8 HAMM HD 110 rollers

- 1 HAMM HD 13 VT roller

- 2 HAMM HD 14 VV rollers

- 1 HAMM GRW 280-10 roller

- 4 HAMM GRW 15 rollers

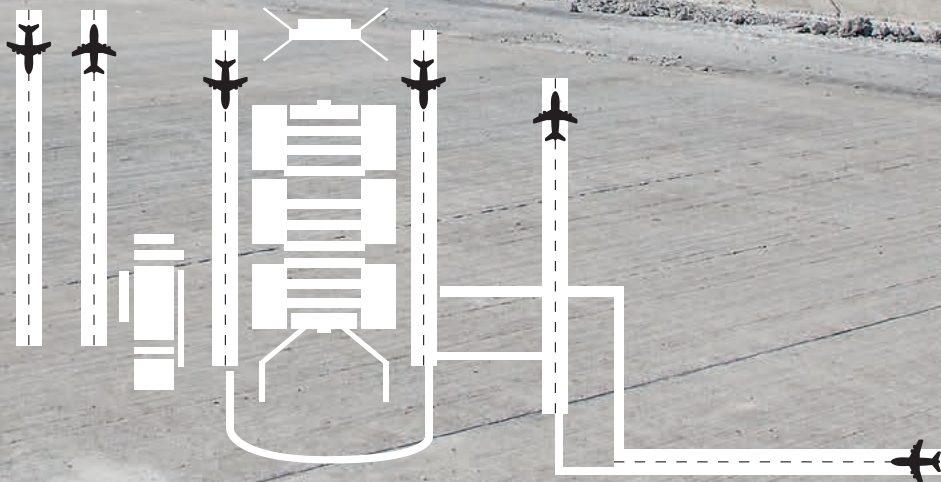
Concrete paving:

- 3 WIRTGEN SP 500 slipform pavers
with dowel bar inserters.

- 2 WIRTGEN TCM 95

texture curing machines

- 1 WIRTGEN SP 25 slipform paver



The "New Istanbul Airport" is designed for 150-200 million passengers per year. This will set a new world record. The new-build project comprises six runways on an area of around 9,000ha. The number 1 airport to date is Hartsfield-Jackson Atlanta International Airport (USA), with around 105 million passengers per year.



HAMM compactors lay the perfect foundations

The earthworks for the new airport were a major project in themselves. On this 9,000ha site, the challenge was to create a base with a high load-bearing capacity. But, with their operating weight of 16t, the 10 HAMM 3516 compactors which took on the job were more than up to the task. The unbound layers of gravel and crushed stone were compacted with ease by the Series 3000 machines. They offer a winning combination of high centrifugal force and static linear load. Strip by strip, the machines compacted the layers of material which had been

placed by lorries (dumping height 30-40cm) and spread by graders – laying the basis for an infrastructure that scores high on superlatives. A key advantage of HAMM technology for earthworks is the 3-point articulation developed by HAMM. It provides for outstanding all-terrain mobility, supporting safe manoeuvring even on rough ground. It also offers excellent driving comfort, since jolts are effectively dampened. >>>

A team with a high compacting power:
HAMM rollers tackle the toughest jobs,
whether they are used for earthworks
or - as in the photo - for compacting the
water-bound base.



”

My first WIRTGEN GROUP machine was a VÖGELE SUPER 1800 - that was 20 years ago now. Today, we also have WIRTGEN cold milling machines, HAMM rollers and BENNINGHOVEN asphalt mixing plants - that's over 100 machines and plants in total.

Veysi Koloğlu, Board Member
Kolin İnşaat construction company, a contractor in the İGA consortium

”

BENNINGHOVEN ECO highlights:

- › Transportable asphalt mixing plant in a container design
- › Can be set up quickly
- › Intelligent modular system
- › Easy transport
- › Compact plant
- › Low logistics costs
- › Mixing capacities from 100t/h (ECO 1250) to 320t/h (ECO 4000)





Six BENNINGHOVEN asphalt mixing plants form the backbone of the job site

A glimpse at the fleet of vehicles highlights the massive scale of the airport project: over 3,000 modern lorries are in use – many of them to transport material. The high-quality asphalt mix for the runway construction is being produced by 6 BENNINGHOVEN mixing plants, one each of the types TBA 3000 and TBA 4000 and two each of types ECO 3000 and ECO 4000, with mixing capacities of 240t/h and 320t/h. This corresponds to up to 1680t per hour, depending on the type of asphalt to be produced. The mix for the surface course consists of a stone mastic asphalt with polymer-modified bitumen. The material is used for surfaces which are subjected to heavy stresses and consists of a mix with a high proportion of aggregate, polymer-modified bitumen and stabilizing additives for the bitumen. The composition is balanced so as to ensure lasting resistance to deformation, producing surface courses which are robust, safe for traffic and have a long service life. All BENNINGHOVEN plants can handle such challenging production processes – including the transportable asphalt mixing plant (TBA) or the plant in container design, ECO for short.

“A big box of wonders”: ECO creates flexibility

The BENNINGHOVEN ECO plant is a particularly suitable choice when asphalt mixing plants are required on temporary sites, as in Istanbul. It combines cutting-edge BENNINGHOVEN technologies with a high standard of production, all within compact containers, guaranteeing maximum mobility and flexibility. ECO plants can be operated as stationary units, but can also handle rapid changes of location without difficulty. Since all main components are designed in ISO standard container dimensions (20 or 40 feet), they are also easy to transport by lorry, ship or rail. Meanwhile, these high-performing plants with fixed options guarantee optimum mix quality. Another winning feature of the ECO model – as with all BENNINGHOVEN plants – is the maintenance-friendly, high-quality and long-lived components. >>>



VÖGELE pavers in formation flight

A total of 12 VÖGELE pavers are in operation, laying asphalt for the runways and a number of taxiways. In addition to the latest “Dash 3” generation of SUPER pavers (3 SUPER 2100-3), some of the paving teams are also working with predecessor models (3 SUPER 2100-2 and 6 SUPER 1900-2). These pavers have already completed many thousands of operating hours and are proof of the great longevity and reliability of VÖGELE technology. The machines are constructing the first three of a total of six runways – comprising a 29cm base course, a 12cm binder course and a 4cm surface course.

Asphalt paving over an area of 2.2 million m²

The fleet of 12 VÖGELE pavers is equipped with extending or fixed-width screeds of types AB 600 TV or SB 250 TV. The AB 600 Extending Screeds have a basic width of 3m and can pave at widths of up to 9.5m when fitted with bolt-on extensions. On the airport job site, the SUPER 1900-2 Highway Class pavers operate with the AB 600 TV Extending Screed at a width of 7.5m. The SUPER 2100-2 and SUPER 2100-3 pavers are also in the Highway Class and are combined with SB 250 TV Fixed-Width Screeds. Their basic width is 2.5m, but this can be extended to 13m using fixed and hydraulic bolt-on extensions. On the job site, the pave width is 12m. In this configuration, the tracked pavers work “hot to hot”, consistently meeting the high demands on both quality and productivity as they pave the 3,750m or 4,100m-long and 75m-wide runways and a number of taxiways – a total area of 2.2 million m².



HAMM tandem rollers compact the runways

A total of around 20 HAMM Series HD+ and HD tandem rollers are being used to compact the vast asphalt surfaces. They ensure rapid compaction and large area coverage thanks to the large drums. The kneading effect of the GRW 280-10 and GRW 15 rubber-wheeled rollers guarantees good surface sealing. With so many HAMM rollers in action, the runways are positively bustling with vehicles. In these circumstances, visibility is a key factor for efficient working and the avoidance of accidents. To that end, HAMM rollers have excellent all-round visibility thanks to a large operator's platform or the large, all-round glazed panoramic cabin that allows a clear view of the working area directly around the roller and the surrounding area on the job site. This visibility ensures the quality of the compacting work and a high level of safety. >>>



Teamwork increases quality:
the entire fleet of 12 SUPER pavers is
working "hot to hot". This means the
joints are significantly better protected
against water penetration and can
withstand stresses for longer.



The taxiways in the apron area are being paved in concrete. Three WIRTGEN slipform pavers ensure that the surfaces can handle the high concentrated loads from waiting aircraft.

WIRTGEN slipform pavers building concrete taxiways

When it comes to building concrete taxiways, the iGA consortium similarly brooks no compromises, electing to use machines from WIRTGEN, the market leader in slipform pavers. Initially, two SP 500 models with dowel bar inserters, one SP 25 and one TCM 95 texture curing machine were used for the concrete paving work. They are paving taxiways with a depth of 40cm and a width of 2-6m. However, the technology was such a sensation on site that the customer ordered a further "machine set" comprising an SP 500 – one of the last concrete pavers of this type manufactured – and a TCM 95 from the WIRTGEN brand headquarters in Windhagen (Germany). The SP 500 – which has been a genuine WIRTGEN triumph – is being replaced by the new SP 60 series. The slipform pavers in this series are proven masters in inset and offset applications and can be equipped with a range of options, including a dowel bar

inserter. This is the case for the three SP 500 machines in Istanbul. They insert dowel bars at spacings of 38-50cm, thus ensuring the correct height of adjacent slabs.

TCM 95 texture curing machine for optimum texture of the concrete surfacing

The WIRTGEN TCM 95 is the ideal co-pilot to accompany the SP 500 mid-range concrete paver or the new SP 60 and even the SP 90 series. The texture curing machine is equipped with an automatic spraying and brooming system. Once the surface has been broomed to the desired texture, the spraying unit applies dispersion to the fresh concrete surfacing to retard the evaporation of curing moisture, preventing stresses and the cracks this can cause. The TCM 95 is equipped with four wheeled chassis and covers working widths of up to 9.5m. ///



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**We use only WIRTGEN GROUP
original spare parts.
The quality and rapid availability
via the WIRTGEN GROUP
sales and service company
WIRTGEN Ankara are unbeatable.**

**Veysi Koloğlu, Board Member
Kolin İnşaat construction company,
a contractor in the İGA consortium**

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READY FOR TAKE OFF

WIRTGEN GROUP machines and perfect planning combine to get the runway at Tbilisi Airport in shape for the next decade.

An airport in night mode

The biggest and most important airport in Georgia is located in Tbilisi. Its passenger numbers have been rising for many years, with more than 1.8 million travellers passing through in 2015. Its unusual hours of operation – from 6 pm to 7 am – are designed to optimize aircraft utilization: airlines from Europe, the Middle East and the former Soviet republics leave their own countries in the late evening and land in Tbilisi during the night. In the early morning they then fly back from the Caucasus to their home regions.

Georgia // Tbilisi

The runway at Tbilisi Airport was extensively rehabilitated in the early summer of 2016. The project was the first major step in the modernization of the entire airport with the aim of enabling even large aircraft such as the Airbus A340 to land in the Georgian capital. Machines from the WIRTGEN GROUP played a key part in the proceedings. They were used by the professional and highly motivated team from the Georgian company Black Sea Group LLC to lay a total of 135,000t of asphalt on a 22-year-old concrete runway without any interruption to flight operations. >>>

IN

THE CAUCASUS





Modern machine fleet

Georgia, a country with a rich history and breathtaking natural scenery, is enjoying increasing popularity among tourists and business people. The airport operator is responding to this positive trend by expanding capacities. It awarded the contract to rehabilitate the runway to the Georgian company Black Sea Group LLC (BSG) - the biggest construction enterprise in the country with some 500 employees. BSG have been relying on machines from the WIRTGEN GROUP for years and set great store by modern technology, as Managing Director Amiran Mamutchadze explains: "We consistently replace construction machinery that is more than 5 years old with new equipment. I see it time and again: no one else has such high-quality technology as the WIRTGEN GROUP."

Rehabilitation by day, flight operations by night

There was never any question of closing the airport for the asphalt paving work. Instead, asphalt was laid over a precisely 100m-long section every day - from 8 am to 6 pm. That was possible because in Tbilisi the aircraft only take off and land at night. To ensure that flight operations could begin punctually, the team from BSG made meticulous preparations for the asphalt paving work, selecting the number of machines so as to ensure the maximum utilization of each. The crucial factor in all this is, of course, the reliability of the machines. With this in mind, only models from HAMM and VÖGELE were used to pave the asphalt on the runway in Tbilisi: HD+ 110, HD+ 120, HD 70 tandem rollers, GRW 280 rubber-wheeled rollers and SUPER 1900-3 and SUPER 1800-3 pavers. These were supplemented by two WIRTGEN milling machines to produce the tie-ins. The mixes were produced by an MBA 3000 asphalt mixing plant from BENNINGHOVEN. >>>

No one offers
such high-quality
technology as the
WIRTGEN GROUP.

Amiran Mamut Chadze, Managing Director
Black Sea Group LLC



Job site details

Rehabilitation of the runway at Tbilisi Airport, Georgia

Length of runway: 3,100m
Width of runway: 60m
Rehabilitated area: 135,000m²

Material

Level regulating layer: AC 32 TS
Reinforcement: asphalt reinforcement for stress absorption
Binder course: AC 16 BS
Surface course: AC 11 DS with polymer-modified bitumen

Equipment

- 1 WIRTGEN W 2100 DC milling machine
- 1 WIRTGEN W 35 DC milling machine
- 1 BENNINGHOVEN MBA 3000 asphalt mixing plant
- 1 VÖGELE SUPER 1900-3 paver with AB 600 TV Extending Screed
- 1 VÖGELE SUPER 1800-3 paver with AB 600 TV Extending Screed
- 1 VÖGELE SUPER 1600-3 paver with AB 500 TV Extending Screed
- 3 HAMM GRW 280 rubber-wheeled rollers
- 3 HAMM HD+ 120 VO tandem rollers
- 3 HAMM HD+ 110 VO tandem rollers
- 3 HAMM HD 70 tandem rollers





The rollers followed an exact rolling pattern, so that by the end of every shift, every point had been passed over 18-21 times.

Pave widths	Sequence of strips	Slope
7.2m	Strip 4	2.5%
7.3m	Strip 1	1.5%
7.5m	Strip 2	1.1%
8m	Strip 3	1.1%
8m	Strip 3	1.1%
7.5m	Strip 2	1.1%
7.3m	Strip 1	1.5%
7.2m	Strip 4	2.5%
100m		

Modern paving scheme

Paver 1

Paver 2

For construction of the level regulating layer, 100m of wire was tensioned each day. The wire defined the grade of the new runway. Then two pavers working in parallel laid the asphalt in a total of 8 strips across widths between 7.2 and 8m with a slope of 1.1 to 2.5%. The process was timed so that the two central - and hence most important - strips were paved “hot to hot” along the entire length.

The paving time for 100m came to just around 20-25 minutes per asphalt layer and strip. Once the 2 x 4 strips had been paved, including reversing of the paver over an adjacent strip, profile adjustment, repositioning and compaction, there was still sufficient time for cooling before flight operations resumed.

With 2 pavers, the asphalt was placed in such a way that each strip was adjacent to a warm or hot strip, resulting in an asphalt surface virtually without longitudinal joints over a width of 45m.



Deputy Prime Minister and Economics Minister Dimitri Kumsiashvili visited the job site during the construction work, underlining the project's importance to the country.

Superbly organized use of the HAMM rollers

The preparations for compaction were planned down to the last detail. The site managers developed a rolling pattern, for instance, to ensure optimum compaction of the three asphalt courses – while taking compaction technology, weight and drum width into account. For the initial compaction of the asphalt concrete used for the levelling course and binder course, BSG put a rubber-wheeled roller to work behind every paver. It was a different story for the surface course with modified bitumen. “It holds up against the very dynamic loads of the aircraft as they land for longer than standard mixes,” explains Laboratory Manager Dito Dekanosidze. “However, the material cannot withstand the kneading effect of the rubber-wheeled roller, so when compacting the surface course we also deployed HAMM tandem rollers immediately after the paver,” adds Site Manager Teimuraz Patashuri.

Main compaction with oscillation and vibration

The main compaction work on all layers was carried out by a mid-weight tandem roller with vibration of type HD 70, followed by an 11t HD+ 110 tandem roller with oscillation. Final compaction across the joint to the next strip was performed by a 13t HD+ 120 tandem roller – initially with oscillation and then statically on the last few passes to smoothen the asphalt surfacing.

Training as preparation

To ensure that everything in the time-critical project ran smoothly, one of the measures organized in the run-up by David Mkheidze, Head of Sales at WIRTGEN International in Georgia, was a training course for the roller operators. This covered operation and the optimum set-up of all rolling parameters, as well as the all-important daily care and maintenance of the machines. After all, well-maintained HAMM rollers will continue to give reliable service and deliver the required performance for many years to come.

10 out of 10 for service

That is just what the rollers achieved in Tbilisi – very much to the delight of Site Manager Teimuraz Patashuri. He knows that maintenance and servicing play a major role and describes his experience like this: “The WIRTGEN GROUP subsidiary here in Georgia has all the standard spare and wearing parts in stock. Any parts that are seldom needed can be flown in very quickly from Germany if and when required. If I had to award points, the service would get 10 out of 10 from me.” ///

EXTREME CONCRETE PAVING

Because of the dry desert winds, the work can only be carried out at night - and only for three to four months in the summer: the largest WIRTGEN slipform paver, the SP 1600, and the flexible SP 500 bring all their skills into play when paving concrete at the New Ulaanbaatar International Airport.



Georgia

Tbilisi

The WIRTGEN SP 1600 was usually in operation from 7 pm to 6 am. During the day, the intensive sunlight and strong winds would have dried out the concrete pavement too quickly.



“

Dual-layer concrete paving with one machine saves time and money. That's why we opted for the SP 1600 - a machine we've had great experiences with in the past.

**Seunghwan Lee, Commercial Manager
Sungdo Construction**

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Mongolia // Ulaanbaatar

Ulaanbaatar is the hub for the booming economy and centre of expansion for trade and industry in Mongolia. The country is also the world's second largest landlocked country and depends on efficient aircraft traffic bringing in and taking out passengers and cargo. Built in 1956, Chinggis Khaan International Airport was therefore in need of an upgrade and expansion of the airport capacity was absolutely essential. "The current airport faced safety, usability and operation deficiencies," concludes Project Manager Enkhbat Navaantseden. In response to this situation, the new airport was set up in the Khushigiin Khundii valley of the province of Tuv, only 52km away from Ulaanbaatar. The New Ulaanbaatar International Airport (NUBIA) is located on an easily accessible elevated plain with no mountains. The air corridor is hence relatively short and does not pass through any populated areas. >>>

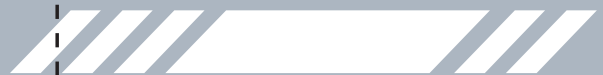




Job site details

Construction of the new airport for Ulaanbaatar, Mongolia

Length of runway:	3,600m
Width of runway:	45m
Taxiways:	50,000m ²
Aprons:	7,500m ²
Total material costs	
Concrete paving:	US\$ 20 million



Working parameters

Pave width:	11.25m (SP 1600)
	5.625m (SP 500)
Layer thickness:	38cm in two layers
	SP 1600

Equipment

WIRTGEN SP 1600 slipform paver
WIRTGEN SP 500 slipform paver

Built to withstand extreme climatic conditions and larger aircraft

NUBIA was designed with a robust 3,600m-long category-4E runway, which is to be constructed from concrete. As a result, the runway can withstand the harsh conditions of the extreme continental climate. Furthermore, it will be able to handle large aircraft such as the Boeing 747 or the Airbus A340. The new location, advanced design and technical installations will help to improve the safety and the potential of the airport facility. NUBIA has been designed to take 3 million passengers a year, three times more than Chhngis Khaan International Airport, and it will even be able to handle ten times more cargo. The contract for the entire construction work was awarded to Samsung C&T. Sungdo Construction, a long-standing WIRTGEN customer based in South Korea, was selected as the subcontractor for the concrete paving work.

High-performance concrete paving operation with the utmost precision

The SP 1600 is the flagship among the large WIRTGEN slipform pavers. Driven by a powerful 313kW diesel engine, the inset paver builds high-quality concrete pavements in widths up to 16m and thicknesses up to 45cm. Equipped with a second complete concrete paving kit, the SP 1600 was able to pave the dual-layer concrete slabs highly economically in a single pass. The 45m-wide and 3,600m-long runway was built in segments with a pave width of 11.25m and a layer thickness of 38cm on average. The paving work was carried out in a single operation. The first 27cm-thick cement concrete layer was immediately followed by a second, 11cm-thick layer. Known as "wet-in-wet", this paving process achieves a strong bond between the top-layer and the bottom-layer concrete. Wire bar fabric was placed between the layers for additional reinforcement before 48 electric vibrators emitting high-frequency vibrations optimally compacted the material. The finishing beam and super smoother which are integrated in the SP 1600 ensured that the specified functional properties were achieved.



11.25m

11cm top-layer concrete

27cm bottom-layer concrete

Flexible in every application

Meanwhile, the SP 500 was highly suitable for paving the slightly curved aprons and some taxiway sections – the connecting links between runways and aprons. Like its successor in the new SP 60 series, this machine excels with its wide range of applications in inset and offset paving. Up to five adjoining, parallel slabs can be paved with this easily manoeuvrable machine. As a result, concrete was swiftly paved on 50,000m² of taxiways and 7,500m² of aprons. ///

Services of the WIRTGEN GROUP

Technical support

- › Workshop service
- › On-site service

Spare parts

- › Original parts
- › "Parts and More" catalogue

Know-how

- › Training
- › Applications consulting
- › WIDOS information system

Service agreements

- › SmartService
- › WITOS® FleetView telematics solution



The EVO

Product campaign from KLEEMANN with the new
MOBISCREEN EVO screens.



They classify crushed natural stone as well as a wide variety of recycling materials, and they enhance the quality of the end products: classifying screens play an indispensable role in the production of mixes of all kinds. With their new MOBISCREEN EVO generation, KLEEMANN are launching innovative screens on the market whose high performance, flexible applications and ease of transport take efficiency to the next level. >>>

lution continues



The MOBISCREEN EVO screening plants boast a wide field of applications and come as double or triple-deck classifying screens with screen surfaces of 7m² or 9.5m².



MOBISCREEN EVO for flexible applications

In total, KLEEMANN are expanding the EVO series by 4 classifying screens: 2 double-deck classifying screens, the MS 702 EVO (with a screen surface of 7m² in the upper deck) and MS 952 EVO (9.5m²), as well as 2 triple-deck classifying screens, the MS 703 EVO (7m²) and the MS 953 EVO (9.5m²). All four are mounted on crawlers. Like the crushing plants of the EVO series, the classifying screens meet the needs of contractors thanks to their compact transport dimensions and short set-up times.

Sophisticated material flow for high performance

The MS 702 EVO and MS 703 EVO achieve a maximum output of 350t/h, the MS 952 EVO and MS 953 EVO an hourly output of up to 500t. This high performance is largely attributed to the well organized flow of material through the plant. It begins with loading: thanks to the large feed hopper, MS EVO screens can be supplied with material both by wheel loaders and by an upstream crushing plant. This material is transported to the screen case on an extra-wide, 1,200mm feeding conveyor. To allow the screening plant to be adapted flexibly to a variety of applications, the screen angle can be adjusted as required, ensuring high quality and output. An impact plate at the discharge point of the feeding conveyor distributes the material evenly over the screen media, resulting in less wear and a high throughput.

Outstanding safety standards and high operating comfort

KLEEMANN have established excellent safety standards for the EVO screening plants. The screening plant is operated by means of a mobile control panel that can be attached to the plant at three different points, ensuring the best possible visibility of the plant functions being executed. The control panel also displays data on the operation of the machine. If the MS EVO screening plants are being operated in combination with other EVO crushing plants, all of them can be switched off at once in the event of a hazardous situation via the emergency stop function. The lowering brake stop valves on all discharge conveyors further enhance safety, keeping the conveyors in position if the hydraulic system fails. >>>



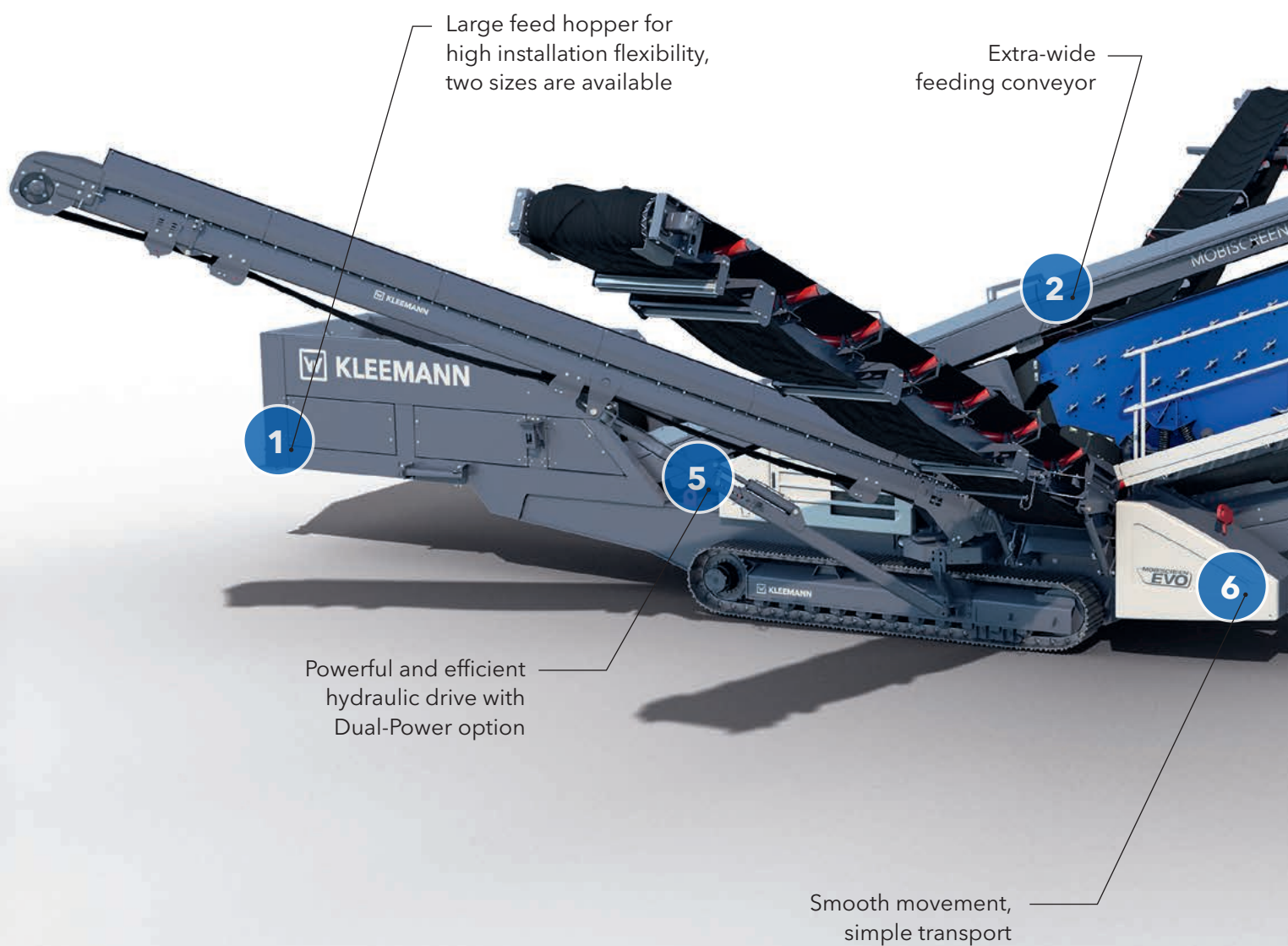
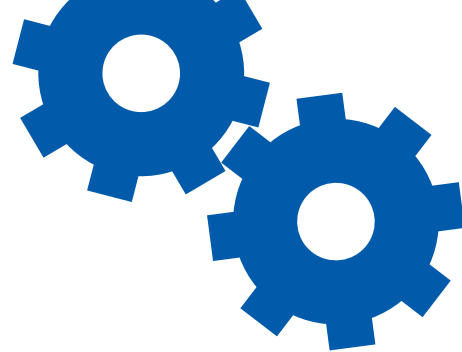
The MS EVO screening plants from KLEEMANN take efficiency to the next level.

Kirpal Singh Sian,
Product Manager
KLEEMANN



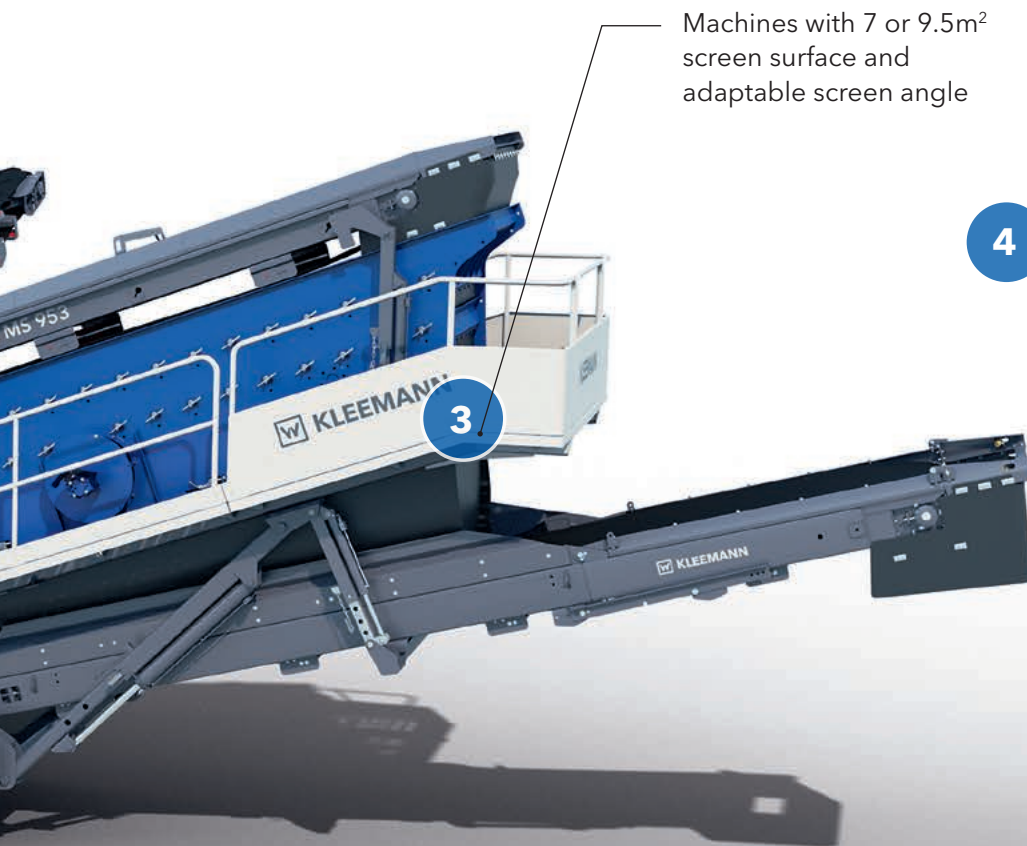
A team player: the screens operate particularly efficiently when linked with crushers of the EVO series that are configured in size and output to the MS EVO screens.

Highlights of the MOBISCREEN EVO classifying screens



Service and maintenance: Easy screen media changes

The issue of maintenance is particularly important in plants that often have to handle thousands of tonnes of rock in one shift. With the MOBISCREEN EVO screens, the capacious engine compartment makes inspection much simpler. Other service elements can be reached quickly and easily via the all-round work platform with handrails. The easy access to the screen decks also makes it simpler for the user to change the screen media. The fine grain conveyor, for instance, can be lowered in order to enable access to the lower screen media. KLEEMANN also offer a wide array of screen media and are certain to have the right one for every application.



Machines with 7 or 9.5m²
screen surface and
adaptable screen angle

4

Easy-to-use control system
via mobile control panel

Technical data for MOBISCREEN EVO plants

	MS 702 EVO	MS 703 EVO	MS 952 EVO	MS 953 EVO
Type	vibrating classifying screen	vibrating classifying screen	vibrating classifying screen	vibrating classifying screen
Screen decks	2	3	2	3
Screen surface (upper deck)	1,550 x 4,500mm	1,550 x 4,500mm	1,550 x 6,100mm	1,550 x 6,100mm
Feed capacity up to approx.	350t/h	350t/h	500t/h	500t/h

Ready to deliver a top performance: MS 703 EVO at work on an irrigation project

The new MOBISCREEN EVO screening plants work particularly efficiently in combination, making a significant contribution to the productivity and cost-effectiveness of construction projects. The screening plants currently located near Hyderabad in India are furnishing clear proof of this. Here, mining specialist BGR Mining & Infra Pvt. Ltd. have invested in 4 sets of crushers and screens from KLEEMANN - the MOBICAT MC 110 Z EVO jaw crusher, the MOBICONE MCO 9 EVO cone crusher and new mobile triple-deck screening plants of type MS 703 EVO. One of the main attributes that prompted BGR Mining & Infra Pvt. Ltd. to opt for KLEEMANN was the high flexibility of their mobile plants. With a few adjustments to settings, the MC 110 Z EVO can also work alone.

The Palamura Ranga Reddy Lift Irrigation (PRLIS) project is an irrigation scheme that aims to supply water to a 404,685ha area in the Mahabubnagar, Ranga Reddy and Nalgonda districts. BGR were awarded the contract to build the Venkatadri Reservoir in Vattam. It will have a capacity of 464.24 million m³. To construct the dam, BGR need approx. 3 million tonnes of crushed granite sand with a grain size of 0-6mm and up to 2 million tonnes of granite with a grain size of 0-80mm.

The combination of 3 KLEEMANN plants - including the new MS 703 EVO classifying screen - processes granite for the construction of a water reservoir in Vattam.



200t/h of end product in two grain sizes

The 4 linked KLEEMANN plants prepare the construction material, beginning with the MC 110 Z EVO jaw crusher. The feed size of the granite rock can be as much as 600mm. In the first crushing stage, the granite is crushed down to 0-160mm before being fed into the MCO 9 EVO. The cone crusher produces a grain size of 0-45mm that is classified into two exact end products by the MS 703 EVO. The oversize grain is returned to the MCO 9 EVO. This enables the plants to supply up to 50t/h of end product in the grain size 0-6mm and up to 150t/h in the grain size 6-45mm. ///



Crushing and screening plants of the EVO series: Leading technology from KLEEMANN

High output plus low operating costs, a multitude of pioneering innovations, flexibility in use, excellent transportability, rapid set-up times, efficient operation and an intuitive operating concept: the EVO series from KLEEMANN has been setting standards in processing technology for many years. The immense performance is delivered by suitable drive concepts that combine power with economical consumption.

The EVO series includes the MOBICAT EVO mobile jaw crushers, the MOBIREX EVO2 mobile impact crushers and the MOBICONE EVO mobile cone crushers. Now they have been joined by MOBISCREEN EVO screening plants – giving operators and users yet another advantage: the plants are optimally tailored to each other and can be operated as a combination in multi-stage crushing processes.

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**It is due to
WIRTGEN GROUP
India's continuing
support and
service that we
went for
KLEEMANN
equipment.**

**Kola Brahmananda Tara Prasad,
Plant Manager
BGR Mining & Infra Pvt. Ltd.**

”



**New InLine Pave train:
Leading technology,
leading quality**

VÖGELE's high-compaction technology is what makes it all possible: the surface course paver can drive over the freshly paved binder course without prior rolling because it is extremely well precompacted with an AB 600 TP2 Plus High Compaction Screed.



Road rehabilitation at top speed: the new "Dash 3" generation of the InLine Pave train shows just what it can do in practice. The unique combination of cutting-edge VÖGELE technologies lays the binder and surface courses in a single pass - a method which makes this recognized construction method particularly economical, too.



Rehabilitation “hot on hot”

A heavily trafficked motorway with severe damage requiring urgent repair: a job site on the German B9 is a typical case for InLine Pave from VÖGELE. That’s because the paving train supports a unique construction method: the paving of compact asphalt pavements “hot on hot” – a process that makes road rehabilitation particularly simple and economical. This is because, with InLine Pave, the binder and the surface course can be laid in a single pass. The excellent bond between layers also enhances

the quality and resistance to deformation of the asphalt pavement. The cutting-edge technology involved comprises a mobile MT 3000-2i Offset PowerFeeder, a SUPER 2100-3i IP paver for binder course with the AB 600 TP2 Plus High Compaction Extending Screed and a SUPER 1800-3i paver for surface course.

**Two-lane rehabilitation on the B9:
the InLine Pave train of contractors
Strabag AG and Eurovia puts on an
impressive performance.**



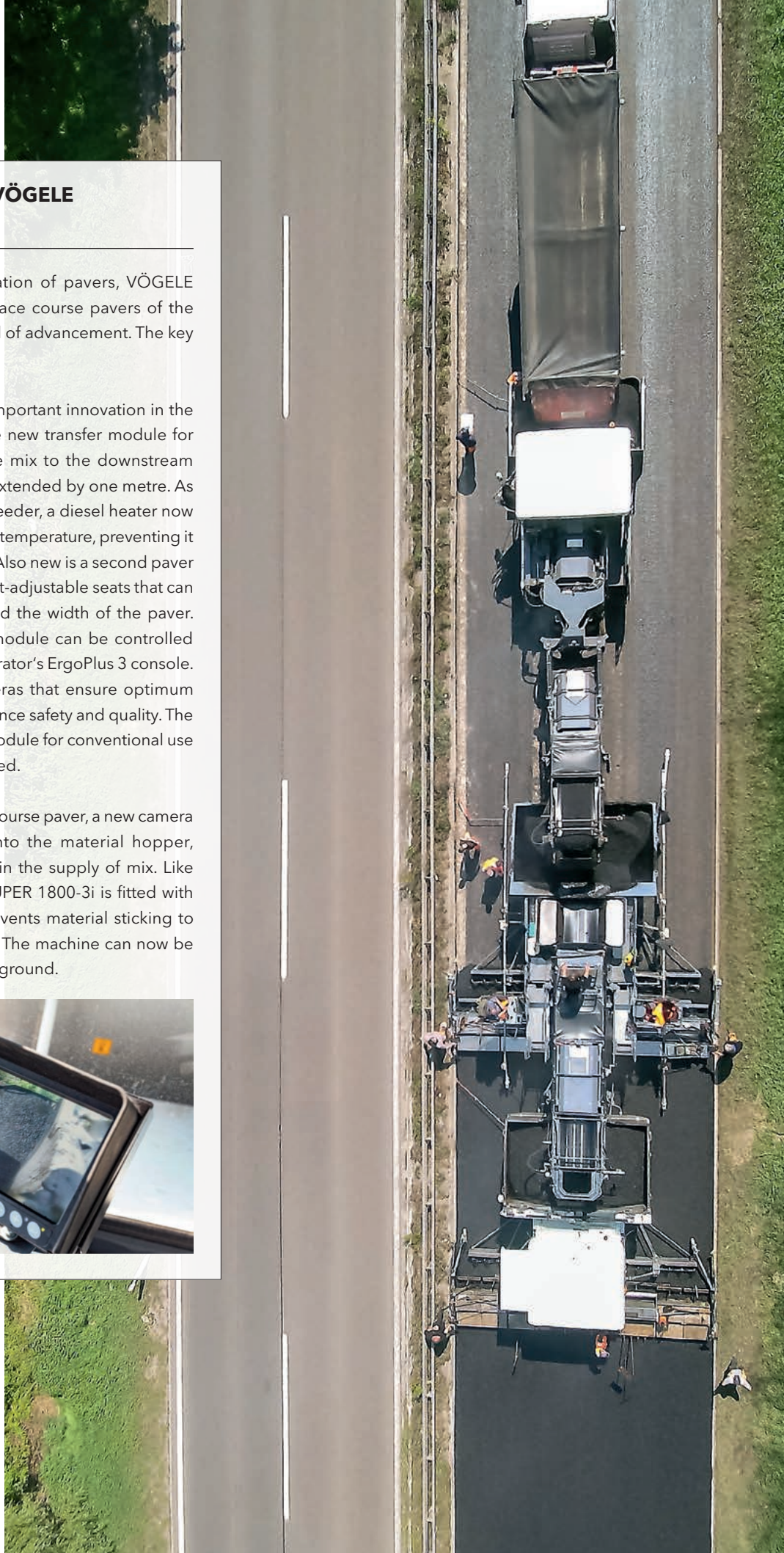
InLine Pave boosts cost-efficiency and quality

“The challenges when rehabilitating roads frequently consist in minimizing the impact on traffic while improving economic efficiency for the client at the same time,” says Björn Westphal, Product Manager at VÖGELE. InLine Pave, a development by the global market leader, attests to the company’s high applications expertise. The possibility of paving the binder and surface courses “hot on hot” is directly related to VÖGELE’s high-compaction technology: to ensure that the freshly laid binder course can be driven over by the surface course paver prior to compaction by roller, the SUPER 2100-3i IP paver for binder course is fitted with an AB 600 TP2 Plus Extending Screed. Inside the screed are two extremely high-compaction pressure bars operated by pulsed-flow hydraulics that ensure very high precompaction values. »»

Innovations of the new VÖGELE InLine Pave train:

With the new "Dash 3" generation of pavers, VÖGELE have taken the binder and surface course pavers of the InLine Pave train to the next level of advancement. The key innovations at a glance:

- › **SUPER 2100-3i IP:** The most important innovation in the paver for binder course is the new transfer module for conveying the surface course mix to the downstream paver. The module has been extended by one metre. As with the MT 3000-2i material feeder, a diesel heater now maintains the mix at a constant temperature, preventing it from sticking to the conveyor. Also new is a second paver operator's platform with height-adjustable seats that can be swung through 90° beyond the width of the paver. All functions of the transfer module can be controlled from here using the paver operator's ErgoPlus 3 console. Two freely positionable cameras that ensure optimum all-round visibility help to enhance safety and quality. The process for demounting the module for conventional use of the paver has been simplified.
- › **SUPER 1800-3i:** In the surface course paver, a new camera system improves the view into the material hopper, helping to avoid bottlenecks in the supply of mix. Like its predecessor model, the SUPER 1800-3i is fitted with a water spray system that prevents material sticking to the 40cm-wide crawler tracks. The machine can now be fuelled conveniently from the ground.



Intensive interlocking of binder and surface courses

When paving with InLine Pave, the binder and surface courses interlock particularly intensively, creating a high-quality bond. After all, a perfect bond between layers is a fundamental requirement for the longevity of roads. With InLine Pave, the binder course is thicker while the surface course is thinner at 2-2.5cm.

The resultant pavement has higher degrees of density and fewer air voids following its subsequent final compaction by rollers. The surface course is consequently impervious to water and protects the binder course from harmful effects. The resistance to deformation under the influence of heat rises at the same time and this, in turn, helps to counteract rutting in the summer months.

Paving train also ready for use on conventional job sites

One important aspect when considering an investment in construction machinery is, of course, its capacity utilization. Thanks to its flexibility, InLine Pave machine technology is very much in its element in conventional applications as well. The SUPER 1800-3i paver for surface course and the MT 3000-2i Offset PowerFeeder are only slightly modified. The SUPER 2100-3i, too, largely makes use of standard technology. The transfer module for conveying the surface course mix into the material hopper of the SUPER 1800-3i is a special structure, but it is easy to demount.

InLine Pave featuring the innovations of the "Dash 3" generation

The two SUPER 2100-3i IP and SUPER 1800-3i pavers feature the latest innovations of VÖGELE's "Dash 3" paver generation - the machines that represent the new benchmark in energy-efficiency, operating comfort and pavement quality. Take the VÖGELE EcoPlus, for instance: the low-emissions package reduces exhaust emissions and noise levels as well as fuel consumption, taking efficiency to the next level.

VÖGELE has also thought of the operators: the new paver operator's and screed operator's ErgoPlus 3 consoles now integrate high-contrast colour displays, making them even easier to read. ///



**Experience the new InLine Pave train in action -
at a job site on the German A8 motorway.**
To view the video go to:
www.voegele.info/ip-a8

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 - 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

”

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.

Asphalt production, next level

Pathbreaking technologies for asphalt with a 30% RAP material rate and for low-temperature asphalt with foamed bitumen: with a BENNINGHOVEN ECO 3000 mixing plant, contractor Balgorza S.A. is gearing itself up for the challenges of today and tomorrow.



Spain // Vitoria-Gasteiz

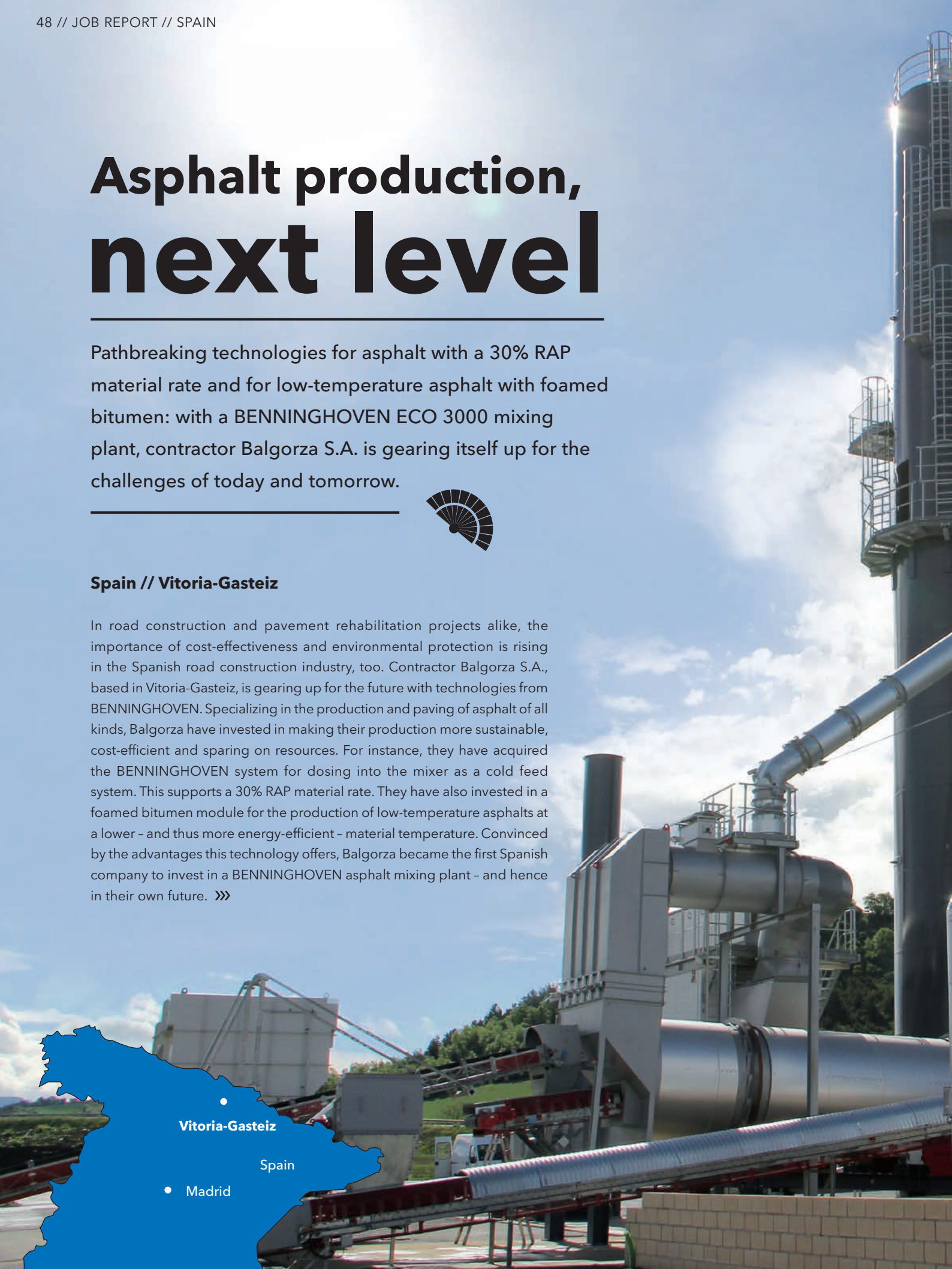
In road construction and pavement rehabilitation projects alike, the importance of cost-effectiveness and environmental protection is rising in the Spanish road construction industry, too. Contractor Balgorza S.A., based in Vitoria-Gasteiz, is gearing up for the future with technologies from BENNINGHOVEN. Specializing in the production and paving of asphalt of all kinds, Balgorza have invested in making their production more sustainable, cost-efficient and sparing on resources. For instance, they have acquired the BENNINGHOVEN system for dosing into the mixer as a cold feed system. This supports a 30% RAP material rate. They have also invested in a foamed bitumen module for the production of low-temperature asphalts at a lower - and thus more energy-efficient - material temperature. Convinced by the advantages this technology offers, Balgorza became the first Spanish company to invest in a BENNINGHOVEN asphalt mixing plant - and hence in their own future. >>>



Vitoria-Gasteiz

Spain

• Madrid



Twofold premiere: the ECO 3000 is the first BENNINGHOVEN asphalt mixing plant in Spain and also the first in the new BENNINGHOVEN design.



Plant details

Commissioning of a new BENNINGHOVEN ECO 3000 asphalt mixing plant in Vitoria-Gasteiz, Spain

Plant

ECO 3000 asphalt mixing plant

Working parameters

Mixing output:	240t/h
Drying output:	220t/h
Number of feed hoppers:	5-fold cold feed system, 12m ³ each 3-fold cold feed system, 12m ³ each
Burner:	EVO JET 3 FU G-Öl combination burner for oil and natural gas, 19MW
Screen output:	220t/h
Capacity of mixed material storage silo:	100t in 2 compartments + direct loading
Bitumen supply:	3 tanks, 60m ³ each

Technologies

System for dosing into the mixer, a cold feed system for a 30% RAP material rate

Foamed bitumen module for production of low-temperature asphalt

”

More to it than meets the eye: our ECO 3000 plant has vast potential for today and tomorrow.

**Rafael Pedreira, Director General
Balgorza S.A.**

”

Highlights of the BENNINGHOVEN ECO asphalt mixing plant in container design

- › 5-fold cold feed system
- › 5-deck screen
- › Hot bin capacity of 17t in 5 bins
(optionally 55t in 5 bins)
- › Precise electronic weighing of aggregate,
bitumen and filler
- › Insulated twin-shaft pugmill in sizes from
1.25 to 4t
- › Filter unit in performance classes
up to 78,000Nm³/h
- › Mixed material storage silo designed for
positioning at the bottom or side



All set for the future! Rafael Pedreira (Director General of Balgorza S.A.), Alberto Fontana (founder of EMSA) and Daniel Diaz de Argandoña (engineer at Balgorza S.A.) at the commissioning ceremony for their ECO 3000.

ECO plants: Modular system delivers made-to-measure solutions

Prior to the start of production, the transport and erection proceeded quickly. After all, ECO plants offer owners maximum flexibility: the container design supports rapid changes of location at any time, while logistics costs are low. Dismantling and assembly are a simple process. Not least because of the “plug & play” principle of the electronics, ECO plants are up and running particularly quickly at new locations – a fact which also gives Balgorza flexibility. The modular structure also permits the integration of a large number of high-tech components that can be tailored to the specific requirements of asphalt mixing plant operators. This improves both economic efficiency and investment security, ensuring that Balgorza can also meet future requirements with the ECO 3000.

System for dosing into the mixer for a 30% RAP material rate

Recycling is also on the rise in Spain. It's a trend that Balgorza have recognized, which is why they systematically make full use of their capacities for the recycling of resources. After all, newly processed aggregate – known as mineral – is more expensive than reclaimed asphalt. To conserve resources and reuse reclaimed material from pavement rehabilitation projects directly, Balgorza opted for recycling technology from BENNINGHOVEN. With the system for dosing into the mixer as a cold feed system, an RAP material rate of up to 30% can be achieved. The feed process can be summed up as follows: a wheeled loader delivers the reclaimed or milled-off asphalt into an RAP cold feed hopper. From there the material – dosed by belt scales – is carried on an RAP elevator directly to the mixing tower, where it is fed to the 3t mixers of the ECO 3000 by a chute. »»

Low-temperature asphalt saves 0.9l of heating oil per tonne

Apart from the recycling of raw materials, the amount of energy used is a major factor when it comes to operating the asphalt mixing plants efficiently, with maximum environmental friendliness. Here too, Balgorza are in the vanguard – with an innovative foamed bitumen module for producing low-temperature asphalts, a global technology trend. The asphalt is prepared at a temperature of 110°C, some 50°C lower than the 160°C required for conventional asphalt. This reduces energy consumption for asphalt production by around 9kWh/t, which equates to 0.9l of heating oil. CO₂ emissions are also reduced: Balgorza's ECO 3000 achieves this by using foamed bitumen, an innovative binding agent.

Foamed bitumen module permits reduction in temperature

The foamed bitumen is produced in a pressurized chamber that is integrated into the mixer and connected to the conventional bitumen supply system. A small quantity of water and air is then injected at high pressure into the normal bitumen, which is at a temperature of 175°C. The surface area of the bitumen rapidly expands by a factor of 20 and the resultant foamed material is then added into the mixer, where it is mixed with mineral. The large surface area causes foamed bitumen to durably coat the mineral, lending it the required durability, while the water contained in it evaporates. One of the characteristics of low-temperature asphalt is its lower viscosity, which makes it temporarily easier to pave. ///



Proven technology from foamed bitumen pioneer, the WIRTGEN GROUP:



The production and use of foamed bitumen as a binding agent is a well established technology throughout the world. It is playing an ever more important role in road construction and pavement rehabilitation and has increasingly come to the attention of highways authorities and contractors. The WIRTGEN GROUP have been using foamed bitumen since as long ago as 1995 – and are rightly regarded as the foamed bitumen pioneers. The process was originally developed for cold recycling – a WIRTGEN speciality.

Advantages of the process:

- › Extreme durability
- › Greater economic efficiency
- › More sparing use of resources
- › Lower CO₂ emissions

One of the most important properties of foamed bitumen is that the foamed binding agent coats the mineral optimally thanks to its large surface structure – delivering lasting durability.



Recycling reclaimed asphalt: asphalts with a 30% RAP material rate can be produced with the system for dosing into the mixer as a cold feed system. BENNINGHOVEN also offer hot feed systems for 90 + X% RAP material rates.



Perfect interaction for maximum quality:
the MT 3000-2i Offset PowerFeeders
supply the SUPER pavers with mix and
prevent interruptions to paving work as
well as jolts from feed vehicles.



Germany // Weinsberg

Decoupled material transfer from the feed vehicle to the road paver is one of the major drivers in road construction. After all, this process is a critical factor with a considerable impact on the quality of asphalt paving projects. Material feeders are consequently gaining ground around the world – also because the machines simultaneously enhance productivity. The advanced MT 3000-2i Offset PowerFeeder, for instance, has a conveying capacity of 4,000t per work shift. Equipped with a pivoting conveyor for transferring the mix – as indicated by the Offset in the name – the VÖGELE machines are particularly flexible in use. Just how flexibly this innovation enables paving teams to meet the requirements of major projects is demonstrated by a job site at the Weinsberg intersection between the A6 and A81 motorways, a route which carries 100,000 vehicles every day. >>>



**Discover the VÖGELE MT 3000-2i Offset PowerFeeder
in the big web special at:**
www.voegel.info/webspecial/powerfeeder



Innovative technology pays off

First job for two MT 3000-2i Offset PowerFeeders fresh out of the factory: the VÖGELE PowerFeeders supported the 3 SUPER pavers rehabilitating the carriageways at the Weinsberg motorway intersection. The advanced machines ensured a consistently high flow of mix for a continuous paving process.



Non-contacting and with no danger of collision: 3 laser sensors continually measure the distance between PowerFeeder and paver. The system stops the paver automatically as soon as the distance falls below the preset minimum.



You can watch a video of the job site here:
www.voegele.info/weinsberg

The PowerFeeder delivers just what we so urgently require in today's competitive climate: highly efficient and highly productive work in superb quality.

**Michael Weber, Technical Director
Wolff & Müller Tief- und Straßenbau**

Two PowerFeeders - A doubly perfect solution for the supply of mix

When rehabilitating the carriageways of the A6 motorway, the aim was to make the paving process continuous, i.e. to avoid any interruptions to paving. Thanks to a huge total storage capacity of 45t and a peak conveying capacity of 1,200t/h, the 2 new MT 3000-2i Offset PowerFeeders met requirements in full – and still had some capacity to spare. When material feeders are used, the transfer of material is decoupled, which means that the lorries dump the mix into the receiving hopper of the feeder. This prevents the lorries from passing jolts to the paver, which could have a detrimental effect on the paving result. In this way, the non-contacting transfer of mix improves the pavement quality. A safe and reliable transfer of mix is another hallmark of VÖGELE machines: collisions are prevented by the automatic distance control with anti-collision protection. These are benefits that only VÖGELE machine technology offers. These attributes clinched it for the contractor, Wolff & Müller.





Job site details

Rehabilitation project at the Weinsberg intersection of the A6 motorway, Germany

Continuous paving thanks to large mix storage capacity

"On motorway job sites, a lot of feed vehicles have to unload paving material within a very short space of time. And such a critical process can't be rushed. Our new VÖGELE PowerFeeders provided valuable support with this, right from the first metre," explained Lars-Peter Schwarzer, Asphalt Construction Manager for Wolff & Müller. With the MT 3000-2i Offset PowerFeeder, 25t of mix can be transferred in the space of just 60 seconds. The material slides down into the material feeder's large receiving hopper in which conical augers transverse to the direction of travel ensure that the material is withdrawn evenly. Together with the trough-shaped conveyor, this counteracts mechanical and thermal segregation. ///

Length of section: 1.6km

Working parameters

Pave width: 6.5-8.5m
 Pave speed: 5.5m/min.
 Layer thickness
 Surface course: 4.5cm
 Binder course 1: 6.5-8.5cm
 Binder course 2: 11.5cm

Material

Surface course: porous asphalt
 Binder course 1: AC 22 BS 25/55/55
 Binder course 2: AC 16 BS 25/55/55

Equipment

- 2 VÖGELE MT 3000-2i Offset PowerFeeders
- 1 VÖGELE SUPER 1900-3i paver
with AB 500 TP2 Extending Screed
- 1 VÖGELE SUPER 1900-3i paver
with AB 600 TP1 Extending Screed
- 1 VÖGELE SUPER 2100-3i IP paver
with AB 600 TP2 Plus Extending Screed



Job site details

Pavement rehabilitation of the Sachsenring race track near Chemnitz, Germany

Area of section:	50,000m² (approx.)
Length of section:	3.7km
Width of section:	14-20m

Working parameters

Milling depth:	8cm
Milling speed:	7m/min (approx.)
Total tonnage:	2,500t

Material

Binder course:	4.5cm AC 16
Surface course:	4.0cm AC 11 GP with polymer- modified bitumen

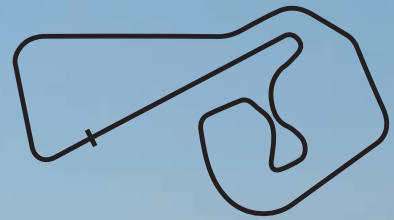
Equipment

- 1 WIRTGEN W 200 cold milling machine
- 1 WIRTGEN W 220 cold milling machine with 3D control
- 3 VÖGELE SUPER 1900-2 pavers with the AB 500 TP1 Extending Screed
- 1 VÖGELE MT 3000-2i Standard PowerFeeder
- 1 VÖGELE MT 3000-2i Offset PowerFeeder
- 1 BENNINGHOVEN TBA 3000 asphalt mixing plant



Millimetre accuracy at top speed: Made for record breaking

WIRTGEN W 200 and W 220 cold milling machines play a key role, laying the ground for the pavement rehabilitation and reprofiling of the legendary Sachsenring race track.



Optimum milling results have a significant influence on the quality and economic efficiency of the subsequent race track rehabilitation work.

Levelling technology - Always on the level

To achieve optimum milling results, WIRTGEN cold milling machines offer state-of-the-art features. These include one of WIRTGEN's core technologies - levelling. When the surface course is removed, the LEVEL PRO levelling system continually compares the actual milling depth with the preset target milling depth.

LEVEL PRO can work with different sensors - cable, hydraulic cylinder, sonic and slope sensors or laser and sonic ski sensors as well as multiplex systems - and can be extended as required. 3D levelling is also possible with installed interfaces that are compatible with 3D systems from common manufacturers.



Germany // Saxony

Millimetre accuracy is essential when every thousandth of a second counts: when it was time to rehabilitate the Sachsenring race track, one of the most famous circuits in the east of Germany, the client took the opportunity to reprofile the track, too. The plan was to change the geometry of the track on selected bends to ensure that the regulations of the motorcycle racing organization Fédération de Motocyclisme International are also complied with

in the future. This was just the job for the WIRTGEN W 200 and W 220 large milling machines. Together with VÖGELE pavers and a BENNINGHOVEN asphalt mixing plant, the construction teams of Strabag, the contractor responsible for the project and SAT, the milling service provider, were able to rehabilitate the legendary race track in the Ore Mountains quickly and precisely. >>>





**On reprofiling jobs,
precision is essential for
quality. The WIRTGEN
milling machines reliably
delivered this.**

Rolf Lohberger and Marco Seidel, Milling Machine Operators
SAT Straßensanierung GmbH



Digital data for track layout

Maximum precision was a must during milling, as cold milling machines have a considerable influence on the quality of road rehabilitation works. This is especially true for race tracks, as the demands to be met during rehabilitation by far exceed those of normal road paving jobs. It was necessary to mill off the existing asphalt pavement to a depth of 8cm. The call for tender specified 3D levelling for the reprofiling of several bends. The milling service provider used the digital terrain model previously created by the client to feed the processed data for levelling into the cold milling machines via an interface. "This means that it's no longer necessary to scan references on the ground. Instead, the machines receive their milling depth information via a total station that is set up next to the pavement surface which is to be milled. It automatically follows the cold milling machine with a range of up to 100m," explains Gerald Kluge, university-qualified engineer and Head of Milling Division at SAT. To ensure that the machine receives a continuous reference signal during 3D milling, the total station must be relocated roughly every 100m and recalibrated at the new position. Two total stations were used at the Sachsenring race track, each alternately serving as a signal transmitter for the milling machine.

High precision with PTS

A tight schedule meant that the rehabilitation work had to be completed as quickly as possible. Both WIRTGEN W 200 and W 220 high-performance milling machines not only met expectations with regard to the milling performance, but also with functions such as automatic machine alignment by means of PTS (Parallel To Surface). During parallel alignment of the large milling machine with the pavement surface, the automatic function takes care of all the tasks the operator would otherwise have to carry out himself. Time-consuming corrections are no longer necessary. The WIRTGEN LEVEL PRO levelling system should be mentioned in this context; it processed the digital data with great precision, delivering an even milled surface. "In the end, the asphalt of the entire track was removed extremely efficiently and accurately with only 2 milling machines," commented Uwe Walter, Head of the WIRTGEN GROUP subsidiary in Zwickau, which provided support during the project. »»





Reprofiling with 3D levelling. Before milling work was started, surveyors created a digital terrain model of the new track profile. The data were then sent via an interface to the WIRTGEN milling machine and subsequently served as a target milling depth for levelling.

A legendary race track: the Sachsenring in figures

› Inaugurated:	1927
› Reopened:	1996
› Current track length:	3.67km
› Number of bends:	14
› Track width:	12-20m
› Width at start/finish line:	14m
› Maximum downhill gradient:	12.8%
› Maximum uphill gradient:	10%
› Longest straight:	780m (start/finish straight)
› Track record:	1:21:530 mins (motorcycle - Marc Márquez, Honda RC213V, 2015)



The 8mm tool spacing creates
a finer surface structure.
At the Sachsenring race
track, this laid the ground for
optimum racing conditions.

High evenness demands met at a breathtaking pace

In combination with the 3D levelling system, the WIRTGEN large milling machines fulfilled the high evenness requirements of below 6mm, measured across a width of 4m. In addition, the grade of the milled surface was not permitted to deviate from the specifications of the digital terrain model by 8mm at any point. This requirement was also met, as evidenced by control measurements made during milling and the verification with a rolling straight edge. The 2 large milling machines removed the surface and binder courses on the entire race track with an area of just over 50,000m² in only four days. The average advance rate of the machine was 7m/min. The cold milling machines were equipped with a milling drum featuring a tool spacing of LA 8 – another client specification to ensure optimum interlocking of the new asphalt binder course with the milled surface.

BENNINGHOVEN and VÖGELE meet the highest asphalt demands

Following on from the precise preliminary work of the WIRTGEN cold milling machines, 5 VÖGELE machines then took care of the high-quality asphalt paving. Strabag used 3 SUPER 1900-2 pavers with AB 500 TP1 Extending Screeds and two MT 3000-2i PowerFeeders for the job. The asphalt was supplied by a BENNINGHOVEN TBA 3000 transportable asphalt mixing plant operated by Deutsche Asphalt GmbH. ///



Factors influencing the surface quality

In addition to the evenness, the texture, i.e. the geometric form of the surface, is a decisive property of the milled surface. The following parameters have a key impact on the texture:

› Milling drum: tool spacing

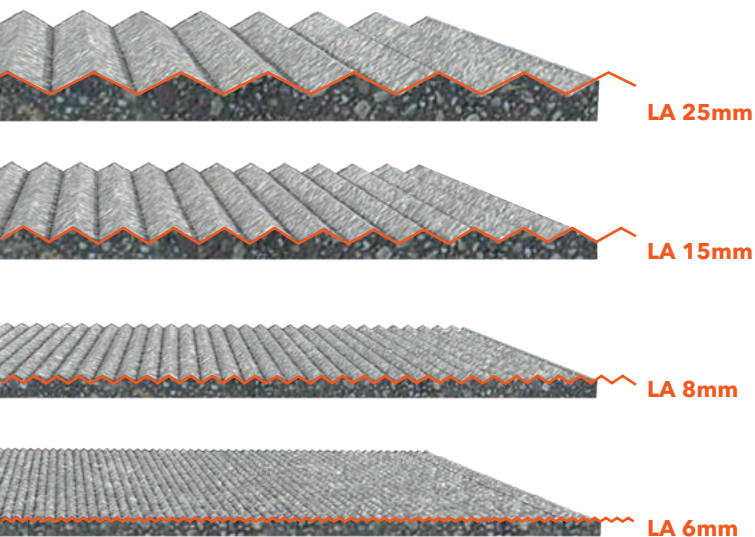
Large tool spacing (e.g. LA 25) = rougher surface
Small tool spacing (e.g. LA 6 or 8) = finer surface

› Milling machine: milling speed

High milling speed (e.g. 20m/min) = rougher surface
Low milling speed (e.g. 10m/min) = finer surface

› Milling drum: speed

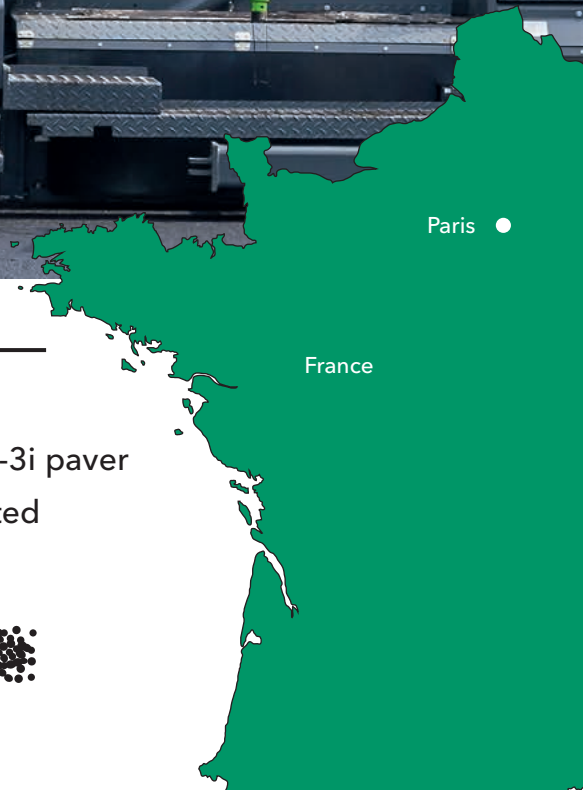
Low milling drum speed (e.g. 96rpm) = rougher surface
High milling drum speed (e.g. 127rpm) = finer surface



Fixed-width screed, perfect evenness



Technologies from VÖGELE deliver perfect evenness: when resurfacing the A36 motorway near Dijon, a new SUPER 1900-3i paver equipped with an SB 250 TV Fixed-Width Screed and supported by an MT 3000-2i Standard PowerFeeder produced high quality results across a pave width of 7.5m.



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Motorway job sites in France must meet very stringent requirements on evenness, as was the case on the A36 near Dijon, the surface course of which was rehabilitated and, in some areas, reinforced. To meet these requirements, the company Roger Martin Entreprise elected to use leading VÖGELE technology: an SB 250 TV Fixed-Width Screed which paved across a width of 7.5m. It is of extremely stable design and ensures outstanding evenness in the transverse direction. To ensure evenness in the longitudinal direction, the paving work must

proceed without any interruptions, because every time the paver stops, the material in front of the screed cools down, making it more difficult to compact effectively, thereby risking the formation of humps when resuming work after the stop. To prevent this from happening, the lorries transported the mix to the material feeder: the MT 3000-2i Standard PowerFeeder reliably supplied the SUPER 1900-3i paver with material along the entire length of 22.5km. "The paving work proceeded without a hitch, thanks to the PowerFeeder; the paver did not have to stop at all," confirmed Site Manager Charles Mercey. »»

Eighty lorry loads a day: a VÖGELE MT 3000-2i Standard PowerFeeder ensured smooth material transfer without interruptions.



Job site details

Surface rehabilitation on the A36 motorway near Dijon, France

Length of section: 2 x 11.25km

Working parameters

Pave width: 7.5-11m
Layer thickness
Base course: 9cm
Binder course: 8cm
Surface course: 4cm

Material

Base course: bituminous mix
GB 0/14, Class 4, with 40% recycled material
Binder course: bituminous mix GB 0/14, Class 4, with 40% recycled material
Surface course: BBMC 0/10, with 10% recycled material

Equipment

WIRTGEN W 210i cold milling machine
WIRTGEN W 2000 cold milling machine
VÖGELE MT 3000-2i Standard PowerFeeder
VÖGELE SUPER 1900-3i paver with SB 250 TV Fixed-Width Screed
VÖGELE SUPER 1600-2 paver with AB 600 Extending Screed
VÖGELE SUPER 1600-3i paver
HAMM DV+ 90 VV tandem roller
HAMM HD 110 tandem roller



High evenness across a wide pave width

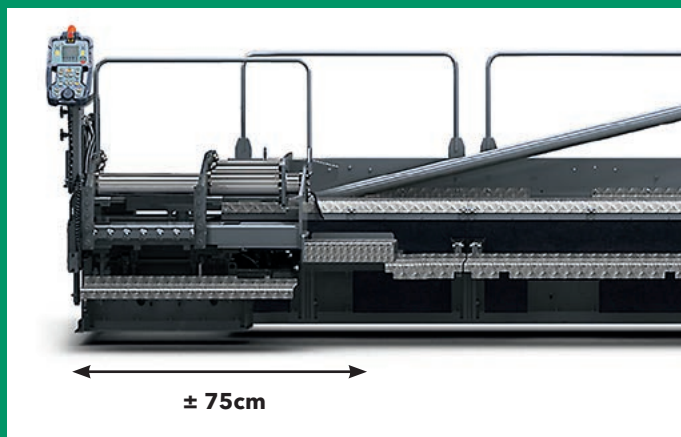
“The SUPER 1900-3i with its SB 250 TV Fixed-Width Screed was an important investment for us. We have never had a machine of this calibre before,” says Vincent Barbieux, Operations Manager at Roger Martin Entreprise. “We opted for this paver because it is very versatile. After all, we don’t just work on motorway job sites.” Although the SUPER 1900-3i falls into VÖGELE’s Highway Class, it covers a wide range of tasks. In view of the demands specified for motorway job sites, the construction company ultimately decided on an SB 250 TV Fixed-Width Screed.

Our new VÖGELE machines have really delivered. The evenness is extraordinary.

Vincent Larrochette, Head of Machinery and Equipment
Roger Martin Entreprise

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

Fixed-width screeds from VÖGELE prove their prowess when paving across large widths. The SB 250 Fixed-Width Screed has a basic width of 2.5m, but can be built up with bolt-on extensions up to a maximum pave width of 13m. Hydraulic bolt-on extensions make paving flexible: they are infinitely variable within a total range of 1.5m.



SB 250 screed - Quality up to a width of 13m

The SB 250 Fixed-Width Screed from VÖGELE really comes into its own wherever large pave widths of up to 13m need to be achieved true to line and level: on the job site in Dijon, for example, the screed had to remain within a tolerance range of $\pm 5\text{mm}$, measured along the total distance of 22.5km. But in fact, it worked within an even tighter $\pm 3\text{mm}$ tolerance range. "The SB 250 TV perfectly meets our needs. We will be using it on motorway job sites, whether they involve new construction or pavement rehabilitation," says Site Manager Charles Mercey of Roger Martin Entreprise.

PowerFeeder keeps things moving

Apart from the machine technology, quality in road construction also depends on process reliability. This is one of the main reasons why hardly any motorways are built without a material feeder these days. "We expected our MT 3000-2i Standard PowerFeeder to help us achieve uninterrupted paving, increasing the evenness of the carriageway. And that is exactly what it delivered. The feed with mix is continuous, meaning the paver need not stop, and that's a crucial factor for good results," explains Site Manager Charles Mercey. Operations Manager Vincent Barbieux agrees: "The VÖGELE technology fulfils our goals in terms of quality and performance." ///



The SB 250 Fixed-Width Screed in action:
to see a video of this job site on the A36
near Dijon, go to
www.voegel.info/dijon

An aerial photograph showing a dark asphalt road that winds through a dense, green forest. The road features several sharp, hairpin turns, creating a series of loops and curves. The surrounding forest is composed of tall, coniferous trees. In the lower portion of the image, a white truck is visible traveling along the road.

**The stunning curves of the Transylvanian Alps:
Transalpina long-distance road in Romania.**