RoadNews for new roads

The WIRTGEN GROUP User Magazine for China // № 03

WIRTGEN VÖGELE HAMM KLEEMANN BENNINGHOVEN

The WIRTGEN GROUP partners the Chinese construction industry:

Achieving more together

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Editorial

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Dear Reader,

The dynamic nature of the Chinese market enjoys worldwide recognition. This is particularly true of China's measures to develop a state-of-the-art infrastructure. Several prime examples will be featured in this issue of RoadNews. Among them is the construction of an 1,880km long-distance highway from Kunming to Bangkok, some of which were built (perhaps for extra good luck!) by SUPER 1880-3 L pavers. Such impressive projects as the rehabilitation of the grand boulevard leading to the Jinci temple complex in just two weeks or the processing of 2 million tonnes of residiual construction materials by KLEEMANN crushers demonstrate the great feats our customers and users can achieve. Meanwhile, HAMM were able to deliver on their strengths in the successful compaction job on an orbital motorway on the island of Hainan.

We at the WIRTGEN GROUP do our utmost to ensure that our machines and plants are more than capable of meeting such immense challenges – and we will continue to do so in the future. You can also find out about current developments and innovations in our technology articles. For instance, a new generation of VÖGELE sensors for grade and slope control are ensuring maximum precision and raising operating comfort in asphalt paving. You can also read up on 2 new WIRTGEN cold milling machines, the W 195 and the W 205, which – like the W 215 – have been tailored to the Asian market.

We hope you enjoy reading this third edition of the WIRTGEN GROUP RoadNews for China!

Best wishes from

Ulrich Reichert
CEO and Managing Director
WIRTGEN (CHINA)
Machinery Co., Ltd.

Uncompromising technology for high-speed rehabilitation

Road rehabilitation in high-speed mode: it was essential that the technology used for road rehabilitation at Jinci operated with uncompromising reliability. A job for the machines of the WIRTGEN GROUP.

Shanxi // Taiyuan

Jinci, an enormous temple complex on the outskirts of Taiyuan in the Chinese province of Shanxi, is one of China's most prominent state-protected monuments. As the complex, believed to have been built around the year 500, is a popular tourist destination, a large hotel is also located nearby. After many years of use, the almost 2km-long, six-lane road leading to the temple and hotel complexes had to be rehabilitated in 2017. To minimize the disturbance caused to guests by the repair work, the asphalt was replaced at top speed during the spring, in the short period between the end of the winter and the beginning of the travel season. To meet this very tight schedule, the Municipality of Taiyuan elected to use machinery known for its reliability: milling machines from WIRTGEN, pavers from VÖGELE and rollers from HAMM. »»

We collaborate with the WIRTGEN GROUP as partners. Service responds very fast and in time, communication is smooth, and the supply of spare parts is good.

Yin Yue, Deputy Managing Director Taiyuan City Municipal Construction Company

Job site details
Pavement rehabilitation of a major city road in Taiyuan, Shanxi

Length of section:	2km (approx.)
Total area:	44,000m²
Carriageway width:	2 x 11m

Working parameters

Milling depth:	10–20cm
Layer Thickness	
Binder course:	6cm
Surface course:	4cm

Material

Binder course:	AC 20
Surface course:	SMA 16
Paved material quantity:	7,000t (approx.)

Equipment
1 WIRTGEN W 2000 cold milling machine
1 WIRTGEN W 100 H cold milling machine
2 VÖGELE SUPER 2100-3 L pavers with an AB 600 TV Extending Screed
1 VÖGELE SUPER 2100-2 paver with an SB 300 TV Fixed-Width Screed
2 HAMM HD O 128V tandem rollers
1 HAMM HD 10 VV tandem roller

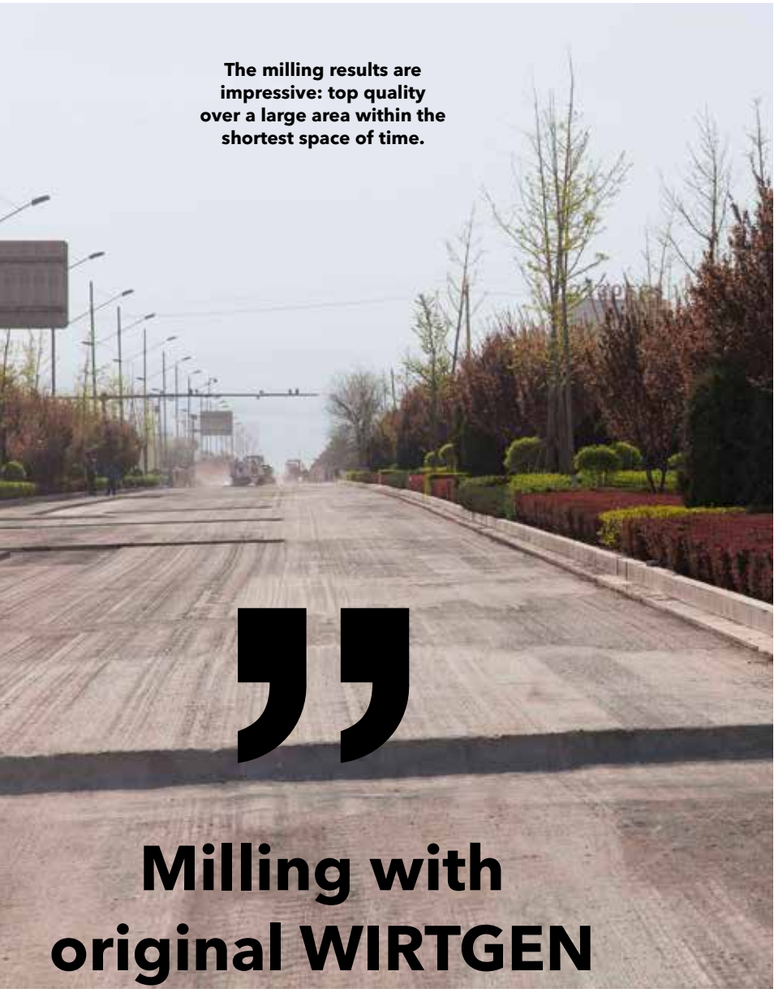
Quality first: for the 11m-wide one-way carriageways and the 24m-wide roundabout, asphalt was paved "hot to hot".

Rehabilitation of the six-lane boulevard

The just under 2km approach road to the temple and the Jinci hotel has three lanes in each direction intersected by a large roundabout. The asphalt on the road had suffered varying degrees of damage. The asphalt surface and binder courses therefore needed to be replaced along the entire road. In some areas, the base course also needed repairing. The last two weeks in April 2017 offered ideal conditions for carrying out this work: the frost period was over, but visitor numbers were still low at this time of year.

Three days of milling, seven days of paving

Bearing the weather conditions in mind, the Municipality of Taiyuan scheduled the planned rehabilitation measures for the approach road, at short notice. The time frame was challenging: just three days were available for the milling work, seven for the entire asphalt paving work. "We were able to adopt this plan of action, knowing that WIRTGEN GROUP machines work reliably and economically, delivering high-quality results. Our positive experiences with the WIRTGEN GROUP Service were also significant. If ever you need a spare part, you can rely 100% on a prompt delivery and the team of service technicians. For this reason, it was important for us to have WIRTGEN, VÖGELE and HAMM machines on this job site," says Yin Yue, Deputy Managing Director of the Taiyuan City Municipal Construction Company. »»



The milling results are impressive: top quality over a large area within the shortest space of time.

Milling with original WIRTGEN cutting tools is the most economical option.

Cheng Zhiping, Manager
Taiyuan City Municipal Construction Equipment Renting Company

When operated without a discharge conveyor, the WIRTGEN small milling machine can neatly deposit the milled material on the milled surface with its hydraulically height-adjustable scraper blade.

WIRTGEN large and small milling machines work reliably

The Taiyuan City Municipal Construction Equipment Renting Company brought 2 reliable WIRTGEN cold milling machines to the job site for the milling work: a W 2000 large milling machine for the large areas and the W 100 H small milling machine to handle the transitions, the edges and the curves. The work was performed in two steps: in the first step, the 2m large milling machine removed the asphalt to a depth of 10cm across a total area of approximately 42,000m². However, the heavy damage in some parts made it necessary to carry out a second pass, during which the large milling machine also removed the remaining 20cm-thick asphalt pavement. It performed this task at an advance rate of 4m/min. With a maximum milling depth of 32cm and a powerful discharge conveyor, which transfers large quantities of granulated RAP quickly and reliably to the transport lorry, the W 2000 delivered an impressive performance, particularly when milling at greater depths.

W 100 H demonstrates power and efficiency

Being exceptionally easy to manœuvre, WIRTGEN's rear-loading W 100 H small milling machine once again proved to be an agile specialist for precision work on the job site, with a milling width of 1m. To mill along edges and boundaries, the operator can also swing the right wheel round to the front of the milling chamber in a few swift moves. The small turning radius also allows precision milling along tight curves. Both milling machines were equipped with original WIRTGEN cutting tools, because "this is the most economical option," says Cheng Zhiping, Manager of the machine rental company. Due to their high-quality workmanship, the cutting tools – in this case the W 5 for the W 100 H and the W 6 for the W 2000 – wear very slowly and can be replaced easily and quickly. This all adds up to very cost-efficient operation. »»

Highlights of the WIRTGEN W 100 H small milling machine: Efficiency in the one-metre class

- The robust small cold milling machine in the one-metre class stands for a high milling output and a tried and tested machine concept
- Its simple and precise operation supports efficient work processes
- The machine is particularly cost-efficient with its low fuel consumption and tool wear
- The LEVEL PRO levelling system delivers precise milling results
- The powerful rear-loading system can be flexibly adjusted to optimize material loading

The VÖGELE SUPER 2100-3 L pavers with their extra-long material hopper are perfectly aligned with the dimensions of Chinese lorries.

VÖGELE EcoPlus: Less is more

The philosophy behind the machine concept of the "Dash 3" generation (which also includes the SUPER 2100-3 L) is "lower consumption – lower emissions –lower costs". The VÖGELE EcoPlus low-emissions package combines a series of individual measures that reduce fuel consumption by up to 24%*. This enables machine contractors to increase their profit margins.

* Actual fuel consumption depends on multiple factors, such as machine configuration, type of job site and paving parameters

"Hot to hot" across 24m

When paving asphalt on the 11m-wide one-way carriageways and the 24m-wide roundabout, the Taiyuan City Municipal Construction Equipment Renting Company always used at least 2 pavers operating alongside one another. By paving "hot to hot", they created a nearly jointless, homogeneous surface. The success of such an operation depends upon machine availability as well as a reliable supply of mix. This worked excellently in Taiyuan: the pavers progressed smoothly at a pave speed of 3m/min.

A winning combination of fixed-width and extending screeds

To ensure sufficient flexibility during the paving process, all 3 VÖGELE pavers on the job site were fitted with adjustable screeds: the SUPER 2100-2 paver worked with the SB 300 TV Fixed-Width Screed. It can be extended to an impressive width of 12.5m. To nevertheless ensure the requisite degree of flexibility during paving, the two outer ends of the screed used in Taiyuan were fitted with 75cm-wide, hydraulic bolt-on extensions. The 2 SUPER 2100-3 L pavers arrived at the job site fitted with an AB 600 TV Extending Screed. With these screeds, the pave width can be varied within a range of 3 to 6m. This combination of pavers and screeds allowed all widenings and narrowings along the carriageways, as well as the roundabout, to be paved mechanically, delivering extremely high-quality results at top speed.

15 years of excellent experiences

The Municipality of Taiyuan team has been enjoying the benefits of VÖGELE pavers for over 15 years. "We bought our first VÖGELE machine in 2001 when we had to pave a 14.5m-wide carriageway without joints. This could only be done with a VÖGELE paver. We have known ever since that these machines are of the highest quality and extremely robust at the same time – that's why we currently have 4 VÖGELE pavers in our fleet," says Cheng Zhiping, Managing Director of the Taiyuan City Municipal Construction Equipment Renting Company. He is particularly taken with many of the technical features, for example the system for grade and slope control, which guarantees very even road surfaces. He also extols the virtues of the electric screed heating: "It reliably heats the screed to 120°C and also maintains this temperature. This enables us to meet technical requirements while working very efficiently at the same time. And we can do this better than with any paver with gas-fired heating we've tried so far." »»

German oscillation rollers – Made in China

Compaction was carried out by HD O 128V tandem rollers from HAMM. These oscillation rollers are manufactured at the Langfang production facility and combine HAMM's tried and proven compaction technology with the Chinese clients' specifications regarding operation, comfort, safety and service. The Taiyuan City Municipal Construction Equipment Renting Company has been working with these oscillation rollers for some time now, because "with them, we get the best compaction results," according to Manager Cheng Zhiping. And no wonder: oscillation rapidly increases compaction, ensuring perfect evenness and optimum compaction of joints. Another advantage is that HAMM's oscillation drums only generate low vibrations in the area around the roller. This makes the roller ideal for compaction jobs in the vicinity of vibration-sensitive buildings. The operators also notice the difference: "They prefer the HAMM oscillation rollers, because of the excellent vibration damping," says Foreman Zhu Jianjun.

Excellent weight distribution

The HAMM rollers also delivered a compelling performance with their self-levelling 3-point articulation, especially on the roundabout. This feature gives the HD and HD CompactLine rollers excellent driving and steering characteristics, ensuring unsurpassed directional stability and outstanding driving comfort. Even at the maximum steering angle, the chassis design distributes the weight evenly across the drums – as experienced at the Taiyuan roundabout.

Tandem rollers from HAMM: Small turning radius as a standard feature

Manœuvring made easy: the articulated HD tandem rollers can even compact the asphalt very quickly in tight bends, as their turning radius is extremely small – under 4m, depending on the roller model.

In addition, the drum positions can be offset to the right or left. This track offset function is available in all operating situations, so that complete and thorough compaction right up to the edges is always assured.

Compaction right up to the edge

Another advantage of HAMM's HD and HD CompactLine tandem rollers is their wide side clearance, a product of the intelligent drum suspension design. This feature of the tandem rollers enables complete machine-based compaction of surfaces, even closely along boundaries such as curbs or walls. As a result, time-consuming manual reworking is eliminated, especially when the schedule is as tight as during the project in Taiyuan – an important point. ///

The very thing: Combined use of AB and SB screeds

The paving job in Taiyuan proves that SUPER pavers can also work “hot to hot” when AB and SB screeds are used simultaneously. RoadNews shows users what to keep in mind.

For the quality of asphalt pavements, the formation of the longitudinal joints is a crucial factor. These joints are precisely the points at which water may begin to seep in over time. This is why “hot to hot” paving has become the preferred method around the world, as it achieves a perfect interlocking of adjoining pavement strips. Although the joints still exist, the strips overlap and are compacted by roller. When paving teams work with a combination of fixed-width and extending screeds, a number of details must be kept in mind.

Smooth teamwork between an SB 300 TV Fixed-Width Screed and an AB 600 TV Extending Screed.

Different screeds, different planing angles

The AB extending screeds have a fundamentally different design to the fixed-width screeds. This is because, when retracted, the screed doubles in depth (the screed’s hydraulic extending units are positioned behind the basic screed). This is why VÖGELE’s extending screeds, such as the AB 600, are equipped with shorter screed plates than the fixed-width screeds. This in turn steepens the planing angle of the screed. Fixed-width screeds always “lie flatter” on the material and in this way achieve a higher degree of precompaction.

The greater the paving width, the lower the weight applied to the ground by the extending screeds

In addition, the AB 600 TV Extending Screed mentioned in the report weighs 3.65t without bolt-on extensions – regardless of whether it is operating at the basic width of 3m or if the screed is extended (without bolt-on extensions) to 6m. The planing angle, however, does not behave identically – it varies according to the pave width, as does the static load acting on the material. In this respect, the SB 300 TV Fixed-Width Screed is different. With its weight of 2.4t and longer screed plates than the AB 600, the static load and planing angle remain constant. Bolt-on extensions also have little influence on the planing angle as, although the weight increases with each bolt-on extension, the ground contact also increases at same time.

Compensation by means of tamper speed adjustment

The main differences between the two VÖGELE screed technologies are the planing angle and the weight distribution. Operators balance out these differences by increasing the tamper speed for the extending screed – or alternatively by lowering the tamper speed for the fixed-width screed. The tamper ensures intense precompaction of the mix. In a simple process, tamper speed and stroke length can be easily and precisely adjusted to match the volume of material, the type of material and the layer thickness. Or – as in Taiyuan – it can be used to synchronize the compacting power of different screeds.

Settings should be tested in the first few metres of paving

The exact number of percentage points by which the tamper speed needs to be lowered or increased depends on various factors such as mix temperature, layer thickness, load-bearing capacity, grain size of the mix and, as described above, the pave width of the AB screed. For this reason, when paving “hot to hot” with a combination of AB and SB screeds, operators are advised to test the compaction behaviour of the screeds when they start the paving job and optimize the settings. ///

Setting the tamper speed on the paver operator’s ErgoPlus 3 console:

1. **Press the F2 key to call up the Tamper Settings screen**
2. **Use the arrow keys to increase or lower the tamper speed (in percentage points)**
3. **Press the F4 key (Automatic mode)**

The maximum tamper speed for the AB 600 TV and SB 300 TV screeds is 1,800rpm.

The right WIRTGEN machine for every application:

W 195 W 205 W 215

With their latest highlights, the W 195 and the W 205, WIRTGEN have completed their new large milling machine series for the Asian market, which now comprises the two new models as well as the W 215.

W 195

Advanced – A cold milling machine for economical applications

The two-metre front loader in a tried-and-tested design was developed for efficient milling operations. Equipped with a 410KW diesel engine, the large milling machine delivers enormous engine power yet still consumes less fuel per cubic metre of milled asphalt. With a multitude of new and valuable features, it dovetails with the established WIRTGEN features to optimize the milling process, offer high flexibility in use and make operation of the milling machine considerably easier. The W 195 is suitable for all milling operations typical of the two-metre-class.

Maximum precision thanks to the levelling system

LEVEL PRO PLUS, the 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 handling. The preset target milling depth is accurately controlled via robust displacement sensors located in the hydraulic cylinders which are mounted on the side plates. It is shown on the high-resolution LEVEL PRO PLUS colour display. The plug-and-play interface allows a large choice of additional sensors to be connected easily to the levelling system at any time.

Easy and economical operation

High daily production rates can be achieved thanks to an exceptionally simple and reliable operating concept. For example, the robust, easy-to-handle controls are arranged in a clear pattern and in line with application requirements. The weatherproof control screen provides clear information on all relevant data and operational parameters.

Optimized weight and advanced machine technology ensure high flexibility in operation. The reduced machine weight for ease of transport combined with high engine performance leads to an efficient weight-to-performance ratio of the W 195. Furthermore, the new WIRTGEN milling machine is exceptionally cost-effective thanks to low diesel consumption and tool use. »»

1. Multifunctional joystick
Ergonomically designed multifunctional joystick for driving, steering, selecting the operating mode, raising the machine and switching off conveyor features.

2. Clearly arranged controls
The robust easy-to-handle controls are arranged in a clear pattern and in line with application requirements. The weatherproof control screen provides clear information on all relevant data and operational parameters.

3. Fully integrated levelling system
Full integration of the LEVEL PRO PLUS levelling system into the machine management system provides for a high degree of automation.

4. Intuitive levelling
The new LEVEL PRO PLUS levelling system offers intuitive, easy operation.

5. Hydraulic cylinders integrated in side plates
The reference line is scanned by high-precision displacement sensors integrated in the hydraulic side plate cylinders and then displayed on the high-resolution LEVEL PRO PLUS control screen.

6. High-precision levelling system
The new LEVEL PRO PLUS levelling system achieves unprecedented evenness values.

ADVANCED

Highlights in performance and productivity

› **Exceptionally efficient weight-to-performance ratio**
Reduced machine weight for ease of transport combined with high engine performance

› **New "Delta18" milling drum technology**
The newly developed, optimized arrangement of cutting tools results in a significant increase in milling power while simultaneously reducing cutting tool wear

› **Three selectable milling drum speeds**
Three selectable milling drum speeds ensure an optimum milling performance across a wide range of applications

W 205

Performance – A cold milling machine for high milling power

The W 205 two-metre cold milling machine hits the mark with its high milling performance and professional supplementary equipment. This professional machine is equipped with a 455KW diesel engine and caters to a wide range of applications from surface course rehabilitation all the way to full pavement removal.

Flexible Cutter System Light: Maximum range of applications

The Flexible Cutter System Light, or FCS Light for short, allows the use of different milling drums to increase flexibility and machine utilization. High capacity utilization is a key factor for the economic operation of large milling machines. It can be achieved particularly effectively if the cold milling machine is operated with a variety of milling drums, provided, of course, that the milling drums can be replaced quickly and easily. With FCS Light, WIRTGEN offer the optimum solution: milling drums with various tool spacings can be replaced in a short space of time. That makes it possible to perform a wide range of milling operations with one and the same machine. As a result, the W 205 is extremely versatile to use, covering everything from standard applications through fine milling for the creation of new, level road surfaces (ideally with the multiplex levelling system) to the use of ECO cutters for a particularly high area performance at low cost. This increases the capacity utilization of the W 205, boosting its economic efficiency in the process.

Increasing milling performance

What is more, the new Delta 18 milling drum technology and three adjustable milling drum speeds also ensure high performance at low operating costs. With Delta 18, the W 205 achieves an even higher milling output due to the optimized arrangement of the cutting tools in the outer ring and the conveying and ejecting areas of the milling drum, while simultaneously reducing the cutting tool wear. The three selectable milling drum speeds lead to an optimum milling performance across a wide range of applications with milling widths of 2,000mm and milling depths up to 330mm. The high traction of WIRTGEN's large milling machine is ensured by the exceptionally robust track units fitted with large track pads. »»

PERFORMANCE

THE ULTIMATE

W 215

The ultimate – A cold milling machine for professional applications

The W 215 is the top performer among the cold milling machines, delivering maximum milling performance and high productivity in a broad scope of applications. More power equals more output equals faster work. This equation adds up thanks to innovations that enable customers to respond optimally to the different requirements on job sites. With this large milling machine, they can call on an extra 25% of milling output. Equipped with a 470KW diesel engine, the front loader delivers enormous engine power yet still consumes 15% less fuel per cubic metre of milled asphalt.

Furthermore, the W 215 boasts a comprehensive range of equipment including the VCS Vacuum Cutting System for good visibility and optimum working conditions, a camera system, LED lights, a milling drum turning device and, last but not least, a set of levelling equipment.

LEVEL PRO PLUS

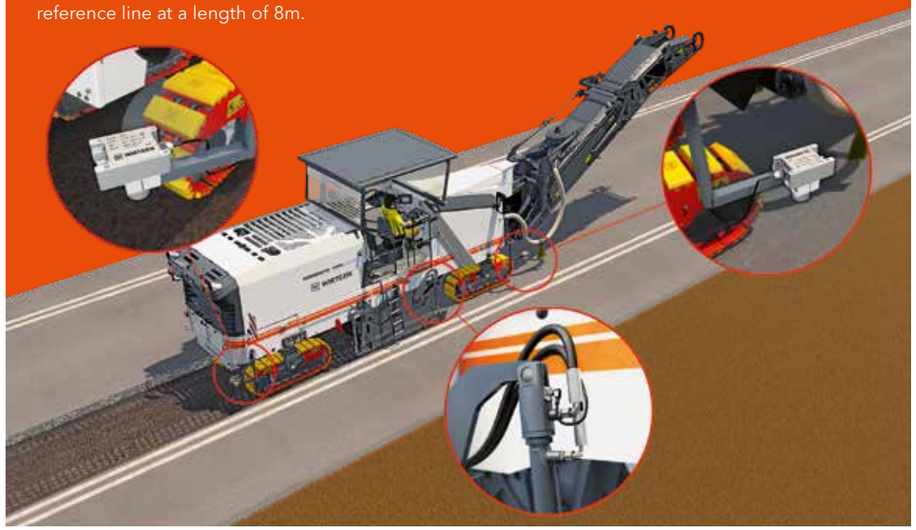
Large choice of sensors

The new LEVEL PRO PLUS enables a wide range of sensors to be used as standard equipment. Mechanical surface scanning, a cross slope sensor, sonic sensors or the Multiplex system ensure high-precision levelling for a wide variety of different milling applications.

In the multiplex system, for instance, three sensors on each side of the machine scan the height. The automatic levelling system factors all three measurements into its analysis so that the preset target milling depth is met exactly, but any unevenness in the road surface is not copied. This is a highly effective way of levelling out longitudinal undulations. What is more, defined surface profiles can be created, such as specified cross slopes on race tracks or crowns. This allows the entire road structure to be rehabilitated if necessary. ///

Levelling with multiplex systems

Multiplex systems are used to measure sustained, elongated unevenness and combine multiple sensors on both machine sides. To ensure maximum surface evenness, the three sensors scan the height on a reference line at a length of 8m.



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

100 miles day and night

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

ROAD WORK AHEAD

USA // San José

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

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

Down-cut method increases paving quality

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

New load-bearing capacity for the streets of San José

One illustrative example is W. Campbell Avenue, a main road in San José in the heart of Silicon Valley. The WIRTGEN cold recycler, with its usual reliability, first milled off a 10cm layer of damaged asphalt across a width of 3.8m, granulated it, and mixed in the 1% pre-spread cement. Two tank lorries supplied the recycler with hot bitumen and water via connected hose lines. Added pressurized air generates foamed bitumen. Microprocessor-controlled injection bars ensure precision injection of the foamed bitumen – in this case 2.5% – into the mixing chamber, where it is optimally processed with the granulated material. Ejectors positioned on the rotor then transfer the mix to the 3800 CR's conveyor belt.

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

Job site details

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

Costs:	US$ 13.7 million
Length of section:	100 miles
Area of section:	224.000m²

Working parameters

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

Material

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

Equipment

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

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

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

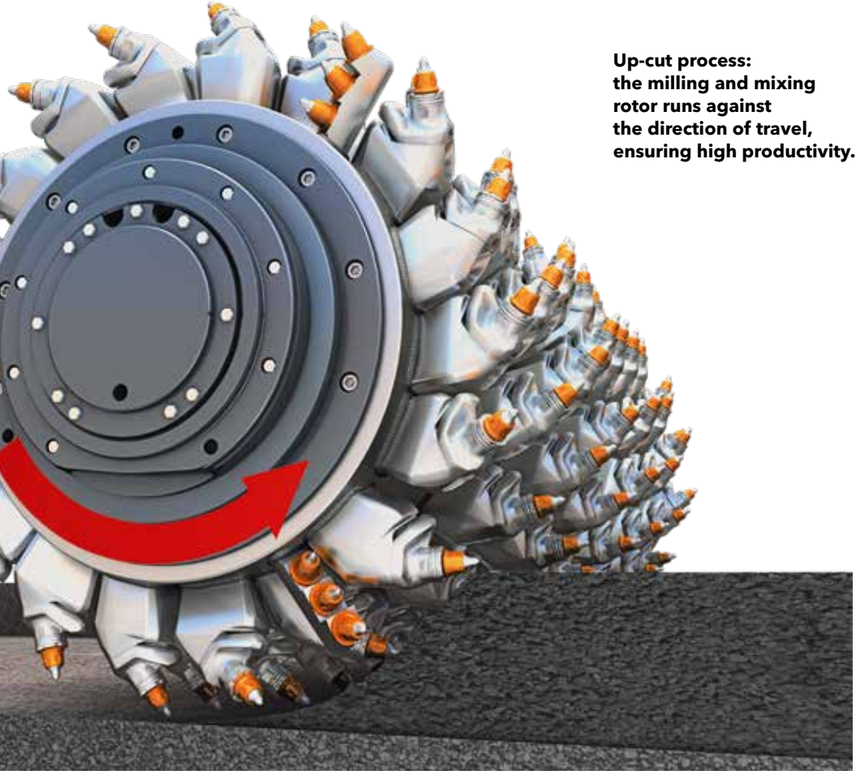
Cold recycling in-situ fulfils exacting quality requirements, is extremely economical, environmentally-friendly, and has the least impact on the public.

Frank Farshidi,
Project Manager for the City of San José

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

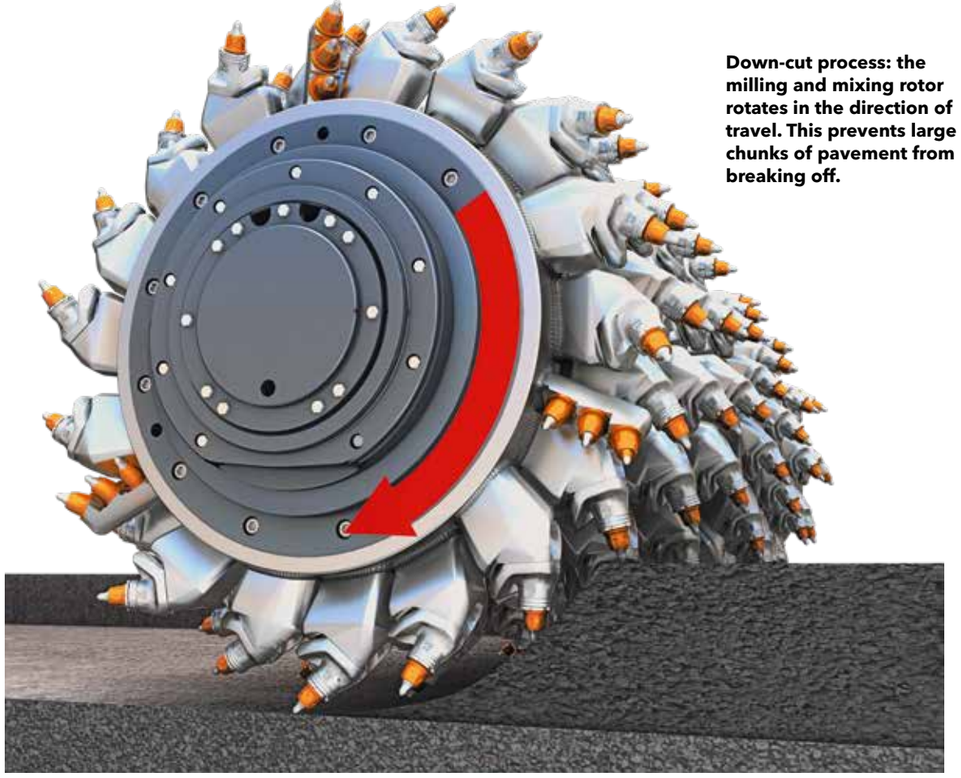
If necessary, a binder agent spreader first pre-spreads cement, followed by water and binder agent tank lorries. The milling and mixing rotor granulates the asphalt layers down to a depth of 15cm. At the same time, the cement is mixed in and the water and bitumen emulsion or foamed bitumen are injected into the mixing chamber by injection bars. After an auger spreads the prepared material across the entire pave width, the VÖGELE extending screed paves it true to line and level. HAMM rollers then take over compaction.

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



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

Working direction ›››



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

Working direction ›››

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

Cost-efficient and eco-friendly

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

In the end, the results speak for themselves: some 9,600 fewer lorry hours significantly reduced CO_2 emissions, fuel consumption and construction traffic on streets that receive between 12,000 and 35,000 vehicles daily. In total, the city saved some US$1.5 million. ///

High surface accuracy – from the very first metre

They are light green in colour and their standard features include a wide array of advantages which make life easier for operators, ensuring optimum results on each and every job: VÖGELE sensors for grade and slope control.

Surface accuracy is pivotal for road quality. Like Niveltronic Plus, the VÖGELE System for Automated Grade and Slope Control, which we presented in the last issue of RoadNews, sensors for grade and slope control play the main role in this context. The precision of their measurements is essential to the achievement of results that are right on target, accurate to the very last millimetre. The most frequently used VÖGELE sensors for grade and slope control are sonic and mechanical sensors. These sensors are also compatible with VÖGELE's Niveltronic Basic System for Automated Grade and Slope Control available for the Mini Class and SUPER 1880 L pavers. »»

Sensors for Niveltronic Plus and Niveltronic Basic

In this article we discuss the VÖGELE sensors for Niveltronic Plus and Niveltronic Basic, the Systems for Automated Grade and Slope Control used on SUPER pavers. You can read more about the advantages of Niveltronic Plus in the last issue of RoadNews.

Highlights of the VÖGELE sensors for grade and slope control

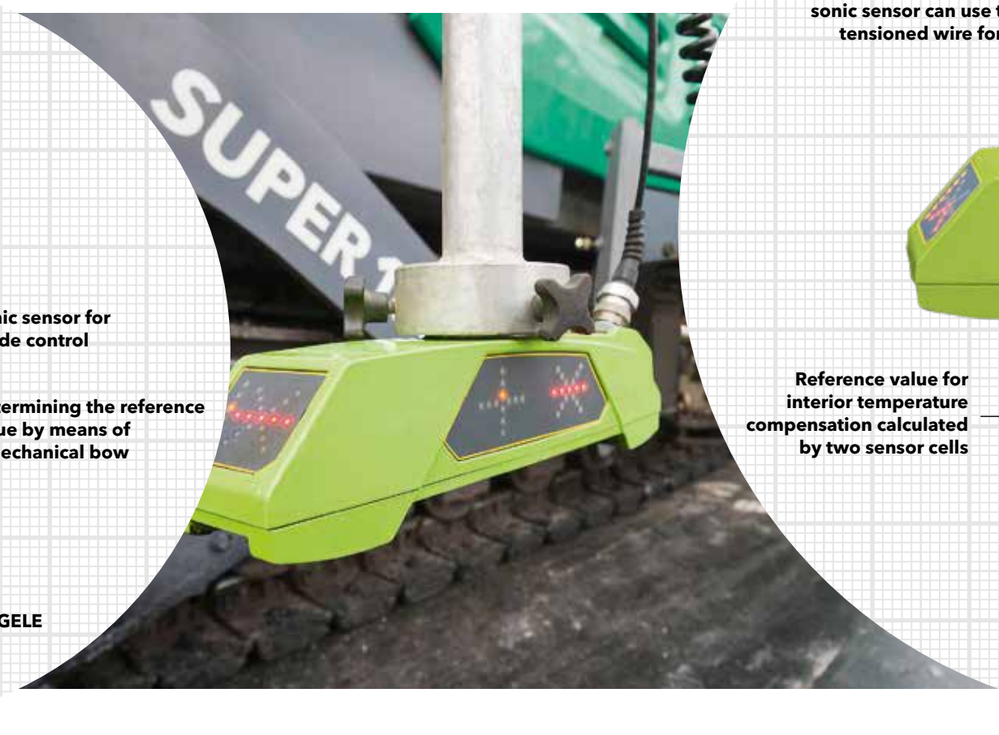
- The extremely robust design offers effective protection against impacts
- High degree of precision and reliability
- Easy commissioning with intuitive set-up assistance – the correct position is indicated by LEDs
- Additional LED cross prevents paving errors
- The powerful LED clearly illuminates the area or the reference to be scanned
- "Plug & Play" connection to VÖGELE's Niveltronic Plus or Niveltronic Basic System for Automated Grade and Slope Control
- Straightforward setting from the ErgoPlus 3 screed console or the ErgoBasic remote control unit for the screed

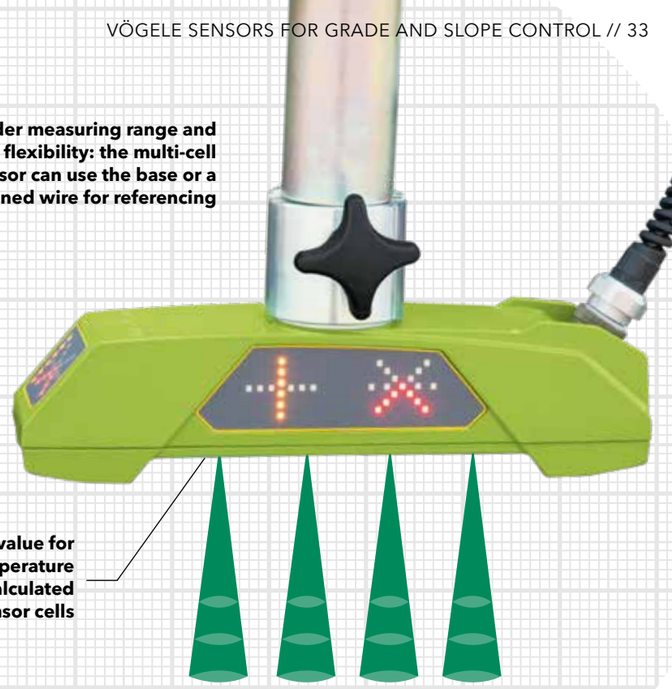
Always in view: the additional LED cross on the display of the VÖGELE sensors is positioned in the location that screed operators look at most frequently – the outer end of the screed. This is an effective measure against paving errors.

Sonic sensor for grade control

Determining the reference value by means of a mechanical bow

Precision scanning of the reference: the single-cell sonic sensor from VÖGELE





Wider measuring range and increased flexibility: the multi-cell sonic sensor can use the base or a tensioned wire for referencing

Reference value for interior temperature compensation calculated by two sensor cells

Four sensor cells for grade control

Non-contacting acoustic sensors

Non-contacting precision

VÖGELE offer a variety of non-contacting acoustic sensor systems: the single-cell sonic sensor (available only for ErgoBasic machines of the Mini Class and the SUPER 1880 L) and the multi-cell sonic sensor (available for all other VÖGELE machines). The working principle is identical: an acoustic signal is emitted, reflected and received. The time that elapses between emission and reception of the signal provides information on the distance that the signal has travelled. As the speed of sound depends on the ambient temperature, these sensors always calculate a temperature-compensation value. This ensures that grade control results are consistently accurate, even when the temperature fluctuates.

Single-cell sonic sensor copies references 1:1

The single-cell sonic sensor emits a sound cone and consequently copies references 1:1 without calculating an average. The sensor can be used to scan a diverse array of bases. It is also noted for its fast and easy installation and operation. On account of its compact dimensions, the single-cell sonic sensor is ideally suited for use on particularly confined job sites or winding roads with small curve radii. It is also recommended for all situations requiring high-precision copying of a reference, such as paving two parallel strips “hot to hot” or “hot to cold”. The single-cell sonic sensor is also the preferred choice whenever major changes in layer thickness must be made within a short period of time.

Highlights of the acoustic sensors from VÖGELE

- Non-contacting measurement using sound cones
- Calculation of a reference value for high-precision results, regardless of fluctuations in the ambient temperature
- Available in two versions – single-cell sonic sensor and multi-cell sonic sensor
- The single-cell sonic sensor copies references 1:1
- The multi-cell sonic sensor measures a longer range and calculates an average
- Either the base or a tensioned wire can be used as references

Multi-cell sonic sensor measurements with four sound cones

Unlike the single-cell sonic sensor, which only uses one sound cone for grade control, the multi-cell sonic sensor uses four. An average is then calculated from the readings of these four sonic measurements. Values exceeding the tolerance range of 3mm are not included in the calculations. This automatically prevents unrealistic irregularities in the reference, such as shovels or other obstacles, from being included in grade control.

Tensioned wires can also be used as references

The VÖGELE multi-cell sonic sensor features high versatility. It can level out short irregularities in the reference by calculating an average from the measurement readings. It can scan the base or tensioned wires with a minimum thickness of 2mm and tensioned ropes at least 3mm thick. For this purpose, the sensor is positioned at right angles to the direction of motion, i.e. rotated through 90° compared to the “Ground mode” position. The screed operator switches from “Ground mode” to “Stringline mode” at the press of a button in the Niveltronic Plus menu. »»

Big MultiPlex Ski

Perfect teamwork by three multi-cell sonic sensors

The Big MultiPlex Ski normally operates with three multi-cell sonic sensors fitted to the beam. Each sensor delivers its measurements directly to the ErgoPlus 3 screed console or the ErgoBasic remote control unit for the screed. The control unit then calculates an average from the readings and passes it on to Niveltronic Plus or Niveltronic Basic, the VÖGELE Systems for Automated Grade and Slope Control.

Variable beam length up to 13m

Thanks to the modular design of the beam, the Big MultiPlex Ski can cover distances ranging from 5 to 13m. The beam itself is made up of several elements. The individual sensors can be repositioned on the beam to best meet any conditions on the job site. The beam length most commonly used in practice is 8m or longer.

Perfect levelling of long irregularities

The Big MultiPlex Ski is particularly suited to paving jobs that call for absolute evenness in a longitudinal direction. Thanks to the calculation of an average based on measurements taken by several multi-cell sonic sensors, the system can detect long irregularities in the base that a single multi-cell sonic sensor would not recognise as a fault. The Big MultiPlex Ski is also extremely helpful for paving perfect transitions between new and existing surfaces, without manual grade control.

Scanning within or beyond the pave width

The Big MultiPlex Ski offers two mounting options. One option allows base scanning within the pave width. For this purpose, the beam is attached to the screed arm. The special advantage in this case is that the freshly paved surface behind the screed becomes part of the reference and is included in grade control. The alternative option is to attach the beam of the Big MultiPlex Ski, including the sensors, to the screed's side plate, if the area beyond the machine's pave width is more suitable for scanning. »»

Highlights of the Big MultiPlex Ski

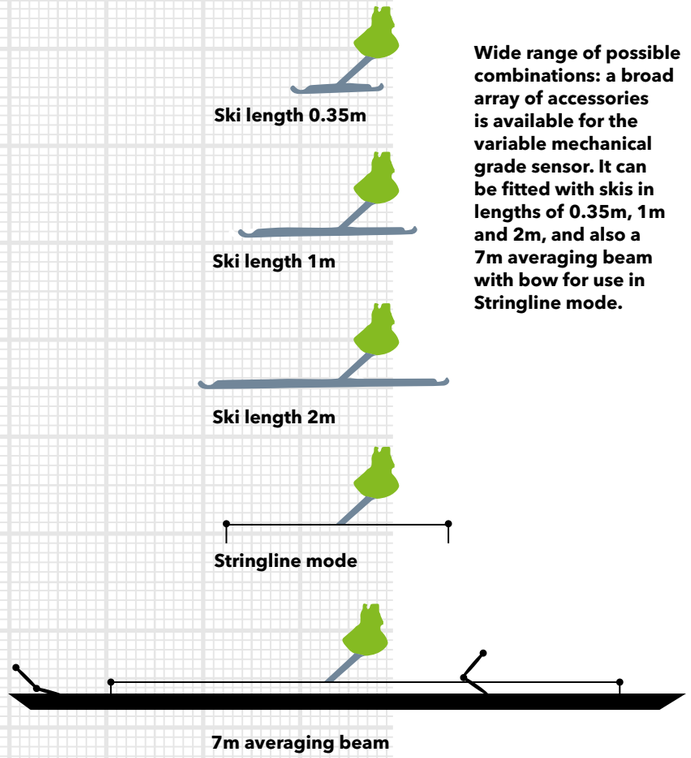
- Calculation of an average based on at least three multi-cell sonic sensors
- Large measuring range of up to 13m
- Allows levelling of long irregularities
- Flexible application
- High evenness
- The picked up values are processed directly by the ErgoPlus 3 screed console or the ErgoBasic remote control unit for the screed (no separate hardware required)
- Fast and easy installation

Mechanical sensors

Visible measurement, sturdy technology

Variable mechanical grade sensor with a large measuring range of ±10cm

Skis of different lengths are available for use in Ground mode; for referencing from a tensioned wire, the ski is replaced by a bow



Wide range of possible combinations: a broad array of accessories is available for the variable mechanical grade sensor. It can be fitted with skis in lengths of 0.35m, 1m and 2m, and also a 7m averaging beam with bow for use in Stringline mode.

Highlights of VÖGELE's mechanical sensors

- Variable mechanical grade sensor with large measuring range of ±10cm
- Can be combined with a variety of skis, in lengths of 0.35m, 1m and 2m, and a 7m averaging beam for referencing
- Bow for tracing a tensioned wire

In addition to its sonic sensors, VÖGELE also offer mechanical sensors. Their advantage is that they are completely insusceptible to external influences such as moisture, wind, sunlight, temperature fluctuations or air turbulence caused by passing traffic. Another strong point is that their measurements are extremely precise and "visible" to the operator. This makes it particularly easy to check that the sensor's contact with the reference remains stable. The point at which the reference is being traced can therefore be recognised immediately.

Variable mechanical grade sensor from VÖGELE

The variable mechanical grade sensor developed by VÖGELE combines the advantages of a sonic grade sensor with the high precision of mechanical sensors. The underlying principle is simple: when tracking a reference, the upwards and downwards movements of the ski or bow are transmitted to the sensor. If there are any deviations from the specified value, the position of the screed is corrected automatically by Niveltronic Plus or Niveltronic Basic, the Systems for Automated Grade and Slope Control.

Extensive measuring range for high precision

The variable mechanical grade sensor's measuring range of ±10cm is quite sizeable for a mechanical sensor, and is actually more comparable to the range of a multi-cell sonic sensor. The variable mechanical grade sensor is also configured at the touch of a button, just like the VÖGELE sonic sensors: the sensor is automatically recognized by Niveltronic Plus or Niveltronic Basic when it is connected to the ErgoPlus 3 screed console or the ErgoBasic remote control unit for the screed. A simple touch of a button and it is zeroed and ready for use.

Highly accurate paving with tensioned wire

For highly accurate paving along a tensioned wire, the variable mechanical grade sensor can also be fitted with a bow. A tensioned wire is usually used in cases where a suitable reference is not available, or when this method is specifically requested by the client. Extremely precise paving results with tolerances in the ±0.5mm range can be achieved by combining a tensioned wire with a highly accurate variable mechanical grade sensor. ///

China
Kunming

Two SUPER 1880-3 L pavers at work on the 1,880km highway from Kunming to Bangkok

Bangkok
Thailand

Cross-border Highway:

Paving across the frontier

Utilizing the innovations of the "Dash 3" paver generation: the 2 SUPER 1880-3 L machines pave a section of the state-of-the-art long-distance highway near the Shangyong border crossing.

Yunnan // Shangyongzhen tollgate

On a 50km-long, up to 24.5m-wide section of the Kunman Highway, the project to connect the southern Chinese metropolis of Kunming with Thailand's capital Bangkok, via Laos, is running at full steam. The job site lies between Kunming and Laos, which means that the logistics need to be perfect. The asphalt mixing plant that produces the asphalt for the highway is well over 40km away. »»

Speeding up foreign trade with Laos and Thailand

The 6.8-million metropolis of Kunming is an economic and technology development zone and is home to numerous flourishing, export-oriented companies. The capital of the Yunnan province plays a key role, particularly in trade with Laos and Thailand. The new Kunman Highway, which will connect southern China with the Southeast Asian countries and is planned to open in 2020, is correspondingly significant. The Yunnan Highway Development & Investment Company is responsible for the construction of a 50km section along the border to Laos.

1.1km completed every day

The logistics of the construction measure, in particular, required meticulous planning, as the asphalt mixing plant, installed specifically for this project, is about 40km away. Nine lorries with three loads per work shift supply the 2 VÖGELE pavers with fresh mix. “Under these conditions, we can work at an average pave speed of 4m/min and complete 1.1km of highway per day. This puts us right on target,” says Qian Jinrui, Job Site Manager at the Yunnan Highway Development & Investment Company.

L version with extra-long material hopper

To ensure that material transfer goes without a hitch, VÖGELE have designed an extra-large 242cm-long material hopper for the SUPER 1880-3 L, specifically tailored to the volumes of the Chinese feed lorries. The hopper’s low position, widely opening sides and sturdy rubber baffles also simplify material transfer to the paver. The SUPER 1880-3 L can store a total mix volume of 15t, which gives the paving team ample reserves for special contingencies, such as paving below bridges and in other places where lorries cannot easily dock on to the paver. »»

VÖGELE pavers hit the mark with their wide range of functions. They are simple to operate, thanks to the ErgoPlus 3 operating concept.

Li He, Chief Operator
Yunnan Highway Development & Investment Company

“Hot to hot” through Yunnan: the 2 SUPER 1880-3 L pavers build a high-quality asphalt pavement.

Job site details

Asphalt paving on a section from Longlin to Mohan in Yunnan, as part of the “Kunman Highway” construction project

Length of highway:	1,880km
Length of section:	50km
Width:	up to 24.5m

Working parameters

Pave speed:	4m/min
Pave width:	4.1m
Layer thickness:	7cm

Material

Base course: AC 25

Equipment

2 VÖGELE SUPER 1880-3 L pavers with AB 600 TV Extending Screed

SUPER 1880-3 L with extra-long material hopper: VÖGELE produce the L versions of the SUPER pavers exclusively for the Chinese market.

If ever we need them, the WIRTGEN GROUP Service team will always reach us. And quickly, too!

Jinrui Qian, Job Site Manager
Yunnan Highway Development & Investment Company

Highlights of the VÖGELE Universal Class SUPER 1880-3 L paver

- Maximum pave width 10m
- Laydown rate up to 1,000t/h
- Maximum layer thickness 50cm
- Robust and high-quality design for a long life cycle and reduced wear parts cost
- Powerful diesel engine rated at 158kW
- VÖGELE EcoPlus low-emissions package for a low carbon footprint significantly reduces fuel consumption and noise levels
- ErgoPlus 3, the ultimate paver operating concept with a number of additional ergonomic and functional advantages for safe and efficient operation

The right screed for every application:

- AB 600 Extending Screed and SB 200 Fixed-Width Screed in the TV and TP1 version for asphalt job sites guarantee high quality and evenness
- SB 300 HDT Fixed-Width Screed for roadbase applications

Material handling system makes light work of highway job sites

The construction machinery for major projects such as the Kunman Highway naturally needs to be designed for high-performance operation. A requirement that the SUPER 1880-3 L meets to the full, not least because of its material handling system. Powerful, separate hydraulic drives for both the conveyors and the augers support high laydown rates of up to 1,000t/h. The proportional control and continuous monitoring for conveyors and augers, in conjunction with the easily adjustable size of the auger tunnel, ensure a uniform head of mix in front of the screed – on straight stretches and curves alike. The head of mix is also regulated by a sensor that continuously monitors the material level and is clearly visible to the screed operator at all times.

Highway construction in ECO mode

The SUPER 1880-3 L pavers still had substantial power reserves during the Yunnan construction project. The pavers worked "hot to hot" using the AB 600 TV Extending Screed, each operating at a pave width of 4.1m. VÖGELE's extending screed is infinitely variable in the range of 3m to 6m. The pave width can be extended up to a maximum of 10m by means of bolt-on extensions. If the pave width is smaller, as was the case in Yunnan, the ECO mode increases efficiency. The 158kW Dongfeng Cummins 6-cylinder engine reduces its speed from 2,000 to 1,700rpm at the touch of a button, which is sufficient for most applications. Even in normal operation, the engine gets by on very little diesel fuel. This is accomplished by an innovation from the "Dash 3" paver generation: the VÖGELE EcoPlus low-emissions package. The package includes a whole series of measures to reduce fuel consumption by as much as 24%*, such as demand-based operation of the hydraulic pumps.

* Actual fuel consumption depends on multiple factors, such as machine configuration, type of job site and paving parameters.

Successful partnership with the WIRTGEN GROUP

Not only the performance values but also the Yunnan Highway Development & Investment Company's positive experience with the WIRTGEN GROUP came into play when SUPER 1880-3 L pavers were selected for this job. "We've been relying on VÖGELE pavers, HAMM rollers and WIRTGEN cold milling machines for four years now," says Job Site Manager, Qian Jinrui. "The machines are simply first class. We achieve perfect results with the VÖGELE pavers, for instance. And thanks to the straightforward, easy-to-understand ErgoPlus 3 operating concept, even new operators can get to grips with the machines in next to no time. Another key aspect for us is the fact that, if ever we need them, the WIRTGEN GROUP Service team will always reach us – no matter where we're working. And quickly, too!" ///

Intelligent compaction

At the job site in Hainan, four HD 138 tandem rollers from HAMM proved not only that they are highly efficient, but also extremely reliable.

HAMM compaction technology guarantees top quality and maximum productivity in rehabilitating and widening a motorway approach road near Haikou, in Hainan.

Hainan // Haikou

The tropical climate of Hainan Island, located in the province of the same name, draws holidaymakers from all over the world and the tourism industry there is booming. What is more, the emerging economy in the region is fuelling a rise in trade and therefore also traffic. To adapt the infrastructure to increasing traffic volumes, work commenced in the summer of 2016 rehabilitating a 32km approach road to the G 98 orbital motorway near Haikou and widening it from two to three lanes in both directions. Eco-friendly, pioneering technologies from the WIRTGEN GROUP were deployed on the job. The contractor used HD 138 rollers from HAMM to handle the lion's share of the compaction work, because not only are they premium quality machines, they are also highly efficient in compaction and therefore cost-effective. »»

Expanding a main motorway approach road

With over 45,000 vehicles per day, the four-lane G 223 had become very heavily trafficked in recent years as an approach road to the G 98 motorway. The Hainan Transportation Engineering Construction Bureau was expecting a further increase to some 55,000 vehicles per day, prompting plans to widen the road from two to three lanes in both directions.

HAMM rollers handle the main compaction work

The contractor, China Highway Engineering Consulting Corporation, chose HAMM rollers to do the main compaction work following asphalt paving, because "with these rollers, we can compact surfaces particularly efficiently," says Equipment Manager Yang Derong. He has had good experiences with HAMM rollers over several years, because he already had HD 130 rollers – the predecessors to the HD 138 – in his fleet of machines. He knows that "HAMM rollers operate extremely reliably. And if a problem ever occurs, the service team always comes up with a solution in no time at all."

Out in front with a high compacting performance

In expanding the road near Haikou, the four HD 138 rollers with an operating weight of 13.8t compacted the 8cm-thick binder course of AC 20 asphaltic concrete and then the 4cm-thick surface course of SMA 13. The pavers advanced at a speed of about 3.5-4m/min, with the rollers following at 14–15m/min (approx. 4km/h). The rollers fully compacted the 15m-wide carriageways with high-quality results in two static, six dynamic and four additional static passes. Subsequent laboratory analysis verified a degree of density of 96% in the binder course (specifications had called for at least 94%) and 99% in the surface course, which had to exceed a density of 98%.

High-efficiency compaction

The reason behind these good results is the high compacting power of the rollers. In vibration mode, they achieve high centrifugal forces of 195kN. This enables high-quality but also cost-efficient compaction, as demonstrated by a trial conducted at the start of the project: an HD 138 from HAMM needed only six passes in vibration mode to achieve the same level of compaction as was reached by competitor rollers in the same weight class in eight passes. This 25% lead has a positive impact on many factors, above all the time required to complete a job and the operating costs. »»

Daily maintenance can be completed easily and quickly. As a result, HAMM rollers run without any problems.

Yang Derong, Equipment Manager
China Highway Engineering Consulting Corporation

Job site details

Rehabilitation and widening of a motorway approach road in Haikou, Hainan

Length of section (total):	32km
Rehabilitation (milled area):	490,350m²
Paving:	735,525m²

Working parameters

Layer thickness	
Surface course:	4cm
Binder course	8cm

Material

Surface course:	SMA 13
Binder course:	AC 20

Equipment

4 HAMM HD 138 tandem rollers
2 VÖGELE SUPER 2100-2 paver with SB 250 Fixed-Width Screed
1 VÖGELE SUPER 2100-3 L paver with SB 250 Fixed-Width Screed
1 VÖGELE SUPER 1800-2 paver with AB 600 Extending Screed
5 WIRTGEN W 2000 cold milling machines
2 WIRTGEN KMA 220 cold recycling mixing plants

Working together for the success of customers and available on site (left to right): Hans Wang (Applications Specialist for HAMM at WIRTGEN CHINA), Zhang Jinliang (Service Manager of Haikou Rick Technology Development Co., Ltd.), Yang Derong (Equipment Manager at China Highway Engineering Consulting Corporation), Tim Xie (General Manager Marketing at WIRTGEN CHINA), Wu Ceyuan (Service Technician WIRTGEN CHINA).

The HD 138 from HAMM is the tandem roller with the greatest centrifugal force on the Chinese market. As a result , it operates extremely efficiently and with a high compacting power.

Water sprinkling system from HAMM: Designed for high daily performances

The water sprinkling system on the HD 138 tandem roller is designed for high performance and productivity. The 900-litre water tank that supplies the sprinkling system holds sufficient water for an entire shift. Furthermore, the water sprinkling system is equipped with two pumps to ensure high operating reliability in every paving situation.

The water spray bar on the HD 138 is mounted behind the cross member so that the spray cones are not disturbed by the effects of wind.

The fine nozzles on the water sprinkling system operate effectively, while conserving water at the same time.

A steady eye on the water sprinkling system

The HD 138 – produced in China – offers the key advantages of HAMM rollers on Chinese job sites, including good visibility. Thanks to the intelligent design of the frame, tanks and operator platform, machine operators have an unobstructed view of the drums and water spray bars on the water sprinkling system from every sitting position. That promotes high-quality results, because the operator can see right away if a spray nozzle is clogged. Incidentally, replacing the nozzles is an extremely simple process, because they are directly accessible and easy to remove and install.

Everything under control

Another advantage is that the driver's seat in the HD 138 and its sister model, the HD 128, can be turned effortlessly in either direction, giving operators an exceptional view of the drum edges and the machine's immediate surroundings. This simplifies such tasks as compacting along edges. High-quality lamps on the protective roof and bright lights on the cabin further provide a good view of the area around the machine. Intuitive operation and the clearly structured display, with all key operating data and easy-to-understand symbols, further simplify compaction with HD Series tandem rollers from WIRTGEN CHINA. The displays have no text at all, meaning that operators need no knowledge of a particular language. That's a tremendous advantage and an important safety enhancement.

Training by WIRTGEN CHINA

To ensure the high performance of the rollers even when they are in continuous operation for extended periods, Robert Li, Service Manager at WIRTGEN CHINA, gave the operators numerous helpful tips on routine maintenance during an operator training class prior to the start of the project. The HAMM roller is particularly popular among machine operators in Hainan because of its easy maintenance and maintenance-free hydraulic drive. But they also like the details, such as the low oil level required in the vibration drive, which makes oil changes a very quick process. Yang Derong summarizes it like this: "Daily maintenance tasks can be completed extremely quickly and easily. Our HAMM rollers just keep on running without any problems as a result. That is a key requirement for completing such major projects cost-efficiently and successfully." ///

4 KLEEMANN impact crushers VS. 2 million tonnes of residual construction materials

Completely new residential areas are currently under construction in the Luohu district of Shenzen. Derelict buildings in Mumianling and Buxin are being demolished and the sites cleared for the new development projects. A total of 4 MOBIREX MR 110 Z EVO2 and 4 MOBISCREEN MS 19 D plants are being used to recycle the residual construction materials.

Efficiency through teamwork: the MOBIREX MR 110 Z EVO2 impact crusher and the MOBISCREEN MS 19 D screening plant join forces to crush and classify some 260t of residual construction materials per hour in Luohu.

Guangdong // Shenzhen

Approximately 7.7 million m³ of residual construction materials weighing more than 10 million tonnes are produced in the greater Shenzhen area each year. Roughly 20% of this material is generated in the Luohu district alone – a volume of 2 million tonnes. To ensure that these raw materials can be reused profitably and are not disposed of at high costs, it is particularly important to recycle the residual construction materials. A task in which the KLEEMANN impact crushers of the MOBIREX series excel worldwide: they process rock and stone efficiently, are easy to use and, thanks to their robust construction, are particularly reliable. For some time now, as many as 4 of these mobile KLEEMANN plants have been rising to the challenge of processing the immense volumes of residual construction materials in the service of the Shenzhen Tagen Group Co. Ltd. construction company. Directly afterwards, 4 MOBISCREEN screening plants begin to classify the material in three final grain sizes. »»

Quality is key: the KLEEMANN machines readily meet the high demands on final product quality in recycling applications, too. This precision creates the basis for high load-bearing capacities in asphalt layers, for instance.

Job site details

Recycling residual construction materials in Shenzhen

Feed material

Residual construction materials in the feed size of 0–600mm

Final products

Construction rubble in grain sizes of 0–20mm, 20–25mm and >25mm

Equipment

4 KLEEMANN impact crushers MOBIREX MR 110 Z EVO2
4 KLEEMANN screening plants MOBISCREEN MS 19 D

7.7 million m³

of residual construction materials are produced yearly in Shenzhen, one fifth of which is generated in Luohu.

Fewer lorries, less dust: processing rock and stone or residual construction materials on site is a clean solution, even in city centres. One important reason for this is the water spraying system of the KLEEMANN plants, which keeps dust to a minimum.

KLEEMANN EVO series: Flexible machines for high productivity

All of KLEEMANN's EVO plants are characterized by their compact design and excellent transportability. This makes them the systems of choice for frequently changing operation sites. The set-up times of the crushing plants are short, because the hopper walls and side discharge conveyors can be quickly manœuvred into operating position with hydraulic support.

Great importance was attached to a productive material flow when designing the EVO series. As a result, the Continuous Feed System (CFS) automatically adjusts the feeding of the crusher as a function of its filling level. If there is too much material in the crusher, the material feed is restricted and, when crusher utilization is low, the feed is immediately accelerated again. This guarantees an optimum material flow.

Another highlight of the EVO plants is the powerful diesel-direct drive. The crusher is driven directly by a fluid coupling with low losses. The integrated generator supplies the electricity to drive the chutes, screens and conveyor belts. The fuel consumption of the systems is consequently significantly lower than comparable systems with fully hydraulic drives.

Efficient technology increases sustainability and productivity

The preparation of the site in Luohu for a new housing development is a prestigious project being implemented by the Shenzhen Tagen Group in cooperation with the local government. The Shenzhen Tagen Group covers the entire process from demolition to crushing, screening and recycling. Depending on the final grain size, the resulting construction rubble is used to manufacture bricks, as filler material or for the construction of roadbase. Since the entire recycling cycle can be handled by the 8 KLEEMANN plants directly on site, the material does not require separate storage or costly transportation to landfills. The systems are ready for action within half an hour, directly on the heaps of material. Eliminating the transportation of the material not only increases economic efficiency, but also minimizes the associated formation of dust. In addition, the use of recycled material in the new buildings reduces the amount of natural stone required, which contributes significantly to sustainability and also brings a sharp reduction in costs.

Crushing and screening plants team up

To meet its tight project schedule of one year, the Shenzhen Tagen Group opted for new crushing and screening plants from KLEEMANN. Mobile equipment was an obvious choice, as the plants needed to be relocated on the extensive site as the demolition operations progressed. Since February 2017, 4 machine sets, each consisting of one track-mounted MOBIREX MR 110 Z EVO2 impact crusher and one track-mounted MOBISCREEN MS 19 D classifying screen working in unison with each other, have been processing the residual construction materials. "The sturdiness of the KLEEMANN plants has convinced me. We achieve excellent product quality while maintaining a high performance at the same time," explained Guo Shiyong, Mobile Crushing Onsite Project Manager of the Shenzhen Municipal Civil Engineering Corporation. »»

The sturdiness of the KLEEMANN plants has convinced me. We achieve excellent product quality while maintaining a high performance at the same time.

Guo Shiyong, Mobile Crushing Onsite Project Manager
Shenzhen Municipal Civil Engineering Corporation

Efficient and powerful diesel-direct drive

In particular the MR 110 Z EVO2 impact crusher with its diesel-direct drive squarely hits the mark when operating in city-centre locations. The drive with fluid coupling is extremely efficient and powerful. The prescreen, chutes and conveyor belts are driven directly by the power generator. As a result, the compact crushing plant boasts a low consumption. The integrated magnetic separator is also an ideal asset for recycling jobs, as it can extract metal reinforcements from the material. The four MR 110 Z EVO2 crushers are currently breaking the feed material down from a grain size of 0–600mm to 0–100mm. In this way, they can handle feed quantities of up to 260t/h. The crushed material is then screened by the MS 19 D triple-deck classifying screen into three fractions of 0–20mm, 20–25mm and >25mm and can be processed immediately, thanks to the precise classification.

Fully hydraulic crushing gap adjustment

"As different materials are being processed on the site, the MR 110 Z EVO2 needs to be quickly and easily adjustable for new applications. But that is no problem, as the crushing gap can be fully hydraulically adjusted using the touch panel. To do this, the rotor only needs to be running idle, as the adjustment can also be carried out while it's turning," explains John Lin, KLEEMANN Senior Product Manager of the WIRTGEN GROUP in China. To ensure that the impact crusher is always optimally utilized and operates at high capacity, the integrated Continuous Feed System aligns the feeding of the crusher with its filling level.

First-class service keeps plants up and running

The WIRTGEN GROUP Service team in China worked very closely together with the Shenzhen Tagen Group to ensure good customer care and fast technical support. Suitable and durable spare parts are required to keep downtimes to a minimum, particularly when processing mixed rubble. The KLEEMANN crushing and screening plants were instrumental in ensuring efficient implementation of the entire process in Shenzhen. ///

Highlights of the MOBIREX MR 110 Z EVO2 impact crusher

- Expanding system widths for optimized material flow
- Feeding unit with hydraulic hopper-folding and locking system
- Effective prescreening thanks to independent double-deck prescreen
- Continuous crusher utilization with Continuous Feed System (CFS)
- Crusher unit with innovative C-shape rotor ledges for top product quality
- Lock & Turn safety system for safe replacement of rotor ledges
- Efficient and powerful diesel-direct drive
- Simple control with menu-guided touch panel
- High-performance secondary screening unit with extra-large screen surface
- Trouble-free loading thanks to greater ground clearance

Heaven-Linking Avenue:
the winding road up Tianmen Mountain in Hunan
certainly does justice to its name.

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