

RoadNews for new roads

The WIRTGEN GROUP User Magazine // N° 02



WIRTGEN



VÖGELE



HAMM



KLEEMANN



BENNINGHOVEN



CIBER

Introducing the new CIBER iNOVA series of continuous mobile plants:

Breaking new ground in asphalt production



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Dear Reader,

Simple transportation, sophisticated technology and an impressive product quality – those are the main attributes of CIBER's new iNOVA series of continuous asphalt plants. Following an intensive phase of development and testing, we are delighted to be presenting 4 new types of plants to our customers and users at the M&T Expo trade fair in São Paulo – and in this issue of RoadNews. We are convinced that the new iNOVA series will play a key role in advancing road construction.

All the other WIRTGEN GROUP brands have also recently launched countless innovations and carried out exciting construction projects. The most impressive of these being the construction of the biggest airport in the world, the "New Istanbul Airport". Our machines also got to work on Brazil's road network. For instance, a WIRTGEN W 200 cold milling machine was used to rehabilitate the Anchieta motorway, one of the main links between São Paulo and Santos. And in the Colombian capital of Bogotá, South America's most advanced batch asphalt mixing plant, an ECO 2000 from BENNINGHOVEN, has just gone into operation.

Technologies and processes from the WIRTGEN GROUP are continually setting new standards. KLEEMANN's innovative MOBISCREEN EVO classifying screens, which sort aggregate fractions precisely and efficiently, are a prime example. As are the material feeders in VÖGELE's PowerFeeder series, which are scientifically proven to improve the paving result thanks to decoupled material transfer. Cold recycling with foamed bitumen, a process developed by WIRTGEN, and oscillation compaction technology from HAMM have been used with great success for many years. Oscillation technology is currently celebrating its 35th anniversary.

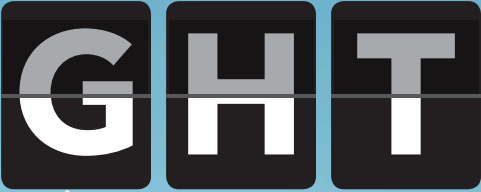
We hope you enjoy reading this second edition of RoadNews.

Best wishes,
Your RoadNews Team

PROGRESS TAKES FLIGHT

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
- 1 WIRTGEN soil stabilizer WR 200
- 1 WIRTGEN soil stabilizer WR 240
- 1 WIRTGEN soil stabilizer WR 2500

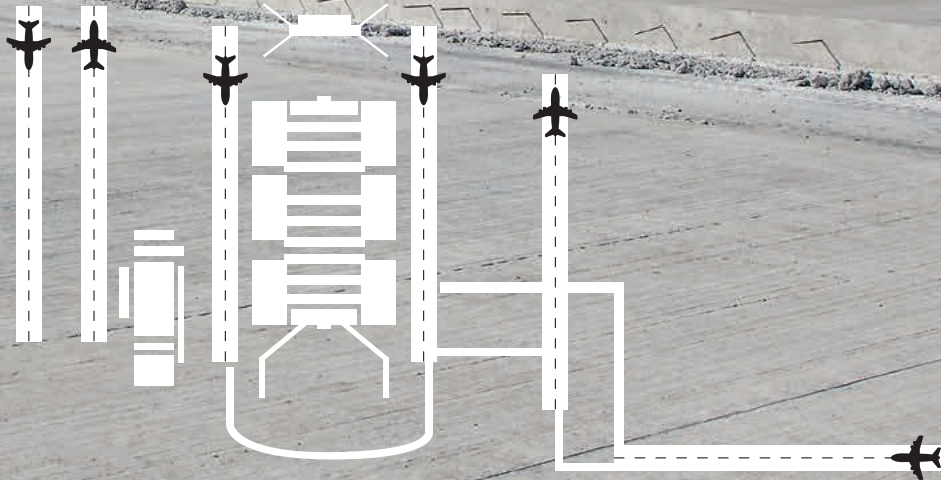
Asphalt paving:

- 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.



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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 İnsaat construction company, a contractor in the İGA consortium

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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 1,680t 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 40ft), 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 pneumatic-tyre 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. A total of 3 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 3 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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Premier launch at

M&T EXPO 

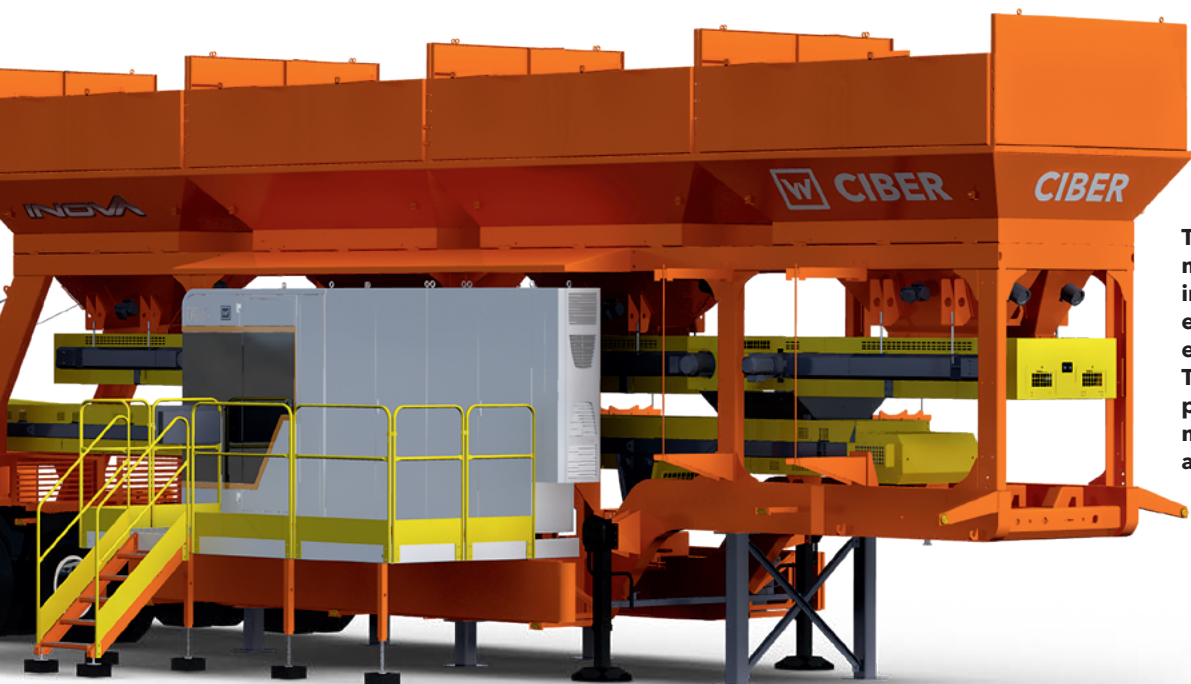
PART OF **bauma** NETWORK

CIBER Street I, no. 500



New CIBER iNOVA Series:

**Mobile
Unique
Innovative**



The new line underwent more than two years of testing before market launch to ensure the perfection of the equipment's functionalities. The iNOVA 2000, the first plant of the series to be manufactured, is already available in three continents.

This June, CIBER will be presenting their entire new iNOVA series of asphalt plants at the M&T Expo in São Paulo.

With maximum production ranging from 100 to 200t per hour, the new line is perfect for all types of jobs, from small job sites to large ones in which high daily production is a requirement. In terms of their concept and technology, the 4 models of the series feature basically the same highlights, in line with CIBER's usual practice of always making equipment with a high added value available to the market. >>>

Technical data of the iNOVA Series

- › The new series features five key highlights in the form of simple logistics, low-cost transportation, technologies to reduce fuel consumption and to support the production of different types of mixtures while maintaining constant quality and productivity. Sophisticated and perfectly coordinated electronic systems and simple and intuitive operation with a low level of maintenance deliver strength, reliability and safety during operation. The five highlights are described below.



iNOVA 1000**50t/h - 100t/h**

Number of mobile units: 1

iNOVA 1500**75t/h - 150t/h**

Number of mobile units: 1

iNOVA 1502**75t/h - 150t/h**

Number of mobile units: 2

iNOVA 2000**100t/h - 200t/h**

Number of mobile units: 2

High production capacity with fewer mobile units

CIBER are internationally recognized for their mobile plants, mounted on semi-trailer trucks. The equipment can be transported from the factory to the job site or from one job site to another by simply connecting the kingpin of the plant's semi-trailer to a truck. With the new iNOVA series, the concept of mobility has been taken to the extreme. The plants feature one or two mobile units, depending on the model, resulting in an excellent relation between production and the number of mobile units. The advantage of a highly productive compact plant lies in the low cost of transportation (by land or sea) and installation, in addition to the increased flexibility of installation in confined spaces.



Compact



Innovative



Easy



Best Mix



Reliable

Operation from 50% of maximum production for more flexibility

Another important characteristic is the broad production range of the plants in this line. They can operate at 50% of the maximum production rate without compromising on the quality of the mix or incurring increased production costs. In consequence, production can be adapted very flexibly to the logistics available during the process (amount and size of the dump trucks and speed of application). When producing at up to 50% below the nominal rate, the quality is kept constant, thanks mainly to the new technologies used in the burner, drying drum and mixer. >>>



CIBER have developed their own Total Air Burner which automatically controls the air and fuel flow ratio, guaranteeing a high combustion rate.



Up and running quickly and easily: plants in the iNOVA Series comprise one or two mobile units.

Efficient fuel consumption

The production costs of asphalt mixes are directly related to the profitability of the manufacturer producing the mix in the plant: in other words, CIBER's customer. The cost of fuel plays a very significant role, since it usually represents the third-largest cost factor (following the cost of asphalt cement and aggregates). Mindful of the impact of fuel on our customers' business, CIBER have invested in technologies that aim to minimize fuel consumption. Among the technologies implemented in the new line, some of the highlights are the thermal insulation of the drying drum, the new Total Air Burner in a closed loop and the smart heat exchange system.

Total Air Burner in a closed loop

The new technology of CIBER burners accurately and automatically controls the optimum air-to-fuel ratio required for combustion. With this technology, all the air for combustion is mechanically supplied by the plant (without ambient air intake) by means of two fans (a blower and an axial fan). Known as Total Air, this burner works in a closed loop, operating automatically and constantly, with an intense flame, always maintaining the ideal asphalt mix temperature set by the operator.

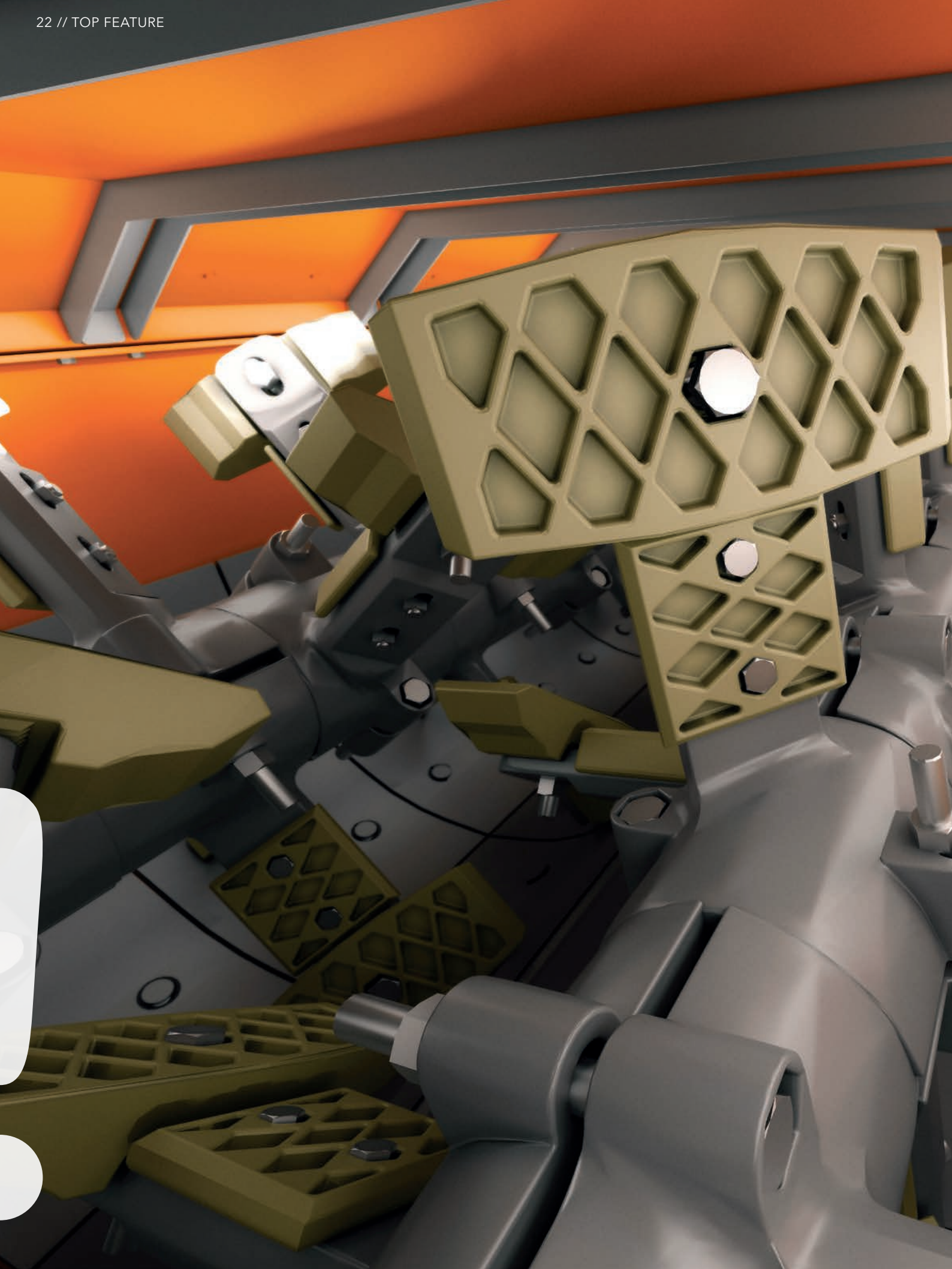


Intelligent heat exchange

For the aggregates to make maximum use of the thermal energy produced by the plant's burner (the flame and the combustion gases), they must be dry and heated to ensure that they adhere to the asphalt binder in the mixing process. Thermal energy is maintained at a constant level. As a result, the more energy the aggregates receive while in the drying drum, the lower the temperature of the downstream gases. The reverse is also true: the higher the temperature of the gases downstream of the dryer, the less energy the aggregates have received from the heat source. It is also known that the temperature of the gases in the bag filter (downstream of the dryer) should be greater than or equal to 100°C to avoid condensation of the water in the filter box and impairment of the combustion process, increasing maintenance requirements. When the temperature of the gases in the filter is equal to 100°C, we therefore have the best heat exchange possible between the aggregates and the heat source, as well as an appropriate temperature inside the filter.

Automatic temperature control reduces fuel consumption

Based on this principle, the latest generation of CIBER plants can automatically control the temperature of the gases in the bag filter by varying the speed of rotation of the dryer, ensuring a perfect thermal exchange regardless of the characteristics of the aggregates and the mix. This minimizes fuel consumption to the greatest possible extent for each specific condition. In addition, the flow of gases sucked in by the exhaustor is automatically varied by a speed variator coupled to the engine. The flow through the exhaustor is therefore always in line with demand for an excellent combustion quality and reduced electric power consumption. »»





View into the dryer drum:
automatic control of
the process time ensures
homogeneous mixes.

High performance in special mixes

The growing increase in the loads to which highways are subjected calls for the development of asphalt mixes adapted to this new reality. The academic community and asphalt mix producers have hence been creating and applying special asphalt mixes, often using special input materials. In this context, the asphalt plant must be able to produce any type of mix, from conventional dense mixes to discontinuous mixes with modified asphalt, with the same quality and productivity.

To this end, CIBER created the dry mix system in a continuous flow mixer. It allows the aggregates (coarse aggregates coming from the dryer, reused fines from the bag filter, external filler and fibres) to be homogenized before injection of the asphalt binder. This is important to maintain a constant thickness of the asphalt film on the surface of the aggregates in order to ensure the quality of the mix. This technology plays a decisive role in the production of SMA-type mixes that require cellulose fibres. These fibres should be thoroughly homogenized in the dry aggregates in order to avoid segregation of the mix.

Intelligent mixing process for high quality

Another technology applied exclusively in the iNOVA line is the automatic control of the mixing time for the aggregates and asphalt binder. It is known that the adhesion capacity between these materials depends mainly on the characteristics of the aggregates (mainly the quantity and type of clay-minerals present) and these characteristics vary significantly depending on the origin and processes of formation of the aggregates. Adjusting the mixing time to meet actual requirements is essential to the production of homogeneous mixtures, regardless of the characteristics of the materials and design. »»

Ease of operation

The automation systems installed in CIBER asphalt plants have long been unique. These include, for instance, an industrial computer which can withstand the harsh conditions prevailing on the job site, a touch screen operating interface and a digital data transmission system, among other technologies. All these technologies aim to ensure constant production controlled by the operator. When developing the new line, the focus was on retaining all of the technology that was already established on the market, while advancing machine/operator interaction and increasing the level of plant automation.

Optimized maintenance

The technological development aimed at boosting the performance of the equipment while reducing corrective maintenance. With this line, CIBER have invested on two fronts: firstly, on the development of systems and parts more resistant to abrasion and secondly on the machine's capacity to predict failures. Mechanical systems that sustain greater wear, such as the mixer, were redesigned. The new design of the mixer and the interaction with the paddles reduced the wear of this component. The geometry of some components, such as the mixer paddles, also evolved. The "honey comb" design of the new paddles generates a coating of asphalt mix that protects the steel, reducing wear. Lastly, materials that are highly resistant to wear (heavy duty) were used. Previously established systems, such as the EasySpin tool for quick exchange of the sleeves, also reduce maintenance time.

The system for diagnosing failures monitors all plant components during production. Parameters such as the power consumption of all engines are monitored and the operator is alerted to any data that deviates from ideal operating conditions. By these means, preventive maintenance eliminates the need for corrective maintenance. Meanwhile, in the event of any specific failures, the system maps the problem and allows for a faster solution. ///





Inspired by smart phones: EasyControl®

In terms of the operating interface, CIBER have developed a system called EasyControl®. Modelled on smart phones, this system supports extremely intuitive operation, with minimal intervention by the operator, standardizing production parameters for ideal conditions. Operation is now 100% automatic. These plants are designed to operate in much the same way as an aircraft, in which a pilot inputs flight data and the aircraft operates practically autonomously without pilot intervention. To operate the plant, the operator should input the relevant data for production (formula, aggregate humidity, temperature of the mix and filter gases) and press play. The equipment will activate the engines smoothly thanks to the frequency inverters and soft starter, and wait for the signal to begin production. The operator pushes a button to start production and the plant will operate fully automatically, controlling and maintaining the target temperature by automatically controlling flame intensity, the rotational speed of the dryer and the mixing time, among other parameters.



**High-tech, with a user-friendly structure:
the operation of iNOVA plants is intuitive
and convenient.**



"The iNOVA 2000 speeds up production times and ensures fuel efficiency."

A mobile asphalt plant from CIBER Equipamentos Rodoviários was used in the construction of important highways in the country's foremost economic region.



Mexico // State of Mexico

Mexico projects an annual production of six million vehicles by 2022, more than half of which will be exported. Currently the country is among the ten largest car producers in the world and among the five largest exporters. The Mexican automotive industry accounts for more than 6% of the country's gross domestic product (GDP) and for 25% of its exports. The main car makers of several automobile brands are focussed in the central region of the country, between the cities of Puebla and Toluca, capital of the State of Mexico, which is 67km from Mexico City, the nation's capital. Due to the industrial and economic importance of the region, the Toluca-Naucalpan Highway has been under construction in the State of Mexico since 2014; it connects five municipalities: Toluca, Lerma, Xonacatlán, Huixquilucan and Naucalpan.



Contractor MAAC is building the Toluca-Naucalpan Highway

The highway has been dubbed the “Green Road” because of the benefits it is expected to bring to surrounding areas in terms of environmental sustainability. Budgeted at a total investment volume of US\$ 268,000,000, the work is being carried out by the company Mezcla Asfáltica de Alta Calidad, S.A. de C.V. (MAAC), with completion scheduled for 2018. MAAC is a company of GRUPO HIGA, founded in 1999 by the engineer Juan Armando Hinojosa Cantú and headquartered in the city of Toluca. The company represents the benchmark in the production of asphalt material within the quality standards and specifications recommended and required by the regulations of the Federal Communications and Transport Department and the international entities of the sector.

Four lanes for 30,000 vehicles per day

The construction project on the Toluca-Naucalpan Highway was commissioned by the Autopistas de Vanguardia S.A. de C.V., a concessionaire that manages the Toluca-Naucalpan Highway. The works are scheduled for completion this year and comprise the construction of the A4 highway with two lanes in each direction, a total length of 39km and an expected capacity of 30 thousand vehicles per day. The construction of the highway will bring social and economic advantages to the region, channelling vehicles from the northern and western regions of the Metropolitan Zone of the Valley of Mexico to the city of Toluca in the near future. Vehicles from these regions currently travel on the Chamapa-Lechería Highway, which operates with a low traffic volume during peak hours. The highway will also have a key impact on the development of the central-eastern region of the state, creating a link with the International Airport of Toluca. »»

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The flexibility of the equipment and the ability to adapt to the evolutionary needs and stages of the project; as well as ease of use and transfer speed make it easy to complete the works.

**Alberto Luthe, General Director
Mezcla Asfáltica de Alta Calidad, S.A. de C.V. (MAAC)**

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iNOVA 2000 is the mobile asphalt plant of choice

MAAC chose the iNOVA 2000 due to the great versatility the plant offers at the large production volume required by the project, in addition to the quality and speed of the processes. With maximum production ranging from 100 to 200t per hour, the new iNOVA 2000 line is perfect for all types of jobs, from small job sites to large ones where daily production is a requirement. General Director of MAAC, Alberto Luthe, says that the iNOVA 2000 is “a thorough plant and all of its components are automated, speeding up production times, reducing execution times and the duration of work and ensuring fuel efficiency.” What is more, the WIRTGEN GROUP team is always available to solve any problem or concerns that might arise, be it for customer services or support, spare parts or training.

High quantity and quality

The iNOVA 2000, the first plant to be manufactured in the series, is already available in three continents. CIBER Equipamentos Rodoviários carried out more than two years of testing before marketing the product in order to guarantee the perfection of the equipment’s functionalities. Alberto Luthe says that the mobile installation of iNOVA 2000 facilitates the use of the equipment for jobs carried out by the company: “The flexibility of the equipment and the ability to adapt to the evolutionary needs and stages of the project; as well as ease of use and transfer speed make it easy to complete the works.” These new technologies ensure the productivity of the asphalt plant, regardless of input materials and projects involved, meeting quality requirements in line with the parameters specified for the project.



Close partnership with the WIRTGEN GROUP

General Director of MAAC, Alberto Luthe, also says “The WIRTGEN GROUP team is on hand throughout our material crushing process as well as during asphalt plant production and application. Our product is far superior to that on offer from competing plants on the market. Meanwhile, the efficient operation of our equipment ensures a fast and simple logistic cycle for the provision of material, saving costly time for customers and carriers alike. These advantages put us in a position to accomplish the main goals we have as a company.” MAAC is using the following WIRTGEN GROUP equipment for its projects: 3 VÖGELE paver models (SUPER 1800-3 SprayJet, SUPER 1800-2 SprayJet, SUPER 1300-3); 2 HAMM compactors (HD 90, GRW 280); 1 WIRTGEN large milling machine W 210 and 3 KLEEMANN crusher models: (MC 110 Z EVO, MS 19 D). ///



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All of the components of the iNOVA 2000 are automated, speeding up production times, reducing execution times and the duration of work and ensuring fuel efficiency.

**Alberto Luthe, General Director
Mezcla Asfáltica de Alta Calidad, S.A. de C.V. (MAAC)**

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Australia

Hazelmere

Canberra



Mobile solution eliminates long trips

Catering to jobs across remote Western Australia, BGC Asphalt needed a high-production and versatile mobile asphalt plant, and the WIRTGEN GROUP's CIBER iNOVA 2000 delivered.

Australia // Hazelmere

In late 2016, BGC Asphalt introduced a mobile batch mix plant to its fleet, but nearly a year later and with an array of regional projects in the pipeline, the businesses needed another mobile plant to meet demand. Securing a contract at Busselton Airport, about 250km from Perth and another remote airport project for BHP in Newman soon after, the Western Australia-based firm needed to complement its existing mobile asphalt plant with a high-capacity set-up. "Because we were expecting to take on that extra airport project, and we're doing projects in remote locations, that drives our requirement for extra plant and resources," explains Craig Hollingsworth, General Manager - BGC Asphalt & Quarries. "We wanted an extremely mobile, highly productive and unique plant in a short timeframe, and the WIRTGEN GROUP was the only one that could deliver," he says.



"The ideal fit": Investment in the new iNOVA 2000

The business engaged with the WIRTGEN GROUP in regards to its CIBER range of asphalt plants. "We didn't know CIBER too well before the WIRTGEN GROUP took over, but once they did and applied their ethos with regards to manufacturing, we believe it improved the quality of the product," Mr Hollingsworth says. CIBER Equipamentos Rodoviários - or CIBER - part of the WIRTGEN GROUP, which incorporates the WIRTGEN, VÖGELE, HAMM, KLEEMANN and BENNINGHOVEN product brands, specializes in asphalt plants for Latin America, Africa, Australia and New Zealand. In 2015, it launched its CIBER iNOVA 2000 mobile asphalt plant, which BGC Asphalt identified as the best fit for its operations. The CIBER iNOVA 2000 plant provides a high-production capability in just two mobile units, helping to minimize transportation and installation costs while also maximizing production output. These production benefits, given its mobility and adaptability for remote jobs, made the CIBER iNOVA 2000 the ideal fit for BGC Asphalt.

Production output of 200t/h

"It's designed to work in remote locations like Busselton so it doesn't need to be highly sophisticated in terms of asphalt design. It's able to produce what mixes we need, such polymer-modified bitumen or special bitumen mixes that we require out in those remote locations. It means we could supply a large range of asphalt to every point in Australia if we wanted." While opting for the basic equipment set-up with an additional storage silo, Mr Hollingsworth asserts that the beauty of the CIBER iNOVA 2000 lies in its significant production capability. >>>



Servicing and maintenance made simple

"One of the most important things with the iNOVA is that our guys can set it up in two to three days. That's not wondrous in itself, but this has got an output of 200t per hour," he says. "If we can take this plant 1500km away from Perth and produce 200t per hour after a two-day set-up, that's quite wondrous." Mr Hollingsworth says the plant is ideal for Western Australia, and ticks all the boxes for the business in regards to completing jobs in remote locations – something that is a significant bonus for the Perth-based business. "When we go out to these remote locations up to 1500km outside of Perth, we need to be entirely self-sufficient. It's meeting all our requirements, and it's so simple that if something does go wrong, we don't need to fly out a technician from Germany – we can fix it ourselves."

Perfect teamwork with the WIRTGEN GROUP

For the Hazelmere-based business, the added bonus of the CIBER iNOVA 2000 and it coming under the WIRTGEN GROUP brand is that the manufacturer's main workshop is just one suburb over in South Guildford. "That's the icing on the cake – the workshop and technicians are right there and we know they'll always have an abundance of spare parts on hand," Mr Hollingsworth says, adding that the WIRTGEN GROUP's spare parts service is second to none. The WIRTGEN GROUP in Australia worked closely with BGC and the factory engineering team to ensure the iNOVA 2000 met all of the compliance requirements prior to being fully commissioned. The WIRTGEN GROUP's local support team, led by in-house engineer Ash Johnson, were able to ensure a smooth programme of engineering modifications that were completed on time. He adds that the after-sales support from the WIRTGEN GROUP team has been fantastic, and the company's experience with WIRTGEN GROUP machines in general, has been an extremely positive one. BGC Asphalt's current fleet includes the CIBER iNOVA plant, a WIRTGEN W 35 Ri small milling machine, a VÖGELE SUPER 1303-3 road paver, an HD 14 TT pneumatic-tyre roller and 2 HD 14 VO tandem vibratory and oscillation rollers from HAMM. "Our operators tell us how safe and efficient the WIRTGEN GROUP machinery is to use, but also how easy the equipment is to run. Ease of use is something we hear quite often, not just from our own operators, but from others in the industry." ///

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The CIBER iNOVA 2000: The ideal fit for BGC Asphalt.

Craig Hollingsworth, General Manager
BGC Asphalt & Quarries
BGC Australia PTY Ltd.





Brazil

iNOVA 2000 asphalt plants: High quality and production in Central-West Brazil

The iNOVA 2000 line from CIBER Equipamentos Rodoviários brings innovation and high production capacity to asphalt plants.





Brazil // Goiânia

NG Asfaltos e Engenharia Ltda., founded in 2007 by the company's director and engineer, Geraldo Teixeira de Oliveira, has a strong presence in the Central-West region of Brazil. Headquartered in Goiânia and operating subsidiaries in the cities of Aparecida de Goiânia and Anápolis in the state of Goiás, and Cuiabá in the state of Mato Grosso, the company operates in the field of paving services, producing asphalt for infrastructure

works. NG Asfaltos has the iNOVA 2000, 2 iNOVA 1200, 01 UACF 17 P2 and the UA-2 120/140, all of them currently operating in the states of Goiás and Mato Grosso on the following job sites: iNOVA 2000 on job sites in the region of Goiânia, iNOVA 1200 in the region of Cuiabá, Advanced P1 in the region of Anápolis, Advanced P2 and UA-2 in the region of Caldas Novas. >>>

1,500

Speaking of the supply of the iNOVA 2000 plant, he highlights the timely delivery, daily monitoring, full-time technical assistance and final adjustment by Ciber Equipamentos Rodoviários - factors which enabled the equipment to be used to maximum effect.



New iNOVA 2000 is a key success factor

According to Geraldo Teixeira, the company chose the WIRTGEN GROUP asphalt plants "given their quality and production, which are perfectly tailored to the market in the region, in addition to the quality, production and service of CIBER Equipamentos Rodoviários." The Director of NG sees the capacity for high production with great performance and quality as the main advantage of the iNOVA 2000 plant in relation to the other models. The iNOVA 2000 plant went into operation in 2016, producing asphalt mixes ranging from conventional dense mix to SMA mixes with rubber asphalt, offering a high degree of technological control. The production forecast for 2018 lies between 100 and 150 thousand t.

Over 1,500t per work shift

The iNOVA 2000 asphalt plant works continuously, supporting NG Asfaltos in its contracts and works and producing asphalt for the regional market for road asphalt and urban mesh maintenance. The company director, who is also the engineer, checks up on the works. He reports that the iNOVA 2000 plant achieved an excellent yield and made production gains during the day, reducing the time required for execution of the work and producing up to 1,500t per work shift. Geraldo Teixeira also reports that operators have praised the easy handling and comprehensibility of the equipment and its individual controls. The plant features the full set of individual and mechanical controls, facilitating operation of the plant. He also points out that the wear materials of the iNOVA 2000 plant are of high durability, for improved maintenance features.

Ot

of asphalt per work shift



Other WIRTGEN GROUP technologies used

In addition to CIBER plants, NG Asfaltos e Engenharia has other equipment from the companies in the WIRTGEN GROUP, such as WIRTGEN W 100 small milling machines and its HAMM roller, which are being used in projects for regional dealerships and condominiums carried out by the company. Geraldo Teixeira de Oliveira says that the delivery of WIRTGEN GROUP equipment was within the stipulated deadlines and that each piece of equipment is excellent in quality and cost-benefit for the development of the company's works. ///



Brazil

Brasília

São Paulo

Santos

W 200 rehabilitates Brazil's congested road network



Job for a W 200 in the Brazilian uplands: with precision milling results and flexible deployment options, the WIRTGEN large milling machine put in a convincing performance in the rehabilitation of two main traffic arteries between São Paulo and Brazil's largest port.

Brazil // São Paulo

The Anchieta-Imigrantes motorway system is the main link between the metropolitan region of São Paulo and the port of Santos, the largest port in Brazil and the busiest in Latin America. Construction of the Anchieta motorway began in 1947, with Imigrantes following at the start of the 1970s. Today the Anchieta handles mainly heavy goods traffic - 95% of its daily traffic consists of trucks - while cars predominantly use the Imigrantes. Now the two motorways are being rehabilitated over a total length of 300km. The removal of the surface and binder course was handled by a WIRTGEN large milling machine of type W 200. »»

**Job site details**

Removing the surface and binder course of the Anchieta-Imigrantes motorway system between São Paulo and the port of Santos, Brazil

Length of section: 65km (approx.)

Working parameters

Milling depth: 8-28cm
Milling width: 2 x 2m

Equipment

WIRTGEN W 200 cold milling machine

Machine parameters

Milling width: 2,000mm
Milling depth: 0-330mm
Engine rated output: 410kW (558PS)



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**We use the WIRTGEN W 200
because it is extremely economical
and can be deployed flexibly.**

**Jorge Luis Dos Santos, Production Coordinator
CR Almeida Group**

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Precise and economic milling

The high proportion of heavy-goods vehicles and the significant traffic density place enormous strain on the asphalt surfaces, making regular maintenance vital. The contract for the current job was won by the Baixada Santista Consortium. The construction company worked alternately on both roads - northbound and southbound. While the W 200 milled the Anchieta motorway, which was closed completely, traffic was diverted to the Imigrantes motorway. »»



Site Manager Cleiton Farias de Jesus also appreciates the eco-friendly technologies of the W 200. They play a key role in ensuring that his company meets the ISO 14001 environmental management standard.

WIRTGEN highlights W 200 large milling machine

- › Proven machine concept for efficient milling operations
- › Ergonomically designed, walk-through operator's platform and intuitive operating concept for high daily production rates
- › Wide range of applications from surface course rehabilitation through complete pavement removal to fine milling jobs
- › High performance capability on both large and confined sites
- › Compact dimensions and low weight for high flexibility in use



Milling rate up

For this mammoth project CR Almeida is using the efficient W 200 large milling machine, which runs in continuous operation 24 hours a day during the rehabilitation work. This is where the powerhouse can really put its enormous capabilities to the test. That's because the W 200, with its powerful engine delivering a maximum power of 410kW, is specially configured for high area outputs – whether on large sites or in confined spaces. The manoeuvrability of the large milling machine particularly proves its worth in the very narrow defiles that snake their way through the Brazilian uplands 40km south of São Paulo, so that the W 200 was able to mill both road surfaces over a width of 2m and to a depth of 8cm rapidly and precisely in one operation.

Operating costs down

Milling machine operator Janderson de Souza Mota emphasises the ease of handling offered by the WIDRIVE machine control system, which links the most important machine functions together: "While the engine, for instance, sets the operating speed automatically when the milling process is started, it automatically returns to its idling speed when milling is finished. This allows us to reduce not only fuel consumption but also noise emissions." What is more, the water required for cooling the cutting tools is regulated as a function of the engine load and milling speed. The load-dependent sprinkler unit allows a water saving of up to 20%. "For me that means I need to fill up less water, but the service life of the cutting tools is still longer," says a delighted De Jesus of the much lower downtimes.



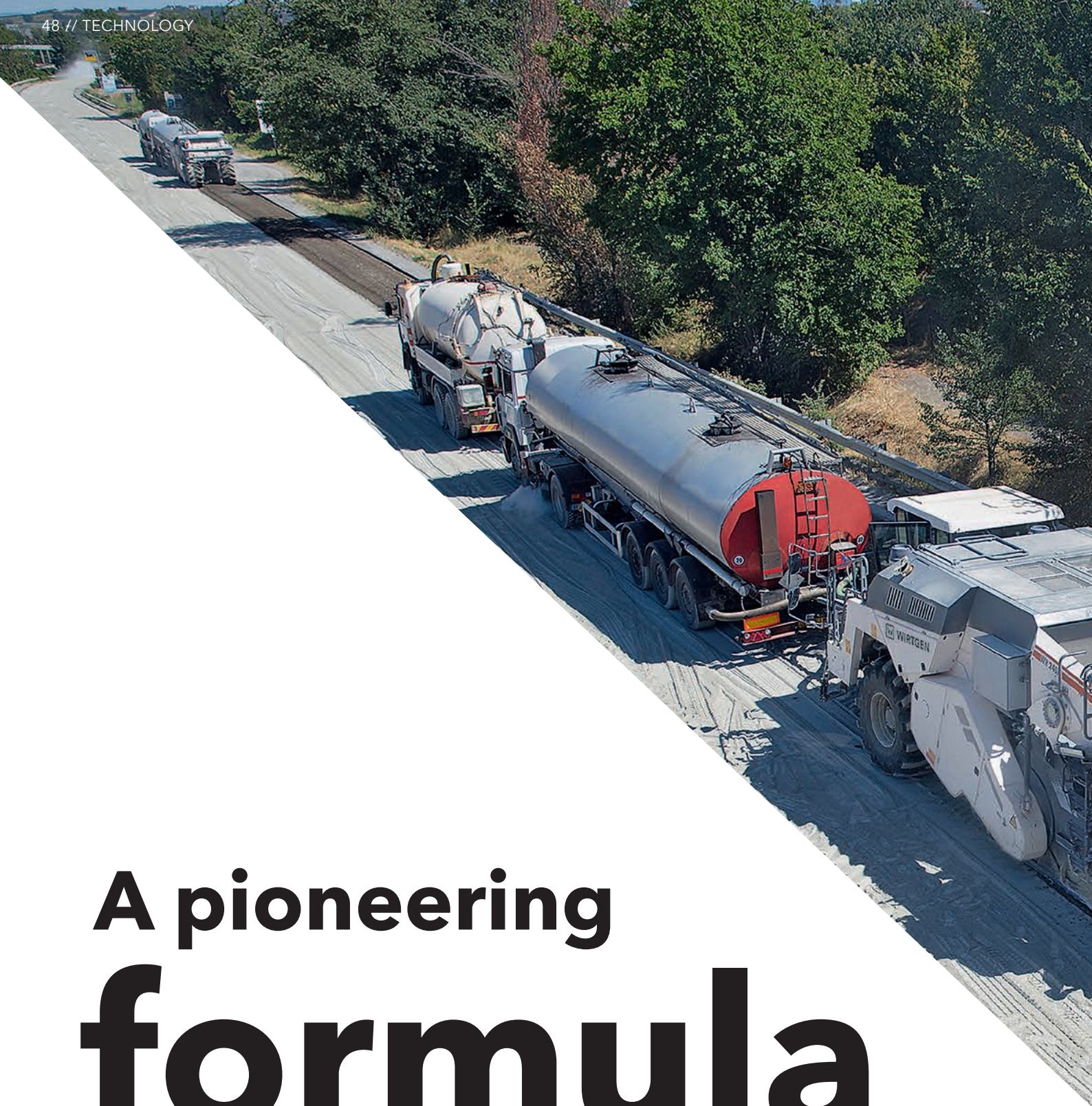
The variable tare weight and additional weights that can be added as required allow the W 200 to be carried even on vehicles with a low maximum permitted payload.

Transport made easy

With the milling work on the Anchieta motorway having been completed faster than anticipated that day, the W 200 even made up time before it was to begin its scheduled night-time job on the Imigrantes motorway. So, without hesitation, Cleiton Farias de Jesus and his team stopped at Cubatao, just a few kilometres away, in order to mill a strip a few hundred metres long over a working width of 2m, but this time to a depth of 28cm. "The site is on the way, and the fact that we can load and unload the W 200 quickly and easily enabled us to fit this little job in today." The folding loading belt, for instance, shortens the transport length of the large milling machine,

so that it can be transported even on light low-bed trucks with a low overall weight. The weather canopy can also be folded in hydraulically for onward transport. Site Manager Cleiton Farias de Jesus says: "Ease of transport is a decisive criterion and makes the logistics a whole lot easier. This way, we can move quickly from one job to the next and always make optimum use of the W 200's capacity." ///





A pioneering formula

Cold recycling with foamed bitumen: resource-saving technologies are more in demand than ever before. The WIRTGEN cold recycling process has been proving its credentials for many years - and already meets the demands of tomorrow.



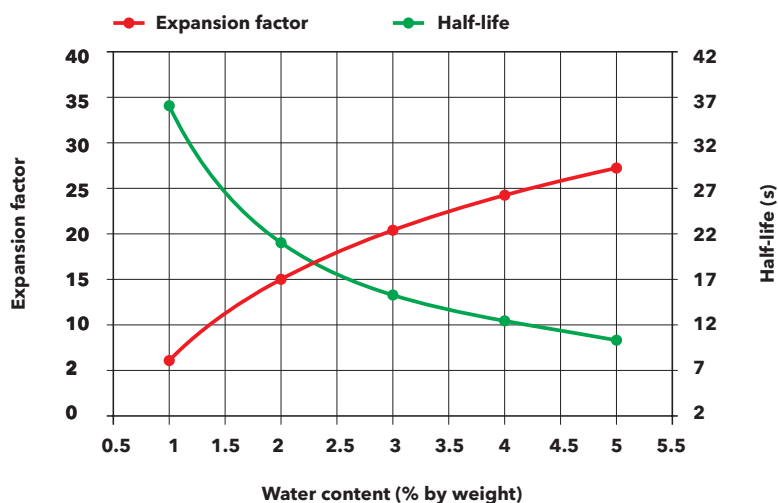
With foamed bitumen, it is possible to pave high-quality base courses cost-effectively using cold mix.



What is foamed bitumen and how is it made?

Foamed bitumen is produced by injecting small quantities of water and air into hot bitumen under high pressure. The water evaporates and makes the bitumen foam up rapidly to between 15 and 20 times its original volume. The foam is then injected into a mixer through injection nozzles and optimally mixed into cold and moist construction materials.

The quality of the foamed bitumen is primarily described in terms of the parameters "expansion ratio" and "half-life". The greater the expansion ratio and half-life, the more easily the foamed bitumen can be processed.



Curves showing half-life and expansion ratio for determining the water content



The foaming process takes place in expansion chambers, where air and water is injected at a pressure of 5 bar into bitumen that has been heated to a temperature of 160 to 180°C.

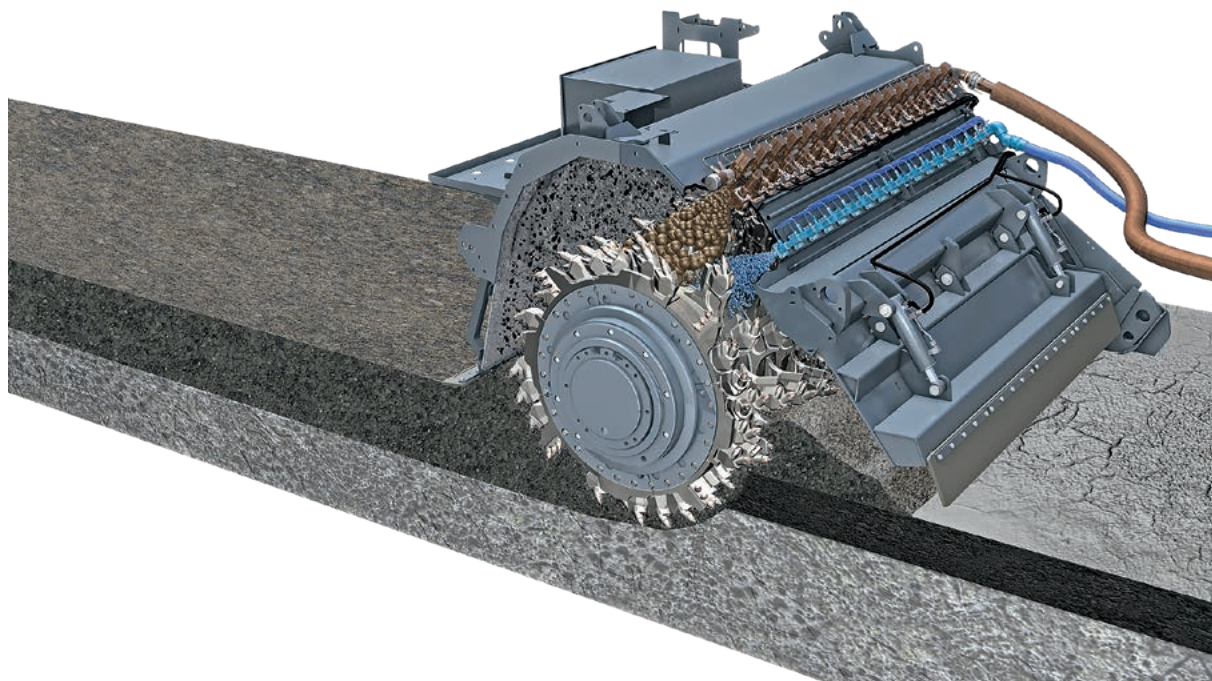


Roads that are subjected to continuous and heavy traffic often show signs of damage that extend down to the roadbase. To eliminate this damage, the entire road needs structural rehabilitation. Full re-use of the milled material as well as its cost-effective treatment make cold recycling with foamed bitumen – a process pioneered and decisively shaped by WIRTGEN over the past 30 years – environmentally friendly and economical.

Asphalt road rehabilitation with a moving job site

Cold recycling with foamed bitumen as a binding agent is a globally established process that is attracting increasing interest from road construction authorities and construction companies for asphalt road rehabilitation. It permits the paving of flexible and durable base layers. As part of the pavement structure, these form the perfect foundation for the final, thinner asphalt surfacing. State-of-the-art technology is used to produce foamed bitumen from normal bitumen which has been heated to approximately 175°C. With the in-situ method, a precisely dosed quantity of binding agent is added to mineral aggregate inside the WIRTGEN 2200 CR or 3800 CR cold recycler or the soil stabilizers of the WR series, using microprocessor-controlled injection systems. The project can hence be carried out as a moving job site. »»

Addition of foamed bitumen and water to mineral aggregate by means of separate injection systems.



Ancillary cold recycling equipment from WIRTGEN



Both in specialist laboratories for road construction and in research facilities: the WIRTGEN laboratory equipment provides all experts in the field, be they contractors or consultants, with optimum support for cold recycling applications using foamed bitumen.

New WLW 1 laboratory compactor

WIRTGEN developed the new WLW 1 laboratory compactor for the production of test specimens. Developed especially for cold recycling applications, the compaction process permits the production of large test specimens for carrying out triaxial tests as well as small test specimens for indirect tensile strength testing.

WLM 30 laboratory-scale mixer

The WLM 30 laboratory-scale mixer defines the best mix composition and reliably produces different mix formulas in a very short time. The WLM 30 holds some 30kg of material; mixer speed and mixing time are variable.

WLB 10 S laboratory foamed bitumen plant

The foamed bitumen quality can be accurately defined in preliminary tests in the WLB 10 S mobile foamed bitumen plant even before construction starts. With its simple operation, parameters such as the water volume, pressure and temperature can be varied.



Cold recycling on the rise

The cold recycling process has proven its worth around the world. In practical use, there are two different methods: an in-situ approach using wheeled or tracked WIRTGEN cold recyclers, and the in-plant method using the WIRTGEN KMA 220, a mobile cold recycling mixing plant. The methods allow a large number of materials to be recycled such as milled asphalt, crushed asphalt or new material. The application range for foamed bitumen is varied, and it can also withstand very high traffic loads, as two examples in Brazil and Greece show. >>>



For more information on WIRTGEN cold recycling technology, see: www.wirtgen.de/cold-recycling



The bitumen used for production of foamed bitumen is widely available around the world.



The WLB 10 S laboratory-scale foamed bitumen plant can be used to carry out series of tests to determine the foamed bitumen properties.



A key attribute of the WLM 30 twin-shaft compulsory mixer for batches of approximately 30kg is its high mixing intensity.



Depending on the test procedures, the WLV 1 produces test specimens of various heights. Their quality is then examined with the indirect tensile strength test.



Cold recycling with WIRTGEN: Applications expertise included

To achieve such results, extensive preliminary tests must be conducted on the entire pavement structure, while the mix produced with foamed bitumen must pass a rigorous mix design test. WIRTGEN not only supply the right equipment for the job – customers can also make use of their comprehensive range of advisory services

around the world at any time. For instance, WIRTGEN experts and road construction engineers provide on-site support and advice for customer projects. The WIRTGEN training programme also conveys in-depth applications know-how on the topic of cold recycling.

**Brazil:****Recycled material exceeds expectations**

The Ayrton Senna Highway in Sao Paulo is used by more than 250,000 vehicles every day, 15% of them lorries. During the rehabilitation project in 2011, milled material from the asphalt pavement was recycled with foamed bitumen in a WIRTGEN cold recycling mixing plant and repaved in two layers (20 plus 10cm) by a road paver. Then a 5cm-thick asphalt surfacing was laid.

Greece:**High load-bearing capacity for more than 10 years**

The cold recycling projects carried out with foamed bitumen back in 2003/2004 on the motorways between Iliki, Korinthos and Athens, Greece, have been demonstrating their strength for more than ten years, withstanding a high traffic volume of 40,000 vehicles per day including a 25% share of heavy vehicles. ///

Cold recycling: Advantages at a glance

- › Extreme durability of the layers
- › High cost-efficiency
- › Resource conservation through 100% recycling
- › Reduced CO₂ emissions
- › Reduced construction time

Quality through

A job site in South Africa has demonstrated that the VÖGELE MT 3000-2 Offset PowerFeeder improves pavement quality. Proof comes from the University of Twente, Netherlands, which monitored the project from a scientific perspective - and their equipment included RoadScan, the innovative temperature-measurement system from VÖGELE.



innovation

A phenomenal performance on South Africa's N14 national route near Johannesburg: the VÖGELE MT 3000-2 Offset PowerFeeder supplies a VÖGELE tracked paver of type SUPER 1800-2 with mix to ensure uninterrupted paving.





Job site details

Pavement rehabilitation on a section of the N14 national route near Johannesburg, South Africa

Length of section: 2 x 4km
Width of section: 10.6m

Working parameters

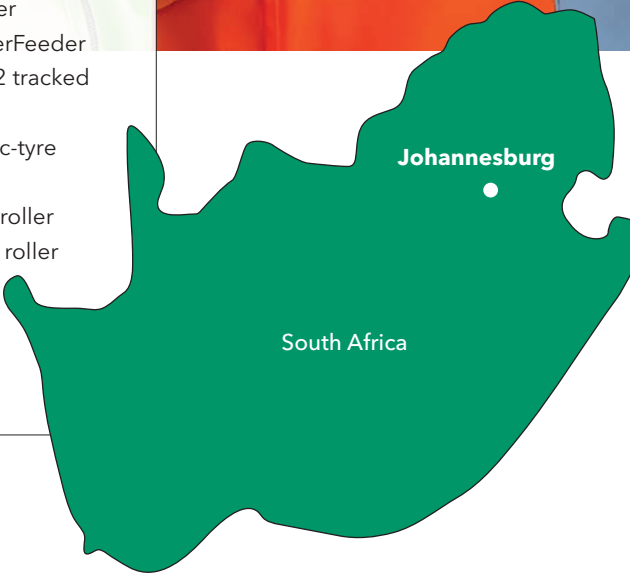
Pave width: 4m
Pave speed: 4-6m/min
Layer thickness
Surface course: 4cm

Material

Surface course: AE-2, comparable with asphaltic concrete (AC)

Equipment

- 1 VÖGELE material feeder
MT 3000-2 Offset PowerFeeder
- 1 VÖGELE SUPER 1800-2 tracked paver
- 2 HAMM GRW pneumatic-tyre rollers
- 1 HAMM HD 90 tandem roller
- 1 HAMM HW 90 tandem roller
- 1 WIRTGEN W 200 cold milling machine





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With the MT 3000-2 Offset, the temperature of the asphalt immediately after paving never fell below 120°C, which left a huge window of time for final compaction.

**Dr Seirgei Miller,
University of Twente**

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South Africa // Johannesburg

Organizing paving work so that it can proceed without interruption in order to enhance quality is one of the key reasons for using material feeders. And it's why in South Africa there is a strong focus on the decoupled transfer of mix from feed lorry to paver. Indeed, for major construction projects, SANRAL, the national roads agency, insists on the use of material feeders. An advanced VÖGELE MT 3000-2 Offset PowerFeeder with a VÖGELE SUPER 1800-2 paver was used for the rehabilitation of a 4km-long stretch of the N14 national route near Johannesburg by the South African construction company Power Construction (Pty) Ltd. On the job site, scientists

from the University of Twente investigated whether the innovative VÖGELE material feeder improved the quality of the paved binder and surface courses. One of the crucial factors was the temperature of the asphalt immediately after paving. The temperature was measured using two mutually independent systems, one of which was RoadScan, the non-contacting temperature-measurement system from VÖGELE. To provide a comparison, some sections were also completed without using a material feeder. »»

There are many different and compelling reasons for using material feeders – the first and foremost being quality and cost efficiency. It is hence in the interests of construction companies to opt for decoupled material transfer: while the road paver can focus entirely on paving, the material feeder handles the transfer of mix from the feed lorry, allowing both quality and productivity to be increased. The number of feed lorries and their waiting times can also be reduced, because material feeders buffer paving material, prolonging the window of time for continuous material supply. This, in a nutshell, is the theory. On the N14 job site, the aim was to see what impact the use of the VÖGELE material feeder had on pavement quality.

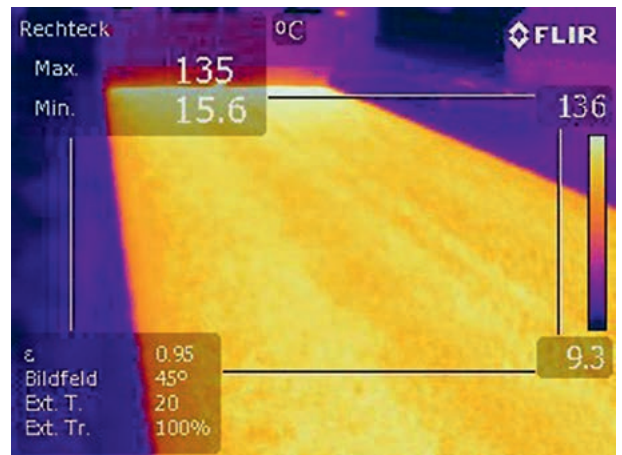
PowerFeeder ensures uninterrupted paving process

The MT 3000-2 Offset PowerFeeder features an intelligent material transport and storage concept with a total capacity of 43t. Lorries carrying 25t of mix can be unloaded within 60 seconds. That enabled paving on the job site located on the outskirts of Johannesburg to proceed without interruptions. This is of central importance to pavement quality, because interruptions cause a wide range of problems, the main one being the cooling of the mix and the associated reduction in compactability, not to mention the loss of time involved. Undesired side-effects such as these occurred on sections where the paving work was carried out without a material feeder for the purposes of comparison.

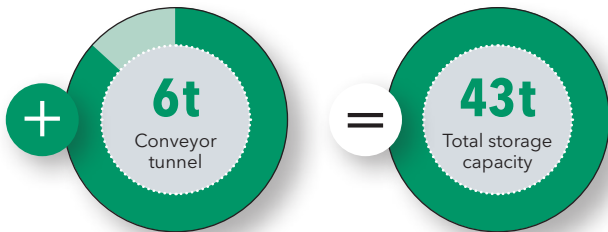


Homogenization of the mix temperature

The study by the University of Twente also revealed that the VÖGELE material feeder contributed to the homogeneity of the mix and hence improved pavement quality. In the VÖGELE MT 3000-2 Offset, conical augers in the receiving hopper ensure a uniform withdrawal of the mix from all areas of the receiving hopper and blending of the colder and warmer material. This reduces temperature fluctuations caused by transport. When combined with a trough-shaped conveyor, the VÖGELE design reliably prevents both mechanical and thermal segregation. »»



The MT 3000-2 Offset PowerFeeder improves pavement quality by ensuring good thermal homogenization of the mix.



Highlights of the VÖGELE MT 3000-2 Offset PowerFeeder

- › Uninterrupted paving thanks to a total storage capacity of 43t with a maximum conveying capacity of 1,200t/h
- › Non-contacting material transfer makes for maximum pavement quality
- › Homogenized material in the receiving hopper of the material feeder due to conical augers
- › Wide range of applications thanks to the pivoting and inclining conveyor
- › Reliable material transfer based on automatic distance control and collision protection
- › Optimum overview and safety thanks to the convenient and practical ErgoPlus operating concept



Animations on the machine technology explain more about the VÖGELE PowerFeeder generation
www.voegel.info/webspecial/powerfeeder

Exclusive solution from VÖGELE: Material feeder with innovative heating

One of the main advantages of the VÖGELE PowerFeeder over conventional paving is its integrated heating system. The powerful infrared heating with non-contacting panels over the conveyor is a solution offered only by VÖGELE. It actively counteracts the temperature drop that arises in the transport chain between the mix leaving the mixing plant and being compacted, vastly improving pavement quality. This, too, is demonstrated by the university study: it found that the VÖGELE material feeder constantly guaranteed a homogeneous heat distribution in the freshly laid asphalt pavement. In the N14 project, the asphalt temperature never fell below 120°C immediately after paving, which left a large window of time for final compaction by HAMM rollers.

Consistently high temperature from the first metre

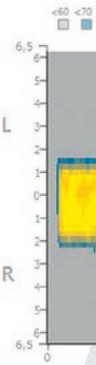
It is a key advantage in the field: the PowerFeeder reaches the high temperatures right at the start of paving – and requires no heating phase. This goes to show that VÖGELE's engineers were perfectly in tune with requirements and developed the PowerFeeder to meet the specific challenges of tough, day-to-day job-site operations.

Temperature measurement with RoadScan from VÖGELE

A homogeneous paving temperature is the foundation for uniform and even compaction. That is why the scientists from Twente recorded the temperature immediately after paving using two mutually independent measuring systems. One of these was attached directly to the hardtop of the SUPER 1800-2 paver, ensuring simple, convenient and reliable measurement: RoadScan from VÖGELE – an innovation first unveiled at Bauma 2016. A non-contacting temperature-measurement system, RoadScan allows paving teams to keep an eye on the temperature of the mix immediately after paving so that they can find appropriate solutions during the paving process, should the need for intervention arise. The thermoscan images are presented in real time on the colour display of the paver operator's ErgoPlus console. And, on completion of the construction project, contractors also have detailed evidence that the work was carried out within the correct temperature range – thanks to recorded GPS data including precise positioning. >>>

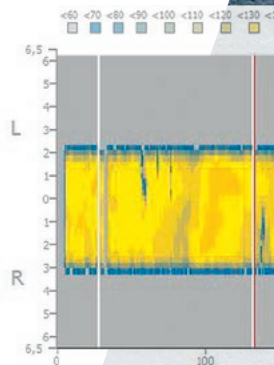
Paving without a material feeder:

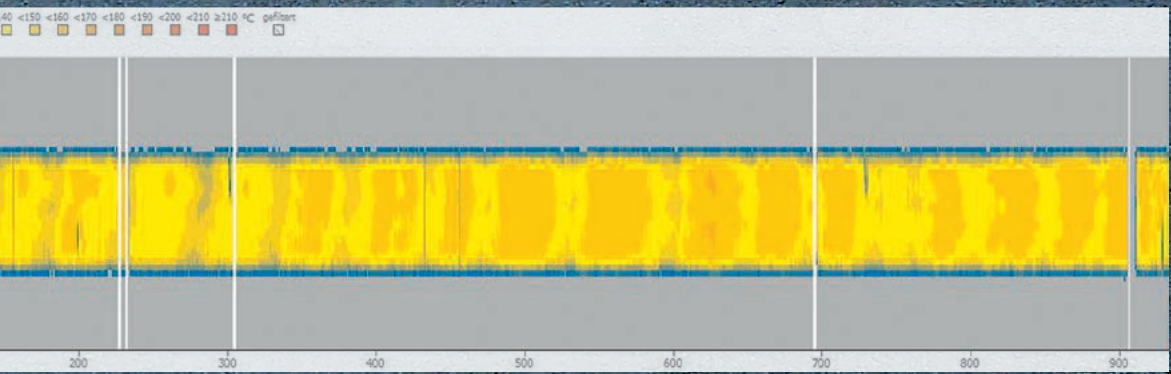
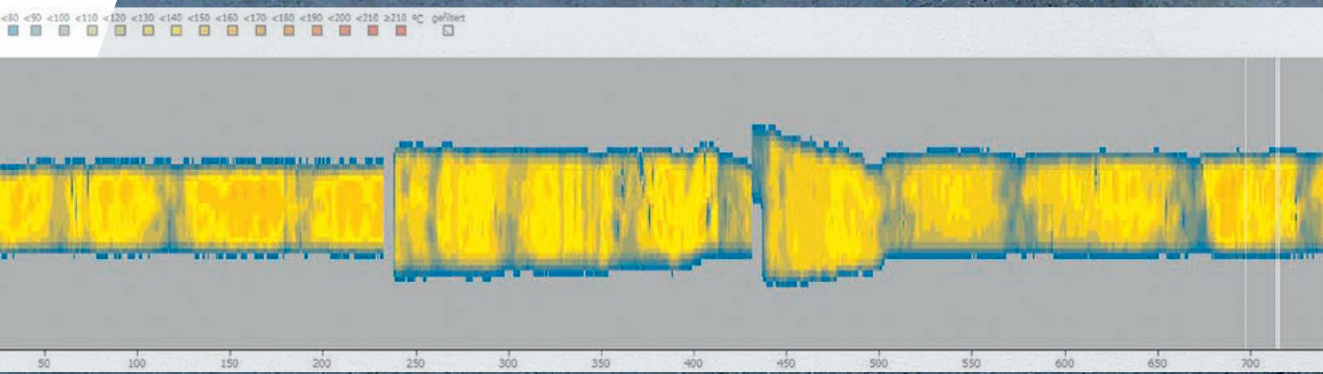
No continuous paving. On some of the test days, work on the N14 proceeded in the conventional manner. The result: a lot of stoppages in paving caused by the feed lorry – clearly identifiable by vertical blue lines and areas.



Paving with a material feeder:

Continuous paving, uniform temperature distribution. Thanks to its large storage capacity, the VÖGELE MT 3000-2 Offset PowerFeeder can prevent interruptions in paving, ensuring premium pavement quality, as the RoadScan thermoscan of the N14 proves. With the exception of the edges, almost no area is cooler than 120°C.





A milestone in pavement quality

The VÖGELE innovation RoadScan, a non-contacting temperature-measurement system, makes pavement quality verifiable.



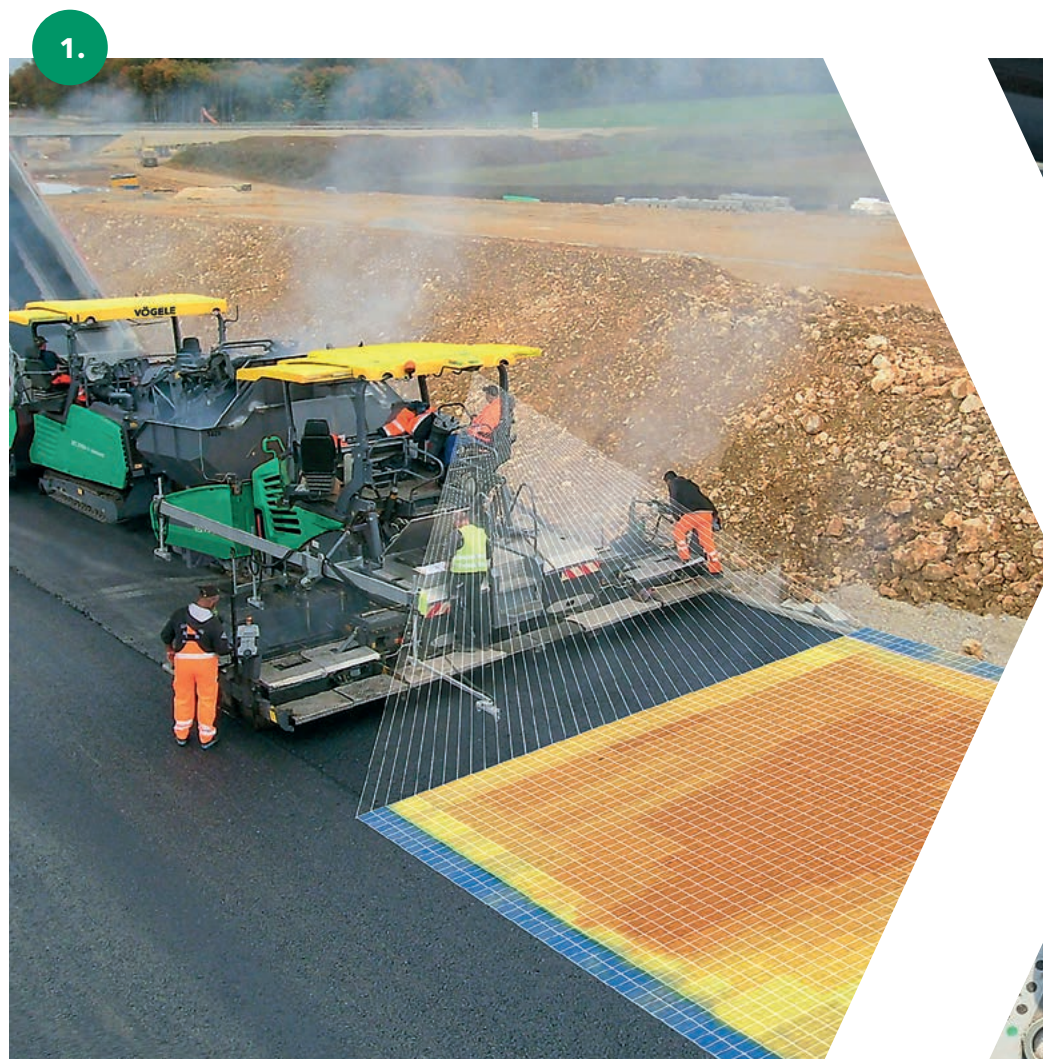


The highlights of VÖGELE RoadScan

- › Area-wide temperature measurement
- › Real-time display on the paver operator's ErgoPlus 3 console to help the paving team produce a high-quality asphalt pavement
- › Robust hardware without moving parts (e.g. infrared camera instead of a movable pyrometer)
- › Measuring unit easily mounted on the machine (job site)
- › No need to adjust the measuring unit on site (plug & play)
- › Integration in WITOS Paving, the innovative tool for process optimization on asphalt job sites

Making quality measurable is one of the big issues for contractors and clients worldwide. One of the key criteria for the longevity of roads is maintaining a consistent paving temperature. As a result, the significance of area-wide temperature monitoring is currently rising sharply in more and more markets. With RoadScan, VÖGELE's non-contacting temperature-measurement system, the company is on the leading edge of this future trend. The innovation was presented to a multitude of professionals from the industry at Bauma 2016, where it generated tremendous interest.

The VÖGELE innovation RoadScan helps paving teams assess the temperature of the mix immediately after paving so that they can find appropriate solutions, should the need for intervention arise. On completion of the construction project, contractors also have detailed evidence that the work was carried out in the correct temperature range – thanks to recorded GPS data including precise positioning. »»



1. **Seamless temperature measurement in a range of approx. 2m behind the screed.**
2. **Fast, simple recording: the RoadScan system's user interface is integrated into the paver operator's ErgoPlus 3 console.**
3. **Quality management made easy: measurement data can be analysed conveniently in the office - with RoadScan Analysis.**

High-precision infrared camera with 100% measurement coverage

The heart of the RoadScan system is an infrared camera which scans the area of freshly paved asphalt some 2m behind the screed. The high degree of precision is unparalleled: it records grids of 25 x 25cm over a measuring width of 10m. Each of these squares contains up to 16 single measuring points which are then used to calculate a mean value. That allows the system to capture the newly paved surface with no gaps, and so no theoretical or computed values need to be added. The measurable temperature range of RoadScan lies between 0°C and 250°C with a tolerance of $\pm 2\%$ of the measured value. The purpose of RoadScan's other components is to capture the base temperature before paving (pyrometer), record precise positional data (high-precision GPS receiver) and document the wind strength and direction, ambient temperature, air pressure and humidity (weather station available as an option).

3.



Integration into ErgoPlus 3

Just as one would expect of VÖGELE equipment, the RoadScan system is intuitive to operate and is easily activated from the paver operator's ErgoPlus 3 console. The paver operator views the temperatures currently being recorded on the colour display, and these are clearly visualized using thermal images and shown in real time. If the temperature is too low, action can be taken immediately and causes of the problem eliminated: either the paving team adjusts the screed and auger settings (in the case of mechanical segregation) or the asphalt mixing plant or lorry logistics company is informed (in the case of thermal segregation). That makes RoadScan an effective instrument for ensuring high pavement quality.

Encrypted recording of measurement data

RoadScan also saves the measurement data in the paver operator's ErgoPlus 3 console. After paving, this data can be read off via an external data storage device. At the same time, VÖGELE have taken effective measures to protect the data: a specially designed memory stick communicates with a VÖGELE interface on the paver operator's ErgoPlus 3 console, which transfers the data in encrypted form. The data is then analysed in the office using the RoadScan Analysis web application, which presents the data in different types of diagrams and in a map view. ///

HAMM Oscillation:

**Successful in asphalt
construction and earthworks
for the last 35 years**

Over 35 years ago, HAMM were the first roller manufacturer to introduce a drum with oscillation technology. Today this technology is an integral part of the HAMM product portfolio: one in four new HAMM tandem rollers is equipped with an oscillation drum. One reason behind HAMM's success is their broad range of products, including oscillation rollers in all weight classes and for all markets. The other reasons: with oscillation rollers from HAMM, you can complete high-quality compaction jobs quickly and cost-efficiently, and the range of applications is enormous. >>>

Oscillation from HAMM - The original



Product portfolio with over 35 oscillation rollers:
apart from tandem rollers from 7-14t, HAMM is the only
supplier worldwide to also manufacture oscillation rollers
in the compact class (2.5-4.5t) and soil compactors with
VIO drum that additionally support oscillation compaction.

Fast, cost-efficient, high-quality

Tandem rollers from HAMM with one oscillation and one vibrating roller drum achieve at least the same degree of density as a double vibrating drum roller, but with fewer passes. At the same time, they emit significantly lower levels of vibration to the surrounding area. Another plus: oscillation rollers can begin dynamic compaction right behind the paver. What is more, they can handle the main compaction work. Even when asphalt temperatures are low at the end of the process, oscillation makes it possible to increase the degree of compaction without grain destruction. Overall, the time available for compaction is considerably longer with oscillation than with vibratory rollers.

Use in earthworks and asphalt construction

Oscillation rollers can be used for all layers encountered in earthworks and road construction. In earthworks applications, they are in demand wherever the upper layers need to be reliably prevented from re-loosening, for instance on landscaping jobs. Another important application is compacting surfaces in vibration-sensitive areas, such as above pipelines or in the vicinity of railway tracks. In asphalt construction, oscillation rollers reliably compact all base, binder and surface courses. They are particularly effective in compacting generally hard-to-compact asphalts, such as SMA or polymer-modified material mixes. This is because, in contrast to vibration compaction, the effective direction of the vibrations during oscillation promotes the desired redistribution of long-chain binding agents.

Demanding job sites

Other applications include work on thin layers (surface courses, thin overlay) in vibration-sensitive areas (bridges, confined urban spaces, buildings or parking decks) and anywhere where mix cools quickly (thin overlay, windy or cold environments). The compaction of joints is another important application: here, oscillation rollers compact hot asphalt without damaging the adjacent cold asphalt. >>>

35 YEARS





HAMM - A pioneer of oscillation

- › HAMM were the first to introduce oscillation rollers to the market and have since continuously advanced the technology.
- › Today, HAMM have over 30 models equipped with oscillation technology in their range.
- › HAMM are the only manufacturer worldwide to engineer rollers in the compact class and soil compactors with oscillation technology.
- › HAMM offer oscillation rollers that meet different exhaust emissions standards (Tier 3 and Tier 4).

Rollers with an oscillation and vibrating roller drum compact faster and achieve higher degrees of density than double vibrating drum rollers.



Advantages of oscillation

Oscillation has a positive impact on the efficiency and quality of compaction



Advantage 1: High compaction performance - High efficiency

Oscillation rollers compact very rapidly. Put another way: their compaction performance is extremely high, thanks to the combination of dynamic shear forces and continuous static load resulting from the net weight of the machine. Significantly fewer passes are required as a result, particularly when compacting large surface areas. Therefore, using oscillation is very cost-efficient on many major projects, because thanks to the rapid increase in the degree of density, fewer rollers are required for an optimized process.



Advantage 2: Easy operation

To generate vibration, HAMM harness the laws of physics in such a way that oscillation rollers are extremely easy to operate. Just switch on the machine and it automatically sets the right amplitude based on the rigidity of the material to be compacted. And it adjusts so quickly that compaction is at the optimal setting at all times, even when the type of ground varies. This way, HAMM also prevent operating errors caused by choosing the wrong settings.



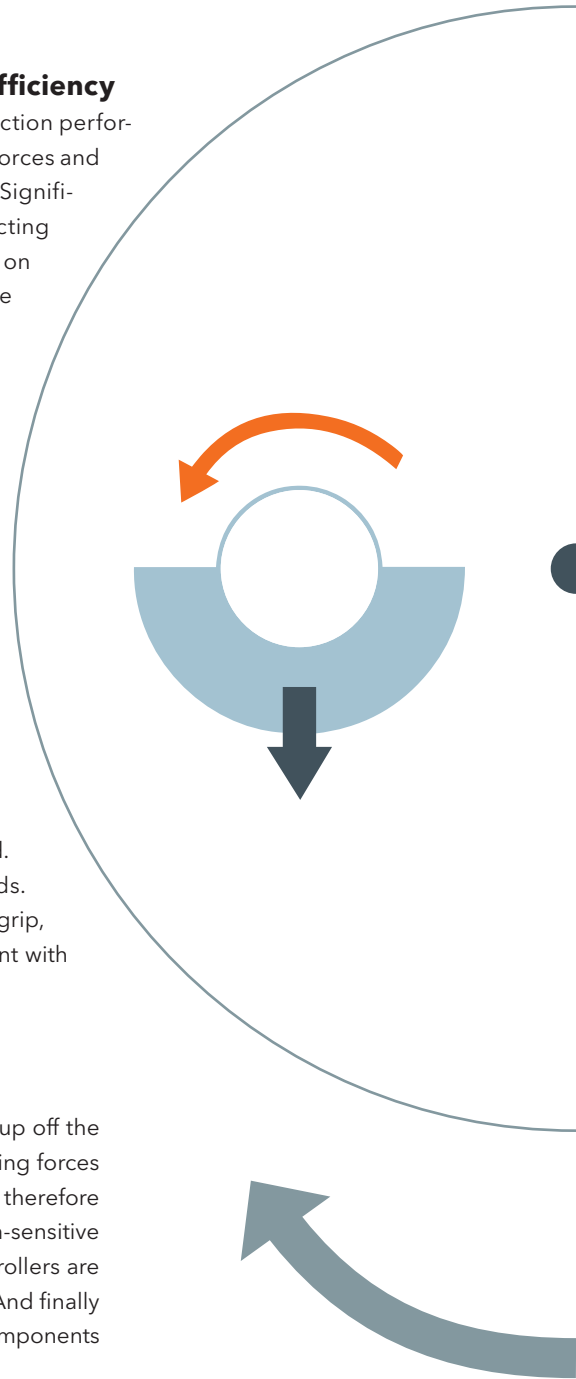
Advantage 3: Level, non-skid surfaces

Oscillation rollers produce surfaces with outstanding longitudinal evenness, because the drum is in continuous contact with the ground. What is more, no undulations result, even at high operating speeds. Asphalt compaction with oscillation also produces an excellent initial grip, because the drum abrades the bitumen on the surface of the pavement with its oscillating motion.



Advantage 4: Low vibration load

In comparison with vibration technology, oscillation drums do not rise up off the ground during compaction and therefore only about 15% of the vibrating forces are conducted into the ground around the roller. Oscillation rollers can therefore easily be used for dynamic compaction in the direct vicinity of vibration-sensitive buildings or systems. Because they generate less vibration, oscillation rollers are also considerably quieter and contribute to environmental protection. And finally but importantly, low-vibration compaction is easier on all the machine components and relieves some of the stress on the roller operator.



The principle of oscillation

With vibration technology, a single eccentric shaft is responsible for the up and down motion of the drum. It hits the ground at high frequency. In contrast, two eccentric shafts rotate synchronously in the oscillation rollers, driven by a toothed belt. The eccentric shafts are mounted at an offset of 180°, which causes the drum to execute a rapidly alternating forward-backward rotation.

This motion conducts the compaction power, in the form of tangential shear forces, into the ground towards the front and back. Unlike with vibrating roller drums, the compaction power acts continuously on the ground, because the drum is in continuous contact with it. Oscillation rollers thus compact dynamically but also statically at all times on account of their machine weight.

Advantage 5: Compaction does not damage the paving material

In vibration compaction, above a certain rigidity level, you risk destroying the material structure or destroying the grain. This is not the case with oscillation, which ensures non-destructive redistribution of the grain. In other words, oscillation avoids grain destruction or over-compaction. What is more, oscillation compaction produces dense, durable joints without damaging the cold asphalt.

Advantage 6: Wider temperature window

With oscillation, you widen the temperature window in which compaction is possible, because non-destructive compaction is possible for oscillation rollers even at relatively low temperatures. Oscillation is therefore particularly suitable for compacting thin overlay or on rapidly cooling surfaces, like bridge decks. Furthermore, this characteristic enhances the flexibility of the construction process. >>>

Clients worldwide are choosing oscillation

Building authorities and private clients know that dynamic compaction with oscillation improves quality in road construction. Not least because oscillation has proven its worth on major construction jobs. The rapid increase in the degree of density optimizes the process and fewer passes are required. It's no wonder then that using rollers with oscillation technology for compaction is an increasingly common requirement when rapid completion, quality and durability are of the essence. ///



Road construction site in Ithaca, New York: oscillation is as much in demand in the USA as it is in Europe and Asia.



Earthworks between railway tracks and historic buildings in Oberwesel, Germany: just one oscillation roller could deliver the required compaction here without damaging the half-timbered houses or the sensitive railway tracks.



Constructing the Formula 1 track in Baku, Azerbaijan: when building this city circuit, a premium-quality asphalt surface had to be produced despite confined conditions as well as underground parking decks and pipelines. Oscillation rollers were therefore mandatory on this job.



Construction of motorway section on the A61, Germany: oscillation rollers from HAMM achieved a high compacting performance and premium quality results.



Construction of the Hong Kong-Zhuhai-Macao bridge in southern China: oscillation rollers dynamically compacted the thin asphalt overlay on the 35km-long bridge. The resultant surface was of outstanding quality, thanks to HAMM technology.



Compacting the roadbase around existing installations (manhole covers etc.) in a new housing development in Münchberg, Germany: the compact HAMM H 7i VIO compactor is in its element on jobs like this. Thanks to the VIO drum, this compactor can operate with either oscillation or vibration.



Rehabilitation work along a railway line in Vienna, Austria: while replacing supply lines, the pavement of a main roadway had to be broken up, fresh asphalt was paved and compacted. Compact oscillation rollers from HAMM were used for this job.

2,600m up: Advanced asphalt production in Bogotá

Bogotá

Colombia

Technology from BENNINGHOVEN is taking asphalt production to a new level: a mixing plant of type ECO 2000 has gone into operation in the capital of Colombia - and it's reckoned to be the most modern batching plant in South America.

Easily up to the demands of even long journeys: the key components of the cutting-edge plant fit into standardized containers.



Colombia // Bogotá

Compañía de Trabajos Urbanos (CTU), one of the largest and longest-standing contractors in Colombia, are investing in the future: the ECO 2000 mixing plant from BENNINGHOVEN has formed the backbone of its modern asphalt production facility in Bogotá for some time. The initiative for the investment came from Ernesto Gutiérrez, Managing Director of CTU. The contract was overseen and negotiated by FIZA S.A.S., a dealer specializing in the sale of WIRTGEN GROUP machines and plants. The new asphalt mixing plant is making a decisive contribution to the modernization and advancement of CTU, because the ECO 2000 takes the company to a whole new level. The plant integrates cutting-edge technology from

BENNINGHOVEN, for instance, and makes operation a great deal more economical and environmentally friendly as well as improving quality. Although the plants are developed and produced more than 9,000km away in Germany, delivery and service are a simple matter: the container design makes the plants easy to transport, while the WIRTGEN GROUP's considerable presence throughout South America means that spare parts and service engineers can be on the scene extremely quickly. The plant's ease of operation further enhances cost-efficiency. It just requires two people – a wheeled loader driver to feed the cold feed hoppers and a mixing plant supervisor to control the plant. >>>



Configured for a plant production of 160t/h: the ECO 2000 performs reliably even at an altitude of 2,600m.



Plant details

Commissioning of a new BENNINGHOVEN ECO 2000 asphalt mixing plant in Bogotá, Colombia

Working parameters

Mixing output:	160t/h
Drying output:	145t/h
Number of feed hoppers:	4-fold cold feed system, 12m ³ each, separate 15m ³ cold feed hopper for RAP
Burner:	EVO JET 3 combination burner for oil and natural gas, 19MW
Capacity of mixed material storage silo:	60t in 2 compartments + direct loading
Bitumen supply:	2 electrically heated tanks, 40m ³ each

Technologies:

Cold feed system for dosing into the mixer for a 30% RAP material rate

Made-to-measure solution thanks to container design and modular system

The advantages of the container design of the BENNINGHOVEN type ECO asphalt mixing plant emerged as early as in the installation and commissioning processes, both of which were completed in just five weeks. "With conventional plants, it can take as much as four to six months before the first mix lorry leaves for the job site," reports Iván Riveros, Commercial Manager of the material extraction and processing department at FIZA S.A.S. The ECO plants also offer operators maximum flexibility: locations can be changed quickly 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. 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 – even at a later stage. This improves both economic efficiency and investment security, ensuring that CTU can also meet future requirements with the ECO 2000.

Recycling technology supports RAP material rate of 30%

The new BENNINGHOVEN plant also demonstrates its versatility in operation. That's because the ECO 2000 in Bogotá integrates recycling technology that allows the addition of RAP that CTU generally "extract" in their rehabilitation jobs. BENNINGHOVEN offer solutions that enable operators to produce asphalt using RAP instead of disposing of the material, saving hard cash. In Colombia, what is known as a cold feed system has been installed, with which the old asphalt is added to the mixing process cold, i.e. without prior heating. Specifically, this is a system for dosing into the mixer – the RAP is added straight into the 2t mixer of the plant. Up to 30% of the aggregate fractions can be replaced with RAP. The result? A significant increase in the profit per batch. Recycling technologies are on the advance across the world. In BENNINGHOVEN, operators have a partner that already offers many efficient and sophisticated solutions today. The hot feed systems of the technology leader even allow recycling rates of more than 90% to be achieved. >>>



Leading EVO JET burner for up to four fuels

Leading burner technology from BENNINGHOVEN also makes a significant contribution to economic efficiency. The company is the world market leader for burners, and the only manufacturer of combination burners for up to four fuels. This ensures flexibility when it comes to drying and heating the mineral – crushed aggregate in a variety of defined fractions: EVO JET burners can optionally handle heating oil, gas, liquid gas (LPG) or coal dust. Fuels can be switched at the press of a button. This prevents downtimes caused by a shortage of raw materials or supply difficulties. It also gives operators a high degree of independence, since they can use whichever fuel is currently cheapest. At their plant in Bogotá, CTU have installed a type EVO JET 3 burner that can run on fuels such as natural gas, liquid gas, heavy oil or heating oil, achieving a burner output of 19MW.

Electrically heated bitumen tanks accelerate plant start-up

For José Ibáñez, commercial consultant for FIZA, there was another argument that was critical to the decision to invest in BENNINGHOVEN plants: “The fact that the bitumen tanks are heated electrically – and therefore efficiently – means there is no need to wait several hours for heating before starting work.” Thanks to the sensors and the thermal insulation of the storage tanks, the ECO 2000 does not require diesel-fed boilers to keep the asphalt at the right temperature. This has a beneficial impact on both operating costs and the environment. When it comes to emissions, too, CTU are geared up for sustainability: like all BENNINGHOVEN plants, the ECO 2000 incorporates a dust collection system. The flue gas produced in the dryer drum and other exhaust air from the production process are extracted by vacuum and cleaned. The coarse particles are separated by slowing down the speed of flow, while fine particles are trapped by filter cloths. Both are then fed into the return filler silo, so even the dust that is created becomes available for asphalt production. >>>

BENNINGHOVEN type ECO asphalt mixing plants: The perfect mix of cost-efficiency, mobility and quality

Made in Germany – used worldwide: the ECO plants are an impressive testament to the high production standards of cutting-edge BENNINGHOVEN technology. Maximum mobility and hence optimum flexibility are the key characteristics of these plants, which can be used in stationary operation but are also easy to relocate quickly. A key aspect of ECO asphalt mixing plants is the design of their main components in standard container sizes, allowing them to be transported without difficulty by road, ship or rail. A large number of options – including systems for the cold and hot feeding of RAP – allows ECO plants to be customized to the needs of customers and operators, further enhancing economic efficiency and capacity utilization.

A2t

The ECO 2000 produces asphalt every 45 seconds, which comes to 160t per hour.

Bogotá is located not only at high altitude, but also in an earthquake zone. BENNINGHOVEN therefore strengthened the statics of the Bogotá plant.



Points to consider when mixing plants are located at high altitude

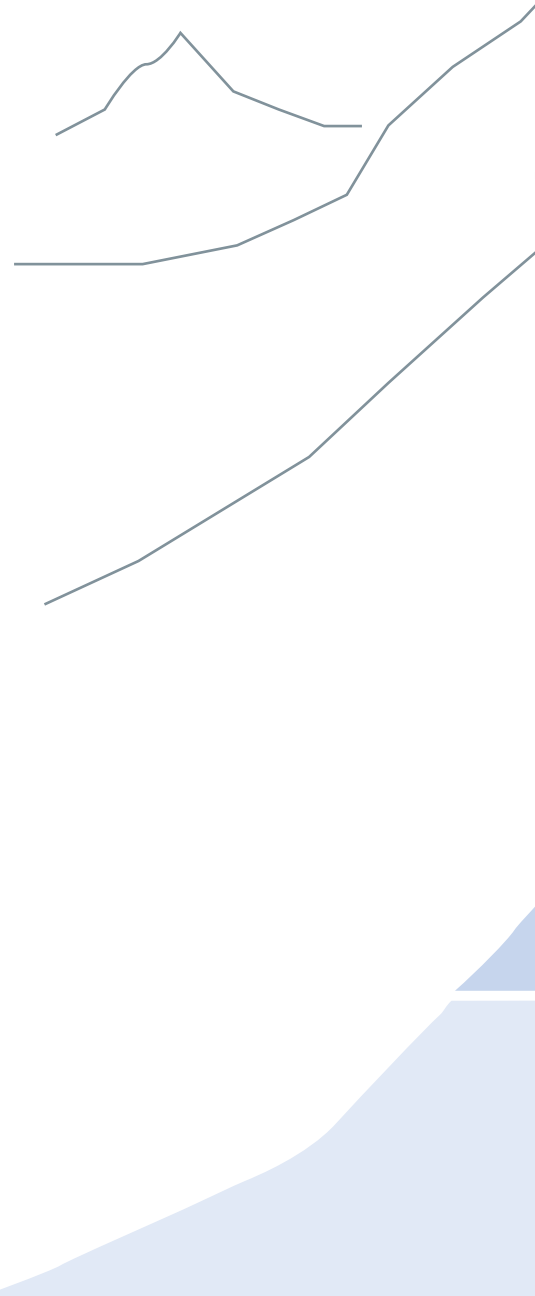
There are two factors that influence the output of asphalt mixing plants: the moisture contained in the aggregate, and the altitude at which the asphalt mixing plant is operating. While operators can actively influence the first factor, moisture, by storing the aggregate in a roofed location, for instance, the production altitude cannot generally be influenced. And that is the situation in Bogotá, where mixes are produced at an altitude of 2,600m.

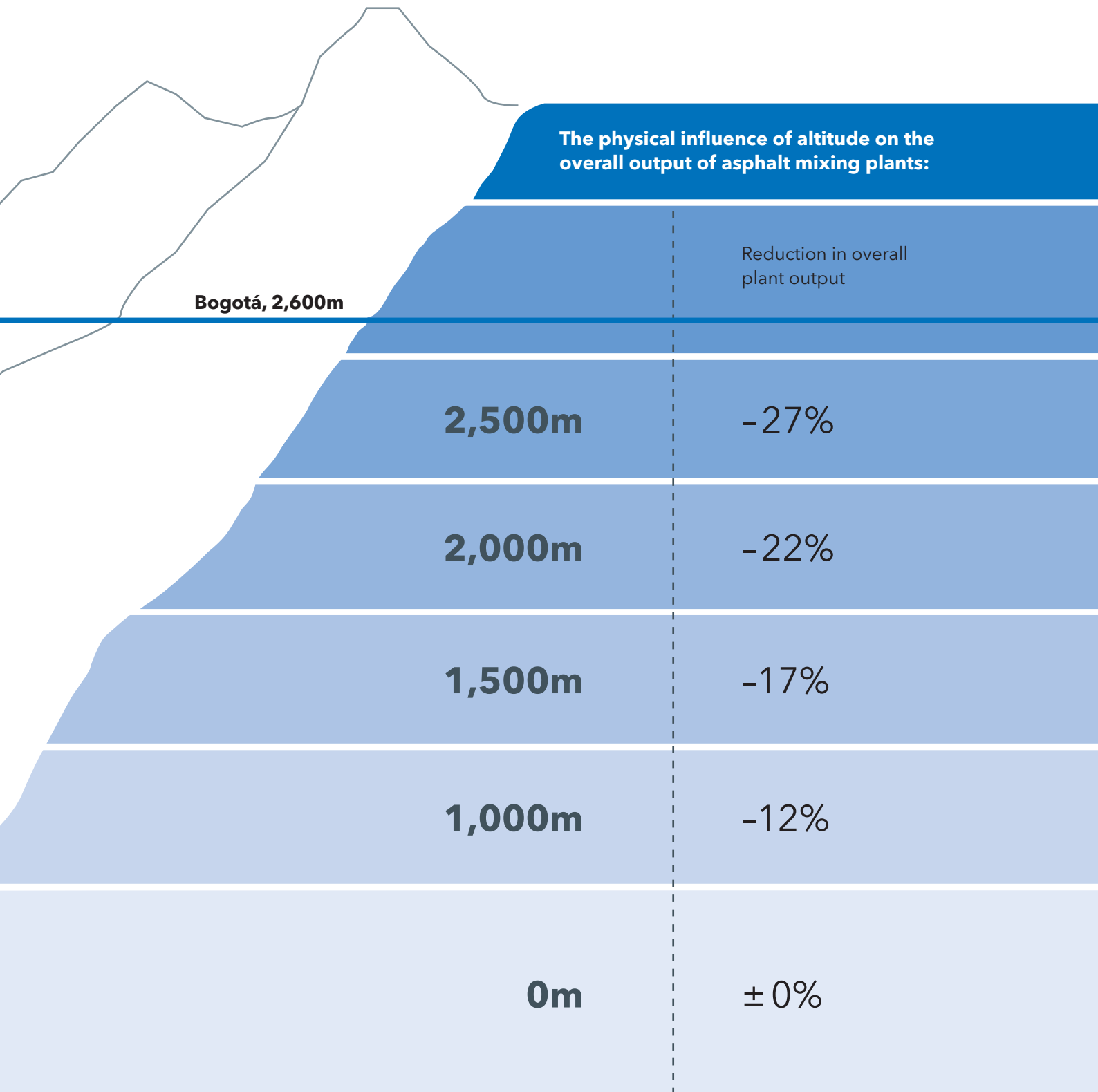
Burner output falls with every extra metre of altitude

The difficulty is that both the oxygen content of the air and the air pressure decline as the altitude rises. The stated maximum output of asphalt mixing plants always assumes an altitude of 0m above mean sea level. At an altitude of 2,000m, the output of asphalt mixing plants is already 22% lower. The limiting factor is the burner of the dryer drum. That's because a fire not only needs a fuel, it above all requires oxygen. The less oxygen there is, the less thermal energy is available for drying and heating the aggregate.

BENNINGHOVEN expertise counteracts effects of altitude

To make up for the lower performance level to the greatest possible extent, BENNINGHOVEN have channelled considerable expertise into counteracting these physical factors. Although the technology leader cannot push the boundaries of physics, it can counter them with more powerful components – such as larger EVO JET burners. The process and planning experts possess a high level of expertise and have already successfully implemented asphalt mixing plants in all climate zones and at all altitudes across the world. They are therefore aware that it is not just the burner that needs to be larger at high altitudes: so, too, do other components – like the frequency converter and the fans, for instance. This is of fundamental importance if the electrical components are to be cooled reliably at an altitude as high as that of Bogotá. BENNINGHOVEN thus ensure full functionality so that operators always receive an optimum, high-quality end product – even at 2,600m above mean sea level. ///





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. >>>



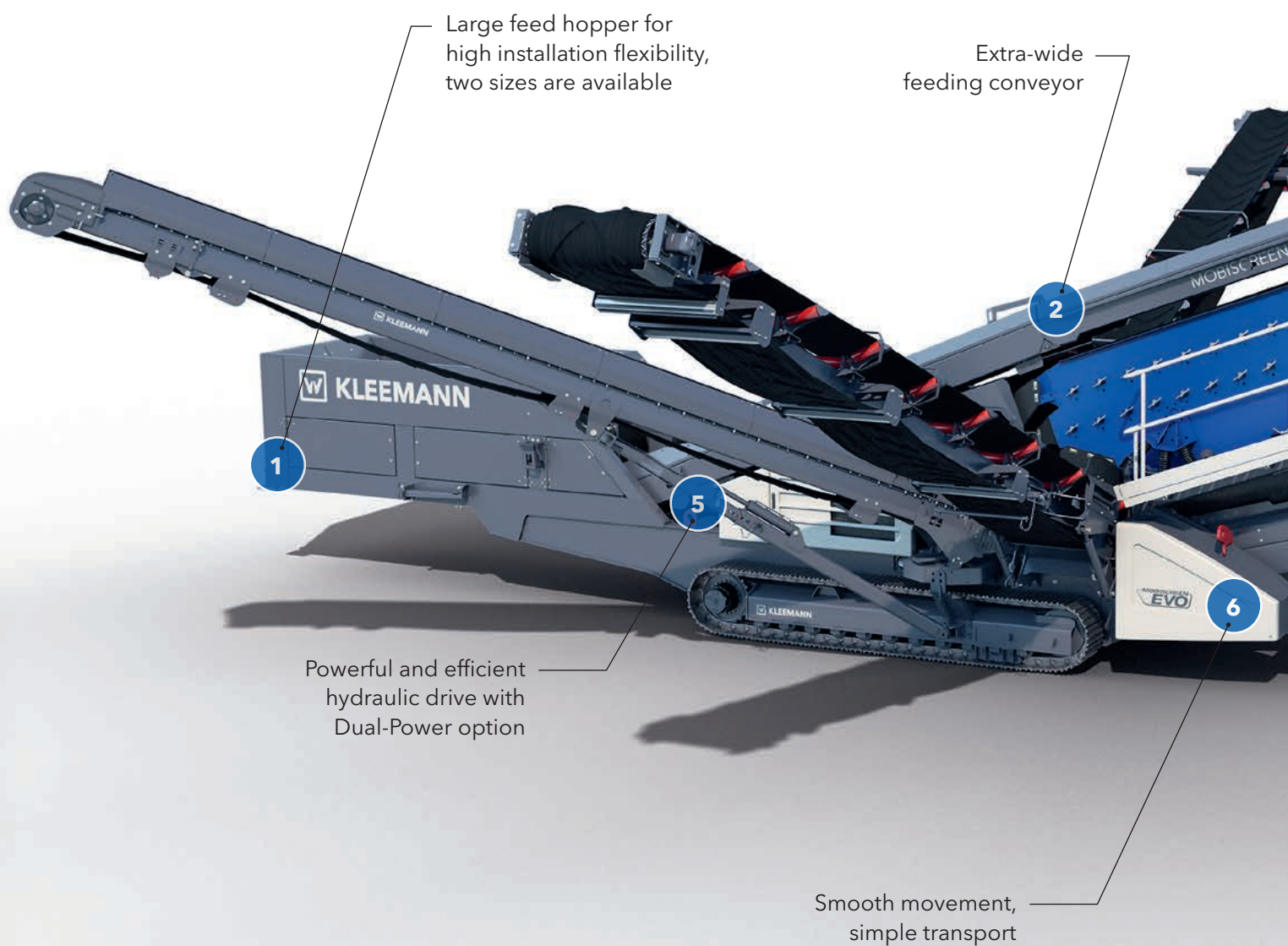
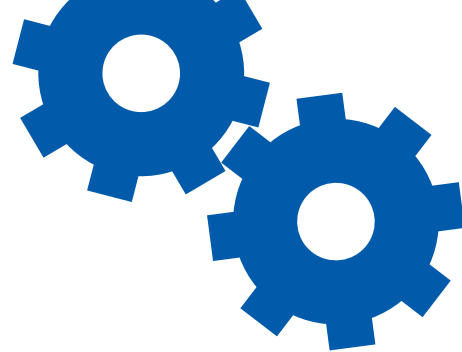
The MS EVO screening plants from KLEEMANN take efficiency to the next level.

Kirpal Singh Sian,
Product Manager
KLEEMANN



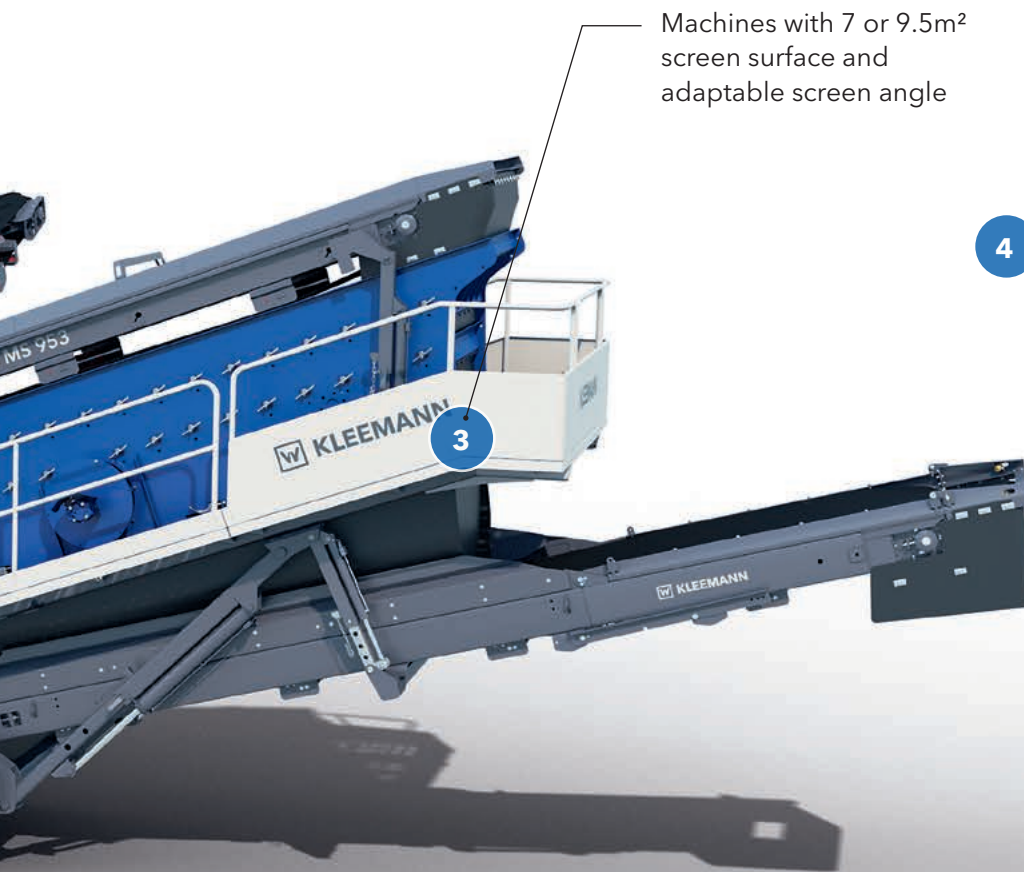
A team player: the screens operate particularly efficiently when linked with crushers of the EVO series that are configured in size and output to the MS EVO screens.

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 work 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 t of crushed granite sand with a grain size of 0-6mm and up to 2 million t 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.**

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View over Brazil's Silicon Valley:
the multi-laned Avenidas of Vila Olímpia in São Paulo.