RoadNews for new roads

The WIRTGEN GROUP User Magazine // № 02

WIRTGEN VÖGELE HAMM KLEEMANN BENNINGHOVEN

Building the Formula 1 circuit through Baku, Azerbaijan:

The fastest city road in the world

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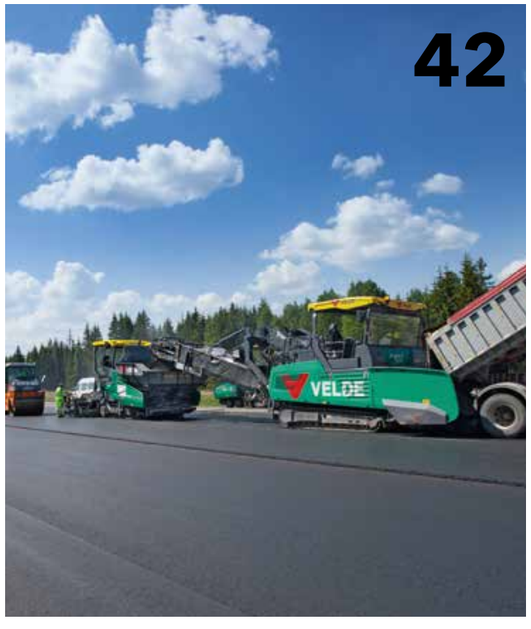

Editorial

Dear Reader,

Success is not always achieved through innovative technologies alone. Combining them intelligently is often another key factor. This is demonstrated by KLEEMANN and BENNINGHOVEN plants that really work together. The result is an optimized recycling process that first screens and then classifies the RAP (Reclaimed Asphalt Pavement), ultimately saving fuel and minimizing maintenance work. This is a prime example of the synergies that our Group can create.

Machines from the WIRTGEN GROUP also do an outstanding job of paving and compacting asphalt. A recent and particularly impressive example of this is the Baku city circuit. The Formula 1 track runs through the capital of Azerbaijan and was recently inaugurated in the elite class of motor sports. Before the race, VÖGELE pavers and HAMM rollers delivered an asphalt pavement that met the very highest demands.

In this issue, we follow the new WIRTGEN slipform pavers of the SP 60 and SP 90 series – two Bauma 2016 innovations – in job reports on their first applications.

We received a great deal of positive feedback on the relaunch of the RoadNews at Bauma 2016 this year. We would like to thank everyone who contacted us and wish you all a riveting read with the second edition of our user magazine.

Best wishes,

Stefan Wirtgen Jürgen Wirtgen

PUBLISHING DETAILS

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Improved efficiency in asphalt recycling

Technologies from KLEEMANN and BENNINGHOVEN optimize recycling process.

At present, 12 million tonnes of RAP (Reclaimed Asphalt Pavement) are produced and used in Germany alone every single year – out of a total 40 million tonnes of paved material. It is a huge figure that highlights just how great the potential of recycling technologies is. Systems and technologies from KLEEMANN and BENNINGHOVEN enable operators of asphalt mixing plants to boost their process efficiency. A particularly impressive example comes from the Juchem Group, a long-standing customer of the WIRTGEN GROUP. The construction company have invested in four KLEEMANN MOBISCREEEN screening plants that screen the RAP, boosting the asphalt production quality and efficiency of the BENNINGHOVEN mixing plants.

New efficiency in the recycling process – With technologies from the WIRTGEN GROUP

For the Juchem Group, recycling reclaimed asphalt is part and parcel of their daily work. Layer after layer, WIRTGEN cold milling machines of a variety of milling contractors remove damaged road pavements. This mono-material is transported to the group's asphalt mixing plants for processing – with equipment made by KLEEMANN and BENNINGHOVEN. The aim is to achieve aggregate fractions that are as homogeneous as possible, laying the basis for a high-quality end product. That is why the RAP needs to be screened thoroughly first. For the last few months, the Juchem Group have been deploying 4 mobile MOBISCREEN MS 16 D and MS 16 Z screening plants from KLEEMANN for this process step. They are each operated in combination with a BENNINGHOVEN asphalt mixing plant of type BA at the Landau, Niederwörresbach, St. Wendel and Ürzig locations.

The recycling process in overview:

Mixing

› A BENNINGHOVEN asphalt mixing plant processes the homogeneous material into a new mix in classified grain sizes as specified in the respective formulas.

Paving

› The recycled asphalt is laid by VÖGELE pavers in the conventional way.

Compacting

› HAMM rollers then compact the asphalt layer.

Processing

› The RAP is screened: wheeled loaders feed the material to the KLEEMANN screening plants. The oversize grain is sent to a BENNINGHOVEN granulator for secondary treatment, the fines are screened out, if necessary.

Step 1: Reclaiming and inspecting recycling material

In the rehabilitation projects carried out by the Juchem Group, WIRTGEN cold milling machines remove the surface, binder and base courses, extracting three different fractions. It is not uncommon for 3,000t of RAP to be milled off in a construction project – in just one work shift. "To ensure a high material quality, we inspect the RAP closely in our own laboratory and then select it," says Dr Hermann Heppenheimer, Branch Manager at Asphaltmischwerk Landau Juchem KG. "The material also has to be highly homogeneous to allow further processing – and that calls for perfect processing techniques."

Step 2: Screening with mobile screening plants from KLEEMANN

Next in line are KLEEMANN's MOBISCREEN mobile classifying screens. They ensure that up to 80% of the RAP can be used for direct further processing immediately after delivery. Only the oversize grain needs to be treated in crushers or a granulator. This method is a great deal more cost-effective than subjecting all of the RAP to secondary treatment.

Since part of the previously classified material is then stored in the open and can therefore become damp through exposure to the weather, fines < 5mm are screened beforehand, if necessary, and then stored in a dry place. This results in a significant reduction in the energy consumption of the asphalt mixing plant. The rule of thumb is that a 1% reduction in moisture corresponds to a 1 litre reduction in heating oil in 1t of asphalt mix.

These facts prompted the Juchem Group to buy 4 KLEEMANN MOBISCREEN screening plants – three MS 16 D triple-deck screening units and one MS 16 Z double-deck screening unit. The MS 16 D used by Juchem has a throughput of 150 – 300t/h. The feed material (0 – 150mm) is classified into the following grain sizes, depending on the asphalt formula of the mixing plant: 0 – 8, 0 – 11, 0 – 16, 0 – 22, or 0 – 32mm. The feed capacity is lower with finer screen meshes, but for the purposes of further processing, the focus is on achieving a homogeneous product. That's another strength of KLEEMANN: the large number of different screen meshes combined with the simple replacement gives operators considerable flexibility. The operator can feed material to the MS 16 D while controlling it remotely at the same time. All the components of the unit are also easily accessible, making them very maintenance-friendly.

The investment in KLEEMANN screens and RAP feed systems from BENNINGHOVEN has boosted our competitiveness.

Dr Hermann Heppenheimer,
Branch Manager
Asphaltmischwerk Landau Juchem KG

The MOBISCREEN MS 16 D and MS 16 Z classifying screens sort fines and oversize grain.

MOBISCREEN MS 16 D: The mobile triple-deck screening unit from KLEEMANN

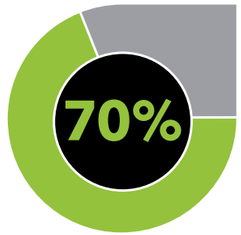
- Diesel-hydraulic drive with the possibility of an external electrical power supply (option)
- Feed capacity up to approx. 500t/h
- For natural stone and recycling applications
- Maximum feed size: 150mm

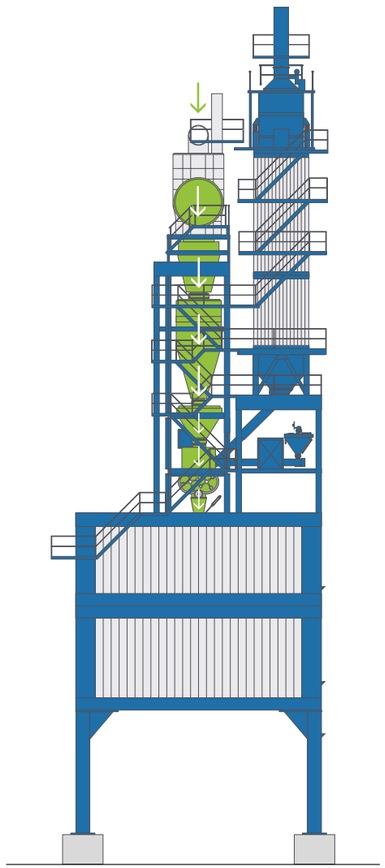
Step 3: Production of mix in the BENNINGHOVEN asphalt mixing plant

In the Juchem Group's mixing plants, the classified RAP is processed into a new mix. This has been the case since 1999, when the company invested in one of the first parallel drum systems in the Rhineland-Palatinate region. "The investment in recycling feed systems from BENNINGHOVEN has boosted our competitiveness," reports Dr Heppenheimer. Juchem have since equipped several of their asphalt mixing plants with a variety of systems.

Combination of multivariable feed and parallel drum systems delivers flexibility

The use of parallel drums, a hot feed system, is particularly worthwhile for large quantities and high RAP feed rates of up to 70%. Juchem also rely on the multivariable cold feed system. In this case, the RAP is fed directly into the mixer in a cycled process. Feed rates of up to 40% are possible (see also page 56). Why have Juchem integrated both systems into their recycling process? "It gives us the flexibility we need. The multivariable feed enables us to also cover small quantities from 2t. And we use the parallel drum for large jobs. Both systems are sophisticated and deliver first-class quality," Dr Heppenheimer explains. »»





Parallel drum: The BENNINGHOVEN system for 70% of RAP material

- Up to 70% of RAP can be added
- Parallel drum system
- Tried and tested solution for RAP hot feed systems

The Landau location – shown here – operates a BA 4000 that was installed in 1999 and retrofitted with a multivariable feed unit in 2012.

Type BA stationary asphalt mixing plants: BENNINGHOVEN's flagship

With a plant production of up to 400t/h, the type BA stationary asphalt mixing plant is the highest performer in the BENNINGHOVEN product range.

- 6 single feed hoppers
- 6-fold screening
- Hot bin capacity of 170t and 285t in 7 bins
- Mixers 3 to 5t
- Filter unit in three performance classes from 58,000 – 96,000Nm³/h
- Mixed material storage silo 175, 335 and 495t

Daniel Speisser, Manager Customer Support Training at KLEEMANN, advises users around the world on matters concerning MOBISCREEN plants.

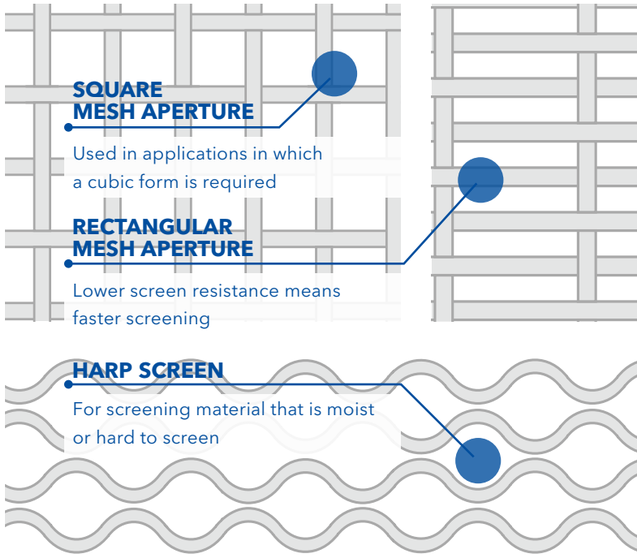
The right screen mesh for every job

How users can improve the productivity and efficiency of screening plants.

The quality of the screen mesh is critical to the screening result: the higher the quality of the mesh, the more precise the separation of fractions. That is why KLEEMANN use only meshes that meet high requirements in terms of precision and robustness. Where a variety of fractions and materials are to be screened, it is important to have a wide range of meshes available – which is why KLEEMANN offer a large number of meshes for their MOBISCREEN plants. The key differences lie in the shape of the mesh aperture – square, rectangular or harp screen – and in what it is made from – steel or plastic. What all screen meshes have in common is that they can be changed quickly, easily and conveniently.

Factors for selecting the appropriate mesh:

- Type of material: natural stone or milled material
- Grain shape: cubic or elongated
- Desired final grain size: this determines the size of the mesh aperture of the screen deck
- Moisture content: if the feed material is moist, it is essential to prevent caking
- Screen angle: the steeper the screen angle, the larger the mesh aperture must be relative to the desired separation
- Top deck to bottom deck ratio: this must be no greater than 4:1, otherwise the classification will not be precise enough and the efficiency will decline. There will also be greater wear.



How to determine the optimum tension:
Tension the screen mesh and drop an object of 2 – 3kg onto the mesh. If the object bounces on the mesh, the tension is correct. If the object does not bounce, the tension is too low.

Tips for operating the screen efficiently:

- Select the appropriate screen meshes based on the criteria indicated above.
- Screen angle: the steeper the screen angle, the larger the mesh aperture must be, as the material falls faster and lies on the deck for a shorter time. If the material is to be screened particularly thoroughly, a smaller screen angle is advisable. Although the throughput will be lower, the result will be more precise.
- Layer thickness: the speed of the feeding conveyor has a bearing on the layer thickness. If the speed is too high, the layer on the screen deck will be higher. Since coarse material will then be accumulated, the screening result will be less accurate and too fine material may get into the oversize grain.

What to consider when screening fine material:

- If the chosen mesh size of the bottom deck is too fine, the mesh can clog up since the fine material cakes.
- The finer the wire thickness, the less caking will occur and the higher the throughput will be. The wear will also be greater, however. If the wire thickness is greater, the opposite will be the case: more caking and lower throughput. The mesh is then more robust.
- Plastic meshes are best suited to fine material and moist material, as the meshes vibrate more strongly, preventing caking. However, the separation with these meshes is not as precise as with steel meshes.
- In isolated cases, it also makes sense for the mesh aperture of the top deck to be coarser so that the bottom deck is kept free by the coarse material. ///

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

Small, compact and tough

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

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

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

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

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

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

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

1. The most comprehensive product range

WIRTGEN offer a total of 33 cold milling machines, 24 of them small and compact models – one for every application profile.

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

2. Focus on the user and job site practices

Product development focuses on the users and process optimization.

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

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

Totally new: no model is older than 24 months.

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

4. Leading technology: One generation ahead

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

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

WIRTGEN innovations that make the difference when the going gets tough

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

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

Automatic efficiency

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

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

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

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

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

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

4 Automated steering and positioning functions: Simply versatile

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

Slipform paver: The latest generation

Two job reports show how the technology of the new WIRTGEN slipform pavers of the SP 60 and SP 90 series has proven its worth in the field.

The new WIRTGEN paver generation gets going: an SP 64i (shown here) delivers a sturdy solution in the Port of Valencia, Spain. The first project for an SP 94i was building a new runway for Jefferson City Memorial Airport in Missouri, USA.

The new WIRTGEN SP 94i slipform paver excels in the reconstruction of a runway in Missouri, USA.

Job site details

Reconstruction of the runway at Jefferson City Memorial Airport in Missouri, USA

Length of section:	1.8km
Width of section:	30m

Working parameters

Thickness of concrete layer:	25cm
Reinforcement:	Dowel bars at transverse intervals of 0.45m and longitudinal intervals of 3.8m
Pave width:	7.5m
Paved material quantity:	20,000m³ of concrete (approx.)
Area paved:	5,600m² per work shift (approx.)

Equipment

SP 94i

A perfectly even runway

Missouri, USA // Jefferson City

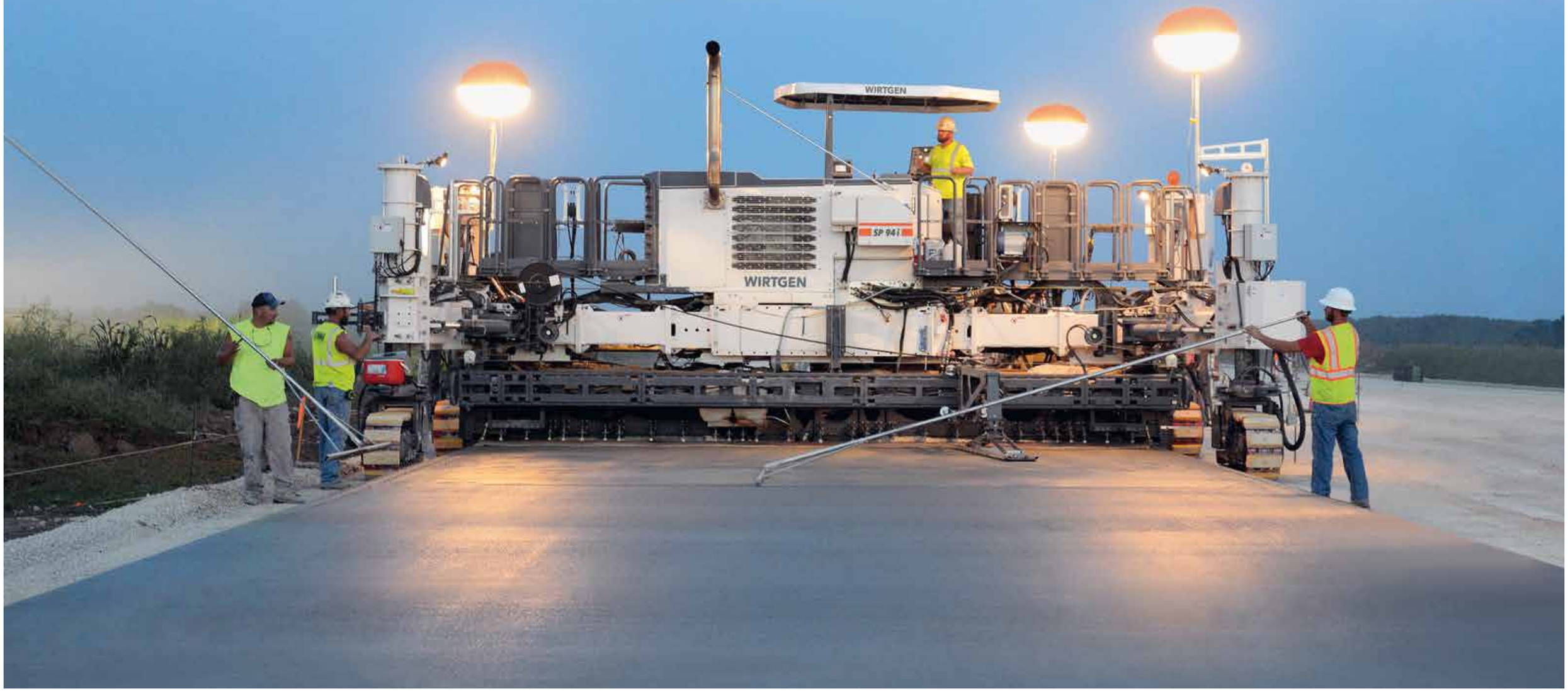
With more than 30,000 take-offs and landings a year, Jefferson City Memorial Airport (JEF) is one of the most heavily frequented airports in the US state of Missouri. Thousands of visitors travel through it every day on their way to the government and congress offices in the state capital on the Missouri River. At the end of April 2015, work commenced on the reconstruction of a runway approximately 1800m in length. It marked the premiere of one of the first type SP 94i slipform pavers to be delivered. »»

The evenness that the SP 94i achieves is outstanding. That comes down to the innovative technological features of the new slipform paver. The uniform spreading of the concrete by the spreader plough and the slab paving kit with wear-resistant pad also play an important role.

Adam Carroll, Head of Department
Lehman Construction Company

Precision work after just two days of set-up

The owner of the slipform paver, the Lehman Construction Company, got to work on the site as soon as the two days required for set-up of the machine were over. The 25cm-thick concrete layer was paved on a prepared base course which was also 25cm thick. Apart from dowel bars spaced at transverse intervals of 45cm and longitudinal intervals of 3.8m, the runway does not have any continuous reinforcement. Some 20,000m³ of concrete in total was laid on the runway, which is 1.8km long and 30m wide. "The specification for surface evenness allowed for a maximum permitted deviation of 7.0in per mile (18cm per 1.61km)," explains Tim Nash, Director Concrete Products WIRTGEN, WIRTGEN AMERICA. "Since the machine first went into operation, we have not had a deviation of more than 1.0in/mile (2.54cm per 1.61km) on any paving job. Usually, in fact, it was 0.0in." Lehman achieved this high standard of evenness with practically unchanged factory settings, i.e. with no major modifications on the job site. The productivity was also impressive: each day the SP 94i paved concrete over an area up to 750m long and 7.50m wide. Due to high daytime temperatures of over 30°C, paving largely took place during the night hours. »»



Edges at 90° angle

The authorities also had stringent requirements on how the edges of the runway were shaped – the angle was to be exactly 90°. "The representatives of the construction inspection authority confirmed to us that they had never yet seen such precise edges," Tim Nash recalls. "A vertical concrete edge is crucial for laying the next slab," confirms John Gibson, Test Engineer at Burns & McDonnell, the company responsible for inspecting the construction work. "And this machine delivered a very good edge." »»

Dowel bar inserter (DBI): Inserting dowel bars and longitudinal joint bars automatically

While in Jefferson City, the dowel bars had been placed in a reinforcement cage beforehand, with the slipform paver subsequently laying the spread concrete on top, the SP 94i also offers the option of inserting dowel bars and longitudinal joint bars in one operation during the concrete paving process.

The dowel bar inserter (DBI) integrated in the frame of the machine inserts the dowel bars in the correct position in order to secure the height of adjacent slabs.

Longitudinal joint bar inserters: inserted automatically, the longitudinal joint bars prevent pavement slabs from moving apart.

Inset pavers such as the SP 94i are ideal for the cost-efficient building of large concrete pavements, for instance on highly resilient motorways and runways.

Highlights of the SP 90 series: The mid-range WIRTGEN inset pavers

- 2 models: SP 92/SP 92i and SP 94/SP 94i
- Pave width: 3,500 – 9,500mm standard
- Layer thickness: up to 450mm standard
- Standardized operating concept: self-explanatory with clear, language-neutral symbols
- Eco mode: load-dependent engine management reduces fuel consumption and noise emissions
- Machine control system: latest generation, automatically recognizes the machine configuration, sets the optimum machine parameters
- Compaction technology: machine can be equipped with hydraulic or electric vibrator drive

Construction expert impressed by the quality

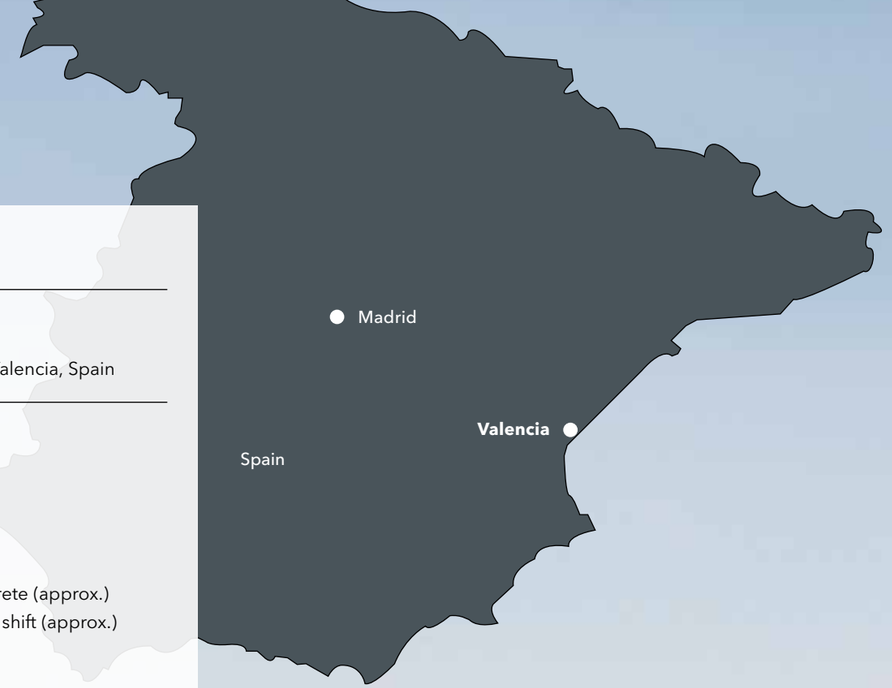
The SP 94i performed impressively in every respect: "The weight of the machine and the well-thought-out design ensure an outstanding surface. The quality is more or less built in, you can see that even in the tiniest details. It's very impressive."

Investment in leading technology pays off

Lehman's decision to buy the new WIRTGEN SP 94i slipform paver has been thoroughly vindicated. Kenny Lehman, Owner and Director of the Lehman Construction Company, put it this way: "We wanted to try out something new, because I'd heard that this machine could achieve a smoother surface than machines of competitors. With the SP 94i, we're actually achieving even better surface accuracy than we had expected." The process of setting the concrete paver up at the job site – which includes positioning and zeroing the crawler tracks and the swivel arms – is quick and easy with the SP 94i. "The crawler units work very well and the set-up time for the sensor system is short. All the settings can be done very quickly," says Lehman.

Boosting competitiveness with the SP 94i

"The specifications in our contracts are frequently very strict, so everything has to be just so," the owner added. "This machine will boost our competitiveness. The requirements on motorways can be met much more easily with the SP 94i. We're really happy with this slipform paver." The first project was already a complete success – we've delivered a first-class runway. Now the pilots taking off and landing at Jefferson City Memorial Airport can put this to the test. »»



Job site details

Expansion of the container terminal in the Port of Valencia, Spain

Total surface area:	89,737m²

Working parameters

Layer thickness:	32cm
Pave width:	5 – 5.25m
Paved material quantity:	29,000m³ of concrete (approx.)
Area paved:	1,500m² per work shift (approx.)

Equipment

WIRTGEN SP 64i slipform paver

High load-bearing capacity for the container terminal

Spain // Valencia

The areas of port facilities are exposed to some of the heaviest loads anywhere. Stacks of containers, heavy goods traffic, cranes and forklift trucks all bring their weight to bear on the sub-base. It's little wonder, then, that the Port of Valencia on the Mediterranean elected to use concrete for the expansion of its container terminal: it is more rigid, and hence has a greater load-bearing capacity than asphalt. The task of paving concrete on the new area, some 90,000m² in size, was entrusted to a new WIRTGEN SP 64i slipform paver.

A highly resilient concrete surface is paved in the Port of Valencia, Spain, with the new WIRTGEN SP 64i slipform paver.

Highlights of the SP 60 series:
The mid-range WIRTGEN inset and offset pavers

› 3 models: SP 61/SP 61i (Offset), SP 62/SP 62i and SP 64/SP 64i (Inset)

Field of application for inset pavers:
Pave width: 3,500 – 6,000mm, standard
Layer thickness: up to 450mm, standard

Area of application for offset pavers:
Pave width: up to 4,000mm
Layer thickness: up to 2,200mm, standard

› Hydraulics: new hydraulic concept makes more efficient use of energy so that more power is available for additional equipment options

› Machine control system: interfaces for WIDIAG or WITOS FleetView, Paving Plus package, hydraulic rotational drives

1

Transverse finishing beam:
The eccentrically driven transverse finishing beam smooths the surface immediately after the concrete is paved.

2

Longitudinal finishing beam:
The longitudinal finishing beam with oscillation, moving over the concrete pavement, provides for a perfectly smooth surface.

> **The SP 64i has significantly boosted the efficiency of the construction project.**
>
> **Isidro Cabezuelo Moreno, Site Manager**
> **UTE Dragados-Pavasal**

Paving quality up, fuel consumption down

Given the tight timescale of just one month, the most important demands on the machine technology were reliability and productivity. The paver surpassed expectations: "With the SP 64i we were not only able to build the 5m-wide and 32cm-thick concrete surface precisely and reliably," reports Site Manager Isidro Cabezuelo Moreno of the building contracting company, UTE Dragados-Pavasal. After all, the completion of 1,500m² of area per work shift was, he revealed, much higher than with comparable machine models. "We were also able to reduce our fuel consumption by some 30%." This was thanks to the load-dependent "ECO mode" engine control system, which sustainably lowers consumption despite the 40% higher engine output compared with the predecessor model, the SP 500. The SP64i ultimately passed its baptism of fire with flying colours: "The quality of the concrete pavement is absolutely first rate," says Moreno.

Resilience for areas carrying heavy loads

Up to four shipping containers are stacked on top of each other in the container terminal at the Port of Valencia. Depending on the container version – there are 20, 40 and 45ft versions – the weight can amount to between 96 and 120t – an immense concentrated load on the areas supporting the containers. Concrete is the material of choice for surfaces bearing heavy loads. And the SP 64i slipform paver is the machine that sets the standards. ///

True colours

shine out in a landscape contract

Unusual design solution for outdoor facilities in Baden-Baden with coloured asphalt – and machine technology from VÖGELE and HAMM.

Park pathways in a light shade of beige: VÖGELE and coloured asphalt go together like Baden-Baden and parks.

Job site details

Rehabilitation of the asphalt surfacing in the Lichtenthaler Allee and redesign of Seufzerallee with coloured asphalt in Baden-Baden, Germany

Length of section:	365m

Working parameters

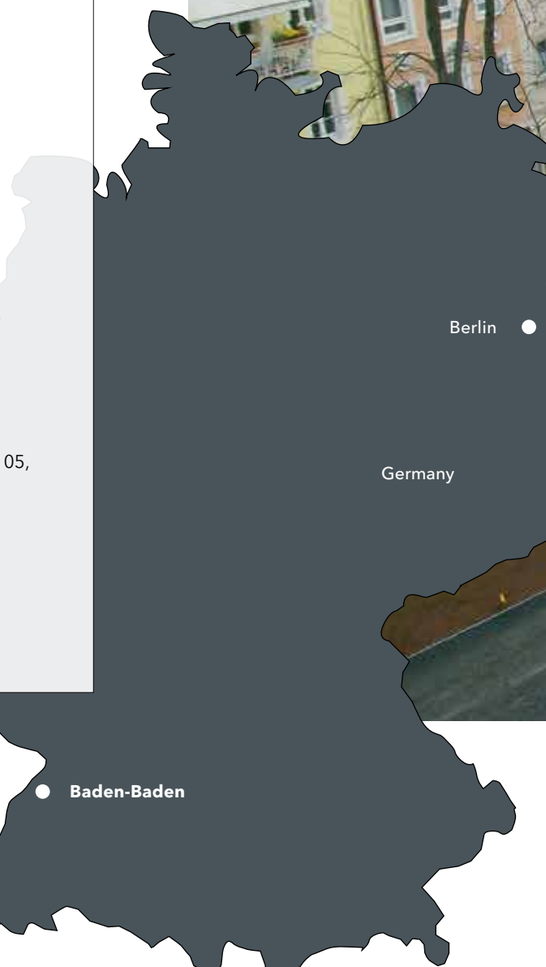
Pave width:	1.8 – 3.5m
Layer thickness	
Binder course:	10cm
Surfacing:	2 – 3cm
Paved material quantity	
Binder course:	338t
Surfacing:	109t
Pave speed:	2 – 4m/min

Material

Binder course:	AC 11 BN 50/70
Surfacing:	Stone mastic asphalt 05, coloured beige

Equipment

VÖGELE SUPER 1300-3i
VÖGELE SUPER 800-3i
HAMM HD 10 VO
HAMM HD 10 VV



Germany // Baden-Baden

The park along the Lichtenthaler Allee is typical of the magnificent townscape of the spa city Baden-Baden. The landscaping project comprised two sections with different space conditions and sizes. To create the visual impression of gritted avenues and simultaneously ensure durability, a stone-mastic asphalt with beige colour pigments was used to surface the area. While the VÖGELE SUPER 800-3i Mini Class paver with its compact dimensions and different feeding options was absolutely ideal for the smaller job site section, the SUPER 1300-3i was perfect for the requirements of the larger section, featuring a pave width of up to 5m. Both machines were supported by the two HAMM rollers of the CompactLine series. »»

Maximum performance in a small area

Both landscaping projects in Baden-Baden required a great deal of flexibility with regard to manœuvrability, pave width and feeding. When landscaping outdoor areas located directly in the park, the VÖGELE Mini Class SUPER 800-3i tracked paver was therefore used to pave the surface course with beige coloured asphalt. As there was an underground car park below the job site and it was essential to prevent cracking in the ceiling slab, the compact HAMM roller type HD 10 VO with oscillation took centre-stage during compaction. On the second section, a VÖGELE Compact Class SUPER 1300-3i tracked paver showed off its skills. Here, 160t of coloured asphalt mix had to be paved. The HAMM HD 10 VO and HD 10 VV rollers were used for compaction. »»

More design freedom with coloured asphalt

Whether it is used to give signals to road users at crossings, to direct the flow of traffic or as an attractive design element in landscaping applications – coloured asphalt is an excellent way for urban planners, landscape designers and construction companies to create effects. The mix is produced using "colourless bitumen", a synthetic binder based on mineral oil, that is coloured with pigments.

VÖGELE Mini Class pavers

The extremely compact SUPER 700-3i and SUPER 800-3i Mini Class pavers are the right choice for very confined job sites, be they tight, low or narrow. Featuring pave widths ranging from 0.5m up to a maximum of 3.5m, an asymmetrical material hopper for space-saving feeding by lorries and delivering excellent precompaction values with the state-of-the-art AB 220 TV Extending Screed, VÖGELE Mini Class tracked pavers prove that it is possible to pave in very confined spaces without compromising on technology, performance and operating comfort.

In the landscaping sector, demands are often high but space is limited. The compact VÖGELE pavers and HAMM rollers are therefore ideal.

Christian Goralczyk, Area Sales Manager WIRTGEN Vertriebs- und Service GmbH, Augsburg

HAMM HD CompactLine rollers

Good compaction performance, even in tight conditions: the rollers of the HD CompactLine are equally suitable for crushed stone, gravel or sand as well as for standard and special asphalt types. They can hence tackle a wide array of applications – in road construction, landscaping and building construction alike. With models ranging from the HD 8 to the HD 14, the series includes everything from tandem rollers with two vibratory drums or with one vibratory and one oscillating drum to combination and rubber-wheeled rollers.

VÖGELE Compact Class pavers

Small to medium-sized construction projects with confined conditions: this is the domain of this manœuvrable compact paver generation. From combined foot and cycle paths to urban roads, farm tracks and small to medium-sized areas – with the four wheeled or tracked paver models SUPER 1100-3i, SUPER 1103-3i, SUPER1300-3i and SUPER 1303-3i, VÖGELE supply optimum machine solutions for the building of new roads and for pavement rehabilitation with pave widths ranging from 0.75m to 5m.

VÖGELE and HAMM's landscaping competence

High-quality materials, design challenges, unusual colours – landscaping projects confront contractors with an increasingly varying range of tasks. The machine technology employed is every bit as versatile – and impressive, right down to the last detail. With the Compact Class and Mini Class pavers and the HD CompactLine rollers, VÖGELE and HAMM supply reliable and perfectly dimensioned solutions with high operating comfort. ///

Uncompromising quality for the 500km/h track

Maximum precision is called for when paving a dragstrip in Norway.

Norway // Gardermoen

The race itself only takes a few seconds, but in these brief moments, everything has to be absolutely perfect. This is true of both the dragster itself as well as the track. When the drivers rev up their engines for the acceleration duels – so-called drag races – they not only rely on automotive technology. The track must also be completely even and have an excellent grip. When rehabilitating the Gardermoen Raceway near Oslo, the only permanent dragstrip in Norway, the paving team of Stange Asfalt AS therefore placed very high demands on the asphalt paving – and used state-of-the-art equipment supplied by VÖGELE and HAMM. »»

Job site details

Rehabilitation of the Gardermoen Raceway dragstrip near Oslo, Norway.

Length of section:	1,200m
Width of section:	18.5m

Working parameters

Pave speed:	3.5m/min.
Pave width:	4.5m (approx.)
Layer thickness	
Base course:	1 – 18cm
Binder course:	4cm
Surface course:	4cm

Material

Base course:	4,000t AG 11
Binder course:	2,200t AB 16
Surface course:	2,200t AB 11 PMB

Equipment

VÖGELE MT 3000-2i Offset PowerFeeder
VÖGELE SUPER 1900-3i paver with the AB 500 TV screed
HAMM DV 70 VO tandem roller
HAMM DV 90 VO tandem roller

The quarter mile (402.34m) track record at the legendary Gardermoen Raceway is 4.7 seconds and the top speed is 514km/h. These figures underline how important it is that the asphalt layer is absolutely perfect.

Millimetre precision

During a dragster race, the drivers hit extremely high speeds. For this reason the track itself must meet stringent evenness requirements. The tolerance range on the Gardermoen Raceway was only ± 2mm across a width of 4.5m, and a crown with a slope of exactly +1° was specified. The track must be absolutely precise, as the slightest unevenness can cause instability in the dragster's road performance. On the dragstrip, the drivers accelerate up to top speeds of more than 500km/h within seconds. After a quarter of a mile (402.34m) the race is already over – and the braking parachute is deployed.

Making all the right moves – With ErgoPlus

To achieve the required level of precision, the Norwegian road construction company Stange Asfalt AS left nothing to chance on the dragstrip near Oslo airport: the SUPER 1900-3i worked with two VÖGELE multi-cell sonic sensors for grade and slope control. To guarantee continuous paving without interruption, a VÖGELE PowerFeeder type MT 3000-2i Offset was used for material feed. HAMM DV 70 VO and DV 90 VO rollers – each equipped with vibratory and oscillating drums – compacted all three layers of the new asphalt pavement. Both the innovative and reliable machines and the well-versed paving team proved invaluable during the project. Their familiarity with the VÖGELE technology was a great boon in all situations. ///

With the ErgoPlus 3 operating concept, we can operate the paver practically blindfolded. This really helps us to keep an overview of the job site at all times.

Aigars Pupelis, Screed Operator
Stange Asfalt AS

Made-to-measure paving: the paving team of Stange Asfalt AS met the highest demands for evenness and surface quality on the dragstrip.

Continuous filling enhances

efficiency

Filling cavities between safety barriers on the A 81 Black Forest motorway with an MT 3000-2i Offset PowerFeeder and a SUPER 800-3i paver demonstrates the added value delivered by the VÖGELE PowerFeeder series.

Job site details

Filling the cavity between two concrete safety barriers on the A 81 Black Forest motorway near Tuttlingen, Germany

Length of section:	7km
Width of section:	2.5m

Working parameters

Pave speed:	5m/min.
Pave width:	2.5m
Layer thickness:	10 – 12cm

Material

Filling:	0/32 mineral aggregate

Equipment

VÖGELE MT 3000-2i Offset PowerFeeder
VÖGELE SUPER 800-3i paver with the AB 220 TV Extending Screed

Continuous filling amid moving traffic: the VÖGELE MT 3000-2i Offset PowerFeeder makes this possible with its pivoting conveyor.

Germany // Tuttlingen, Black Forest

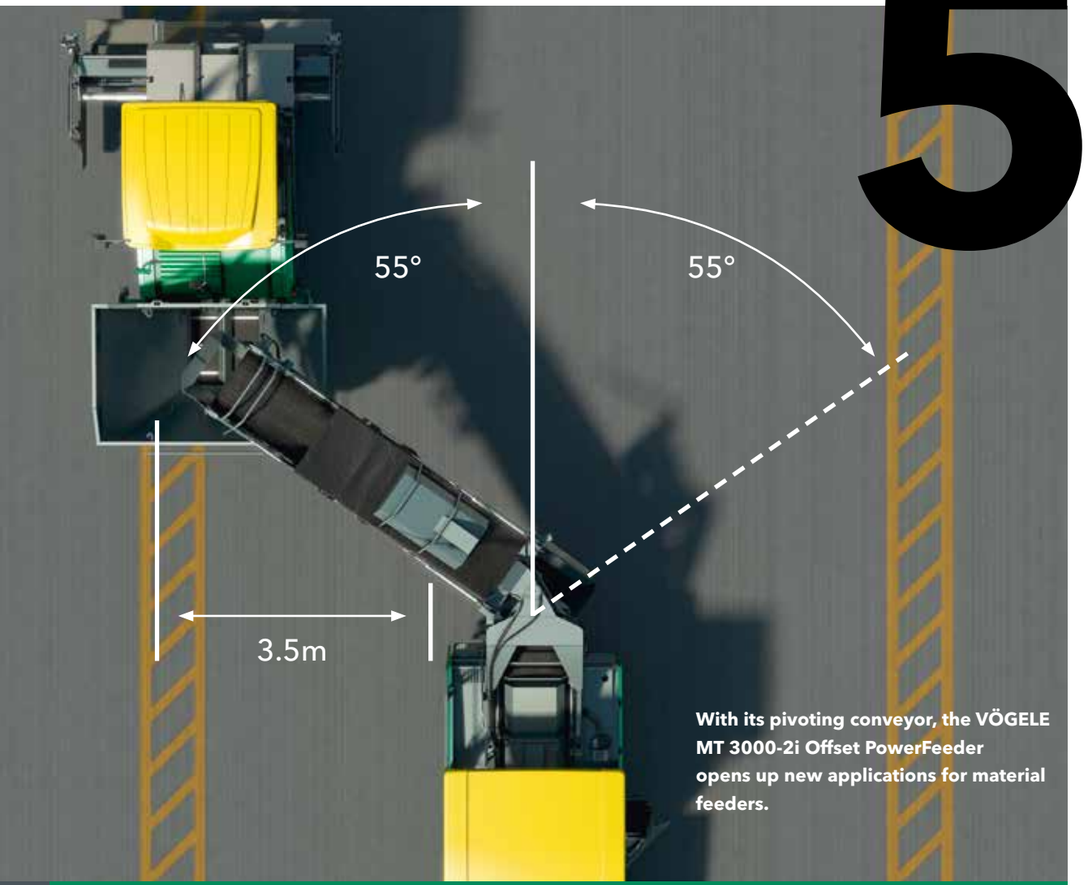
Using material feeders boosts the paving quality. Decoupling the paver and feed lorry improves job site logistics, prevents sudden jolts to the screed during docking and actively counteracts segregation. For these reasons, material feeders are being specified for an increasing number of construction projects in many countries. With the two material feeder models in their PowerFeeder series, VÖGELE are spearheading technological advancement in this machine segment. With its proportionally controlled pivoting conveyor, the MT 3000-2i Offset PowerFeeder in particular offers flexibility to paving teams – and opens up completely new applications to construction companies. This was demonstrated by a job on the A 81 Black Forest motorway in which an MT 3000-2i Offset PowerFeeder fed a SUPER 800-3i Mini Class paver from the side. By these means, it was possible to fill a cavity between two safety barriers on the median strip of the motorway continuously – and therefore efficiently. At the motorway job site in the Black Forest, the innovative PowerFeeder brought yet another added bonus into play with its pivoting conveyor: the technology is so robust that it cannot only handle asphalt, but also water-bound base course material or – as on the A 81 – mineral aggregate. »»

Feeding the paver from the side is really easy with the precise joystick control.

Ralf Wagner, Foreman
J. Friedrich Storz Verkehrswegebau GmbH & Co. KG

Learning by doing: the construction project in Tuttlingen was an interesting case study – also for construction engineer student Desirée Hermann from J. Friedrich Storz Verkehrswegebau GmbH & Co. KG.

55°



With its pivoting conveyor, the VÖGELE MT 3000-2i Offset PowerFeeder opens up new applications for material feeders.

Flexible thanks to its pivoting conveyor: VÖGELE MT 3000-2i Offset PowerFeeder

The ultra-modern MT 3000-2i Offset PowerFeeder can do a great deal more than other material feeders. The pivoting conveyor in particular opens up a wide range of applications that greatly improve machine utilization. An innovative feed concept maximizes conveying capacity, while the ErgoPlus operating concept ensures safe and simple operation.

- Non-contacting material transfer makes for maximum paving 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
- Outstanding power and low consumption from the powerful Deutz diesel engine, which delivers 160kW at 2,000rpm
- Outstanding mobility on any terrain and steering precision provided by crawler tracks with powerful separate drives

Feeding the paver from the side boosts efficiency

It was an unusual sight on the motorway job site: the largest and smallest VÖGELE machines joined forces to work as a team. This yielded a number of advantages: since the paver was supplied with material from the side, it was possible to safely maintain the flow of traffic. The alternative – filling the cavity with an excavator or wheeled loader – requires an additional slewing and manœuvring area, lorries have to tip the material onto the traffic lane and work cannot proceed uninterrupted. “Working on a motorway has seldom been so relaxed. Traffic simply passed us by without affecting the construction work at all. The lorries with the mineral aggregate simply merge in front of the VÖGELE material feeder and transfer the material with no further ado,” enthused Ralf Wagner, Foreman at J. Friedrich Storz Verkehrswegebau GmbH & Co. KG, describing his experience working with the MT 3000-2i Offset PowerFeeder. Additional compaction was also unnecessary when placing the mineral aggregate with the SUPER 800-3i and the AB 220 TV Extending Screed. As a result, the new concrete safety barriers, which form a 7km-long structural separation of the traffic lanes, were quickly and safely filled. ///

Transfer of material to the pivoting conveyor: the robust rubber belts also convey abrasive materials with ease – and without any losses.

Transfer to the material hopper of the paver: even the relatively small hopper of the SUPER 800-3i is neatly filled – without losses.

An investment with a future

It is the first BENNINGHOVEN plant to produce asphalt in Italy: a TBA 3000 is improving productivity and flexibility for its owner, PMB s.p.a.

The TBA 3000 with multivariable feed delivers impressive asphalt quality even at an RAP material rate of 40%.

Plant details

Commissioning of a new BENNINGHOVEN asphalt mixing plant with upstream granulator in Cavernago, Italy

Plants

Asphalt granulator SBRG 2000
Asphalt mixing plant TBA 3000

Working parameters

Asphalt granulator SBRG 2000	
Version:	stationary
Screening:	2-deck screen
Electrical power set:	fixed line
Output:	200t/h
Block width (edge length):	1,800mm (max.)
Asphalt mixing plant TBA 3000	
Mixing output:	240t/h
Drying output:	220t/h
Amount of feed hoppers:	6 x 16m³
Burner:	EVO JET 3 combination burner for oil and natural gas, 19MW
Screen output:	200t/h
Capacity of mixed material storage silo:	210t (alongside)
Bitumen supply:	5 x 80m³ tanks, 1 x 40m³ tank of modified bitumen with loading fittings

Italy // Bergamo

The city of Bergamo is known throughout Italy for its thriving industry, with the production of building materials as one of the most important fields. The latest innovation in this segment is a recently acquired asphalt mixing plant from BENNINGHOVEN. And it's something of a sensation. The type TBA 3000 is the first ever that BENNINGHOVEN has delivered to Italy, with the market being dominated by local suppliers. So what made the difference? "Our machine pool comprises 20 WIRTGEN milling machines, VÖGELE pavers and HAMM rollers. That's why we have so much confidence in the WIRTGEN GROUP. Once we had visited the BENNINGHOVEN headquarters and looked at the performance characteristics, we were fully convinced this was the right choice." This is how the partners of PMB s.p.a, Angelo Legrenzi, Mauro Bergamelli and Matteo Bergamelli, explain their investment in technology "made in Germany". »»

Highlights: Transportable BENNINGHOVEN plant (TBA)

- Modular system
- Large performance range
- RAP proportion over 70%
- Wide array of options
- Robust design ensures resistance to earthquakes and high wind loads
- Easy to transport and quick to install thanks to the accommodation of the main components in a container with plug & play connections

Acquiring the TBA 3000 is a strategic decision for PMB s.p.a.: it boosts our productivity and flexibility and enables us to meet new market requirements.

Mauro Bergamelli, partner
PMB s.p.a.

Italy's BENNINGHOVEN pioneers: the three managing directors of PMB s.p.a., Angelo Legrenzi, Mauro Bergamelli and Matteo Bergamelli.

First-class technology for high-grade asphalt

The transportable BENNINGHOVEN type TBA asphalt mixing plants are characterized by their modular design, a large performance range, the possibility of adding more than 70% of RAP material, high robustness and the wide range of options. These features make the acquisition of a type TBA 3000 plant a strategic decision for PMB s.p.a., since it allows the company to boost its productivity, gain flexibility with regard to new market requirements and significantly improve eco-friendliness.

Three tonnes of asphalt every 45 seconds

The TBA 3000 of the Italian contractor PMB is equipped with a 3,000kg mixer and guarantees a mixing output of 240t/h. Plants of this type are typically designed to be extremely robust, allowing them to be installed even in earthquake zones and making them resistant to high wind loads. Even so, their modularity and the preinstalled cabling designed for rapid connection means that each TBA is easy to transport and install speedily at another location.

Rising demand for RC processing

Specializing in asphalt production, "Produzione Materiali Bituminosi" – or PMB s.p.a. for short – was founded in 1980 as a joint venture between three companies that had already been actively involved in this field since the 1950s. PMB operates two asphalt mixing plants in the immediate vicinity of the A4, one of the busiest motorways in Europe. The need to replace one of these plants was used as an opportunity to upgrade the technology for the future. »»

Highlights of the recycling process: Granulator and multivariable feed

Two central components are responsible for the high portion of RAP material that can be used: the upstream stationary granulator SBRG 2000 and the multivariable RC feed system. The innovative BENNINGHOVEN granulator crushes the reclaimed asphalt particularly gently, preserving the grain structure. In the asphalt mixing plant these RAP granules are delivered "cold" into the mixer by means of a multivariable feed system. The procedure is as follows: a space-saving elevator delivers the granules to the mixing tower. The defined feed quantity is delivered to the mixer in small quantities. This prevents shocks caused by steam expansion, thus protecting the plant and minimizing maintenance.

Modern BENNINGHOVEN bitumen tanks deliver additional boost to efficiency

As well as the recycling technologies, PMB attaches great importance to diversity: "We want to offer our customers the greatest possible range of asphalt grades. That's why we opted for multiple bitumen tanks – not least because it enables us to store modified bitumen," says Angelo Legrenzi of PMB. Here too, BENNINGHOVEN offer an innovative solution: in the tanks, the 160 – 180°C hot bitumen's temperature is maintained electrically – and hence cost-efficiently – under constant movement by the BENNINGHOVEN mixing nozzle. ///

Highlights: BENNINGHOVEN granulator

› Available in stationary (SBRG 2000) and mobile (MBRG 2000) versions

› Reclaimed asphalt is crushed gently into its original constituent parts without destroying the grain structure

› The technology creates perfect conditions for almost 100% reuse of the reclaimed asphalt

› The crushing process produces very little additional fines – the prerequisite for high formula precision and mix quality, even with high RAP rates

State-of-the-art technology for the Baku city circuit

HAMM rollers and VÖGELE pavers deliver excellence for the first Formula 1 track in the Caucasus.

Job site details

Conversion of the city roads to a
Formula 1 circuit in Baku, Azerbaijan

Length of the circuit:	6,003m
Width of the circuit:	7.5 – 19m
Asphalt-paved area:	113,400m²
Slope	+ 12% to - 9%

Working parameters

Paved material quantity

Binder course:	10,400t
Surface course:	11,600t

Layer thickness

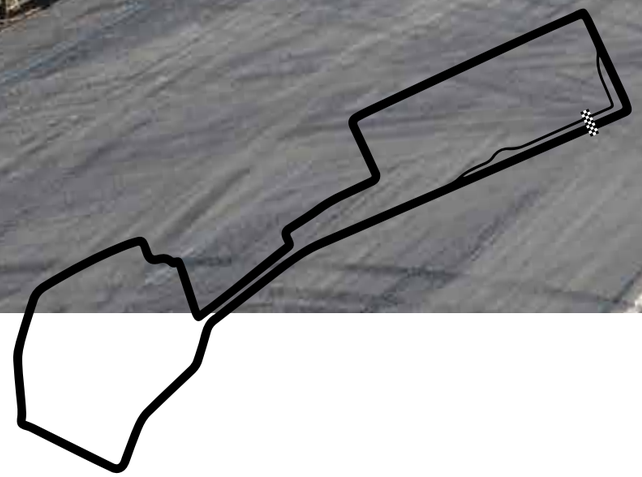
Binder course:	5cm
Surface course:	4cm

Material

Binder course:	AC 16 BS SG
Surface course:	AC 11 RT

Equipment

1 WIRTGEN W 2100 milling machine
8 VÖGELE SUPER 1900-2 pavers with AB 600 TV Extending Screed
4 HAMM HD+ 110 VO tandem rollers
4 HAMM HD+ 90 VO tandem rollers
2 HAMM HD 110 tandem rollers
2 HAMM HD 90 tandem rollers
2 HAMM HD 10 tandem rollers
1 HAMM HD 14 tandem roller



The race circuit in Baku features 8 righthanders and 12 lefthanders – including a lap around the historic city centre with a double chicane and an uphill section. At the end of the circuit, the Formula 1 racers reach top speeds of more than 340km/h on the approximately 2km straight.

Azerbaijan // Baku

Whenever the 22 Formula 1 pilots race around the track, vying for pole position, the air in one of the many metropolises around the world is charged with excitement. In June 2016, Baku, the capital city of Azerbaijan, got its first taste of this heady cocktail of top speeds, precision and thrills, glamour and celebrations. This spring, a city circuit was created in the centre of the capital, on the "balcony of Europe" amid the centuries-old buildings, contemporary high-rise towers and the port on the Caspian Sea. To make sure that the pilots can safely keep their powerful 815hp (600kW) racing cars on the track, WIRTGEN, VÖGELE and HAMM machines built a high-quality asphalt pavement on the narrow streets and the wide boulevards of the city. »»

First choice for the top league

Formula 1 races make the highest demands on the pavement. The asphalt must be particularly homogeneous and even – and naturally have an outstanding grip. Ideally, such circuits are paved on a defined sub-base. This was not possible in Baku, however, as the circuit passes straight through the city. At the beginning of the year, the streets were a mixture of normal, asphalt roads and historic cobblestones.

Special formula for the ancient cobblestones

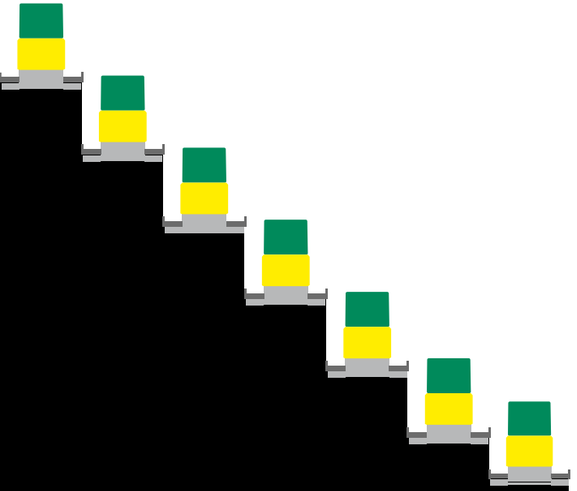
As a feature of a UNESCO World Heritage site, the historic cobblestones had to remain intact and be restored to their original glory after the race. "We solved this unusual challenge by separating the cobblestones from the asphalt with a layer of chippings. A pavement of base course, binder course and surface course was then paved. In the cobbled areas, a carbon-reinforced asphalt layer was integrated into the surfacing. It was designed to prevent the new asphalt pavement shifting over the cobblestone," explains Dr Rainer Hart, an asphalt consultant.

On the other circuit sections, the contractor, AzVirt LLC from Baku, employed 3D-precision milling to create an exact, precisely pre-defined profile that met Formula 1 standards on the existing city roads. »»

AzVirt used several rollers following closely behind the pavers to compact the asphalt in the optimum time frame – an important aspect for meeting the highest quality demands.

At the moment, Baku can justifiably claim to have the best city roads in the world.

Dr Rainer Hart, Managing Director
Hart Consult International GmbH



The perfectly interlocked asphalt pavement

The formation of the joints has a crucial impact on the service life of asphalt surfaces. This is because cracks at the joints or those resulting from heavy loads are the first places to be attacked by water. "Hot to hot" paving is therefore recommended to permanently prevent moisture from penetrating the asphalt pavement. At least two pavers simultaneously place the asphalt strips "hot to hot" in a slightly staggered formation. Two or more pavers working in echelon is the best way to ensure perfectly bonded longitudinal joints.

EXPERT TIPS

- The distance between the individual pavers should be kept as short as possible so that the joint face of the first strip is still sufficiently hot.
- Rollers with a light operating weight should follow directly behind the pavers. They should compact the surface from the outside inwards in the direction of the joint. It is recommended that the rollers work with an overlap of at least 15cm parallel to the longitudinal joint.
- Joints should be offset in the individual pavement layers and produced with oblique faces.

Eight SUPER 1900-2 pavers with AB 600 TV Extending Screed

The binder and surface courses were then paved onto the previously prepared roadways. This was accomplished by an impressive armada of VÖGELE pavers and 15 HAMM rollers, with the machines sometimes working simultaneously on different sections; all in all, 8 SUPER 1900-2 pavers were used, each equipped with an AB 600 TV Extending Screed. The use of identical screed types was stipulated in the contract.

Perfect logistics

During paving, the asphalt production, transport and feeding were controlled so as to ensure that the pavers were able to work at an almost constant pave speed. More than 40 lorries transported the asphalt from three mixing plants to the pavers. Due to their careful preparation and planning, AzVirt were able to supply asphalt to the pavers just in time without stoppages, despite the difficult traffic situation in the city centre – an impressive feat of logistics and civil engineering.

Seven at one blow

The absolute highlight was the "hot to hot" paving in the area of the seafront, where 7 pavers plus 15 rollers featuring operating weights of between 2 and 14t built the asphalt pavement for the track and the spectator area in a single step. Their combined width spanned 52m – a true highlight for all involved! »»

"Hot to hot" through Baku: the VÖGELE pavers produced a perfectly interlocked asphalt surface.

HD, HD+ and HD CompactLine for high-quality compaction

The AzVirt experts know that final compaction has a decisive influence on the surface quality of the asphalt pavement. With this in mind, they exclusively used HAMM tandem rollers of the HD, HD+ and HD CompactLine series. The design of the articulated rollers already ensures a regular weight distribution – a key factor for outstanding pavement evenness without bumps and cracks. An added advantage is the excellent side clearance combined with the large track offset. Ideal for ensuring consistently precise and full compaction along curbs, road fittings and walls.

Safe and effective with unique visibility

All HAMM rollers feature outstanding visibility. On the HD+, this is guaranteed by the clever frame construction combined with the panoramic cabin. The compact machines of the HD CompactLine range provide drivers with a full view of the working area at all times due to the slim-line front end. This not only influences quality, but is also a safety aspect, particularly when a large number of rollers closely follow the pavers as in Baku.

Protecting historic buildings

Another decisive factor for the quality of the compacting work in Baku was the use of oscillation rollers. They cause significantly lower levels of vibration to the surrounding area than vibratory rollers. The invitation to tender specified oscillation compaction, as the entire circuit is flanked by century-old buildings. In addition, there are gas pipes as well as underground car parks and tunnels under many of the roads. Vibration compaction was therefore an absolute no-go in most areas. For Manfred Martin, Head of the AzVirt Technical Division, there was no alternative to the HAMM rollers: "As a pioneer in this field of technology, HAMM have more than 30 years of experience with oscillation – much more than any other manufacturer."

Final finish with oscillation compaction

However, oscillation has a great deal more to offer than "just" low-vibration compaction. The special drum movement also creates even surfaces with a good initial grip – the second key point in favour of using oscillation in Baku.

The best city roads in the world

Oscillation compaction was also the first choice for the surface course of the F1 circuit, as areas compacted with oscillation have an excellent longitudinal evenness. The final quality control to check the position and evenness of the track showed that AzVirt had built a superb pavement on the originally inhomogeneous city roads and easily met the stringent surface accuracy requirements of 3mm over a distance of 4m. ///

Oscillation technology from HAMM was used for dynamic compaction of the circuit around the historic city centre, the modern government district and the stylish seafront, without impacting above-ground and underground structures. The compaction results achieved in the process were excellent.

Oscillation

Low-impact methods for the city
On city-centre job sites with confined conditions, dynamic compaction with oscillation is recommended, as it only introduces around 15% of the vibrating force into the surrounding area in comparison to vibration. This protects the surrounding buildings as well as the pipes and installations below the pavement.

ADVANTAGES
- Low vibrating forces in the area around the machine
- Dynamic compaction, also for vibration-sensitive areas

Perfect surfaces for Formula 1 races
Surfaces that are compacted with oscillation feature a very high degree of longitudinal evenness. This is because the drum is in constant contact with the ground. This type of asphalt compaction also produces an excellent initial grip, as the drum rubs the bitumen on the upper surface of the pavement with its oscillating movement. A clear bonus when it comes to safety.

ADVANTAGES
- Excellent longitudinal evenness, no irregularities in the surface
- High level of initial grip

Storseisund Bridge in Norway –
one of the most spectacular structures on the Atlantic road and
widely regarded as one of the most beautiful routes in the world.

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