

FAYAT ON THE ROADS

BETTER ROADS

INNOVATION
LEADERSHIP



OPERATOR
FIRST



APPLICATION
EXPERTS



SUSTAINABILITY



WELCOME
to BAUMA Munich
& CONEXPO Las Vegas!



FAYAT
ROAD EQUIPMENT



JEAN-CLAUDE FAYAT
Chief Executive Officer

Companies of the FAYAT group, and more particularly the FAYAT Road Equipment division, are working towards decarbonation and digitization through equipment and technologies for the future of road construction, maintenance and rehabilitation.

Covering everything from safe and alternative drives and other technologies for reducing energy consumption and carbon footprint, to autonomous machines and digital integration, the FAYAT group shows how they are making these ideas reality.

We see three main priorities driving the industry of road equipment: advancing safety, improving environment and harnessing digitization; they are at the heart of every machine, so contractors can be more productive, efficient and profitable. Specifically on planning and documentation of jobsites, but also in operator assistance systems to improve both the quality of work and also the safety of the jobsite, the FAYAT group is presenting solutions for all of these.

The FAYAT Road Equipment division caters to all steps of the road life cycle, with solutions in asphalt production, application and compaction, road maintenance, sweeping, cold milling, stabilization & recycling and soil compaction. These solutions, products and services, create value for our customers. Our brands BOMAG, DYNAPAC, ERMONT, MARINI, SECMAIR, DULEVO and SCARAB meet all global needs, responding to local specificities, with solutions that respect our four strategic messages: Innovation Leadership, Operator First, Application Experts and Sustainability.

All these innovations, revolving around our four pillars, always combine the two essential axes of digitization and decarbonation, for business, but also for society to which we must remain fully committed, in a complex world context that demands an ever-more inventive and agile approach.





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Bomag MyCockpit on new BW 154 / BW 174 tandem roller offers maximum flexibility and operator ergonomics (functions frequently used in everyday work are positioned within easy reach)



SAFETY & ERGONOMY



SECMAIR

Enhanced cab ergonomics

Based on customer feedback over the last ten years, the man-machine interface in Secmair cabs is being modified for enhanced user comfort and optimised performance. Its name is Smart Cab.

It's no secret that operating road maintenance machinery requires continuous management of numerous operations, such as binder dosage, gravel dosage, spraying width, or selecting the areas to treat. It could be compared to a Tetris puzzle which is not always easy to master from the outset.

At the same time, the operator must keep a constant eye on the road, more particularly in urban worksites, which are increasingly complex and frequent in number. Operators must be constantly aware of traffic movements while observing their work zone and the potential obstacles in their path, in addition to controlling the gauge of their vehicle.

It is thus obvious that well-designed, optimal and integrated (thanks to a single screen) cab ergonomics improve the speed and accuracy of the movements an operator must execute continuously. In a word, enhanced working conditions, an operator who is more attentive to their worksite and optimal safety for all. Designing new cab ergonomics must start with a user survey to meet operators' needs effectively. It was essential for us to take technical advances into account and to integrate users' experience as much as possible in order to provide the most appropriate solution. High-quality components designed for professional use were selected in order to ensure optimal system longevity. Key functions have been made more accessible, to facilitate equipment handling, enhance task interest and optimise machine use.

An approach which draws directly on use and common sense.

This new ergonomic design (arm rest + screen) will be rolled out across our range as of September 2023.

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Smart Cab: comfort and optimized performance

NEW SECMAIR CAB ERGONOMICS

- A 'single' 12" high-resolution colour touch-screen (1,280 x 800): this will bring together basic Chipsealer functions (dosage), the aim assist system (New Pilot) and rear-view and tracking cameras.
- An ergonomic arm rest with a mini joystick for enhanced operating precision and speed.
- Improved integration of the control panel in the cab environment.

BOMAG

New generation of large cold planers: slim design, efficient removal

Bomag launches its new BM/65 series of cold planers in early September 2021. With a CECE operating weight of only 27 tonnes, the BM 2000/65 is the lightest planer currently available in the 2-metre class. Its low weight achieved by the special lightweight design and the shorter conveyor belt now make the planers even more flexible to use. When it comes to efficiency, ease of operation and work safety, the new generation of planers features numerous innovative details.



Bomag's new 2-metre class cold planer BM 2000/65, France



A modular design for an easy check, service or replace of each unit

The productivity of a cold planer depends heavily on the perfect interaction of all components. The operator is at the centre of the process and has to confidently monitor everything from the control station – from the cutting edge to the conveyor belt. In the new BM/65, an unobstructed view has become an essential part of the construction: the front contour's slim design and the position of the operator's platform make it easier to work precisely and safely. The flat rear profile optimised for visibility also increases safety when manoeuvring. The obscured area behind the machine can be viewed seamlessly with the camera system. The control platform itself can be moved steplessly by up to 200 mm, allowing the operator to easily keep an eye on the right cutting edge and the side plate.

The slim construction enables a tight turning radius of only 1.7 m, resulting in high flexibility and manoeuvrability. Combined with the latest generation of conveyor belts featuring a 130-degree swivel angle, the planer with the smallest milling radius in the 2-metre class makes loading the truck a simple task, even when milling in mini-roundabouts.

Another new feature is the operation from the driver's platform: short input

paths and few submenus enable the machine settings to be accessed quickly and easily. Sensors and assistance systems are equally easy to select and use. All relevant information is presented clearly and easy-to-read on the two rugged 7-inch full-colour displays. The familiarisation process is minimised thanks to tried-and-tested, intuitive controls.

The 640 hp engine, which complies with Stage V and TIER 4f emission standards, is perfectly matched to the application with a milling gear tailored to the characteristics of the six-cylinder in-line engine. Together with the likewise optimised conveyor belt operation, this means that construction companies can count on consistently low operating costs with the new generation of Bomag planers in their machine fleet.

Contact

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27-TONNE BM 2000/65 MILLING MACHINE

A slim and lightweight design for greater efficiency, maneuverability and ease of use.

BOMAG

Asphalt paving in underground car parks

In the new underground garage in Rottenburg an der Laaber, a 10-cm thick bearing course (AC 32) now serves as a stable base. It transfers all traffic loads to the substrate – concrete in this case. A 4 cm thick asphalt surface course (AC 8) is responsible for the required surface properties of the traffic area.

A total area of 3,200 m² was to be asphalted, and an evenness of ± 6 mm was specified. The paving work was carried out by Strabit Straßen- und Bitumenbau GmbH & Co. KG from Wörth an der Isar.

With a weight of less than 6 t, a machine height of 2 m and a screed width of just 1.1 m, the Bomag compact paver fits through and in almost anywhere. Even behind the rows of pillars and right up to the wall, it was fully operational during the car park expansion works in Rottenburg. Manual paving was only necessary on very few and particularly angular sections.

It combines compact dimensions with a 2-platform concept and maximum all-round visibility. The operating panel is height-adjustable and equipped with a display for controlling the paving functions. Due to the low ceiling height, the machine operator often selected the low standing position during paving. Even from there, a viewing tunnel in the hopper wall always provided a clear view of the direction rod when manoeuvring. The Sideview system and dual screed controls (right and left) offered an additional plus in ergonomics. This increased working comfort also resulted in even better work results here. Even under very low ceilings, paving was a breeze, as the BF 200 C-2's light towers can be folded by 90°.

A decisive factor in maintaining the required evenness (in this case ± 6 mm) was the most even possible material feed in front of the screed. The BF 200 C-2's cleverly dimensioned auger distributed the material perfectly over the entire screed width. In Rottenburg, the powerful hydraulic drives still had ample reserves and always remained finely adjustable.

One challenge, however, was to continuously feed the pavers with asphalt mix. The asphalt had to be delivered with a total of three fully insulated asphalt tippers and was then transported by wheel loader to the underground car park for feeding. The construction time for the bearing course was 4 days. After another 6 days, the surface course was also completed.

Contact

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A compact paver fitting through and in almost anywhere (here in Germany)



Strabit Straßen- und Bitumenbau GmbH & Co. KG has the perfect asphalt paver for the confined conditions in multi-storey car parks

BOMAG BF 200-2 PAVER

- Less than 6-tonne weight
- 2-meter height
- A screed width of minimum 1.1 meter

DYNAPAC

Operator's health first!

One of our key focus is to keep your team confident and healthy when operating on the job site. We are committed to ensure good working safety, ergonomics and make it easy to use our operating system. To improve the operator's comfort, we are now introducing the Dynapac CA1300/1400 with Safety Cab including fresh air ventilation, heating and air conditioning. External traffic mirrors, 4 times LED working lights, rotating beacon and radio with USB/MP3 and Bluetooth connection is standard.

Dynapac CA1300/1400 soil compactors are vibratory roller designed for compaction operations in pipe trenches, compacting roads, streets and parking lots. Due to the small size and exceptional maneuverability, the rollers are also well suited for compaction on large building foundations and industrial construction sites and in cramped spaces in connection with refilling work. The rollers are also suitable for repair work and give good maneuverability even on very steep slopes. All types of supporting and reinforcement courses can be compacted.

Safety first

Safety functions include back-up alarm, battery switch outside fire zone and interlock. As always on Dynapac machines the parking brake is separated from the forward and reverse lever, not to unintentionally being able to release the parking brake. The engine hood is lockable to cover all filling points to secure operation even if machine is left in field overnight.

Operator's station with view

The ergonomically designed operator's station offers a high level of operator comfort and good visibility over the work area and surroundings. Working lights for best visibility and also night work is standard as well as the protective structure around operator's legs and 3" seat belt. The vibration insulated platform gives very low body and hand/arm vibrations. The cab door is large and possible to open at an angle that facilitates easy entering of the operator's station.

Safety first: Traffic mirrors, LED working lights and rotating beacon make sure to see and be seen



Side view of CA1400 with Safety Cab

The safety cab features external traffic mirrors, 4 times LED working lights, rotating beacon and radio with USB/MP3 and Bluetooth connection as standard. Fresh air ventilation with filter, heating and air conditioning is standard as well as tinted windows to minimize heat radiation and reflections. Wipers and washers front and rear and right cab window openable for communication and positioning mirrors together with interior light makes it possible to work in all conditions. Low noise level at operator's station is ensured by the curved front window and insulation in both floor and ceiling.

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DYNAPAC CA 1300/1400 ROLLERS

Our key focus:
Operators' safety, comfort & ergonomics

Low-vibration seating position with good lateral support





DYNAPAC

Laying the road to advanced documentation and safer automation

Safety on busy job sites became a number one priority over the last decades in the road construction industry. The current approach: Combine the running traffic and road works by using half closed roads where construction work and running traffic can co-exist. However, this can lead to a high risk of accidents on site and quality issues caused by time pressure.

Dynapac is supporting our customers in this difficult task with combining modern technologies as intelligent assistant systems into the machine line up. Combining the following advanced systems in one tool gives our customers the chance to operate safely, highly precise and highly efficient:

- The **MatTracker** keeps the operator out of the danger zone of running traffic.
- The **Pave-IR Systems** allows the operators to get a detailed inside look on their paving results.
- The **TH E** high compaction screed series is able to handle compaction needs to high mat thicknesses and handle sensitive materials on thin layer wearing course paving at the same time.

Stay out of danger zones with the MatTracker

While working on a half-closed-road-jobsite the distance between the screed operator and the running traffic can be less than a meter due to the lack of space. If there is an accident happening the screed operator will be directly exposed to the crash and there is no time for him to escape. Hundreds of issues have been reported over the years but now there is a solution to keep the screed operators safe: The MatTracker sensor system.

The sensor can be easily attached to the side shield even on the run without stopping the machine. Once the system is powered on, it can detect edges from curbs or already existing mats next to the paver based on advanced optical image processing. By doing that the system can follow the edge and send the screed extension and retraction signals to the machine, so the screed is fully automatically adjusted in width, based on the reference given. The operator can leave the screed remote and let the MatTracker and the integrated leveling system take over. Both systems can be observed from the main dashboard or the second remote control to avoid accessing the danger zone during the complete machine operation.

Ensure high quality standards with thermal mapping systems

A continuous documentation process becomes more and more crucial on sites around the globe. Due to the short time slots, increasing traffic and a variety of sub-contractors the quality assurance is very challenging. Thermal mapping systems from MOBA or TF Technologies are designed to tackle the issues by using advanced data coming from machines and material and combining it with machine learning algorithms.

The MOBA Pave-IR Systems allows the operators on site to get a detailed inside look on their paving results by using an infrared camera that scans the



Check on your paving results any time

laid mat continuously. By using the data collected the system recognizes cold spots or hot spots in the mat that need to be treated careful during the rolling process to keep the overall quality on the same level.

Adapt to your current conditions with the TH E Vario Screed Series

High efficiency is the industries' main driver: Fuel reduction, high speed and best quality is delivered by Dynapac's high compaction screed series. A system that is able to handle highest compaction needs to high mat thicknesses and also sensitive materials on thin layer wearing course paving at the same time – in one machine. Controlled by the Pave Manager OS the screed's compaction settings can be adjusted individually to fit the current material's needs. This is resulting in drastically reduced overall energy needs of the complete paving train by saving roller passes and rework.

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ALL ADVANCED SYSTEMS IN ONE TOOL

MatTracker + Thermal mapping systems + TH E Vario Screed Series. The interaction of these components ensures the highest level of operator safety and the most efficient work. Fulfills the requirements for the documentation of the process.



Optimized cabin conditions, from adjustable electro-pneumatic seats to hygienic air-flow systems



Superior solutions offering the highest standards of driver comfort and safety

FAYAT ENVIRONMENTAL SOLUTIONS

A safer, better experience for the operator

At Fayat Environmental Solutions (FES), in the same way that our engineers are focused on making innovative improvements in performance, they're also committed to developing new safety features and operator amenities, and to enhancing the existing ones.

All Dulevo, Mathieu, Ravo and Scarab cleaners and sweepers can be equipped with features that include a rear-view camera or even a 360° camera, giving the drivers the full picture as they work. In addition, Dulevo, Mathieu and Ravo can be outfitted with blind-spot cameras and first aid kits. Overload indicators can be installed on Dulevo and Mathieu solutions. What's more, these safety features can be customized at the client's request.

Intelligent operating parameters include an open-door detection system that prevents sweepers from moving forward at inopportune times and, for Dulevo, a hopper-hatch alert that sounds an alarm and causes the touch screen display to light up when the driver tries to move the vehicle when the hatch isn't properly locked into position. In addition, Dulevo's D6 has four double-caliper disc brakes to cut breaking distance to the minimum.

It's not just the on-board technology that protects the driver of a FES sweeper – reliable, durable and strong high-quality construction materials go into every aspect of a FES product, shielding operators from harm on the street and reducing maintenance requirements in the garage.

Regarding comfort, no one has it better than a FES driver! From adjustable electro-pneumatic seats (Dulevo and Mathieu seats come with heating options as well!) to hygienic air-flow systems, cabin conditions have been

made as pleasant as possible. Sweepers and cleaners can be equipped with virus sanitizing solutions as well; in the case of Dulevo vehicles, there's the option of an antiviral photocatalytic oxidation system.

Ergonomics is essential to efficiency and operator satisfaction, and last year Mathieu made a major improvement to its flagship product, the MC 210, by altering the control pad and giving the driver more space. Dulevo designed its D6 without a central tunnel, leaving room for a third seat, for a refrigerated compartment or just for allowing space for the operator to be able to walk inside the cabin. Spacious cabins are, in fact, characteristic of all FES sweepers, making every working shift a little more pleasant. Making work easier as well as more pleasant is yet another goal of FES, and the latest Dulevo vehicles are helping to achieve this with their adaptive sweeping technology, permitting the vehicle operator to configure operational settings one time and then re-activate these preferred settings with a single touch to the adaptive screen on the dashboard or multifunction joystick on the armrest.

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FAYAT. BETTER ROADS.
Road equipment & solutions by FAYAT



INNOVATION LEADERSHIP – OPERATOR FIRST – APPLICATION EXPERTS – SUSTAINABILITY

roadequipment.fayat.com





ECO-RESPONSIBILITY



ERMONT

Decarbonation: the move towards eco-responsible hot-mix asphalt worksites

There are many sources of CO₂ emissions on a hot-mix asphalt worksite which must be taken into account in the site's carbon footprint.

Ermont has constantly striven to develop new solutions to meet ever-evolving environmental requirements. Here are its solutions to substantially improve the carbon footprint of a road worksite, which act on all the below-listed sources of CO₂ emissions (with the exception of road planing and asphalt laying, which do not come into the framework of Ermont operations). The carbon footprint must take every element of a worksite into account. It is expressed in CO₂ equivalent tonnes (CO₂e), a unit created by the IPCC (Intergovernmental Panel on Climate Change) to compare the impacts of various greenhouse gases on climate change and to total their emissions.

CARBON FOOTPRINT MEASUREMENTS ON A WORK SITE

1. Asphalt production
2. Bitumen production & transport
3. Aggregate production & transport
4. Fuel production & transport
5. Electricity production
6. Transport logistics between the asphalt plant and the worksite
7. Road planing
8. Asphalt laying

Recycling

With over 40 years experience in recycling, Ermont offers a full range of procedures to recycle up to 100% of Reclaimed Asphalt Pavement (RAP). This unrivalled experience enables Ermont to provide solutions adapted to all its customers' recycling needs.

The use of RAP from road planing proportionally reduces the need for the additional raw materials (bitumen and aggregates) required to produce asphalt. The CO₂e emissions linked to the production processes of these raw materials are thus directly and proportionally reduced.

Extreme mobility

Ermont's supermobile and supertransferable designs represent strategic solutions to reduce to a minimum the transport logistics between the asphalt production site and the application worksite. No civil engineering requirements, crane-free assembly and embedded interfaces, etc. are just a few examples of the benefits of these designs.

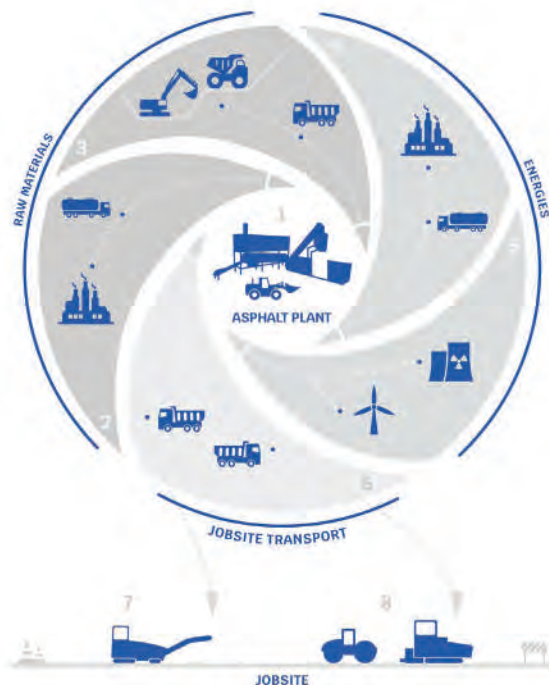


Diagram of CO₂e emissions around a road asphalt worksite.

Thanks to more than 30 years of regular developments in close collaboration with all its customers, Ermont has designed various ranges of supermobile and supertransferable asphalt plants which can reach any type of worksite, no matter how inaccessible or geographically limited.

These mobility features enable Ermont customers to move their production tool according to the location of their projects, to be as close to the worksite as possible and thus reduce the distance for lorries transporting asphalt to the worksite or RAP to the production site. Reducing material transport in this way diminishes related CO₂e emissions by three (on average).

Furthermore, the implementation of 'circular' transport logistics enables optimal lorry trips to transport asphalt to the worksite and planed RAP to the production site (forming a return trip). CO₂e emissions linked to RAP transport are thus reduced by 82%.

LPG storage for Ermont asphalt plant





The supermobile Ermont RF400 Highway asphalt plant

The Ermont TRX Highway asphalt plant: up to 100% Reclaimed Asphalt Pavement (RAP)



Eco-energy

Ermont offers high-performance energy and low carbon multi-fuel solutions. Optimising and ensuring low energy use in terms of both thermal (aggregate heating) and electric power (engines, heaters, etc.) to reduce CO₂e emissions requires:

- Optimal asphalt plant performance;
- The ability to produce warm-mix asphalt which consumes less energy;
- The implementation of reduced yet optimal electric power for the asphalt plant;
- Cutting-edge Softmix automation to manage and optimise energy use in real time;
- Energy-efficient tanks to store binders;
- Insulation of all hot zones on the asphalt plant to reduce heat loss.

Ermont also offers the possibility of using renewable bio-fuels in its asphalt plants. The CO₂e emissions linked to material drying operations depend on the type of fuel used in the machinery. Ermont burners are designed for use with all types of fuels, including 100% renewable carbon bio-fuels (neutral combustion), efficient and sustainable alternatives to oil-based resources which ensure the lowest (or zero) CO₂e emissions.

All these solutions can reduce the CO₂e emissions of a road worksite significantly. The difference in emissions between a worksite A applying no Ermont solutions and a worksite B applying all Ermont solutions can be as much as 80%!

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ERMONT

TSX: the production of asphalt with a high recycling rate has never been so simple

With over 40 years of experience in recycling technology for asphalt plants, Ermont has created TSX, a unique technology used in the hot-mix TSX Highway (supermobile) and TSX Incity (stationary) ranges, enabling easy recycling of up to 70% of Reclaimed Asphalt Pavement (RAP), while guaranteeing high-quality and environmentally-friendly asphalts.

TSX: OUTSTANDING INNOVATION



Winner of the 1st prize in the latest edition of the Fayat Innovation Challenge, in the 'Eco-responsibility' category

Environment

Thanks to recycling, in addition to proportionally reducing the addition of raw materials (bitumen and aggregates) and the CO₂ emissions linked to both the production process and the whole raw material logistics chain, the TSX technology also includes a new process: Duotherm. The latter combines heat exchange between RAP and slightly over-heated aggregates, and heat exchange between RAP and moderate-temperature gas which has previously been exchanged with the aggregates. This results in lower atmospheric emissions than the regulatory standards in effect.

High-quality asphalts

The TSX technology guarantees high-quality asphalts thanks to a dryer drum composed of 3 different zones, assembled as a series with a synchronised twin-shaft mixer:

- The 1st zone of the drum is the combustion zone housing the burner flame, which produces hot gases to dry and heat materials.
- In the 2nd zone of the drum, the hot gases from the 1st zone are first exchanged with the aggregates only in order to dry and heat them, store energy in the aggregates and lower gas temperatures. This zone acts as a thermal shield to prevent any flames from reaching the 3rd zone.
- In the 3rd and last zone, the RAP are added via a recycling loop and dried using the Duotherm process (see above).

During this process, the RAP binder spreads evenly through all the aggregates (1st phase of binder remobilisation). When it leaves the drum, the at-temperature and homogeneous grain-size mixture is fed into the synchronised twin-shaft mixer, where it is mixed with added binder and possibly a regenerating agent. An extended mixing time completes the total remobilisation of the binder.



The supermobile Ermont the TSX28 Highway, France

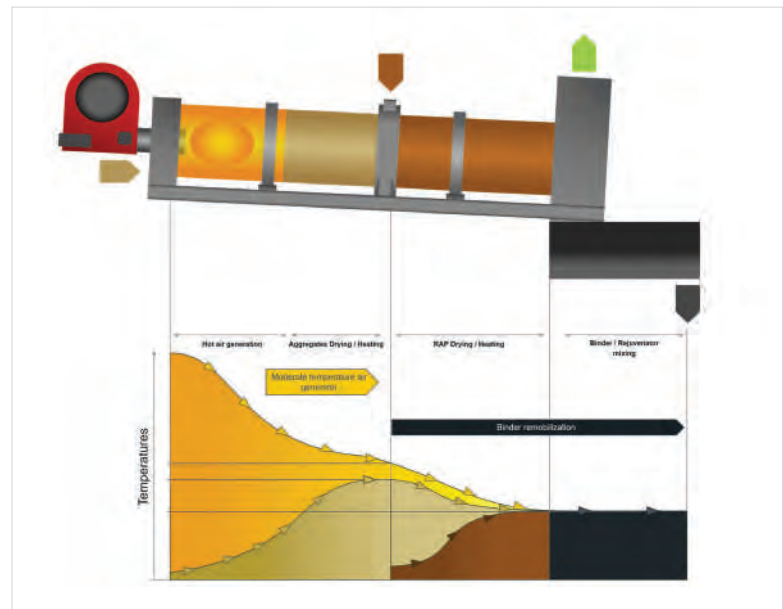


Diagram of TSX Ermont technology

In a world where environmental requirements change constantly, Ermont continues to offer ever-more innovative solutions to ensure compliance. The TSX technology is a perfect example of this and is designed to assist customers with their eco-responsible projects of the future.

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MARINI

Evodryer, a new generation milestone in Reclaimed Asphalt Pavement (RAP)

Nowadays the respect for the environment is a non-negotiable requirement when envisioning a new plant and, for this reason, customer requests have increasingly shifted towards solutions that can embody, all in one, the different market demands. Marini EvoDryer represents, to date, the best available technology when it comes to introducing the RAP (Reclaimed Asphalt Pavement) into the recycling ring and allow customers that flexibility of action that would significantly help meeting the most different market needs.

Marini EvoDryer unique distinctive features rely on the increased length of the dryer drum, allowing the plant to change the position of the introduction of the RAP after the dryer flame, making it versatile for multiple use; in this way the heat exchange area for the aggregates is kept unaltered and therefore the efficiency of the drying process is guaranteed in all operating situations. In addition, it is necessary to provide a special "long" burner - with appropriate internal protection - in order to ensure the correct position of the flame inside the dryer drum. As a consequence, the area of introduction of the RAP is positioned after the flame and therefore a mixing area can be created in the final part of the cylinder, between the aggregates and the RAP, with suitable special mixing blades that considerably reduce the stickiness problems of the RAP inside the dryer drum.

The RAP material can then be heated gradually and without being over-strained by the very high temperatures in the flames area; in this way the residual bitumen can be redeemed in the best possible way without the risk of being burnt and the drawbacks that could happen with the dryers now available on the market i.e., increasing emissions, increasing odours, reducing the quality of the final product.

Marini EvoDryer unique distinctive features rely on yet another important enhancement: the new EvoDryer cylinder, offering the possibility of treating the fumes produced by the mixing tower, in particular in the discharge area of the mixer. In fact, with the help of a dedicated fan it is possible to suck the diffuse emissions that are produced at the mixer discharge and / or to manage the complete system in order to maintain the depression of the tower up to the upper part of the dryer in a dedicated chamber. Therefore, the emissions are treated so that all organic particles are burned by the flame, resulting in an important reduction in atmospheric emissions and odours. Marini Evodryer - next generation milestone in the field of RAP management.

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Marini Evodryer, next generation milestone in the field of RAP management





Marini Master Tower, Cesena (Italy)

MARINI

Master Tower field tests show highest RAP percentages in the recipe

The cooperation between Marini, the University of Bologna and the customer proved ground-breaking, making it possible to optimize the calibration of several factors involved in asphalt production: the perfect working temperature, impeccable depression and a state-of-the-art gas recirculation method.

This is how the customer was able to produce over 300,000 tons in the last 12 months with an average use of 47% reclaimed asphalt pavement (RAP) and, as a consequence, to optimize energy consumption at an average of 75.34 kWh / ton for asphalt production.

The initial tests with different types of rejuvenating additives proved essential to establish the exact type and quantity of rejuvenator according to the type of reused RAP material, to achieve the correct diffusion and mixing of the new bitumen, together with the remobilized one.

Once this first test phase was completed, several additional tests were made on the finished product at the customer's lab in order to control the compliance with the granulometric curve of the formula, on the resulting voids index and, above all, on the performance characteristics of the asphalt such as stiffness modulus and indirect tensile strength.

The learning outcome showed that, with the help of a correct preventive study and the right investments, it is possible to achieve the desired results and it is also possible to maintain the stiffness modulus in the correct range i.e. higher

than 5,000 MPa at 20°C and lower than 17,000 MPa. A similar consideration applies to the indirect tensile strength, in fact with the correct additive it is possible to stay between 0.72 MPa and 2 MPa as indicated in the tenders road specifications. It goes without saying that, with the help of the appropriate laboratory analysis, it is possible to find the right solutions and the perfect mixes to reach the correct performance parameters.

A great achievement of Marini innovative technologies, making it possible to use the highest RAP percentages, respecting the granulometric curve, the quantity, and the quality of the bitumen indicated in the dosing recipe while, at the same time, respecting the environment as a result of low energy consumption and low emissions.

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NEW MARINI MASTER TOWER

- More than two years' experience
- Over 600,000 tonnes produced

SAE

eTank, the high-performance tank for storing binders

eTanks are high-performance storage tanks, in container format, suitable for all types of road binders and compliant with even the strictest of current environmental requirements.



Supertransferable eTank, in Nigeria and Norway respectively

In addition to its undeniable economic benefit thanks to the CSC (Convention for Safe Containers)-approved container format which enables transport and installation at a low cost, the eTank is designed with the environment in mind and boasts cutting-edge technology to limit its carbon footprint and facilitate its integration into the local surroundings.

High energy efficiency

The eTank is an electrically-heated binder storage tank that uses very little energy. This energy efficiency is the result of several solutions:

- Electrically-heated tank, piping and accessories;
- Reinforced insulation;
- Elimination of thermal bridges;
- SAE fume energy recovery technology (see above).

Environmental protection

In addition to energy solutions, the eTank also includes a built-in retaining trough to ensure zero leakage of matter, and boasts cutting-edge SAE energy recovery technology for the fumes emitted by the generator, thus contributing to maintaining the temperature of the tank (-50% of energy use and CO₂ emissions).

The eTank has also been designed to fit into its surroundings, in order to minimise its visual impact. The low rise, compact horizontal shape, with both

fold-up loading arms and inter-tank connections stored inside the container, are key features which allow the tank to blend into its surroundings.

Supertransferability

The supertransferability of the eTank significantly reduces the amount of logistics involved in its transport and installation, which thus reduces its carbon footprint.

Its container format is CSC-approved with embedded equipment (retaining trough, dosing unit, power generators, etc.) and retractable accessories (loading arm, etc.). Simple and rapid transport in addition to installation close to the worksite directly reduces the logistics of supplying binder to laying machinery. It can be installed easily on stabilised ground and does not require civil engineering operations (which eliminates related CO₂ emissions) or crane lifting (self-loading trailer or eTank installed on a trailer).

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SECMAIR

A technological breakthrough thanks to electric solutions

At a time when the environment, the ecology and alternative solutions are playing a growing role in everyone's lives, Secmair, the leader in road maintenance, is taking the initiative with its very-low carbon vehicle.



A very-low carbon vehicle

The Box boasts two special features.

Reinforced insulation and the elimination of thermal bridges

- Resulting in heat optimisation for the emulsion tank and its associated circuit thanks to an innovative heating system, output rises to 95%, compared to the general average of 70%. Lastly, its 'immersed' emulsion circuit offers loss-free vat mixing and facilitates starting. With no hydraulic action, maintenance operations are reduced and leakage is eliminated, which thus prevents environmental risks linked to hydraulic oils. No power is drawn from the lorry, thus improving its energy output.

The electrification of the machinery

encompasses the emulsion pump and the height and span of the ramp. Electrification enables more precise dosage, and enhanced dose management significantly reduces waste, all of which helps to optimise worksite quality.

The Box comes in two formats:

- 100% electric;
- Gas-operated, for improved instant heating power.

The Box is thus an effective and environmentally-friendly solution. As the machinery is fully independent of the lorry, it can be placed in a 22" container for installation by a local coach builder anywhere in the world. In France and Europe, assembly is carried out directly in the Secmair workshops.

Smart design, compatible and adaptable, The Box is a very-low carbon electric sprayer which will change the rules of play. See and order this solution in Secmair's 'Low emission' range at Bauma 2022.

Contact

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THE BOX VERY-LOW CARBON SPRAYER

- ✓ An electrified and heat optimisation solution
 - More environmentally-friendly
 - The same level of Secmair efficiency
 - 4000 / 6000 / 8000l emulsion vat
 - Telescopic electric ramp, 46 jets in 100mm steps
 - Max. working width: 4.60m
 - Length / height => 20" container compatible

Edensprayer, the thermal cousin of THE BOX, same functionalities, different power source





This contract marks the beginning of a decisive long-term partnership.

AN ORDER FOR

- 9 T440 Chipsealers
- 1 Breining P12

Signed by the Turkish Municipality of Erzurum.

SECMAIR

Turkey: mass roll-out in the long-term

The current situation of economic and geo-political tension is generating in particular a significant rise in oil and more specifically bitumen costs, and is forcing numerous construction organisations and companies to rethink their road building and maintenance methods.

In this context, the shift to alternatives to hot mixes, such as surface dressing or cold-pour asphalt, demonstrates the drive by road sector stakeholders to diversify worksite types, with a view to strengthening their road networks and generating long-term savings. In this regard, the recent order entrusted to Secmair by the municipality of Erzurum, in east Turkey, is a perfect example.

In response to chronic problems related to the quality of its road network, the Erzurum municipal authority, further to an in-depth study of road surface maintenance techniques, has opted for surface dressings and cold-pour asphalt. Having contacted various material providers, a delegation from the municipality's Infrastructure Department embarked on a tour of Europe to visit suppliers and observe worksites in operation. The active involvement of Secmair teams in warmly welcoming the delegation to the Cossé-le-Vivien plant, the rallying of customers happy to demonstrate their machinery and the relevant choice of illustrative worksites rapidly convinced the delegation of Secmair's position as a reliable and solid partner.

Following this initial meeting, ongoing contact between Secmair and Erzurum Municipality led to a visit by the Secmair teams to Turkey in March, in order to present their technology and maintenance equipment to all the executives of the Infrastructure Department. Secmair also received support and guidance from the Marini Turkey teams, who greatly facilitated discussions with customers. This second meeting confirmed the interest in Secmair equipment and led to negotiations for an ambitious order for nine T440-3 Chipsealers and a Breining P12. The order was officialised in Cossé-le-Vivien on 6 April 2022, in the presence of the customers. The first equipment was delivered in the summer of 2022. Deliveries will continue up to March 2023.

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SECMAIR

Assembly relocation, a decisive strategic asset

The majority of Secmair products consist of machinery mounted on support frames. The current context of a worldwide shortage in lorry transport has sped up Secmair's relocation process, already under way for several years, particularly in the USA and Australia.



Combi 1515 assembly at the Bomag plant (USA)

Industrial procedures had to be adapted in order to manufacture machinery without receiving the support frames in our workshops. This recent industrial challenge was overcome in the last two years by the French company. The revolution in manufacturing procedures was made possible thanks to the Design Office's ability to work exclusively from plans. New technologies and 3D software were obviously decisive factors in this achievement. This industrial strategy is a perfect solution to current commercial, environmental and economic issues.

Reducing delivery lead times, drawing ever closer to customers

In reaction to the current economic outlook and ever-attentive to its customers, Secmair launched a process to manage manufacturing lead times. In addition, it is now possible to ship complete, tested machinery from the main factory in Cossé-le-Vivien to one of our partners or a plant of the Fayat Group for the final assembly phase. Secmair machinery can thus be installed regardless of the lorry type or geographical area, and will meet all the specific requirements of local markets.

Lastly, given that road regulations and legislation are specific to each country, local assembly carried out by our partners ensures rapid regulatory approval.

Reducing logistic constraints

All transport to and from the French plant which was previously an absolute necessity, can now be eliminated thanks to the relocation of machine assembly via straight truck. This presents an advantage on three levels:

- Environmental (reduction in greenhouse gas emissions from road and



Starsprayer modules ready for shipment to Australia

maritime transport)

- Lead times, thanks to the reduction in transport and customs clearance times
- Economic, thanks to the reduction in transport costs

This new strategy was implemented thanks to the expertise and professionalism of our local partners: Morocco-based Berenger (Bomag - Ermont - Secmair distributor), for the installation of a range of bitumen sprayers; Varley, which installs multi-service sprayers on Japanese straight trucks for the Australian and New Zealand markets, and Bomag (Ridgeway, South Carolina) which installs Chipsealers and Topsprayers for the entire North American market.

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RELOCATION

A threefold advantage :

- Environment
- Lead times
- Cost savings

BOMAG

First ever battery-powered tamper

Resource-saving technologies and machines have been gaining ground for years – a development that also applies to the construction machinery sector. Now Bomag, as one of the leading manufacturers in the field, presents its powerful BT 60 e battery-electric tamper for the first time.

Electrification paired with power and robustness

The new BT 60 e tamper is future-proof for use in trench and pipeline construction, landscaping, compaction work on backfills and foundations, as well as for repair work. It is also ideal for use in areas where legal emission regulations apply, such as trenches or subways. Thanks to its battery-electric drive, the tamper operates without direct emissions. At the same time, it offers optimum compaction technology and impact force – even over prolonged working periods.

Bomag e-performance

"The new battery-electric tamper performs exactly the same work as a petrol one, just with a different drive. So, in terms of machine performance and work result, there is no difference – that is very important to us for the practical application. Another advantage for our customers is that the tamper can already be used anywhere – even where regulations stipulate the use of emission-free drive systems. These requirements will increase significantly in the coming years. Bomag's strategic goal is to expand its product range to include machines with emission-free drives, thereby increasing its competitiveness. Last but not least, the machines make a significant contribution to reducing CO₂ emissions on the construction site", says Ralf Junker, President of the Bomag group.

Like the other tamper models in Bomag's portfolio, the BT 60 e comes with full engine protection. This provides owners with a reliable machine for use in the rough and tumble of everyday construction work while saving on maintenance and repair costs.

Proven battery technology

Two battery sizes with either 1000 Wh or 1400 Wh are available to operate the tamper. Both battery models, eP 20 and eP 28, can be used flexibly. The tamper is conveniently ready for action at the touch of a button, even at low temperatures. Standard and fast chargers are also available for recharging the batteries. Swapping power packs is quick and easy with the release lever. This makes exchanging different battery models child's play.

Maintenance made easy

Thanks to the electric drive, the machine requires less maintenance because the BT 60 e doesn't require engine oil or an air filter.



Delivering the accustomed performance with the same robust machine qualities



The new BT 60 e battery-electric tamper meets strict emission limits

BOMAG NEW BT 60 E

- Battery-electric powered
- Same performance as a conventional tamper

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Bomag BT 60 e tamper, full e-performance making construction even more sustainable by combining alternative electric drives with ample power





The first street circuit in motorbike racing since 1977 is set to host the Indonesian International Grand Prix next year

BOMAG

Building the new Mandalika International Street Circuit

On the still quiet tourist island of Lombok (Indonesia), work on the Mandalika International Street Circuit is in full swing. After completion, the circuit will be one of the most exciting tracks in the motorsport world. The first street circuit in motorbike racing since 1977 is set to host the Indonesian grand prix next year. As many as 150,000 visitors are expected on any given racing weekend.

The new track was designed by Bahraini company MRI Consulting – not as a permanent racetrack but as a road course that will only be closed to public traffic on racing weekends. The track surface must meet the highest standards, as it is crucial for the motorbikes' grip and tyre wear.

The loads exerted on the asphalt during a race are tremendous. In the premium motorbike class today, top speeds of over 360 km/h are reached. At such high speeds, overpressure is generated in front of the tyre and underpressure behind it. The heated tyres develop an adhesive effect that pulls the material upwards. Hermann Tilke, a German civil engineer and well known for developing many racetracks, once explained in a Motorsport-Total article: "For the asphalt, it's like hitting it with a hammer at the front while using a vacuum cleaner at the back."

Highest quality for the highest requirements

Even the slightest unevenness results in less grip, potentially increasing the

risk of accidents. To fulfil all the specifications, the optimum paver settings for evenness, degree of compaction and surface texture were first determined on a test section. In Mandalika, for example, a surface evenness of +/- 5 mm was required for the bearing and binder course (measured over a distance of 4 meters). The tolerance for the wearing course was even lower at +/- 3 mm. The local paving team was supported throughout the project by Bomag Singapore's service team and experts from PT United Tractors Tbk provides support.

Phase 1

80 mm asphalt bearing course

Two Bomag BF 800 C pavers were used to install the bearing course. With their combination of high productivity and flexibility, these all-rounders are the perfect choice for both high-quality and efficient road construction. Equipped with innovative Bomag assistance systems and options, they greatly simplify the job for the operator and the entire paving team – for example, with all-weather protection that protects the machine operator not only in the rain, but also in intense sunshine, or by the use of technologies such as Bomag Ecomode, an intelligent control system that keeps the engines in the optimum range at all times, thus reducing fuel consumption and noise levels.

Phase 2

60 mm asphalt binder course

Analogue to phase 1, a 2-paver configuration was used in this phase. A third paver was deployed to pave the wide curves as well as to establish the connection to the pit lane. One of the biggest challenges, however, were two sharp bends in the track layout. This section required detailed planning to ensure continuous asphalt paving without interruption. Here, too, paving was no problem for the two BF 800 C pavers as they offer an optimal view of the machine's edge, hopper, auger and screed. The control panel and seat form an adjustable unit. All switches are arranged logically and ergonomically. This allows the operator to concentrate on what really counts: continuous, smooth asphalt paving.

Phase 3

40 mm asphalt surface course

The surface course consists of stone mastic asphalt (SMA mix) with polymer-modified bitumen. It was paved in five segments to minimize the amount of the transverse joints. The sections were also defined precisely in order to meet the aesthetic requirements of the track. A 3-paver configuration was used for this phase. It took five days to complete the whole surface course. Thanks to the «hot-on-hot» paving method and the use of three pavers, the longitudinal joints are invisible.

Let the races begin

In phase one and two, the asphalt was compacted with Bomag BW 161 AD-4 articulated tandem rollers and BW 24 RH pneumatic tyred rollers. During the first two passes, the tandem rollers were used directly behind the pavers for

static compaction. Next came two low amplitude passes. Then it was the turn of the pneumatic tyred rollers.

For the compaction of the surface course tandem rollers were used only. This was due to the mix and to achieve the surface as required. These rollers ensured an optimum surface quality and the required degree of compaction of at least 98 %.

The Mandalika International Street Circuit is now ready for its first races in front of a great audience.

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MANDALIKA INTERNATIONAL STREET CIRCUIT

- Used by everyday traffic 350 days a year
- As well as withstanding subsequently the extremely high speeds of racing motorbikes

The track must continue to meet all future demands,
 so the asphalt must be geared to durability



BOMAG

Efficient soil stabilization with a tractor

Bomag is expanding its machine portfolio with the RS 250 and RS 300 tractor-towed stabilizers, which have a working width of 2.5 m and a milling depth of up to 40 cm and 50 cm respectively and are optimally designed for flexible use in soil stabilization and road and path construction.

The power-packed machines are driven by the rear PTO shaft of a powerful tractor with 200-300 hp or 300-450 hp. Tractor-towed stabilizers are a new addition to Bomag's product range. Their design is based on numerous tried-and-tested technologies and many years of experience in the field.

Modern tractors are versatile pulling and driving machines. In combination with optimally matched attachments, they are constantly opening up new areas of application and can even be used for heavy earthmoving work. The new Bomag RS 250 and RS 300 tractor-towed stabilizers can now fill a void in the fleets of construction companies and service providers looking for a flexible and economical tractor solution for milling, stabilizing and mixing soils. The light and manoeuvrable systems are the perfect complements, especially on smaller construction sites, but not just there. They ensure even better utilisation of tractors, which have become indispensable on modern construction sites due to their versatility and flexibility. One core application scenario is soil stabilization: The tractor can now be used universally and flexibly to pull a binder spreader, water tank or tractor-towed stabilizer.

The RS 300 is coupled to the tractor via three-point hitch and driven at 1,000 rpm by the PTO (Power Take Off) shaft



The RS 300 has height-adjustable side plates, including skids, with a free, hydraulically, adjustable milling depth up to 50 cm



Bomag Product Manager Sebastian Ibold explains: "When stabilizing, there is no need to replace non-load-bearing soils. Stabilizing is therefore usually the better choice, both economically and ecologically, compared to removing reusable soils. By mixing in binders such as lime, this method removes moisture from the soil on site, thus improving its compaction properties and load-bearing capacity. With our new tractor-towed stabilizers, the highly efficient Bomag technology for milling, mixing and stabilizing can now be used even more easily and flexibly on smaller construction sites. Optimized power transmission and high-performance cutting technology meet sophisticated and maintenance-friendly holder systems. They guarantee maximum milling performance, uniformly smooth surfaces after milling and comparatively low fuel consumption." Available in two power classes, the RS 300 (for tractors with 300-450 hp) is suitable for larger applications in stabilization, soil improvement and road construction. The lighter and even more compact RS 250 for tractors from 200-300 hp is a good choice in road construction, for building embankments or slopes, and for backfilling.

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FAYAT ENVIRONMENTAL SOLUTIONS

Eco-Friendly solutions for a sustainable future

Fayat Environmental Solutions (FES) acts in an environmentally responsible manner to protect people and the planet. This commitment is reflected in Dulevo, Mathieu and Ravo's ISO 14001 certification. It's also evident in the newest technological advances incorporated into FES vehicles and truck mounts, designed to produce the least possible environmental impact while still maintaining outstanding operational efficiency.



CAN bus network coordinating communication for the electronic control units in the vehicle



Economical and eco-friendly EcoMode lowering fuel consumption

Saving water resource

There is perhaps no natural resource more valuable than water; it's imperative that every measure be taken to reduce unnecessary water use. Dulevo's patented mechanical-suction filtering technology only uses water to cut down on dust on the external brushes, ensuring maximum water conservation. When required, these innovative machines can sweep completely waterless, without losing any filtration power.

Another method for conserving water in operational processes is by reusing it; this is accomplished through a wastewater suction and filtration process. Waste water is re-injected into the suction nozzle, and added to a precisely proportional dose of clean water that is then sprayed onto the brushes or through the nozzle. Thanks to this reclamation technology, available with Ravo and Mathieu sweepers and with Dulevo compact suction sweeper models such as the 850 and the D.zero, clean water requirements can be reduced by significant levels.

From re-use to recycling: the mechanical and hydraulic components of all FES sweepers and cleaners are entirely recyclable. The process is made easier by the predominance of metals in the construction materials: 90% of the components are made of steel, cast iron, aluminum or copper. The remaining plastic parts are also reprocessed, using specialised methods. Noise pollution is always a concern in urban environments. Fayat Environmental Solutions have made quiet technology a priority, developing low-noise engines and using

high-quality soundproofing materials to decrease the operational decibel output of their Dulevo, Mathieu and Ravo sweepers.

Conserving fossil fuels is environmentally important as well, and the EcoMode feature available with Dulevo D3 diesel engines and D6 diesel and compressed natural gas (CNG) engines, and with Mathieu diesel and petrol engines allows operators to do just that, by activating this setting at the start of each shift. By lowering fuel consumption, the EcoMode makes sense economically, as well as environmentally. So does another feature that can help conserve fuel and lower emissions; the CAN bus network in the Dulevo, Scarab and Mathieu vehicles coordinates communication for the electronic control units (ECUs) in the vehicle. The network cuts down on vehicle weight and improves overall system reliability.

Regarding dust pollution, all FES sweepers have a minimum three-star fine dust rating for PM10/2.5, and some have even earned the maximum 4-star PM10/2.5 rating. Scarab sweepers are innovative performers in dust collection efficiency – they're also excellent on fuel consumption and emissions, thanks to their inventive single-engine system.

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FAYAT ENVIRONMENTAL SOLUTIONS

Caring for a Clean Future

Today more than ever, companies must be ready to deliver sustainable solutions that meet the needs of both the planet and the market, ensuring that good business and good ecological stewardship go hand in hand. Fayat Environmental Solutions (FES) is proud to provide its clients with the very latest in innovative and environmentally friendly technology that also happens to be efficient, reliable and economical, too.

Drawing on the years of industry experience that its standard-setting companies possess, FES is proud to offer a complete range of powerful electric sweepers and cleaners. From Dulevo in northern Italy comes the Dulevo D.zero², a compact unit that is the first entirely electrical street sweeper manufactured by Dulevo. Operating on electrical power alone, the D.zero² is amazingly quiet, making it perfect for unobtrusive night-time and early morning operation. What's more, its streamlined size means that manoeuvrability is not a problem, making it ideal for crowded areas, tree-planted walkways or any central urban areas where operating space might be tighter. The electric power source is reliable and requires much less maintenance than conventional combustion engines; recharging the batteries rather than refilling the tank is also significantly more economical. What's more, a recharge unit for the batteries could be put on the vehicle itself, saving time and effort. Joining this innovative solution in the new Dulevo range is the compact D.zero² Hydro, which has the distinction of being Dulevo's first entirely electrical street washer.

From France comes the revolutionary Mathieu 2 eSeries, including both a street sweeper and a street cleaner. These compact vehicles are both 100% electric, which means they produce absolutely no emissions, carbon or otherwise, as they perform their tasks. What's more, their battery power is

sufficient to carry them straight through an entire shift, eliminating any need to pause for recharging or search for recharging points. The batteries, that these vehicles use, are quick-charging and high-performance as well, so any prep time prior to shift is minimal. They're also next-generation technology, which means they've been designed to optimal safety standards, making recharging a worry-free process. Naturally, as its power source is 100% electric, the 2 eSeries performs with the same noiseless characteristics as the other electric FES solutions, making it, too, an ideal choice for late night or early morning operations, even in residential areas.

The mid-sized Ravo sweeper, already the industry's most popular mid-sized sweeper, is now available as a fully electric-powered sweeper, for quiet, hassle-free operation. Operators will enjoy its spacious cab and the driver-focused features that make it so comfortable, while administrators will appreciate its low maintenance costs. Everyone will benefit from its clean-air exhaust system, its energy-saving LED lighting, its water recycling technology and its use of fuel-efficient regenerative braking. The sweeper comes with a number of options, including a tipping container, a third brush and a high-pressure water pump.

Revolutionary Mathieu 2 eSeries, including both a street sweeper and a street cleaner





Fayat Environmental Solutions: a complete range of powerful electric sweepers and cleaners

As for truck-mounted sweepers, the Scarab eMerlin 62 is a revolutionary sustainable addition to the product line, one which delivers the same powerful suction performance that has characterised all Scarab sweepers. The first electric-powered truck-mounted sweeper produced in England, the eMerlin 62 can, like other Merlin models, be fitted to a wide choice of chassis.

In addition to this range of electric-powered solutions, FES has also developed a complementary range of Compressed Natural Gas (CNG) vehicles from Dulevo and Scarab, as well as an ethanol-powered vehicle from Mathieu. These alternative energy vehicles produce far less noise, and the emissions they do give off are far less harmful to the environment than those produced by conventional combustion engines.

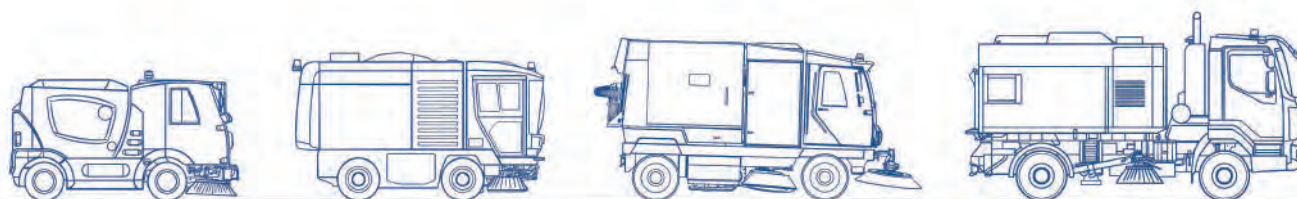
With these new products, Fayat Environmental Solutions is honouring its commitment to a clean future. These new solutions offer the same high standards of performance that people have come to expect of all FES solutions,

but with the minimum environmental impact achievable. Going forward, these sweepers and cleaners will be doing two jobs at once; they will, as they have always done, be cleaning up and improving the urban environment in which so many of us live, but they will also be doing it in the cleanest way possible.

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FAYAT ENVIRONMENTAL SOLUTIONS



Fayat Environmental Solutions, world leader in sweeping solutions



DIGITAL SOLUTIONS



ERMONT

A.C.E., a cutting-edge solution for Customer Service

At the heart of Ermont's organisation, the Services department provides its support to customers throughout the lifetime of their asphalt plants, from commissioning to the upgrading / modernisation of ageing equipment. Ermont has been working for many years on new digital solutions for Training and After-sales Services. This development advanced greatly in 2021.



Using A.C.E. in virtual reality | Training

Ermont has thus created A.C.E. (Asphalt Customer Experience), a secure digital platform, geared towards its teams and all generations of present and future customers.

A.C.E., which draws directly on our 3D design resources, transports users to the heart of an asphalt plant, for an immersive and dynamic experience in virtual reality format or via joystick navigation.

A.C.E. demonstrates Ermont's commitment to providing a modern, pro-active, and effective training and after-sales service which meets all the individual or collective requirements of customers and organisations.

A.C.E. and training

The Ermont training centre, created for road industry companies, specialises in industrial technology for cold-mix and hot-mix asphalt production and bitumen binders. For almost 25 years, it has been providing training to an annual average of 150 people and draws on teaching fundamentals which are regularly updated in line with evolving demands

and the emergence of technological training tools. In addition to its resources in scale and other models, simulators and interactive 3D screens, the centre now offers the A.C.E. application which immerses trainees in an asphalt plant and allows them to interact from inside or outside the plant, as if they were physically on the worksite. A.C.E. can be used to train customers in multiple areas and themes:

- Personal Protection Equipment (PPE);
- Safety and storage of asphalt plants;
- Operating an asphalt plant;
- Maintenance and servicing, etc.

A.C.E. is also available for tailor-made training courses on the customer's premises.

A.C.E. and After-sales Service

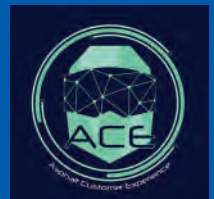
In the ongoing drive to improve the proactiveness and efficiency of its Customer Service, Ermont rolled out the A.C.E. Via screen sharing, this tool enables remote technical teams and on-site staff to carry out breakdown inspections together, and instantly if possible, or to activate the dispatch of spare parts or a technician. A major advantage which significantly reduces repair lead times.

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A.C.E. ASPHALT CUSTOMER EXPERIENCE

An immersive and dynamic experience
in the heart of an asphalt plant



MARINI

Cybertronic, next level production optimization

As part of a constant quest for excellence, Marini continuously invests in research and development to enhance the usability of its product portfolio. In the past few years, Marini has heavily invested in software development to allow customers to achieve additional operating advantages in the field of energy saving, the reduction of on-site complications and the use of high RAP percentages during asphalt production.



Marini Cybertronic, example of user Interface

For this purpose, to complement Cybertronic solid features, a series of kits were created in partnership with the University of Bologna (Italy) in order to maximise response to customer needs, allow a very high level of technical support, the correct analysis of heat exchange flows and the optimization of energy performances.

The following kits are now available:

- The automatic control of the drying process is vital to ensure seamless operations and, for this reason, it is at the core of the latest Marini Cybertronic advancements; in fact the latest Marini Cybertronic implementation is based on the physical model of the drying / filter process allowing:
 - An automatic feedback control of the outlet temperature of the material - even in the presence of hot / cold recycled material.
 - A self-commissioning process for continuous learning of the control parameters, which depend on the physical structure of the drum / filter system and on the calculation of the gas / material heat exchange coefficient.
- The correct management of the cold RAP into the mixer is yet another key function to ensure perfect production output.

- The dynamic RAP recipe is the third outstanding software development advancement; while complex to execute when it comes to preliminary studies and calibrations at the jobsite, this feature proves to be a turning point for the customer; Marini Cybertronic modifies the quantities of bitumen, filler and the various aggregates present in the different hoppers under the screen, depending on the quantity of RAP material chosen by the operator, in order to ensure the perfect quality of the final product.

In addition, Marini Cybertronic, is of the utmost support when the operator must manage different changes of recipe with very different RAP percentages; it is in fact possible to make a gradual RAP percentage change, following the temperatures of the aggregates and, in turn, the final asphalt. Marini Cybertronic is also very useful when particular environmental conditions occur in order to guarantee the correct temperature of the asphalt while respecting of the granulometric curve.

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Decisive benefit of Bomag was immediately recognised by the users

BOMAG

Competitive advantage thanks to digital equipment

The Bulgarian road construction company Pytengineeringstroy-T AD is successfully using Bomag Connect for the first time worldwide to intelligently connect asphalt rollers on a major new motorway construction project. Bomag's smart and user-friendly solution optimizes the compaction process across all machines, ensuring excellent results and a highly efficient machine utilization. Thanks to Bomag's digital cloud service, the company was able to save 20% in time and fuel.

Bomag Connect passed its first important test with flying colors in autumn 2020 on a new motorway construction project in Bulgaria. With Bomag Connect, all machines on a construction site can be easily networked with each other. This allows the compaction process to be controlled and documented across all machines. The minimal equipment for Bluetooth communication and GPS positioning can be installed on the machine in just a few minutes and with Bomag, the free app and digital assistance system that runs on all standard Android tablets, the connected machines are ready for their first compaction job in next to no time.

The Awtomagistrala A2 is a planned and partially completed motorway in Bulgaria. The final length will be 433 km. Once completed, it will connect the capital Sofia with Varna on the Black Sea coast. The local road construction company, Pytengineeringstroy, faced strong international competition but still came out on top. The recipe for success of the up-and-coming, medium-sized Bulgarian company: consistent use of high-tech machines and state-of-the-art technologies for maximum productivity and quality in road construction.



Pytengineeringstroy opted for a complete solution from Bomag

That's why Pytengineeringstroy opted for a complete solution from Bomag. One BF 800 C2 track-driven paver and three pivot-steered BW 174 AP-AM rollers with Asphalt Manager were delivered to the company in June 2020. A key reason for choosing Bomag was the complete integration of Bomap Connect. The app from Bomag not only records the compaction progress of an individual machine. Bomap Connect also provides networked control and documentation of all machines and equipment involved in compaction across the entire construction site. Simple installation and an intuitive tablet application make it particularly easy to use Bomag's new digital services.

Pytengineeringstroy was the first company in the world to test this latest Bomap upgrade in the field. With Bomap Connect, the data from all rollers are networked with each other in real time and made available in a cloud. Like a navigation system in a car, Bomap Connect guides roller drivers to optimum compaction with a minimum number of passes. In Bomap, important data for compaction such as passes, temperatures, vibration applied or the use of grit spread is displayed in Google Maps.

One decisive benefit of Bomap was immediately recognised by the users: It achieves significantly more uniform compaction results. Without the smart assistance system, the roller marks are usually concentrated in the center, while the edge areas are neglected. Pytengineeringstroy took drill cores over the entire paving width of 7.5 m for inspection purposes. The results were convincing: thanks to Bomap, the density was consistently between 98.4% and 99.8%.

Remote control for the construction site

With Bomap Connect, compaction progress can be monitored from the office and documented in easy-to-understand reports. For Pytengineeringstroy, however, documentation was of secondary importance. The company used Bomap Connect primarily to optimize the pattern during rolling. Based on the experience in Bulgaria, reducing the number of passes by at least 20% is realistic. Fuel consumption and CO₂ emissions also drop accordingly.

The experience on the construction site in Bulgaria confirms the benefits compared to conventional SCDCC systems: Bomap Connect is extremely easy to use and can be implemented with very low investment costs. The app itself is available for free in the Google Play Store and runs on any standard Android tablet with a SIM card. Even third-party GPS receivers can be used as an alternative. The components can be interchanged flexibly between machines, and Bomap Connect offers a suitable solution for increased smart compaction as a scalable service for all operational sizes.

Full control of the roller fleet

The roller drivers on the Bulgarian pilot construction site were immediately convinced by Bomap. Although they were a little sceptical because of their experience with previous SCDCC systems, nobody wanted to be without

Bomap Connect after the first day. And rightly so: For roller drivers like Ridvan Ahmedov, Bomap Connect makes their work much simpler. Networking, in particular, makes working in a line of machines more relaxed, effective and safe. With a glance at the tablet, the roller drivers can track their colleagues' work, and Bomap reliably informs them about all machines' rolling patterns at any time. Bomap Connect gives roller operators full control over their work. Every roller driver agreed: in order to operate Bomap Connect, all you need to know is how to use a smartphone.

SMART COMPACTION, FROM SOFIA TO THE BLACK SEA

Customer Pytengineeringstroy opted for a complete solution from Bomag

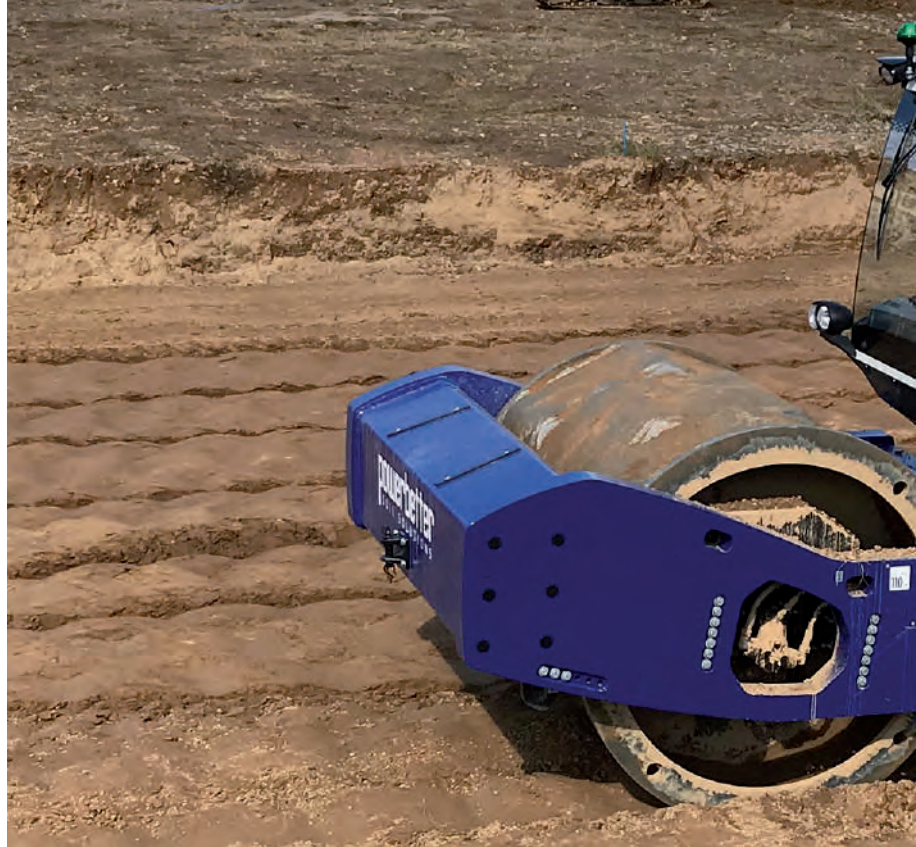
- 1 BF 800 C2 track-driven paver
- 3 pivot-steered BW 174 AP-AM rollers with Asphalt Manager and Bomap

"It achieves significantly more uniform compaction results."

Customer Pytengineeringstroy

Contact

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BOMAG

Solid ground

Ten semi-detached houses are to be built in the Irish village of Baile Chaisleán an Róistigh (Castletownroche). The development site, extended by a second section, is located near Irish Blackwater Castle and has an area of approx. 4,000 m².

The subgrade here - typical for this area in the southwest of Ireland - consists first of sandy silt, followed by loosely and layered silty, gravelly sands. For the new two-storey houses, the developer of the project, PC Quality Homes Ltd, plans a shallow foundation. To do so, the structural loads will be transferred directly below the building into the subgrade.

Dynamic soil compaction using heavy single drum rollers has been common practice on earthworks sites for decades. Depending on the soil type, it is only possible to achieve effective depths of up to 1 m. With the polygonal roller, the penetration of a classic single drum roller can be significantly increased. Depending on the soil, Bomag's BW 226 DI achieves a depth effect of 2 to 3 m. The single drum rollers with polygonal drums developed by Bomag have gained an excellent reputation worldwide thanks to their outstanding depth effect. They are deployed worldwide for ground improvement and compaction of very thick fill layers - in backfill projects, large-scale embankments in road building, airport construction and dam engineering, port expansions and land reclamation projects. Their significantly higher performance is particularly evident on gravelly, sandy, silty soils and stony mixed substrates.

Three special features characterize Bomag polygonal single drum rollers:

- The unusual-looking octagonal drum shape, which generates particularly efficient and deep compaction by constantly alternating between plate-like and wedge-shaped forces in the soil.

- The integrated compaction measuring system Terrameter, which continuously determines the compaction gain and quality and displays it to the roller driver. An important optional extra to the measuring system is Bomap, which ensures full documentation of the compaction quality and the passes.

- A unique and sophisticated drum exciter system that generates directional vibrations with very high amplitudes and can also be operated with an automatic amplitude control system (Variocontrol).

Bomag single drum rollers with polygonal drums are powered by state-of-the-art engine technology. The intelligent Ecomode speed control saves up to 30% fuel while at the same time ensuring significantly lower noise emissions. In addition, the optional Ecstop further reduces fuel consumption and wear.

The contractor Powerbetter has been successfully using the BW 226 DI for several years in small and medium-sized development projects for subsoil improvement up to 3 m deep as well as for backfill with layer thicknesses of 1 to 2 m. In the new Castletownroche construction area, only 1.2 m of soil had to be removed from the silty, weak non-load-bearing substrate. The Bomag polygonal roller was then able to compact the level below. The specifications called for a compaction ratio of at least 95% modified Proctor density down to a depth of 2 m. After the last pass, the settlement had to be less than 5 mm.



The depth effect of Bomag heavy single drum rollers is remarkable and significantly increased by the polygonal drum

To identify weak points during the compaction process while also minimizing the number of unnecessary passes, the roller drivers at Castletownroche use the Bomap assistance system and Joblink. With Bomap compaction progress can be easily monitored in real time. The assistance system uses the compaction parameters determined by the machine and displays them clearly on a colour map of the construction site. Bomap shows where and how much compaction is still needed. The app is simple to use on everyday smartphones and tablets for Android™. Android is a trademark of Google LLC.

Thanks to Bomap, the roller driver can see - just like on a navigation system - where the subgrade has already been optimally compacted or whether further passes are still required. The compaction quality maps generated here by Bomap benefited not only the roller drivers but also the site management and quality control in the lab. In most sections, the required compaction quality was already achieved after approximately 30 passes. After 5 days of work within 2 weeks, the Bomag machine had completed the task of «deep compaction». Achieving the required degree of compaction without any problems, enabling a cost-effective shallow foundation for the houses despite poor subsoil, protecting residents from too much construction site traffic, staying easily on schedule and within the budget - for the investor, the decision to contact a company equipped with a Bomag single drum roller and polygonal drum in its construction machinery fleet was the right choice.

Contact

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SINGLE DRUM ROLLER WITH POLYGONAL DRUM

Only available by Bomag,

- Powered by state-of-the-art engine technology
- Intelligent Ecomode speed control:
 - > up to 30% fuel saved
 - > significantly lower noise emissions

DYNAPAC

Dyn@lyzer, taking continuous compaction control to new smarter levels

As a company built on innovation, Dynapac is committed to breaking new boundaries in Continuous Compaction Control (CCC). Our latest Dyn@lyzer generation is such an example and offers operators and contractors alike new levels of performance, control, quality, and documentation. Complete with a whole host of updates like cloud-based applications and real-time reporting, the Dyn@lyzer offers the same levels of control and documentation for both soil and asphalt rollers.

DYN@LYZER

Continuous Compaction Control offering operators and contractors alike a new level of performance, control, quality and documentation on the job site.

Improved and ready to impress

The Dyn@lyzer has undergone significant improvements since its last debut. Among the most important of these is the new cloud-based office application with a connected onboard system. This update allows for the near real-time transfer of data from the roller to the cloud server. The system is called Dyn@lyzer Online. What makes it both unique and effective is that important job preparation, data access, and analysis can be done from any computer with an internet connection. This convenient innovation makes having to actually go and visit the machine and physically access data no longer necessary.

Another time- and cost-saving feature is the new Dyn@lyzer Multi. With it, multiple rollers can seamlessly communicate with each other when working on the same layer – all while being independent of an internet connection. All machines connected to the Dyn@lyzer Multi receive near real-time updates on the total number of passes that were made, thus heightening overall efficiency. Connection is achieved using short-range wireless communication. One major advantage of this new procedure is that the combined results of all rollers working on the same layer can be digitally captured, accessed, and evaluated for greater quality assurance and less unnecessary repetition.

Precise documentation down to the last detail

Aside from greatly increasing efficiency both in costs and time, the Dyn@lyzer and Dyn@lyzer Multi can be used as a control and assurance tool with seamless and detailed documentation. Thanks to a powerful CCC system, all compaction work, and corresponding data are simultaneously recorded and saved. The compaction maps are shown in real-time and all stored data can be used for analysis and reporting. This not only ensures absolute documentation and

traceability but also improves the efficiency of the overall compaction process, with fewer passes and no over- or under compaction. The roller position is delivered by a GNSS receiver, GNSS stands for Global Navigation Satellite System and includes (but is not limited to) NAVSTAR-GPS, Galileo and Beidou.

Built-in brilliance

Innovation should never be just an add-on which is why the Dyn@lyzer, unlike many other systems on the market, comes purpose-built inside the roller. This not only optimally integrates all systems with each other but also offers more intuitive handling with an easy-to-use and robust touch screen developed and designed around a user-friendly interface.

Savings at every turn

Using the Dyn@lyzer can greatly increase operational efficiency while simultaneously lowering costs, emissions, and time spent on a job site. More efficient compaction and reduced passes not only save fuel but can also play a part in reducing one's carbon footprint and help meet planned sustainability goals. Potential legal costs are also avoided through the watertight digital documentation of all results that prove the quality of the job done.

Available and able

The Dyn@lyzer is currently offered on most of our soil roller range, as well as being an option for the CA1500 to 6500. For asphalt rollers, the Dyn@lyzer is available as an option for the CC2200 VI to CC6200 VI as well as for the CG2300 VI-3300 VI. The Dyn@lyzer is available as a factory-mounted feature or as a field kit. Set-up requires that the roller is equipped with a compaction meter, as well as temperature sensors on asphalt rollers. A Dyn@lyzer preparation kit containing necessary wiring and brackets is also required. Mounting the GNSS receiver and onboard computer on a Dyn@lyzer-equipped machine is quick and hassle-free and allows receivers and computers to be shared by multiple machines.

Our customer Implenia, leading Swiss construction and infrastructure specialist is satisfied with the results.

Contact

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Dyn@Lyzer system in use

"In using the Dyn@Lyzer, we have been able to achieve several key project benefits. The first has been to collect data that gives us a complete view of compaction levels achieved across the project, as this information is recorded at each pass. With the use of Seismic, noise reduction and decreased environmental impact have eased the impact on local residents; fuel savings have also been significant."

Peter Claesson, Implenia Head of production Earthworks (south)





Jobsite at Houston International Airport

DYNAPAC

TH E fulfilled high requirements of airport job site in Houston

Equipment from Dynapac is playing an important role in improving the facilities at Houston Airport. The new TH E technology has been employed to deliver a surface to grade, with high levels of pre-compaction and also automation.

Flatiron, a construction service provider operating in the US / Canada is currently preparing for a huge airport job site at Houston airport together with rental company Closner Equipment Co. Inc. The authorized dealer of construction equipment delivered a large Dynapac paver SD2550CS with a high compaction screed and two rollers model CC6200 VI and CP2700. The machine was highly specked with several application assistants like Trimble 3D Leveling System, Dynapac's MatTracker width assistant, MOBA levelling as well as MOBA Big Ski Plus.

All these systems are supporting the customer to reach the highest paving quality possible – perfect for an airport job site like this one.

The customer had three main requests the machine need to fulfill: Perfect grade (crucial for airports), maximum pre compaction (crucial for RCC material due to short time slots for material processing) and high level of automation (paving crew should be able to handle the process with max three people around the paver). The combination of advanced leveling systems, the MatTracker and the TH E screed series delivered exactly what was requested. The machine's automatic functions made it easy to handle the material handling, while the screed delivered the maximum compaction possible for the material used.

The combination of MOBA and Trimble leveling and the integration of both systems into the MOBA remote controls made it possible to seamless switch between both systems during the process.

Dynapac, Closner and the Flatiron crew completed an extensive training week where they learned how to handle the machine, to set the correct height and how to use the integrated leveling automatic functions. Especially the setup of the material flow and the use the auto-fill function by processing the RCC material was imported to them as the "roller compacted concrete" requires short processing times.

TRIPLE SATISFACTION WITH THE NEW TH E TECHNOLOGY

- Perfect grade
- Maximum pre-compaction
- High level of automation



Large Dynapac paver SD2550CS with high compaction screed

After three successful training days they did a final test strip to measure the compaction on a material that came close to the material they have planned to use on the final job. The paver performed very good and the crew was able to handle the machine on their own based on the previous trainings. The most important information for the crew to get out of the final test strip was the roller behavior and the compaction amount since the screed's pre-compaction is on another level compared to pure US-Style vibration screeds what highly influences the roller compaction.

After the training both customers Closer (dealer) and Flatiron (rental partner) were very pleased with the machine performance and the service Dynapac offered to support them with their project. Also, the paving crew felt more comfortable using the machine after the training and the high level of build in technology and assistant systems was very convincing to them.

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DYNAPAC

PaveComp Online: the construction 4.0

With PaveComp Online, Dynapac offers its customers and potential customers a comprehensive online tool for not only choosing the right equipment but also ensuring its efficient use for all the paving and compaction jobs ahead.

This unique service platform is built on thousands of hours spent testing and evaluating our machines under realistic conditions to measure their actual performance. The gathered data flows into PaveComp Online, which customers can access for better workflows and successful and predictable outcomes.

Knowledge is (compacting) power

Any selection process concerning compacting machines and equipment should be based on as much information, insight and innovation as possible. Different needs, applications, expectations, and budgets all play a vital role in deciding for a certain model. Add to this the many parameters that define successful compaction, like the correct number of passes for the material and the right amplitude in relation to layer thickness, and it's clear why any choice is not made lightly. That's where PaveComp Online comes in. As a highly informative recommendation tool, PaveComp Online gives registered users in-depth access to vital data, facts and figures regarding model types, their characteristics and compaction performance on different soils and asphalt mixes.

We know what works

No one knows Dynapac machine performance better than us, which is why every model recommendation is based on the exact need of the customer. Aside from pure product information, PaveComp Online additionally provides customers with vital information regarding the maximum recommended layer thickness for each roller and their corresponding performance data. Registered users can also look forward to more precise method recommendations, including the number of passes required to reach a certain degree of compaction. A capacity table based on layer thickness and the number of passes required to reach a certain degree of compaction is also available. Based on this, the number of machines required to achieve a certain production rate can be calculated. All services can be accessed from any computer with an internet connection.

Benefit from compacting performance, savings, and efficiency thanks to our expert advice

A graph is worth a thousand words

All data, performance parameters, surface characteristics, compaction results and product analyses are shown in rich detail with easy-to-understand graphs and diagrams that provide a clear and concise overview. Each one is a product of exhaustive testing in real-life conditions and is created considering all aspects that can accompany the compaction process.

Choose more choice

Every job comes with its particular set of demands, which is why PaveComp Online is more than just a purely product recommendation tool. On the contrary, it provides detailed information regarding all issues surrounding optimal compaction and which machine is right for the desired job. Aspects such as in-depth compaction data for a multitude of soil and asphalt conditions can be accessed, as well the right paving speeds and optimal screed settings. Users can also look forward to project efficiency-boosting features like information regarding the number of rollers needed, the number of passes, laps and amplitude settings. By addressing compaction demands from every product and customer perspective, PaveComp Online can provide solid recommendations that help customers choose the right machine for them and all they have planned. Because when it comes to compacting performance, savings, and efficiency - expert advice is always good to have.

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PAVECOMP ONLINE

A comprehensive online tool that not only helps to select the right machine, but also ensures its efficient use for all upcoming paving and compaction jobs.



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