

Special Class

VÖGELE InLine Pave

**The economical paving method
for compact asphalt pavements**



Maximum pave width 8.5 m
Maximum laydown rate 1,100 tonnes/h

 www.voegele.info

The economical paving method for compact asphalt pavements



With the InLine Pave concept, VÖGELE offer a particularly innovative paving technique specially suited for “hot on hot” paving when building compact asphalt pavements. Yet conventional road construction jobs, too, can be carried out in high quality and very economically with the VÖGELE InLine Pave machine technology.

InLine Pave places the binder course and surface course in a single pass, which not only yields a perfect bond between layers but also ensures strong interlocking of the layers. This is a fundamental requirement for the durability of roads.

InLine Pave is based on the use of series produced machinery that undergoes just slight modification for “hot on hot” paving. For contractors, this means that every single machine in the InLine Pave train can also be used for conventional road construction jobs at any time. This substantially increases the productive utilization of the contractor’s machine pool and enhances the return on investment.

Thus, the InLine Pave technology is tailored not only to large road building contractors. VÖGELE InLine Pave also offers to small and medium-sized companies the possibility of submitting tenders, based on innovative machine technology, for two-layer construction of asphalt pavements.

The advantages of VÖGELE InLine Pave technology at a glance



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Greatest evenness

Thanks to VÖGELE high compaction technology installed in the screed, the binder course reaches a density beyond 98%.

When applying InLine Pave, the surface course is paved "hot on hot" on a binder layer which, in terms of evenness and density, is on a par with a binder layer compacted in the conventional way.



Use of conventional rollers

Medium-weight rollers can follow right behind the paver for placing surface course to produce the final density.

VÖGELE high compaction technology applied for InLine Pave attains such a high degree of precompaction that the number of roller passes required for the final density is reduced substantially. The gentle compactive action of rollers with oscillation is ideal for thin surface layers like the ones placed with InLine Pave.



Clear separation of layers

InLine Pave achieves excellent monolithic interlocking of binder and surface courses.

At the same time, VÖGELE high compaction allows for a clear separation of the layers.



High productive utilization through use of machines close to standard design

The material feeder and the paver for surface course can be used for conventional paving jobs at any time, without a need for conversion.

The transfer module of the SUPER 2100-3i IP can be mounted or demounted in just a few hours. As a result, every machine of the InLine Pave train is available for conventional paving applications at all times.



Placing base courses with the SUPER 2100-3i IP

The SUPER 2100-3i IP with the AB 600 High Compaction Screed in the TP2 Plus version can also be used as a stand-alone paver for placing high-density base courses.

Paving can be done in a single layer, which saves time and money.



Easy operation for high process reliability

The operation of all InLine Pave machines is to a large extent identical with ordinary paving jobs.

Also as far as grade and slope control is concerned, the paving teams can fall back on their knowledge gained from jobs with conventional VÖGELE equipment.

Wide range of applications

The InLine Pave machinery covers a wide range of road construction jobs. Whether rehabilitation of existing pavements or construction of new ones, VÖGELE InLine Pave always offers innovative and highly cost-efficient machine technology for building long-lasting roads.

Already when it comes to transport, the VÖGELE technology shows its particular advantages. As InLine Pave only uses machinery which is very close in design to series produced VÖGELE pavers, its size and weight are dimensioned so that transport is mere routine.

Today, rehabilitation of road pavements in single-lane width is a big challenge in many countries all over the world. Job sites taking long to complete and traffic piling up for kilometres due to roadworks place a burden on the countries' national economies. InLine Pave not only allows to substantially cut times required for paving jobs. Thanks to the compact design of InLine Pave machinery, paving jobs can be carried out while traffic

keeps flowing, a circumstance reducing the potential of pile-ups considerably. InLine Pave is capable of handling pave widths from 3 m to 8.5 m. This allows for pavement rehabilitation or new construction of cross-town links, rural roads, highways and even motorways to be carried out to the highest standards of quality, within the shortest period of time and at low costs.



Pavement rehabilitation of a motorway, pave width 4m:
Rehabilitation of lorry lane. Traffic kept flowing on the adjacent lane.



Pavement rehabilitation of a federal highway, pave width 7 m: Seamless pavement rehabilitation of a federal highway with curve radii of less than 200 m.



Pavement rehabilitation of a federal highway, pave width 7.5 m: Thanks to its large pave width and high pave speed the InLine Pave train was supplied with material from two PowerFeeders simultaneously.



Pavement rehabilitation of a motorway, pave width 4.7 m:
The roadworks on the busy motorway were carried out at night.



New construction of a motorway, pave width 5m:
Before placing binder and surface courses, the base course had been built with the SUPER 2100-2 IP.



Pavement rehabilitation of a national road, pave width 3.75 – 5.25 m: Rehabilitation in single-lane width. Traffic kept flowing on the adjacent lane. Slope of 2%. Referencing from the milled base using the Big MultiPlex Ski allows for paving to the highest standards of evenness.



New construction of a federal highway, pave width 7.5 m:
Two-layer paving between 6 bridges. On the bridge decks asphalt was placed by the paver for surface course. VÖGELE Big MultiPlex Ski used for grade and slope control.



Pavement rehabilitation of a rural road, pave width 5.5 – 7 m: 9.5 cm binder course and 2.5 m surface course were paved in 12-hour shifts – no problem for the InLine Pave train.

The applications shown here are typical of the SUPER 2100-3i IP. The illustrations may also show the predecessor model.

The method of “hot on hot” paving: Characteristics and advantages



In the majority of countries all over the world, roads are constructed in the conventional manner by building up asphalt pavements in layers. After the anti-freeze layer gravel and crushed-stone base courses are placed as well as an asphalt base, followed by asphalt binder and finally by surface courses.

Today's massively growing traffic volume and above all the rise in heavy vehicle figures and axle loads lead to an increasingly higher stress on the roadway as a structure. In the wake, conventional road construction is facing new challenges.

The two-layer construction of asphalt pavements by “hot on hot” paving constitutes a particularly efficient method of building long-lasting roads. When using this method, binder and surface courses of hot rolled asphalt are laid “hot on hot”. This offers a number of advantages.

The method of “hot on hot” paving: Characteristics and advantages



When paving two layers “hot on hot”, the usual ratio of 8cm binder course and 4cm surface course can be abandoned and another ratio be selected. This is due to the fact that, when paving “hot on hot”, the still hot binder course prevents rapid cooling of the surface course. A higher temperature prevails, which allows for a thinner surface course of just 2 to 2.5 cm to be paved.

Also on account of the high temperature inside the surface course, a higher degree of density is achieved during subsequent compaction by rolling, along with a low voids content. When planning the surface course and especially when paving stone mastic asphalt (SMA), selecting a correct amount of binder is of utmost importance. The aim is to minimize the voids in the finished surface course to a content of no more than 2.5 – 3.5 percent by volume.

This kind of surface is waterproof, thus protecting the binder course from adverse influences. The high degree of density in conjunction with the layer thickness of 2 to 2.5 cm increases the pavement’s resistance to deformation under the influence of heat to such an extent that rutting is massively counteracted, particularly during the summer months.

For the paving process itself, the “hot on hot” method also reveals a valuable advantage. Due to the improved heat storage capacity, this kind of paving can be carried out in cold or wet weather without problems. The time available to building contractors for roadworks thus becomes considerably longer, a fact adding substantially to cost-effectiveness and reliable planning.

The advantages of “hot on hot” paving at a glance

1 Cost savings

Economy of expensive surface course mix, rich in bitumen, in favour of low-cost binder material featuring higher stiffness and resistance to deformation cuts costs.

There is no need to spray bitumen emulsion, which saves time and material.

2 Longer service lives of road pavements

Optimal interlocking of binder and surface courses guarantees an excellent bond between layers. Furthermore, compaction of the surface course with a low but sufficient voids content is supported, thus prolonging the pavement’s service life considerably.

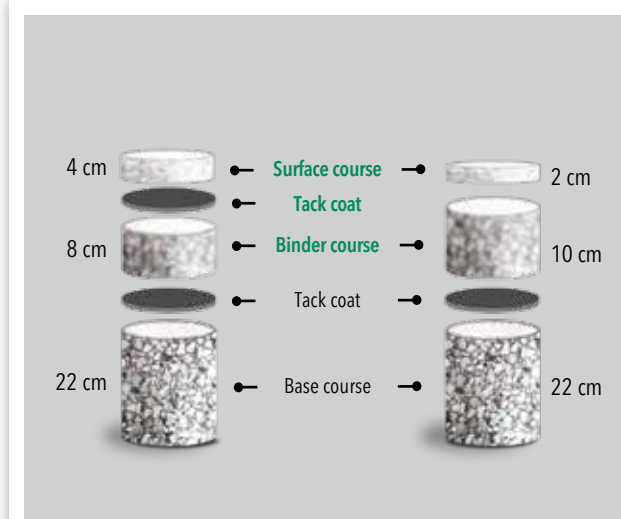
A higher share of binder course, resistant to deformation, and a lower share of surface course, rich in bitumen, increases the pavement’s stability. Deformation and rutting are reduced substantially.

3 Easy paving in low-temperature regions or during the cold season

Two-layer paving increases the pavement’s heat storage capacity. The period of time available for compaction is prolonged, so that paving work can be carried out to a high standard of quality even in cold weather.



Excellent bond and interlocking
of binder and surface courses



Conventional Paving
Construction Class SV according to RStO (German Directives for the Standardization of Traffic Area Surfaces)

Two-Layer Paving
Construction Class SV according to MKA (Information for the Construction of Compact Asphalt Pavements)

VÖGELE InLine Pave machine technology

InLine Pave means that the process of paving takes place by machinery working in a line, one immediately after the other. All machines feature a very compact design. The InLine Pave train comprises three machines. An MT 3000-3i Offset material feeder, a SUPER 2100-3i IP paver for placing binder course and a SUPER 1800-3i paver for placing surface course.



PowerFeeder MT 3000-3i Offset

The material feeder is the first machine involved in the paving process. It receives binder or surface course mixes supplied by feed vehicles and transfers the mix, by turns, either directly into the large extra material hopper of the paver for binder course or – via a transfer module – into the material hopper of the paver for surface course.



SUPER 2100-3i IP for paving binder course

The SUPER 2100-3i IP for placing binder course is a modified machine of standard design, fitted with a special transfer module for the surface course mix. The transfer module conveys the mix directly into the material hopper of the paver placing surface course. The SUPER 2100-3i IP builds a binder course of high density and, as a result, of high resistance to deformation.



AB 600 High Compaction Screed in the TP2 Plus version

The AB 600 High Compaction Screed in the TP2 Plus version, based on the unique VÖGELE pulsed-flow hydraulics, is equipped with two pressure bars. The screed is the technological gem of the InLine Pave machine technology. The binder placed and compacted by the AB 600 TP2 Plus features such a high density that the paver for surface course, following behind, can travel on the binder layer.



SUPER 1800-3i for paving surface course

A SUPER 1800-3i is used to pave the surface course. Only slight modifications must be made before the paver can be used in the InLine Pave train. It is fitted with crawler tracks which have larger track shoes and a water spraying system, as well as a particularly large, thermally insulated extra material hopper which can hold 25 tonnes of mix in total.

PowerFeeder MT 3000-3i Offset

The **PowerFeeder MT 3000-3i Offset** with a conveying capacity of 1,200t/h is available to feed the pavers in the InLine Pave train. The MT 3000-3i Offset is equipped with a particularly long conveyor allowing to alternately supply the SUPER 2100-3i IP with binder material on the one hand and with surface course mix, to be transferred to the second paver, on the other.

The material hopper of the paver and the transfer module are located at different heights. The height of the hydraulic conveyor and the material feeder's distance from the paver are automatically adjusted when the operator switches back and forth between binder and surface course mixes.



Optimum job site logistics are vital when working on an InLine Pave contract, as very large quantities of mix have to be paved within a short space of time. Utmost importance must be attached to perfect co-ordination of the mixing plant and the vehicles for transport of the paving materials, so that sufficient mix consistent in quality is available on site at all times. On the job site itself, the feeder operator pulls the strings. He directs the feed vehicles to their positions by green or red lights. The green signal light stands for binder, the red light for surface course mix.

Automatic distance control makes the feeder operator's work easier and ensures safe, reliable operation on site.

The distance between the material feeder and the paver for binder material is measured without direct contact using laser sensors and maintained constant by an automatic controller. The pace is set by the paver placing binder course mix which dictates the pave speed of the entire InLine Pave train. If the distance between the two machines decreases, for instance because the feed lorry inadvertently slows down, all other machines are automatically halted.

Two different distances can be set for alternately feeding the paver with binder and surface course mixes.



The **pivoting conveyor** is controlled via a joystick in the armrest of the operator's seat.



For **automatic distance control** the operator can select between two different distances.



By way of the transfer module on the paver placing binder, surface course mix is conveyed to the second paver following behind.



The **feeder operator** has an unimpeded view of the feed vehicles and the SUPER 2100-3i IP.

SUPER 2100-3i IP for placing binder course with transfer module



The conveyor of the transfer module is heated in order to prevent mix from sticking.



Two height-adjustable operator's stands give the operator an optimum view of the entire workflow on the job site.



The core of the InLine Pave train is the SUPER 2100-3i IP, a paver of standard design which undergoes just slight modification to get ready for an InLine Pave job. It can be used for conventional paving jobs at any time. For application on an InLine Pave job site, the SUPER 2100-3i IP comes with a special transfer module.

The module transfers the surface course mix received from the material feeder – over the paver for binder course – directly into the surface course paver's material hopper. The transfer module can be mounted or demounted within a very short time. In addition to the conveyor, the module also includes two additional, height-adjustable operator's stands

which allow a higher operator position for an unobstructed view of all processes on the job site.

The extra conveyor unit is heated to prevent mix from sticking. For a safe clearance between pavers placing binder and surface course mixes, electronic distance control and an anti-collision protection are installed.

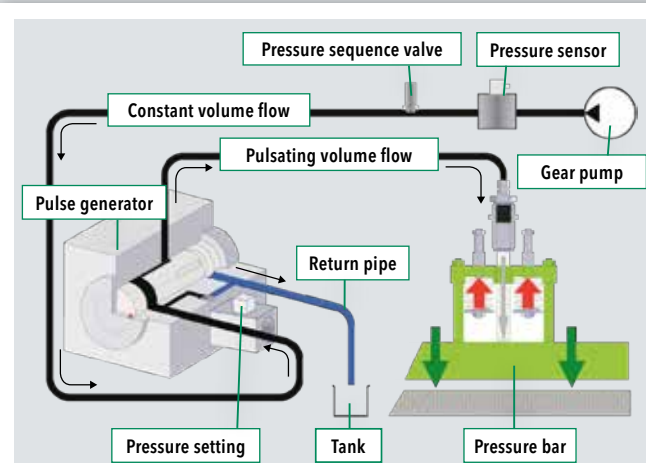
For the storage of binder, an extra hopper holding 20 tonnes and insulated against loss of heat is available, to be placed into the paver's material hopper.

AB 600 High Compaction Screed in the TP2 Plus version

The **AB 600 High Compaction Screed** in the TP2 Plus version is ideally suited to meet the special requirements of “hot on hot” paving. On an InLine Pave contract, it achieves an extraordinarily high degree of precompaction. As a function of the paving material used, a density of more than 98% is attained for the binder layer. Without rolling, of course.

On this layer then travels the paver placing surface course. Weighing some 40 tonnes (including mix and extra material hopper), this paver places the surface course onto the freshly paved and still hot binder layer.

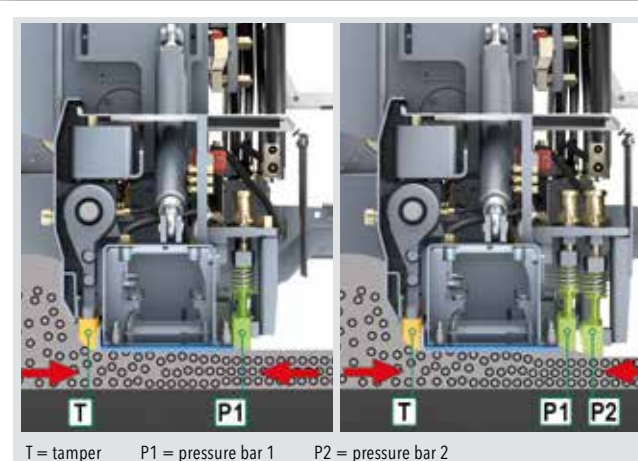
In terms of mix composition, the binder layer must be designed so as to be capable of transferring the traffic loads downwards, without deformation. If this is ensured, the tracks of the paver placing surface course leave no more than negligible impressions in the hot, precompacted binder layer avoiding adverse effects on the quality of either the binder course or the surface course.



- » The **VÖGELE high compaction process** begins with the pulse generator. It generates high-frequency pressure pulses. As a result, the pressure bars remain in permanent contact with the mix, forcing it down until it cannot be compacted any more.
- » **Due to the resultant high level of precompaction**, distinctly fewer passes are required for subsequent compaction by rolling.

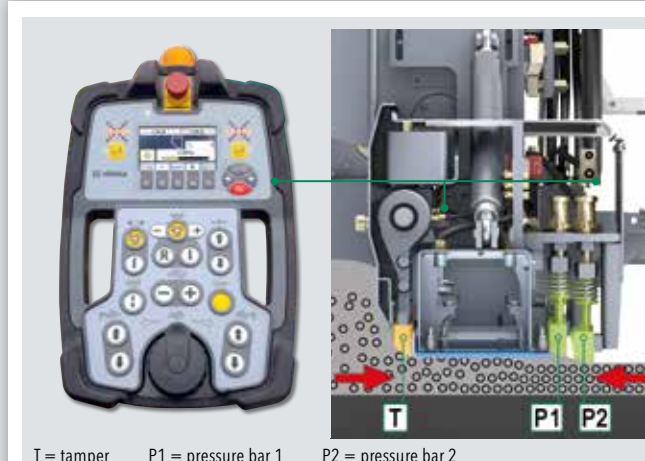


- » The **pressure bar(s)** driven by pulsed flow hydraulics are the core of VÖGELE high compaction technology.
- » **Thanks to this unique technology**, VÖGELE High Compaction Screeds in the TP1, TP2 or TP2 Plus versions bring about the highest degree of density a road paver can achieve.



T = tamper P1 = pressure bar 1 P2 = pressure bar 2

- » The **pressure bars P1 and P2** are the last elements in the process of compaction as a whole. Logically, they are located in the rear area of VÖGELE High Compaction Screeds. Only in this location can the highest possible compacting effort be achieved, as the mix is prevented from yielding to the front. Nor can it yield to the sides, where it is constricted by the screed's side plates.
- » A **change from high compaction** to conventional compaction and vice versa can easily be made from the ErgoPlus 3 operating consoles. This allows the screed to be used for highly varied applications.



T = tamper P1 = pressure bar 1 P2 = pressure bar 2

- » A **separate control** is provided for each compacting system installed in a VÖGELE High Compaction Screed.
- » **Infinite fine control** of the pressure for the pressure bar(s) allows VÖGELE high compaction technology to be used for paving surface courses as well.

SUPER 1800-3i for placing surface course

A **SUPER 1800-3i**, the last InLine Pave machine in the group of three, comes either with an AB 500 TV or with an AB 600 TV of standard design to place surface course onto the still hot binder layer.

The paver's crawler unit is fitted with extra wide track shoes and comes with a water spraying system to prevent the tracks from sticking to the hot binder material.

For a large storage capacity, an extra hopper holding 25 tonnes is placed into the paver's material hopper to ensure that a sufficient quantity of mix is available at all times.

The extra material hopper is insulated against loss of heat and heated electrically in critical places to maintain a constant temperature of the mix even for a prolonged period of time and to prevent mix sticking to it.

The SUPER 1800-3i can be used for conventional paving jobs without conversion. All that needs to be done is remove the large extra material hopper.



An extra material hopper holding 25 tonnes stores a large quantity of surface course mix.



Due to the two pavers' auto-levelling properties, InLine Pave achieves evenness at the highest level.



Your VÖGELE QR Code
will take you directly to
the "SUPER 2100-3i IP"
on our website.



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