



# VÖGELE InLine Pave

The Economical Paving Method  
for Compact Asphalt Pavements



# VÖGELE InLine Pave: The Innovative and Economical Paving Method for Long-Lasting Roads



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 equipment. 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 longevity 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 paving jobs at any time.

This substantially increases the productive utilization of the contractor’s equipment 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 bids, based on innovative machine technology, for compact asphalt pavement contracts.



## Wide range of applications due to the use of conventional machine technology



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

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 carriageways 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 work. 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 3m to 8.5m. This allows 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.



# The Method of “Hot on Hot” Paving: Characteristics and Advantages

In the majority of countries all over the globe, roads are constructed in the conventional manner by building up asphalt pavements in layers. After the anti-freeze layer are placed gravel and crushed-stone base courses as well as an asphalt base, followed finally by asphalt binder and 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 a thinner surface course of just 2 to 2.5cm 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 binder content 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 2.5cm 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 proper, the “hot on hot” method also reveals a valuable advantage. Due to the heat retention capability, 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

### 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 tack coat, which saves time and material.

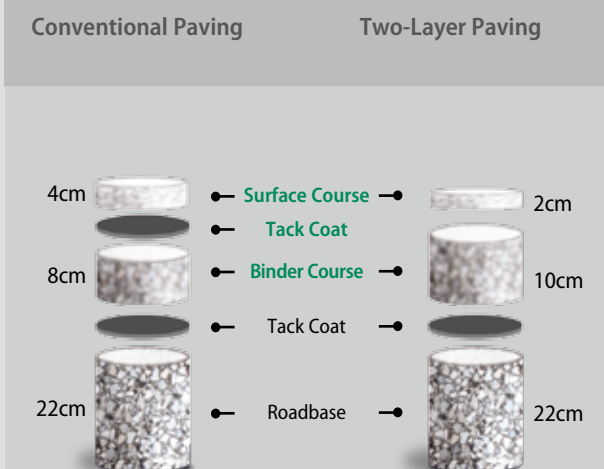
### Longer In-Service Lives of Road Pavements

- » 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 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.

### Easy Paving in Low-Temperature Regions or During the Cold Season

- » Two-layer paving increases the pavement’s heat retention capability. 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.

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





# Machine Technology for VÖGELE InLine Pave



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: a MT 3000-2 Offset or MT 1000-1 material feeder, a SUPER 2100-2 IP paver for placing binder course and a paver of the SUPER 1600 or SUPER 1800 classes for placing surface course.

**Paver of the SUPER 1600 or SUPER 1800 Classes for Paving Surface Course**

For placing the surface course, a paver of the SUPER 1600 or SUPER 1800 classes can be used. These, too, are machines of standard design, however equipped with a water spraying system for the crawler tracks and an extra material hopper insulated against loss of heat and holding a total of 25 tonnes of mix.

**AB 600 High Compaction Screed in 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 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 2100-2 IP for Paving Binder Course**

The SUPER 2100-2 IP for placing binder course is a slightly modified machine of standard design, fitted with a special transfer module for the surface course mix. The transfer module transfers the mix directly into the material hopper of the paver placing surface course. The SUPER 2100-2 builds a binder course of high density and, as a result, of high resistance to deformation.

**Material Feeder MT 3000-2 Offset or MT 1000-1**

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



# PowerFeeder MT 3000-2 Offset



The PowerFeeder MT 3000-2 Offset with a conveying capacity of 1,200 tonnes/h is available to feed the pavers in the InLine Pave train. The MT 3000-2 Offset is equipped with a particularly long conveyor unit allowing to alternately supply the SUPER 2100-2 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 conveyor and the 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 on the one hand and the vehicles for transport of the paving materials on the other, 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 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 programmed 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 2100-2 IP.



# SUPER 2100-2 IP for Placing Binder Course, with Transfer Module



The core of the InLine Pave train is SUPER 2100-2 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 2100-2 IP comes with a special transfer module including an extra conveyor unit. The module transfers the surface course mix received from the material feeder – over the paver for binder course – into the surface course paver's material hopper. The transfer module mounts or demounts within a very short time. Conversion can be completed in no more than 6 hours in the contractor's workshop by just two persons.

The transfer module comprises, in addition to the extra conveyor unit, an operator station adjustable in height. The operator station allows a higher operator position for an unobstructed view of all processes on 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 system 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.



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



The operator station adjustable in height provides for an unobstructed view of all processes on site.



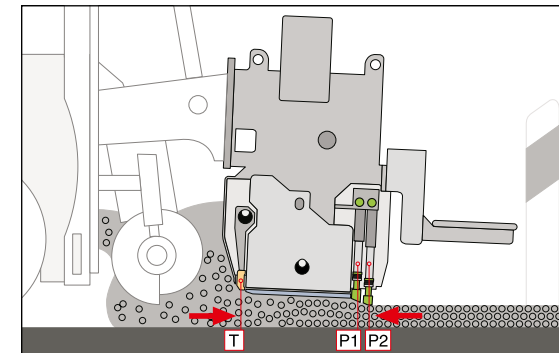


# High Compaction Screed AB 600 TP2 Plus



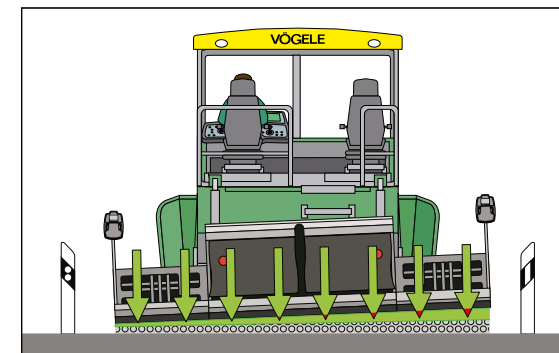
The AB 600 High Compaction Screed in the TP2 Plus version is ideally suited to meet the special requirements of „hot on hot“ paving. On an InLine Pave contract, it achieves an extraordinarily high degree of pre-compaction. As a function of the paving material used, a density of more than 98% is attained 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, pre-compacted binder layer avoiding adverse effects on the quality of either the binder course or the surface course.



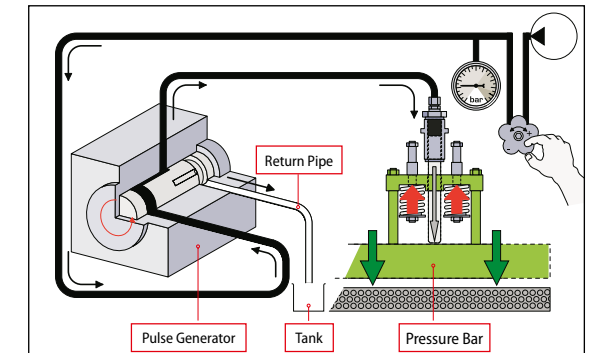
» The pressure bars P1 and P2 are the last elements in the process of compaction as a whole. Logically, they are located in the rear area of VÖGELE HPC screeds. Only in this location can the highest possible compactive effort be achieved, as the mix is prevented from yielding to the front. Nor can it yield to the sides where it is confined by the screed's end plates.

» A change from high compaction to standard compaction and vice versa can easily be made from the paver operator's console. This allows use of the screed for most varied applications.



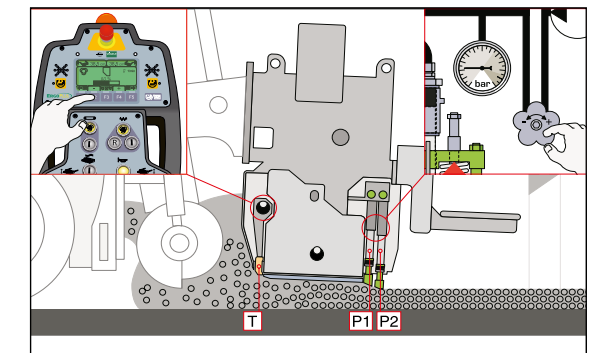
» High pre-compaction is essential for perfectly building up a pavement in layers and for a pavement profile true to line and level.

» When paving layers varying in thickness, VÖGELE High Compaction Technology ensures that, although an identical pressure is applied across the screed width, the pressure bar(s) are forced down to varying depths. This way, an absolutely uniform density is produced.



» The element at the beginning of the process of VÖGELE High Compaction is the pulse generator as part of the pulsed flow hydraulics. It generates high-frequency pressure pulses. The pressure bar(s), in contrast to the beating tamper bar, remain in permanent contact with the mix, thus forcing the mix down for a prolonged period of time.

» Thanks to the high density achieved by the pressure bar(s), fewer passes are required for subsequent compaction by rolling.



» For each compacting system installed in a VÖGELE HPC screed, separate control is provided.

» Fine control of the pressure for pressure bar(s) allows use of VÖGELE High Compaction Technology for paving surface course, too.

Key: T = Tamper  
P1 = Pressure Bar 1 P2 = Pressure Bar 2



# Paver for Placing Surface Course, with AB 500 TV Extending Screed



A SUPER 1600-2, the last InLine Pave machine in the group of three, comes with an AB 500 TV Extending Screed of standard design to place surface course onto



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

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 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 1600-2 can be used for conventional paving jobs without conversion. All that needs to be done is remove the large extra hopper. As an alternative, a paver of the SUPER 1800 class can be used as well for InLine Pave operations.



» The AB 500 Extending Screed in TV version provides for a uniform and even pavement.

» A water spraying system prevents hot binder mix from sticking to the paver's tracks.

» Due to the two pavers' "self-levelling" behaviour, InLine Pave achieves evenness at the highest level.



# Conversion from Standard Paver into an InLine Pave Machine for Placing Binding Course, with Transfer Module

The VÖGELE InLine Pave concept is a highly cost-effective solution for contractors. All machine components can be used for conventional paving work at any time and after that be applied for two-layer paving “hot on hot” on an InLine Pave job.

So how long does it take to install the transfer module on the SUPER 2100-2 IP paver? The answer is just 6 hours. And this is what you need for fitting the transfer module:

- » Workshop
- » 5-tonne lifting gear
- » Two members of workshop staff



1 The SUPER 2100-2 IP is ready for conversion. Work starts at 7 a.m.



2 Conversion begins with removal of the paver's hardtop and the muffler end pipe.



3 Next is removal of the engine hood, the driver's seats and the guard rails.



4 Then the ErgoPlus operating console is taken off, including slide rail.



5 The ErgoPlus operating console is fitted on the operator station of the InLine Pave transfer module. Electrical cables are connected.



6 Before lifting the transfer module onto the paver, the engine hood has to be attached.



7 Using the lifting gear, two workshop staff members raise the InLine Pave transfer module onto the SUPER 2100-2 IP, positioning it in place and securing it. Then they fit the muffler end pipe.



8 Finally, hydraulics and electrics are connected. A test run should be performed, checking all components for proper functions and making final adjustments.



9 And that's that!

About 6 hours are all that's needed for fitting the InLinePave transfer module onto the SUPER 2100-2 IP. Two people can easily manage the conversion in less than one day.

All that remains to be done on the job site is to place the extra hopper, holding 20 tonnes, into the material hopper of the SUPER 2100-2 IP and paving can commence.



# The Advantages of VÖGELE InLine Pave Technology at a Glance





## The Advantages of VÖGELE InLine Pave Technology at a Glance

### 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 screed to produce the final density.
- » VÖGELE High Compaction Technology applied for InLine Pave attains such a high degree of pre-compaction 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



- » The high pre-compaction of the binder course precludes blending of binder and surface course mixes.
- » At the same time, VÖGELE high compaction achieves 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 forming part of the InLine Pave train can be employed for conventional paving jobs at any time, without a need for conversion.
- » The transfer module of the SUPER 2100-2 IP mounts or demounts 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 Course with the SUPER 2100-2 IP



- » The SUPER 2100-2 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 course.
- » 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.



# The Wide Range of InLine Pave Applications



**Pavement rehabilitation for motorway, pave width 7.5m:**  
Two-layer paving of porous asphalt (ZWOPA).



**Pavement rehabilitation for motorway, pave width 3.75m:**  
Rehabilitation of lorry lane. Ambient temperature 0 °C.



**Pavement rehabilitation for federal highway, pave width 2 x 3.2m:** Rehabilitation in single-lane width. Traffic kept flowing on the adjacent lane.



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



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



**Pavement rehabilitation for motorway, pave width 7.5m:**  
Rehabilitation in two-lane width. Layer thicknesses for binder and surface courses 10cm + 2cm.



**New construction of federal highway, pave width 7.5m:**  
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 for cross-town link, pave width 2 x 3.2m:** Rehabilitation of 950m section in single-lane width. Traffic kept flowing on the adjacent lane. Short set-up time of just 2 hours for the basic configuration allows economical paving of short stretches.



**New construction of motorway, pave width 5m:**  
Before placing binder and wearing courses, the roadbase had been built with the SUPER 2100-2 IP.



**Pavement rehabilitation for rural road, pave width 7.5m:**  
During the pavement rehabilitation work, the road was closed to traffic. For the binder course, grade and slope control by means of the VÖGELE Big MultiPlex Ski referencing from the milled base. Slope up to 3.5% on curved sections. Crown set to 2.5%.



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

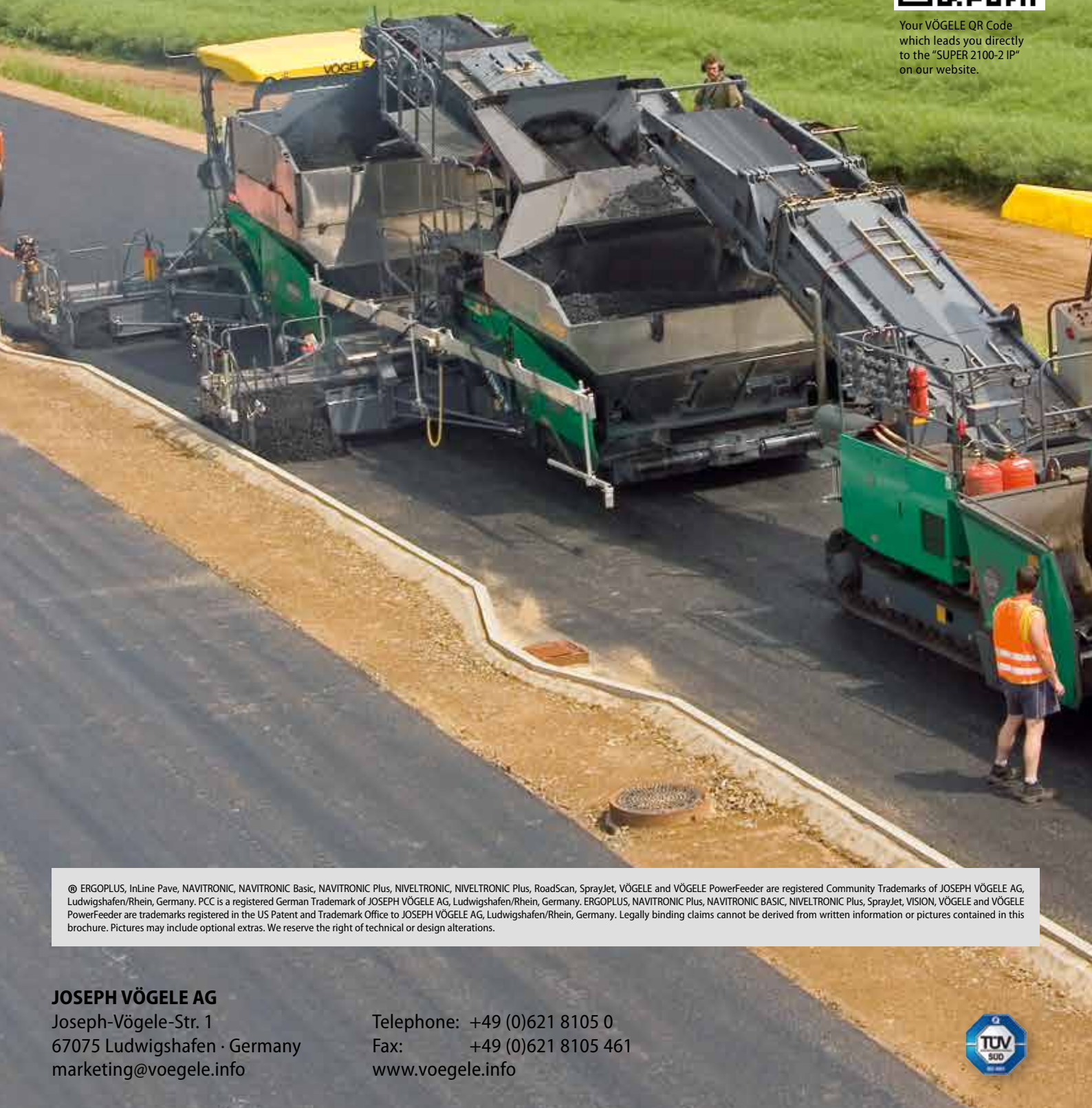


**Pavement rehabilitation for national road, pave width 3.75 - 5.25m:** Rehabilitation in single-lane width. Traffic kept flowing on the adjacent lane. Slope of 2%. Referencing from the milled base using the Big MultiPlex Ski allows paving to the highest standards of evenness.





Your VÖGELE QR Code  
which leads you directly  
to the "SUPER 2100-2 IP"  
on our website.



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