





Preface

This user manual set out the criteria for safe and successful installation of S&P asphalt reinforcement.

S&P asphalt reinforcements are bitumen-impregnated grids made of high-tensile glass fibre and/or carbon fibre with a reinforcing effect in accordance with EN 15381.

S&P asphalt reinforcements are used to strengthen and protect newly laid asphalt layers above them.

For the production of the asphalt layers and all adjacent trades, the valid technical regulations apply.

The effectiveness of asphalt reinforcement depends on the quality of the installation. Due to their product properties, S&P asphalt reinforcements support a flexible and high-quality application.

The S&P engineers and technicians are available for installation planning and support at any time. A wealth of useful documents and resources can also be found on our website at www.sp-reinforcement.eu.





Site Preparation

TRANSPORT & STORAGE

S&P asphalt reinforcement is protected by packaging against normal transport stresses. On receipt of the goods, they must be checked for transport damage.

Both in the warehouse and on the construction site, the goods must be stored on a flat, dry and clean surface and protected from the effects of weather and direct sunlight.



Secure stacking prior to being wrapped for transport

SITE PLANNING

It is advisable to carry out a site inspection before installation and to draw up an installation plan. S&P technicians will be happy to assist you with this.

The construction site and the chronological sequence of the trades are to be planned in such a way that the requirements presented in this document can be met as well as possible.

In particular, unnecessary or permanent driving over the installed S&P asphalt reinforcement is to be avoided. Sufficient turning and waiting areas should be available for asphalt mix trucks outside the area to be reinforced whenever possible.



S&P technician providing support and advice on the jobsite



Preparation

SURFACE REQUIREMENTS

S&P asphalt reinforcement can be installed on:







New surfaces

Milled surfaces

Existing surfaces

The quality of the surface is decisive for installation success and effectiveness of the reinforcement.

All surfaces for installation must, with regard to their condition (roughness, structural integrity, etc.) and geometry (evenness, slope, etc.), at least comply with the locally valid regulations for the superstructure with asphalt.

The surface must be prepared in such a way that the prerequisites for professional installation with the aim of a good layer bond can be met.

S&P recommends an evenness \leq 10 mm / 4 m in longitudinal as well as transversal direction.

There must be no ledges / steps > 1 cm on the surface. Break-outs and cavities need to be filled according to the state of the art.

If a poor installation surface is to be expected for example due to very coarse-grained asphalt layers, patches, excavations etc., the use of an asphalt levelling layer is advisable. For this work, the applicable technical rules and regulations must be taken into account.

Surface type	Requirement
New Surface	Newly paved surfaces must have cooled down to ambient temperature be- fore the asphalt reinforcement can be installed.
Milled Surface	The quality of milled surfaces must comply with the locally valid regulations for the superstructure with asphalt. S&P recommends a structural depth ≤ 6 mm for best installation results on milled surfaces.
Existing Surface	Existing surfaces must have sufficient roughness to allow for aggregate inter- lock with new asphalt layers in order to achieve proper layer bonding. In the case of very smooth asphalt surfaces and / or polished aggregates, the necessary roughness needs to be produced by fine milling the surface.



CRACKS & JOINTS

Pre-treatment of existing cracks and joints is advisable. Gaping cracks or open joints should be professionally cleaned or milled and filled with hot bitumen sealing compound. This is recommended for all cracks and joints with an internal opening width \geq 3mm.

BITUMEN EMULSION

S&P asphalt reinforcement is installed on the broken and dried bitumen emulsion.

The bitumen emulsion should be applied to a clean, properly prepared substrate. S&P recommends existing and milled surfaces to be high-pressure washed and vacuumed before application.

Spraying must be carried out using a ramp spraying device in such a way that an even distribution of the binder quantity is achieved. In complex shapes (e.g. junctions), spraying can be carried out using a hand lance. The processing instructions for the emulsion must be observed.

S&P recommendation for installation:

- Type: C60 (polymer modified) for layer bonding.
- Amount: According to local regulations / substrate condition for layer bonding.

Due to the bitumen-impregnation the S&P grids, additional quantities are usually not necessary.

Depending on regulations and substrate (new / milled / rough / depleted asphalt), sprayed quantities between 150-500 g/m² sprayed are common (app. 90-300 g/m² residual binder).

Local recommendations may vary. Contact your S&P representative and refer to your local Technical Data Sheet for detailed recommendations.

Contamination of the bitumen emulsion (e.g. by construction site- or neighbouring traffic) must be avoided at all costs.



Crack filling with hot bitumen



Surface cleaning



Tack coat application



Installation

AMBIENT CONDITIONS & TEMPERATURE

The surface of the broken bitumen emulsion must be clean, dry and free of any contaminants that could hinder the adhesion of the asphalt reinforcement grid.

The surface and air temperature should be at least 3 °C. Make sure that there is no water or dew film on the surface.

In case of rain, the installation work must be interrupted and only continued after the surface has dried.

If the surface temperature is expected to exceed the softening point of the broken bitumen emulsion due to heat / sunshine, additional measures may be required. In this case, contact your S&P technician for additional support in installation planning.

MACHINE TECHNOLOGY

Installation of the S&P asphalt reinforcement is carried out with machines specially designed and manufactured by S&P.

Depending on the width of the roll and the size of the job, the big installation machine or the small hand-guided machine is used.

In the interest of the highest possible installation quality, the big machine should be used whenever possible. Manual installation without S&P machine technology should be avoided as the performance of S&P asphalt reinforcement benefits from mechanical installation.

For detailed information on the operation of the installation machines, please refer to the machine operating instructions. Contact your S&P representative for the corresponding documentation.



Mechanical installation machine



Manual installation aid



INSTALLATION PROCESS

S&P asphalt reinforcement should always be installed by an S&P certified installation team or under the supervision of an S&P site technician.

The installation of S&P asphalt reinforcement is carried out through:

- Unrolling and evaporation of the separating foil by means of a propane gas burner.
- Application of the asphalt reinforcement to the surface with pressure rollers.

During this process, the bitumen in the grid is heated and the grid structure becomes supple and adaptable. By rolling it onto the substrate, the adhesive bond with the bitumen emulsion is created.

A full-surface contact between the asphalt reinforcement and the base must be ensured. If necessary, the reinforcement can be rolled with a light rubber wheel or combination roller directly after installation.

The asphalt reinforcement is to be installed without folds and wrinkles. In the case of isolated folds, they are to be cut, pulled flat and bonded together under the application of light heat from a propane torch.

During all work steps, ensure that the bitumen in the grid does not burn or char due to excessive heating.

TECHNICAL ROAD EQUIPMENT

Technical road equipment such as manholes, valve boxes, etc. are overlaid and can later be easily cut out with a box cutter or a similar sharp knife.

INSTALLATION AROUND CURVES

The adaptable grid structure of S&P asphalt reinforcement allows for installation around curves.

If the radius of the curve is too small, the material will show this by lifting on the outside of the lane or by slight wrinkling on the inside. In this case, a separation cut should be made and the installation should be restarted, taking the necessary overlap into account.



Mechanical installation



Manual installation



Grids can be easily cut around manholes



Example of an S&P asphalt reinforcement grid installed in a curve



INSTALLATION DETAILS

General requirements

S&P asphalt reinforcement can be used to counteract localised damage or for full-surface reinforcement of the asphalt pavement.

In the case of local application, a 50 cm protrusion of the grid over the edges of the damage pattern must be achieved on all sides to ensure sufficient anchorage length.

A distance of 5 cm should be maintained from the edges of the pavement.

Overlaps

In order to achieve a continuous reinforcement effect, the reinforcement lanes must be overlapped when laid next to each other.

Minimum overlap widths:

- $\geq 10 \, \text{cm}$ in longitudinal direction
- $\geq 10 \, \text{cm}$ in transverse direction

Transversal overlaps must be offset from each other when installing multiple lanes.

Fourfold overlaps are to be avoided.



Recommendation for overlap positioning and spacing



Transversal overlaps must be arranged in such a way that they cannot be folded up by the asphalt paver.





Longitudinal overlaps should be positioned outside the ideal tyre track as far as possible.



POSITIONAL STABILITY

The adhesive effect of the bitumen in the grid on the broken emulsion as well as the top side sanding enable a high positional stability of the grid when properly installed.

To maintain the installation quality, the following points must be observed:

- Traffic on the grid needs to be limited as much as possible.
- Pavers and transport vehicles must be driven carefully to minimise shear stress on the grid.
- Walking speed is recommended for all site traffic.
- Abrupt braking and steering movements should be avoided.

If possible, asphalt mix trucks drivers should not apply brakes when in contact with the paver during unloading. On inclines, it may be advisable to drive mix trucks along under their own power during unloading.

Regardless of the weather conditions, S&P recommends the use of hydrated lime suspension (e.g. Asphacal) to protect the asphalt reinforcement and bitumen emulsion from site traffic and thus increase the quality of layer bonding. Contact S&P for more information.





Tyre tracks visible on top of grid

Hydrated lime spraying



Pavers and transport vehicles must drive carefully



Overlay



ASPHALT OVERLAY

S&P asphalt reinforcement can be overlaid with asphalt immediately after installation. Asphalt overlay must be carried out within 24 hours at the latest. The installed grid should not be exposed to large temperature fluctuations (e.g. day/night) until it is overlaid.

The minimum superstructure thicknesses for S&P asphalt reinforcement products can be found in the respective technical data sheets.

S&P asphalt reinforcement can be overlaid with all conventional asphalt types (AC, SMA and similar). More specialised asphalt types such as mastic asphalt (MA) and porous asphalt (PA) may have special requirements for the construction process.

S&P engineers will be happy to assist you with the implementation planning.

The specification for the asphalt as well as the individual layers must comply with the local regulations and the expected load classes.

All valid rules and regulations for asphalt pavement construction and the paving of the asphalt mix apply. The technical regulations for the compaction of asphalt layers must also be observed.



Conclusion

This is a general description of the installation of S&P asphalt reinforcement. Special features such as local conditions, boundary conditions and other influences from the construction process cannot be covered by these installation instructions.

The S&P engineers and technicians are available for further consultation and support at any time.

We reserve the right to make changes and improvements to the product or the installation method in line with technical progress.

Warranty claims cannot be derived from this information.



Since 2012 S&P has been part of Simpson Strong-Tie, an international building products company based in California with multiple locations across Europe.

The company is committed to helping customers succeed by providing exceptional code-listed products, full-service engineering and field support, product testing and training, and on-time product delivery.





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