



INSTALLATION GUIDELINE

# MIRAGRID PGL



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# 1. INTRODUCTION

**MIRAGRID**® PGL is a reinforcing asphalt interlayer grid with a lightweight non-woven serving as installation aid. The following information reflects the present level of knowledge of Solmax pertaining to the maintenance of roads with **MIRAGRID** PGL asphalt interlayers. The data and techniques described in these guidelines apply exclusively to **MIRAGRID** PGL types. Due to differing production technologies and types of fibers, similar products may require substantially different methods of application. Minor deviations from this guideline suggested by Solmax may be permitted in the individual case due to special conditions on the construction site.

## 2. PREPARATORY WORKS



### A. Cleaning of the road

Cleaning of the road surface and the cracks from debris, dust and vegetation shall be done by using a road-sweeper or water-jet.



### B. Filling of potholes and leveling uneven sections

Poor joints, excessively uneven or badly rutted areas should be either planned or regulated using suitable coated materials. The void content of the road surface shall not be higher than 8%. Concrete roads must be relaxed correspondingly by means of falling-weight so that a tilting of the concrete slabs is excluded.

### C. Filling of cracks

Cracks wider than 4 mm should be cleaned and filled with a proprietary treatment to the surrounding level to eliminate any loss of tack coat in the crack.

The following treatments have been used successfully:

- Filling with coated materials
- Filling with chippings and emulsion
- Single surface treatment
- Application of a bituminous leveling layer (especially at substantial uneven sections)
- Joint filling compound (obligatory for crack distances > 3 m).

# 3. APPLICATION OF BINDER

## TYPE OF TACK COAT

Both straight-run bitumen and cationic bitumen emulsions (65–70%) are suitable tack coats. Polymer-modified bitumen's are particularly recommended, whilst those containing fluxing agents should not be used.



### A. Influencing factors

#### Climatic conditions

High surface temperatures can lead to bleeding and adhesion problems with the paving felt when tack coats with a softening point lower than the surface temperature are used. Similarly, low surface temperatures can lead to a loss of the adhesive bond strength of the layers.

#### Asphalt overlays

Polymer-modified tack coats are generally recommended for thin asphalt overlays.

#### Traffic load

Heavy traffic loads or high air and surface temperatures combined with thin asphalt overlays can lead to a reduction in the stability of the asphalt due to moving up of the tack coat.

### B. Recommended type of tack coat

#### a. Polymer-modified bitumen (pmB) or emulsions are suitable in case of:

High air temperature (> 25 C) during the installation or high traffic loading,  
Asphalt overlay < 40 mm (special type) or if new asphalt layers are installed with polymer bitumen.

#### Characteristics of polymer-modified bitumen:

Softening point (Ring & ball) > 50 C EN 1427

Breaking point (Fraass) < - 15 C EN 12593

The given values may vary according to the a.m. factors of influence.

#### b. Standard bitumen (or emulsions) are suitable in case of:

Moderate air temperature conditions and medium traffic loading,  
Asphalt overlay > 40 mm

The term 'standard bitumen' refers to the type and grade required for each surface type, the overlay material, and the traffic loading, using conventional construction methods.

#### c. Note should be taken of the following properties when using emulsions:

##### 1. High viscosity (min. 500 mPa at 40 C)

The amount of emulsion required can lead to run-off or creating a pond.  
These problems are exacerbated on roads with a steep camber or cross fall.

##### 2. Short curing time

The shortest possible curing period speeds up the work considerably.  
Note should be taken that high quantities of emulsion are required.

## RECOMMENDED QUANTITY OF TACK COAT

The required amount of tack coat is calculated from the quantity necessary to impregnate **MIRAGRID PGL** and achieve full adhesive bonding.

A typical quantity Q of effective binder (residual bitumen) is:

**MIRAGRID PGL** 0.40 to 0.70 kg/m<sup>2</sup>

The quantity of tack coat must be adjusted to take into account the condition of the existing road surface to be overlaid, as follows:

Rough surface condition	+ 0.1 kg/m <sup>2</sup>
Heavily cracked surface	+ 0.1 kg/m <sup>2</sup>
Dry, brittle surface	+ 0.1 kg/m <sup>2</sup>
Smooth mastic asphalts	- 0.1 kg/m <sup>2</sup>
Open textured macadam of existing old surface	+ 0.1 kg/m <sup>2</sup>
Dense macadam of existing old surface	- 0.1 kg/m <sup>2</sup>

The maximum change in the mean quantity should not exceed + 0.2 kg/m<sup>2</sup> or - 0.1 kg/m<sup>2</sup>.

When using emulsion, it is necessary to make a further adjustment to allow for the dilution caused by added water.

In order to achieve the mean quantity Q = 0.4 to 0.70 kg/m<sup>2</sup> when using a 70% emulsion, the quantity of tack coat must be increased to 0.7 to 1.0 kg/m<sup>2</sup>.

## SPRAYING OF TACK COAT



Spraying of tack coat should always be undertaken using a truck-mounted calibrated spraying-bar to ensure the correct quantity is applied. The tack coat should be sprayed 15 cm wider than the width of the **MIRAGRID PGL**.

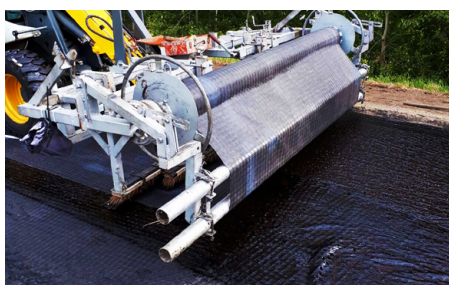
## 4. LAYING OF MIRAGRID PGL

**MIRAGRID PGL** should only be laid by trained staff.

### A. Commencement

The start of the installation is determined by the Solmax installer. It takes into account the quality of the used tack coat and the predominant climatic conditions.

If the tack coat chosen is bitumen (either polymer-modified or straight-run), laying the **MIRAGRID PGL** can commence immediately. If, however the tack coat is to be emulsion, lying of the **MIRAGRID PGL** must be delayed until the emulsion has nearly broken. This can cause delays, as the breaking-time cannot be accurately forecast and varies according to the climatic conditions.



## B. Using an installation device

When laying **MIRAGRID** PGL more than 1.0 m wide, it is recommended to use a laying rig. It shall be handled only by trained and experienced staff.

## C. Manual laying procedure

Laying **MIRAGRID** PGL smaller than 500 m<sup>2</sup> wide does normally not demand the use of a laying rig, and occasions may arise when a rig is unavailable. **MIRAGRID** PGL can then be laid by hand.

The following points must be considered:

- The paving felt must be kept under light tension to prevent the formation of folds or wrinkles – a suitable bar passed through the center core will facilitate this.
  1. Lift up the roll
  2. Unwind only short lengths, 2 to 3 m, at a time
  3. Maintain the tension
  4. Apply the paving fabric onto the tack coat under tension
  5. Press the paving fabric lightly onto the tack coat with a brush
- Emulsions are preferable for hand installations to allow corrections. When laying the paving felt they should not yet have achieved their full adhesive force.
- Cut the paving fabric into segments for installation around curves.

If **MIRAGRID** PGL has been laid onto emulsion which has not yet broken, bleeding might occur. ‘Blind’ these areas as well as all transverse jointing with coated materials or chippings (app. 2 kg/m<sup>2</sup>).

## D. Adjacent MIRAGRID PGL panels

For laying **MIRAGRID** PGL panels adjacent to each other along the road butt joints are preferable. Gaps up to 40 mm can be ignored if there are no severe cracks underneath. Occasional overlaps wider than 30 mm need an additional 0.3 kg/m<sup>2</sup> tack coat applied to the lower edge.

## E. Cutting

**MIRAGRID** PGL is easily cut by using a sharp knife or a pair of scissors.

## F. Removing folds or wrinkles

The paving felt should be laid wrinkle-free; however it is inevitable that they will appear from time to time. Small wrinkles are unimportant and can be disregarded, however any folds which can be formed into three layers of paving felt should be removed by cutting or heating.

### a. Cutting

Large folds as described should be cut using a knife or a pair of scissors. One part of the fold is then laid in the tack coat and a further 0.3 kg/m<sup>2</sup> applied before the other part is pressed into place.

### b. Heating

A gas burner can be applied to the fold to burn it off. Care must be taken to ensure that holes are not made in the paving fabric.

## G. Blinding - spread chippings

It is not normally necessary to 'blind' **MIRAGRID** PGL, however certain circumstances may require the newly-laid paving felt to be protected:

- Bleeding of the tack coat (in this case the tires of the vehicles may stick to the paving felt).
- The softening point of the tack coat is too low, causing the wheels of the paver to displace the paving fabric.

It is sufficient to lightly 'blind' the wheel tracks by spreading chippings (2 kg/m<sup>2</sup>) or the coated material being placed in the permanent works. Transverse joints should be lightly 'blinded' to allow site traffic to travel freely before the tack coat has reached its' full adhesive strength.

## H. Weather

### a. Wind

Wind is extremely unlikely to affect the laying of the paving fabric. However, should it become necessary due to lack of adhesion to the tack coat, lightly roll using a rubber wheeled roller.

### b. Rain

Surfacing onto the paving felt should not commence until rain has evaporated, as the adhesive bond will be greatly reduced. Slight residual dampness is acceptable if the temperature of the overlay is sufficient to allow evaporation. It is possible for the traffic to run on the wet **MIRAGRID** PGL, but care must be taken as tire grip is considerably reduced.

# 5. APPLICATION OF BITUMINOUS OVERLAY

All types of bitumen bound asphalts and macadam's within a temperature range of 140 C and 180 C can be used.

The thickness of the asphalt layer built-in over the paving fabric must be at least 40 mm. The overlay should be applied in the conventional manner, taking into account the following:

- Normally construction traffic can travel over correctly laid **MIRAGRID** PGL. Heavy braking or acceleration as well as movement of the steering wheels whilst the vehicle is stationary should be avoided. When the tack coat has fully hardened a limited amount of public traffic can be allowed onto the **MIRAGRID** PGL for a short time, taking into account the reduced grip between the paving felt and the vehicle tires.
- No tack coat shall be applied onto **MIRAGRID** PGL (exception in overlapped areas)
- 'Blinding' of the wheel tracks must be carried out if bleeding occurs.
- If the paving felt is not applied over the full width of the cross-section, a longitudinal strip of up to 200 mm must be left uncovered to enable a longitudinal joint.
- As the paving felt provides low grip for tires, the paver should not be loaded to full capacity.
- If the paver has tendency to swerve on the felt, 'blinding' the wheel tracks will both protect the **MIRAGRID** PGL and add grip.

### **About Solmax**

Solmax is a world leader in sustainable construction solutions, for civil and environmental infrastructure. Its pioneering products separate, contain, filter, drain and reinforce essential applications in a more sustainable way – making the world a better place.

The company was founded in 1981, and has grown through the acquisition of GSE, TenCate Geosynthetics and Propex. It is now the largest geosynthetics company in the world, empowered by more than 2,000 talented people. Solmax is headquartered in the province of Quebec, Canada, with subsidiaries and operations across the globe.

### **Uncompromised quality**

Our products are manufactured to strict international quality standards. All our products are tested and verified at our dedicated and comprehensive laboratories which maintain numerous accreditations. We offer our partners a wide scope of testing according to published standards to ensure products delivered to sites meet specified quality requirements.

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