

# Installation Guide AR-GNS

## Scope

This installation guide applies to the maintenance of road surfaces with the structural asphalt reinforcement product, Tensar AR-GNS. AR-GNS is composed of a punched and stretched asphalt reinforcement polypropylene grid, which is factory bonded to a mid-grey polypropylene backing fabric. The grid absorbs stress by an optimal interlock with the asphalt mix due to the high profile ribs and provides a structural reinforcing effect. The fabric aids installation and provides together with the bitumen, a stress relief effect and interlayer barrier against moisture and oxygen. The product characteristics and described effects (reinforcing, stress relief, interlayer barrier) are in accordance to EN 15381.

The user should evaluate the suitability of the product for any specific project prior to installation. Every step of the installation has to be in accordance with general requirements and regulations for the construction.

## Storage and transport

The rolls must be transported carefully and stored in dry and clean environment on even surfaces so that deformation of the rolls is avoided. The rolls should be covered to protect them from sunlight and water-ingress.

## Preparation of the surface

- Bound substrates of asphalt and concrete are suitable for the installation
- The surface has to be even to ensure a continuous contact between AR-GNS and the surface
- Finely milled substrates with a maximum rill depth  $\leq 10\text{mm}$  (picture 1) are acceptable for the installation of the product
- The surface must be clean, free of dust and debris, dry and be in accordance with the basic requirements for conventional asphalt paving
- Uneven surfaces must first be regulated or profiled with a suitable asphalt mix; the asphalt mix used for the regulating layer should be sufficiently dense to avoid absorption of the bond coat
- Potholes, joints, cracks or voids must be filled beforehand with a suitable material
- The surface (if newly laid) onto which the bond coat is applied must have been allowed to cool to ambient temperature

## Bond Coat Application

- The bond coat can either be hot bitumen or a bitumen emulsion; cut back bitumen's (i.e. bitumen mixed with a volatile liquid, e.g. kerosene) should be avoided and are not recommended for the installation of Tensar AR-GNS. For hot applied bitumen, the penetration grade can vary from 160/220 for moderate climates (e.g. UK) to suitable lower penetration grades in hotter climates. The minimum air temperature at the time of applying the hot bitumen should be  $+5^{\circ}\text{C}$ . Variances depending on site conditions should be agreed upon by the engineer and the installer of the product.
- For bitumen emulsions these should be suitable for surface dressings and provide a bitumen solids content of  $\geq 69\%$  (e.g. C 69 B4 according EN 13808). The minimum air temperature at the time of applying the bitumen emulsion should be  $+10^{\circ}\text{C}$ . Variances depending on site conditions should be agreed upon by the engineer and the installer of the product.
- The bond coat should be sprayed mechanically onto the surface at a uniform rate. Small or localized areas can be sprayed by hand.
- Spray rates:
  - $\geq 1.1 \text{ kg/m}^2$  in case of hot bitumen;
  - In the case of bitumen emulsion sufficient to deliver for  $1.2\text{-}1.5 \text{ kg/m}^2$  of residual bitumen

The quantity should be measured controlled and recorded. It may vary and needs to be adjusted according to surface conditions (for example porous surfaces require more bitumen). As a visual help on site to indicate that the spray rate may be correct,

- the bitumen film should provide a reflective mirror effect (see picture 2) and;
- the bitumen should leave “black prints” in the fabric when installed from footsteps and tyres (see picture 2).

Please note that these indicators do not replace the need for correctly calibrated spraying equipment and experienced staff on site ensuring the appropriate spray rate

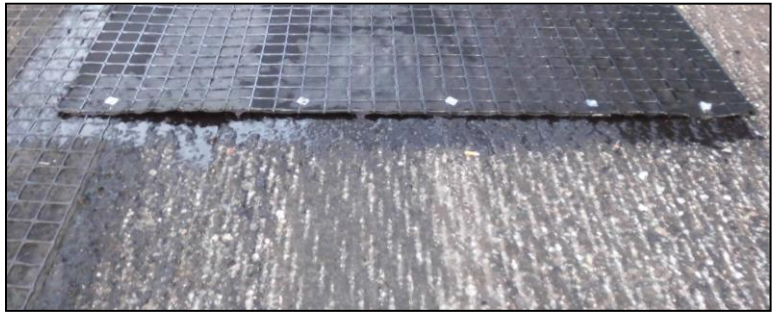
- For overlaps, spray binder on top of the previously installed layer, slightly wider than the overlap width; avoid oversaturation



Picture 1: Finely milled substrate



Picture 2: Mirror effect of fresh bond coat/black prints on product



Picture 3: Example of nails with head plate

## Installation of Tensar AR-GNS

### Installation equipment and tools

The following tools are required to install AR-GNS:

- A properly calibrated bond coat sprayer to ensure the correct and uniform spray rate
- A disk saw to cut rolls to width (if necessary)
- Nail gun(s) with adequate nails ( $d \geq 4\text{mm}$ ) with head plate ( $d \geq 30\text{ mm}$ ; see picture 3) of a length determined by the substrate that is sufficient to hold the product in place where necessary;
- Face shield to prevent from splashing bitumen emulsion
- Stable cutters (metal) for individual product cutting

#### **Mechanical Installation:**

- Traverse, chains for connection to the bond coat sprayer; Z-shaped steel bars to adjust roll orientation (picture 4)
- Grid installation machine (preferred installation - picture 5)

#### **Manual Installation:**

- Steel bar (put through core) to adjust roll orientation or Z-shaped steel bars (picture 4)



Picture 4: Installation with traverse and adjust bars directly after spraying the bond coat

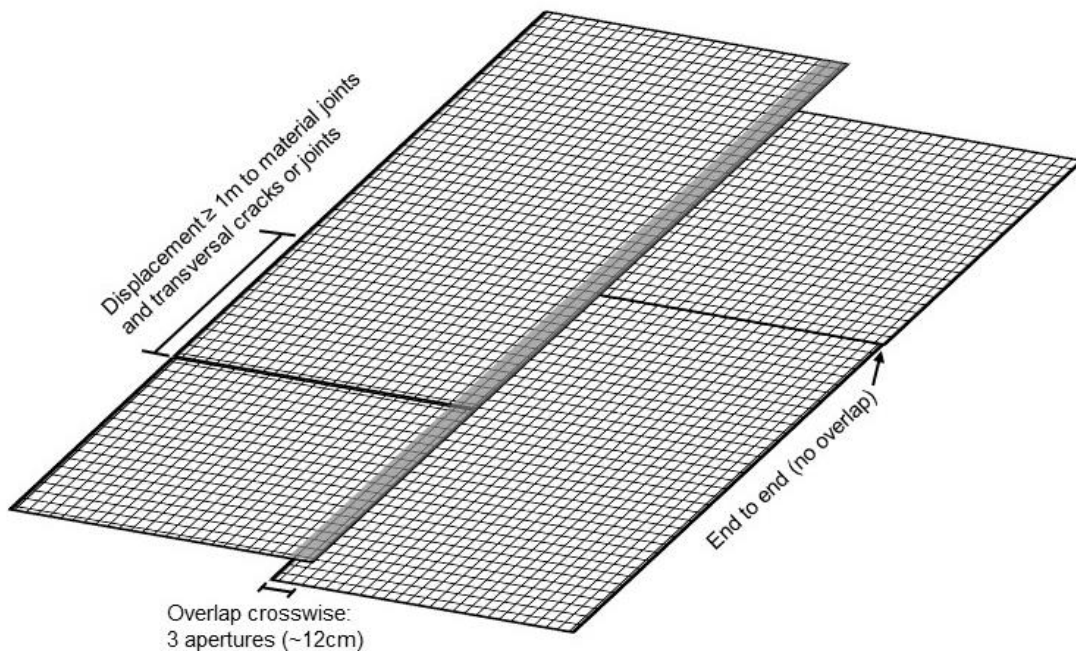


Picture 5: Grid Installation machine

### Installation procedure

- The installation should be carried out by trained and experienced staff
- Installation should be performed in dry weather conditions

- Installation can be performed by laydown machine or by hand
- The product needs to be laid into the freshly sprayed bond coat
- A firm and wrinkle free contact between the product and the surface should be achieved by applying pressure with a broom, or suitable alternative. In case of wrinkles, these have to be cut and stuck down with bond coat
- Adjacent rolls should overlap 3 grid apertures (about 120 mm) (see picture 6). Try to avoid installing overlaps over cracks or joints or wheel/track lanes of the paving machine
- Rolls are laid end to end, in lengthwise direction without an overlap. Joints should be staggered with a displacement of  $\geq 1\text{m}$  in adjacent roll lengths (see picture 6). Avoid joints coinciding with transverse cracks. Roll ends need to be fixed with nails at a maximum spacing of 300mm according to the condition of the substrate
- In curves the product should be installed in short straight lengths to suit the curvature, ensuring that the product is overlapped correctly in all cases
- For the rehabilitation of discrete or single cracks, or joints, the product should be installed with a minimum width of 1m centered over the crack or joint
- Traffic on the installed product should be restricted to construction traffic necessary for the asphalt paving process
- Operators of construction vehicles should avoid sudden braking, or acceleration, or turning the tyres while stationary. Drivers of asphalt delivery trucks must avoid full braking while being pushed by the paver.
- If necessary, e.g. in hot climates or where excessive construction traffic is anticipated, a stone chipping can be applied. Chipping should be evenly distributed over the installed product at a rate up to  $1.5 \text{ kg/m}^2$ . The chipping should be dust-free and consist of solid, hard stones with a size of 5-8 mm. Excess chippings should be removed.



Picture 6: Overlaps

## Asphalt Paving

- Low-temperature asphalt mixes and mastic asphalts cannot be used
- If an emulsion bond coat is used paving should not commence until the bond coat is totally cured; Where it rains on the installed product, paving operations have to stop until the surface is dried again; Where construction delays are not permitted, weather conditions should be taken into account
- Minimum compacted thickness of the first lift of asphalt over the product is 60 mm
- Avoid locating paving joints over the product overlaps
- Any damaged product must be cut out and replaced, with sufficient overlaps before paving
- To ensure the integrity of the overlaps, at the start of paving, or over repaired areas, loose asphalt mix can be broadcast on the surface immediately before paving

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