

Installation Guideline for Tensar AR-GN™ Asphalt Interlayer

Scope

This Installation Guideline provides a step by step guide to Contractors installing Tensar AR-GN™ asphalt interlayer supplied by Tensar International or any of its appointed distributors. There are several product grades in the Tensar AR-GN range. This guideline applies to all products in the range.

Tensar AR-GN is composite asphalt interlayer product providing the combined functions of reinforcement, stress relief, and moisture barrier.

The product is composed of a polypropylene grid factory bonded to a polypropylene paving fabric. The grid controls strains in the overlay by an optimal interlock with the asphalt mix due to the high-profile ribs providing a structural reinforcing effect. The fabric aids installation and provides, together with the bitumen absorbed from the bond coat, a stress relief effect and interlayer barrier against ingress of moisture and oxygen. The product functions (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. These general guidelines should be closely followed unless there is a conflict with the contract documents. In such cases clarification should be sought from the Engineer.

Storage and transport

The rolls will be delivered to site wrapped in a polypropylene film. They 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 remain wrapped until use to protect the product from sunlight and water-ingress.

Preparation of the substrate surface

- Bound substrates of asphalt and concrete are suitable for the installation.
- Potholes, joints, cracks, or voids must be filled beforehand with a suitable material.
- The surface must be even to ensure a continuous contact between AR-GN and the substrate.
- Finely milled substrates with a maximum rill depth less than 10mm (Figure 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 or coarsely milled 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.
- The regulating layer (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 (referred to in EN 13808 as the tack-coat) can either be hot-applied bitumen or a bitumen emulsion; cut-back bitumen products (i.e. bitumen mixed with a volatile liquid, e.g. kerosene) should be avoided and are not recommended for the installation of Tensar AR-GN. 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°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 ≥69% (e.g. C 69 B4 according EN 13808). The minimum air temperature at the time of applying the bitumen emulsion should be +10°C. Variances depending on site conditions should be agreed upon by the engineer and the installer of the product.
- The bond coat bitumen or emulsion proposed for the interlayer should first be approved by the Engineer.
- 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 1.2-1.5 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 Tensar AR-GN fabric when installed from footsteps and tyres (see picture 2).

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 bond coat on top of the previously installed layer, slightly wider than the overlap width; avoid oversaturation



Figure 1: Finely milled substrate **Figure 2: Mirror effect of fresh bond coat/black prints on product**

Figure 3: Example of nails with head plate

Installation of Tensar AR-GN asphalt interlayer

Installation equipment and tools

The following tools are required to install AR-GN:

- 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 Figure 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.
- Snips or shears (metal) for product cutting.

Mechanical Installation:

The preferred method of installation is with a purpose-built interlayer installation machine (See Figure 4). Tensar International or a local Tensar distributor can advise on the availability of this type of specialist equipment.



Figure 4: Grid Installation machine

Manual Installation:

Manual installation is possible by rolling out the interlayer product immediately following the bond coat application. This can be greatly aided using 'Z' shaped handles inserted into the roll ends. (See Figure 5).

For longer lengths the manual process can be aided by connecting the roll to the bond coat spray truck using chains connected to a steel bar passed through the roll core with 'Z' shaped handles to control orientation (See Figure 5).



Figure 5: Installation with traverse and adjust bars directly after spraying the bond coat

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 interlayer 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 must be cut and stuck down with bond coat.
- Adjacent rolls should overlap 2 grid apertures (about 130 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.
- If necessary, e.g. in hot climates or where excessive construction traffic is anticipated before overlaying with asphalt, a stone chipping can be applied. Chipping should be evenly distributed over the installed product at a rate up to 1.5 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 before the overlay.

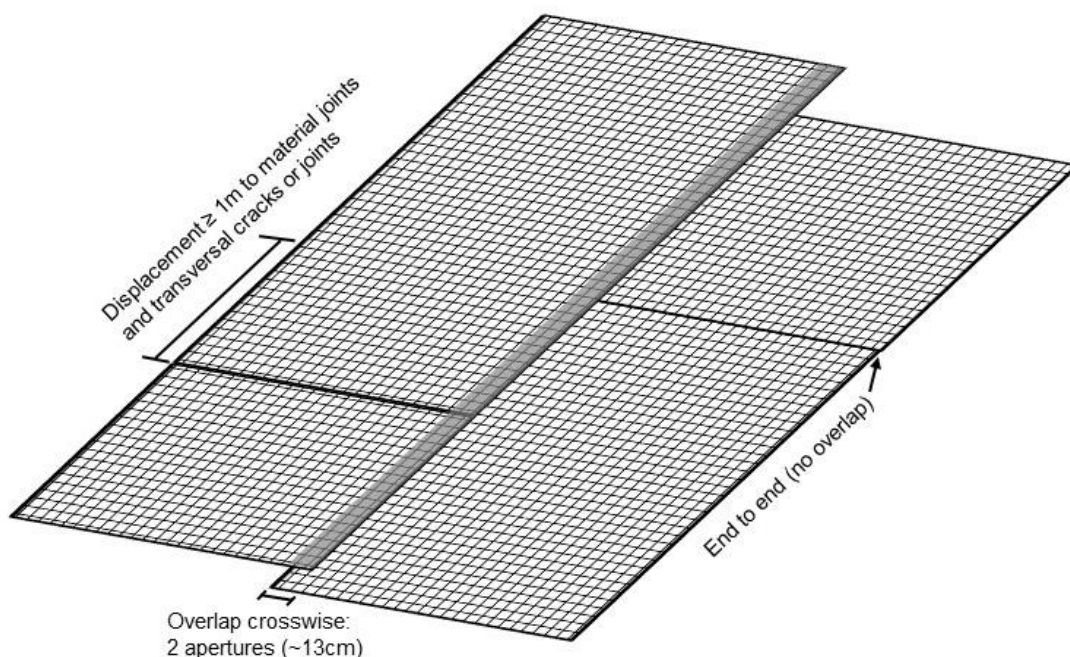


Figure 6: Overlap and butt joints

Asphalt Paving

- Low-temperature asphalt mixes and mastic asphalts cannot be placed directly over Tensar AR-GN interlayer.
- 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 must stop until the surface is dry again; Where construction delays are not permitted, weather conditions should be considered before work commences.
- The compacted thickness of the first course of asphalt placed directly over the product must be a minimum 70mm
- Operators of construction vehicles should avoid sudden braking, or acceleration, or turning the tires while stationary. Drivers of asphalt delivery trucks must avoid full braking while being pushed by the paver.
- 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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