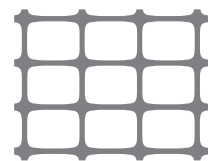
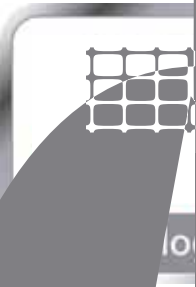


# Asphalt Pavements

Reinforcing asphalt layers in  
roads and trafficked areas



**Tensar**<sup>®</sup>  
INTERNATIONAL



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## Use our experience for your projects

### TENSAR PROJECT SERVICE

Tensar is your partner with the necessary experience and competence to provide a customised service that meets the specific requirements of your project. We develop efficient and economical solutions that suit your individual needs. Our staff are happy to assist you in all areas covering analysis, conception and project support.

### FROM THE INITIAL IDEA TO FINAL CONSTRUCTION, WE OFFER YOU THE FOLLOWING RANGE OF SERVICES:

- Comprehensive advice on products and applications
- Application suggestion for specific construction problems
- Competent technical support
- Customised information and training programmes

### YOUR BENEFITS:

By selecting the appropriate Tensar system, proven benefits can include:

- significantly reduced reflective and fatigue cracking
- extended pavement structural life
- quick and easy installation
- long-term cost savings compared to traditional restoration methods
- durable and efficient solution
- technology proven over more than 25 years of experience
- reduced rutting

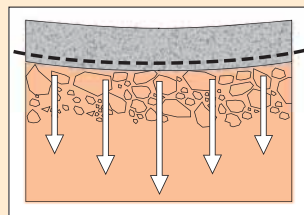


*Tensor asphalt reinforcement systems can be used over concrete to mitigate reflective cracking problems*

Tensor reinforcement systems cover 7 major pavement reinforcement applications.

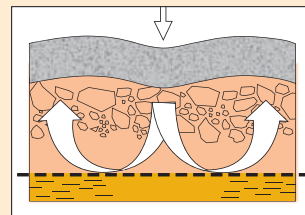
### Structural reinforcement

Asphalt fatigue resistance



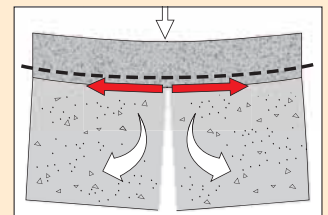
Asphalt reinforcement products can provide fatigue resistance by controlling crack initiation and/or propagation in asphalt.

Subgrade driven rutting



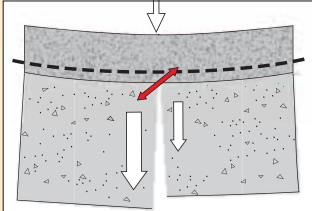
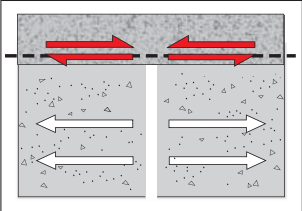
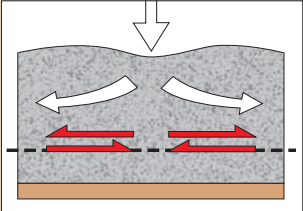
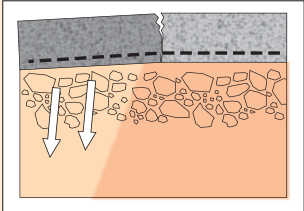
Asphalt rutting due to subgrade strain can be minimised by reinforcing the granular base layers.

Bending



Asphalt reinforcement products can improve fatigue resistance of asphalt subjected to bending movement by delaying the onset of cracking.



Reflective cracking		Asphalt rutting	Differential settlement
<p style="text-align: center;"><b>Shear</b></p>  <p>Asphalt reinforcement products can reduce cracking by improving asphalt shear resistance and load transfer capabilities.</p>	<p style="text-align: center;"><b>Thermal</b></p>  <p>Asphalt reinforcement products can reduce cracking due to thermal expansion and contraction of the substrate.</p>	<p style="text-align: center;"><b>Permanent strain</b></p>  <p>Asphalt reinforcement products can reduce horizontal strain at the reinforcement layer interface to improve resistance to rutting.</p>	<p style="text-align: center;"><b>Road widening</b></p>  <p>Asphalt reinforcement products can mitigate cracking due to differential settlement.</p>

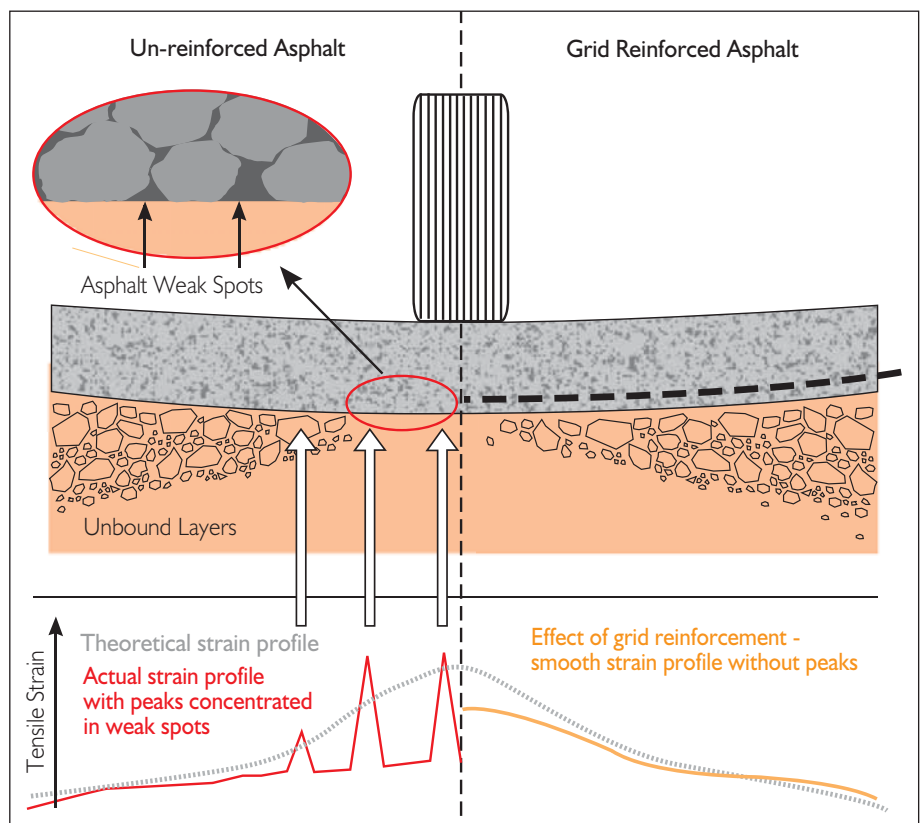


*Tensar asphalt reinforcement systems ensure ease of installation in most environments*

## How do Grids control cracking of asphalt?

### FATIGUE CRACKING

In an un-reinforced asphalt layer, strain is not evenly distributed but develops in peaks located at weak spots in the asphalt which can lead to the development of cracks. In reinforced asphalt, the grid will delay fatigue and reflective cracking mainly by providing a confinement that prevents strain build-up at these weaker spots.



G / c t / t e e e a t e a t a a t t a b t t t e a a t a y a r



# Selecting the right product

## TENSAR PROVIDES FOUR DIFFERENT PRODUCT GROUPS FOR ASPHALT REINFORCEMENT:

### Tensar AR-G

AR-G is a composite product comprising a stretched polypropylene grid thermally bonded to a fabric backing. The fabric backing facilitates installation and provides a long-term sealing effect once saturated with bitumen. Owing to the 3-dimensional geometry of the grid, the new asphalt layer is mechanically interlocked into the grid's wide apertures, thus providing both reinforcing and sealing functions.

- Must be installed on a sound substrate
- Potholes and open cracks must be patched or sealed
- Any surface that is not finely milled requires a regulating course
- Installed using a bitumen bond coat
- Bond coat must cure before placing new asphalt layer

AR-G is a composite product comprising a stretched polypropylene grid thermally bonded to a fabric backing. The fabric backing facilitates installation and provides a long-term sealing effect once saturated with bitumen. Owing to the 3-dimensional geometry of the grid, the new asphalt layer is mechanically interlocked into the grid's wide apertures, thus providing both reinforcing and sealing functions.

### Tensar AR1

Identical to AR-G but without the fabric backing, AR1 has open apertures to allow layer to layer bonding through the grid.

- Must be installed on a sound substrate suitable for the use of nails
- Any surface that is not finely milled requires a regulating course
- Requires tensioning and mechanically fixing to the substrate
- Requires a bond coat and chippings to fill the apertures, preventing movement during paving and providing inter-layer bonding

AR1 is identical to AR-G but without the fabric backing, AR1 has open apertures to allow layer to layer bonding through the grid.

### Tensar Glasstex®

Glasstex® is a composite product comprising a grid of glass filaments stitch bonded to a non-woven fabric. The high modulus glass filaments provide high absorption of stress at low strains. After being saturated with bitumen the fabric performs a sealing function. Glasstex® provides reinforcement, stress relief and sealing functions.

- Installed directly on a sound substrate using a bitumen bond coat
- Bond coat must cure before placing new asphalt layer
- Does not require a regulating course if the milled surface is not too coarse

Glasstex® is a composite product comprising a grid of glass filaments stitch bonded to a non-woven fabric. The high modulus glass filaments provide high absorption of stress at low strains. After being saturated with bitumen the fabric performs a sealing function. Glasstex® provides reinforcement, stress relief and sealing functions.

### Tensar Glasstex® Grid

Glasstex® Grid is a grid of coated glass filaments with an adhesive backing. It has open apertures to allow layer to layer bonding and provides reinforcement in a fully bonded layer system. The open area structure (approx 50%) of the grid strikes a balance between the essential bonding between the layers and a stress relief effect to dissipate the stress on each side of the crack.

- Installed on a smooth surface, typically a levelling course
- The self adhesive properties provide a bond to the levelling course
- After bitumen tack coat application, sanding is required before paving
- Bitumen bond coat and chippings may be used to increase layer interface bonding

Glasstex® Grid is a grid of coated glass filaments with an adhesive backing. It has open apertures to allow layer to layer bonding and provides reinforcement in a fully bonded layer system. The open area structure (approx 50%) of the grid strikes a balance between the essential bonding between the layers and a stress relief effect to dissipate the stress on each side of the crack.

**Need guidance on product selection? Please contact Tensar. We will be happy to discuss your project and provide application suggestions.**

	AR-G/AR1	Glasstex® Glasstex® Grid
Asphalt fatigue cracking	✓✓✓	✓
Subgrade - driven rutting	n/a*	n/a*
Bending	✓✓✓	✓✓
Shear	✓✓✓	✓✓✓
Thermal	✓	✓✓✓
Permanent strain	✓✓✓	✓✓
Road widening	✓✓	✓✓✓

\*Please refer to Tensar Ground Stabilisation brochure

## Open Grid Structures

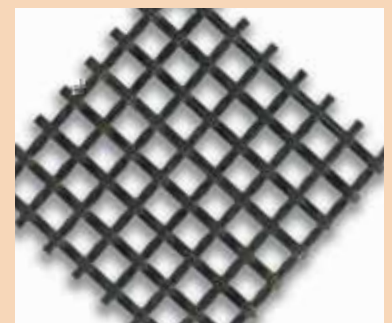
### High profile products

Stretched polypropylene grids with thick ribs for maximum mechanical interlock



### Thin profile products

Glass filament reinforcement with high modulus for absorption of stress at low strain





*Glasstex® and Glasstex® Grid can be used to control reflective cracking in thinner surfacing layers*

## Asphalt reinforcement product selection guide

Asphalt bonds directly through the grid apertures with the pavement layer below

### Grid/Fabric Composites

Fabric/bitumen membrane interlayer as water barrier and/or for stress relief

#### AR1

Square apertures: > 60mm  
 Open area: above 80%  
 Rib thickness: approx. 3mm  
 Stiffness: approx. 0.33MN/m  
 Minimum thickness of first asphalt overlay: 60 to 70mm  
 (subject to local mix design)



#### AR-G

Square apertures: > 60mm  
 Bitumen retention: ~ 0.5kg/m<sup>2</sup>  
 Stiffness: approx. 0.33MN/m  
 Minimum thickness of first asphalt overlay: 60 to 70mm  
 (subject to local mix design)

#### Glasstex® Grid

Rib spacing: either 12.5mm or 25mm  
 Open area: approx. 44% or 65%  
 Rib thickness: < 2mm  
 Stiffness: approx. 0.33MN/m  
 Minimum thickness of asphalt overlay: 40mm (subject to local mix design)



#### Glasstex®

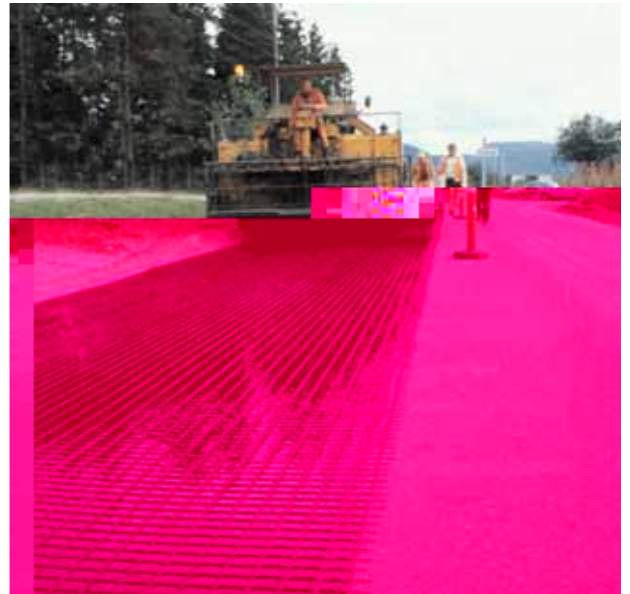
Bitumen retention: approx. 1kg/m<sup>2</sup>  
 Minimum thickness of asphalt overlay: 40mm  
 (subject to local mix design)



*Glasstex® Grid has a self-adhesive coating on the underside to secure the grid before paving*



*Tensor AR-G bonds well into the underlying surface to allow paving directly over the grid*



*AR1 is tensioned and fixed to the surface before applying a bond coat*



*A simple overlap joint for Glasstex®*



Contact Tensar International or your local distributor to receive further literature covering Tensar products and applications.

Also available on request are product specifications, installation guides and specification notes.

The complete range of Tensar literature consists of:

- **Tensar Geosynthetics in Civil Engineering** A guide to the products and their applications
- **Ground Stabilisation** Reinforcing unbound layers in roads and trafficked areas
- **Tensar Structural Solutions** Bridge Abutments - Retaining Walls - Steep Slopes
- **Foundations over Piles** Constructing over weak ground without settlement
- **Basal Reinforcement** Constructing embankments over weak ground
- **Railways** Mechanical stabilisation of track ballast and sub-ballast
- **Asphalt Pavements** Reinforcing asphalt layers in roads and trafficked areas
- **Erosion** Controlling erosion on soil and rock slopes

Your local distributor is:

Tensar International Limited  
Cunningham Court  
Shadsworth Business Park  
Blackburn BB1 2QX  
United Kingdom

Tel: +44 (0)1254 262431  
Fax: +44 (0)1254 266868  
E-mail: [info@tensar.co.uk](mailto:info@tensar.co.uk)  
[www.tensar-international.com](http://www.tensar-international.com)



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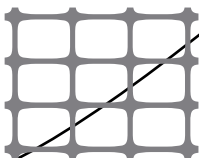


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