

## Benefits and Features

### Lifespan

- Extends crack life of pavement up to 300%
- Reduces maintenance cost

### Installation

- Quick and efficient installation
- Strong bond between layers

### Environment

- Excellent milling performance
- Recyclable
- Natural raw materials

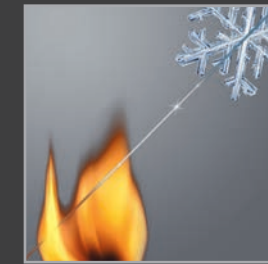
### Experience and Expertise

- Proven performance for 20+ years
- Global sales & distribution
- Project specific problem solving

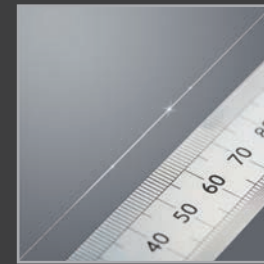
## The Economical Solution

- When asphalt pavement cracks, water permeates the base and reduces the life of a road.
- Improving the asphalt's natural ability to resist cracks, improves the drainage capabilities of a road and the Federal Highway Administration (FHWA) suggests by doing this a road's life can be extended.
- GlasGrid improves asphalt's natural ability to reduce cracking by up to 3 times by providing a tensile element to the asphalt. This helps keep water out of the base and improves the drainage capabilities of a road by 10%.

Based on 25+ years of successful installations around the world, GlasGrid typically provides a 50% reduction in future investment cost (e.g. maintenance, rehabilitation and use costs) over the life of an average road.



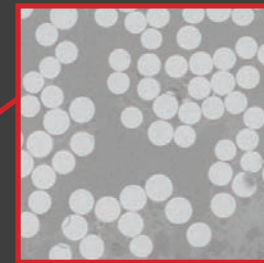
Temperature Stable Grid



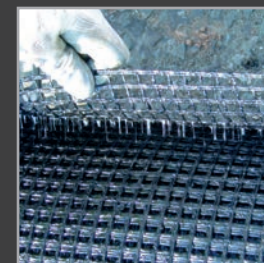
High tensile-strength by minimal tensile elongation (<3%)



Filaments completely coated with an elastomeric polymer

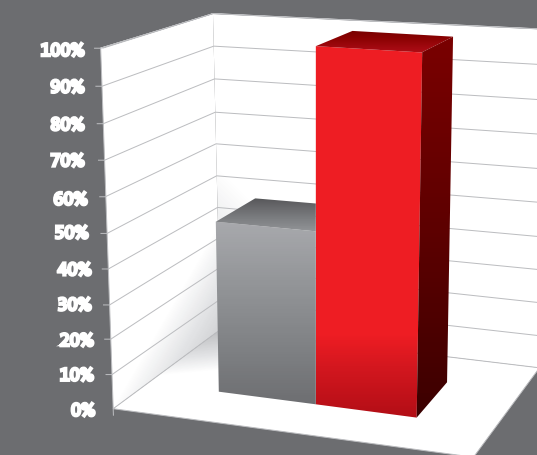


Installation performance per day - up to 20,000 m<sup>2</sup>/machine



Self-adhesive backing (GG, TF, and IM)

### Future Life Cycle Costs



- With GlasGrid\*
- Without GlasGrid

\*With added life benefit of 1.1 due to improved drainage FHWA

## Saint-Gobain ADFORS

World-class capabilities. Worldwide reach.

GlasGrid® is manufactured by Saint-Gobain ADFORS. Saint-Gobain ADFORS is a global company within the Innovative Materials Branch of Compagnie de Saint-Gobain. We are an industry leader in the manufacture and distribution of a wide range of reinforcement fabrics. We offer a diverse selection of products, including some of the world's best-known reinforcement brand names.

Our worldwide manufacturing plants ensure reliability, quality and cost-effective material supply, while our research facilities and global sales offices deliver world-class service. We are committed to providing innovative solutions to your challenges and to developing breakthrough products.

### Asphalt Concrete Mix Considerations

Asphalt concrete (AC) mix varies by country and by region. GlasGrid has been designed for use with conventional hot asphalt mixes that are placed with proper compaction to at least 97% of bulk relative density or at least 93% of maximum relative density. AC must meet the local surface course hot mix specification for heavy traffic (high AADT) conditions, with sufficient stability and durability to carry traffic loadings and withstand temperature changes. The AC mix must be designed according to: a) Marshall method (Asphalt Institute Manual MS2), to achieve stability of at least 8000 Newtons (1800 lbs); or, b) Superpave method (Asphalt Institute Manual SP2) for surface course hot mix asphalt subject to heavy traffic conditions, incorporating aggregates and asphalt cement. When using any specialized mixes or additives in AC mixes with GlasGrid, please contact Saint-Gobain ADFORS for detailed technical guidance.

Learn more about how GlasGrid Pavement Reinforcement System products can increase the life of your paving projects.

adfors.cz@saint-gobain.com  
www.glasgrid.com

www.adfors.com

SAINT-GOBAIN ADFORS CZ s.r.o.  
Sokolovska 106  
570 21 Litomyšl  
Czech Republic  
Tel.: +421 461 651 111



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## Professional Asphalt Reinforcement

GLASGRID®



Save money and extend pavement life up to 300%



Stronger ideas for a sustainable world





Retard reflective cracking caused by traffic loading, age hardening and temperature cycling with GlasGrid®.

## Your Problem

Cracks in asphalt surfaces

### Issue:

- Increased traffic loading
- Huge temperature cycling
- Age hardening

### Results:

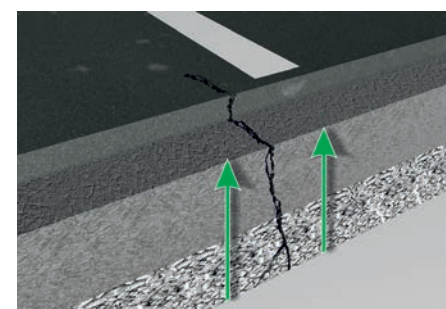
- Reduces pavement life
- Higher risk of accidents
- Erosion of vehicle parts
- Interruption of traffic flow due to construction
- Increases maintenance costs
- Potholes due to severe cracking



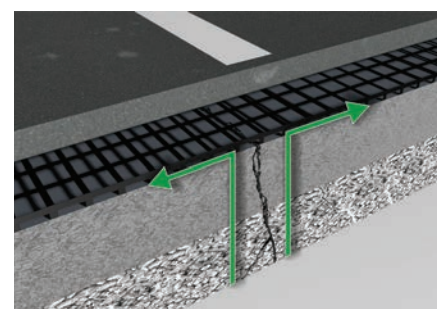
## Our Solution

Retard reflective cracking with GlasGrid® pavement reinforcement

GlasGrid turns crack stresses horizontally and dissipates the stress.






Without GlasGrid  
Stress travels uninterrupted, causing cracks



With GlasGrid  
Stress is redirected horizontally and is dissipated, minimizing cracks

## Our Products

Installation on leveling course

Product	Characteristics	Applications
 Pavement Reinforcement System	<ul style="list-style-type: none"> <li>• Self-adhesive backing</li> <li>• Patented polymer coating</li> <li>• High-tensile fiberglass grid</li> <li>• Effective bonding during installation</li> </ul>	<ul style="list-style-type: none"> <li>• Airports</li> <li>• Highways and roads</li> <li>• Industrial ports</li> <li>• Parking lots</li> </ul>
 Complete Reinforcement System	<ul style="list-style-type: none"> <li>• Patented, highly engineered tack film</li> <li>• Eliminates tack coat curing time.</li> <li>• Lower environmental impact</li> </ul>	<ul style="list-style-type: none"> <li>• Airports</li> <li>• Highways and roads</li> <li>• Industrial ports</li> <li>• Parking lots</li> </ul>
 Protective Indicator Mesh	<ul style="list-style-type: none"> <li>• Fluorescent orange self-adhesive reinforcing mesh</li> <li>• Protective indicator layer for bridge decks</li> <li>• Easy visibility during the milling process, eliminates the risk of damaging the grid</li> <li>• Savings up to 20% when compared to red asphalt</li> </ul>	<ul style="list-style-type: none"> <li>• Bridges</li> </ul>







GlasGrid GG



GlasGrid TF

Installation on milled surface and leveling course

Product	Characteristics	Applications
 Composite Reinforcement Solution	<ul style="list-style-type: none"> <li>• Effective moisture barrier</li> <li>• Composite product contains fiberglass grid coated with patented polymer and a non-woven fabric layer</li> </ul>	<ul style="list-style-type: none"> <li>• Airports</li> <li>• Highways and roads</li> <li>• Industrial ports</li> <li>• Parking lots</li> </ul>
 Waterproofing Paving Mat	<i>Economical combination of</i> <ul style="list-style-type: none"> <li>• Moisture barrier</li> <li>• Asphalt reinforcement and a unique high strength fiberglass scrim embedded between two lightweight polyester geotextiles</li> </ul>	<ul style="list-style-type: none"> <li>• Airports</li> <li>• Highways and roads</li> <li>• Industrial ports</li> <li>• Parking lots</li> </ul>
 Rapid Repair System	<ul style="list-style-type: none"> <li>• Quick and efficient installation due to self-adhesive bitumen layer</li> </ul>	<ul style="list-style-type: none"> <li>• Detail repair</li> </ul>
 Manhole Patch Solution	<ul style="list-style-type: none"> <li>• Self-adhesive repair ring for asphalt areas around any iron works</li> </ul>	<ul style="list-style-type: none"> <li>• Manhole covers</li> </ul>



GlasGrid GP

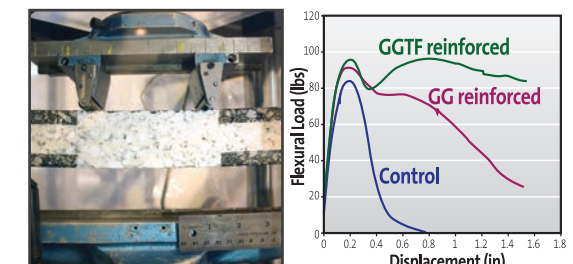


GlasGrid PM

## Tested in the lab, proven in the field

### 4-point Bending Flexural Fatigue Test

The 4-Point Bending Flexural Fatigue Test was used to assess the flexural resistance of a GlasGrid reinforced pavement structure. A GlasGrid reinforced test beam was subjected to a nominal load of 240N and a fatigue test was conducted at a frequency of 5 Hz with varying amplitude of +/- 40N. The results indicated flexural improvement of the pavement up to 500% for GlasGrid TF, lowering maintenance costs significantly.



Test set-up

Altering crack development

### The Leutner Shear Test – RWTH Aachen University

The Leutner Shear Test was used to conclude that GlasGrid reinforcements coated with our patented polymeric coating provide a highly effective interlock between asphalt layers. GlasGrid reinforced asphalt reached a test value higher than the minimum requirement of 15kN.



Core sample

Test set-up in labor

### Milling Performance and Recyclability – RWTH Aachen University

In this test, a 200kN/m glass fiber grid was installed on an existing binder course and covered with 4cm thick top layer. After the milling process, no adverse effects were realized and milling depth was not affected. A second test, the Cycling Tension test, concluded that the partial reuse of milled asphalt granulate (including glass fibers) in a new asphalt mixture improved the results of the recycled asphalt.



Milling the reinforced area

Milling drum after milling operation

### More international testing

**Reinforcing Fiberglass Grids for Asphalt Overlays**  
Lytton, R. L., Texas A&M University, 1988

**Anti-Reflective Cracking Design of (Reinforced) Asphalt Overlays**  
De Bondt, A. H., Ph.D thesis, Delft University of Technology, 1999

**A Study of Grid Reinforced Asphalt To Combat Reflective Cracking**  
Brown, S.F., Thom, N.H. and Sanders, P.J., AAPT Annual Meeting, 2001

**Characterization of Reinforced Asphalt Pavement Cracking Behavior Using Flexural Analysis**  
Tebaldi, G. and Romero, E., University of Parma, 2012

**Asphalt-Reinforcement Testing with MMLS3**  
Part, M. and Raab, C., EMPA Materials Science & Technology (CH), Test Report No 456298, 2012

**Review of Glass Fiber Grid Use for Pavement Reinforcement and APT Experiments at IFSTTAR**  
Nguyen, M.L., Blanc, J., Kerzrého, J.P. and Hornych, P., IFSTTAR, 2013

**Investigation on millability and recycling of glass fibre reinforcement asphalt layers**  
Meyer, A. and Schulze, C., RWTH University Aachen Germany, 2013

Please contact ADFORS for further information.



Asphalt granulate without glass fibres (left) and with glass fibres (right)