

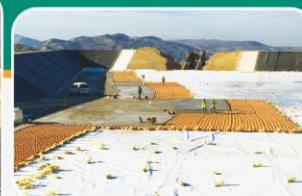


COMITÉ MAROCAIN DES  
GÉOSYNTHÉTIQUES



5<sup>ème</sup>

## RENCONTRE GÉOSYNTHÉTIQUES SOUS LE THÈME — LES GÉOSYNTHÉTIQUES AU SERVICE — DE L'ENVIRONNEMENT ET LE DÉVELOPPEMENT DURABLE



08 > 10  
JUN  
2023

HÔTEL ROSE GARDEN  
MARRAKECH

### SOUS-THÈMES

- Normes et applications des géosynthétiques
- Etanchéité et géomembranes
- Géotextiles, drainage, filtration, protection et séparation
- Géogrilles et renforcements

*Garder uniquement le sous-thème concerné*

## SUSTAINABLE ROAD REHABILITATION WITH REINFORCEMENT SYSTEMS

Omar Abdenbi  
SAINT-GOBAIN ADFORS



**P 01.** Why reinforcement

**P 02.** Types of applications

**P 03.** Sustainable offer



# Why reinforcement



01

# WHY reinforcement in pavement



Reflective cracking from concrete bays



Alligator Cracking due to structural failure



Reflective Cracking from expansion joints



Temperature Cycles Reflective Cracking



Utilities Cracks



Surfacing failure caused by underlying setts

- Increase of traffic volume

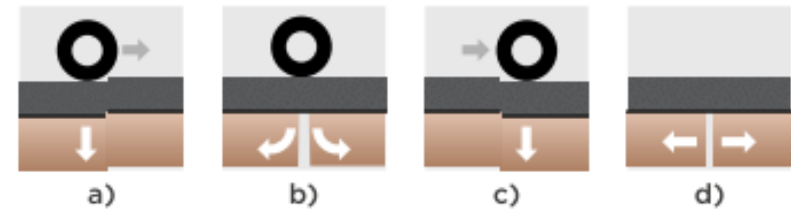
- Temperature Cycles

- Subbase movements

# WHY reinforcement in pavement

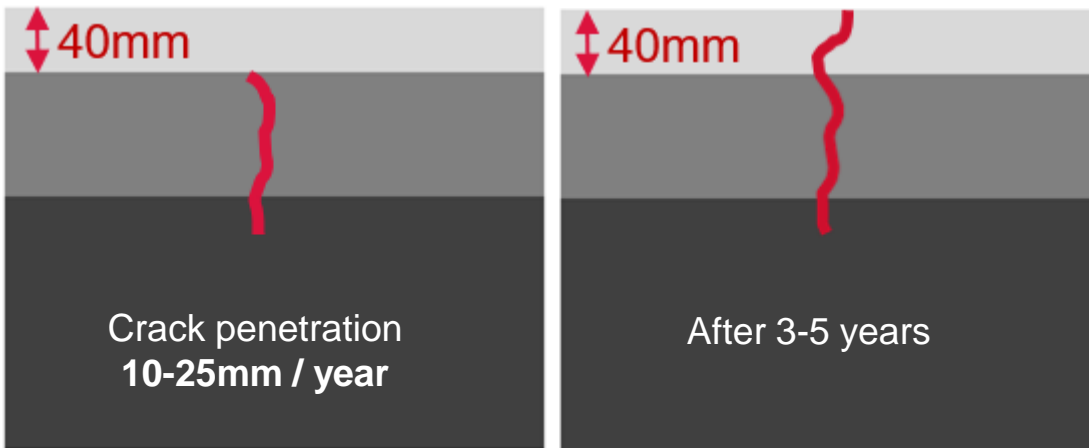
Mechanisms cause the damage

- Vertical shear (a,c)
- Bending (b)
- Thermal movements (d)

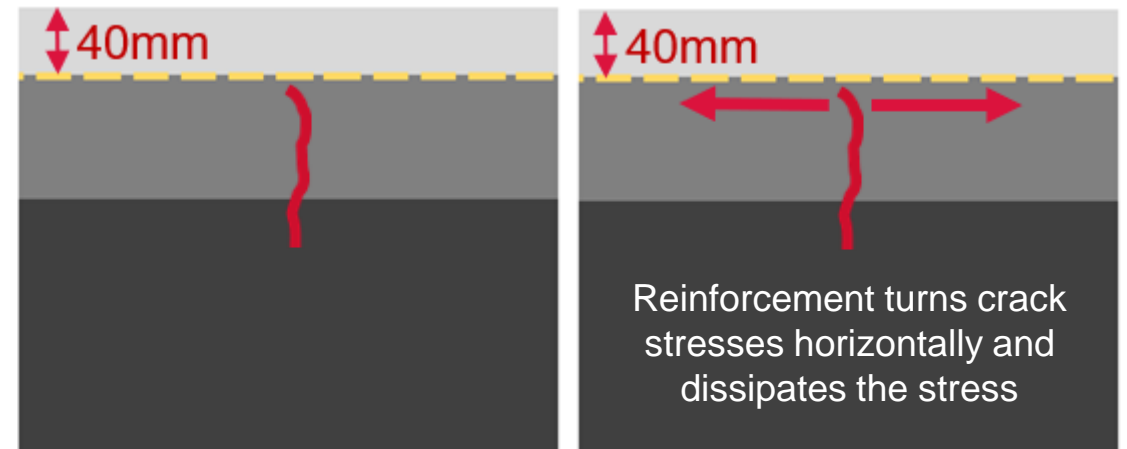


## How to avoid reflective crack growth

without reinforcement



with reinforcement



# WHY reinforcement in pavement

## BENEFITS



Safer roads



Flexible delivery and high quality service



3times longer roads lifetime



50% reduction in future investment costs



Traffic jam reduction



Quick and efficient installation



25% reduction of the downward rut depth



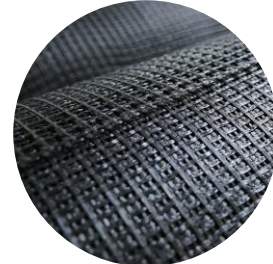
10% better waterproofing and drainage of the road

## BE ENVIRONMENTALLY FRIENDLY WITH ADFORS GLASGRID

Produced from mineral raw materials

Reduction of CO<sub>2</sub>

Full recyclability





# Types of applications



02

# Types of applications

## AREA-WIDE REPAIR

- Self-adhesive grid for application on existing or new surface (flat surfaces)
- Compogrid for application on milled surface

### ■ ADVANTAGES

- Easy and fast application without nails need
- Edge marking for easy overlapping
- Not damage during application and compaction
- Good trafficability on applied grid (suppliers, trucks, paver)
- Excellent asphalt layers bonding



Example of cracking for area-wide repair



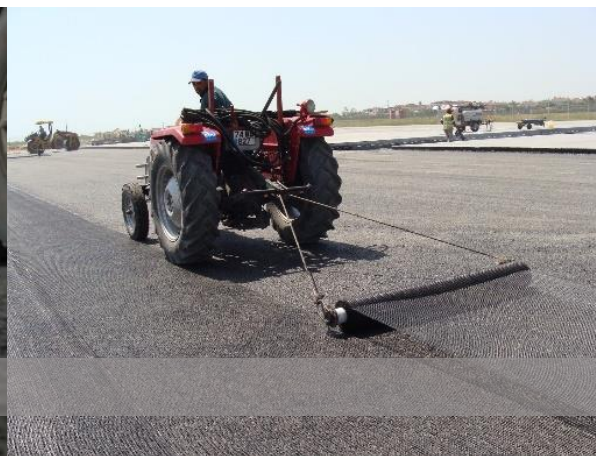
area-wide repair

### PRODUCTS for area-wide repairs:

- GlasGrid® GG
- GlasGrid® CG
- GlasGrid® CGL



Atatürk International Airport, Turkey





# Types of applications

## AREA-WIDE REPAIR – FLAT SURFACE

- Self-adhesive reinforcement ADFORS GlasGrid® GG
- 50/100/200 kN/m tensile strength



Application of GlasGrid GG on flat surface



Pressure of reinforcement



Application of tack coat (for asphalt layers bonding)



Curing of tack coat



Asphalt paving



# Types of applications

## AREA-WIDE REPAIR – MILLED SURFACE

- ADFORS GlasGrid® CG with heavy non-woven → Composite reinforcement for interlayer barrier
- ADFORS GlasGrid® CGL → Composite reinforcement with lite non-woven for optimization of tack coat amount
- 50/100/200 kN/m tensile strength



Application of tack coat



Application of GlasGrid CG/CGL on flat surface and pressure to fresh tack coat



Curing of tack coat



Asphalt paving



# Types of applications

## LOCAL REPAIRS

- Small local area repair of asphalt layers on critical areas of potholes, joints, superstructures, utility trench, roadsides and around manholes.

### ■ ADVANTAGES

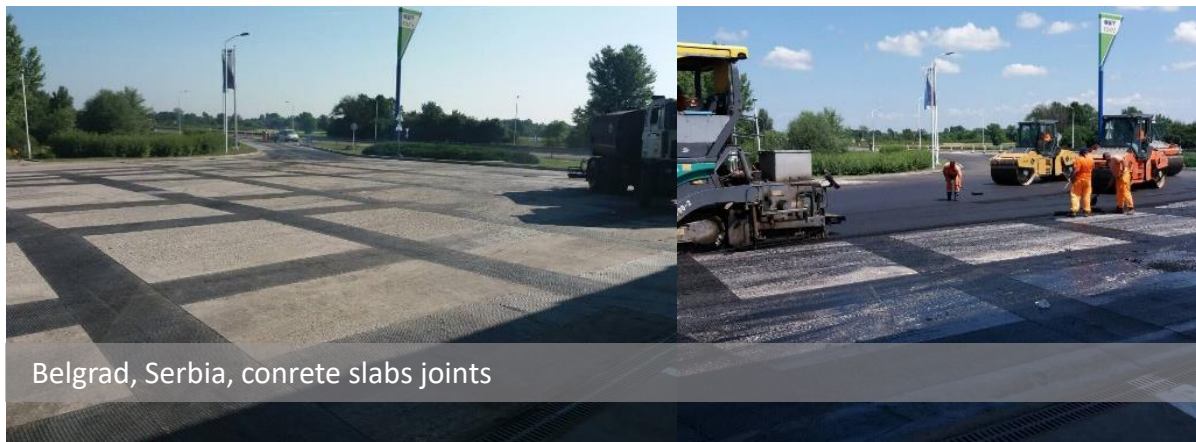
- Rapid Repair = STICK & PAVE
- Application on all types of asphalt or concrete surfaces (milled & flat)
- Fast and easy manual application due self-adhesive bitumen layer
- Less technological processes saving manpower and mechanization on job site
- Usable from desert to mountain weather due to ensured adhesion
- Available in rolls & special shapes for around manhole and hydrant areas



Example of cracking for local repair



local repairs



Belgrad, Serbia, concrete slabs joints

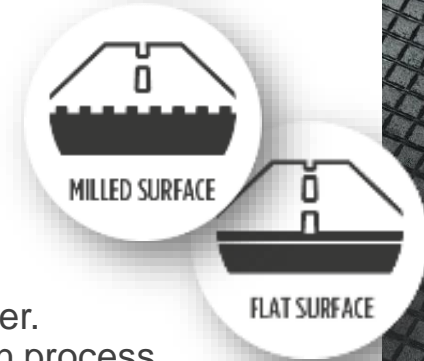
**PRODUCTS for local repairs:**  
GlasGrid® RAPID  
GlasGrid® PM

# Types of applications

## LOCAL REPAIRS – ALL SURFACES

### New ADFORS GlasGrid® Rapid

- Superior asphalt pavement reinforcement with built-in high modified bitumen self-adhesive layer. Engineered solution to reinforce pavements and dramatically speed up the road reconstruction process by replacing the need for applying a tack coat.
- Application on all types of asphalt or concrete surfaces (milled & flat)



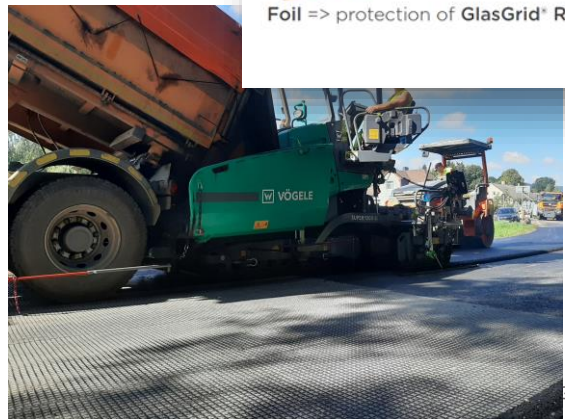
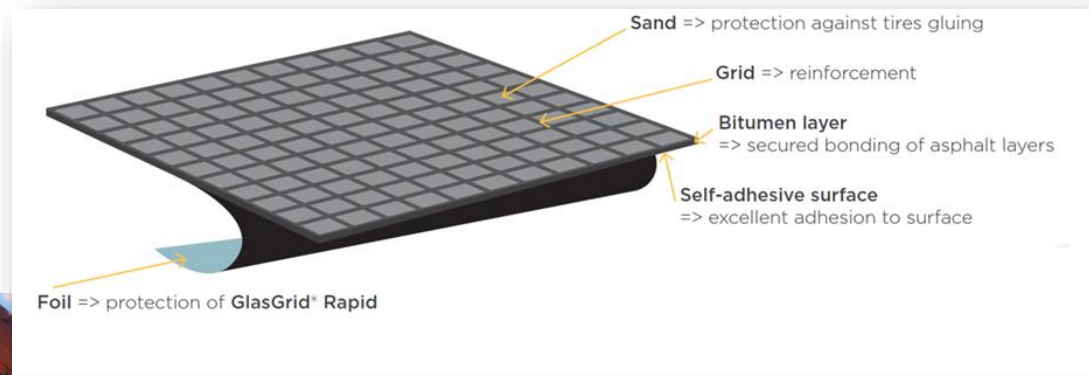
Application of GlasGrid RAPID



Pressure of reinforcement



Asphalt paving





# Sustainable offer



03



The background image shows a perspective view of a paved road lined with lush green trees. The sun is shining brightly from the right, creating a warm, golden glow and casting long shadows on the road. The image is partially obscured by a teal square overlay in the center and a teal vertical bar on the left.

# Sustainable offer

## Let's act for a sustainable future

Self-adhesive **ADFORS GlasGrid®** allows a **REDUCTION IN CO<sub>2</sub> EMISSIONS**

An independent company from Sweden has evaluated and calculated the positive environmental impact of ADFORS GlasGrid GG self-adhesive geogrid, comparing two **1 km long motorway sections over a 30-year period**. The motorway section repaired without the use of road reinforcement was compared with a section of the motorway maintained using GlasGrid GG. The geogrids reduced total CO<sub>2</sub> emissions by 19%, amounting to **197 tonnes of CO<sub>2</sub>** thanks to extended repair intervals of the road surface.

*3th party verified report available upon request.*



197 tonnes  
of CO<sub>2</sub> emissions



112 Paris - New York  
return flights

# Sustainable offer

## A success story

### Self-adhesive geogrids to **REDUCE CO<sub>2</sub>** emissions & to **SAVE APPLICATION TIME**

In 2021, ADFORS supplied 540.000 m<sup>2</sup> of self-adhesive ADFORS GlasGrid® for the rehabilitation of the A1 highway section from Chirpan to Stara Zagora (Bulgaria). Designed to reinforce asphalt concrete overlays, our self-adhesive geogrid contributes to limiting the greenhouse gas emissions associated with road rehabilitation and future maintenance.

- GlasGrid has been **prolonging the lifetime** of the road (min. 2 maintenance works less)
- The self-adhesive feature allows for a **faster road rehabilitation** (approx. 20% less) with less workers (approx. 50% less) and significant **reduction of the tack coat application** (approx. 60% less) during the construction.
- **Our product is also recyclable**: can be milled and reused in new asphalt binder mixture



**Reduction of 432.000 kg of tack coat thanks to self-adhesive function**



**Extension of maintenance period**



**Safer road without potholes**

*3th party verified report available upon request.*

# Sustainable offer

## Solution for roads

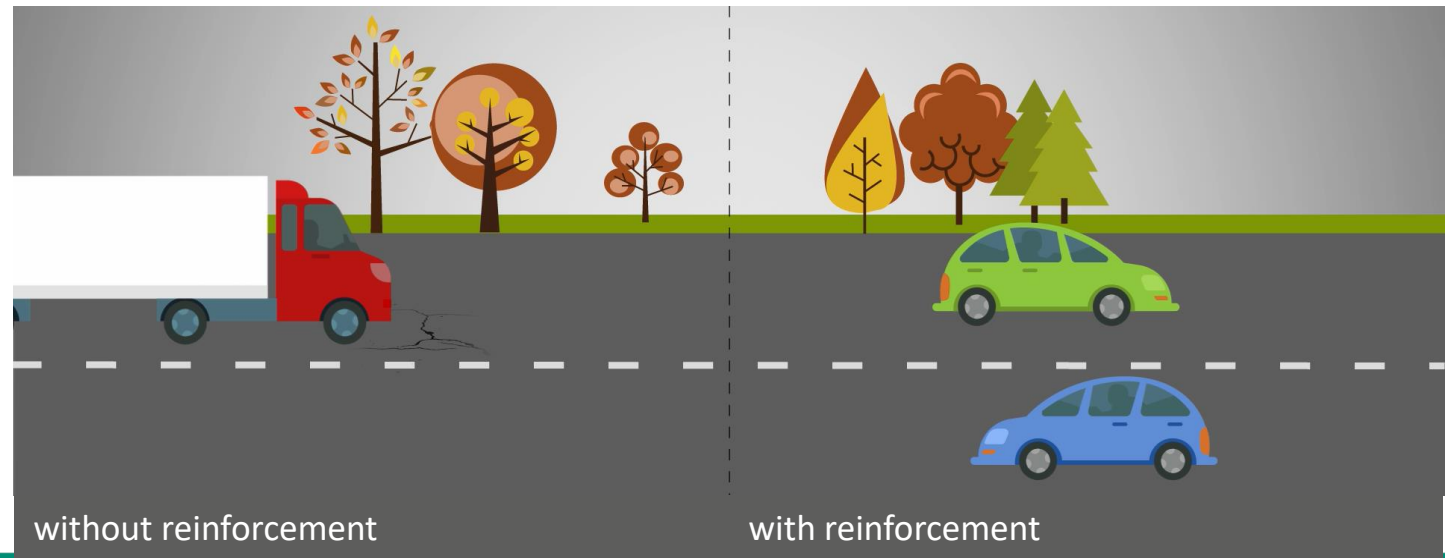
The road transport and industry contribute to the majority of CO<sub>2</sub> emissions

- Independent studies proved that higher pavement smoothness reduces CO<sub>2</sub> emissions.
- Trucks driving on smooth rehabilitated pavements → **4,5 % less fuel consumption.**
- Rehabilitation of the 1/3 entire European road network by 2030 → **14 million tonnes of CO<sub>2</sub> less per year** → replacing **6 million cars** with zero-emission cars.

Asphalt industry has the potential to become a key tool for the preservation of natural environment and is already active in various fields to target a climate-neutral future.

Source: European Asphalt Pavement Association

There is a big **difference** between well **maintained** and **non-maintained** roads







# MERCI POUR VOTRE AIMABLE ATTENTION

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