ASPHALT REINFORCEMENT

Edilfloor
Geosynthetics

On last 15 years increased heavy traffic and load vehicle are producing faster damage till the full roads disrupting in some specific cases.

Flexible asphalt layers are exposed to cyclical loads, hole formation and fatigue cracking can easily appear. Simple resurfacing is a temporarily solution because cracks from the underlying layers propagate into the new overlay, causing again same problem: this effect is called “reflective cracking”.

Factors that cause asphalt degradation over time mostly fall into one of three categories: construction quality, environmental considerations and traffic loads. Often, damage results from combinations of all three categories.

Increased budget problems on road maintenance pushed industries to develop specific product for new road construction or road rehabilitation to increase expected service life and road service level: reinforcement made by geosynthetic is an answer!

This means road reinforcement a possible solution: the whole life cost can be reduced when new roads or especially in case of road maintenance specific geosynthetic is used to reinforce asphalt layers. This simple measure allow to reduce stress on pavements, differential settlements due of thermal shock or lack of bearing capacity. Thanks to decreased maintenance the whole life cost of roads is increased with a definitely better average service level.

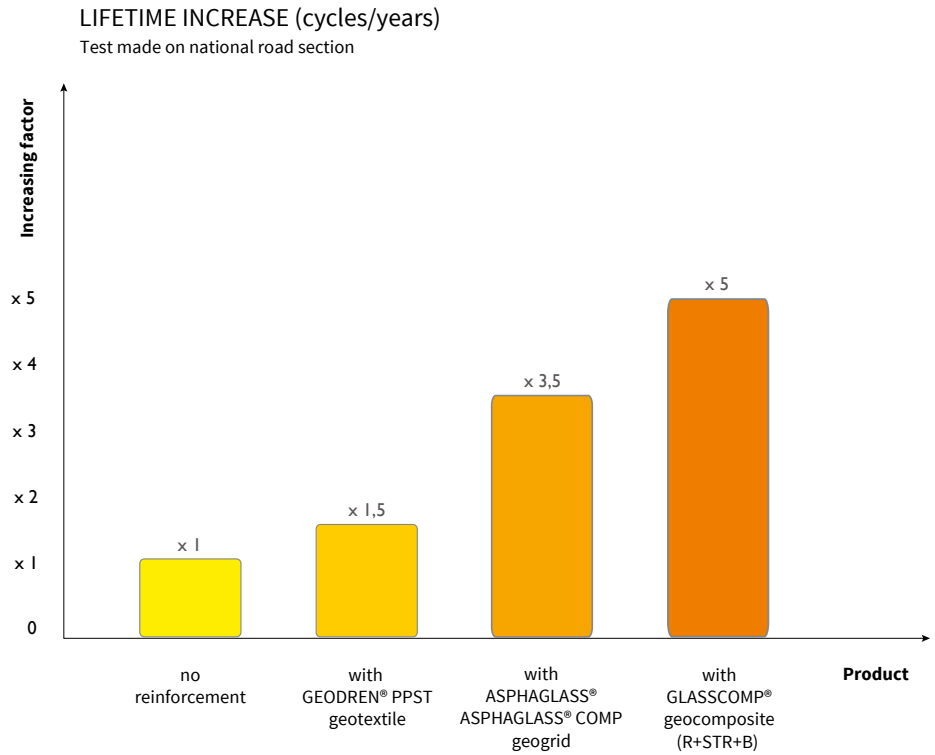
PROBLEMS

Asphalt degradation can include crocodile cracking, potholes, upheaval, ravelling, bleeding, rutting, shoving, stripping, and grade depressions. In cold climates, frost heaves can crack asphalt even in one winter. Filling the cracks with bitumen is a temporary fix, but only proper compaction and drainage can slow this process. Here below some pictures of asphalt degradation.




GEOSYNTHETICS SOLUTIONS

The use of geogrids or geocomposite to retard and minimize reflective cracking within old layer from propagating through new placed asphalt overlay is a topic discussed for long time. Many equations can be found in literature and many onsite test can be done.
The following chart graphically summarize the advantage to use glass reinforcement on asphalt overlays to increase roads lifetime (in terms of number of load cycles / years).
Thanks to glass geogrid or geocomposite, crack growing rate significantly decreases, this result on lifetime increase.
Additional advantage can be the mobilization of its tensile strength during asphalt temperature change between day and night (till 50 °C in some areas).



ASPHAGLASS®

ASPHAGLASS® and ASPHAGLASS® SA

ASPHAGLASS® is a fiberglass woven geogrid coated with bitumen polymer. It's the most economic and simple product suitable for asphalt reinforcement in paving application.

ASPHAGLASS® can be used for road, motorway and runway rehabilitation where longer service life is needed. Thanks to its fiberglass mesh ASPHAGLASS® has a the highest modulus available for this kind of products.

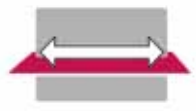
ASPHAGLASS® can be provided in two different versions: standard or self-adhesive (ASPHAGLASS® SA), this last version offers the advantage of a self-adhesive side to improve the adhesion with support asphalt layer.

ASPHAGLASS® COMP

It is a geocomposite made of fiberglass woven geogrid combined with a light nonwoven geotextile (40 g/m^2) and coated with bitumen polymer. ASPHAGLASS® COMP is the ideal product where road and service condition are rather poor.

In addition to the advantages mentioned for the standard version, the COMP one allows a better stress relief and a small interlayer barrier function thanks to light geotextile. Spunbonded geotextile allows a minimum bitumen retention to help the installation also on cracked roads, it's the cheapest solution if composite product is required by designer.

FUNCTIONS



REINFORCEMENT

SIZES

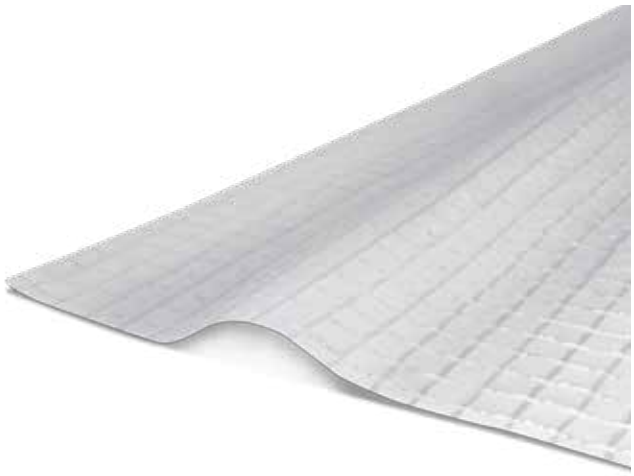
ASPHAGLASS®	50/50	100/100	50/50 SA	100/100 SA	COMP 50/50	COMP 100/100
Width (m)			2,00/2,50/3,95/5,00*			
Length (m)			100			

*available width to be verified

FOCUS

The installation laying of a new asphalt layer on a damaged previous one may generate the "reflective cracking" mechanism, in other words the crack spread from the lower to the upper level. Thanks to the use of glass fiber geogrids, having high modulus, we can reduce or eliminate the propagation upwards of cracks, as demonstrated by several studies in the literature. This benefit can be increased by using ASPHAGLASS® COMP, our geocomposite made of glass geogrid with light nonwoven geotextile.

GLASSCOMP G



GLASSCOMP G is a geocomposite made of a needlepunched nonwoven geotextile reinforced with high modulus fiberglass geogrid.

GLASSCOMP G is the best product where reinforcement, stress relief and interlayer barrier properties are requested for road or runaway rehabilitation.

It was developed to meet standard according EN 15381 with functions R + STR + B (Reinforcement + STress Relief + interlayer Barrier), allows a minimum bitumen retention (saturation of geocomposite) of over 0,9 kg/m^2.

GLASSCOMP G is the best product for rehabilitation works when your main goal is increase structure service life, increase bearing capacity, reduce differential settlements.

GLASSCOMP G found application on main road, motorway, heady or industrial parking area, port facility, airports (runaway or apron).

FUNCTIONS

REINFORCEMENT STRESS RELIEF INTERLAYER BARRIER

SIZES

GLASSCOMP	G 50/50	G 100/100
Width (m)	2,00/2,50/3,95/5,00*	
Length (m)	100	

*available width to be verified

FOCUS

GLASSCOMP G is the new product able to absorb a high quantity of bitumen emulsion, quantity required for installation is obviously lower than the one necessary to saturate the geocomposite (1,20 kg/m^2). To obtain the best result, once spread the bitumen emulsion layer and the geocomposite above it, the white geotextile must absorbs part of the emulsion and it became darker in some areas, this means that the geocomposite is perfectly linked to the old asphalt surface, then we can proceed with the installation of new asphalt layer.
It is recommended to work with asphalt temperature over 170 ° C, in this way geotextile is close to its melting point temperature and “stress relief” and “interlayer barrier” functions can be deployed as much as possible.

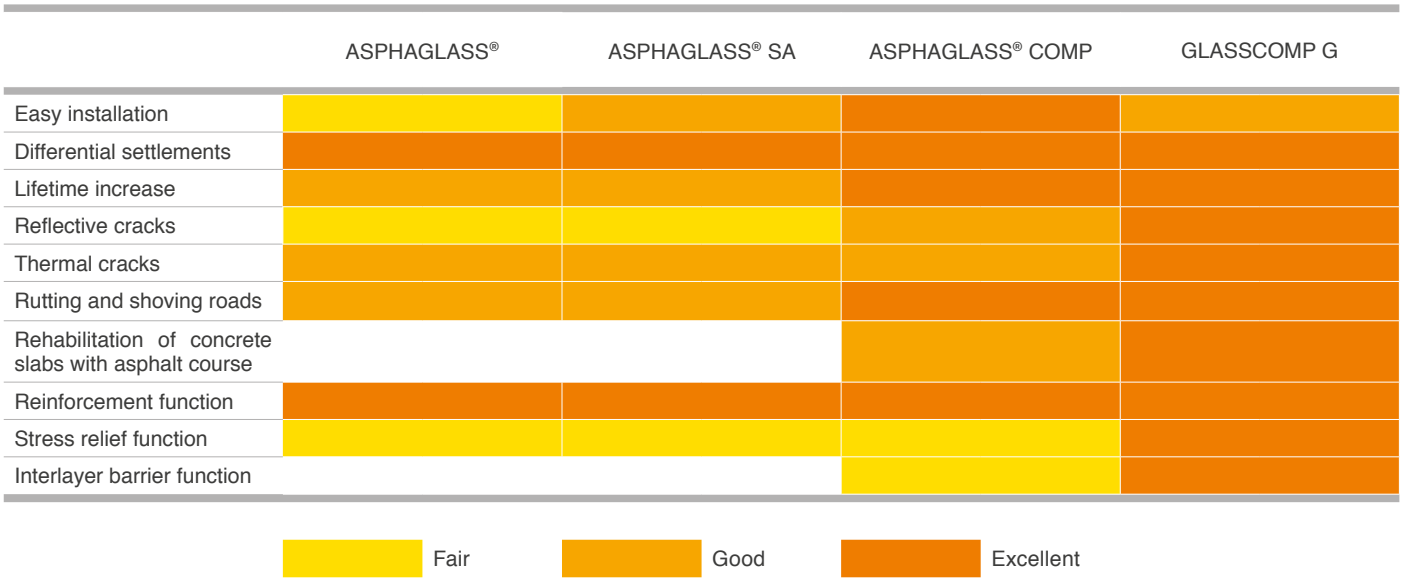
INSTALLATION TIPS

We always think every job site is different than other: we strongly suggest to ask specific installation guidelines to our sales manager or dedicated onsite assistance by one of our engineer, however some tips can be resumed as follow:

- Installation area should be cleaned from dust to have a better bonding surface;
- bituminous emulsion must be sprayed before installation of geosynthetic (quantity depends on road conditions, design parameters, geosynthetic used, weathering conditions);
- drapes, folds and wrinkles of product during installation should be avoided;
- edge overlapping can be done easily adding some bituminous emulsion between two geosynthetic layers;
- minimum thickness of asphalt layer mix over the reinforcement product must be 4 cm or more.

The following chart can give you the possibility to understand at a glance the main advantages using a product over another, it's a kind of choice help chart.
We are always available to support your choice with the best cost-effective solution, our technical department is able to offer design assistance and installation tips according to specific project needs.

Choice help chart:



Bituminous emulsion spread

ASPHAGLASS® installation

New asphalt layer

Final result

D07A112_R00/17

EDILFLOOR SPA
Via L. Da Vinci, 15 - 36066 Sandrigo (VI) Italy
T +39 0444 750350 **F** +39 0444 657246
E info@edilfloor.com **W** www.edilfloor.com