MACCAFERRI

MacGrid® AR

Geosynthetics for road reinforcement applications

MacGrid® AR is a family of geogrids and geocomposites specifically designed for road reinforcement applications. The basic product (**MacGrid® AR**) is a woven geogrid made of high-strength polyester or glass fibres with a coating of polymer material. The mesh size of the grid may vary depending on the size of the gravels. If necessary - as well as reinforcing the road pavement - a separation element may be formed by coupling the basic geogrid with a non-woven geotextile with characteristics specifically developed for this application.

The **MacGrid® AR series G** geocomposites also form an impermeable barrier to surface water - as they are saturated with bitumen.

The family of **MacGrid® AR** geogrids therefore have the characteristics and performance of a reinforcement whilst the **MacGrid® AR G** geocomposites acts as a separator as well as a reinforcement. The material is available with various strengths and in various sizes and may be produced as specified by the Client.

WHY MACCAFERRI MACGRID® AR?

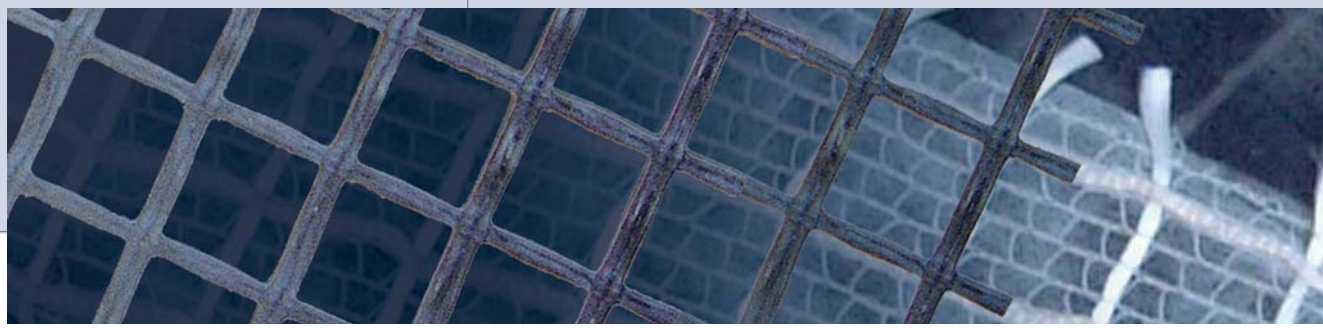
- **Reduce Costs**
- **Increase life of the road**
- **Reduce maintenance costs**
- **Stop cracks in the pavements**
- **Many different products to fit any technical requirement**

MacGrid® AR advantages

The considerable benefits for the road structure which may be achieved by using the **MacGrid® AR** range of products are summarised below:

- The presence of the **MacGrid® AR** products reduces the occurrence of cracks in the road pavement;
- The presence of the **MacGrid® AR** reinforcement element prevents settlement of the road structure and the formation of ruts in the road;
- The dimensions of the reinforcement element mesh guarantee excellent penetration and connection of the reinforcement with the layers of asphalt;
- The presence of a geotextile (version **G**) enables - by saturating it with bitumen - the creation of an impermeable layer which prevents the penetration of rainwater and the development of freezing and thawing cycles which lead to the collapse of the road.

Our technical department is available to provide further, in-depth information on the materials and on the use and installation.



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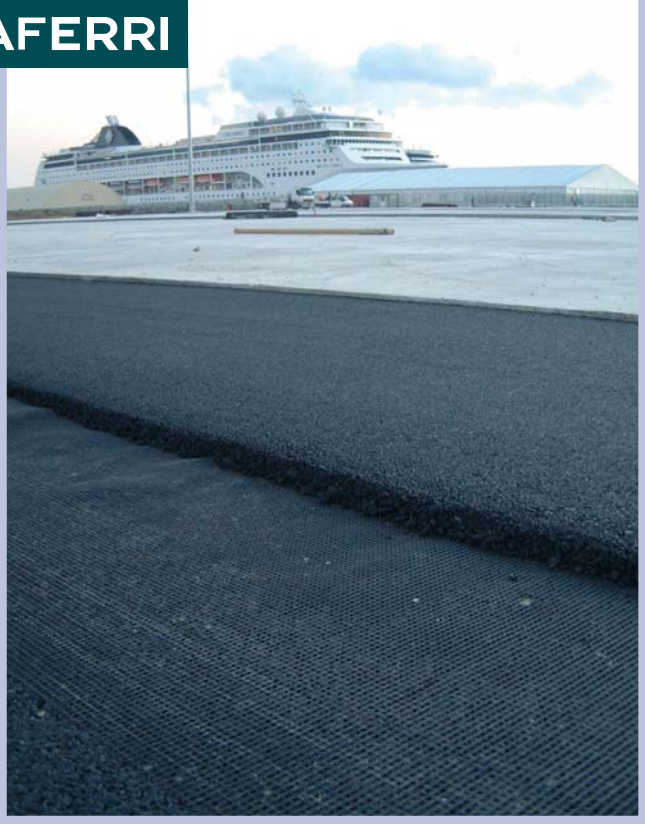
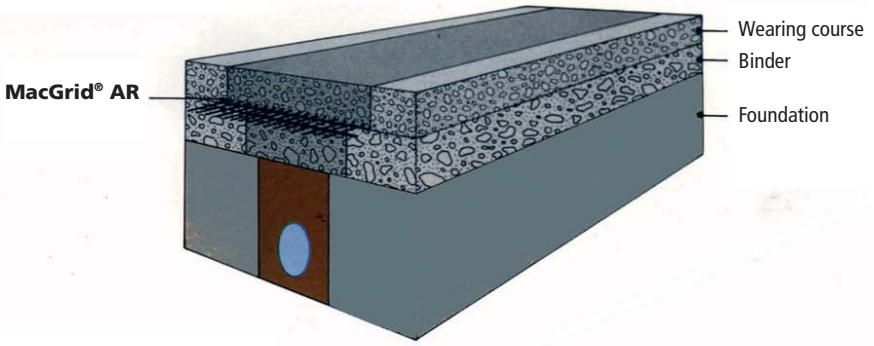


Functions

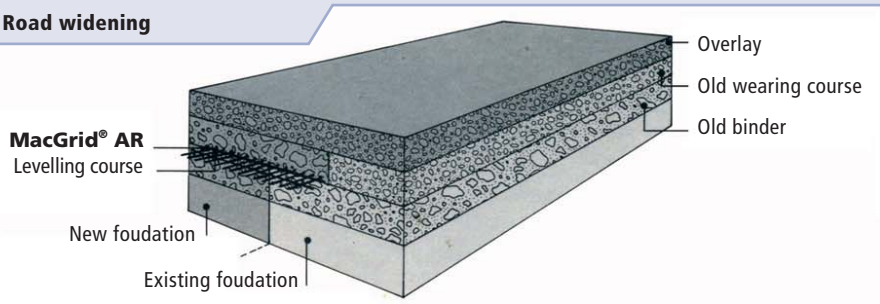
MacGrid® AR is excellent for performing several fundamental functions, such as:

- **Separation:** the presence of a non-woven geotextile separator (version **G**) forms an excellent separation between the various layers of the road package;
- **Adhesion:** the presence of a non-woven geotextile (version **G**) ensures that the product adheres perfectly to the bituminous base primer which amalgamates with the entire reinforcement surface, thereby guaranteeing a high degree of adhesion between the reinforcement itself and the base layer. There is also a version **A** which is characterised by the presence of an adhesive that activates under pressure, thereby making the installation of the geotextile extremely easy and fast;
- **Reinforcement: MacGrid® AR** limits the movements of the road superstructure since - due to its rigidity - it mobilises high levels of stress, from the very beginning of the deformation phenomena, which oppose the occurrence of the deformation itself.

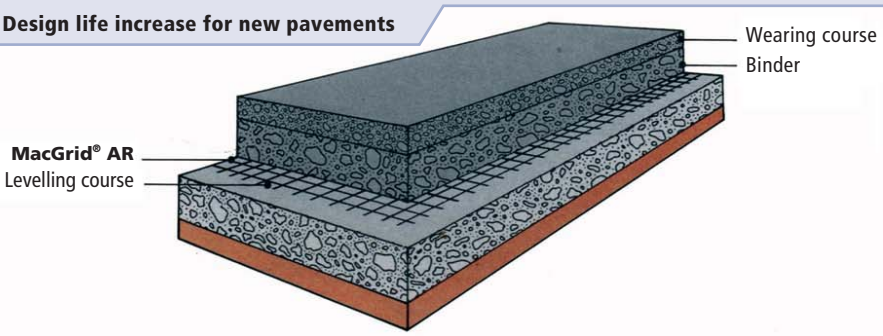
Trench reinstatement



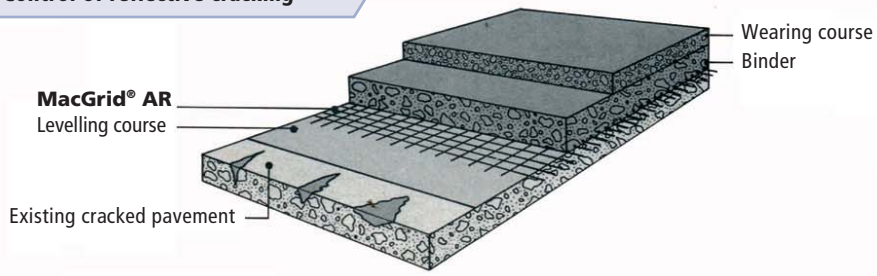
Road widening



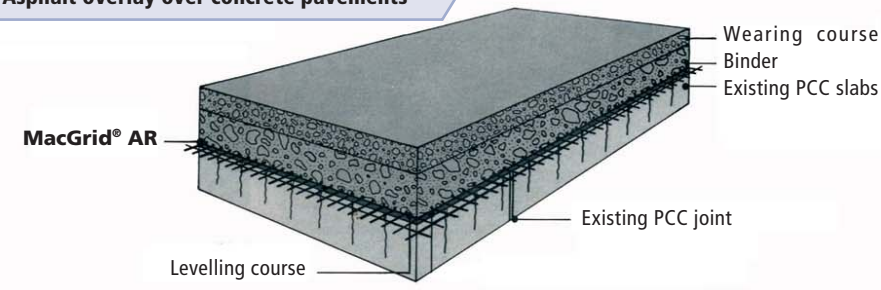
Design life increase for new pavements



Control of reflective cracking



Asphalt overlay over concrete pavements



MacGrid AR applications

Consequently, the main applications for the range of **MacGrid® AR** products are in highway designs and in all those situations in which a superstructure is formed that is similar in nature to that of a road package (some typical applications are shown on this page):

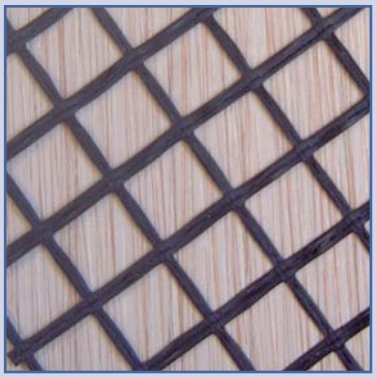
Parking areas;

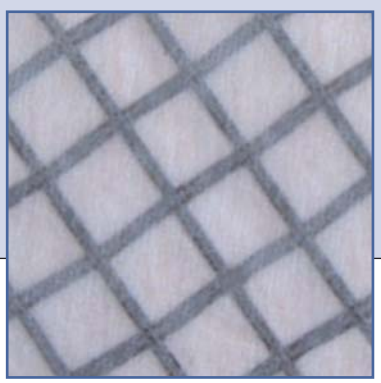
Reinforcement of the wearing course during reconstruction and routine or extraordinary maintenance of the road surface. These works are mainly carried out to eliminate the "cobweb" type cracking which occurs over time in the road wearing course;

Reinforcement of new pavement during the widening of existing roads or the installation of services beneath the wearing course; The reinforcement is used to consolidate the new part of the superstructure in order to avoid differential settlements and cracks between the adjacent areas of the existing and new pavement;

Improvement of the strength and service life characteristics of the road package during construction of new structures; Such works improve the efficiency of the road pavement in terms of number of equivalent vehicles/axle load/service life of structure and it is recommended for major highways and roads with heavy goods traffic;

As a reinforcement separation layer for the pavement when this is formed on concrete block foundations. This is a typical situation in many airport runways and on roads in northern Europe.





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Installation notes

1. The surface to be repaired must be first regulated to fill cracks and remove irregularities greayer than 5 mm. In case of concrete carriageways, filled and regulating corse applied acrossthe whole area.

2. Except where a regulating corse has been applied the surface to be repaired should be swept clean of loose material and sprayed with tack coat.

3. MacGrid® AR materials (either glass or polyester based) can be easily cut to width using a disc cutter or, once rolled out, with a sharp knife. The **MacGrid® AR** geogrid/composite is rolled out over the area to be reinforced and should be flat and free of ripples. The leading edge of the first roll should be fixed using nails or a small quantity of compacted bituminous material. Longitudinal joints, between rolls, should have an overlap of 50-100 mm. Transverse joints at the ends of rolls, where there is a risk of relative movement, should have an overlap of approx 250 mm. At transverse joints the new length should be placed 50 mm clear of the edge of the road and can be easily cut to fit around drain gullies and other obstructions.

4. For best results the initial overlay should be at least 50 mm thick or alternatively a minimum weight of 125 kg/m^2. Care should be exercised when using vibratory rollers and should be restricted to overlays in excess of 80 mm thick.

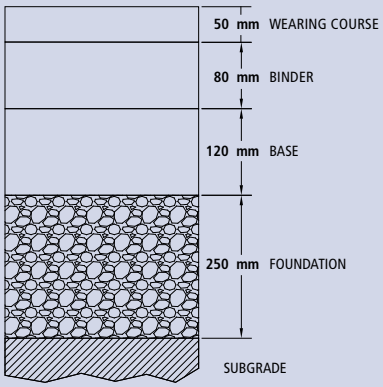
More detailed info are available on the product installation guide.

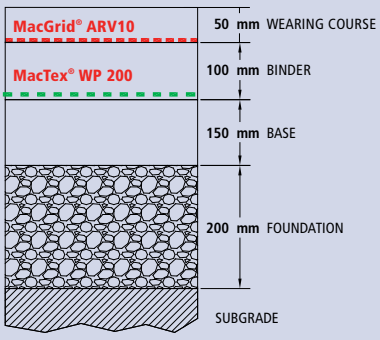
Research and development

All the geosynthetics specifically designed and developed by Maccaferri for use in road pavements are identified by the **AR** suffix. There are a specific types of non-woven geotextile material called **MacTex AR** which is designed for use on bituminous roads. Many other products are being continuously studied in laboratories and internationally renowned universities or developed for specific applications and situations.

The entire range of materials complies with the highest standards of quality at both a national and international level and they constantly undergo tests to check their performance.

Maccaferri's design department is available to verify the benefits which the use of these materials would result in and compare the equivalent performances of a reinforced and unreinforced road pavement.





Bureau Veritas Certified Quality System Company
with SINCERT's and UKAS's accreditation

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