



Glass Fibre Reinforcing Fabrics for Facades and Thermal Insulation Systems

High quality glass fibre mesh fabrics are an important part of façade systems and internal plastering because they can prevent cracks and reduce the risk of mechanical damage to the surface.

To achieve a long service life of facades and plasters and to preserve their flawless appearance, it is necessary to pay attention to the quality of the materials of the

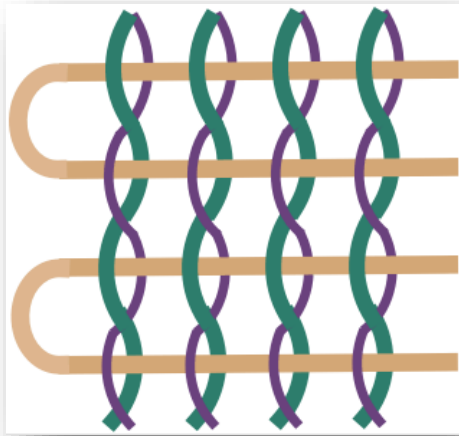


Diagram of Leno weave

entire system. If one component has a shorter life than the others, it can lead to significantly shorter life of the system as a whole. When you use poor quality mesh fabric, you get insufficient strength of the finish and, within a few weeks of completion, cracks can start to appear due, for example, to the curing of the plaster, the temperature, the wind, or movement of the insulation panels.

Mesh for external facades and insulation

Most meshes are used for reinforcement of thermally insulated façades, which fulfils the high strength demands of the ETICS insulating system. In the production of mesh fabric, it is typically so called E-glass that is used, and the products comply with the ETAG004 standard which lays down a minimum residual tensile strength, with a 20% margin compared to other materials (e.g. Chinese C-glass). The lifespan of ETICS depends upon the quality and strength of all elements of the façade so it pays off to use a heavier façade mesh (e.g. Adfors styles R131 and R117). In the lower parts of the facade where mechanical damage can occur e.g. the impact of a ball or a car, it is recommended to use so-called Panzer mesh (e.g. Adfors styles R267 or R275).

Internal plaster reinforcement

Meshes are also used extensively for internal plaster; for example to protect walls against cracking, in areas where places where two types of material with different co-efficients of expansion meet under the plaster (areas that have a higher

potential for cracks). A mesh fabric which overlaps these locations absorbs the emerging tensions. It is recommended to use mesh over the whole surface of the inner plaster because this also reduces the risk of mechanical damage (e.g. from children or even careless handling of the vacuum cleaner). In these instances lighter meshes with a lower tensile strength are usually sufficient (e.g. Adfors styles R51, R85, R96, but also the R117).

Other uses for mesh fabrics

Thanks to their excellent functional characteristics meshes are also used in the production of building elements, decorative materials and in technical building equipment. For example, so-called "thin, structural panels" are often covered on both sides with very fine meshes. These reinforced boards are used widely in the production of dimensionally-demanding wall partitions, shower enclosures, intricately-shaped swimming pools and even in the side walls of vans. Glass fibre mesh fabrics are also used on a large scale in the marble industry. Large & less stable marble slabs are often reinforced with a mesh fabric to minimize the risk of damage during handling and further processing. Another use for mesh is for electric heating flooring mats where mesh fabrics coated on one side with a self-adhesive layer are often preferred for to ease installation.

What are the important parameters of a quality mesh?

Any reinforcement should meet a few basic but necessary parameters. The first is elongation. This value should be as low as possible. Reinforcement must be resistant to stress. Good meshes achieve 3 - 4% elongation at maximum. Hand in hand with elongation goes the strength of the fabric. The industry standard for thermal insulation systems is a minimal value of 2000 N/5 cm.

Another very important parameter is alkali-resistance. Reinforcing glass used most commonly in construction is not alkali-resistant. Durability is guaranteed by the coating where the greige glass fabric is covered with a synthetic rubber which wraps and protects the 'naked' fibres from the effects of alkalinity. European meshes tend to use a more expensive coating substance SBR (styrene butadiene) whilst the majority of Asian competitors tend to use cheaper acrylic products.

Fabric coating is quite an important parameter as it influences the stability of the fabric during handling. Greige fabric can easily 'slide' but thanks to the 'seal' provided by the coating, the entire structure becomes stable and can be easily cut and handled.



How to identify poor quality meshes?

If the manufacturer is not mentioned on the label (or if only shows the importers' name and the price is suspiciously low), it is likely that this is a poor quality product meaning there is a risk you are using a cheaper and lower quality C-glass material. The strength of the façade with this kind of mesh is lower and there is an increased risk of cracking. When you touch the product you can often see that the cross-points are very weak and do not hold together. If these points do not hold perfectly together, there can be a breakdown of the mesh

when cutting or during application.

Unfortunately, recent stories from markets have shown another trick of importers. A favourite trick is to buy greige, uncoated fabrics in China. Import them by sea to

Europe and then coat them at some EU-based facility, format them and declare them as a European product. From a quality perspective however there are several associated risks. Chinese glass (so called C-glass) in its' original condition is already weaker than the typical European E-glass. This would not be so problematic if they were not exposed to the action of atmospheric moisture (combined with a salty environment) during transportation. The damaged fabric after coating falls well below the required strength values and can damage the entire system into which it is inserted.

How this could be avoided? It is certainly not easy. Use of products from established European manufacturers is the safest way. Another option is to use the entire proven insulation system from a well-known system manufacturer that complies with the relevant legislation. One last important consideration is the quality of the supervision on the construction site; to prevent substitution with cheap products that are not prescribed by the architect.

Practical tips to conclude

- When applying adjacent strips of mesh, ensure they overlap side by side by 10 cm.
- Always follow the 2/3 and 1/3 rule and place the mesh into the 2/3 layer thickness (i.e. 1/3 under the surface).
- The greater the risk of mechanical damage; the heavier the mesh that should be chosen.

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