

FOAM GLASS INTEGRATED PLATE EFFECTIVE IN WATER AND FIRE PROOFING, THERMAL INSULATION AND DECORATION

Technical Field of the Invention

The present invention relates to a foam glass integrated plate.

Background of the Invention

A traditional foam glass integrated plate is made of a bonding layer, a piece of foam glass and a decorative layer. The foam glass surface is a common plane structure so that the decorative layer secured on the surface must be required to achieve a decorative effect. When securing the decorative layer, an intermediate medium (mesh fabric, for example) is required, thus resulting in complex process and high cost. In order to secure the foam glass onto a wall, a thin dusting mechanism is employed in most cases. The bonding layer used in such cases is cement-based and suitable to rough concrete wall surfaces, but it has poor bonding effect for glass, steel or other dense and smooth wall surfaces so that a foam glass plate is very likely to fall off such wall surfaces. Furthermore, the construction process is very complex, where riveting is required in addition to wall surface dedusting, surface mortar applying, bonding mortar applying and mesh fabric bonding, and as a result, the process is complex and the cost is high. The existing thermal insulating materials for buildings must have a same service life as the buildings, and since the buildings may have cracks due to various causes during its service span, the thermal insulating materials with inorganic adhesive used in the existing thin dusting mechanism will peel off or crack together with the buildings, thereby resulting in leakage.

Summary of the Invention

In order to solve the deficiencies of complex process and high cost of the foam glass integrated plate as described above, the present invention provides

a foam glass integrated plate which has the advantages of simple structure, low cost, good decorative effect and wide application range.

To achieve this purpose, the present invention employs the following technical solutions.

A foam glass integrated plate effective in water and fire proofing, thermal insulation and decoration is provided, comprising a foam glass plate; a bonding layer is combined on the inside of the foam glass plate and a coating layer is combined on the outside thereof, and the foam glass plate is fixed onto a wall surface by the bonding layer; and an outer surface of the foam glass is a stereoscopic embossed face after cutting.

The coating layer is formed by directly applying a coating on the outer surface of the foam glass, the thickness of the foam glass plate is 20 mm to 800 mm, and the area of the foam glass is 0.01 m² to 10 m².

The bonding layer is made of a rapid-curing organic adhesive and an anchor bolt securing member.

The anchor bolt securing member is a metal member or rigid plastic member.

One or more grooves for placing the anchor bolt securing member is provided on four side faces of the foam glass plate, and a rigid support member is pasted inside each of the grooves.

The rapid-curing organic adhesive is applied between the foam glass plate and the anchor bolt securing member, and the rapid-curing organic adhesive is applied in a joint between the adjacent foam glass plates.

The rapid-curing organic adhesive is a weather-resistant silicone adhesive or resin adhesive.

An inner surface of the foam glass is a stereoscopic face matched with the wall surface in shape.

The present invention has the following advantages. First, it is environmentally friendly and high in economic benefit since the main raw materials of the foam glass plate are industrial waste residues or construction

wastes; it is easy to cut and carve the foam glass plate into various patterns and shapes; and the coating is directly applied onto the stereoscopic embossed face, thereby realizing simple process, low cost, and good decorative effect. Second, the mounting is so easy that the foam glass plate can be directly bonded onto the wall surface just by subjecting the wall surface to simple dedusting, with a rapid-hardening organic adhesive being used as the bonding layer: the foam glass plate can be directly bonded onto the wall surface just by subjecting the wall surface to simple dedusting and point-coating or applying surface mortar; and the joints may be reinforced by rivets which are forced into the grooves on the side faces of the foam glass and the adhesive is applied in the grooves, thereby realizing simple process, convenient construction, low labor intensity, high efficiency, high adaptability to wall surfaces of different materials and densities, high bonding strength, and strong weather resistance. Third, such a foam glass integrated plate is simple in structure, light in weight and high in strength, and is thus suitable for thermal insulating and fire proofing decoration internal and external to building walls, as well as for thermal insulating and fire proofing decoration of building roofs and for thermal insulating and fire proofing decoration of indoor ceilings, with good thermal insulating and fire proofing effects and stable performance. Fourth, the weather-resistant organic adhesive, as used in the present invention, may effectively resist against tensile stress generated by the occurrence of some small cracks in the buildings. Fifth, the foam glass integrated plate of the present invention may be used for replacing GRC products used in buildings, and it is very appropriate to use the foam glass as the decorating and shaping material of buildings due to its high strength, light weight, high plasticity, good stability and convenient construction and the like. And, sixth, the foam glass integrated plate may be used, as the indoor fire and water proof, thermal insulating, sound insulating and decorative material, in indoor walls and ceilings.

Brief Description of the Drawings

Fig. 1 is a cross-sectional structure view of Embodiment 1 of the present invention;

Fig. 2 is a cross-sectional structure view of Embodiment 2 of the present invention;

Fig. 3 is a cross-sectional structure view of Embodiment 3 of the present invention;

Fig. 4 is an enlarged view of portion A of Fig. 1; and

Fig. 5 is an enlarged view of portion B of Fig. 2.

Detailed Description of the Invention

Referring to Fig. 1 and Fig. 4, a foam glass integrated plate effective in water and fire proofing, thermal insulation and decoration includes a foam glass plate 1; a bonding layer is combined on the inside of the foam glass plate and a coating layer 2 is combined on the outside thereof, and the foam glass plate is fixed onto a wall surface 3 by the bonding layer; and an outer surface of the foam glass is a stereoscopic embossed face after cutting. The coating layer is formed by directly applying a coating on the outer surface of the foam glass, the thickness of the foam glass plate is 20 mm, and the area of the foam glass is 0.01 m². The bonding layer is made of a rapid-curing organic adhesive 41 and an anchor bolt securing member 42. The anchor bolt securing member is a metal member. One or more grooves for placing the anchor bolt securing member is provided on four side faces of the foam glass plate, and a rigid support member 5 is pasted inside each of the grooves. The anchor bolt securing member comes into point contact with the rigid support member. The rapid-curing organic adhesive is applied between the foam glass plate and the anchor bolt securing member, and the rapid-curing organic adhesive is applied in a joint between the adjacent foam glass plates. The rapid-curing organic adhesive is a weather-resistant silicone adhesive. An inner surface of the foam glass is a stereoscopic face matched with the wall surface in shape.

Embodiment 2

Referring to Fig. 2 and Fig. 5, a foam glass integrated plate effective in water and fire proofing, thermal insulation and decoration includes a foam glass plate 1; a bonding layer is combined on the inside of the foam glass plate and a coating layer 2 is combined on the outside thereof, and the foam glass plate is fixed onto a wall surface 3 by the bonding layer; and an outer surface of the foam glass is a stereoscopic embossed face after cutting. The coating layer is formed by directly applying a coating on the outer surface of the foam glass, the thickness of the foam glass plate is 800 mm, and the area of the foam glass is 10 m². The bonding layer is made of a rapid-curing organic adhesive 41 and an anchor bolt securing member 42. The anchor bolt securing member is a rigid plastic member. One or more grooves for placing the anchor bolt securing member is provided on four side faces of the foam glass plate, the anchor bolt securing member comes into plane contact with the grooves. The rapid-curing organic adhesive is applied between the foam glass plate and the anchor bolt securing member, and the rapid-curing organic adhesive is applied in a joint between the adjacent foam glass plates. The rapid-curing organic adhesive is a resin adhesive. An inner surface of the foam glass is a stereoscopic face matched with the wall surface in shape.

Embodiment 3

Referring to Fig. 3, a foam glass integrated plate effective in water and fire proofing, thermal insulation and decoration includes a foam glass plate 1; a bonding layer is combined on the inside of the foam glass plate and a coating layer 2 is combined on the outside thereof, and the foam glass plate is fixed onto a wall surface 3 by the bonding layer; and an outer surface of the foam glass is a stereoscopic embossed face after cutting. The coating layer is formed by directly applying a coating on the outer surface of the foam glass, the thickness of the foam glass plate is 400 mm, and the area of the foam glass is 5 m². The bonding layer 4 is a rapid-curing organic adhesive. The rapid-curing organic adhesive is applied in a joint between the adjacent foam

glass plates. The rapid-curing organic adhesive is a weather-resistant silicone adhesive. An inner surface of the foam glass is a stereoscopic face matched with the wall surface in shape.

The above embodiments are merely individual cases of the present invention, and any replacements made according to the spirit of the present invention should be regarded as not departing from the protection scope of the present invention.

Claims

1. A foam glass integrated plate effective in water and fire proofing, thermal insulation and decoration, comprising a foam glass plate, characterized in that a bonding layer is combined on the inside of the foam glass plate and a coating layer is combined on the outside thereof, and the foam glass plate is fixed onto a wall surface by the bonding layer; and an outer surface of the foam glass is a stereoscopic embossed face after cutting, and an inner surface of the foam glass is a stereoscopic face matched with the wall surface in shape;

wherein the bonding layer is made of a rapid-curing organic adhesive and an anchor bolt securing member, with the rapid-curing organic adhesive being applied between the foam glass plate and the anchor bolt securing member;

a groove for placing the anchor bolt securing member is provided on a side face of the foam glass plate, a rigid support member with which the anchor bolt securing member comes into point contact is pasted inside the groove, and the anchor bolt securing member is a metal member or rigid plastic member;

the main raw materials of the foam glass plate are industrial waste residues or construction wastes;

the coating layer is formed by directly applying a coating on the outer surface of the foam glass, the thickness of the foam glass plate is 20 mm to 800 mm, and the area of the foam glass is 0.01 m² to 10 m²;

the rapid-curing organic adhesive is applied in a joint between the adjacent foam glass plates; and

the rapid-curing organic adhesive is a weather-resistant silicone adhesive or resin adhesive.