

ADVANCEMENT OF COATED NON-WOVEN GLASS MATS FOR HIGH-PERFORMANCE BUILDING MATERIALS

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Coated non-woven fiber glass mat represents a new generation of facing materials applied to a variety of board products used in interior and exterior building applications, such as polyiso foam boards, polystyrene foam boards, gypsum wallboards, gypsum roof boards and tile backers. Due to the high strength and Young's modulus of glass fiber, the coated mat reinforces the building materials to achieve a superior flexural strength, stiffness and fracture resistance over traditional paper-faced materials. In addition, the strong, moisture-resistant mat enhances the productivity significantly as a continuous substrate in high-speed manufacturing of these board products.

For different end use purposes, various physical properties or attributes, for instance, low moisture absorption, water repellence, air permeability, fire resistance, mold/mildew resistance, abrasion resistance, surface quality, and color aesthetics can be engineered to provide unique benefits to the building products:

Moisture Absorption and Water Repellence – A low water absorption by the coating is typically 0.1 to 0.5 g, measured by the Cobb Test, protecting gypsum boards from water absorption and suffering of damage or property degradation. The coating can be further engineered to improve its hydrophobicity for applications under weathering and wet conditions.

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Fire Resistance – Containing a significant amount of mineral fillers, the coating is not regarded as flammable. Additional flame retardants in coating formulations can further improve the fire resistance of the board materials, offering a significant safety benefit to polymer-based foam boards.

Mold and Mildew Resistance – In certain applications, the coating is proven to have a superior resistance to micro-organism growth such as mold and mildew, protecting the living environment of residents.

Low to High Air Permeability – The air permeability of coating is a very important property for the board manufacturing to avoid liquid or slurry bleed-through while allowing vapor to pass quickly in the thermal curing or drying process. The coating composition can be engineered to achieve several Gurley seconds to over 1000 Gurley seconds to meet specific board manufacturing or applications requirements.

Abrasion Resistance – The coated non-woven fiber glass mats can significantly improve the surface hardness of gypsum boards and provide an excellent durability against abrasion and denting.

Nailing – The strengthening of gypsum or foam boards by the strong fiber glass mats improves the performance of nailing and fastener pull-through on the gypsum wallboards, roof boards and tile backers.

Surface Quality – The smoothness or roughness of coating surface can be adjusted to meet certain application requirements, for instance, to promote the adhesion of tiles, or achieve a smooth quality of interior walls.