

Specialty Finishes Expand Applications for 3-D Glass Fabric

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A variety of research and development projects at Parabeam bv (Helmond, The Netherlands) have focused on specialty surface finishes, including everything from the application of a metal composite “gel coat” or a real stone veneer to protective coatings designed to protect against chemical, fire, and more.

Parabeam® 3-D glass fabric is woven from E-glass yarn and consists of two deck layers bonded together by vertical piles that are woven into the deck layers to form an integral sandwich structure. Compatible with nearly all thermoset resins, the fabric rises to a preset level once impregnated with resin. A variety of processes and materials can be integrated on the surface to make the perfect composite for nearly any application.



3-D glass fabric © by Parabeam

A Touch of Metal

The addition of a metal surface coating offers both decorative and functional advantages. For instance, a stainless steel coating can protect against corrosion and impacts. While an antimicrobial copper coating can be used for medical applications. Metals can also be used to provide improved heat dissipation in molds. VeroMetal (www.verometal.com) provides a variety of metal coating options, including copper, aluminum, zinc, tin, iron, bronze, and stainless steel. VeroMetal coatings contain 95 percent metal powder, which is mixed with a binding agent and a reactor. For application on Parabeam 3-D fabric, researchers found VeroMetal worked best as a first layer gel coat system. In fact, processing is reported to be similar to conventional gel coat systems.

The coating can be sprayed or rolled onto the mold. Two layers are recommended for best finish. When the VeroMetal is cured a reaction layer builds at the surface. The trick to proper adhesion throughout the composite is building up the material layers at the appropriate time. Too soon and the curing effect of the metal coating can be impacted. However, if the VeroMetal coat is completely cured it will not chemically adhere to the resin-impregnated Parabeam fabric. Once the composite is complete, the metal coating can be finished using traditional metal processing techniques, e.g. polishing.



Sprayed metal coating © by Parabeam

Lightweight Stone Interior Paneling

For a stone affect, researchers considered two options, both of which are well suited for interior paneling and ceiling systems in mass transportation applications.

Stone-Veneer® from Richter-Furniertechnik (www.richter-furniertechnik.de) is real stone from split slate rock. Because the veneer has a glass-reinforced polyester backing, Parabeam can be laminated directly onto it using a polyester/epoxy resin. It also is possible to press or glue the veneer onto the Parabeam composite. The stone sheets are very thin (1-3 mm), but the panels have limited flexibility.

For applications that require more flexibility, there is FlexSandStone®, which consists of sedimentary rock consisting of 90 percent pure quartz bonded vertically onto large sheets of an open weave fiber with thermoplastic binders. The fabric backing allows for 3-D forming with the addition of heat. FlexSandStone was applied to Parabeam using a PUR hot meld adhesive, although other adhesives can be used.



FlexSandStone ® by Parabeam

Functional Finishes

Researchers investigated two lines of specialty protective coatings for functional surface finishes. With a protective coat, point loads are absorbed, allowing thin Parabeam deck layers that would otherwise break to be used for applications such as flooring systems, antislip ship decking, and truck bed liners. With a chemical resistant coating, the material also could be used for lining chemical storage containers and tanks.

Both Line-X® Protective coatings (www.line-X.com) and Turboliner MPL11® polyuria from Kunststof Coating Nederland (www.kunststofcoatings.nl) are two-part polyuria coatings delivered via high-pressure spraying equipment. Both coating systems offer realtime curing (between 2 and 5 seconds), allowing for a minimal layer thickness of approximately 0.5 mm. The coatings are water and air tight, shock absorbing, and resistant to temperatures ranging from -40°C to 350°C. High-chemical resistant and fire retardant variations are also available.

These protective coatings can be applied to cured Parabeam panels, as well as 3-D components. When the coating is applied, the surface must be clean and dry, and on the mold side, all the remaining release agents should be removed, prior to sanding. By adjusting the distance from the applicator, surface finish can be varied from smooth to coarse. Because of the coatings extremely short curing time, when the spray distance is further away particles partly cure before impacting the surface, providing a granular finish. Therefore, the closer the applicator is to the Parabeam surface, the smoother the coating. By using a wider range of spraying nozzles, KCN is able to achieve a finer granular finish with its TurboLiner coating than the Line-X coatings.

For further information, please contact sales@parabeam.com.