

SCIGRIP specified for composite bridge beams

The Situation

Harbor Technologies, a leading manufacturer of bridge beams, needed a reliable adhesive and dispensing system to bond composite tops to concrete and steel-filled composite beams. The adhesive had to meet rigorous strength and performance standards, particularly in harsh environments. Scigrup SG230 HV not only met these demanding requirements but exceeded expectations.

The Solution

A new type of composite bridge beam relies on the proven performance of SCIGRIP™ methacrylate adhesive from SCIGRIP Americas to deliver extremely strong, reliable structural bonds while helping reduce material and labor costs for the manufacturer.

This structural hybrid composite beam or HCB, combines the best of reinforced plastic composites, concrete and steel to produce bridge beams that are one-tenth the weight of steel yet strong enough to carry railroad locomotives and freight cars.

The beam designer, John Hillman says his beams use composites, concrete and steel in their most efficient form which acts as a tierarch bridge encased in a fiberglass composite box. Hillman says the beams will last indefinitely.

SCIGRIP SG230 HV structural two-component adhesive was used to bond a composite top to the concrete and steel filled composite beam “box.”

Beams are fabricated by Harbor Technologies, Brunswick, Maine. Kristofer Grimnes, product development manager for Harbor Technologies said several methyl methacrylate (MMA) adhesives were tested for this HCB application.

Our distributor, North American Composites (NAC), Lino Lakes, Minn., told us SCIGRIP adhesive products have a proven track record for bonding and assembling composites and that they would produce

stronger, better bonds than the other adhesive system we were contemplating using in this application, Grimnes said.



Technicians at Harbor Technologies dispense a bead of SCIGRIP SG230 HV adhesive on the composite bridge beam. The adhesive is used to structurally bond a composite top to the beam. The bulk metermix dispenser improved productivity by 50 percent.



CUSTOMER CASE STUDY

“But what we didn’t realize was that by using SCIGRIP adhesive and by switching over from our current labor intensive applicator to a bulk pneumatic meter mix dispensing system, our material costs would be reduced and our labor cost would go down,” he said.

Grimnes said it was unbelievable that we were able to reduce our bonding costs nearly 50 percent and still produce superior structural bonds in the bridge beams. In addition, Grimnes also pointed out that the minimal surface preparation requirements and the adjustable cure times of the two component SCIGRIP SG230 HV adhesive made the product very user friendly. The SCIGRIP adhesive offered other benefits like little or no odor during curing, he said.

Todd McKechnie, the NAC sales representative who handles Harbor Technologies, pointed out that NAC is more than just a distributor. “We offer our customers so many more key valued added services,” he said. McKechnie continued to explain that NAC relies on the expertise of their suppliers, like SCIGRIP, for technical support in finding solutions for their customers.

Both McKechnie and Karen Brock Amoah, SCIGRIP structural adhesive sales and marketing director, and the SCIGRIP technical service team worked hand-in-hand with Harbor Technologies to identify their specific bonding requirements and ultimately recommended SCIGRIP SG230 HV for this novel bridge beam application.

One reason for selecting SCIGRIP SG230 HV adhesive was because of its unique combination of tensile, elongation and shear strength properties and its proven performance bonding composites which are subjected to harsh operating environments, Brock Amoah said.

The beams have already been used in several highway projects. Currently, Harbor Technologies has completed fabrication of 647, 70-foot-long beams that will be used on a 520-foot long causeway.

Hillman received the 2010 Award of Excellence from Engineering News Record magazine for his novel patented HCB design.

In addition to bonding composites, SCIGRIP SG230 HV can be used for structural bonding of gelcoats, thermoplastics and metals. For more information on SCIGRIP SG230 HV or other SCIGRIP structural adhesives visit: www.scigrip.com or call Karen Brock-Amoah at 877-477-4583.



Seventy-foot-long structural hybrid bridge beams, bonded with SCIGRIP SG230 HV adhesives, are being craned into position on this causeway.