

CaseHistory

Composite prevents burns



Production starts by grit-blasting a cast iron "dish."

Application:	Hybrid manhole cover
Resin:	Vipel® impact-modified vinyl ester
Manufacturing Processes:	Hand lay-up & filament winding
Diameter:	31.2 inches (79.2 centimeters)
Installed:	2008

People and animals who inadvertently touch steam manhole covers made of cast iron have been burned, and even branded.

To solve this problem, Industrial Fiberglass Specialties, Inc., (IFS) developed a hybrid cover that includes an insulating layer of fiber-reinforced polymer (FRP) composite. In addition to making the surface safer to touch, the high-performance composite makes the overall cover stronger. The resin for the composite is a Vipel® vinyl ester, engineered by AOC for enhanced resilience and superior resistance to heat, steam and corrosion.

Composite prevents burns, continued



The composite cures into a high-strength, thermally-insulating layer.

“Engineers looked at cast iron with conventional insulation, but this did not provide enough reduction of heat transfer,” said Ted Morton, President of IFS. “The composite layer of the hybrid cover meets the need to reduce heat transfer. In addition to protecting against burns, the non-metallic composite layer is a deterrent to scrap metal thieves.”

The steel for the hybrid design already met required AASHTO [American Association of State Highway and Transportation Officials] traffic standards of 25,000 pounds (11.3 metric tons). Testing showed the combination steel and composite hybrid manhole covers can handle traffic loads up 100,000 pounds (45.4 metric tons).

The 0.25-inch (6.4-millimeter) thick composite laminate adds only 35 pounds (15.8 kilograms) to the 255-pound (115.7-kilogram) cast iron dish for a final hybrid cover weight of 290 pounds (131.5 kilogram).

The making of a hybrid

The hybrid manhole cover is 31.2 inches (79.2 centimeters) in diameter. Manufacturing starts by grit-blasting a cast iron “dish” to achieve a white metal surface that provides excellent bonding

between the composite and iron. The grit-prepared surface is coated with Vipel impact-modified vinyl ester. The resin chemistry includes an epoxy component that provides good adhesion properties that also contribute to the excellent metal-to-composite bond.

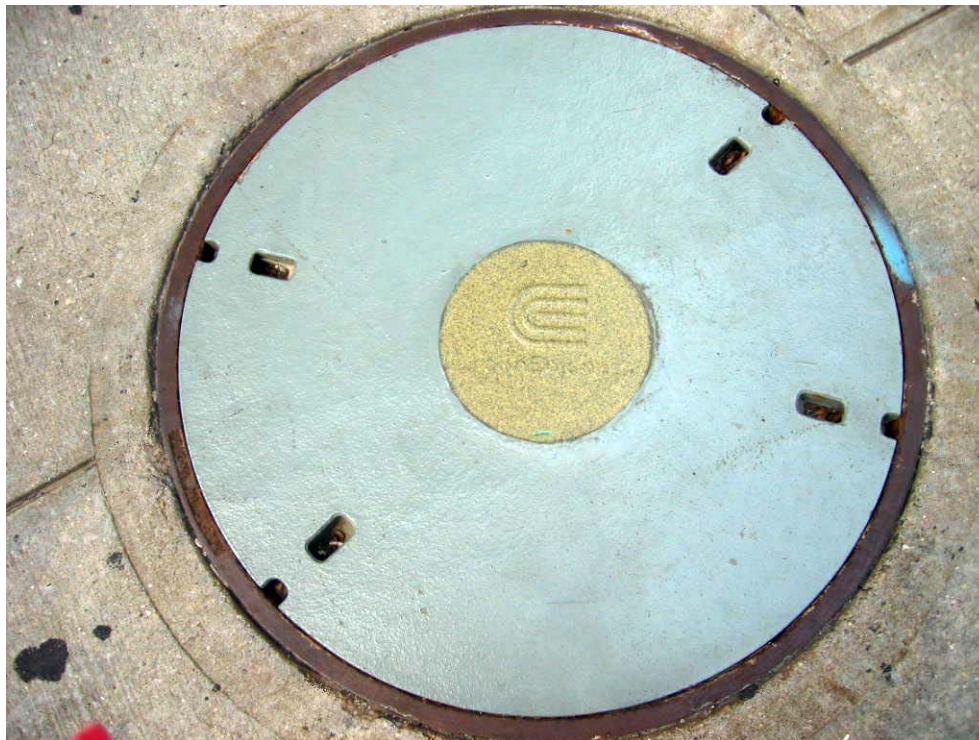
Next, layers of Vipel resin-impregnated glass fiber are manually applied to build a structural composite. Before the wet laminate chemically cures into a solid state, the service provider’s logo is integrally molded into the top of the cover. Final production steps are applying a special skid-resistant coating that has won praise from customers and engraving a serial number into the surface.

“Future versions of the cover under development will be based entirely on FRP,” Morton said. “These all-FRP covers will be lighter weight, meet AASHTO requirements, and have even greater thermal insulating properties to protect people and animals from serious harm.”



A serial number is engraved into each part before shipping.

Composite prevents burns, continued



An installed hybrid cover prevents burns and branding.

About Industrial Fiberglass Specialties, Inc.

For more than 60 years, Industrial Fiberglass Specialties, Inc., has been a premier custom manufacturer of fiber-reinforced polymer composite products for superior strength and corrosion resistance. The company is headquartered in Dayton, Ohio, and has manufacturing facilities in Dayton and Polk County, Florida. For more information, phone 937-222-9000, e-mail sales@ifs-frp.com or go to www.ifs-frp.com.

About AOC

AOC is a leading global supplier of resins, gel coats, colorants, additives and synergistic systems for composites and cast polymers. AOC knows technology, lives quality and delivers service better than any other supplier. For more information, e-mail Corrosion & Infrastructure Market Development Specialist Ben R. Bogner, P.E., C. Engr. at bbogner@aoc-resins.com, phone him at (630) 665-2675, or go to www.corrosionresins.com.