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CaseHistory

Composites serve Dubai water resort

Appalachian Plastics, Inc., manufactures water filters up to 96 inches (243.8 centimeters) in diameter.

Application:	Large sand filters
End-Use:	Water-themed resort
Resin:	Vipel® F010 bisphenol A epoxy-based vinyl ester
Manufacturing Processes:	Filament winding Hand lay-up
Diameter:	5 feet (1.5 meters)
Length:	12 feet (3.7 meters)
Pressure:	100 psi (6.9 bar)
Location:	Dubai
Installed:	2009

Once considered only a major oil producer, Dubai, one of seven United Arab Emirates, has diversified its economy and emerged as a major 21st Century tourist destination.

One of the most spectacular visitor attractions in Dubai is Atlantis The Palm, one of the largest and most exciting water-themed resorts in the world. The aquatic center features:

- 42 acres of waterpark with slides, rivers, rapids, pools and beaches,
- a sprawling, interactive dolphin exhibit in three tropical lagoons, and
- underwater tunnels to view the lost chambers of Atlantis and 65,000 marine animals.

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Composites serve Dubai water resort, continued

Keeping the water clean at Atlantis The Palm, Dubai, is a daunting task that is facilitated by 167 special mega-filters. Seventy-five ISO shipping containers were needed to transport the filters from the U.S. to Dubai. The filters were supplied by Neptune-Benson™ whose expertise in filter design and marketing blends perfectly with the filter manufacturing expertise of Appalachian Plastics, Inc. (API).

To achieve high strength and outstanding chemical resistance, API turned to resin technology from AOC. The large fiber-reinforced polymer (FRP) composite housings for the filter systems are produced with Vipel® F010 bisphenol A epoxy-based vinyl ester. The resin is certified for API use in filters by NFS International, an independent, not-for-profit organization that certifies products and writes standards for food, water and consumer goods.

Making filters that last

Appalachian Plastics manufactured the horizontal, cylindrical components for the filters by winding resin-impregnated glass fiber reinforcement on a rotating mandrel. The fiber reinforcement was a combination of continuous roving for hoop strength and stitched fabric for axial strength. The end caps for each filter were open molded of chopped strand mat and woven roving. The interior surfaces of all composite components used C-veil to create a resin-intensive corrosion barrier that protects the reinforcing fibers and provides a seal against internal pressure.

API General Manager Allen DeBusk, said the Vipel F010 resin processes well for both winding and hand lay-up operations and is backed by very good technical support. He added how the toughness and durability of Vipel F010 vinyl ester helps resist cracking and crazing.

“To meet requirements for corrosion resistance, the filters could be made with an isophthalic polyester resin,” DeBusk said. “But isopolyesters are brittle and develop surface cracks under the cyclic action of the filtering process. This does not affect structural performance but encourages unwanted algae to grow.”

The horizontal composite filters for Dubai are 5 feet in diameter by 12 feet long (1.5 by 3.7 meters). Each filter has an internal manifold made of polyvinyl chloride. Water is pumped into the filters and conveyed under pressure through a bed of sand filtering media which trap dirt and particles. The filters are designed to withstand pressures up to 100 psi (6.9 bar).

About Appalachian Plastics, Inc.

Supplying Atlantis The Palm, Dubai, was a natural extension to the reputation of Appalachian Plastics, Inc., which is based in Glade Spring, Virginia, USA. The company is the world leader in the manufacture of water filters for zoos and aquariums. Filters range in size from 30 inches to 96 inches (76.2 to 243.8 centimeters) in diameter. API also manufacturers composite lightpoles and a range of corrosion-resistant equipment and systems. For more information, e-mail api@comcast.com, phone (276) 429-2581 or fax (276) 429-2631.

About AOC

Headquartered in Collierville, Tennessee, USA, AOC LLC is a leading global supplier of materials and systems for composites and cast polymers. AOC knows technology, lives quality and delivers service better than any other supplier. To discover more, phone Corrosion & Infrastructure Market Development Specialist Ben R. Bogner, PE, CEngr., at (630) 665-2675; e-mail bbogner@aoc-resins.com, or go to www.corrosionresins.com, the Internet’s best resource for corrosion-resistant composites.

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