



Your Formula for Success
RESINS | GEL COATS | COLORANTS

CASE HISTORY



A Challenging Chimney Project

Market Segment:	Power & Energy
Composite Application:	FRP chimney liners
Resin:	Vipel K022-ACA bisphenol-A epoxy vinyl esters
Manufacturing Process:	Filament Winding Stack
Height:	820 feet (250 meters)
Liners Per Stack:	2
Maximum Stack Diameter:	Nearly 23 feet (7 meters)
Installed:	2014
Location:	Hadera, Israel

Israel's largest power station, Orot Rabin, is located on the Mediterranean Coast and owned and operated by the Israel Electric Company (IEC). In the beginning of 2012, the power station began installing new environmentally friendly equipments to reduce emissions that include scrubbers and exhaust chimney.

Soaring 820 feet into the sky, this huge concrete chimney will feature two FRP chimney liners fabricated and installed by Plasticon Composites and impregnated with AOC's Vipel K022-ACA epoxy vinyl ester resin. Plasticon Composites was awarded the contract by Commonwealth Dynamics Inc., an international construction company specializing in the building of concrete stacks. The chimney should be operational by the end of the 2015.

Robert Koenis, general manager of Plasticon Composites, stated this is the most challenging job his company has worked on in its 65-year history. Two main issues contributed to the complexity—the logistics of running a project



Chimney stack parts ready to be hoisted into place.



FRP cans from the mold prior to assembly.

A Challenging Chimney Project, continued

in coastal Israel and the engineering and construction of the liners. Together with IEC, AOC partnered with Plasticon Composites and Commonwealth Dynamics to overcome those challenges.

Confronting a Complicated Supply Route

Hadera, where Orot Rabin is stationed, is 28 miles from the major cities of Tel Aviv and Haifa. Transporting finished products to the project site by road would be too costly. So Plasticon Composites built an onsite factory to fabricate the liners. All raw materials—including resins, glass fiber and blending compounds—had to be shipped to the coastal power station. “Having an onsite factory is the main reason we were able to fabricate high-quality liners within the tolerances,” says Koenis. “It’s a unique way of producing.”

AOC delivered 265 metric tons of (584,000 lbs) resin by sea in 10 separate shipments from its plant in Thailand to Haifa, then transported it by truck to the production site. Each delivery of resin was offloaded immediately into insulated intermodal containers (ISO) and stored until fabrication.

Vipel K022-ACA resin was selected for its corrosion resistance and fire resistance, plus its heat deflection-temperature (HDT) properties. It also offers excellent mechanical properties for filament winding. Even so, the design of the chimney created engineering challenges for Plasticon Composites and its material suppliers.

Crafting an Engineering Solution

The new chimney, designed by the IEC, includes scrubbers that process gases from the power station and mix them with gypsum to remove polluting gases from the stack. Those gypsum absorption scrubbers sit in the lower part of the chimney, up to 147.6 feet (45 meters). Typically, chimneys are straight stacks that house the support structure for FRP liners. The chimney at Orot Rabin has a silo underneath it to store and process the gypsum.

This unique design, in turn, meant that the IEC had exacting specifications for the FRP liners. The liners run down the chimney and have elbows at four different points. The entire liner is exposed to winds, which places a tremendous load on it. “We were able to overcome these challenges through design and engineering,” says Koenis.

AOC assured that the resin would stand up to the challenges. “The upset temperatures and duration of the upset temperatures were much higher than what we normally see in stack liners,” says Jim Ness, corrosion market specialist with AOC. “It challenged the resin because resin has a particular heat deflection temperature and its structural capacity diminishes as it approaches that level. So the design had to accommodate the resin’s strength at this higher temperature.”

Working hand-in-hand with AOC, Plasticon Composites devised a fiberglass engineering solution that worked. “AOC was very involved and did an extreme amount of testing—more so than we would do on a regular job,” says Koenis. “AOC supported Plasticon Composites throughout the engineering process and ensured on-time delivery.”

Thanks to its hard work and innovative solution, Plasticon Composites secured a second job with Commonwealth Dynamics. It will supply chimney liners for the Rutenberg Power Station 63 miles (102 kilometers) south of Orot Rabin on the Israeli coast.

About Plasticon Composites

Plasticon Composites is the world’s largest manufacturer of specially engineered FRP products. The company, with headquarters in The Netherlands, offers services and products to customers worldwide through its global network of more than 30 sales and operations offices and on-site winding machines that enable the company to serve customers wherever needed in all conditions.

About AOC

AOC is a leading global supplier of resins, gel coats, colorants, additives and synergistic material systems for composites and cast polymers. For more information on AOC technology, quality and service, e-mail corrosionresins@aoc-resins.com, phone (866) 319-8827, or go to AOC-RESINS.com.

