

CaseHistory

Composites withstand waste-to-energy exhaust heat

Resins:	
Application:	Vipel® epoxy novolac vinyl esters
Composite Applications:	Two chimney liners
Manufacturing Processes:	Filament winding Hand lay-up
Diameter:	55 inches 1400 millimeters
Liner X	<p>Length: 236.2 feet 72 meters</p> <p>Operating temperature: 150°C 302°F</p> <p>One-hour exposures: 180°C 356°F</p> <p>Resin Vipel® F086</p>
Liner Y	<p>Length: 226 feet 69 meters</p> <p>Operating temperature: 130°C 266°F</p> <p>One-hour exposures: 160°C 320°F</p> <p>Resin: Vipel® F085</p>



The stack liners were manufactured using Tunetanken's cutting-edge winding technology.

More than 40 years of experience and expertise helped Tunetanken A/S obtain the contract for high-performance, fiber-reinforced polymer (FRP) composite chimney liners for a modern waste-to-energy incineration plant. To get the best technology, quality and service for the liner resins, Tunetanken specified Vipel® epoxy novolac vinyl esters from AOC.

The incineration plant in Bergen, Norway, is operated by BiR Avfallsenergi, a company owned by various municipalities to convert waste that otherwise would have to be landfilled into useful energy. Incineration exhaust is sent through two composite stacks in a combined housing made of steel.

The liners were installed in the housing by Tunetanken customer, chimney manufacturer Steelcon A/S, Esbjerg N, Denmark, before the lined housing was sent to the plant for erection. One liner is 69 meters (226.4) tall, while the other is 72 meters (236.2 feet) tall. Both liners are 1400 millimeters (55.1 inches) in diameter.

Composites withstand waste-to-energy exhaust heat, continued

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Incineration exhaust is so hot that one liner must withstand an operating temperature of 150°C (302°F) and exposure to 180°C (356°F) for up to one hour. To meet these requirements, the liner was made with Vipel F086 epoxy novolac vinyl ester. The design temperature for the other liner is 130°C (266°F), and the maximum one-hour exposure temperature is 160°C (320°F). These requirements are met with Vipel F085 epoxy novolac vinyl ester.

Manufacturing the liners

Tunetanken manufactured the liners by filament winding resin-impregnated, E-glass roving over a cylindrical mandrel. Each liner was made in three sections that were joined using composite lamination in the field. The longest individual section was 27 meters (88.6 feet).

Laminated joints and the top section of each liner were manufactured using hand lay-up. To improve the resistance of interior surfaces exposed to the hot and corrosive exhaust, 2.5-millimeter (0.1-inch) thick barrier layers were formed with resin-impregnated ECR veils.

“The Vipel epoxy novolac vinyl esters are easy to process for both our winding and hand lay-up operations,” said Tunetanken Administrative Director Henrik Kjærholm. “AOC also has a very fast and helpful team when we need resin chemical resistance data and performance specifications.”

About Tunetanken A/S

Located in Vejen, Denmark, Tunetanken A/S has more than 40 years experience in the design and manufacturing of superior corrosion-resistant composite parts and systems. Applications include silos and tanks for agricultural and industrial use as well as flue gas scrubbers, ducts and stack liners. For more information, phone +45 75588188, fax +45 75588537, e-mail hk@tunetanken.dk, or go to www.tunetanken.dk.



The composite liners were installed in a combined steel housing that was shipped to the plant site.

About AOC

With World Headquarters in Collierville, Tennessee, USA, AOC, LLC is a leading global supplier of materials and systems for composites and cast polymers. AOC serves the global composites industry from twelve manufacturing plants strategically located in nine countries throughout North America, Europe and the Asia-Pacific region. AOC knows technology, lives quality and delivers service better than any other supplier. For more information, e-mail Ben Bogner, P.E., C. Eng., at BBogner@aoc-resins.com, phone him at (630) 665-2675, or go to www.corrosionresins.com.


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