

# CaseHistory

## Composite stacks save taxpayers money



Two 72-foot tall stacks were installed.

Each stack was designed to meet air velocity requirements.

<b>Resin:</b>	Vipel® K022 fire-retardant bisphenol A epoxy vinyl ester
<b>Composite Applications:</b>	Exhaust stacks, ducting, covers, dampers for odor control system
<b>Manufacturing Processes:</b>	Filament winding Hand lay-up
<b>Stack Height:</b>	72 feet (22 meters)
<b>Stack Diameter:</b>	96 inches (152 centimeters)
<b>System Capacity:</b>	120,000 cubic feet (3,400 cubic meters) per minute
<b>Installed:</b>	2010
<b>Location:</b>	Camden, New Jersey, USA

An alternative specification for two new towering exhaust stacks not only significantly reduced initial costs for the Camden County Municipal Authority. The durability and superior corrosion resistance of the stacks' all-composite design will essentially eliminate maintenance costs at a Camden, New Jersey, wastewater facility for years to come.

The 96-inch diameter by 72-feet tall stacks were designed and manufactured by Composite and odor control specialists Engineered Composite Systems. ECS made the stacks and odor control system components with corrosion-resistant and fire-retardant Vipel K022 bisphenol A epoxy vinyl ester from AOC.

To meet the specification for freestanding stacks without guy lines, the Authority initially selected stacks made of steel. A thin inner liner of fiber-reinforced polymer (FRP) composite was to be added to protect the metal from corrosive exhausts. President Jeff Jones pointed out how all-composite stacks could do the job better for less.

## Composite stacks save taxpayers money, continued

“We explained how with a bit of creativity, composites could be used to build stacks which would withstand the same forces that the steel stacks were designed for. In addition the solid composite construction ensures superior corrosion resistance while providing a Class 1 fire rating throughout the entire structure – inside and out.

The stacks were manufactured by the filament winding process in which continuous fiberglass roving is encapsulated in the Vipel® resin. One design parameter that helped each composite stack meet the freestanding requirement was to manufacture the cylinder wall to be well over 1-inch (25.4-centimeter) thick.

Building a composite that thick can compromise laminate integrity because of excess exotherm, the heat generated when a composite resin cures into a structural solid. “Controlled exotherm was another benefit of using the AOC material, Jones pointed out. AOC’s Eric Stuck worked with us to develop a resin formulation that keeps exotherm down until the resin was fully cured.”

### 120,000 CFM System

Suggesting the all-composite stacks drew upon ECS’ reputation for offering superior solutions with high value. “Like everyone else today, municipal authorities are looking for ways to trim costs”, said Jones. “We offer a variety of odor control systems to help meet performance requirements in the most cost-effective way.”

The stacks were a natural extension of an odor control system designed to move 120,000 cubic feet (3,400 cubic meters) per minute of air. The system’s 100-inch (254-centimeter) diameter, filament wound composite ducting and open-molded composite covers and dampers were also made in the ECS facility with Vipel K022 vinyl ester.

Vipel K022 resin resists the highly acidic internal operating environment of the anti-odor system where pH levels can get as low as 2. Furthermore, with minimal synergist addition, the resin meets ASTM E84 Class 1 flame spread requirements.

### About Engineered Composite Systems

Headquartered in Central Texas, Engineered Composite Systems specializes in the design, manufacture, sales and service of equipment for the municipal, chemical and power industries. ECS / BPI is the largest odor control system supplier in North America. Product offerings include a full line of odor control systems, such as carbon adsorbers, chemical scrubbers, several different biological systems, ductwork, dampers, chemical storage tanks and odor control covers. For more information, e-mail [jeff.jones@ecs-frp.com](mailto:jeff.jones@ecs-frp.com) or go to [www.ecs-frp.com](http://www.ecs-frp.com).



The installed stacks cost less than steel.



Composite ducting moves air toward the stacks.

### About AOC

AOC is a leading global supplier of resins, gel coats, colorants, additives and synergist systems for composites and cast polymers. Offering a wide range of Vipel resin technologies, AOC is the leading producer of corrosion-resistant resins in North America. 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](mailto:BBogner@aoc-resins.com), phone him at (630) 665-2675, or go to [www.corrosionresins.com](http://www.corrosionresins.com).

  
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