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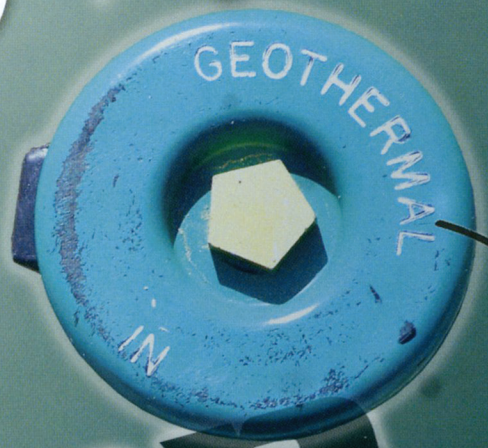

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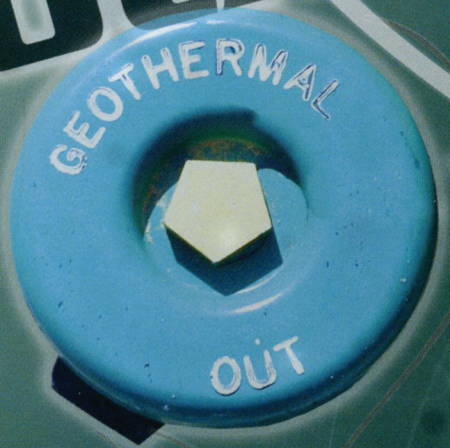


A magazine for sheet metal, heating, cooling and ventilation contractors

Advanced degrees

Connecticut college project required special extreme-temperature duct products

The state of Connecticut has embarked on a huge construction project with Gateway Community College to erect a $198 million addition in downtown New Haven. The 358,000-square-foot campus is one of the largest construction projects ever undertaken by the state, and its first public building designed to be gold-certified under the U.S. Green Building Council's Leadership in Energy and Environmental Design program.

It promises to increase the college's enrollment capacity by 50 percent, making it one of the fastest growing community colleges in Connecticut.

The school is a massive undertaking and consists of two four-story buildings connected by a bridge. One building houses a large commercial kitchen for the culinary arts program and requires high-temperature ductwork for the burner hoods.

The building's unusual design created a few complications.

Grease ducts, unlike ducting used for general HVAC, are susceptible to high-temperature fires because of the grease that accumulates on the inside of the duct. Periodic cleanings by a certified service provider are required, and it's important to make access as convenient as possible so it's done quickly and efficiently.

Standard practice is to run grease ducting vertically with a minimum number of directional changes to the outside — leaving fewer locations for grease to collect and create a fire hazard. The engineer for Gateway college had no other choice but to run the grease ducting horizontally for access to an outside wall.

Special requirements

The grease ducting also requires a special insulation wrap to prevent internal fires from igniting combustibles outside the ducting as well as outside fires from igniting grease within the duct. Historically, rigid fire-rated gypsum or calcium-silicate board was used as the insulators, but today flexible, high-temperature fiber blankets do a better job and are easier to install, many experts say.

Grease ducts also require a means of access to remove the fat and oil buildup, and this is where access doors play a critical role.

"Code requirements dictate a cleanout door be installed every 20 feet and at each change of direction when running the grease duct horizontally," said Glenn Goyer, specifying engineer for BVH Integrated Services in Bloomfield, Conn. "We needed to find a supplier of cleanout doors that would not only meet the fire code but one that preferably was a mated-system with the high temperature insulation that blankets the ducting."

Goyer specified Ductmate's ULtimate and F2 prefabricated grease duct access doors because he was very familiar with their easy installation, "Sandwich" design. Goyer also liked the fact that the Ductmate doors had been tested and approved by Intertek Testing Services

with high-temperature insulation as a single system.

Ductmate's ULtimate and F2 access doors are prefabricated rectangular grease duct doors that have been tested in conjunction with Unifrax FyreWrap Elite 1.5 high-temperature wrap systems to the Underwriters Laboratories' 1978 and the ASTM International E2336 test standards. Both the doors and wrap must meet five separate fire tests, two of which subject the duct to external and internal fires while monitoring the temperature rise.

Important

Sarah Brewer, group product manager for Unifrax LLC in Niagara Falls, N.Y., said joint testing the access doors in conjunction with the high-temperature insulation duct wrap is important to ensure users they have maximum protection against damaging grease fires.

"Grease fires in ducts are about the most severe type of fire a building can experience," said Brewer. "Temperatures can exceed 2,000°F within minutes, igniting surrounding materials."

Unifrax is a producer of high-temperature insulation products for a wide variety of industrial applications. The company says it continually upgrades its flexible, high-temperature insulation wrap in both thickness and density to insure maximum performance and ease of installation.

Brewer described some of the testing methods where the duct outside surface is gradually heated to 1,850°F and held at that temperature for two hours. This tests the insulated duct and access door assembly's ability to block fire penetration in to the duct and to limit temperature rise from ambient to 250°F ensuring an external fire cannot use the duct to spread to adjacent rooms.

Brewer said for the internal test, the grease duct interior is heated to 2,000°F and maintained at that temperature for 30 minutes. The allowable temperature rise is likewise 250°F over the ambient conditions. By passing the rigid testing, the insulated duct and access door assembly proves it can contain an internal fire within the duct and can be installed at zero clearance from the enclosure to the combustibles.

Grease ducting with ULtimate doors in place awaiting layers of high temperature insulation. Door insulation blankets are installed over long studs attached to the door.

Gateway Community College's $198 million addition in downtown New Haven, Conn., is seeking certification from U.S. Green Building Council's Leadership in Energy and Environmental Design program. Images supplied by Ductmate Industries.

Eleven hoods, seven ducts

The school's kitchen has 11 grease hoods with seven ducts running 300 feet, each horizontally. That means there is considerable setup and installation to get the ducting and doors installed correctly the first time.

"The school is a state project and that makes the installation even more critical," Goyer said. "The fire marshals and inspectors are exceptionally thorough and we need to be absolutely certain the ducting is installed exactly to code."

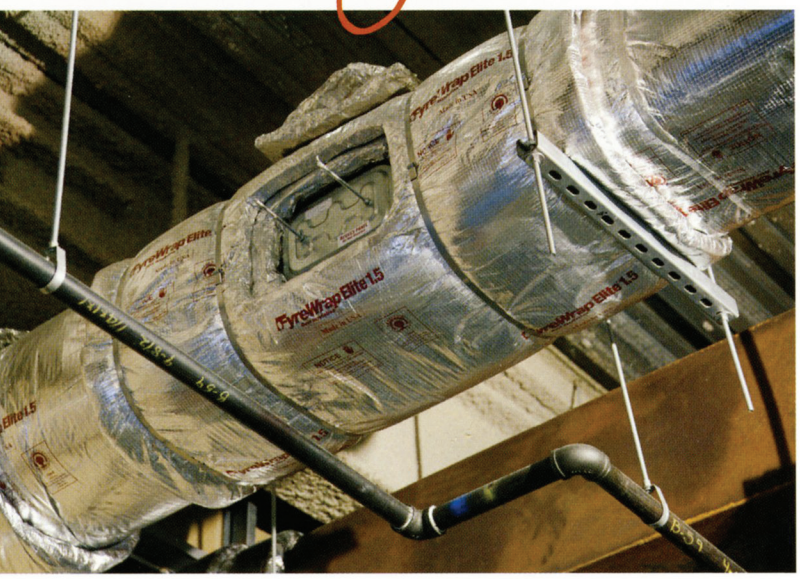
Because of the nature of the project, and the number of cleanout doors required, the duct fabrication process needed to go smoothly to stay on schedule while meeting safety inspection requirements. This is where the Ductmate ULtimate and F2 Sandwiched doors proved their worth.

Jim Sullivan and Al Pressamarita, project managers for Arona Corp., the sheet metal contractor for the project, said a few years ago they made their own doors but that's a thing of the past.

"We would cut the doors out manually and prepare them for installation ourselves," Sullivan explained. "We were introduced to Ductmate doors and have never gone back since."

Sullivan and Pressamarita said Ductmate's doors install quickly. They come with a self-adhesive cut-around template so no measuring is required. A frame is not needed, eliminating fabrication, welding, drilling and sealing.

college



ULtimate access doors remove quickly for duct cleaning by first removing insulation layers and then loosening the tool-less door wing nuts for fast entry, company officials say.

Patented construction

Because of its patented Sandwich construction, the door smoothly slides into the duct opening and is fitted into place. Wing nuts secure it into position and perimeter bolts provide a grease- and airtight seal. No tools are required for installation and removal, and the door's design has minimal protrusion in the airstream.

Site-fabricated doors are certainly nothing new in the HVAC industry but they do take time. The door must be cut from sheet stock and finished. Holes must be accurately drilled, gasket material added and studs welded in place. Depending on the size of the door, fabrication and installation time can easily be 90 minutes per opening.

The Ductmate access door took about 30 minutes to install, Sullivan and Pressamarita said.

Sullivan pointed out that once they cut the hole in the grease duct, they quickly install the Ductmate door in place, and it's ready for hanging. Extra-long threaded rods extend beyond the outside door to accept the high temperature insulation wrap at the jobsite.

In a typical grease duct installation, the FyreWrap Elite flexible insulation is applied in two layers to a thickness of 3 inches while the Ductmate grease duct access door has three layers for a total of 4 ½ inches. The three layers of insulation are step cut for an overlapping seal, pierced onto the extended door bolts and covered by an insulation plate.

Vince Bloom, engineer for Ductmate Industries, says the ULtimate and F2 Sandwich access doors are up to the job.

"Ductmate manufactures its ULtimate and F2 access doors for high-temperature applications where as the ULtimate was designed specifically for grease duct application," he said.

Bloom said the rectangular and round ULtimate doors are manufactured from 11-gauge black iron and includes a high-temperature, full-size ceramic board gasket rated to 2,300°F. Wing nuts and thumb bolts eliminate the need for tools during installation or removal.

And while the ducting project ran smoothly overall, Goyer said there were additional benefits that made the job satisfying.

"It was a painless experience and Ductmate helped us fully," he said. "When we specify a product, we need results, not excuses, and they were there when we needed them."

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