

Pre-Fabricated Duct: Designing a Well-Rounded Solution for University Dining Trends



Case Western Reserve University in Cleveland, Ohio, met these particular challenges with intense collaboration and the final decision to use pre-fabricated, zero-clearance grease duct from the Duravent Group.

The 28,079 sq ft dining hall renovation began in spring 2020 and involved a thorough gutting of the existing building to accommodate a reimagined two-story, open-concept kitchen and dining space, with a large, centrally located kitchen/food service island and a separate hot/cold food preparation area for “after-hours” food and beverage service. Grease duct was required to serve exhaust hoods in both areas, with some of the duct openly exposed to the main dining space.

As universities press forward in their efforts to attract more students, showstopping dining facilities are increasingly part of the pitch. From wood-fired pizza ovens to sushi, universities are doing everything they can to meet the high expectations of Gen Z and their parents, both in terms of food options and dining environments.

However, serving up all that variety can be challenging when it comes to grease duct design, especially in a renovation project where space limitations make it hard to deliver a safe and aesthetically pleasing environment. The design and mechanical teams for the new Fribley Dining Commons at



Matt Murphy, PE, LEED AP at Karpinski Engineering in Cleveland, Ohio, was the lead mechanical design engineer and project manager for the Fribley Commons renovation.

With two distinct (front and back-of-house) kitchens, Murphy originally specified pre-fabricated round grease duct for the front-of-house kitchen since the duct would be exposed to the dining area and specified common welded duct for the back-of-house kitchen. But when the mechanical contractor suggested that using all pre-fabricated duct from the Duravent Group would help facilitate the project, Murphy was amenable.

“Anything that helps the contractor helps us. Generally, we try to do whatever we can to streamline their process,” said Murphy.

Smith & Oby isn't just one of the most experienced contractors in all of Ohio, having provided mechanical services to educational, healthcare, civic and industrial facilities for over a century, the company also has extensive in-house welding and sheet metal fabrication capabilities. They are more than accustomed to fabricating their own duct, which makes it all the more telling that they chose Duravent's pre-fabricated grease duct for the Fribley Commons project.



Chris Klein, Project Manager for Smith & Oby, explained “Logistically it just made sense to use one type of duct.” He also used Duravent pre-fabricated flue duct for venting three Patterson-Kelley condensing hot water boilers on the project. The Duravent Group's specialty duct product lines, through Duravent and Security Chimneys brands, are UL listed for boiler, engine exhaust and grease duct applications which allowed for one source of product and design support.

No Leaks, No Welding

Pre-fabricated, UL Listed grease duct offers many advantages to installers and owners.

Topping the list is enhanced fire safety since grease fires are an all-too-common occurrence in commercial and institutional kitchens and can quickly become catastrophic if the duct is not properly installed.

The Duravent Group's pre-fabricated duct virtually eliminates the chance for installation errors, as experts design each and every component for the specific job and provide precise 3-D drawings for the installer to follow. The Duravent zero clearance grease duct is also tested per UL-1978 and UL-2221 standards and therefore does not require additional insulation wrap to achieve its 2-hour fire rating. Less wrap means fewer inspections, less fabrication time on jobsite and dramatically improved aesthetics.



Duravent's exclusive No Leak EZ Install sleeve provides joint redundancy to eliminate potential leaks from the initial inspection through the frequent Code required cleanings for grease duct applications. The sleeve additionally makes installation easier by perfectly positioning and supporting any two pieces of duct when they are joined together. The end result is a system that passes smoke, light and even stringent water tests with a perfect score and won't leak grease, cleaning chemicals or smells into the space through the lifecycle of the exhaust system.

These modular, Plug-N-Play systems ship complete with all the components that are required to assemble the exhaust duct, connect it to the fan hood and anchor it to walls, roof, and floors.



"Since no welding is required, you also reduce safety prep, smoke eaters, etc. that goes with hot work," added Klein.

A Lot of Teamwork

D.B. Johnsen Company provided approximately 270 ft of zero clearance Duravent pre-fabricated double-wall stainless steel grease duct that served two kitchen exhaust fans. One system used a 34-in diameter common duct to connect kitchen hoods to a 9610 CFM exhaust fan and the other system used a 32-in diameter common duct to connect the kitchen hoods to an 8184 CFM exhaust fan. In addition to the building layout, the zigzag profile of the art deco roof made rooftop installations tricky and limited the layout options for much of the interior ductwork. “It was a pretty tedious job,” said Vince DiCaprio of D.B. Johnsen, recalling that there were several design iterations to the duct layout, as one space issue after another reared its head.

Each change required significant collaboration between the contractor and the manufacturer.

“Our lead coordinator, Mike Luke, worked closely with other trades on the project to come up with a routing plan for the duct, which we passed onto the Duravent Group. They came back to us with nice, 3-D drawings already approved by the engineer. Their support team was really good.” Said Chris Klein.



While Klein said that maneuvering very wide diameters of the double-wall duct was challenging due to the tight space, the installation team found the 24-in and under pre-fabricated duct easier to install than welded black iron. “Once you get the hang of it the install goes well.”

“We love to work directly with the Engineering and Contracting Community. We have so much experience with the product and have seen so many applications that it allows us to provide solutions that others don’t see. Working directly on complex projects can save all stakeholders time and reduce cost.” Said Mike Heavener, Technical and Application Manager at the Duravent Group.

Controlled Outcomes

Matt Murphy noted that, from an engineering perspective, there are many advantages to pre-fabricated duct, even though his firm typically “defaults” to welded duct unless the space demands the cleaner, more refined look of pre-fabricated duct. However, Karpinski Engineering is generally open to pre-fabricated duct if it is what the contractor prefers.



“There are many times when pre-fab can and should be driven by the contractor. It’s good for contractors to make that suggestion and the more they do, the more likely we are to change our basic specification.” Said Murphy.

For Murphy, the greatest incentive for specifying pre-fab is that it gives the engineer more control over the outcome. With experts like the Duravent Group providing the design and selection of each and every component, he knows the system will go in exactly as it is drawn. That’s not always the case with welded iron installations, which have a tendency to evolve at the job site, often creating conflicts over space with other trades.

“For an engineer, having a project go in exactly as planned is a sign of success,” continued Murphy.

The same might be said for colleges and universities, now more focused than ever on leveraging dining facilities as a means toward increasing enrollment.

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