

Factory-Built Grease Duct

New Code, Historic Downtown Building How Restaurant Rehab Incorporates Factory- and Field-Fabricated Grease Duct to Solve Code and Space Issues.



1

Like so many towns across America, Lancaster, Pennsylvania, is in the midst of a revitalization. Preserving the architectural integrity of Lancaster's historic downtown has, and continues to be, a major concern for the city as owners and developers seek to reimagine centuries-old buildings into thriving commercial and retail spaces. Restaurants are among the most challenging spaces to integrate into the existing historic infrastructure, largely because of the space required to install code-compliant grease duct for kitchen exhaust. A major renovation to Yorgos restaurant at 66 N. Queen St. proves it can be done.

In 2013, the City of Lancaster issued a new building ordinance requiring all commercial kitchen duct systems built with Type I hoods be designed, constructed, listed, and installed in accordance with UL 1978 and Section 304.1 of the Mechanical Code. The ordinance, in effect, requires that new or renovated kitchens install factory-built, UL-Listed grease duct instead of field-welded systems.

The reason behind the ordinance is safety. Prior to 2013, code officials frequently encountered sub-standard field welding of grease duct during inspections, an issue that is known to contribute to fires in commercial kitchens.

"The quality was often poor, and many times systems lacked the required testing," said Gary Horning, bureau chief, code compliance and inspections for the Department of Economic Development & Neighborhood Revitalization in Lancaster.

This problem, coupled with the historic and urban nature of downtown Lancaster, prompted Horning to draft the ordinance requiring all kitchen hoods and grease ducts be listed.

Why Factory-Built is Safer, and How it Saves Time

Since passage of the ordinance, fire safety and code compliance throughout Lancaster has "improved dramatically" according to Horning.

Factory-built grease duct eliminates most, if not all, of job site welding. The systems are modular in design and easily assembled. Instead of welding, components fit together with bands and are made liquid-tight by use of a special sealant. Factory-built systems also include leak-proof, fire-tight access doors, which are required



for regular duct cleaning but are often improperly installed or omitted in field-welded systems.

The DuraVent zero clearance (UL 2221 Listed) grease duct that was selected for the Yorgos project is double-wall stainless steel and ships pre-insulated from the factory, so no additional fire wrap is required to achieve its two-hour fire rating. The product is certified to UL 1978 “Grease Ducts for Restaurant Cooking Appliances” and UL 2221 “Standard for Tests of Fire Resistive Grease Duct Enclosure Assemblies.” DuraVent grease duct also includes a unique centering sleeve that stabilizes the tubes during assembly and covers joint grooves that might otherwise trap grease contaminants. This sleeve offers additional support during installation, and often requires less manpower to hold the duct in position while the sealant is applied.

A Tight Spot

In general, zero clearance, UL-Listed duct saves space, especially when there are long vertical runs that would otherwise have to be enclosed in a fire rated shaft or wrapped in bulky foil-faced insulation. But when ceiling heights are low, as they often are in older buildings, the round shape of factory-built duct can occasionally create some space issues. Such was the case in the Yorgos.

The renovation plan was to convert what was once just a lower level sports bar into a tri-level bar and dining establishment. The multi-million-dollar project involved creating a new kitchen in the basement; a larger, casual sports bar on the first floor; a more upscale dining area called Kefi at Yorgos on the second floor; and a third-floor cocktail lounge, surrounded by a newly constructed outdoor deck.

The problems started in the basement kitchen. “This was an old, historic building and the ceiling height in the basement was too low. The pre-fabricated round duct was not shallow enough to

meet the 18-inch clearance required for the exhaust hood,” explained Edward Poorman, BCO, CCO of Associated Building Inspections, LLC.

To get around this issue, the DuraVent Design Team and Jessica Harrington, executive account manager for Accurex in eastern Pennsylvania, New Jersey, and Delaware, worked directly with Clark Mechanical



Services, Inc., the mechanical contractor, to design transitional pieces between the factory-built duct and a limited amount of field-welded rectangular duct, which can be constructed with a lower profile. Ordinarily field-welded duct would not be allowed in a new or renovated Lancaster building because of the previously mentioned ordinance. However, because making the round duct fit in certain areas of the basement and above the top floor ceiling would involve extensive structural modifications to the building, the construction team (with the help of the third-party inspector) sought and was granted permission from the City of Lancaster to install limited runs of field-weld duct.

Clark fabricated the transitional pieces in its shop according to DuraVent’s design, along with the necessary rectangular sections of duct. All the duct

sections, welded and factory-built, were pre-tested for leaks in the shop using a light test administered by the code inspector under full blackout conditions. Once the complete system was installed, a smoke test was administered at the jobsite to detect any joint leaks. For more information on leak testing, reference DuraVent's leak testing white paper.

Despite the early challenges, William O'Shea, HVAC Manager at Clark, said installation of the DuraVent zero clearance duct is easy as long as installers follow the manufacturer's directions. O'Shea manages installations for Clark Food Service Equipment, sister company to Clark Mechanical, and has extensive experience with field-welded

duct as well as various factory-built duct systems.

"It [DuraVent zero clearance grease duct] is a faster install than their competitors. My field supervisor, Barry Reynolds, likes the bands where you fill in the zero clearance insulation. It goes in a little easier than other listed ducts," said O'Shea.

O'Shea is referring to the extra-large spacing between the outer wall sections of DuraVent's zero clearance grease duct. The extra space and a unique flanged design provides workers with more room to insert the insulation and then attach the outer band with bolts without cutting their hands on sharp metal. This feature alone can save installers a significant amount of time and aggravation on large jobs.

Mission Accomplished

Yorgos is a perfect example of how design build teams, owners/developers, and Authorities Having Jurisdiction (AHJ) can come together to resolve problems that might otherwise bring construction projects to a screeching halt. The goals are always the same, even if the challenges vary from project to project. Historic Districts, due to their construction materials and past practices, are at risk. A fire event means potential danger to the adjacent structures and the possible loss of a community's history and related tourism revenue. Factory-built reduces the probability of a fire and its consequences. Current safety codes must be upheld, and historic architecture must be preserved while owners and developers move forward with projects that revitalize downtown spaces and economies. In this case, a mixed approach using the required UL-Listed zero clearance grease duct with a limited amount of carefully designed, shop-fabricated transitions with appropriate fire wrap kept the project on track. The result is a vibrant three-story restaurant/bar where patrons have a new view of a very old town.

¹ <https://www.opentable.com/yorgos-restaurant-and-lounge>

For more information and literature on grease duct systems, please visit:
duravent.com/kitchenexhaust • securitychimneys.com/kitchenexhaust

DuraVent[®]

