Plastics News

PLASTIC VENTING PRODUCERS SEEK CODE UPDATE FOR SAFETY

By Catherine Kavanaugh
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Two manufacturers of plastic venting systems are pushing for a national fuel gas code in the United States that requires Underwriters Laboratories Inc. certification for use in some natural gas-fired water heaters, furnaces and boilers.

Albany, N.Y.-based Centrotherm Eco Systems LLC, which produces UL-certified polypropylene systems, and Pineville, N.C.-based IPEX USA LLC, which is introducing a UL-certified PVC formula in a couple of months, say venting components installed with high-efficiency appliances should be made from materials qualified for the application for safety reasons.

UL-listed vent pipes and accessories are engineered systems that connect appliances to a chimney or vent and then direct noxious gases produced by the combustion of fuels, namely carbon monoxide, to the outdoors.

However, the UL standard, called UL 1738, isn't well-known even though it has been around since the 1980s. And, since 2009, PP has been the only nonmetallic material capable of meeting it for so-called condensing Category II and IV appliances.

Even so, U.S. codes currently permit unlisted plastic vents to be installed with high-efficiency Category IV gas-fired appliances if installed according to the manufacturer's instructions, James Molloy, vice president of business development for Centrotherm, said in a phone interview. As a result, some installers are using PVC products designed for drain, waste and vent plumbing applications, not heating, he added.

"They do that because the equipment manufacturers approve PVC as a vent system in their lab testing," Molloy said. "The PVC manufacturers don't certify to the venting standard, yet the equipment manufacturers test them to be used as such. With that type of disconnect, there's apt to be problems, and there have been, like carbon monoxide poisoning."

Venting systems made with unlisted materials are susceptible to corrosion, cracking and joint separation, which can release the dangerous silent killer gas into living areas.

For example, PVC designed for plumbing vents is generally intended for applications where operating temperatures won't exceed 149° F. However, Molloy said situations can arise where gas-

burning appliances run hotter. He pointed to incidents where a plumber sets a boiler at 180°-200° for it to be used with baseboard heaters in a home; or a water heater isn't maintained and scale buildup results in higher flue gas temperatures; or a furnace air filter gets clogged and restricts the air flow that cools flue gases.

"If the plastic doesn't have a high enough temperature rating, it can start to degrade, soften and melt," Molloy said.

In response, Centrotherm, a division of Brilon, Germany's Centrotec Sustainable AG, developed a PP formula that meets the UL-1738 standard for venting systems of gas-burning appliances. Their system, which is branded as InnoFlue, costs more than PVC but is warranteed for sustained flue gases up to 248° F (120° C).

In January, IPEX USA, part of the Oakville, Ontario-based IPEX Group, will introduce the second plastic system – and first engineered PVC system – to meet the standard, Gaetano Altomare, an IPEX product manager, said in a phone interview. Aptly called System 1738™, the components are made from a certified compound PVC that is unlike DWV PVC, foam core PVC or foam core ABS. The soon-to-be-released flue gas venting option made the UL list because it can withstand all the test requirements, including temperature spikes up to 219° F, Altomare said. He is joining Molloy in calling for a national code update.

"There's got to be some level of importance to a subject matter when you've got competing materials uniting for the greater purpose of the industry," Altomare said. "Plastics have been used for decades, however, they have been using plumbing pipe and fittings certified for plumbing standards to vent combustion gases. It's enough of a problem to create a lot of chatter in the industry because of catastrophic failures that have happened."

Altomare wants to redirect the chatter to possible solutions with the System 1738™ product launch and a technical session at the International Air-Conditioning, Heating, Refrigerating Exposition, scheduled for Jan. 14-16 in Atlanta.

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"As a manufacturer of plastics that spends a lot of dollars on research and development, IPEX was able to engineer a plastic of PVC that's now capable of reaching the requirements of UL-1738 and we're the first ones to do it," Altomare said. "We've been working on it the last four to five years, and we're bringing it to market Jan. 1."

Meeting the UL-1738 standard requires passing more than 40 tests to qualify both the material and the performance of the pipe and fittings as a system. Some of the tests cover how the material and system handle low and elevated temperatures, UV light, joint load, vent sag, punctures, impact and flammability. The certification process also includes approval of detailed installation instructions and special labeling requirements. To ensure quality and compatibility, the standard stipulates that pipe, fittings and joining methods from different manufacturers shouldn't be mixed.

Altomare and Molloy would like the next version of the U.S. fuel gas code to mandate certification to the UL standard and eliminate the use of plumbing products for flue gas applications.

"The code for 2021 is being reviewed now and the two of us have submitted for changes that will get reviewed over the course of the next couple of years," Molloy said.

Up to now

The Canadian Standards Association set a precedent for the change, Altomare said, when it adopted the ULC S636 standard for non metallic flue gas venting systems in 2007 after reports of many field failures predominantly involving ABS. Canada doesn't allow plumbing products to be used in flue gas applications and now inspectors can confidently verify whether safety and installation requirements have been met, he said.

In January, IPEX USA LLC will launch a new PVC flue gas venting system that meets UL 1738 standards, which certifies that both the material and system components perform properly and won't leak noxious gases into living spaces.

IPEX USA LLC photo

IPEX offers two options made from certified compounds that meet Canadian venting codes and are branded as System 636® PVC, which is suitable for condensing appliances with flue gas temperatures up to 149° F (65° C) yet meets all performance requirements, and System 636® chlorinated PVC, which can be used up to 194° F (90° C).

"In the U.S., we're trying to take lessons learned from Canada and help develop the industry here," Altomare said.

The issue did make U.S. headlines 20 years ago when the Consumer Product Safety Commission recalled some 250,000 high-temperature plastic vent pipe systems branded as Plexvent and Ultravent after it was found they could crack or separate at the joints and leak deadly carbon monoxide gas. While no deaths were directly attributed to cracked pipes, CPSC said four people died because of incorrectly installed plastic vents in 1994 and 1995.

The recall of the two product lines began in 1998 following landmark mediation with 27 manufacturers of vent pipe, boilers and mid-efficiency furnaces. The manufacturers agreed to pay up to $100 million to replace the plastic vent pipes with metal pipes.

"The recall essentially involved every major appliance manufacturer in North America," Altomare said. "That plastic was then no longer allowed to be used."

More recently, he said foam core ABS and foam core PVC were deemed unsuitable for flue gas venting. The exhaust temperature can distort the interior core and cause holes or cracking of the pipe and fittings after prolonged exposure. The appliance manufacturers again modified their list of approved materials, Altomare said, but he thinks there's a better solution.

"Instead of identifying unsuitable materials as a result of failures, let's move away from plumbing products and go to products certified to a venting standard," he said. "The industry turned to plumbing products because of a lack of awareness of UL-1738, and plastics weren't capable of meeting it. But things have evolved. Technologies have emerged. We're capable of engineering and sourcing plastics today that meet the standard. We need to go out and educate the industry."

At state levels

In the meantime, some places are addressing the issue locally and statewide. Idaho requires a pressure test. New York City prohibits the use of PVC for appliance venting. And New Hampshire requires installers of Category IV venting to select materials based on the high-limit set point of the appliance.

A 2016 bulletin announcing the New Hampshire amendment says, "Upon investigation and the study of Category IV venting, it was concluded that certain types of venting systems recommended by the appliance manufacturer can fail when exposed to periods of operation outside the parameters of the safe operating temperature of the venting material."

In Danvers, Mass., Altomare said town officials only allow UL-1738-certified products for venting combustion gases, which he thinks is the way to go.

"There's no consistency in the American industry today," he added. "UL-1738 will help create consistency and through that you build awareness. It brings attention to the overall purpose and objectives."

Centrotherm and IPEX also are trying to get the attention of other agencies that write codes, such as the International Code Council, International Association of Plumbing and Mechanical Officials and National Fire Protection Agency.

"Most of them follow the NPFA," Molloy said. "We're working on changing NFPA 54 to require UL-1738 or have the equipment manufacturers actually supply their own vent systems."

In the market

Some equipment manufacturers are content to allow DWV PVC with their installation instructions because alternatives like PP and stainless steel can cost three times more.

"If you're the only one that doesn't have PVC, then you're the one that supposedly has a higher-cost system," Molloy said.

With most venting systems in the 3- to 25-foot range, the price difference is generally about $100 or less.

Other installers are concerned that if UL-1738 is enforced, it will discredit systems put in to date. Altomare tells them not to worry.

"You installed that because nothing was available until now. It's a natural evolution of the industry with new technologies, new materials and new products," Altomare said.

IPEX is producing its new line UL-certified PVC system in Pineville. IPEX USA LLC is the seventh-largest pipe, profile and tubing extruder in North America, according to *Plastics News*' latest ranking.

Meanwhile, Molloy said Centrotherm's sales of PP venting systems, which are manufactured in Albany, have seen double-digit growth since 2010. The company's biggest selling item is residential vent systems, followed by commercial vent systems and then sales to OEMs equipment manufacturers.

Part of the publicly traded Centrotec, Centrotherm Eco Systems is among several companies in the flue gas systems segment, which accounted for 20 percent of 2017 overall sales of $685.1 million (594.2 million euros).