

DuraVent®

PolyPro®

A Better Connection: DuraVent Introduces Best-In-Class Locking Clamp for PolyPro® Vent Pipe



Leaders in-Venting Innovation™

March 2020

This white paper is available for download at no cost at www.duravent.com

This paper is written with regard to applicable codes and standards and intended for use and application in the United States of America.

A Better Connection: DuraVent Introduces Best-In-Class Locking Clamp for PolyPro® Vent Pipe

Polypropylene vent pipe has never been better positioned to become the top choice for venting ANSI Category II and IV gas-burning appliances in North America. For those who have not yet fully embraced the product, DuraVent's new locking clamp for its Polypro vent pipe just might seal the deal.

Polypropylene has become increasingly popular throughout the United States and Canada for venting Category II and IV applications since it was introduced to those markets around 2010. Polypropylene can withstand higher maximum temperatures (230°F/110°C) than either PVC (140°F/60°C) or CPVC (180°F/82°C), making it appropriate for a wide range of heating appliances. It is resistant to the corrosive effects of condensate that forms in the vent and is far less expensive than the next alternative, stainless steel. Polypropylene has also become the go-to solution in jurisdictions where PVC is prohibited as a venting material. However, some installers, accustomed to the solvent welding techniques used to join PVC/CPVC piping components, have not always felt comfortable with the, traditionally problematic, connecting components (clamps and/or locking bands) that have been commonly used on polypropylene systems.

This issue is exclusive to North America, since clamps are not used in the installation of polypropylene vent in Europe, where it has been used successfully for over 20 years. After all, it is not the clamp that provides the "seal" that prevents condensate or gases to leak from the pipe; it is the internal gasket (DuraVent uses EPDM - ethylene propylene diene monomer). In fact, manufacturers of polypropylene vent never even made locking clamps for their products until they began selling them in North America, where standards have evolved specifically to address failures of PVC pipe use with Category II and IV venting applications.

Concern over PVC vent failures led the Canadian Standards Association to adopt the ULC S636 standard as a requirement for non-metallic flue gas venting systems in 2007. This standard references specific tests on the vent assemblies that verify performance in terms of temperature, strength and other attributes relevant to a Category II and IV appliances. In particular it references a "pull" test, included to ensure, among other things, the strength of the adhesive/sealant joined parts of PVC/CPVC:

"Tests are to be made on a sufficient number of assemblies as furnished by the manufacturer to include representative samples of each size part intended to be field-joined to each other. System parts shall not open up, break apart, slip, nor become damaged sufficiently to cause the system to be unsafe for use when subjected to a longitudinal force of 0.45 kN [101 lbs.] . . .

". . . Parts joined by adhesive/sealant shall be allowed to dry or cure in accordance with the manufacturer's installation instructions prior to testing. A force of 0.45 kN, applied as if to pull the assembly apart, is to be applied for a period of 5 min. The force is to be applied along the longitudinal center line of the assembly, and the components are to be gripped such that there is no distortion or bending of the assembly at the joint."¹

¹ULC-S636-08, Standard for Type BH Gas Venting Systems. Toronto, Ontario, CA: Underwriters' Laboratories of Canada



The Pull Test

Several manufacturers of non-metallic vent (PVC, CPVC and polypropylene) in both the Canadian and US markets have had their products tested and listed to ULC-S636. However, as is often the case, the relevancy of a given test tends to vary from one product solution to the next.

Case-in-point, polypropylene vent pipe, widely used in Europe without notable incident, is not a solvent-welded product. Rather, the vent pieces are designed with male and female ends so that the male end of one pipe (or fitting) fits tightly against the gasket when fully engaged in the female end of another pipe (or fitting). No solvents or cements are required for installation. While this works in the field, it is not a connection that can be tested per the above standard since polypropylene pieces are not designed to be permanently connected. Hence, the creation of the various bands or clamps by polypropylene manufacturers; essentially, these parts enable polypropylene vent components to be joined and tested as assemblies. Every manufacturer of polypropylene vent pipe for the North American market has developed their own clamp design for this single reason.

That's not to say the clamps don't provide actual field benefits, but until recently, the various designs have been met with less than enthusiastic response. Installers found some designs are extremely time-consuming and tedious to install, while others felt the clamps were not sturdy enough.

"Some installers had concerns that the clamps might not hold under real world operating conditions and could lead to leaks, even though the internal gaskets are there to prevent leaks, not the clamps," said Chris DeWitt of J&K Sales Associates in Manchester, New Hampshire.

According to DeWitt, there were also concerns that the connections could become loose in the event of an appliance backfire or malfunction. Under these circumstances, connection points (solvent welded or clamped) are vulnerable to leaks.

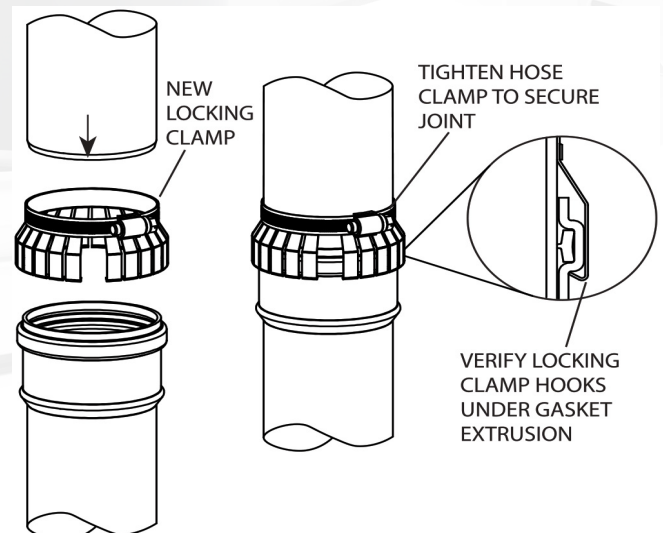
DuraVent Leads With New Clamp Design

Acting upon these concerns as an opportunity to improve their own connection design while positively differentiating Polypro, DuraVent released a new designed locking clamp in Q3, 2019.

The clamp, which can be used on both new and existing PolyPro installations, is made of 430 stainless steel and comes semi-installed on the female end of every piece of PolyPro pipe and fitting. A single stamped part, the clamp seamlessly incorporates a hose clamp and a series of metal "teeth" that encircle the pipe and hook onto a gasket extrusion (seat) on the female end of the pipe.

To make a connection, the installer loosens the hose clamp on the female end of one piece of pipe just enough to slide the male end of another piece of pipe into the pipe until it is firmly engaged within the female end. Using a flathead screwdriver, the installer then hand tightens the hose clamp so that the metal teeth grip the extruded seat on the outside of the female end.

Information with installation instructions for the DuraVent PolyPro Locking clamp can be found by viewing this [video](#), visiting our DuraVent YouTube Channel or by downloading the [Installation Guide](#).



Stronger. Faster. Smarter.



“Testing certifies that the band can support a hanging weight of 101 lbs. (0.45 kN) but our own laboratory tests have shown that it can hold up to 300 lbs.,” said Daniel Smith, product manager for DuraVent. “There’s no question it provides extra structural support.”

This extra support means that the pipe maintains its linear integrity, especially important in a horizontal installation where any interruptions in the pipeline could lead to condensate collecting in the joints and possibly damaging the rubber gasket. As an added bonus, this new locking method reduces connection time by 20 to 30 seconds per joint.

While reexamining the locking clamp design, DuraVent also verified that horizontal PolyPro vent systems only require a 3/8-inch rise per foot of run pitch for proper condensate drainage as opposed to the previously required 5/8-inch. This reduction in required pitch saves precious vertical space over previous DuraVent instructions, especially when appliances are installed in mechanically crowded basements with standard 8-ft. (2.4m) ceilings.

These benefits underscore one of the greatest advantages that polypropylene has over solvent-welded PVC/CPVC systems -- mechanically connected systems can be adjusted! If it is discovered that a section of pipe was cut incorrectly, the piping section can be quickly disassembled, recut and re-installed in short order.

The new clamp has been extremely well received and reports from the field have been positive. Most importantly, installers are feeling much more confident about the systems they install.

According to Smith, “bottom-line, installers want to feel the strength of a mechanical connection on a gas vent pipe. If that’s not there, it doesn’t matter how many listings a product has.”

For more information on PolyPro venting solutions, visit:
www.duravent.com.

DuraVent®