

Technical Note

TN 5.16_C Methods for Sealing Vent Tubes

Introduction

The manufacturing process of corrugated plastic pipe requires the release of hot air from inside the corrugations in order to properly form the corrugations. This hot air is allowed to escape from the corrugations during the extrusion process via vent tubes that run the length of the pipe. Vent tubes become exposed when the pipe is cut in the field to install a fitting, connect to a manhole, or otherwise adjust the length of a pipe run. Exposed vent tubes may result in a leak path, and therefore it is recommended that they be sealed. It should be noted that internal cuts or exposed vent tubes are not structural concerns and the requirement to seal them depends on site conditions and project specifications. A variety of methods can be used to seal vent tubes. This technical note will discuss two methods, spin welding and chemical adhesives.

Spin Welding Vent Plugs

Spin welding is a technique that can be used to seal vent tubes. The spin welding method utilizes the heat produced by friction to create a weld between the pipe and a vent plug.

To create a quality weld, the plug and the pipe must be the same material. Plugs made of either polyethylene or polypropylene are to be used (see Figure 1). They are designed with a shank that fits into a drill, and they also have multiple sealing segments to accommodate different vent tube sizes. The vent plugs are sold kits for the different pipe materials. Table 1 shows the vent plug kits.

Table 1: Vent Plug Kits

Kit Number	Pipe Sizes	Vent Plugs in Kit			Minimum Vent Tube Diameter	Maximum Vent Tube Diameter
		Part Number	Material	Quantity		
1260VPPPK	300 mm - 1500 mm (12" - 60")	1260VPPP	Polypropylene	10	4.6 mm (3/16")	21.8 mm (7/8")
1260VPPEK	300 mm - 1500 mm (12" - 60")	1260VPPP	Polyethylene	10	4.6 mm (3/16")	21.8 mm (7/8")

Tools Required

Tools required for installation are a standard drill and drill bit. The drill should be set to its highest speed and it must be able to reach a ***minimum of 1500 rpm***. If using a cordless drill, it should have a fully charged battery. A drill bit will only be necessary in a case where the vent tube diameter is smaller than the minimum diameter from Table 1 above. If the vent tube diameter is too small, it will need to be drilled to the correct size.

Installation Instructions

1. The pipe must be cut directly in the center of the valley between corrugations (see Figure 2). Failure to do this will result in a vent hole opening that cannot be welded shut with the spin welding method (see Figure 3).
2. Ensure that the diameter of the vent tube meets the minimum requirement from Table 1.
3. If the vent tube diameter is large enough, skip to step 5. If the vent tube diameter is too small (see Figure 4), drill out the vent tube using a drill bit that corresponds to the minimum vent tube diameter from Table 1 (see Figure 5).
4. Manually lock a vent plug into the drill chuck so that the entire shank is held by the chuck (see Figure 6). Do not lock the plug into the drill under power.
5. With the power off, position the tip of the plug into the vent tube, and then start the drill.
6. With the drill at its highest speed, put slight pressure on the drill to begin inserting the plug into the vent tube (see Figure 7).
7. Continue letting the drill spin, and the plug will gradually push into the vent tube. It should take about 30-seconds to complete a weld. Reduce pressure on the drill if the plug appears to be inserting into the pipe too quickly.
8. When the vent plug appears to have been inserted enough to completely seal the vent tube, continue spinning the vent plug to the next larger segment. Stop the drill when this segment is flush with the pipe (see Figure 8), and hold the drill in place for no less than 20-seconds to allow the weld area to cool.
9. After the weld has cooled, squeeze the trigger of the drill again. If a quality weld was created, the shank of the spin plug will shear off (see Figure 9).
10. Release the trigger and manually un-chuck the plug shank.

Figure 1: Vent Plugs

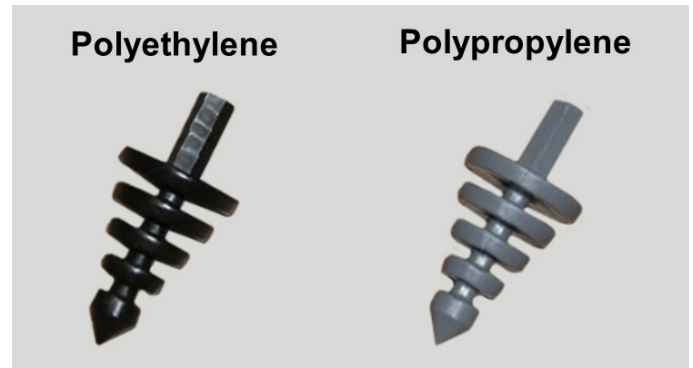


Figure 2: Cutting the Pipe



Figure 3: Incorrectly Cut Pipe



Figure 4: Small Vent Tube



Figure 5: Drilling Vent Tube



Figure 6: Chucked Vent Plug



Figure 7: Spin Welding



Figure 8: Holding Drill Flush



Figure 9: Sheared Shank



11. If necessary, the welded area can be cleaned up with a sureform tool or similar scraping device (see Figure 10).
12. Visually inspect the weld, and check for looseness.
13. Repeat steps 2 through 12 for each exposed vent tube

Figure 10: Finishing the Weld



Sealing Vent Tubes with Chemical Adhesives

Another method of sealing vent tubes is by using a chemical adhesive along with polyolefin material. This approach requires a specially designed 2-part adhesive, applicator gun and polyolefin material in the shape of small discs. This method can be more cumbersome and expensive than the aforementioned procedure, but may be used when spin welding is no longer an option, as may be the case with a very large vent tube

1. Prepare the area to be sealed by first lightly scuffing and removing any small flakes of plastic with the use of a medium grade sand paper or round file.
2. Using acetone or Isopropyl alcohol, thoroughly clean the area to be bonded of any dirt, grease, or foreign debris and allow the area to fully dry prior to applying epoxy.
3. Using an epoxy suitable for PP bonding (3M® Scotch-Weld Acrylic Structural Plastic Adhesive DP-8005 or other approved adhesive), liberally coat a small area around the hole and thoroughly fill the hole with epoxy. A HDPE or PP disk or chip should be placed over the hole and "glued" or bonded with the epoxy to serve as the sealing mechanism.
4. Following all application and cure times as provided by the epoxy manufacturer, a second coat of epoxy may be applied where necessary.
5. Allow to set for 3 hours or as recommended by the epoxy manufacturer before joining to another pipe or disturbing the area which has just been sealed. Temperature and humidity may effect set time. The long-term integrity of the seal is dependent on the quality of the materials and the sealing technique.



Manufacturer Contact Information

ADS cannot anticipate all unique situations encountered on specific installations; however, several common repair methods are addressed in this text. Contact an ADS representative for answers to other unique conditions or for contact information regarding any companies listed in this technical bulletin.

