

Polyethylene Pipe Squeeze-Off

Squeeze-Off Overview

There are instances such as installation tie-ins and emergency repairs, where it may be desirable to stop the flow of gas through polyethylene natural gas distribution pipe. The elastic nature of both HDPE & MDPE pipe is an intrinsic benefit that allows for the pipe to be fully compressed without causing damage nor impacting performance. A properly executed squeeze-off can achieve complete flow constriction however, there are instances where a second squeeze-off is required to achieve complete flow shut off. There are a number of tools available on the market that are capable of squeeze-off by compressing the pipe between two parallel hydraulically driven bars until the inner walls of the pipe make contact.

Manufacturer Guidance

PolyPipe's squeeze off procedures and recommendations are in alignment with the following ASTM specifications and additional guidance pursuant The Plastic Pipe Institute (PPI), American Gas Association (AGA), and OSHA can be summarized as follows.

- ASTM F1041 *Standard guide for Squeeze-Off of Polyolefin Gas Pressure Pipe and Tubing*
 - Tool location is to be *at least three pipe diameters from any fusion joint (butt, socket, saddle or electrofusion) or mechanical fitting*. See PPI TN-54 for additional guidance.
 - Compress the pipe at a slow rate to allow stress relaxation in the pipe. This spec recommends a maximum compression rate of 2 inches per minute. For additional compression rate guidance please refer to PPI TN-54, specifically Table 1 details compression and release times at various ODs and DRs below 32F.
 - It is critical that release rate and squeeze-off tool removal are done slowly in accordance with this spec which states that the release rate not exceed 0.5 in/min
 - Pipe is to be closely inspected for signs of damage following each squeeze-off procedure. Never squeeze off the same area of pipe more than once. If pipe damage is suspected and/or discovered, it is strongly recommended that the damaged pipe be removed from service. Per Section 7.6, *When an emergency condition requires squeeze-off without regard for possible pipe damage, the procedure should include actions to be taken based on the likelihood the pipe has been damaged.*

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- ASTM F1563 *Standard Specification for Tools to Squeeze-Off Polyethylene (PE) Gas Pipe or Tubing*
 - Verify that the squeeze-off tool meets the requirements of this ASTM spec. Center the squeeze-off tool squarely on the pipe. The tool is to be inspected to ensure parallel alignment between the squeeze plates and that the tool is square to the pipe.
 - Do not over-squeeze the pipe. Ensure that the squeeze-off tool has stopping mechanisms in place that limit the squeeze to 70% of twice the maximum wall thickness pursuant ASTM F1563.
- PPI TN-54 *General Guidelines For Squeezing Off Polyethylene Pipe in Water, Oil and Gas Applications*
 - Section 3.0 GUIDELINES FOR SQUEEZE-OFF OF PE PIPES Tool Location –Locate the squeeze-off tool a minimum distance of 3x the pipe diameter, or 12 inches, whichever is greater, from any fusion joint, mechanical connection, prior squeeze-off point, or second squeeze-off tool.
 - Section 4.0— PREVENTING PIPE DAMAGE—Cold weather increases the pipe's susceptibility to damage. Compression and release times should increase by double in cold weather (32°F and below). For pipe that is in above ground applications, consideration may be given to pre-warming the pipe, however this should not replace the increase in compression and release times.
- ASTM F1734 *Standard Practice for Qualification of a Combination of Squeeze Tool, Pipe, and Squeeze-Off Procedures to Avoid Long-Term Damage in Polyethylene (PE) Gas Pipe*
- Safety **Hazard Information Bulletin** on Static Electricity Buildup in Plastic Pipe
[OSHA Hazard Information Bulletins Staic Electricity Buildup in Plastic Pipe | Occupational Safety and Health Administration](#)
 - The American Gas Association (AGA) in its February, 1985 *Plastic Pipe Manual for Gas Service* (Catalog No. XR0185, American Gas Association, 1515 Wilson Blvd., Arlington, VA 22209) states: "When conditions exist that a flammable gas-air mixture may be encountered and static charges may be present, such as when repairing a leak, squeezing off an open pipe, purging, making a connection, etc., arc preventing safety precautions are necessary." (Squeezing off involves clamping down a plastic pipe to stop flow upstream of a leak or rupture. This can be done with smaller-diameter pipe, typically two inches or less.)