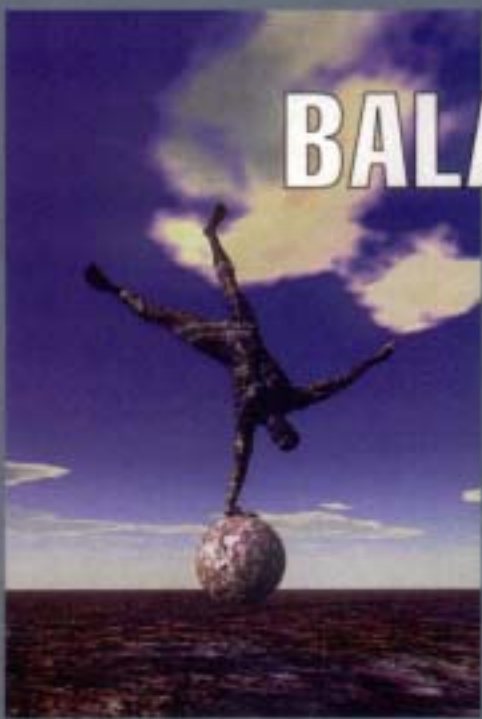




Wisconsin Perspective

A PUBLICATION FOR WISCONSIN PLUMBING AND HVACR-RELATED INDUSTRIES



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A SINGLE SOURCE FOR PIPE AND FITTINGS CAN SIMPLIFY YOUR LIFE

By Chris Horner, Horner Plumbing

You've seen it before. It's happened to all of us at one time or another. A joint in the plumbing system failed, causing a leak. The subsequent damage and construction delays can be costly. The pipe manufacturer blames it on the fitting maker, and the fitting maker blames it on the pipe manufacturer. But it's your reputation—and pocketbook—on the line.

If this hasn't happened to you, it could if you use pipe from one manufacturer and fittings from another. The solution to this problem seems obvious—specify pipe and fittings from one company. Yet few contractors even pay attention to what brands of pipe and fittings they use, much less whether they come from the same company or not. Too many plumbing contractors think all pipe and fittings are the same and that they all fit the same. Unfortunately, it is possible for a mechanic to receive pipe and fittings that do not fit together properly, even though they meet all of the applicable ASTM standards.

To understand how this is possible, let's first review how pipe and fittings are properly joined. Sometimes apprentice installers believe that a PVC joint is made when the solvent cement hardens and fills the void between the pipe and the fitting, and that the joint will last only as long as the "glue." However, ABS, PVC, and CPVC plastics owe their global popularity and reliability in part to their unique capability of being softened or "melted" by solvent cements. And where the softened pipe is forced into direct contact with the softened fitting, the thermoplastic material at the surfaces becomes co-mingled, forming a cross-molecular bond. Once the surfaces cure and harden back to their original state, the resulting weld is permanent. It is not dependent upon an adhesive for its structural integrity.

This cross-molecular bond cannot be formed if the pipe and fitting are not forced into direct contact. That is why the ASTM dimensional standards for solvent-welded systems require that the pipe be larger than the fitting at the bottom of the fitting hub. For instance,

FEATURE

when manufactured to the nominal ASTM dimension, 2" PVC DWV pipe has an outside diameter of 2.375", and the fitting at the base of the hub has an inside diameter of 2.370". The pipe is .005" larger than the fitting hub, ensuring that the pipe and fitting will be forced into contact at the base of the fitting. This arrangement is termed an interference fit (figure 1).

With that in mind, how then is it possible for pipe and fittings that meet the dimensional standard to not fit together properly? The following example should demonstrate.

The dimensional standard for 2" PVC DWV fittings allow for a variance of plus or minus .005", which could result in a fitting hub at the high end of the range measuring 2.375". Meanwhile, 2" PVC DWV pipe allows for a variance of plus or minus .006", which could result in pipe at the low end of the range measuring 2.369". When a fitting at the high end of the dimensional range is joined to pipe at the low end of the dimensional range, the result is a gap of .006" instead of the .005" interference fit designed for the system (see chart below).

ASTM D-2665 PVC DWV	Nominal	Allowable Variance
2" fitting (socket bottom)	2.370	2.370
Tolerance +/- (0.005)	0.000	+0.005
	2.370	2.375
2" Pipe	2.375	2.375
	0.000	-0.006
	2.375	2.369
Resulting Fit	Interference -.005	Gap +.006

If the system failed, and the pipe and fittings came from the same manufacturer, they should accept responsibility. It's their system. But what if the pipe and fitting came from two different manufacturers? The pipe and fitting both met applicable standards. Who is responsible?

Contractors should hold manufacturers accountable, and the best way for a contractor to do that is to specify pipe and fittings from the same manufacturer. Ideally, the contractor should specify a brand that manufactures to the middle of the specification range or higher, rather than extruding pipe to the minimal allowable wall thickness in an effort to reduce extrusion costs. That way, you get the peace of mind that comes with knowing the system will fit. ■

Chris Horner is vice president of Horner Plumbing, a residential, commercial, and remodeling contractor based in Pewaukee.

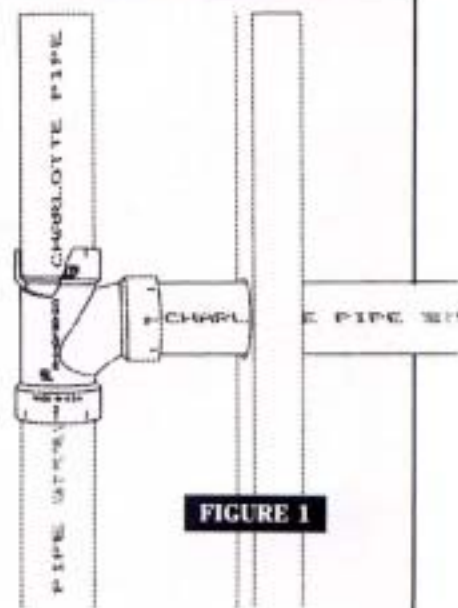


FIGURE 1

