

TRANSITIONING BETWEEN DUCTILE IRON AND PVC PRESSURE PIPES

In some field situations, it becomes necessary to transition between ductile iron (DI) pipe and AWWA C900 PVC pipe made to the Cast-Iron equivalent Outside Diameter (CIOD) system. Pipes made from both materials use the same outside-diameter regimen – meaning that the outside diameters specified in the respective product standards are identical. Thus, it would be logical to assume that the spigot of one pipe should fit into the bell of the other. However, there are three factors to consider:

1. Actual outside diameters
2. Spigot-end bevels
3. Bell-socket depths

WHY DI SPIGOTS SHOULD NOT BE INSERTED INTO PVC BELLS

ACTUAL OUTSIDE DIAMETERS

DI pipe ODs are held to tight tolerances in the inside of the bell and the outside of the spigot, while the outside of the remainder of the barrel of the pipe is held to looser tolerances. As a result, the OD of field-cut DI pipe may vary. When inserting a field-cut DI spigot into a PVC bell, this variation could create either:

1. Difficulty in joint assembly due to too large a DI outside diameter
2. Joint leakage caused by too small a DI outside diameter

SPIGOT-END BEVELS

DI pipe has a smaller bevel than PVC pipe. When inserting a DI spigot into a PVC bell, the relatively square, sharp edge of the DI spigot can damage or dislodge the gasket during assembly.

For these reasons, insertion of a DI spigot into a PVC bell is NOT recommended.

Transition couplings are available that provide watertight joints between PVC and DI pipes. Typical products include solid-sleeve couplings or mechanical-compression couplings. Use of one of these products is recommended rather than inserting a DI spigot into a PVC bell.

INSERTING PVC SPIGOTS INTO IRON BELLS – EASILY ACCOMPLISHED

BELL-SOCKET DEPTHS

DI pipe has shorter bell sockets than PVC pipe. Prior to inserting a PVC spigot into a DI bell, two modifications are required:

1. *Bevel:* the beveled end of the PVC spigot should be removed and the resulting square outer edge should be ground off
2. *Insertion line:* because PVC pipe bells are longer than DI bells, the PVC spigot cannot be inserted all the way to the pipe's insertion line as would occur with a typical PVC-to-PVC pipe joint. Instead, the insertion line should be ignored and the PVC pipe should be bottomed in the DI bell. When the pipe is fully bottomed, there will be a gap between the insertion line and the end of the DI bell.

References: AWWA C151 "Ductile-Iron Pipe, Centrifugally Cast"; AWWA C900 "Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 in. through 60 in."