

PVC PIPE ASSOCIATION TECHNICAL BRIEF

AWWA STANDARDS FOR PVC PIPE: PRODUCT TESTING

AWWA standards for PVC pipe require extensive testing to assure product quality. In addition to the materials testing covered in Tech Brief “PVC Pipe and Fittings Materials” ([click here](#)), AWWA standards include tests on finished products.

As of 2016, AWWA C900 includes all PVC pipe products – the larger-diameter products that had been covered by AWWA C905 were moved to C900-16. As a result, C905 will no longer be published as a separate standard.

PRODUCT TESTS

Pipe

These tests are conducted by the manufacturers at frequencies specified in the C900 standard:

- Acetone immersion per ASTM D2152 – proper fusion of PVC material
- Flattening per ASTM D2412 – pipe ductility
- Burst pressure per ASTM D1598 – short-term pressure capacity
- Ring tensile per ASTM D2290 – short-term pressure capacity (equivalent to burst-pressure test)
- Sustained pressure (1000-hour) as specified in AWWA C900 – longer-term pressure test

Fittings

Additional tests are required for AWWA C900 fabricated PVC fittings and for AWWA C907 molded PVC fittings. Further information on these tests can be found in the appropriate standards.

OTHER TESTS

Gasketed Joints

All gasketed joints for AWWA PVC pipe and fittings must meet the requirements of ASTM D3139. Testing includes both internal pressure and internal vacuum (to simulate external pressure from ground water). Products include all pipes, fabricated fittings, and molded fittings. Gaskets must meet the requirements of ASTM F477.

Potability

All AWWA PVC pipe and fittings intended for drinking water usage must meet the requirements of NSF Standard 61. Testing includes analysis for the presence of potential contaminants. Products include all pipes, fabricated fittings, and molded fittings.

CERTIFICATION

In addition to quality-control tests done by manufacturers, additional tests are typically conducted by certifying agencies to qualify products for certification. This use of third-party testing agencies provides additional assurance for designers and users of PVC pipe products.

PROCESS ASSURES PRODUCT QUALITY

Testing of AWWA PVC piping products is a comprehensive process:

1. Quality-control tests are conducted at specified frequencies by manufacturers.
2. Quality tests are also conducted by third-party testing agencies.
3. Ongoing product certification is maintained through certifying agencies.

These testing procedures help to assure that PVC piping products meet the requirements of the AWWA standards.

References: ASTM D2152 “Standard Test Method for Adequacy of Fusion of Extruded Polyvinyl Chloride (PVC) Pipe and Molded Fittings by Acetone Immersion” (2013); ASTM D2290 “Standard Test Method for Apparent Hoop Tensile Strength of Plastic or Reinforced Plastic Pipe” (2016); ASTM D2412 “Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading” (2011); ASTM D2837 “Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products” (2013); ASTM D3139 “Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals” (1998); ASTM F477 “Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe” (2014); AWWA C900 “Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 Inch Through 60 Inch” (2016); NSF Standard 61 “Drinking Water System Components-Health Effects” (2016)