1.3 Materials, design, and construction

For plastic piping system components and materials cited by the references in 2, the materials, design, and construction requirements of this Standard and the applicable product standard(s) in 2 shall apply. When materials, designs, or constructions are utilized that are not cited in 2, the plastic piping system components and related materials shall comply with the applicable requirements of this Standard. Plastic piping system components and related materials that incorporate materials, designs, or constructions not cited in 2 shall be acceptable, provided that such plastic piping system components and related materials can be demonstrated to be at least equivalent in terms of strength, quality, effectiveness, durability, and safety to those that are cited in this Standard.

3.27 hydrostatic design stress (HDS): The estimated maximum tensile stress a material is capable of withstanding continuously with a high degree of certainty that failure of the pipe will not occur. This stress is circumferential when internal hydrostatic water pressure is applied.

3.42 pressure rating: The estimated maximum water pressure at a specified temperature that a pipe is capable of withstanding continuously with a high degree of certainty that failure of the pipe will not occur.

3.54 special engineered (SE) specification: A document that specifies the design of an SE product, and the requirements that must be attained to ensure that the SE product is at least equivalent (in terms of strength, quality, effectiveness, durability, and safety) to standardized products having a similar end use.

4.1.1 Virgin materials

Plastic piping system components and related materials shall be produced from virgin plastics complying with this Standard, unless the applicable product standard(s) contained in 2 of this Standard specifically allows the use of recycled plastics.

NOTE—When recycled plastics are used, they shall only be used as specified in the applicable product standard. For example, ASTM F1732 and ASTM F1760 have requirements for recycled plastics, including but not limited to the types of plastics that can be used and any limitations on the amounts of various materials that can be incorporated into the final product.

4.1.2 Rework materials
The use of clean, rework material of the same formulation from the same manufacturer is shall be acceptable provided that the finished products meet the requirements of the applicable product standard(s). Plastic piping system components and related materials shall be manufactured in such a way as to prevent contamination.

4.1.3 Substitution of materials

The substitution of materials used in pipe, fittings, and other components is shall be acceptable provided that the materials meet all of the applicable requirements of this Standard and the applicable product standard(s).

5.4 Critical dimensions

Plastic piping system components shall comply with the critical dimensions of the applicable standards as referenced in 2 of this Standard. For pipe and spigot ends of fittings, the critical dimensions shall be the minimum wall thickness, outside diameter, and out-of-roundness. For pipe intended to be used with insert-type fittings such as PE, PEX, PEX-AL-PEX or PE-AL-PE, the critical dimensions are shall be the minimum wall thickness, the maximum wall thickness and outside diameter. For socket or threaded fittings, the critical dimensions are shall be the minimum wall thickness, socket entrance diameter, bottom diameter, out-of-roundness, socket depth, threads (as measured with thread gauges), and thread length. For other fittings, critical dimensions are shall be those specified in the normative reference standard.

5.8.2.3 Requirements

There shall be no evidence of cracking when viewed with a microscope with a minimum magnification of 10X. Failure of one of the three specimens tested is cause for retest of three additional specimens. Failure of one specimen in the retest shall constitute failure in the test.

NOTE – The requirements for resistance to dezincification and resistance to stress corrosion cracking are intended to establish a minimum level of performance for products intended for use in potable water systems. These requirements are not a guarantee that for prevention of erosion or corrosion will not occur.

7.4 Monitoring

In addition to the physical and performance monitoring requirements specified in 5.6, plastic piping system components and related materials intended for potable water shall be monitored annually to ensure compliance with NSF/ANSI 61, except as permitted in 9.8 for solvent cements and primers. PVC and CPVC pipe, tubing, fittings, and appurtenances intended for potable water shall also be tested a minimum of three times annually for RVCM. Appurtenances produced using a material or compound that is also being used to produce fittings subject to these requirements do shall not require separate monitoring for RVCM. RVCM in PVC and CPVC potable water piping products shall not exceed 3.2 mg/kg.
8.2.1 Designations and Identifications

The manufacturer shall place on all plastic pipe the designations and identifications required in the applicable standards as referenced in 2 of this Standard or as required by the SE Specification. Plastic pipe shall also bear an appropriate code identifying the day, month, and year of production, the extrusion line, and the compound designation. For pipe made by a multiple head, extrusion technique with intermediate storage before marking, a code indicating the week, rather than the day, of production is acceptable. In instances where the manufacturer has more than one plant location or produces for other suppliers or distributors, an identifying symbol shall be used.

9.2 Start-up and qualification

In each case, with the exception of annual and semi-annual tests, the frequency of testing indicated in 9.9 shall be interpreted as follows: the indicated tests shall be performed at the start-up of any production operation, on each extruder or injection molder, and continued until a steady-state operation that meets the test requirement is obtained. The test shall be repeated at the required frequency until there is a change in the steady-state operation. When there is a change in operation, testing shall be conducted continuously until a new steady-state operation is achieved. After a steady-state operation is attained, the applicable testing frequencies shown in 9.9 shall resume.

Mold qualification as discussed in this section shall be defined as molds that produce precise functional finish dimensions not otherwise obtained by an additional manufacturing process. The test frequency indicated for fittings shall be used only after the mold has been qualified. In order for a new or retooled mold to be considered “qualified,” all products from all cavities in the mold shall attain compliance with all of the appropriate dimensions and tests. This does not include annual or semiannual tests. After qualification, the indicated test frequencies shall apply to one cavity per mold, rotating cavities within the mold, including start-ups. If any physical change is made to the mold itself, all cavities within the mold must be re-qualified.

When annual testing is required, annual testing performed by a third-party certifier shall satisfy the requirement.