NSF International
Special Engineered Specification
NSF SE 8200

Polybutylene (PB) Plastic Meter Pit Tubing

The Public Health and Safety Company.™

NSF SE 8200

SPECIFICATIONS FOR A SPECIAL ENGINEERED (SE) PRODUCT

Polybutylene (PB) Plastic Meter Pit Tubing

1. Purpose:

Polybutylene (PB) tubing is used in belowground meter pit installations because its flexibility offers easy access to the meter for maintenance and readability. Polybutylene tubing used for this purpose was previously tested under the specifications of ASTM D2666, which was withdrawn from ASTM in 2005.

2. Scope of Specification:

This specification outlines the requirements and test methods for materials, workmanship, dimensions, sustained pressure, burst pressure, elongation value at break, product marking, and in-plant quality control for polybutylene (PB) tubing (SDR 9 with nominal sizes ¾" and 1") used in meter pit assembly.

3. Application:

This product is intended for use in meter pit assemblies at a use temperature of 73.4°F. It is not intended for general use in water distribution systems. It is the responsibility of the user of this specification to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

Products meeting the requirements of this specification are for use in potable water systems.

4. Reference Documents:

ASTM Standards:

ASTM D1603	Test Method for Carbon Black in Olefin Plastics
ASTM D2581	Specification for Polybutylene (PB) Plastics Molding and Extrusion Materials
ASTM D2666	Standard Specification for Polybutylene (PB) Plastic Tubing

ISO Standards:

ISO 9080	Plastics piping and ducting systems - Determination of the long-term hydrostatic strength of thermoplastics materials in pipe form by extrapolation

NSF Standards:

NSF/ANSI Standard 14	Plastic Piping System Components and Related Materials
NSF/ANSI Standard 61	Drinking Water Systems Components – Health Effects

Plastic Pipe Institute (PPI) Technical Report:

TR-3	Policies and Procedures for Developing Hydrostatic Design (HDS), Pressure Design Basis (PDB), Strength Design Basis (SDB), and Minimum Required Strength (MRS) Ratings for Thermoplastic Piping Materials or Pipe

5. Materials:

5.1 Polybutylene materials must have a Hydrostatic Design Stress of 1,000 psi for water at 73.4°F per Plastic Pipe Institute's TR-3 or a Minimum Required Strength (MRS) of 14 MPa at 20°C per ISO 9080.
5.2 Polybutylene materials must be a Type II, Grade I, Class B with antioxidant, or Class C per ASTM D2581.
5.3 Polybutylene material must have a pressure rating per Table 1.
5.4 Polybutylene materials used in production of tubing meeting this specification shall contain 2% carbon black when tested in accordance with ASTM D1603.
5.5 Polybutylene materials for use in potable water applications shall comply with NSF/ANSI Standard 61.

Table 1 - Standard Dimension Ratio and Water Pressure Rating at 73.4°F

Standard Dimension Ratio (SDR)	Pressure Rating, psi for PB1120
9	250

6. Workmanship and Dimensions:

6.1 The tubing shall meet the workmanship requirements of ASTM D2666 Section 6.1.
6.2 The outside diameter and wall thickness of the tubing shall conform to Table 2. These measurements shall be made per ASTM D2122.

Table 2 - Dimension Requirements for SDR 9 PB Tubing

Nominal Tubing Size	Outside Diameter	Tolerance	Minimum Wall Thickness	Tolerance
3/4" CTS	0.875 in.	+ 0.014 in.	0.097 in.	+ 0.012 in.
1" CTS	1.125 in.	+ 0.014 in.	0.125 in.	+ 0.014 in.

7. Testing Requirements:

7.1 *Hydrostatic Sustained Pressure*:
When tested in accordance with ASTM D2666 Section 7.6, polybutylene tubing shall meet the hydrostatic sustained pressure requirements of Table 3.

7.2 *Burst Pressure:*
When tested in accordance with ASTM D2666 Section 7.7, polybutylene tubing shall meet the requirements of Table 4.

7.3 *Elongation Value at Break:*
When tested in accordance with ASTM D2666 Section 7.8, the minimum machine-direction elongation at break shall meet or exceed an average of 125%.

Table 3 – Hydrostatic Sustained Pressure at 73.4°F	
Nominal Tubing Size	Minimum Sustained Pressure, psi[A]
3/4 in.	475
1 in.	475

[A]The fiber stress used to derive this pressure for PB2110 at 3°F is 2,000 psi.

Table 4 - Burst Pressure at 73.4°F	
Nominal Tubing Size	Minimum Burst Pressure, psi[A]
3/4 in.	550
1 in.	550

[A]The fiber stress used to derive this test pressure is 2,200 psi.

8. Product Marking:

8.1 Product marking shall be applied in such a manner that it remain legible under normal handling and installation conditions.

8.2 The following information shall be placed upon the tubing in no less than 2' intervals:

- Nominal pipe size
- Material designation, i.e. PB1120
- Standard dimension ratio
- Pressure rating at 73.4°F
- Manufacturer's name or trademark
- "SE"

9. In-plant Q.C. Requirements:

The following tests from Table 5 are to be performed at start-up and at the designated frequencies thereafter. These tests shall be performed in accordance with Section 7 of this document.

Table 5 – In-Plant Quality Control Requirements for Polybutylene Tubing	
Test	**Frequency**
Burst pressure[1]	24 h
Dimensions a) Pipe outside diameter b) Pipe wall thickness	 2 h 2 h
Elongation value at break	Annually
Sustained pressure	Annually
[1] If one material is continuously used in several machines or sizes, then when a steady-state operation is obtained on each machine, sample selection shall be from a different extruder each day and rotated in sequence among all machines or sizes.	