HDPE General Specifications & Material Standards

REFERENCE SPECIFICATIONS

- ASTM F714: Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR). Based on outside diameter.
- CSA B137.1: Polyethylene Pipe, Tubing and Fittings for Cold Water Pressure Services.
- ASTM D3350: Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
- AWWA C901: Polyethylene (PE) Pressure Pipe and Tubing, 1/2 in. Through 3 in. for Water Service.
- ASTM D3035: Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR). Based on Controlled Outside Diameter
- ISO 9001:2000: Model for Quality Assurance in Production and Installation.
- AWWA C906: Standard for Polyethylene (PE) Pressure Pipe and Fittings 4 in. Through 63 in., for Water Distribution.
- NSF 14, 61
- API 15LE

MATERIAL

The pipe shall be made from polyethylene resin compound with a minimum cell classification of PE 345464C for PE 3408 materials in accordance with ASTM D3350. This material shall have a Long Term Hydrostatic Strength of 1600 psi when tested and analyzed by ASTM D2837, and shall be a Plastic Pipe Institute (PPI) TR4 listed compound.

The raw material shall contain a minimum of 2%, well dispersed, carbon black. Additives, which can be conclusively proven not to be detrimental to the pipe may also be used, provided that the pipe produced meets the requirements of this standard.

The pipe shall contain no recycled compound except that generated in the manufacturer's own plant from resin of the same specification and from the same raw material supplier.

Compliance with the requirements of this paragraph shall be certified in writing by the pipe supplier, upon request. Manufacture's Quality System shall be certified by an appropriate independent body to meet the requirements of the ISO 9001:2000 Quality Management Program.

PIPE DESIGN

The pipe shall be designed in accordance with the relationships of the ISO-modified formula (see ASTM F714).

$$P = \frac{2S}{(D°/t) - 1}$$

S = Hydrostatic Design Stress (psi)
P = Design Pressure Rating (psi)
D° = ODavg for IPS Pipe
ODmin for ISO Pipe
t = Minimum Wall Thickness
D°/t = Dimension Ratio

The design pressure rating P shall be derived using the formula, expressed in pounds per square inch.

The Hydrostatic Design Basis for PE 3408 materials is 1600 psi.

The pipe dimensions shall be as specified in manufacturer's literature.

MARKING

The following shall be continuously indent printed on the pipe or spaced at intervals not exceeding 5 feet:

- Name and/or trademark of the pipe manufacturer.
- Nominal pipe size.
- Dimension ratio.
- The letters PE followed by the polyethylene grade per ASTM D3350, followed by the Hydrostatic Design basis in 100's of psi e.g. PE 3408.
- Manufacturing Standard Reference e.g. ASTM F 714
- A production code from which the date and place of manufacture can be determined.

JOINING METHODS

Whenever possible, polyethylene pipe should be joined by the method of thermal butt fusion as outlined in ASTM D2657, Heat Joining Polyolefin Pipe and Fittings. Butt fusion joining of pipe and fittings shall be performed in accordance with the procedures recommeneded by the manufacturer. The temperature of the heater plate should be between 400°F and 450°F. Follow the recommendations of ASTM D2657 regarding interfacial pressures for pipe wall thickness less than or equal to 1.5". Follow the manufacturer's recommendations regarding interfacial pressures for pipe walls thicker than 1.5".

Polyethylene pipe may be connected to fittings or other piping systems by means of a flanged assembly consisting of a polyethylene flange adaptor or stub end, and a metal backup ring that has a bolting pattern meeting the dimensional requirements of Class 150, ANSI B16.1/B16.5 in sizes up through 24", and meeting Class 150 Series A, ANSI B16.47 or AWWA C207 Class B for larger sizes. Follow the manufacturer's recommendations regarding bolting techniques and the use of gaskets. Pipe or fittings may be joined by butt fusion only by technicians who have been trained and qualified in the use of the equipment.

GENERAL REQUIREMENTS

The pipe manufacturer shall provide, upon request, an outline of quality control procedures performed on polyethylene system components.