



**Summary of Substantive Changes  
between the 2010 and 2017 editions of  
ASTM F1282 “Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite  
Pressure Pipe”**

**Presented to the IAPMO Standards Review Committee on July 10, 2017**

**General:** The change to this standard may have an impact on currently listed products. The substantive change is:

- Changed the polyethylene material classification and UV requirements (see Section 5.4).
- Added new pressure design basis requirements (see Section 6.7)

Section 1, Scope: Clarified that the scope covers only PE-AL-PE pipe as follows:

*1.2 This specification relates only to ~~metal and plastic~~ composite pipes incorporating a welded ~~metallic~~ aluminum tube having both internal and external polyethylene layers. The welded ~~metallic~~ aluminum tube ~~of itself~~ is capable of sustaining internal pressures. Pipes consisting of metallic layers not welded together and plastic layers other than polyethylene are outside the scope of this specification.*

Section 2, Referenced Documents: Updated the referenced standards as follows:

*~~D1898 Practice for Sampling of Plastics (Withdrawn 1998)~~*

*~~D2104 Specification for Polyethylene (PE) Plastic Pipe, Schedule 40 (Withdrawn 2010)~~*

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

Section 5.1, General: Clarified that the adhesive between layers is a polyethylene melt adhesive as follows:

*5.1 General - The PE-AL-PE pipe is composed of one metallic layer, two layers of the same polymeric polyethylene melt adhesive and two layers of the same polyethylene. For pipe made to this specification the constituent materials must meet the following requirements:*

5.3 Polyethylene: Changed the polyethylene material classification and UV requirements as follows:

*5.3.1 Polyethylene plastics resin used to make pipe meeting the requirements of this specification are categorized by means of two criteria, namely, (1) short-term strength tests and (2) long-term strength tests shall be virgin resin having a material designation Code of PE2708, PE4708 or PE4710. As defined in PPI TR-3.*

*5.3.2 This specification covers pipe made from PE plastics as defined by three hydrostatic design stresses developed on the basis of long-term tests (see Appendix X1). 5.3.3 Polyethylene plastics used to make pipe meeting the requirements of this specification shall be virgin resin meeting the requirements of*



~~either Grade PE20, PE26, PE27, PE30, PE36, PE37, PE40, PE46 or PE47 and meeting the color and UV stabilizer code of either A, B, or C in accordance with Specification D3350.~~

~~5.3.3.1 Class B compounds shall have sufficient ultraviolet (UV) stabilizers to protect the pipe from deleterious effects due to continuous outdoor exposure during storage and shipping. Pipe produced from Class B compounds is not suitable for exposed outdoor application. Class A, B, and C compounds shall have sufficient antioxidants to meet the requirements in Specification D3350.~~

5.3.1.1 The inner PE compound shall meet the color and UV stabilizer code of A, B, C, D or E in accordance with Specification D3350. The outer layer PE compound shall meet the color and UV stabilizer code of E in accordance with Specification D3350.

~~5.3.3.2 Only polyethylene plastics meeting the requirement of Grade PE27 as defined in Specification D3350 shall be used to manufacture pipe rated at 82°C (180°F). The PE27 shall be an ethylene octene copolymer having a PPI listing for 82°C (180°F). 5.3.4 The polyethylene compound used shall meet the minimum 80°C (176°F) temperature stress rupture lifetimes for pipe as specified in Table 7 of Specification D3035.~~

5.3.1.2 Only polyethylene plastics having an HDB at 82°C (180°F) shall be used to manufacture pipe rated at 82°C (180°F).

Section 5.4, Polyethylene Melt Adhesive: Clarified that the adhesive between layers is a polyethylene melt adhesive as follows:

5.4 Polyethylene Melt Adhesive—The polyethylene melt adhesive shall have a density cell of 1, 2, or 3; a melt index cell of 1, 2, or 3; and a color code of A or B, in accordance with Specification D3350.

Section 6, Requirements: Moved the informative Appendix X2. into Section 6.7 in the body of the adding the new pressure design basis requirements as follows:

~~X2.1 The hydrostatic design basis pressures for water recommended by the Plastic Pipe Institute are used to pressure rate the PE-AL-PE composite pipe covered by this specification. These design basis pressures are 2.76 MPa (400 psi) at 23°C (73.4°F) and 2.21 MPa (320 psi) at 60°C (140°F). These hydrostatic design basis pressures apply only to pipe meeting all of the requirements of this specification.~~

~~X2.2 The PE-AL-PE composite pipe meeting the requirements of this specification shall be pressure rated for maximum water pressures of 1.38 MPa (200 psi) at 23°C (73.4°F) and 1.10 MPa (160 psi) at 60°C (140°F) or 0.69 MPa (100 psig) at 82°C (180°F). See PPI TR-4 for these listings.~~

6.7 Pressure design basis (PDB)—All pipe meeting the requirements of this specification shall have a PDB of 400 psi at 73°F and 200 psi at 140°F obtained by categorizing the long-term hydrostatic pressure strength determined in accordance with Test Method D2837 and PPI TR-3. PDB is specific to the particular wall construction and pipe diameter.