



Standard Specification for Linings for Asbestos-Cement Pipe¹

This standard is issued under the fixed designation C 541; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification covers requirements for plastic linings to be applied to asbestos-cement pipe, designed for special service in carrying corrosive fluids. This specification also covers methods of testing plastic lining material as well as sections of lined pipe. The requirements established by this specification shall serve as a guide in, but not the sole basis for, judging the suitability of the product for a particular service. The selection of the material should include consideration of performance in similar applications or testing under the intended service condition.

NOTE 1—To determine the suitability of the product for a particular service or corrosive fluid, refer to the manufacturer for specific recommendations.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 The following precautionary caveat pertains only to the test method portion, Section 9, of this specification: *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

D 543 Practices for Evaluating the Resistance of Plastics to Chemical Reagents²

D 714 Test Method for Evaluating Degree of Blistering of Paints³

D 2946 Terminology for Asbestos and Asbestos-Cement Products⁴

3. Terminology

3.1 Definitions:

3.1.1 *coupling*—fitting made from a larger diameter pipe of at least the same type and class, for joining asbestos-cement pipe that, when properly installed with the proper accessories, develops a joint equivalent in strength and serviceability to the pipe joined.

3.1.2 *lot*—quantity of pipe of a given size and class manufactured during the same shift.

3.1.3 *plastic lining*—a lining formed principally from thermoplastic or thermosetting polymer. The term “plastic coating” is synonymous with the term “plastic lining” with respect to composition.

3.2 Additional terminology is presented in Terminology D 2946.

4. Adhesion Requirements

4.1 Thermosetting polymer linings and those thermoplastic linings that do not rely on mechanical means to hold them to the pipe wall shall have a strong permanent bond to the pipe wall. No sign of peeling or any other form of separation of the lining from the pipe wall is permissible when tested in accordance with 9.2.1.

4.2 If bubbles or blisters appear after testing and are smaller and fewer than Reference Standard 6F of Test Method D 714, a pull-out test shall be performed in accordance with 9.2.2. The adhesion shall be considered acceptable if the results from the pull-out tests exceed 2.75-MPa (400-psi) stress or if at least 75 % of the fractured surface is covered by asbestos cement pulled from the substratum. Retesting shall be required if the failure occurs between the metal contact piece and the lining. Samples with bubbles or blisters that are larger and more dense than Reference Standard 6F shall be considered rejected.

NOTE 2—Pipes producing such bubbles or blisters during testing may be expected to exhibit similar characteristics during actual service.

5. Chemical Requirements

5.1 The plastic lining used shall be highly resistant to acids and alkalis, and shall be completely resistant to acids generated by the hydrogen sulfide corrosion cycle.

5.2 The plastic lining shall withstand a 5 mass % sulfuric acid solution and a 5 mass % sodium hydroxide solution, when

¹ This specification is under the jurisdiction of ASTM Committee C17 on Fiber-Reinforced Cement Products and is the direct responsibility of C17.03 on Asbestos-Cement Sheet Products and Accessories.

Current edition approved Sept. 10, 1998. Published March 1999. Originally published as C 541 – 64 T. Last previous edition C 541 – 98.

² Annual Book of ASTM Standards, Vol 08.01.

³ Annual Book of ASTM Standards, Vol 06.01.

⁴ Annual Book of ASTM Standards, Vol 04.05.