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Standard Specification for Vitrified Clay Liner Plates¹

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1. Scope

1.1 This specification establishes the criteria for the acceptance of vitrified clay liner plates used to protectively line or face pipe, culverts, abutments, structures, or appurtenances.

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

2. Referenced Documents

2.1 *ASTM Standards:*

C 43 Terminology of Structural Clay Products²

C 301 Test Methods for Vitrified Clay Pipe²

3. Terminology

3.1 *Definitions:*—*Clay, fire clay, shale, and surface clay are defined in Terminology C 43.*

4. Classification

4.1 Liner plates manufactured in accordance with this specification shall be known as curved liner plates or flat liner plates.

5. Materials and Manufacture

5.1 Liner plates shall be manufactured from fire clay, shale, surface clay, or a combination of these materials that, when formed into liner plates and fired to suitable temperatures, yield a product that is strong, durable, serviceable, free of objectionable defects, and conform to this specification.

6. Physical and Chemical Requirements

6.1 *Absorption*—The absorption of liner plates shall not exceed 6 %.

6.2 *Acid Resistance:*

6.2.1 This test is used to determine the resistance of liner plates to the action of acids. The test shall be performed only when specified.

6.2.2 Liner plates shall be acceptable if the acid-soluble matter does not exceed 0.25 %.

7. Dimensions and Permissible Variations

7.1 *Tenon Ribs:*

7.1.1 Liner plates shall have either three or five longitudinal, monolithic, dovetail tenon ribs uniformly and symmetrically spaced on the back of the plate (see Note 1). When five tenon ribs are used, the outer fin of the exterior tenons shall be eliminated so that parallel jointing faces between abutting plates may be achieved.

NOTE 1—Special liner plates are available for linings where tenon ribs are not desired. They are furnished in the same thickness, length, and width as standard liner plates.

7.1.2 Tenon ribs shall be of trapezoidal cross section to firmly key or attach the plate into the backup material with a mortising type of fastening. The ratio of the dimension of the larger base to the smaller base shall be about 8 to 5, with the smaller base dimension to be $\frac{5}{8} \pm \frac{1}{8}$ in. (16 ± 3 mm). The smaller base of the trapezoid shall be adjacent to the liner plate.

7.2 *Length:*

7.2.1 Length is the overall dimension of the liner plate when measured in the same direction as the tenon ribs.

7.2.2 Liner plates shall be available in standard lengths of 6 in. (152 mm), 9 in. (229 mm), 12 in. (305 mm), 18 in. (457 mm), or 24 in. (610 mm), with a tolerance of $+0, -\frac{1}{4}$ in./ft of length ($+0, -21$ mm/m of length).

7.3 *Width:*

7.3.1 The width of curved liner plates shall be $9\frac{1}{4} \pm \frac{1}{8}$ in. (235 ± 3 mm) measured along the radial arc.

7.3.2 The width of flat liner plates shall be $9 \pm \frac{1}{8}$ in. (229 ± 3 mm).

7.4 *Thickness*—Liner plates, both flat and curved, shall be $\frac{3}{4} \pm \frac{1}{16}$ in. (19 ± 1 mm) thick. Tenon ribs shall be $\frac{1}{2}$ in. $\pm \frac{1}{16}$ in. (13 ± 1 mm) thick, which provides an overall thickness, at the tenon rib, of $1\frac{1}{4} \pm \frac{1}{8}$ in. (32 ± 3 mm).

7.5 *Design*—Liner plates are designed to be used in the numbers and with radii corresponding to inside diameters as designated in Table 1.

8. Workmanship, Finish, and Appearance

8.1 Liner plates shall be uniformly vitrified throughout their thickness and have a homogeneous structural texture. They shall be free of chips that are more than $\frac{1}{4}$ by $\frac{3}{4}$ in. (6 by 19 mm) in surface dimension or that have a depth greater than $\frac{1}{64}$ in. (4 mm). They shall be free of well-defined cracks and shall

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² Annual Book of ASTM Standards, Vol 04.05.