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Standard Guide for Design of a Liner System for Containment of Wastes¹

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1. Scope

1.1 This guide covers information which will aid in the design of liner systems to minimize the migration of wastes to the environment. Basic information is provided on facility requirements and site characteristics. Information on various liner materials including test methods and suggestions for determination of liner characteristics and compatibility with wastes are also presented.

2. Referenced Documents

2.1 ASTM Standards:

- C 33 Specification for Concrete Aggregates²
- C 109 Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-mm Cube Specimens)³
- C 150 Specification for Portland Cement³
- C 226 Specification for Air-Entraining Additions for Use in the Manufacture of Air-Entraining Portland Cement³
- C 260 Specification for Air-Entraining Admixtures for Concrete²
- C 311 Method for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland Cement Concrete²
- C 494 Specification for Chemical Admixtures for Concrete²
- C 573 Method for Chemical Analysis of Fireclay and High-Alumina Refractories⁴
- C 593 Specification for Fly Ash and Other Pozzolans for Use with Lime³
- C 595 Specification for Blended Hydraulic Cements³
- C 618 Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete²
- C 821 Specification for Lime for Use with Pozzolans³
- C 845 Specification for Expansive Hydraulic Cement³
- D 412 Test Methods for Rubber Properties in Tension⁵
- D 413 Test Methods for Rubber Property—Adhesion to Flexible Substrate⁵
- D 421 Practices for Dry Preparation of Soil Samples for Particle-Size Analysis and Determination of Soil Constants⁶

- D 422 Method for Particle Size Analysis of Soils⁶
- D 427 Test Method for Shrinkage Factors of Soils⁶
- D 471 Test Method for Rubber Property—Effect of Liquids⁵
- D 558 Test Methods for Moisture-Density Relations of Soil-Cement Mixtures⁶
- D 559 Method for Wetting-and-Drying Tests of Compacted Soil-Cement Mixtures⁶
- D 560 Methods for Freezing-and-Thawing Tests of Compacted Soil-Cement Mixtures⁶
- D 624 Test Method for Rubber Property—Tear Resistance⁵
- D 638 Test Method for Tensile Properties of Plastics⁷
- D 698 Test Methods for Moisture-Density Relations of Soils and Soil Aggregate Mixtures, Using 5.5-lb (2.5-kg) Rammer and 12-in. (305-mm) Drop⁶
- D 746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact⁷
- D 751 Method of Testing Coated Fabrics⁸
- D 792 Test Methods for Specific Gravity (Relative Density) and Density of Plastics by Displacement⁷
- D 806 Test Method for Cement Content of Soil-Cement Mixtures⁶
- D 882 Test Methods for Tensile Properties of Thin Plastic Sheetings⁷
- D 1004 Test Method for Initial Tear Resistance of Plastic Film and Sheetings⁷
- D 1149 Test Method for Rubber Deterioration—Surface Ozone Cracking in a Chamber⁵
- D 1203 Test Methods for Volatile Loss from Plastics Using Activated Carbon Methods⁷
- D 1204 Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheetings or Film at Elevated Temperature⁷
- D 1239 Test Method for Resistance of Plastic Films to Extraction by Chemicals⁷
- D 1556 Test Method for Density of Soil In-Place by the Sand-Cone Method⁶
- D 1557 Test Method for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb (4.54 kg) Rammer and 18-in. (457-mm) Drop⁶
- D 1558 Test Method for Moisture Content Penetration Resistance Relationships of Fine-Grained Soils⁶
- D 1586 Method for Penetration Test and Split-Barrel Sampling of Soils⁶
- D 1593 Specification for Nonrigid Vinyl Chloride Plastic Sheetings⁷

¹ This guide is under the jurisdiction of ASTM Committee D-34 on Waste Disposal and is the direct responsibility of Subcommittee D34.05 on Evaluation of Liner Materials.

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² Annual Book of ASTM Standards, Vol 04.02.

³ Annual Book of ASTM Standards, Vol 04.01.

⁴ Annual Book of ASTM Standards, Vol 03.06.

⁵ Annual Book of ASTM Standards, Vol 09.01.

⁶ Annual Book of ASTM Standards, Vol 04.08.

⁷ Annual Book of ASTM Standards, Vol 08.01.

⁸ Annual Book of ASTM Standards, Vol 09.02.