



Designation: D 3748 – 98

Standard Practice for Evaluating High-Density Rigid Cellular Thermoplastics¹

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1. Scope *

1.1 This practice covers the basic test procedures for determination of the physical properties and reporting of data for high-density rigid cellular thermoplastics.

NOTE 1—This practice and ISO Standard 9054 are not technically equivalent.

2. Referenced Documents

2.1 ASTM Standards:

C 177 Test Method for Steady-State Heat-Flux Measurements and Thermal Transmission Properties by Means of the Guarded Hot Plate Apparatus²

C 518 Test Method for Steady-State Heat-Flux Measurements and Thermal Transmission Properties by Means of Heat Flow Meter Apparatus²

D 149 Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies³

D 570 Test Method for Water Absorption of Plastics⁴

D 618 Practice for Conditioning Plastics and Electrical Insulating Materials for Testing⁴

D 638M Test Method for Tensile Properties of Plastics [Metric]⁴

D 648 Test Method for Deflection Temperature of Plastics Under Flexural Load⁴

D 695 Test Method for Compressive Properties of Rigid Plastics⁴

D 696 Test Method for Coefficient of Linear Thermal Expansion of Plastics⁴

D 790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials⁴

D 883 Terminology Relating to Plastics⁴

D 1622 Test Method for Apparent Density of Rigid Cellular Plastics⁴

3. Significance and Use

3.1 This practice provides appropriate testing methods, and a specific data reporting procedure for high-density rigid cellular thermoplastics.

4. Terminology

4.1 Definitions:

4.1.1 *cellular plastics*—plastics containing numerous small cavities (cells), interconnecting or not, distributed throughout the mass. These cells cannot be mechanically assembled, but are produced through the “in situ” plastics processing methods.

4.1.2 *density, apparent*—the mass, in air, of a unit volume of a material.

4.1.3 *high density*—greater than 20 lb/ft³ or 320 kg/m³ (0.32 g/cm³) apparent density.

4.1.4 *rigid*—having an apparent flexural modulus greater than 689.5 MPa (100 000 psi) when tested at 23°C in accordance with Test Methods D 790.

4.1.5 *skin*—a relatively dense layer at the surface of a cellular polymeric material.

4.1.6 *thermoplastic, n*—a plastic that repeatedly can be softened by heating and hardened by cooling through a temperature range characteristic of the plastic, and that in softened state can be shaped by flow into articles by molding or extrusion.

4.1.7 For definitions of other terms used in this practice, refer to Terminology D 883.

5. Sample Preparation

5.1 Samples may be processed directly into proper size specimens or prepared from larger sections as specified in each individual test.

5.2 The report section should be precise as to the manner of sample preparation.

6. Conditioning

6.1 Condition specimens prior to testing in accordance with Procedure A of Practice D 618.

7. Number of Test Specimens

7.1 Cellular plastics are often nonuniform in density distribution; therefore, there should be a minimum of five specimens tested per testing method to obtain representative values.

¹ This practice is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.22 on Cellular Materials—Plastics and Elastomers.

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² *Annual Book of ASTM Standards*, Vol 04.06.

³ *Annual Book of ASTM Standards*, Vol 10.01.

⁴ *Annual Book of ASTM Standards*, Vol 08.01.