



Standard Practices for DETERMINATION OF HYDROSTATIC COMPRESSIVE STRENGTH OF RIGID SYNTACTIC FOAM¹

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1. Scope

1.1 These practices cover the determination of the hydrostatic compressive strength value for rigid (Note 1) syntactic foam (Note 2). Both Practices A and B cover any rigid syntactic foam capable of withstanding hydrostatic pressures of 7 MPa (1000 psi) or higher.

NOTE 1—Rigid is defined as showing no significant change in volume with application of hydrostatic pressure. (This is intended to cover the "non-spongy" type foams whose bulk modulus of elasticity is approximately of the same order as water.)

NOTE 2—Syntactic foam is a material consisting of hollow sphere fillers in a resin matrix.

2. Applicable Documents

2.1 ASTM Standards:

D 695 Test for Compressive Properties of Rigid Plastics²

D 1898 Recommended Practice for Sampling of Plastics²

3. Significance and Use

3.1 Either of the two practices provide information for predicting the usefulness of a syntactic foam for a given hydrostatic pressure application. The practice is limited to foams with a hydrostatic compressive strength of more than 7 MPa (1000 psi) because the accuracy of determinations below this level is questionable.

4. Interferences

4.1 Some of the problems that may be encountered in this practice and should be avoided are:

- 4.1.1 Entrapped air in the pressure vessel,
- 4.1.2 Leaks in the hydraulic system,
- 4.1.3 Testing of "spongy" specimens in-

stead of rigid specimens,

4.1.4 Friction between the seal and the cylinder wall (in Practice A).

5. Safety Precautions

5.1 Observe the usual safety precautions applicable to systems under high hydraulic loads.

5.2 Ensure that all seals are tight.

5.3 Make every effort to exclude large air pockets in the hydraulic system (especially if the hydraulic medium is oil).

6. Sampling

6.1 The material shall be sampled in accordance with the standard methods of sampling prescribed in Sections 10 and 13 of Recommended Practice D 1898.

7. Test Specimens

7.1 The test specimen shall be machined in the form of a right circular cylinder 25.4 ± 0.1 mm (1.0 ± 0.005 in.) in diameter and 50.8 ± 0.25 mm (2.0 ± 0.10 in.) long.

7.2 A minimum of five specimens shall be tested for each sample.

8. Conditioning

8.1 After preparing the specimens, condition them in air for at least 24 h at $23 \pm 1^\circ\text{C}$ ($73.4 \pm 1.8^\circ\text{F}$) and $50 \pm 2\%$ relative humidity.

¹ These practices are under the jurisdiction of Committee D-20 on Plastics and are the direct responsibility of Subcommittee D 20.22 on Cellular Plastics.

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² Annual Book of ASTM Standards, Part 35.