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Standard Test Method for Compressive Strength of Gaskets at Elevated Temperatures¹

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1. Scope

1.1 This test method covers the determination of compressive strength characteristics (crush-extrusion resistance) of gasket materials at elevated temperature.

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

1.3 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:*

F 104 Classification System for Nonmetallic Gasket Materials

F 1315 Test Method for Density of a Sheet Gasket Material

3. Summary of the Test Method

3.1 Specimens cut from gasket material are subjected to various stresses perpendicular to the flat surface of the specimens for a specified time at 149⁵⁰°C (300²°F). Dimensional changes to the thickness and in the plane of the specimen are determined while it is under stress and after the stress has been removed. A graphical display of percent deformation plotted against the applied stress will enable determination of a compressive yield stress point beyond which the material will no longer decrease in thickness without also extruding in the planar dimensions. This condition is also revealed by physical measurements of the change in size of the specimens in the planar dimensions. Tests may be performed at various temperatures, as agreed upon between the producer and the user, to determine the relationship between temperature and compressive behavior.

4. Significance and Use

4.1 The compressive strength or crush-extrusion resistance of a gasket material is a major factor with regard to the selection of a given material for use in a particular sealing application. The significance of the test method is based, in part, on the assumption that a material, once it has been crushed or extruded, will no longer function as effectively as a seal. This assumption can only be used as a guide, however, since exact yield or failure points are difficult to define for gasket materials (which are usually viscoelastic in nature). Two or more materials can be compared to determine differences in their resistance to compressive stress. A sample of material can be compared to an established standard or previously determined characteristics on original lots of the same material, for quality assurance purposes. See 6.2 for discussion of specimen area and geometry effects.

¹ This test method is under the jurisdiction of ASTM Committee F03 on Gaskets and is the direct responsibility of Subcommittee F03.20 on Mechanical Test Methods

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