

Standard Method of Test for

YOUNG'S MODULUS IN FLEXURE OF NATURAL AND SYNTHETIC ELASTOMERS AT NORMAL AND SUBNORMAL TEMPERATURES¹



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This Standard of the American Society for Testing Materials is issued under the fixed designation D 797; the final number indicates the year of original adoption as standard or, in the case of revision, the year of last revision.

Scope

1. (a) This method of test covers the procedures for determining Young's modulus (in flexure) of natural and synthetic elastomers at normal and subnormal temperatures.

(b) Increases in Young's modulus of elastomers upon exposure to progressively lower temperatures are attributable to either or both of the following two distinct freezing effects (see Explanatory Note):

(1) *Second Order Transition (Vitrification)* which is relatively independent of time of exposure to low temperatures, and

(2) *Crystallization* or other effects which are strongly dependent on time of exposure to low temperature.

Procedures for measuring the effects of these two changes are different and are described separately in this method.

Apparatus

2. The apparatus, a satisfactory ex-

ample of which is shown in Fig. 3, shall consist of the following (Notes 1 and 2):

(a) *Cooling Chamber*.—A cooling chamber of sufficient size to contain the test apparatus with openings or ducts appropriately placed for remote control and capable of attaining and holding the desired test temperatures. All specified temperatures shall be maintained within plus or minus 1.0 F., preferably by automatic regulation. Uniformity of temperature throughout the cooling chamber should be assured by means of a suitable air-mixing fan.

(b) *Supports for Specimens*.—Supports for the simple beam test specimens made in the form of a saddle as shown in Fig. 1. The curved surfaces of the supports shall be cylindrical with a radius of 0.187 ± 0.003 in. and at least 1.01 in. in length. The distance between the center lines of the specimen supports shall be 2.000 ± 0.002 in. Retaining pins shall be placed at each end and side of the specimen supports as shown in Fig. 1, to assist in correctly aligning the specimens and to prevent accidental dislodging of test specimens.

(c) *Liquid Containers*.—A means for completely immersing in a liquid the

¹ Under the standardization procedure of the Society, this method is under the jurisdiction of the A.S.T.M. Committee D-11 on Rubber and Rubber-Like Materials.

² Prior to adoption as standard, this method was published as tentative from 1944 to 1946.