



Standard Test Method for Rubber Deterioration—Surface Ozone Cracking Outdoors or Chamber (Triangular Specimens)¹

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1. Scope

1.1 This test method permits the estimation of the relative ability of rubber compounds used for applications requiring resistance to outdoor weathering or ozone chamber testing.

1.2 This test method is not applicable to materials ordinarily classed as hard rubber, but is adaptable to molded or extruded soft rubber materials and sponge rubber for use in window weatherstripping as well as similar automotive applications.

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. For a specific hazard statement, see Note 1 and 8.1.*

NOTE 1—**Warning—Ozone is a hazardous chemical.**

2. Referenced Documents

2.1 ASTM Standards:

D 518 Test Method for Rubber Deterioration—Surface Cracking²

D 1149 Test Method for Rubber Deterioration—Surface Ozone Cracking in a Chamber²

D 4575 Test Method for Rubber Deterioration: Reference and Alternative Method(s) for Determining Ozone Level in Laboratory Test Chambers²

3. Summary of Test Method

3.1 Procedures are given for preparing triangular cross-section specimens, for mounting them in strained condition around specified circular mandrels, and for rating the effect of exposure as evidenced by the appearance of surface cracks. The type, time, temperature, and other conditions of exposure are not given but shall be agreed upon by the purchaser and the seller and shall be completely described in the test reports.

3.2 Two techniques are described, the exposure rating and the quality-retention rating.

3.3 Refer to D 4575 for the reference and optional alternative methods for the measurement of the ozone partial pressure

in laboratory test chambers.

4. Significance and Use

4.1 Molded or extruded rubber products must withstand the effects of ozone cracking and outdoor weathering for satisfactory use. This test enables a simple comparison of performance to be made under specified test conditions, either in a laboratory test chamber or in an outdoor test. No direct correlation between test performance and service performance can be claimed due to the wide range of service conditions.

5. Apparatus

5.1 *Mounting Mandrel*—A wood mandrel 50 mm (2 in.) in outside diameter, suitably coated with spar varnish or a clear lacquer. The mandrel may be supported by any convenient method.

5.2 *Fastening Wire*—Enameled copper wire.

5.3 *Test Chamber*—An ozone chamber as described in Test Method D 1149.

6. Test Specimen

6.1 The triangular cross-section test specimen shall be a molded, extruded, or sponge section with a continuous skin or surface layer, 250 mm (10 in.) long, and cured in a straight position. The cross-sectional dimensions shall be as shown in Fig. 1. Duplicate specimens shall be tested.

6.2 It is recommended that the manufacturer observe a minimum rest period of 24 h between compound mixing and compound preparation, and a minimum rest period of ½h between compound preparation and curing when preparing specimens. The finish of the specimens shall be as smooth as possible.

METHOD A—EXPOSURE RATING

7. Procedure

7.1 *Mounting of Specimens*—Place bench marks on each specimen with a crayon, 190 mm (7.5 in.) apart and 32 mm (1.25 in.) from the ends. Form the specimens into a loop by placing the 19-mm (0.75-in.) sides together and tying securely with wire at the bench marks. Slip the complete loop over the mandrel. Place as many specimens on the mandrels as length of mandrel will permit.

7.2 *Exposure of Specimens:*

¹ This test method is under the jurisdiction of ASTM Committee D-11 on Rubber and is the direct responsibility of Subcommittee D11.15 on Degradation Tests.

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² *Annual Book of ASTM Standards*, Vol 09.01.