



LOW TEMPERATURE BRITTLINESS OF RUBBER AND RUBBER-LIKE MATERIALS

Application

This procedure is used to determine the ability of compounds made from rubber or rubber-like materials to resist the effect of low temperature.

Apparatus Required

Cold Chamber

Capable of maintaining temperature to -40 ± 2 °C. Must be large enough to accommodate test fixture with samples.

Flexing Fixture

The flexing fixture shall consist of two parallel plates each having a width of at least 50 mm so supported in guides that they may be rapidly moved from a position 62 mm apart until they are separated by a distance of 25 mm. Suitable clamping bars shall be provided for holding the ends of the specimens for a distance of 6 mm at the corresponding edge of each plate so that when mounted, the specimens form similar partial loops between the plates. Reference ASTM D 380, Figure 2.

Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 ± 2 °C and $50 \pm 5\%$ relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Procedure

1. Whenever possible, all test specimens shall be die-cut tensile bars conforming to ISO 37 or ASTM D 412, DIE C, from the finished parts. When not feasible, specimens cut from molded test sheets manufactured from the same material and with equivalent cure to molded parts are recommended. The test sheets shall conform to ASTM D 3182.
2. Mount the test specimens in a partial loop position between the plates of the flexing fixture with the enlarged ends spaced at least 3 mm apart and held in the clamps for a distance of 6 mm.

Date	Action	Revisions
2007 02 21	Revised	Reference ASTM for Fixture K. Mueller
2001 08 23	Revised	Editorial – no technical change A. Cockman
1991 05 03		





3. With the plates in the open position, separate 62 mm, and place in the cold box. Time and temperature of the exposed specimens shall be as specified on Engineering Materials Specification or Engineering Drawing.

Note: At least two specimens from each compound must be checked in the same fixture.

4. At the termination of the exposure period and while still in the cold box, the flexing fixture shall be moved rapidly (within 1 +/- 0.5 seconds) from the 62 mm distance of separation to a position where they are 25 mm apart.
5. Examine the specimens for cracks or fracture.

Chemicals, materials, parts, and equipment referenced in this document must be used and handled properly. Each party is responsible for determining proper use and handling in its facilities.