



Designation: E1068 – 85 (Reapproved 2009)

# Standard Test Method for Testing Nonmetallic Seal Materials by Immersion in a Simulated Geothermal Test Fluid<sup>1</sup>

This standard is issued under the fixed designation E1068; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This test method covers a procedure for a laboratory test for performing an initial evaluation (screening) of nonmetallic seal materials by immersion in a simulated geothermal test fluid.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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 specific precautionary statements, see Section 6 and 11.7.

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

D395 Test Methods for Rubber Property—Compression Set

D412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension

D471 Test Method for Rubber Property—Effect of Liquids

D575 Test Methods for Rubber Properties in Compression

D1415 Test Method for Rubber Property—International Hardness

D2240 Test Method for Rubber Property—Durometer Hardness

### 2.2 ASME Standard:

Boiler and Pressure Vessel Code, Section VIII<sup>3</sup>

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee E44 on Solar, Geothermal and Other Alternative Energy Sources and is the direct responsibility of Subcommittee E44.15 on Geothermal Field Development, Utilization and Materials.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Three Park Ave., New York, NY 10016-5990, <http://www.asme.org>.

## 3. Summary of Test Method

3.1 Separate sets of material specimens are subjected to both the test liquid and its vapor at saturation conditions at the test temperature.

3.2 Specimens exposed to the test fluid for a given test may be from a single material to prevent interaction between dissimilar materials.

3.3 The samples shall be unstressed during exposure to the test fluid.

3.4 Tests of mechanical and physical properties shall be performed on specimens before and after immersion testing.

## 4. Significance and Use

4.1 This test method is intended for laboratory screening of materials. Due to large differences in the composition, pressure, and temperature of geothermal fluids, this test method may not correlate with actual service conditions. It does not consider the effects of geothermal fluid combined with oxidizing environments, stress loading, or thermal cycling.

## 5. Apparatus

5.1 *Test Vessel*, shall be capable of containing the test fluid at the test pressure and temperature. It is suggested that reference be made to the ASME Boiler and Pressure Vessel Code, Section VIII.

5.2 *Specimen Supports*, shall be capable of holding specimens submerged in the liquid and specimens suspended in the vapor so that the specimens are unstressed and do not touch other specimens or the walls of the vessel.

5.3 The apparatus, as illustrated in Fig. 1, shall include a means of heating the test vessel to a controlled temperature as selected.

5.4 *Safety Devices and Controls*, should be provided to protect the vessel from overpressure and overheating.

5.5 All parts of the apparatus that shall be exposed to the test fluid or its vapor shall be constructed of materials that are non-reactive with the fluid. Corrosion by-products may affect test results.