



Standard Specification for Rubber Seals Used in Flat-Plate Solar Collectors¹

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This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification covers the general requirements for materials used in rubber seals of flat-plate solar collectors, except vertically mounted passive collectors. Particular applications may necessitate other requirements that would take precedence over these requirements when specified.

1.2 The design requirement pertains only to permissible deflections of the rubber during thermal expansion or contraction of the seal in use and the tolerances in dimensions of molded and extruded seals.

1.3 This specification does not include requirements pertaining to the fabrication or installation of the seals.

1.4 The values stated in SI units are to be regarded as the standard.

1.5 The following safety hazards caveat pertains only to the test methods portion, Section 9, of this specification: *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:

C 661 Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer²

C 717 Terminology of Building Seals and Sealants²

C 719 Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)²

D 395 Test Methods for Rubber Property—Compression Set³

D 412 Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers—Tension³

D 865 Test Method for Rubber—Deterioration by Heating in Air (Test Tube Enclosure)³

D 1149 Test Method for Rubber Deterioration—Surface Ozone Cracking in a Chamber³

D 1229 Test Method for Rubber Property—Compression Set at Low Temperatures³

D 1349 Practice for Rubber—Standard Temperatures for Testing³

D 1415 Test Method for Rubber Property—International Hardness³

D 1566 Terminology Relating to Rubber³

D 2137 Test Methods for Rubber Property—Brittleness Point of Flexible Polymers and Coated Fabrics³

D 2240 Test Method for Rubber Property—Durometer Hardness³

D 3182 Practice for Rubber—Materials, Equipment, and Procedures for Mixing Standard Compounds and Preparing Standard Vulcanized Sheets³

D 3183 Practice for Rubber—Preparation of Pieces for Test Purposes from Products³

G 7 Practice for Atmospheric Environmental Exposure Testing of Nonmetallic Materials⁴

G 26 Practice for Operating Light-Exposure Apparatus (Xenon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials⁴

2.2 Other Standards:

RMA Handbook—Rubber Products: Molded, Extruded, Lathe Cut, and Cellular⁵

3. Terminology Definitions

3.1 Refer to the definitions of terms in Terminology C 717 and Terminology D 1566.

4. Classification

4.1 Types:

4.1.1 Type C, intended for use in cold climates (below – 10°C in winter).

4.1.2 Type W, intended for use in warm climates (above – 10°C in winter).

4.2 Grades:

4.2.1 Grade designations represent differing degrees of hardness as follows:

4.2.1.1 Grade 2, hardness of 20 ± 5 .

4.2.1.2 Grade 3, hardness of 30 ± 5 .

¹ This specification is under the jurisdiction of ASTM Committee D11 on Rubber and is the direct responsibility of Subcommittee D11.36 on Seals.

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² Annual Book of ASTM Standards, Vol 04.07.

³ Annual Book of ASTM Standards, Vol 09.01.

⁴ Annual Book of ASTM Standards, Vol 06.01.

⁵ Available from the Rubber Manufacturers Association (RMA), 444 Madison Ave., New York, NY 10022.