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Standard Specification for Structural Silicone Sealants¹

This standard is issued under the fixed designation C 1184; 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 (ϵ) indicates an editorial change since the last revision or reapproval.

~~^{e1}Note—An editorial change was made in 8.6.2.5 in June 2001.~~

1. Scope

1.1 This specification describes the properties of cold liquid applied, single-component or multicomponent, chemically curing elastomeric structural silicone sealants herein referred to as the sealant. These sealants are intended to structurally adhere components of structural sealant glazing systems.

1.2 Only those properties for which there are industry-agreed-upon minimum acceptable requirements, as determined by available ASTM test methods, are described in this specification. Additional properties are presently being defined and will may be added as ASTM test methods for those properties become available.

1.3 The values stated in metric (SI) units are to be regarded as the standard. The values in parentheses are for information only.

~~1.4 Committee C-24, with jurisdiction over this specification, is aware of only one comparable standard, ETAG No. 002.~~

1.4 Committee C24, with jurisdiction over this specification, is aware of two comparable standards by other organizations: ETAG No. 002 and the Chinese national standard GB16776.

2. Referenced Documents

2.1 ASTM Standards:²

C 603 Test Method for Extrusion Rate and Application Life of Elastomeric Sealants

C 639 Test Method for Rheological (Flow) Properties of Elastomeric Sealants

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

C 679 Test Method for Tack-Free Time of Elastomeric Sealants

C 717 Terminology of Building Seals and Sealants

C 792 Test Method for Effects of Heat Aging on Weight Loss, Cracking, and Chalking of Elastomeric Sealants

C 794 Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants

C 1087 Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems

~~C 1135 Test Method for Determining Tensile Adhesion Properties of Structural Sealants²~~

~~C 1193 Guide for Use of Joint Sealants²~~ Test Method for Determining Tensile Adhesion Properties of Structural Sealants

C 1401 Guide for Structural Sealant Glazing

~~GC53 1442 Practice for Operating Light- and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials~~ Conducting Tests on Sealants Using Artificial Weathering Apparatus

G 151 Practice for Exposing Nonmetallic Materials in Accelerated Test Devices That Use Laboratory Light Sources

G 154 Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials

G 155 Practice for Operating Xenon Arc Light Apparatus for Exposure of Nonmetallic Materials

2.2 European Organization for Technical Approvals Document:³

ETAG No. 002 Guideline for European Technical Approval for Structural Sealant Glazing Systems

2.3 Chinese National Standard:⁴

GB 16776-1997 Structural Silicone Sealants for Building

¹ This specification is under the jurisdiction of ASTM Committee C24 on Building Seals and Sealants and is the direct responsibility of Subcommittee C24.35 on Structural Sealants.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For Annual Book of ASTM Standards, Vol 04.07, volume information, refer to the standard's Document Summary page on the ASTM website.

³ Annual Book of ASTM Standards, Vol 14.04.

⁴ Available from www.cota.be

⁴ Published May 15, 2005, Implemented August 1, 1997; www.nstn.org

3. Terminology

3.1 *Definitions*— Refer to Terminology C 717 for definitions of the following terms used in this specification: adhesive failure, chemically curing sealant, cohesive failure, compatibility, cure, elastomeric, glazing, hardness, non-sag sealant, primer, sealant, shelf life, silicone sealant, structural sealant, substrate, and tooling.

4. Significance and Use

4.1 Not all sealants meeting this specification should be presumed to be suitable for all applications and all substrates. This specification assists in selecting sealants that meet certain minimum standards of performance.

4.2 Although this specification qualifies a sealant for use, it does not address the adhesion capability of the sealant for a specific substrate nor the compatibility of the sealant with the materials it contacts. Adhesion and compatibility characteristics required for specific substrates or finishes can be determined by Test Method C 794 for adhesion and Test Method C 1087 for compatibility.

4.3 To properly specify a sealant for the intended use when using this specification, it is essential that the applicable type and use be included.

5. Classification of Sealants

5.1 A sealant qualifying under this specification shall be classified as to type and use as given in 4.1.1-4.1.4.

5.1.1 *Type S*—Single-component sealant.

5.1.2 *Type M*—Multicomponent sealant.

5.1.3 *Use G*—A sealant that meets the requirements of this specification when tested on a clear, uncoated float glass substrate.

5.1.4 *Use O*—A sealant that meets the requirements of this specification when tested on a substrate other than a clear, uncoated float glass substrate (for example, Use O—Granite).

6. Materials and Manufacture

6.1 Furnish single-component sealants as a homogeneous mixture of a consistency suitable for application and within the manufacturer's stated shelf life. Apply the sealant in accordance with the written recommendations of the sealant manufacturer. The cured sealant shall be an elastomeric solid.

6.2 Furnish multicomponent sealants in two or more components. Mix and apply the sealant in accordance with the written recommendations of the sealant manufacturer. The cured sealant shall be an elastomeric solid.

6.3 Furnish primer of the type required by, and apply in accordance with, the written recommendations of the sealant manufacturer.

7. Requirements

7.1 The physical, mechanical, and performance properties of the sealant shall conform to the requirements described in Table 1.

7.2 When a primer (see Note 1) is required by the sealant manufacturer, all tests performed in accordance with this specification shall be performed with the primer. When a primer is not required by the sealant manufacturer, all tests performed in accordance with this specification shall be performed without a primer.

NOTE 1—The proper use of primers is described in Guide C 1401.

7.3 The standard substrate for this specification is clear, uncoated float glass.

TABLE 1 Requirements for Physical, Mechanical and Performance Qualities of the Sealant

Property	Requirement	Test Method
Rheologic, max		C 639
Vertical	4.8 mm (3/16 in.)	
Horizontal	no deformation	
Extrudability, max	10 s	C 603
Hardness, Shore A	20-60	C 661
Heat aging		
Weight loss, max	10 %	
Cracking	none	
Chalking	none	
Tack-free time, max	no transfer in 3 h	C 679
Tensile value, min		C 1135
Standard conditions:	345 kPa (50 psi)	
88°C (190°F)	345 kPa (50 psi)	
-29°C (-20°F)	345 kPa (50 psi)	
Water immersion	345 kPa (50 psi)	
5000 h weathering	345 kPa (50 psi)	8.6.2.5
Shelf life, min	6 months	9.1