



Designation: ~~C1619~~—~~20~~ C1619 – 23

Standard Specification for Elastomeric Seals for Joining Concrete Structures¹

This standard is issued under the fixed designation C1619; 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.

1. Scope

1.1 This specification covers the physical property requirements of elastomeric seals (gaskets) used to seal the joints of precast concrete structures conforming to Specifications **C14**, **C14M**, **C118**, **C118M**, **C361**, **C361M**, **C443**, **C443M**, **C505**, **C505M**, or **C1628** used in gravity and low head pressure applications.

1.2 Requirements are given for natural or synthetic rubber gaskets, or a combination of both.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 The following precautionary caveat pertains only to the test method portion, Section 8, 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

- C14** Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe
- C14M** Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe (Metric)
- C118** Specification for Concrete Pipe for Irrigation or Drainage
- C118M** Specification for Concrete Pipe for Irrigation or Drainage (Metric)
- C361** Specification for Reinforced Concrete Low-Head Pressure Pipe
- C361M** Specification for Reinforced Concrete Low-Head Pressure Pipe (Metric)
- C443** Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
- C443M** Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets (Metric)
- C497** Test Methods for Concrete Pipe, Concrete Box Sections, Manhole Sections, or Tile
- C497M** Test Methods for Concrete Pipe, Concrete Box Sections, Manhole Sections, or Tile (Metric)
- C505** Specification for Nonreinforced Concrete Irrigation Pipe with Rubber Gasket Joints
- C505M** Specification for Nonreinforced Concrete Irrigation Pipe With Rubber Gasket Joints (Metric)

¹ This specification is under the jurisdiction of ASTM Committee C13 on Concrete Pipe and is the direct responsibility of Subcommittee C13.08 on Joints for Precast Concrete Structures.

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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* volume information, refer to the standard's Document Summary page on the ASTM website.

- C822 Terminology Relating to Concrete Pipe and Related Products
- C1628 Specification for Joints for Concrete Gravity Flow Sewer Pipe, Using Rubber Gaskets
- 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
- D573 Test Method for Rubber—Deterioration in an Air Oven
- D1149 Test Methods for Rubber Deterioration—Cracking in an Ozone Controlled Environment
- D1566 Terminology Relating to Rubber
- D2240 Test Method for Rubber Property—Durometer Hardness
- D2527 Specification for Rubber Seals—Splice Strength

3. Terminology

3.1 *Definitions*—For definitions of terms relating to concrete pipe, see Terminology C822. For definitions relating to rubber or elastomers, see Terminology D1566.

4. Classification

4.1 In order to provide for the various types of seals and requirements, multiple classifications have been established.

4.1.1 Class A is generally intended to cover seals in low head pressure piping applications not exceeding 125 ft (375 kPa) where premium physical properties are required.

4.1.2 Class B is generally intended for Class A and Class E applications that also require special oil resistant performance.

4.1.3 Class C is generally intended to cover seals in applications not exceeding 30 ft (9.14 m) of hydrostatic head.

4.1.4 Class D is generally intended for Class C applications that also require special oil resistant performance.

4.1.5 Class E is generally intended for gravity flow sewer pipe in applications not exceeding 30 ft (9.14 m) of hydrostatic head.

5. Composition and Manufacture

5.1 All gaskets shall be extruded or molded in such a manner that any cross-section will be dense, homogeneous, and free of blisters, pitting, or other defects that make them unfit for the use intended. The gaskets shall be fabricated from an elastomeric material meeting the appropriate classification physical property requirements in Section 7. The base polymer shall be natural rubber, synthetic rubber, or a blend of both that is acceptable to the owner.

6. Dimensions and Tolerances

6.1 Specified Durometer Shore A hardness shall be within the range given in Section 7, Table 1, and actual gasket durometer shall conform to ± 5 points from the specified value.

6.2 Cross-sectional and circumferential dimensions and tolerances shall comply with the relevant standard specification that is referencing this standard.

TABLE 1 Physical Property Requirements for Elastomeric Seals

	Class A	Class B	Class C	Class D	Class E
Tensile, min, psi (MPa)	2300 (15.9)	1500 (10.3)	1200 (8.3)	1200 (8.3)	1800 (12.4)
Tensile, min, psi (MPa)	2300 (15.9)	1500 (10.3)	1200 (8.3)	1200 (8.3)	1800 (12.4)
Elongation at break, min, %	425	350	350	350	425
Specified Hardness, Shore A	40-60	40-60	40-60	40-60	40-60
Oven-Age Tensile reduction, max % of original	15	20	15	20	15
Oven-Age Elongation reduction, max % of original	20	40	20	40	20
Oven-Age hardness increase, max points	—	15	—	15	—
Compression Set, max %	20	20	25	25	20
Water Absorption, max % weight increase	5	15	10	15	5
Ozone Resistance level, 50 ppm	No cracks	No cracks	No cracks	No cracks	No cracks
Liquid Immersion IRM 903 Oil. Max % volume change	—	80	—	80	—
Splice Strength Classification	Class 3	Class 2	Class 3	Class 2	Class 3