



# Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings<sup>1</sup>

This standard is issued under the fixed designation C 564; 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.

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

## 1. Scope

1.1 This specification covers preformed rubber gaskets used to seal joints in cast iron soil pipe and fittings.

~~1.2 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.~~

1.2 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.

1.3 The following safety hazards caveat pertains only to the test methods section 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.*

1.4 The committee with jurisdiction over this standard is not aware of another comparable standard for materials covered in this standard.

## 2. Referenced Documents

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

A 644 Terminology Relating to Iron Castings

D 395 Test Methods for Rubber Property Compression Set

D 412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers Tension

D 471 Test Method for Rubber Property Effect of Liquids

D 573 Test Method for Rubber Deterioration in an Air Oven

D 624 Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers

D 1149 Test Methods for Rubber Deterioration Cracking in an Ozone Controlled Environment

D 1415 Test Method for Rubber Property International Hardness

D 2240 Test Method for Rubber Property Durometer Hardness

### 2.2 Other Documents

RMA Class 3 Dimensional Tolerances, RMA Manual<sup>3</sup>

## 3. Terminology

3.1 *Definitions*—For definitions of terms in this standard see Terminology C 717.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *flash*—the excess material protruding from the surface of a molded article at the mold junction.

3.2.2 *virgin rubber, n*—a term that may be used interchangeably with raw rubber (raw thermoset elastomer). A rubber or thermoset elastomer that has not had any additional work, diluents incorporated, processes performed on it, or any combination thereof. A rubber that is in an unmodified state or one in which no attempt has been made to alter it in any fashion as received from the manufacturer or supplier.

3.2.3 *manufacturer, n*—the entity that molds the gaskets covered by this standard.

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee A04 on Iron Castings and is the direct responsibility of Subcommittee A04.75 on Gaskets and Coupling for Plumbing and Sewer Piping.

Current edition approved Oct. Sept. 1, 2008-2009. Published November 2008-October 2009. Originally approved in 1965. Last previous edition approved in 2003-2008 as C 564-03a-C 564-08.

<sup>2</sup> 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.

<sup>3</sup> Rubber Manufacturer's Association, 1400 K Street NW, No. 900, Washington, DC 20005 – 2455, http://www.rma.org.

#### 4. Materials and Manufacture

4.1 Gaskets shall be made of a properly vulcanized virgin compound containing virgin rubber as the sole elastomer with no scrap or reclaim.

#### 5. Physical Requirements

5.1 Sample gaskets selected as specified in Section 8 shall conform to the requirements for physical properties listed in Table 1 when tested in accordance with the methods specified in Section 9.

#### 6. Dimensions and Permissible Variations

6.1 Gaskets shall conform to the dimensions specified by the manufacturer.

6.2 All cross-sectional dimensions shall have an RMA Class 3 tolerance as shown in Annex A1, and all diametral dimensions shall have a tolerance of  $\pm 1$  percent.

#### 7. Workmanship

7.1 The surface of the gasket shall be smooth and free of pitting, cracks, blisters, air marks, and any other imperfections that will affect its behavior in service. The body of the gasket shall be free of porosity and air pockets.

7.2 Neither the flash thickness nor the flash extension shall exceed  $0.8 \text{ mm}$  ( $1/32 \text{ in.}$ ),  $1/32 \text{ in.}$  ( $0.8 \text{ mm}$ ), at any point on the sealing ring.

7.3 The offset, or failure of the mold to register accurately, shall not exceed  $0.4 \text{ mm}$  ( $1/64 \text{ in.}$ ),  $1/64 \text{ in.}$  ( $0.4 \text{ mm}$ ).

#### 8. Sampling

~~8.1 For each of the tests, gaskets shall be selected at random as required by the method of test specified.~~

8.1 For each of the tests, gaskets shall be selected at random and tests be performed by the method and frequency of the tests as specified in Section 9.

#### 9. Test Methods

9.1 *Hardness*—The gasket material shall be tested for hardness in accordance with ASTM Test Method D 2240. Test Method D 1415 shall be used as the referee method. Hardness measurements shall be made on specimens prepared in accordance with 9.2. However, hardness readings for guidance purposes shall be permitted to be taken directly on the gasket, recognizing that these readings may vary slightly from those taken on the dumb-bell specimens. However, hardness readings for guidance purposes shall be permitted to be taken directly on the gasket, recognizing that these readings may vary slightly from those taken on the dumb-bell specimens. Tests shall be performed during the day of production not to exceed a 24-h period for each size and type gasket produced during that period.

9.2 *Elongation and Tensile Strength*—The gasket material shall be tested for elongation and tensile strength in accordance with Test Methods D 412. Standard ASTM Type C dumb-bell specimens conforming to Fig. 1 (Apparatus for Tensile Set Test) of Test Methods D 412 shall be cut from a section of the gasket for this test. To obtain a uniform thickness, these gasket sections shall be permitted to be buffed prior to cutting into dumb-bell specimens, so as to produce a finely ground surface without cuts or burns. shall be cut from a section of the gasket for this test. To obtain a uniform thickness, these gasket sections shall be permitted to

**TABLE 1 Physical Requirements of Gaskets**

Property	Requirements			ASTM Test Method
Hardness (nominal durometer $\pm 5$ ) as specified by the pipe manufacturer	50	60	70	D 2240
Elongation, min, %	350	300	250	D 412
Tensile strength, min, MPa	40	40	40	<del>D 412</del>
Tensile strength, min, psi	1500	1500	1500	D 412
(psi)	(1500)	(1500)	(1500)	
(MPa)	(10)	(10)	(10)	
Tear strength, min, lbf/in.	150	150	150	
Tear strength, min, N/cm	268	268	268	D 624
(N/cm)	(268)	(268)	(268)	D 624
(lbf/in.)	(150)	(150)	(150)	
Compression set, max, %	25	25	25	D 395
Heat aging, 96 h at $70 \pm 1^\circ\text{C}$ ( $158 \pm 2^\circ\text{F}$ ):				D 573
Heat aging, 96 h at $158 \pm 2^\circ\text{F}$ ( $70 \pm 1^\circ\text{C}$ ):				D 573
Hardness increase, max, durometer points	10	10	10	...
Loss in tensile strength, max, %	15	15	15	...
Loss in elongation, max, %	20	20	20	...
Water absorption:				D 471
Weight increase, max, %	20	20	20	...
Ozone resistance	no cracks	no cracks	no cracks	D 1149
Oil immersion:				
Volume increase, max, %	80	80	80	D 471