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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Specification for Chemical-Resistant Sulfur Mortar¹

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1. Scope

1.1 This specification covers the requirements for chemical-resistant sulfur mortar, which must be heated and molten to be used, for bonding chemical-resistant brick or tile. For the use of these materials, see Practice C 386.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are provided for information only.

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.* See Section 7 for specific safety hazard.

2. Referenced Documents

2.1 ASTM Standards:

- C 267 Test Method for Chemical Resistance of Mortars, Grouts, and Monolithic Surfacing²
- C 307 Test Method for Tensile Strength of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing²
- C 321 Test Method for Bond Strength of Chemical-Resistant Mortars²
- C 386 Practice for Use of Chemical-Resistant Sulfur Mortar²
- C 413 Test Method for Absorption of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing²
- C 579 Test Method for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing and Polymer Concretes²
- C 580 Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing and Polymer Concretes²
- C 904 Terminology Relating to Chemical-Resistant Non-metallic Materials²

3. Terminology

3.1 **Definitions**—For definitions of terms used in this specification, see Terminology C 904.

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4. Chemical Composition

4.1 The sulfur mortar shall conform to the following requirements for chemical composition:

Sulfur, %	55 to 70
Inert filler, %	45 to 30

Fillers are usually carbon or silica and can affect the chemical resistance of sulfur mortars.

5. Chemical Resistance

5.1 A general guide to chemical resistance of sulfur mortars may be found in Table 1.

5.2 The resistance of sulfur mortar to specific chemicals shall be determined by Test Method C 267.

6. Physical Properties

6.1 The sulfur mortar shall conform to the following physical requirements:

Tendency of filler to settle, maximum variation from unity	0.6
Tensile strength, min, psi (MPa)	400 (2.8)
Compressive strength, min, psi (MPa)	4000 (28)
Flexural strength, min, psi (MPa)	1000 (6.9)
Strength retained after thermal shock test, min, psi (MPa)	150 (1.0)
Bond strength, min, psi (MPa)	150 (1.0)
Absorption, max, weight %	1.0

7. Test Methods

7.1 Sample the sulfur mortar and determine the properties enumerated in this specification in accordance with the following test methods:

7.1.1 **Sampling and Preparation of Sample**—Using a minimum of 5 lb (2.3 kg), melt the sample in less than 1 h. Then hold at a temperature of 265 to 290°F (129 to 143°C) for at least 15 min, while stirring with a laboratory-type mixer. This mixer shall be of such type and operate at a speed to lift the aggregate, but without beating air into the molten sample. Cast all test specimens from this sample.

7.1.2 **Storage of Test Specimens**—Store all test specimens at a temperature of 73 ± 4°F (23 ± 2°C).

7.1.3 Filler Content:

7.1.3.1 Determine the filler content of the sulfur mortar by extraction with carbon disulfide, (CS₂—see Note 1) using Soxhlet-type equipment. Dry and weigh the filter thimble. Place 10 to 15 g of the sample in the thimble and place thimble in the extraction equipment. Pour 40 to 50 mL of carbon

¹ This specification is under the jurisdiction of ASTM Committee C-3 on Chemical-Resistant Nonmetallic Materials and is the direct responsibility of Subcommittee C03.02 on Mortar and Monolithics.

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² Annual Book of ASTM Standards, Vol 04.05.