

# Soapstone

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Marble Institute of America  
380 East Lorain St. Oberlin, Ohio 44074  
Telephone: 440-250-9222  
Fax: 440-774-9222  
[www.naturalstoneinstitute.org](http://www.naturalstoneinstitute.org)**

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# SOAPSTONE

## 1.0 GENERAL

### 1.1 Related Documents

1.1.1 Drawings and general provisions, including General and Supplementary Conditions of the Contract and Division I Specification sections, apply to this section.

### 1.2 Applicable Publications

1.2.1 The following publications listed here and referred to thereafter by alphanumeric code designation only, form a part of this specification to the extent indicated by the references thereto:

#### 1.2.2 ASTM International (ASTM):

1.2.2.1 There currently is no ASTM Standard Specification for Soapstone Dimension Stone.

1.2.2.2 C97, Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone

1.2.2.3 C99, Standard Test Method for Modulus of Rupture of Dimension Stone

1.2.2.4 C170, Standard Test Method for Compressive Strength of Dimension Stone

1.2.2.5 C241, Standard Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic

1.2.2.6 C880, Standard Test Method for Flexural Strength of Dimension Stone

1.2.2.7 C1353, Standard Test Method Using the Taber Abraser for Abrasion Resistance of Dimension Stone Subjected to Foot Traffic

#### 1.2.3 Marble Institute of America (MIA):

1.2.3.1 Membership, Products, and Services Directory

1.2.3.2 [Dimension Stone Design Manual](#)

1.2.3.3 Additional publications may be available from the MIA Bookstore. Go online at [www.marble-institute.com](http://www.marble-institute.com).

### 1.3 Scope of Included Work

1.3.1 The work to be completed under this contract includes all labor and materials required for the furnishing and installation of all slate work shown or called for on the contract drawings, specifications, and addenda.

### 1.4 Definition of Terms

1.4.1 The definitions of trade terms used in this specification shall be those published by the MIA or ASTM International.

### 1.5 Source of Supply

1.5.1 All soapstone shall be obtained from quarries having adequate capacity and facilities to meet the specified requirements, and by a firm equipped to process the material promptly on order and in strict accord with specifications. The Specifying Authority (architect, designer, engineer, contracting officer, end user, etc.) reserves the right to approve the Material Supplier for slate prior to the award of this contract. Stone and workmanship quality shall be in accordance with Industry Standards and Practices as set forth by the MIA.

### 1.6 Samples

1.6.1 The Soapstone Contractor shall submit through the General Contractor, for approval by the Specifying Authority, at least two sets of samples of the various kinds of Soapstone specified. The sample size shall be 1'-0" x 1'-0"

and shall represent approximately the finish, texture, and anticipated range of color to be supplied. One set of samples shall be retained by the Specifying Authority, and one set shall be returned to the Soapstone Supplier for his/her record and guidance. It is noted herein that Soapstone is a natural material and will have intrinsic variations in color, markings, and other characteristics. Color variation range is to be only from natural markings in the Soapstone or from the reflective sheen and shadow value of the graining of the natural-cleft textures and cleavage planes. Depending on Soapstone selected and quantity required, a range mockup may be used to further define the characteristics of the material. Cost of mockup, if required, shall not be included in this section.

**1.6.2** Prior to fabrication, an inspection and approval by the Specifying Authority and/or General Contractor and/or End User of the finished slabs is recommended to understand the finish and full range of the material.

## 1.7 Shop Drawings

**1.7.1** The Soapstone Contractor shall submit through the General Contractor, for approval by the Specifying Authority, sufficient sets of shop drawings showing general layout, jointing, anchoring, stock thickness, and other pertinent information. These drawings shall show all bedding, bonding, jointing, and anchoring details along with the net piece dimensions of each Soapstone unit. One copy of the approved shop drawings shall be retained by the Specifying Authority, one copy shall be retained by the General Contractor, and one copy returned to the Soapstone Contractor for fabrication. **NO FABRICATION OF SOAPSTONE SHALL BE STARTED UNTIL SUCH DRAWINGS HAVE BEEN FULLY APPROVED AND MARKED AS SUCH.** The Soapstone Contractor shall not be responsible for determining, making, or verifying (1) design, structural, wind, seismic, or other design loads; (2) engineering estimates; (3) plans or specifications; (4) the types, sizes, or locations of anchors; or (5) verification of field

dimensions, unless specifically added to the scope of work.

## 1.8 Defective Work

**1.8.1** Any piece of Soapstone showing flaws or imperfections upon receipt at the storage yard or building site shall be referred to the Specifying Authority for determination as to responsibility and decision as to whether it shall be rejected, patched, or redressed for use. Any material in question should not be installed prior to inspection and approval.

## 1.9 Repairing Damaged Stone

**1.9.1** Chips at the edges or corners may be patched, provided the structural integrity of the stone is not affected and the patch matches the color and finish of the natural stone so that it does not detract from the stone's appearance. Scratches may be hand-sanded after which mineral oil shall be re-applied to achieve uniform color.

## 2.0 MATERIALS

### 2.1 Soapstone

**2.1.1 General:** All Soapstone shall be of standard architectural grade, free of cracks, seams, starts, or other traits which may impair its structural integrity or function. Inherent color variations characteristic of the quarry from which it is obtained will be acceptable. Texture and finish shall be as shown in the sample(s) approved by the Specifying Authority.

**2.1.2** See the chart of applicable ASTM standards and tests in the Appendix.

**2.1.3 Schedule:** Soapstone shall be provided as follows:

**2.1.4** For (state location on building) (state name and color) Soapstone with a (type) finish,

supplied by (*name company or list several approved suppliers*).

**2.1.5** Provide information as in (1) for each different Soapstone/finish combination in the project.

**2.1.6 Finishes:** Face finish of exterior panels should be a fine honed finish. All exposed edges should be honed to remove saw marks and darken the edge color. Finished surfaces should be treated with mineral oil to achieve a uniform, dark, rich color.

**2.1.7** Finishes listed in the schedule shall conform with definitions by the MIA or ASTM International.

### **3.0 FABRICATION**

#### **3.1 Moldings, Washes, and Drips**

**3.1.1** Moldings, washes, and drips shall be constant in profile throughout their entire length, in strict conformity with details shown on approved shop drawings. The finish quality on these surfaces shall match the finish quality of the flat surfaces on the project.

#### **3.2 Cutting and Drilling For Other Trades**

**3.2.1** Any miscellaneous cutting and drilling of stone necessary to accommodate other trades will be done by the Soapstone Fabricator only when necessary information is furnished in time to be shown on the shop drawings and details, and when work can be executed before fabrication. Cutting and fitting, due to job site conditions, will be the responsibility of the Soapstone Contractor.

**3.2.2** Incidental cutting, such as for window frame clips, etc., which is normally not considered to be the responsibility of the Stone Supplier, will be provided only by arrangement by the General Contractor and Soapstone Contractor with the Soapstone Fabricator.

## **4.0 SHIPPING AND HANDLING**

### **4.1 Packing and Loading**

**4.1.1** Finished Soapstone shall be carefully packed and loaded for shipment using all reasonable and customary precautions against damage in transit. No material which may cause staining or discoloration shall be used for blocking or packing.

## **5.0 INSTALLATION**

### **5.1 General Installation**

**5.1.1** Installation shall be accomplished with competent, experienced Stone Setters, in accordance with the approved shop drawings.

**5.1.2** All Soapstone stone pieces shall be identified with a unique piece number corresponding with the number on the shop drawings. Interchanging of numbered pieces is not permitted.

**5.1.3** Soapstone stone shall be free of any ice or frost at time of installation. Salt shall not be used for the purpose of melting ice, frost, or snow on the stone pieces.

**5.1.4** Adequate protection measures shall be taken to ensure that exposed surfaces of the stone shall be kept free of mortar at all times.

### **5.2 Expansion Joints**

**5.2.1** It is not the intent of this specification to make control or expansion joint recommendations for a specific project. The Specifying Authority must specify control or expansion joints and show location and details on drawings.

### **5.3 Caulking**

**5.3.1** Where so specified, joints shall be pointed with the sealant(s) after first installing the specified backup material and applying a

primer if required, all in strict accordance with the printed instructions of the Sealant Manufacturer.

5.3.2 All sealants shall be tooled to ensure maximum adhesion to the contact surfaces.

## 6.0 CLEANING AND PROTECTION

### 6.1 Cleaning

6.1.1 The Soapstone Contractor shall keep the Soapstone clean with a sponge and clean water, utilizing a neutral detergent if necessary.

### 6.2 Protection of Finished Work

6.2.1 After the Soapstone work has been installed, it shall be the responsibility of the General Contractor to see that it is properly and adequately protected from damage or stains until all trades are finished. This responsibility includes the stone cleaning costs prior to final inspection. The Soapstone Contractor will outline the needs for protection, in writing, to the General Contractor.

# PRODUCT DESCRIPTION – Soapstone

## 1.0 GEOLOGICAL CLASSIFICATION

1.1 Soapstone currently enjoys a resurgence of popularity for surfaces, kitchenware, traditional decorative uses, industrial applications and artistic carvings. The long-known, unique physical properties and wide range of colors are once again driving forces in this recent interest.

1.2 Soapstone is a *metamorphic*<sup>1</sup> stone or rock composed of one or more minerals; however, in most industrial applications it is almost always a mixture of minerals because the mixture is somewhat harder than single-mineral soapstone and mineral mixtures in nature are common, while single mineral purity is much less common.

1.3 Soapstone texture can vary from massive<sup>2</sup> to fibrous or flaky. The best commercial grades are highly compacted and are not absorbent. It commonly has a “soapy” to slippery and soft feel when the surface is unaltered by long use or treated with chemicals or oils.

1.4 Soapstone of commercial value is quarried in many places around the world: in far Arctic areas of Canada, Scandinavia, Siberia and Russia, as well as in Brazil and northeastern United States.

1.5 Soapstone has been used for thousands of years by the Inuit people (“Eskimo”) and others as a medium for carving highly valued sculpture.

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<sup>1</sup> Soapstone is always of metamorphic origin, formed by very high pressures and generally from light-colored, low specific gravity, highly silicic (> 60% SiO<sub>2</sub>; or quartz) igneous rock.

<sup>2</sup> *Massive* in metamorphic stone means a stone whose constituents are neither oriented in parallel position nor arranged in layers; that is, a stone that does not have layering, schistosity, foliation or similar structure.

## 2.0 MINERALOGY

2.1 Minerals commonly found in soapstone  
- in general order of abundance:

**2.1.1 Talc:** Hydrrous magnesium silicate  $Mg_3Si_4O_{10}(OH)_2$  is the most abundant mineral component and thus dictates some of the stone's characteristic properties like hardness and feel. Since talc defines the Mohs hardness of 1, the softest level of the Mohs scale, soapstone dominantly composed of talc may be a bit soft for use as a surface material since it could easily be scratched by even a fingernail. Soapstone is somewhat harder if its composition includes one or more of the minerals below.

**2.1.2 Magnesite:** Magnesium carbonate ( $MgCO_3$ ) moderately hard Mohs 3.5 – 4.5, not soluble in cold, dilute hydrochloric acid, generally the second most abundant soapstone mineral. Exhibits excellent rhombohedral cleavage that is microscopic and not detrimental in massive soapstone. Is generally the white mineral filling “veins” in soapstone and may be responsible for much of the mottled appearance.

**2.1.3 Dolomite:** A calcium and magnesium carbonate ( $CaMg(CO_3)$ ), Mohs hardness of ~3.5, does not react with dilute hydrochloric acid.

**2.1.4 Micas:** Muscovite is inert, colorless, elastic and flaky mica. Less common in soapstone is the dark mica biotite which contains iron and magnesium, H=2.5 - 4.

**2.1.5 Chlorite** is a metamorphic greenish mica that is soft, non-flexible; and non-reactive. It is responsible for the greenish color of some soapstone.

**2.1.6 Rare Accessory Minerals:** minor to trace amounts of pyroxene (augite, etc.) and

amphibole (hornblende etc.) derived from the alteration of ferromagnesian silicates in igneous rock that, because of the Fe and Mg, may yield “disfiguring” coloration or blemishes.

**2.2 Steatite** (a.k.a. “steatite talc”): A nearly obsolete term for soapstone or very pure talc-rich rock used for talcum powder and formerly for electrical insulators. Since the term is used in some older definitions of soapstone, it has found its way into the literature of some quarries and distributors of soapstone. It is recommended the use of this term be discontinued as it demands a definition that at best is often vague and confusing. Almost everyone is familiar with talcum powder (talc), its softness and feel.

## 3.0 PHYSICAL PROPERTIES OF SOAPSTONE:

**3.1 Hardness:** Soapstone used for surfaces is a soft dimension stone. Mohs hardness 1-4, depending on mineral content. The softness is a plus: It can be worked with ordinary tooling, scratches and dings can be eliminated or minimized with ordinary sandpaper, and it is forgiving of china—much more so than granite. It does not have a bothersome preferential breakage or fracture direction.

**3.2 Chemical reactivity:** Soapstone is very inert. It does not react with strong acids or alkali (basic) solutions. It is non-poisonous and safe to cook in or use around food.

**3.3 Heat retention** is very high. Soapstone is unaffected by temperatures from well below zero to above  $\pm 2,000^\circ$  F. Thus it is very useful as refractory material and is frequently used for wood burning stoves that use both of these properties. It is dimensionally very stable through a wide range of temperature. The ancient Nordic Vikings used flat soapstone pebbles for pocket hand warmers.

**3.4 Absorbency:** Since soapstone is a metamorphic stone formed under high pressure, it is highly compacted and dense; thus absorbency is zero or so close to zero that it is inconsequential, making this stone exceedingly sanitary as a food preparation surface, as well-maintained surfaces resist harboring bacterial growth.

**3.5 Color:** Usually in the gray to gray-bluish ranges to mottled white or lighter gray and greenish hues and/or streaked with irregular veins of white that may be talc, magnesite, chlorite, dolomite or again, a mixture.

**3.6 Electrical:** Soapstone is non-conductive and thus is ultra safe for kitchen counter surfaces. Formerly used for high voltage electrical insulation.

## **4.0 FIRE RESISTANCE**

**4.1** Soapstone is not combustible according to underwriters' ratings, and therefore is considered a fire-resistant material. Because of its thermal conductivity, heat transfer is fairly rapid. Most soapstone is not considered a highly rated thermal insulator.

**4.2** Underwriters' fire-resistance ratings evaluate whether or not a material will burn, as well as how long it will keep surrounding combustible materials from reaching temperatures which will cause them to ignite. Methods of estimating fire-resistance periods of masonry walls and partitions utilizing component laminae are given in "Fire Resistance Classifications of Building Construction," BMS92, National Bureau of Standards.