

2021 Virginia Construction Code

CHAPTER 21 MASONRY

SECTION 2103 MASONRY CONSTRUCTION MATERIALS

2103.1 Masonry units.

Concrete *masonry units*, clay or shale *masonry units*, stone *masonry units*, glass unit *masonry* and AAC *masonry units* shall comply with Article 2.3 of [TMS 602](#). Architectural cast stone shall conform to [ASTM C1364](#) and [TMS 504](#). Adhered manufactured stone masonry *veneer units* shall conform to [ASTM C1670](#).

Exception: *Structural clay tile* for nonstructural use in fireproofing of structural members and in wall furring shall not be required to meet the compressive strength specifications. The *fire-resistance rating* shall be determined in accordance with [ASTM E119](#) or [UL 263](#) and shall comply with the requirements of [Table 705.5](#).

2103.1.1 Second-hand units.

Second-hand *masonry units* shall not be reused unless they conform to the requirements of new units. The units shall be of whole, sound materials and free from cracks and other defects that will interfere with proper laying or use. Old *mortar* shall be cleaned from the unit before reuse.

2103.2 Mortar.

Mortar for masonry construction shall comply with [Section 2103.2.1](#), [2103.2.2](#), [2103.2.3](#) or [2103.2.4](#).

2103.2.1 Masonry mortar.

Mortar for use in masonry construction shall conform to Articles 2.1 and 2.6 A of [TMS 602](#).

2103.2.2 Surface-bonding mortar.

Surface-bonding mortar shall comply with [ASTM C887](#). Surface bonding of concrete *masonry units* shall comply with [ASTM C946](#).

2103.2.3 Mortars for ceramic wall and floor tile.

Portland cement *mortars* for installing ceramic wall and floor tile shall comply with [ANSI A108.1A](#) and [ANSI A108.1B](#) and be of the compositions indicated in [Table 2103.2.3](#).

TABLE 2103.2.3
CERAMIC TILE MORTAR COMPOSITIONS

LOCATION N	MORTAR	COMPOSITION
Walls	Scratchcoat	1 cement; $\frac{1}{5}$ hydrated lime; 4 dry or 5 damp sand
	Setting bed and leveling coat	1 cement; $\frac{1}{2}$ hydrated lime; 5 damp sand to 1 cement; 1 hydrated lime, 7 damp sand
Floors	Setting bed	1 cement; $\frac{1}{10}$ hydrated lime; 5 dry or 6 damp sand; or 1 cement; 5 dry or 6 damp sand
Ceilings	Scratchcoat and sand bed	1 cement; $\frac{1}{2}$ hydrated lime; $2\frac{1}{2}$ dry sand or 3 damp sand

2103.2.3.1 Dry-set Portland cement mortars.

Premixed prepared Portland cement *mortars*, which require only the addition of water and are used in the installation of ceramic tile, shall comply with [ANSI A118.1](#). The shear bond strength for tile set in such *mortar* shall be as required in accordance with [ANSI A118.1](#). Tile set in dry-set Portland cement *mortar* shall be installed in accordance with [ANSI A108.5](#).

2103.2.3.2 Latex-modified Portland cement mortar.

Latex-modified Portland cement thin-set *mortars* in which latex is added to dry-set *mortar* as a replacement for all or part of the gauging water that are used for the installation of ceramic tile shall comply with [ANSI A118.4](#). Tile set in latex-modified Portland cement shall be installed in accordance with [ANSI A108.5](#).

2103.2.3.3 Epoxy mortar.

Ceramic tile set and grouted with chemical-resistant epoxy shall comply with [ANSI A118.3](#). Tile set and grouted with epoxy shall be installed in accordance with [ANSI A108.6](#).

2103.2.3.4 Furan mortar and grout.

Chemical-resistant furan *mortar* and grout that are used to install ceramic tile shall comply with [ANSI A118.5](#). Tile set and grouted with furan shall be installed in accordance with [ANSI A108.8](#).

2103.2.3.5 Modified epoxy-emulsion mortar and grout.

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Modified epoxy-emulsion *mortar* and grout that are used to install ceramic tile shall comply with [ANSI A118.8](#). Tile set and grouted with modified epoxy-emulsion *mortar* and grout shall be installed in accordance with [ANSI A108.9](#).

2103.2.3.6 Organic adhesives.

Water-resistant organic adhesives used for the installation of ceramic tile shall comply with [ANSI A136.1](#). The shear bond strength after water immersion shall be not less than 40 psi (275 kPa) for Type I adhesive and not less than 20 psi (138 kPa) for Type II adhesive when tested in accordance with [ANSI A136.1](#). Tile set in organic adhesives shall be installed in accordance with [ANSI A108.4](#).

2103.2.3.7 Portland cement grouts.

Portland cement grouts used for the installation of ceramic tile shall comply with [ANSI A118.6](#). Portland cement grouts for tile work shall be installed in accordance with [ANSI A108.10](#).

2103.2.4 Mortar for adhered masonry veneer.

Mortar for use with *adhered masonry veneer* shall conform to [ASTM C270](#) for Type N or S, or shall comply with [ANSI A118.4](#) for latex-modified Portland cement *mortar*.

2103.3 Grout.

Grout shall comply with Article 2.2 of [TMS 602](#).

2103.4 Metal reinforcement and accessories.

Metal reinforcement and accessories shall conform to Article 2.4 of [TMS 602](#). Where unidentified reinforcement is *approved* for use, not less than three tension and three bending tests shall be made on representative specimens of the reinforcement from each shipment and grade of reinforcing steel proposed for use in the work.