popular for residential masonry styles because of its softer profile and less commercial look. All three brick types must meet the same strength and physical property criteria, but brick type is not related to color or color range. If the project specifications do not identify a specific proprietary product or designate brick type, ASTM C216 states that Type FBS standards shall govern.

Brick *grade* classifies units according to their resistance to damage from freezing when they are wet. The property requirements for Grades SW and MW are given in a table that covers minimum compressive strength, maximum water absorption, and minimum saturation coefficient (see Chapter 3). These properties are tested in accordance with ASTM C67, *Standard Test Methods of Sampling and Testing Brick and Structural Clay Tile.* Since ASTM C67 is referenced in ASTM C216, it is not necessary for the specifier to list ASTM C67 as a separate reference standard. If the brick is specified to meet the requirements of ASTM C216, that automatically requires that the units be tested for compliance in accordance with ASTM C67 methods and procedures.

In general, Grade SW (Severe Weathering) should be specified when a "high and uniform" resistance to damage from cyclic freezing is required and when the brick is likely to be frozen when it is saturated with water. Grade MW (Moderate Weathering) should be specified where only moderate resistance to damage from cyclic freezing is required and when the brick may be damp but not saturated when freezing occurs. ASTM C216 includes a table of grade recommendations for various types of exposure and a related map of geographic weathering regions (see Chapter 3). If the project specifications do not designate the required grade, Grade SW is the default standard, and Grade SW may be substituted by the supplier if Grade MW is specified.

Grade SW brick is required by ASTM C216 to have a minimum average *gross area* compressive strength of 3000 psi, and Grade MW brick, 2500 psi. These strengths are more than adequate for most non-loadbearing applications, and the majority of brick produced in the United States and Canada is much stronger. If a specific unit strength requirement greater than the standard minimum is required, that compressive strength should be required by the project specifications.

ASTM C216 also requires that brick be tested for efflorescence in accordance with ASTM C67 and be rated "not effloresced." Color is not covered in this standard, so the specifier must designate the desired color, by specifying a proprietary product, with color and color range verified with a sample panel or mock-up panel.

ASTM C62, Standard Specification for Building Brick (Solid Masonry Units Made from Clay or Shale). Building brick (sometimes called common brick) is used primarily for utilitarian applications or as a backing for other finishes, where strength and durability are more important than appearance. ASTM C62 covers Grades SW and MW on the basis of the same physical requirements for durability and resistance to freeze-thaw weathering as face brick. Building brick is also available in Grade NW (No Weathering), which is permitted only for interior work where there will be no weather exposure.

This standard lists permissible variations in size, but does not classify units by various types. The size tolerances listed apply to all ASTM C62 brick. Since these units are generally used in unexposed applications, there is no requirement for efflorescence testing. The discussion of compressive

strength requirements under ASTM C216 above also applies to building brick.

ASTM C652, Standard Specification for Hollow Brick (Hollow Masonry Units Made from Clay or Shale). ASTM C652 covers hollow brick with core areas between 25 and 40% (Class H40V) and between 40 and 60% (Class H60V). The two grades listed correspond to the same requirements for durability as for face brick—Grade SW (Severe Weathering) and Grade MW (Moderate Weathering). Types HBX (Select), HBS (Standard), and HBA (Architectural) are comparable to face brick types FBX, FBS, and FBA, respectively. Another type, HBB, is for general use where appearance is not a consideration and greater variation in size is permissible. Type HBB is the hollow brick equivalent of ASTM C62 building brick. When the project specification does not designate brick type, requirements for Type HBS govern. The default standard for brick grade is SW. This standard does include requirements for efflorescence testing the same as for ASTM C216 face brick. The discussion of compressive strength requirements under ASTM C216 also applies to hollow brick.

Color is not covered in this standard, so the specifier must designate the desired color, by specifying a proprietary product, with color and color range verified with a sample panel or mock-up panel.

ASTM C1405, Standard Specification for Glazed Brick (Single-Fired, Solid Brick Units). Most glazed brick is single-fired with a glaze that is applied during the normal firing process rather than after the unit itself is fired. ASTM C1405 covers physical requirements for the brick body and includes Grade S (select) and Grade SS (select sized or ground edge), where a high degree of mechanical perfection and minimim size variation is required. Units may be either Type I, single-faced, or Type II, double-faced. Weathering properties are specified as Exterior Class or Interior Class. Properties of the glaze and tolerances on dimension and distortion are covered as well as strength and durability requirements.

ASTM C126, Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units. Double-fired glazed brick and structural clay tile are fired with clear or colored ceramic coatings to produce a matte or gloss finish. ASTM C126 covers properties of the ceramic finish including imperviousness, chemical resistance, crazing, and limitations on unit distortion and dimensional variation. Durability and weather resistance are not covered by this standard, so for exterior use, the body of glazed brick should be specified to conform to the requirements for ASTM C216 face brick, Grade SW, except with unit tolerances and surface glaze in accordance with ASTM C126. Glazed brick and tile may suffer severe freeze-thaw damage in cold climates if not adequately protected from moisture penetration, and are not recommended for copings or other horizontal surfaces in any climate. ASTM C126 covers Grade S (select) and Grade SS (select sized or ground edge), where a high degree of mechanical perfection and minimum size variation are required. When unit grade is not specified, the requirements for Grade S govern by default. Units may be either Type I, single-faced, or Type II, double-faced (opposite or adjacent faces glazed). When unit type is not specified, the requirements for Type I govern. ASTM C126 includes tests for imperviousness, chemical resistance, crazing, and opacity of the finish, and references ASTM C67 for compressive strength testing.