

Technical Aspects in Brick Selection

When selecting brick for a project we first need to know what specific application the brick will be used. What are you building? The standards for brick cover the specific uses of brick and classify the brick by performance characteristics. Performance criteria include strength, durability and aesthetic requirements. The selection of the proper specification and classification within that specification, proper design and construction will result in the expected performance.

The ASTM International, www.astm.org, publishes the accepted and up to date standards on brick. These standards are periodically updated through ASTM and a committee of producers, users and general interest people.

The standards, use a series of tables to help to direct and define different types of brick. The table below can be used to determine the use of the brick and the ASTM standard that covers that specific use.

TABLE 1
Specifications for Brick

Title of Specification	ASTM Designation ¹	CSA Designation ²
Building Brick	C 62	—
Facing Brick	C 216	A82
Hollow Brick	C 652	A82
Thin Veneer Brick Units Made from Clay or Shale	C 1088	—
Pedestrian and Light Traffic Paving Brick	C 902	—
Heavy Vehicular Paving Brick	C 1272	—
Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units	C 126	—
Glazed Brick, Single Fired	C 1405	—
Firebox Brick, Residential Fireplaces	C 1261	—
Chemical-Resistant Masonry Units	C 279	—
Sewer and Manhole Brick	C 32	—
Industrial Floor Brick	C 410	—

1. ASTM International, 100 Bar Harbor Drive, West Conshohocken, PA 19428.

2. Canadian Standards Association, 5060 Spectrum Way, Suite 100, Mississauga, Ontario, L4W 5N6 Canada.

Technical Aspects in Brick Selection (cont.)

Once the use of the brick is determined, there are several classifications for grade, class, type, application and use. These classifications cover many aspects of the brick use such as exposure or durability, appearance, physical properties, tolerances on dimension and distortion, chippage and void area. The table below indicates the classifications in specifications for brick.

TABLE 2
Classifications in Specifications for Brick

	Classification			
	Durability	Appearance	Void Area	Use
ASTM Specification				
C 62 Building Brick	Grade	None	None	None
C 216 Facing Brick	Grade	Type	None	None
C 652 Hollow Brick	Grade	Type	Class	None
C 1088 Thin Veneer Brick	Grade	Type	None	None
C 902 Pedestrian and Light Traffic Paving Brick	Class and Type	Application	None	Type
C 1272 Heavy Vehicular Paving Brick	Type	Application	None	Type
C 126 Ceramic Glazed Facing Brick	None	Grade and Type	None	None
C 1405 Single Fired Glazed Brick	Class	Grade and Type	Division	None
CSA Specification				
A82 Fired Masonry Brick Made from Clay or Shale	Grade	Type	None ¹	None

1. No classification given, but solid, cored and hollow brick are defined. See Void Area.

Brick are classified based on their properties after manufacturing. Sometimes the production method plays a role in its classification. For example a molded brick cannot meet the tightest dimensional tolerances as this method uses water causing more shrinkage, while an extruded brick can meet the tighter dimensional tolerances.

Technical Aspects in Brick Selection (cont.)

As the tables describing each classification become more detailed and specific, it is best to refer to The Brick Industry Association, www.gobrick.com, technical note 9A – Specifications for and Classification of Brick. There is a lot of detail here.

Most brick used for building and used on buildings in our area fall under the classification of the standard ASTM C-216 Facing Brick. This use can be for structural or non-structural, such as a veneer and the appearance is an important factor.

Under classifications:

- Durability and Exposure - a brick carries a durability classification and rated by its more severe exposure SW, or less severe exposure MW.
- Physical Property Requirements - the compressive strength, water absorption and saturation coefficient. These items determine the durability of a brick.
- Appearance - with limits on dimensions, distortion, out-of-square and chippage.
- Void Area - brick are classified as solid or hollow with a solid brick being 25% or less void. A brick greater than 25% to 60% void is considered hollow.
- Efflorescence - this is a crystalline deposit of water soluble salts that can form on the surface of the brick. There is a test to determine how likely a brick is to effloresce or not.
- Strength - brick used as a structural element needs to be a certain compressive strength to be used for a structure.
- Initial Rate of Absorption - a measure of how quickly a brick will remove water from mortar spread on it. This may be useful for a brick with a low IRA, good for summer, high IRA good for winter.
- Sampling and Testing – all brick under ASTM specifications are sampled and tested for compliance to their specification prior to use.
- Facing Brick, ASTM C216 and CSA A82 – this is an additional tolerance for solid facing brick limiting the out of square a brick can be.
- Glazed Brick – this classification pertains to glazed brick and their imperviousness, opacity, resistance to fading, resistance to crazing, flame spread, fuel contribution and smoke density, toxic fumes, hardness and abrasion resistance.
- Paving Brick – this refers to the additional durability requirements needed for abrasion resistance in paving brick.
- As I stated above, this information is explained in detail at The Brick Industry Association, www.gobrick.com, technical note 9A – Specifications for and Classification of Brick. There is more explanation with tables that go into great detail for each classification.