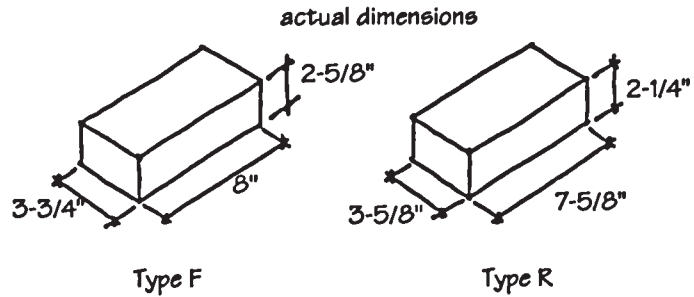


- Type R—brick intended to be set in a mortar setting bed supported by an adequate concrete base, or an asphalt setting bed supported by an adequate asphalt or concrete base
- Type F—brick intended to be set in a sand setting bed, with sand joints, and supported by an adequate base
- Application PS—pavers intended for general use
- Application PX—pavers intended for use where dimensional tolerances, warpage, and chippage are limited
- Application PA—pavers intended to produce characteristic architectural effects resulting from non-uniformity in size, color, and texture

| Abrasion Requirements | | |
|-----------------------|------------------------|--|
| Type | Maximum Abrasion Index | Volume Abrasion Loss, (Max. cm ³ /cm ²) |
| R | 0.11 | 1.7 |
| F | 0.11 | 1.7 |



| Tolerances on Dimensions | | | |
|--------------------------|---------------------------------------|----------------|----------------|
| Dimension (in.) | Maximum Permissible Variation (± in.) | | |
| | Application PS | Application PX | Application PA |
| 3 and under | 1/8 | 1/16 | no limit |
| Over 3 to 5 | 3/16 | 3/32 | no limit |
| Over 5 to 8 | 1/4 | 1/8 | no limit |
| Over 8 | 5/16 | 7/32 | no limit |

| Maximum Permissible Extent of Chippage | | |
|--|------------------------|----------|
| Application | Chippage (in.) in from | |
| | Edge | Corner |
| PS and PX | 5/16 | 1/2 |
| PA | no limit | no limit |

| Tolerances on Distortion | | | |
|---------------------------|--------------------------------------|----------------|----------------|
| Specified Dimension (in.) | Maximum Permissible Distortion (in.) | | |
| | Application PS | Application PX | Application PA |
| 8 and under | 3/32 | 1/16 | no limit |
| Over 8 to 12 | 1/8 | 3/32 | no limit |
| Over 12 | 5/32 | 1/8 | no limit |

| Physical Requirements | | | | | | |
|-----------------------|--|------------|-----------------------------------|------------|----------------------------------|------------|
| Type | Minimum Compressive Strength, Gross Area (psi) | | Maximum Cold Water Absorption (%) | | Minimum Modulus of Rupture (psi) | |
| | Average of 5 Bricks | Individual | Average of 5 Bricks | Individual | Average of 5 Bricks | Individual |
| R | 8000 | 7000 | 6.0 | 7.0 | 1200 | 1000 |
| F | 10000 | 8800 | 6.0 | 7.0 | 1500 | 1275 |

Figure 3-14 Requirements for heavy vehicular paving brick. (Tables on this page copyright ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428. Reprinted with permission.)

| Physical Requirements | | |
|-----------------------|----------------------------------|--|
| | Minimum Modulus of Rupture (psi) | Minimum Pyrometric Cone Equivalent (PCE) |
| Firebox brick | 500 | 13 |

| Tolerances on Dimensions | | |
|---------------------------|---|--------------------------------------|
| Specified Dimension (in.) | Maximum Permissible Variation in Dimension (\pm in.) | Maximum Permissible Distortion (in.) |
| 3 and under | 1/16 | 1/32 |
| Over 3 to 4 | 1/16 | 3/64 |
| Over 4 to 6 | 3/32 | 1/16 |
| Over 6 to 8 | 1/8 | 5/64 |
| Over 8 to 12 | 5/32 | 1/8 |

Figure 3-15 ASTM C1261 firebox brick. (Copyright ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428. Reprinted with permission.)

Refractory brick of different chemical composition is covered in a series of ASTM standards, and is graded according to fusion temperature, porosity, spalling strength, resistance to rapid temperature changes, thermal conductivity, and heat capacity. Some commonly used types of refractory brick are alumina brick, chrome brick, magnesite brick, and silica brick. The highly specialized nature of refractory design requires consultation with manufacturers to assure correlation between design needs and product specifications.

Many industrial operations, such as foundries, steel mills, refineries, and breweries, require flooring materials that are resistant to vibration, impact, heavy vehicular traffic, thermal shock, and chemical attack. *Industrial floor brick* has been used successfully in these applications because of its dense structure, chemical stability, hardness, and “non-dusting” characteristics. Four basic types of units are described in ASTM C410, *Standard Specification for Industrial Floor Brick*, and are classified on the basis of absorption, chemical resistance, and modulus of rupture. Type T provides high resistance to thermal shock and mechanical impact, but also has relatively high absorption (10%). Type H has a lower percentage of absorption (6%), but offers only moderate resistance to chemicals and thermal shock. Type M should be used where low absorption (2%), limited mechanical shock resistance, and high resistance to abrasion are required. Type L provides minimum absorption (1%) and maximum chemical and abrasion resistance, but limited resistance to thermal and mechanical shock. Jointing material for industrial floor brick should be portland cement mortar or grout or, when required, chemical-resistant mortar.

Most well-burned clay masonry, including conventional face brick, building brick, structural clay tile, and ceramic glazed units, has excellent resistance to chemicals and chemical agents. In some installations, however, such as waste treatment facilities, dairies, chemical plants, refineries, and food processing plants, extraordinary resistance may be required. *Chemical-resistant bricks* or acid-proof bricks are machine-made, uncured, kiln-fired units made specifically for this purpose. They are strong, free of laminations,