

DESIGN TIPS – TECHNICAL BULLETIN #49
BASIC COMPARISONS BETWEEN VARIOUS MASONRY MATERIALS

Cast Stone is a time-tested alternative to natural cut stone and has been in existence for hundreds of years. Through the product’s history, technical and performance standards have been established to assure long-term durability and resistance to freeze-thaw, water absorption, abrasion and dirt. United States Cast Stone standards are designed to provide a product of “infinite life” which, in concrete terminology, means exceeding 100 years. Since other concrete and simulated stone products are available for use in construction, architects or other specifiers who are looking for such durable physical attributes should be sure to specify a product that meets established codes and specifications for that level of performance. Most other simulated stone, ordinary concrete and stone look-alike materials cannot meet the minimum physical requirements established as Cast Stone standards. The in-service impact of look-alike materials and their inability to meet rigorous endurance performance criteria are other issues that should be taken into account by designers when comparing the alternative materials and, are discussed below.

Basic Material and Standards Comparisons

- Cast Stone is an architectural concrete building stone product. It combines the strength and durability of reinforced precast concrete with the appearance of natural stone. It consists of Portland cement, fine and coarse aggregates usually of granite, quartz or limestone, natural or manufactured sands and high performance chemical admixtures. Many ASTM Standards exist for Cast Stone and all of the raw materials it comprises. Additional standards for design, performance, sampling and testing of Cast Stone concrete products are published by AIA, CSI, ACI, APA, PCI and UKCSA.
- Of prime importance in selecting an enduring masonry product to be used as an architectural trim, feature or ornament for buildings and other structures should be the following, as measured by an ASTM Standard Test Method specifically designated for the particular product:
 - Relative high compressive strength
 - Relative low absorption
 - Enduring freeze thaw resistance
 - Inclusion of steel reinforcement to provide tensile and or flexure strength

PERFORMANCE CHARACTERISTICS

All concrete products are not equal! The Cast Stone Institute® strives to maintain some of the highest quality concrete produced for the Architectural community. With our quality control program and the high production standards, we believe that our products exceed most architectural requirements for building components. The chart below points out the physical features as compared to other types of building products.

PHYSICAL PROPERTIES COMPARISON CHART

Cast Stone Requirements of the American Society of Testing Materials and the Construction Specification Institute.

Product Type	*Number	PSI Minimum	Air Content Range (Cast Stone Institute® Spec 04 70 00-04)	Absorption Maximum	Freeze-thaw Maximum Loss
Cast Stone (Dry)	ASTM C 1364	6,500	NA	6%	5% @ 300 cycles
Cast Stone (Wet)	ASTM C 1364	6,500	4%-8%	6%	5% @ 300 cycles
Architectural Precast	CST 03450	5,000	4%-6%	6%	NOT REQUIRED
Limestone Dimension Stone	ASTM C 568	Grade II 4,000	NA	7.5%	NOT REQUIRED
Calcium Silicate Brick (Sand-Lime Brick)	ASTM C 73-99a	Grade: MW 3,500 SW 5,500	NA	18% 15%	NOT REQUIRED

* Not all compared products have ASTM requirements.

This Technical Bulletin is provided by the Cast Stone Institute®, and is intended for guidance only.
Specific details should be obtained from the manufacturer or supplier of the Cast Stone units.