

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

Referenced Specifications from the American Society of Testing Materials and the Architectural Precast Association. (Not all compared products have ASTM requirements.)

Product	Minimum PSI	Maximum Absorption	ASTM Designation	Durability Freeze-thaw	Reinforced
Cast Stone	6,500	6%	C-1364	5% loss or less @ 300 cycles	Yes
Architectural Precast	5,000	6%	None	None	Yes
Limestone Grade II	4,000	7.5%	C568	None	No
Calcium Silicate	Grade MW 3,500	14.0%	C73	None	No
	Grade SW 5,500	11.6%			
(assuming average density of 129 lbs/cf)					
Adhered Manufactured Stone Masonry Veneer	2,100	None as per ASTM	C1670-13	1.5% loss or less @ 50 cycles	No

This Technical Bulletin addresses generally accepted practices, methods and general details for the use of Architectural Cast Stone. This document is designed **only as a guide** and is **not** intended for any specific application or project. It is the responsibility of design and construction professionals to determine the applicability and appropriate application of any detail to a specific project based on professional judgment, specific project conditions, manufacturer's recommendations and solid understanding of product characteristics. The Cast Stone Institute makes no express or implied warranty or guarantee of the techniques or construction methods identified herein. Technical references shall be made to the edition of the International Building Codes for the location of the structure, the latest edition of the TMS 402/406 Masonry Standards document and TMS 404, 504, 604 Standards for Design, Fabrication and Installation of Architectural Cast Stone.

The Cast Stone Institute (CSI) is a not-for-profit organization created to advance the design, manufacture and use of Architectural Cast Stone. To further this goal, the CSI continually disseminates information to targeted construction industry audiences through presentations, programs and technical publications.