



BASIC COMPARISONS BETWEEN VARIOUS MASONRY MATERIALS

Cast stone has been in existence for hundreds of years and is a cost effective alternative to natural cut stone. Through the product’s history, technical and performance standards have been established and maintained to assure long-term performance. 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 building 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

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 when needed

PERFORMANCE CHARACTERISTICS PHYSICAL PROPERTIES COMPARISON CHART

The chart below points out the physical features compared to other types of building products.

| Product | Minimum PSI | Maximum Absorption | ASTM Standard | Durability/Freeze-thaw | Can Be Reinforced |
|---|--|--------------------|---------------|-------------------------------|-------------------|
| Architectural Cast Stone | 6,500 | 6% | C1364 | 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 (assuming average density of 129 lbs/cf) | 11.6% | | | |
| Adhered Manufactured Stone Masonry Veneer | 2,100 | None as per ASTM | C1670 | 1.5% loss or less @ 50 cycles | No |

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

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 additives. ASTM C1364 exists for cast stone and references all of the raw materials standards it comprises.

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 Producer Certification Program and the high production standards, our products exceed most architectural requirements for building components.

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.