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SPECIFYING CAST STONE

By Jan Boyer, Cast Stone Institute® Executive Director

Cast Stone has a bit of an identity problem. You see, it makes sense that any material that replicates natural stone is cast stone. If it looks like stone and is a manufactured product, then it must be cast stone. Not true. It could be Adhered Manufactured Stone Masonry Veneer (AMSMV), architectural precast, calcium silicate, or even a natural stone. On many construction documents today, there is confusion in both terminology and physical properties when a material is called out as cast stone, adhered stone veneer or architectural precast. Each product has its appropriate applications dependent upon the project. How can you determine the difference so that you are specifying the correct product for the building application?

CAST STONE AND OTHER MATERIALS

Adhered Manufactured Stone Masonry Veneer (AMSMV) is a light-weight architectural non-load bearing product produced from a wet cast blend of cementitious materials, lightweight and other aggregates, iron oxide pigments and admixtures. It is sometimes referred to as simulated stone or adhered veneer and usually cast into random sizes, in a variety of colors with a natural undressed quarried or cleft stone finish. AMSMV is generally applied as a residential or lightweight commercial masonry veneer adhered to exterior and interior walls, structures, columns, landscape structures, and other structures suitable to receive lightweight adhered units. These simulated stone products are manufactured at 1,800 to 2,000 psi with 22% (UBC Standard 15-5) absorption to meet Construction Specifications Institute (CSI) Division 04 73 00. There are currently no ASTM standard specifications for AMSMV.

Architectural Precast is a wet cast architectural unit made from coarse aggregates, grey or white cements, sand and color pigments manufactured to meet CSI Division 03 45 00. According to this specification, it must be a minimum of 5,000 psi and 6% absorption with no Freeze Thaw durability requirement. It is generally specified for architectural panels, columns and large architectural elements and installed as a precast product as opposed to a masonry product.

Cast Stone is defined as “a refined architectural concrete building unit manufactured to simulate natural cut stone, used in unit masonry applications and is manufactured to meet Division 04 72 00 requirements. Used as an architectural feature, trim, ornament or facing for buildings or other structures, it is created with a fine grain texture to simulate all types of natural cut stone including but not limited to limestone, granite, slate, travertine or marble. Cast Stone can be made from white and/or grey cements, manufactured or natural sands, carefully selected crushed stone or well graded natural gravels and mineral coloring pigments to achieve the desired color and appearance while maintaining durable physical properties which exceed most natural cut building stones. Cast stone is generally built into a load bearing masonry wall system in traditional commercial and residential buildings and other structures. It is specified as per ASTM C1364, Standard Specification for Architectural Cast Stone that was originally approved in 1997.

Cast Stone requirements in ASTM C1364 are:

- Compressive Strength - ASTM C1194: 6,500 psi minimum for products at 28 days
- Absorption - ASTM C1195 of 6% maximum by the cold water method, or 10% maximum by the boiling method for products at 28 days
- Air Content – ASTM C173 or C 231, for wet cast product shall be 4-8% for units exposed to freeze-thaw environments. Air entrainment is not required for VDT products
- Freeze-thaw – ASTM C1364: of less than 5% after 300 cycles of freezing and thawing. Of note is that Cast Stone is the only product with a freeze thaw requirement that must be met by all manufacturers.

Table #1	Physical Property Requirements Comparison Chart		
	PSI	Absorption	Freeze Thaw
AMSMV	1,800 - 2,000	22% (UBC Standard 15-5)	None
Architectural Precast	5,000	Maximum 6%	None
Cast Stone	6,500	Maximum 6%	5% loss or less at 300 cycles

Cast Stone generally is a higher quality finish than other types of precast products. It has a fine grained texture and is used as architectural trim, veneer facing and ornamentation in unit masonry.

In order to clarify the use of Cast Stone it was ultimately determined that the correct ASTM designation, ASTM C1364, be referenced in the International Building Codes.

CAST STONE NOW AS PER ASTM C1364 IN BUILDING CODES

The International Code Council (ICC) Family of Building Codes, including those for all structures, residential and others, have now been adopted in most States. These Codes are legally binding and supersede any other specification unless referenced in these documents. So what does this mean for Specifiers?

Most all materials in the Codes are referenced by definition and as per their ASTM number. In the past, Cast Stone was referenced by definition only as a material that replicated natural stone with no ASTM requirement. This allowed for other products to be referenced in the Code under Cast Stone when it was not the same material.

The Cast Stone Institute ®, through the efforts of the Masonry Alliance for Codes and Standards, forwarded a Code Change proposal to the ICC to require that Cast Stone be defined by, and comply with the requirements of ASTM C1364 in the International Building Code. This proposal was voted at the final action hearings in May 2010 and adopted. It will be included in the 2012 International Building Code (IBC) which is available for distribution as of April 2011.

This is important as it means that Cast Stone specified on a project ***must*** comply with all of the ASTM C1364 standards – including freeze thaw requirements.

Each of these materials is referenced in the IBC by the appropriate category and Chapter. Cast stone is referenced under the Masonry Section. As the International Residential Code references the IBC for terminology, the ASTM C1364 reference applies to residential structures as well.

ABOUT THE CAST STONE INSTITUTE®

As a non-profit trade association, the Cast Stone Institute ® (Institute) was formed in 1927 for the purpose of improving the quality of cast stone and disseminating information regarding its use. Today our mission remains, not only to be the authoritative spokesperson for Cast Stone, but also to provide expert counsel to the architectural and engineering communities. The activities of the Institute are designed to benefit both the industry and its patrons. Institute Technical Specification, Bulletins, Details and related material are included in the Cast Stone Institute Technical Manual available for free download from the website www.caststone.org.

The most important valuable resource to Specifiers is our Certified Producer Members who adhere to the high standards for quality and are bound by a strict code of ethics. Prior to membership approval by the Institute Board of Directors, all potential producer members (manufacturers) must have been manufacturing cast stone for a minimum of three years and pass a rigorous certification that checks for outstanding quality control, safety procedures, consistency of product, housekeeping, meticulous record keeping and many other manufacturing processes which are involved in the production of high quality cast stone elements. In addition, members must provide testing of product every 500 cubic ft. for compression and absorption as well as independent laboratory test results every six months to confirm their product meets the Institute standard specification and ASTM C1364. They must also have a current compliant Freeze Thaw test.

These are tests mandated by ASTM C1364 and our members comply with these strict regulations and provide proof to the Institute of this compliant test data every six months. Since the products that go into the mix design for Cast Stone come from the earth, there can be variances in sands, aggregates, etc... Testing assures the Producer Member, the specifier and owner that they are indeed producing cast stone to specifications. Without this testing, there is no way to assure quality cast stone production.

Cast Stone Institute® Producer Members must also undergo the recertification process every two years by unannounced plant inspections. This unannounced inspection is performed by an independent Engineering Firm in order to assure compliance to requirements. The Institute certification differs from others in that they certify that not only the processes are in place to make quality product but that the product itself is meeting specifications.

CAST STONE INSTITUTE PRODUCER MEMBER 10 YEAR LIMITED PRODUCT WARRANTY

As of January 1, 2011, all Certified Cast Stone Institute Producing Members provide a 10 year Limited Product Warranty for the Cast Stone they supply on projects.

Continuing to lead the industry, the Cast Stone Institute® Producer Members voted on October 8, 2010 to adopt the language for a 10 year Limited Product Warranty. Institute Producer Members are aware of the evolving environment for products in the marketplace that demand sustainability, durability and useable service life. This warranty demonstrates that they embrace these principles and produce product that will stand the test of time.

CONCLUSIONS

What does all of this mean for the specification of cast stone?

- All Architectural Cast Stone must meet ASTM C1364 including test data and freeze thaw durability as per the 2012 International Building Code.
- Certified Cast Stone Institute Producer Members are required to comply with ASTM C1364 and provide the test data to back this up.
- The 10-year Warranty provided by Cast Stone Institute® Producer Members.

Certified Producer Members of the Cast Stone Institute are engaged in the relentless pursuit of excellence in manufacturing. The results of these efforts include consistently high product quality, through continuous improvement in manufacturing methods and materials, and the assurance that Cast Stone Institute Certified Producer Members are keeping cast stone a premier building material. Properly manufactured, designed and installed, cast stone can result in an architectural project of enduring beauty to be enjoyed for decades. When specifying cast stone on a project, be sure to call out for a Cast Stone Institute Member and hold to that specification. This provides Specifiers and Owners the quality assurance the project deserves.

For more information, log onto www.caststone.org.