

## FREQUENTLY ASKED QUESTIONS

> Do SOUNDBLOX and Sound Cell ACMUs comply with the requirements of ASTM C90 Standards?

### [Do SOUNDBLOX and Sound Cell ACMUs comply with the requirements of ASTM C90 Standards?](#)

Yes, both SOUNDBLOX and Sound Cell ACMUs meet ASTM C90 requirements. The physical properties and performance attributes of CMUs vary according to each block producer’s individual cement/aggregate mix design, manufacturing process, and curing method. If a producer’s Base Unit Configuration meets ASTM C90 Standards when tested according to ASTM C140/C140M Standard Test Methods, then predictably SOUNDBLOX and Sound Cell will meet the ASTM C90 requirements, too.

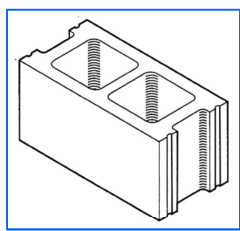
### ASTM Standards

**ASTM C90 Standard Specification for Loadbearing Concrete Masonry Units** is the primary specification for specifying Concrete Masonry Units (CMUs) in the United States. It covers the classification, physical properties, performance attributes, and appearance criteria for manufactured CMUs to ensure satisfactory performance of the resulting construction in real-world applications.

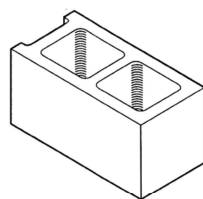
**ASTM C140/C140M Standard Test Methods for Sampling and Testing Masonry Units and Related Units** provide the test methods and procedures for evaluating characteristics of CMUs; the results of which are assessed to verify if the CMUs comply with the minimum standards of ASTM C90.

### Testing and Certification

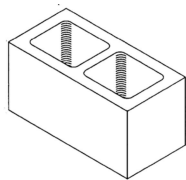
Local CMU producers will routinely test their products according to ASTM C140 for verification that they comply with ASTM C90 Standards. However, even though producers may offer a vast number of sizes and shapes, only a relative few CMUs are actually tested for certification. Typically, a producer will merely test Base Unit Configurations, (e.g. 4”, 8”, 10”, and 12” stretchers), and then apply their performance attributes and inherent characteristics across-the-board to other related CMU products. As example, a producer may submit ASTM C140/C140M test results performed on an 8” stretcher unit as certification that it, as well as other 8” unit configurations (e.g. shown below), will comply with ASTM C90 Specifications and are fit for general construction purposes.



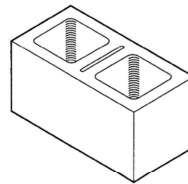
**Tested: 8” Stretcher  
Base Unit Configuration**



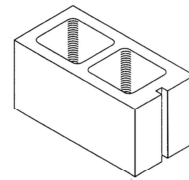
8” Corner



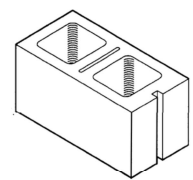
8” Flush-End (FE)



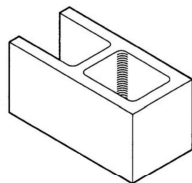
8” FE/Splittable



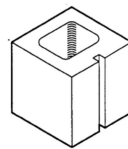
8” FE/Sash



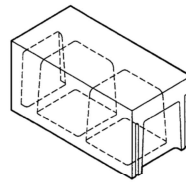
8” FE/Sash Splittable



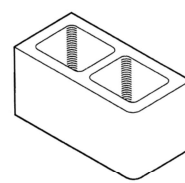
8” Pipe



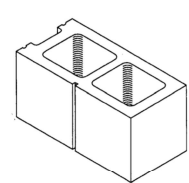
8” Half long



8” Solid Top



8” Bull Nose



8” Scored

In addition to regular CMUs, split-faced, ground-faced, textured face, offset split-faced, plus single and multiple scores may be added to the profiles of CMUs, which significantly increases product option availability. With selection options numbering in the hundreds, it is impractical and cost prohibitive to have each and every CMU size, shape, configuration, and texture tested for ASTM C90 compliance. Again, a tested Base Unit Configuration is relied on as an accurate

representative of how the manufacturer's current cement/aggregate mix design, manufacturing process, and curing methods will perform within the physical characteristics of **density**, **water absorption**, and **compressive strength for these profile masonry units**. As example, if an 8" Split-face stretcher unit is tested according to ASTM C140/140M and found to produce a density of 135 lb/ft<sup>3</sup>; an absorption rating of 8.84 lb/ft<sup>3</sup>, and net area compressive strengths of 3250 lb/in<sup>2</sup>; then equivalent physical results can be expected from an 8" Split-face Flush-End, 8" FE/Sash, etc. units.

Historically, when comparing test results of regionally produced **SOUNDBLOX** and **Sound Cell** AMUs to a regular Base Unit Configuration made with identical cement/aggregate mix design, they tend to yield comparable or better **density** and **water absorptions** results, because of the increased cycle and compaction times required to manufacture these units. Because **SOUNDBLOX** and **Sound Cell** AMUs have greater face-shell thicknesses (1-1/2") than a typical regular CMU Base Unit Configuration (1-1/4"), the AMUs will generally have greater **gross compressive strengths** and yield similar net **compressive strengths**.

It is recommended where owner funding is available and project scheduling allows, that all regular and special Profile Masonry Units, including Acoustical Masonry Units, be inspected and sampled at the place of manufacture from the lots ready for delivery, and tested in accordance with Test Methods C140/C140M.

## ASTM C90 Standards – Physical Requirements

### Density & Water Absorption

Regionally produced **SOUNDBLOX** and **Sound Cell** AMUs will typically yield comparable density and water absorptions results as those of the manufacturer's Base Unit Configuration when made with identical cement/aggregate mix design and manufacturing processes.

### Compressive Strength

Because **SOUNDBLOX** and **Sound Cell** AMUs have greater face-shell thicknesses (1-1/2") than the typical Base Unit Configurations (1-1/4") and typically have longer compaction times, AMUs will generally have greater gross compressive strengths and yield similar net compressive strengths than the Base Unit Configuration.

### Minimum Face Shells

**SOUNDBLOX** and **Sound Cell** molds are configured to yield face-shell thicknesses of 1-1/2", which exceed ASTM C90 minimum requirements of 1-1/4".

### Minimum Web Thickness

**Sound Cell** molds are configured to yield minimum web thicknesses of 1-1/4", which exceed ASTM C90 minimum requirements of 3/4".

**SOUNDBLOX** molds are configured to yield minimum web thicknesses of 1", which exceed ASTM C90 minimum requirements of 3/4".

### Normalize Web Area

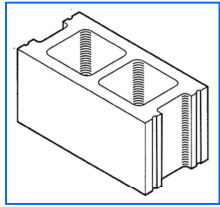
**Sound Cell** molds are configured to yield units comprising Total Minimum Web Areas of 19.2 in<sup>2</sup>/ft<sup>2</sup> resulting in a Normalized Web Area of 21.6, which exceed ASTM C90 minimum requirements of 6.5 in<sup>2</sup>/ft<sup>2</sup>.

**SoundBlox** molds are configured to yield units comprising Total Minimum Web Areas of 19.1 in<sup>2</sup>/ft<sup>2</sup> resulting in a Normalized Web Area of 17.2, which exceed ASTM C90 minimum requirements of 6.5 in<sup>2</sup>/ft<sup>2</sup>.

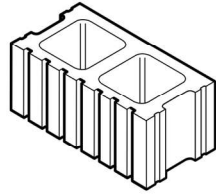
## Appendix

### ASTM C90 Outlier CMUs

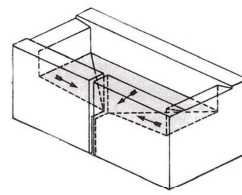
**SOUNDBLOX** and **Sound Cell** and **Acoustade** AMUs fall into an ASTM C90 outlier class of CMUs. These outlier CMUs are configured distinct from the Base Unit Configuration and have characteristics not conventionally assessed with ASTM C140/C140M test procedures; yet they meet all ASTM C90 physical requirements for Loadbearing Concrete Masonry Units and are considered compliant to the Standard.



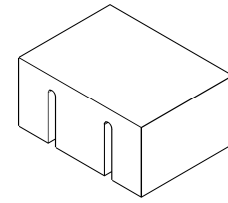
Base Unit Configuration



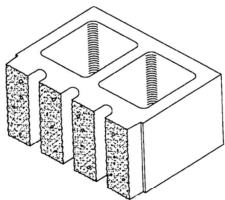
Multi-Scored CMUs



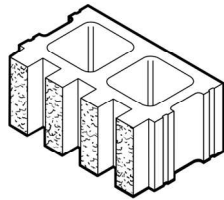
Integral Flashing CMU



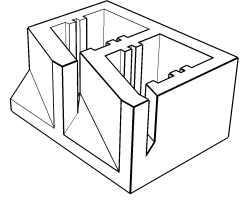
**SOUNDBLOX**



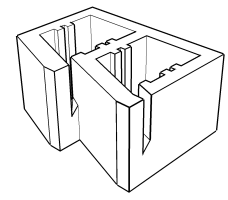
4 - Ribbed



Fluted Split-faced



**Sound Cell**



**Acoustade**

ASTM C140/C140M does not currently provide provisions for assessing characteristics of CMUs that are designed with attributes that are distinct from the full face-shell plane that is typical of Base Unit Configurations. This includes distinctions regarding reductions, interruptions, spaces, and skews.

**Reductions.** One (1), three (3) and seven (7) vertical scores may be cut into the face-shells of standard CMUs to render decorative patterns. Typical scores are 3/8" wide by 3/8" deep and will reduce a 1-1/4" face shell thickness to an effective width of 7/8". A unit having seven (7) scores will reduce the face-shell volume by 5%. Even so, scores are not considered detrimental to the structural integrity of CMUs. ASTM C140/C140M states, "Disregard grooves, scores, and similar details in the face shell thickness measurements."

**Interruptions.** A similar detail to face-shell reductions are interruptions. Some CMUs are designed having partial or full interruptions of the face-shell plane. Units such as the Integral Flashing Units are formed with a full interruption of the face-shell plane; **SOUNDBLOX** AMUs are formed with partial interruptions. **SOUNDBLOX** units are made in a solid-top configuration in order to form internal acoustic resonators; this configuration also adds strength and stability to the CMU and finished wall.

**Spaces.** Ribbed and Fluted CMUs are formed with significant spaces occurring across the working face-shell plane. The flutes are typically 2" wide and extend 1-5/8" to 2-3/16" from the face of a recessed interior frame. A CMU having a 10" frame and 2" flutes is known in the industry as a 10 + 2 Fluted CMU and is considered a 12" load-bearing unit if the flutes are mortared and supported with a 12" foundation.

**Skews.** Sound Cell and Acoustade AMUs are formed with a skewed face-shells to improve in-place acoustical performance. These units are made with 1-1/2" face-shell thicknesses, which results in an increased bedded area over the minimum 1-1/4" face-shell dimension. Theoretical stress analysis calculations conclude that axial and flexural stresses are lower on these skewed CMUs and are equivalent in strength to the typical Base Unit Configuration.

### Conclusion

**SOUNDBLOX**, **Sound Cell**, and **Acoustade** AMUs meet the minimum requirements of *ASTM C90 Standard Specification for Loadbearing Concrete Masonry Units*. They are Structural, Load-Bearing CMUs and will provide comparable physical characteristics as standard hollow concrete masonry units of similar composition.