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WHAT IS THE DIFFERENCE BETWEEN A “CINDER BLOCK” AND A “CONCRETE BLOCK”?

Concrete masonry units are colloquially known by many names, most predominately “concrete block”, “cinder block”, “CMU”, or simply “block”. Related concrete products, manufactured using similar materials and production methods but used in different applications, include products such as concrete pavers, segmental retaining wall units, and articulating concrete block.

There are many, many opinions and theories that have been proposed through the years (and continue to circulate) that attempt to explain the difference between a “concrete block” and “cinder block”. The reality, however, is that these masonry units are essentially the same product produced with the same three basic constituent materials: water, cement, and aggregate.

In the early years of the 20th century as concrete masonry units were beginning to be used with more frequency, producers were looking for ways to reduce the weight of the units to facilitate their use in construction and increase mason productivity. To reduce the unit weight, many producers (but not all) incorporated cinders into their block as an alternative to conventional stone aggregate. Cinders, which include both waste by-products of coal combustion as well as volcanic cinders, were an ideal, cost-effective, lightweight aggregate that was readily available in many areas of the country. Soon after, the terms “cinder” and “block” were perpetually linked. The use of waste by-products such as coal cinders effectively made concrete masonry the first construction material to adopt green, sustainable practices; a century before it was fashionable to do so.

The practice of incorporating coal combustion cinders (as well as other waste by-products) into concrete masonry units continues today. Yet, using cinder aggregates as a lightweight alternative to stone and gravel aggregate may have inadvertently led to another common misconception regarding the term cinder block: that cinder block are lighter (have a lower density) compared to concrete masonry units. While it is true that a concrete block manufactured with cinders will tend to have a lower density compared to a concrete block manufactured with

stone aggregate, there are many other lightweight aggregate types (both natural and man-made) that are commonly used in block production. As such, the density of a block is not an indication of whether it has been manufactured with or without cinders.

For many the term cinder block is associated with older concrete masonry; presumably manufactured during the first half of the 20th century. As previously discussed, cinders (both volcanic and coal combustion by-products) continue to be used in block production today – as such, there is no differentiating a concrete block from a cinder block based upon its age.

What has changed over the past 100 years is the technology used today to produce concrete masonry results in a consistently high-quality product with uniform properties. Likewise, codes and standards have evolved through the years to comprehensively address minimum physical requirements for concrete masonry to ensure the long-term durability and performance of these products. Consequently, some associate cinder block with inconsistent or poor quality units produced in early 20th century, which has led some to believe that cinder block are not permitted to be used to construct buildings today. The reality is that all concrete masonry units used in construction must meet minimum requirements established by building codes, regardless of whether they contain cinders or not. Further, regardless of whether you are studying a newly constructed building or a 100 year old foundation – those concrete units are concrete masonry units, CMU, concrete block...or if you prefer, cinder block – although it is nearly impossible to tell visually if a given unit contains actual cinders.

The introduction of new manufacturing technologies, alternative or non-traditional constituent materials, unique unit configurations, and ever-expanding market-driven applications has in recent years pushed the boundaries of what has conventionally been known as a “concrete masonry unit” into areas where some, or most, would no longer associate a given

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product with historical definitions for these units.

Some of the material differences are small, such as units that are manufactured with small amounts of recycled or by-product materials that are similar in nature to constituent materials traditionally used in production. Other differences are more substantial, such as compressed earth/clay products whose visual appearance mimics that of concrete masonry but with few other similarities. The question that results is: "At what point are the characteristics of a concrete masonry unit changed so significantly that it evolves into a different type of product entirely?"

While on the surface establishing specific guidance for defining a concrete masonry unit may seem trivial or pedantic, it can have multiple important consequences. One such important consideration is ensuring that building code requirements and design provisions are applied to the construction material for which they were intended – and not extrapolated to other products that share similar attributes or applications, but lack the characteristics to perform similarly. Nevertheless, even contemporary codes and standards are vague in their definition of a concrete masonry unit.

Chapter 21 of the 2009 *International Building Code* contains the following definitions:

Concrete Masonry Unit—A building unit or block larger in size than 12 inches by 4 inches by 4 inches (305 mm by 102 mm by 102 mm) made of cement and suitable aggregates.

Concrete Brick—A masonry unit having the approximate shape of a rectangular prism and composed of inert aggregate particles embedded in a hardened cementitious matrix.

Masonry—A built-up construction or combination of building units or materials of clay, shale, concrete, glass, gypsum, stone or other approved units bonded together with or without mortar or grout or other accepted methods of joining.

ASTM C1232-09, *Standard Terminology of Masonry*, contains several definitions that are relevant to this discussion, but does not contain a definition for a generic concrete masonry unit. The introduction of such a definition has been attempted multiple times, but continues to be a point of contention due in part to the broad use of the term.

Concrete Brick, *n*—a concrete masonry unit made from portland cement, water, and suitable aggregates, with or without the inclusion of other materials. See Specification C 55.

Manufactured Masonry Unit, *n*—a manmade noncombustible building product intended to be laid by hand and joined by mortar, grout, or other methods of joining.

Masonry, *n*—the type of construction made up of

masonry units laid with mortar, grout, or other methods of joining.

CMHA TEK 01-04, *Glossary of Concrete Masonry Terms*, contains the following definitions:

Block—A solid or hollow unit larger than brick-sized units. (See also "Concrete block, concrete masonry unit, manufactured masonry unit")

Brick—A solid or hollow manufactured masonry unit of either concrete, clay or stone.

Concrete block—A hollow or solid concrete masonry unit. Larger in size than a concrete brick.

Concrete brick—A concrete hollow or solid unit smaller in size than a concrete block.

Concrete masonry unit—Hollow or solid masonry unit, manufactured using low frequency, high amplitude vibration to consolidate concrete of stiff or extremely dry consistency.

Manufactured masonry unit—A man-made noncombustible building product intended to be laid by hand and joined by mortar, grout or other methods.

Masonry—An assemblage of masonry units, joined with mortar, grout or other accepted methods.

Historically, a more informal classification of a concrete masonry unit has also considered the following criteria:

- Manufactured on high-speed equipment that use a combination of compression and vibration to consolidate a mix into a mold;
- Manufactured using a no-slump, or nearly no-slump, concrete mix (also referred to as dry-cast concrete);
- Manufactured using inert (including chemically non-reactive), inorganic constituent aggregates, such as those meeting the requirements of ASTM C331 for lightweight aggregates or ASTM C33 for normal weight aggregates;
- Manufactured using conventional cementitious materials including cements meeting the requirements of ASTM C150, C595, C618, C989, or C1157 that, with the addition of water, chemically hydrate to permanently bind the constituent materials together;
 - Produced using other constituent materials, such as admixtures or pigments, which have been established by test or performance to be suitable for use in the production of such units without detrimental impact on the use or performance of the resulting construction.
- Laid or placed, typically by hand, with or without the use of mortar, grout, or supplemental reinforcement;
- Used in building, non-building, and hardscape applications; and
- Used in loadbearing or non-loadbearing applications.

ABOUT CMHA

The Concrete Masonry & Hardscapes Association (CMHA) represents a unification of the Interlocking Concrete Pavement Institute (ICPI) and National Concrete Masonry Association (NCMA). CMHA is a trade association representing US and Canadian producers and suppliers in the concrete masonry and hardscape industry, as well as contractors of interlocking concrete pavement and segmental retaining walls. CMHA is the authority for segmental concrete products and systems, which are the best value and preferred choice for resilient pavement, structures, and living spaces. CMHA is dedicated to the advancement of these building systems through research, promotion, education, and the development of manufacturing guides, design codes and resources, testing standards, and construction practices.

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