

## Designer information for DesignBLOK<sup>®</sup> blended color, smooth face architectural block

For Architects to achieve design objectives, it is important to understand technology of blended color, smooth face architectural concrete masonry units. If you prefer to have discussion about why smooth face masonry CMU aesthetics may be challenging, please contact any of us listed on page two.

Smooth face architectural CMU are regular CMU with color pigment in the mix design. Split face, sand blasted and ground face CMU are not as sensitive to minor color hue variations, because the finished surface does not rely on "surface cement paste."

Aggregate color varies due to the sedimentation process of pre-historic oceans and glacial deposits, and this contributes to color variability of gray and color CMU. Aggregate quarry operators harvest specific layers of aggregates to minimize color variation, although as layers are exhausted they mine deeper layers or extend quarry sites. We have evolved procedures to minimize aggregate variables, however variations in the sand fineness index (fineness modulus) is beyond our control. Be assured we make ongoing investments in computerized batching systems to precisely dispense cement, slag cement, water, limestone, sand, color admixtures and water repellent admixtures.

We achieve color CMU by batching pigments (iron oxides) into the concrete mix and they become part of the sand, cement and water paste, which is the binding agent for the coarse aggregates. When concrete block are produced, the pigmented concrete mix is compacted in the mold under high pressure forcing cement paste to the block surface. The concentration of surface paste may vary due to differential frequency and amplitude vibrations within the block mold assembly.

In year 2000, Oberfields introduced DesignBLOK<sup>®</sup> "blended colors" to create soft color hues in smooth block walls. This is referred to as "color range." Light colors show more color range than dark colors. We utilize two color recipes with slightly different pigment loadings. "Graphite blend #3325 recipe A" is batched into hopper One and "Graphite blend #3325 recipe B" is batched into hopper Two. Both hoppers feed the block machine simultaneously. Our "smooth CMU blended color program" has been successful in minimizing dark and light color patches in the wall.

Concrete block are cured in kilns at elevated temperatures and high humidity levels, which is an essential step in the production process. Once the kiln curing process is complete at our Sunbury Ohio architectural CMU plant, kiln humidity is evacuated to minimize color variation. Our architectural kilns are long bays, which are preferred to open space kilns. It is easier to achieve uniform temperature and moisture in long bays; however differential temperature and humidity may contribute to subtle color hues.

Block plants not equipped with two holding hoppers may advise Designers to limit smooth face CMU to areas of the wall at higher elevations, such as a single course band of smooth face within a field of split face. Another idea may be to use gray concrete block and stain the wall afterward. Deep penetrating masonry stains maintain the natural texture of the block and have excellent durability. Color stains mask jobsite incurred blemishes and blend the naturally occurring range of block color.

We recommend Architects specify sample panels be erected, photographed, approved, and kept safe until the project is closed out. In some cases the sample panel may become a wall to hide recycling bins.

**Scratching:** The concentrated colored cement paste on the surface of a smooth face block may scratch during handling and delivery. The scratch appears as a white chalk line and is not removed by washing. One block rubbing against another may remove cement paste at the point of contact. Split face and sand blasted block are not prone to scratching because aggregates of the exposed concrete matrix masks impact marks.

**Chipping:** Small chips or a rough edge may be challenging to blend into smooth face block due to its lack of texture. The rough texture of split face and sand blasted blocks mask minor chips and allows mason contractors to easily fill minor chips when mortar joints are tooled.

On some projects, smooth face CMU are considered after split face, sand blasted, and ground face CMU are eliminated due to cost. If you have questions about our blended color, smooth face architectural masonry please contact:

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“Designer information for DesignBLOK® blended color, smooth face architectural block” replaces “A Masonry Design Service of Oberfields LLC.”

Contact us for a copy of ASTM C90 or order it from ASTM. <https://www.astm.org/Standards/C90.htm>

“ASTM C90 Standard Specification for Load Bearing Concrete Masonry Units” recognizes that all concrete block projects experience chipping of the units from delivery and handling at the jobsite.

Below is an excerpt from ASTM C90

*“7. Finish and Appearance*

*7.1 No more than 5 % of the units in the shipment shall exhibit one or more of the characteristics described in 7.1.1 through 7.1.4 and 7.2.*

*7.1.1 Units with dimensions not meeting the requirements of 6.1.*

*7.1.2 Units with finished face(s) containing chips larger than 1 in. (25.4 mm) in any direction.*

*7.1.3 Units with finished face(s) containing cracks wider than 0.02 in. (0.5 mm) and longer than 25 % of the nominal height of the unit.*

*NOTE 10—Units specified to have particular features or finishes, such as split-face and tumbled units, should not be evaluated for conformance of such features to the requirements of 7.1.2.*

*7.2 Where units are to be used in exposed wall construction, the face or faces that are to be exposed shall not show chips or cracks, not otherwise permitted in 7.1.2 and 7.1.3, or other imperfections when viewed from a distance of not less than 20 ft (6.1 m) under diffused lighting.*

*7.3 The color and texture of units shall be specified by the purchaser. The finished surfaces that will be exposed in place shall conform to an approved sample, consisting of not less than four units, representing the range of texture and color permitted.*

*NOTE 11—Concrete masonry units are produced using a wide variety of natural aggregates and other materials. As such, slight variations inherent from natural materials should be expected. Since specifying units and approving samples can take place several months prior to production of actual units for a project, slight variations in appearance from the approved sample are to be expected.”*