What is porcelain? This topic of debate continues to arise in the North American ceramic tile industry.

Any ceramist or materials scientist will likely describe porcelain as such: a triaxial composition of quartz, clay, and feldspar that, when fired between 1200 and 1400 degrees Celsius, produces a tough white, usually translucent and virtually non-permeable body.

However, when used in reference to ceramic tile, the word “porcelain” has a different definition. In the American tile industry, porcelain has traditionally been described as an “impervious” ceramic tile, meaning that its water absorption is less than or equal to 0.5 percent. Although porcelain tile is routinely produced with a composition typically meeting the ceramist’s porcelain definition, the tile industry considers any ceramic tile with water absorption less than or equal to 0.5 percent to be porcelain, regardless of composition. Thus, this impervious categorization has evolved into a class of ceramic tile unto itself.

How ISO defines it

When referencing ISO 13006, which is the specification for ceramic tile as designated by the International Standards Organization (ISO), the word “porcelain” is not used. The group of tile that we would call porcelain is referred to as a class, BI (B: Dry pressed tile, I: Water absorption group ≤ 0.5 percent). Because ISO does not define the word “porcelain” some manufacturers use the term improperly causing confusion in the marketplace.

ANSI: based on water absorption

The American National Standard for ceramic tile, A137.1, which is accredited through the American National Standards Institute (ANSI) defines porcelain tile as fine-grained, usually formed by the dust-press method, and with water absorption less than or equal to 0.5 percent. In this standard, water absorption is measured by the test method ASTM C373 “Standard Test Method for Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired Whiteware Products,” as designated by the American Society for Testing and Materials (ASTM). This method is both more exacting and more rigorous.
than the methods specified under ISO for measuring water absorption. While porcelain tile is more often made by dust-pressing, the current version of ANSI A137.1 also considers extruded tile to be porcelain if it meets the water absorption criteria. This means that porcelain, which has commonly been made from pressed clay, light in color and abundant in kaolinite with very few impurities, could also be made from organic-rich red clays that are either pressed or extruded so long as the fired product has a low enough water absorption.

Brazilian definitions target absorption

The Brazilian Association for Technical Standards/Norms (ABNT) recently released an entire document dedicated to the specifications for porcelain tile that includes water absorption criteria. The scope of this document states that it “establishes the characteristics required for manufacture, marking, declarations (information) in catalogues, receipt, inspection, sampling and basis for acceptance of porcelain tiles.” The Brazilian standard describes porcelain tile as any ceramic tile made of clay, feldspar, and other inor-
ganic raw materials that is either pressed or extruded and contains water absorption of less than 0.5 percent. The Brazilians have also included an even lower water-absorptive class, referred to as “technical porcelain” for porcelain tile with water absorption less than 0.1 percent.

**PTCA: certifying tiles meet the definition**

Because ISO has not yet defined criteria for the word “porcelain,” even though they have defined a class with water absorption less than or equal to 0.5 percent, we continue to see tiles in our market that are falsely marked as porcelain. To help bring clarity to the marketplace, TCNA teamed up with the Ceramic Tile Distributors Association (CTDA) to launch the Porcelain Tile Certification Agency (PTCA). This agency will serve to test and certify tiles that meet the water absorption criteria of true porcelain tiles.

The average person most likely associates the word “porcelain” with the dense, translucent white body found in fine china and dinnerware. However, developments within the ceramic tile industry allow porcelain tile to be made from different types of clay so long as they meet the water absorption criteria. Whether dry pressed or extruded, kaolinite or red body, porcelain in the ceramic tile industry is defined as a ceramic tile with water absorption (per ASTM C373) less than or equal to 0.5 percent.

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