



## ‘Rectifying’ the Misconceptions Associated with Rectified Tile and Narrow Grout Joint Installations

**W**ith ceramic tiles, as with many products, consumers expect dimensional consistency from one tile to another. Green-body (unfired) tiles within the same product line are nearly identical in size when they exit an extruder or press. However, shrinkage during drying and firing results in variability of facial dimensions from one tile to another. This occurrence results from reactions between the three primary ingredients in the majority of all ceramic tiles: silica (sand), clay, and feldspar. Combined reactions of the three components result in a permanent contraction of the ceramic body, causing the tile exiting the kiln to be noticeably smaller than when it enters.

### What is calibrated tile?

Due to the variation from shrinkage, even with the most modern equipment and technology, manufacturers must use a sorting process to make sure that all tiles within a box are dimensionally consistent. Once tiles are sorted, they are commonly grouped into two to four different calibers, depending on the size with which they most closely correspond. This is a process called *cali-*

*bration*, and is performed to ensure that manufacturers meet strict sizing requirements. These requirements typically allow no more than +/-0.5% variation from the average facial dimension of the corresponding caliber, never exceeding +/-2 mm.

### What is rectified tile?

In order to minimize size variation from one tile to another, more than what can be achieved by calibration alone, a tile can be *rectified*. A rectified tile is one that has had all sides mechanically finished to achieve a more precise facial

dimension. This mechanical finishing most commonly includes the use of precision saws and grinders. By rectifying tile, a manufacturer can produce a single precise size, eliminating the need to warehouse and ship multiple calibers.

### What can be expected from a box of tile labeled “rectified”?

Although consumers expect dimensional consistency from tiles that have been rectified, until recently there has not been a standard to specify sizing tolerances for rectified tile. As a result, many tiles on the market are labeled rectified when in fact they exhibit sizing variation not particularly different from what would be expected with calibrated tile.

However, in the new version of ANSI A137.1, the American National Standard Specification for Ceramic Tile, that is currently being balloted, rectified tiles are addressed. This document contains both a definition and specific dimensional tolerances for rectified tile. The size requirements for rectified tile



**Right: Tile rectification commonly involves equipment with precision saws and grinders.**

will be significantly more stringent than calibrated tile. Once the new document is adopted, it will hopefully bring more clarity to the marketplace regarding what is and what is not rectified tile.

### What are the issues associated with narrow grout joints? How can rectified tile help?

Commonly and mistakenly, people assume that using a rectified tile allows them to have a narrow grout joint. However, there are five separate and important issues that must be addressed to accomplish a successful narrow grout joint installation:

- Narrow grout joints provide less room to allow for variation in the size of the tiles.
- Narrow grout joints provide less room to allow for variation in the layout due to an uneven substrate.
- With narrow grout joints, lippage due to an uneven substrate is more apparent.
- With narrow grout joints, lippage due to varying mortar thickness or limited installer proficiency is more apparent.
- With narrow grout joints, lippage due to inherent tile warpage is more apparent.

The use of rectified tile addresses only the first of these five points. To address points two and three, it is critical to have a flat

substrate. If the substrate is not flat, then slight variations in floor topography can result in a layout that requires varying grout joints. Uneven substrates can also contribute to an increased amount of lippage. While section 4.3.7 of ANSI A108.02, the American National Standard Specifications for the Installation of Ceramic Tile, allows for a certain amount of lippage, for grout joints of 1/8" or less the allowable lippage is only 1/32", and in general, lippage is far more noticeable with narrow grout joints. Consequently, an appropriately flattened substrate is critical for any successful narrow grout joint installation.

Similarly, narrow grout joints can more clearly reveal lippage due to uneven mortar thickness. To address this (point four), installers need more time, and compensation for such, to achieve a flat installation when the tiles are placed close together. For example, dimension stone is commonly installed with narrow grout joints, and such installations require a much larger amount of time and material than one would commonly use with a thin-set tile installation with regular grout joints.

To address point five, certain tile patterns should not be considered in an installation with narrow grout joints. Whenever the center of one tile is beside the end of another (for example, running bond or staggered "brick" patterns) even minimal warpage can create lippage. With regular-sized grout

joints this lippage is not as evident, but with narrow grout joints these types of patterns are highly problematic.

In summary, narrow grout joints can be achieved with rectified tile, but only when used in conjunction with proper substrate preparation, when installed by a proficient installer who is properly compensated for the extra time required, and when installed in a pattern that will not exhibit lippage from inherent tile warpage. **TILE**



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### About the Author

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Product Performance Testing Laboratory, is responsible for testing tile and installation materials to ASTM, ANSI and ISO standards. He is involved in the development and revision of ASTM, ISO, and ANSI product standards. Griese earned a Bachelor of Science degree in ceramic and materials engineering from Clemson University in Clemson, SC.