

# PORCELAIN/CERAMIC TEST RESULTS

## EVALUATING THE STATIC COEFFICIENT OF FRICTION (COF) OF CERAMIC TILE, ASTM C1028-06

COF\* defines the relative slip resistance of floor surfaces. The tile industry uses ASTM C1028-06 to measure the COF published in Dal-Tile's product literature. The procedure involves the use of a calibrated dynamometer; a specified neolite heel assembly; a standard reference tile surface, and a 50 pound weight. This procedure measures the maximum force required to initiate motion in the testing assembly in four perpendicular directions. The values are recorded and an averaging calculation is performed that determines the static COF.

## WATER ABSORPTION, ASTM C373-88

Water absorption is measured using ASTM C373-88. Individual tiles are weighed, saturated with water, then weighed again. The percent difference between the two conditions is referred to as the water absorption value. Tiles are classified according to water absorption percentages as follows:

<b>Impervious</b>	Tiles exhibiting 0.5% or less.
<b>Vitreous</b>	Tiles exhibiting more than 0.5% but not more than 3.0%.
<b>Semi-Vitreous</b>	Tiles exhibiting more than 3.0% but not more than 7.0%.
<b>Non-Vitreous</b>	Tiles exhibiting more than 7.0%.

## SCRATCH HARDNESS (MOH'S SCALE RATINGS)

The relative hardness of glazed tile is an important issue that should be addressed when selecting a tile. The test is performed by scratching the surface of the tile with different minerals and subjectively assigning a "MOH's Scale Hardness" number to the glaze, the softest mineral used is talc ("1" rating), the hardest is a diamond ("10" rating). Other minerals of varying hardness provide Moh's Scale Hardness values of 5 to 7 are suitable for most residential floor applications. A value of 7 or greater is normally recommended for commercial applications.

## BREAKING STRENGTH CERAMIC TILE, ASTM C648-04






Ceramic tiles used on floors and walls must be able to withstand the expected load bearing capacity of various installations. The tile industry uses ASTM C648-04 to determine the strength and durability of the tile. A force is applied to an unsupported portion of the tile specimen until breakage occurs. The ultimate breaking strength is then recorded in pounds. Final selection of the tile should be based upon the breaking strength and the appropriate installation method. Tile integrity is critically dependent upon proper installation. Dal-Tile recommends strict adherence to industry installation guidelines set forth in ANSI A108, A118 and A136.

## CHEMICAL RESISTANCE, ASTM C650-04

Chemical resistance is measured using ASTM C650-04. A tile sample is placed in continuous contact with a variety of chemicals for 24 hours, rinsing the surface and then examining the surface for visible variation.

### SHADE VARIATIONS

Tiles range from complete inconsistency to a more random appearance. Here's an overview of color and shading of individual tile selections.

	Monochromatic (V0) - Very uniform, monochromatic color
	Low (V1) - Consistent color within each tile and from tile to tile
	Medium (V2) - Color variation within each tile
	High (V3) - Some variation from tile to tile, and within each tile
	Random (V4) - Considerable variation from tile to tile

## ABRASION RESISTANCE, ASTM C1027-99

The durability of glazed tile is measured, subjectively, by observing the visible surface abrasion of the tile when subjected to the ASTM C1027-99 testing procedure. Dal-Tile evaluates glazed tile recommended for floor applications using this test method which includes the following classification system:

<b>Class Zero</b>	Not recommended for use on floors.
<b>Class One</b> (Light Residential) 1	<i>Light Traffic</i> - Residential floor coverings in areas subject to soft-soled footwear or normal footwear traffic, without scratching dirt (i.e. domestic bathrooms and bedrooms without exterior access).
<b>Class Two</b> (Residential) 2	<i>Medium to Light Traffic</i> - Residential floor coverings in areas subject to soft-soled footwear or normal footwear traffic with small amounts of scratching dirt (i.e. rooms in the living areas of homes except kitchens, entrances and other areas that may be subjected to high usage).
<b>Class Three</b> (Heavy Residential or Light Commercial) 3	<i>Medium to Heavy Traffic</i> - Residential or light commercial may withstand normal footwear and regular traffic, with some dirt and/or other abrasives present in limited quantities. Tile in this class may be used in light commercial installations with limited foot traffic and with no direct access to the outside. Examples may include residential kitchens and hallways with limited traffic from the outside.
<b>Class Four</b> (Commercial) 4	<i>Heavy Traffic</i> - Residential and commercial floor coverings subjected to considerable traffic and scratching dirt (i.e. entrances, workrooms, inns, exhibition halls, and sales rooms, as well as other rooms in public and private buildings). Floors should be adequately protected against scratching dirt at the entrances to buildings by either floor mats or some other footwear cleaning device.
<b>Class Five</b> (Heavy Commercial) 5	<i>Heavy Traffic</i> - Heavy commercial floor coverings subject to heavy traffic with very abrasive soil.

## INDUSTRY STANDARDS

The American Society for Testing and Materials (ASTM) and the American National Standards Institute (ANSI) are nationally recognized organizations, which identify and develop industry test methods and technical standards.

\*Neither ASTM nor ANSI establish an industry standard identifying a minimum COF value whereby ceramic tile may be labeled "slip resistant".

All Standard Grade ceramic tile products manufactured by or for DalTile meet or exceed the requirements of ANSI A137.1. See product pages for series-specific technical data.