

TESTING METHODS AND RESULTS

This glossary serves as a reference for the technical data listed on our tile specifications sheets and further explains the different tests and standards that are provided for our porcelain and ceramic tiles.

If you have any additional questions, please visit your local showroom or contact our customer service representatives at 1.888.398.6595

WATER ABSORPTION (EN 99, ISO 10545-3, ASTM C373-88)

A tile's water absorption rate (WA) will tell you if the tile you're considering is the right tile to use in an outdoor or wet area. The WA is determined by measuring the degree of internal porosity of the tile body and consists of boiling the tile in water and measuring its gain in weight from the original dry state.

LOW DENSE Dry pressed tile with a water absorption rate of more than 7%	A>7
MEDIUM DENSE Dry pressed tile with a water absorption rate between 3% and 7%	3<A<7
HIGH DENSE Dry pressed tile with a water absorption rate between 0.5% and 3%	0.5<A<3
EXTREMELY DENSE Dry pressed tile with water absorption of 0.5% or less This is where porcelain tile is categorized.	A<0.5%

SURFACE ABRASION (EN 154, ISO 10545-7, A 187.1, ASTM C1027-99)

All glazed floor tiles (including ceramic tiles) are classified under a Porcelain Enamel Institute (PEI) rating for the suitability of fixing in a particular location. This test determines how much the tile will resist abrasion and its suitability as a floor tile.

VERY LIGHT TRAFFIC Suggested uses: indoor wall applications, interior light use (countertops and bathrooms), and very light traffic residential bathroom floors	PEI I
LIGHT TRAFFIC Suggested uses: interior wall applications, all interior countertop applications, and light traffic residential interior floors	PEI II
MODERATE TRAFFIC Suggested uses: all interior wall applications, all interior countertop applications, and all residential interior floors	PEI III
MODERATE TO HEAVY TRAFFIC Suggested uses: all interior wall applications, all interior countertop applications, all residential interior floors, and all light commercial applications (restaurants, lobbies, etc.).	PEI IV
HEAVY TRAFFIC Suggested uses: all interior wall applications, all interior countertop applications, all residential interior floors, and all heavy commercial applications (airports, shopping malls, supermarkets, etc.).	PEI V

RESISTANCE TO DEEP ABRASION (EN 101, ISO 10545-6)

To determine a relative measurement of scratch resistance of tile and stone, manufacturers and suppliers use the Moh's Hardness Scale. The Moh's scale uses ten fairly common minerals of known hardness and gives each of them a relative value of 1-10. Each mineral in the scale will scratch those with lesser values and will not scratch those with higher values.

MOHS	Mineral	Compared to other flooring Materials
1	Talc	Resilient flooring (vinyl, asphalt tile)
2	Gypsum	Wood flooring
3	Calcite	Polished marble, laminate flooring
4	Fluorite	Black marble
5	Apatite	Glazed ceramic tile
6	Feldspar	Glazed ceramic tile
7	Quartz	Quarry tile, glazed porcelain tile
8	Topaz	Unglazed porcelain tile
9	Corundum	No flooring is this hard
10	Diamond	No flooring is this hard

FROST RESISTANCE (EN 202, ISO 10545-12, ASTM C1026)

Frost resistance determines whether or not a tile is suitable for outdoor applications in colder climates. When a tile absorbs a large quantity of water and the volume increases from freezing, the tile can break. This test consists of soaking the tiles in water and subjecting them to temperature cycles from +51°C to -51°C (+123.8°F to -59.8°F). All sides of the tiles are exposed to freezing over 100 freeze-thaw cycles.

STAIN RESISTANCE (EN 122, ISO 10545-14)

This test measures a surface's resistance to staining. Staining tests are achieved by prolonged exposure of the tile surface to test solutions and dry staining agents. Tiles are visually evaluated after the staining agent has been cleaned off using a combination of cleaning procedures.

Stain is not removed	Class 1
The stain is removed using solvent, such as acetone	Class 2
The stain is removed using a strong commercial cleaning agent	Class 3
The stain is removed using a weak commercial cleaning agent	Class 4
The stain is removed using hot water	Class 5

SLIP RESISTANCE (EN, ISO 10545-17, ASTM C1028)

Slip resistance (also referred to as friction) is the force that resists the sliding motion of one surface against another. This measurement can be altered by contaminants or liquids when the tile is wet. There are two types of friction: Static Coefficient of Friction (SCOF), which is the ratio of forces necessary to start two surfaces sliding, and Dynamic Coefficient of Friction (DCOF), which is the ratio of forces necessary to keep two surfaces sliding. The previous standard for testing slip resistance was ASTM C1028, which is still seen throughout some product specification sheets.

DRY INNER SPACES Areas with slope lower than 6%	Class 1
Areas with slope equal or higher than 6% and staircases	Class 2

DAMP INNER SPACES Halls with entrance from the street, covered terraces, changing rooms, showers, toilets and kitchens	
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Areas with slope lower than 6%	Class 2
Areas with slope equal or higher than 6% and staircases	Class 3

INNER SPACES
Apart from water, there may be other elements (grease, lubricant...) that diminish the slipperiness resistance such as industrial kitchens and areas of industrial use.

Areas with any slope	Class 3
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OUTER SPACES Swimming pools	Class 3
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RECOMMENDED INSTALLATIONS

These are based off of the technical specifications and design styles of our products. We have included a key to show the recommended areas of application.

Areas that are NOT recommended are marked with a slash:



Recommended installation areas are as follows:

F	W	B	A	SP	EX
FLOOR	WALL	BACKSPLASH	ACCENT	SHOWER PAN	EXTERIOR

*Please note that these are only recommendations and in some cases the products may be suitable for installation in additional spaces. Contact our customer service representatives or your local showroom for more information.

INDUSTRY STANDARDS INFORMATION

Descriptions of industry standards are listed below

AMERICAN SOCIETY FOR TESTING AND MATERIALS	ASTM
INTERNATIONAL ORGANIZATION FOR STANDARDIZATION	ISO
EU INTERNATIONAL ORGANIZATION FOR STANDARDIZATION	EN

*The American Society for Testing and Materials (ASTM), the International Organization for Standardization (ISO), and the EU ISO are internationally recognized organizations that identify industry test methods and technical standards. All tests are subject to change based on new studies and standards may vary across different industry procedures. To confirm the most accurate results always check with a Tile Shop representative before purchasing.

