Technical Characteristics of Porcelain Stoneware

Porcelain stoneware has established itself as one of the most appreciated and widely used finishing materials globally, thanks to its exceptional technical and aesthetic qualities. Its production is the result of an advanced process combining high-quality natural raw materials, including white clays, kaolins, quartz sand, and feldspars. Selected pigments are added to these components to create surfaces with intense colors and precise shades, making each product visually unique and appealing.

The production process begins with mixing the raw materials, followed by an extremely powerful pressing phase reaching over 5000 t/m². This step gives porcelain stoneware exceptional compactness and resistance. The firing phase then occurs in kilns at temperatures above 1250°C, essential conditions for developing the material's distinctive technical features.

Thanks to the combination of high-pressure pressing and high-temperature firing, porcelain stoneware offers durability, wear resistance, and extremely low porosity. These qualities make it ideal for meeting daily challenges while maintaining its aesthetic beauty and functionality over time.

In summary, porcelain stoneware represents an excellent choice, combining refined design with unparalleled technical performance, confirming its role as a versatile and long-lasting material for any setting.

Slip Resistance Rating (R) - DIN 51130
Colored and full-body porcelain stoneware (UGL)

The R rating indicates slip resistance and classifies products according to specific application requirements, increasing with surface slipperiness risk—particularly relevant for industrial and commercial settings.

Inclination Angle	Classification	Application Area
a < 6°	Not classified	Indoor residential and commercial areas
6° ≤ a ≤ 10°	R9	Entrances and stairways with outdoor access
10° ≤ a ≤ 19°	R10	Moderately damp areas (bathrooms, garages), covered outdoor areas
19° ≤ a ≤ 27°	R11	Workspaces, labs with high water presence, uncovered outdoor areas
27° ≤ a ≤ 35°	R12	Workspaces with slippery substances present
a > 35°	R13	Environments with heavy presence of oils and grease

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Slip Resistance Rating (R) - DIN 51097
Colored and full-body porcelain stoneware (UGL)

This test determines compliance of tiles used in barefoot areas such as pools, wellness centers, and changing rooms, focusing on user safety and health.

Inclination Angle	Classification	Application Area
a < 12°	Not classified	Indoor residential and commercial areas
12° ≤ a ≤ 18°	A	Changing rooms, barefoot access zones
18° ≤ a ≤ 24°	B (A + B)	Showers, pool edges, etc.
a ≥ 24°	C (A + B + C)	Sloped underwater pool edges, submerged stairs, areas with stagnant water risk

VSHADE – Tile Shade Variation "Shade variation" refers to chromatic and/or graphic variation between tiles of the same color within a collection.

Classification	Description
V1 – UNIFORM APPEARANCE	The color and graphic texture are uniform with minimal, barely noticeable differences.
V2 – SLIGHT VARIATION	Tone and structure differences are visible, but color variation stays within a specific base color tone.
V3 – MODERATE VARIATION	Color and texture seen on one tile only give a general idea of the variation in the whole batch; designed to mimic natural veins, vintage effects, or worn textures.
V4 – SUBSTANTIAL VARIATION	Tiles can show completely different colors and graphics, with maximum variability for a unique and original overall effect.

Dimensional Characteristics – UNI EN ISO 10545-2
Applicable to: all products
Dimensional characteristics define the geometry of ceramic tiles. Standard UNI EN ISO 10545-2 includes:

1. Side measurements:
    - Side dimensions and thickness
    - Edge straightness: verifies absence of outward/inward curvature along tile sides
    - Squareness: ensures tile sides are perpendicular to each other
2. Flatness measurements:
    - Center curvature (distance of tile center from plane defined by 3 of 4 corners)
    - Edge curvature (distance of side center from the same reference plane)

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Water Absorption – UNI EN ISO 10545-3

Water absorption is the tile's ability to absorb moisture, which is important for assessing mechanical properties. Porcelain stoneware belongs to Group BIa with: **Water absorption: EB < 0.5%**

Deep Abrasion Resistance – UNI EN ISO 10545-6
Applicable to: colored and full-body unglazed porcelain stoneware (UGL)

Test performed on unglazed surfaces to measure the amount of material removed after 150 revolutions of an abrasive disk. The lower the material removed, the higher the product's resistance.

Flexural Strength – UNI EN ISO 10545-4

Flexural strength is the maximum load a tile can withstand in a three-point bending test before breaking, expressed in N/mm². Porcelain stoneware in Group BIa must meet the following minimums: **Flexural strength (Rb) > 35 N/mm² Breaking strength (S) > 1300 N**