PEI Ratings & Surface Wear Resistance Guide

A Technical Specification Guide to PEI Ratings



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Selecting the correct tile specification relies on understanding how floor coverings react to mechanical stress, foot traffic, and environmental factors. Under EN ISO 10545-7, glazed vitreous and porcelain stoneware tiles are categorised by their PEI (Porcelain Enamel Institute) wear-resistance rating.

While all floor coverings experience wear over time, the rate and visibility of degradation depend heavily on:

- Frequency and type of foot traffic
- Degree of soiling and prevailing cleaning conditions
- Mechanical stress (e.g., foot traffic vs. wheeled equipment)
- The hardness, thickness, finish, and color/brightness of the glaze



PEI Classification Matrix (Glazed Tiles)

Class 0 | Lightest Stress: Unsuitable for floor applications.

Class I | Very Light Stress: Suitable for areas subject to very infrequent use in soft-soled shoes with no abrasive contamination (e.g., residential bedrooms and low-use bathrooms).

Class II | Light Stress: Suitable for residential areas subject to infrequent use in normal footwear with minimal abrasive contamination (e.g., residential spaces excluding kitchens, stairs, terraces, and loggias).

Class III | Medium Stress: Suitable for residential and light commercial environments subject to regular foot traffic and moderate abrasive contamination (e.g., domestic hallways and living areas, hotel rooms, and hospital therapy/sanitary rooms).

Class IV | Medium-Heavy Stress: Suitable for high-traffic environments subject to frequent use and intensive soiling (e.g., primary residential entrances, commercial kitchens, retail spaces, offices, schools, and public buildings).

Class V | Heavy Stress: Designed for areas subject to intensive public use and heavy foot traffic, offering exceptionally high wear resistance (e.g., bakeries, retail flagships, hotel entrance halls, banks, and restaurants).

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Technical Performance & Specification Notes

Surface Wear Mechanics

As a standard rule, floor finishes are worn down by abrasive micro-particles (such as sand and grit) adhering to footwear, which act like sandpaper under foot pressure. While quality glazed and porcelain tiles feature durable finishes designed for easy maintenance, prolonged exposure to unmanaged abrasive debris can cause minor a loss of gloss or surface roughening.

Note: Because surface wear does not impair the structural integrity or serviceability of the tile, minor aesthetic surface changes do not constitute valid grounds for complaint.

Mitigating Surface Scratches

Scratches to glazed surfaces are typically caused by materials of equal or greater hardness (such as quartz grains or embedded sand) moving under load. To maximize the lifespan of the installation, we strongly recommend specifying adequate entrance matting systems (barrier matting zones) at all external access points to capture dirt and debris before they reach the tiled floor.

High-Traffic & Maximum Stress Recommendations

- **Specification Margin:** When designing spaces subject to heavy foot traffic or borderline conditions, we recommend stepping up to the next higher wear-resistance group to safeguard aesthetic longevity. Higher-rated tiles can always be specified for lower-demand areas.
- **Commercial & Extreme Zones:** For heavily frequented commercial environments, check-out areas, or transitional corridors subject to extreme mechanical stress, we recommend specifying unglazed porcelain stoneware for superior long-term performance.

Unglazed Porcelain Stoneware Properties

Unglazed porcelain stoneware tiles (complying with DIN EN 14411, Group Bla with a water absorption rate of E < 0.5%) possess some of the highest wear-resistance properties (deep abrasion resistance) available in modern floor coverings. Because the body of the material is completely homogeneous, it reveals virtually no visible signs of wear even after decades of intensive commercial use.

- Deep Abrasion Resistance: Tested in accordance with DIN EN 10545-6, unglazed tiles measure volume loss under abrasive stress (permitted tolerance: max 175mm.
- In areas subject to extreme wear across any application, minor variations from the original surface appearance may occur over time.



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