

THE BRAZILIAN STANDARD ON PORCELAIN TILE AND ITS IMPACT

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ABSTRACT

The year 2007 marked a historic moment in the ceramic tile sector: Brazil became the first country to create a specific standard for porcelain tile products, with demanding technical requirements not considered in any other international standard. Brazilian Standard “NBR 15463/2007 – Placas Cerâmicas para revestimento – Porcelanato” (Ceramic slabs for cladding – Porcelain tile) was published on 19 February 2007. Its objective was to establish the requirable characteristics for the production, marking and labelling, informative statements on the packaging, sampling, acceptance conditions, and technical requirements of porcelain tiles.

However, this process started in 2003 when the Ceramic Centre of Brazil, CCB, summoned its Technical Committee along with the companies to discuss the various requirements of the Brazilian standards. In 2005, at the request of ANFACER (National Association of Ceramic Tile Manufacturers) and the national porcelain tile manufacturers, the CCB carried out a quality study on porcelain tiles. Glazed and unglazed products from 10 Brazilian manufacturers were evaluated. The technical requirements were analysed according to the national and international standards. In 2006, after adjusting its production processes, ANFACER, in technical coordination with CCB, the support of ABNT (Brazilian Association of Technical Standards), and the coordination and chairmanship of CB 02, reinstated the Committee for the Study of Ceramic Tiles – CE-02:109.10. The Brazilian ceramic sector, represented by manufacturers, consumers and neutral entities, started this process in the first phase of Standards revision, creating a specific standard for porcelain tile: Brazilian Standard NBR 15463/2007 Standard – Ceramic slabs for cladding – Porcelain tile.

The main aspects of Standard NBR 15463/2007, including the definition and differentiation between the types of porcelain tile and the configuration of the technical requirements, which are more stringent than those of the BIa absorption group of the ISO 13006 standard, are summarised below.

1. DEFINITION AND TECHNICAL DIFFERENTIATION OF THE TWO TYPES OF PORCELAIN TILE

Differentiation between technical porcelain tile (with water absorption below or equal to 0.1%) and glazed porcelain tile (with water absorption below or equal to 0.5%). Technical porcelain tiles may be further divided into polished (*“technical porcelain tile that is mechanically polished, resulting in a surface with variable gloss intensity, on the entire surface or part of the surface, in accordance with the desired aesthetic effect”*) and natural (*“unpolished technical porcelain tile”*). With respect to the side finish, the tiles are defined as: rectified and unrectified porcelain tile. In its definitions, Standard NBR 15463/2007 also distinguishes porcelain mosaics as porcelain tiles with a surface area below 50 cm².

2. CONFIGURATION OF THE TECHNICAL REQUIREMENTS

2.1) The geometric properties set out in NBR 15463/2007, which are more stringent than those of ISO 13006, as well as the visual properties set out in NBR 15463/2007, are shown in Table 1.

2.2) The physical properties required by NBR 15463 for technical and glazed porcelain tiles are summarised in Table 2. In comparison with the water absorption group BIa of ISO 13006, to be noted are the differences between water absorption in technical porcelain tile and in glazed porcelain tile, in addition to the higher values for the breaking load, bending strength, and deep abrasion for technical porcelain tile.

2.3) In the chemical properties required for technical and glazed porcelain tile, according to NBR 15463, the resistance to household chemicals and swimming pool salts, and to low-concentration acids and alkalis shall be stated, while the resistance to high-concentration acids and alkalis shall be defined by agreement between the parties. To be highlighted is the stain resistance of 3 or higher, required for both technical porcelain and glazed tile.

GEOMETRIC AND VISUAL PROPERTIES OF TECHNICAL AND GLAZED PORCELAIN TILE (T = TECHNICAL, E = GLAZED, R = RECTIFIED, NR = UNRECTIFIED, P = POLISHED, N = NATURAL)											
Dimensions and surface appearance	Units	Product surface area≤ 50 cm ²		50 cm ² < product surface area > 2 500 cm ²				Product surface area > 2 500 cm ²			
		T	E	T		E		T		E	
				R	NR	R	NR	R	NR	R	NR
				P/N	N			P/N	N		
Allowable deviation in % of the average measurement of each tile with respect to the work size W	%	Non applicable		± 0,6	± 0,6	± 0,6	± 0,6	± 0,6	± 0,6	± 0,6	± 0,6
Allowable deviation in % of the average measurement of each tile with respect to the average measurement of 10 test pieces		± 0,75		± 0,1	± 0,2	± 0,1	± 0,2	± 0,1	± 0,2	± 0,1	± 0,2
Allowable deviation in % of the average thickness of each tile with respect to the corresponding work size		Non applicable		± 5	± 5	± 5	± 5	± 5	± 5	± 5	± 5
Straightness of sides		Non applicable		± 0,1	± 0,2	± 0,1	± 0,2	± 0,1	± 0,2	± 0,1	± 0,2
Rectangularity		± 1,0		± 0,2	± 0,4	± 0,2	± 0,4	± 0,2	± 0,4	± 0,2	± 0,4
Central curvature		Non applicable		-0,15/ + 0,2	-0,2/ + 0,3	-0,2/ + 0,3	-0,2/ + 0,3	-0,08/ + 0,1	-0,08/ + 0,1	± 0,12	± 0,12
Side curvature		Non Applicable		-0,15/ + 0,2	-0,2/ + 0,3	-0,2/ + 0,3	-0,2/ + 0,3	-0,08/ + 0,1	-0,08/ + 0,1	± 0,12	± 0,12
Warpage		Non applicable		± 0,2	-0,2/ + 0,3	-0,2/ + 0,3	-0,2/ + 0,3	-0,08/ + 0,1	-0,08/ + 0,1	± 0,12	± 0,12
Surface appearance		≥ 95%									

Table 1. Geometric and visual properties for porcelain tile in accordance with NBR 15463.

Physical properties		Units	Product surface area ≤ 50 cm ²		Product surface area > 50 cm ²	
			Technical	Glazed	Technical	Glazed
Water absorption	Average	%	≤ 0,1	≤ 0,5	≤ 0,1	≤ 0,5
	Individual (maximum)	%	0,2	0,6	0,2	0,6
Bending strength	Average	MPa	≥ 45		≥ 45	≥ 37
	Individual (minimum)	MPa	42		42	35
Breaking load	e < 7,5 mm	N	≥ 1 000		≥ 900	≥ 900
	e ≥ 7,5 mm	N	Non applicable		≥ 1 800	≥ 1 500
Resistance to deep abrasion (unglazed tile)		mm ³	≤ 140	Non applicable	≤ 140	Non applicable
Resistance to surface abrasion			Non applicable	By agreement	Non applicable	By agreement

Table 2. Physical properties required by Standard NBR 15463 for technical and glazed porcelain tiles.

Publication of the Standard has had a number of consequences: the quality of the porcelain tile marketed in Brazil rose and was recognised, while the credibility

of Brazilian products on the world market was also enhanced. The publication of Standard NBR 15463 made Brazilian and foreign consumers feel easier and more secure about buying high quality products. Brazil hopes that concrete definitions will be introduced for porcelain tiles in the revision of International Standard ISO 13006, and that technical requirements for this type of product will be revised. NBR 15463 is intended as a suggestion to be incorporated into ISO 13006.

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