JOHNSON ▪ TILES

TECHNICAL DETAILS, FLOOR TILES	EN177 (EUROPEAN STANDARD)	JOHNSON CERAMICS INTERNATIONAL	COMMENT
LENGTH TOLERANCE	0.6%	0.5%	Exceeds
WIDTH TOLERANCE	0.6%	0.5%	Exceeds
THICKNESS TOLERANCE Percentage variance from stated norm	5%	5%	Complies
STRAIGHTNESS OF SIDES The percentage that any side can bow out from straight (Trapezium) or curve from straight l(Lunette)	0.5%	0.5%	Complies
RECTANGULARITY The percentage that any side can be smaller than the other three. Also known as "Wedge"	0.6%	0.5%	Exceeds
CENTRE CURVATURE The percentage that the centre of the tile can deviate from flat, either humped or hollowed	0.5%	0.5%	Complies
EDGE CURVATURE The departure of one edge from any plane in which three of the four corners lie	0.5%	0.5%	Complies
WARPAGE The percentage that a tile can display twist from flat. Measured by the departure of one corner from the plane in which the corners lie.	0.5%	0.5%	Complies
WATER ABSORPTION The amount of water taken in by the pores of the tile body when it is boiled in water. The measurement is directly linked to the strength of the tile. If high, it indicates more or bigger pores in the body, rendering it weaker	Av 3<E<6	4.5	Complies
MODULUS OF RUPTURE Tensile breaking strength. This is related to above. The stronger the body, the higher the tensile strength.	>22	28	Exceeds
RESISTANCE TO SURFACE ABRASTION (PEI) The amount of glaze abraded from the surface during wear. The PEI rating is specific to the glaze finish tested.	Class I – IV	III and above	Complies
RESISTANCE TO SCRATCH (MOHS) The resistance to scratching. The MOHS rating is specific to the glaze finish tested.	Min 5	6 and above	Exceeds
COEFFICIENT OF LINEAR THERMAL EXPANSION Measures how much a tile expands at a given temperature (reversible). The lower the thermal expansion, the greater variance in temperature the tile can take without 'popping' off the floor.	Max 10^{-5}	6 x 10	Exceeds
CHEMICAL RESISTANCE Class A shows resistance to household chemicals, swimming pool agents, acids and alkalis with little or no visible effects on the tile. Class B shows resistance with a clearly visible effect.	Min Class B	A	Exceeds
STAIN RESISTANCE Class I denotes removal of specified staining agents with water. Class Ii denotes removal with detergent.	Min Class II	II	Complies
RESISTANCE TO CRAZING Crazing is the fine web of cracks spreading on the surface of a glaze when the expansion of the glaze and the body are at variance and can appear some time after manufacture.	Must not craze	Passes	Complies
THERMAL SHOCK RESISTANCE The tile must withstand rapid changes in temperature from hot to cold at specified levels without damage to the body or glaze.	Required	Passes	Complies
FROST RESISTANCE Related to Water Absorption. Only tiles with water absorption of below 5 are frost resistant. Water freezing in the larger pores of tiles with a higher water absorption will expand to the point where the tile will crack.	Required	Passes	Complies
IRREVERSIBLE MOISTURE EXPANSION Most fired ceramic materials exhibit an irreversible moisture expansion over a period of time. This can cause differential movement between the tile layer and the sub-structure. Categories measured are from low (0.00 – 0.5%) to high (>2%). The lower the category, the fewer problems are likely to be caused.	Category must be stated	0.02%	Category = Low

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TECHNICAL DETAILS, WALL TILES	SABS 1449 : 1996	JOHNSON CERAMICS INTERNATIONAL	COMMENT
LENGTH TOLERANCE	0.5%	0.5%	Complies
WIDTH TOLERANCE	0.5%	0.5%	Complies
THICKNESS TOLERANCE Percentage variance from stated norm	5%	5%	Complies
STRAIGHTNESS OF SIDES The percentage that any side can bow out from straight (Trapezium) or curve from straight I(Lunette)	0.5%	0.5%	Complies
RECTANGULARITY The percentage that any side can be smaller than the other three. Also known as "Wedge"	0.3%	0.3%	Complies
CENTRE CURVATURE The percentage that the centre of the tile can deviate from flat, either humped or hollowed	0.5%	0.5%	Complies
EDGE CURVATURE The departure of one edge from any plane in which three of the four corners lie	0.5%	0.5%	Complies
WARPAGE The percentage that a tile can display twist from flat. Measured by the departure of one corner from the plane in which the corners lie.	0.5%	0.5%	Complies
WATER ABSORPTION The amount of water taken in by the pores of the tile body when it is boiled in water. The measurement is directly linked to the strength of the tile. If high, it indicates more or bigger pores in the body, rendering it weaker	E>10%	18 – 23%	Complies
MODULUS OF RUPTURE Tensile breaking strength. This is related to above. The stronger the body, the higher the tensile strength.	> 15 MPa	16 – 19MPa	Exceeds
COEFFICIENT OF LINEAR THERMAL EXPANSION Measures how much a tile expands at a given temperature (reversible). The lower the thermal expansion, the greater variance in temperature the tile can take without 'popping' off the floor.	Max $9x10^{-6}$/ ℃	$7x10^{-6}$/ ℃	Exceeds
CHEMICAL RESISTANCE Class A shows resistance to household chemicals, swimming pool agents, acids and alkalis with little or no visible effects on the tile. Class B shows resistance with a clearly visible effect.	Min Class B	A	Exceeds
STAIN RESISTANCE Class I denotes removal of specified staining agents with water. Class Ii denotes removal with detergent.	Min Class II	II	Complies
RESISTANCE TO CRAZING Crazing is the fine web of cracks spreading on the surface of a glaze when the expansion of the glaze and the body are at variance and can appear some time after manufacture.	Must not craze	Passes	Complies
THERMAL SHOCK RESISTANCE The tile must withstand rapid changes in temperature from hot to cold at specified levels without damage to the body or glaze.	Required	Passes	Complies
IRREVERSIBLE MOISTURE EXPANSION Most fired ceramic materials exhibit an irreversible moisture expansion over a period of time. This can cause differential movement between the tile layer and the sub-structure. Categories measured are from low (0.00 – 0.5%) to high (>2%). The lower the category, the fewer problems are likely to be caused.	Category must be stated	0.03%	Category = Low