



Sizes	120x278 cm	120x240 cm	75x150 cm	120x120 cm	45x90 cm	75x75 cm	60x60 cm	30x60 cm	
Sizes	47 1/4"x109 1/2"	47 1/4"x94 1/2"	29 1/2"x59"	47 1/4"x47 1/4"	17 3/4"x35 3/8"	29 1/2"x29 1/2"	23 5/8"x23 5/8"	11 3/4"x23 5/8"	
	± 6mm	± 9mm	± 9.5mm	± 9mm	± 9mm	± 9.5mm	± 9mm	± 9mm	

	Characteristics	Test Method	Requirements for nominal size N			MARVEL			
			Requirements for nominal size N			Polished rectified	Polished rectified ± 6mm 120x278 cm	Matt rectified	Matt rectified ± 6mm 120x278 cm
			7 cm ≤ N < 15 cm	N ≥ 15 cm					
			(mm)	(%)	(mm)				
Regularity characteristics	Length and width	ISO 10545-2	± 0,9 (*)	± 0,6 (*)	± 2,0 (*)	±0.3% ±1.0mm	±0.3% ±1.0mm	±0.3% ±1.0mm	±0.3% ±1.0mm
	Thickness		± 0,5 (**)	± 5 (**)	± 0,5 (**)	±5.0% ±0.5mm	±5.0% ±0.5mm	±5.0% ±0.5mm	±5.0% ±0.5mm
	Straightness of sides		± 0,75 (***)	± 0,5 (***)	± 1,5 (***)	±0.3% ±0.8mm	±0.3% ±0.8mm	±0.3% ±0.8mm	±0.3% ±0.8mm
	Rectangularity (Measurement only on short edges when L/l ≥ 3)		± 0,75 (****)	± 0,5 (****)	± 2,0 (****)	±0.3% ±1.5mm	±0.3% ±1.5mm	±0.3% ±1.5mm	±0.3% ±1.5mm
	Surface flatness		c.c. ± 0,75	c.c. ± 0,5	c.c. ± 2,0	±0.3% ±1.5mm	±0.3% ±1.5mm	±0.4% ±1.8mm	±0.4% ±1.8mm
	e.c. ± 0,75	e.c. ± 0,5	e.c. ± 2,0						
	w. ± 0,75	w. ± 0,5	w. ± 2,0						
Structural features	Water absorption level (in% by mass)	ISO 10545-3	$F_B \leq 0,5\%$ Individual Maximum 0,6% - Individual Maximum 0,6%			≤0.1%	≤0.1%	≤0.1%	≤0.1%
		ASTM C373-18	Requirement ANSI A137.1-2017 Water Absorption Max < 0,5%			≤0.5%	≤0.5%	≤0.5%	≤0.5%
Bulk mechanical features	Breaking strength	ISO 10545-4	S ≥ 700N (per spessore < 7,5mm - for thickness < 7,5mm) S ≥ 1300N (per spessore ≥ 7,5mm - for thickness ≥ 7,5mm)			S ≥ 1500 N	S ≥ 1000 N	S ≥ 1500 N	S ≥ 1000 N
	Modulus of Rupture		R ≥ 35 N/mm ²			R ≥ 40 N/mm ²	R ≥ 40 N/mm ²	R ≥ 40 N/mm ²	R ≥ 40 N/mm ²
	Bending Strength and Breaking Load	EN 1339 Annex F	-			-	-	-	-
	Impact resistance, as coefficient of restitution	ISO 10545-5	Declared value			≥0.55	≥0.55	≥0.55	≥0.55
Surface mechanical features	Mohs hardness	EN 101	-			MOHS 5	MOHS 5	MOHS 6	MOHS 6
	Resistance to deep abrasion of unglazed tiles (removed volume)	ISO 10545-6	≤ 175 mm ³			≤150mm ³	≤150mm ³	≤150mm ³	≤150mm ³
Thermo-igrometric features	Coefficient of linear thermal expansion	ISO 10545-8	Declared value			≤7 1/mk	≤7 1/mk	≤7 1/mk	≤7 1/mk
	Thermal shock resistance	ISO 10545-9	Pass according to EN ISO 10545-1			Resiste	Resiste	Resiste	Resiste
	Moisture expansion (in mm/m)	ISO 10545-10	Declared value			≤0.01% (0.1mm/m)	≤0.01% (0.1mm/m)	≤0.01% (0.1mm/m)	≤0.01% (0.1mm/m)
	Frost resistance	ISO 10545-12	Pass according to EN ISO 10545-1			Resiste	Resiste	Resiste	Resiste
Physical properties	Bond strength/adhesion for improved cementitious adhesives	EN 1348	Declared value			≥ 1.0 N/mm ² (Class C2 - EN 12004)	≥ 1.0 N/mm ² (Class C2 - EN 12004)	≥ 1.0 N/mm ² (Class C2 - EN 12004)	≥ 1.0 N/mm ² (Class C2 - EN 12004)
	Reaction to fire	-	Class A1 or A1 _{fl}			A1 - A1 _{fl}	A1 - A1 _{fl}	A1 - A1 _{fl}	A1 - A1 _{fl}
Chemical features	Resistance to household chemicals and swimming pool salts	ISO 10545-13	Minimum Class B			A	A	A	A
	Resistance to low concentrations of acids and alkalis		Declared Class			LA	LA	LA	LA
	Resistance to high concentrations of acids and alkalis		Declared Class			0	-	HA	HA
	Resistance to staining for glazed tiles	ISO 10545-14	Declared Class			5	5	5	5
Safety characteristics	Shod Ramp Test	DIN 51130	Declared Class			N.C.	N.C.	R9	R9
	Barefoot Ramp Test	DIN 51097	Declared value			0	0	A	A
	Pendulum Friction Test	BS 7976	PTV 36 classifies the surface as "low slip risk"			≥ 36 Dry ≤ 24 Wet	≥ 36 Dry ≤ 24 Wet	PTV ≥ 36 Wet on demand / su richiesta	PTV ≥ 36 Wet on demand / su richiesta
		AS 4586	Declared Classification of the new pedestrian surface materials according to the Pendulum Test			-	-	P3 on demand	P3 on demand
		UNE-ENV 12633	Declared value			-	-	C2 on demand	C2 on demand
	Coefficient of friction (COF)	B.C.R.A. Rep. CEC/81	D. M. 236/89 del 14/06/89 μ > 0,40 per elemento scivolante cuoio su pavimentazione asciutta μ > 0,40 per elemento scivolante gomma dura su pavimentazione bagnata			>0.40Asciutto <0.40Bagnato	>0.40Asciutto <0.40Bagnato	>0.40Asciutto >0.40Bagnato	>0.40Asciutto >0.40Bagnato
Dynamic coefficient of friction (DCOF)	ANSI A.137.1	ANSI A.137.1-2017 Requires a minimum value of 0.42 for level interior space expected to be walked upon when wet. (3)			<0.42Wet	<0.42Wet	>0.42Wet	>0.42Wet	

- * Deviazione ammissibile, in % oppure mm, della dimensione media di ogni piastrella (2 oppure 4 lati) dalla dimensione di fabbricazione (W).
The permissible deviation, in % or mm, of the average size for each tile (2 or 4 sides) from work size (W).
- ** Deviazione ammissibile, in % oppure mm, dello spessore medio di ogni piastrella dallo spessore riportato nella dimensione di fabbricazione (W).
The permissible deviation, in % or mm, of the average thickness for each tile from the work size thickness (W).
- *** Deviazione massima ammissibile di rettilineità, in % oppure mm, in rapporto alle dimensioni di fabbricazione (W) corrispondenti.
The maximum permissible deviation from straightness, in % or mm, related to the corresponding work sizes (W).
- **** Deviazione massima ammissibile di ortogonalità, in % oppure mm, in rapporto alle dimensioni di fabbricazione (W) corrispondenti.
The maximum permissible deviation from rectangularity, in % or mm, related to the corresponding work sizes (W).
- c.c. Deviazione massima ammissibile della curvatura del centro, in % oppure mm, in rapporto alla diagonale calcolata secondo le dimensioni di fabbricazione (W).
The maximum permissible deviation from centre curvatures, in % or mm, related to diagonal calculated from the work sizes (W).
- e.c. Deviazione massima ammissibile della curvatura dello spigolo, in % oppure mm, in rapporto alle dimensioni di fabbricazione (W) corrispondenti.
The maximum permissible deviation from edge curvatures, in % or mm, related to the corresponding work sizes (W).

- w. Deviazione massima ammissibile dello svergolamento, in % oppure mm, in rapporto alla diagonale calcolata secondo le dimensioni di fabbricazione (W).
The maximum permissible deviation from warpage, in % or mm, related to diagonal calculated from the work sizes (W).
- Determinazione della resistenza allo scivolamento delle superfici pedonabili; non si applica alle pavimentazioni sportive ed alle pavimentazioni stradali veicolari.
- (1) Determination of slip resistance of pedestrian surfaces; it does not cover sports surfaces and road surfaces for vehicles (skid resistance).
- (2) Le prestazioni anti-slip vengono garantite al momento della consegna del prodotto.
Anti-slip performance is guaranteed at the time of delivery of the product.
However, tiles with a DCOF of 0.42 or greater are not necessarily suitable for all projects.
- (3) The specifier shall determine tiles appropriate for specific project conditions, considering by way of example, but not in limitation, type of use, traffic, expected contaminants, expected maintenance, expected wear, and manufacturers' guidelines and recommendations."
- (4) For further details, please refer to outdoor design general catalogue.
- (5) Only for products with 20 mm thickness.





Sizes	50x110 cm 19 5/8"x43 1/4" ± 8.5mm	30.5x91.5 cm 12"x36" ± 8.5mm	30.5x56 cm 12"x22" ± 8.5mm
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	Characteristics Characteristics	Test Method Test Method	Requirements for nominal size N Requirements for nominal size N			MARVEL WALL								
			7 cm ≤ N < 15 cm		N ≥ 15 cm									
			(mm)	(%)			(mm)							
Regularity characteristics Regularity characteristics		Length and width Length and width	± 0,75 (*)	± 0,5 (*)	± 2,0 (*)	±0.3% ±1.0mm								
						Thickness Thickness	± 0,5 (**)	± 10 (**)	± 0,5 (**)	±10.0% ±0.5mm				
										Straightness of sides Straightness of sides	± 0,5 (***)	± 0,3 (***)	± 1,5 (***)	±0.3% ±0.8mm
														Rectangularity Rectangularity
		Surface flatness Surface flatness	c.c. + 0,75 - 0,50	c.c. + 0,5 - 0,3	c.c. + 2,0 - 1,5	±0.3% ±1.5mm								
e.c. + 0,75 - 0,50			e.c. + 0,5 - 0,3	e.c. + 2,0 - 1,5										
w. ± 0,75			w. ± 0,5	w. ± 2,0										
Structural features Structural features		Water absorption level (in% by mass) Water absorption level (in% by mass)	ISO 10545-3	Average >10%. When the average > 20%, this shall be indicated. Individual value > 9% Average >10%. When the average > 20%, this shall be indicated. Individual value > 9%			10% < EB ≤ 20%							
Bulk mechanical features Bulk mechanical features		Breaking strength Breaking strength	ISO 10545-4	S ≥ 600N			S ≥ 600 N							
		Modulus of Rupture Modulus of Rupture		R ≥ 15 N/mm ²			R ≥ 15 N/mm ²							
Thermo-igrometric features Thermo-igrometric features		Coefficient of linear thermal expansion Coefficient of linear thermal expansion	ISO 10545-8	Declared value Declared value			≤ 7 1/mk							
		Thermal shock resistance Thermal shock resistance	ISO 10545-9	Pass according to EN ISO 10545-1 Pass according to EN ISO 10545-1			Resiste							
		Moisture expansion (in mm/m) Moisture expansion (in mm/m)	ISO 10545-10	Declared value Declared value			≤ 0.06% (0.6mm/m)							
		Crazing resistance: glazed tiles Crazing resistance: glazed tiles	ISO 10545-11	Pass according to EN ISO 10545-1 Pass according to EN ISO 10545-1			Resiste							
Physical properties Physical properties		Bond strength/adhesion for improved cementitious adhesives Bond strength/adhesion for improved cementitious adhesives	EN 1348	Declared value Declared value			≥ 1.0 N/mm ² (Class C2 - EN 12004)							
		Reaction to fire Reaction to fire	-	Class A1 Class A1			A1							
Chemical features Chemical features		Resistance to household chemicals and swimming pool salts Resistance to household chemicals and swimming pool salts	ISO 10545-13	Minimum Class B Minimum Class B			A							
		Resistance to low concentrations of acids and alkalis Resistance to low concentrations of acids and alkalis		Declared Class Declared Class			LA							
		Resistance to high concentrations of acids and alkalis Resistance to high concentrations of acids and alkalis		Declared Class Declared Class			HA							
		Resistance to staining for glazed tiles Resistance to staining for glazed tiles	ISO 10545-14	Minimum Class 3 Minimum Class 3			5							
		Rilascio di sostanze pericolose: Cadmio (in mg/dm²) e Piombo (in mg/dm²) Rilascio di sostanze pericolose: Cadmio (in mg/dm ²) e Piombo (in mg/dm ²)	ISO 10545-15	Declared value Declared value			≤ 0.01mg/dm ² Cd ≤ 0.1mg/dm ² Pb							

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 The permissible deviation, in % or mm, of the average size for each tile (2 or 4 sides) from work size (W).

** Deviazione ammissibile, in % oppure mm, dello spessore medio di ogni piastrella dallo spessore riportato nella dimensione di fabbricazione (W).
 The permissible deviation, in % or mm, of the average thickness for each tile from the work size thickness (W).

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 The maximum permissible deviation from straightness, in % or mm, related to the corresponding work sizes (W).

**** Deviazione massima ammissibile di ortogonalità, in % oppure mm, in rapporto alle dimensioni di fabbricazione (W) corrispondenti.
 The maximum permissible deviation from rectangularity, in % or mm, related to the corresponding work sizes (W).

c.c. Deviazione massima ammissibile della curvatura del centro, in % oppure mm, in rapporto alla diagonale calcolata secondo le dimensioni di fabbricazione (W).
 The maximum permissible deviation from centre curvatures, in % or mm, related to diagonal calculated from the work sizes (W).

e.c. Deviazione massima ammissibile della curvatura dello spigolo, in % oppure mm, in rapporto alle dimensioni di fabbricazione (W) corrispondenti.
 The maximum permissible deviation from edge curvatures, in % or mm, related to the corresponding work sizes (W).

w. Deviazione massima ammissibile dello svergolamento, in % oppure mm, in rapporto alla diagonale calcolata secondo le dimensioni di fabbricazione (W).
 The maximum permissible deviation from warpage, in % or mm, related to diagonal calculated from the work sizes (W).

Determinazione della resistenza allo scivolamento delle superfici pedonabili; non si applica alle pavimentazioni sportive ed alle pavimentazioni stradali veicolari.
 Determination of slip resistance of pedestrian surfaces; it does not cover sports surfaces and road surfaces for vehicles (skid resistance).

(1) Le prestazioni anti-slip vengono garantite al momento della consegna del prodotto.
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