

CERTIFICATION ON TECHNICAL CHARACTERISTICS

GRESPANIA S.A.CERTIFIES:

That the Wall Tile “**BOREAL**” with white body cladding comply with the International Standard ISO 13006 / EN-14411:2012 referred to Ceramic Tiles manufactured using a dry pressing procedure with water absorption $E > 10\%$ (Grup B III) and that they comply with the conditions as per rule UNE-EN ISO 10545-1.

And they comply the UNE-EN-ISO-10545-2:

Minimum 95% of the wall tiles must be free of flaw which prejudice to the appearance of a bigger surface, and refers to the dimensionals values.

This products fulfil the following chemical properties:

CHARACTERISTICS	EUROPEAN STANDARD	STANDARD VALUE	GRESPANIA VALUE Wall Tiles
Stain Resistance (Class 5 to 1)	UNE-EN ISO 10545-14	Minimum Class 3	Class 5
Resistance to domestical cleaning products and pool aditives (Class GA to GC)	UNE-EN ISO 10545-13	Minimum Clase GB	Class GA
Resistance to acids and alkali (Class GLA to GLC)	UNE-EN ISO 10545-13	Not required	Not required (1)

And the following physical properties:

CHARACTERISTICS	EUROPEAN STANDARD	STANDARD VALUE	GRESPANIA VALUE Wall Tiles
Water absorbtion % weight	UNE-EN ISO 10545-3	Average: $E > 10\%$ Individual:9 minimum (2)	Average absorbtion $10\% < E < 20\%$
Breaking load in N a.- thikness > 7.5 mm b.- thikness < 7.5 mm	UNE-EN ISO 10545-4	a.- 600N b.- Min 200 N	Between 700 and 1500 N (1 Kg = 9,8 N)
Resitance breaking strength in N/mm^2 Not if breaking load > 3000 N	UNE-EN ISO 10545-4	a.- $e > 7.5$ mm: $15N/mm^2$ b.- $e < 7.5$ mm: $12N/mm^2$	More than $20 N/mm^2$ (1 Kg/cm ² = $0,098 N/mm^2$)
Hardness to superficial scratch (Mohs scale).	EN - 101	Not required as Norma UNE-ISO	Between 3 and 4
Coefficient of lineal thermal expansion from $+ 5^{\circ}C$ a $100^{\circ}C$	UNE-EN ISO 10545-8	Not required	Less than $7 \times 10^{-6} K^{-1}$
Thermal shock resistance	UNE-EN ISO 10545-9	Not required	Resistant
Resistant to cracking	UNE-EN ISO 10545-11	Required	Resistant ($10 kg/cm^2$)

(1) Required by manufacturer agreement

(2) If $E > 20\%$ must be specified by manufacturer

Signed: GRESPANIA Wall Tiles
Laboratory Director / Research Director

