

TECHNICAL DATA

Series "GRAAL"

1. Technical Features

Norma UNI EN 14411 - Annex G –Dry-pressed ceramic tiles with low water absorption - GROUP B1aGL,

	Technical features	Norms	Required standards	Average
REGULARITY AND QUALITY SURFACE CHARACTERISTICS	LENGTH AND WIDTH (The deviation, in percent, of the average size for each tile (2 or 4 sides) from the work size (W))	UNI EN ISO 10545-2	± 0,6 %	COMPLIANT
	THICKNESS		± 5 %	COMPLIANT
	STRAIGHTNESS OF SIDES		± 0,5 %	COMPLIANT
	RECTANGULARITY		± 0,6 %	COMPLIANT
	SURFACE FLATNESS		± 0,5 %	COMPLIANT
	SURFACE QUALITY		A minimum of 95% of tiles shall be free from visible defects that would impair the appearance of a major area of tiles	COMPLIANT
PHISICAL CHARACTERISTICS	WATER ABSORPTION	UNI EN ISO 10545-3	Eb ≤ 0,5 %	COMPLIANT
	BREAKING STRENGTH (S) – MODULUS OF RUPTURE (R)	UNI EN ISO 10545-4	S > 1300 N R > 35 N/mm ²	COMPLIANT
	CRAZING RESISTANCE	UNI EN ISO 10545-11	REQUIRED	COMPLIANT
	RESISTANCE TO FROST	UNI EN ISO 10545-12	REQUIRED	COMPLIANT
	CATEGORY USE	INTERNAL CLASSIFICATION		C5* (Natural) C4* (Lapped)
CHEMICAL CHARACTERISTICS	CHEMICAL RESISTANCE	UNI EN ISO 10545-13	Must not produce noticeable signs of chemical attack	COMPLIANT
	RESISTANCE TO STAINING	UNI EN ISO 10545-14	Minimum Class 3	COMPLIANT

* Classification and recommendations for the use of Monocibec floor tiles

The resistance of ceramic floor tiles depends on a combination of various factors, some of which are referable to the correspondence of certain laboratory test, others depend on the place of use of the product and the specific conditions of use. Monocibec provides its own valuation of the resistance of the different products following a procedure that bears in mind and summarizes the results of the various laboratory tests and their PEI, MOHS, REFRACTION relationship, together with the comparison with past experience on the various types over years of use of the product in countless conditions. Below is a table that divides the products in five different classes and is an extremely useful instrument for the correct choice of the most suitable material for each purpose, provided that this choice is backed-up by the judgement of the user concerning the effective conditions of use on the product.

1 Ceramic floor tiles subject to light traffic to be used in rooms protected from abrasive and scratching agents. In general these tiles may be used in bedrooms and bathrooms of private homes.

- 2 Ceramic floor tiles subject to medium light traffic to be used in rooms protected from abrasive and scratching agents.
- 3 Ceramic floor tiles subject to medium-traffic to be used in rooms protected from abrasive and scratching agents. In general, these tiles may be used in all rooms of private homes to which there is no direct access from the outside.
- 4 Ceramic floor tiles subject to medium-heavy traffic to be used also in rooms to which there is direct access from the outside, provided that they are protected from abrasive and scratching agents.
- 5 Ceramic floor tiles for floors subject to heavy wear. In general, these tiles may be used in hotels, shops, offices and schools.

2. Sizes, Colours, Finishings:

2.1 Sizes : 33,3x33,3 – 50x50 – 25x50 – 25x25- 16,5x16,5

2.2 Colours: 6 (Montsegur, Arras, Bors, Sinclair, Glastone, Perceval)

2.2 Finishings:, Rectified, Lapped

3. Process features

The GRAAL series is realized in porcelain stoneware by dry pressing of a mix of spray-dried bodies obtained from precious natural raw materials. The obtained substrate is later silk-screen printed (decorated) and fired at over 1200°C, temperature needed to reach the sintering necessary to make the product frost-proof, non-absorbing and resistant to chemical attacks.

4. Compliance with standards



GRAAL is a material that ensures compliance, as far as the first choice is concerned, with the requirements specified in the international standards UNI EN 14411 appendix G and ISO 13006, for the surface chemical and physical features; the compliance is extended to all commercial choices for the safety features connected with the CE marking. GRAAL is also CCC certified.

The Quality management system - implemented by the company and certified according to the standard UNI EN ISO 9001:2008 - ensures a steady compliance.



5. Environmental Certification



5.1 ANAB-ICEA

Monocibec, for GRAAL, has successfully gained the ANAB-ICEA product labeling which, according to the requirements of the EN ISO 14024 norm, ensures that the products bearing the ANAB mark:

- are obtained from raw materials mined with a reduced environmental impact
- do not contain substances harmful for man and the environment
- are obtained from a productive process which is strictly checked and with a reduced environmental impact
- do not release polluting substances in the surrounding environment.

The ANAB certification can aid reaching the requirements needed to obtain the benefit granted by the new Italian HOME PLAN (at least in regions relating the cubage benefits with the use of bio-building materials and techniques

5.2 LEED Rating System

GRAAL guarantees the following LEED credits:



Credit MR 4.2 - Recycled content (according to UNI EN ISO 14021:2002) GRAAL is manufactured using recycled material. The percentage content of recycled material is > 40% ("pre-consumption material") **as certified by BUREAU VERITAS.**

+40%
RECYCLED CONTENT



Credit SS 7.1/7.2 - Heat Island Effect: GRAAL does not increase the temperature of city areas compared to country areas (No heat island effect), as the solar reflectance index SRI is ≥ 29 . GRAAL is thus particularly suitable for outdoor roofed and non-roofed installations.

Credit EA 1 - Optimize energy performance: heat conductivity λ of GRAAL ranges between 1 and 1.3 Watt/(m·K). Therefore GRAAL is provided of very good insulating performance.

Credit EQ 4.2 - VOC content: GRAAL does not emit VOC (Volatile Organic Compounds), as certified by qualified external laboratories.

Credit MR 1.2 - Building re-use: GRAAL can contribute to this credit by coating existing floors and walls, renovating surfaces and structures avoiding their demolition and rebuilding.(1pt)

Credit MR 2.1-2.2 - Management of building wastes: GRAAL can contribute to this credit, as all ceramic tiles can be totally considered as recovered materials to be used as aggregates for different filling operations (substrates, embankments, etc.).

Credit MR 5.1-5.2 – Regional materials: 65% of the materials used to produce GRAAL comes from quarries located within 500 miles from its production headquarters.

Credits ID 1.1-1.4 - Innovation in Design :

- Referred to credit MR 4.2: the percentage content of recycled material in GRAAL is > 40% ("pre-consumption material") according to the BUREAU VERITAS certification
- GRAAL is ANAB/ICEA certified and this is an innovative performance as for the environmental benefits offered by the product.