Breton Technologies and Plants

for producing slabs and tiles made of
agglomerate stones with cement
A TECHNOLOGICAL REVOLUTION IN THE MANUFACTURING OF AGGLOMERATE STONES WITH CEMENT

Bretonterastone® is the exclusive technology which, while using cement, honours those conditions indispensable for making high-quality compound stone.
Bretonterastone®,
a product everybody likes

Beautiful, durable
Beautiful, durable and practical Bretonterastone®
a product everybody likes

and practical
Breton, a world leader in its field, has been developing compound stone (Natural stone surface by Breton technology) for forty years by devising exclusive manufacturing techniques and has also been constructing plants for the production and processing of such compound stone. Breton has its own Research Centre and works in conjunction with a great number of universities.
Respect for the environment

Bretonterastone® is made with such natural components as stone aggregates obtained through the crushing of waste material from marble, granite, quartz and quartzite quarries; siliceous sand, water, cement, dyes and the additives usually found in cement mixtures.

Residue from Bretonterastone® processing does not pollute the environment.
Bretonterastone®’s truly exceptional features are due to the system’s technology and production process.

THE HOMOGENEITY OF THE MIXTURE
- During the making of Bretonterastone® products, the composition of the mixture and the water-to-cement ratio remain unchanged. The mixtures themselves are always thick and homogeneous. In this manner, we avoid the porosity and lack of homogeneity typical of products made by removing excess water from the mixture.

THE LOW WATER-TO-CEMENT RATIO
- Bretonterastone® mixtures, the low water-to-cement ratios are usually no greater than 0.30.
- The hardened mix is thick, homogeneous, compact and strong, perfectly bonded to the aggregate particles.

THE VACUUM EFFECT
- Bretonterastone® is made under vacuum. Vacuum eliminates air from the mixture, makes the mixture compact and contributes to its perfect adhesion to stone aggregates.

VIBRO-COMPACTION UNDER VACUUM
- Bretonterastone®’s vibration under vacuum makes it possible the excellent setting achieved between the particles of stone aggregate. In the uniformly compact mass, the concentration obtained is even greater than 72%.

THE LARGE AMOUNT OF STONE
- The large amount of stone gives Bretonterastone® a full, uninterrupted, natural and enviable appearance. This factor is likewise responsible for the great resistance to abrasion as well as for the other physical and mechanical features.

THE PRODUCT HARDENING
- Bretonterastone® is moulded into overlayable moulds that dovetail upon one another. This overlaying creates a sealed chamber between moulds, a moisture-saturated chamber in which – within a period of approximately 24 hours – the initial hardening of the mixture takes place. The hardening of the product in its mould avoids any handling in the fresh state as well as all the resulting cracks and breakage usually found with such handling.
Vibro-compaction under vacuum
CONSISTENT QUALITY

- The Bretonterastone® System is a production process in which everything is finalized by the obtaining of products that feature excellent and consistent quality.
- The Bretonterastone® process excludes any chance result.
- In their infinite range, Bretonterastone® products can be designed and made with the certainty that you will always obtain excellent quality.

BRETONTERASTONE®, PLANTS

- Bretonterastone® plants are simple and rationally constructed, and they are also easy to operate and maintain.
- No matter what the degree of automation selected by operators using this equipment, the plants themselves require only a limited number of personnel.
- These plants have been built to operate under a continuous work cycle, to be long-lasting and to spread amortization costs over a lengthy period of time.
Micrography of traditional terrazzo (2500x)

Thanks to the “Bretonterastone® System” production technology, the structure of Bretonterastone® is compact and uniform.

Bretonterastone® Micrography (4000X)

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<th>Physical &amp; mechanical features of Bretonterastone® tiles</th>
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(*) After 28 days of seasoning
Bretonterastone® PMC: tiles even thinner and stronger

PMC stands for “Polymer Modified Concrete”.

Throughout the concrete industry, polymers placed in water (lattices) are being used more and more for the purpose of making items with special features. As a matter of fact, the addition of polymers to concrete increases mechanical strength, decreases porousness and water absorption, and makes it possible to lower the water/cement ratio even while improving the workability of the mixture. The concrete mixtures formed by adding polymers are known as Polymer Modified Concrete (PMC) and Polymer in Concrete (PIC).

When is it useful to add polymers to Bretonterastone® mixtures?

The addition of polymers to Bretonterastone® is useful when one wishes to manufacture tiles that are very thin (e.g., 9.5 mm. [or 3/8”]) or to make large-size products while using especially small-sized aggregates.

For Bretonterastone® mixtures prepared with the addition of polymers, in fact, one normally uses a water/cement ratio not greater than 0.26%.

The exceptional physical and mechanical features of Bretonterastone® products are further enhanced by the decreased water/cement ratio and by structural improvements in the cement mixture.

(*) Lattices are produced throughout the world by the most important chemical companies.
The flexural strength of Bretonterastone® PMC products is found above the 20 N/mm$^2$ figure, in keeping with the UNI 6133 standard.

The resistance to impact is likewise increased by 30%.

Water absorption in the mass is usually less than 1.5%, in keeping with the UNI 10444 standards.

In tests conducted in rooms at 60° C. (140° F.) (in any event, a temperature never reached in work or use areas), water absorption in the mass usually ranges between 0.7% and 0.9%.

Surface absorption on polished materials (Bretonterastone® PMC formed with Montorfano granite) does not reach 0.012 g/cm$^2$ (*) (British Standard 4131:1973).

(*) On slabs of polished Montorfano granite, the surface absorption totals 0.011 g/cm$^2$. 
bretonterastone® Complete plants
FORMATS USUALLY PRODUCED:
- 30x30 cm
- 40x40 cm
- 40x60 cm
- 60x60 cm
- 68x153 cm

FINISHED THICKNESS:
- from 0.95 cm to 3

PRODUCTION CAPACITY:
Bretonterastone® plants:
- from 230m² in 8 hours of work per day
  (630m² in 22 hours of work per day)
- to 1,000m² in 8 hours of work per day
  (2,750m² in 22 hours of work per day)
Layout of the mod. TM -V6-M/G
1 Storage and feeding of aggregates and cement

2 Weighing and mixing of the mixtures

3 Automatic continuous cycle to mould slabs and tiles

4 Area for the setting and initial hardening of the product

5 Unfinished product storehouse

6 Continuous line for the calibrating, honing, polishing, chamfering and drying of slabs and tiles

7 Equipment for the automatic loading and unloading of the finishing line

8 Finished products storehouse

9 Closed circuit system for clearing the processing water
The production process

MIXING plant
The mixtures are prepared by mixing together cement, water, stone aggregates, the fluidifying agent and the dyes. The aggregates may be marble, granite, or quartz grits or even grits of other stones, all in the granulometry most suitable for obtaining the desired product.

FILLING THE MOULDS
The mixture moves from the mixer to the dosing and distributing equipment which fills the moulds.
**COMPACtion BY VIBRATION UNDER VACUUM**

The filled moulds move into the compaction by vibration under vacuum machines, where the tiles and/or slabs are formed.

**SETTING AND HARDENING**

The moulds containing compacted tiles and/or slabs are stacked in a dovetailing manner. Those stacks are then transferred to a room kept at a temperature of between 25° and 30° C, where both the setting and the initial hardening of the product take place.

**UNFINISHED PRODUCT STOREHOUSE**

The hardened tiles and/or slabs that are not immediately processed on the finishing line, are stored in the unfinished product storehouse.

**FINISHING AND PACKING**

The seasoned product moves on to the processing line, where the tiles and/or slabs are calibrated, honed, surface-polished, finished on the edge and the chamfer and finally dried and waxed.
- All processing takes place in a continuous cycle.
- The processing line can be equipped to give the surface of the products an appearance different from the honing or polishing effect – i.e., a bushhammered, sanded, scratched or other such look.
bretonterastone® tile and slab plant

Plant for dosing components and for blending the mixtures.

The mixtures forwarded from the mixing machine are distributed in the moulds in dosed amounts.
The moulds feed the units of compaction by vibration under vacuum.
The units of compaction by vibration under vacuum, automatically loaded and unloaded, form slabs and tiles in an uninterrupted sequence.
The moulds containing slabs and tiles are stacked together in a dovetailed manner. In this way, each and every slab hardens in its own damp chamber.

The piles of moulds are stacked for one day in rooms kept at a temperature of from 25° to 30° C.
The pallets are handled by using a forklift... or automatic shuttle devices.
The tiles are removed from the moulds and stacked on benches. The moulds return automatically to the work cycle in order to be filled again.
Tiles and slabs are automatically loaded onto the finishing line in order to be calibrated, honed, polished, edge-finished, chamfered and finally packed.
Breton and its customers: a true partnership

Breton boasts a well-equipped Research and Development Centre where product innovations in the compound stone sector are created and developed and where the related production processes and technologies are fine-tuned. In the laboratory connected to the Research Centre, technicians are given training of both a theoretical and practical nature, training which those technicians must then carry into practice within the plants.

Breton has been right at the customer’s side:
- from the instant in which the idea of creating a company to produce Bretonterastone® came into being;
- during the stage when the factory was being built;
- when the production had its initial start-up;
- in all the years since.

Breton offers a complete package of services:
- examination of the raw materials available to the client;
- preparation of the product samples;
- development of preliminary and final projects;
- supply of the plant and the related documentation;
- assembly of the plant and production start-up;
- transfer of the production know-how;
- training of the client’s personnel responsible for operating the plant and refining products, all at Breton R&D laboratory for compound stone;
- informational reports on future developments of the plants and products;
- technological assistance and the supply of spare parts.
No limits to imagination

Bretonterastone® means compositional freedom. Its beauty can be designed.

Clients have a choice of the natural appearance of marble, stone, quartz and granite, but they can also create their own “appearance” as well as absolutely new and original compositions.
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Inlaid Bretontérasstone®: technological interpretation of art of decorating
With the Bretonterastone® plants, you can get:

- tiles measuring: 30x30x1.2 cm, 40x40x1.5 cm, 40x60x1.8 cm and 60x60x2 cm.
- PMC tiles measuring: 30x30x0.95 cm, 40x40x0.95 cm, 40x60x1.2 cm. and 60x60x1.5 cm.
- self-supporting tiles for raised floors, measuring 60x60x3 cm.
- inlaid tiles measuring: 30x30x1.2 cm, 40x40x1.5 cm, 40x60x1.8 cm e 60x60x2 cm
- especially thick tiles for outside use (even with refined double-layer on the top and simple on the bottom);
- slabs measuring 68x153 cm with thickness from 2 to 3.5 cm, to be used in making: stairways, windowsills, door jambs, panels for internal and external coatings, vanity tops and kitchen counters, and many other items for use in home construction and interior decorating.
The surface finishing of the Bretonterastone®, product will be that requested by the end-user: polished or just honed, sanded, brushed or otherwise finished. Bretonterastone®, may be also honed and polished while being set in place, as with normal marble or granite flooring. One additional great advantage of Bretonterastone®, is that its technical and aesthetic features remain unchanged, even when large projects are involved. This fact becomes just another solid recommendation for using Bretonterastone®, even for the completion of large surface areas where Bretonterastone®, guarantees naturally the uniformity of colours as well as of the aesthetic appearance. Laying Bretonterastone®, is an extremely easy matter, no more difficult than laying ceramic items. Bretonterastone®, has the advantage of being light in weight, a factor due to the limited thickness of the items and to the superior strength that greatly facilitates handling. Bretonterastone®, can also be laid on a bed of cement mortar.
Bretonterastone® is ideal for exterior cladding.
A world to be “dressed up” with Bretonterastone®
bretonteastone® tile and slab plant
bretonteraldstone® tile and slab plant
Bretonterastone® STEEL: 60x60 cm self-supporting finished panels, ideal for raised floors.
Breton S.p.A. reserves the right to improve the products specifications and design, even during the execution of contracts. Therefore, every figure supplied, has to be regarded as an indicative and approximate figure.