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NEW TECHNOLOGIES FOR DECORATION WITH TOTALLY DIGITAL CONTROL

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Digital decoration technologies, now consolidated in ceramic tiles field, have represented an important innovation in the last decade, which allowed this field to achieve high aesthetical and qualitative standards.

However, it must be pointed out that the aesthetical quality refers to tile or slab surface only; actually, decoration systems able to operate in the whole thickness are not available. Besides, inkjet digital decoration, now so globally spread, has undoubtedly led to a certain flattening of production and thus a standardization of chromatic and aesthetical effects.

In an attempt to increase the possibilities of penetrating of the ceramic products, even in alternative fields to floor and wall tiles, four different processes for producing large size porcelain slabs by continuous compacting are listed hereinafter, all characterized by high intrinsic aesthetical value.

- **Synchronized body veins**: suitable for working tops (cooking tops, bathroom countertop, etc.), where the decoration at high superficial resolution meets a continuity even in the thickness. The two different decoration effects are perfectly synchronized in space, in order to look like the natural product (marble, granite, etc.).
- **Synchronized structures**: the forming of slabs creates a relief pattern, even of great depth. The following decoration at high definition is perfectly synchronized with the structure and gives results of great aesthetical impact. Thanks to artificial vision systems, the synchronization is performed after examining the formed surface.
- **Multiple decorations**: an able combination of dry and wet digital application techniques allows achieving slabs of high added value in spite of reduced operation costs. This is the best combination for high productivity lines.
- **Digital structures**: in this case, the superficial structure is realised by means of digital application of dry powders (similarly to additive manufacturing processes). Inkjet decoration at high resolution follows structure printing and allows achieving very new aesthetical and optical results.

All a.m. processes share the common feature of totally digital management of graphic and production parameters. Each product results from the juxtaposition of a great number of graphic layers (each colour of inkjet digital printing, each dry applied colour, possible applications of glue and other materials), which are all stored and managed co-ordinately by a single supervisor for the whole plant.

This way, quality level is assured and the risk of human mistake is reduced to minimum. Besides, the production line, with Industry 4.0 perspective, allows high automation degree and automatic management of production lots and product change (and consequently the change of graphic designs and structures to be applied).

New scenarios open in the production of ceramics, with flexible production lines, suitable for the new challenges of the future and able to produce materials of more and more charming aesthetics, of various appearance from natural products up to those new patterns (optical and geometric designs, etc.), which are of great interest for interior design and furnishing fields.

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