

## **Innovative porcelain stoneware large slabs (LAMINA<sup>®</sup>) from processing to application**

M. Raimondo<sup>(1)\*</sup>, C. Zanelli<sup>(1)</sup>, G. Guarini<sup>(1)</sup>, M. Dondi<sup>(1)</sup>, F. Marani<sup>(2)</sup> and L. Fossa<sup>(2)</sup>

(1) ISTECCNR, Institute of Science and Technology for Ceramics, via Granarolo 64, Faenza (Italy)

(2) SYSTEM Group, via Ghiarola Vecchia 73, Fiorano Modenese (Italy)

\* Corresponding author

Large porcelain stoneware slabs (up to 360 x 120 cm<sup>2</sup> and 3 mm of maximum thickness) are currently manufactured by the innovative Lamina<sup>®</sup> process, involving pre-milled raw materials, wet mixing and spray drying, forming by special purpose presses, a fast single drying and firing cycle at about 1200 °C, and finishing (trimming, lapping, functionalization). Lamina<sup>®</sup> slabs are peculiar as they can be bent and applied to both plain and curved surfaces in building and construction (floorings and wall coverings, ventilated façades, tunnels, roofings) as well as in indoor furnitures (e.g. table tops, doors, insulating panelling).

The Lamina<sup>®</sup> manufacturing cycle will be put in relation with microstructure (SEM, MIP) and phase composition (XRPD, Rietveld refinement) of industrial slabs. Technological performances, such as water absorption, open and closed porosity, bulk density, mechanical properties (modulus of rupture, Young modulus, fracture toughness), tribological properties (deep abrasion resistance, surface roughness), and functional properties (resistance to chemicals, stains, freeze/thaw cycles) will be overviewed and compared with conventional porcelain stoneware tiles.

The outstanding performances of these very large and thin slabs make them suitable for a wide range of indoor and outdoor applications, including energy harvesting.