

NOVEL PERFORMANCE REQUIREMENTS OF BUILDINGS: NEW CHALLENGES FOR CERAMIC MATERIALS

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The application of the European Union directives to reduce energy consumption and improve indoor comfort of buildings is turning ever stricter many material requirements, such as thermal conductivity, acoustic insulation, thermo-hygrometric behaviour. This expectation for enhanced performances is deeply involving ceramic building materials (i.e. clay bricks, wall and floor tiles) which are already facing the strong demand for innovation in terms of low unit weight, mechanical strength, functionalization (e.g. self-cleaning, energy harvesting), compatibility and integration with other building components. Such converging tendencies represent great challenges for clay bricks and ceramic tiles, which offer a high added value in terms of aesthetic solutions combined with durability, but need to enhance their energy, acoustic and thermo-hygrometric performances. The old and new routes the ceramic industry is striving for in order to improve these performances and fill the gap with the new expectations for building materials will be overviewed and the limits discussed with reference to materials and processing constraints. Moreover, an insight into the further frontier for ceramic building materials will be given by considering new composites for building and construction and the long-term sustainability of the energy-intensive ceramic processing.