

## RESUMEN N° 113

### Ceramic tiles surface functionalisation by photovoltaic cells

Sandra Fazio<sup>1,2</sup>, Alberto Fregni<sup>2</sup>, Barbara Mazzanti<sup>1</sup>, Giovanni Ridolfi<sup>1</sup>, Arturo Salomoni<sup>1\*</sup>, Ivan Stamenkovic<sup>1</sup>

<sup>1</sup>Centro Ceramico di Bologna, Bologna, Italy.

<sup>2</sup>DICASM, Università di Bologna, Bologna, Italy.

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\*Corresponding author: salomoni@cencerbo.it

Within Italian Ceramic Centre it was established the Laboratory CECERBENCH specialised to study and develop ceramic products with a functional surface. The Laboratory offers technical assistance and continuously supports the Italian ceramic tiles producers, mainly, but not only, those located in the Emilia Romagna Region, through mastering the production technologies of high added value products.

Ceramic tiles have been traditionally applied as material for residential buildings but, during last decades, the development and production of “porcelain stoneware”, characterised by excellent physical-chemical characteristics and attractive aesthetics, enormously expanded their use within public buildings, also. Bearing in mind the development history of the ceramic tiles, the Laboratory CECERBENCH is directed towards the development of tiles having specific surface properties and, consequently, high market potential. Initially, its work was devoted to the development of building facade ceramic tiles having the surface able to deliver electricity through the photovoltaic effect. The following activities were carried out to achieve such objectives:

- Study of different materials able to substitute the glaze layer and to deliver photovoltaic electricity. Three different types of coatings were examined: i)conductive, ii)photovoltaic, iii)protective one.
- Development and optimisation of the procedure to create, preferably during the ceramic tiles production cycle, the coating in the form of solar cells.

During the study, different materials were taken into consideration and related with the process conditions and the coating layer. The results of the study are presented and the essentials characteristics of the created prototype are given and discussed.