

lumentile)

The LUMinous ElectroNic TILE

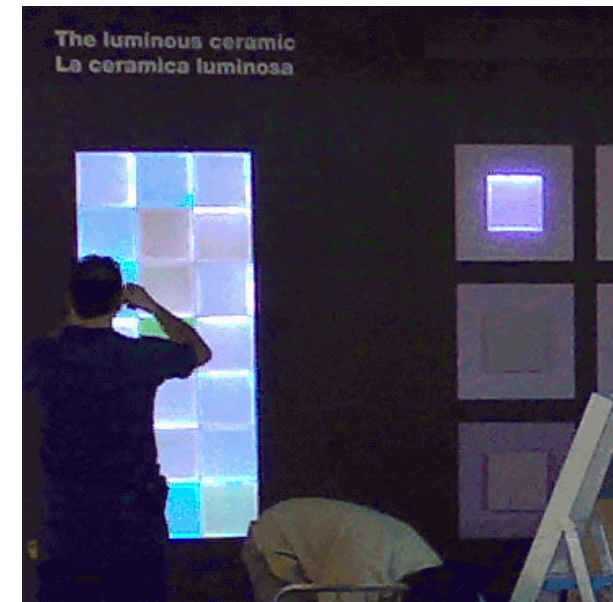
Guido Giuliani, University of Pavia - guido.giuliani@unipv.it



This project has received funding from the European Union's Horizon 2020 for research and innovation programme under grant agreement No 644902.

Overview

The LUMENTILE project aims to **fill the gap between a simple construction element and a luminous surface element**, by developing a cutting-edge technological module - **the luminous electronic tile** - that is capable of **displaying lights, colors and images**, that can be used as a chameleonic display to be employed as a skin for horizontal (floor) or vertical (wall) applications. The possibility of adding sensors embedded in the tile further increases its potential allowing, for example, the detection of people walking onto each tile of the floor.

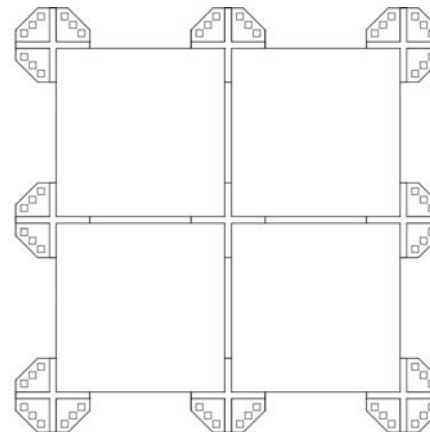
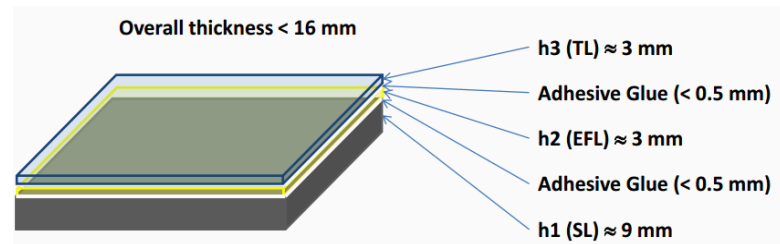
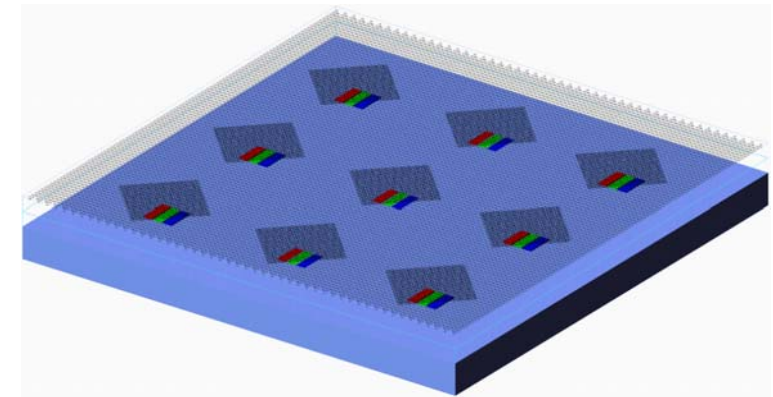
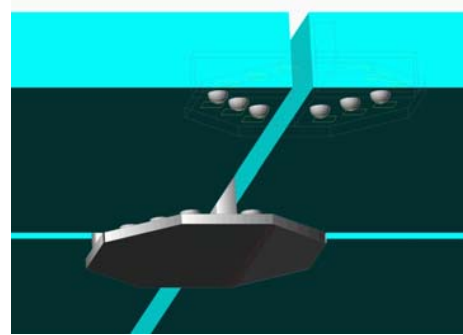
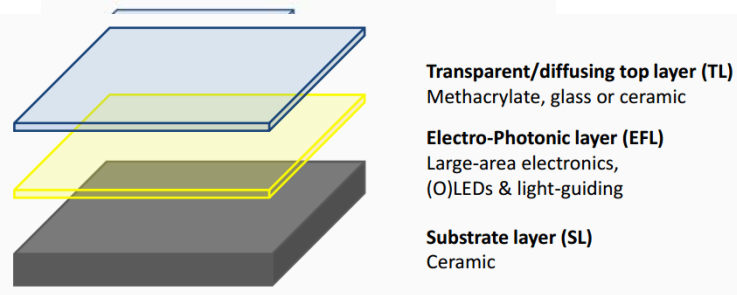


Four new products

- **Luminous tile for interior design**, capable of changing color and luminosity, adapting itself to the needs and will of the Designer
- **Illumination tile**, for **high-efficiency lighting** of interiors through a structural element that can be embedded into the wall, floor, ceiling, and does not require a specific wiring
- **Sensing luminous tile**, that can embed different integrated sensors providing additional functionality, like the detection of people walking onto the tile, touch-pads, microphones, loudspeakers, and so on...
- **Video tile**, where each tile represents a single pixel of an enormous screen to display videos using structural elements that cover the wall of a building, the floor of an airport or mall, etc.
- All the above, while the luminous tile remains a ceramic tile that can be installed using conventional techniques, and has the ruggedness of traditional tiles!



Technology



Technological Objectives

- Development of a **high-efficiency luminous layer**, that integrates LED light emitters and electronic circuits for LED driving and tile intelligent management.
- Investigation on the **best LED sources** and **light-guiding structures** for the different luminous tile applications.
- **Smart technological integration** of large-area electronics/photonics with traditional ceramic material, towards mass production of the luminous tile.
- Implementation of **dedicated video signal distribution system** compatible with tile-to-tile communication, without the use of an external dedicated bus.
- Development of **flexible and versatile luminous tile product/technology**, capable to respond to the needs of design-driven solutions and applications.
- Development of **functional demonstrators** to showcase the solution to the general public.



Expected impact

- Development of a **new product** (the **electronic luminous and sensing tile**) to be put in the hands of designers, who will be free to develop new ideas and solutions
- Discovery of **novel functionalities** (mosaic-floor that dynamically and visually lights the way to people as they walk onto it)
- Opening of **new markets** (use of the luminous tile for interior design and architecture, and for novel extra-large video screens to be permanently installed on the floor of public spaces or on building facades, with applications to advertising and smart-city interfaces)
- **Technology advance** in the fields of large area electronics and photonics (increased volumes and efficiency, lower production cost, integration with other materials like ceramics)
- Opening of **new societal opportunities** in term of employment and creation of new disciplines and experts
- **Strengthening Europe's excellence and leadership** in smart application



This project has received funding from the European Union's Horizon 2020 for research and innovation programme under grant agreement No 644902.

Applications examples - Outdoor



Martini Illuminazione – high resistance walkable glass that simulate porphyry



AGBAR tower (Barcelona)



Jacko Steps, a floor lamp by Roberto Paoli for Serralunga



Times Square NYC (USA)

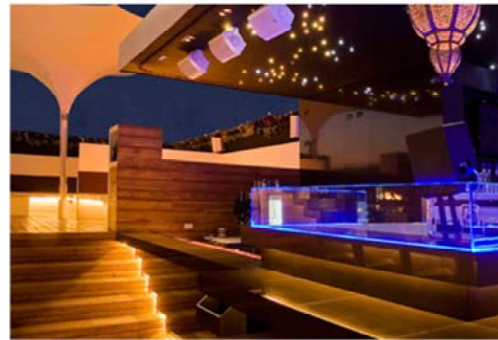


This project has received funding from the European Union's Horizon 2020 for research and innovation programme under grant agreement No 644902.

Applications examples - indoor



Display for retail applications



LEDs C4 Company – Hookah Satellite Restaurant (Mexico)



Interactive LED Screen



ILLUMIFLOOR by Illusions



Interactive LED Floor



This project has received funding from the European Union's Horizon 2020 for research and innovation programme under grant agreement No 644902.

Partners



University of Pavia

