

# THERMAL MONITORING OF A HEAT BARRIER TREATMENT FOR GLASS SURFACES

## TECNAN

### Product: TECNADIS HEATSHIELD

TECNAN offers a wide spectrum of nanoparticle materials, which can be employed in several different industries and applications.

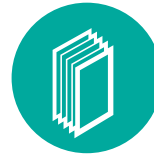
Their **TECNADIS HEATSHIELD** is a thermal protective coating for glazed surfaces, designed to block the transmission of infrared solar radiation.



Application of the product within the BEEpilot test facility

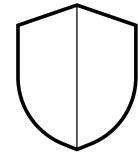
## Pilot Measurement & Verification Line 6

Managed by: Politecnico di Milano (POLIMI)

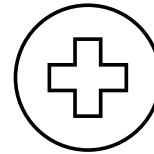


PM&VL6

PM&VL6 offers a comprehensive characterization of building envelope components, thanks to its two infrastructures: the Materials & Structures Laboratory (**M&S Lab**, mechanical characterization) and the **BEEpilot** (thermal, hygrothermal, air quality and airtightness performances).



SAFETY



HEALTH



EFFICIENCY

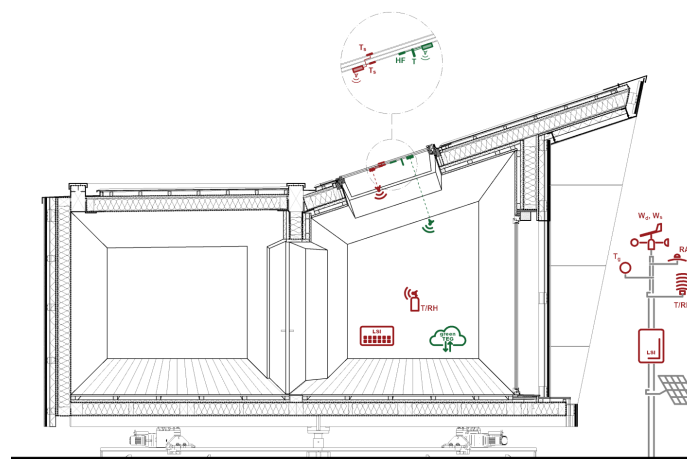
## Which is the need covered by this service?

Buildings are the biggest energy end-use sector, with heating and cooling as key factors contributing to such trend, thus representing commonly poorly performing envelopes. This could be generally predicted and prevented during the design-phase, but on-site measurements have shown wide gaps in the actual operative performance of buildings. The real-life performance assessment is thus a powerful way to evaluate and potentially prevent such gaps. In that context, the activity aimed to **accurately assess the performance and behavior of the TECNAN product in real-life conditions.**

## Design of Experiments

The product was applied on the **exterior glass surface of one of the two roof windows** (facing SW), according to instructions provided by the manufacturer. The assessment was based on the simultaneous monitoring and comparison of glass surfaces with and without protective coating.

The monitoring started in spring 2023 and was conducted for 5 months under real-life outdoor conditions. The product was applied in the office portion of the **BEEpilot**, in Lecco (IT), and was hence subject to real-life indoor conditions as well (split system operated according to user comfort).

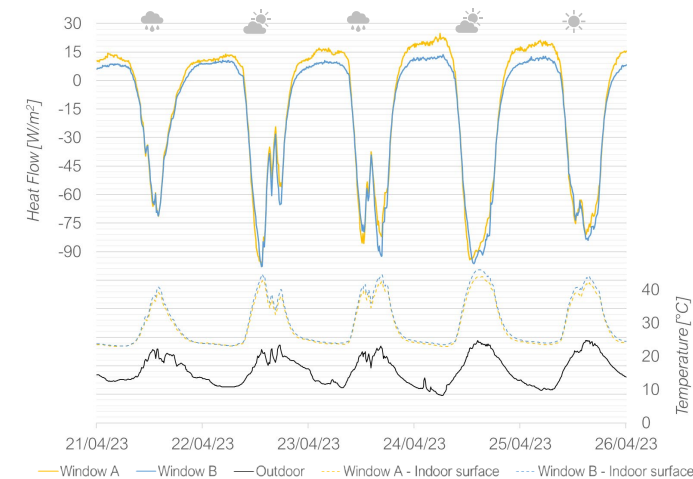


Monitoring setup for the thermal performance assessment

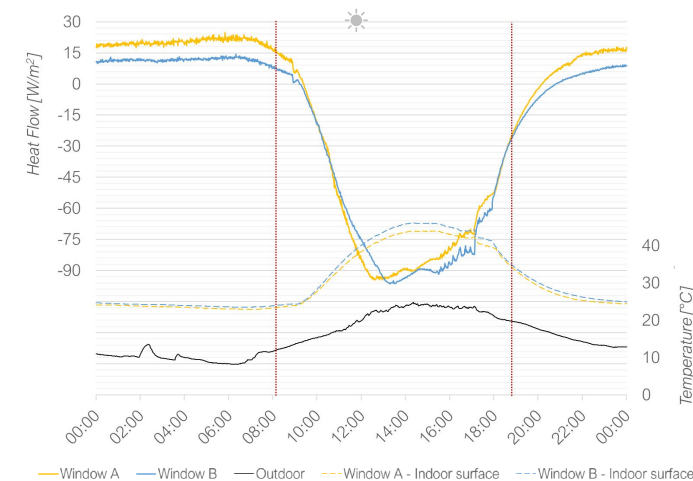
## Results

### April 2023

During daylight hours, the coating reduces heat flows compared to a standard roof window with no coating. The product has a positive effect in lowering the temperatures recorded on the inner surface of the roof window.



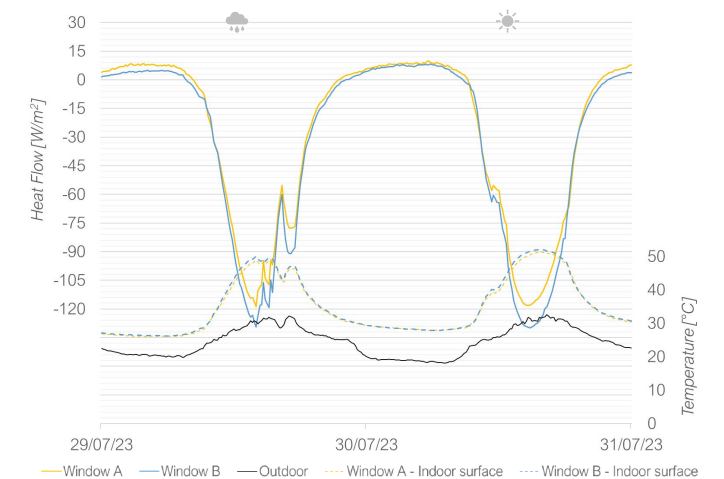
21<sup>st</sup>-25<sup>th</sup> April 2023 - Comparison between Window A (with coating, yellow) and Window B (without coating, blue).



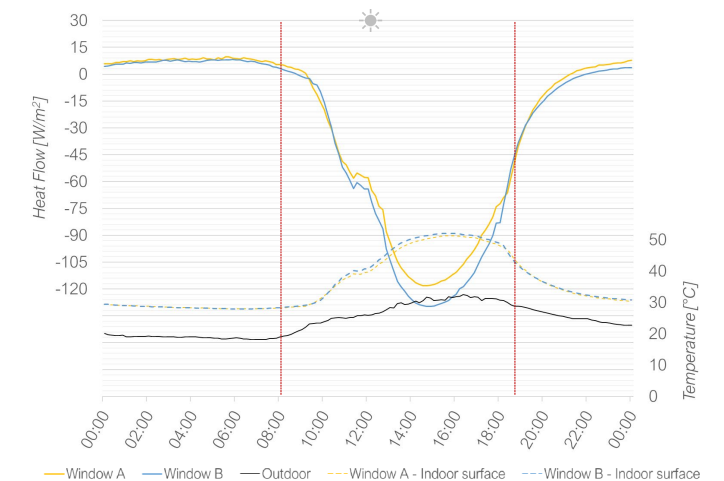
26<sup>th</sup> April 2023 - Comparison between Window A (with coating, yellow) and Window B (without coating, blue).

### July 2023

During daylight hours, the product remarkably reduces heat flows if compared to the roof window with no coating applied. This happens, at different degrees, both on days with clear sky as well as on cloudy and/or rainy days.



29<sup>th</sup>-30<sup>th</sup> July 2023 - Comparison between Window A (with coating, yellow) and Window B (without coating, blue).



30<sup>th</sup> July 2023 - Comparison between Window A (with coating, yellow) and Window B (without coating, blue).

## Conclusions

The thermal monitoring has allowed to understand the real-life coating behavior and contribution in terms of effectively blocking the transmission of infrared solar radiation through the glazing surface. This performance has, in particular, shown higher contributions during daylight hours in summer, thus ensuring higher thermal comfort levels indoor.



The sole responsibility for the content of this poster lies only with the authors. It does not necessarily reflect the opinion of the European Union. The European Commission is not responsible for any use that may be made of the information contained therein. The MEZeroE Project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 953157.

Research partner:



Main author:

Diletta Brutti [diletta.brutti@polimi.it](mailto:diletta.brutti@polimi.it)

Industrial partner:



Want to know more?

- Follow us on LinkedIn

- Write us to [contact@mezeroe.eu](mailto:contact@mezeroe.eu)

- Visit our marketplace [www.mezeroe-platform.eu](http://www.mezeroe-platform.eu)

