

Dear Reader,  
We are delighted to introduce the third edition of the EENSULATE newsletter. In this edition, we will share with you the progress made in the development of the EENSULATE module, highlights of the workshop co-organized by EENSULATE, and of course a list of planned and past events.



Development of innovative lightweight and highly insulating energy efficient components and associated enabling materials for cost-effective retrofitting and new construction of curtain wall façades.

## WHERE WE ARE



## PROJECT PROGRESS

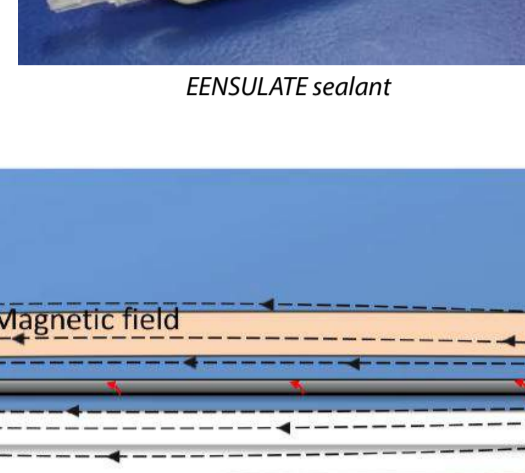
### EENSULATE MODULE

EENSULATE consortium is currently developing and testing all EENSULATE components - **Vacuum Insulated Glass (VIG), Sealant, Getter, and Foam**. After the system design, the first prototypes will be manufactured and the performances tests will be conducted to validate the full system. How specifically the researchers have developed each product is shown below.

### EENSULATE VACUUM INSULATED GLASS (VIG), SEALANT AND GETTER

A number of prototype VIG samples have been fabricated at Ulster University using sealant and getter materials developed by SAES. The **EENSULATE sealant** is a mono-component epoxy resin dispensable in the range 60 - 100 °C. The thermal curing allows low processing temperature (below 200 °C). The resin has extremely high barrier performance for Ar, N2 and O2 (till two orders of magnitude better than commercial sealants for insulating glasses). The sealant contains also an active filler for moisture absorption. The resin has high yield stress and adhesion strength (> 7MPa) on glass surfaces. It can be processed in air and deposited by an automatized system working with precise erogation.

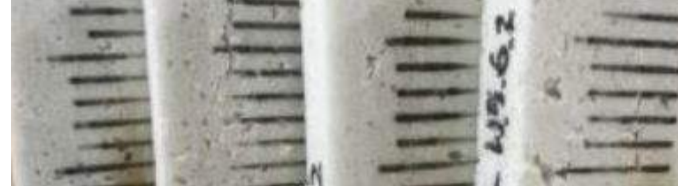
The **EENSULATE getter** comprises a Zirconium based alloy under the tradename ZAO® 2, with Nitrogen sorption capacity, superior than state of art getter solutions for VIG. It is delivered in form of laminated double-side getter strips (200µm thick and 8mm large) that allow easy handling and positioning in air. Getter is activated by radio frequency heating under vacuum pumping.



### EENSULATE ONE-COMPONENT FOAM AND TWO-COMPONENT FOAM

We are developing two kinds of EENSULATE foam in the project: **One-component foam (OCF)** and **Two-component foam (TCF)**. The OCF will be used as an effective thermal sealant between curtain wall and sub-structures, comprising a bittering agent that will prevent small animals and insects from eating and destroying the foam in the cavities. The polyurethane foam is packaged in a pressurized can and can be easily used in construction sites.

**Why is it beneficial?**  
EENSULATE OCF has improved fire behavior thanks to the use of nanosized inorganic fillers and expandable graphite which ensure a high level of fire resistance. The experience from two-component foam was transferred to increase the fire properties and removing toxic compound (e.g. halogen molecules).



EENSULATE One-component foam samples

TCF is highly insulating polyisocyanurate (PIR) foam based insulating material enhanced with eco-friendly lamellar inorganic fillers, that contributes to meet energy performance requirements, environmental challenges and cost reduction without undue compromise of the overall building fire safety. The TCF is used to be injected workable for the manufacturing of spandrel replacing cut-to-measure mineral wool panels.



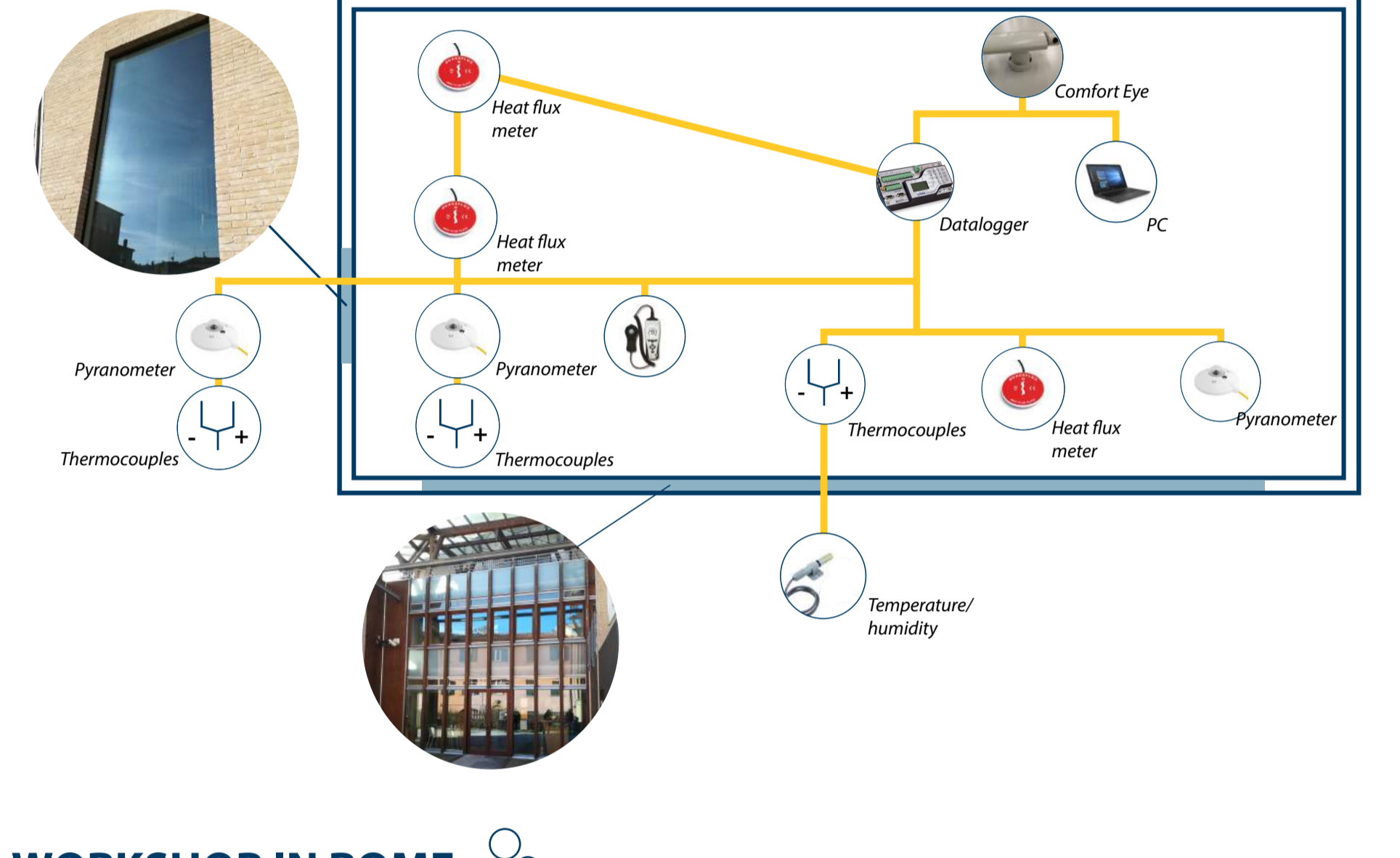
EENSULATE Two-component foam samples

### Why is it beneficial?

The advantages of the TCF system during the production system are the **increased efficiency of 35 kg/m<sup>3</sup>** and **ease of the processing**. PIR system with layer fillers also provides fire reaction properties because of favor the formation of a reinforced layer, providing an effective barrier against heat and oxygen, release non-flammable gases, and at the same effectively suppress smoke and gases during the combustion process.

## MONITORING AND METHODOLOGY

Thermal comfort and energy indicators (such as lighting, cooling energy demand, etc.) are monitored in order to efficiently test and verify EENSULATE components. **The main aim of the monitoring is to optimize these factors in function of the potential variables** (light intensity and IR radiation, heat flux, temperature and humidity, an open/close status of the window). Experimental data that we need to collect are environmental parameters, glass reflectance, and transmittance and their dependence on temperature and indoor parameters. Take a look on the scheme below and see the whole energy performance and indoor comfort monitoring methodology in detail.



## WORKSHOP IN ROME

Partners from RINA organized a workshop dedicated to the **P2Endure project**, a research project that has received funding from the European Union's Horizon 2020 research and innovation programme, titled "Deep Renovation Joint Workshop". The event was organized in conjunction with EENSULATE project and ENVISION project.

The "Deep Renovation Joint Workshop" brought together stakeholders representing key decision makers and implementers in the field of the deep renovation of buildings, along with retrofitting solutions experts, and developers for an array of interactive poster sessions and discussions, and a unique hands-on showcase of the innovative deep renovation of building solutions.

Partners from RINA, namely Paola Robello, presented our project and the whole consortium had a chance to attend this meeting and network with other project representatives. The workshop was attended by 70 people and the projects were presented via presentation, poster session, and brochures.



## PARTNERS



**HORIZON 2020 RESEARCH PROJECT**  
This project has received funding from European Union's Horizon H2020 research and innovation programme under grant agreement No. 723868. H2020-EEB-2016-2017/H2020-EEB-2016



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## PAST EVENTS

### 13.-14.11. 2018 | ECTP CONFERENCE

FENIX TNT presented the EENSULATE project via booth and brochures during the ECTP conference "When EU Construction Industry shapes high-tech Sustainable Built Environment". The 8<sup>th</sup> ECTP Open Conference took place in Brussels on November 13-14, 2018 and was dedicated to present and discuss current and anticipated innovation in the built environment field. This event was a key opportunity to meet and network with experts, receive a full update on RDI in the construction sector and be informed on new and innovative technical developments.



### 3.10.-5.10 2018 | GENERAL ASSEMBLY MEETING

The consortium gathered for the sixth General Assembly meeting in Rome, Italy. The partners discussed project progress and after that, they participated in an exploitation workshop to agree on the future use of EENSULATE results.



### 10/2018 | SCIENTIFIC REPORTS

EENSULATE Partners from the Ulster University College London submitted a scientific paper where our project is acknowledged. The researchers from UCL focused on a technological paper that they are investigating. Find the paper [HERE](#).



### 20.9.2018 | ECO-BINDER WORKSHOP

Thirty professionals from various fields attended the ECO-Binder workshop in Treviso (Italy) to share their knowledge and experience not only with the European projects but also with energy efficiency, building innovations, and new materials. EENSULATE project was represented via poster and brochures.



### 12.9.-14.9. 2018 | 3<sup>RD</sup> ESFSS 2018

EENSULATE representatives from the Ulster University presented our project during European Symposium on Fire Safety Science 2018 in Nancy, France. The aim of the conference was to gather researchers from and beyond Europe to have exchanges and discussions about fire safety science.



### 9.7.-13.7. 2018 | EUROMEMBRANE 2018

SAES presented the EENSULATE project during the Euromembrane 2018 conference which is an annual conference organized by the membrane group of the Research Institute for Industrial, Radio Physical and Environmental Safety on behalf of the European Membrane Society (EMS). The conference took place from 9 to 13 July 2018 in Valencia, Spain and SAES representatives focused on the sealant modelling in their presentation.



### 11.7.-12.7. 2018 | GENERAL ASSEMBLY MEETING

EENSULATE consortium met during the fifth General Assembly meeting after 24 months of the project in Charleroi, Belgium. Partners presented the detailed project progress within the individual Work Packages, focused on the last six months and also introduced the plans for the next period of the project.



### 26.6.2018 | CHINA ACADEMY OF BUILDING RESEARCH VISIT

EENSULATE project was introduced to the representatives of the R&D Academy of Building Research (CABR) who visited the FENIX TNT premises in Brno, Czech Republic. CABR is the largest comprehensive China institution in the building sector in China. Their research and business cover 70 fields of such specialties as building structure, soil foundation, earthquake-resistance engineering, building environment and energy efficiency, building software, construction mechanization, building fire-prevention, construction technology and building materials. In recent years, CABR has put more efforts to research and development of technologies concerning green buildings, new energy applications, disaster prevention and mitigation and intelligent integration. EENSULATE project was presented via presentation, video and brochures.



### 24.-29.6.2018 | QUIRT 2018

QUIRT 2018 is a forum for discussing the latest developments in the instrument technique, methodology and methods of analysis in the field of infrared thermography helping to disseminate the latest results in the field throughout the industrial and research worlds. The EENSULATE project was represented by the Universita Politecnica Delle Marche from 24<sup>th</sup> to 29<sup>th</sup> June in Berlin, Germany.



### 30.5.2018 | E2EVENT WORKSHOP



EENSULATE project was presented by FENIX TNT during the Workshop called "E2EVENT project - Horizon 2020 in practice". The workshop took place on 30<sup>th</sup> May in Technology Centre CAS in Prague, Czech Republic. The project was represented via roll-up and brochures.

### 1.5.2018 | EUROPEAN ENERGY INNOVATION MAGAZINE

We proudly share with you an article about our project in the European Energy Innovation Magazine Summer edition! Find us on the page #35 [HERE](#).



### 25.- 28. 4.2018 | INTERNATIONAL BUILDING FAIRS BRNO



FENIX TNT team represented the EENSULATE project at Building Fairs in Brno, Czech Republic. From 25<sup>th</sup> to 28<sup>th</sup> April 2018 visitors had a chance to see a unique presentation of all aspects of housing and house constructions, building management services, technical solutions and equipment. The event was visited by more than 40 000 people.

