

Dear Reader,

We proudly present the second EENSULATE newsletter. The aim of this newsletter is to provide you with a summary of the news and progress achieved so far in the project as well as to inform you about our plans for the next six-month period, including the events where you can meet the EENSULATE representatives and learn more about the project.



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



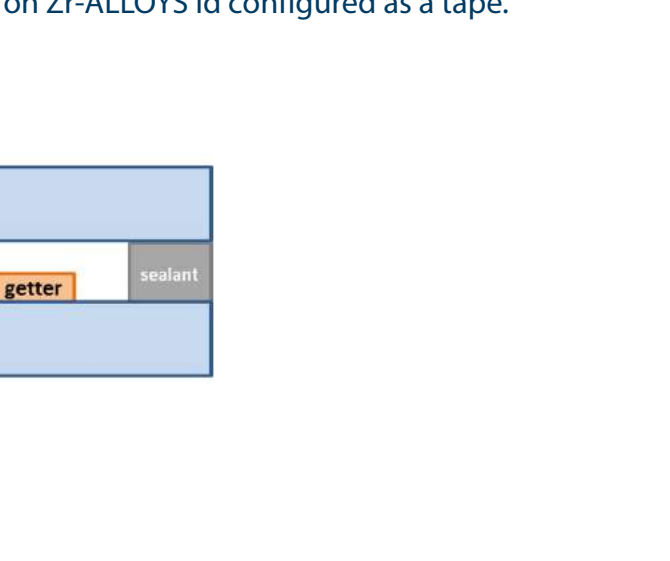
## PROJECT PROGRESS

### EENSULATE MODULE

The aim of the EENSULATE module is the connection of the EENSULATE components, the identification of the assembly process and the demonstration of the scalability of the full system. EENSULATE module's main components – VIG and foam – are currently under the definition of the final specifications and, in the next months, the system design of the EENSULATE module will be realized. After the system design, the first prototypes will be manufactured and the performances tests will be conducted to validate the full system.

### VACUUM INSULATED GLASS (VIG)

A number of prototype VIG samples have been fabricated at Ulster University using seal materials developed by SAES. These included a hot melt type polymer and an epoxy resin. Initial trials were conducted on small scale (300x300mm) samples to determine appropriate application techniques, processing criteria including heating schedules for temperature and time and application of pressure. Initial samples used annealed glass with or without a hard low-e coating. Larger size 500x500mm samples have subsequently been fabricated from 6mm thick fully tempered glass using a combination of uncoated and soft low-e coated glass. Based on modelling results, an array of stainless steel support pillars, 0.4mm in diameter, 0.2mm high and spaced on a 50mm regular grid maintains the separation of the glass panes. Initial prototype fabrication has proved successful and further work will concentrate on refinement of the assembly technique and processing criteria.



VIG prototype

### EENSULATE SEALANT

Four sealant classes have been investigated:

1. THERMOPLASTIC POLYOLEFINS
2. POLYISOBUTYLENE
3. POLYSULFIDE
4. EPOXY RESINS

Current achievable permeability is  $10^{-1}$  barrer, while target permeability is  $10^{-2} / 10^{-3}$  barrer achievable through **filler addition** and **chemical modifications**.



Scheme of the EENSULATE glass

### EENSULATE GETTER

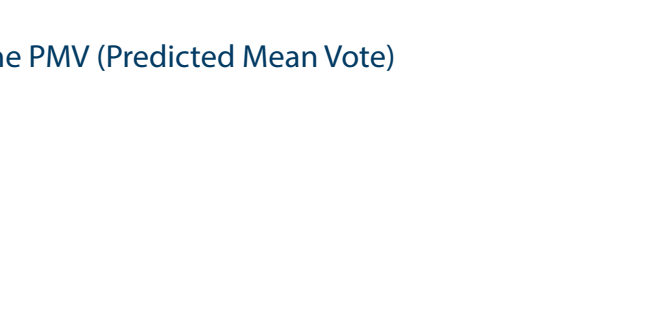
Three getter families have been investigated:

1. ZEOLITES
2. Zr - ALLOYS
3. Li - ALLOYS

Current focus on Zr-ALLOYS id configured as a tape.

### EENSULATE FOAM

SELENA is currently working on one-component foam (OCF) to improve fire resistance and higher yield. At the end of April 2018 SELENA will realise preliminary Single Burning Item test (SBI) for three types of foam. After the test, we know whether the foam will achieve the appropriate fire resistance and SELENA will begin preparing preliminary industrial samples for fire tests and certification. SELENA is also working on delivering a high-pressure PUR foaming machine to FOCCHI in order to improve the foam filling technology in the spandrel, by:



Three types of foam

- elimination of the shrinkage occurs due to a problem with the process,
- doing SBI spandrel again with the appropriate production conditions.

Improving the foaming process needs a sufficient temperature of around 60°C to obtain a good curing as well as better foam flow – in cooperation with EVONIK.

## DEMOSITES PROGRESS

### PUBLIC LIBRARY SAN GIOVANNI- PESARO, ITALY

Monitoring of the indoor thermal conditions and thermal comfort conditions of users

- Monitoring of the indoor thermal conditions and thermal comfort conditions of users, i.e. the PMV (Predicted Mean Vote)

- Measurement of environmental and personal parameters:

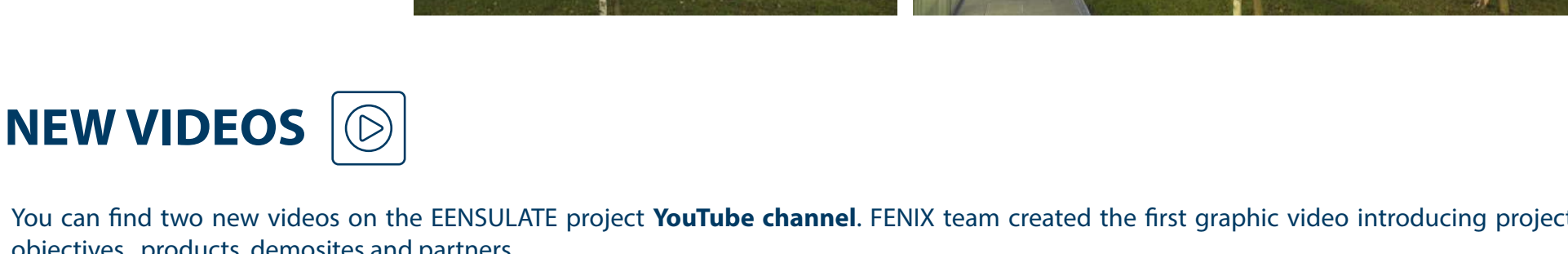
- Indoor air temperature  $T_{in}$  [°C]
- Indoor relative humidity RH [%]
- Indoor air velocity  $v_{in}$  [m/s]
- Mean radiant temperature MRT [°C]
- Metabolic activity of the subject  $M$  [met]
- Clothing level of the subject  $I_{cl}$  [clo]



Pesaro Public Library demo site

Dynamic optimisation of the building thermo-acoustics performances and thermal comfort

Comfort and energy parameters (lighting, cooling energy demand, etc.) optimization in function of the potential variables as light intensity and IR radiation, heat flux, temperature and humidity, open/close status of the window. The optimization will be performed on the basis of numerical data obtained from building energy simulation on a virtual mock-up.



### FOCCHI BUILDING - RIMINI, ITALY

Another demo case for the EENSULATE module is the conference room in Focchi Headquarter (Rimini, Italy). The portion of the building where the EENSULATE module will be installed is a double volume with currently a double glass stick system fully glazed façade for a total surface around 48 square meters.



## NEW VIDEOS

You can find two new videos on the EENSULATE project YouTube channel. FENIX team created the first graphic video introducing project objectives, products, demosites and partners. We also uploaded a record from Polish MELORADIO, where the representative of DZIERZONOW, Rafal Pilsniak, gave an interview about the EENSULATE project. The interview is in Polish language only.



EENSULATE graphic promo video

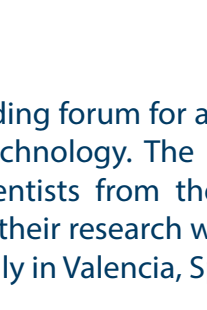


Interview at MELORADIO

## 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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## UPCOMING EVENTS

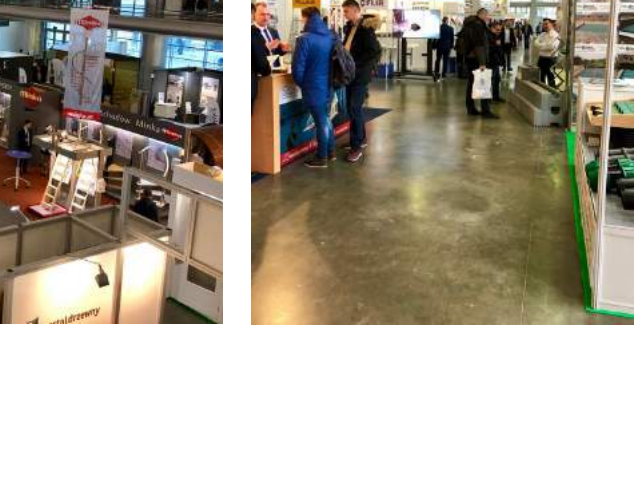
### 25.-28.4. 2018 | BUILDING FAIRS IN BRNO

The EENSULATE project will be presented by one of the project partners, FENIX TNT, during the **Building Fairs in Brno**, Czech Republic in April 2018. Fairs in Brno are well known for a unique presentation of all aspects of housing and house constructions, building management services, technical solutions and equipment.



### 24.-29.6. 2018 | QUIRT CONFERENCE 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 will be represented by the Università Politecnica Delle Marche from 24<sup>th</sup> to 29<sup>th</sup> June in Berlin, Germany.



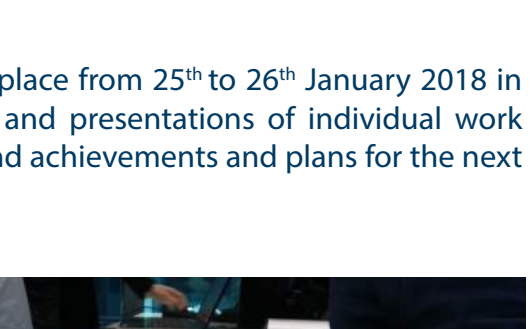
### 9-13.7. 2018 | EUROMEMBRANE 2018

The series of Euromembrane Conferences have been an outstanding forum for an intensive and inspiring exchange of knowledge in a broad range of membrane science and technology. The aim of the **Euromembrane 2018 Conference** is to bring together academic and industrial scientists from the field of membrane science and technology to stimulate contacts and to exchange new ideas on their research work. The EENSULATE project will be represented by SAES. The event will take place from 9<sup>th</sup> to 13<sup>th</sup> July in Valencia, Spain.

## PAST EVENTS

### EENSULATE AT ECTP

Read about our project at the **European Construction, built environment and energy efficient building Technology Platform (ECTP)**, which is a leading membership organisation promoting and influencing the future of the Built Environment.



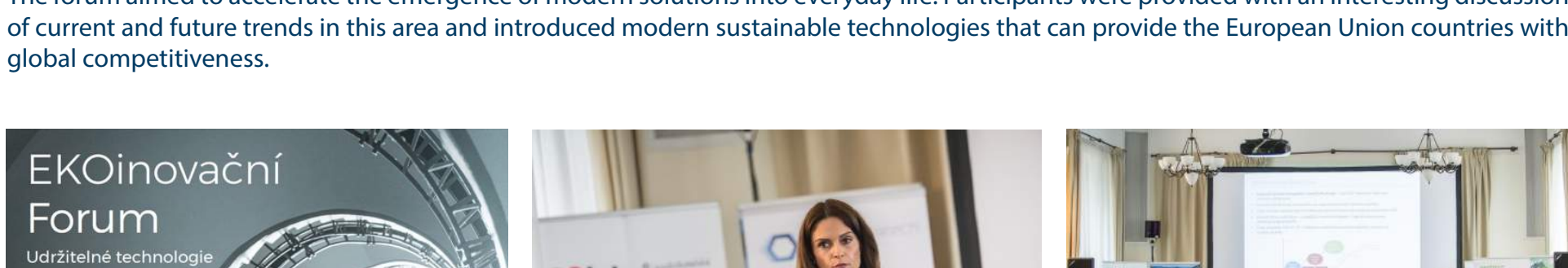
### 31.1.-2.2. 2018 | BUDMA FAIR IN POLAND

FENIX team presented the EENSULATE project at **BUDMA Fair in Poznan**, Poland. BUDMA is the largest construction fair in Poland and Central and Eastern Europe with more than 800 exhibitors from all over the world. It was a unique opportunity to introduce new products to wide public and a rich source of latest market information. The EENSULATE was presented via booth, roll-up, and brochures.



### 26.1. 2018 | NEW YEAR'S ENTREPRENEUR'S COCKTAIL

EENSULATE project was introduced at 'New Year's Entrepreneur's Cocktail' in Dzierżonów, Poland. The event took place on 26<sup>th</sup> January 2018 and it was hosted by the mayor of the town, who invited the most important companies from the city and region.



### 25.-26.1. 2018 | GENERAL ASSEMBLY MEETING AFTER 18 MONTHS

The EENSULATE consortium met at **General Assembly Meeting after 18 months**. The meeting took place from 25<sup>th</sup> to 26<sup>th</sup> January 2018 in Brussels, Belgium. The agenda of the meeting included the project overview and overall progress, and presentations of individual work packages. Within these presentations, partners presented the work package update, progress, issues, and achievements and plans for the next six-month period.



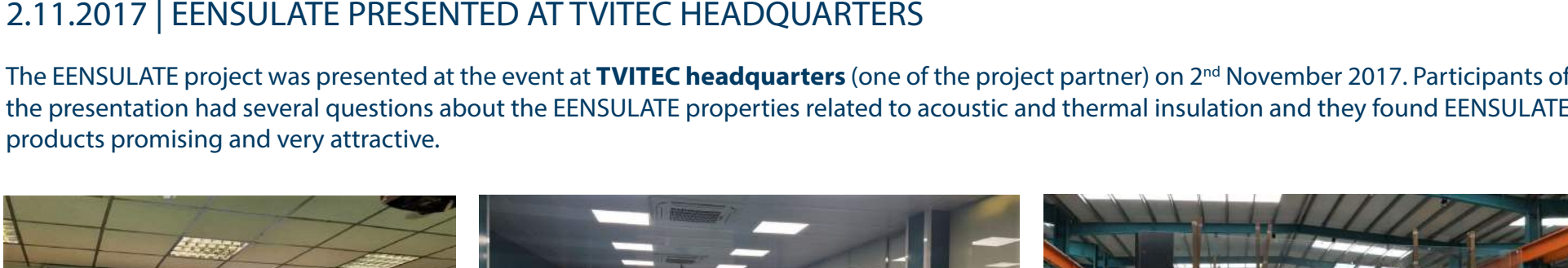
### 22.1. 2018 | INTRODUCTORY WORKSHOP

EENSULATE representatives attended an Introductory Workshop called "**SUSTAINABILITY BENCHMARKING OF ADVANCED CONSTRUCTION MATERIALS THROUGH LIFE CYCLE (LCA) AND LIFE CYCLE COST ANALYSIS (LCCA)**" (part of the AMANAC cluster activities) on 22<sup>nd</sup> January 2018 in Brussels, Belgium. The EENSULATE project was introduced by RINA in the section "Project presentations on advanced materials sustainability based on Eco balance analysis findings: technology options, opportunities and barriers".



### 30.11. 2017 | EKOINNOVATION FORUM

The EENSULATE project was introduced within a FENIX's presentation at the **EKOinnovation Forum** on 30<sup>th</sup> November in Krtyn, Czech Republic. The forum aimed to accelerate the emergence of modern solutions into everyday life. Participants were provided with an interesting discussion of current and future trends in this area and introduced modern sustainable technologies that can provide the European Union countries with global competitiveness.



### 22.11. 2017 | INFODAY HORIZON 2020

On 22<sup>nd</sup> November 2017, the Technological Center of the Academy of Sciences of the Czech Republic organized an **Infoday focused on the Horizon 2020 programme** about Nanotechnology, Advanced Materials, Biotechnology and Advanced Manufacturing and Processing (NMBP) in the National Technical Library in Prague. The EENSULATE project was presented by Petra Colantonio from FENIX TNT.



### 6.11.-7.11.2017 | THE EENSULATE PROJECT AT CAE CONFERENCE

The EENSULATE project was presented by FENIX team at the **33<sup>rd</sup> International CAE Conference and Exhibition** in Vicenza, Italy. The conference and exhibition covered the rich landscape of Simulation Based Engineering and Sciences but also the European research projects. Distinguished speakers, sponsors, exhibitors, training courses and dedicated Research Agora were all there to enrich the experience with their leading insight in the use of simulation to meet the needs of Industry 4.0.



### 2.11.2017 | EENSULATE PRESENTED AT TVITEC HEADQUARTERS

The EENSULATE project was presented at the event at **TVITEC headquarters** (one of the project partner) on 2<sup>nd</sup> November 2017. Participants of the presentation had several questions about the EENSULATE properties related to acoustic and thermal insulation and they found EENSULATE products promising and very attractive.



### 21.10.2017 | ENERGY IN BUILDINGS 2017

EENSULATE was presented at **ENERGY IN BUILDINGS 2017** conference in Athens, Greece, within the workshop "Research and Innovation activities in nanotechnology concerning Energy Efficient Buildings" which took place on 21<sup>st</sup> October 2017 in Athens, Greece. The project was introduced by Dr. Marco Arnesano from the Università Politecnica delle Marche. Dr. Arnesano focused on Innovative technologies for improved built environment and energy efficiency.



### BEST PAPER OF THE 19<sup>TH</sup> INTERNATIONAL CONFERENCE ON SUSTAINABLE BUILDINGS DESIGN AND CONSTRUCTION

We are pleased to share with you an interesting paper released by one of the EENSULATE project partner, Ulster University. Authors of this paper are Farid Arya and Trevor Hyde. The paper was presented during the **19<sup>th</sup> International Conference on Sustainable Buildings Design and Construction** in Venice, Italy and the authors received the certificate for the best paper. Click on the picture to access the PDF version.



### 4.-5.10.2017 | GENERAL ASSEMBLY MEETING AFTER 12 MONTHS

**EENSULATE General Assembly Meeting after 12 months** took place from 4<sup>th</sup> to 5<sup>th</sup> October in Genoa, Italy and was hosted by one of the project partners, Rina Consulting. The consortium shared the overall progress of the project over the past six months and discussed a detailed plan for the next period. Part of the meeting was also an Exploitation Workshop organised by FENIX TNT, which presented a clear vision of the objectives of the project and a well-planned strategy for the protection and exploitation of results.

