HORIZON 2020

A fire-resistant, thermal and acoustic insulating lightweight fabric

Rendicontazione

Informazioni relative al progetto

smartMELAMINE

ID dell'accordo di sovvenzione: 756081

Sito web del progetto

DOI
10.3030/756081

Progetto chiuso

Data della firma CE
5 Aprile 2017

Data di avvio
1 Maggio 2017

Data di completamento
30 Aprile 2019

Finanziato da
INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Nanotechnologies

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€ 2 338 954,00

Contributo UE
€ 1 637 267,80

Coordinato da
MELAMIN KEMICNA TOVARNA D.D. KOCEVJE
Slovenia

Periodic Reporting for period 2 - smartMELAMINE (A fire-resistant, thermal and acoustic insulating lightweight fabric)

Periodo di rendicontazione: 2018-05-01 al 2019-04-30

Sintesi del contesto e degli obiettivi generali del progetto

Non-wovens are an important type of textiles with a variety of uses in everyday products e.g. filters, medical use, geotextiles, diaper stock and insulation. Some of the most commonly used materials are polypropylene and polyethene with fire hazard low-temperature resistance as their main disadvantages. One way to address this issue is by adding fire retardants to the final products, but a more convenient one is by using fire-resistant starting material. Melamine is a chemical with widespread use, like for melamine resins and fire retardant additive. Melamine resins are known for their good fire resistance and from that perspective are a great candidate for a starting material in production of the fire resistant non-woven. There is a great need for a fire-resistant non woven in different areas, like automotive, aircraft, train, construction industry. Another area of melamine non woven possible use is in speciality occupation gear and clothing e.g. firefighters, military. Major advantages of melamine non-woven fibres are high fire resistance, non-dripping flame and low emission of toxic gases/fumes while burning. Use of such type of non woven would greatly improve overall fire safety and enable better performance at high working temperatures, like hot gas filtering. Objectives of this project are scale-up of the pilot meltblown plant to industrial scale and development of the starting MER RESIN suitable for meltblown processing with the production of filaments to (or less than) 1-micron diameter and non woven of different thicknesses. MER RESIN suitable for this type of process must be of appropriate melting point range and of relatively low polymer polydispersity.

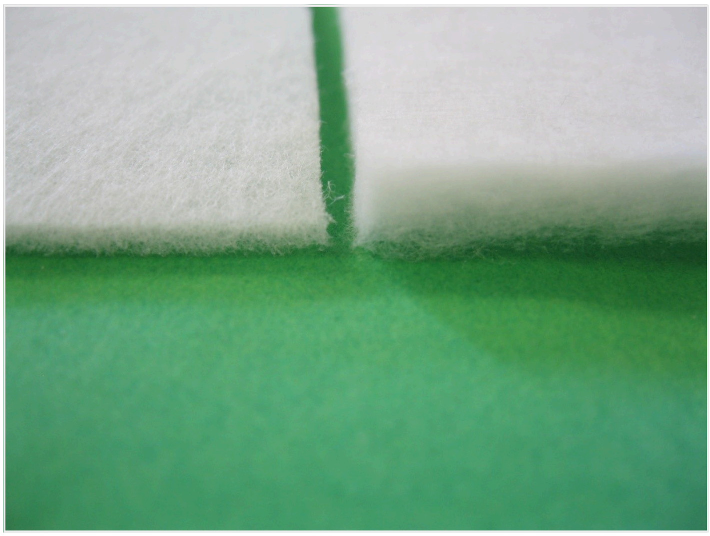
Lavoro eseguito dall'inizio del progetto fino alla fine del periodo coperto dalla relazione e principali risultati finora ottenuti

In this project, a big deal of work was performed. We developed the melamine-based resin to the point that is suitable as a starting material for using it in the meltblown process. A full investigation was done in this respect and we ended up with a duroplastic resin that behaves under certain circumstances as a thermoplast and thus can be converted via improved meltblown process into a melamine-based non-woven. The meltblown process was upscaled from a pilot plant to the industrial scale, which was a big challenge due to the scale-up ratio. The meltblown process itself is also unique and the result is a worldwide unique non-woven material with unique properties and advantages against existing non-woven materials known to the industry so far. All this work was accompanied by active dissemination, publication, promotion and marketing activities. At the end of the project, we achieved a state where we can produce this unique non-woven material in industrial scale and can deliver samples to the potential customers, which we did. Today, we have the ability to offer different types of this high-performance non-woven to the market in industrial scale. With the material, we can adapt to the individual needs of every potential customer depending on their need and expectations. The project smartMELAMINE was fully successful and the project targets were successfully achieved.

Progressi oltre lo stato dell'arte e potenziale impatto previsto (incluso l'impatto socioeconomico e le implicazioni sociali più ampie del progetto fino ad ora)

The whole idea of using a melamine-based resin as a starting point to produce the melamine-based non-woven is completely unique on a global scale. In many ways and aspects, it is first of its kind.

Producing the non-woven with excellent fire resistance properties without using any binder or fire retardant is revolutionary. It will have a great impact on many technical challenges for industrial use, as well as in the everyday life of every human in the future. Besides excellent fire resistance, this new material delivers also superior acoustic and thermal insulation properties. The combination of all three properties is unique for organic material and will greatly improve the ability to achieve targets for end products that are today not reachable. It will enable improved features in transportation industries, in particular aerospace, automotive, trains, buses, ships... Using this type of non-woven in the clothing industry will open new possibilities in heavy duty professional workwear (firefighters, military,...) by greatly improving their safety, comfort and their performance under even extreme circumstances. Another potential impact the material can make in the construction industry by incorporating it into VIP panels, which could substantially improve its properties. The project targets were achieved within the timetable. Socioeconomic impact of this project so far is providing more quality jobs in the local community, which is located in a socially disadvantaged area of the south/east part of Slovenia with a high unemployment rate. Those high-end jobs in the Kočevska region will improve the demographic picture of the area. It may also attract new qualified persons, which consequently will improve the quality of living in Kočevska region with a brighter economic outlook. This project will create new supply chains and will create new small business opportunities in the local environment. In the future, the project will create further job opportunities. Using the unique non-woven will have a positive impact in many technical areas and make our society even more friendly and environmentally sustainable.



smartMELAMINE nonwoven with different thicknesses

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