Development of a high quality stainless steel dowel for easy renovation and construction in façades, thermal insulation and solar panels sub-sectors

Rendicontazione

Informazioni relative al progetto

INNOFIXX

ID dell'accordo di sovvenzione: 773315

Sito web del progetto

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10.3030/773315

Progetto chiuso

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SOCIETAL CHALLENGES - Secure, clean and efficient energy

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HERZSPRUNG-DREHTEILE GMBH
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Periodic Reporting for period 1 - INNOFIXX (Development of a high quality stainless steel dowel for easy renovation and construction in façades, thermal insulation and solar panels sub-sectors)

Periodo di rendicontazione: 2017-05-01 al 2017-08-31

Sintesi del contesto e degli obiettivi generali del progetto

a) What is the problem/issue being addressed?

Deep renovation of buildings could cut 36% of their energy consumption by 2030, while reducing EU energy import dependency, creating growth, innovation and employment, reducing fuel poverty and resulting in more comfortable and healthier buildings . Additionally, the EU has set a target for all new buildings to be nearly zero-energy by 2020 .
Every building needs dowels to be constructed. Current dowels are an obstacle for the renovation of buildings, and addition of new technologies that support energy efficiency directives. The current dowels do not allow retrofit addition of elements onto the external building structure (balconies, natural ventilation facades structures, among others), they also do not guarantee an easy and secure fixation for solar panels on the facades , and cannot renovate or refurbish thermal insulation wall layer without the complete destruction of the wall. Moreover, it is impossible to use one single kind of dowel for multiple tasks: they cannot carry simultaneously lateral, transverse and tensile loads over large distances; for this reason, nowadays constructions need different type of dowels to support all the forces in a structure.

b) Why is it important for society?

As previously mentioned, European building sector are facing difficulties for various reasons:
•The installation of the current dowels requires too many tools and working time, due to its design and structure.
•The raw plugs/dowels do not allow to be used for multiple fixation of the additional elements (balconies) onto the external building structure and existing raw plugs are not able to cover multiple defining areas simultaneously.
•At least three different types of dowels or screws are required to support the lateral and tensile forces (facades).
•To remodel with the standard dowels it is necessary to destroy the entire wall, this will result in more construction costs, energy consumption and waste.
•Building industry is currently experiencing an increasing financial pressure due to escalating prices for raw materials and, particularly, energy.

In response to the technological drawbacks of the construction sector, and contributing to enhancing the competitiveness of the European building industry, our company proposes a new type of dowels for heavy duty loads and facades (See Figure 1), has demonstrated to be fast and easy to assemble, it can carry simultaneously vertical and horizontal loads, it covers a wide range of applications, it supports the European Energy directives in buildings (2010 Energy Performance of Buildings Directive, and the 2012 Energy Efficiency Directive) and, can be recycled and re-used; it avoids the destruction of walls while renovating. Our INNOFIXX dowel system will enable construction companies all over Europe to install facades and other heavy loads much faster (50% time savings),

more cost-effictive(40 % cost savings) and more flexible and sustainable (easy removable). By improving the energy efficiency of buildings, we could reduce total EU energy consumption by 5% to 6% and lower CO2 emissions by about 5% . HERZSPRUNG represents a SME innovation driver in the construction sector and knows that buildings possess a large potential to save energy consumption, and to reduce greenhouse gases, to respond not only to challenges like growing competition and quality demand but also, to aspects like climate change and fossil resource depletion. Once commercialized and implemented, the INNOFIXX dowels will lead to millions € of cost savings increasing productivity and competitiveness of the European building industry. Such as reduce quantity of materials needed, simplify the effort in construction resource- and energy-efficient solutions are welcome in sectors still dominated by SMEs where energy costs are crucial.

Overall, some of the most important ambitions of INNOFIXX includes:
•To provide to the construction sector a tailor-made, h

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

Before Stage 1 of the project was conducted, the underlying production technology had already been verified in several trials, in the relevant environment. The development of the INNOFIXX system is based on the outcomes of a National funded R&D project (ZIM-397514), which aimed at the development of a multifunctional dowel system for facades. The underlying technological concept has already been verified in several trials by the Deutsches Institut für Bautechnik (German Institute for Structural Engineering) and show great potential. First field tests of the prototype had already proven its proper functioning and its great potentials. Results demonstrated reduced time in building constructions, thus, lower wage costs (up to 2€/m2), and total cost savings (up to 20€/m2 for ventilating façades). However, it has been found that final technological improvements as well as a market demonstration and commercialization concept would be necessary for a successful market introduction.

During Stage 1 of the project, the dowels were further developed. All activities necessary for the development of a marketable product and subsequent market introduction were investigated and plans for the implementation of the activities in Stage 2 of the project were made. Moreover, the market potential was recalculated and the financial planning was further specified. A market research was conducted, in order to thoroughly characterise the European building industry and identify the most suitable target countries for the INNOFIXX dowels market introduction. For the commercialization concept, contacts with potential stakeholders and dowels distributors were made and a database was compiled with all the information related to potential customers, end-users and competitors. Additionally, the compliance with legal aspects and safety regulations (e.g. CE & DIN certificates) was assessed.

During the period covered by this report, INNOFIXX´s technical and economic feasibility was confirmed and the results obtained in Stage 1 are promising: There is an enormous market potential for INNOFIXX dowels in Europe and it offers unique advantages compared to competing solutions,

thus, being superior to them. The implementation of the adjustments that have been identified are feasible and the finalization of a marketable product is possible.

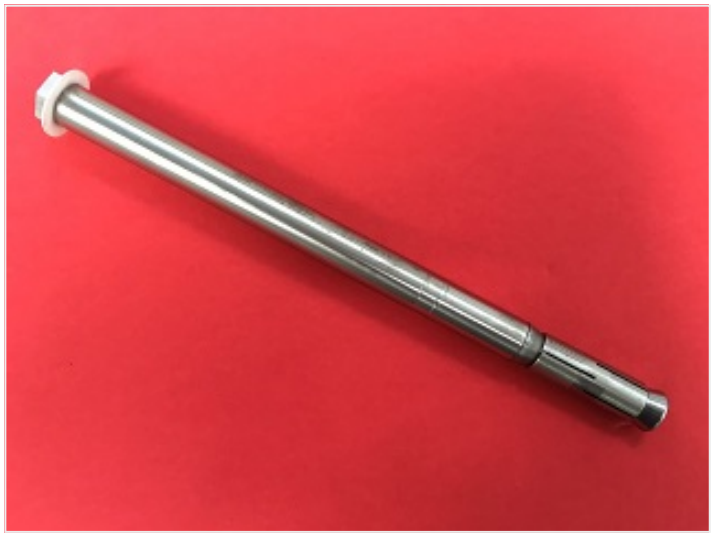
Progressi oltre lo stato dell'arte e potenziale impatto previsto (incluso l'impatto socioeconomico e le implicazioni sociali più ampie del progetto fino ad ora)

Compared to the state of the art, HERZSPRUNG will provide advantages to European building sector, as the successful realization of INNOFIXX will offer a new generation of innovative and eco-efficient dowels to the market. Being cost-effective and time-saving building process, HERZSPRUNG addresses the current financial pressure issues over the rising prices of raw material and energy and provides a useful and everlasting alternative to current materials and systems. The building sector is trying to evolve towards more sustainable and profitable methods to meet the needs of the interested stakeholders.

On the one hand, building sector will strongly benefit from the use of the INNOFIXX dowels. The industry trade association FVHF reported that annually 6-8 million. m^2 ventilating facades are build in Germany alone and all German speaking countries (Germany, Austria, Switzerland). Using the new INNOFIXX dowel would result in actual costs savings between seven and 20€/m2. The faster mounting additionally means lower wage costs of 1 to 2 €/m2. The reduced material and wage costs results in an area/surface price for sub constructions of 15 to 20 €/m2.

In addition, the market introduction of the INNOFIXX dowels will bring important societal and environmental benefits, as the energy efficiency of buildings will reduce energy consumption by 5% to 6% and lower CO2 emissions by about 5%. Likewise, recycling and re-using is possible and less CO2 emissions are obtained, this will result in less construction costs, energy consumption and waste.

So far, the project has played an important role in the construction industry, as it has shed light on the poor technique and difficult installation of the existing dowels. The development of INNOFIXX has sharpened the importance of reducing the amount of materials needed and simplifying the effort during construction, addressing such important issues as energy consumption and resource use.
The knowledge presented here and the facts gathered show clearly the shortcomings of the currently used pins and highlight the necessary advantages, offering the construction sector the key solution to meet their needs.
The here presented knowledge and collected facts clearly show the currently used dowels' deficiencies and highlights the needed advantages, offering the construction sector the key solution to meet their needs.



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