HIFIVEN

HIGH DURABILITY AND FIRE PERFORMANCE WOOD PLASTIC COMPOSITES (WPC) FOR VENTILATED FACADES

PAVING THE WAY FOR SUSTAINABLE CONSTRUCTION

UXAMA FACHADAS SINGULARES

Prolabin&Tefarm Polymer Additives, Cosmetic Ingredients, Catalysts

pesl

bave Badische Faser-Veredelung GmbH

beologic

tecnalia Inspiring Business

STUDIUM GENERALE CIVITATIS PERUSII A.D. MCCCVIII

Fraunhofer WKI

HIFIVENT CONCEPT

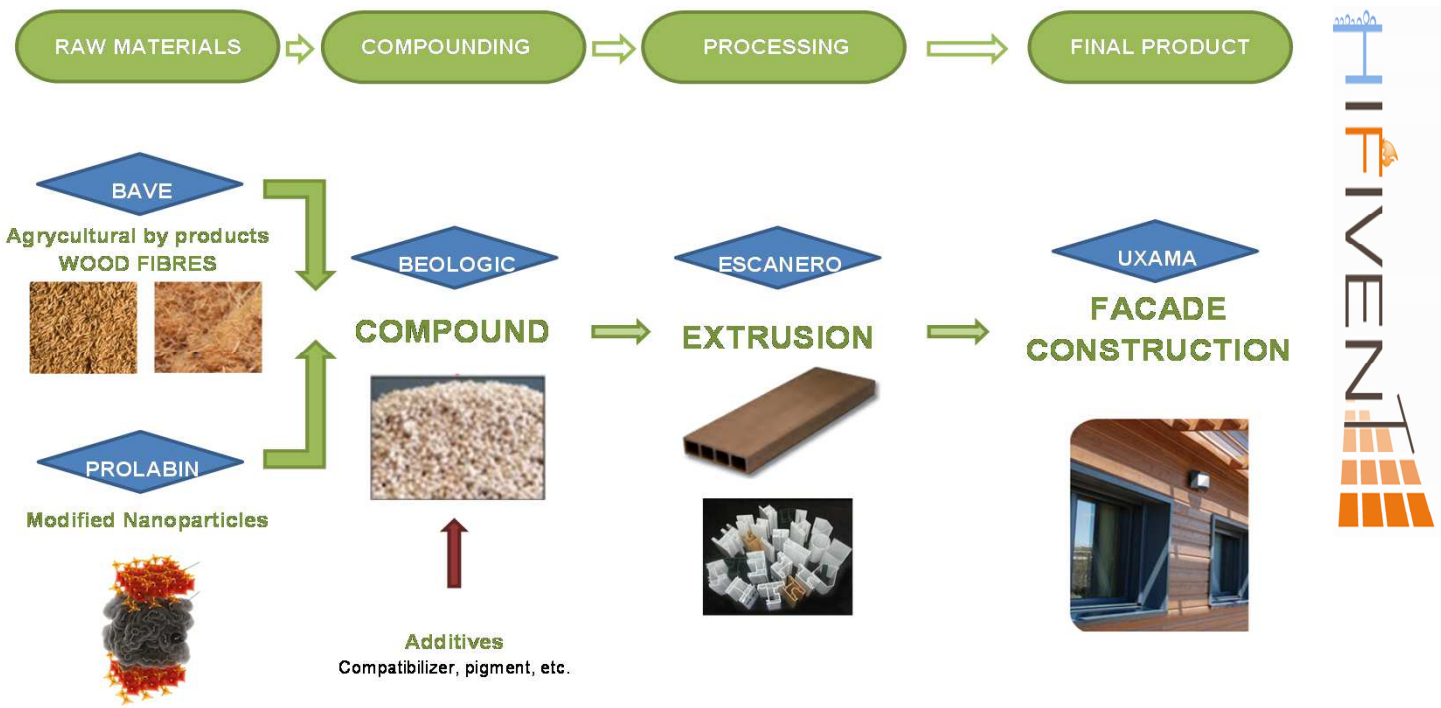
Retrofitting is currently one of the major activities within the construction sector in Europe. The majority of actions are related to either recovering aged facades or solving insulation deficiencies. In these cases, **ventilated facades** are considered one of the most efficient systems.

Wood is a sustainable material that can be used for ventilated facades, but it lacks the necessary durability for outdoor exposition and intensive maintenance is required. This drawback can be addressed by new technological materials which combine durable polymers with high contents of wood (Wood Polymer Composites/WPCs). WPCs offer better thermal and acoustic isolation than aluminium, and better durability than wood, however other problems arise that have to be addressed like for example their poor fire performance.

HIFIVENT project develops a new family of **WPC** compounds, especially suitable for ventilated facades by facing the challenges of their fire performance and durability issues.

Weathering resistance		Mechanical resistance	Fire performance
FIBRE TREATMENT	WPC ADITIVATION	LONG NATURAL FIBRE/ NANOPARTICLES	NANOPARTICLES BASED FLAME RETARDANT

HIFIVENT project has joint experienced european companies in the field of natural fibres, flame retardant nanoparticles, WPC compounding, WPC construction products as well as ventilated facades specialist **(respectively BAVE, PROLABIN & TEFARM, BEOLOGIC, PLASTICOS ESCANERO and UXAMA)**. Additionally, those companies will be assisted by three relevant Research Institutions: **Fraunhofer-WKI, Università degli Studi di Perugia and TECNALIA Research & Innovation** (Project coordinator).



OBJECTIVES

Scientific

Use of nanotechnology to improve mechanical and fire properties of composites.

.- **Flexural stiffness and strength: at least 10% higher than current commercial WPCs**.

.- Reducing the amount of traditional fire retardant (never halogenated) **in at least a 50%.**

.- Fire performance of ventilated façade in a reaction to fire test, **Euroclass B-s3,d0**

Improve mechanical performance of WPC by using long fibres for structural parts: **30% increase in stiffness and strength** compared to traditional WPCs**.**

Wood fibre modification to improve weatherability: **Good surface aspect after 2000 hours in accelerated weathering conditions** (UV light+water spray) and **30% lower water absorbance and dimensional change** than for traditional WPCs.

Industrial

HIFIVENT aim to develop a ventilated facade system **easy for assembly** (reduction of 30-50% in weight with respect to ceramic and stone) that fulfil the following properties:

- Watertightness of joints (EN 12865:2002)= 2.000A
- Wind load resistance (ETAG 034)= 3000 Pa (Pressure) – 2.500 (Suction)
- Airborne noise transmission (EN ISO 140-3:1995) = 40 dB
- Thermal Behavior (EN ISO 10077-2:2008)= 2 W/m2·K
- Reaction to fire (EN 13501-1)= B-s3,d0

Social/Environmental

This project contributes to the development of **sustainable production patterns** in the field of construction. It increases the use of non hazardous materials and uses leading edge technologies developing more effective and lower embodied energy materials.

HIFIVENT promote better indoor quality due to the application of the ventilated façade system and **Improvement on citizen's safety** by reducing the risks caused by the fire in buildings .

Development of **eco-friendly and fully recyclable system (facing and structure) :** Reduction of fossil fuel resources through the usage of biomass based fibers. **Maximum of 40% of polymer (recycled origin) and natural fibre content equal or higher than 40%.**

PROJECT DETAILS

HIFIVENT has received funding from the **European Union's Seventh Framework Programme** for research, technological development and demonstration under grant agreement nº 605891

Duration

October 2013 to March 2016

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