

AMULET: Self-healing mortar for external thermal insulation composite facade system

Summary

Profile type	Company's country	POD reference
Research & Development Request	Slovenia	RDRSI20220606020
Profile status	Type of partnership	Targeted countries
PUBLISHED	Research and development cooperation agreement	• World
Contact Person	Term of validity	Last update
Tomaz Lutman	6/6/2022 6/6/2024	06/06/2022

General Information

Short summary

Slovenian producer of building materials is looking for solution to the following challenge. If facade final coats are cracked rain water penetrates inside the facade system, which reduces thermal insulation properties of the external thermal insulation composite facade system and can damage also the buildings load-bearing structure. The developments of new materials, like self- healing materials, are highly needed to prolong facade service life.

Full description

Slovenian company is successful international corporation with tradition in the production of paints, coatings, mortars and insulation materials, which comprises twelve subsidiaries and operates in more than thirty markets.

External thermal insulation composite facade system (ETICS) is assembled from different materials and each has its own specific function. Basic function of Base coat is to bear stresses due to thermal expansions and possible impacts (e.g. hail, ball...). Usually base coat is made by cementitious mortars in thickness 3 to 5 mm and reinforced with glassfibre mesh. Quite common cracking of base coat occurs (up to 0.5 mm) together with decorative top coat before end of life, which is usually considered to be 25 years.

Concrete self-healing solutions are already on the market, but self-healing solutions for cement-based mortars are still not well defined. From literature the known self-healing solutions are: superabsorbent polymers (SAPs), shape memory polymers (SMP), bacteria- based self-healing, encapsulated healing agents (macro and microcapsules), engineered fibres, which provide crack closures for crack widths greater than 0.15 mm; while shape memory composites (SCMs) seal smaller cracks widths (< 0.15 mm).

Scope of the project would be to develop self-healing mortar for base coat that in the case when cracking occurs cracks up to 0.2 to 0.3 mm would self-filled and prevent water to penetrate deeper into the facade system. The company prefers the solutions with microencapsulated agent, which is present in mortar and it is released when crack occurs. Solution with SCMs and expansive minerals as fly ash, silica fume, BFS, CSA, bentonite clay or any other material which make a strong bond between the crack faces... It would be desired using waste material from local productions, that the company can contribute to circular economy and also, the company would like to contribute to reducing pollution. The company is seeking self-healing solution for achieving crack-free mortars in normal conditions (without further heating or compressing). The know how should include the knowledge about the effect of self-healing additive on the properties of cement mortar especially durability improvements. Challenge-giver would provide basic formulation of the mortar.

Objectives:

- To develop formulation of mortar with self-healing properties.
- To quantify properties of developed mortar (chemical, mechanical, applicable, healing).

IMPORTANT: This technical cooperation request refers to an innovation challenge published within the AMULET project (financed within the Horizon 2020 INNOSUP-01-2018-2020 call). If an organization (eligible are SMEs only) expresses interest before the closing date, it will be guided towards the AMULET project website (<https://amulet-h2020.eu/>), where all additional information and guidelines for submission are published. With the support of AMULET matchmaking activities or on their own, interested SMEs have to form micro-consortia of 2 or 3 SMEs, to prepare the solution to the specific innovation challenge and submit it through the AMULET application form.

Advantages and innovations

New self-healing formulation of a base coat for ETICS to enable sealing of cracks and prevent penetration of water into the insulation layer.

Stage of development

Concept stage

Sustainable Development goals

• **Goal 9: Industry, Innovation and Infrastructure**

IPR Status

No IPR applied

Partner Sought

Expected role of the partner

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Type of partnership

Type and size of the partner

Research and development cooperation
agreement

- SME 50 - 249
- SME <=10
- SME 11-49

Dissemination

Technology keywords

- **02007003 - Ceramic Materials and Powders**
- **02007002 - Building materials**
- **02007005 - Composite materials**

Targeted countries

- **World**

Market keywords

- **08001015 - Other speciality materials**
- **08001007 - Coatings and adhesives manufactures**
- **08001013 - Ceramics**

Sector groups involved

- **Materials**