

Project name: „Development and application of thermoplastic textile reinforcement for prefabricated TRC building elements “
– TRCeI–

Partner: University of Transport and Communications (UTC)
Johne & Groß GmbH
FRP Vietnam., JSC

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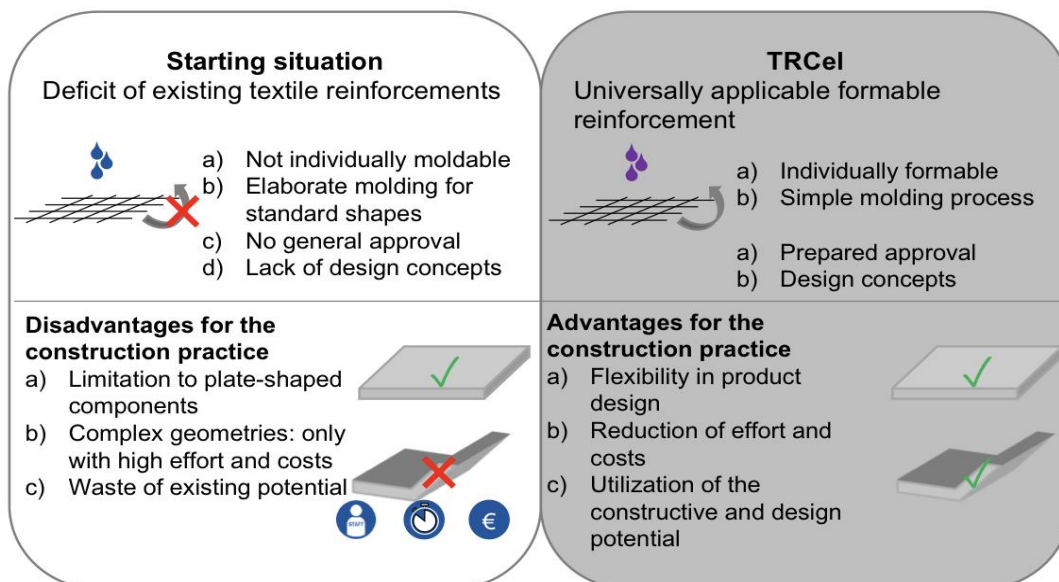
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Mission Statement

Over the past 25 years, fiber-reinforced composites have become increasingly important in the construction industry. Their main manifestation is in the form of textile-reinforced concrete. Compared with reinforced concrete, which has been used successfully for around 100 years, textile-reinforced concrete allows a significant reduction in the wall thickness and weight of the components, since the corrosion-sensitive steel reinforcement is replaced by corrosion-resistant textile reinforcement made of carbon fibers or alkali-resistant AR glass fibers. The weight of textile-reinforced concrete elements compared to the same elements made of reinforced concrete is reduced by up to 45 %, the use of resources by up to 80 %. At present, textile-reinforced concrete is mainly used in plate-shaped structural elements such as facade elements and bridges. However, a large number of components in conventional concrete construction are individual pieces or small series that are subject to high requirements in terms of strength and geometric freedom. Geometrically complex components, however, cannot be realized with the textile materials and processes currently available, so that fields of application such as interiors, trade show construction, stairs, street furniture and architecturally unusual structures cannot be developed economically.



Solution

In this research project, a universally applicable, formable textile reinforcement for the realization of individually formed concrete components and a corresponding forming tool will be developed. The tool will be based on well-known principles from classical reinforced concrete construction. First concepts for (partial) automation and quality assurance will be developed. At the same time, necessary tests for material characterization as well as developments for production concepts will be carried out in preparation for approval of the reinforcement. Special focus will be put on the design and the high-temperature behavior. The project will conclude with the implementation of a demonstrator.

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