

Recycled fibres in textile-reinforced concrete combined with building component activation

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The construction industry is the most resource-intensive sector. Concrete is, with an annually demand of 4.4 billion tonnes, the most widely used material in the world. An increase in demand of a further 25% is already forecast for the year 2050. The main components of concrete are resources limited materials.

By using textile-reinforced concrete, resources can be saved in concrete production compared to steel-reinforced concrete. Compared to steel reinforcements, the textiles do not corrode and therefore do not have to be protected from external environmental influences with a minimum concrete cover. Thus, a low concrete cover is sufficient, which can save up to 80 % concrete. Currently, particularly alkali resistant glass and carbon fibre textiles are suitable for the use as textile reinforcement.

Since the production of the new carbon fibres requires a high energy input, it is desirable to use these already existing fibre materials for as long as possible. Studies show that recycled carbon fibres from carbon fibre reinforced plastic waste still have 80% of the original mechanical properties. The construction industry is a possible field of application for the fibre reuse. Furthermore, it is also possible to use the conductivity of carbon fibres for simultaneous use as reinforcing material. The conductivity can be used as a sensor or, due to the thermal conductivity, as a heating element. A possible field of application for this could be, the thermal activation of building components.