

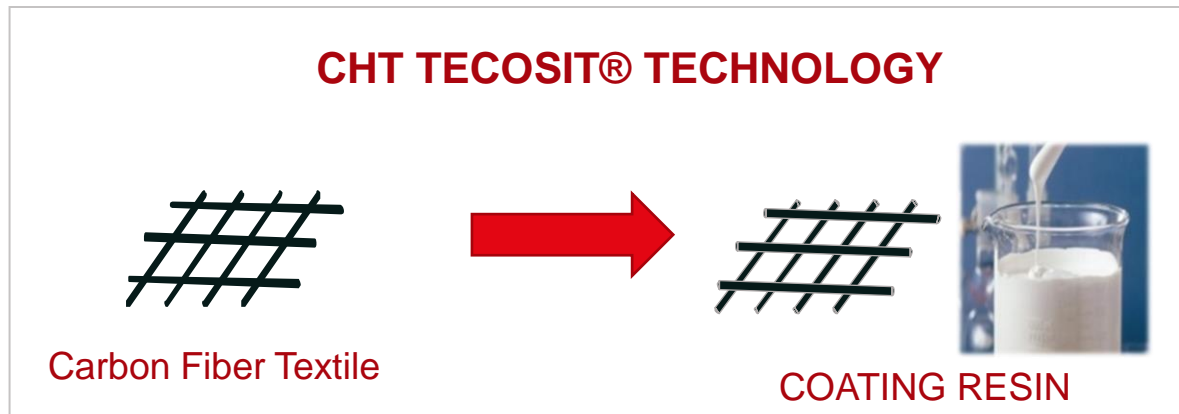
TEXTILE REINFORCED CONCRETE (TRC)

► Innovative Building Material: non metallic carbon fiber reinforcement

- ▷ C-Fiber: 1/4 weight, 5 times strength: 15 €/kg ⇔ 1 €/kg steel => competitive!
- ▷ C-Fiber: durable (non corrosive) => no concrete cover for corrosion protection!
- ▷ Economization of materials & resources
 - ▶ 40% less concrete necessary => less energy, cement, sand and waste



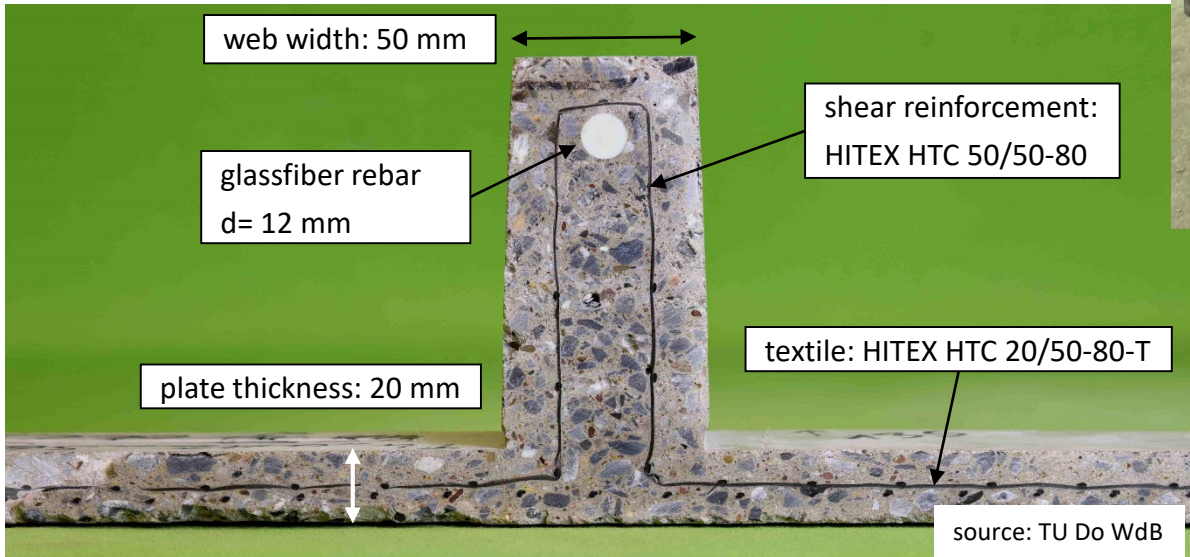
		steel	carbon fiber
density	[g/cm ³]	7,9	1,8
tensile strength	[MPa]	310 - 690	3.500 – 4.500
corrosion resistance		-	+++
GWP	[CO ₂ -eq/kg]	0,74 – 1,72	22,4 – 38,9
price	[€/kg]	1	15



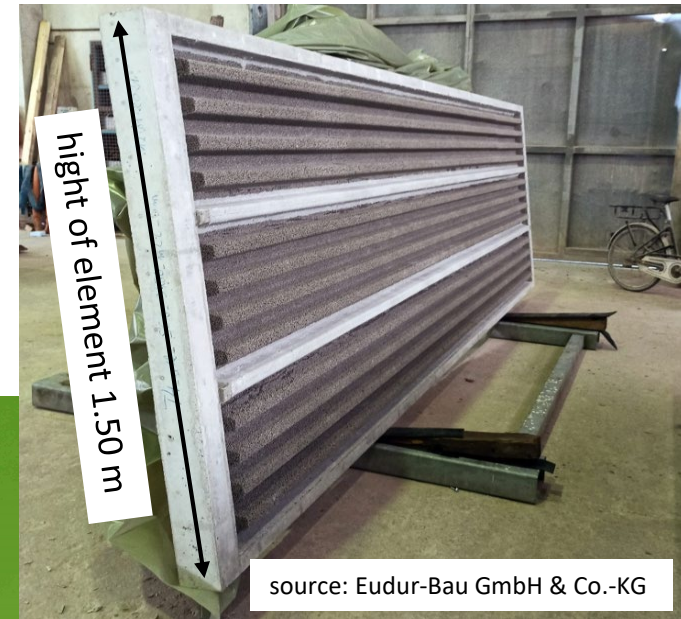
Challenge: Interface between textile reinforcement and concrete matrix

Project: Development of a resources saving noise barrier wall out of TRC

- Use of non-metallic reinforcement
- Reduction of the concrete volume by developing a weight and load bearing optimized structure
- Optimization of the materials concerning price and load bearing behavior



weight and load bearing optimized T cross section



Noise barrier wall out of TRC (textile reinforced concrete) in the precast factory

Projektpartner:



www.eudur.de - 33442 Herzebrock-Clarholz



Department of concrete structures
Department of building materials



Supported by:



on the basis of a decision by the German Bundestag

Project: Development of a resources saving noise barrier wall out of TRC

Results:

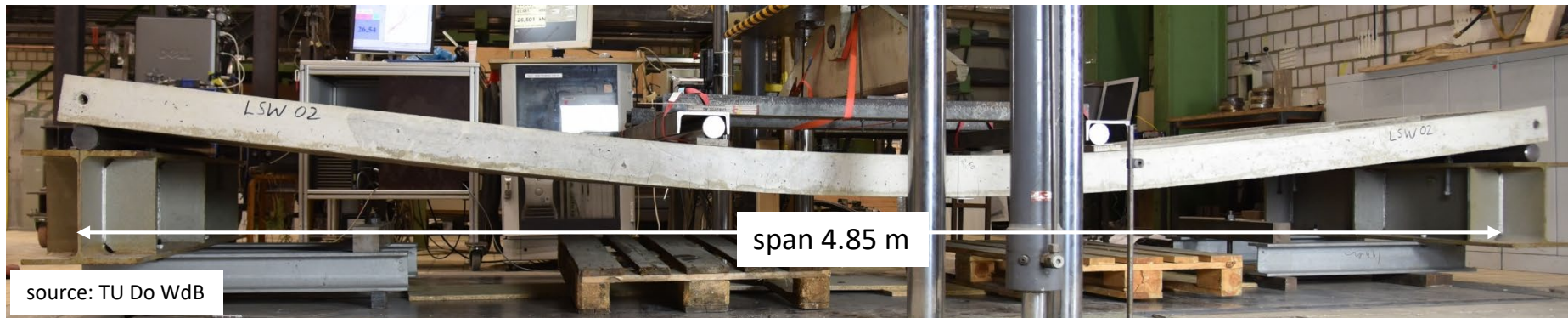
- Reduction of the concrete volume to 34 % in comparison to a steel reinforced element
- Reduction of the CO₂ emissions to 58 % regarding the production of cement
- Paper:

Orlowsky, J.; Maurer, R.; Heeke, G.; Beßling, M.; Bettin, M.
Ressourcenschonende Lärmschutzelemente aus Textilbeton als Alternative für konventionelle Stahlbetonfertigteile.
Beton- und Stahlbetonbau 2021, doi:10.1002/best.202100061.



Source : Eudur-Bau GmbH & Co.-KG

View into the element before concreting the load bearing structure



source: TU Do WdB

Large-scale component test in the experimental hall of TU Dortmund University

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