

NDE Webinar - Rethink how we build

Carbon reinforced concrete

80% material efficiency and 50% less emissions - a gamechanger for the built environment?

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initiiert von



GEFÖRDERT VOM



unterstützt von



Quelle: TU Dresden

Motivation



Urbanisation



Steel-Corrosion



Resource Consumption



CO₂-Pollution

Quelle: fotolia.de, verticalgalva.info

Solution



Slim-Construction



Non-Corrosiv



Resource-Efficient

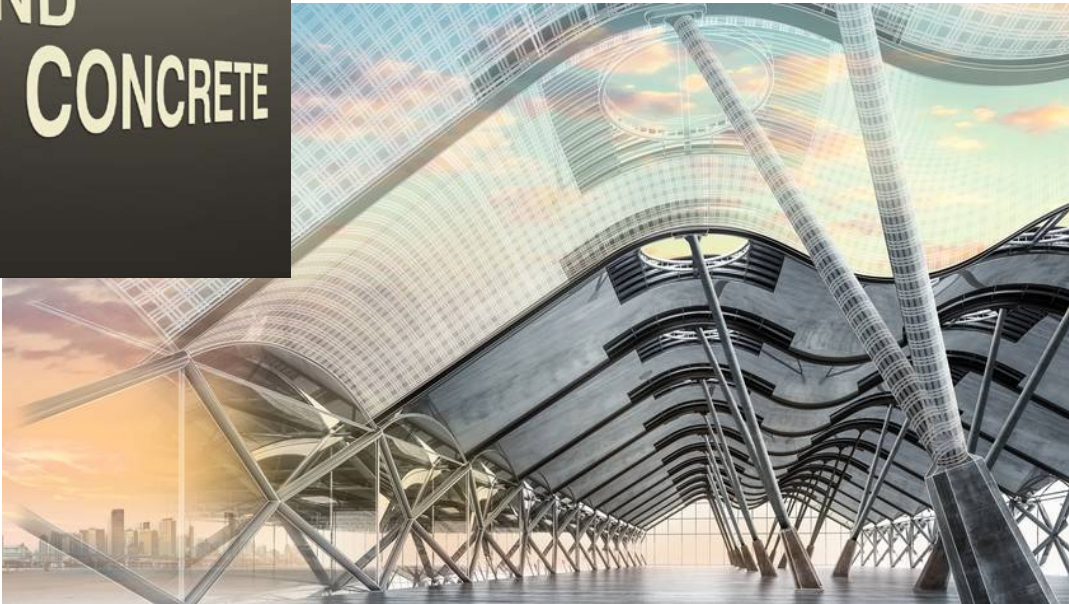


CO₂-Reduction

Quelle: Solidian, TU Dresden, Betonwerk Oschatz, Filmaton



MEGATREND
CARBON CONCRETE



Quelle: Solidian

Approvals



Quelle: DIBt

Carbon reinforced concrete – Material

Carbon reinforced concrete – Carbon fiber production



PAN-Precursor

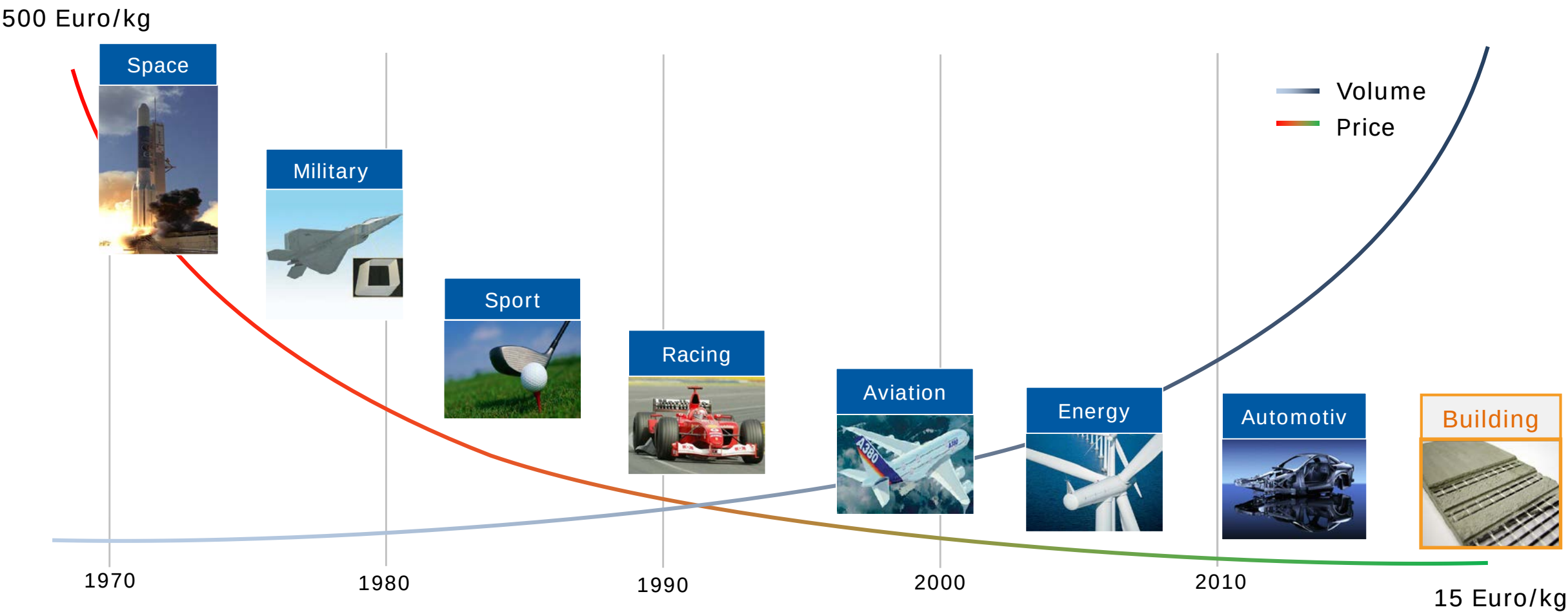


Carbon Fiber



Quelle: HTWK Leipzig, Filmaton

Carbon fiber – Volume and price development



Quelle: Jäger, SGL Group

Carbon fiber – Material Advantage (Density/Tensile strength)

Non-corrosive

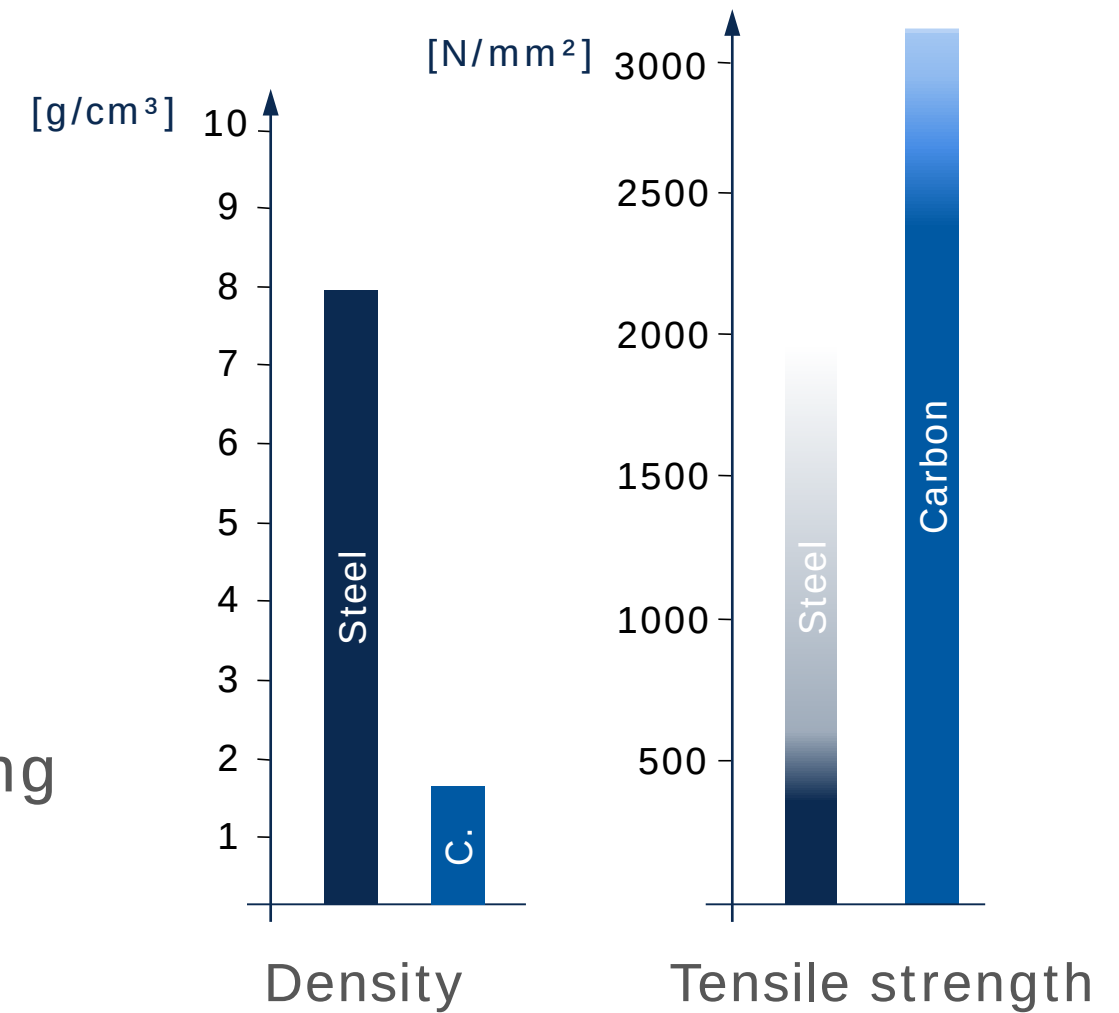
Chemically inert

Freely formable

No minimum concrete cover required

Slender components with the same performance

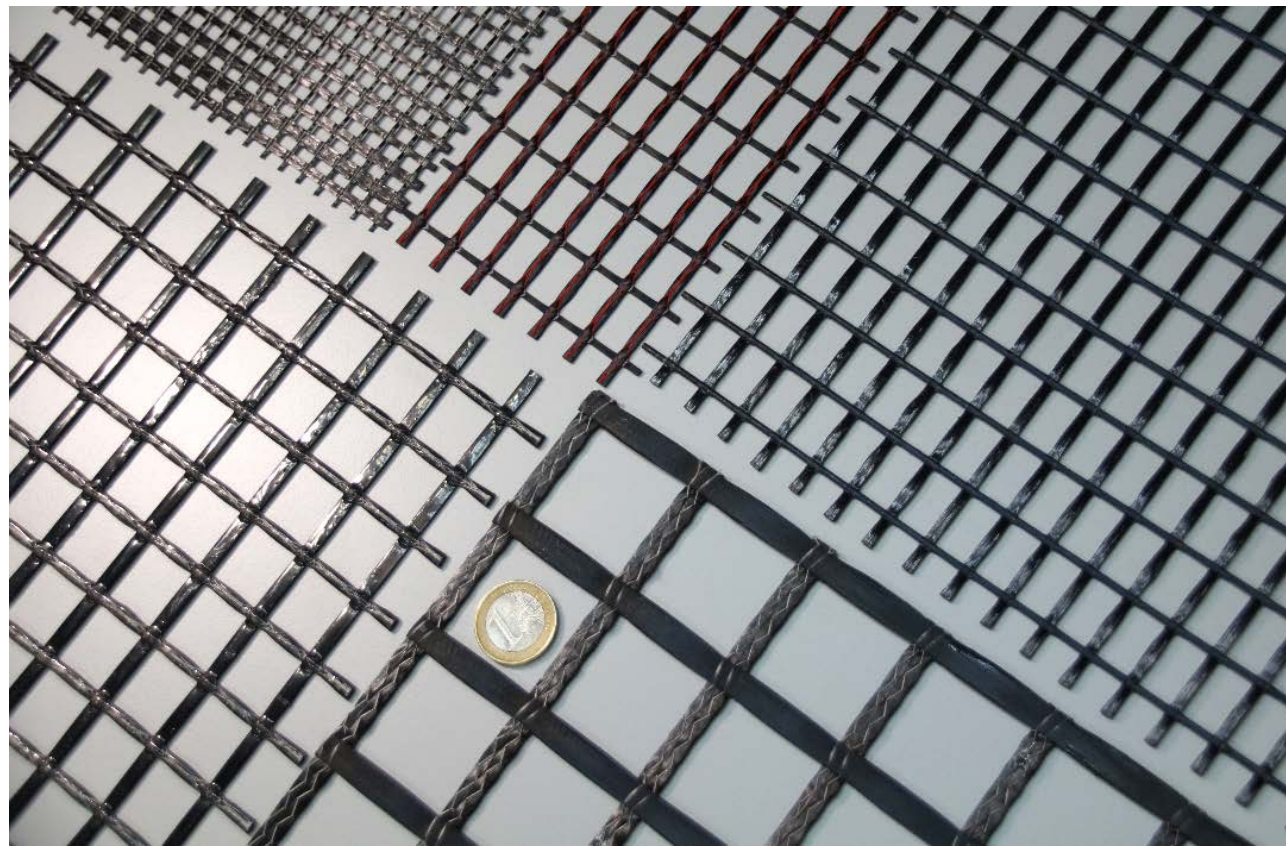
Economical advantage in transport and assembling



Quelle: TU Dresden

Carbon reinforced concrete – Reinforcements

Grid



Rebar

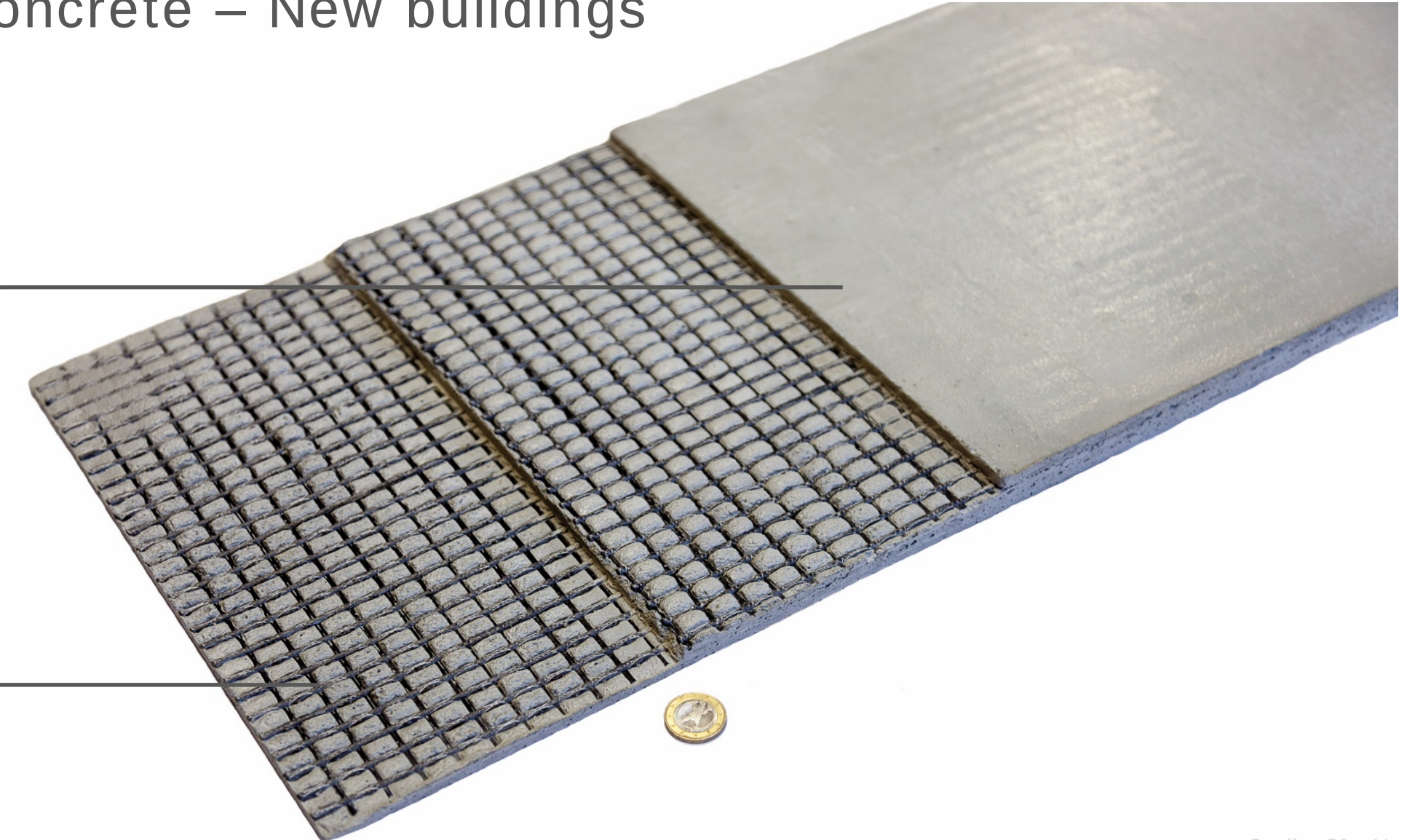


Quelle: C³ e.V.

Carbon reinforced concrete – New buildings

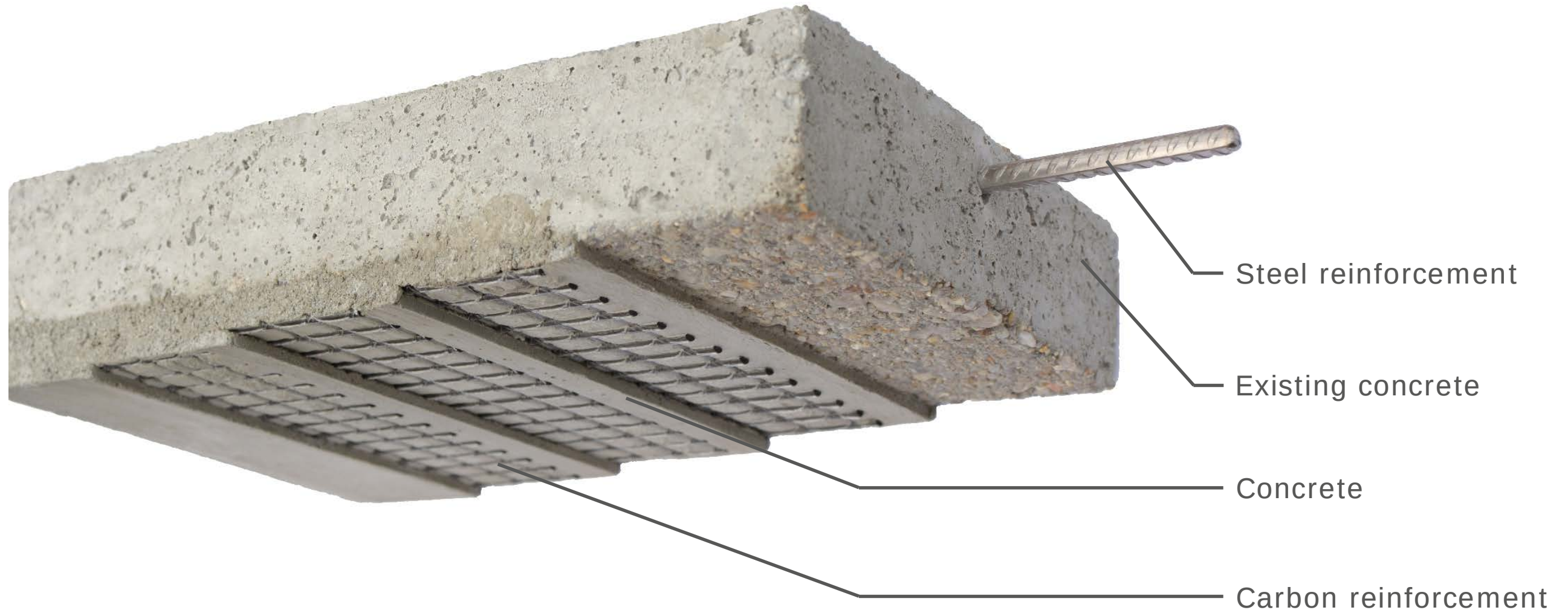
Concrete

Carbon Reinforcement



Quelle: C³ e.V.

Carbon reinforced concrete – Existing buildings (Strengthening)



Quelle: C³ e.V.

Carbon reinforced concrete – Existing buildings (Strengthening)

Economic advantages

Long service life

Lower costs

Short construction time

Easy handling

Steel reinforced



Steel reinforcement
Diameter 10 mm / 7,5 cm
(10,61 cm²/m)

h = 8,5 cm

Carbon reinforced



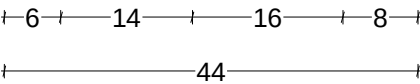
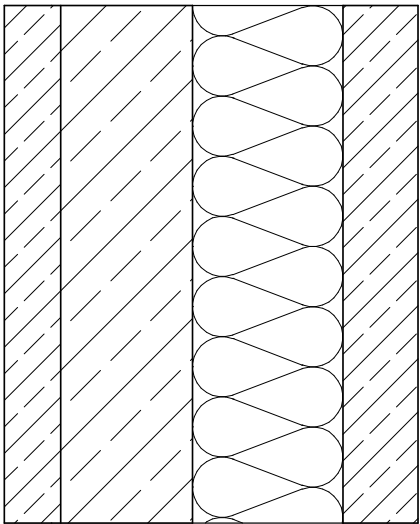
2 Layers Carbon Textile
(equivalent to Steel
12,9 cm²/m)

h = 1,2 cm

CUBE

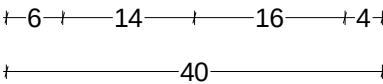
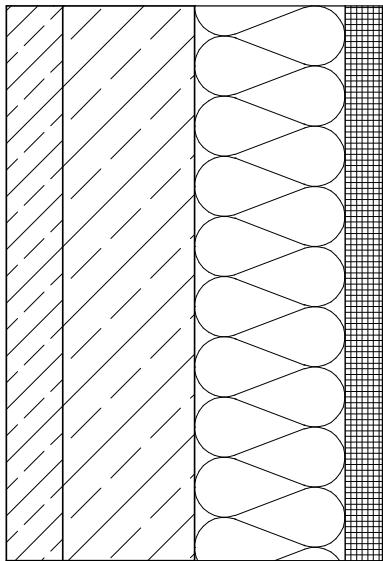
Wall development – Reduction of construction space

Conventional Precast Wall
Steel reinf. Concrete



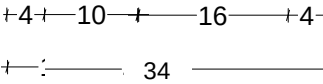
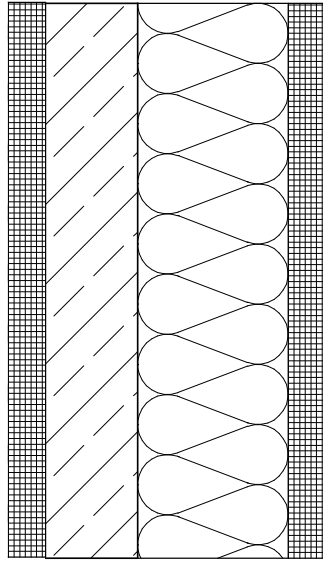
Hybrid precast Wall
Carbon and Steel reinf. Concrete

10%
space gain



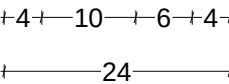
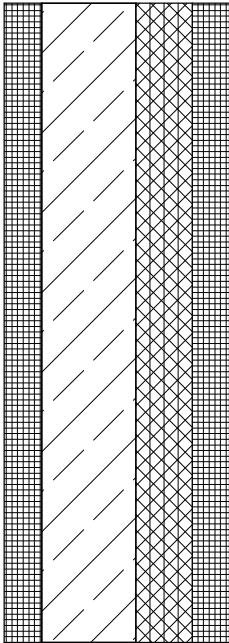
Precast Wall
Carbon reinf. Concrete

22,5%
space gain



CUBE Dresden
Carbon reinf. Concrete

45%
space gain



CUBE – TWIST Elements

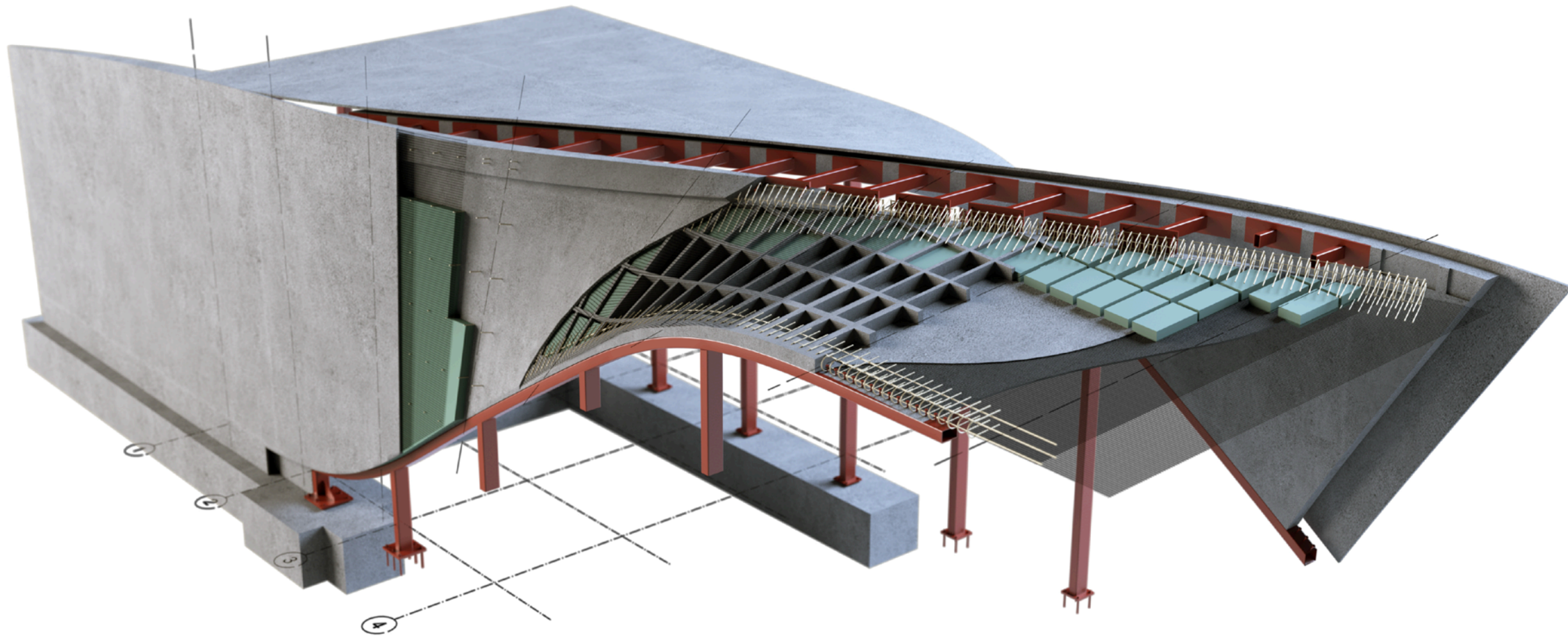


Foto: Aufbau des TWIST Dach - Iurii Vakaliuk (TU Dresden)

