

PRESS RELEASE

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Carbon reinforced concrete building "CUBE": first construction phase successfully completed

On 11.05.2021, the partial acceptance of the first construction phase "shell construction BOX" took place on the construction site of the carbon reinforced concrete building CUBE at the corner of Zellescher Weg and EinsteinstäÙe in Dresden, Germany. The C³ partner Bendl HTS was responsible for this as a member of the Hentschke Bau and Bendl HTS consortium.

The BOX – the rectangular component – illustrates the economic efficiency of the carbon reinforced concrete construction method, because, for example, the walls were produced in a precast concrete plant, in this case in Betonwerk Oschatz GmbH, using conventional semi-automatic processes for semi-finished parts. It consists of a double wall system with 4 cm thin carbon reinforced concrete shells. The concrete is an anthracite-coloured mixture, a so-called fair-faced concrete. The wall thickness of the slender construction was further reduced by the high-performance Slentite insulation from CUBE partner company BASF. The in-situ concrete core was also reduced to a minimum to achieve a wall thickness of 27 cm. Both concrete wall shells are connected with a glass fibre reinforcement bar from C³ partner Schöck Isolink. Prefabricated elements with integrated cavities with a total thickness of $d = 25$ cm were developed and used for the ceiling construction.

"With the BOX, we save up to 50 % of the conventional amount of concrete. In addition, it is a very lightweight construction, which enables us to build in a resource-efficient way." – says the builder and director of the Institute for Concrete Structures, Professor Manfred Curbach. By using carbon reinforced concrete, it is not only possible to save an enormous amount of material, but also to reduce CO₂ emissions and conserve valuable resources that are becoming increasingly scarce, such as sand.

The so-called CUBE is planned as a two-storey building and is intended to present the practical application of the composite material carbon reinforced concrete as an economical construction system. The building is subject to all the necessary building code requirements; due to the lack of standardisation, these were met by approvals in individual cases. "With this, we are paving the way for future building projects in the field

of carbon reinforced concrete construction" – says architect Marén Kupke from AIB GmbH – Architekten Ingenieure Bautzen, who is responsible for the general planning.

At the beginning of June, the next exciting construction phase will begin - the production of the curved roof-wall construction, which bears the name TWIST. This is a multi-layered shell construction that takes on the function of both the supporting shell and the weather shell. First, a formwork is made of wood and in the next step, it is concreted on site using a spraying process. Due to the complexity and the size of the TWIST elements of 40 metres, this process will extend until October 2021.

The CUBE construction project bundles the individual research results from the Federal Ministry of Education and Research's construction research project C³ – Carbon Concrete Composite and pursues the goal of designing and manufacturing components that are suitable for practical use.

Photos and videos can be used free of charge in connection with the topic CUBE if the source © **Stefan Gröschel, IMB, TU Dresden** is mentioned:

High resolution images: <https://cloud.bauen-neu-denken.de/s/xmHHkBQzsY3Xef6>



1: Builder Manfred Curbach and architect Marén Kupke in front of the BOX made of carbon concrete © Stefan Gröschel, IMB, TU Dresden



2: Michael Molitor is responsible for quality management. © Stefan Gröschel, IMB, TU Dresden



3: Last check before the successful partial acceptance of the BOX: Michael Molitor and Manfred Curbach (from left to right). © Stefan Gröschel, IMB, TU Dresden



4: The BOX is now in place, preparations for the next construction phase start at the end of May © Stefan Gröschel, IMB, TU Dresden

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