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## Charting new territory

**Interactive rooms and versatile exteriors – a new specialist field of research is emerging dedicated to the eco-friendly construction of tomorrow.**

The new Collaborative Research Centre (SFB 1244) at Stuttgart University is exploring ways to create sustainable and eco-friendly construction for the future. “Entirely new types of buildings are being created – our research is entering completely uncharted territory in many areas”, said the renowned architect and engineer Werner Sobek, founder and now also the voice of the Collaborative Research Centre. The aim is to significantly reduce the amount of resources used in the construction industry step by step within just a few years on the basis of the research completed.

Building more with fewer resources: as Director of the Institute for Lightweight Structures and Conceptual Design (ILEK) of Stuttgart University and head of the Werner Sobek global business, the name Sobek stands for eco-friendly construction. Sobek coined the “Triple

Zero" concept, an ingenious description of the characteristics that buildings must have to be sustainable. As the voice and founder of the Collaborative Research Centre at Stuttgart University, he predicts a significant reduction in resource consumption in the construction industry over the next few years, particularly in the construction of high-rise buildings and bridges. The research is focussed on adaptive systems that "interact" in a targeted way with building residents and the environment.

### **The dynamic building of tomorrow: able to adapt to residents and their needs**

"The building environment of tomorrow will be very different from today's static and passive constructions, featuring interactive rooms and adaptive structures." This is one of Werner Sobek's key messages. An important step towards eco-friendly construction was the founding of Stuttgart University's Collaborative Research Centre, supported by six faculties and fifteen institutes. The interdisciplinary research is planned to last for 12 years and according to Sobek is entering "completely uncharted territory" in many areas.

An important example of eco-friendly yet more efficient construction is the "Stuttgart SmartShell", developed by Stuttgart's ILEK in 2012 and absolutely groundbreaking for the new research project. This was the world's first large-scale adaptive shell structure: an ultra-thin wooden shell measuring only 4mm in thickness yet spanning a surface of 100 square metres. The adaptable supporting structure can react in milliseconds to changes in load thanks to a special control system, resulting in the effective prevention of material fatigue and producing a considerable increase in the performance of supporting structures in high-rise buildings, wide-span façades, bridges or stadium roofs in particular.

### **Creating new residential buildings – the experimental B10 Active House**

The future will see stronger connections between people and their homes and workplaces. This will influence the building environment around us - the aim will be to increase user comfort and functionality throughout. The B10 Active House designed by Werner Sobek was built in Stuttgart Killesberg on the Weissenhof Settlement housing estate in 2014, attracting considerable international interest as the first of its kind. Even now, the completely future-oriented house still serves as an innovation lab, giving visitors impulses for energy self-sufficient, sustainable future living combined with the use of electric vehicles.

**Building more with less**

"B10 is a prototype designed to show how the Active House principle can be applied to high-density residential city buildings", explains the architect. "Faced with a continual increase in world population and an expected scarcity of resources, we urgently need new methods that will allow us to build more with less – and help us to fully return materials used in construction back to their natural or technical material cycles. This is the guiding principle behind the work of the Collaborative Research Centre.

A "demonstrator" is currently under development in the grounds of the institute – a 10-storey building being erected to facilitate the detailed analysis of practical applications for adaptive façades and supporting structures.

A one-day symposium entitled "Sustainability and Mobility in the Built Environment" was held on July 13th 2017 in the thyssenkrupp AG test tower in Rottweil – the Collaborative Research Centre (SFB 1244) played a key role in the event, which was jointly hosted by ILEK and Werner Sobek.

The Institute for Lightweight Structures and Conceptual Design (ILEK) hosts a series of lectures each semester related to Adaptivity.

Stuttgart, August 2017

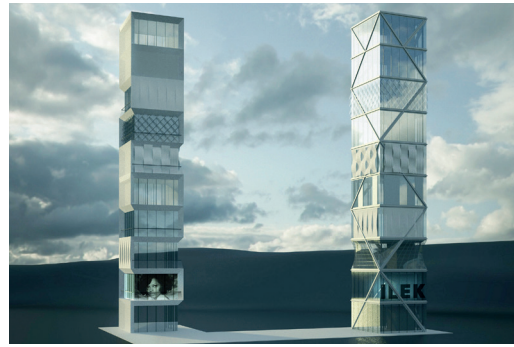
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**About Werner Sobek**

Werner Sobek set up the company in his name in 1992. The firm stands for engineering, architecture, design and sustainability throughout the world, with approximately 280 employees located in Stuttgart, Dubai, Frankfurt, London, Moscow, New York and Istanbul. Each and every project penned by Werner Sobek is a winning combination of superior design and premium engineering, incorporating ingenious concepts to minimize use of energy and material resources. In 2015 the engineer and architect Professor Werner Sobek was awarded the Fritz Leonhardt Prize for lifetime achievements.



The Active House concept developed by Werner Sobek is an example of how adaptivity can be integrated in the built-up environment – it is even conceivable to utilize vacant plots of land in highly-populated built-up areas to build multi-storey modular design constructions, with the aim of reducing the amount of resources used in construction. Image: Werner Sobek



A 10-storey building is being erected in the grounds of Stuttgart University's ILEK to facilitate the detailed analysis of practical applications for adaptive façades and supporting structures.  
Image: Institute for Lightweight Structures and Conceptual Design, Stuttgart University



Prof. Dr. Dr. E.h. Dr. h.c. Werner Sobek. The renowned architect and engineer Werner Sobek has recently been nominated spokesman of the Collaborative Research Centre of which he is a founder.  
Image: Tillmann Franzen, Düsseldorf