

# A house goes on a journey into the world

**The housing deficit is a global challenge that affects not only developing countries but also industrialised countries. Valuable industry knowledge and experience allowed B.T. innovation GmbH to recognise early on the need of the construction industry for a time and cost-efficient concept that also combines sustainable and ecological aspects.**

As a result of years of research and development, BT innovation introduced an innovative living space concept a few years ago that enables the construction of high-quality, safe living space in a very short time. The aim of the development work was to create quickly erected, solid concrete houses with thin walls - the butterfly house. These key factors not only make the house affordable for a large number of people, but at the same time meet the quality requirements. It is named after the highly efficient production technology used to manufacture the precast concrete elements, the Butterfly Formwork®.

The butterfly house concept first attracted public attention when a regional television team from MDR documented the quick assembly of the house in just two hours. This sparked interest in the butterfly house concept, particularly among governments, private sector actors and companies looking for affordable solutions to housing needs in their countries.

The complete assembly of the prototype in less than two hours was possible with the application of the patented pre-fabricated connection system BT-Spannschloss® (turnbuckle).

With this composite element, walls are simply screwed together on the building site and connected in a friction-locked and immediately loadable manner. Welding or other time-consuming measures such as concreting are completely eliminated on the building site. For later prototypes of butterfly houses with thin walls of 6 cm, BT innovation introduced the smallest turnbuckle in the range, the BT-Spannschloss (turnbuckle) M12.

In addition to the quick assembly, the advantage of a screw connection is also the simple disassembly. Precast concrete elements or houses that have been connected with the BT-Spannschloss (turnbuckle) can be dismantled afterwards and, for example, moved to another location. This is a helpful feature for temporarily created living and working spaces at project locations, for example after natural disasters.

The RubberElast® compression sealant tape is applied to the dry joints of the prefabricated parts of the butterfly house and seals the house against water, dust and insects. Due to the pressure created when connecting the concrete parts, the material adheres automatically and securely to the elements and remains permanently elastic.

In April 2019, BT innovation agreed with a partner from Kenya to deliver a prototype of the butterfly house manufactured in Magdeburg. To be able to present the new house concept on the Kenyan market, the butterfly house had to make the



*Assembly of the first prototype in Magdeburg, Germany*



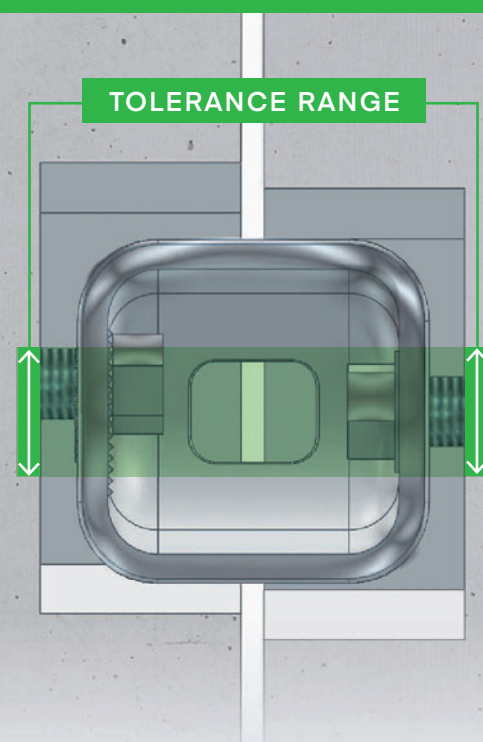
The butterfly house consists of 14 prefabricated panels connected with 55 BT-Spannschloss turnbuckles.



BT-Spannschloss® (turnbuckle) in the sizes M20, 16 and 12 is part of an easy-to-use connection system – without any additional materials or aids.

journey to Africa. For this purpose the house, with a floor space of 36 m<sup>2</sup>, was dismantled into its individual parts. In total, the house consists of 14 prefabricated panels connected with 55 BT-Spannschloss turnbuckles. With exact marking of the individual elements and consideration of the necessary safety precautions during the loading process, all precast elements and the necessary tools were loaded into two high-cube containers. In this way, the relatively thin but stable concrete panels of 6, 10 and 15 cm in thickness could be transported over thousands of kilometres to their destination.

## Compensates structural element tolerances



### BT-Spannschloss® Dry connection of precast concrete elements

- ::: INSTANTLY LOADABLE
  - ::: SHORT ASSEMBLY TIMES
  - ::: INSTANTLY WATERTIGHT WITH RUBBERELAST®
  - ::: ETA\* APPROVAL FROM APRIL 2019
- \*EUROPEAN TECHNICAL ASSESSMENT

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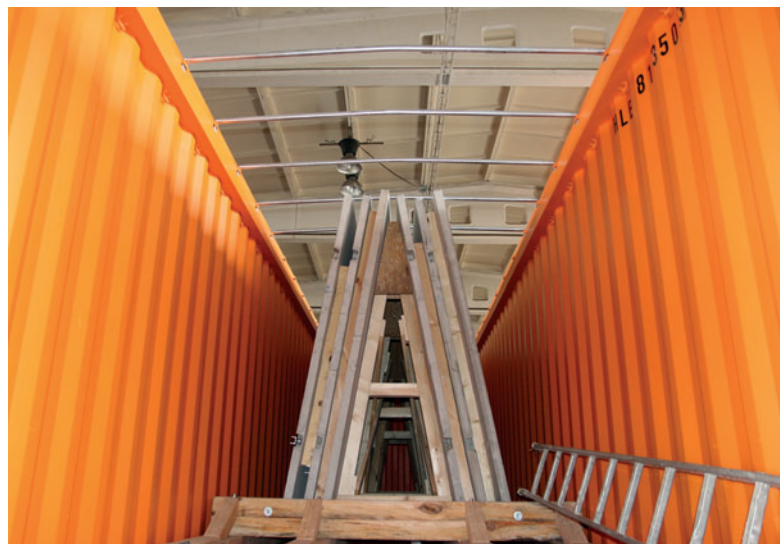
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*The butterfly house dismantled and loaded.*



*The butterfly house before dismantling in Magdeburg, Germany*



*The butterfly house after re-erection in Kenya.*

Upon arrival in Kenya, floor slabs, walls and roof elements were reconnected using the same BT-Spannschloss turnbuckles and, despite temporary problems such as the unavailability of a crane or lifting equipment, the house was completed in less than 4 hours. The goal of the journey was attained: a German butterfly house can now be visited in Africa. The innovative solution of dry connection of the concrete elements using the BT-Spannschloss (turnbuckle) made this incredible journey of an entire house from Germany to Kenya possible.



Follow the first attempt to erect the butterfly house, which was successfully implemented in only two hours. Simply scan the QR Code with your smartphone and watch the video.

#### FURTHER INFORMATION



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