

B.T. innovation GmbH, 39116 Magdeburg, Germany

Less space required but capacity still increased: a new formwork system makes it possible

B.T. innovation GmbH from Magdeburg, Germany, is well known for constantly searching for new possibilities to make the production and use of precast concrete elements more efficient. One of its current projects is the low-cost house in which comparatively high-quality living space can be created in a very short time and with very little means thanks to a cleverly devised concept. Striving for further optimisations in the production process has now led to the development of a new formwork system that offers advantages in many respects: The butterfly formwork.

In the production of precast concrete elements, in particular wall elements, the use of a battery mould is ideal where space is limited. Battery moulds are established systems and are available in different variants from various manufacturers. Heated/unheated, with integrated or optional docking vibrators, with separating plates between the elements and the like.

The main advantage of a battery mould is that, after the appropriate preparation of the formwork pockets, a comparatively large total area of wall elements can be concreted, formwork-smooth on both sides, in one filling process and in a very small space.

The required reinforcements are usually prepared in the vertical position. The correct fixing of the reinforcements in the right position as well as the integration of built-in components is often very laborious and

complicated. The same applies if an architectural finish using form liners is planned. The application of form liners to vertical formwork panels is nowhere near as simple as their installation in the horizontal position.

Combination of the advantages of horizontal and vertical production

The considerations mentioned above gave rise to the idea that the preparation of the formwork should ideally be done in the horizontal position, while still using the advantages of the battery mould. B.T. innovation GmbH thus developed the butterfly formwork.

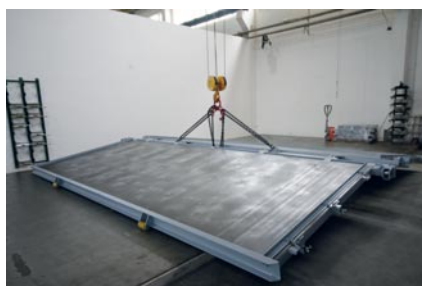
With the new butterfly formwork, all work preparation is carried out in the horizontal position in exactly the same way as production on tracks or tables. Thanks to the doubling of the formwork surfaces, the lift-

ing (and simultaneous folding together) of the two formwork elements produces two fully prepared formwork surfaces – the so-called “butterflies” that give the new formwork its name.

The butterflies prepared in this way can be pushed directly into the battery mould. Alternatively, these butterflies can also be pre-produced in another suitable place and temporarily stored in the smallest of spaces. This allows much greater flexibility, because the tooling times of the battery mould are drastically shortened.

At the same time the possibility of the structural finishing of wall elements is simplified, because the installation of the form liners in the horizontal state is usually much less complicated than with vertical formwork surfaces.

If familiar, unchanging house types are to be produced, ready prepared butterfly



The photo sequence shows the functional principle of the butterfly formwork

formwork elements on which the appropriate edge formwork is firmly positioned can be put into storage. This allows the production to be changed from one house type to another virtually without delay.

Completely smooth butterflies without permanent stopend formwork elements can be individually equipped with special stopend formwork elements, so that any desired wall elements can, of course, also be produced.

Extension of the product portfolio with regard to sandwich elements

The production of sandwich walls is also easily imaginable in this situation. This takes place in exactly the same way as if the butterfly is "only" equipped with reinforcements and built-in elements. In the case of sandwich walls, the prepared formwork elements are concreted immediately in a horizontal position and subsequently covered with an insulating material.

The previously usual process for the production of thermo or sandwich walls in the horizontal position takes place using a turning unit. Apart from the costs and the space requirement for the turning unit, the half shells covered with the insulation must harden to the extent that they can be clamped in the turning unit and turned.

In the production of sandwich walls with the aid of the butterfly formwork, conversely, the half shells covered with the insulation can be folded up earlier, because during the handling the concrete is only subjected to a compressive load and no bending stress.

Once folded up, the butterflies are either pushed directly into the battery mould in the same work step for the formwork-smooth concreting of the second shell (load-bearing shell) or temporarily stored for subsequent concreting.

The butterfly formwork – an ideal supplement to the battery mould

The butterfly formwork not only offers a horizontal work surface, it also contains the lateral stopend formwork elements for the battery mould. Hence, a completely new formwork system is created with the butterfly formwork and the battery mould that can produce solid and sandwich walls, formwork-smooth on both sides, as well as architecturally finished wall elements – in the smallest of spaces and with very high productivity.

As a rule, the shortening of the tooling times more than doubles the production capacity by a considerable margin. In the production of the wall elements for the low-cost house from B.T. innovation, even higher increases in productivity are achieved due to the unchanging element contours, as a result of which the costs for the single house can be lowered still further. However, the butterfly formwork is also generally of interest for all plants that wish to increase their productivity or expand their product range despite limited space and without any large-scale investment.

The butterfly formwork was one of the highlights at B.T. innovation GmbH's booth at the bauma 2016. This initial presentation already showed that the concept had found favour with producers from all over the world, so it probably won't be very long before the butterfly formwork is in use at one of B.T. innovation's customers.

Holger Karutz

FURTHER INFORMATION



B.T. innovation GmbH
 Sudenburger Wuhne 60
 39116 Magdeburg, Germany
 T +49 391 73520
 F +49 391 735252
info@bt-innovation.de
www.bt-innovation.de