BT innovation

“Future of Construction”

Press Kit

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B.T. innovation GmbH, 39108 Magdeburg, Germany

Innovative spacer system for the production of double walls is refined

In 2008 B.T. innovation provided the concrete and precast market with a composite fibre double wall spacer for the production of double and thermal walls which had no steel components and therefore met new application criteria - the DowaTherm double wall spacer system. Since then the DowaTherm double wall spacer system has taken its place in the concrete and precast industry and is finding favour with ever more users.

Since its market launch the development team of B.T. innovation has continued to exploit the special benefits of the composite material in combination with the variable support system (foot design) and met the requirements of the new concrete standard with respect to larger concrete covers and also industry demands for better stability. As of April 2010 the latest version of the double wall spacer and the new processing and storage system, the DowaTherm Terminal, are available to users.

The new support system, a new foot design with a double-hole mounting, permits the user to use different-diameter glass fibre reinforced rods from 8 – 10 mm in a single foot design. Its new shape means the support system can be used for concrete covers of 15 – 50 mm, in respectively 5 mm steps. It is easily inserted below the first reinforcement layer and, standing vertically on the pallet, guarantees secure positioning in the concreting process and compliance with the selected installation position.

This design, in which the foot and the rod are supplied separately and connected on site, means that large quantities of spacers can be checked, stored in an easy-to-find system and efficiently processed, even in the most confined spaces.

DowaTherm Terminal

The DowaTherm Terminal incorporates the complex processing and storage system for the double wall spacers required for double and thermal wall production. The DowaTherm Terminal includes a specially designed storage system with twelve drawers for the storage and dispensing of the most useful lengths of glass fibre reinforced plastic rods. The rod lengths are colour-coded so they cannot be confused when installing the spacers.

Each drawer is designed to hold approx. 800 – 2000 units of a particular length. The capacity of the overall storage system permits the storage of up to 15,000 double wall spacer units in a floor space of 2.0 x 0.6 m, 1.5 m³ at any one time.
The terminal includes a pendulum saw for the immediate and dust free production of required custom lengths with minimum effort. For this purpose, glass fibre reinforced plastic rods can be obtained and stokked in lengths of 3.0 - 6.0 m and in the desired different diameters.

The terminal also includes a mobile plastic container for the DowaTherm feet. The storage compartments are manually stocked from packs of respectively 500 units/size. The feet are supplied in sacks and refilling requires minimal effort.

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DowaTherm Terminal – a compact storage system for the production and storage of the wall spacer system

Improved concrete embedding of the glass fibre reinforced plastic rod, two-hole design

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Economic sealing of precast wall elements

The Göhl company has been a reliable partner to the building industry since its establishment in 1934. As a specialist in building and underground construction, concrete technology, masonry technology and turnkey prefabricated construction, it offers its customers problem solutions that are both convincing and innovative. One of these problem solutions is the presswater-tight execution of the joints in precast wall elements using the innovative RubberElast sealing tape from B.T. innovation.

Whereas until now the presswater-tight securing of butt joints between precast elements has meant high expenditure connected with the danger of cracks under mechanical loading of the sensitive joint, the potential of modern prefabricated house construction can be exploited to the full with RubberElast. The reason: RubberElast is mounted by simply pressing it onto the joint of a concrete element; it seals the joint immediately against presswater by the contact pressure of the concrete element set on top of it. The general building authority test certificate from the Material Testing Institute in Braunschweig vouches for the quality of the product. RubberElast remains permanently elastic, thus allowing the joint to be displaced by up to 7 mm and as such fulfils the highest quality requirements on the structure.

In the case of vertical joints, the BT turnbuckle from B.T. innovation is used. The vertical joint is also sealed quickly and securely against presswater by pulling the two elements together and clamping them using the turnbuckle. The BT turnbuckle connects the precast elements constructively to one another. Only a little grout is required in order to protect the turnbuckle with sufficient concrete coverage. The BT turnbuckles have been tested by the Material Testing Institute in Braunschweig and given building authority approval by the DiBt (German Institute of Building Technology). The BT turnbuckle is now also available in a hot-dip galvanised version. It is then no longer necessary to fill the joints.

"Thanks to our experience, expertise, flexibility and pronounced innovative ability, we are always able to meet the changing requirements of our customers and of the market. Our central goal is to recognise our customers' problems and to offer them solutions which are subsequently implemented in a success-orientated manner", says Dipl. Ing. (FH) Josef Fugmann, proxy of the Göhl-Bau company, "and we have found a partner who can support us in many points in B.T innovation GmbH."

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Göhl-Bau installs the exterior basement walls

Precast exterior walls with thermal insulation and BT turnbuckle

B.T. innovation GmbH, 39108 Magdeburg, Germany

Further developed spacer system successfully employed at Mueller-Altvatter Betonfertigteile GmbH

The DowaTherm spacer system developed by B.T. innovation was brought onto the concrete and precast part market some two years ago, since when the number of users of the innovative product have been steadily increasing. The new spacer system was developed in close co-operation with Mueller-Altvatter Betonfertigteile GmbH and was taken critically and with expertise from the first development stage to the present-day practical user form. Thus the advantages of the glass fibre composite material in connection with the variable support system were developed further and the requirements derived from the new concrete standard with regard to increased concrete coverage and improved installation conditions were implemented in the short term.

The further developed spacer system and the new processing and storage system, the DowaTherm Terminal, have been available to users since April 2010. The new support system, a new foot design with a double-hole mounting, permits the user to use different-diameter glass fibre reinforced rods from 8 – 10 mm in a single foot design. The redesigned foot can be pushed easily under the first reinforcement layer and, standing vertically on the pallet, guarantees secure footing during concreting as well as the retention of the selected installation position. This design, in which the foot and the rod are supplied separately and connected on site, means that large quantities of spacers can be checked, stored in an easy-to-find system and efficiently processed, even in the most confined spaces.

The DowaTherm Terminal incorporates the complex processing and storage system for the double wall spacers required for double and thermal wall production. The specially designed storage system includes twelve drawers for the stocking and storage of GRP rods cut to the most common lengths, a pendulum saw that enables immediate operative and dust-free manufacturing of necessary custom lengths with the least possible effort, as well as a mobile plastic container in which the DowaTherm feet are stored.
The capacity of the entire store enables the simultaneous storage of up to 15,000 double wall spacers with a space requirement of only 1.5 m³.

The DowaTherm spacer system and also the DowaTherm Terminal are used to their full extent and with all advantages at Müller-Altvatter Betonfertigteile GmbH. Hence, in summary, the following considerable advantages could be used and savings achieved with the introduction of the new technology:

- Spacers are suitable for concrete coverings up to 50 mm
- Improved concrete embedding and stability of the spacers
- Spacer foot suitable for 8 mm and 10 mm rods due to double-hole system
- Significant space savings, because previously required storage and shelf space is no longer necessary (saving of 125 m³ shelf space)
- Improved access to, and overview of stock
- More effective handling of materials due to reduced shipping volume
- Fast, rational self-manufacturing of rods in custom sizes possible

Previously: storage of the spacers on an area of over 125 m³

Today: with the DowaTherm Terminal, 15,000 double wall spacers are stored on an area of just 1.5m³

DowaTherm-Terminal

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Friction-locked and pressurised-groundwater-proof connection of concrete precast elements

"The basic idea of an otter crossing arose due to the fact that the pipe passage at that time was continually clogging up with branches and leaves. Nobody would have thought at the start that it would be so nice," said Helmut Brodowski, Chairman of the Kossau Waterways Maintenance Association and his deputy Manfred Koch, who are the creative minds behind the federal road crossing in Engelau for otters and small animals. With the precast elements by the Fritz Witt company of Weddingstedt, the main company in the region in the field of structures for waterway management and special construction, the structure worked within a very short time.

The RubberElast pressurised groundwater seal by BT innovation and the matching clamping system, the BT turnbuckle, enabled an immediate friction-locked, pressurised-groundwater-proof connection of the special concrete precast elements. Due to the elimination of on-site concreting for the connection of the elements, it was possible to save an entire working day.

Sven Jacobsen (Fritz Witt company) explains the advantages of the BT clamping system: "I no longer need concrete on the building site; time-consuming shuttering and, above all, demoulding the following day is no longer necessary. Just a little grout around the BT turnbuckle with sufficient concrete coverage for protection and the job is done. Elaborate filling and reworking of the joint is no longer necessary, thanks to the RubberElast pressurised groundwater seal by BT innovation."

The four concrete precast elements, each weighing between 12.6 and 22 tonnes, make up the federal road crossing for otters and the Moorsaalweide brook with a total length of 17.4 metres and a width of 2.4 metres. The water in the brook can be as

Four concrete precast elements make up the federal road crossing for otters and the Moorsaalweide brook with a total length of 17.4 metres and a width of 2.4 metres.

The RubberElast pressurised groundwater seal by BT innovation and the matching clamping system, the BT turnbuckle, enable an immediate friction-locked, pressurised-groundwater-proof connection of the concrete precast elements

deep as 0.8 metres in the passage, but the otters and other small animals can still run from one end of the small animal tunnel to the other without getting their paws wet. With a standing height of 1.5 metres, cleaning is easy, although it is unlikely that there will be any blockages in future anyway.

This type of structure is found more and more frequently. As early as 2007, the Fritz Witt company built a complete fish ladder made of precast elements for the continuity of the River Arlau near Hattstedt. "If we had had the BT turnbuckle and the RubberElast by BT innovation at that time, we would certainly have been able to save 3 to 4 days for the assembly of the fish ladder," Sven Jacobsen continues. "Saving time also means saving costs."

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New generation of magnet and formwork technology

In the year 2002 the Magdeburg company B.T. innovation GmbH patented a positioning aid for magnetic clamps. The aid in question is a foot/spring system that prevents a magnet, when placed on a tilting table, a circulating pallet or another magnetic formwork surface, from immediately adhering. Instead, a small air gap remains between magnet and surface. The magnet can then be precisely aligned without effort and subsequently activated with slight pressure, so that it then develops its full adhesive force. Thanks to this simple, but very helpful idea, the MagFly magnetic clamps advanced within a very short space of time to become one of the most successful magnetic systems in the precast concrete industry.

In combination with the MultiForm shuttering carrier system they replaced the classic formwork construction with wooden panels or chipboards and their attachment with conventional magnets in many stationary production lines. Moreover, in circulating plants with a flexible manufacturing range and constantly changing element thicknesses, such as for solid and sandwich walls, the system by B.T. innovation is also considered to be a genuine alternative to heavy steel formwork, which inevitably requires cranes, handling devices or expensive robots.

The users naturally percieve the advantages of this system solution in different ways. For some it is important that the magnetic clamps are not only light, can be positioned without force and exhibit a reliably high adhesive force, but also that they can be released again at any time using the built-in eccentric lever with no additional tools. Others attach importance to the fact that formwork heights of 10 to 60 cm can be equally well implemented with one and the same system. Again, others see the biggest advantage in the saving of working time and formwork material, as well as the associated reduction in waste.

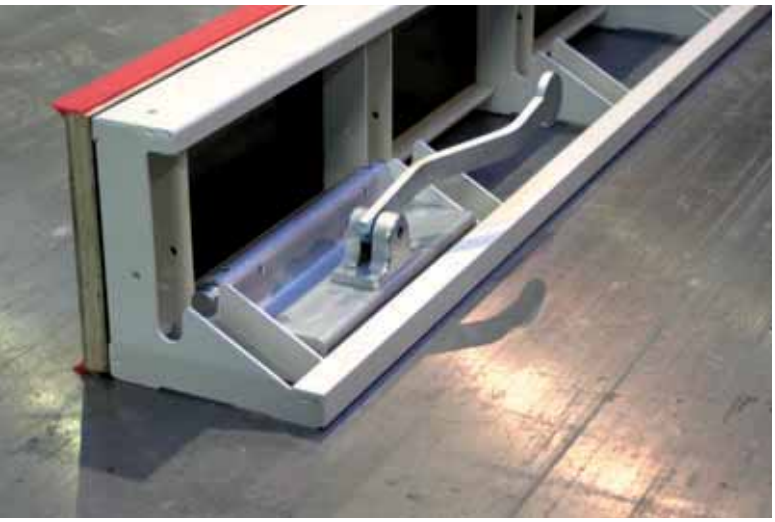
In view of these many advantages and the positive opinions of the current system, the task of further improving the system appears to be a real challenge. "However, we have always had the reputation of being able to make a better solution out of a good one," commentated Felix von Limburg, Managing Director of B.T. innovation, describing his ambitions. "Employers' liability insurance associations, on the one hand, with their justified interest in industrial safety and the protection of the health, and the constantly rising pressures of cost on precast plant operators and works managers on the other motivated us to think about how the weights could be significantly reduced even further without thereby abandoning the other advantages or compromising with respect to the characteristics."

2 employees with 6 m formwork (FlyFrame and formwork shell) and 4 magnets (MagFlyAP)

And precisely this balancing act appears to have been successful. The Magdeburg company recently officially presented the new MagFlyAP magnet, after it had been put through its paces at several test customers. It differs significantly from its predecessor in design. Hence, the latest development has an aluminium housing, which is at the same time designed as an integrated adaptor for the shuttering carrier system. The technology is also impressive: if one compares the new MagFlyAP with the old MagFly 1600, the bestselling magnet from the MagFly series, the weight of the new magnet has been reduced by about half due to the optimisation of the magnetic material and the steel part, whilst at the same time increasing the adhesive force by more than twenty percent.

Of course, the new MagFlyAP also has tried-and-tested functions, such as the patented MagFly foot/spring system for accurate positioning or the integrated eccentric lever for releasing the magnets without tools. The test customers' verdict was correspondingly positive: "Thanks to the enormous weight reduction, the employees now take two to four magnets at the same time, instead of only one or two previously. We already get the feeling that it is simpler and faster ", was the unanimous feedback.

Simultaneously to the new MagFlyAP magnets, the Magdeburg company also presented the new FlyFrame shuttering carrier system. This concerns the corresponding further development of the MultiForm. FlyFrame is an ultra-light, but nevertheless extremely sturdy shuttering carrier system



MagFlyAP and FlyFrame on the formwork table

made of hardened and specially coated aluminium. The formwork shell made of wood panels or chipboard can be screwed on from the rear, so that the forming surface is free of damage or screw heads. Large openings on the rear side of the FlyFrame make it also possible to anchor heavy fittings from the rear.

In order to meet the requirement for lower weight and the associated simple handling, the magnetic clamps and the shuttering carriers are not connected or even screwed together. The magnets are simply hooked into the rear of the shuttering carrier system, depending on requirements. Together with the magnets, the formwork can be precisely aligned before the MagFly magnets are then finally fixed by pressing them down. Hence, the system remains easy to handle, very flexible and extremely economical.

Of course, the developers at B.T. innovation have made sure that the systems are compatible with each other. The MagFlyAP can therefore also be combined with the MultiForm.

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bauma 2010 Stand A2.103

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Successful trade fair presence with no less than seven product innovations

bauma 2010 was once again a barometer for the economic trend in the building industry. The company B.T. innovation had specific projects and investment schemes on show. Altogether the trade show was a great success for the B.T. innovation, with a large number of visitors from Germany and abroad. Even the flight ban caused by the volcanic ash at start of the exhibition had little effect.

B.T. innovation is known for its simplified solutions for the construction sector, which lead to increased efficiency. At bauma the company had no less than seven new products on show.

The first innovation related to the successful MagFly magnet. The new, lightweight MagFly AP magnet with a capacity of 2 tonnes now features an aluminium housing. Overall the modifications compared with the previous model resulted in 50% weight reduction and 30% more holding power, and all that at a reduced price. bauma visitors were also impressed with the modified MultiForm shuttering support system. Steel was replaced with hardened aluminium and the result was FlyFrame which offers up to 60% weight reduction, depending on height. Together, MagFly AP and FlyFrame therefore result in a significant reduction in the weight workers in the precasting works have to handle, which naturally results in healthier working conditions, faster production and higher quality.

FlyFrame makes it easy for a single worker to handle 6 m of shuttering

InnoElast & ProElast

Not least in view of the current high steel prices, visitors were particularly interested in the DowaTherm double wall spacer with its new base and the DowaTherm terminal. The glass fibre rods used as spacers thermally separate the two shells, thereby greatly enhancing the insulation characteristics of the system. As a side effect, the risk of rust patches in the finished concrete is eliminated. The DowaTherm Terminal offers very compact storage of the double wall spacers and features an integrated saw to enable special sizes to be produced quickly and efficiently.

The company also presented advanced screw anchors and triple walls anchoring systems made of glass fibres. Here too improved insulation is one of the key features.

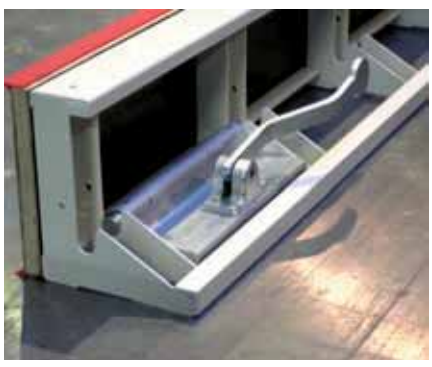
When it comes to safety at work, the fall protection sleeve for precast slabs with in-situ topping offers a cost-effective and simple solution.

Innovative sealing solutions were also on show. InnoElast from B.T. innovation is a new generation of adhesive that sets new standards in terms of elasticity and processing. The sealing adhesive can even be processed at temperatures slightly below zero and in humid conditions. In addition, it offers good resistance against a wide range of acids and alkaline solutions. In conjunction with the UV-resistant ProElast (an EPDM film), buildings, manholes and even roofs and balconies can be sealed safely and durably.

The BT-Turnbuckle attracted particular attention. It is DIBt-approved and offers a long-awaited solution for connecting precast concrete elements. It is available in two sizes and is suitable for connecting walls with thicknesses from as little as 12 cm cost-effectively, quickly and firmly. ■

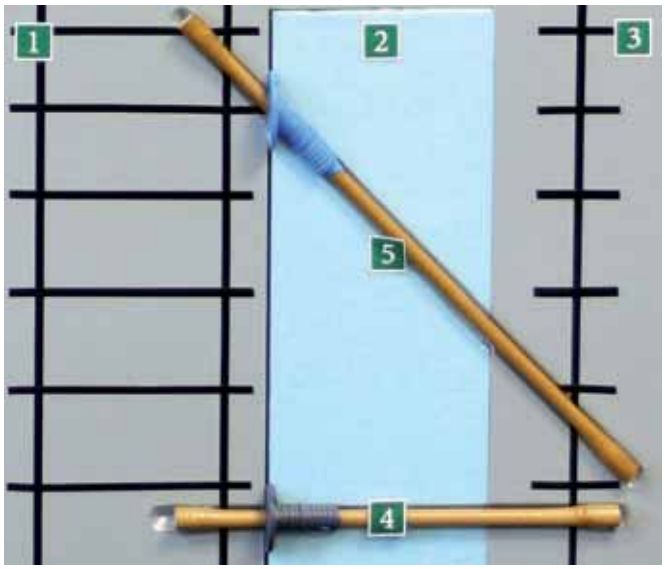
DowaTherm terminal: 15,000 spacers within a space of only 1.5 m³

Enhanced safety at work through fall protection sleeve



MagFly AP & FlyFrame

The BT-Turnbuckle is suitable for a wide range of connections



Screw anchors and anchoring systems made of glass fibre for improved insulation

1. *Supporting shell*
2. *Thermal insulation*
3. *Exterior shell*
4. *Connecting rod GRP dia. 7.5 mm (transverse)*
5. *Connecting rod GRP dia. 7.5 mm (diagonal)*

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New joint sealing system provides for high security in groundwater under pressure

In the field of house and apartment construction, Klaus Hufnagl Betonwaren GmbH uses its own proprietary manufactured precast solid wall elements, from the foundation slab to the roof ridge. The company has decided in favour of the system by B.T.innovation from Magdeburg for the implementation of the cellar. The 'white tank' is used here, or rather the 'zebra sealing', i.e. the joints are subsequently sealed from the outside with a film strip that is approved for this purpose and has been tested by the building authorities. A pressure water seal of up to 20 m water column is thus achieved with InnoElast and ProElast.

Klaus Hufnagl Betonwaren GmbH offers a comprehensive assortment of concrete precast elements for purposes ranging from agricultural construction to house building. The company was founded 30 years ago by Mr Klaus Hufnagl and has made a name for itself in the field of agricultural building and house and apartment construction at its location in Leonhardsbuch near Allershausen, some 40 km from Munich.

The first steps were taken towards house and apartment construction 25 years ago. In between times, however, the company has concerned itself with the main products of drive-in silos and precast elements for agriculture and industrial halls. Klaus Hufnagl GmbH began with the construction of an apartment block in spring 2009. As is often the case in this region, the apartment block stands on a slope, so that the cellar completely disappears into the ground on one side. According to the geotechnical report, seasonally dependent groundwater under pressure is to be expected. In order to work as independently and economically as possible, the Hufnagl company produces the products for house and apartment construction itself, whereby large-area solid wall panels are used that are made of waterproof concrete. Joints are unavoidable with this method of building, because the manufacture and transport of precast elements is subject to certain parameters.

These joints have to be manufactured so that no water can penetrate. Such waterproof constructions are generally a time and cost-intensive process. In the InnoElast and ProElast system, B.T. presents an innovative solution that offers not only high security in areas with groundwater under pressure, but at the same time a large potential for rationalisation due its the fast, simple handling.

InnoElast is a single-component special polymer sealant and adhesive that is applied without problem using a notched trowel to the concrete surface of the joint area in order to press on the stuffed ProElast film in a width of 300 mm. The free edges are subsequently sealed with InnoElast. The system can be used on moist substrates and at temperatures from as low as -3 °C; primers are not required and there are no waiting times between the individual working steps. The film is resistant to weathering and UV light and has high chemical and microbiological resistance. The ProElast system additionally possesses a building authority test certificate as proof of use for the described application.

A pressure water seal of up to 20 m water column is obtained with InnoElast and ProElast.

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