

Umdasch Group Ventures unveils the future of construction.

Umdasch Group Ventures, the innovation hub of the Umdasch Group AG and future designer of construction, will present three potentially disruptive innovations for construction processes at bauma 2019:

- **Contact** – digital construction site intelligence for an effective and sustainable increase in the productivity of construction processes.
- **Neulandt 3P** – a mobile field factory for worldwide industrial production of precast concrete elements to create living space.
- **Contour Crafting** – large-scale 3D construction printing with concrete on site.

The future of construction.

The Umdasch Group Ventures GmbH is the innovation hub of the internationally active family company Umdasch Group AG. Together with formwork expert Doka and shopfitting professionals Umdasch The Store Makers, the company employs 8,500 employees in 70 countries.

The aim of Umdasch Group Ventures is to shape the future of construction. The focus is exclusively on important future challenges. They are dealing with megatrends having an impact on all areas of economy and society, for example digitization, sustainability, urbanization and demographic change. By 2050, the world population will have grown to roughly 10 billion people, 70 percent will live in cities. This poses enormous challenges for humankind. There is an urgent need for housing and infrastructure solutions that will be affordable as well as socially and ecologically compatible.

Umdasch Group Ventures GmbH deals with the latest technologies to deliver sustainable and potentially disruptive solutions for these global challenges that work along holistic construction processes – from greenfield to greenfield. Topics on the daily agenda include the Internet of Things (IoT), artificial intelligence, 3D printing, robotics, smart buildings and urban mining.



Bauprozesse der Zukunft | Future_of_construction.png | Credit: Umdasch Group Ventures

"We see ourselves as game changers and future designers. We deal exclusively with business models that have a potentially disruptive technical and commercial effect in order to provide important answers to urgent global challenges," says Werner H. Bittner, Member of Executive Board of Umdasch Group Ventures.

The new developments are intended to offer customers in the construction industry completely new solutions in order to revolutionize construction processes. The products will either be distributed by the Umdasch Group Ventures or integrated into the portfolio of a sister company.

Founded in November 2016, Umdasch Group Ventures is already presenting three innovations for the future of construction at bauma in 2019.

Contact – Digital construction site intelligence to increase productivity.

Digitization is a very powerful tool to increase productivity in construction, but there is one blind spot – the construction site itself. Contact is digitizing this spot and has developed a digital platform to improve the productivity of construction processes during the shell construction phase.

Contact supports all participants in the construction process: Site managers and foremen with their teams, construction companies and real estate clients such as building owners, real estate developers, planners and architects.

Contact – the smart construction site talks to you.

The smart construction site with Contact is the heart of the digital solution. Site managers and foremen plan, organize and control the tasks, teams and supply on construction sites with the Contact app based on the 3D building model (BIM-compatible) and cycle planning.

The special feature of the Contact solution are the sensors (IoT) on site. They automatically provide crucial data on construction progress. The formwork functions as a "host" for this purpose, as the movement and use of the formwork provides clear construction status information. For instance, the sensors recognize whether a wall formwork has been set up and, in addition, they detect as soon as concrete is poured into the formwork.

Site managers and foremen receive real-time data on the construction progress on their site and can thus optimally control the construction process. Furthermore, the documentation is done automatically and saves them time. With Contact, construction companies can increase productivity by 6 to 15 percent by optimizing processes.

Progress monitoring – everything at a glance.

Construction companies, building owners and clients such as developers, planners and architects receive real-time reporting on the progress of construction sites with all relevant data. The transparency of target and actual data identifies problems and delays at an early stage and thus can be solved proactively.



Contact Site | Kontakt-site.png | Credit: filmriss, www.filmriss.media

Big data and Artificial Intelligence optimize construction processes.

By digitizing construction sites, construction companies and contractors can build up their own Big Data. Using data analytics methods and Artificial Intelligence, construction processes can be optimized on the basis of field data.

- Analysis of construction processes to identify waste (lean construction) and derivation of best practice construction processes.
- Data-based decision basis for future projects in calculation and work preparation, e.g. material and time requirements, recommendations for optimal construction cycles, most efficient construction teams, and much more.

The Kontakt method.

Contact ties in with BIM and represents the digital twin of the construction site. The method follows a cycle of continuous improvement: the planning and the subsequent construction are digitally mapped. Through monitoring, target/actual comparisons and data analysis, improvements can be derived, which in turn flow into the next planning cycle.

“Contact brings transparency to construction processes for construction companies, real estate developers, building owners, architects and planners. The best practices of the construction processes are identified and construction costs and time are reduced throughout the entire process”, Lucas J. Winter, Managing Director of Kontakt GmbH, sums it up.

www.kontakt.build

Neulandt 3P – Your mobile field factory for the production of concrete precast elements.

Neulandt 3P is a mobile field factory, specially designed to produce precast concrete elements directly at the project location, in large quantities and cost effectively.

High productivity through Butterfly Technology.

The prefab factory convinces by a higher productivity than comparable technologies, which is achieved by the combination of the patented butterfly technology with a battery formwork. Butterflies are foldable formworks, which are prepared horizontally outside the battery. This decoupling of the preparatory works enables the battery formwork to be used to full capacity. Up to three concreting cycles per day can be carried out thus producing 56 walls.

"The output per factory is around 270,000 m² of high-quality precast elements per year. This means that one field factory can produce precast elements for 1,500 houses with a living space of 50 m² per year", says Marco Romahn, Managing Director of Neulandt GmbH.

The mobility of the factory enables worldwide precast production directly at the site.

The factory is deployable. It is transported in sea containers and can be temporarily operated worldwide at any project location (construction site). Part of the delivery is a tent with a fully integrated infrastructure including cranes in order to produce weather-independently. Within four weeks, the factory is set up and ready for production – anywhere in the world.

On-site production enables industrialization and standardization of the production process. A sophisticated factory layout and process concept contributes significantly to improve productivity. In addition, shortened transport routes save costs and construction time. Furthermore, reaction times in production are streamlined considerably, as the plant is located directly on site.

With this concept, Umdasch Group Ventures enables industrial mass production of precast elements in emerging and developing countries.

"We have interested parties from Africa and the Middle East, but also from Europe. Here, too, construction companies are looking for new technologies that enable the production of high-quality living space at low cost," says Johann Peneder, Project Manager and Managing Director of Neulandt GmbH, describing the market situation.



Neulandt 3P – Plant | Neulandt3P-01.jpg
Credit: Umdasch Group Ventures



Neulandt 3P – Butterfly | Neulandt3P-02.jpg
Credit: Umdasch Group Ventures

Strengthening the local economy through local value creation.

Local production keeps the value added in the country and strengthens the local economy, another important advantage of Neulandt 3P. The mobile field factory will be operated with local workers who can be quickly trained and qualified by the Neulandt-Team. Materials and services are also procured locally. Neulandt contributes to sustainability and social compatibility from three perspectives: affordable housing is created, people are qualified and employed, and value creation remains local.

www.neulandt.build

Contour Crafting Corporation – large scale 3D construction printing with poured concrete

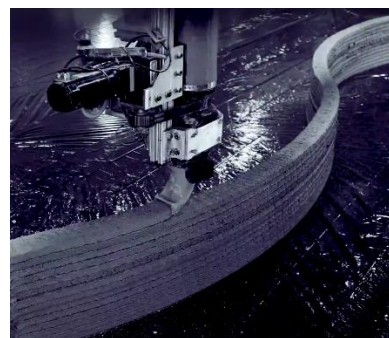
Contour Crafting Corporation is the technology leader in large scale 3D construction printing with concrete and holds over 100 relevant technological patents. Prof. Berok Khoshnevis, the inventor and founder of Contour Crafting, published already in 1996 about 3D printing of buildings. In 2009, Generation 0 was the first to print building structures with cementitious materials.

At bauma 2019, Contour Crafting is presenting the Generation 1 CC-108, which can print with standard concrete. Standard concrete as a printing material is on one hand technically known and proven and on the other hand much more cost-effective than e.g. printing with expensive special mortars.

In just 24 hours, a building shell with an area of up to 200 m² is printed. The printer weighs considerably less than 1 metric ton, and is therefore easy to transport and deployable. Thanks to automation, the printer is available 24/7 and usually requires only one operator (except for assembly and installation). With 3D printing, material consumption is optimized and the use of other machines is greatly reduced.



Contour Crafting 3D Printing Concept | 3D-Printer_Concept.jpg
Credit: Contour Crafting



Contour Crafting 3D Printing | 3D-Printing.png
Credit: Contour Crafting

However, the "Contour Crafting concept" goes far beyond only printing, because it will be a combination of concrete 3D printing and automatic insertion of components such as pipes, lines, electronic installations, reinforcement, etc. Thus, it aims at an automation level as close as possible to turnkey. This second technological component of automation will be implemented in Generation 2. Only in this way, 3D construction printing will be able to have a clearly superior effect technically, economically and ecologically in the defined area of application.

3D printing is an additional technology for construction. The 3D construction printing will find application where fast and cost-efficient construction is required, e.g. in social housing or after natural disasters as well as in military applications. Contour Crafting has a close development cooperation with the US Department of Defense. 3D construction printing will be particularly attractive for organic architectural solutions in order to create sophisticated and unusual wall geometries fast and cost-effectively.

Contour Crafting Corporation was founded in 2014 as a spin-off from the University of Southern California (USC). That year, the first NASA prize was won and the second in 2016. Since May 2017, Umdasch Group Ventures GmbH has held a 30% stake in 3D printing pioneer, based in Los Angeles, USA. At the end of the year, the young company will start with "Printing as a Service" in order to bring this groundbreaking technology to the market. The experience gained will be incorporated into further product development. At the same time, Umdasch Group Ventures will also develop the business model of "Printing as a Service".

www.contourcrafting.com

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