Factsheet

Mischek Systembau:

Reducing CO_2 through prefabrication

Prefabrication is a huge trend in construction and an important “lever” in helping the sector to become more efficient and more sustainable. As part of this trend, the construction site is moving into dry dock, so to speak, as robotic systems prefabricate certain parts of the building in the factory hall for later on-site assembly.

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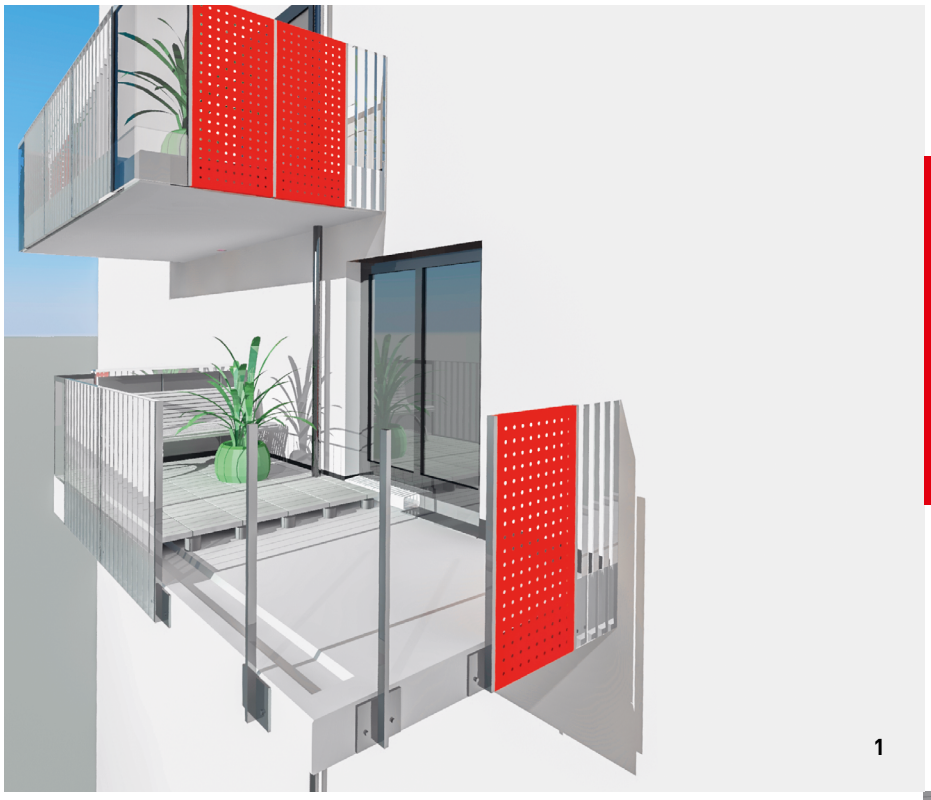
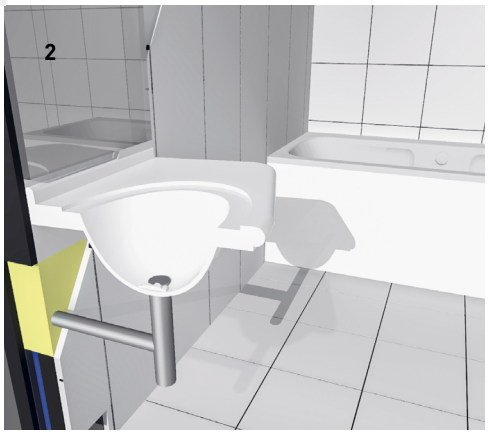
With its product portfolio of intelligent prefabricated concrete modules, Mischek Systembau, based in Gerasdorf near Vienna, is a pioneer in this segment. Mischek's modular components already include the sanitary, electrical and mechanical installations when they are delivered to the construction site. Even lightning conductors and rainwater drainage systems are pre-fitted into the products if necessary. Combining the intelligent prefabricated elements, such as the Mischek outdoor" floor slab, the "strong & active" ceiling element or the "smart one" sanitary module, creates the greatest added value. Because every Mischek product that is fabricated off site translates to leaner processes, fewer manual operations on site and, as a result, a shorter construction time.



Learn more about Mischek Systembau in this video.

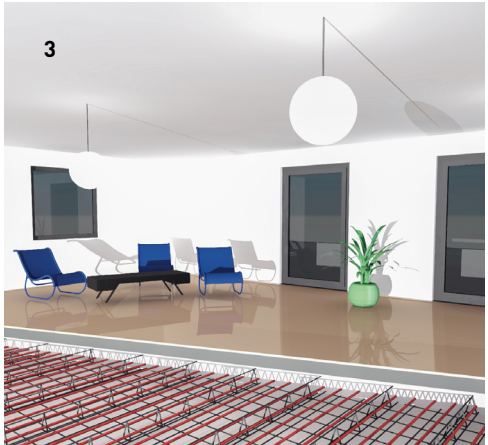
1 Mischek outdoor is a prefabricated floor slab for outdoor use with preinstalled drainage system and railing attachments. / **2** Mischek smart one is delivered to the construction site with connections for sanitary installations pre-fitted at the factory. / **3** With its integrated heating and cooling ducts, Mischek strong & active ensures rapid, quality-controlled component activation on the construction site.



Higher quality, faster construction

The most important factors in any construction project are cost, schedule and quality certainty. Mischek Systembau's innovative concept makes it possible to have a quality-controlled project with guaranteed deadlines and costs that is also sustainable.

All parts are delivered to the construction site with as many fixtures preinstalled as possible. This not only reduces the amount of storage space required on site but also the amount of work that needs to be performed compared to the conventional in-situ concrete construction method. Prefabrication can cut the number of working hours during the actual construction period by up to 50 %. Walls, ceilings, lift shafts and balconies/terraces are manufactured in advance in a controlled production facility, which guarantees the best quality of the reinforced concrete design. So prefabrication and modular construction can increase both the pace and quality of construction.



Robot at work

The Mischek precast plant works in the truest sense of the word ‘covered’: regardless of wind and weather, intelligent precast elements are produced here in shifts for use in the greater Vienna area. State-of-the-art technology is used in the form of robots that have been specially developed for this purpose together with partner companies. The shuttering robot lays the shuttering, the reinforcement is produced by a mesh welding system, the heating/cooling register is bent by a hose laying robot, and loggia slabs harden in a battery.

4 The formwork robot places the formwork precisely where it is marked on the plan. /
5 The hose-laying robot lays the ducts for the component activation of the Mischek strong & active prefabricated module. /
6 The mesh welding machine works automatically to produce precisely fitting steel reinforcement mesh that is automatically lifted into the correct position in the prefabricated component.

Systematically reducing carbon emissions

Mischek Systembau is pursuing the ambitious goal of consistently modernising the entire plant in order to be able to operate all systems with green energy produced on the plant premises. A photovoltaic system on the roof of the halls is already producing green electricity. This green energy is used, among other things, to charge the almost entirely electrically operated fleet of vehicles on the plant premises. In addition, a biomass boiler is already in operation, which recycles wood waste in an environmentally friendly way and converts it into thermal energy. This is used to heat the factory buildings and to operate the hardening furnaces. The aim is to achieve climate-neutral production of the innovative finished parts step by step. The finished parts are to be produced in a completely climate-neutral way.

Prefabrication helps to cut our greenhouse gas emissions. For a residential building comprising 100 flats with an average of 65 m² of living space each, the modular system saves around 65,000 kg of CO_2 equivalent compared to conventional in-situ concrete construction. That corresponds to the emissions from 20,600 litres of diesel fuel, or almost 460 tank fillings for a VW Golf 8.

The greatest contribution to carbon emissions during the construction phase results from the necessary site deliveries and construction materials. Using the products from Mischek cuts site deliveries of building materials by up to 40 %*. The repeated use of the formwork materials in the factory also saves up to 50 %* of construction materials such as sawn timber, formwork panels and construction chemicals.

* All comparative values are based on a comparison between the modular system and in-situ concrete construction. The values were calculated on the basis of a project currently under construction.

Prefabrication as a solution to the challenges currently facing the industry

Industrial prefabrication is also an important factor for mastering another pressing challenge facing society today: the ongoing urbanisation and the growing need for affordable housing. Prefabrication systematically reduces noise, dirt and the need for road closures during the construction phase. Using Mischek's products also helps to adhere to tight construction schedules: the higher the percentage of Mischek's modular products used in construction, the less manual work is necessary on the construction site itself. In a conventional in-situ concrete construction site, for example, the heating and cooling ducts have to be laid by hand whereas Mischek strong & active is delivered preinstalled so that the elements only have to be joined together at one point and are immediately ready for use. Mischek smart one also has thinner walls and does not need any additional siding or cladding, which increases the utilisation factor of the gross floor area by up to 3 %*. Especially in urban areas, where living space is expensive and available space for building is scarce, this helps to optimise the usable living space.

"Especially in urban areas, prefabrication allows us to manage our construction sites in a more resource-efficient manner. We can respond more economically to the progress of construction and to storage capacities on site. The quality of the work itself also increases when carried out in the factory hall and not outside exposed to wind and weather."

Markus Engerth,
STRABAG Division Manager Austria

Modular system vs. in-situ concrete construction:

Advantages of prefabrication compared to the conventional in-situ concrete construction method

LABOUR COSTS

Reduction of labour costs between **40 and 50%**

CONSTRUCTION MATERIALS

Reduction of on-site building materials **by up to 50 %**

GREENHOUSE GAS EMISSIONS

Reduction of greenhouse gas emissions **by around 5% or 10 kg per m²** of usable living space

UTILISATION FACTOR

Increased utilisation of gross floor area **by 2 % to 3 %**

TRANSPORTS

Reduction of site transports **by up to 40 %** (approx. 142 fewer trips for a residential complex with 100 units)

Contact

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