



Syspro<sup>®</sup>4energy



*We build „green“ constructions. The world is changing, raw materials are limited — and alternative energy concepts are in demand.*

## Syspro<sup>®</sup>4energy is: ○○○

### ○○○ Healthy living and working in modern architecture.

Each building is individually planned based on the specifications of the architect and the builder. The wellbeing of its occupants was already at the forefront of the design due to the new technology developments in green energy and is thus much more than just a pleasant side effect.

### ○○○ Save on energy and preserve resources.

Our member companies have been masters of industrial, pre-fabricated concrete building parts with special accessories for decades. Today, the parts are equipped with additional functions that include thermal activation: heating, cooling, absorption and the storage of primary energy. All of these reduce the consumption of secondary energy and optimise the overall energy footprint including an energy self-sufficient plus house.

### ○○○ Teamwork.

The basis for the project's success is the current coordination and collaboration between the skilled trades and suppliers, especially in relation to the construction site processes and economic aspects. From the building technology to the solar system — our partners define the best components for your building project and upgrade it with just-in-time delivery for an integrated system solution.

Construction quality.

Our clients are presented with a unique situation in construction where there is a correlation between the quality of the certified production process and the high, equally certified product quality standard. Monitored by independent experts and put into reality by positive, competent, and committed employees. This quality concept is illustrated in the HIQ brand.



SySpro HiQ promises clients that the building materials as well as the production processes used are subjected to uncompromising control. The result is precision products that represent a new standard for advancement in construction.

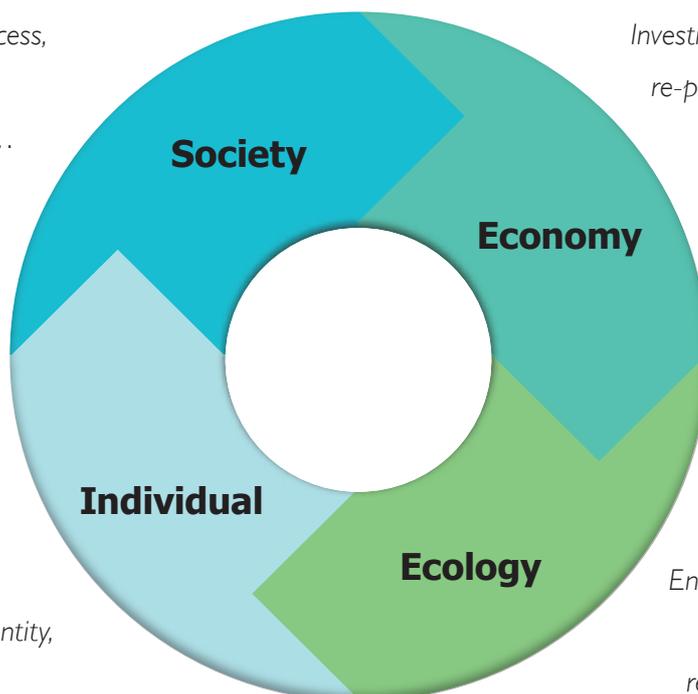
With SySpro<sup>energy</sup>

you have placed your bets on the future when it comes to energy-efficient construction at its highest form. All the elements of sustainability are trackable. The basis is the perfect interaction between the accumulation, distribution and storage of heat and even cooling in concrete building parts.

New technologies in the prefabrication of concrete building parts ensure the future in construction.

*Safety, function, access,  
accessibility for the  
disabled, location ...*

*Investment, operating costs  
re-purposing, dismantling,  
life cycle costs ...*



*Comfort, health  
personalisation, identity,  
individuality ...*

*Environmental pollution,  
emissions, energy,  
resources, recycling ...*

# Concrete building parts with a smaller environmental footprint and increased insulation values

It's supposed to be visual concrete. In spite of a modest budget, the architect of this single family home was able to build a dream house with pre-fabricated concrete elements. The outer walls of the KfW 70 Passive House consist of SySpro thermo walls, i.e. two pre-fabricated concrete shells that are completed with in-situ concrete at the construction site. An insulating layer is already mounted to the inside formwork at the factory.

With their smoothly formed concrete surfaces, the visible sides form an authentic façade and serve as finished walls in the interior rooms. The exposed ceilings with their half-finished fragmented look remain visible in their expressive materiality.

*Source: Gudrun de Maddalena, Tübingen*





Besides the core-insulated thermo walls, further pre-fabricated concrete components such as supports, floor panels and separating walls were included in the design by the architect Maier. These also include the narrow chamfered elements at the attic that conduct water into the inward running drainage of the flat roof. Even though they are hardly visible from the outside, such carefully planned details support the homogeneous overall impression of the house.

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## Administrative building with geothermically activated walls

To heat and cool this office building, a geothermal heating system using underground pipelines and the thermo wall in the basement were activated as mass absorbers.

Two heat pumps supplement the system. Radiant heating integrated into the concrete slab heat and cool the interiors. In this system, the water circulates in concreted plastic pipes that were installed in the pre-fabricated slab at the factory. In the winter, the warm water in the ground is pumped up and transported into the interior rooms through the heat registers pre-installed in the concrete slab. During the summer, the system operates the other way around.

The rooms are cooled without a mechanical cooling generator where room temperatures will amount to approx. 26°C in the summer.

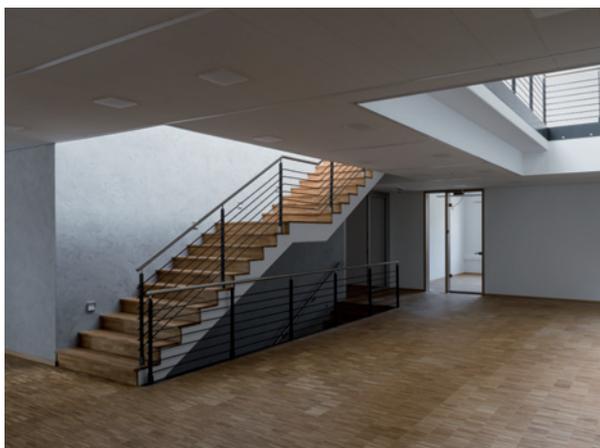
A mechanical ventilation and exhaust-air unit with heat recovery along with adiabatic cooling complete the installations.

# Sustainability through the Passive House Standard

A modern office building with 2,450 m<sup>2</sup> offers a high quality working space for up to 100 employees to stay in Geisingen. Architect Günter Limberger, a certified passive house planner, designed this concrete building according to the zero-emission standard. The distinctive projecting building design with a rectangular floor plan, the sculptured bridges and stairways are not only there for visual appeal but also due to reasons of necessary flood protection.

The contractor, a manufacturer of concrete components, completed a model project with his own administration to demonstrate the benefits and options of system construction with pre-fabricated concrete elements for architecture, climate protection and comfort. Besides the floor slab elements, load-bearing, double-shelled outer walls — so-called thermo walls — offer finished surfaces in visual concrete quality with integrated insulation. All the elements were filled with in-situ concrete and result in a homogeneous airtight building that fulfils the specifications and high comfort level of a passive house building.





Source: Egon Elsäßer Bauindustrie GmbH & Co.KG

In new generation thermo walls, connectors made of plastic are installed instead of stainless steel lattice girders that practically do not conduct heat yet achieve an improved U-value.



By implementing a well thought-out energy concept, architect Limberger designed the administrative building according to the passive house standard using the double-shelled concrete construction method and the integrated core insulation in a simple way. The necessary remaining energy was gathered through a local heating connection. One of the remarkable details is the implementation of pre-fabricated slab elements that are already equipped with heating and cooling tubing at the factory. By using this slab element system, the concrete core is activated close to the surface, which achieves a higher performance level and shorter reaction times in comparison to conventional construction methods. Thus, additional heating are not required in the interiors and optimal as well as individual room temperatures are possible even so.





## Large-scale acoustic climate-control ceiling

Low installation height: high span length and no beams

In order to attain a pleasant and productive work atmosphere in the offices of the Ehinger Volksbank, the decision was made for an acoustically optimised climate-control ceiling. It keeps the rooms at a comfortable temperature all year round due to the sound absorber slats installed in the ceiling at the factory.



„The new building accentuates its city entrance and thus self-confidently lends itself to scale through its staggered design in context to the old city and the rail line. The exterior design connects the existing green areas and leads into the atrium inside. The atrium and the spacious glass fronts integrate the outer areas with the interior and thus create light spaces with a comfortable working atmosphere.

“We decided to use the climate-controlled ceiling since it is not thick in spite of the integrated technology. After the intensive design phase, the implementation phase was relatively short.”

Source: Braunger Wörtz Architekten

Since the ceiling was not designed with vertical beams, it was stabilised with additional crossbeams. It thus reached a span length of up to 7.5 meters without any supports. During pre-fabrication at the factory, the heating and cooling registers, insulating elements, ventilation, electricity and sound absorption were integrated into the ceiling. Nevertheless, it is only just 35 cm thick. An in-situ concrete construction with a suspended ceiling would have required almost double the building height to provide the same range of functions.

An air-conditioning system is not necessary: The pipe registers heat or cool as necessary. They are divided into zones and can be regulated separately in every room. The installations close to the surface along with the insulating layer above ensure that the heat is conducted efficiently down into the interiors. The high ratio of radiant heat warms the spaces evenly with a minimum amount of convection.

Acoustic slats are integrated flush into the bottom of the ceiling that absorbs a precisely calculated proportion of the noise. This reduces the noise in the spaces and thus creates improved communication and work conditions. The heating and cooling performance thereby remains unaffected. In order to ensure a uniformly white ceiling, a spray-on acoustic plaster finish that is sound permeable was especially developed so as not to hinder the acoustic function.

Source: Green Code GmbH & Co. KG





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[www.syspro.de](http://www.syspro.de)



*Source: Concrete Rudolph GmbH,  
Weiler-Simmerberg, Germany*

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First Edition

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