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Concrete Architecture & Design

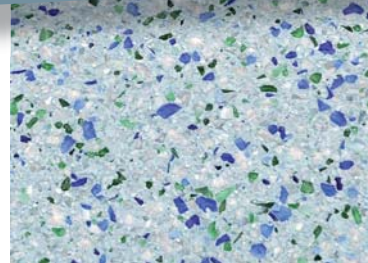
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Special *opusC* FEATURE

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**BRITISH
PRECAST**



The 20 secrets on the Rosary Path are arranged into 4 themes: the joyful, the luminous, the painful and the glorious secrets. >>

Up to the light

Concrete columns on the Hergiswald Rosary Path

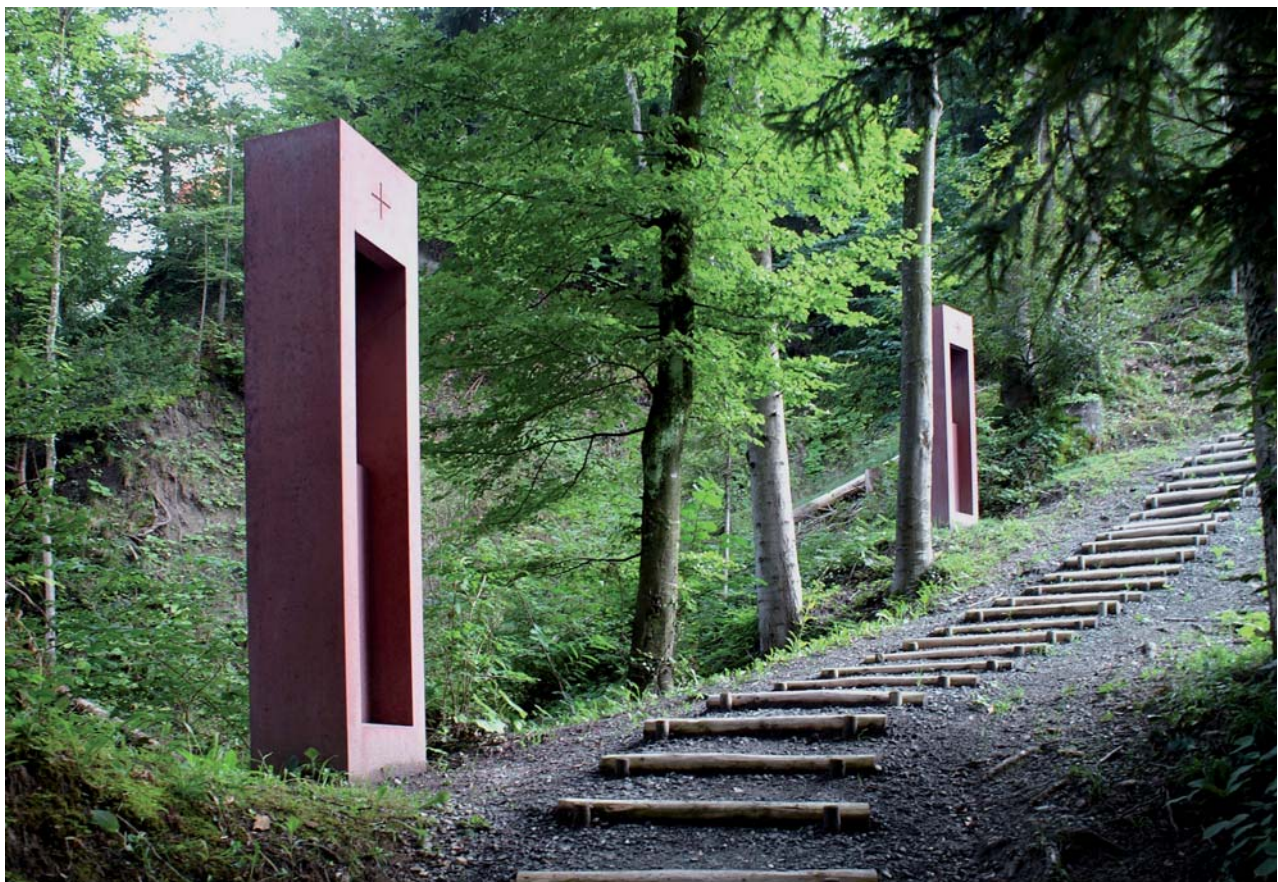
From the Hergiswald wooden bridge up to the pilgrimage church near the city of Lucerne in Switzerland, the log causeway is flanked by 20 abstract chapels in the form of 260 cm high columns symbolising the twenty secrets of the rosary. The Obwalden-based artist Kurt Sigrist created the columns from red-brown concrete together with the Rotzloch works of the MÜLLER STEINAG Group. Very great demands were placed on the end product. The surface had to be cast completely without pores and the edges immaculately sharp edged, which required particular caution when demoulding the picture niches. A steel plate with a welded reinforcement had to be cast in for the attachment to the foundation. The inscriptions proved to be particularly difficult. The positive-milled wood relief was inserted into the formwork, creating recessed lettering in the cast concrete. Demoulding had to be



carried out with extreme care in order to avoid damaging the edges. The desired red-brown colour and the dyeing of the concrete also represented a big challenge. An even colour was demanded from the first to the last column, which was ensured by a very precise

production process. The elements, each weighing 1160 kg, were transported by truck in an upright position to Hergiswald. From there a helicopter took over the exact positioning of the columns in their locations.

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The laid out logs gives the path its name: The „log causeway“ up to the light. Each of the 20 chapels houses a fresco by the artist Franz Wanner illustrating a secret of the rosary.





Facing concrete stoves

Architectural highlights in living areas

Concrete can be given a customised design, is not inflammable and is also a very good heat accumulator. It is precisely these advantageous properties that not long ago inspired Martin Rogmans, a civil engineer from Vilsbiburg, Germany with the idea of planning and constructing stoves and fireplaces with facing concrete elements. "I realised that concrete and fire clay possess practically identical thermal capacities. This makes concrete eminently suitable as a construction material, as it both stores heat and presents a finished visual surface. Facing concrete can replace the outer mantle of a stove; all components that come into contact with the fire, such as combustion chamber or flues, are still manufactured as before in traditional quality fire clay. In its appearance, facing concrete appeals spot on to current tastes," explains Rogmans. He introduced his facing concrete stove idea to architects and planners and met with a high degree of demand.

In the intervening time, Rogmans, the engineer, – in cooperation with Klaus Oswald, a master stove builder – has specialised in planning, constructing and assembling stoves and fireplaces with facing concrete elements and can provide high-class, customised solutions for all types of living and heating situations. From modern panorama fireplaces with a pane of glass



that slides upwards and stainless steel extractor cowl to traditional free-standing stoves, Martin Rogmans can plan the most diverse fireplace variations made from facing concrete each tailor-made to the customer's space requirements and wishes. Whether it concerns a question of smooth side elements, a structured granite block appearance or matching bench seat made of black facing concrete – no limits are set to design diversity. Self-compacting, high-performance concretes with a high proportion of basalt are employed to this end. This ensures particularly good heat storage. Martin Rogmans continues: "For us, it is important that no dominant stove scenarios be created but rather that the elements are integrated unobtrusively into a room. Only when the fire itself has been lit should the stove become the centrepiece of the living area and generate a pleasant atmosphere within its four walls."



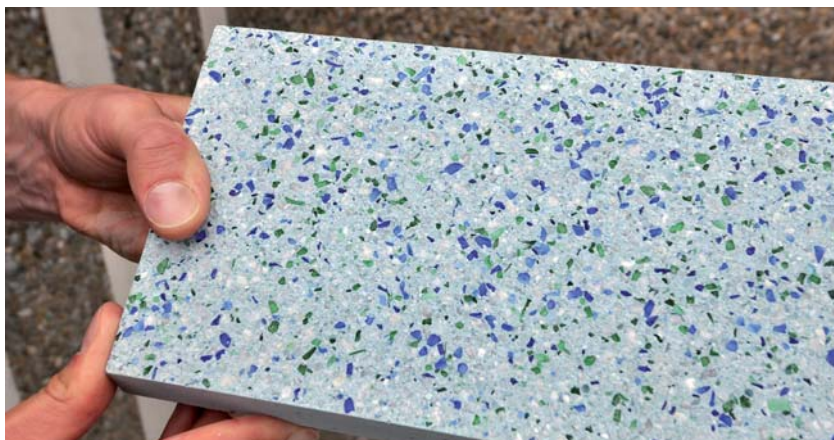
Photo: Martin Rogmans

Panorama fireplace with smoothly plastered stove body made from fire clay and self-supporting bench seat made from facing concrete

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Glass in concrete

New creative possibilities in architecture



A real eye-catcher – genuine glass in facing concrete opens up new possibilities in façade design

Filigree facing concrete façades supplemented by glass that glitters in the sunshine with varying incidence of light. Or high-quality, large-sized concrete panels with flamboyant splashes of colours made from glass. Integrating glass into facing concrete – the concrete specialists from Hering Bau, Burbach, Germany are certain of the fact – will in future make entirely new creative scenarios possible in architecture. Together with the University of Siegen, the company has undertaken research, within the framework of a substantial scientific project over a period of several months, into the possibilities of manufacturing long-lasting, stable concrete recipes with the addition of real glass. This turned out to be a particular challenge since, when concrete and glass bond together – depending on the composition of the glass –, it is well known that the “dreaded” alkali / silicic acid reaction occurs. A viscous alkali-silicate gel forms as a result of the chemical reaction of the glass with the alkaline constituents of the concrete. As the reaction also causes an increase in volume, i.e. there occurs a dilation of the gel, the concrete is simply “blown up”. This finally results in cracks in the concrete, which can have severe adverse effects on its aesthetics, serviceability and longevity.

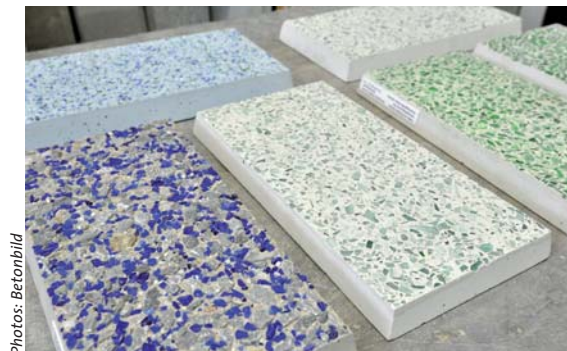
RECYCLING GLASS BEST SUITED FOR THE JOB

Prof. Dr. Reinhard Trettin, who holds the chair for construction and raw

material chemistry at the University of Siegen and who is research partner in the project, explains: “Basically, we knew that certain types of recycling glass react much less with concrete than normal glass types due to their chemical composition and are thus eminently suitable. We then obtained selected samples of materials in varying colours and particle sizes directly from a recycling company. These samples were tested as regards their resistance to alkalis in conjunction with differing concrete recipes and numerous aggregates.” And with success, since in the course of the test series, the team of scientists found the optimum mixture ratio. This means that eight of the glass types tested are suitable for use in practice and fulfil the stipulations of the DAfStb alkali guideline (part 2). The special concrete/glass recipe developed by Hering Bau even complies with the criteria defined in DIN 1045 for load-bearing concrete construction components.

CONSERVES RESOURCES WITH VERSATILE APPLICATIONS

Dipl.-Eng. Reiner Grebe, head of the engineering office at Hering Bau says: “When compared with common aggregates or glass imitations employed up to date, real glass generates substantially more intensive colours. Depending on the incidence of sunlight and perspective of the viewer, these glass aggregates cause a façade to glitter or shine, thus creating an absolute eye-catcher. This



Photos: Betonbild

Sample panels – in the course of the project, concrete recipes were developed that conform to prevailing standards for the addition of yellow, green and blue recycling glass

opens up completely new aesthetic possibilities for architects and planners.” There is also a very wide colour spectrum available. In the intervening time, the experts at Hering have been able to develop concrete recipes that conform to prevailing standards for the addition of yellow, green and blue recycling glass. Last but not least, the innovation is comparatively very friendly to the environment. Valuable resources can be saved by utilising recycling glass. ▮



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