High surface quality on all sides thanks to vertical production technology in North America

Ratec GmbH has developed out of the engineering office Reymann Technik which was established in 1974 and is today a leading supplier of magnetic shuttering equipment for the production of precast concrete elements. The company has set standards with innovative solutions over the last 20 years and has helped decisively to shape the industry. With four locations – in Germany, the USA, Spain, and, since 2017, in Singapore – as well as a worldwide distribution network, the company’s more than 80 employees develop and produce customised solutions that are subsequently readied for series production and establish innovative standard products for the global market.

The upcrete technology has established itself in the past years as a modern and effective solution. This process has already proven its particular advantages several times in projects that were in some cases sensational, like the façade of the Italian pavilion at the Expo 2015 in Milan.

In the current project, the technology is being used for the production of high-quality boundary elements. The manufacturer, which specialises in noise barriers and safety walls, was looking for a production solution with which it could produce its standard walls in high quality as well as expanding the previous range of products.

Upcrete® makes it possible: concrete façade of the Italian pavilion at the Expo 2015 in Milan. Photo © Styl-Comp – Camillo Bonfanti
The company is certified by FDOT, the Florida Department of Transportation, which issues the specifications for the design of noise barriers, amongst other things. These specifications also have to be taken into account with regard to the shuttering.

Several advantages of production with upcrete come into effect in the new plant:

1. The vertical production enables the contouring and texturing of the wall surfaces on both sides.
2. For walls that are textured on both sides, pumping from below into the shuttering guarantees that even fine structures are formed perfectly and no air inclusions impair the surface quality.
3. With the help of the pre-lined battery pockets, large quantities of identical elements can be produced quickly, efficiently and in constant quality.

The decisive advantage is the surface quality on all sides of the finished element resulting from the pumping process, which presses the excess air upwards and out of the shuttering.

To put it in a nutshell: upcrete is particularly well suited where special demands are made of the surface quality and elements with complex geometries are to be manufactured.

Noise barriers with contoured surfaces are manufactured in the pre-lined battery moulds. Photo: Intrepid Precast Technologies LLC

Walls with textured surfaces on both sides are produced in Florida using form liners suspended in the moulds. Photo: Intrepid Precast Technologies LLC
This process, as simple as it may seem, has been continuously developed by Ratec for over a decade in various test series and by means of pump trials. Only in this way can the system components (shuttering, pump, filling connection and concrete recipe) be matched optimally to one another.

Individual solution for Florida

The customer’s production area extends to almost 2000 m² in two halls. The upcrete plant is installed in Hall 1 together with a tilting table production plant for special elements. The upcrete plant includes three battery moulds in total:

- Type A: 1 x 10 pockets, size 6.0 x 1.8 m and 1 x 5 pockets, size 6.0 x 2.4 m
- Type B: 1 x 10 pockets, size 6.0 x 3.6 m

Noise barriers with a fixed contour and fixed size are manufactured in the type-A moulds (figure 2). The walls of the battery are permanently lined in accordance with the desired wall contour, allowing the fast manufacture of identical elements in a constant high quality. The two batteries installed cover different standard lengths.

The type-B mould is not pre-lined and is flexibly usable for the most diverse elements in variable sizes. It is used amongst other things for the production of noise barriers with form liners on both sides (figure 3). These are realised using so-called form liner panels, which are suspended in the mould and are available with numerous surface textures.

All battery moulds are designed as a double system and can thus be extended by further pockets in order to increase the production capacity still further in future.

An upcrete UPP100 pump station is used for filling. The production capacity of the plant is around 300 m² or 150 linear metres of wall per day in single-shift operation.

Important for the customer: he not only gets the technology, but is also given comprehensive know-how with which to operate his production plant efficiently and to a high quality standard. The project was a first for Ratec, since the battery moulds were manufactured in parallel at the company’s production locations in the USA and Germany.
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