

Progress 3D Concrete Printing, 39042 Brixen, Italy

3D concrete printing offers entirely new possibilities in precast construction

The Progress Group from Brixen (Italy) has achieved a technological breakthrough with its specially developed SPI 3D concrete printer (Selective Paste Intrusion). With complex shapes, high precision and sustainable use of resources, the process can offer completely new options for the precast industry. The resort Pareus in Caorle is now the most important reference project to date, impressively demonstrating the possibilities of the technology on a large industrial scale.

New dimensions in form and function

The SPI 3D concrete printer developed in the research and development department adds a flexible tool for architects, engineers and manufacturers to traditional precast element production. Thanks to a layer resolution of just three millimetres, components are produced with a very high level of detail – from façades and furniture to customised precast elements. With dimensions of 5.00m long, 2.80 m wide and 1.5 m high, the printer is designed to ensure that transport and further processing remain efficient.

SPI technology: Layer by layer to the top

The Selective Paste Intrusion (SPI) process works in a similar way to Selective Laser Sintering (SLS). Whereas in SLS a laser melts the powder, in SPI a print head applies a cement paste made of water and cement to a bed of sand with pinpoint accuracy. The cement hardens the sand mixture at the intended points and thus forms the desired geometry. After each layer, the platform is lowered and a new layer of sand is applied. The loose sand therefore acts as a supporting structure throughout the entire process. Once printing is complete, the material hardens within 24 hours and the excess sand is vacuumed off and completely reused.

Symbiosis of aesthetics and functionality

With the SPI technology, the Progress Group offers completely new design freedom, especially for façade design. The system combines the advantages of 3D printing with the proven properties of double wall systems. The outer layer is customised using the 3D printing process, offering a high

The sand bed of the 3D concrete printer serves as the basis for the production of various forms and elements.



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The SPI technology enables flexible design of any geometry.



The 3D concrete printer sets new dimensions in precast construction.

degree of architectural design freedom and a unique look. The subsequent layer consists of standardised double walls, which provide stability, thermal and sound insulation. The resulting symbiosis of design freedom and functional quality sets the standard for modern construction projects.

Sustainability as a core principle

The process only uses material where it is really needed. The support structure of the sand bed can be completely reused after the process. This significantly reduces material consumption, CO₂ emissions and waste. This opens up not only economic, but also ecological advantages - without compromising on design or functionality.



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*Façade element with
3D-printed brick texture.*



Unfinished holiday home with 3D-printed concrete façade elements.



Shell of the Pareus project in the holiday resort of Caorle (Italy).

Resort Pareus in Caorle: Lighthouse project in the industry

The resort Pareus in Caorle, Italy, is currently a major reference project for industrial 3D concrete printing. On a construction area of around 28,000m², 28 holiday homes are being built, whose load-bearing and shell structures are being realised to a large extent using innovative SPI technology. The scope of delivery comprises a total of 11,000m² of façade elements, including 4,000m² of 3D façade with Green Code Thermowand Plus®, 4,300m² of double walls and 4,000m² Green Code Eco Slab® and 1,500m² Progress XM-Slab®. Pareus thus manifests itself as a project of exceptional technical relevance. For the first time, it demonstrates on a large scale that additive manufacturing can be used not only as a complementary but also as a load-bearing production method in precast concrete construction. In particular, the Green Code Thermowand Plus® emphasises the focus on sustainable solutions.

Timetable and economic significance

Completion of the building shell is set for summer 2026. The opening of the entire resort, on the other hand, is scheduled for May 2027. In addition to architectural freedom and high quality, the project also demonstrates economic efficiency. Controlled factory production speeds up processes, reduces costs and at the same time guarantees very high precision. This optimises the use of resources and guarantees implementation on schedule.





3D-printed wall element for the Pareus Resort.



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International signalling effect

The resort Pareus is regarded as a benchmark for future large-scale precast construction projects. With its dimensions and technical complexity, it establishes 3D concrete printing as a commercially viable process. The combination of economic efficiency, sustainability and design flexibility sets new standards and can make the Progress Group's SPI 3D concrete printing a strategic tool for the precast concrete industry worldwide. ■

FURTHER INFORMATION

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