VERTICO

Catalogue 2023

Contents

Printing on demand

Using parametric tools to design and realise unique concrete objects

Voronoi

Parametric Wall

This project from 2018 showcases the advantages of parametric design in combination with the freedom of concrete 3D printing. The design is by Saxion University Enschede and is a great example of how simple design can result in complex forms.

Optimised

Concrete bridge

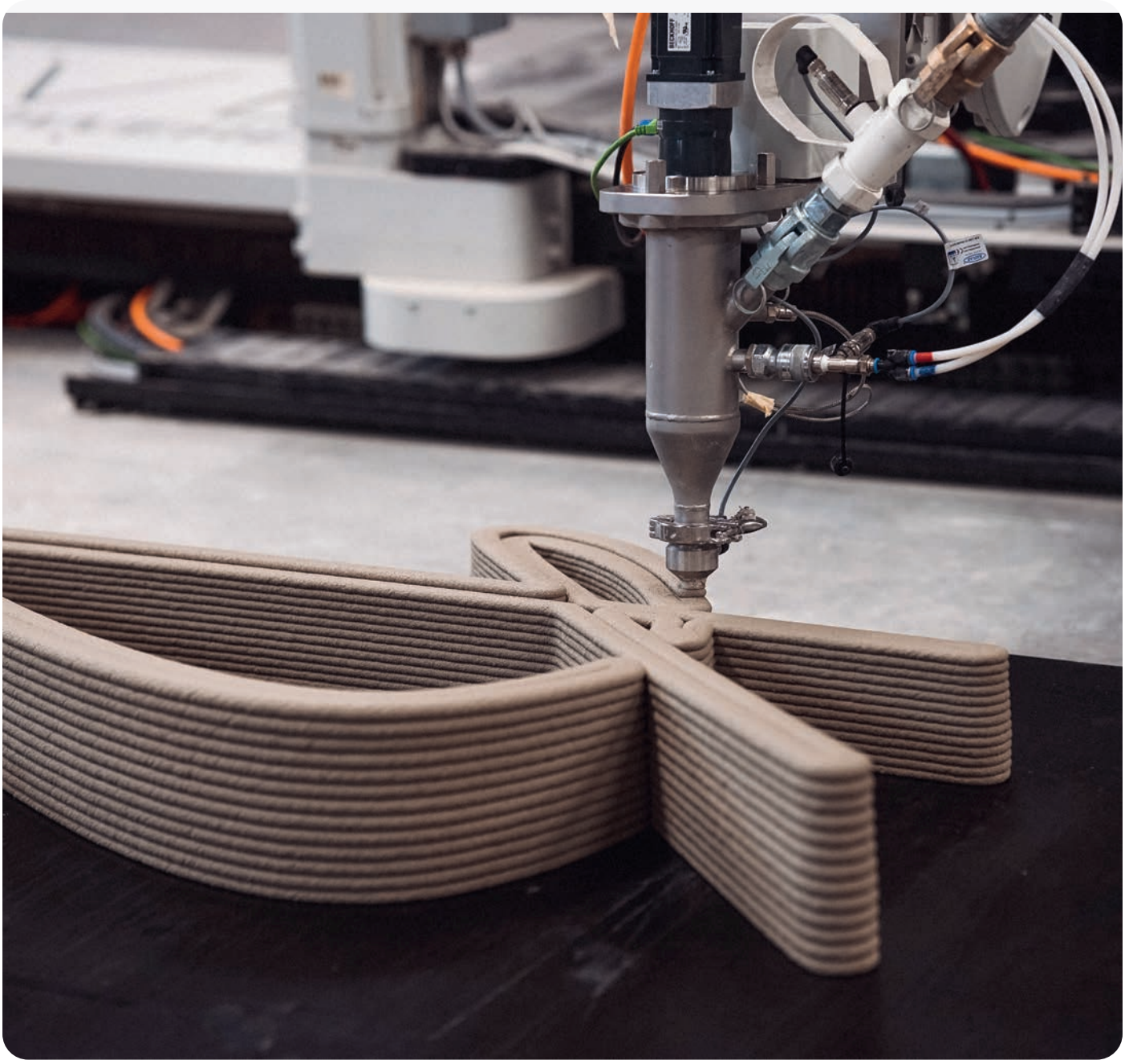
The TU Gent and Technion designed this topology optimised bridge. Compared to traditional manufacturing, this bridge boasts significant material reduction. 3D concrete printing is ideally suited to take advantage of these structual principles and create organic forms. The reduction in cost and formwork plays an important role.

Design

Hanging gardens

Together with Christian Odzuck we designed the hanging gardens.

The technology, and the exploration of what is possible with 3DCP was central within this project, resulting in a 1on1 and 1 on 20 prototype, exploring the possibilities and beautiful patterns.



Museum

Bench

Designers Kiki & Joost collaborated with Vertico to print public benches for the Singer Museum in Laren for Heilijgers BV. The result is a highly complex form inspired by a pen stroke.

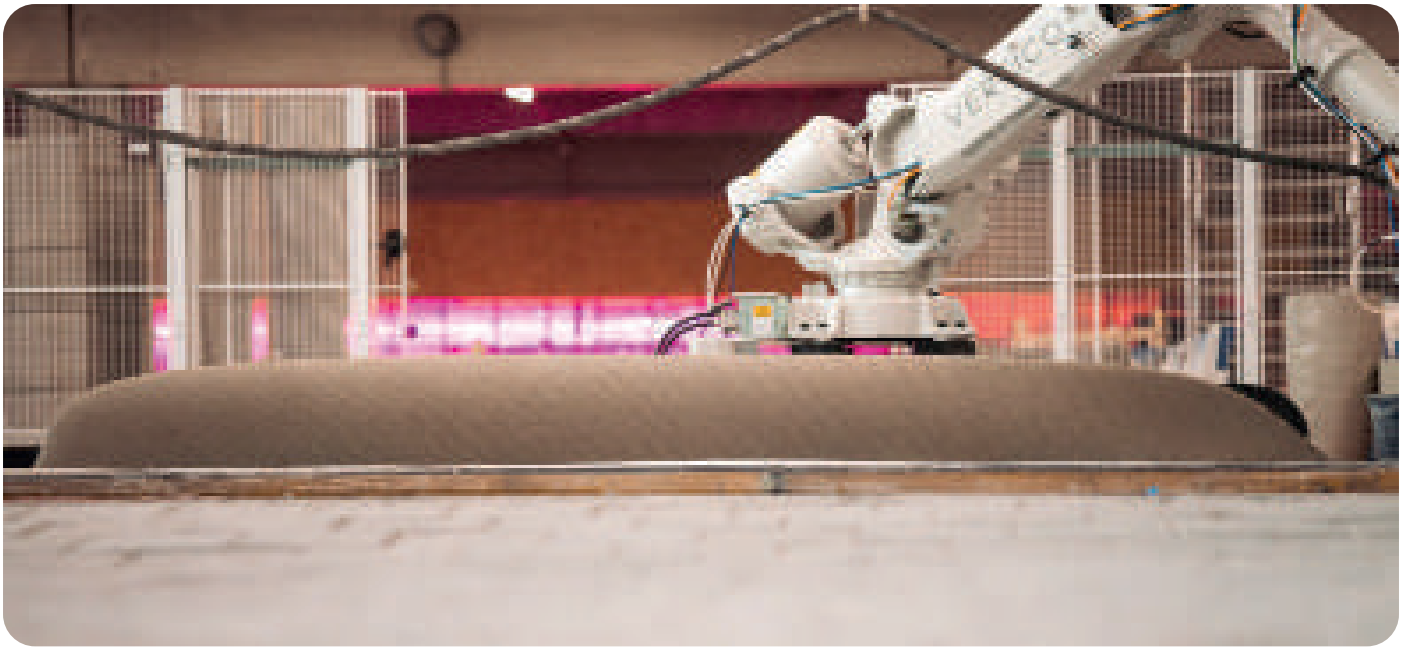
This bench was stress tested (see image left) and was found to have a capacity of 10kN bearing load.

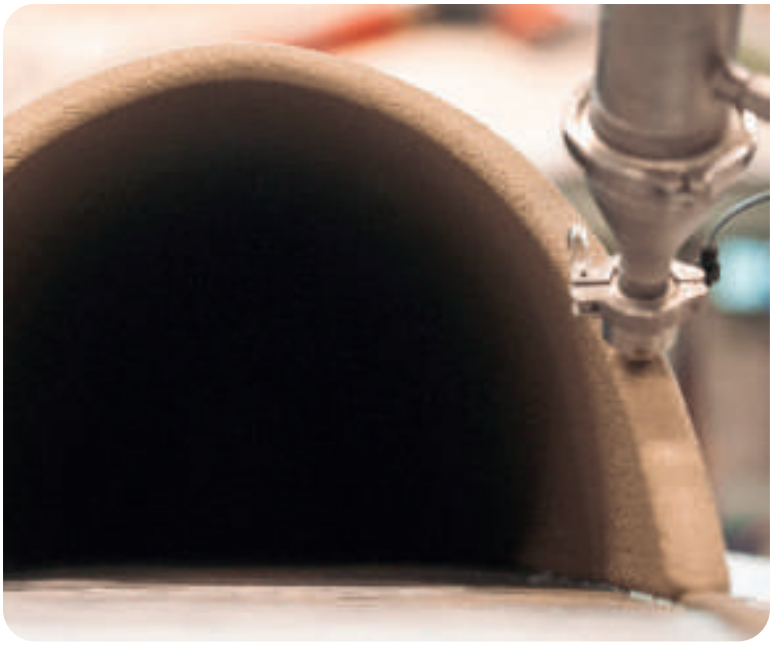
Office

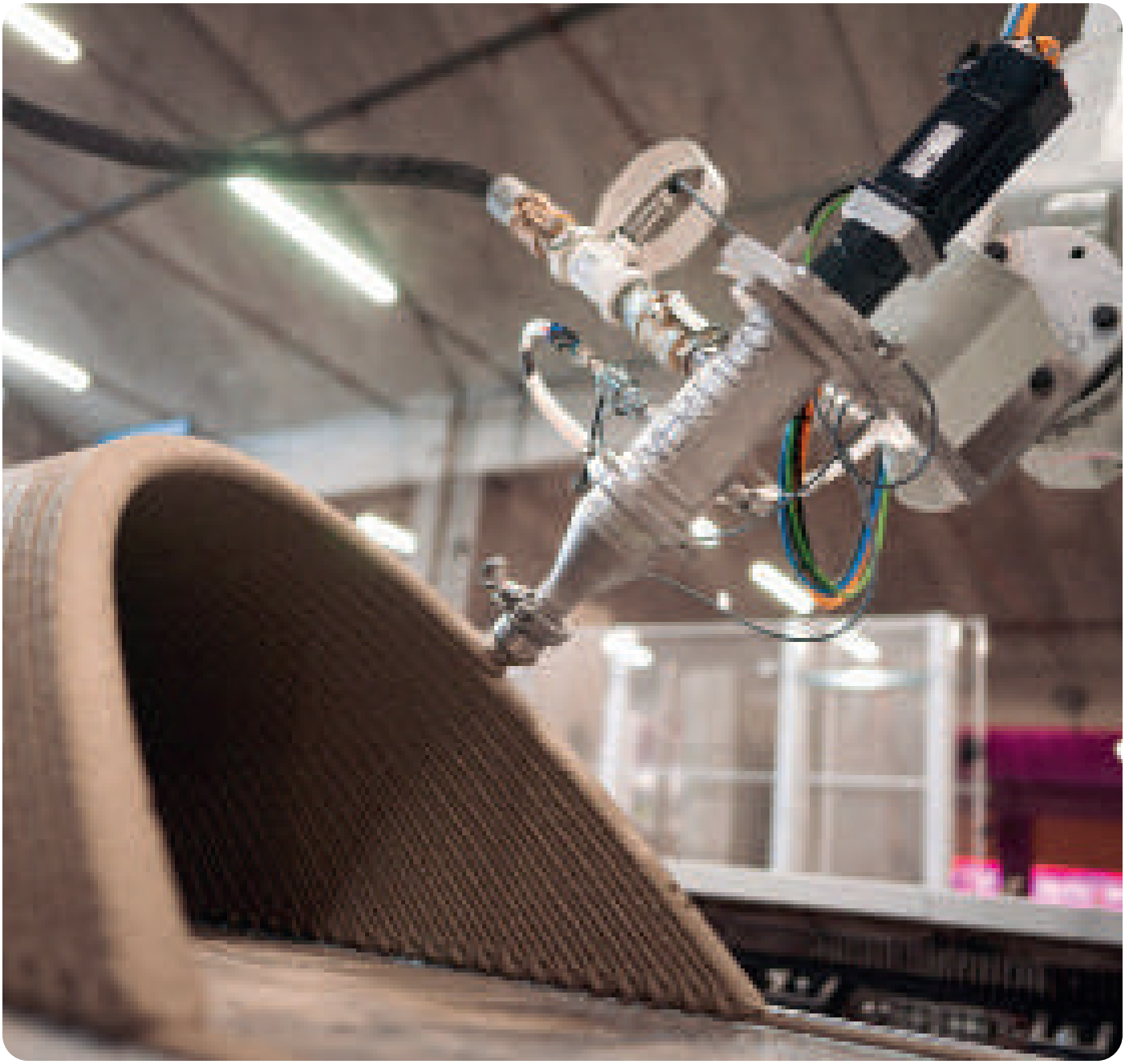
Interior Planter

This project from 2023 showcases an example for indoor office environments.

Together with Heiliggers we designed this planter with intergrated seating, as a nice place to lunch, relax, and enjoy nature in your office space.







Canoe

Nubian vault inspired

The first project ever printed by Vertico was a concrete canoe, in early 2018. At the time we used 1700kg of sand to support the overhang of the structure.

This year's edition (2022) showcases the progress that we have made. Inspired by Nubian vaults, we were able to print the canoe without any support material whatsoever.

2021-2022

Dutch Design Week

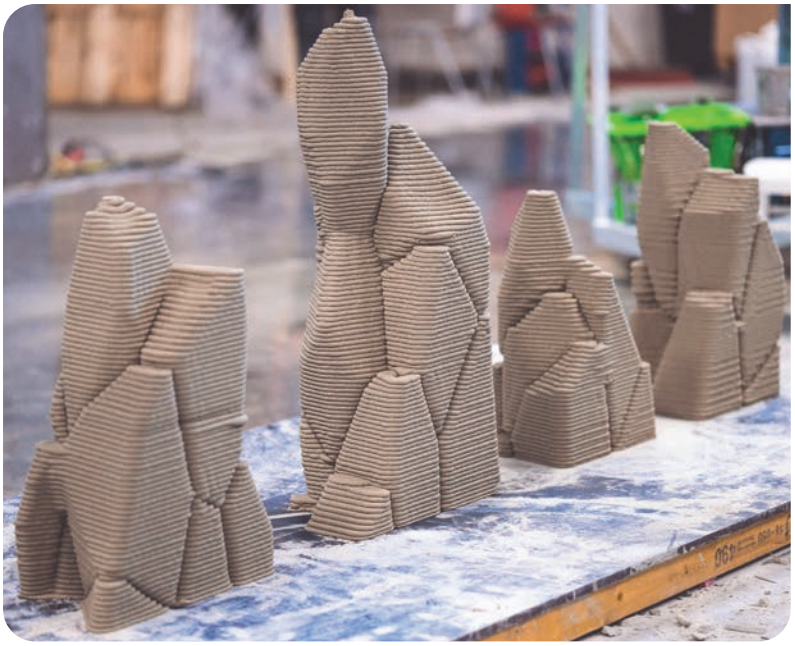
Vertico has showcased their technology in the previous two Dutch Design Weeks in Eindhoven. On both occasions, Vertico worked with the TU Eindhoven to realise these impressive structures.

Our accelerated 3D concrete printing technology offers several key advantages compared to other concrete printing systems. Some of these include:

- Extreme overhang angles
- Thin walled, lightweight structures
- Highly detailed patterning
- Very quick setting times

Microbiocene

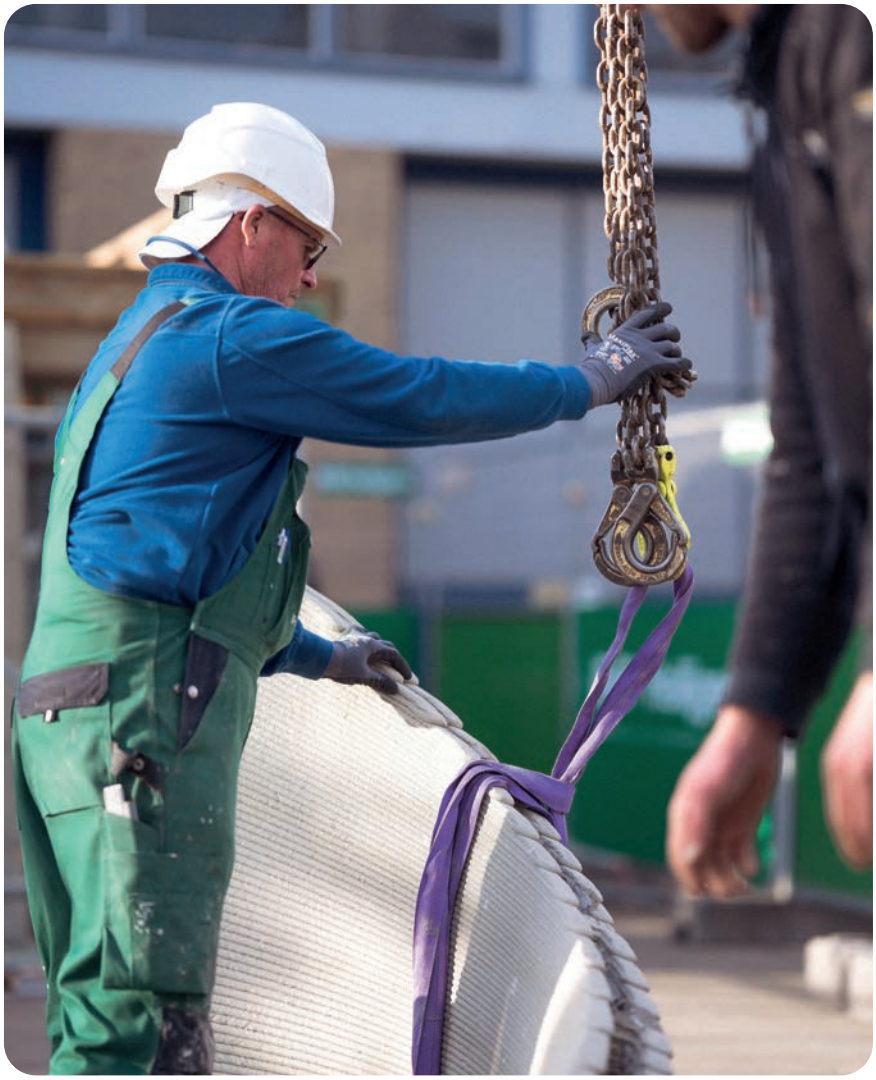
Using the full potential of form freedom offered by robotic 3D printing, our technology is very well suited for artists and designers to realise designs never before seen. Vertico routinely collaborates with artists from all over the world.



Mars Habitat

TU Delft & ESA

Vertico supports the TU Delft and the European Space Agency in pushing the boundaries of 3D printing off-planet. This research project investigates the possibility of establishing habitats on Mars. We were able to succesfully print with actual Mars Regolith simulant.

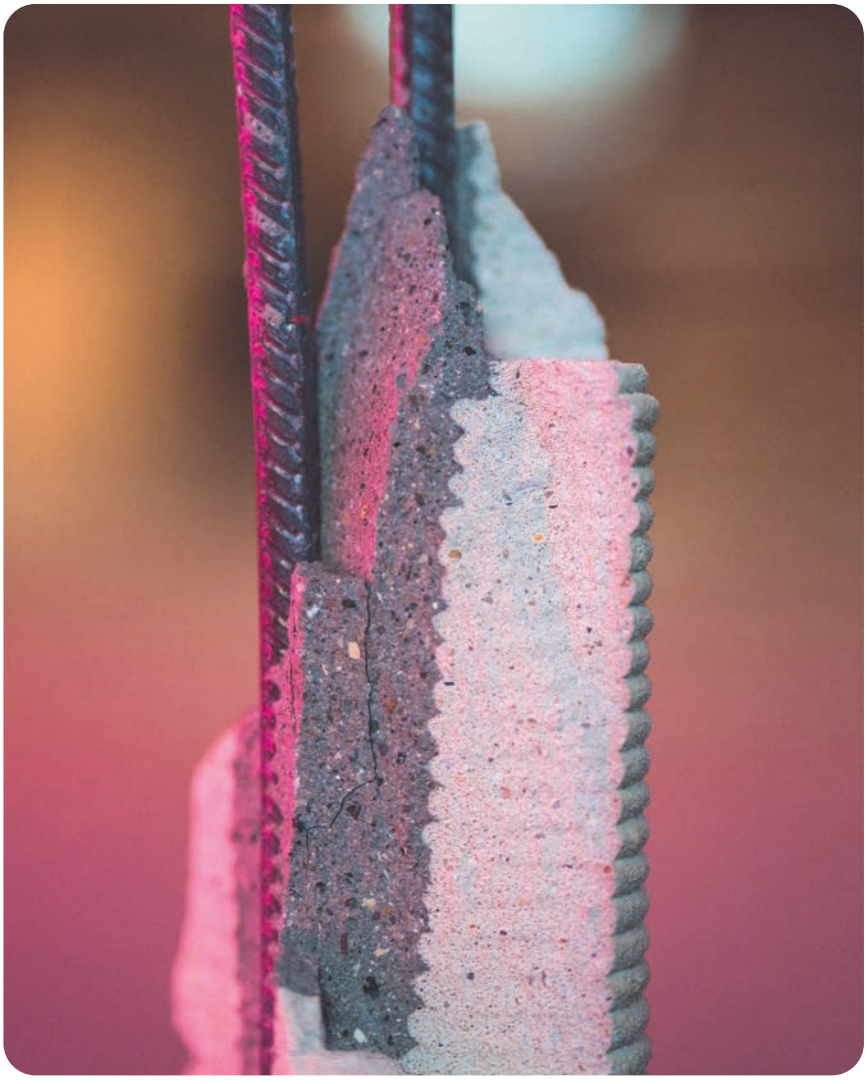


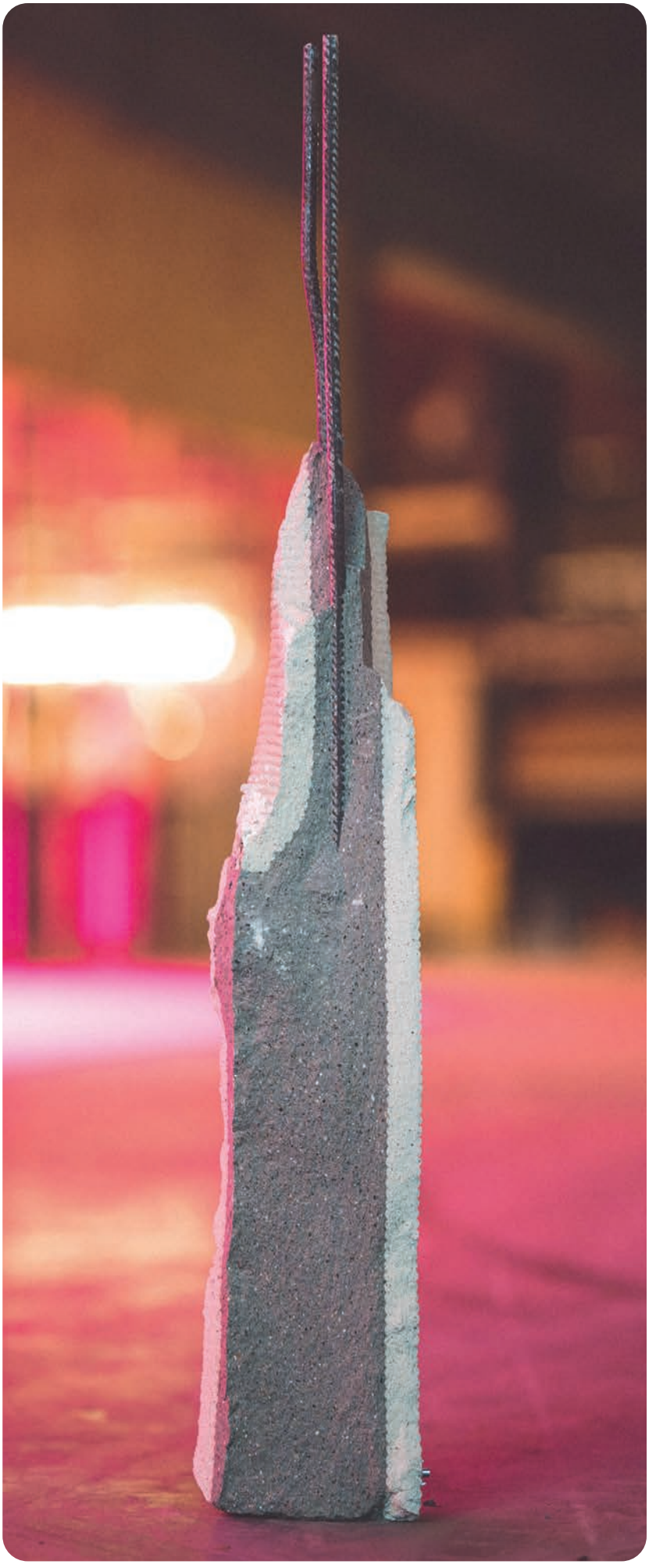
Shells

Pavilion

At Vertico we aim to push the boundaries of what is possible with additive manufacturing. Our first pavilion is an optimized, modular, shell structure. What's more, it eliminates the need for custom formwork.

This project shows what can be achieved when a group with a likeminded spirit of perseverance commit to a common goal, De Huizenprinters.





Structural

Reinforcement

Textbook example of 3D concrete printed, thin walled formwork with reinforcement inserted and standard self compacting concrete, with very high compressive strength. Design by the University of Liverpool.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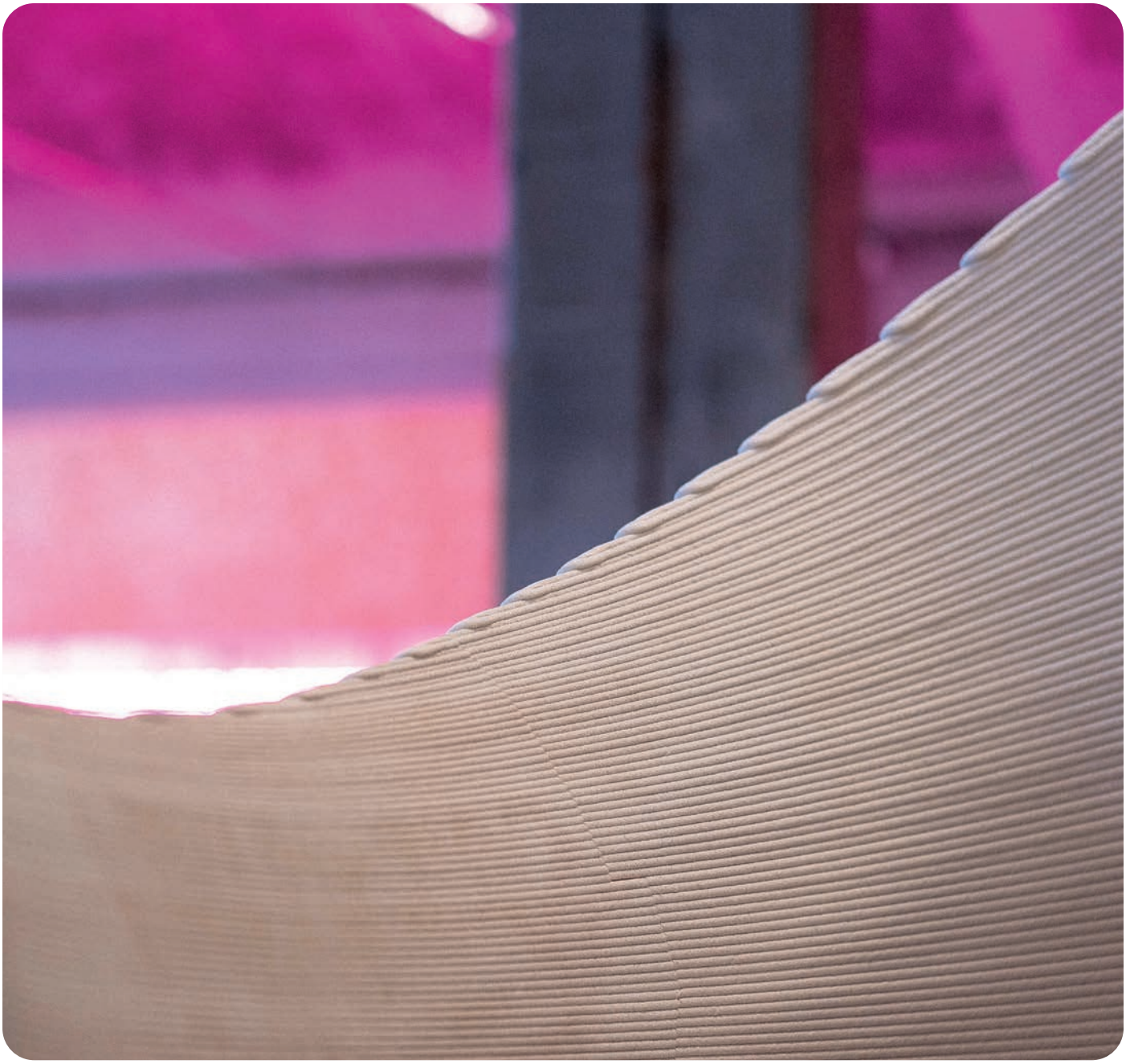
Stay in place Formwork

Structural

Column

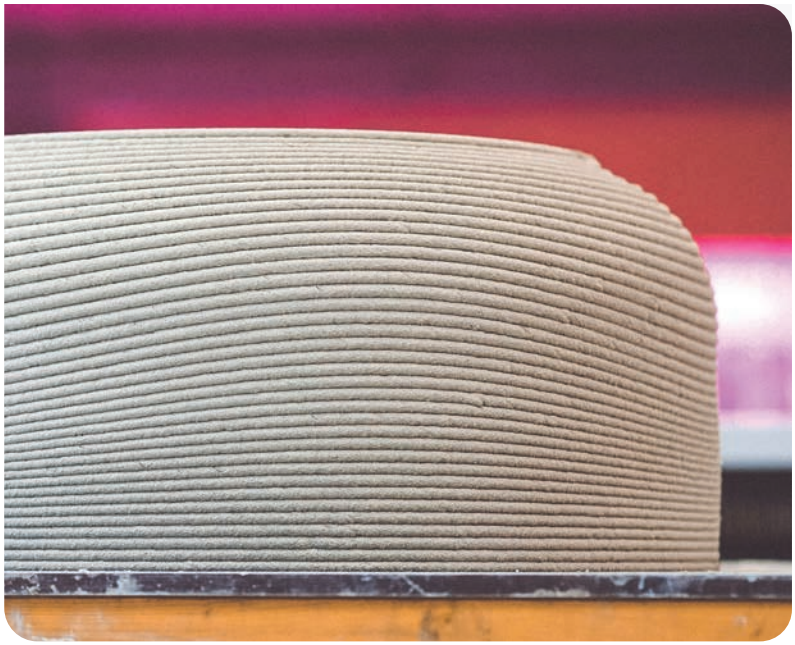
The optimised column is a prime example of how you can take full advantage of the new design language of concrete printing whilst retaining full structural performance. The formwork is printed, reinforcement is inserted and traditional pouring completes these fantastic columns.



Non Planar

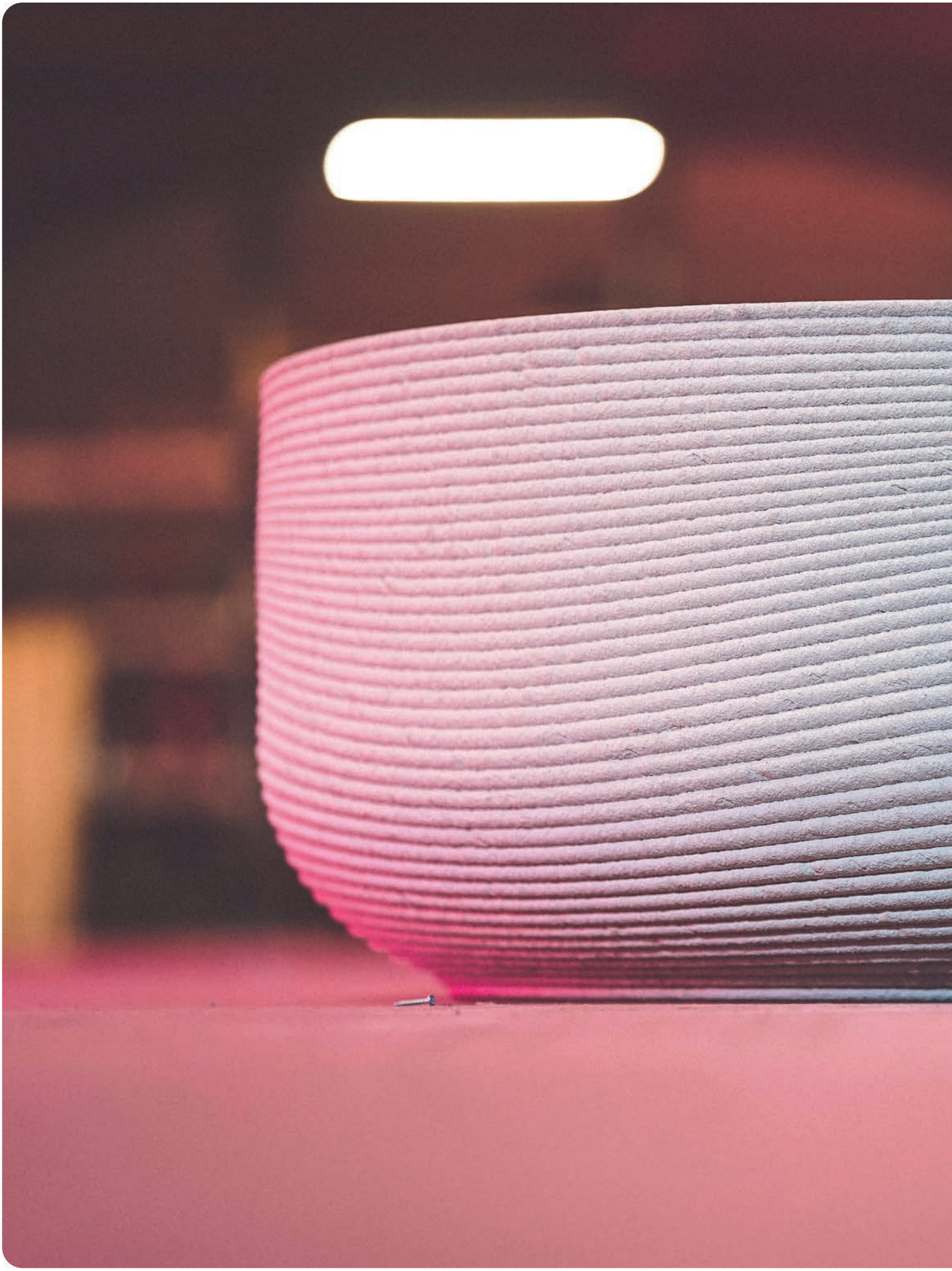
Variable layer height

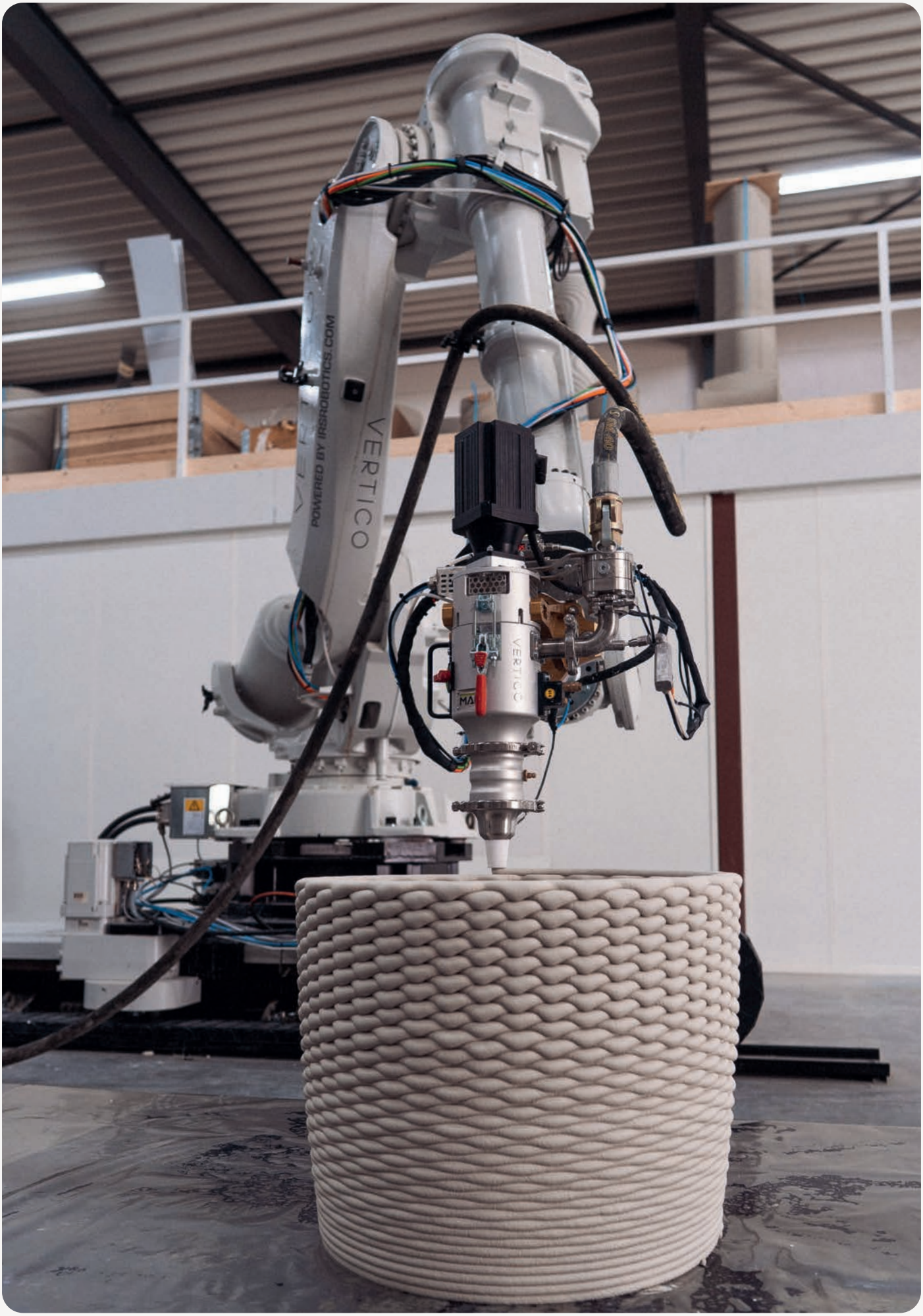
Vertico pioneers the use of robotics in 3D printing and pushes the limits of what is possible. With our proprietary software, we are able to produce toolpaths with varying layer heights and widths. Our software is included with any machine purchase, license free, so you can pioneer with us.



Creating a new design language

We explore the aesthetic potential of this breakthrough technology. Our Accelerator Printhead allows us to produce patterns with high accuracy and variability. The parametric design software combines seamlessly with our slicing capabilities. Expect more breathtaking designs from us in the future.

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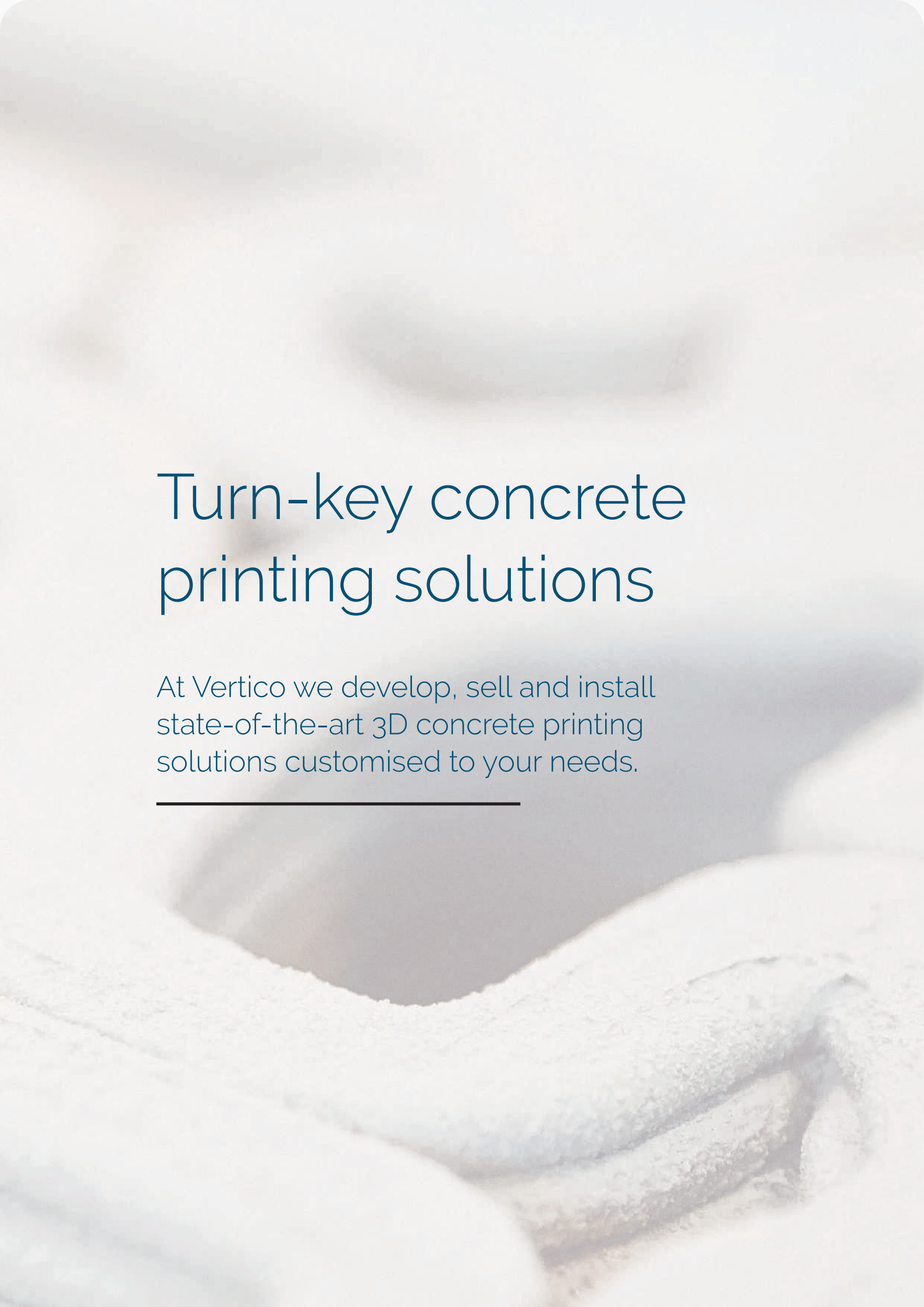
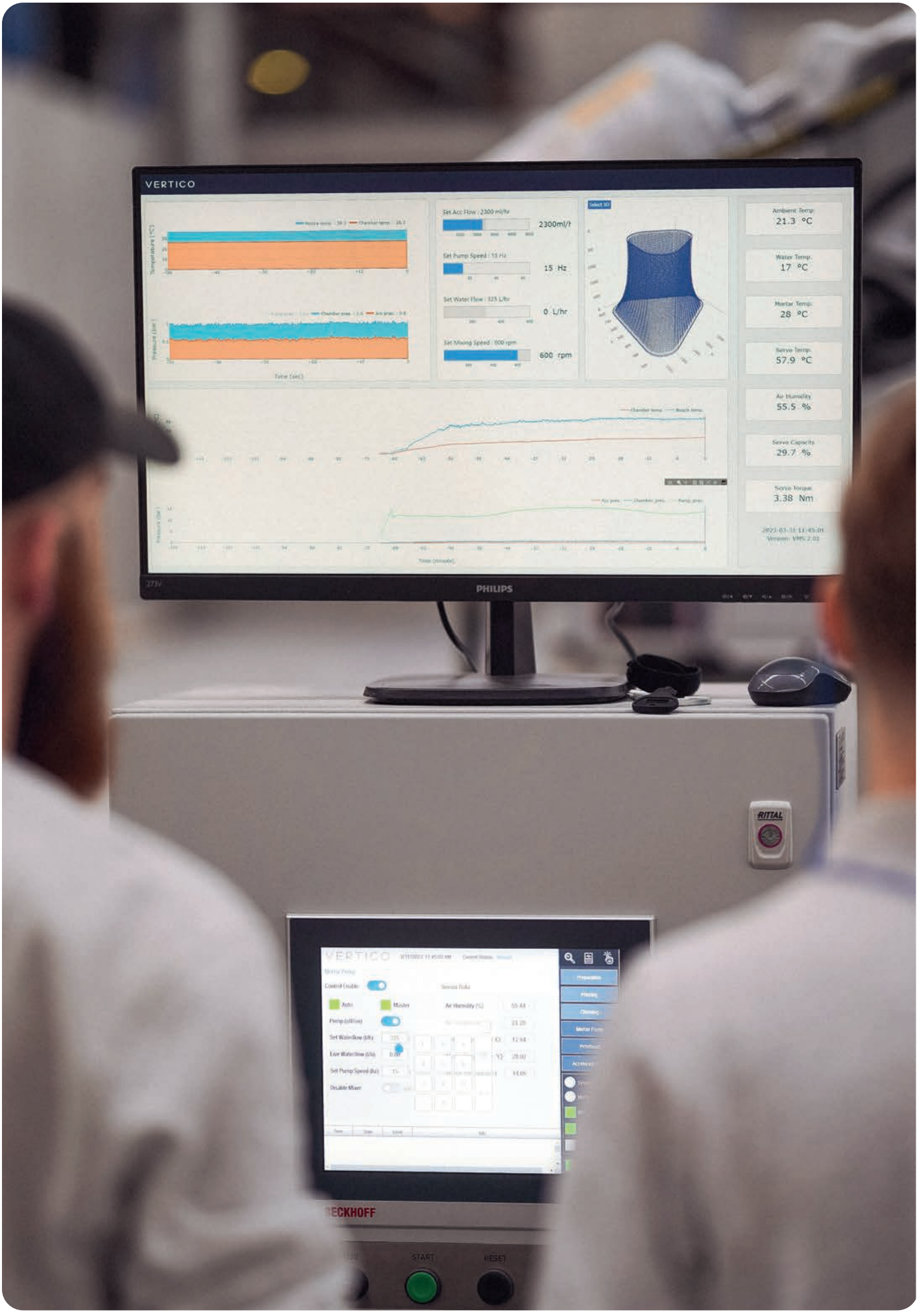


Turn-key concrete printing solutions

At Vertico we develop, sell and install state-of-the-art 3D concrete printing solutions customised to your needs.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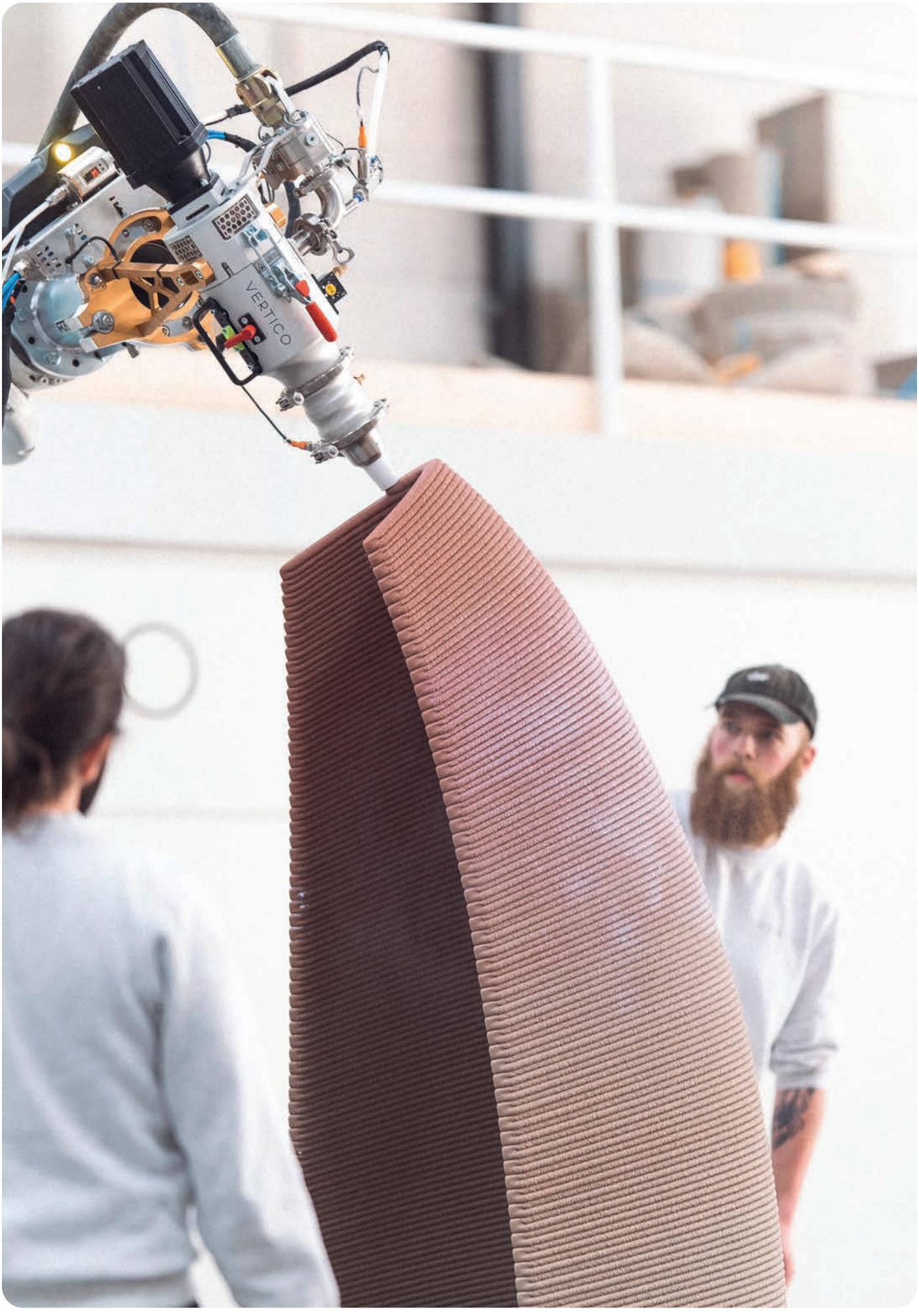
Set Acc Flow : 2300 ml/hr
2300ml/h
Set Pump Speed : 15 Hz
15 Hz
Set Water Flow : 325 L/hr
0 L/hr
Set Mixing Speed : 600 rpm
600 rpm
Ambient Temp.
21.3 °C
Water Temp.
17 °C
Mortar Temp.
28 °C
Servo Temp.
57.9 °C
Air Humidity
55.5 %
Servo Capacity
29.7 %
Servo Torque
3.38 Nm
PHILIPS
RITTAL
BECKHOFF
START
RESET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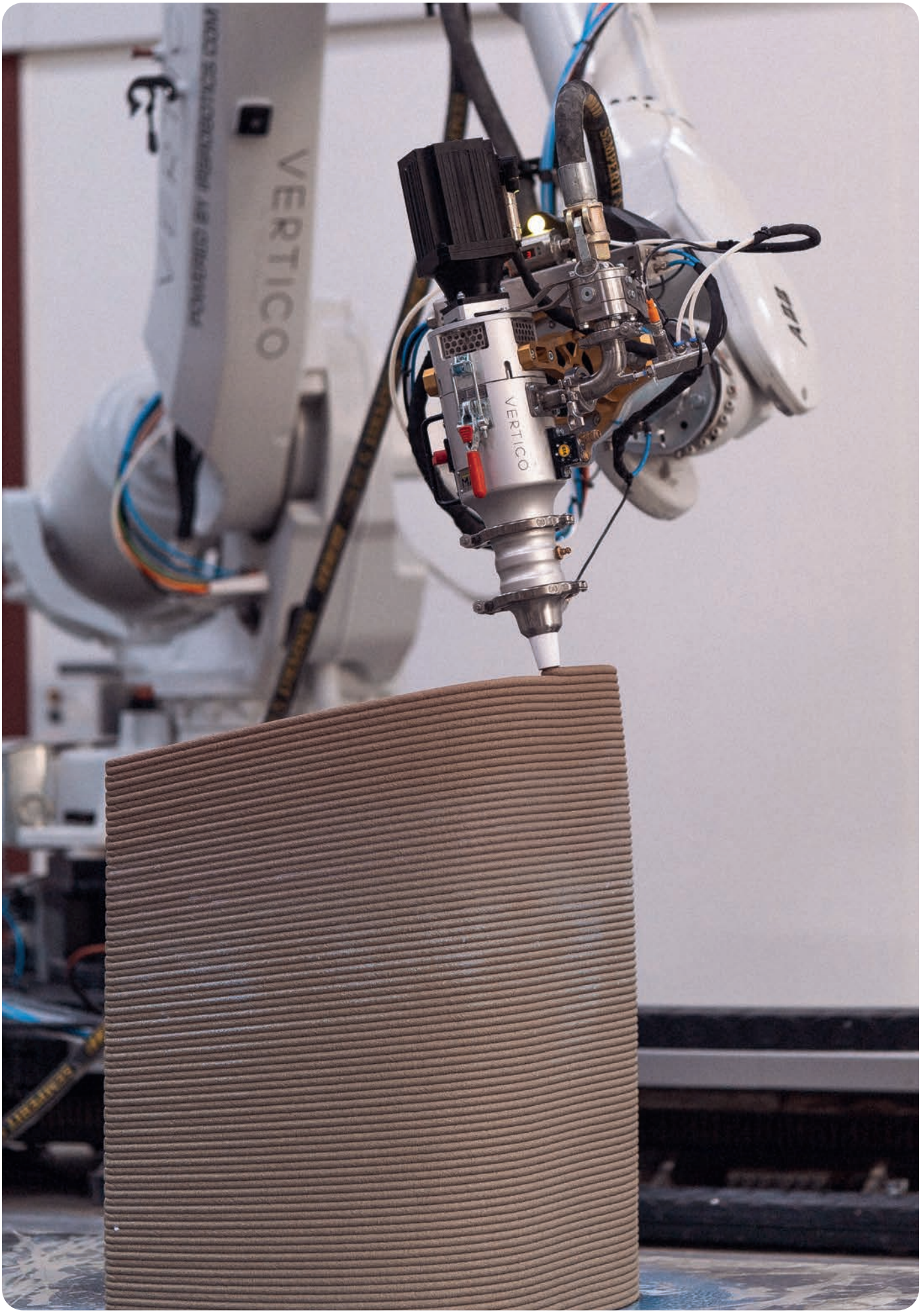
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Accelerator Printhead

Set-on-demand concrete

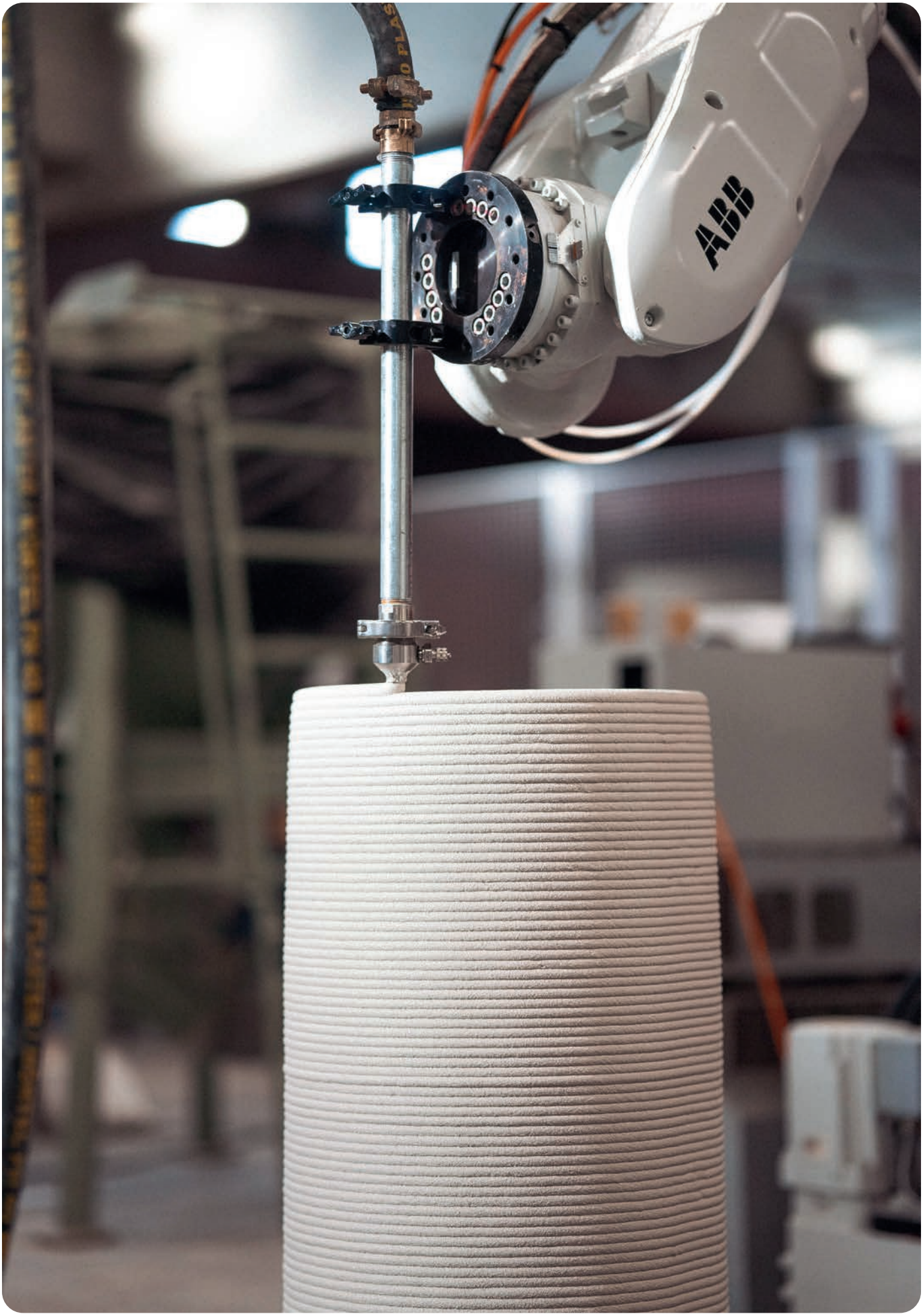
Experience the best of 3D concrete printing with the Accelerator Printhead. Developed in collaboration with Mai International, this state-of-the-art solution sets a new standard for industrial set-on-demand concrete printing. Benefit from Vertico's expertise in robotic 3D printing and Mai's extensive experience in mixing and pumping, resulting in a hardware and software solution that leads the way in the industry.

QUALITY AND INTERGRATION
Discover unparalleled mixing quality and eliminate deformations with the Accelerator Printhead Solution, the printhead works with the best concrete printing pump availabile on the market - the Mai Multimix.

The solution is fully integrated and runs from a centralised Human Machine Interface (HMI). The full solution features multiple in-line pressure and temperature sensors and also measures air humidity, accelerant flow rate, motor torque and much more. All this information is monitored live in order to take timely action. The operator has full control over the machine from its touch screen interface.

MATERIAL
We have developed our own material which produces high resolution, stable printing. Our material recipe is provided free of charge with the purchase of a machine for your own local production. Additionally, you are free to use any material on the market on the machine.

SOFTWARE
Our advanced slicer software was developed in-house. The full software and training are provided, license-free with the purchase of a machine. At Vertico we work to design and realise the most complex prints on the market. Our software reflects this ambition.



ABB

Construction 3D Printing

Mono-Material

Printing for construction requires a different material strategy. Printing very large structures requires a material with a longer open time. The Vertico concrete printers are fully capable of printing both Accelerated and Mono-Material.

PUMP
We work with the best concrete printing pump available on the market - the Mai Multimix. This pump is able to pump the largest range of materials and has a large output volume range. It can be integrated with a silo and boasts advanced data reading.

MATERIAL
For construction 3D printing we are open to working with material from any supplier. We have succesfully printed many of the materials currently on the market and can provide relevant feedback and local reseller contacts.

SOFTWARE
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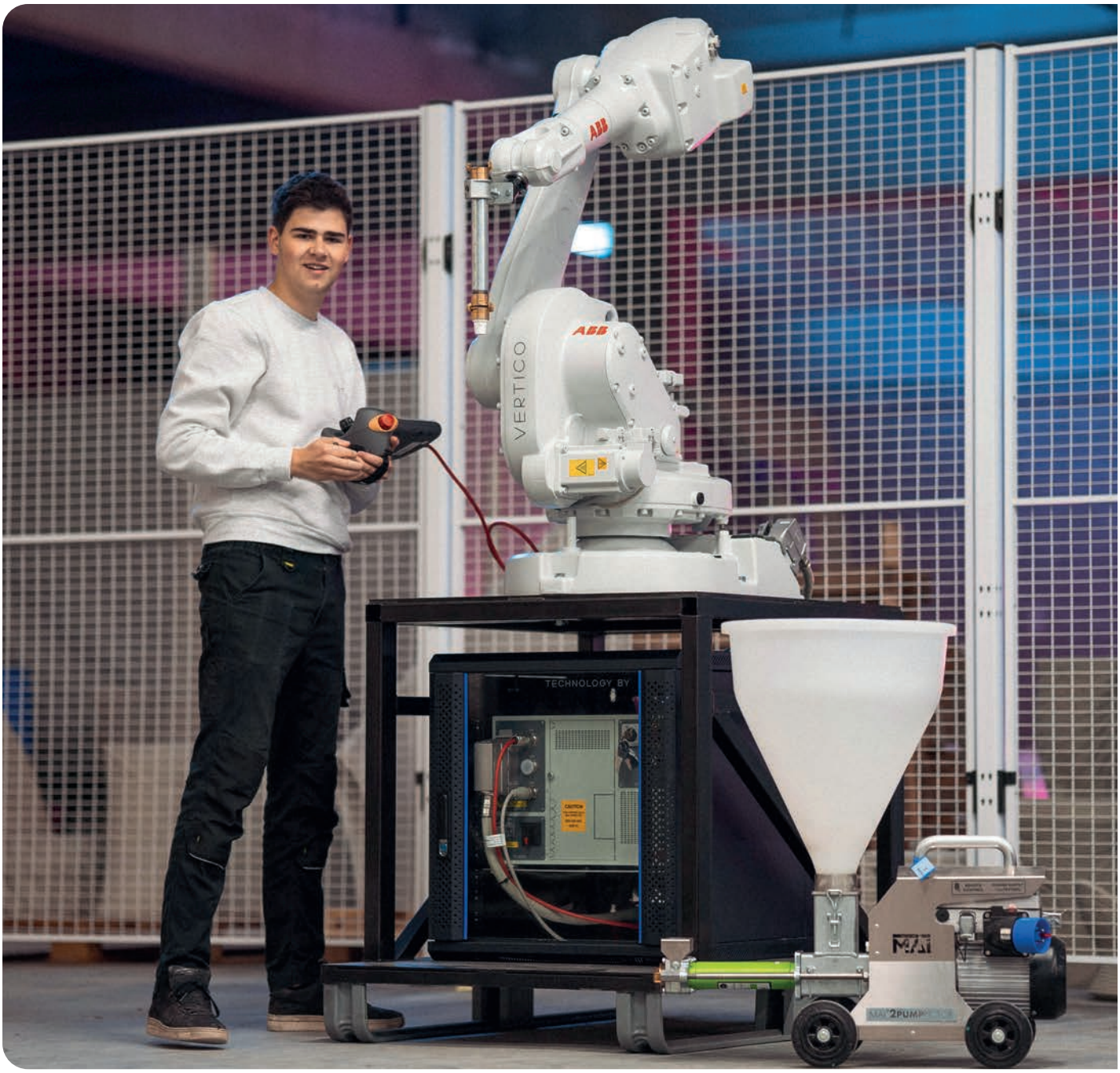
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TECHNOLOGY BY

EVA setup

Getting started in concrete printing

Popular with universities and material suppliers, this little machine offers access to all the basics of concrete printing: robotics, software, pumping and material. It can be stored away easily when not in use, which will be the case sometimes as it is not a production machine.

EVA can be integrated with different safety systems such as light curtains or fixed safety fences. However, generally it is run in manual mode meaning the speed is limited to 250mm per second and the safety switch is permanently engaged. As a result, most clients will run the machine without safety fences.

Designed for material research and training, our compact printing solution is the ideal introduction to this groundbreaking technology.

EVA has a footprint of 80cm x 120cm and requires no installation. Additionally, it runs on a standard 230V power supply.

We design:

Solutions in all sizes

With the Vertico 3D concrete printing setup you are fully set to enter a new market. Our deep industry knowledge and all-round printing experience make us excellent partners to get you started. You are free to choose your material supplier and our advanced slicer software is free of charge!


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We deliver:

Installation on site

A Vertico team will fly out to you for installation. With engineering done beforehand, there should be not surprises. The same team will them do commissioning, full hardware and software training.


VERTICO
ABB

We do:

Printing on demand

Let us print your project at our 3D concrete printing facility. Our print engineers will make sure your project is a success; assisting in design-for-printing to code generation and realisation. Feel free to reach out.

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