

COBOD CONNECT

SEPTEMBER 28, 2023

The event will be recorded.

**Use the Q&A feature to ask questions during presentations,
followed by a brief Q&A session after each.**



WELCOME & INTRODUCTION

Welcome to our COBOD Connect Event!

This biyearly gathering is more than just an event; it's a recognition of our collaborative achievements and a platform to unveil the strides we've made. Today, we'll explore some customer projects and COBODs latest into our latest innovations.

Beyond just updates, expect interactive sessions, firsthand experiences of our new offerings, and the opportunity to share your insights with fellow COBOD customers.

Gear up for an enriching and engaging time ahead!

COBOD participants



Henrik Lund-Nielsen

Founder & General Manager



Zoë A. C. Knudsen

Head of Products & Communication



Gerius Moelich

Head of Materials

AGENDA

Timing*	Topic	Presenter
09.00 - 09.20	State of the union	Henrik Lund-Nielsen Zoë A. C. Knudsen
09.20 - 09.30	Product launches	Zoë A. C. Knudsen
09.30 - 10.05	Innovations	Henrik Lund-Nielsen Gerius Moelich
10.05 - 10.25	PERI presentation	Michael Osswald
10.25 - 10.45	L&T presentation	S. Lakshmi Narayanan
10.45 - 11.00	Q&A & competition	Henrik Lund-Nielsen Zoë A. C. Knudsen

*Central European Time (CET)

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COMPILATION OF PROJECTS DONE BY COBOD'S PRINTERS

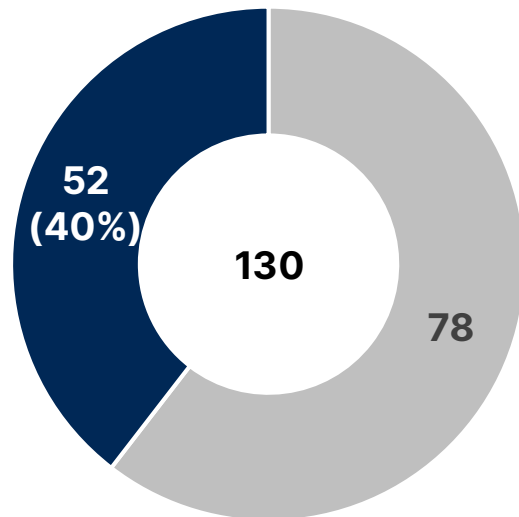


COBOD LEADS THE GLOBAL CONSTRUCTION 3D PRINTING INDUSTRY

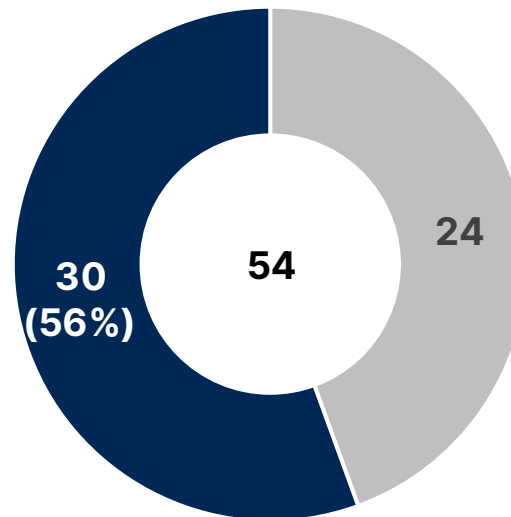
OVERVIEW PER DEC 31, 2022



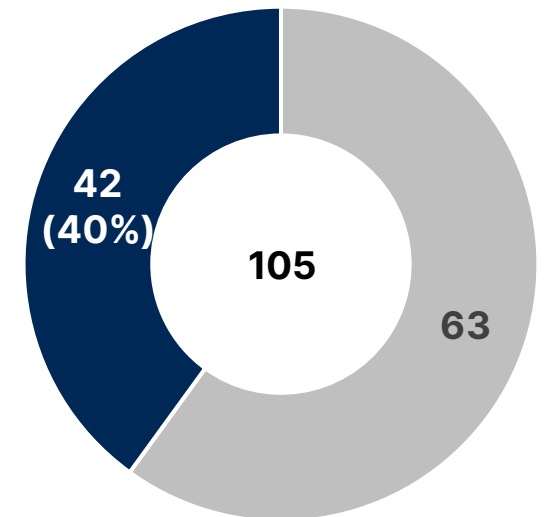
3D printed buildings total globally until 2022



3D printed buildings in 2022



Construction sites with 3D print technology



MARKET DEVELOPMENTS

The Market So Far In 2023

- ▶ Due to the increased interest rates the European and US markets have cooled of, and construction of new housing is severely reduced
- ▶ Africa, The Middle East and Asia is not influenced, and lots of new projects are being initiated

Applications, And Larger And Larger Projects

- ▶ Throughout 2022 and now also in 2023, more and more different kind of applications of our technology are being pursued
- ▶ Next to private residential housing, now many customers are involved in social housing projects, office & utility buildings, and various infrastructure projects, beyond wind turbine towers, like water tanks etc.
- ▶ The focus on especially the infrastructure projects is on using optimal geometries, which only 3DCP can do, where the design supports the structural integrity as much as possible hereby minimizing the amount of concrete and reinforcement used
- ▶ The 3D printed projects have not only grown in terms of the size of buildings printed (like we will hear today), but more and more customers are also now being involved in large scale projects, where the 3DCP technology is used for multiple buildings units on the same site
- ▶ Such multiple units' projects will start in Africa (50) and Northern America (20+12) in Fall

INFRASTRUCTURE PRINTING: TWO CHICKEN DRINKING WATER TANKS

KUWAIT



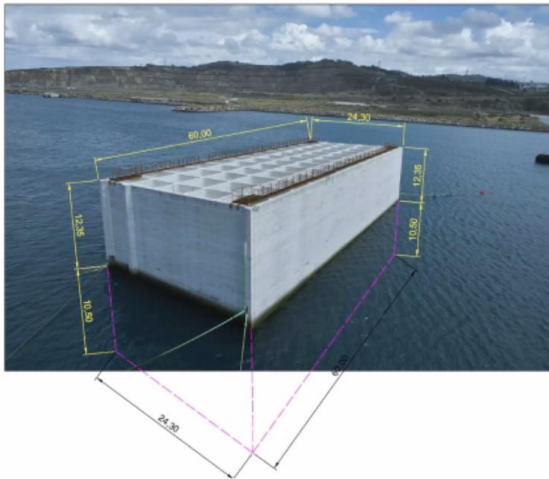
Kuwait desert, 2 water tanks each of $\varnothing 7\text{m}$ (22.97 feet) and 4.5m (14.76 feet) height. The left has glass fibers (20 kg/m³, 1.25 lb/ft³), the right no fibers or reinforcement. Varying layer width; 40cm (15.75 inches) first 1.5m (4.92 feet), then 30cm (11.81 inches) for next 1.5m (4.92 feet), and 20cm (7.87 inches) for the last 1.5m (4.92 feet). Both tanks used 30 m³ (7,924.16 gallons) concrete.

Next tank will be $\varnothing 12\text{m}$ (39.37 feet) and 9m (29.53 feet) tall.

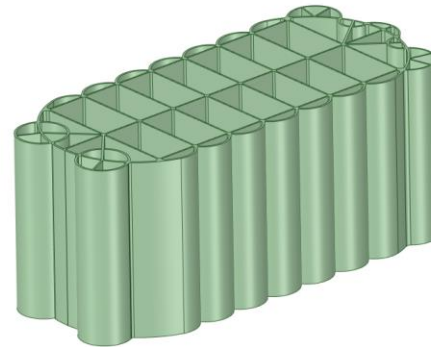
INFRASTRUCTURE PRINTING: FOCUS ON OPTIMAL DESIGNS SAVINGS ON MATERIALS (1/2)

OPTIMIZING THE DESIGN OF A CAISSON LEADS TO A +50% SAVINGS IN MATERIALS

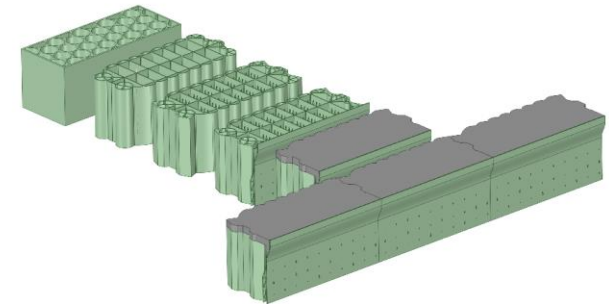
Traditional designed "box" caisson



Optimised design based on 3DCP with 53% less materials usage



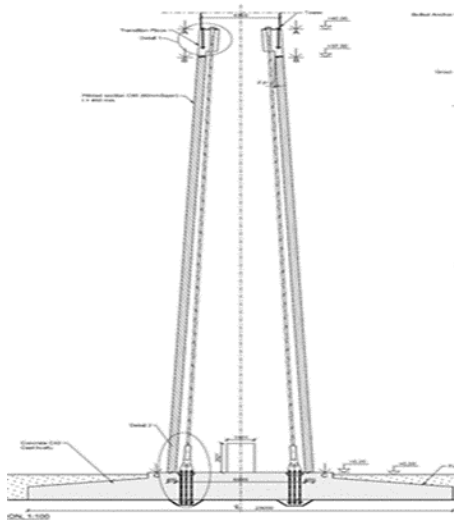
Putting more caissons together to form a harbor quay



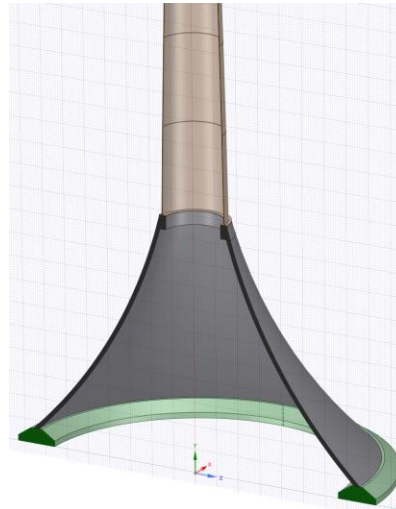
INFRASTRUCTURE PRINTING: FOCUS ON OPTIMAL DESIGNS SAVINGS ON MATERIALS (2/2)

TRUMPET SHAPED TOWER LEADS TO STRIP FOUNDATION INSTEAD OF SOLID FOUNDATION, WITH 40% MATERIALS SAVINGS

Traditional designed conical tower with solid foundation



Trumpet designed tower with wider base



Leading to that the foundation can be reduced to a strip foundation



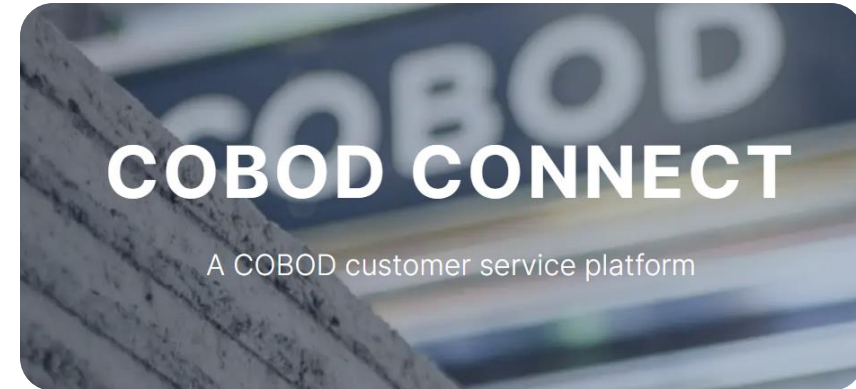
COBOD CONNECT: OUR CUSTOMER SERVICE PLATFORM

Platform Overview

- ▶ COBOD Connect is our dedicated customer service platform, designed to facilitate seamless interactions, provide support, and offer exclusive content to our users.

Features & Development

- ▶ Latest development allows COBOD Connect users to download 3D printable files.
- ▶ Enables customers to print parts themselves, e.g., U-motor protection cover and much more.
- ▶ This file library will continuously be update in accordance with our latest developments and is accessible for free to download.



U-motor protective cover



COBOD CARE PACKAGES

COBOD Care

- ▶ At its core, COBOD CARE is all about ensuring your 3D printing technology continues to flourish and add value to your operations.
- ▶ This service concept entails three different service packages, each tailored to meet the unique needs of different users.

Bronze Care

- ▶ Ideal for lower frequency equipment in labs/workshops.
- ▶ Budget-friendly; covers essential services.
- ▶ Suited for minimal maintenance needs.

Silver Care

- ▶ Versatile; caters to a broad base.
- ▶ Ideal for frequent on-site operations and equipment transport.
- ▶ Provides priority support and minimizes downtime.

Gold Care

- ▶ Premium choice for high-performance teams.
- ▶ Ensures fastest response and unlimited support.
- ▶ Extends warranty; offers smooth and efficient maintenance.

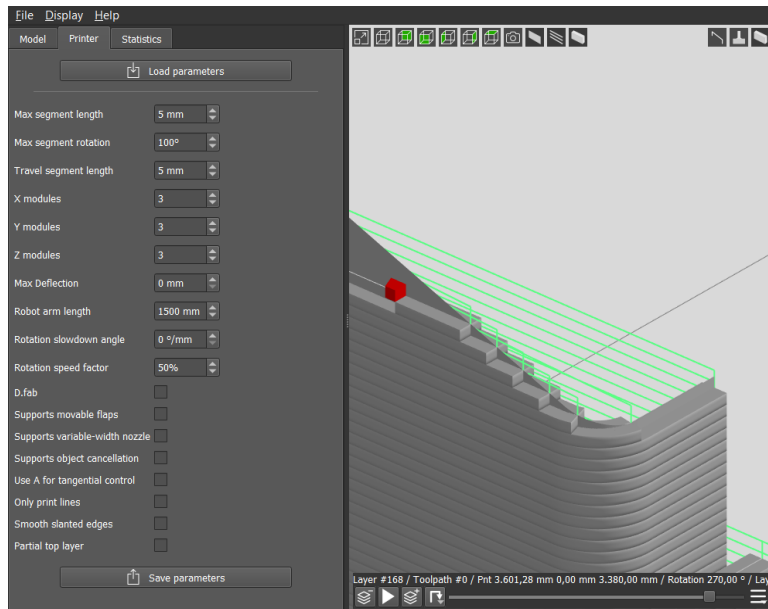
BASIC CARE	BRONZE CARE
✗ COBOD Connect access ✗ Internet of Things (IoT) Kit ✗ Firmware updates ✓ Ticket support 4 business days ✓ Hotline support 180 €/h ✗ Yearly maintenance visit ✗ Priority support ✗ 1 year extended warranty	✓ COBOD Connect access ✓ Internet of Things (IoT) Kit ✓ Firmware updates ✓ Ticket support 2 business days ✓ Hotline support 180 €/h ✓ 1 Yearly maintenance visit ✗ Priority support ✗ 1 year extended warranty
SILVER CARE	GOLD CARE
✓ COBOD Connect access ✓ Internet of Things (IoT) Kit ✓ Firmware updates ✓ Ticket support within 24 hours ✓ Hotline support 8 hours pr. month ✓ 1 Yearly maintenance visit ✓ Priority support ✗ 1 year extended warranty	✓ COBOD Connect access ✓ Internet of Things (IoT) Kit ✓ Firmware updates ✓ Ticket support within 12 hours ✓ Hotline support Unlimited ✓ 2 yearly maintenance visits ✓ Priority support ✓ 1 year extended warranty

Contents

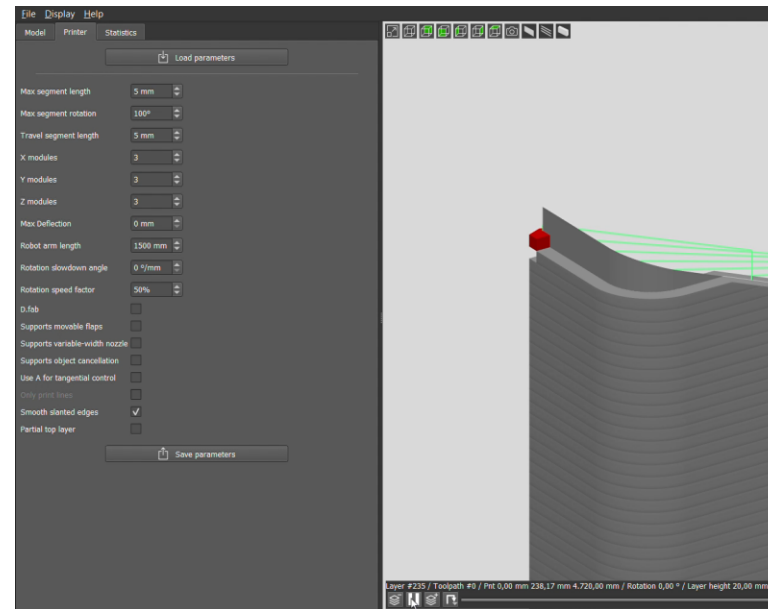
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SOFTWARE (1/2): COBOD SLICE

Smooth Slanted Edges: Ensures that slanted edges are printed smoothly, aligned with the intended design

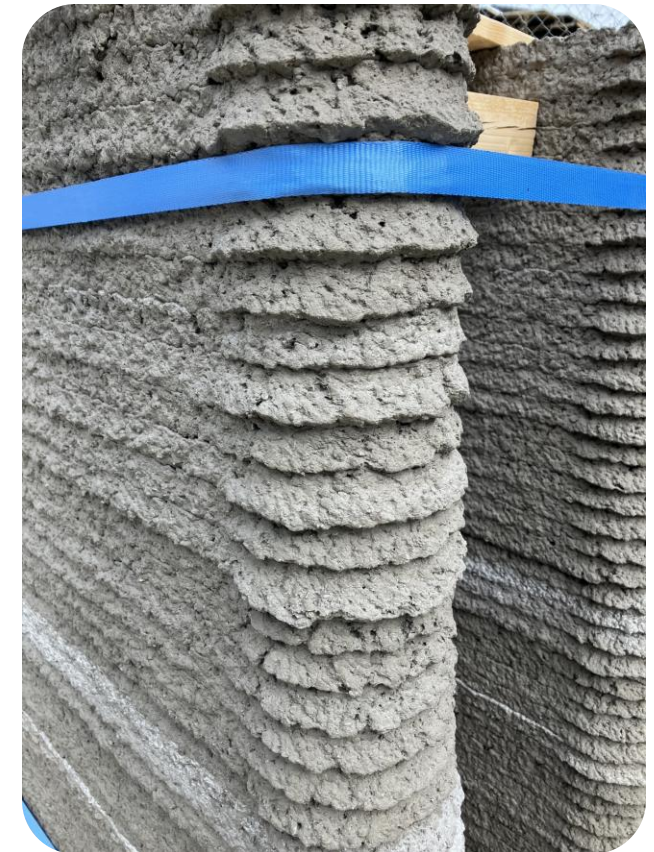


Before



Now

Corner Extrusion Multiplier: Prevent over-extrusion in the corners, like the image below



SOFTWARE (2/2): BED LEVELLING 2.0

Bed Mesh Compensation Feature

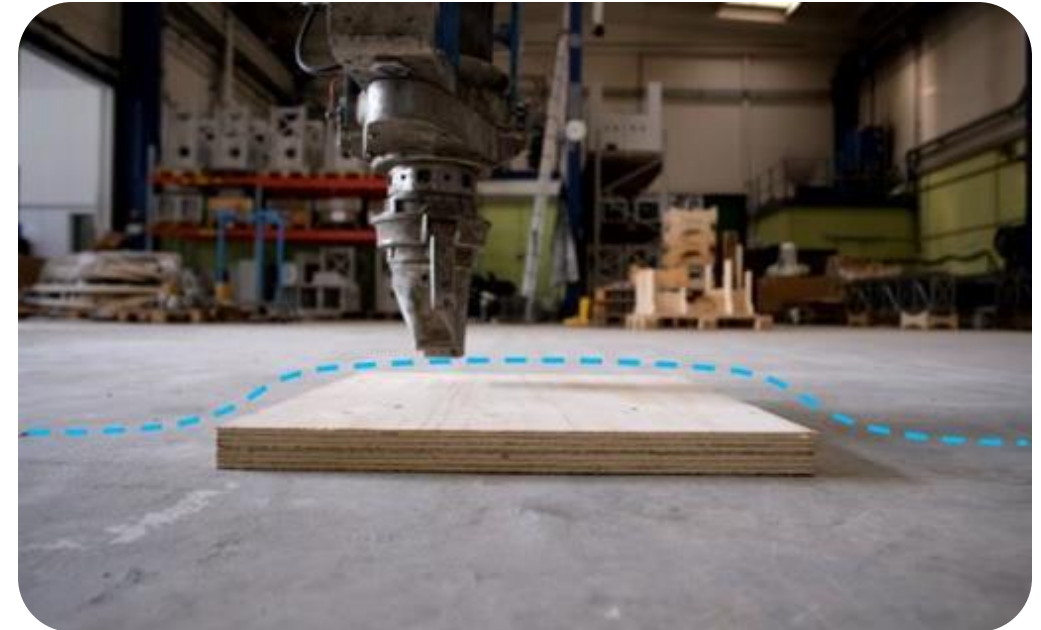
The existing Bed Mesh Compensation feature is the printer's ability to compensate for irregular shapes and unevenness within the printable area. Thereby, the ability to even out the unevenness of the ground layer by layer.

This feature has been further developed into Bed Levelling 2.0.

Key features of Bed Levelling 2.0

1. New sensor has an improved range and precision
2. Mapping the printable area while doing a “dry-run”, making it possible to map around rebar and on foundations with irregular shapes
3. Improved speed, the bed data is collected while doing dry-runs for a 2-in-1 print preparation routine.
4. Bed mesh is automatically dimensioned optimally for the print area
5. Visualization of the bed mesh on HMI

Retrofittable - Upgrade kit will be made available for purchase



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BOD3 – VERY MOBILE 3D PRINTER ON TRACKS FOR MULTI UNITS BUILDING SITES

THE FIRST HAS JUST ARRIVED IN ANGOLA



Based on the same modules/ trusses as the BOD2, and as many other parts as possible from the BOD2.

Developed for printing low rise residential housing in large numbers

Zero set up time when printing housing units on a straight line.

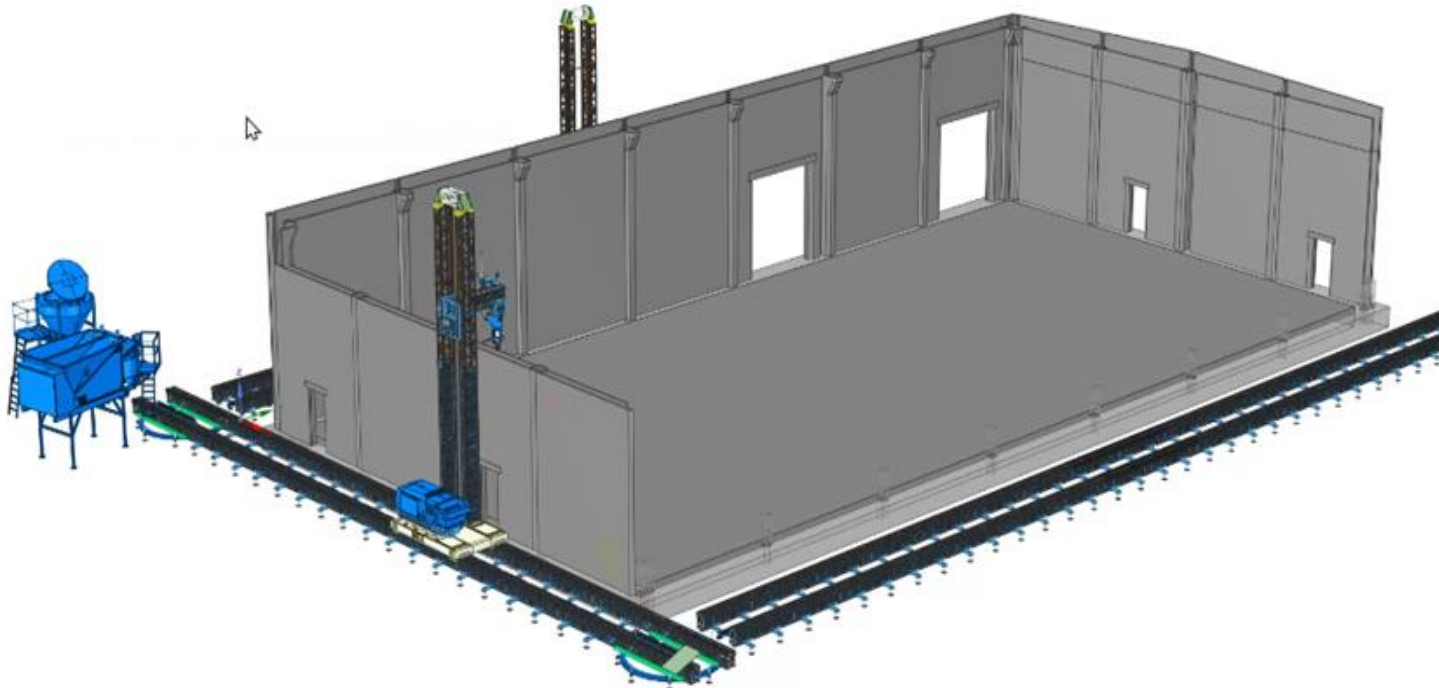
4 Y-trusses equal to 10m (33ft) of trusses can be moved together at once using a Jack driving wheel system => very quickly to go from first print position to the third print position

BOD3

3D printing multiple
houses on one row

BOD3 INFINITY – FROM RESIDENTIAL HOUSING TO LARGE SCALE INDUSTRIAL WAREHOUSES

BEING OFFERED TO THE FIRST CUSTOMERS CURRENTLY



For a more price of app. 60.000 euro, the BOD3 can also be used as a BOD3 Infinity model.

The BOD3 Infinity has no width or length limitations due to the use of a short x-axis without the usual corresponding Z-axis on the other side.

Distribution warehousing is the fastest growing sector B-to-B construction market due to the growth in e-business.

Requires empty shell buildings, which are filled up with pallet racking

Initially the Z-axis and Y-wagon will be lifted to the next set of tracks with a crane, but a swivel turn table solution will be developed later.

Any BOD3 bought (except the two first ones we have made) can easily be upgraded to a BOD3 Infinity, making the BOD3 an extremely versatile printer with many functions.

Print of Warehouse
20 by 40 and 8 meters height
with BOD Infinity

ROBOTIC ARM

From 3D printers to multifunctional construction robots

- ▶ In line with COBOD's strategy adding a COBODTIC arm will turn the printer into a multifunctional construction robot capable of much more than just extrusion of concrete

What can the COBODTIC arm be used for

- ▶ Adding wall binders
- ▶ Spraying paint
- ▶ Shotcreting and much more

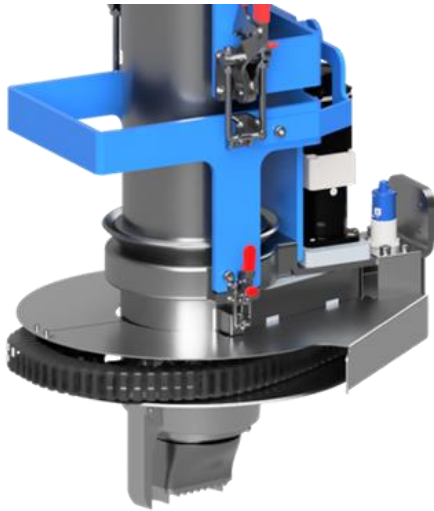
How is a COBODTIC arm different than any other robotic arm

- ▶ The COBODTIC arm can be programmed and controlled via the slicer, removing the tedious programming required for a 6-axis robotic arm.



NOZZLE ACCESSORY PLATFORM (NAP) + AUTOMATICALLY CONTROLLED EXTRUSION (ACE)

NAP: A platform for mounting nozzle accessories
with access to power, air, and fluids



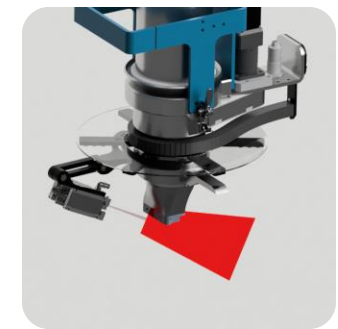
Applications

- ▶ ACE laser
- ▶ Misting
- ▶ Curing/bonding sprays
- ▶ Tangential camera
- ▶ Other sensors (temperature, humidity, etc)

Specifications

- ▶ Fits four 8mm wires or tubes
- ▶ 360deg flexible mounting
- ▶ Total 720 degrees of rotation

ACE Laser: Scanning the "bulge" in front of the printhead
to automate extrusion control



Misting & Sprays: Misting fluids to the layers
while printing



CruiseControl BUT FOR YOUR CONCRETE!

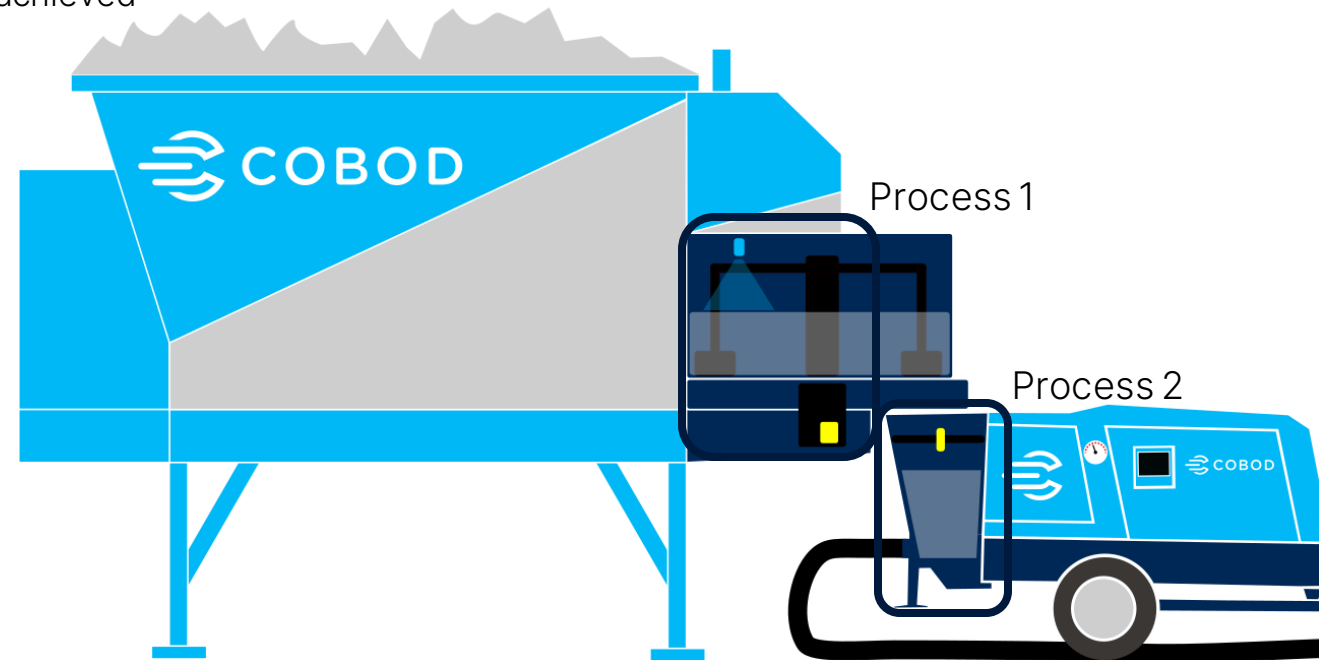
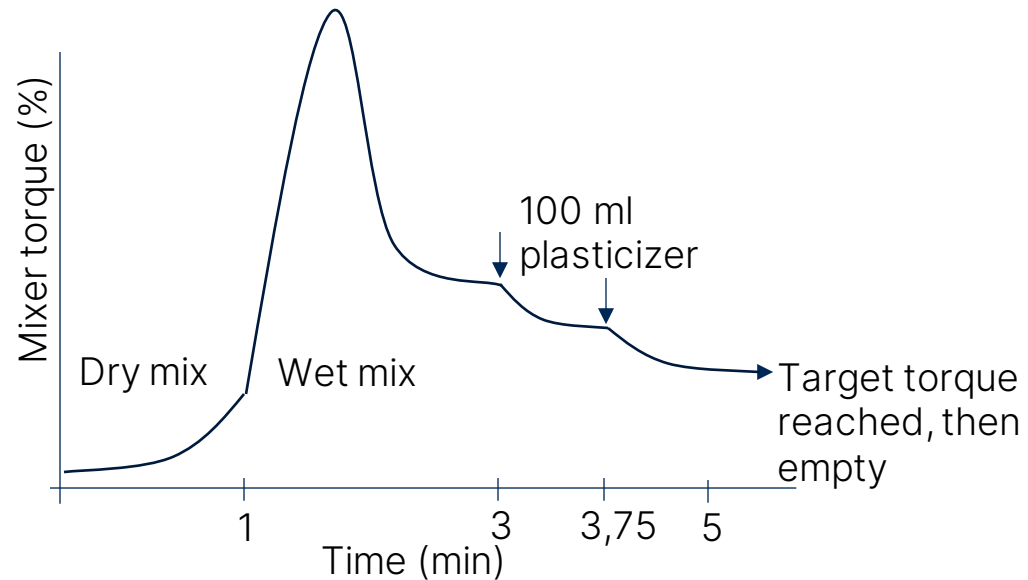
- ▶ Two processes
- ▶ **ConsistencyControl**: automate concrete batch modification
- ▶ **AutoEmpty**: automate the filling of the pump hopper
- ▶ **Advantages:**
 - ▶ No pump operator needed during printing
 - ▶ Increase batchplant concrete output by 50%
 - ▶ Improve concrete consistency
 - ▶ Reduce risk of human error
 - ▶ Increased workplace safety
- ▶ **A software update**
 - ▶ Available free of charge
 - ▶ Retrofittable
 - ▶ Available end of October 2023



DETAILED PROCEDURE: ConsistencyControl AND AutoEmpty

► Process 1: ConsistencyControl

- Add sand, gravel, cement, water and only 60-80% of plasticizer
- Monitor motor torque (power needed) on the mixer motor
- Add plasticizer in 100 ml increments (micro-dose)
- Stop adding plasticizer once the specified mixer load is achieved

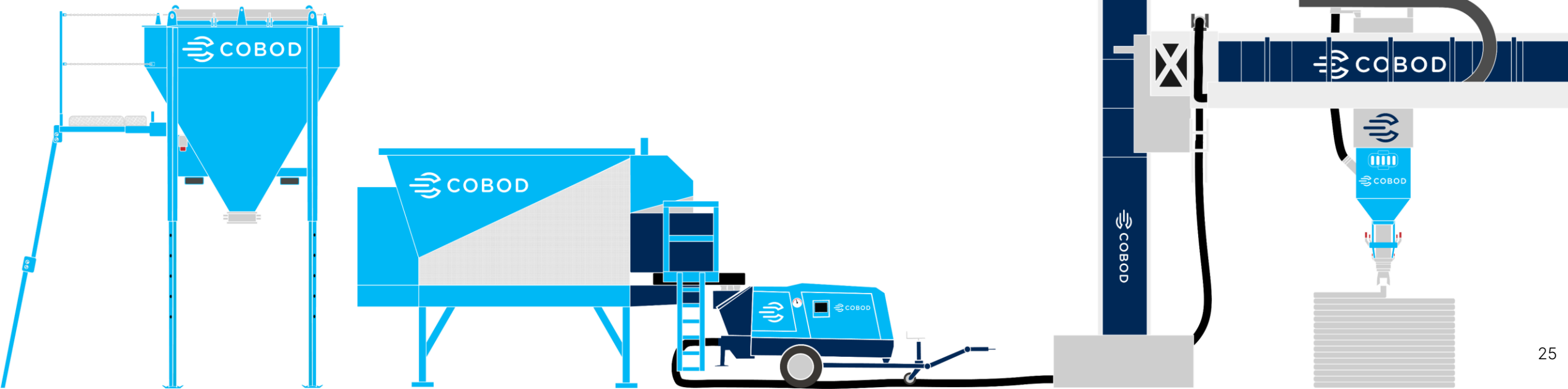


► Process 2: AutoEmpty

- When pump hopper is empty, fill it with fresh concrete
- When batch mixer is empty, start a new batch

OLD VS. NEW MATERIAL DELIVERY SYSTEM PROCESSES

- ▶ In the past
 - ▶ Operator had to check and modify each concrete batch
 - ▶ Ensure the concrete pump hopper is full by manual emptying the mixer
- ▶ With new features
 - ▶ Determine settings on the first two concrete batches of the day
 - ▶ Switch to **ConsistencyControl** and **AutoEmpty**
 - ▶ Monitor batchplant semi-remotely from the site office
 - ▶ Check raw material quantities often
- ▶ Requirements for retrofit
 - ▶ Watt-meter control
 - ▶ Functioning Chemical pump 1 (for dosing the plasticizer)



PRINTS USING ConsistencyControl AND AutoEmpty



POLL: WHICH NEW PRODUCT OR INNOVATION IS YOUR FAVORITE?

VOTE IN CHAT

Product / innovation	Description
1 COBOD Slice	New features will be released in COBOD Slice
2 Bed leveling 2.0	Improved feature release related to bed level compensation
3 BOD3	Mobile 3D printer on tracks for multi units building sites
4 BOD3 Infinity	From residential housing to large scale industrial warehouses
5 Robotic arm	A multifunctional tool for introducing more automated processes to the building site
6 Nozzle accessory Platform (NAP) + Automatically Controlled Extrusion (ACE)	NAP is a new development that enables more features, like ACE for automated extrusion control
7 ConsistencyControl and AutoEmpty	Enhanced automatization related to the material process

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PERI 3D CONSTRUCTION





LARSEN & TOUBRO

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COBOD CONNECT COMPETITION

We're thrilled to launch a unique competition focused on enhancing our Human-Machine Interface (HMI)! More specifically, the software that is accessible on the touchscreen of the main E-box, which is primarily used for setting up the machine.

This is more than a contest; it's an invitation for you, our valued customers and partners, to share your insights and innovative ideas to help shape and refine our user experience.

Your feedback will be the driving force behind our innovative advancements, allowing us to align our technology even more closely with your needs and desires.

It's a collaborative journey to push the boundaries of user interaction and construction technology.



HOW TO WIN

- ▶ Provide detailed, clear, and constructive feedback.
- ▶ Focus on non-obvious, innovative suggestions for enhancing user experience.
- ▶ Actively participate in forum discussions on COBOD Connect.

COMPETITION DETAILS

Duration

- ▶ The competition runs for 1 month, inviting insightful suggestions from our customers.

Prize Announcement

- ▶ The prize will be our newest development in the form of a retrofit kit for the Bed Levelling 2.0.

Winner Announcement

- ▶ The winner will be revealed in our October newsletter! Keep an eye out and join the forum for a chance to win!

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KEY SHAREHOLDERS



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