

WHITE PAPER

THE TRUE STATE OF THE ART OF 3D CONSTRUCTION PRINTING

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1 MISCONCEPTIONS IN THE PRESS DOMINATE

- The 3D construction printing providers should communicate more precisely

CASE: WINSUN

- Winsun has a 3D construction printer installed in their factory in Suzhou, China, that produces elements by 3D printing. The elements are then transported to and assembled at the building site to form the building structure
- Hence, Winsun is actually 3D printing precast elements and do not 3D print on the building site
- Therefore, when Winsun claimed to have done 10 buildings in 10 days, it actually meant, that they assembled 10 buildings in 10 days, out of elements 3D printed in the factory long before. It does not mean that the entire process of 3D printing and assembling at site took just 10 days



- The very often shown Office of The Future in Dubai was, therefore, NOT 3D printed in Dubai, but made out of precast elements 3D printed in Suzhou, China. In addition all the interesting architectural details were not 3D printed, but made manually by traditional construction workers in Dubai. The grey color of concrete in the lower left picture shows what was actually 3D printed



2 NOBODY 3D PRINTED A BUILDING IN 24 HOURS!

– despite many headlines about it



CASE: APIS COR

- Apis Cor began the printing of the small building in Sputnik, Moscow in October 2016 during a 3 day printing event for Russian speakers only. The building was actually finished and announced in February 2017. Hence, it took 4 month to do the printing
- Apis Cor did not print the “entire building”, just the walls. The rest of the building was constructed the traditional way
- Apis Cor in their press release did not directly state that the actual building, which they built, was printed in 24 hours! Rather, they stated it “could have been printed in 24 hours”, but delivered no documentation for it
- Apis Cor is back into R&D mode and is not able to supply printers presently (as of fall of 2019)

CASE: ICON CONSTRUCTION

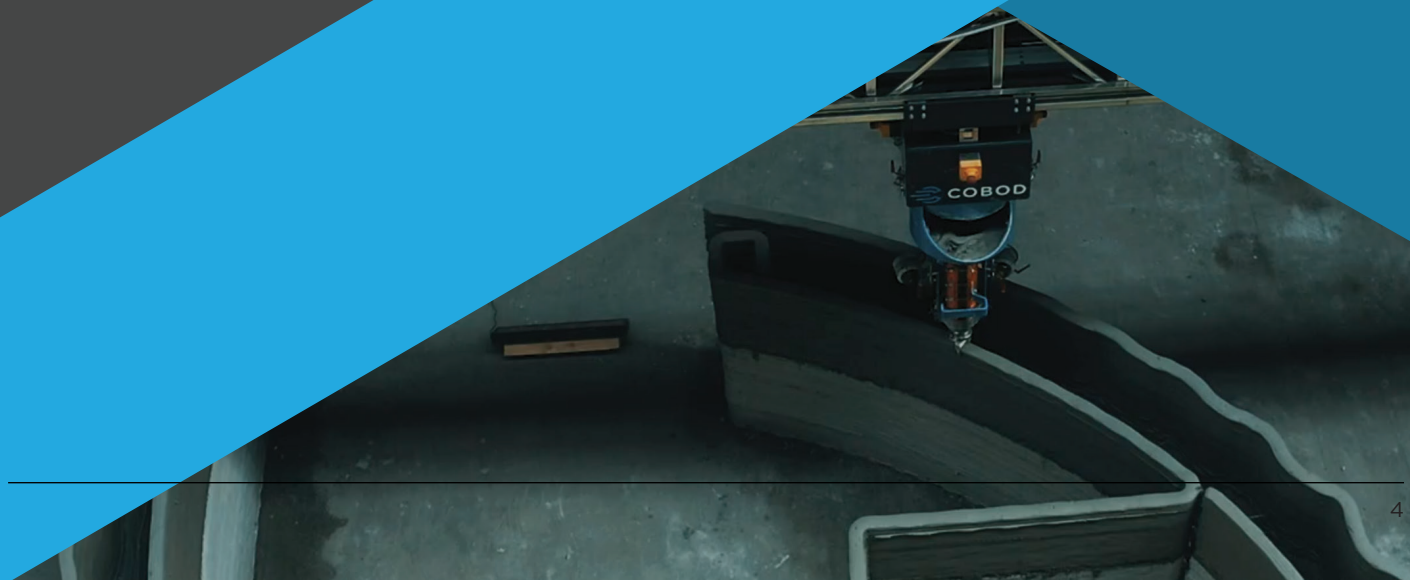
- ICON did not print the small Austin building in 24 hours, but over several days/weeks
- ICON’s video clearly shows consecutive bright days and dark nights during which the printing was made, documenting the many days/weeks it took
- ICON’s own photos document that the printing was done over multiple days, which is why the printed walls (before they were painted) on the pictures have clear horizontal sections separated by the grey tone colour of the print. Each grey tone colour representing one day of print
- ICON stated that their technology “could” 3D print the building in 24 hours, but delivered no documentation to prove it
- ICON has not delivered a printer to a customer yet (as of fall of 2019)

3 THE FASTEST PRINTING OF BUILDING WALLS

– has been done by COBOD

CASE: COBOD

- In 2017 COBOD 3D printed the walls of The BOD building, Europe's first building made with the help of 3D printing
- The printing took 2 month in 2017, using the BOD1 printer, COBOD's first generation printer
- In 2019, COBOD re-printed the walls of an identical copy of The BOD
- This time, using the BOD2 printer, a second generation printer, it took 3 days, or 28,5 hours to be precise. Fully documented
- Even the second time around the printing was not perfect, and COBOD pointed at various issues, which could and should be improved
- The 20 times improvement from 2017 to 2019 in the productivity of the 3D printing shows the quick improvement of this technology and the massive potential



4 NOBODY 3D PRINTED AN ENTIRE BUILDING

– *Traditional construction still required for the majority*

ONLY THE WALLS ARE 3D PRINTED

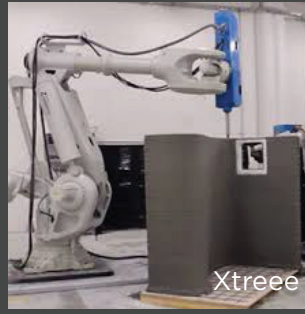
- So far, all projects related to buildings done with 3D printing on site have limited the use of the 3D printer to only printing the walls
- Roofs, slabs and floors, thus, still need to be made the traditional way; similar for plastering, painting, cabling and plumbing
- Hence, in essence it is wrong to state, that a complete building was 3D printed. It is more correct to refer to, that the walls of the building was 3D printed in a certain amount of time
- So far, in general, 3D printing only takes care of the 20-25%, which the walls make up of an entire building, while conventional methods are still responsible for the remaining 75-80%

5 AS OF THE FALL OF 2019 ONLY 3 ACTUAL SUPPLIERS

– Many wishfull companies, very few that actually have supplied printers to customers

3 COMPANIES SUPPLYING PRINTERS

- Despite much hype and many plans being announced in actual fact, only 3 companies have a track record of supplying on site 3D construction printers to the market
- Xtreee, France makes robotic arm printers and has supplied to a franchise in the Middle East
- Cybe Construction, the Netherlands makes robotic arm printers and has supplied printers to a.o. Japan
- COBOD International, Denmark, makes gantry printers and has supplied printers to many markets including The Middle East, Belgium, Germany and Denmark





Get in touch – We know the truth!

Obviously, this white paper has not been based on us speculating about the truth. We base our conclusions on a government funded 3 years research project, which we carried out with the largest construction company in Denmark about the true state of the art of 3D construction printing.

In 2018, Peri Group from Germany, the globally leading supplier of manual formworks equipment, became a minority shareholder and partner of our company. This was not a coincidence. Peri wanted to join us, because we know the truth and know how to convert that into superior 3D construction printing systems and solutions.

3D construction printing is beginning to make it's mark in the construction industry, and we are here to support that. Please get in touch if you would like to know more about the industry or the technology we provide.



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