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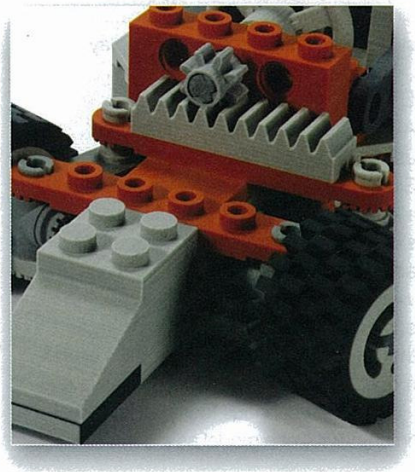
A shoe-in!

Z Corporation makes colour 3D printing easier, larger, faster and more detailed with its new ZPrinter 650

A well-known, but publicity shy, sports shoe manufacturer produces hundreds of new designs every year. The shoe market has design cycles of no more than 6 months, reflecting the style conscious nature of its customers, with release cycles tending to favour the Christmas period.

Previously it took this particular manufacturer of trainers months to carve out a wooden model for each style. The time, effort and cost was unacceptable. Now, new designs can be prototyped directly from the 3D digital model. And the process is as quick and easy as printing! Why do they want prototypes? So they can flash them in front of a very selective band of customers. That's where the second element comes into play - colour!

Z Corporation is the only company currently producing a full colour 3D printer. Recently, it launched the latest in its range, the ZPrinter 650, complementing the 450 and the 510. The 450 was celebrated for its automatic operation. The 510 had a pretty nifty performance. The 650 combines both attributes!



Colour is achieved through the use of the same thermal printheads that you would find in Hewlett-Packard inkjet printers, suitably adapted to lay down layers of powder (a high performance composite material), inkjet colour and binder - 0.89 to 0.2mm at a time at the rate of 2 to 4 layers a minute - to produce a full coloured 3D model.

Thanks to its HP roots the ZPrinter 650 can build models with a high resolution of 600 x 540dpi up to 254 x 381 x 203mm. Quite large enough, I would say, for a size 13 trainer! The binder, which sets the colour and the build material, was developed by Z Corporation. Called Zbond, it is a fast setting resin/superglue. Non-toxic and fast curing, it is used in 90% of Z Corp's printer applications. The company has an even stronger binder - Zmax - which is epoxy based, but which takes 24 hours to cure, rather than the 2 hours or so of Zbond. The inks are standard dye or pigment based.

Z Corporation provides a whole range of high-performance composite materials for use with the printers, including investment, direct casting and elastomeric materials. Investment materials can be dipped in wax to produce casting patterns. Direct casting material can be used to create sand-casting moulds for non-ferrous metals, and elastomerics create parts with rubber like properties. All materials, after emerging from the printers, can be sanded, drilled, tapped, painted (if necessary) or electro-plated.

Enhanced automation covers all aspects of its operation as well. The onboard infiltration unit enables supports to be removed inside the printer housing.

You get four colours with the ZPrinter 650 - CMYK - black being the latest addition. This enables blacks to be deeper and grey to be an alternative colour, instead of composite approximations. The printers will take either STL, VRML or PLY files, or 3DS and ZPR data. Some software applications (Revit and Bentley for instance) can export files directly to a Z Corp printer. The 3D models are sliced horizontally and are then fed into the printer.

The mention of Revit and Bentley is significant. Besides being used for many different mechanical modelling, rapid prototyping and cast-making processes, Z Corp 3D printers are finding the architectural and GIS markets to be particularly interested in the printers. They enable architects to produce scale models of buildings or terrain, suitably coloured and textured, in a fraction of the time and cost of a professional modeller.

Not only does this save time and money, but it means that they can produce models more frequently, and at different stages of a project, to show a client rather. This is far better than the typical process of waiting for the design to be finished and approved before building a one-off model.

It takes time to print a full 3D model. CADVenture, one of Z Corp's main dealers, showed me a small scale building of around 300 x 250 x 100 cm that took about 8 hours to print in 3D. It would take a modeller far longer to produce a similarly detailed model at much higher cost.

Other potential markets? Well, where do you stop? Adding colour makes models more realistic, adding surface designs, textures, patterns and even, in the case of simulation models, adding FEA results! Medical models can be made more realistic, as well, improving the student learning process.

www.zcorp.com
www.cadventure.co.uk