

The Wild Format guides are intended to expand awareness and understanding of the craziness that can be created on wide format digital printing devices, from floors to lampshades and everything in between.

These guides are made possible by a group of manufacturers working together with Digital Dots. We hope you enjoy the articles and that you put into practise what you learn. If you want to talk about it, go to our LinkedIn group at <http://linkedin/1pkeLH1>

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Wide format and additive manufacturing

At first glance there may not be much crossover between wide format and 3D printing. But there is some synergy in the different technologies, and several vendors that we normally associate with wide format have exploited this. More importantly, the kind of people that run wide format printshops tend to be highly entrepreneurial and open to new business opportunities.

There are a number of different ways that 3D printing, or additive manufacturing, as

There are many different types of 3D printers, requiring different levels of skill and investment.

it's more properly called, can be used. The technology was originally used to produce prototypes, including those with different degrees of functionality. But it's also used to make moulds and tooling and increasingly for producing short run parts.

3D Printer Options

There are many different types of 3D printers, requiring different levels of skill and

investment. This includes desktop printers that can be used in any office environment through to industrial plant machinery.

There's plenty of scope within this for wide format print shops, both alongside the existing display business and as a way of diversifying into new markets.

This includes, for example, some opportunities to use 3D printing as part of a visual display. This could be as an advertising model, such as a large model of a drill outside a shop selling tools, or a small model of a wine bottle inside a supermarket to point customers to the wine section of the shop.

The most obvious proponent of this type of display is the Israeli company Massivit, which has developed a very large 3D printer, the Massivit 1800, specifically for this type of work.

It's a big machine, with a printing area of 1.5m x 1.2m x 1.8m, easily big enough to produce large objects, such as life-sized statues. It prints a photo polymer acrylic-based material that solidifies with exposure to UV at room temperature. This is a gel-like material that is squeezed out like toothpaste from a tube to build the object up one layer at a time. The machine can be fitted with two extruders to produce two models side by side.



Massivit has developed this Massivit 1800 3D printer for creating objects for marketing displays. ©Nessan Cleary

Once hardened the material is quite brittle but dimensionally stable so that there's little need to print any supports or in-fill, depending on the shape of the object. The objects are quite light and easy to move around. They are not inherently outdoor resistant but can be coated to add weather resistance.

3D Promotional Items

Wide format print service providers often produce promotional items and this is another area where 3D printing could be applied to produce a complete promotional item rather than just printing a graphic onto an object. This could include anything from

beer bottle openers to bookmarks. Mimaki, for example, has cited this application for its first 3D printer, the 3DUJ-P. This uses a form of LED UV-curable ink to create the 3D objects. It prints in six colours – CMYK plus white and clear – so that the objects have the full colour gamut that we would normally associate with a UV printer with over 10 million colours. Mimaki claims that it can reproduce 84 percent of the Fogra 39L colour gamut, which is considerably more than most other 3D printers.

The ink cures layer by layer to form an acrylic resin modelling material. The printer also lays down a dissolvable resin to support

the object while it's being printed, which is also cured by LED UV light. Once the object is printed, the support can be dissolved in a water wash and the UV object peeled away. There's no need for any further cleaning or polishing. The objects are solid enough that you can insert screws to them without risk of breaking them. It has a build area of 500 x 500 x 300mm.

Other Applications

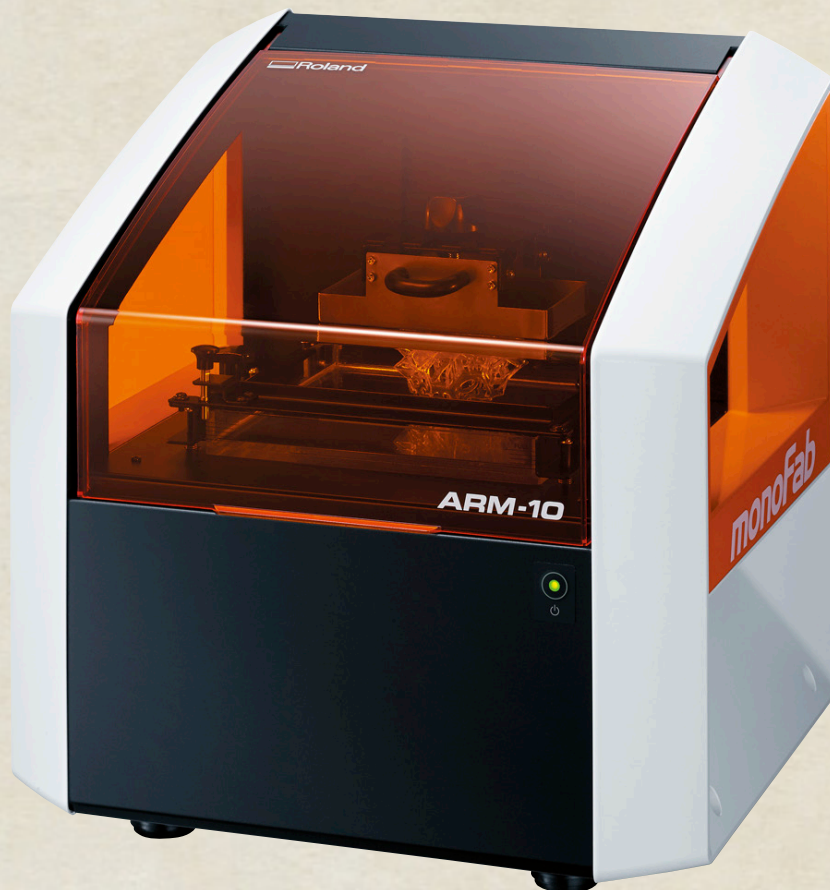
Probably the most obvious crossover between wide format and 3D printing is for those companies that specialise in CAD work. This is mainly because the type of customers that want engineering designs printed, such as designers and architects, also see the value in having 3D models made. It also helps that the software necessary for producing 3D models has developed out of CAD software and so these printers are used to handling these files.

There's a developing industrial market for 3D printing as manufacturers turn increasingly to 3D printing to produce moulds and tooling and even some short run parts. This includes relatively small parts that can be done with a desktop printer all the way up to bigger machines that can produce large parts or many small parts together.

Adding & Subtracting

Roland sells both a desktop milling machine for subtractive manufacturing, and a 3D printer for additive manufacturing, which are often sold as a complementary pair. The 3D printer is the ARM10, which uses digital light processing or DLP, whereby the object is first split into slices or layers and each layer is then projected onto a vat of photopolymer resin; where the light reacts with the resin, it hardens to form the layer. The base is then lowered and the next layer is projected on top of this until the object is built up one layer at a time. The bed is 70 x 130mm and objects can be 70mm tall. This is complemented by the SRM20 milling machine, which can handle a wide range of materials such as modelling wax, wood, acrylic and ABS.

At the other end of the scale, HP has developed its own Multi Jet Fusion 3D Printers. The process works by laying down a very fine powdered plastic and then jetting two liquid agents to modify that powder through standard thermal printheads. One of these fluids is a coalescing agent that causes the powder to be fused when it's hit by a laser, while the second adds other properties such as colour. Each part is printed one layer at a time and a laser is then used to fuse the plastic



Roland has developed this desktop ARM10 3D printer, that's often sold with the similarly-sized SRM20 milling machine.

powder according to the shape defined by the coalescing agent. The unused powder is brushed away and can be re-used and the next layer is printed. There are several models starting with the 3200, which has a build speed of 3500 cm³/hr and is aimed mainly at prototyping. There's also a 4200, with a build speed of 4500 cm³/hr, which targets short run production, and the most recent addition, the recently launched 4210 that can handle slightly longer production runs.

There's no question that manufacturers are increasingly turning to 3D printing, both for

developing new products and for producing short run parts and tooling. But there is a shortage of 3D print service bureaux that are able to handle the CAD-like files used for 3D printing. So 3D printing should represent a good opportunity for wide format service providers, albeit that this market is still developing.

– **Nessan Cleary**