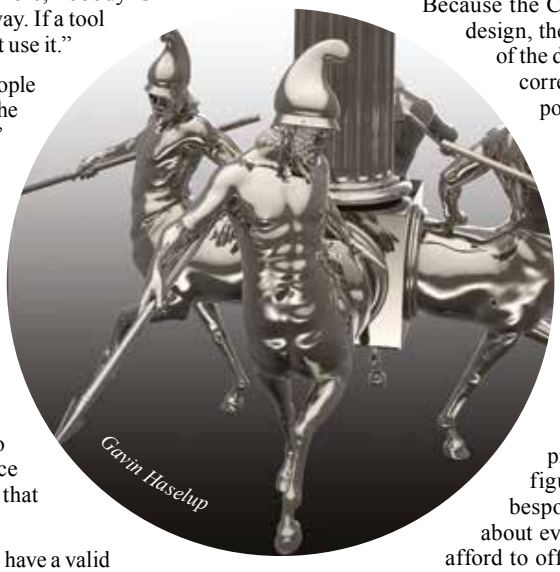
IT'S A CAD

For a variety of reasons, outlined by CAD-users that I have spoken to, the UK jewellery industry has been won over to Computer Aided Design; resistance these days is low and probably futile – CAD is here to stay.

"I've found nowadays it's pretty uncommon to find a jeweller who still acts suspicious around CAD," confirms Jack Meyer, senior CAD tutor at the British Academy of Jewellery (BAJ). "But just like with any tool out there, nobody is forcing them to work in a certain way. If a tool doesn't suit your style, simply don't use it."

Grumbling goes on though. "People do still complain, but the nature of the complaints has evolved over time," Meyer says. "It used to be: 'CAD is not handmade; it's cheating', which suggested that they neither understood nor had actually tried working with CAD. Now the main complaint is along the lines of: 'CAD users often don't know how to make jewellery or how to build a proper stone setting.' Not so in the case of BAJ CAD students – Meyer won't accept anyone onto his course who can't demonstrate some experience at the bench. But he acknowledges that there can be issues.


Gavin Haselup

He accepts CAD software critics have a valid point on one aspect of the technology. "The trouble with working in CAD is that you have no physical feeling of the objects you are making in the programme. To ensure what you're making can actually survive 3D printing and assembly, you must fall back on your existing knowledge of jewellery making and metallurgy," he explains. "This knowledge of tolerances, and the practice of checking measurements in the real world as we are making them in CAD, is crucial for any sort of virtual design. This is why CAD users must know how to work at the bench before they can build anything properly in CAD." CAD is "half-way to manufacturing and beyond design," he adds. "Introducing CAD into the jewellery manufacturing process means adding an additional step after finalising the design and before starting fabrication/wax carving proper. That stage is where the CAD modeller realises the design at actual size in three dimensions. Because the CAD model is interpreted from a 2D design, the modeller must know a large portion of the designer's role. And because it must be correct to tolerance, they must know a large portion of what the manufacturer knows."

Education issues notwithstanding, CAD has certainly contributed to the rise in bespoke design services. "CAD cost savings come not from when you first make the model in CAD, but rather from the modifications that come after. Because the model hasn't been physically made yet, the only cost for making modifications to a design is time. Plus, changing computer files is much easier than changing a physical piece," Meyer says. "Even without exact figures, it's accurate to say the price of bespoke has dropped sufficiently that just about every jewellery retailer in the land can afford to offer a bespoke service for a price that customers are willing to pay."

Gavin Haselup, award-winning sculptor for the goldsmithing, silversmithing and jewellery trades, was originally "very anti-computer" until around five or six years ago. Eventually he was tempted to investigate CAD and discovered Pixologic software, allowing him to cut, carve, push and pull digital clay exactly as if it were real clay but with many more advantages. He was hooked

WORLD

When 11 or so years ago we first wrote in-depth about CAD for jewellers, it was still pretty radical stuff. While it was offering boundless possibilities to the pioneering few, the shiny new technology was regarded by others with scepticism at best and cheating at worst! Different times… as Belinda Morris reports.

and three years ago he stopped sculpting traditionally, with no desire to go back to his old ways. He'd "gone over the dark side"!

"I'm not sure the industry really has woken up fully to what can be done using CAD; there are plenty of 'anti' people still out there," he feels. "Many, like my old self, still believe you type 'NOSE' into your computer and a nose appears on the screen! It's not true; you still have to sculpt it as if it were real clay. Besides its technological advantages, there are many others," he adds. "I no longer need a large workshop for tools and machinery – my lathes, mould- making machines, degassing tanks and hand tools have all been replaced by a flat screen, a pen and a 3D printer. I no longer drop things on the floor and lose them, my eyesight no longer suffers (I can work on a face larger than life size, sculpt both left and right hand sides at once and then print it out to the required size) and if I make a mistake I just go back to a restore point – it's idiot proof."

Matrix Interface

CADMAN

The company name Cadman is a bit of a millstone around Theo Ioannou's neck. Or at least it's a misnomer. "We're traditional diamond mounters, working jewellers, and CAD is just a tool," he emphasises. "The industry has shifted. I enjoy making things, but I adapt to the market. We're a global industry and unless you have a global attitude the trade is gone."

And the Goldsmiths' Centre-based craftsman was no slouch when it came to adapting. Having embraced new technology in his personal life, the notion of CAD was enlightening rather than intimidating. "I was exposed to computers in jewellery at a point when I was entrenched in what I was doing, but because of the changing aesthetic in the work, I was struggling to make certain things accurately; not aware of the tools I wasn't using," he explains.

"I was then introduced to Solidscape machines and two weeks later I had two of them and dived in head first! It was a no brainer. It then became a case of having to master it and replicate what we were doing at the bench and still produce the quality of work. It probably took a matter of weeks to get to grips with CAD, but learning is an ongoing process."

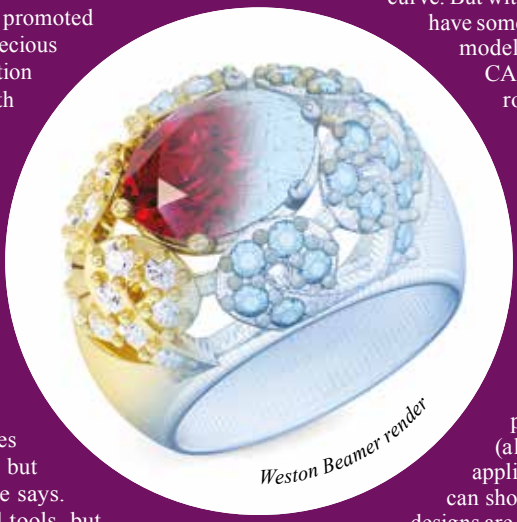
But all this comes with a caveat. "Just because you can change the oil in your car, it doesn't make you a Formula 1 racing driver – owning a laptop and Matrix software doesn't make you a diamond mounter," Theo adds. "If you want to make quality jewellery with the 'wow' factor; if you want a happy customer, you need a good craftsman, you need a diamond mounter."

Cadman is a B2B business and Theo is "desperate" for it to stay that way. "But it's a developing issue – unless retailers are prepared to work with us, support the craftsmanship, people like myself will be forced to look for other revenue streams." Namely, going direct to the consumer. "There's a margin-driven, race to the bottom mindset out there, but the customer is losing out in the end." So what's your message? "If you want something done properly, come to us," he laughs. Then gets back to the intricate work in progress on his screen.

WESTON BEAMOR

Ed Hole, previously Weston Beamor's head of CAD design and 3D printing, was recently promoted to business manager for the bespoke precious metals casting, 3D printing and production division. He joined the team in 2003 with a BA (hons) in industrial design and technology, so naturally he was no stranger to CAD. WB was extremely quick to invest in the emerging new tech – and on a huge scale. But despite (or perhaps because of) Hole's knowledge and passion for the tool, he seems very tolerant when it comes to discussing issues that can occasionally arise when customers are less familiar with it.

"It's a new subject for a lot of colleges and it's great that they're teaching it, but they're just touching the surface," he says. "They may show the techniques and tools, but students need experience. It's like learning a language – you've got to practise. While some designers are computer-savvy naturals, others can become unstuck – they're sold CAD and then find it's a steep learning curve. But with skills and experience [designers] will have some empathy and understand how a CAD model goes from screen to finished piece. CAD isn't always the easiest, or logical route into making something. They need to understand the manufacturing process – how things are made – and we encourage this. Otherwise, if there's a downside to CAD, it's that we're potentially losing some of the industry's traditional skills," he adds.



Weston Beamer render

The benefits far outweigh any negatives however. "It's a more efficient way of making new products," he points out. "The master patterns are created more quickly (although you have to pick the right application – it's not for every design); you can show renders for the go-ahead before the designs are committed to metal; it's travel-friendly and, of course, it's easy to get into for millennials and the Z-generation."

MERRELL CASTING

Offering a precious metal casting service, Birmingham-based Merrell Casting was another early adopter of CAD technology, initially via sub-contractors, then introducing its own in-house service around a decade ago. The advantages were obvious: "We got new designs through more quickly and they were repeatable," says MD Gary Wroe.

And in turn the company's retail customers have embraced CAD, offering the service to their own clients. "It's something different and it's about customisability," he adds. "Its success is down to the selling technique of the retailer. But CAD does have its limitations; it isn't suitable for everything."

Merrell Casting

Merrell Casting's service includes consultation and advice, CAD drawings, creation of a wax model, casting in precious metal, cleaning up and polishing, and stone setting if needed. Bespoke is a growth area, with mounts made to cater for unusual shapes and sizes of stones.

A master model service can be used. A vulcanised rubber mould is created to produce multiples of one design, resulting in an exclusive range of jewellery finished within a short turnaround time.

CADFOLIO

Cadfolio, founded by Ryan Edkins, is a digital design and fulfilment platform allowing jewellers to work with (strictly vetted) freelance CAD designers in a framework that streamlines the design-to-finished product process. "The main issue currently seen by jewellers trying to leverage digital design is the lack of automation and pricing information, meaning that it's difficult for their staff to sell a digital design confidently without seeking manual pricing information from multiple parties involved in making the piece," explains Edkins.

"Cadfolio takes all the admin out of the interaction by analysing the 3D model when uploaded by the designer, and creating renders for the jeweller to show customers. The platform then allows the design to be priced in multiple metals and diamond qualities by the jeweller instantly, confident that they're making the correct margin and can order the finished piece for delivery within 10 working days."

Edkins recognises that many jewellers may have been put off by CAD if they've had bad experiences in the past, but hopes that Cadfolio's service can allay concerns and underscore benefits. "CAD is not just a tool to create new designs from scratch, but also a way to offer existing products in multiple variations of stone and finger size, with no limitation on what can and cannot be done," he adds.

"This is where the future of the jewellery industry is headed, and those jewellers who take advantage of this digital inventory approach will lead the way in years to come. CAD offers the ability for traditional jewellers to become true digital jewellers and feed the growing consumer appetite for customisation; for purchasing bespoke jewellery. Also, by leveraging digital products which can be customised and visualised instantly, with the consumer in store, a jeweller can substantially reduce stock holding and turn it into much needed cashflow in a more competitive economy."

Edkins also recognises that the education of CAD in jewellery is an issue and passionately believes that CAD designers must have bench experience. "Good work is being done by jewellery schools to teach manufacturing tolerances and guidelines, but as yet there is no industry standard," he says. "It's up to the community as a whole to get together and ensure that CAD standards are agreed and taught universally so that the industry can move forward and let CAD/CAM take centre stage."

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GVUK DESIGN

"CAD has now been accepted as an essential tool for all designers and most workshops, along with the retail units that offer an in-house bespoke service, that's where we are really seeing the growth," says Graham Dicks of GVUK, UK and Ireland distributor of Gemvision and EnvisionTEC. "The wealth of benefits CAD brings has long dispelled any doubts and not having in-house CAD services is leaving some manufacturers behind."

CAD isn't for everyone, he admits. "But if you have the ability to draw or paint then you'll love what CAD can do in 3D. The best approach is to try." Naysayers are no problem. "I'm sure all CAD providers like us will be more than happy to sit down and show [sceptics] how it can work – they'll be surprised by the results!"

EnvisionTEC

About 14 years ago, while Dicks was at G&A (Abbeycrest) the company adopted Matrix, moving concept to delivery from six months to weeks. "Knowing the finished weight and gem configuration helped costing and planning. Without a doubt, pleasing the buyers, accountants and designers is a massive achievement. The buyers started demanding all their suppliers offer a similar service and so it all began."

On the issue of education, Dicks believes that Glasgow Kelvin College, Birmingham School of Jewellery and British Academy of Jewellery "do a sterling job" in training the next generation to be jewellers. "CAD is taught at the latter stages of their training, so they first have an understanding of how to actually make jewellery. This is a really important step and we encourage all budding CAD designers to learn the manufacturing techniques before embarking on a CAD career."

PROTOFORMING

"CAD has been well embraced by both designers and jewellers," says Protoforming's MD Scott Forster. "We've seen a steady rise in jewellers taking a positive approach in adopting the computer aided approach to design, be it by employing or outsourcing the process, or purchasing and learning the software themselves. This doesn't concern us – we offer a cost effective flat fee service, which compares favourably in relation to the cost of employing a designer and purchasing software/hardware.

"Five or so years ago early sceptics (traditional jewellers) had no reason to embrace technology or see it as a viable way to design and produce jewellery," he admits. "It was expensive, prototyping technology was unreliable and difficult to get right. Handmade jewellery, while a lengthy process, is a perfectly suitable way to produce jewellery. CAD will never replace the traditional bench jeweller and their skill sets, but it will become a necessary tool in every jeweller's toolbox. A retailer would have to be seriously against change and technology to not consider embracing the possibilities and features which CAD can give to his customers.

So what has contributed to the acceptance now of CAD? "Purchasing costs have dropped, the number of CAD designers has increased, 3D printing technology has reduced in cost and improved in reliability," Forster says. "Within the last two years, reduction in speed and cost has played a pivotal role in making this modern approach a viable option to small to medium businesses."

He agrees that it's easier for a professional jeweller to apply their bench and process knowledge to CAD, rather than the other way round. "Asking a CAD professional to apply the working mechanics and manufacturing limitations to designing a piece of jewellery certainly has its challenges! Ultimately CAD will be prototyped and cast before being passed to a jeweller/bench worker for finishing, and we all know these highly skilled professionals have their own ways of working and their own little idiosyncrasies."

AND FINALLY…

"Of the emerging jewellery technology-related trends that Jack Meyer has followed, one recent interesting one is the change not just in how jewellers perceive CAD, but in how customers perceive it. "Even just a few years ago, CAD was treated by the vast majority of retailers as a dirty little secret, which at best was given a bit of lip service on the "How We Work" pages of their websites. Over the past couple of years, however, we're seeing a few bespoke companies gradually starting to wear their use of CAD and 3D printing on their sleeve," he explains.

"One of my theories, based on my experience with millennials and market data, is that they're comfortable with online shopping and computers in ways previous generations never will be. This seems to fit with the widely discussed 'march to digital' the entire jewellery industry seems preoccupied with right now, as well as the proliferation of 3D printed fashion jewellery and accessories among that same market segment." The fact that CAD has significantly reduced the cost of bespoke design and manufacturing services must certainly have contributed to the rapid proliferation of bespoke design services within jewellery retail… which can only be a good thing.