

INDIAN JEWELLER

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**Advertising in Jewellery
Sector**

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3D Jewellery Printing
The Way Ahead

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Behind The
Photographs

Praveen Shanker Pandya,
Chairman, GJEPC
A Man With A Mission

3D Jewellery Printing

THE WAY AHEAD

3D jewellery printing is the way forward. However, in India, it is still a niche sector. While younger generation is embracing the technology with open arms, the older generation is still not ready to openly talk about it. In this feature, Kavita Parab tries to unravel few myths surrounding the technology.

CAD-CAM and 3D printing are widely used components in jewellery making. The 3D printing technology makes it possible for the manufacturers to produce the most complicated pieces, which would not have been possible with handcrafting. But at the same time with 3D technology, there is risk of losing human element. Sometimes with handcrafting there is a possibility of bringing in miniscule perfection which impresses the buyer. All said and done, technology is the way forward. It helps the designers, manufacturers to push the boundaries. And the jewellers can't turn a blind eye to this technology.

The technology could prove to be a catalyst for the jewellery industry. Elaborating further Gaurav Loyalka, co-founder of Novabeans says "In the jewellery industry, Computer Aided Design (CAD) has opened up a new period of creativity that some may argue is still in the nascent stage largely due to the traditional attitude of many jewellers. However, because of the benefits of CAD there has been an increasing trend to embrace 3D printing technology. This technology has brought in many jewellery manufacturing service providers who are now offering CAD and Computer Aided Manufacturing (CAM) facilities at more affordable prices. CAM is software that connects CAD in such a way that the output from CAD is carried out directly by machines that are connected to the system in a production line. The CAM system is classified into two types Additive

Prototyping and Subtractive Prototyping. Additive Prototyping is the process used in jewellery production."

The Technology

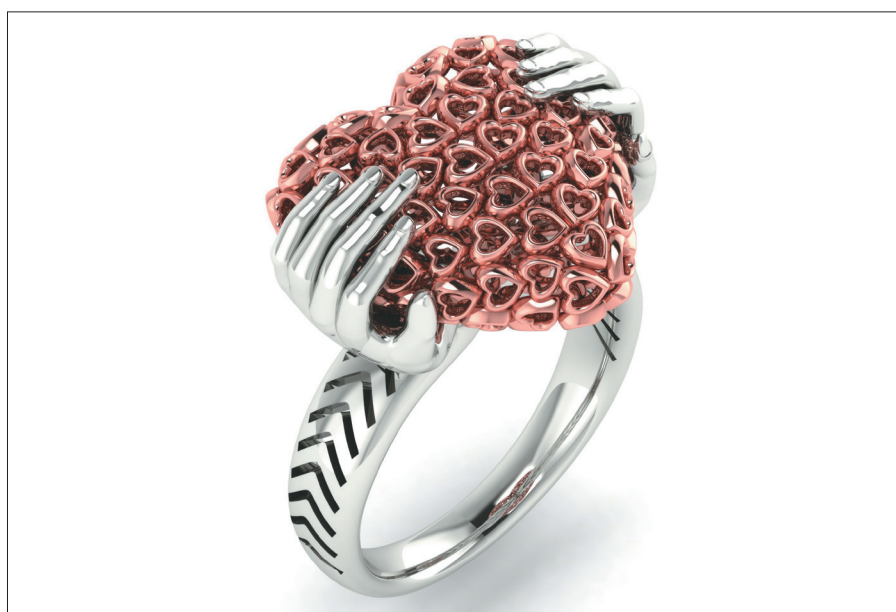
3D printing is a process of automatic construction of physical objects from 3D CAD. It is also known as additive or layered manufacturing.

3D Printers are a kind of Rapid Prototyping (RP) technology, which are positioned as a design tool to produce inexpensive models early in the design procedure. Physical models created by 3D printers make it possible for the design team to review the concepts. In turn, this guarantees that the manufacturer gets better feedback, therefore resulting in a superior product. Additionally, 3D printing offers manufacturer the scope to realize real-

time teamwork on a global scale. In recent times, the use of 3D printing has increased drastically with many industries adopting this technology.

Jewellery making using 3D printing

"Often considered as an epitome of jewellery manufacturing process, Computer Aided Designing makes it possible to create 3D models in a computerised environment. These 'virtual' models can be manipulated onscreen, examined from any angle, built up or cut away the same way as a physical model. Once the file is locked in the required format, it is sent for CAM (Computer Aided Manufacturing) where it is built using additive manufacturing. The output ranges from being a



Metal sintering would lessen the gap between digital design and product-in-hand. It is not from a purely design perspective that this phenomenal new technology makes the impossible possible. From concept to ready-to-finish product in a single day, with almost nil need for a laborious production/post production process, DMLS also brings the ability to rapidly build prototypes, test and change the design, without the need for any other tooling or moulds.

Technology has made it possible to produce complex designs that are lightweight with almost no loss, cost efficient, and absolute quality finish. There couldn't be a better way to expand the limits of human innovation and capability.

prototype, or a master pattern in wax for metal casting, or a final product in metal- if made by Direct Metal Printing process,”

“The jewellery industry is no exception. It was amongst the first industries to utilise 3D printing in their ‘investment casting’ procedure,” says Gaurav Loyalka. Instead of metal printers, they use wax here, that is, the piece of jewellery is printed or sculpted out of wax. Afterwards, plaster is poured on both sides, while liquefied metal is poured on the wax, which melts, leaving behind a metallic version of the wax sculpt in the plaster. Finally, the jewellery piece is polished by the jeweller. To date, this is the basic procedure several independent jewellers have been using 3D printers for in their businesses. However, there are many intricate processes involved in 3D printing, as will be illustrated.

“Jewellery-making is a complicated, time-consuming and expensive craft. Or, at least, it was until 3D printing came along. For aspiring jewellery makers, many doors have recently been opened,” adds Gaurav Loyalka.

Latest Technologies

Our future is being shaped by technology and innovations. And the technological innovations keep happening at an exponential rate. And the world of 3D printing is no exception to it. While talking about latest technology that

Digital

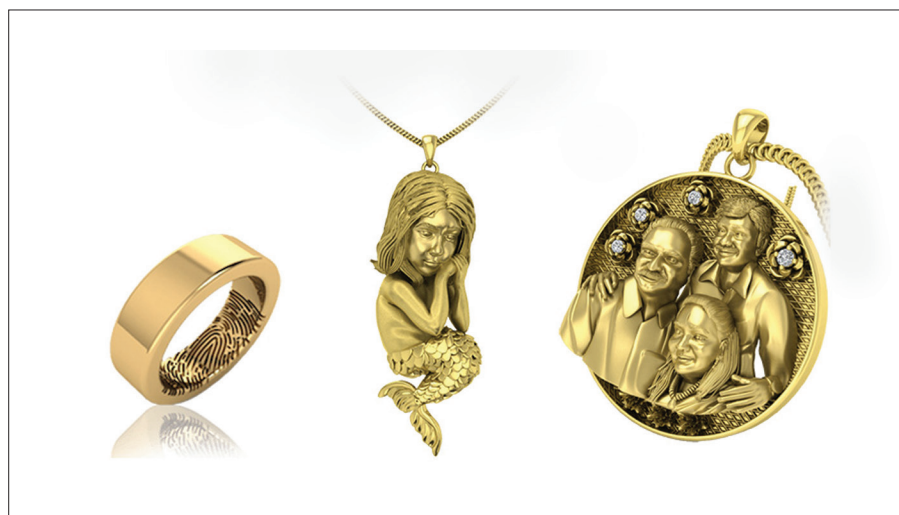
Light Processing (DLP), Multi Jet Modeling (MJM), and Stereolithography (SLA). He says “Most processes utilise a vat of liquid photopolymer resin cured

by ultraviolet laser or lamp to solidify the pattern layer by layer to ‘print’ a solid 3D model. The model is built one layer at a time, as per the data provided by the 3D CAD model.”

He adds further “Another upcoming breakthrough in the manufacturing industry that will lessen the gap between digital design and product-in-hand includes DMLS (Direct Metal Laser Sintering). The procedure involves using the STL file in a CAM setup wherein the part is built layer by layer through melting and solidifying the fine precious metal powder by a focused laser beam.”

While Gaurav from Novabeans says “Using latest B9Creator DLP - SLA 3D printing technology providing high-precision printing and castable materials allows jewellery manufacturers and custom retailers to meet the growing demand for custom work. Consumers want one-of-a-kind pieces that they helped to create. Intricate detail, stunning symmetry and precision, which was never possible with hand carving, are all achievable with today’s 3D printers.”

Additive Prototyping is used for jewellery production. While explaining Gaurav says “In this technique, the jewellery design part is built up by attaching layers of material on each other directly connected with a 3D model (CAD) – the process is called Growing or 3D Printing.”



How would 3D printing benefit?

The technology is hugely beneficial for the jewellery making as it helps in bringing Quality, Consistency, Efficiency and Productivity in jewellery. Designers can design master models of increasing complexity, while manufacturers or suppliers can produce them on 3D printers creating wax masters with superior surface finish and precision. These wax master models are ideal for direct casting into precious metals or mould making. You can make thousands of popular pieces or just one never-before-seen item.

While talking about the advantages of 3D printing Gaurav Loyalka says “The entire process can be done in-house, greatly reducing costs associated with production time as well as granting each designer greater control. Printing in-house gives the designer and their client the opportunity to analyse a 3-dimensional sample of the work before delivery. Fewer returns and changes are a benefit to everyone involved.”

“One of the greatest advantages offered by 3D printing is customization.” . “What was once a complicated and expensive process is now possible with a click of a button. As 3D printing allows designing without constraints, it empowers creativity and



3D printing could mean liberation. It will change the economics of the jewellery design market drastically. Independent designers will be able to bring their designs into the world without having to invest a lot of money first. The designer will be able to cherry-pick what suits his/her talents best – she/he might decide to control the whole process or simply focus on designing great products. 3D printing enables shapes with undercuts, complex structures, and even directly functional parts. The connection between local and international will become flat. Because the CAD files can be sent via email and the production can be done locally, you will have designers in small Indian towns selling to the rest of the world, and the other way around. The actual production will stay in areas close to the actual demand. The orders will come in and can be printed on demand; you will not have to stock big bulks of products, so overproduction might soon be a thing of the past.

– Gaurav Loyalka, Co-Founder, Novabeans, on future of jewellery 3D printing

innovation, which also defines why it is an essential part of the jewellery manufacturing process,” he adds.

“The cost benefits of technology concerns speed, complexities and metal loss. Speaking of complex designs, the precision and intricacy using traditional manufacturing procedures would have to be compromised with. Since

there has always been a limitation on lightweight jewellery, the product would be continuously ground resulting in drastic metal loss. Technology helps in making complex and lightweight designs, and identifying the total cost for manufacturing at a digital stage.”

Does it mean loss of human element?

“Certainly not,” say a number of 3D



Novabeans

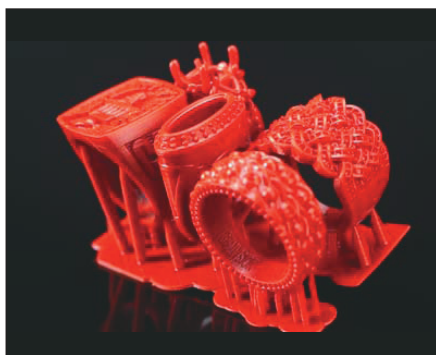
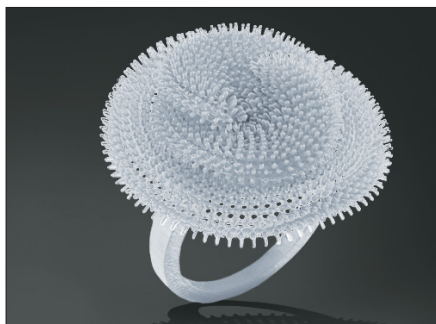
The world is more and more getting flatter. “Creativity” will no more be bound to any geography. There are Indian designers helping International brands, and International designers helping Indian brands. “3D printing” will not help. But 3D designers will surely help..

3D Printing is very commonly used in jewellery industry and is not a well-kept secret. This information of using 3D printing in manufacturing is not passed on to the client because they do not care much about it. What matters to them the most is the end-product and its design and finish.

printing technology providers. Jewellery industry in one sector, which relies heavily on handcrafting skills. Also, this industry is known for creating some of the most exquisite pieces of jewels using solely handcraftsmanship. However, there are limitations to these skills and 3D printing helps to push the envelope further. How?



“Prior to 3D printing, jewellery manufacturing lay in the hands of highly qualified craftsmen and casting processes. Although the idea of hand-made will never be outdated, technology empowers human creativity towards a greater imagination enabling designing without constraints. Back in time intricate designs made by one craftsman couldn't be



Novabeans

replicated by another, resulting in high cost for a particular design. Technology removes any such barriers, making man and machine come together to create the best.”

--the world's first personalised jewellery brand, too affirms that 3D printing does not mean end of handcraftsmanship, rather both can co-exist. He says “Just because you can listen to music digitally/electronically, you don't refrain from attending concerts. Similarly, hand-made jewelry is an art. And, these artists will have to upgrade themselves with digital designing and stuff. What drives art is creativity and not technology. Technology is just an enabler.”

Further he points out “Even if 3D printers exits, there is always some amount of hand work involved. For eg: if I want to make a movable toy jewelry, it can't be completely 3D printed.”

seconded the thought as he says “3D printing will not replace or take over handcrafted jewelry manufacturing. Handcrafted jewelry has its own space and niche.”

Is it cost effective?

Vivek says “For a single personalised products like what AuGrav.com does, it is very much effective. For mass products it is not. As mentioned, most of the jewels you see will not be a unique piece, there will be multiple copies floating all over the worlds. And, 3D printers are good for unique pieces.”

“3D Printing is cost effective as it cuts labour, time and costs included in traditional jewellery manufacturing.”

Change is inevitable and the traditional jewellery industry needs to adapt to the changes. There would always be the fear of the new but that shouldn't restrict the progress. And, the 3D printing is certainly the way ahead. ■