

Stereolithography@work

Viper si2 SLA® system speeds up jewellery production by enhancing efficiency and lowering costs.

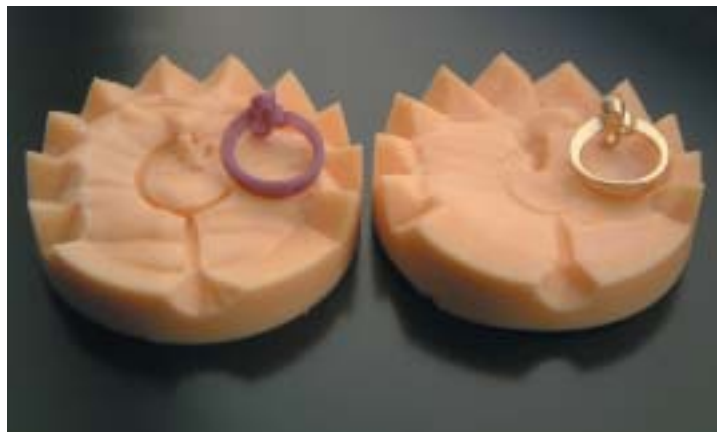
Around the world, jewellery production is evolving into a very strong industry. Increasingly, people from all nations are adorning themselves with precious rings, chains, bracelets, earrings, pendants and all kinds of brooches and other accessories.



In the past months, this sector has felt the need to modify and enhance traditional jewellery making processes to remain competitive. This need has motivated a search for new technologies to satisfy increased demand. By integrating compatible new processes with procedures already in use, there is no need for radical change to the current way of working. Obviously time saved in production is one key element of these improvements.

3D Systems provides a desirable solution

3D Systems, the industry leader in solid imaging solutions, has developed a new Stereolithography system called the Viper si2 SLA system for the jewellery industry. With this system it is possible to build models in a very short time that can be used as samples for aesthetic assessment, as a master for rubber and silicone moulds, and as direct casting patterns.



Compatible with rubber moulding process

Each SLA system consists of an ultraviolet laser, an optical scanning system, a vat of photosensitive epoxy material, an elevator platform, and software that controls exposure and position of the laser and the elevator.

According to the CAD design data, the laser hardens each of the ultra-thin resin layers and builds up, layer-by-layer, precise parts with very fine surface structure. The SLA system thus creates high-precision components with meticulous detail.

The Stereolithography process

A UV laser beam scans the length and breadth of the horizontal surface of the vat of liquid resin (x and y axis). The resin solidifies (polymerizes) with exposure to UV light. The piece that is created is then moved down into the resin by .05mm, which is the thickness of one layer along the vertical or z axis. After each polymerization, the model is covered with more liquid resin by means of the Zephyr coating system. The subsequent layer solidifies and

connects to the previous one and, layer by layer, the model is built. At the end of the process, the platform where the piece is anchored by means of supports, (the only waste material) rises from the vat of remaining, non-polymerized liquid resin. At this point, the platform is detached from the system in order to proceed with the removal and washing of the new part. The system can immediately be loaded with a new platform and the process restarted.

What does the Jewellery Industry require from Solid Imaging Technology?


- High resolution to build models with very fine detail
- High accuracy assemblies
- Excellent surface finish
- Full compatibility with current production technology
- Models which can be used as masters for rubber and silicone moulding
- Compatibility with CAD systems used such as Rhino and Alias Wavefront.
- User-friendliness

Viper si2 SLA® system meets the requirements of the jewellery industry


The Viper si2 SLA system is the most versatile amongst Stereolithography. This system produces high accuracy models with smooth surfaces and extremely thin vertical walls, due to the 75 µm and 100 mW power laser beam. The thickness of the layer construction is 50 µm. The movement of the beam occurs through dynamic scanning mirrors. The laser is a solid state laser with a 7500 hour warranty, thus reducing operating costs.

The maximum build volume is 125mm x 125mm x 140 mm, in the high resolution


Example for build times




No. of designs - 10
Volume - 4501.423 mm³
Surface Area - 7352.587 mm²
Dimension - 122.184 x 53.392 x 29.644 mm
Build Time - 7.10 Hrs
No. of copies - 2
Average build time per part - 21.5 minutes
Total Parts : 20



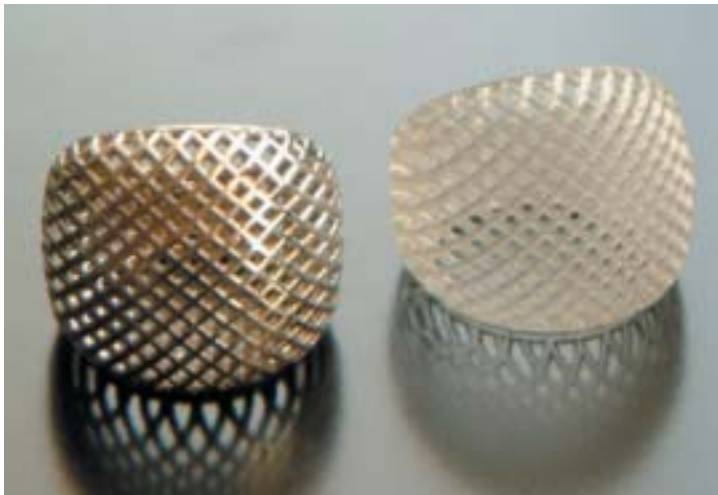
No. of designs - 2
Volume - 366.267 mm³
Surface Area - 1039.688 mm²
Dimension - 27.336 x 11.283 x 20.488 mm
Build Time - 6.13 Hrs
No. of copies - 25
Average build time per part - 7.46 minutes
Total Parts : 50



No. of designs - 1
Volume - 570.034 mm³
Surface Area - 1625.758 mm²
Dimension - 6.065 x 22.422 x 21.325 mm
Build Time - 10.08 Hrs
No. of copies - 44
Average build time per part - 13.82 minutes
Total Parts : 44



No. of designs - 2
Volume - 241.700 mm³
Surface Area - 823.268 mm²
Dimension - 19.569 x 16.000 x 12.798 mm
Build Time - 4.57 Hrs
No. of copies - 25
Average build time per part - 5.94 minutes
Total Parts : 50



Compatible with casting processes



In high resolution mode it builds 44 rings (even different ones) at a size of 6 mm x 22,5 mm x 21.3 mm in only 10 hours

mode. With this build volume it is possible to manufacture 44 rings (which can each be a different design) each with a size of 6mm x 22.5mm x 21.3mm, in only 10 hours. This equates to a production time of 14 minutes per ring. In the standard resolution mode, which still fulfils a high percentage of the accuracy needs in the industry, the Viper si2 SLA system has a build volume of 250mm x 250mm x 140mm or 160 rings, with a build time of 12 hours or 4 minutes, 30 seconds per ring.

The stereolithography material available on the Viper si2 SLA System belongs to the Accura™ product line and is compatible with rubber and silicone moulding. Furthermore, this system is fitted with Lightyear 1.3 which is a dedicated software package for file checking and build preparation. With this software it is possible to correct .STL format errors, position the parts on the platform, as well as automatically create supports. The use of the Viper si2 SLA system is both simple and fast.

Why choose the Viper si2 SLA System?

- This is a system that meets the requirements of the jewellery industry.
- It is a system that provides high resolution and accuracy.
- The Viper si2 SLA system fulfils the standards of a production system by pro-

ducing qualitative repeatable results.

- It is a highly productive system and is easily integrated into current production processes.
- It is simple and easy to use, yet consistently reliable.
- It is a system offered by the market leader in the field of solid imaging systems

INDUSTRY
JEWELLERY
APPLICATION
DESIGN COMMUNICATION,
MASTER FOR INVESTMENT
CASTING AND RUBBER MOULDING

Viper si2 SLA® System – the ideal model making solution for the jewellery industry



Viper si2 SLA System Specifications

LASER	
Type	Solid state Nd:YVO ₄
Wavelength (epoxy resins)	354.7 nm
Power at vat	100 mW available
Laser Warranty	7,500 hours or 12 months (whichever comes first)
RECOATING SYSTEM	
Process	Zephyr™ recoating system
Minimum build layer	0.05 mm *
OPTICAL & SCANNING	
Beam (diameter @ 1/e ²)	Standard mode 0.250 +/- 0.025 mm Hi res mode 0.075 +/- 0.015 mm
VAT CAPACITY	
Maximum build envelope in standard mode	250 x 250 x 250 mm XYZ
Maximum build envelope in HR mode	125 x 125 x 250 mm XYZ
SYSTEM CONTROLLER & SOFTWARE	
Operating system	Windows NT (4.0)
Input data file format	.stl .slc
Network type and protocol	Ethernet, IEEE 802.3 10/100 Base-T
POWER	
100 - 120 VAC +/-10% 50/60 Hz, 6 amps	15 amp, 115V
220 - 240 VAC +/-10% 50/60 Hz, 3 amps	8 amp, 220-240V
UPS requirement	≥ 2 KVA
SIZE	
Uncrated machine	W134 x D86 x H178 cm

* Dependent upon part geometry, build parameters and material.

3D Systems' new Viper si2 SLA system is our first solid imaging system to combine standard and high-resolution part building in the same system. The Viper si2 SLA system lets you choose between standard resolution mode, for the best balance of build speed and part resolution, and high resolution (HR) mode for ultra-detailed small parts and features – all from a carefully integrated digital signal processor (DSP) controlled high speed scanning system with a single, solid-state laser that delivers 100 mW of available power.

The Viper si2 SLA system comes fully equipped with upgraded versions of 3D-Lightyear part preparation and Buildstation control software, with Buildstation software continuing to provide unparalleled control over the build process.

3D Systems Open House: Rapid Prototyping Embraces Jewellery Production



In October 2002 3D Systems Italy held an Open House for over 40 Italian companies, where they introduced the Viper si2 stereolithography (SLA) system to the jewellery community. The Viper SLA system quickly and easily produces clear jewellery models with extremely fine detail, an essential prerogative for the jewellery industry.

The programme of the two-day event, with two sessions held each day, included software presentations by Rhino Ceros and Alias Wavefront. Also presenting was Mr. Maurizio Porzio, R&D office coordinator for Chimento Spa, who illustrated the compatibility of SL materials with rubber moulding and vacuum casting processes in jewellery.

During testing, Chimento and 3D Systems assessed the potential for jewellery production using 3D Systems Viper si2 SLA system. The Viper system produces clear resin models for use as design models, patterns for rubber moulding or direct casting. Stereolithography models are fully compatible with current production technology in the jewellery industry.

Mr. Porzio stated that "3D Systems rightfully predicts that one of the world's traditional artisan trades has been transformed into advanced digital manufacturing (ADM)."

Events



Inhorgenta
booth no. 132A, hall A

21th - 24th February 2003
Munich, Germany



Jewellery Seminar

7th - 8th March 2003
Valenza, Italy



Jewellery Seminar

14th - 15th March 2003
Arezzo, Italy



Basel Jewellery show
booth J 10, hall 3.U

3rd - 10th April 2003
Basel, Switzerland



Oromacchine
padiglione L, booth 4086

7th -12th June 2003
Vicenza, Italy

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