

English translation of the [Device Med May/June edition article](#)

Sterne drives progress in liquid silicone 3D printing

While additive manufacturing has been developed for many years now for metals and polymers, silicone 3D printing is a relatively new technology. Only a few companies in the world have managed to overcome the challenges of the elastomer's unique properties for 3D printing. One such company is the French SME Sterne, which specialises in the manufacture of silicone articles for the medical sector, and whose quality system is ISO 13485:2016 certified. Based in Cavaillon (84) in the south of France, the company has developed an additive manufacturing technology by depositing filaments using UV cured silicones. The process that it developed in 2016 - and improved since then - made it possible to obtain parts in hardnesses of between 30 and 60 shore A on dimensions close to 200 x 200 x 100 mm, with a printing layer of 100 to 550 microns .

Named SiO Shaping, this promising technology was then opening the field of possibilities regarding liquid silicone printing (LSR, for Liquid Silicone Rubber) cured by UV.

Determined to stay on top of technology, Sterne has kept investing in the development of its 3D printing technology. And it is in particular, by taking into account the weaknesses of the first version, that a new version has been developed, with the SiO Shaping 2201 printer.

A hardness from 10 to 80 shore A with a panel of different colors

The progress are significant. At first, it becomes possible to print materials from 10 to 80 shore A, answering technical or esthetical needs, with a panel of different colors, for materials in compliance with FDA quality, USP class VI Medical Grade or implantable.

Moreover, the new printer developed by Sterne is bigger than the previous (SiO Shaping 1601). It covers a surface of 500x500x500mm, expanding the possibilities of printable pieces. Other new feature, these wide dimensions will allow one to print small and medium series (up to 100 pieces) with a single batch of silicone.

One will note that the silicone used for the 3D printing of pieces, can then be transformed by injection. Let us recall here that the company masters extrusion, injection, overmolding and co-extrusion in industrial environment as well as in clean rooms (it disposes of 700sqm in ISO 6, 7 and 8).

A printing technology ideal for quick prototyping

Entirely developed in-house, this new additive manufacturing solution SiO Shaping has become a valuable investment decision support tool for customers wishing to develop a new product.

"The SiO Shaping technology offers a unique innovative potential," explains Anthony Pellafol, R&D manager at Sterne. "Printing prototypes using transformable material that are afterwards injectable in our clean rooms, allows our clients to reduce their "time-to-market" and to carry out if necessary design loops, while mastering the material from prototyping to production.

The company does not intend to stop there, and is actually working on new materials, with specific mechanical properties, and on always more complex shapes in order to answer specific needs of its clients and give shape to their ideas.

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