SHAPEWAYS

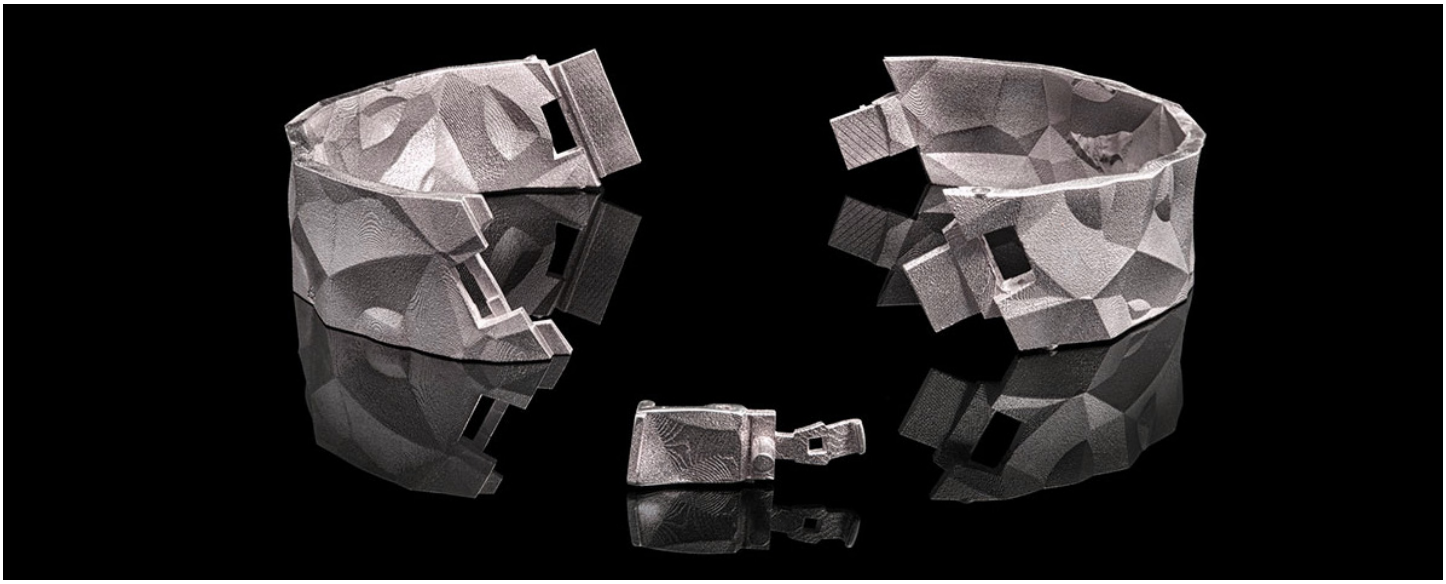
Case Study:
Integration of Craft

Groen & Boothman Present 3D Printed “Elements” Bracelet Series

Hanno Groen and Joanna Boothman knew from the beginning they would choose silver for the *Elements* bracelet series. In viewing the spectacularly reflective surfaces of the jewelry, that’s understandable.

“I saw the possibility for 3D printing with wax and silver at Shapeways, and it motivated me to launch this project,” said Groen.

Featuring two styles, *Water* and *Cosmic*, the Amsterdam-based designers Groen & Boothman enter into a new topology for this fine jewelry series, while still sculpting pieces in their signature, modern style. The bracelets, and underlying foundation of their creation, demonstrate Groen & Boothman’s mettle not just as industrial designers and jewelry makers—but scientists too—using computer generated algorithms as a design tool to conjure up designs invoking waves, crystals and other shapes that capture the spirit of nature.



3D printed parts of the '*Cosmic*' bracelet, before polishing and finishing

Credit: Groen & Boothman

"Our goal is to manipulate and play with the algorithms to take design to a new level."

– Joanna Boothman | Designer, Groen & Boothman

The Elements '*Cosmic*' bracelet

Credit: Groen & Boothman

"Our goal is to manipulate and play with the algorithms to take design to a new level," said Boothman.

Impressive engineering went into making the silver bracelets, made from 3D printed molds and then cast, along with many hours of polishing. The designers sought after a perfect fit on the wrist for both bracelets, a challenge for jewelry expected to just slide over the hand effortlessly. The answer was to create an intricate hinge and interlocking clasp mechanism—a remarkable, minute work of art in itself.

Gaining 'control' over the work, the designers made the bracelets with minimal clearance in two pieces, connected by the clasp. Groen explained that prior to ordering precious silver samples, numerous tests and prototypes were made using Nylon 12 [Versatile Plastic].

Groen & Boothman knew it would be extremely difficult to produce either *Water* or *Cosmic* through conventional techniques. No strangers to 3D modeling, they realized that would be the best route not only to design complex geometries, but also to manufacture them. In the end, some drilling was required too, for parts like the pin connecting the hinge.

"Parts like this, and the complex shape of the hinge, are nearly impossible to make by hand and that's a big advantage of 3D printing—especially 3D modeling—that you can make shapes like this," said Groen.

The Elements '*Water*' bracelet
Credit: Groen & Boothman

In the end, their decision to go with 3D printing allowed Groen & Boothman to retain better control over the design, and handle post-processing requirements on their own.

The designers are not afraid to mix and match their methods, materials, or technology, and they are both fond of adding handcrafted touches. For the *Water* and *Cosmic* series, that meant a lot of polishing. Joanna Boothman explained that although they are aware they could have used Shapeways post-processing offerings for that type of intensive finishing, they knew this polishing project was going to be a massive undertaking. Plus, they enjoy working by hand too.

"There's an aspect that is more subtle," said Boothman. "You've got this high-tech 3D printing process which gives us these beautiful raw silver parts that we finish by hand."

"This integration of craft, the marriage of handicraft and the 3D printing, gives that quality you expect from fine jewelry."

In working with some more traditional companies, Groen notes that they often appreciate the old-school craftsmanship combined with newer technology like 3D printing. They also see the added value of the form freedom allowed through 3D modeling and printing.

"This is a new kind of craftsmanship which has added to what we already know," said Groen. "I think that's a mature way of looking at it."

Undeniably, 3D printing is the very definition of 'disruptive,' and any type of change can be unsettling after decades of manufacturing or

3D printed and hand polished '*Water*' bracelet *Credit: Groen & Boothman*

“Using 3D printing can match quite well with traditional handcraft techniques.”

– Joanna Boothman | Designer, Groen & Boothman

handcrafting products like jewelry in a certain way.

“Using 3D printing can match quite well with traditional handcraft techniques,” added Boothman.

Both Groen and Boothman find 3D printed jewelry to be a fascinating way to explore new materials and methods, but they are also working on other luxury pieces such as watches, which require more conventional technology like CNC machining. The designers regularly work on projects using precious metals in several fields —from jewelry to watches to tableware.

“Definitely, there’s more to come,” said Boothman.

About Shapeways

Shapeways makes world-class 3D printing more accessible to everyone through automation, innovation and digitization. Our purpose-built software, wide selection of materials and technologies, and global supply chain lower manufacturing barriers and speed delivery of quality products. Shapeways’ digital manufacturing services have empowered more than one million customers worldwide to produce more than 20 million parts using 10 different technologies and 90 different materials and finishes. Headquartered in New York City, Shapeways has ISO 9001-compliant manufacturing facilities in Long Island City, N.Y., and Eindhoven, the Netherlands. Contact us at www.shapeways.com to learn more.