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FAST FORWARD TO THE FUTURE

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MISSION EYEWEAR: REIMAGINED 3D PRINTING FOR ON-DEMAND EYEWEAR

3-D PRINTING SOLUTIONS MANUFACTURER, GENERA, ALONGSIDE MISSION EYEWEAR, HAS DEVELOPED A STATE-OF-THE-ART FULLY AUTOMATED SYSTEM FOR 3D PRINTING FRAMES ON SITE IN THE OPTICAL STORE, TAILORED TO THE CUSTOMER'S FACE SHAPE AND COLOUR AND STYLE PREFERENCES. GENERA'S FOUNDER, DR. KLAUS STADLMANN TOLD 20/20 EUROPE WHY HIS 3D PRINTING INNOVATION IS GOING TO CHANGE THE FUTURE OF EYEWEAR DISPENSING FOR THE OPTICAL RETAILER.

Written by 20/20 Editorial Staff



Founder, **Dr. Klaus Stadlmann.** GENERA was founded by Stadlmann, a mechanical engineer with a doctorate in 3D printing, in 2015

GENERA AND MISSION EYEWEAR WILL SHOW THE G1/F1 SYSTEM AND THE NEW COLOUR MIXING SYSTEM C1 AT SILMO IN SEPTEMBER. WHAT IS THE CAPABILITY OF THIS SYSTEM, AND WHO IS IT TARGETED AT?

The G1/F1 is capable of printing frames and temples in almost any shape and colour on demand in the store. It can produce up to 1000 frames per year. The system can produce fully customized frames ensuring a perfect fit. Since the system produces frames from a digital file or digital design there is no stock keeping necessary anymore and new designs are frequently updated to our platform also several labels are working on a digital collection for our system. The system saves more the 94% of CO2 emission compared to the production of acetate frames and is fully automated. Our customers are independent opticians, optical chains and labels: the opticians want to provide a unique customer experience and a new way of customer engagement.

WHY WILL THIS BE ADVANTAGEOUS FOR THE OPTICIAN - AND WILL IT REQUIRE A HIGH LEVEL OF TECHNICAL SKILL TO USE THE SYSTEM?

The system is fully automated and there is no technical skill required to run the system in the shop. Also, there is no smell, no noise and its very safe to use. We already have a couple of customers who are running the system in the centre of their retail space



Mission Eyewear: 3D printing on site

so people can see how the frames are made and understand that the frame is unique and produced locally. In some stores, the retailer has built a whole new customer experience around our machines in a specially designed space – creating a 'digital optical store'.

Through Mission Eyewear, opticians can download existing frame designs with the option of customizing them with our Eyewear Customizer App. The Mission Eyewear x Frameshaper Collection allows opticians to configure eyewear models in real-time without CAD knowledge or design software. At SILMO, we will also present a complete Design Collection for Mission Eyewear by the well-known eyewear designer, Philipp Haffmans.

One of the special highlights for the designs is being able to print a name or custom text directly onto the temple. Production is fully automated through Mission Eyewear's G1/F1 system—on-demand and in any desired colour, whether transparent or translucent. For opticians, this means custom eyewear models with no inventory, produced instantly right in their own store. The ever-expanding collection provides a solid foundation. Additionally, completely unique design lines can be developed, which will also be fully customizable.

We already have some customers, including independent opticians, labels and optical chains, who are making their own designs or working with designers to create their own design collection through the platform.

CAN YOU EXPLAIN THE DIFFERENT STEPS REQUIRED TO MAKE A FRAME USING THIS SYSTEM?

Basically, that's very simple: first you download a design, then you pick a colour you want. You can choose from one of our 40+ standard colours or with the C1 colour mixing system you can pick any tone you want from thousands of choices. For example, you can print a frame in a particular colour your customer wants, mixing the coloured resin for just one frame, which means there is no waste.

After the colour selection, you enter the coloured resin cartridge together with the material unit and the shuttle into the G1 and just press start. The machine then automatically picks a build platform from the shuttle, opens the material unit and starts the printing process. When the printing process is finished you take out the shuttle including the frame or frames and put it into the F1 post processing unit. This system operates automatically and cleans, dries and finishes the frame. After the process, you can immediately start to assemble the frame. The only manual step is taking the shuttle from the G1 and enter it into the F1. This means that running this fully automated system in the shop doesn't distract you from selling frames and all the staff can use the system – it's as simple as 'Click and Print'.

WHAT MATERIAL ARE THE FRAMES MADE FROM? WHAT DOES THIS MEAN FOR THE QUALITY OF THE FINAL PRODUCT?

We use a transparent resin which can be produced in any colour or translucency. The material was developed together with Henkel Loctite for our process and the In-Shop system. The material fulfils all standards for eyewear and passes all



MISSION Eyewear displayed in store



Mission Eyewear

relevant tests like skin irritation, cytotoxicity and sensitization. We even tested the material in a harsh UV aging test setup from the automobile industry and compared it to well-known standard materials like acetate and our Digital Eyewear material outperformed these materials in terms of stability.

The frames are printed using a photopolymer resin co-developed with Henkel Loctite. It combines brilliant colour, transparency, and flexibility, and it outperforms classic acetate in many aspects. It is Biocompatible (ISO 10993-5, -23), UV-resistant (ASTM D4329), mechanically robust (ISO 12870) and polishable, bendable, and durable.

This ensures the frames not only look and feel like high-end acetate, but are even more stable under stress, heat, and UV exposure.

With our unique material, we can achieve any colour and transparency and we can polish, tumble, and heat bend the material. For the first time, it is possible to 3D print a frame with full automation and achieve the look of high-end acetate frames. We are already working with many innovative designers in the optical industry, including Cabrio Eyewear, Leinz Eyewear, Klenze & Baum, Raydiant and VM L'Atelier.

THE SYSTEM HAS A VARIETY OF COMPONENTS. CAN YOU TALK US THROUGH WHAT IS INCLUDED?

Basically, the full system consists of three machines working as a complete automated production system. The full solution comprises:

- **C1** – Colour mixing system (optional)
- **G1** – 3D printer with DLP technology (70 µm resolution, 385 nm wavelength)
- **F1** – Post-processing unit with washing, drying, and curing under inert atmosphere

Each unit is RFID-tracked, easy to operate, and plug-and-play ready for optical retail environments.

TO MAKE IT EASY FOR OPTICIANS TO SET UP THE SYSTEM IN STORE, YOU ALSO OFFER A STARTER PACK. WHAT IS THIS AND WHAT TYPE OF ADVANTAGES DOES IT OFFER?

We offer two starter packages, one without the colour mixing system and one including the colour mixing system. In the starter set, the opticians get access to all our free designs and can print them as often as they want. Also included are 5kg of material, which allows the optician to print up to 250 frames without any material costs. The idea is that this allows the optician to pay back the investment very fast – and this is what we actually see in practice. Some opticians have already replaced 300-400 frames which they sell in their shop with printed frames.

IS THE SYSTEM ALREADY BEING USED BY OPTICIANS? OR IS THE ROLL OUT OF THIS IN EUROPE GRADUAL PLEASE EXPLAIN WHERE IT IS AVAILABLE AND WHAT YOUR HOPES ARE FOR GROWTH IN OTHER MARKETS?

We are selling the G1/F1 to opticians all around the world from the US to Japan, from Italy to Germany. We get very good feedback from our customers. They also love the idea that they can now print any design in any colour they want by using the C1 colour mixing system. Also, the possibility to create own designs and even an own label opens a new opportunity for the opticians. However, we also sell our small system and our big production system to well-known eyewear labels and eyewear companies. Basically, there is a big demand for the frames and our technology, including the very transparent 3d printed styles – we are seeing a growing demand and exceptional feedback from big and established players in the business.

genera3d.com / mission-eyewear.com

Mission Eyewear is a homepage dedicated to the G1/F1 and C1 system for opticians. GENERA's large production systems – which can produce up to 50.000 frames with full automation – are shown at www.genera3d.com, including the G2/F2 system.