





[www.genera3d.com](http://www.genera3d.com)  
[www.mission-eyewear.com](http://www.mission-eyewear.com)

## The unique advantage of GENERA and Mission Eyewear.

Join us in Revolutionizing the Eyewear Business with GENERA!

At GENERA, our passion for 3D printing led us to reimagine the additive manufacturing process. Working with 3D printers daily, we recognized the need for better manufacturing solutions and conceived the idea for in-shop eyewear production. That's why we created the G1/F1 system – a digital, fully automated 3D-production workflow explicitly designed for eyewear.

With our dedicated 3D printing workflow, you can expect reliable, clean, and fast production, providing you with the freedom to explore endless ideas and unleash your creativity. The G1/F1 system seamlessly integrates printing and post-processing, ensuring improved and repeatable results.

Join us in transforming the eyewear industry with our comprehensive and innovative approach to additive manufacturing.

Unlock new possibilities for your eyewear business.

GENERA,  
Creation made reliable.

DI Dr. techn. Klaus Stadlmann,  
Founder & Managing Director of GENERA.

## The GENERA G1/F1 System.



### G1/F1

Desktop. Clean. Automated.

Experience the future of eyewear manufacturing with GENERA's G1/F1 System - Desktop, Clean, and Automated. Our innovative system combines the precision and reliability of our advanced industrial production systems (G2/F2 and G3) with the convenience of a compact desktop format, empowering your In-Shop eyewear production. With automation and user-friendly operation, the G1/F1 System elevates your eyewear business, allowing you to create personalized frames with ease. Utilizing cartridge-based material units and our patented shuttle technology, enjoy a clean and seamless workflow for exceptional results.

## GENERA Mission Eyewear.



### EN

Mission Eyewear empowers opticians to provide personalized eyewear quickly and efficiently, transforming the eyewear industry through an automated workflow. Opticians can download high-quality glasses frame designs and produce them on demand using the GENERA G1/F1 3D printing system. By decentralizing the production of 3D printed eyewear opticians have greater control and flexibility in offering customers a wide range of customizable options, vibrant colors, and impeccable surfaces.

### FR

Mission Eyewear est une plateforme qui vise à décentraliser la fabrication de lunettes en 3D. Elle permet aux opticiens de télécharger des modèles de montures de haute qualité et de les imprimer à la demande dans leurs magasins. Grâce à l'automatisation du système DLP G1/F1 de GENERA et aux résines liquides spécialement développées par Henkel. Les opticiens peuvent proposer aux clients un large assortiment d'options personnalisables, une large gamme de couleurs brillantes et de surfaces parfait.

## System Components.



**G1**  
The 3D printer uses digital light processing (DLP) technology, where resins are polymerized using UV light, layer by layer.



**F1**  
The post- processing unit where the printed frames are washed, dried, and light cured in a fully automated process.



**Shuttle**  
This integrated transport box system (Shuttle) ensures a clean and safe application without direct contact with resin. The Shuttle holds the building platform and offers UV light protection to avoid any additional exposure.

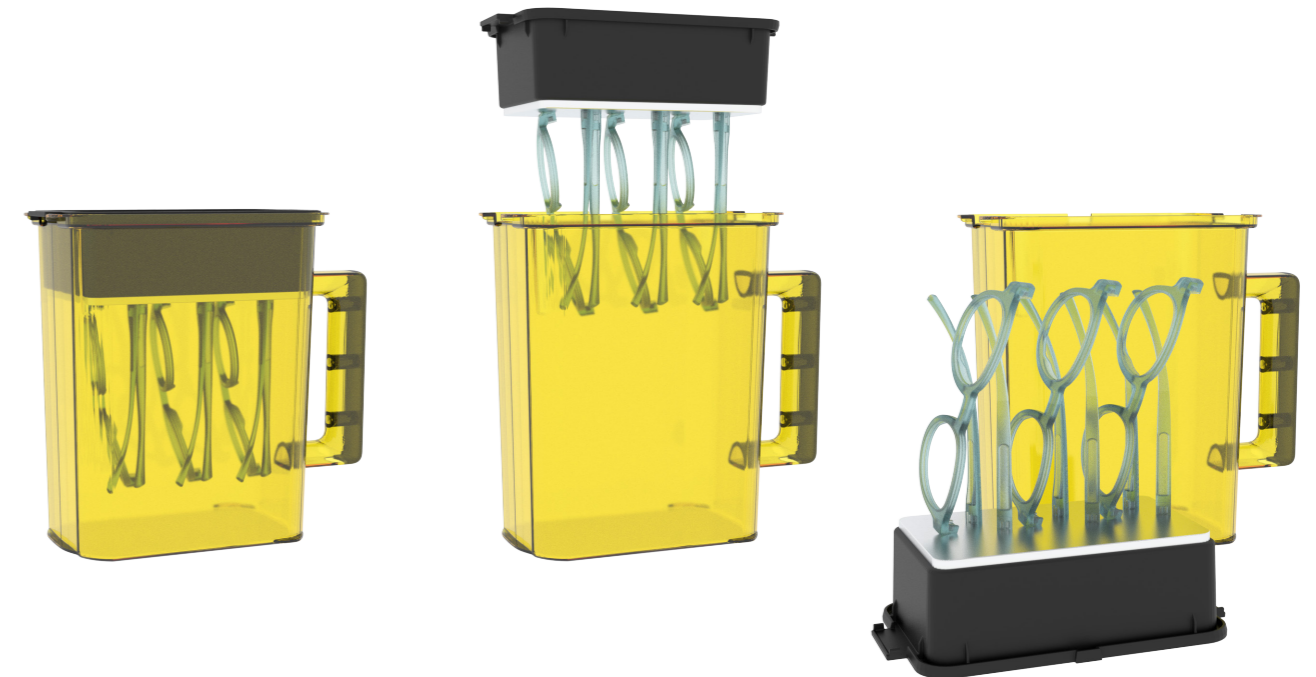


**Cartridges and Material**  
The cartridge is inserted into the material unit and is automatically paired and identified by the CAM software. All colors and transparent materials are possible.



**Washing Containers**  
The F1 post-processing unit includes two washing containers to pre-wash and finally wash the printed object in isopropanol. Thanks to an RFID tag, the system automatically checks the fill level and condition of the contents.

## The Shuttle.



**Effortless production.**  
Our shuttle travels from the G1 3D printer to the F1 post-processing unit throughout our workflow. It allows you to handle and process the printed eyewear frames without dripping, contamination, or unwanted light influence. This means you can work with the frames efficiently and maintain a clean environment for optimal results.

The Shuttle also acts as a seamless link between the G1 3D printer and the F1 post-processing unit, ensuring traceability

and repeatability throughout the entire manufacturing process. GENERA's patented workflow leaves no support marks on the frames. Our Process Development Team has fine-tuned the printing and post-processing parameters for our unique materials to ensure reliable and consistent output, making G1/F1 ideal for in-shop production. Whether you print one frame at a time or multiple frames at once, the quality is always the same as well as the printing speed.

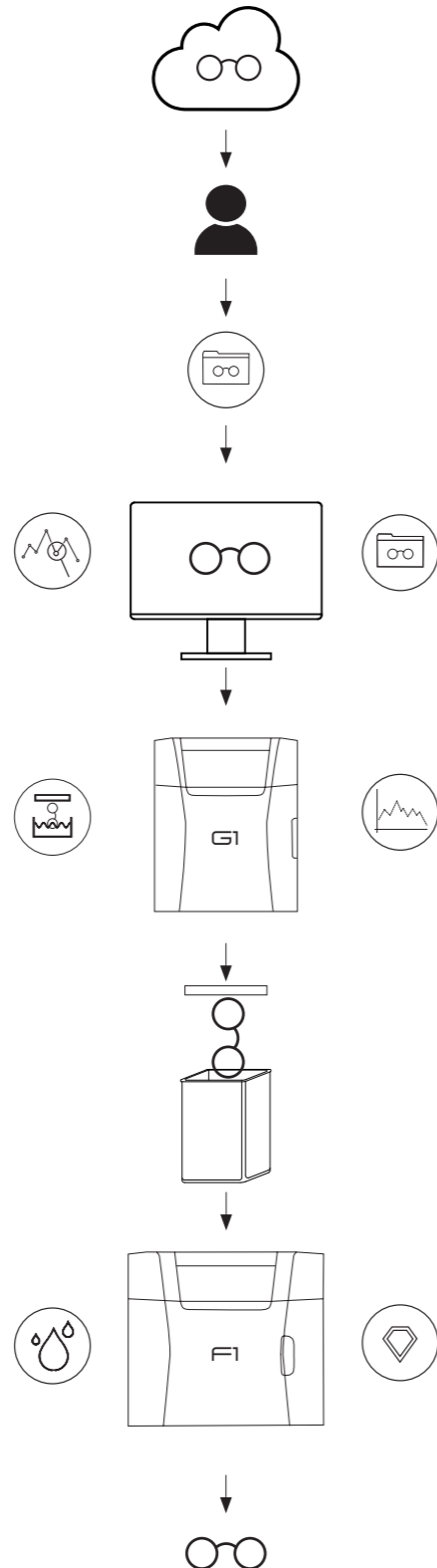


# The GENERA Mission Eyewear Process

## Step 1: Access or Create Digital Designs

You can download a digital production file from renowned eyewear labels by joining the Mission Eyewear platform and simply send it to the G1/F1 system. That's it!

Or design your own custom frames with the help of online tools and start making your own frames optimized for the needs of your client.



## Step 2: 3D Printing in Your Store

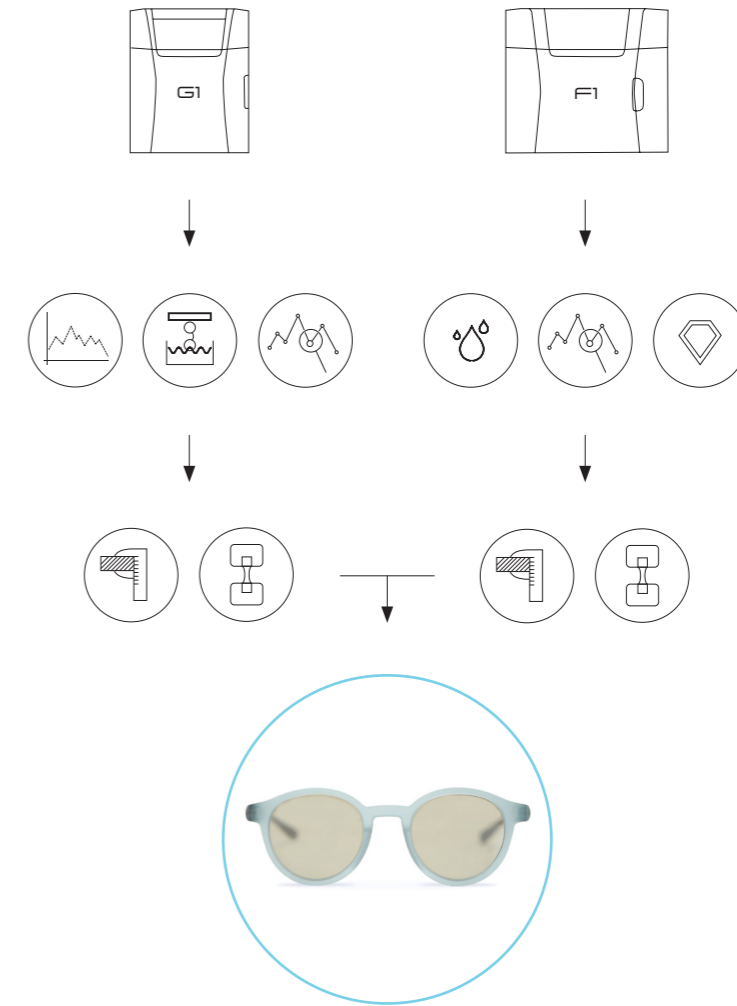
With GENERA's G1/F1 system, you have the power to 3D print the frame right in your store.

The system automatically identifies the cartridge and the material and selects the optimal production parameters accordingly.

## Step 3: Automated Post-Processing

During printing and post-processing, the printed part travels in a tight box or shuttle, from the G1 3D Printer to the F1 Post-processing unit where the frame will be handled and processed with minimal user intervention.

# The GENERA Material Validation Process



**Tested according to ISO-12870**

Quality Assurance. Reliability. Our materials undergo ISO-12870 testing and certification, ensuring top-notch quality and performance. We conduct thorough internal tests, including UV stability and aging assessments, meeting the stringent standards set by the automotive industry. This validation process proves that our In-Shop 3D printing of eyewear is setting a new industry standard.

To ensure the best results, our internal

validation process begins with test prints and frame analysis to evaluate printing parameters. We optimize these parameters and print test bars, conducting mechanical tests and measurements for accuracy. The post-processing phase involves modifying parameters like washing and post-curing times for a variety of test parts and frames. The final test parts undergo mechanical testing and are compared to the material vendor's technical data sheet (TDS). If the data matches, we proceed to a certified

test lab for ISO-12870 testing, guaranteeing repeatable and reliable printing outcomes for our customers.

## Digital Acetate.



Our commitment to innovation and collaboration drives continuous improvement, ensuring we offer our customers the best materials for eyewear applications. Developed exclusively for the G1/F1 system, our material Digital Acetate exhibits a remarkable memory effect, allowing deformation at a specific temperature and reverting to its original shape upon reheating. This material, formulated in collaboration with Henkel for Mission Eyewear, sets new standards in transparency, translucency, and colour brilliance, enhancing eyewear aesthetics.

Our meticulous Process Development Team fine-tuned printing and post-processing parameters, guaranteeing exceptional and repeatable results. Rigorous validation ensures optimised mechanical properties, biocompatibility, UV stability, and overall performance. Excitingly, we are expanding our materials range to include hinges, cases, and other eyewear applications. By integrating this advanced material

with GENERA's G1/F1 system, opticians can embark on a new era of In-Shop manufacturing.

## Sustainability & Responsibility.



The world is increasingly recognizing the urgent need for sustainable practices across industries. One such area is eyewear production, where traditional manufacturing and global supply chains have led to significant carbon emissions and ecological footprints. GENERA is about to change that for good with Mission Eyewear and in-shop 3D printing. By shifting from conventional methods to localized production, the eyewear industry can significantly reduce its environmental impact and foster sustainability.

**The Carbon Footprint Challenge:** Eyewear frames have traditionally been manufactured in centralized factories and then shipped globally to be sold in shops worldwide. This extensive transportation process contributes to substantial carbon emissions and ecological footprints. Freight transportation alone generates large amounts of greenhouse gas emissions, primarily due to burning fossil fuels in ships, planes, and trucks.

**Advantages of In-Shop 3D Printing:** The advent of 3D printing technology has revolutionized various industries, and eyewear production is no exception. In-Shop 3D printing in the eyewear industry holds immense promise for sustainability and reducing the ecological footprint associated with traditional manufacturing and global distribution.

- 1. Localized Production:** By integrating 3D printing technology directly into retail shops, eyewear frames can be produced on-site, eliminating the need for long-distance transportation. This localized approach significantly reduces carbon emissions by minimizing the transportation-related footprint associated with the shipping process.
- 2. Waste Reduction:** Traditional manufacturing methods often result in significant material waste due to inefficiencies and excess production. In contrast, 3D printing enables precise and customized manufacturing, minimizing waste generation. The additive manufacturing process of 3D printing builds products layer by layer, using only the necessary amount of material, thereby reducing environmental impact.
- 3. Design Flexibility:** 3D printing allows

for unparalleled design flexibility, empowering consumers to customize their eyewear frames according to personal preferences. This customization reduces the likelihood of discarded or unused frames, further reducing waste and promoting a circular economy.

- 4. Efficient Resource Utilization:** In-shop 3D printing optimizes the use of resources by producing eyewear frames on demand. Unlike mass production, where excessive inventory is common, 3D printing ensures that products are manufactured precisely when needed. This approach minimizes resource consumption and helps to avoid overproduction and unnecessary waste.

In-Shop 3D printing in the eyewear industry holds immense promise for sustainability and reducing the ecological footprint associated with traditional manufacturing and global distribution. By localized production, we can drastically reduce carbon emissions, minimize waste generation, and offer personalized products to consumers. It is crucial for the industry to embrace and invest in these innovative and sustainable technologies to pave the way for a greener future in eyewear production. Together, we can shape a more environmentally conscious world, one frame at a time.

# Transparent. Translucent. Vivid Colors.



Whether you prefer bold and vibrant hues or subtle and sophisticated tones, Mission Eyewear has you covered. The color options provided by Mission Eyewear are not only visually appealing but also durable, long-lasting and tested for UV stability. The accuracy of our frames and the surface quality set new standards for 3D printed eyewear. And all that in a digital process and without the need of stock keeping. Customizing eyewear In-Shop on demand is finally here and it's here to stay.

At GENERA, we believe in simplifying and automating the additive manufacturing process to maximize productivity and streamline workflows. That's why our G1/F1 system implements a material cartridge, offering numerous advantages for a seamless 3D printing experience.

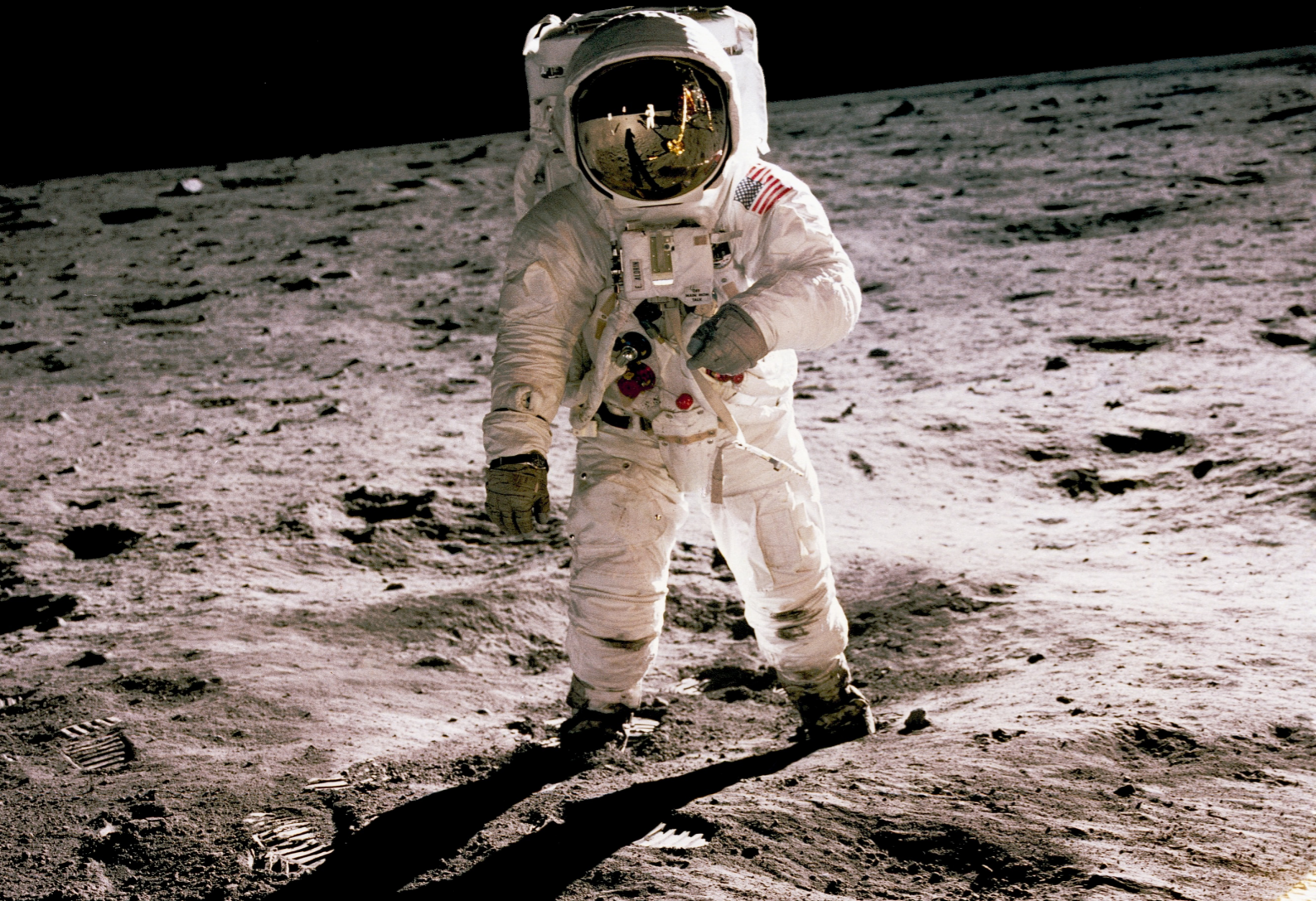
**Material Management:**  
The material cartridge allows for precise control over resin usage and minimizing material waste. This efficient manage-

ment system optimizes material consumption, resulting in cost savings and reduced environmental impact.





## Someone must be First. Starter Package.



When you purchase the G1/F1 system, we provide you with a complimentary starter package that includes 5 free material cartridges, each containing 1kg of our dedicated eyewear material. With this exclusive package, you can confidently print over 200 frames, without any worries about material costs or failed prints as you familiarize yourself with this cutting-edge technology. But the starter package goes beyond that – it's a gateway to

accelerating your business. Easily recoup your machine costs in just a few months or less than a year by leveraging the G1/F1's remarkable ability to print 200+ frames within weeks. Additionally, you can transform your investment into a decentralized production system, securing your returns while expanding your direct sales to other opticians. Embrace new horizons and showcase your unique designs with this empowering starter package. And

that's not all – we're continually developing new materials to cater to diverse eyewear applications, from tools and hinges to customized cases. Mission Eyewear is set to make a significant impact on the industry, and we invite you to be part of this revolutionary journey. Join us now, because someone must be bold, and someone must be the first. With our Starter Package, you can take the lead and reshape the future of eyewear manufacturing.

## Support & Service.



At GENERA, our mission is to be your trusted partner in creating high-quality eyewear. We genuinely care about your success, and that's why we offer specialized support packages, in addition to our standard product warranty. Transparency and customer-centricity are at the core of our service packages. No hidden costs or complex structures, just straightforward and reliable support tailored to your production needs. While you have the freedom to run our systems without a service package,

we're here to ensure you have a seamless experience. Your success is our success, and together, we'll make your eyewear production journey a rewarding one. Let's embark on this journey together and create stunning eyewear that makes a difference.

# G1/F1

Desktop. Clean. Automated.

The G1/F1 brings the GENERA dedicated eyewear workflow and automation to your desktop. It uses validated material for eyewear production and a cartridge-based material unit to store the resin (Digital Acetate). The G1/F1 utilizes the GENERA shuttle technology for a clean and safe workflow. The F1 uses a mercury flash bulb for curing the parts in an inert atmosphere.

The frames are cleaned in two cleaning tanks specially designed for secure use with IPA.

The whole workflow is RFID tracked.

The material unit, combined with a material cartridge, ensures clean and safe handling. The material unit is automatically opened by the G1 and automatically dispensed. An integrated recoater helps to mix the resin within the resin vat to ensure consistent print results. The vat can be heated and tracks low resin levels as well as the film's lifetime. After the printing process the G1 automatically stores the part in the shuttle. The frames are then automatically post-processed by the F1.

## HARD FACTS

### Print volume

@70  $\mu\text{m}$

x: 134 mm

y: 76 mm

z: 150 mm

### Wavelength

385 nm DLP

### 2K Resolution

(1920x1080)

**Glove free process with shuttle technology and automated post-processing**

**Material unit with cartridge for easy and secure resin handling**

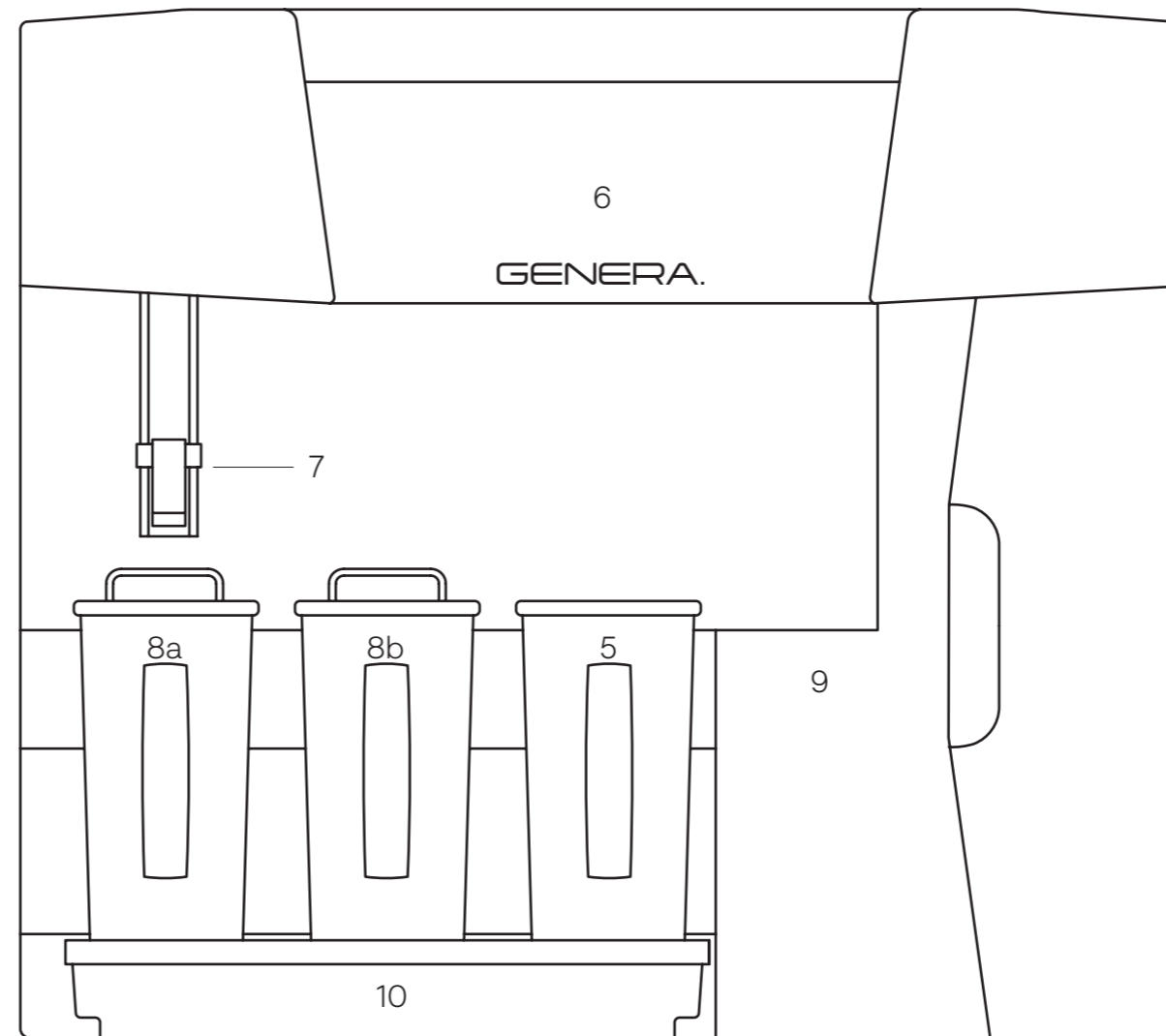
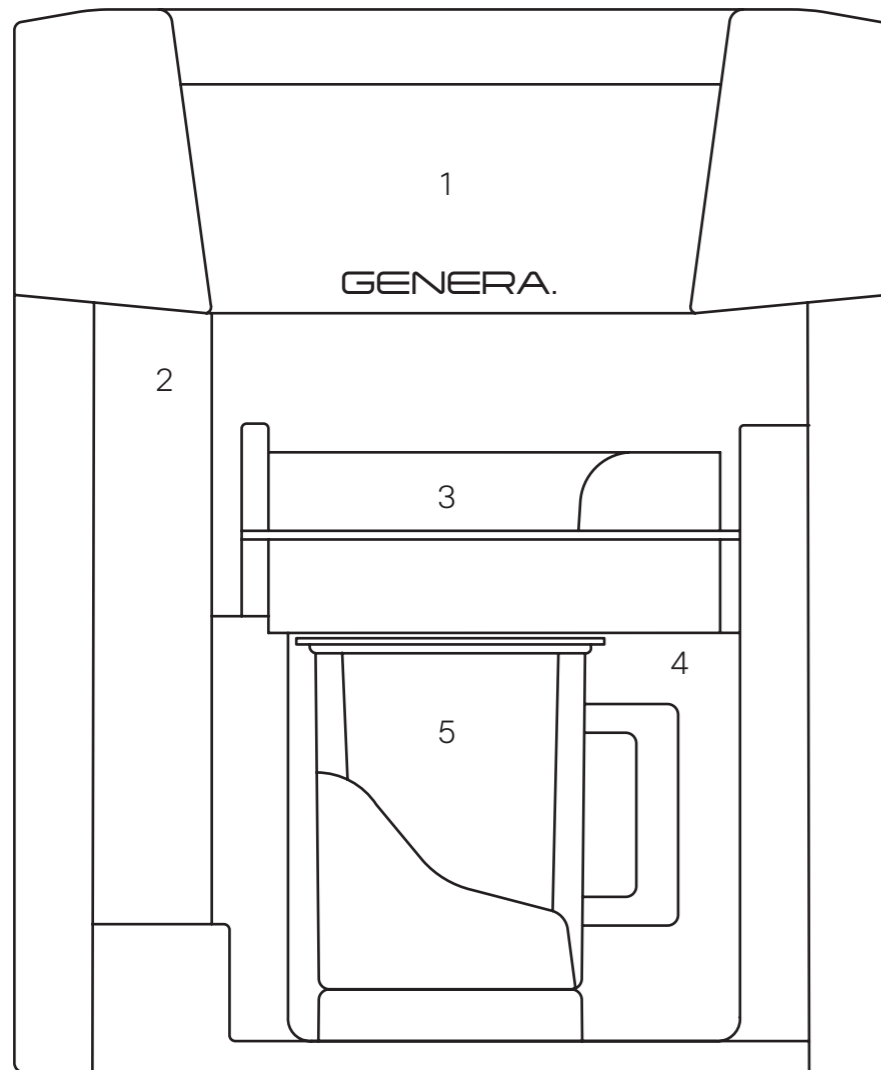
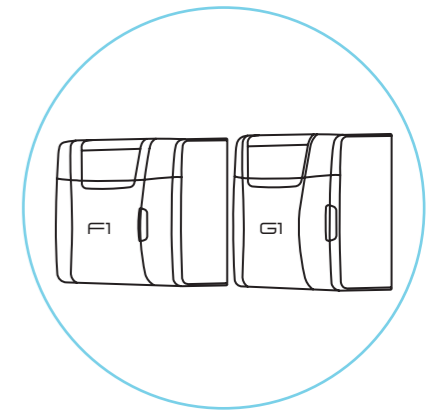
**Active carbon filter for odor reduction**

**Post-curing in inert atmosphere**

**Documentation and traceability by RFID tag and database**







SYSTEM COMPONENTS G1/F1

- 1 Human Machine Interface (HMI) with machine control, part preview and printing progress
- 2 Automatic handling system for platforms
- 3 Material unit and cartridge
- 4 2K 385 nm DLP light engine with 70 µm pixel size
- 5 Glove-free process with RFID-tagged transport-shuttle for fully automated post-processing
- 6 Human Machine Interface (HMI) with machine control, part preview and status progress
- 7 Automatic handling system for platforms
- 8a, 8b Glove-free process with RFID-tagged pre- and post-washcontainer with integrated magnetic stirrer for fully automated washing
- 9 Post-curing chamber
  - o High-power mercury flash bulb
  - o Inert atmosphere
  - o Part drying
- 10 Overflow protection



# G1/F1 Cabinet



#### Attention to detail.

Kappler and GENERA have collaborated to create a bespoke cabinet design, perfectly optimized for your G1/F1 system and your shop needs. This cabinet provides dedicated space for storing all accessories, system equipment, and various material units and cartridges. Safety is prioritized, as the nitrogen gas bottle can be securely stored according to safety standards. Additionally, the cabinet allows for tidy cable management, eliminating visible cables. With

small indentations securing the location of the G1/F1 system, positioning becomes effortless. Moreover, all cabinet surfaces are easy to clean and chemical resistant, ensuring maximum convenience and durability.

# G1/F1



#### GENERAL

<b>G1</b>	
<b>Description</b>	DLP resin vat system with shuttle technology
<b>Materials</b>	Validated with all materials from the GENERA open material library
<b>Build Volume (XYZ)</b>	
@ 70 $\mu$ m	134 x 76 x 150 mm (5.28 x 2.99 x 5.91 in)
<b>Resolution</b>	2K DLP (1920 x 1080)
<b>Wavelength</b>	385 nm
<b>Regulatory Compliance</b>	CE, FCC, IC (Canada)
<b>F1</b>	
<b>Description</b>	Post-Processing Unit optimized for use with the G1 Printer
<b>Materials</b>	Validated with all materials from the GENERA open material library
<b>Washing Technology</b>	Magnetic stirrer
<b>Cleaning Fluid</b>	IPA
<b>Curing Chamber</b>	Mercury flash bulb
<b>Regulatory Compliance</b>	CE, FCC, IC (Canada)

#### PHYSICAL FOOTPRINT

<b>System Size (W x D x H)</b>	G1 530 x 515 x 670 mm (20.9 x 20.3 x 26.4 in) / F1 730 x 515 x 670 mm (28.7 x 20.3 x 26.4 in)
<b>System Weight</b>	G1 41 kg (90.38 lb) / F1 50 kg (110.2 lb)

#### FACILITY REQUIREMENTS

<b>Power Requirements</b>	AC 100-240 V, 50-60Hz, G1 2.0A-0.85A / F1 4.2-2.2 A
<b>Network Connectivity</b>	Ethernet
<b>Nitrogen Connection</b>	4-8 bar (58-116 psi)
<b>Operating Conditions</b>	+15 °C to +35 °C

#### SOFTWARE AND DESIGN TOOL

<b>CAM</b>	GENERA G1/F1 CAM
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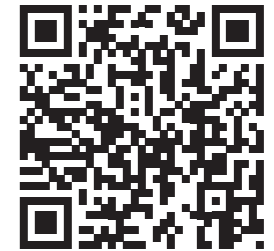
GENERA.



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