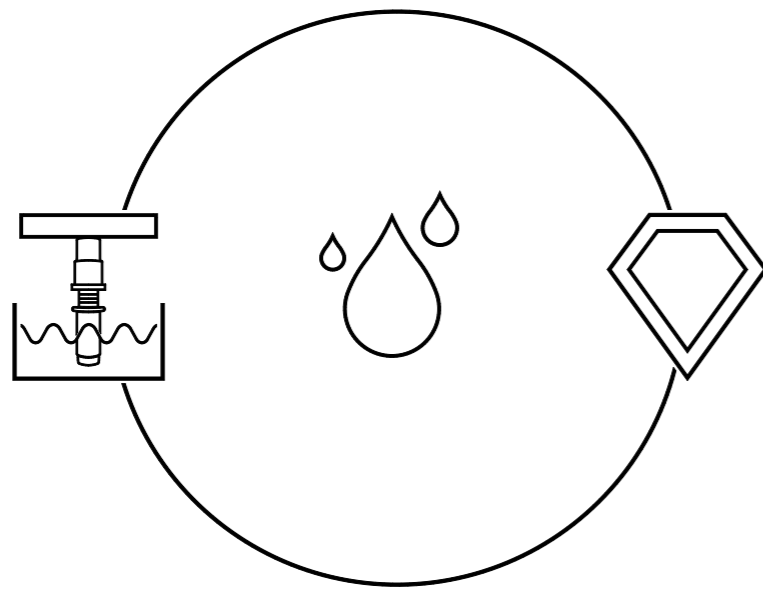




Creation made reliable.

What sets the GENERA systems apart?



Our process. Your parts.

We are users, just as you are.

Working with 3D printers on a daily basis, we were not satisfied with the way additive manufacturing worked in reality. That's why we founded GENERA. Our goal was to deliver on the promises that 3D printing had made for many years: reliable, clean and fast production which creates room for all of your ideas.

We reimagined additive manufacturing as a comprehensive process: printing and post-processing happen in a closely connected system which delivers improved and repeatable results. That is our vision.

GENERA,  
Creation made reliable.

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

# The GENERA Systems

## G1/F1

Desktop. Clean. Automated.

The G1/F1 brings the GENERA workflow and automation to your desktop. It is compatible with our validated material library and uses a cartridge-based material unit to store the resin. The G1/F1 utilizes the GENERA shuttle technology for a clean and safe workflow.



## G2/F2 & the A2 Automation Module

Higher Volume. More Production Speed.

3D printing production like never before. The G2/F2 system was developed for industrial use, for service providers and factories alike.

It is capable of doubling the output, since it can print two separate jobs without supervision. The A2 automation module connects the powerful G2 printer with the F2 post-processing unit to allow for lights-out manufacturing.



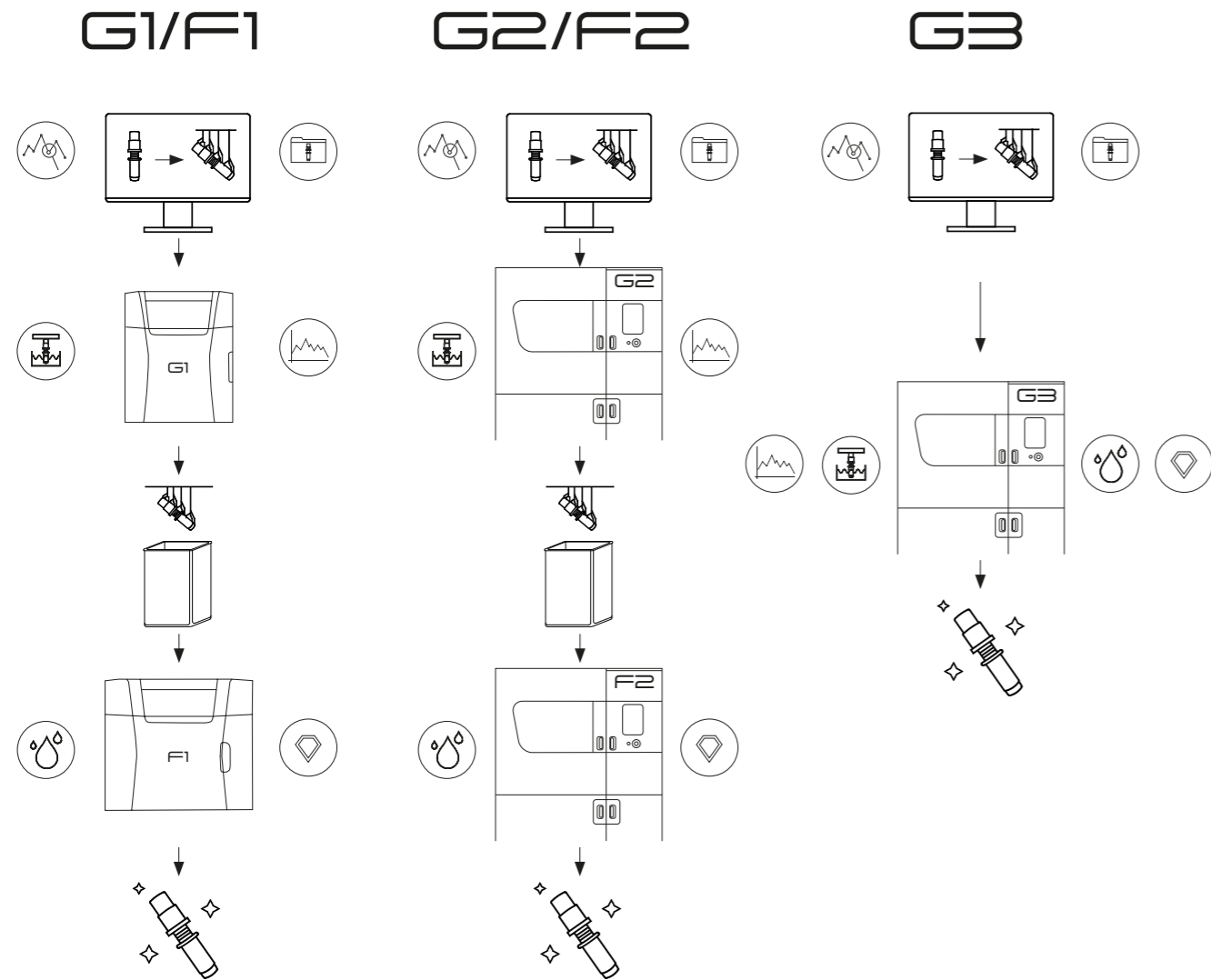
## G3

All-in-One. Automated. Compact.

The G3 is based on the proven G2/F2 technology, modules and functions. The printing module, the washing unit and the post-curing chamber are integrated into the G3 All-in-One system. For the first time ever, users can take a digital part file to a fully washed and post-cured part, all in one machine.



# The GENERA Process

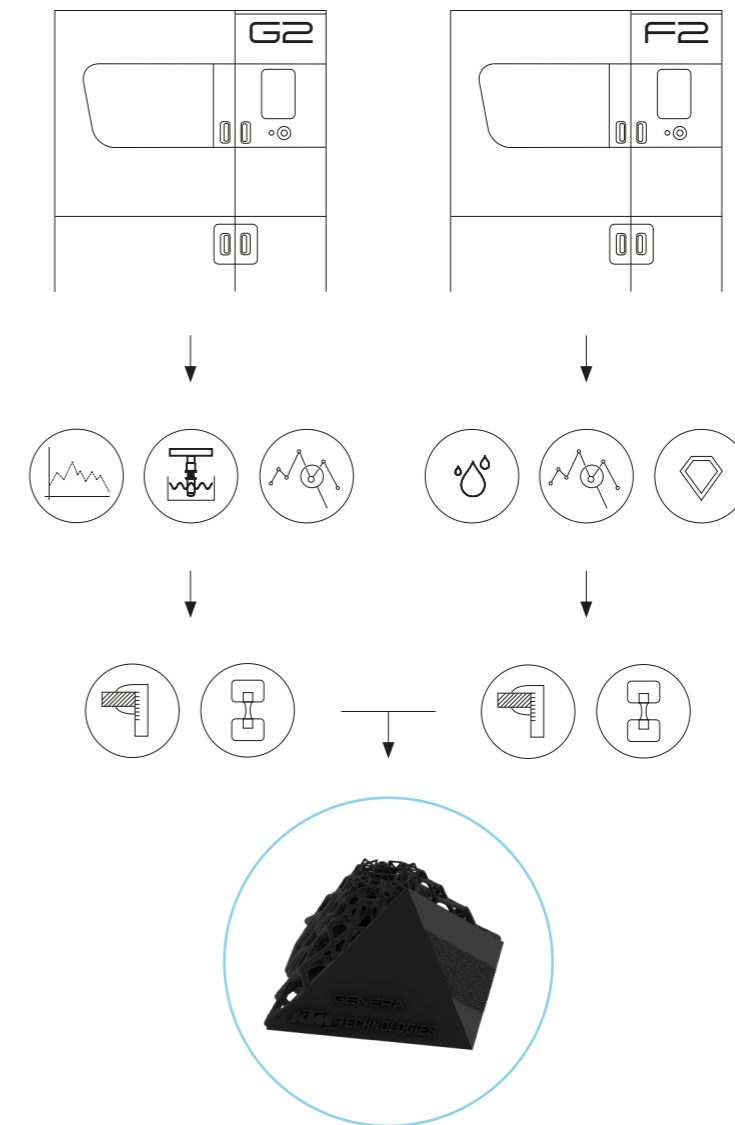


Clean. Safe. Simple.  
We offer our customers a workflow which is clean, safe and simple. All our systems are based on the idea to use such a workflow and a high degree of automation to enable real production with 3D printing. The G1/F1 process and the G2/F2 process use a glove-free handling system that is based on an innovative shuttle solution. During the entire production process, the printed part travels in a tight box or shuttle. Both the precious printed com-

ponents and your hands are protected by this design. The printed component can be handled and processed without any dripping, contamination or light influence from outside. At the same time, the shuttle works as an interface between the 3D printer and the F1 or F2 post-processing unit. It documents the entire manufacturing process and makes it traceable and repeatable. The G3 offers an All-in-One solution, meaning the entire GENERA workflow is

handled within the G3 itself. This includes printing the green part, washing and post-curing. All manufacturing data is documented and stored in the GENERA CAM.

# The GENERA Material Validation Process

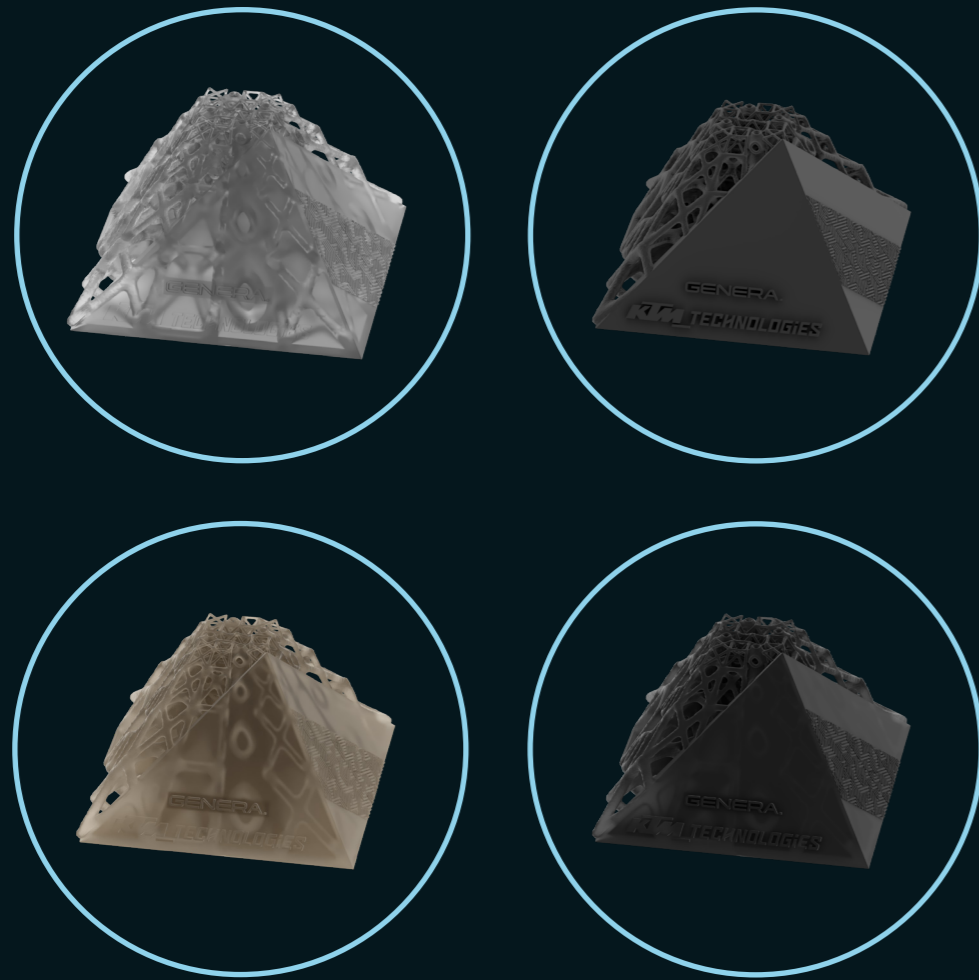


Validated. Reliable. Repeatable.  
New commercially available and technically appropriate materials are continuously screened and vetted by the GENERA Process Development Team. Materials are made available for customers to print high quality parts only after the Process Development Team carefully tunes the machine process parameters for that resin. The validation process starts with the first test prints and analysis of the green parts to evaluate the printing parameters.

After the optimization of the printing parameters, a set of test bars is printed, measured and mechanically tested. If the test parts show good results, the validation of the post-processing starts. In the post-processing we modify all main parameters such as the washing time and post-curing time for a variety of test parts. After the final test parts have been mechanically tested, the results are compared with the technical data sheet (TDS) of the material vendor. If the data matches the

TDS data, the process parameters for printing and post-processing of the material is stored in the GENERA CAM. Our customers can then simply click on one of the materials listed in the GENERA CAM and be sure that the part has the properties according to the TDS. This guarantees our customers repeatable and reliable printing results.

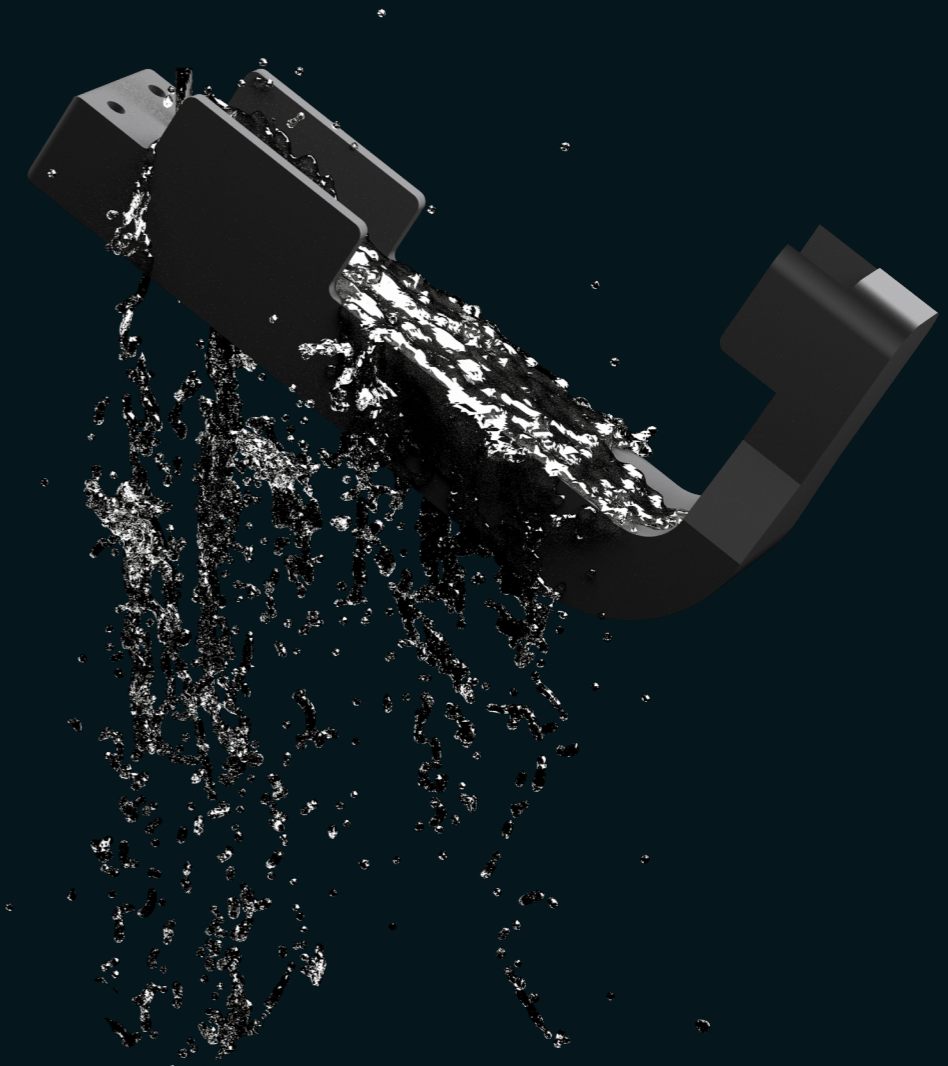
# The GENERA Material Library



The GENERA process features an open and fully validated material library. New materials from our material partners are continuously screened and tested by GENERA. The GENERA Process Development Team carefully tunes the process parameters for each resin to provide the best possible results. Together with our material partners, we validate each material according to their specific properties before a material is released.

The GENERA systems are not locked with proprietary material. This guarantees our customers maximum flexibility, a safe supply and stable market prices. Our close partnership with established and world-famous material suppliers gives us the opportunity to find the right resin for your application.

# GENERA Clear3d



Usually when it comes to cleaning 3D printed parts, isopropyl alcohol (IPA) is the standard used in small scale production. This highly volatile solvent is hazardous to health and safety when stored in large quantities. If the post-processing is not carefully controlled like in the GENERA G1/F1 system, IPA can change the material properties and therefore doesn't guarantee stable printed parts. To solve all these problems in our unique workflow, we developed GENERA Clear3d.

This eco-friendly cleaning fluid is non-flammable, non-toxic and non-volatile and was tailor-made for use in the GENERA Systems. All materials in our open material library were validated with GENERA Clear3d and the material parameters were tested in close cooperation with our material partners. GENERA Clear3d can dissolve twice as much resin as common isopropyl alcohol (IPA) thus making it much more efficient. GENERA Clear3d comes in 60L canisters.

The F2 and the G3 both require two 60L canisters of GENERA Clear3d. It is non-flammable and therefore can be used without safety concerns. It can be used to clean parts at room temperature or elevated temperature (50°C).



# Support & Service



Our goal is to support our customers in the best way possible. GENERA wants you to succeed and produce thousands of parts with our systems.

Therefore, we offer our customers special support packages, in addition to the standard product warranty.

We believe in transparency and in our products.

This is why our service packages have been designed for the customer and the needs of production. All our systems come

with one life-time license for the GENERA CAM included in the purchase price.

Additional licenses can be purchased at any time.

There are no hidden costs, no complex structures, just good and straight forward service packages. You can even run our systems and machines without purchasing a service package.

GENERA customers are free to choose between the two options:

- PREMIUM
- Time and Material

# G1/F1

Desktop. Clean. Automated.

The G1/F1 brings the GENERA workflow and automation to your desktop. It is compatible with the GENERA validated material library and uses a cartridge-based material unit to store the resin. 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 parts 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 lifetime. After the printing process the G1 automatically stores the part in the shuttle. The part is 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**

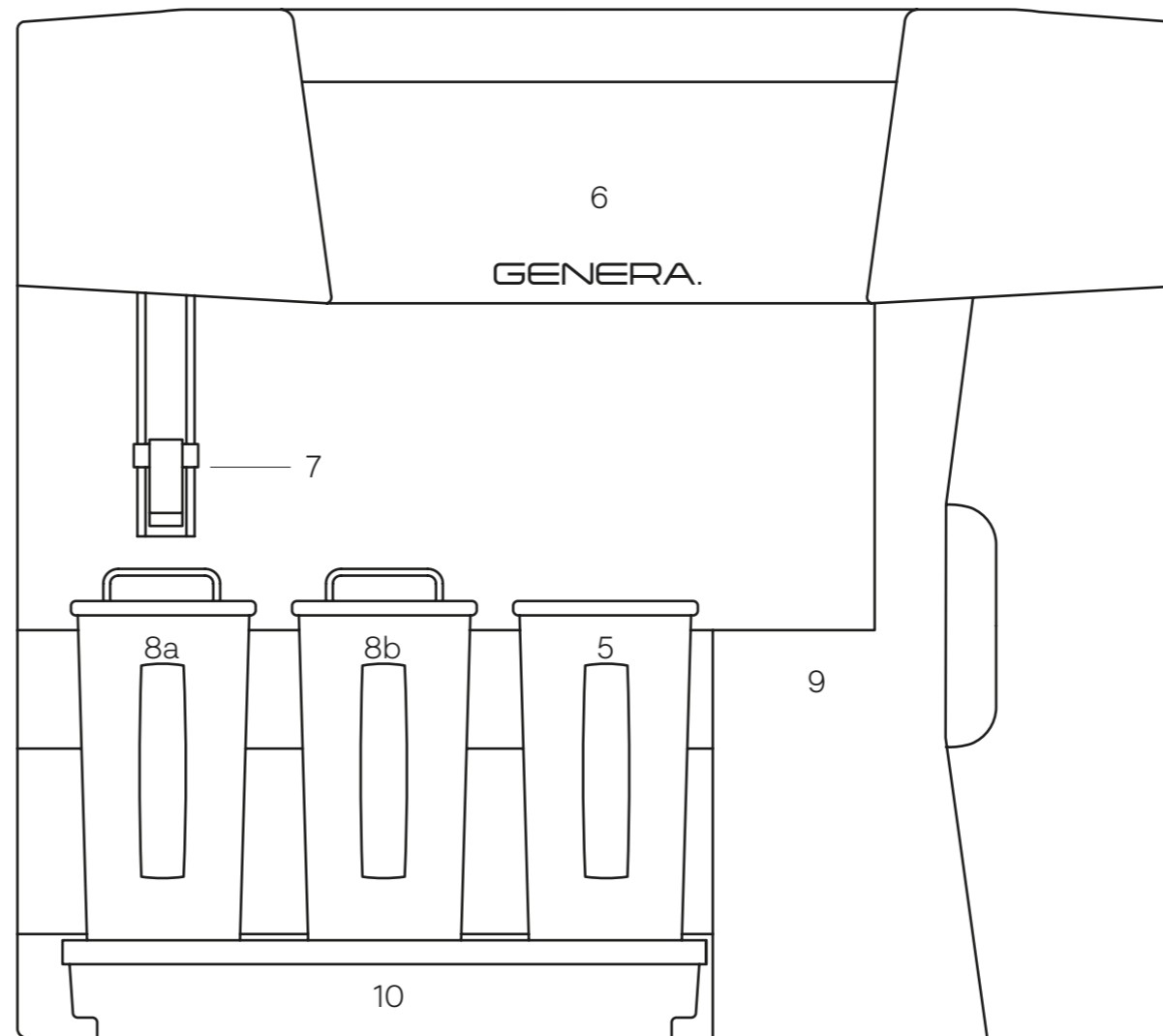
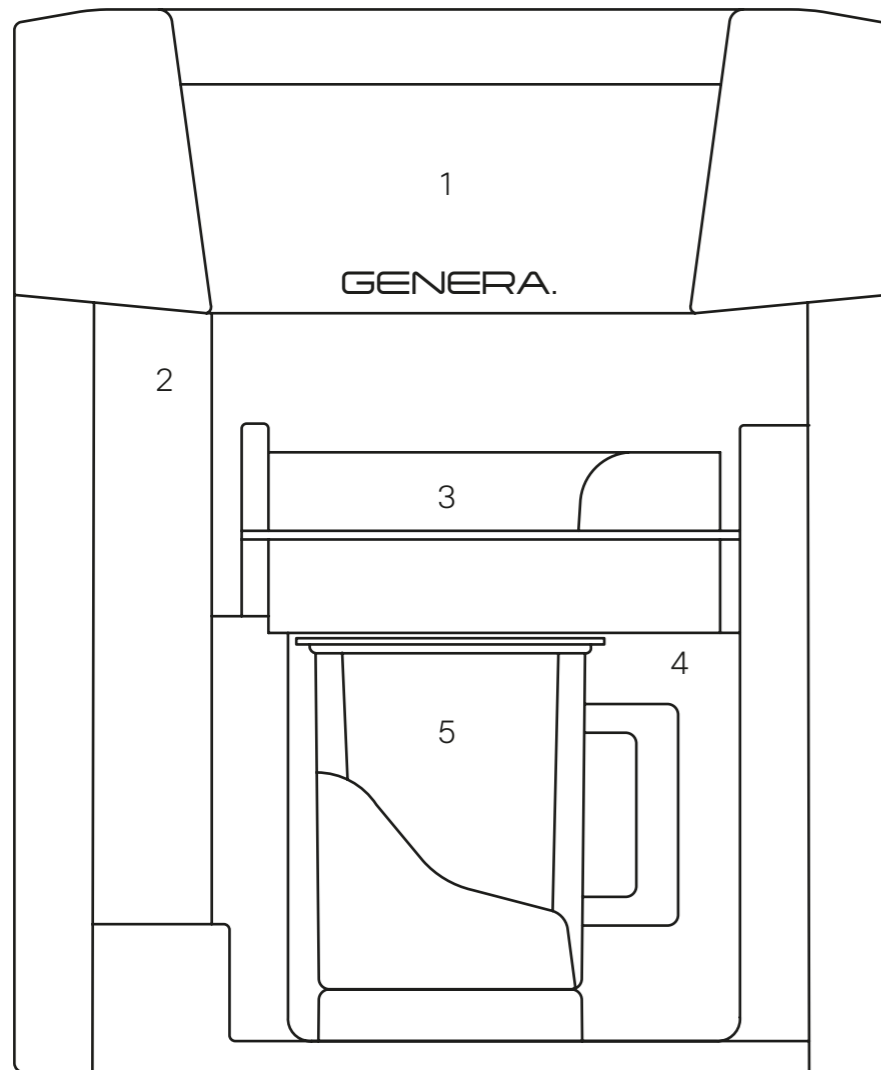
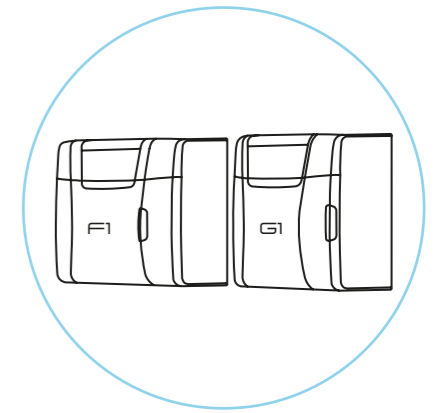
**Material unit with cartridge for easy and secure resin handling**

**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 postwash-container 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



## G2 PRINTER

# G2

Higher Volume. More Speed.

3D printing production like never before. The G2 was developed for industrial use, for service providers and factories alike. It is capable of doubling the output, since it can print two separate jobs without supervision. An innovative resin vat system offers maximum flexibility with minimal set-up times. Future production challenges are addressed by the G2 with an ever expanding and updating parameter database for new materials.

Output increases, while printing costs stay low. While the handling of printed components of conventional 3D printers is often arduous and unclean, the G2 offers a glove-free workflow for clean, easy, and reliable production.

The G2 prints in 4K resolution and three different pixel sizes (40, 70 and 100  $\mu\text{m}$ ) in one system. No matter what the needed printing accuracy is, G2 has the solution in one system.

### HARD FACTS

#### Print volume

@100 $\mu\text{m}$	Pixel size
x: 384 mm	100 $\mu\text{m}$
y: 216 mm	70 $\mu\text{m}$
z: 320 mm	40 $\mu\text{m}$

Wavelength	Speed
385 nm DLP	Up to 3 mm/min*

Light intensity	4K Resolution
max. 25 mW/cm <sup>2</sup>	(3840x2160)

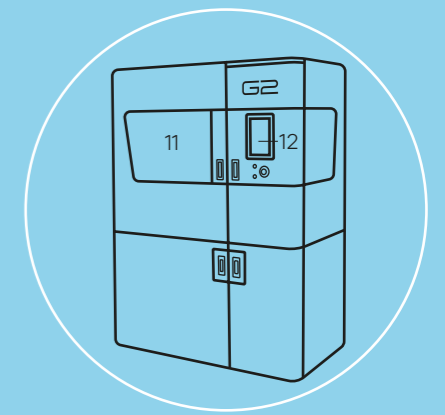
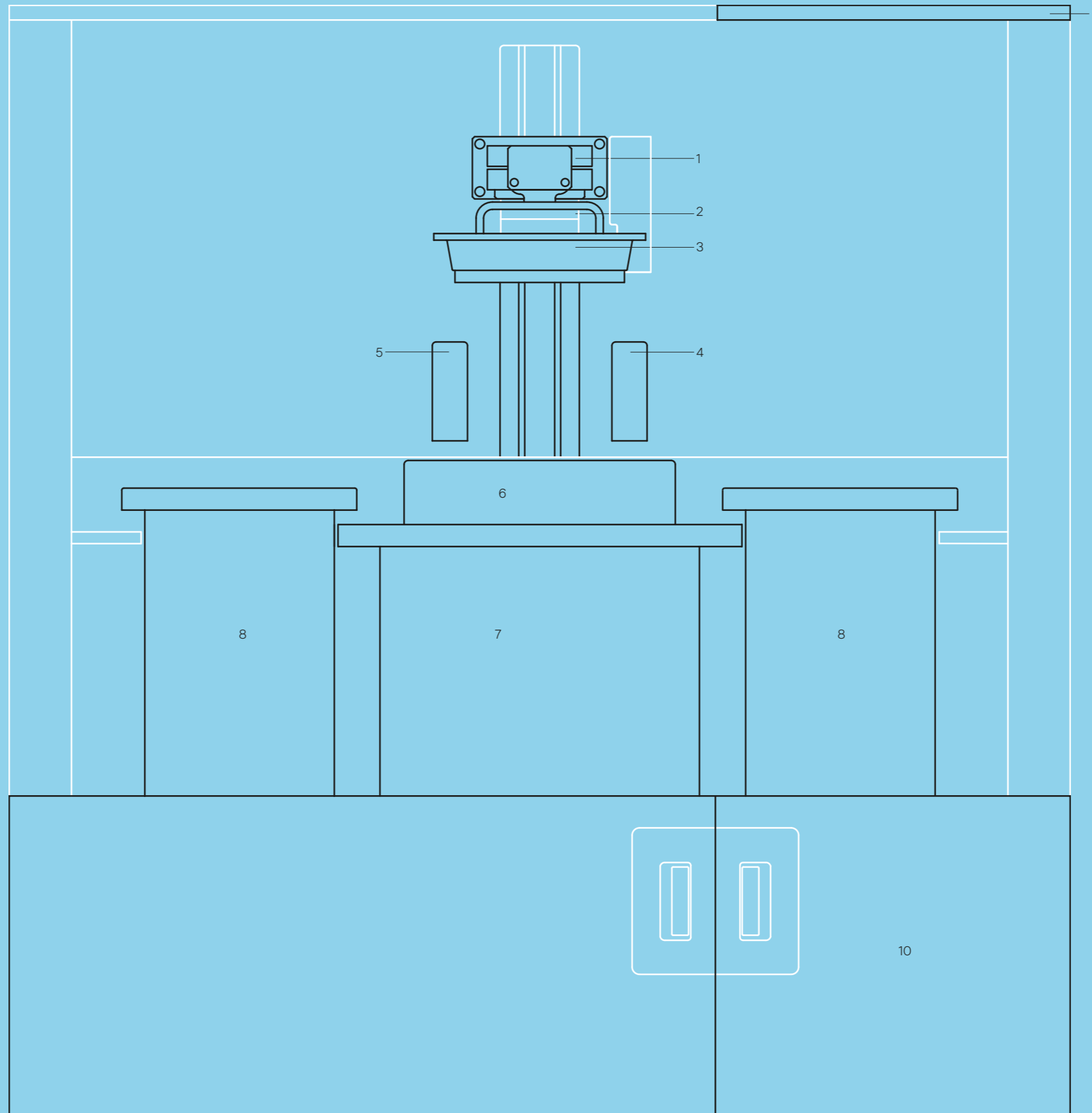
**Automatic platform change, multiple prints, and glove free process**

**Continuous production with shuttle system**

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

\*depending on material and resolution



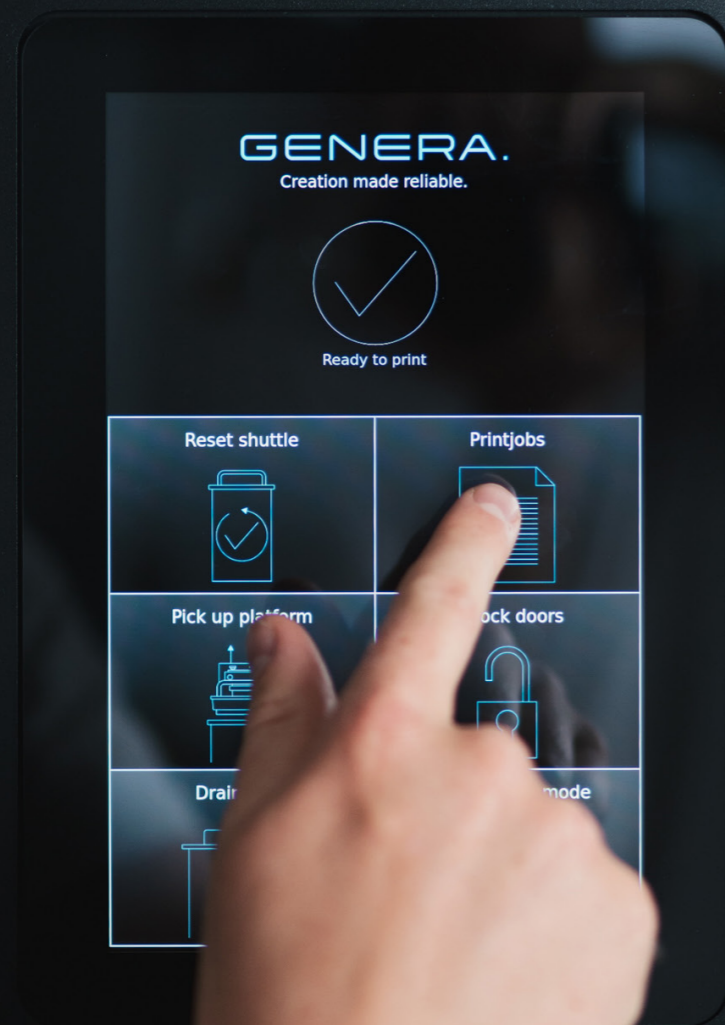


MACHINE COMPONENTS

- 1 Print diagnostic sensors
- 2 Automatic handling system for platforms
- 3 Heated build platform
- 4 Resin temperature sensor
- 5 Resin level sensor
- 6 Special heatable vat system for fast printing and low adhesion
- 7 4K 385 nm DLP light engine with variable pixel size (40, 70 and 100  $\mu\text{m}$ )
- 8 Glove-free process with two RFID-tagged shuttles
- 9 LED for status information
- 10 Resin tank and lightproof, automated resin dispensing system for high throughput production
- 11 Secure, fully enclosed, air filtered machine for use in office environment
- 12 Human Machine Interface (HMI) with machine control, part preview, and printing progress



# GEA





## F2 POST-PROCESSING UNIT

# F2

Industrial. Clean. Automated.

Forget everything you know about post-processing. The intelligent washing program of the F2 adapts to the structure of the printed component and the material used, providing perfect surfaces and printing results every time. The cleaning function is integrated in our innovative washing-shuttle.

The F2 is complemented by an improved UV post-curing chamber connected to a fully automated cleaning process for the very first time. With high optical performance and homogeneous radiation, the F2 produces the best mechanical properties for printed components.

Whether you want to print 1 or 1000 parts, the F2 produces quality results.

### HARD FACTS

**Active carbon filter  
for odor reduction**

**High power and uniform  
LED curing chamber @ 405 nm**

**Post-curing in inert atmosphere  
with part tempering**

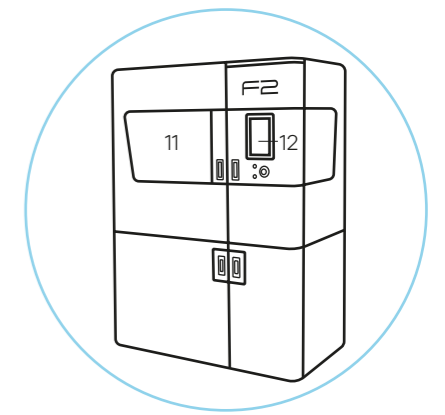
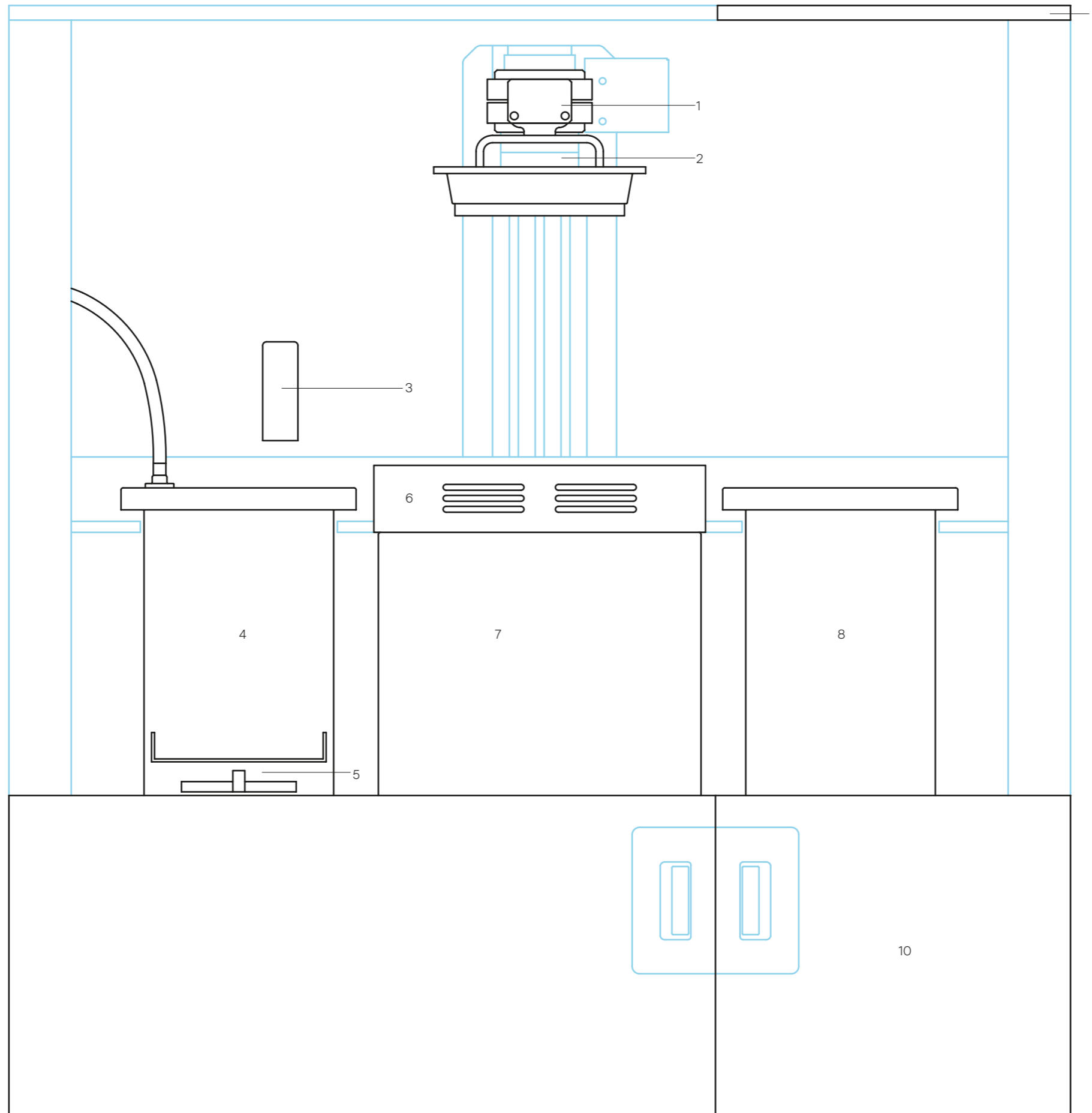
**Intelligent database for post-  
processing and documentation**

**Fully automated RFID-traced  
post-processing**

**Non-flammable cleaning fluid**  
(Genera Clear3d)

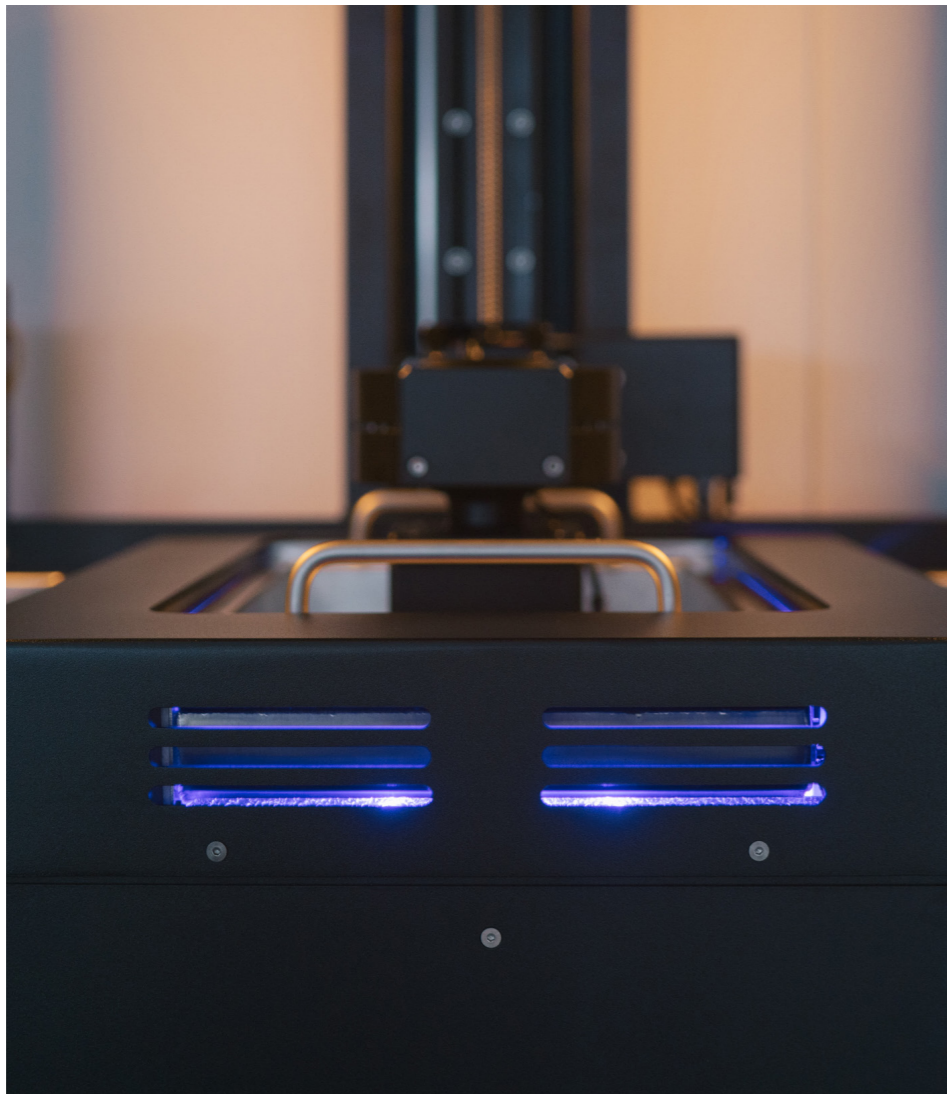






MACHINE COMPONENTS

- 1 Intelligent Force Feedback System
- 2 Automatic handling system for platforms
- 3 Wash fluid level sensor
- 4 Glove-free process with RFID-tagged washing-shuttle for fully automated pre- and post-washing
- 5 Integrated magnetic stirrer and protection for delicate and efficient cleaning of green parts
- 6 Heating unit (part drying and tempering)
  - o Sensor controlled
- 7 Post-curing chamber
  - o High-power and uniform LED panels
  - o Sensor controlled
  - o Inert atmosphere
- 8 Transport shuttle for glove-free part handling
- 9 LED for status information
- 10 2x 60 L cleaning fluid tank for pre- and post-wash including an overflow tank
- 11 Secure, fully enclosed, air filtered machine for use in office environment
- 12 Human Machine Interface (HMI) with machine control, part preview and status



## A2 AUTOMATION MODULE (G2/F2-SYSTEM)

# A2

True industrial automation has reached the 3D printing market with GENERA's A2 system. The A2 automation module connects the powerful G2 printer with the F2 post-processing unit to allow for lights-out manufacturing.

The A2 transfers finished print jobs from the G2 into the F2 for post-processing, while also providing new build platforms into the G2 for continuous printing. After printed parts have been washed and post-cured, they are brought back into the A2 where they can be stored for later removal by an operator without interrupting the machine cycle.

The A2 modular design allows the system to be customized for specific customer production needs with additional modules.

Compatible with current G2/F2 systems.

### HARD FACTS

#### **24/7 production**

#### **Active carbon filter for odor reduction**

#### **Intelligent force feedback system**

#### **Full automation of the G2/F2 system**

#### **Intelligent database for printing, post-processing and documentation**

#### **Documentation and monitoring**

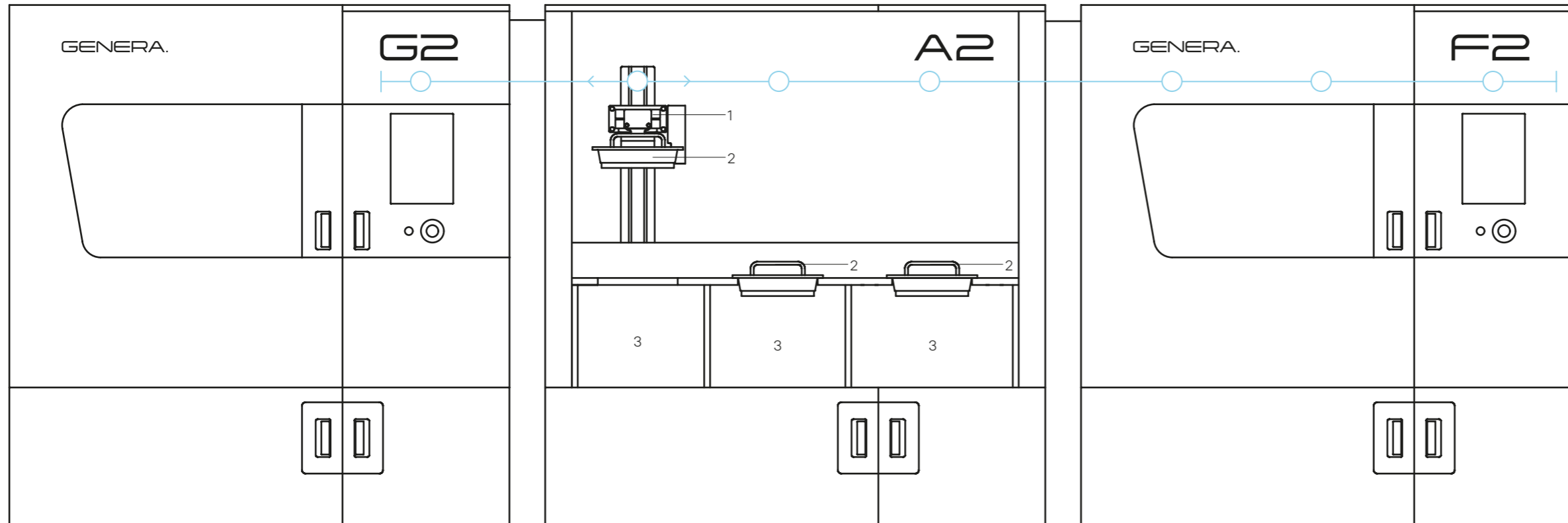
#### **Part storage possibility**

#### **Modular design**

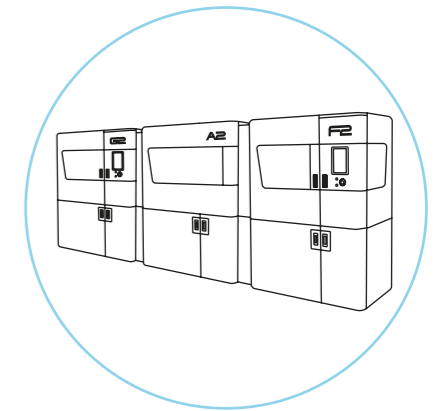
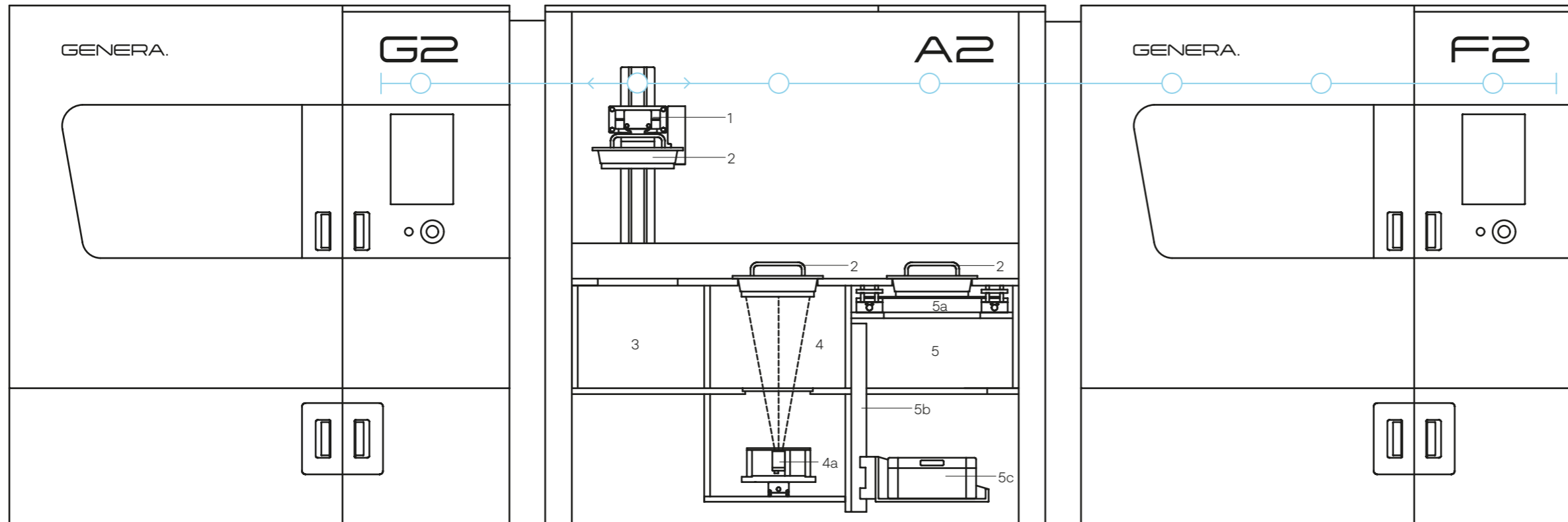
(Customizable for specific customer production needs)



A2 BASIC VERSION



A2 EQUIPPED WITH TWO MODULES



MACHINE COMPONENTS

- 1 Automatic handling system extended from F2
- 2 Platform
- 3 New platform or completed build job storage module
- 4 Visual inspection module for printed component quality, part counting and platform reuse inspection
- 4a Visual inspection device mounted on linear axis for accurate part inspection
- 5 Part separation module for 24/7 production and platform reuse
- 5a Motorized and sensor controlled detachment blade for automatic part separation
- 5b Motorized linear axis for decreasing the part drop height
- 5c Part storage box





All-in-One. Automated. Compact.

The powerful technologies of the G2 and F2 have now been integrated into one compact machine. For the first time ever, users can take a digital part file to a fully washed and post-cured part, all in one machine. G3 can be preconfigured for 40, 70, or 100 µm pixel size resolutions using the same powerful 4K 385nm DLP light engine found in the G2. Print with the same flexibility as the G2 using the open material vat resin system and GENERA's ever-expanding material database. Parts are automatically cleaned after printing with our non-flammable Genera Clear3d cleaning fluid in the wash station with integrated stirrer. Final post-curing is completed in the high-powered and homogenous UV LED post-curing chamber that is temperature programable with optional inert atmosphere.

Print, wash, and post-cure. All with the G3.

**HARD FACTS**

<b>Print volume @40/70/100 µm</b>	<b>Available preset pixel sizes</b>
x: 153/268/384 mm	40 µm or
y: 87/153/216 mm	70 µm or
z: 320 mm	100 µm

<b>Wavelength</b>	<b>Speed</b>
385 nm DLP	Up to 3 mm/min*

<b>Light intensity</b>	<b>4K Resolution</b>
max. 25 mW/cm <sup>2</sup>	(3840 × 2160)

**Active carbon filter for odor reduction**

**Fully automated post-processing**  
(1 Build Job)

**Non-flammable cleaning fluid**  
(Genera Clear3d)

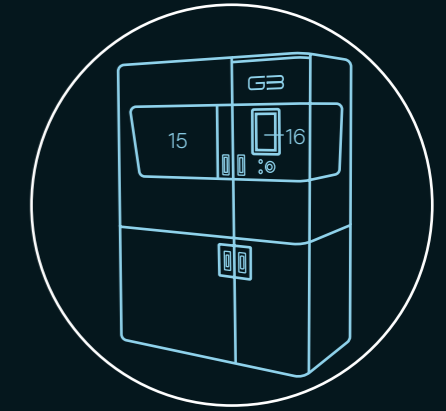
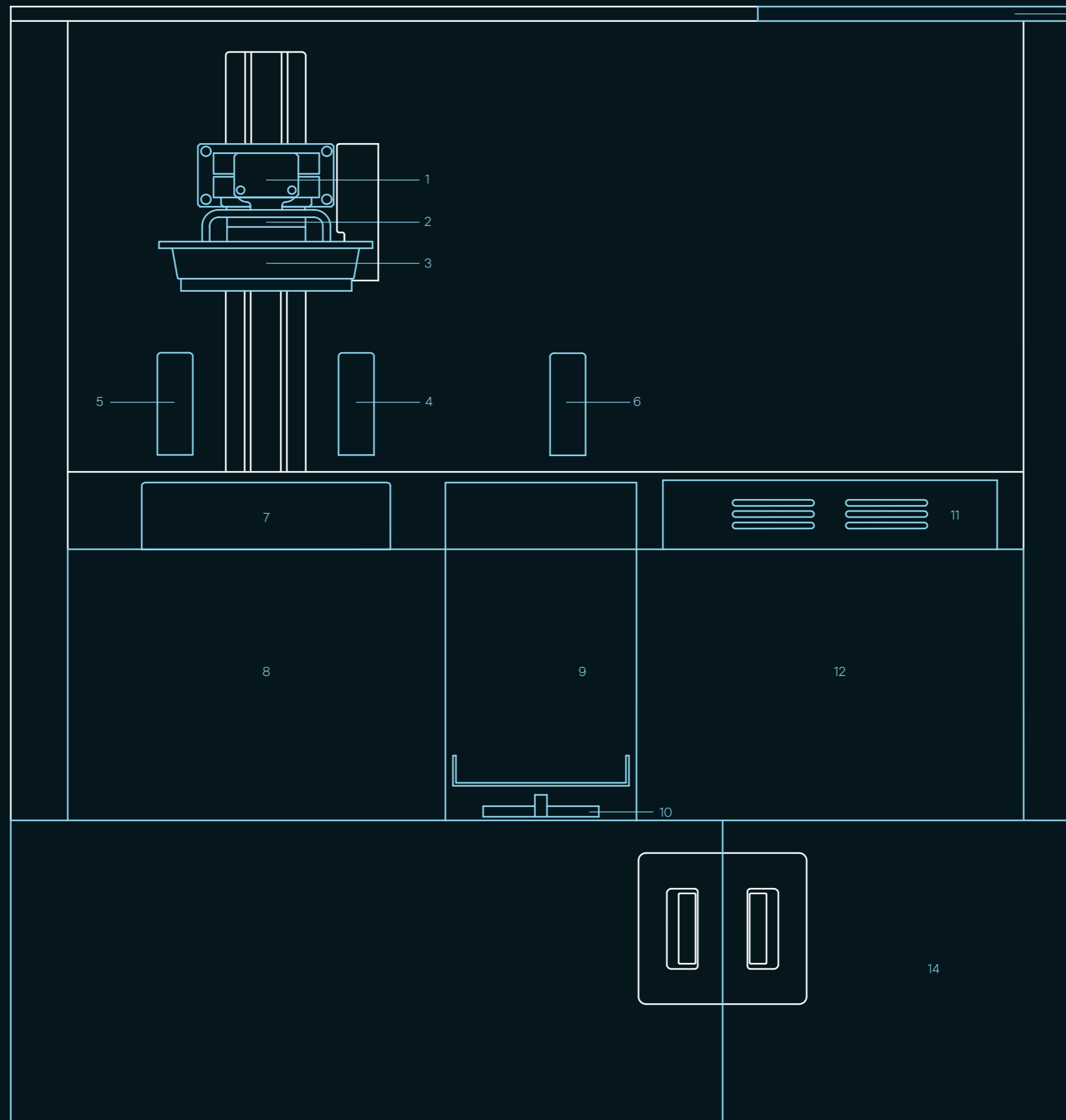
**High power and uniform LED curing chamber @ 405 nm**

**Post-curing in inert atmosphere with part tempering**

**Intelligent database for printing, post-processing and documentation**

\*depending on material and vat system





MACHINE COMPONENTS

- 1 Print/post-processing diagnostic sensors
- 2 Automatic handling system for platforms
- 3 Heated build platform
- 4 Resin temperature sensor
- 5 Resin level sensor
- 6 Wash fluid level sensor
- 7 Special heatable vat system
- 8 4K 385 nm DLP light engine
- 9 Glove-free process with fully automated post-processing
- 10 Integrated stirrer and protection for delicate and efficient cleaning of green parts
- 11 Heating unit (part drying and tempering)
- 12 LED post-curing chamber
- 13 LED for status information
- 14 Resin tank and lightproof, automated resin dispensing system for high throughput production
- 15 Secure, fully enclosed, air-filtered machine
- 16 Human Machine Interface (HMI) with machine control, part preview, and print-/post-process progress

## G1/F1



## Specifications and Factsheets

G1/F1  
G2/F2  
A2  
G3

The following section contains the technical specifications in form of factsheets for all GENERA 3D printing systems. Please note that some technical data is preliminary.

## GENERAL

## G1

<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 $\mu\text{m}$	134 × 76 × 150 mm (5.28 × 2.99 × 5.91 in)
<b>Resolution</b>	2K DLP (1920 × 1080)
<b>Wavelength</b>	385 nm
<b>Regulatory Compliance</b>	CE, FCC, IC (Canada)

## F1

<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 × D × H)</b>	G1 530 × 515 × 670 mm (20.9 × 20.3 × 26.4 in) / F1 730 × 515 × 670 mm (28.7 × 20.3 × 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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## GENERAL

<b>Description</b>	DLP resin vat system with shuttle technology
<b>Materials</b>	Validated with materials from the GENERA open material library
<b>Build Volume (XYZ)</b>	Three pre-calibrated pixel sizes (max. 26.5 L)
@100 µm	384 × 216 × 320 mm (15 × 8.5 × 12.6 in)
@ 70 µm	268 × 151 × 320 mm (10.55 × 6 × 12.6 in)
@ 40 µm	153 × 86 × 320 mm (6 × 3.4 × 12.6 in)
<b>Resolution</b>	4K DLP (3840 × 2160)
<b>Wavelength</b>	385 nm
<b>Light Intensity</b>	Max. 25 mW / cm <sup>2</sup> (@40 µm)
<b>Build Speed</b>	up to 3 mm / min
<b>Regulatory Compliance</b>	CE

## PHYSICAL FOOTPRINT

<b>System Size (W × D × H)</b>	1420 × 970 × 1960 mm (55.9 × 38.1 × 77.1 in)
<b>System Weight</b>	approx. 700 kg (1.543 lbs)

## FACILITY REQUIREMENTS

<b>Power Requirements</b>	AC 220-240 V, 50-60Hz, 9.5 A
<b>Power Consumption</b>	600 W (average)
<b>Network Connectivity</b>	Ethernet
<b>Compressed Air Connection</b>	6-12 bar (87-174 psi)
<b>Exhaust (optional)</b>	Integrated active carbon filters (optional facility exhaust)
<b>Operating Conditions</b>	+15 °C to +25 °C
<b>Recommended Installation Space (W × D × H)</b>	1920 × 2870 × 2060 mm (75.6 × 113 × 81 in)

## SOFTWARE AND DESIGN TOOL

<b>CAM</b>	GENERA CAM
<b>Print Cockpit</b>	Live print monitoring



## GENERAL

<b>Description</b>	Post-Processing Unit optimized for use with the G2 Printer
<b>Materials</b>	Validated with all materials from the GENERA open material library
<b>Washing Technology</b>	Magnetic stirrer
<b>Cleaning Fluid</b>	GENERA Clear3d (non-flammable) 2 × 60 L (pre-wash and post-wash)
<b>Heating / Drying Chamber</b>	up to 80 °C
<b>LED Curing Chamber</b>	405 nm (optional under inert atmosphere)
<b>Typical Post Processing Time</b>	45 min
<b>Regulatory Compliance</b>	CE

## PHYSICAL FOOTPRINT

<b>System Size (W × D × H)</b>	1420 × 970 × 1960 mm (55.9 × 38.1 × 77.1 in)
<b>System Weight</b>	approx. 655 kg (1.444lbs)

## FACILITY REQUIREMENTS

<b>Power Requirements</b>	AC 220-240 V, 50-60Hz, 13.5 A
<b>Power Consumption</b>	700 W (average)
<b>Network Connectivity</b>	Ethernet
<b>Compressed Air Connection</b>	6-12 bar (87-174 psi)
<b>Nitrogen Connection</b>	3-6 bar (44-87 psi)
<b>Exhaust (optional)</b>	Integrated active carbon filters (optional facility exhaust)
<b>Operating Conditions</b>	+15 °C to +25 °C
<b>Recommended Installation Space (W × D × H)</b>	1920 × 2870 × 2060 mm (75.6 × 113 × 81 in)

## SOFTWARE AND DESIGN TOOL

<b>CAM</b>	GENERA CAM
<b>PPU Cockpit</b>	Live post processing monitoring



G3



## GENERAL

<b>Description</b>	All in One System (printing and post-processing)
<b>Materials</b>	Validated with materials from the GENERA open material library
<b>Build Volume (XYZ)</b>	Available preset pixel sizes (max. 26.5 L)
@100 µm or	384 × 216 × 320 mm (15 × 8.5 × 12.6 in)
@ 70 µm or	268 × 151 × 320 mm (10.55 × 6 × 12.6 in)
@ 40 µm	153 × 86 × 320 mm (6 × 3.4 × 12.6 in)
<b>Resolution</b>	4K DLP (3840 × 2160)
<b>Wavelength</b>	385 nm
<b>Light Intensity</b>	Max. 25 mW / cm <sup>2</sup> (@40 µm)
<b>Build Speed</b>	up to 3 mm / min
<b>Cleaning Fluid</b>	GENERA Clear3d (non-flammable) 2 × 60 L (pre-wash and post-wash)
<b>Heating / Drying Chamber</b>	up to 80 °C
<b>LED Curing Chamber</b>	405 nm (optional under inert atmosphere)
<b>Typical Post Processing Time</b>	45 min
<b>Regulatory Compliance</b>	CE

## PHYSICAL FOOTPRINT

<b>System Size (W × D × H)</b>	1420 × 970 × 1960 mm (55.9 × 38.1 × 77.1 in)
<b>System Weight</b>	approx. 700 kg (1.543 lbs)

## FACILITY REQUIREMENTS

<b>Power Requirements</b>	AC 220-240 V, 50-60Hz, 15A
<b>Power Consumption</b>	700 W (average)
<b>Network Connectivity</b>	Ethernet
<b>Compressed Air Connection</b>	6-12 bar (87-174 psi)
<b>Nitrogen Connection</b>	3-6 bar (44-87 psi)
<b>Exhaust (optional)</b>	Integrated active carbon filters (optional facility exhaust)
<b>Operating Conditions</b>	+15 °C to +25 °C
<b>Recommended Installation Space (W × D × H)</b>	1920 × 2870 × 2060 mm (75.6 × 113 × 81 in)

## SOFTWARE AND DESIGN TOOL

<b>CAM</b>	GENERA CAM
<b>Print- / PPU-Cockpit</b>	Live print and post processing monitoring

A2



## GENERAL

<b>Description</b>	G2 / F2 System Automation Module
<b>Regulatory Compliance</b>	CE

## PHYSICAL FOOTPRINT

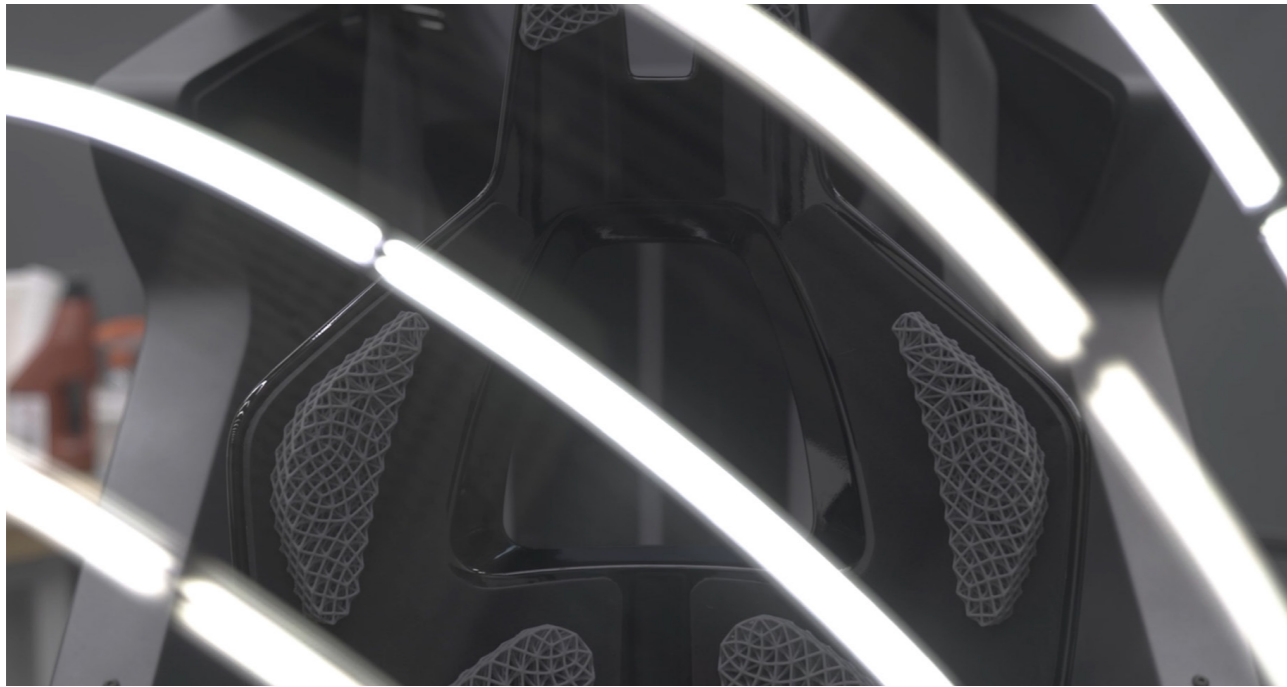
<b>System Size (W × D × H)</b>	1420 × 970 × 1960 mm (55.9 × 38.1 × 77.1 in)
<b>System Weight</b>	approx. 650 kg (1.102 lbs)

## FACILITY REQUIREMENTS

<b>Power Requirements (basic version)</b>	AC 220-240 V, 50-60Hz, 2.5A
<b>Power Consumption</b>	580 W (max)
<b>Network Connectivity</b>	Ethernet
<b>Exhaust (optional)</b>	Integrated active carbon filters (optional facility exhaust)
<b>Operating Conditions</b>	+15 °C to +25 °C

## SOFTWARE AND DESIGN TOOL

<b>CAM</b>	GENERA CAM
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Creation made reliable.

GENERA.

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