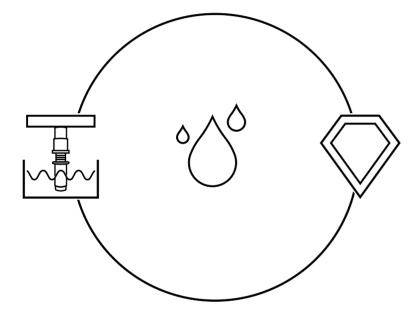


Creation made reliable.



Our process. Your parts.

What sets the GENERA systems apart?

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 postprocessing 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.

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.





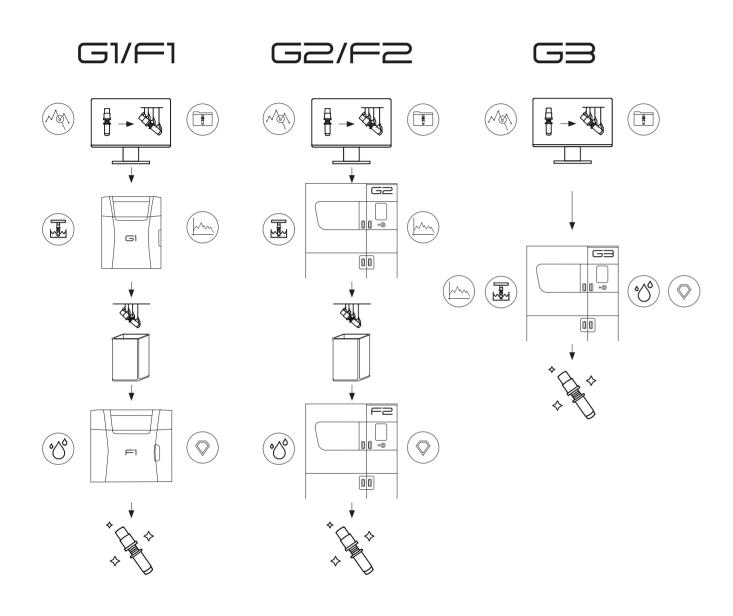






The GENERA Process

The GENERA Material Validation 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.

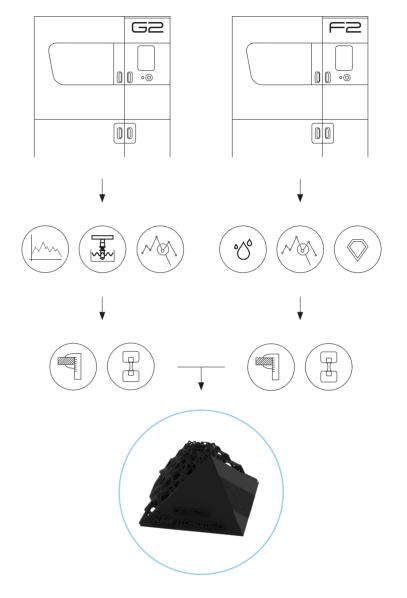
At the same time, the shuttle works as an interface between the 3D printer and the F1 or F2 post-processing unit. It documents the entire manufacturing process and makes it traceable and repeatable.

The G3 offers an All-in-One solution, meaning the entire GENERA workflow is

3

handled within the G3 itself. This includes printing the green part, washing and post-

All manufacturing data is documented and stored in the GENERA CAM.



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 The GENERA systems are not locked with and fully validated material library.

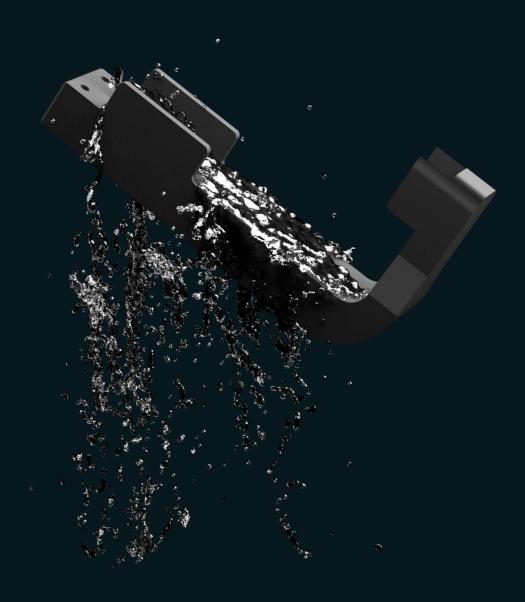
are continuously screened and tested by ply and stable market prices. GENERA.

each resin to provide the best possible re-your application. sults. Together with our material partners, we validate each material according to their specific properties before a material is released.

proprietary material. This guarantees our New materials from our material partners customers maximum flexibility, a safe sup-

Our close partnership with established and The GENERA Process Development Team world-famous material suppliers gives us carefully tunes the process parameters for the opportunity to find the right resin for

GENERA Clear3d



This highly volatile solvent is hazardous Systems. to health and safety when stored in large All materials in our open material library clean parts at room temperature or elevaquantities. If the post-processing is not were validated with GENERA Clear3d and ted temperature (50°C). carefully controlled like in the GENERA the material parameters were tested in G1/F1 system, IPA can change the material close cooperation with our material partproperties and therefore doesn't guaran- ners. GENERA Clear3d can dissolve twice tee stable printed parts.

workflow, we developed GENERA Clear3d. GENERA Clear3d comes in 60L canisters.

Usually when it comes to cleaning 3D This eco-friendly cleaning fluid is nonprinted parts, isopropyl alcohol (IPA) is the flammable, non-toxic and non-volatile and canisters of GENERA Clear3d. It is nonstandard used in small scale production. was tailor-made for use in the GENERA flammable and therefore can be used

as much resin as common isopropyl alco-To solve all these problems in our unique hol (IPA) thus making it much more efficient. The F2 and the G3 both require two 60L without safety concerns. It can be used to

Support & Service



best way possible. GENERA wants you to CAM included in the purchase price. succeed and produce thousands of parts Additional licenses can be purchased at - PREMIUM

Therefore, we offer our customers special There are no hidden costs, no complex dard product warranty.

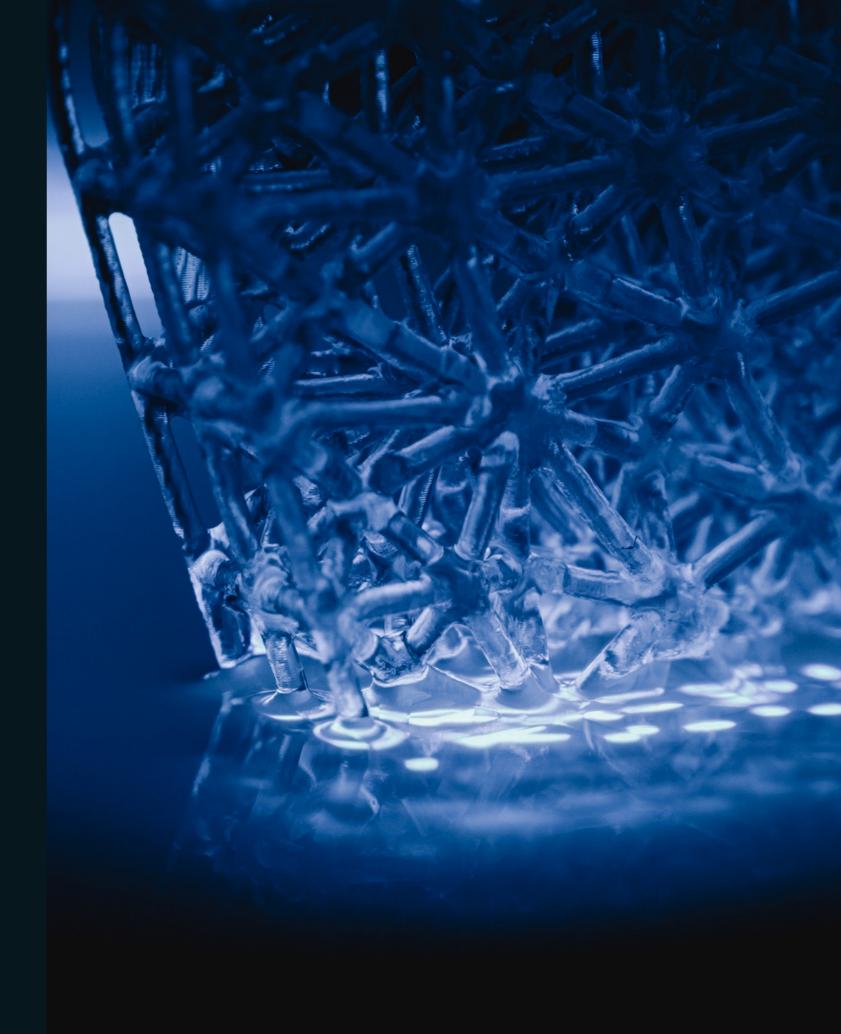
ducts.

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

support packages, in addition to the stan-structures, just good and straight forward service packages. You can even run our We believe in transparency and in our pro-systems and machines without purchasing a service package.

Our goal is to support our customers in the with one life-time license for the GENERA GENERA customers are free to choose between the two options:

- Time and Material



G1/F1 SYSTEM



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 μm 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

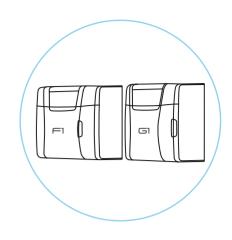
Post-curing in inert atmosphere

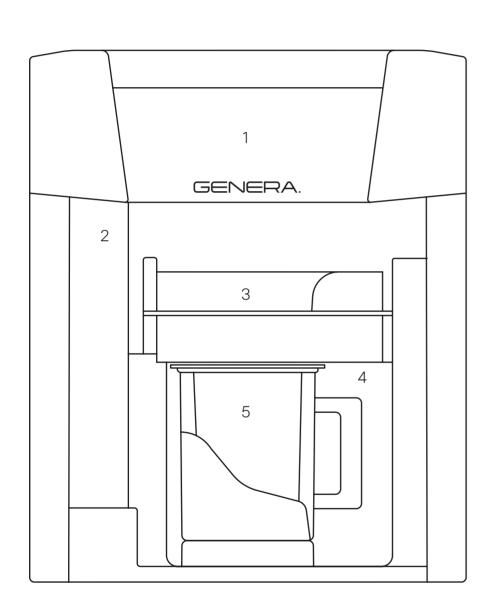
Documentation and traceability by RFID tag and database

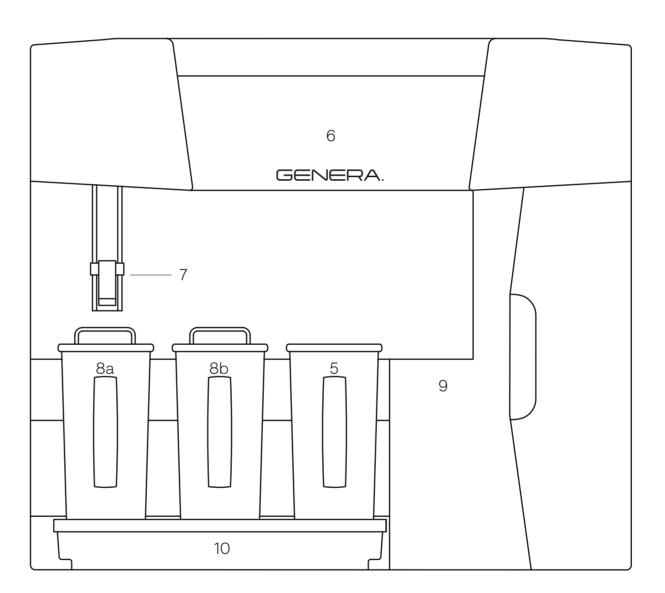




G1/F1







SYSTEM COMPONENTS G1/F1

- 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
 - 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 postwashcontainer with Integrated magnetic
 stirrer for fully automated washing
- Post-curing chamber
 - o High-power mercury flash bulb
 - o Inert atmosphere
- o Part drying
- 10 Overflow protection

G2 PRINTER



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 μ m) in one system. No matter what the needed printing accuracy is, G2 has the solution in one system.

HARD FACTS

Print volume

 @100 μm
 Pixel size

 x: 384 mm
 100 μm

 y: 216 mm
 70 μm

 z: 320 mm
 40 μm

Wavelength Speed

385 nm DLP Up to 3 mm/min*

Light intensity 4K Resolution max. 25 mW/cm² (3840 x 2160)

Automatic platform change, multiple prints, and glove free process

Continuous production with shuttle system

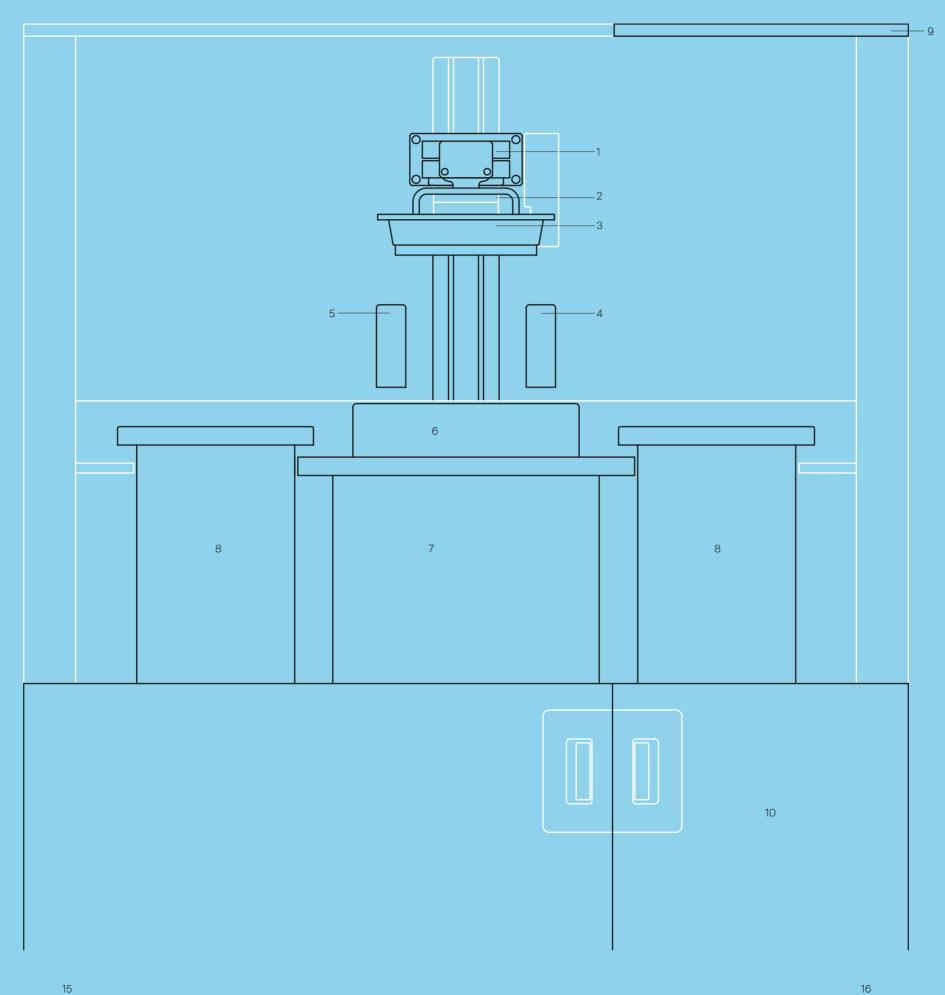
Documentation and traceability by RFID tag and database

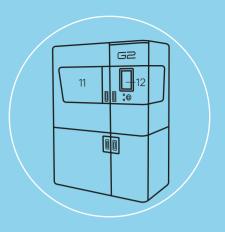
*depending on material and resolution



G2 PRINTER



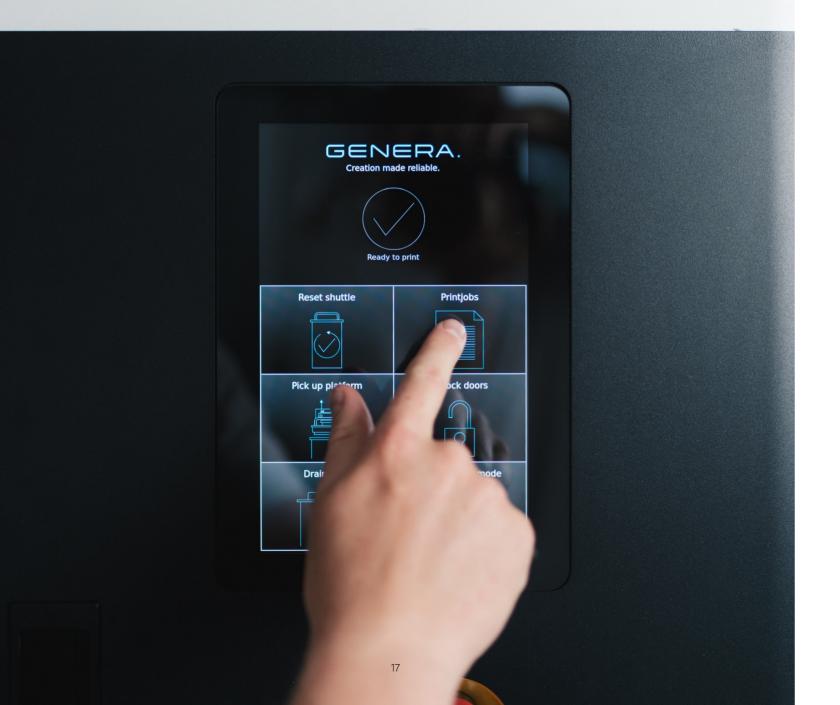


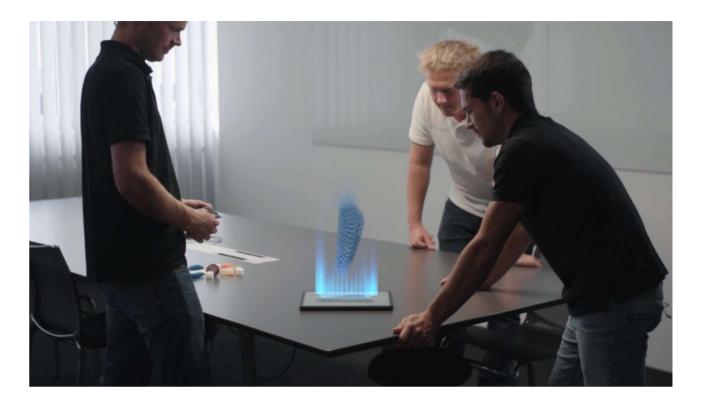


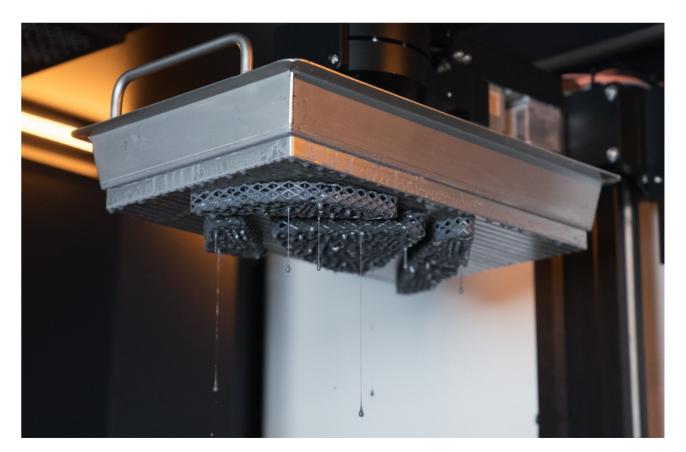
MACHINE COMPONENTS

- Print diagnostic sensors
- Automatic handling system for platforms
- Heated build platform 3
- Resin temperature sensor
- 5 Resin level sensor
- Special heatable vat system for fast printing and low adhesion
- 4K 385 nm DLP light engine with variable pixel size (40, 70 and 100 μm)
- 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
- Secure, fully enclosed, air filtered machine for use in office environment
- 12 Human Machine Interface (HMI) with machine control, part preview, and printing progress









F2 POST-PROCESSING UNIT



Industrial. Clean. Automated.

Forget everything you know about postprocessing. 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 postprocessing and documentation

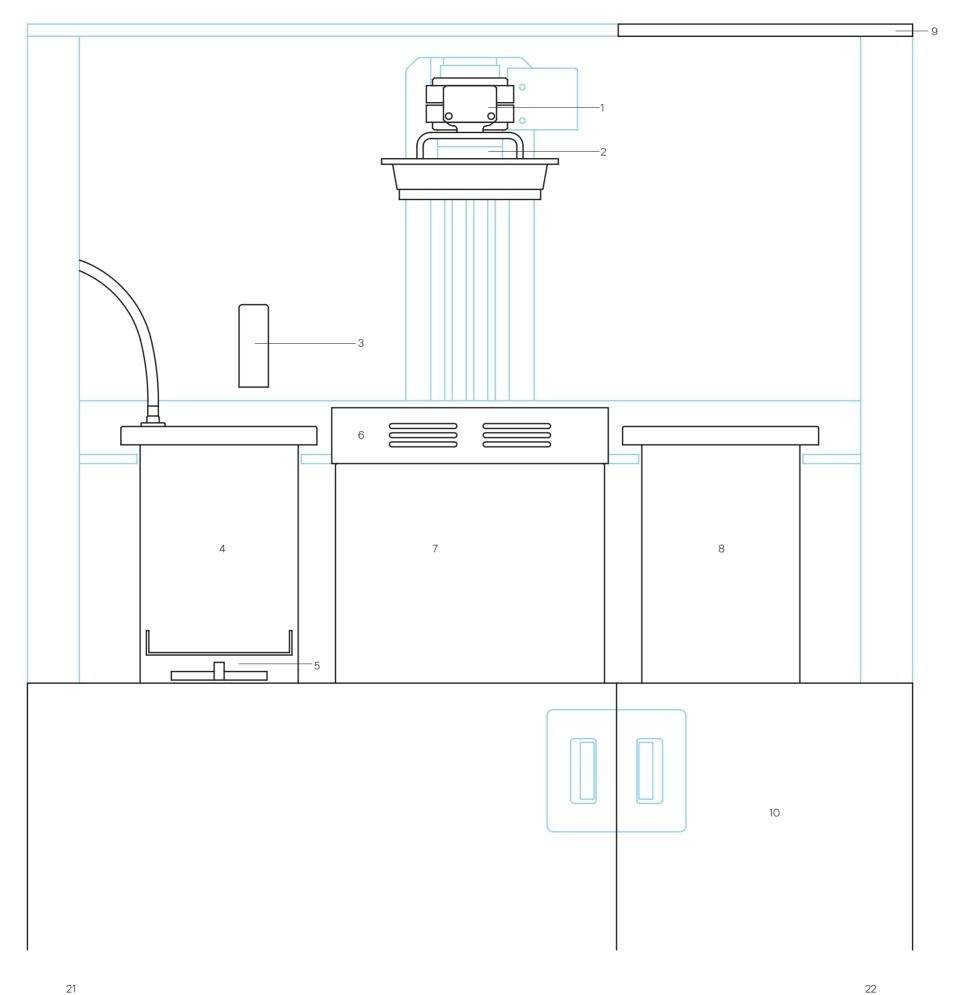
Fully automated RFID-traced post-processing

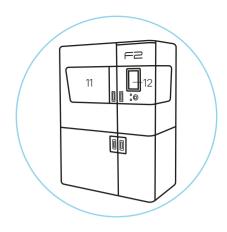
Non-flammable cleaning fluid (Genera Clear3d)



F2 POST-PROCESSING UNIT

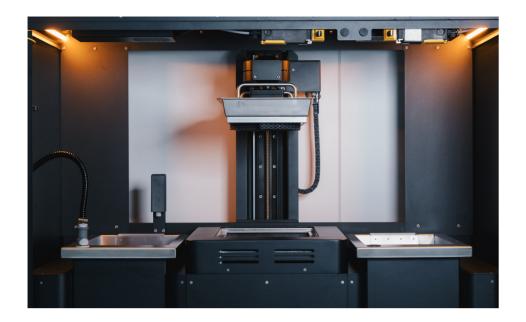


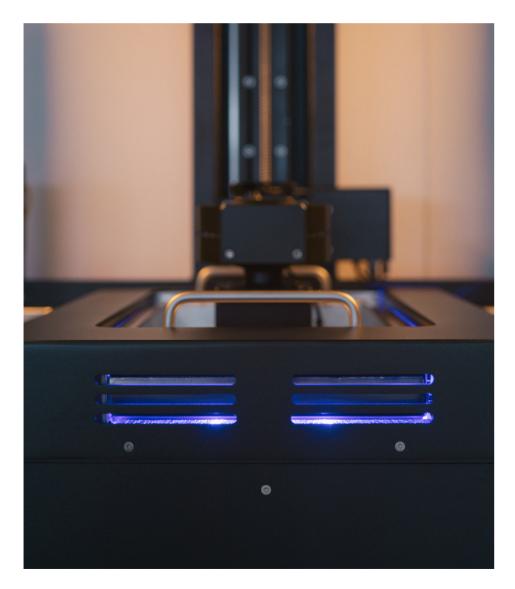




MACHINE COMPONENTS

- Intelligent Force Feedback System
- Automatic handling system for platforms
- Wash fluid level sensor
- Glove-free process with RFID-tagged washing-shuttle for fully automated pre- and post-washing
- Integrated magnetic stirrer and protection for delicate and efficient cleaning of green parts
- Heating unit (part drying and tempering) o Sensor controlled
- Post-curing chamber o High-power and
 - uniform LED panels o Sensor controlled
 - o Inert atmosphere
- Transport shuttle for glovefree part handling
- LED for status information
- 10 2x60 L cleaning fluid tank for pre- and post-wash including an overflow tank
 - 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)



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, postprocessing and documentation

Documentation and monitoring

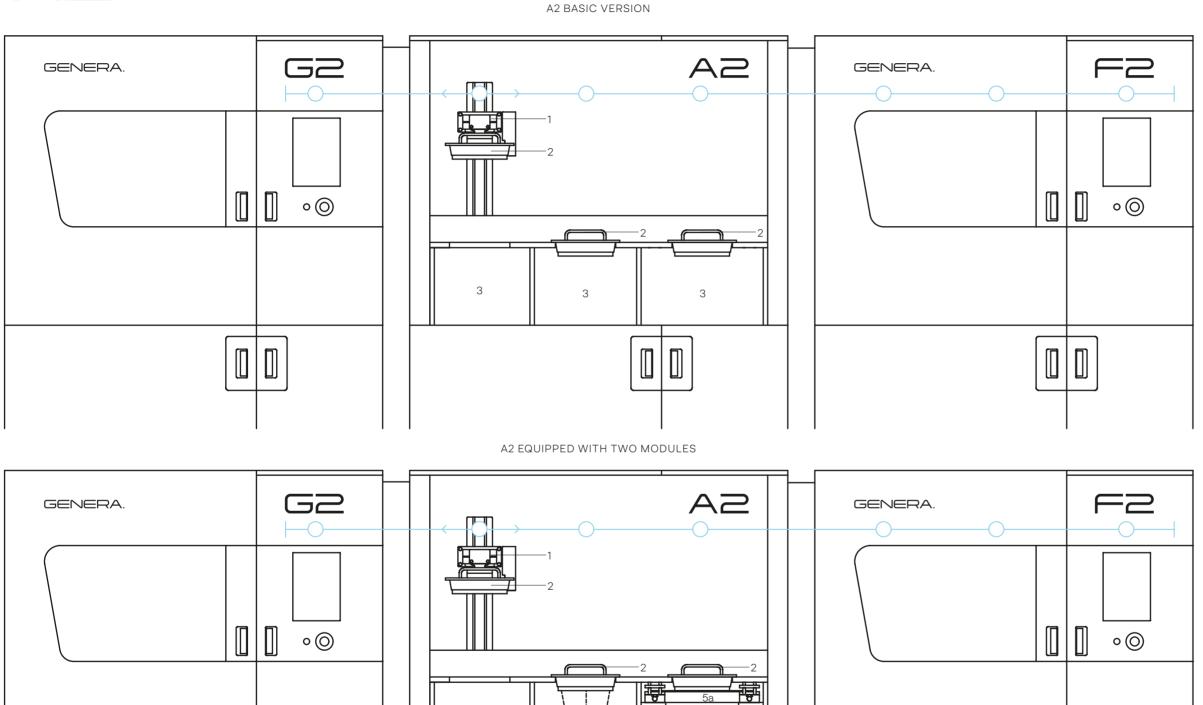
Part storage possibility

Modular design

(Customizable for specific customer production needs)

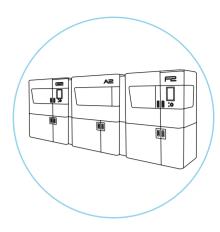






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27



MACHINE COMPONENTS

- 1 Automatic handling system extended from F2
- 2 Platform
- New platform or completed build job storage module
- Visual inspection module for printed component qualitity, 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
- 5c Part storage box

G3 ALL IN ONE SYSTEM



All-in-One. Automated. Compact.

The powerful technologies of the G2 and F2 have now been integrated into one 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

 Print volume
 Available preset

 @40/70/100 μm
 pixel sizes

 x: 153/268/384 mm
 40 μm or

 y: 87/153/216 mm
 70 μm or

 z: 320 mm
 100 μm

 Wavelength
 Speed

 385 nm DLP
 Up to 3 mm/min*

 Light intensity
 4K Resolution

 max. 25 mW/cm²
 (3840 × 2160)

Active carbon filter for odor reduction

Fully automated post-processing (1 Build Job)

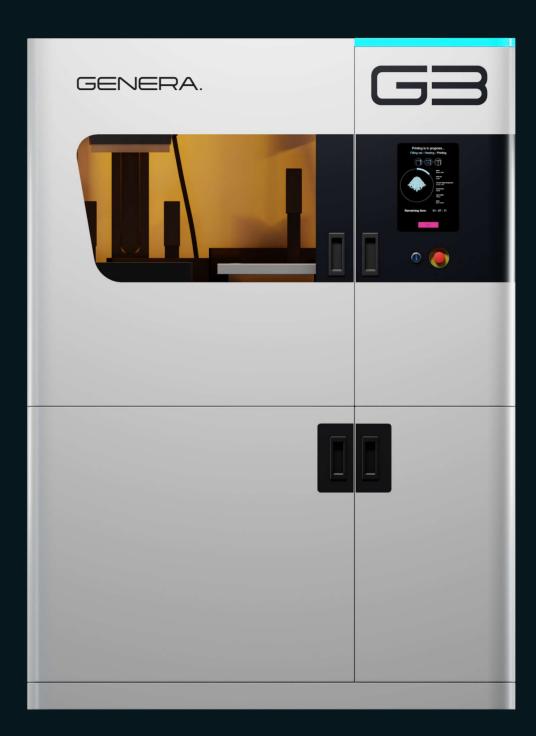
Non-flammable cleaning fluid (Genera Clear3d)

High power and uniform LED curing chamber @ 405 nm

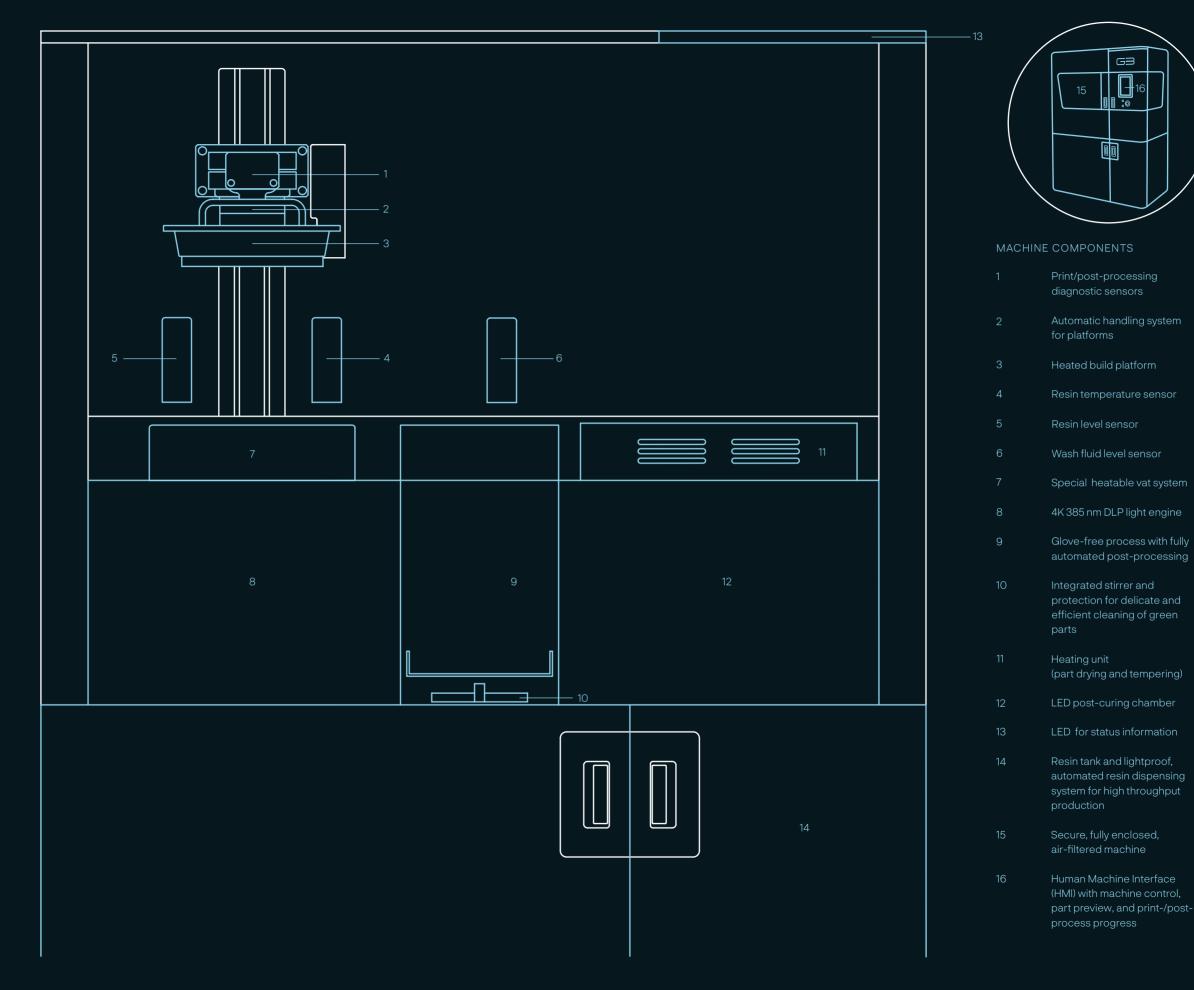
Post-curing in inert atmosphere with part tempering

Intelligent database for printing, post-processing and documentation

*depending on material and vat system







G3

G1/F1 SYSTEM







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

	PHYSICAL FOOTPRINT
System Size (W × D × H)	G1 530 x 515 x 670 mm (20.9 × 20.3 x 26.4 in) / F1 730 x 515 x 670 mm (28.7 × 20.3 × 26.4 in)
System Weight	G1 41 kg (90.38 lb) / F1 50 kg (110.2 lb)
	FACILITY REQUIREMENTS
Power Requirements	AC 100-240 V, 50-60Hz, G1 2.0A-0.85A / F1 4.2-2.2 A

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

SOFTWARE AND DESIGN TOOL		
CAM	GENERA G1/F1 CAM	

Specifications and Factsheets



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.

G2 PRINTER

<u>G</u>2



F2 POST-PROCESSING UNIT (PPU)







	GENERAL
Description	Post-Processing Unit optimized for use with the G2 Printer
Materials	Validated with all materials from the GENERA open material library
Washing Technology	Magnetic stirrer
Cleaning Fluid	GENERA Clear3d (non-flammable) 2 × 60 L (pre-wash and post-wash)
Heating/Drying Chamber	up to 80 ℃
LED Curing Chamber	405 nm (optional under inert atmosphere)
Typical Post Processing Time	45 min
Regulatory Compliance	CE
	PHYSICAL FOOTPRINT
System Size (W × D × H)	1420 × 970 × 1960 mm (55.9 × 38.1 × 77.1 in)
System Weight	approx. 655 kg (1.444lbs)
	FACILITY REQUIREMENTS
Power Requirements	AC 220–240 V, 50–60Hz, 13.5 A
Power Consumption	700 W (average)
Network Connectivity	Ethernet
Compressed Air Connection	6–12 bar (87–174 psi)
Nitrogen Connection	3-6 bar (44-87 psi)
Exhaust (optional)	Integrated active carbon filters (optional facility exhaust)
Operating Conditions	+15 °C to +25 °C
Recommended Installation Space (W × D × H)	1920 × 2870 × 2060 mm (75.6 × 113 × 81 in)





	GENERAL
Description	DLP resin vat system with shuttle technology
Materials	Validated with materials from the GENERA open material library
Build Volume (XYZ)	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)
Resolution	4K DLP (3840 × 2160)
Wavelength	385 nm
Light Intensity	Max. 25 mW / cm² (@40 μm)
Build Speed	up to 3 mm/min
Regulatory Compliance	CE

	PHYSICAL FOOTPRINT
System Size (W × D × H)	1420 x 970 x 1960 mm (55.9 × 38.1 × 77.1 in)
System Weight	approx. 700 kg (1.543 lbs)

FACILITY REQUIREMENTS	
AC 220-240 V, 50-60Hz, 9.5 A	
600 W (average)	
Ethernet	
6–12 bar (87–174 psi)	
Integrated active carbon filters (optional facility exhaust)	
+15 °C to +25 °C	
1920 × 2870 × 2060 mm (75.6 × 113 × 81 in)	

	SOFTWARE AND DESIGN TOOL
CAM	GENERA CAM
Print Cockpit	Live print monitoring

G3 ALL IN ONE SYSTEM

GENERA.



AZ

CAM







	GENERAL
Description	All in One System (printing and post-processing)
Materials	Validated with materials from the GENERA open material library
Build Volume (XYZ)	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)
Resolution	4K DLP (3840 × 2160)
Wavelength	385 nm
Light Intensity	Max. 25 mW / cm² (@40 μm)
Build Speed	up to 3 mm/min
Cleaning Fluid	GENERA Clear3d (non-flammable) 2 × 60 L (pre-wash and post-wash)
Heating/Drying Chamber	up to 80 °C
LED Curing Chamber	405 nm (optional under inert atmosphere)
Typical Post Processing Time	45 min
Regulatory Compliance	CE

	PHYSICAL FOOTPRINT
System Size (W × D × H)	1420 × 970 × 1960 mm (55.9 × 38.1 × 77.1 in)
System Weight	approx. 700 kg (1.543 lbs)

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

	SOFTWARE AND DESIGN TOOL
CAM	GENERA CAM
Print-/PPU-Cockpit	Live print and post processing monitoring



	GENERAL
Description	G2/F2 System Automation Module
Regulatory Compliance	CE
	PHYSICAL FOOTPRINT
System Size (W × D × H)	1420 × 970 × 1960 mm (55.9 × 38.1 × 77.1 in)
System Weight	approx. 650 kg (1.102 lbs)
	FACILITY REQUIREMENTS
Power Requirements (basic version)	AC 220-240 V, 50-60Hz, 2.5A
Power Consumption	580 W (max)
Network Connectivity	Ethernet
Exhaust (optional)	Integrated active carbon filters (optional facility exhaust)
Operating Conditions	+15 °C to +25 °C
	SOFTWARE AND DESIGN TOOL

GENERA CAM



Creation made reliable.

GENERA.

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