



# Raise3D MetalFuse

Full In-House FFF  
3D Printing Solution

Solution



Raise3D Forge1  
Printer



Raise3D D200-E  
Debinding Furnace

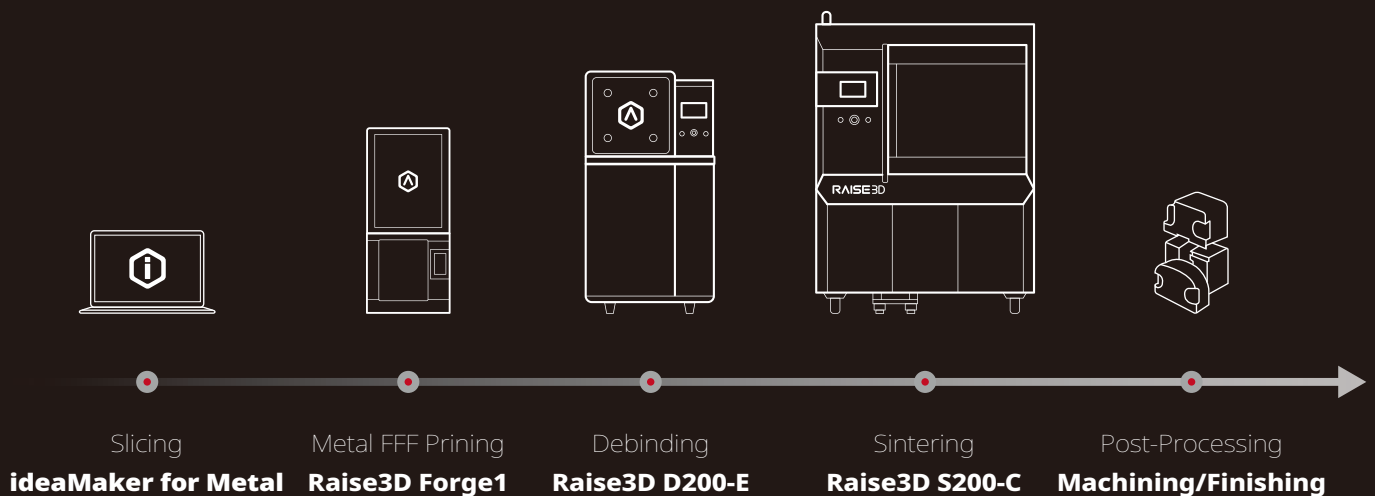


Raise3D S200-C  
Sintering Furnace

**Q** *What does **Raise3D MetalFuse**  
Full in-house FFF Metal 3D Printing  
Solution Offer?*

**A**

Raise3D MetalFuse offers a full in-house FFF metal printing solution for manufacturers who require the internal production of metal parts for various uses.



## Learn More

Raise3D MetalFuse:  
[www.raise3d.com/metalfuse](http://www.raise3d.com/metalfuse)

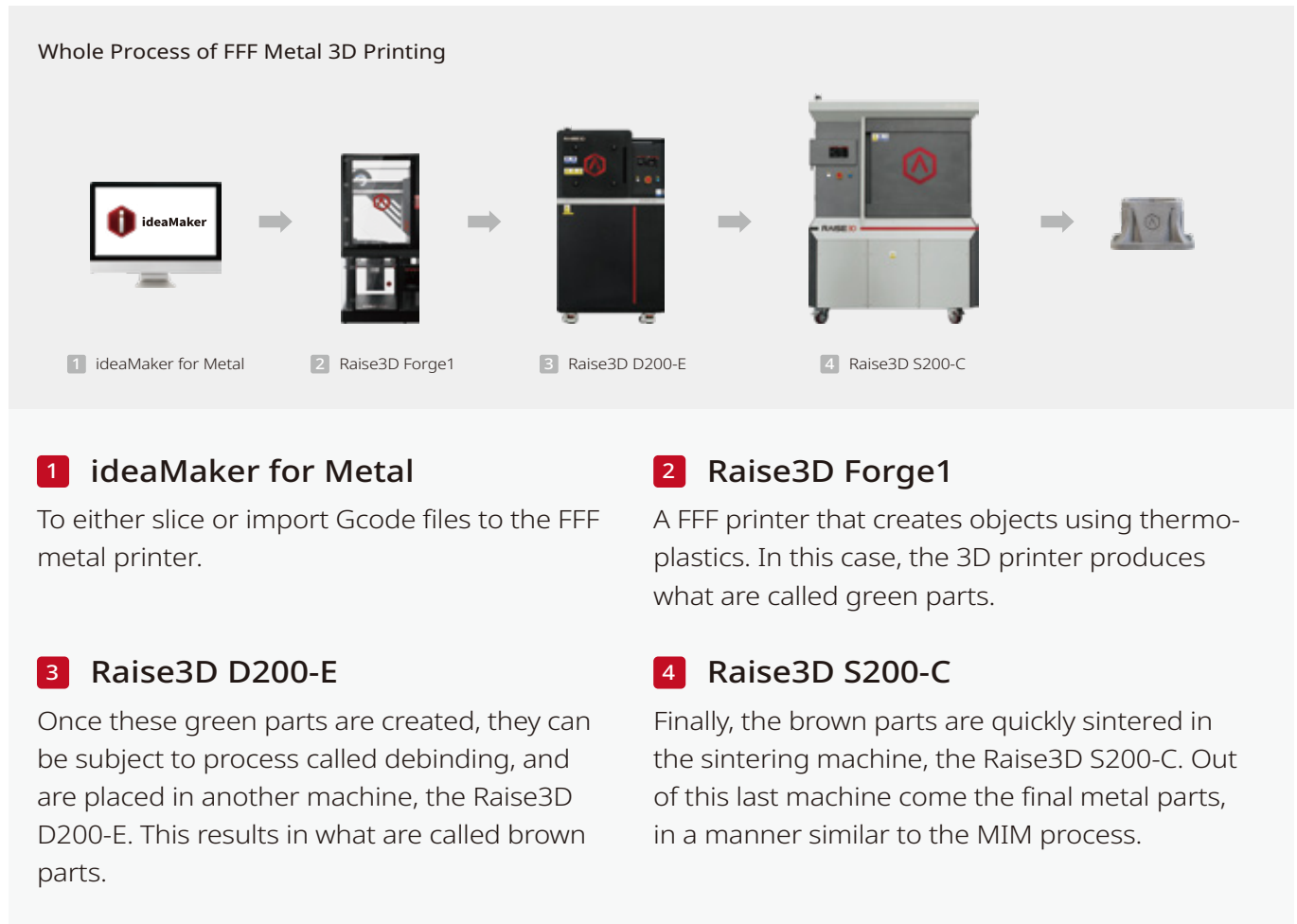
Raise3D Forge1:  
[www.raise3d.com/raise3d-forge1-a-metal-fff-3d-printer](http://www.raise3d.com/raise3d-forge1-a-metal-fff-3d-printer)

Watch the video:  
[www.youtube.com/watch?v=2-j8qMkvW6E](http://www.youtube.com/watch?v=2-j8qMkvW6E)

\*Please consult your local distributor for more information.

# A Simple Process for Users

Raise3D has developed the entire production process from design to printing, to debinding, sintering and to post-processing, all without anything leaving the factory. It includes:



## Specialized Slicing Software ideaMaker for Metal

ideaMaker for Metal is slicing software specially developed for metal 3D printing. A special edition of ideaMaker offers templates optimized for this kind of printing, while taking into account the sintering and debinding processes that the 3D-printed parts are subject to after being created with MetalFuse. It features:



## Templates for all processes

Metal filament templates were previously validated, and these enable easier slicing.

## Easy to set shrink compensation

Unlike other FFF printing methods, metal printing requires a debinding and sintering process to obtain the final parts.

To ensure that the final part matches the intended size, the size of the green parts can be automatically set in the software to account for a certain amount of print shrinkage.

## Metal FFF 3D Printer-Forge1

After slicing with ideaMaker for Metal, the next step is to use Raise3D's metal FFF 3D printer to print green parts.

As previously mentioned, the Raise3D Forge1 can print green parts using perhaps the most widespread 3D printing technology, Fused Filament Fabrication (FFF), making it highly accessible to on-demand scalable production.

The extensively used nature of this technology creates an ecosystem that drives innovation in various industries with multiple end-use applications.

A hybrid filament of metal and POM-based polymers is used to print the green parts. During printing, the POM melts and the metal particles carried within are deposited.

## Advantages of green parts printed using the Raise3D Forge1



The ability to consistently produce complex parts



Smooth surface finish



High accuracy for assembly



Can reliably handle batch printing



High strength and resistance to damage



Compatible with Metal Injection Molding (MIM) process

## Raise3D Debinding Machine-D200-E

Green parts printed using the Raise3D Forge1 need to be debound by a debinding machine. The Raise3D D200-E is a catalytic ethanedioic debinding machine specifically created for this effect.



Green parts need to be debound

It is used to remove the POM from parts and prepare the metal for sintering. In the presence of oxalic acid in the high-temperature acidic environment created by the machine, the catalyst gas penetrates the green parts and the POM is decomposed and vaporized.

The Raise3D D200-E has great performance as it has a high debinding rate, which can achieve catalyst penetration speed of over 1mm/h. Taking “35.6 × 22.6 × 17.7 mm” Connector Inserts in this case as an example, it can simultaneously process up to 7 trays (70 green parts of a given size) in just 15 hours.

The catalyst, oxalic acid gas, is biodegradable with low toxicity, and the methanal and acidic gas produced in the Raise3D D200-E will be discharged along with the protective gas (nitrogen, argon, etc.) through the exhaust gas filtration system. In this way, the Raise3D D200-E is eco-friendly and suitable for an office environment.

## Raise3D Sintering Machine-S200-C



Brown parts are sintered

After debinding, users get the brown parts, but these parts are very brittle and crispy, they need to be quickly and carefully moved and to a sintering machine, where they will be heated to sintering temperatures.

The Raise3D S200-C is a vacuum sintering machine, designed to carry out the sintering portion of the indirect metal 3D printing process. During the sintering process, the loose debound parts will shrink into dense solid sintered parts.

Taking “35.6 × 22.6 × 17.7 mm” Connector Inserts in this case as an example, Raise3D S200-C can simultaneously process up to 6 trays without at once using the same amount of energy. Additionally, the sintered part's density after sintering reaches 97%.

## Post-Processing Machining/Finishing

After going through the printing, debinding, and sintering processes, the final metal parts can be put directly into use. However, for a better surface look, or other special assembly requirements, sintered parts can be lightly machined and processed.

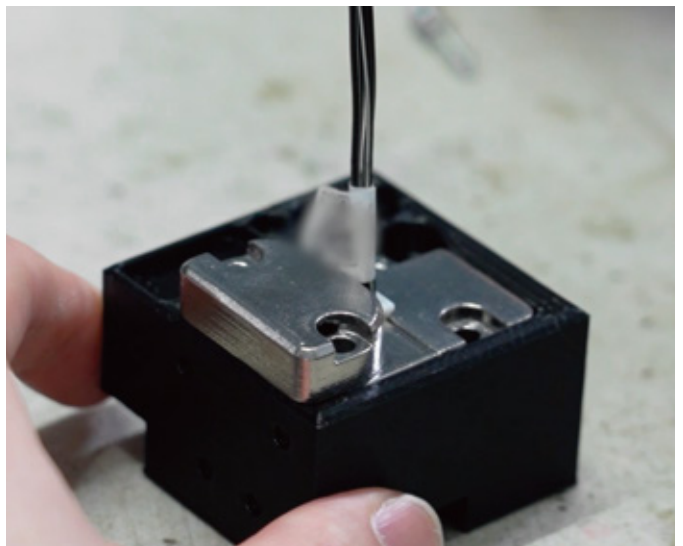
This case, drilling is used to assist in adjustments that may be needed for assembly, and the hole tolerance is  $\pm 0.2\text{mm}$ .



This case with the post-processing, the sintered part's hole tolerances already meet applicable standards, and the drilled sintered parts will be used directly in a client's wiring testing line.



Post-processing methods, such as magnetic abrasive finishing, electroplating, polishing, are also frequently used to fulfill manufacturer requirements. In the example illustrated above, magnetic abrasive finishing is adopted to make the surface of the connector inserts smoother, making it safer and easier to handle.



# Raise3D MetalFuse Solution Benefits

## I Cost-effective

Raise3D MetalFuse solution makes cost-effective metal printing possible, as the lead time and high production difficulties are all reduced. It utilizes the catalytic debinding process, which leads to 60% off in processing time, and an increase of the part's density of up to 97%.

## I Environmentally Friendly

Compared to other processes, such as CNC and SLM (Selective Laser Melting), Raise3D MetalFuse saves more energy, is less wasteful, and environmentally friendly.

## I High Accessibility

Raise3D MetalFuse solution makes on-demand scalable production highly accessible. It drives production in various industries with multiple end-use applications, and can meet clients' requirements for batches of end-use metal parts at lower prices, various batch sizes, ensured quality, reduced maintenance costs, etc.





# Raise3D Forge1 Technical Specifications

Printer	Forge1	
Build Volume (W × D × H)	Single Extruder Print	Dual Extruder Print
	300 × 300 × 300 mm (11.8 × 11.8 × 11.8 inch)	255 × 300 × 300 mm (10 × 11.8 × 11.8 inch)
Machine Size (W × D × H)	620 × 626 × 1390 mm/ 24.4 × 24.6 × 54.7 inch	
Electrical	Power Supply Input	100-240 V AC, 50-60 Hz 230 V @3.3 A
	Power Supply Output	24 V, 600 W
General	Print Technology	FFF (Fused Filament Fabrication)
	Print Head System	Dual-head with electronic lifting system
	Filament Diameter	1.75 mm
	XYZ Step Size	0.78125, 0.78125, 0.078125 micron
	Print Head Travel Speed	30-150 mm/s
	Build Plate	Glass Build Plate
	Max Build Plate Temperature	120°C
	Heated Bed Material	Silicone
	Build Plate Leveling	Auto-Leveling
	Supported Materials	Metals (Ultrafuse® 316L, Ultrafuse® 17-4PH) <sup>1</sup> Support layer material: aluminum oxide (Ultrafuse® Support Layer) <sup>2</sup>
	Nozzle Diameter	0.4 mm (Default), 0.6 mm (Available)
	Max Nozzle Temperature	300°C
	Connectivity	Wi-Fi, LAN, USB port, Live camera
	Noise Emission (Acoustic)	<55 dB (A) (when building)
	Operating Ambient Temperature	15°C to 30°C, 10-65% RH, non-condensing
	Storage Temperature	-25°C to +55°C, 10-90% RH, non-condensing
Software	Slicing Software	ideaMaker for Metal
	Supported File Types	STL/ OBJ/ 3MF/ OLTP
	Supported OS	Windows
	Machine Code Type	GCODE
Printer Controller	User Interface	7-inch Touch Screen
	Network	Wi-Fi, Ethernet
	Power Loss Recovery	Available
	Screen Resolution	1024 × 600
	Motion Controller	Ateml ARM Cortex-M4 120 Mhz FPU
	Logic Controller	NXP ARM Cortex-A9 Quad 1 GHz
	Memory	1 GB
	Onboard Flash	16 GB

1. Metal materials are used to print parts and supports.

2. The support layer material can't be printed on its own and is only used for layer isolation, allowing for good separation between the support and the prints after sintering.

This product is intended exclusively for sales, distribution, and use within the European Union, Albania, Iceland, Liechtenstein, Monaco, North Macedonia, Norway, San Marino, Serbia, Switzerland, Turkey, and the United Kingdom, and is only available for customers located in those countries.

# Raise3D D200-E Technical Specifications

Construction	<table> <tr> <td>Machine Type</td> <td>Debinding Furnace</td> </tr> <tr> <td>Working Volume (W×D×H)</td> <td>200 × 250 × 200 mm (7.87 × 9.84 × 7.87 inch)</td> </tr> <tr> <td>Machine Size (W×D×H)</td> <td>806 × 905 × 1583 mm (31.73 × 35.63 × 62.32 inch)</td> </tr> <tr> <td>Net Weight</td> <td>380 kg (838 lbs)</td> </tr> </table>	Machine Type	Debinding Furnace	Working Volume (W×D×H)	200 × 250 × 200 mm (7.87 × 9.84 × 7.87 inch)	Machine Size (W×D×H)	806 × 905 × 1583 mm (31.73 × 35.63 × 62.32 inch)	Net Weight	380 kg (838 lbs)																										
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\*Metal materials are used to print parts and supports.

# Raise3D S200-C Technical Specifications

Construction	Machine Type	Sintering Furnace
	Working Volume (W×D×H)	200 × 200 × 200 mm (7.87 × 7.87 × 7.87 inch)
	Machine Size (W×D×H)	1434 × 1137 × 1974 mm (54.46 × 44.76 × 77.72 inch)
	Net Weight	800 kg (1760 lbs)
Electrical	Power Supply Input	380-400 VAC, 50/ 60 Hz, 3-Phase (5-wire), 45A/ 30 KW Peak Draw
	Maximum Heat Load	14 KW
Operating	Trays	Adjustable Multi-Level Trays (6-Position)
	Machine Running Time	About 20 hours
	Peak Internal Temperature	1450°C (2642°F)
	Protection Gas	1500°C
	Overheating Protection	Argon, Nitrogen
	Protection Gas	5832 cm <sup>3</sup> (356 in <sup>3</sup> )
	Sintering Workload	Graphite Heating Rod
	Heating Element	L <sub>PA</sub> =62.9 dB(A)
	Sound Pressure Level in the Operator's Position	L <sub>WA</sub> =74.2 dB(A)
	Sound Power Level	Front-mounted E-stop, Over-temperature protection
	Safety Control	Partial-pressure sintering (vacuum-enabled)
	Atmosphere	±6°C at sintering temperatures
	Thermal Uniformity	WLAN and Ethernet
	Network	7-inch touchscreen display
	Onboard Control	ideaMaker for Metal, RaiseCloud
	Remote Software	Accessible via any web browser
	Browser Requirements	Auto-generated custom debinding cycle, Live job progress tracking
	Automation	Accessible via any web browser
	Pre-Emergency Stop	Yes
Material	Material Type	Metals (Ultrafuse® 316L, Ultrafuse® 17-4PH)*

\*Metal materials are used to print parts and supports.

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