Studio System™

The Studio System™ from Desktop Metal is the world's first affordable, office-friendly metal 3D printing system. Safe and easy to use, the Studio System was designed to bring metal 3D printing to the shop floor, allowing engineering and design teams to make metal parts faster, without the need for special facilities or dedicated operators.

End-to-end metal 3D printing

The Studio System is a three-part solution that automates metal 3D printing. Tightly integrated through Desktop Metal's cloud-based software, it delivers a seamless workflow for printing complex metal parts in-house—from digital file to sintered part.

Affordable

- Up to 10x less expensive than comparable laser-based systems
- The only complete metal 3D printing system that is cost-effective for prototyping

Safe and simple:

- By eliminating lasers and powders, the Studio System is safe for any facility
- Unlike other systems, there is no third-party equipment, external ventilation or special facilities required—just power and an internet connection.

Separable Supports™

Existing systems weld parts to supports, requiring machining or wire EDM to remove the part. Proprietary Separable Supports make it possible to remove support structures by hand, simplifying post-processing significantly.

High quality parts

The Studio System delivers near-net-shape parts with densities up to 96-99.8%—depending on the alloy.

An end-to-end solution

The printer

Unlike laser-based systems that selectively melt metal powder, the printer extrudes bound metal rods—similar to how an FDM printer works. This eliminates the safety requirements often associated with metal 3D printing while enabling new features like the use of closed-cell infill for lightweight strength.

- The printer heats and extrudes bound metal rods onto the build plate, shaping the part layer-by-layer in a process called Bound Metal Deposition™, delivering the resolution and accuracy needed for functional prototyping. (Build rate: 16cm^3/hr; Max resolution: 50 um)
- We used encoded ball screws rather than belts for our motion control system. Combined with automated bed-leveling and a heated build area, the Studio printer delivers excellent geometric fidelity and build success.
- The printer features a two extruders—one for metal media and one for ceramic interface media.
- Safe-to-handle, hot-swappable media cartridges make it easy to change materials instantly.
- Fully-automated, cloud-connected for live monitoring and alerts

The debinder

The debinder prepares green parts for sintering by dissolving primary binder. With a low emission design, it requires no external ventilation and is safe for an office environment. Automatic fluid distillation and recycling means there is no need to refill between each cycle.

- The debinder immerses the parts in proprietary fluid, removing primary binder and creating an open-pore channel structure throughout the part in preparation for sintering.
- With a low-emission design, no external ventilation is required.
- Automatic distillation and recycling of debind fluid improve ease of use and cost-savings.
- Fully-automated, cloud-connected for live monitoring and alerts.

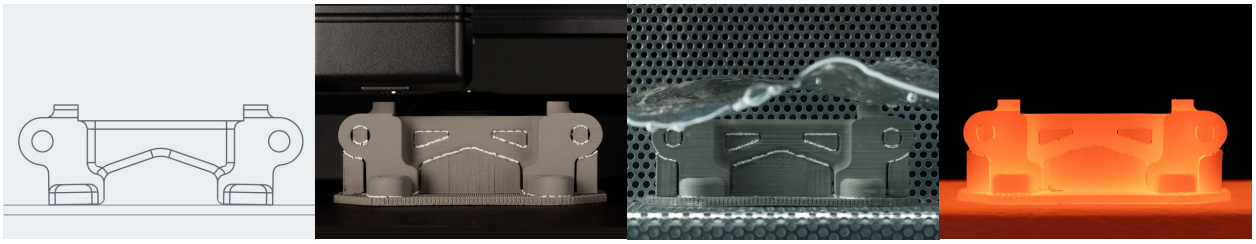
The furnace

Fully-automated with closed-loop thermal control, the furnace is the first to deliver industrial-strength sintering and an office-friendly package. Built-in profiles are tuned to every build and material to ensure uniform heating and cooling without the residual stresses introduced in laser-based systems.

- The furnace heats parts to just below melting (up to 1400° C), removing remaining binder and causing metal particles to fuse together to deliver parts with densities up to 96 to 99.8%.
- Sized to fit through an office door, the furnace delivers industrial-strength sintering in an office-friendly package.
- Built-in temperature profiles are automatically tuned to each build and material.
- Fully-automated, cloud-connected for live monitoring and alerts

How it works

The Studio System was designed as a complete workflow. Each stage of the process is fully automated and managed by sophisticated software, making it simple to go from CAD to part. The entire process is controlled and monitored from the cloud, ensuring a seamless, simple experience.



1 PREP	2 PRINT	3 DEBIND	4 SINTER
Secure, web-based software constructs build plans from STL or CAD files, automatically generating supports and control parameters based on part geometry and material.	Layer by layer, a green part is shaped by extruding bound metal rods—metal powder held together by wax and polymer binder—in a process called Bound Metal Deposition™.	The green part is immersed in proprietary debind fluid, dissolving primary binder and creating an open-pore channel structure throughout the part in preparation for sintering.	As the part is heated to temperatures near melting, remaining binder is removed and metal particles fuse together causing the part to densify up to 96-99.8%.

Remove supports by hand

Introducing Separable Supports™. Designed to simplify post-processing, the Studio System prints supports with a patent-pending interface layer that does not bond to the metal part. Existing systems weld parts to supports, requiring machining or wire EDM to remove the part. Separable Supports makes it possible to separate supports easily by hand.

Materials

- Designed with the world's foremost metallurgists, the Studio System combines unique materials profiles with part data to construct exact print and sinter plans for every part. Bulk sintering and careful process controls enable mechanical properties similar to traditional metalworking processes.
- By enabling the use of metal powders from the MIM industry, our system has access to a wide range of existing materials, from steels to copper and titanium.
- While changing materials in a laser-based system poses safety risks and can take a week or more, the Studio printer was designed with safe-to-handle, swappable media cartridges and quick release print heads for seamless material changes.

Availability & cost

- The complete Studio System, including the printer, debinder, and furnace, is available for $120,000 (US) or €120,000 (EU).
- Shipping begins in December 2017 to participants in the Pioneers Program.

Office-friendly

Hand-removal of supports, fast material changes, and web-based software are just a few of the ways we're making metal 3D printing more accessible. The Studio system was designed from the ground up for simple installation and use.

No hazardous powders
No respirators
No external ventilation

No 480V 3-phase power
No stress relief

No dangerous lasers
No 3rd party equipment
No dedicated operators

No welded supports
No special facilities

Software-controlled workflow

Unlike other systems that require 3rd party equipment, the Studio system was designed as a complete workflow. Every stage of the process is fully automated and managed by sophisticated software, making it simple to go from CAD to part.

Change materials in under a minute

Changing materials in laser-based systems poses safety risks and can take a week or more. The Studio printer was designed with safe-to-handle, swappable media cartridges and quick release print heads for seamless material changes.

Office-friendly sintering

Easily swappable aluminum gas canisters simplify gas management. The system automatically detects supply levels and gas type, dispatching notifications if there is an issue. Built-in effluent filters, binder cold traps, and safety fail safes keep the system safe to use on the shop floor.

Expert metallurgy built-in

Designed with the world's foremost metallurgists, the Studio System combines unique materials profiles with part data to construct sintering plans for every part. Closed loop thermal control enables real-time heating regulation throughout the sintering cycle, ensuring every part is uniformly heated and cooled.