

Production System Parts

3D printed part examples and corresponding data from the
Desktop Metal Production System

Automotive

Part Name

Transmission Coupling

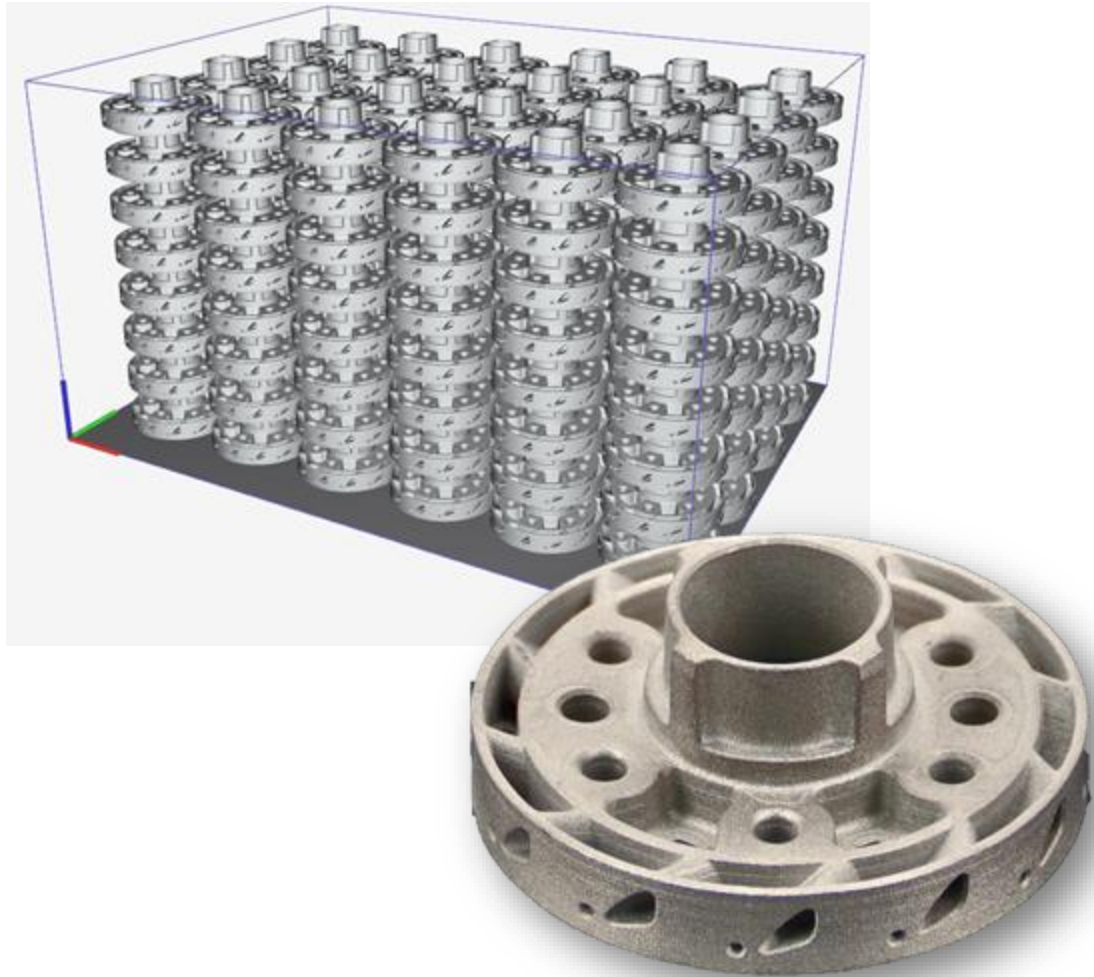
Brief Description

This coupling connects two shafts to transmit power from drive side to driven side.

Why Production System

This part features a lightweight vaned gearing to increase power efficiency and strength.

The Production System allows for the manufacturing of complex geometries in a cost effective and scalable way.



Material

17-4 PH

Size

60 x 60 x 25.8 mm

Cost/ Part

\$7.56

Parts / Build

192

Throughput/ Year

193,137

Part Name

BMW Water Wheel



Brief Description

The waterwheel is an integral part of the BMW's engine cooling system.

Why Production System

Initially made of several plastic parts, BMW redesigned this waterwheel for printing on a laser-based system but found the process to slow and expensive for mass production.

The Production system unlocks higher throughput, allowing the part to be manufactured at a competitive price, bringing the racetrack to the road.

Material

17-4 PH

Size

63 x 63 x 34 mm

Cost/ Part

\$12.92

Parts / Build

95

Throughput/ Year

167,054

Part Name

Seat Belt Pulley



Brief Description

This output pulley is an essential component of the reclining mechanism in a car seat.

Why Production System

This part features an undercut radial groove that, without printing, would require advanced sliders during the press-and-sinter process. Printed on the Production System eliminates the cost and complexities associated with press and sinter.

Material

17-4 PH

Size

48 x 29 x 9 mm

Cost/ Part

\$1.37

Parts / Build

1,137

Throughput/ Year

1,822,836

Part Name

Parking Shift Bracket



Brief Description

This bracket is used in the parking brake assembly of a continuously variable transmission.

Why Production System

This part would require a complex die and multiple secondary operations to be produced via traditional powder metallurgy techniques.

The Production system eliminates the need for tooling, dramatically reducing lead times, reducing part costs and enables the redesign of this part to consolidate an assembly into a single part.

Material

17-4 PH

Size

93 x 44 x 12 mm

Cost / Part

\$4.71

Parts / Build

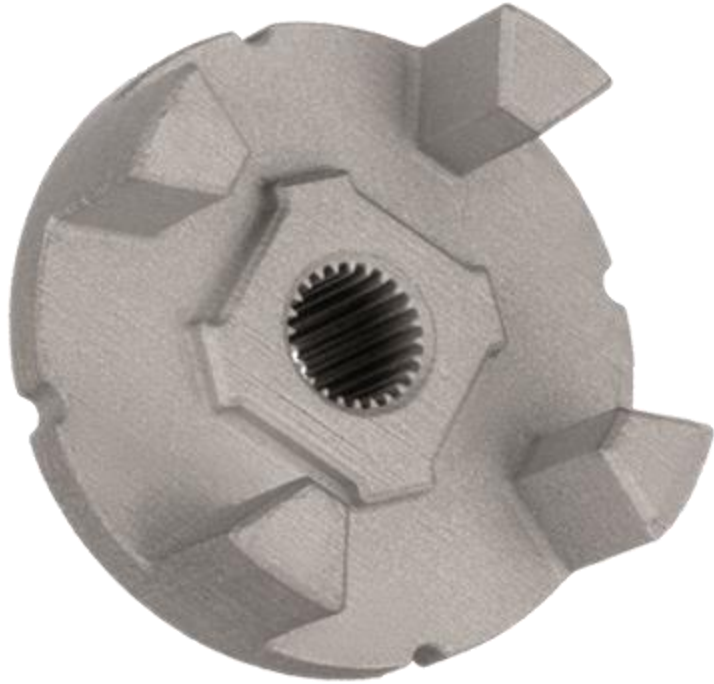
342

Throughput / Year

542,826

Part Name

Power Steering Join



Brief Description

This joint is designed to power transfer in an electric power steering system.

Why Production System

This joint is used for power transfer between an electric power steering motor and the steering shaft in an automobile. The production system allowed for this part to be produced with no tooling, allowing for accelerated lead time and flexible design.

Material

17-4 PH

Size

36 x 36 x 22 mm

Cost/ Part

\$2.79

Parts / Build

532

Throughput/ Year

895,434

Consumer Products

Watch Case / Bezel



Watch bezels and cases are the main components of a watch and house the dial and movement.

For each different watch model and size, different tooling is required. This makes doing smaller, more custom watch models prohibitively expensive. The Production system eliminates the need for tooling dramatically reducing part cost.

Watch producers can now manufacture on-demand, printing multiple different watch models in each run, producing watch designs that never could have been justified before.

17-4 PH

43 x 48 x 9.5 mm

47 x 38 x 7.7 mm

\$1.37

\$1.17

722

1,224

1,117,108

2,014,816

Part Name

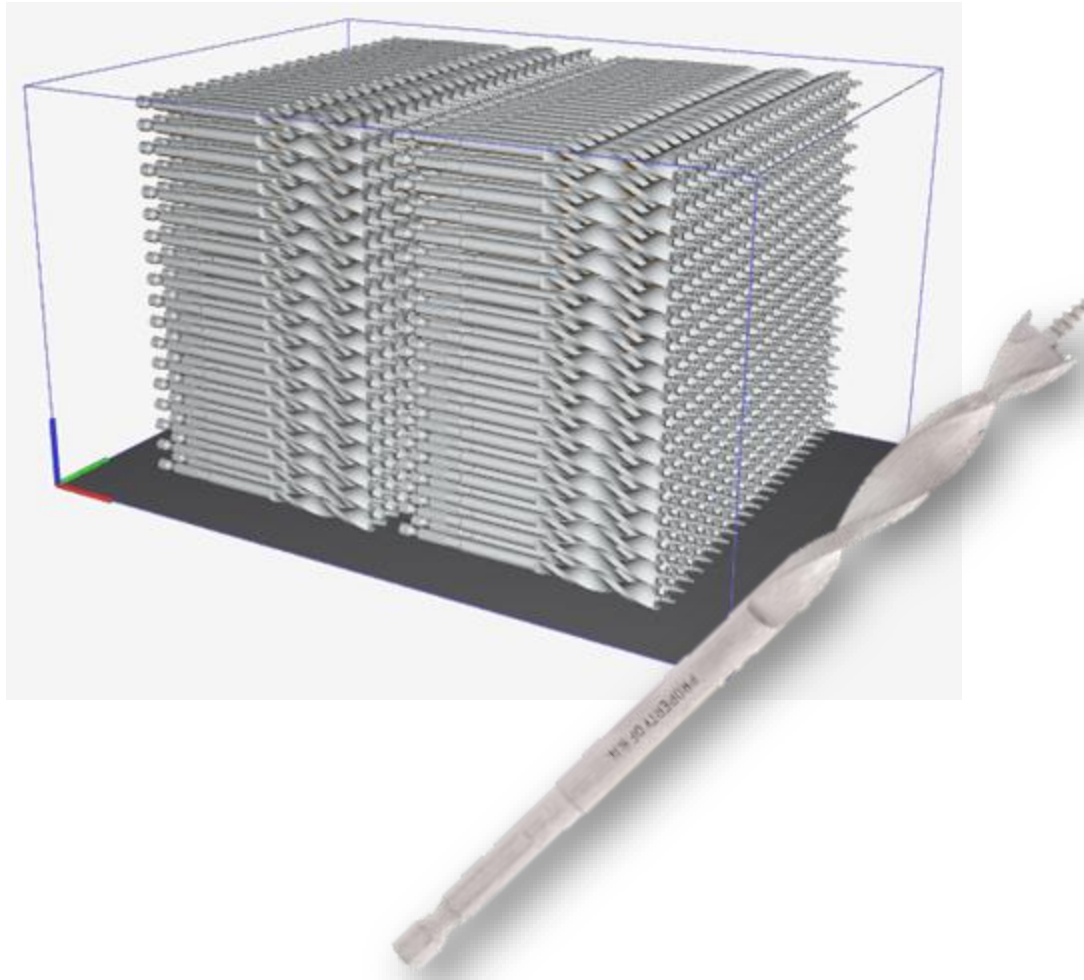
Auger Bit

Brief Description

This part is a drill bit used to quickly drill holes in clean wood.

Why Production System

Using traditional methods, this auger bit required more than 20 manufacturing steps. With the Production System, that number is reduced to just four, with post processing only required to reach the desired hardness and surface finish. This greatly reduces the part cost and manufacturing lead time.



Material

17-4 PH

Size

166 x 12 x 12 mm

Cost/ Part

\$2.17

Parts / Build

627

Throughput/ Year

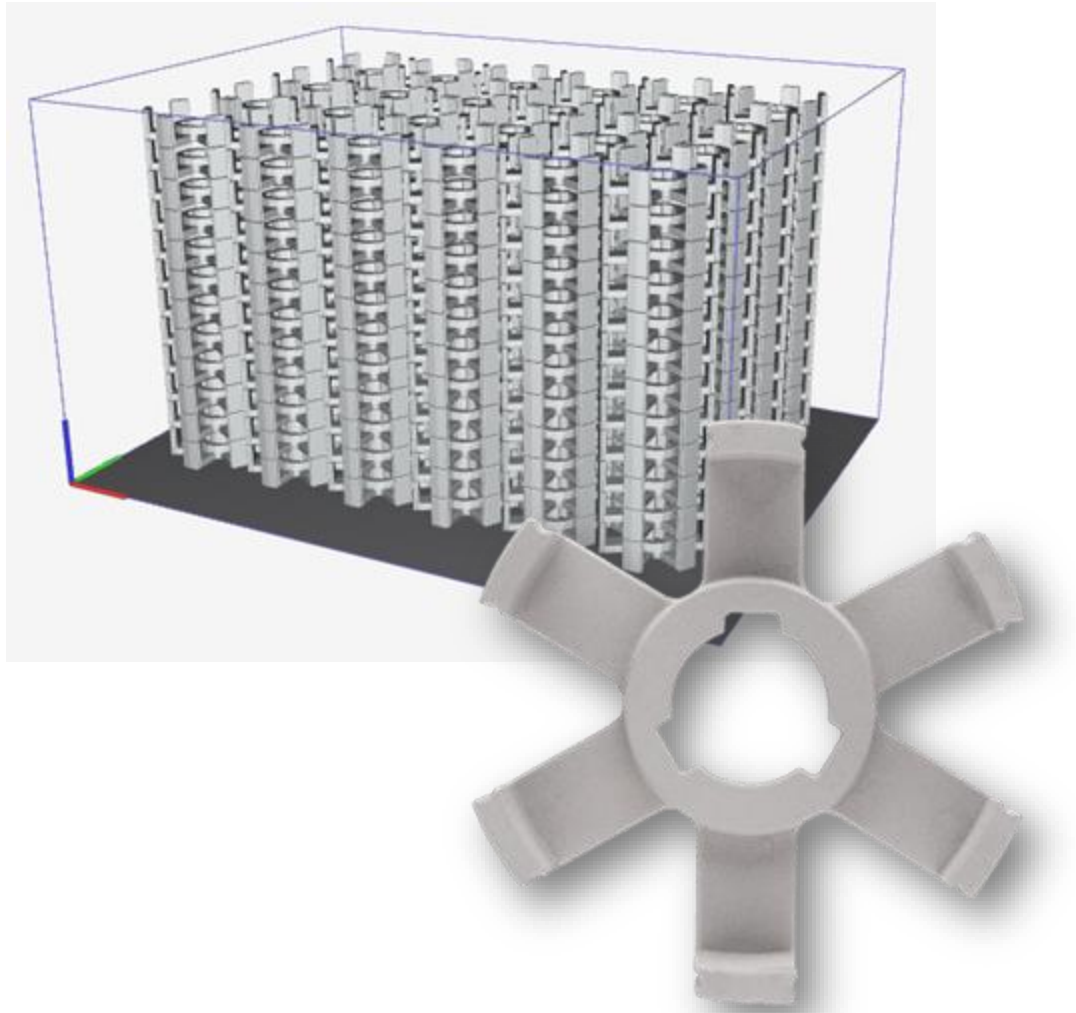
1,152,289

Heavy Industry

Machine Design

Part Name

Stator



Brief Description

This stator is designed for use in a small electric motor.

Why Production System

This stator is part of a small electric motor that was produced in low volume, making it difficult to justify the cost of hard tooling for metal injection molding (MIM). The entire run of parts could be produced in one run of the Production System at the desired part cost and greatly reduced manufacturing lead time.

Material

17-4 PH

Size

60 x 60 x 16 mm

Cost / Part

\$4.37

Parts / Build

274

Throughput / Year

422,902

Part Name

Ntopology Gear



Brief Description

This gear features a complex internal lattice structure only achievable via 3D printing.

Why Production System

This part features a complex lattice structure used to lightweight the part while still providing strength.

The Production System allows for the manufacturing of complex geometries that cannot be manufactured any other way.

Material

17-4 PH

Size

63 x 63 x 12.5 mm

Cost/ Part

\$10.08

Parts / Build

285

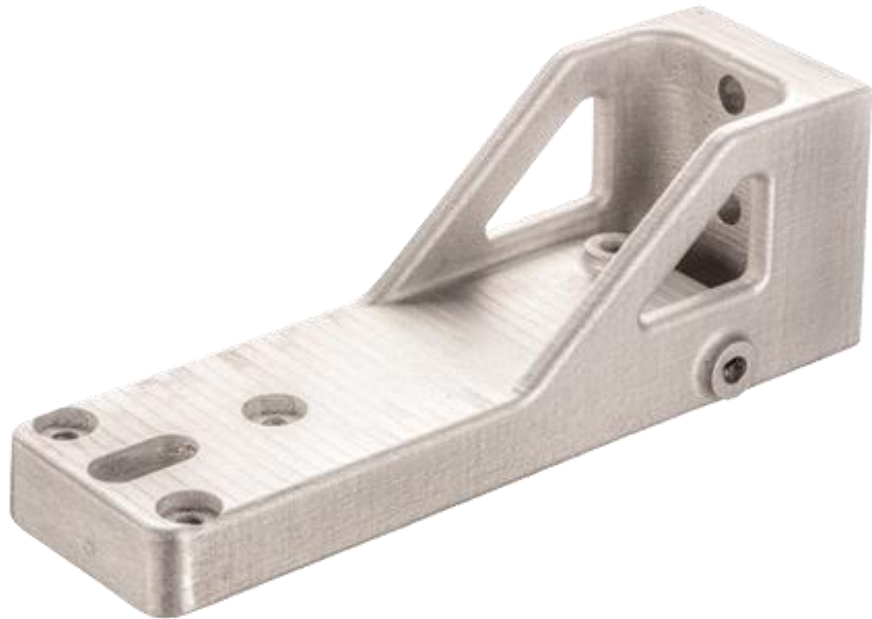
Throughput/ Year

439,996

Manufacturing Tooling

Part Name

Audi Fixture



Brief Description

This custom manufacturing fixture was created for use on an Audi production line.

Why Production System

With complex internal conformal cooling channels that span the base and the wall, this fixture would normally be manufactured in multiple pieces and welded together. As production increases, this part would be too expensive and time-consuming to scale.

Using the Production System, the fixture is printed as a single part with cooling channels intact—reducing part cost, lead time, and manufacturing complexity.

Material

17-4 PH

Size

127 x 51 x 38 mm

Cost/ Part

\$36.16

Parts / Build

48

Throughput/ Year

77,132

Medical Device

Part Name

Surgical Tool

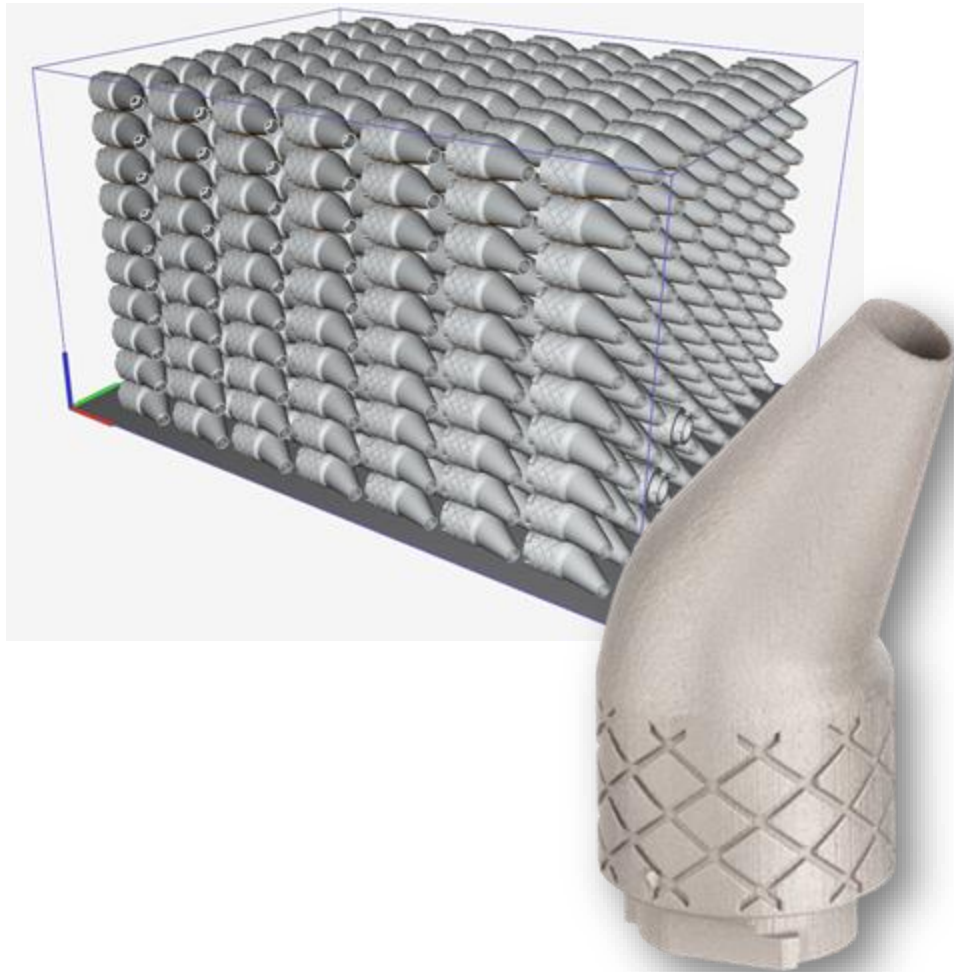
Brief Description

Nozzle used during surgery; customized for each patient.

Why Production System

This surgical nozzle features a customized internal channel designed specifically for each patient. The Production System allowed this part to be mass customized and produced without any tooling, allowing it to be fine-tuned for an array of patients.

The internal channel featured in this nozzle would require complex machining operations with multiple fixturing setups; printing on the Production System eliminates those steps, resulting in cost savings.



Material

17-4 PH

Size

27 x 47 x 21 mm

Cost/ Part

\$2.24

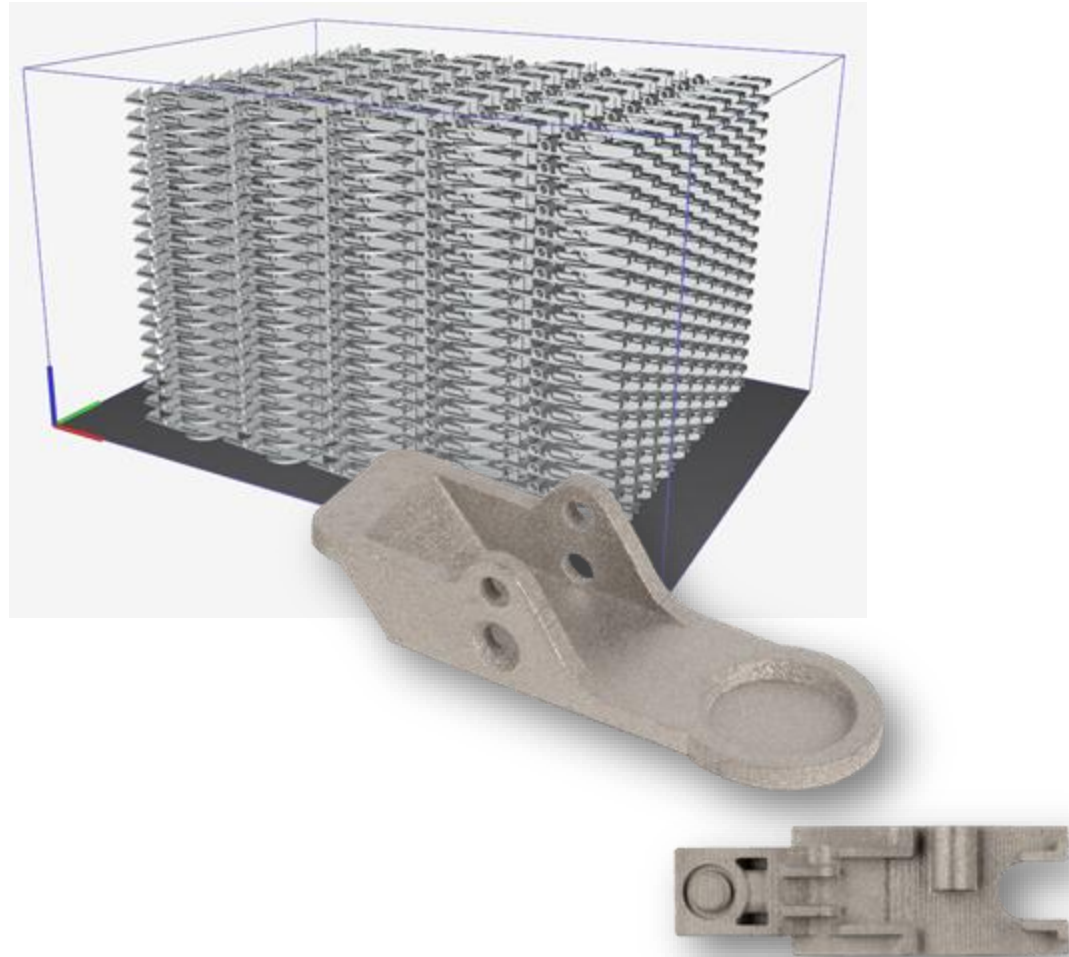
Parts / Build

667

Throughput/ Year

1,060,904

Medical Device Closure/Latch



This assembly is used to latch and hold other components in place in a medical device assembly

These parts require geometry that is very small and precise, this would require extensive machining and/or these fine thin features that would be challenging. To produce these parts via metal injection molding would require a large investment in tooling, since the parts do not need to be produced in very large volume, only about 10,000 needed, the tooling couldn't be justified.

The Production System allowed the parts to be produced quickly and affordably, without any tooling costs.

17 – 4 PH

59 x 26 x 10 mm

37 x 12 x 9 mm

\$5.19

\$1.93

160

745

12,870

15,809