Desktop Metal

[50+] 3D Printed Parts

3D printed part examples and corresponding data from Studio System

Explore real use cases for 3D printing

Across industries

- Automotive
- Consumer
- Oil & Gas
- Machine Design
- Manufacturing Tooling

In a range of materials

- Stainless Steel
- Tool Steel
- Superalloys
- Copper

For various use cases

- Prototyping
- Manufacturing floor aids
- Pilot runs
- Low volume production

Studio System™

—

Two-step, turnkey, production of durable, functional end-use metal parts.

- **Great for low-volume applications** — functional prototyping, jigs & fixtures, rapid tooling
- **Designed for virtually any manufacturing environment** — no hazardous powders, no dangerous lasers, minimal facilities investment required
- **Separable supports** for easy post-processing
- **Workflow automation** via integrated software
- **Easy to change materials** — 17-4PH and 316L stainless steels, 4140 low-alloy steel, copper, D2 and H13 tool steels, nickel alloy Inconel 625 and titanium (Ti64)

Automotive

Part Name

Connecting Rod

Brief Description

Connecting rods transmit power from the piston head to the crankshaft in combustion engines.

Why Studio System

This part would be traditionally forged, followed by multiple machining operations. Printing this part and machining critical dimensions allows for reduced machining lead time, frees up machine shop for other work, and delivers significant cost savings.

Material	Size
4140	73 x 35 x 22 mm 73 x 145 x 22 mm

DM Cost	Traditional Cost	Savings
$59 $159	$653* $322*	78%

*Economy price from Xometry

Desktop Metal™ Studio System™

Part Name

Transmission Shift Fork

Brief Description

Shift forks are used to move the synchronizers that change the gears in a manual transmission to ensure a proper mesh.

Why Studio System

This fork is originally cast in high volumes, but when replacement parts are needed in lower volumes casting is not a suitable manufacturing method due to the very high tooling costs and long foundry lead times.

Printing this part greatly simplifies the process of producing replacements, just upload the files, hit print, and a few days later your replacement part is ready to install; greatly reducing the manufacturing lead time, logistical burden, and part cost.

Material	Size
4140	108 x 73 x 33 mm

DM Cost	Traditional Cost	Savings
$88	$642*	86%

*Economy price from Xometry

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Part Name

Crankshaft Starter Gear

Brief Description

This gear connects the crankshaft to the generator and water pump in a motorcycle engine.

Why Studio System

Manufacturing this part via traditional methods would require casting followed by broaching operations to form the gear teeth.

Using the Studio System, the final part was fabricated in just a few days at a low per-part cost, allowing parts to be prototyped and tested quickly before moving to a mass manufacturing method.

Material	Size
17-4 PH	64 x 64 x 45 mm

DM Cost	Traditional Cost	Savings
$140.19	$482*	71%

*Economy price from Xometry

Desktop Metal™ Studio System™

Part Name

Shock Absorber Pistons

Brief Description

This piston is used in a shock absorber to provide dampening over uneven surfaces.

Why Studio System

This part features complex internal channels that are optimized to direct the flow of oil to provide the right level of damping. These internal channels could not be manufactured in any method other than additive manufacturing.

The Studio System allowed the pistons to be rapidly prototyped and tested in 17-4 stainless steel at a low cost per part. Once the design is finalized, the parts can be mass-produced using the Shop System.

Material	Size
17-4 PH	48 x 48 x 15 mm

DM Cost	Traditional Cost	Savings
$38.00	$245*	84%

*Economy price from Xometry

Desktop Metal™ Studio System™

Part Name

Thermostat Housing

Brief Description

This thermostat housing is part of the cooling system on a vintage Mercedes Benz engine.

Why Studio System

This thermostat housing was originally cast, but as demand for replacement parts dwindled, it was discontinued, and the parts became difficult to find.

Attempts to recreate the part have been frustrated by the fact that the molds and tools used to produce it no longer exist, and geometry that is too complex for machining.

Using the Studio System, however, aftermarket parts suppliers can quickly reproduce rare parts like this housing, making them available for car enthusiasts who want them.

Material	Size
316L	59 x 54 x 80 mm

DM Cost	Traditional Cost	Savings
$99.10	$717*	86%

*Economy price from Xometry

Part Name

Generative Design Piston Head

Brief Description

A prototype piston head for a reciprocating engine, this part was optimized via generative design.

Why Studio System

Typically CNC machined from aluminum alloy, pistons can be time consuming and difficult to rapidly prototype and test - often taking months or even years to move from design to production.

With the Studio System, various piston designs can be easily prototyped and tested—speeding up product development timelines, reducing time to market, and introducing new opportunities for optimization, including generative design—all while avoiding CNC backlog and lead times.

Material	Size
4140	83 x 83 x 49 mm

DM Cost	Traditional Cost	Savings
$285.36	$568.13*	50%

*Economy price from Xometry

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Consumer Products

Part Name

Skateboard Truck

Brief Description

This part is used to attach wheels to a skateboard deck, and was optimized using generative design tools.

Why Studio System

Generative design and 3D printing allows for the fabrication of innovative designs impossible with casting (the traditional production method for skateboard trucks).

The Studio System can print that previously impossible geometry, resulting in trucks that are more aesthetically pleasing, stronger, and lighter.

Material	Size
17-4 PH	164 x 43 x 60 mm

DM Cost	Traditional Cost	Savings
$161.65	$1163*	86%

*Not possible to machine. DMLS Cost

Part Name

Rook

Brief Description

The rook is is a piece in the game of chess resembling a castle. It can move vertically and horizontally, through any number of unoccupied squares.

Why Studio System

Unique chess piece designs can be 3D printed without the design lock-in, long lead times and costs associated with tooling.

The Studio System's high resolution print head produces small parts with fine features and surface finish.

Material	Size
316L	34 x 34 x 57 mm

DM Cost	Traditional Cost	Savings
$80.65	n/a	n/a

Part Name

Open Ring

Brief Description

This ring is an example of the fun, unique jewelry that can be customized and scaled for a tailored fit.

Why Studio System

Unique jewelry pieces can be 3D printed without the design lock-in, long lead times and costs associated with tooling.

The Studio System's high resolution print head produces small parts with fine features and surface finish.

Material	Size
316L	59 x 54 x 80 mm

DM Cost	Traditional Cost	Savings
$43.00 Low	n/a	n/a

Part Name

Putter

Brief Description

Custom designed golf putter is an example of the customization that is possible with 3D printing.

Why Studio System

Golf clubs, especially putters, are typically cast or machined. With the Studio System™, manufacturers can achieve excellent material properties without tooling or expensive CNC machining.

The Studio System allows for customization of parts like putters, so each player can have a design that is best suited to them. And when those designs go into mass production, they can be manufactured via binder jetting.

Material	Size
17-4 PH	110 x 75 x 28 mm

DM Cost	Traditional Cost	Savings
$78.78	$2203*	96%

*Economy price from Xometry

Part Name

Octopus Ring

Brief Description

The octopus ring is an example of the fun, unique jewelry that can be customized and scaled for a tailored fit.

Why Studio System

Unique jewelry pieces can be 3D printed without the design lock-in, long lead times and costs associated with tooling.

The Studio System's high resolution print head produces small parts with fine features and surface finish.

Material	Size
316L	28 x 22 x 29 mm

DM Cost	Traditional Cost	Savings
$17.87	n/a	n/a

Part Name

Guitar Tailpiece

Brief Description

The guitar tailpiece anchors one end of the guitar strings.

Why Studio System

The guitar tailpiece is typically cast from aluminum and can be expensive to customize for short manufacturing runs.

Printing in steel allows design freedom and part customization while eliminating tooling costs. Steel tailpieces also exhibit more pleasing resonance and sustain characteristics for some genres and playing styles.

Material	Size
17-4 PH	102 x 18 x 14 mm

DM Cost	Traditional Cost	Savings
$31.43	$343.28*	91%

*Economy price from Xometry

Heavy Industry

Part Name

UHT Atomizer

Brief Description

This part is a fuel atomizer for a steam boiler on a liquid natural gas (LNG) tanker.

Why Studio System

With the Studio System™, the engineers were able to radically redesign their conventional atomizers for significantly better performance.

This 3D printed atomizer features complex internal channels and oblong shaped holes, which could not be manufactured with traditional methods.

Material	Size
316L	56 x 57 x 60 mm

DM Cost	Traditional Cost	Savings
$124.20	$1089*	89%

*Not possible to machine. DMLS Cost

Part Name

Tri Manifold

Brief Description

This manifold is used to combine three flows into one common flow.

Why Studio System

This part features internal channels to converge three flow paths into one. These channels would be impossible to machine, and instead would need to be drilled as straight holes and plugged.

Printing on the Studio System allows these channels to be designed for their function rather than their manufacturing method. This part can be produced in just a few days with very little hands on work.

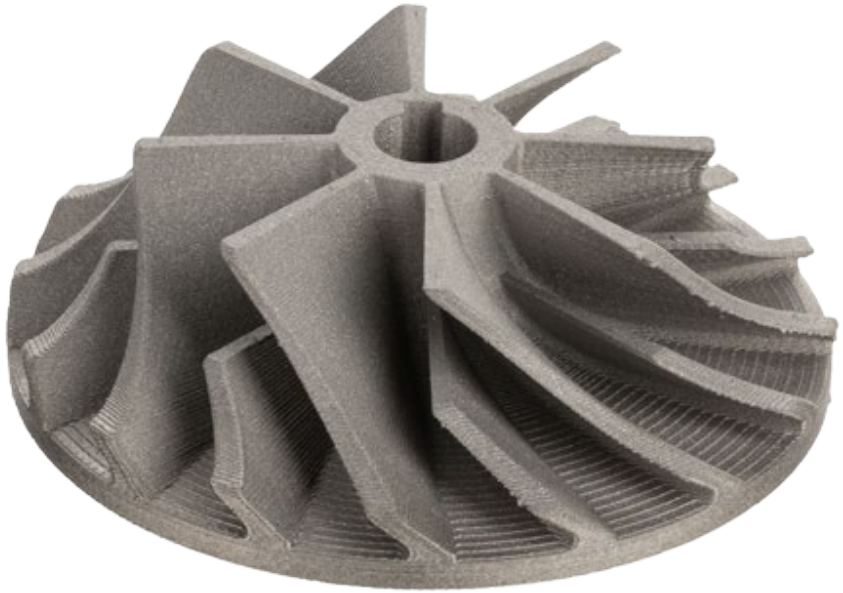
Material	Size
Alloy 625	110 x 102 x 103 mm

DM Cost	Traditional Cost	Savings
$596.04	$4069.28*	85%

*Not Possible with CNC / DMLS cost in 316L

Part Name

Impeller



Brief Description

This impeller is used to control the pressure and flow of fluids in equipment like pumps and compressors.

Why Studio System

Their complex vanes make impellers expensive and difficult to manufacture. When a custom impeller is needed metal 3D printing accelerates design optimization and product development by dramatically reducing lead time and cost.

Material	Size
316L	64 x 64 x 20 mm

DM Cost	Traditional Cost	Savings
$52	$2138*	98%

*Economy price from Xometry

Desktop Metal™ Studio System™

Part Name

Valve Body

Brief Description

This is the valve body for a block and bleed valve.

Why Studio System

This valve body features internal channels that would be impossible to machine. By printing this part on the Studio System the part can be designed for its function rather than its manufacturing method.

The Studio System allows the part to be produced in 316L in just a few days.

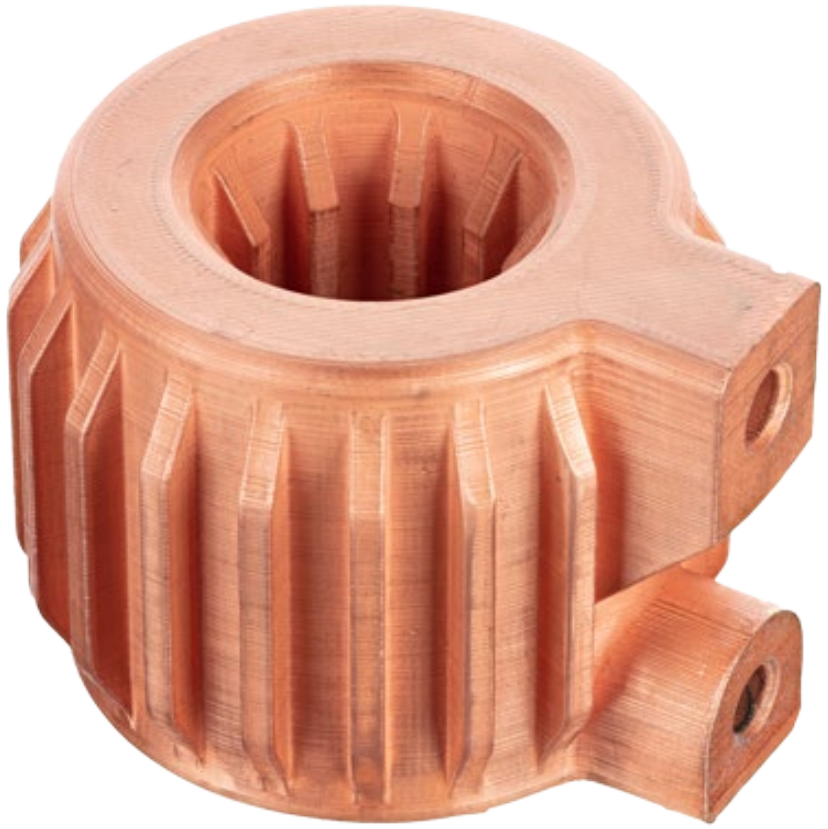
Material	Size
316L	69 x 57 x 30 mm

DM Cost	Traditional Cost	Savings
$88	$2702.27*	97%

*Economy price from Xometry

Part Name

Helical Heat Exchanger



Brief Description

This is a heat exchanger used in chemical processing that features a helical internal cooling channel.

Why Studio System

This heat exchanger is used to cool a hot gas as it flows through a pipe.

The Studio System allows for the heat exchanger to be printed with an internal helical channel that allows cooling fluid to flow through it. The complex geometry of that channel can only be made with additive manufacturing. When combined with the external fins, this heat exchanger enables a much higher heat transfer rate than a traditional part.

Material	Size
Cu	83 x 74 x 58 mm

DM Cost	Traditional Cost	Savings
$385.98	$2138* w/o cooling channel	82%

*Economy price from Xometry

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Part Name

YE6 Burner Tip

Brief Description

This burner tip is used to shape the flame in industrial burners.

Why Studio System

This burner tip was originally cast in the 1950s, and the tooling has since been lost for it. When a customer needed a replacement, the quote for new tooling was in the tens of thousands of dollars.

With the Studio System, the company was able to recreate the part with properties similar to the original cast part, with no tooling cost or long lead times for the customer.

Material	Size
316L	149 x 149 x 91 mm

DM Cost	Traditional Cost	Savings
$671	$1041.20*	36%

*Economy price from Xometry

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Part Name

Oil + Gas Impeller

Brief Description

This impeller is used to flow corrosive chemicals through a pump.

Why Studio System

Impellers require complex vanes to optimize pressures in the pump for different fluids and applications. This custom impeller is designed to pump a specific chemical at a specified pressure, requiring these complex custom vanes.

With chemical impellers, Alloy 625 is the choice material for its chemical resistance and mechanical properties at extreme temperatures.

Material	Size
Alloy 625	109 x 99 x 22 mm

DM Cost	Traditional Cost	Savings
$194.18	$536.72*	64%

* DMLS cost in 316L

Part Name

Master Drilling Sun Gear

Brief Description

This part is a sun gear used in a planetary gearbox for an earth-drilling machine.

Why Studio System

After exploring numbers of alternative manufacturing methods to produce the parts needed to keep crucial machinery up and running, the company chose 3D printing, and cut their lead time for replacement parts from about three months to just three weeks, thereby reducing downtime for the earth drilling equipment.

Material	Size
17-4 PH	118 x 118 x 98 mm

DM Cost	Traditional Cost	Savings
$551.21	$916*	40%

*Economy price from Xometry

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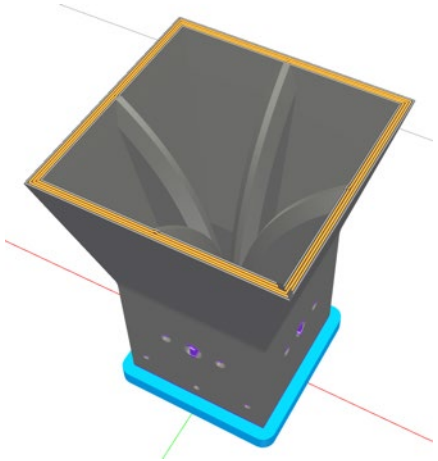
Part Name

Feedhorn



Desktop Metal™ Studio System™

Brief Description

This is a feedhorn used in a cubesat antenna.

Why Studio System

To make this part via traditional manufacturing methods require extensive CNC machining with multiple part setups.

Since only one of these parts was needed, printing on the Studio System was an obvious choice. The part was produced in just a few days at a lower cost than machining.

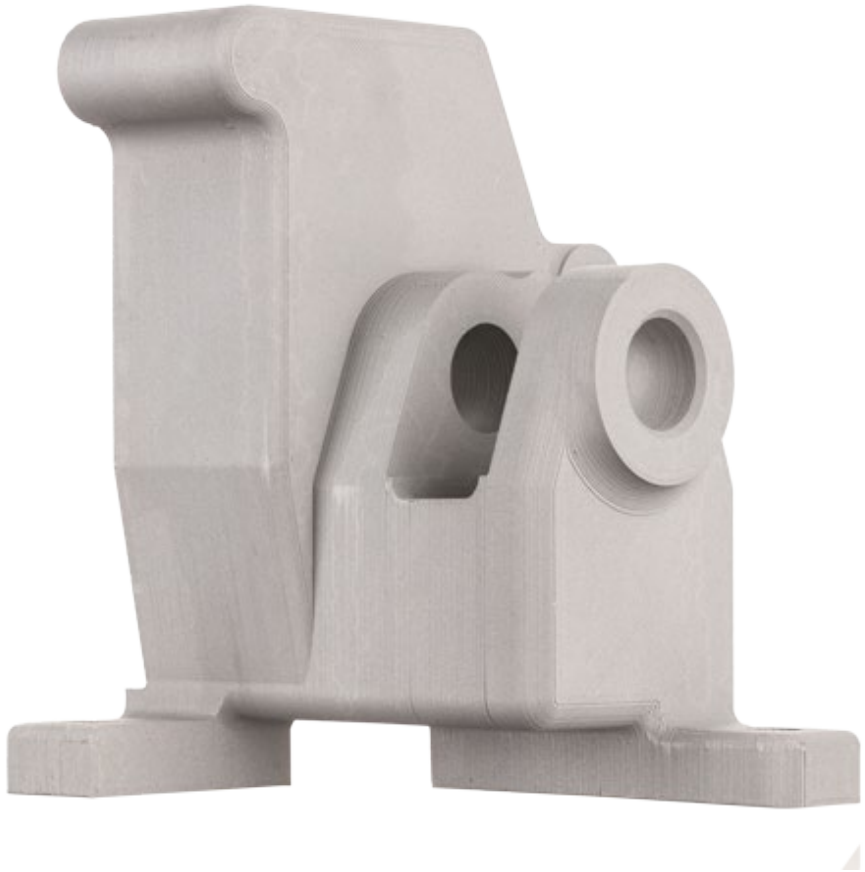
Material	Size
316L	48 x 48 x 63 mm

DM Cost	Traditional Cost	Savings
$57.91	$628*	91%

*Economy price from Xometry

Part Name

Housing



Brief Description

This housing is used to integrate multiple internal moving components.

Why Studio System

This part at one time was cast in high quantities but the manufacturing lines no longer operate. Metal 3DP allows for this housing to be produced with no tooling, on demand, allowing for replacement of legacy parts, like this, to happen in a few days rather than a few months.

Material	Size
4140	133 x 120 x 145 mm

DM Cost	Traditional Cost	Savings
$1,006.56	$2,478.44*	59%

*Economy price from Xometry

Desktop Metal™ Studio System™

Machine Design

Part Name

Lathe Gear

Brief Description

This part is a replacement gear for vintage (circa 1940) lathe.

Why Studio System

In some cases, replacement parts are no longer available, either off the shelf or from the OEM. Fabricating custom gears via hobbing and broaching is often prohibitively expensive, but metal 3D printing allows for the fabrication of legacy parts at much lower cost.

Material	Size
17-4 PH	64 x 64 x 19 mm

DM Cost	Traditional Cost	Savings
$52	$260.67*	80%

*Economy price from Xometry

Part Name

Mounting Flange

Brief Description

This part is the front flange of a worm gear speed reducer, allowing for the connection of different sized motors.

Why Studio System

When it goes into mass production, this flange will be cast, followed by multiple machining operations.

Using the Studio System, this part can be quickly prototyped and iterated on without casting, greatly reducing the part cost and fabrication lead time.

Material	Size
4140	144 x 144 x 43 mm

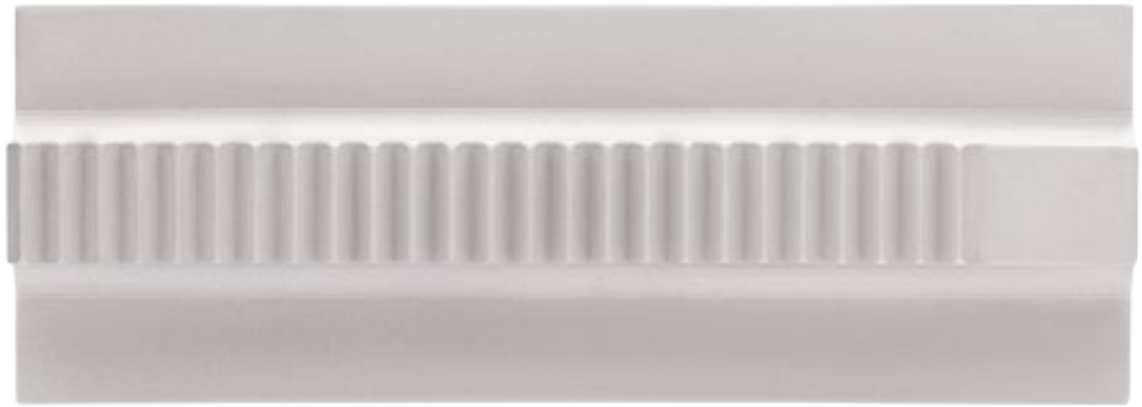
DM Cost	Traditional Cost	Savings
$427.49	$1015*	58%

*Economy price from Xometry

Desktop Metal™ Studio System™

Part Name

Rack



Brief Description

This component is used in a linear actuator with a timing gear to repeatedly push a component.

Why Studio System

Because only a few of these parts needed to be produced for a select number of machines, 3D printing was a perfect option. Machining the part would require multiple setups and a long lead time due to complex features like gear teeth and a deep center channel.

Material	Size
17-4 PH	138 x 50 x 19 mm

DM Cost	Traditional Cost	Savings
$154.54	$395*	61%

*Economy price from Xometry

Part Name

Roller Screw

Brief Description

This part is a roller screw for use in a linear actuator.

Why Studio System

This part was traditionally made by cutting the threads on a lathe, then welding two gears either end of the part.

By printing this part on the Studio System the assembly can be consolidated into 1 part and be produced quicker and more affordably than traditional machining.

Material	Size
17-4 PH	28 x 28 x 88 mm

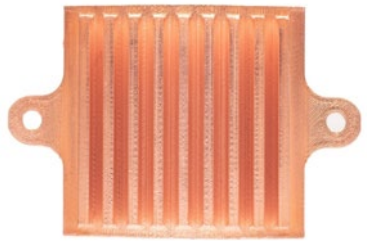
DM Cost	Traditional Cost	Savings
$40.91	$210*	81%

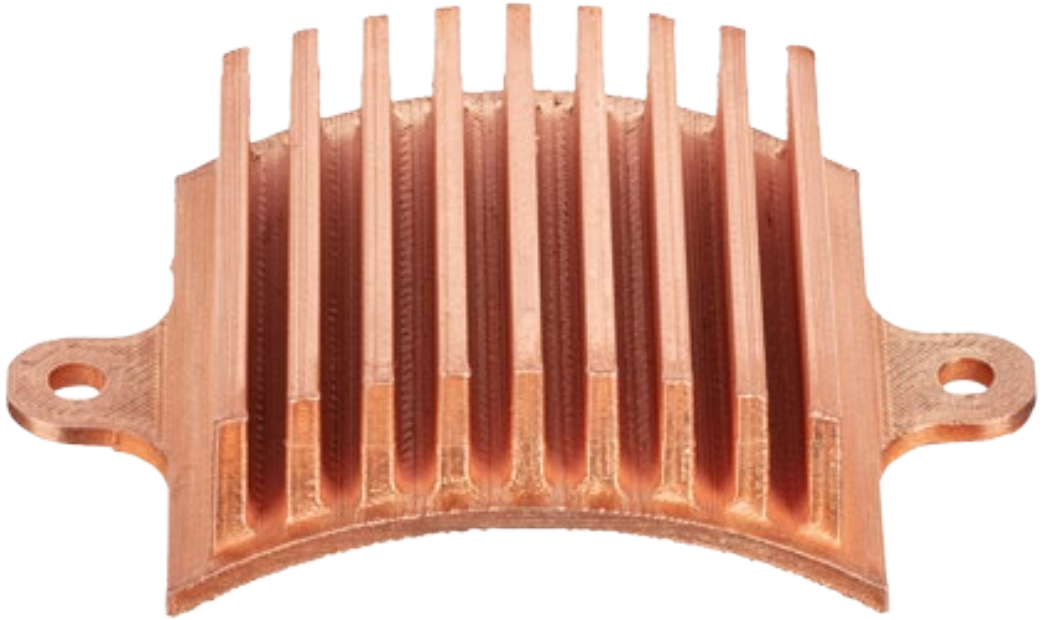
*Economy price from Xometry

Desktop Metal™ Studio System™

Part Name

Heat Exchanger





Brief Description

This heat exchanger is designed to help dissipate heat from an electric motor.

Why Studio System

This part attaches to an electric motor to help dissipate heat while the motor operates.

The Studio System allows for the heat exchanger to perfectly conform to motor shape, allowing heat to more efficiently move into the heat exchanger. Machining the tall, thin fins is challenging due to chattering as the fins are cut - printing allows for their manufacturing with ease.

Material	Size
Cu	79 x 50 x 20 mm

DM Cost	Traditional Cost	Savings
$96.81	$1993.27*	92%

*Economy price from Xometry

Part Name

Bus Bar

Brief Description

This bus bar holds workpieces in place during machining lathe operations.

Why Studio System

This bus bar design features complex cooling channels running throughout its core - requiring a multi-part assembly if manufactured via traditional methods.

Printing in copper on the Studio System allows this bus bar to easily be made as a single component in just a few days. The part is printed as a single component and features internal cooling channels to keep the bus bar cool as power flows through it.

Material	Size
Cu	153 x 56 x 33 mm

DM Cost	Traditional Cost	Savings
$217.58	$1994* w/o cooling channel	89%

*Economy price from Xometry

Desktop Metal™ Studio System™

Part Name

Herringbone Gears

Brief Description

Herringbone gears are advantageous for their smooth power transfer and self aligning nature.

Why Studio System

The complex nature of herringbone gear teeth make them very difficult to manufacture in low volumes. By printing on the Studio System, custom gear sizes and geometries can be produced in just days.

Material	Size
4140	39 x 39 x 25 mm

DM Cost	Traditional Cost	Savings
$40.67	$153.43*	73%

*Economy price from Xometry

Desktop Metal™ Studio System™

Part Name

Propeller Pinion

EWOL PROPELLER EVOLUTION

Desktop Metal™ Studio System™

Brief Description

This part connects a propeller shaft to the blades

Why Studio System

This part is traditionally made via investment casting with lots of constraints around the minimum lot size. It also has a very long lead time and challenging post machining required after casting,

Printing with the Studio System allowed EWOL to be more responsive to customer demands with a faster manufacturing process with reduced health hazards. Ultimately Less demanding in terms of logistics (no lot size constraints) with lower part cost, improved part quality and less labor-intensive process.

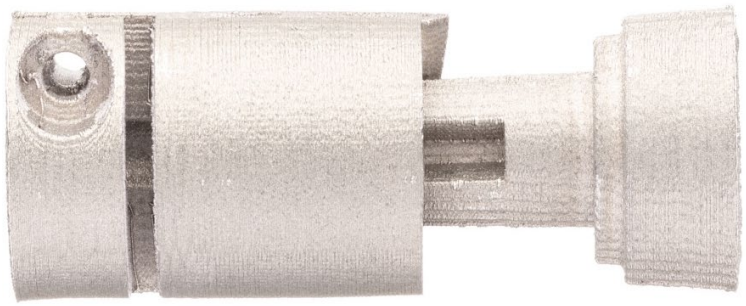
Material	Size
17-4 PH	56 x 55 x 106 mm

DM Cost	Traditional Cost	Savings
$147	$1,468*	90%

*Economy price from Xometry

Part Name

Custom Coupling



Brief Description

This is a custom coupling used for power transfer between two rotating components.

Why Studio System

This part features small intricate details that, while difficult to machine, are easy to print.

By printing these parts, the designer was able to print multiple different prototypes on one print bed. This allowed them to functionally test multiple designs in one week, leading to a better geometry selected to mass produce. The greatly accelerated lead time and low cost per part available on the studio system allowed for this rapid functional prototyping to occur.

Material

4140

Size

A. 21 x 19 x 33 mm
B. 20 x 20 x 30 mm

DM Cost

A. $13
B. $16

Traditional Cost

A. $313
B. $251

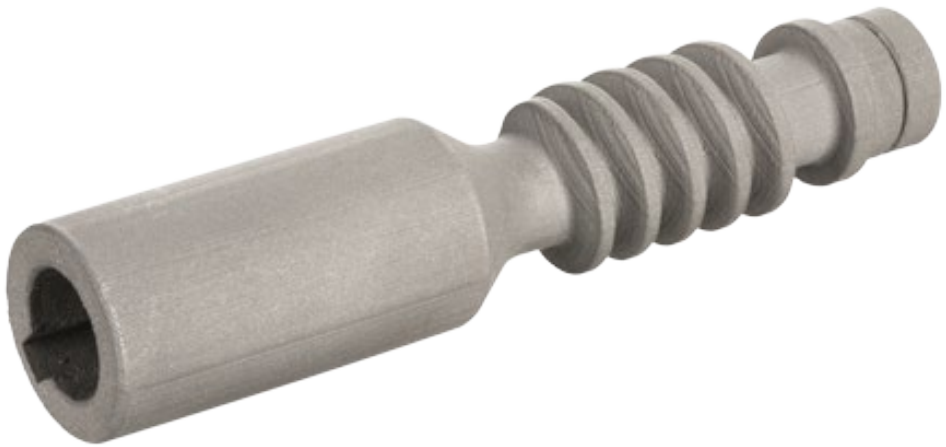
Savings

A. 96%
B. 94%

*Economy price from Xometry

Part Name

Worm Gear Shaft



Brief Description

This meshes with a custom worm gear — determining rotational speed and enabling high torque transmission.

Why Studio System

A common component in gear drives, worms gear drives are used when space is limited, to transfer power or increase rotation speeds.

Metal 3DP eliminates complex and time-consuming machining operations required when iterating on worm gear shaft designs.

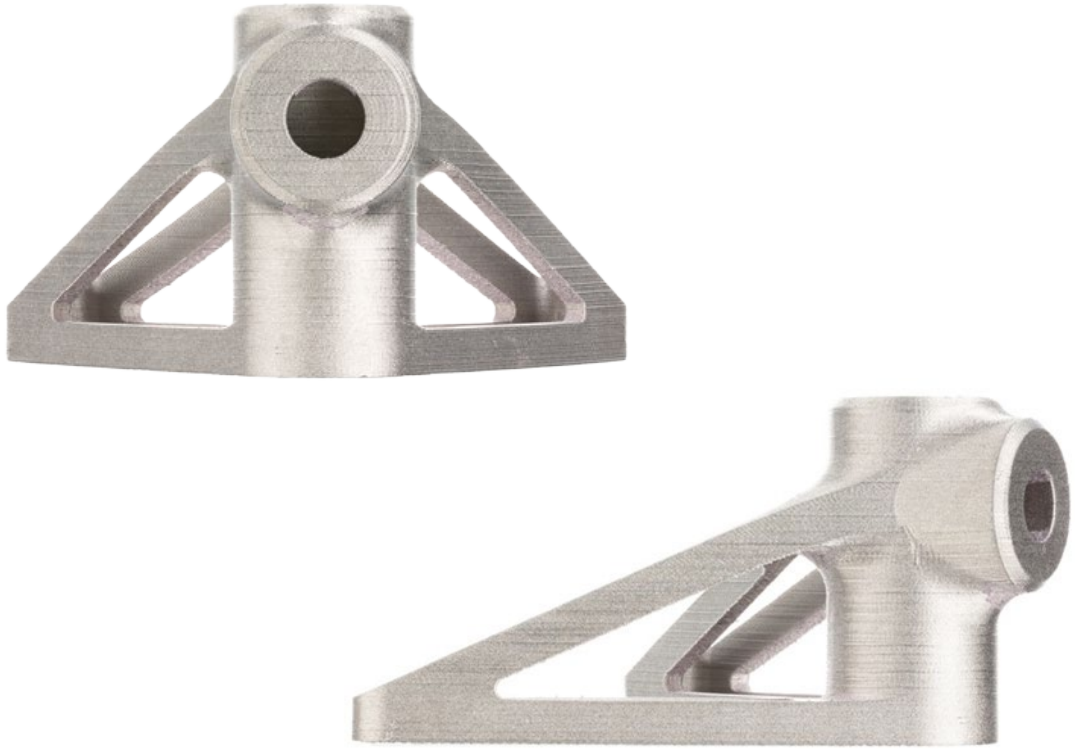
Material	Size
4140	118 x 25 x 25 mm

DM Cost	Traditional Cost	Savings
$86.00	$391.13*	78%

*Economy price from Xometry

Part Name

Battlebots Support



Brief Description

This part is a structural member for use in the robotic arm of a Battlebot.

Why Studio System

Engineers working on a Battle Bot used on a Discovery Channel program had less than a month to produce a custom structural element on robotic arm. Using the Studio system, they were able to print a bracket capable of resisting bending and lateral motion while providing the stiffness, strength, weldability and fire resistance required.

Material	Size
17-4 PH	16 x 96 x 51 mm

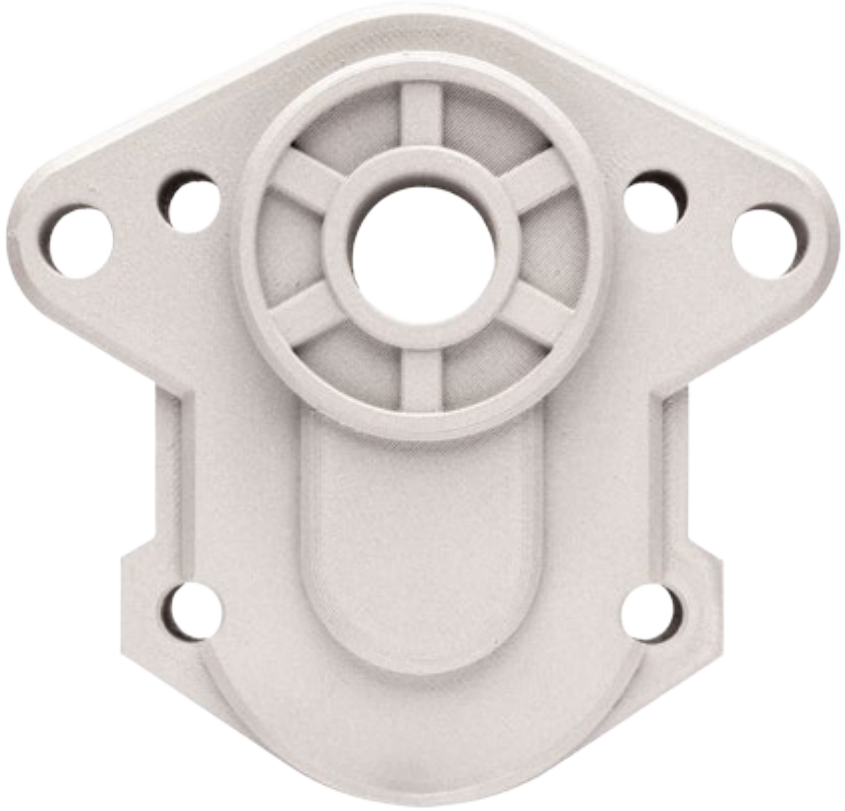
DM Cost	Traditional Cost	Savings
$106.99	$551.90*	81%

*Economy price from Xometry

Desktop Metal™ Studio System™

Part Name

Pump Housing



Brief Description

This is part of the housing for a hydraulic pump.

Why Studio System

This part would normally be cast, followed by secondary machining operations.

By printing on the Studio System, the long lead time associated with casting can be avoided, allowing the manufacturer to produce the part in-house, enabling rapid design iteration and pilot runs.

Material	Size
17-4 PH	109 x 105 x 25 mm

DM Cost	Traditional Cost	Savings
$228.52	$708*	68%

*Economy price from Xometry

Desktop Metal™ Studio System™

Manufacturing Tooling

Part Name

Zipper Mold

REY®

Brief Description

This part is an Injection mold insert for manufacturing zinc zippers.

Why Studio System

3D printing the mold inserts shortens production run lead time and allows rapid iteration and refinement of zipper designs. Using a high resolution printhead allows for smaller parts with finer features, requiring less post processing.

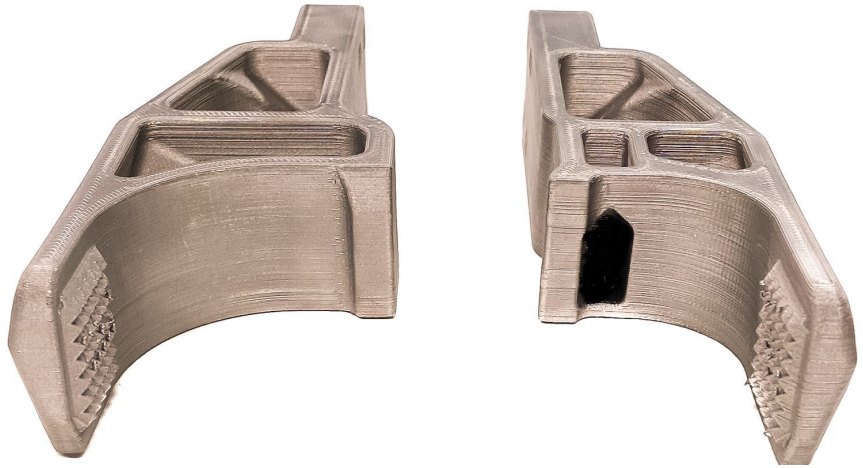
Material	Size
H13	35 x 18 x 12 mm

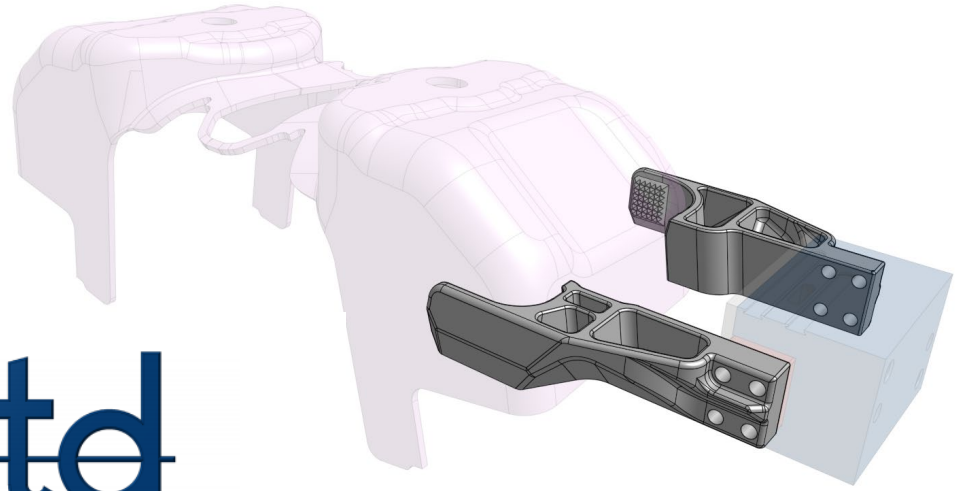
DM Cost	Traditional Cost	Savings
$22	n/a	n/a

Desktop Metal™ Studio System™

Part Name

Transfer Arm Tooling





etd
EGAR TOOL & DIE LTD.

Brief Description

These end of arm tools are used to orient sheet metal pieces so a variety of pressing operations can be performed.

Why Studio System

Since these parts need to perform the same operations tens of thousands of times, it is imperative that transfer arm tooling be both durable and lightweight.

Misfires or delays in the movement of the press can result in impacts, which end-of-arm tooling must survive with minimal damage. Weight reductions, meanwhile, reduce wear and tear on the servos, motors and other components driving the press, and allow the press to move faster - since the arm can move faster - increasing the rate of production.

Printing this part on the Desktop Metal Studio system allowed for a greatly light weighted design, a reduced part cost, and a reduced manufacturing lead time.

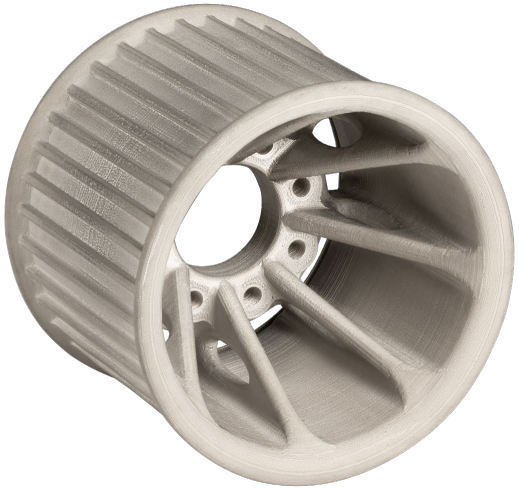
Material	Size
17-4 PH	145 x 47 x 33 mm

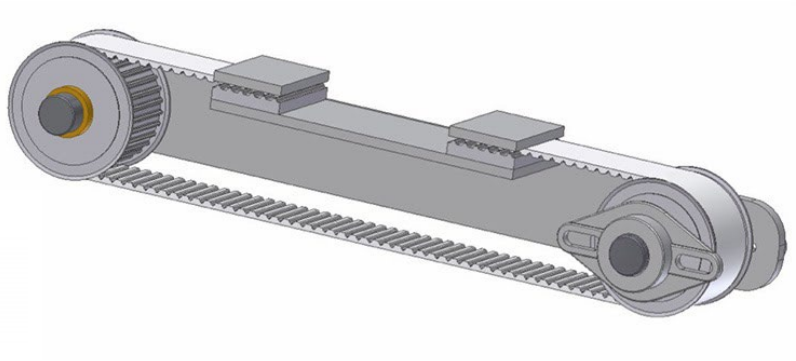
DM Cost	Traditional Cost	Savings
$113/set	$216/set	48%

Desktop Metal™ Studio System™

Part Name

Timing Belt Pulley





EGAR TOOL & DIE LTD.

Brief Description

This timing belt pulley attaches to a servo motor to move a belt for linear actuation, and is a key part of the manufacturing environment at Egar Tool and Die.

Why Studio System

The original design of this part was based on an assembly built from an aluminum extrusion, two screwed-on end plates and a clamp collar. The extruded part also requires extensive machining after extrusion.

By redesigning the part for printing, Egar engineers were able to consolidate the entire assembly into just one piece. This also significantly reduced the weight of the part, allowing the servo motors to run faster, leading to an improved manufacturing environment.

Material	Size
17-4 PH	118 x 118 x 96 mm

DM Cost	Traditional Cost	Savings
$423	$1,054	50%

Desktop Metal™ Studio System™

Part Name

Electrode Holder

EGAR TOOL & DIE LTD.

Desktop Metal Studio System

Brief Description

This part is used for holding electrodes during resistive nut welding, this part also features conformal cooling channels to better regulate part temperature.

Why Studio System

Electrodes are a consumable and need to be replaced quickly and affordably when they wear out to keep the manufacture line up and running. Printing allows for rapid fabrication of copper components like this electrode holder with excellent electrical conductivity properties.

By adding conformal cooling channels the temperature of the electrode can be regulated (brought back down) more quickly. This, in turn, produces a better weld while reducing the rate at which the electrode wears out. These conformal cooling channels can only be created via additive manufacturing.

Copper was essential to be used for its excellent electrical conductivity properties.

Material	Size
CU	50 x 79 x 88 mm

DM Cost	Traditional Cost	Savings
$440	NA	NA

Part Name

Air Manifold

EGAR TOOL & DIE LTD.

Desktop Metal™ Studio System™

Brief Description

Some end of arm tooling requires pneumatic or hydraulic actuators to open and close grippers.

Why Studio System

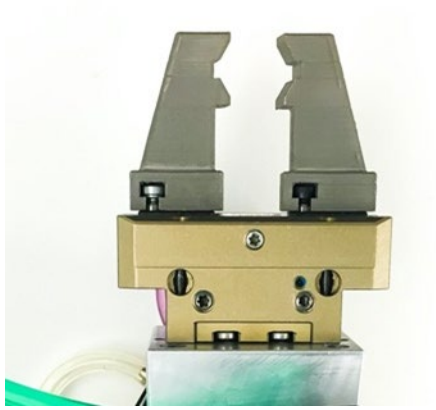
Using additive manufacturing's ability to print complex internal channels, Egar was able to consolidate a complex multiple part pneumatic system into a single air manifold. In addition to considerable cost savings, the Studio System™ allowed Egar engineers to shrink the size of this manifold - a CNC part would need to be significantly larger, which could potentially interfere with other machinery. Printing this part from steel also provides the strength needed to withstand the high pressures used.

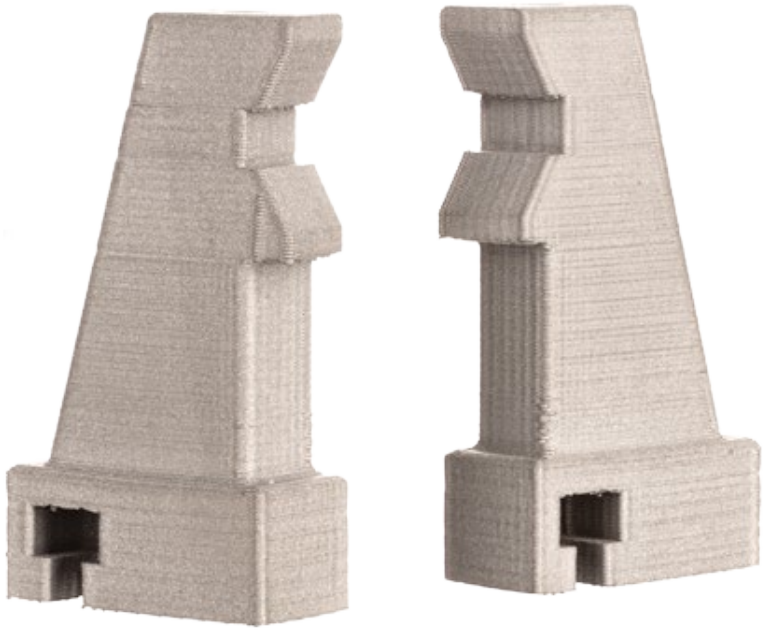
Material	Size
17-4 PH	80 x 74 x 34 mm

DM Cost	Traditional Cost	Savings
$76	300	NA

Part Name

UMC End Effector





Brief Description

These grippers are used to fixture and move aerospace forgings on a manufacturing line.

Why Studio System

The complex geometry of end effectors requires extensive CNC machining, resulting in long lead times that occupy valuable CNC capacity. Using metal 3DP allows for on-demand manufacturing while lowering part cost and lead time.

Material

17-4 PH

Size

41 x 24 x 10 mm

DM Cost

$15

Traditional Cost

$194*

Savings

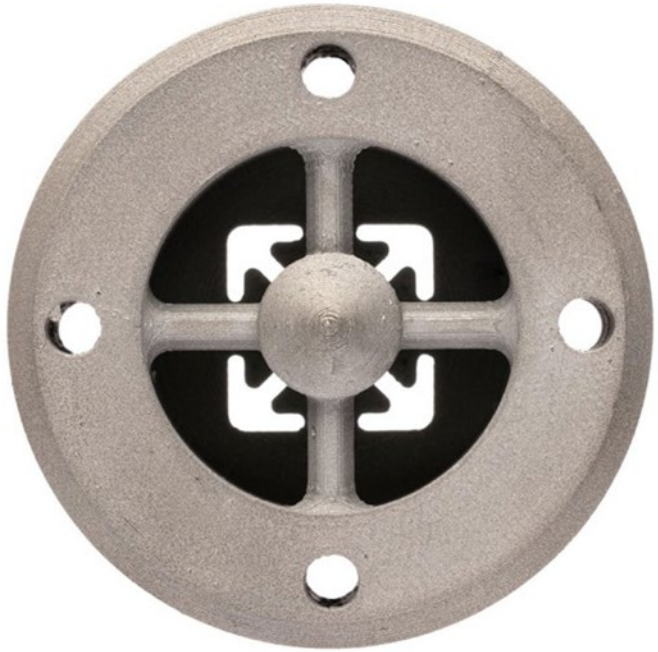
92%

*Economy price from Xometry

Desktop Metal Studio System

Part Name

Extrusion Die



Brief Description

This die is used in the manufacture of extruded plastic framing.

Why Studio System

Metal 3D printing reduces lead times and costs - allowing for rapid iteration and refinement of the die design. Furthermore, lower tooling costs and lead times makes low volume custom extrusion dies economically feasible.

Material	Size
H13	57 x 57 x 44 mm

DM Cost	Traditional Cost	Savings
$143	$329.67*	57%

*Economy price from Xometry

Part Name

APG Coining Fixture

Alpha Precision Group

Desktop Metal™ Studio System™

Brief Description

This fixture is used to achieve critical tolerances on metal injection molded (MIM) parts.

Why Studio System

The faster these parts are manufactured, the quicker a company can get get manufacturing lines running.

Printing these parts with the Studio System eliminates CNC lead time and frees up the machine shop for more critical work.

Material	Size
H13	89 x 44 x 22 mm

DM Cost	Traditional Cost	Savings
$83.77	$1487.45*	94%

*Economy price from Xometry

Part Name

APG Thread Checker Fixture

Brief Description

This fixture pushes a thread checker into a part on a manufacturing line..

Why Studio System

As a wear item, this fixture needs to stand up to repeated use, must be easily produced to keep the manufacturing line up, and must be regularly replaced as it wears out. Printing the part with the Studio System eliminates CNC lead time and frees up the machine shop for more critical work.

Material	Size
4140	35 x 19 x 9 mm

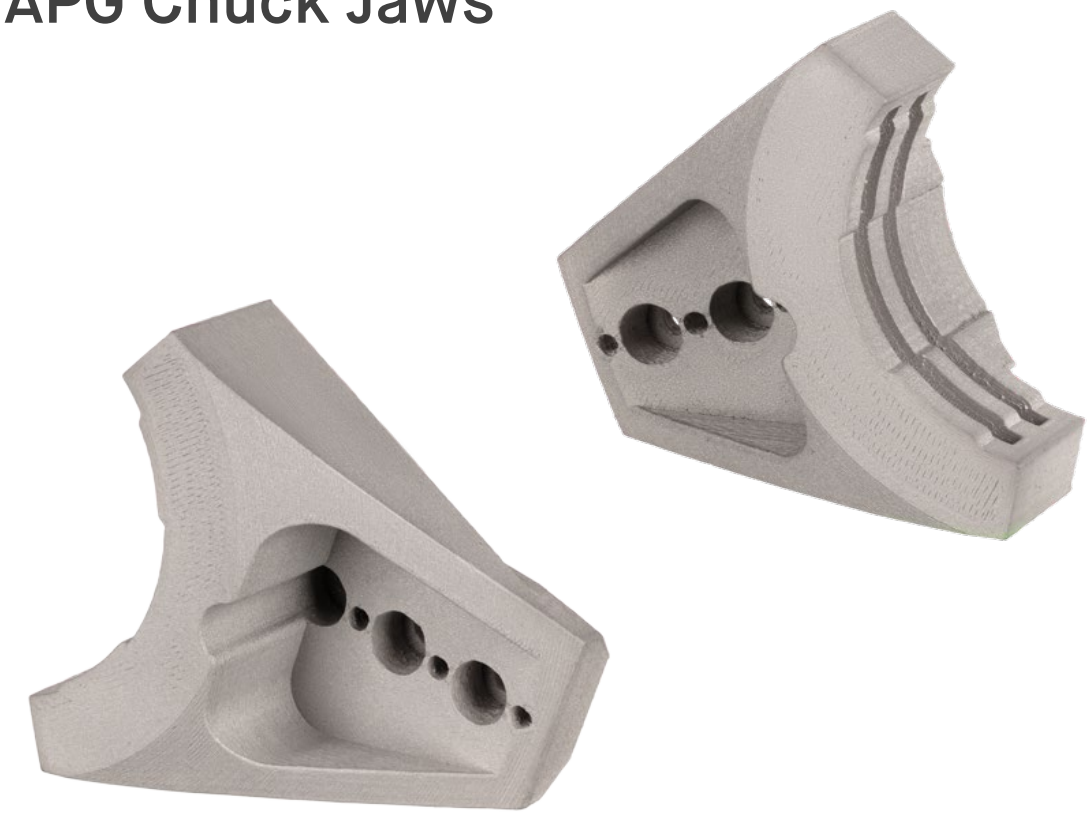
DM Cost	Traditional Cost	Savings
$11.75	n/a	n/a

APG
Alpha Precision Group

Desktop Metal™ Studio System™

Part Name

APG Chuck Jaws



Alpha Precision Group

Desktop Metal™ Studio System™

Brief Description

This part is used to hold a workpiece in place during machining lathe operations.

Why Studio System

This chuck jaws feature complex geometry to closely match the geometry of the part being machined - printing them using the Studio System eliminates CNC lead time and frees up the machine shop for more critical work.

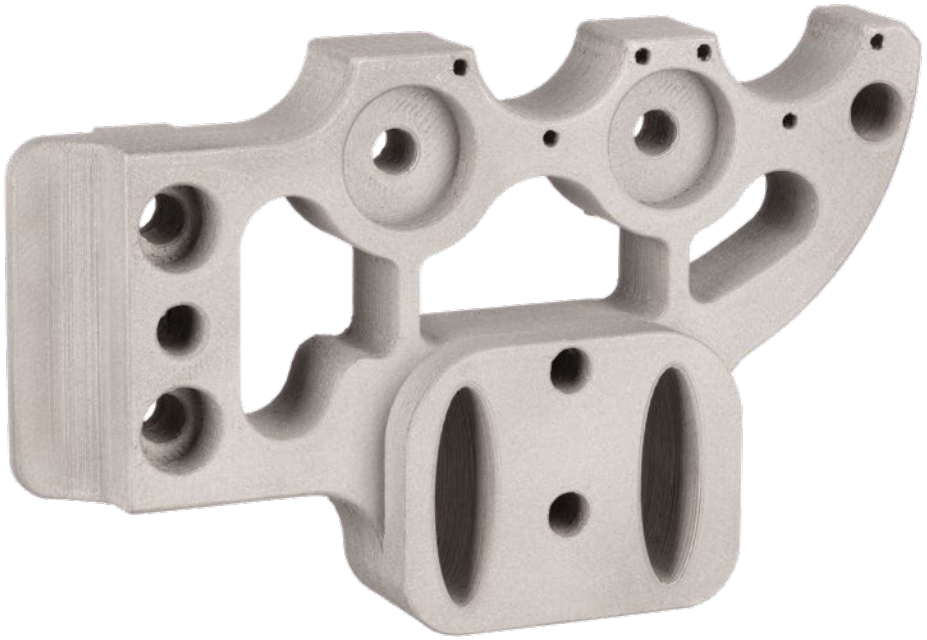
Material	Size
H13	61 x 67 x 32 mm

DM Cost	Traditional Cost	Savings
$107.59	$426.36*	75%

*Economy price from xometry

Part Name

APG Cam Shaft End Effector



Alpha Precision Group

Desktop Metal™ Studio System™

Brief Description

This end effector holds a camshaft during an induction heat treatment process.

Why Studio System

This end effector holds a camshaft as an induction heat treatment process is done to it. The original part was machined out of A2 steel, this part was too heavy for the robotic arm and was causing significant wear on the motors.

By printing the part APG was able to significantly reduce the part weight taking load off the robot arm. They also were able to reduce the manufacturing lead time and part cost.

Material	Size
17-4 PH	120 x 73 x 24 mm

DM Cost	Traditional Cost	Savings
$119	$909*	87%

*Economy price from xometry

Part Name

Assembly Line Screw Driver Tool

Alpha Precision Group

Desktop Metal™ Studio System™

Brief Description

This ratcheting screw driving tool is used for screwing powder metal parts into machining fixtures so critical dimensions can be machined.

Why Studio System

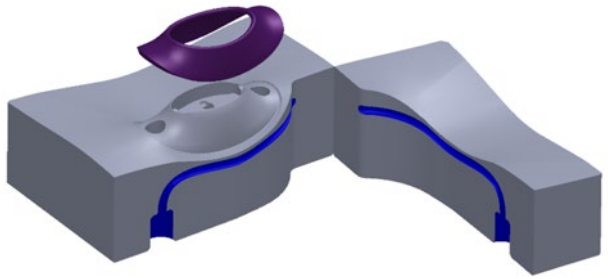
This assembly features many different printed parts all assembled in combination with off the shelf components like fasteners and springs. This complex design was created specifically to be printed, this allowed the design to be much more organic than what could be justified if the part were to have been machined. This meant a higher performance assembly, that was significantly lighter than the machining alternative.

Printing this part provided huge cost savings for APG versus machining of the components. Once completed it also allowed for higher throughput on their mills because now the operator does not need to manually screw the parts in and out of the fixture.

*Economy price from xometry

Part Name

Mouthpiece Mold



Brief Description

The mold insert is used to injection mold medical inhaler mouthpieces.

Why Studio System

3D printing the hard steel insert to near-net shape eliminates 95% of the required CNC machining and associated tool wear.

Because cooling accounts for 95% of the mold cycle time, the ability to incorporate conformal cooling channels into the mold can reduce mold cycle time and increase throughput.

Material	Size
H13	86 x 76 x 38 mm

DM Cost	Traditional Cost	Savings
$351.54	$716.77*	51.87%

*Economy price from Xometry

Desktop Metal™ Studio System™

Part Name

Flower Nozzle

Brief Description

This flower nozzle is used to atomize fluid in industrial equipment.

Why Studio System

Due to its complex geometry, these parts would typically be cast followed by extensive secondary machining.

With the Studio System, the nozzle can be 3D printed without the lead times and setup costs of casting, enabling one-off and small batch orders.

Material	Size
316L	100 x 100 x 34 mm

DM Cost	Traditional Cost	Savings
$199.47	n/a	n/a

Part Name

O-Ring End Effector

Brief Description

This end effector is used to stretch and install O-rings on a hydraulic fitting.

Why Studio System

Small, detailed parts like these end effectors typically require expensive CNC machining and have long lead times. Using the Studio System's high resolution (250μm) printhead allows manufacturers to print small parts with fine features which would be difficult to machine

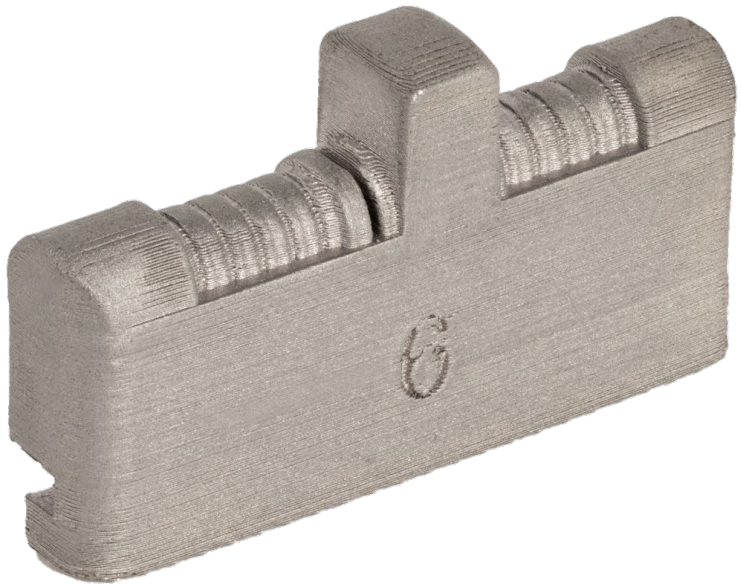
Material	Size
17-4 PH	30 x 10 x 7 mm

DM Cost	Traditional Cost	Savings
$6	$152*	96%

*Economy price from Xometry

Part Name

Cable Glands Mold Insert



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Desktop Metal Studio System

Brief Description

This an injection mold inserts for a cable gland. A cable gland used to secure the end of an electrical cable to equipment.

Why Studio System

Different mold inserts is required for each different size cable. Each insert requires a slightly different design, this would mean different machining fixtures for each mold insert. By printing the inserts, the normal machining fixturing is not required.

Molds were printed in H13 tool steel, which is a very difficult metal to machine, leading to slow feed rates and high tool wear. By printing the mold inserts, only critical dimensions need to be machined after sintering. This grealt accelerated the manufacturing lead time and freed up multiple CNC's in the tool shop (Post machining time per part was less than 1 hr.)

Material	Size
H13	44 x 26 x 9 mm

DM Cost	Traditional Cost	Savings
$20	$331*	94%

*Economy price from Xometry

Part Name

Gear Tooth Chamfer Chuck Jaw

EATON

Desktop Metal™ Studio System™

Brief Description

This is a pneumatic jaw for a gear tooth chamfering machining operation.

Why Studio System

This part features topology optimization to reduce the part weight, material usage, and processing time. Traditionally this part was purchased from an external supplier but by printing the part it was able to be produced for 79% lower cost while also reducing manufacturing lead time.

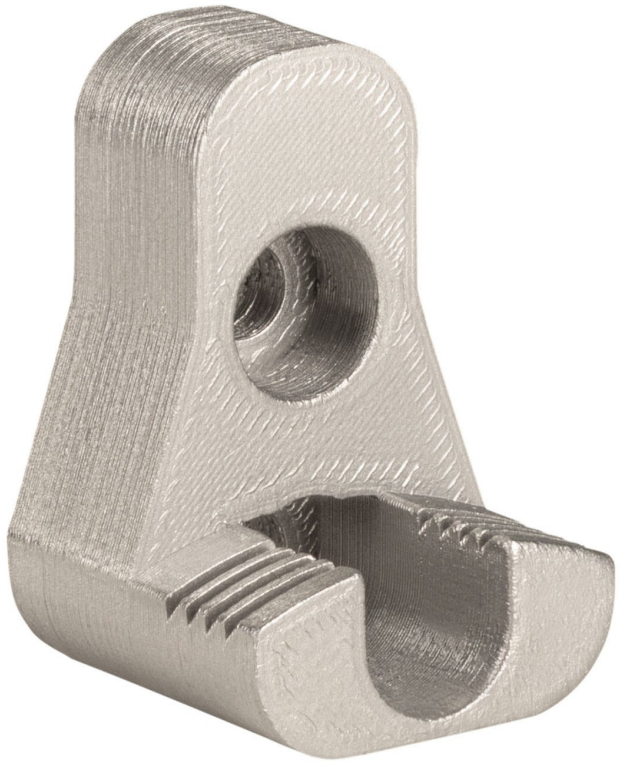
Since the part was produced in house the logistics of inventorying the part were greatly simplified, leading to lower costs and less employee burden.

Material	Size
17-4 PH	70 x 32 x 83 mm

DM Cost	Traditional Cost	Savings
$67	NA	79%

Part Name

Robot gripper



Brief Description

This gripper is used to automatically load a hobber machine so it can perform a gear chamfering operation.

Why Studio System

The part was originally machined followed by a heat treatment process. By printing the part on the Studio System Eaton was able to lower the cost by 90% compared to buying the component from an external vendor. Since this is a tooling component that is essential for keeping their manufacturing environment operating efficiently, being able to produce the part with an accelerated manufacturing lead time was very important to Eaton. Printing the part on demand, when and where it's needed, allows for lower tooling inventory costs and less employee burden caused by managing the warehousing and tracking of the parts.

Material	Size
17-4 PH	38 x 25 x 25 mm

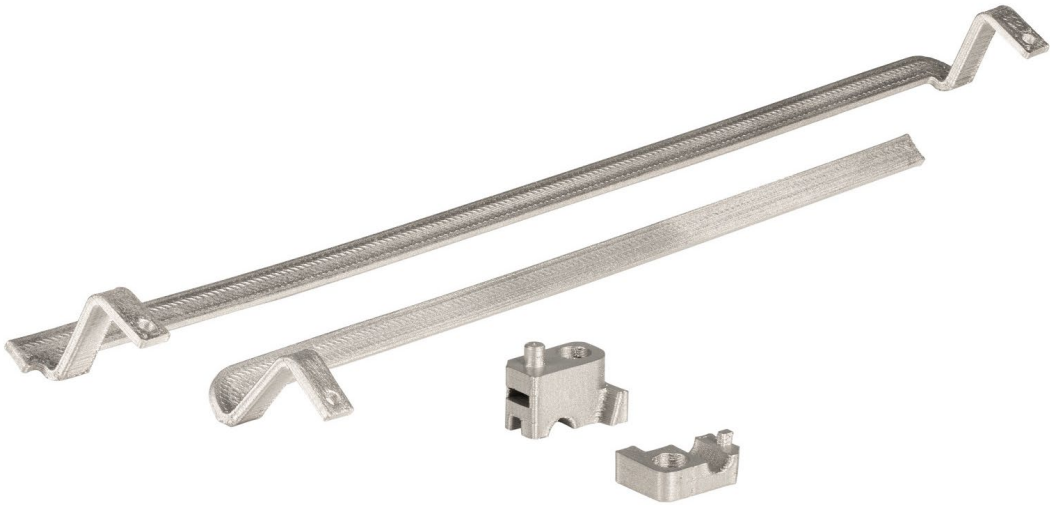
DM Cost	Traditional Cost	Savings
$19	$192*	90%

*Economy price from xometry

Desktop Metal™ Studio System™

Part Name

Product Testing Fixtures



Brief Description

Testing fixture device for product development prototypes

Why Studio System

- Lower cost to produce compared to buy from an external vendor done on traditional machining process
- Lower lead time to obtain the prototypes and get the test done (faster product development)
- ~90% cost savings compared to external vendors
- First prototype developed for our business using DM metal printing technology
- Prototypes done on 17-4 material due no availability on 4140 / H13 material driving lower prototype end of life

EATON

Desktop Metal™ Studio System™

Part Name

Furnace Chain Guide

Brief Description

Furnace loading / unloading conveyor component

Why Studio System

- Lower cost to produce compared to buy from an external vendor done on traditional machining process
- Lower lead time to obtain MRO components and get asset back into operation
- ~82% cost savings compared to external vendors
- Reverse engineering leveraging 3D scanner to build model as drawing was not available

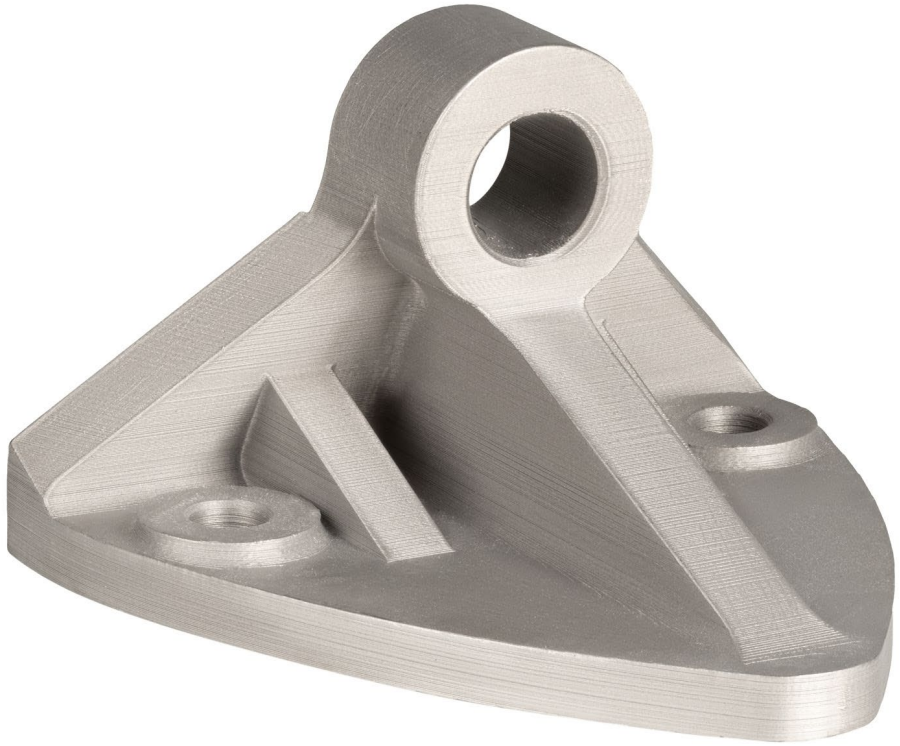
Material	Size
17-4 PH	70 x 32 x 83 mm

DM Cost	Traditional Cost	Savings
$193	NA	82%

Desktop Metal™ Studio System™

Part Name

Furnace Door Bracket



Brief Description

Furnace door bracket to attach cylinder (used to open / close furnace door) to the furnace door

Why Studio System

•Lower cost to produce compared to buy from an external vendor done on traditional machining process
•Lower lead time to obtain MRO components and get asset back into operation
•~74% cost savings compared to external vendor
•Reverse engineering leveraging 3D scanner to build model as drawing was not available

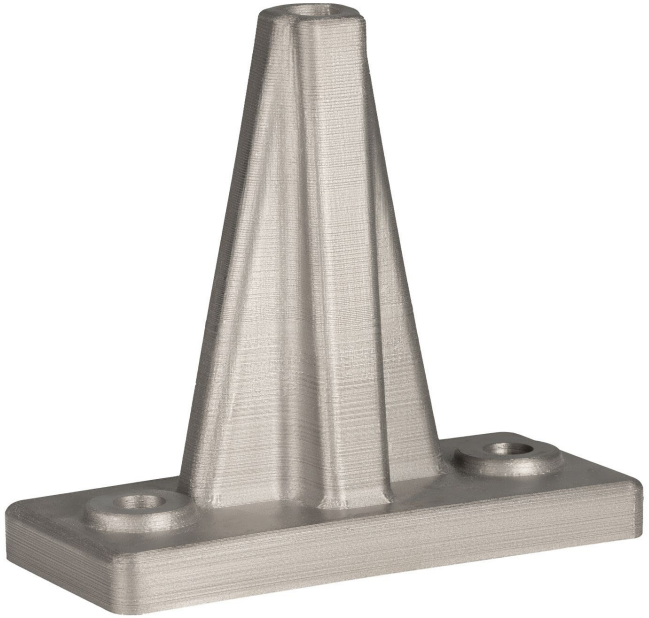
Material	Size
17-4 PH	121 x 118 x 79 mm

DM Cost	Traditional Cost	Savings
$329	NA	74%

Desktop Metal™ Studio System™

Part Name

Furnace Door Stop



Brief Description

Furnace door end stop

Why Studio System

•Lower cost to produce compared to buy from an external vendor done on traditional machining process
•Lower lead time to obtain MRO components and get asset back into operation
•~77% cost savings compared to external vendor
•Reverse engineering leveraging 3D scanner to build model as drawing was not available

Material	Size
17-4 PH	127 x 58 x 115 mm

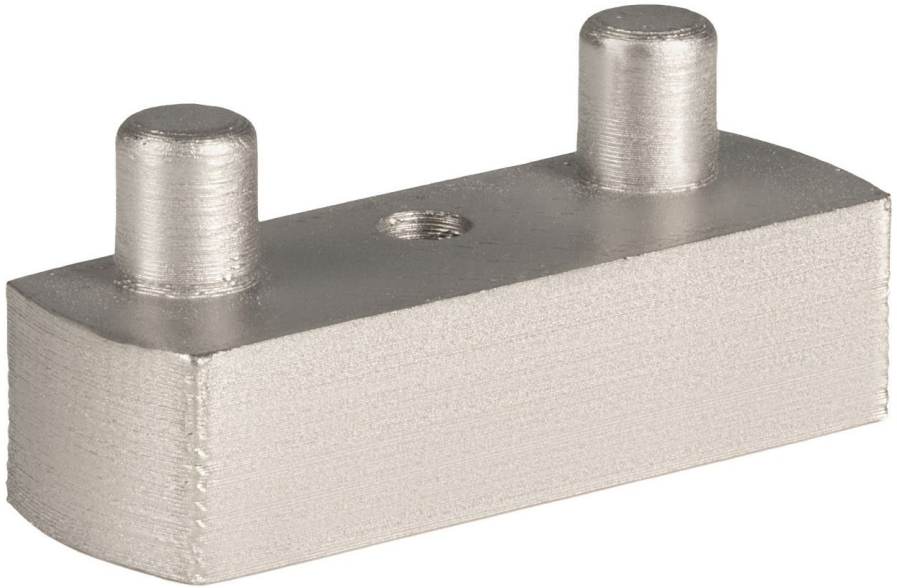
DM Cost	Traditional Cost	Savings
$201	NA	77%

EATON

Desktop Metal™ Studio System™

Part Name

Main Shaft Gear Robot Gripper Pads



Brief Description

Wear contact pads used on load / unload automation devices

Why Studio System

•Lower cost to produce compared to buy from an external vendor done on traditional machining process
•Lower lead time to obtain the tooling (faster problem solving / back to operation)
•~80% cost savings compared to external vendors
•Allow us a lower tooling inventory cost and people to manage it

Material	Size
17-4 PH	51 x 22 x 18 mm

DM Cost	Traditional Cost	Savings
$21	NA	80%

Desktop Metal Studio System

Part Name

Shaft Press Plate

Brief Description

Tool used to help with the press fitting of a shaft

Why Studio System

Lower cost to produce compared to buy from an external vendor done on traditional machining process
Lower lead time to obtain the tooling (faster problem solving / back to operation)
~81% cost savings compared to external vendors
•First tooling where we did printing plus post processing operation to reach the final tolerance required

Material	Size
17-4 PH	89 x 89 x 10 mm

DM Cost	Traditional Cost	Savings
$65	NA	81%

EATON

Desktop Metal™ Studio System™

Part Name

Gear Stamp

Brief Description

Part marking stamp used on gear manufacturing processes

Why Studio System

Lower cost to produce compared to buy from an external vendor done on traditional machining process
Lower lead time to obtain the tooling (faster problem solving / back to operation)
~85% cost savings compared to external vendors
Allow us a lower tooling inventory cost and people to manage it

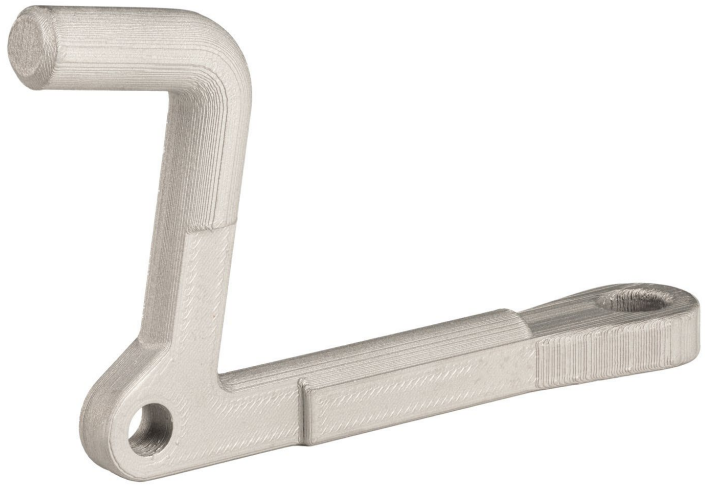
Material	Size
17-4 PH	16 x 16 x 31 mm

DM Cost	Traditional Cost	Savings
$10	NA	85%

Desktop Metal™ Studio System™

Part Name

Buss Box Safety Device



Brief Description

Engage buss box switch arm to turn buss box on and off

Why Studio System

Lower cost to produce compared to buy from an external vendor done on traditional machining process
Lower lead time to obtain MRO components and get asset back into operation
~95% cost savings compared to external vendors

Material	Size
17-4 PH	100 x 59 x 16 mm

DM Cost	Traditional Cost	Savings
$36	NA	95%

Desktop Metal Studio System

Part Name

Gear Lab Coupling Fixture

Brief Description

Fixture to allow parts to be measured at gear lab measurement machines

Why Studio System

Lower cost to produce compared to buy from an external vendor done on traditional machining process
Lower lead time to obtain the tooling (faster problem solving / back to operation)
~62% cost savings compared to external vendors
This was the first project mixing both metal and TPU printing material
First interaction done 100% in polymer didn't last long due to wear

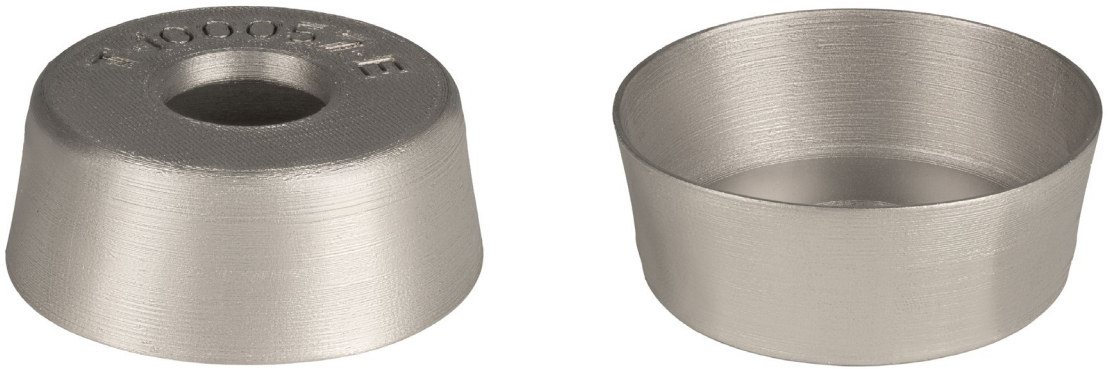
Material	Size
17-4 PH	61 x 51 x 57 mm

DM Cost	Traditional Cost	Savings
$110	NA	62%

Desktop Metal™ Studio System™

Part Name

Assembly Bearing Press Tool



Brief Description

Fixture to allow parts to be measured at gear lab measurement machines

Why Studio System

Lower cost to produce compared to buy from an external vendor done on traditional machining process
Lower lead time to obtain the tooling (faster problem solving / back to operation)
~84% cost savings compared to external vendors
First tooling tested on a critical functional assembly operation

Material	Size
17-4 PH	74 x 74 x 28 mm

DM Cost	Traditional Cost	Savings
$46	NA	84%

Desktop Metal Studio System

Part Name

Test Stand Oil Fill Nozzle

Brief Description

Assembly end of line tester component to faster fill oil to product during tester process

Why Studio System

Lower cost to produce compared to buy from an external vendor done on traditional machining process
Lower lead time to obtain the tooling (faster problem solving / back to operation)
~96% cost savings compared to external vendors due to complex and small quantity order
Internal complex geometry / features that are expensive to produce by standard machining processes

Material	Size
17-4 PH	113 x 70 x 10 mm

DM Cost	Traditional Cost	Savings
$36	NA	96%

Desktop Metal Studio System

Part Name

Sheet Metal Stamping Tools

Brief Description

This custom embosser is used in sheet metal fabrication.

Why Studio System

3D printing with the Studio System reduces tool fabrication costs, shortens production run lead time, and enables rapid iteration and refinement of the sheet metal designs and associated tooling.

Material	Size
H13	47 x 47 x 30 mm

DM Cost	Traditional Cost	Savings
$72.84	$128*	43%

*Economy price from Xometry

Desktop Metal™ Studio System™

Part Name

Sheet Metal Clamp

Brief Description

Clamp allows the sheets of metal to be moved along the workstation

Why Studio System

Four key benefits of metal 3D printing:

- Lighter: With infill alone, a 17% mass reduction (next will explore topology optimization for further mass reduction)
- Faster: >2X faster (7 days vs 2+ weeks)
- Cheaper: 36% lower cost (176€ vs 279€)
- Less Waste: Reduced material waste relative to CNC machining

Material	Size
17-4 PH	214 x 47 x 25 mm

DM Cost	Traditional Cost	Savings
$209	$332*	36%

*Economy price from Xometry

Desktop Metal™ Studio System™

Part Name

Spring Holder Hanger

Brief Description

Part of paneling machine, coupled with a gear through a spring to allow arm to rotate

Why Studio System

Four key benefits of metal 3D printing:

- **Stronger:** Freedom to modify design for increased strength
- **Faster:** In 4 days manufactured 6 samples, ready to be mounted in the machine, without any additional post-processing.
- **Cheaper:** 75% lower price (15€ vs 60€)
- **Less Waste:** Reduced material waste relative to CNC

Material	Size
17-4 PH	62 x 12 x 8 mm

DM Cost	Traditional Cost	Savings
$18	$71*	75%

*Economy price from Xometry

Desktop Metal™ Studio System™