



# MANUFACTURING REINVENTED



[www.konicaminolta.com.au](http://www.konicaminolta.com.au)

ABOUT

# MARKFORGED

Markforged was founded to change the way products are made. At the intersection of traditional manufacturing and cutting-edge material science, we believe in a future where going from your design to finished parts is easy, simple, safe and affordable. That's why we've created the world's only ecosystem of plastic, metal and composite 3D printers— so you can focus on building products that change the world.

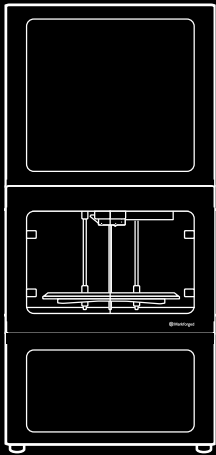


## COMPLETE METAL SOLUTION

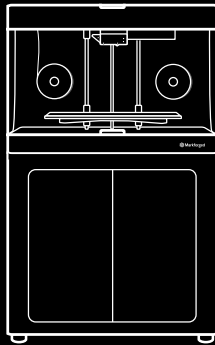
SINTER-1, METAL X, WASH-1

MARKFORGED

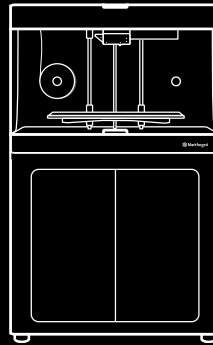
# PRODUCTS



**METAL X**  
Metal Printer



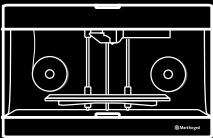
**X7**  
Industrial Precision



**X5**  
Industrial Composite

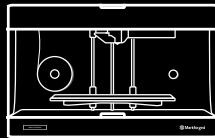


**X3**  
Industrial Onyx



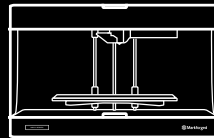
**MARK TWO**

Professional Composite



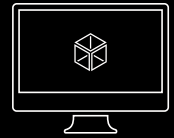
**ONYX PRO**

Onyx Composite



**ONYX ONE**

Onyx Desktop



**EIGER**

Markforged Software

HARDWARE

# BUILD QUALITY

Featuring an all-aluminum unibody and kinematic bed coupling,

Markforged sets the standard in build quality and industrial design. With a fully enclosed build chamber, ultra-quiet motion system and humidity controlled material storage, our printers are equally at home whether in the office or on the factory floor.

**INDUSTRIAL SERIES**

Industrial Precision



HARDWARE

# USABILITY

Cloud-connected software and a 4.3" touchscreen comes standard with every printer, washer and furnace. Regular over-the-air updates mean that your Markforged products keep getting better. Material usage tracking and out-of-material detection help monitor your printers and reduce waste. Just a few of the ways we're working to reduce the distance from design to part.





SOFTWARE

# EIGER

With automatic version control, real-time fleet management and cloud-based collaboration, Eiger is the world's most advanced 3D printing software. Designed from the ground up to make manufacturing simpler, Eiger enables you to print plastic, metal and composite parts straight from your browser. Our internet-connected architecture ensures the latest features and performance enhancements are always available.



SOFTWARE

# OPTIMIZATION

Our cloud software platform gives you an incredibly high degree of control over the final properties of your finished part. By automatically analyzing your parts we enable you to optimize for strength, weight and print time without changing your design.

# Jaw - Large Coupling

Abraham Parangi



Get Support

Visibility

2D

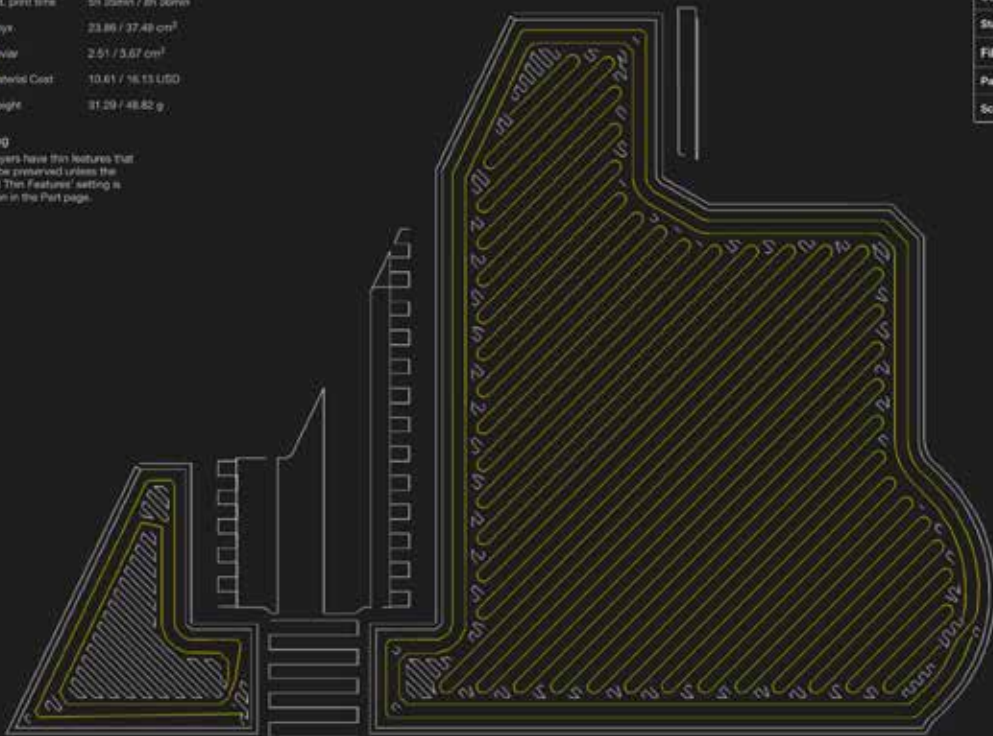
3D

## Part Stats (up to layer 232)

Est. print time	5h 25min / 8h 36min
Chyx	23.86 / 37.48 cm <sup>3</sup>
Kevlar	2.51 / 3.67 cm <sup>3</sup>
Material Cost	10.61 / 16.13 USD
Weight	31.29 / 48.82 g

## Warning

Some layers have thin features that will not be preserved unless the 'Expand Thin Features' setting is turned on in the Part page.



Editing Layer: 232 / 350

Use Fiber	<input checked="" type="checkbox"/>
Fiber Fill Type	Isotropic Fiber
Concentric Fiber Rings	2
Start Rotation Percent	42
Fiber Angle	135
Pause After Layer	<input type="checkbox"/>
Scan After Layer	<input type="checkbox"/>

Revert

Save

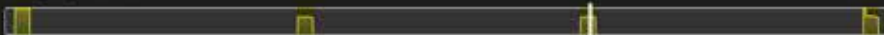
Part View

Print

Editing Layer: 232 / 350

23.2mm

Materials



TECHNOLOGY

# CFF

## *Continuous Filament Fabrication*



**DESIGN**

Shape your part in your favorite CAD package, upload the STL file and select from composite materials such as Carbon Fiber, Fiberglass or Kevlar.



**REINFORCE**

Our cloud-based printing software automatically paths the composite fibers throughout the plastic matrix for optimum strength. Customize reinforcement to meet your design requirements.

Formed from the combination of two materials, composite parts are incredibly strong and versatile. Our unique fabrication process enables you to print parts that are an order of magnitude stiffer and stronger than typical 3D printed objects.



**PRINT**

The dual material system crafts the composite part one layer at a time. The first nozzle builds the plastic matrix and the second winds the fiber throughout.



**FINAL PART**

As strong as aircraft grade aluminum and over 40% lighter, Markforged CFF parts are more than capable of replacing machined metal tools, fixtures and prototypes.

TECHNOLOGY

# ADAM

## *Atomic Diffusion Additive Manufacturing*



**DESIGN**

The ADAM process gives you unparalleled design flexibility. Shape your part in your favorite CAD package, upload the STL file, and select from a wide range of metal materials.



**PRINT**

Metal powder bound in plastic is printed layer at a time into the shape of your part. Parts are scaled up to compensate for shrinkage during the sintering process.



Atomic Diffusion Additive Manufacturing lives at the intersection of 3D printing and metal injection molding. Building on years of experience printing plastic loaded with carbon fiber, ADAM is an all new way to create metal parts.



**SINTER**

After washing to remove binding material, parts are then sintered in a furnace at around 85% of their melting temperature, and the metal powder fuses into solid metal.



**PART**

Complex geometries and captive infills make for isotropically strong lightweight parts. Pure metal and over 99% dense, the final part is now ready for use.

METAL

# 17-4 STAINLESS STEEL

Combining high strength, corrosion resistance and exceptional hardness, 17-4 stainless steel is widely used in the aerospace, medical and petroleum industries.

LAYER HEIGHT

50  $\mu\text{m}$

TOLERANCE

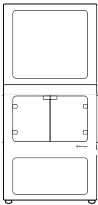
$\pm 50 \mu\text{m}$

(geometry dependent)

SINTERED DENSITY

99%

Compatible with



Metal X



X7



X5



X3



Mark Two



Onyx Pro



Onyx One

## CAMSHAFT SPROCKET

MATERIAL 17-4 STAINLESS STEEL

PART COST \$12.56



PLASTIC

# ONYX

Designed to combine the toughness and durability of Nylon with the dimensional stability and strength of composites, Onyx is the world's most capable 3D printing plastic.

FLEXURAL STRENGTH

81 MPa

TENSILE STRENGTH

36 MPa

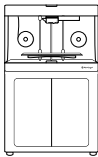
FLEXURAL MODULUS

2.9 GPa

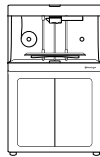
Compatible with



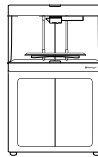
Metal X



X7



X5



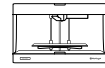
X3



Mark Two



Onyx Pro



Onyx One



## **TURBINE HOUSING**

MATERIAL    ONYX

PART COST    \$26.51

COMPOSITE

# FIBERGLASS

Using our unique composite reinforcement process, Fiberglass parts are an order of magnitude stiffer and stronger than typical 3D printed parts.

FLEXURAL STRENGTH

210 MPa

TENSILE STRENGTH

590 MPa

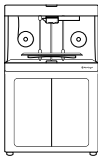
FLEXURAL MODULUS

22 GPa

Compatible with



Metal X



X7



X5



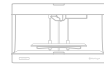
X3



Mark Two



Onyx Pro



Onyx One



## AIRCRAFT BRACKET

MATERIAL ONYX & FIBERGLASS

PART COST \$112.49

EXTERIOR SHELL  
ONYX

INTERIOR REINFORCEMENT  
FIBERGLASS

COMPOSITE

# CARBON FIBER

With excellent strength-to-weight and stiffness, Carbon Fiber is our highest performing composite material. Ideal for applications requiring high strength and low weight.

FLEXURAL STRENGTH

TENSILE STRENGTH

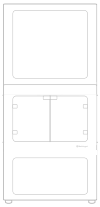
FLEXURAL MODULUS

470 MPa

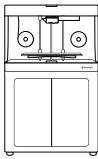
700 MPa

51 GPa

Compatible with



Metal X



X7



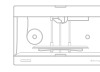
X5



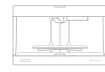
X3



Mark Two

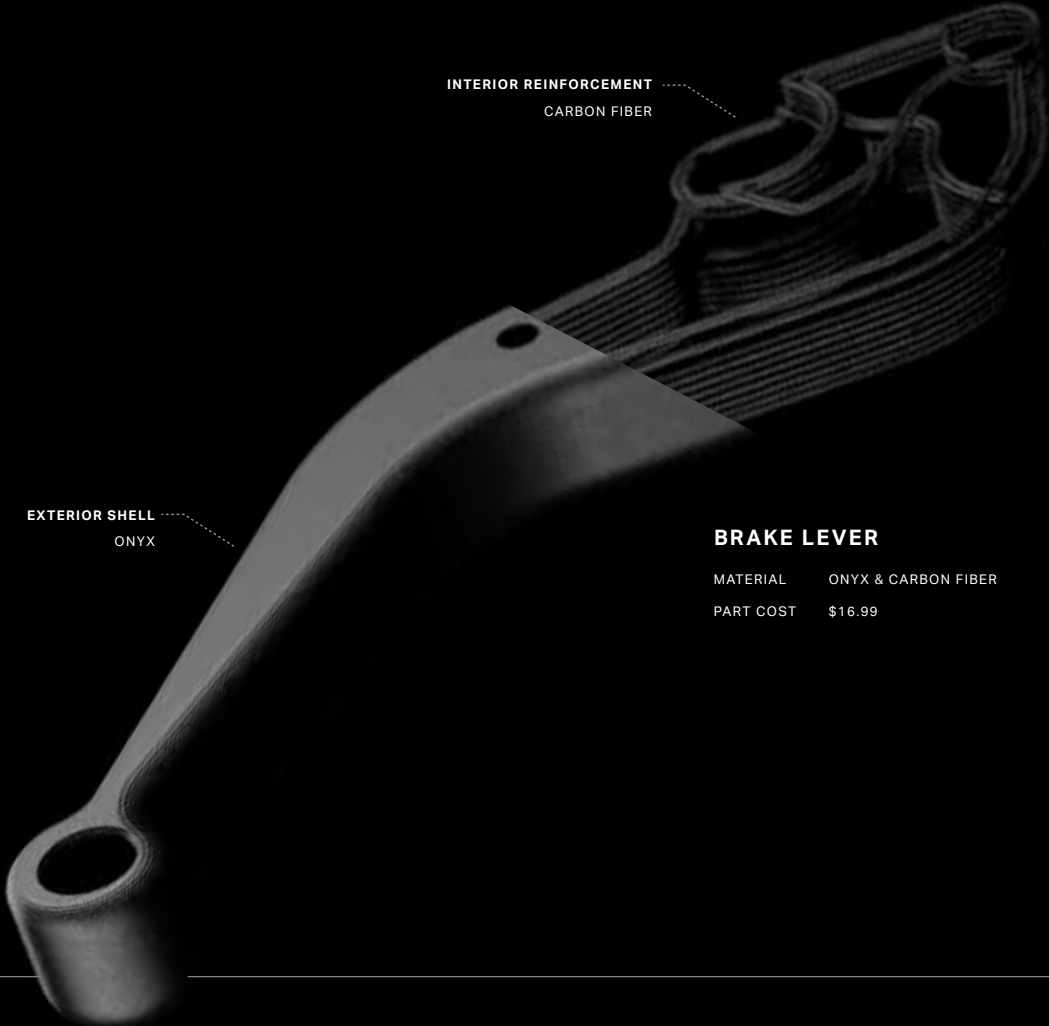


Onyx Pro



Onyx One





INTERIOR REINFORCEMENT  
CARBON FIBER

EXTERIOR SHELL  
ONYX

**BRAKE LEVER**

MATERIAL	ONYX & CARBON FIBER
PART COST	\$16.99

MARKFORGED

# ALL MATERIALS

With excellent strength-to-weight and stiffness, Carbon Fiber is our highest performing composite material.

## PLASTIC

Onyx  
Nylon

## COMPOSITE

Fiberglass  
Carbon Fiber  
Kevlar  
HSH T Fiberglass

## STAINLESS STEEL

17-4 Stainless Steel  
316L Stainless Steel

## ALUMINUM

6061 Aluminum  
7075 Aluminum

## TITANIUM

Ti-6Al-4V

## INCONEL

IN Alloy 625

## TOOL STEEL

A-2 Tool Steel  
D-2 Tool Steel

Find out more at  
[markforged.com](http://markforged.com)

**METAL X**  
Metal Printer



# GET IN TOUCH

To learn more about our technology, printers and advanced materials, please get in touch.

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[www.konicaminolta.com.au/products/3d-printers/composite-printing](http://www.konicaminolta.com.au/products/3d-printers/composite-printing)



# KONICA MINOLTA

 **Markforged**

Authorized Value  
Added Reseller