

# WELCOME TO THE NEW TECHNOLOGY ERA!

## CNC Mill and 3D Printer

A low inertia CNC machine  
that can save you...

- time
- space and
- money





# EDU-MiLL

## Low inertia Milling Machine with metal 3D Printing

The EDUMiLL is a groundbreaking system that blends the best of additive and subtractive manufacturing technologies into a single, cost-effective package. It incorporates a 3D printer and a robust CNC mill, presenting a wealth of possibilities for innovation.

The EDUMiLL is designed to be user-friendly, making it an ideal tool for educational institutions, makerspaces, and small businesses. With the EDUMiLL, users can effortlessly create intricate and precise parts and prototypes.



### CONTROLS



Industrial-grade controls

# About EDU-MiLL

## SPECS

- Servo motors: 130W brushless AC type for X, Y, and Z axis, 6000 rpm
- Travel X 7" (178 mm), Y 10.5" (267 mm), Z 4.64" (118 mm)
- Rapid feed 400 ipm (10,200 mm/min)
- Accuracy 0.0004" (0.01 mm)
- Worktable size - 14.5" x 9.8" (370 x 250 mm)

## SPINDLE SPECS

- 2.2. kW
- 24,000 rpm
- ER-20 taper
- Air cooled
- Runout <0.0004" (0.01 mm)
- 220 VAC, 6 A
- Spindle grade bearings (7005)

## FEATURES

- Servo control technology for each axis
- Size 15 linear guideways
- C7 ball screws
- Safety door sensor
- Tool length sensor
- High-speed spindle

## CHARACTERISTICS

- Dimensions W 27.5" (0.7 m), D 33.5" (0.85 m), H 41.5" (1.05 m)
- Weight 300 lbs. (136 kg)
- 220 VAC, 15 Amp. (110 optnl)
- Steel enclosure
- Large door for easy access to machining area
- Large side windows to monitor processes
- Fits through a standard doorway
- Optional stand with casters for easy relocation



# AUTOMATE YOUR EDUMILL

The FANUC CRX-5iA is a compact and lightweight collaborative robot (cobot) designed by FANUC, aimed at making automation more accessible and flexible in various industries.

## FANUC CRX-5iA

### Key Specifications

- Payload Capacity: 5 kg (11 lbs)
- Reach: 994 mm (39.1 inches)
- Repeatability:  $\pm 0.01$  mm
- Weight: Approx. 27 kg (59.5 lbs)
- Mounting Options: Floor, wall, or ceiling
- Degrees of Freedom: 6 axes
- Safety Features: Collaborative and human-safe design, including force sensors that stop movement when contact is detected
- Programming Interface: Intuitive tablet-based user interface, making it easy to program without specialized knowledge
- IP Rating: IP67, meaning it's dust-tight and protected against temporary immersion in water, suitable for harsher environments
- Power Requirements: 200-240V AC (single-phase)
- Software Compatibility: Compatible with FANUC's standard robot controllers and supports various communication protocols like Ethernet/IP

### Additional Features

- Ease of Use: The CRX-5iA is designed for easy integration, with drag-and-drop programming and a user-friendly interface, even for operators with minimal robot experience.
- End-of-Arm Tooling (EOAT): Supports a range of EOAT, including grippers, welding torches, and more, making it versatile for multiple applications.
- Maintenance-Free Design: FANUC claims that the CRX series is designed for an 8-year maintenance-free period, reducing downtime and upkeep costs.





# 3D Printing Add-On

Add a single or a dual head Fused Deposition Modeling (FDM) to the EDUMiLL by simply attaching the removable 3D printing head to the machine. This will allow you to turn your milling machine into a 3D printer. Printing Process: Fused Deposition Modeling (FDM) or Fused Filament Fabrication (FFF)

## Extruder

### Single Head Extrusion (Levil Control Only)

- 0.04 mm nozzle
- Heating element up to 300 deg.
- Heating bed up to 90 ° C.

### Dual Head Extrusion

- Dual extruder with 0.4 mm nozzles
- Heating element up to 300 deg.
- Heated bed up to 90 ° C.

## SPECS

### Build Volume

6.3" x 10.2" x 4.3" (160 x 260 x 110 mm)

### Extruder System

Belt driven

### Building plate

Heated table 8.6" x 8.6" (220 x 220 mm)

### Material Storage

Within machine enclosure

### Materials

PLA, ABS, PETG, TPU, metals and many more

### Minimum Layer Resolution

100 microns

Before



After

Create strong, durable, functional parts using any FDM printer. Print & sinter from anywhere!

# Metal 3D Printing

Fused Deposition Modeling (FDM) metal 3D printing is a cutting-edge technology that involves melting and depositing metal filaments layer by layer to create intricate and durable metal parts. This technique is gaining popularity in various industries, including education, for its ability to produce high-quality metal parts quickly and cost-effectively.

In education, FDM metal 3D printing can benefit students by providing them with hands-on experience in designing and creating metal components, helping them develop valuable skills for future careers in fields such as engineering and manufacturing. Additionally, it can open up new possibilities for research projects and experimentation, allowing students to explore the limits of what is possible with metal 3D printing technology.

## 3D print in any material you can think of

Turn your ideas into reality, whether it's for production, prototyping, or just for fun. With the EDUMiLL, you can now 3D print using metals ranging from aluminum to stainless steel and even Inconel. Metal 3D printing is the future, and it's here to stay; and now it's more accessible and affordable than ever before.

## Everything you need to print & sinter metal 3D printed parts.

**We  
have  
it  
all!**



# 3D Print Metals in 3 Simple Steps

## Print

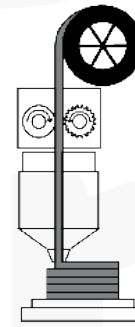
This filament is loaded into a 3D printer just like regular PLA and used in the same way as FFF 3D printers. But instead of using pure plastic, the printer deposits layers of binder infused with metal. The binder acts as a temporary support structure and keeps the metal particles in place.

## Debind

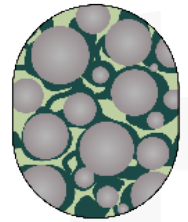
Once printed, the part is subjected to a debinding process involving heat treatment to remove plastic or wax binders from the “green part.” This is done to achieve a porous structure that can be sintered and result in a robust, compact metal component.

## Sinter

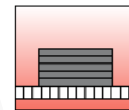
The printed part is now heated to a higher temperature, causing the metal particles to bond and create a solid metal component. This step increases the density of the metal, resulting in a final product that is both strong and dense.



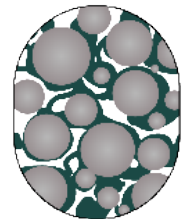
Shaping



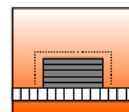
Thermal decomposition



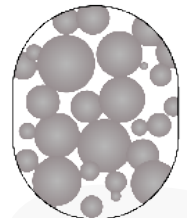
Debinding



Atomic diffusion



Sintering



# The Benefits of Metal 3D Printing

- 1.** Our metal 3D printing technology boasts a number of advantages that make it an attractive choice for those looking to create metal components. With a low barrier to entry, even those new to the world of 3D printing can easily get started with our technology. Additionally, our familiar processes means that users do not need to learn new techniques or workflows, making the transition to metal 3D printing a smooth one.
- 2.** Not only is our technology user-friendly, it also boasts minimal energy consumption, making it an eco-friendly choice for those looking to reduce their carbon footprint. Our mature technology (FFF) has been tried and tested, ensuring that users can rely on our technology to produce high-quality metal components.
- 3.** Hardware costs can be a major barrier to entry for those looking to get started with metal 3D printing, but our technology boasts low hardware costs, making it an affordable option for those on a budget. Furthermore, our hardware flexibility means that users can customize their printer to their needs, ensuring that they are able to produce the components they need, exactly how they need them.
- 4.** Perhaps one of the biggest advantages of our metal 3D printing technology is its safety. Our solution does not require the use of any chemicals in the printing or debinding process, making it a safer choice for users and the environment alike.

## Metal 3D Printing Basic Kiln





# Our Kilns

Introducing an advanced kiln with state-of-the-art features designed for a seamless and efficient sintering experience. This high-performance kiln is perfect for working with various materials, including bronze, copper, Pyrex® (borosilicate), and Amaco 46-D.

## Metal 3D Printing Starter Kiln

### Key Specifications

- Power: 115v, 15A, 1800w, 50/60Hz, Single Phase
- Max. Temperature: 1232°C/2250°F
- Controller: 3-Key Controller
- Solid State Output: Ensures stable and consistent performance.
- UL Listed: Compliant with safety standards.

**Most  
common  
kiln**

### Sintering Area / Chamber Volume

- 8" Width x 8" Depth x 6" Height /  
203mm Width x 203mm Depth x 152mm Height

### Kiln Outer Dimensions

- 15" Width x 20.5" Depth x 14.5" Height /  
381mm Width x 521mm Depth x 368mm Height

### Shipping Information

- Shipping weight: 56 lbs.
- Current lead time: 6-8 weeks



Invest in this cutting-edge kiln for a superior and convenient sintering experience, capable of handling a wide range of materials to suit your creative needs.

## Metal 3D Printing Pro Kiln

### Key Specifications

- Power: 220v, 27.8A, 6660w, Single-Phase / 208v, 26.7A, 5550w, Single-Phase
- Max. Temperature: 1288°C/2350°F
- Controller: 12-Key Controller
- Solid State Output: Ensures stable and consistent performance.
- UL Listed: Compliant with safety standards.

### Sintering Area / Chamber Volume

- 16.5" Diameter x 18" Depth /  
419mm Diameter x 457mm Depth

### Kiln Outer Dimensions

- 15" Width x 20.5" Depth x 14.5" Height /  
381mm Width x 521mm Depth x 368mm Height

### Shipping Information

- Shipping weight: 56 lbs.
- Current lead time: 6-8 weeks



# FILAMET™ METAL AND CERAMIC 3D PRINTING MATERIALS

Levil Technology has joined forces with The Virtual Foundry to revolutionize the 3D printing industry by providing high-quality metal filaments. This collaboration enables users to 3D print a wide range of metals, expanding possibilities and enhancing the overall quality of printed products. All of these materials are compatible with any open-architecture Fused Filament Fabrication 3D printer, including the EDUMiLL with 3D Printer.



**Our most common materials!**

## MATERIALS THAT WE OFFER

### Copper Filamet™

This top-notch, versatile metal filament is available in both 1.75mm and 2.85mm sizes. Offered in 0.5kg and 1kg spools, it contains 87.0% - 90.7% metal and boasts a 4.8g/cc - 5.0g/cc density. Easier to print and less hygroscopic than standard PLA, Copper Filamet™ is perfect for induction coils, electronics, heat sinks, and antimicrobial applications. Save on tooling and machining costs with this fully sinterable, American-made metal filament.



### Bronze Filamet™

This high-grade metal filament comes in 1.75mm and 2.85mm sizes, with 0.5kg and 1kg spool options. It contains 88.0% - 90.0% metal and features a density of 4.29g/cc - 4.5g/cc. Not only is it easy to print, but it's also less hygroscopic than regular PLA. Bronze Filamet™ is the easiest material to print and sinter, making it ideal for beginners. Perfect for research applications, this fully sinterable metal filament eliminates tooling and machining expenses. Note: All sales are final except in cases of defective product. Proudly made in America.



## Aluminum 6061 Filamet™

This superior metal filament is available in both 1.75mm and 2.85mm sizes and comes in 0.25kg and 0.5kg spools. It contains 60.0% - 65.0% metal and has a density of 1.5g/cc-1.54g/cc. Easy to print and less hygroscopic than regular PLA, Aluminum 6061 Filamet™ is strong, lightweight, and corrosion-resistant, making it perfect for lightweight and research and development applications. Cut down on tooling and machining costs with this fully sinterable metal filament. Made in America



**In addition to our popular metal filaments, we also offer a wide range of other materials to suit your specific needs.**

Our diverse selection includes H13 tool steel, high carbon iron, Inconel 718, pure iron, SS17-4, SS316L, Tungsten, Titanium, and more. For more material options or custom materials, please contact a Level representative to get more information and find the perfect filament for your project.



# Metal 3D Printing Project Kit for Schools

Introducing Levil Technology's Metal 3D Printing Project Kit for schools, designed to provide students with hands-on experience in the fascinating world of metal 3D printing.

Our kits are tailored to teach the basics of Sintering and Debinding, essential processes in metal 3D printing. We offer three project kits to suit various skill levels: Beginner, Intermediate, and Advanced.

**For these Project Kits, you will need the following:**

- A 3D printer compatible with or adapted to use Filamet™. Levil Technology recommends the EDUMiLL with a 3D printing attachment as the ideal choice for these projects.
- A Levil Technology Metal 3D Printing Package.
- The Project Kit of your choice.

To fully benefit from our Project Kits, you must acquire the "Metal 3D Printing" Package, which includes all necessary tools and equipment for successful project completion.

Equip your students with this package and our Project Kits for a comprehensive, hands-on learning experience in metal 3D printing.





# Project Kit 1

## Beginner - Calibration Rings in Bronze

Introducing the perfect entry point for students to explore the world of metal 3D printing: Project Kit 1: Beginner - Calibration Rings in Bronze. This kit is designed to provide a hands-on learning experience, allowing students to understand the fundamentals of metal 3D printing while working with high-quality bronze filament.

### WHAT'S INCLUDED

Easy-to-follow instructional guide 1kg Bronze Filamet™

Specially formulated for a smooth and consistent printing experience, this premium filament is perfect for beginners. It provides enough material to print 40 pieces with zero waste. However, to be conservative and account for the learning curve, we estimate that students can successfully create 25 pieces once they've dialed in the process. Calibration Rings (green and sinter part).

**Equip your students with the skills and knowledge they need to excel in the rapidly growing field of metal 3D printing.**



# Project Kit 2

## Intermediate-Caged Box in Bronze or Copper

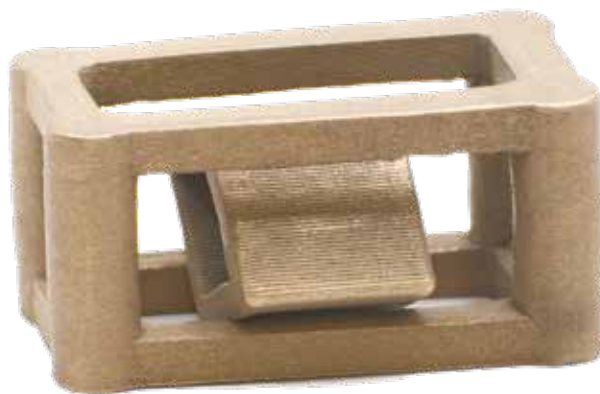
Take your students' metal 3D printing skills to the next level with Project Kit 2: Intermediate-Caged Box in Bronze or Copper. This intermediate kit provides a more challenging and engaging experience, allowing students to expand their knowledge and understanding of metal 3D printing while working with high-quality bronze or copper filament.

### WHAT'S INCLUDED

#### Easy-to-follow instructional guide

4.5kg Bronze or Copper Filamet™: Choose between premium bronze or copper filament, both specially formulated for a smooth and consistent printing experience. With enough material to print 40 pieces (bronze) or 39 pieces (copper) with zero waste, we estimate that students can successfully create 25 pieces once they've dialed in the process. Caged Box Project (green and sinter part).

**Choose Levil Technology's Metal 3D Printing Project Kit for Schools and prepare them for a future full of possibilities.**



# Project Kit 3

## Advanced - Caged Box in Steel

Challenge your students and prepare them for the professional world of metal 3D printing with Project Kit 3: Advanced-Caged Box in Steel. This advanced kit is designed to provide a demanding and rewarding experience, allowing students to refine their skills and understanding of metal 3D printing while working with high-quality stainless-steel materials.

### WHAT'S INCLUDED

#### Easy-to-follow instructional guide

4kg Stainless Steel 316L Filamet™: Our premium stainless-steel filament is specially formulated for a smooth and consistent printing experience. With enough material to print 40 pieces with zero waste, we estimate that students can successfully create 25 pieces once they've dialed in the process. Caged Box Project (green and sinter part).

**Equip your students with the skills and knowledge they need to excel in the rapidly growing field of metal 3D printing.**

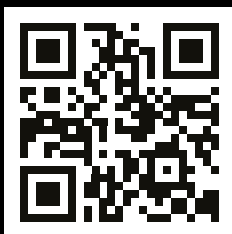




## **We Provide Powerful Solutions TO GET THE JOB DONE!**

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When machining small parts or prototypes, a tabletop CNC machine can save you time, space, and money without compromising the quality of your product.



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