



It's so nice to see you again



# Industrial Applications with **KODAK** 3D Printing

# 3D Printing in the Manufacturing Industry



The manufacturing industry is always looking at new and innovative ways of working, and in recent years, 3D printing has been at the forefront.





# Manufacturing Applications

Low Volume Production

## Moving to 3D Printing

- ▶ Moving across to 3D printing makes it possible for businesses to consider short-run part production, where Product Engineering teams can launch new products more frequently. They are able to work beyond the restraints that come with traditional methods.
- ▶ It delivers an agile development process for physical parts and has the ability to accelerate the production and the time it takes to get to market.



# Manufacturing Applications

Low Volume Production

## Advantages of 3D Printing

- ▶ **Reduction in costs**  
Traditional manufacturing methods are notoriously expensive, whereas the 3D printing process makes the creation of produced parts cheaper and more accessible.
- ▶ **Reduction of Risks**  
When businesses have the ability to confirm a design before committing it to production, it can help to remove the risk of errors, wasted materials and money. A 3D prototype is easier to redesign and alter.
- ▶ **Time to Market**  
3D printing makes it possible to develop ideas faster. In some instances, it could be possible for 3D concepts to be designed and printed on the same day. This can help companies reduce manufacturing time from months to days.



# Manufacturing Applications

Low Volume Production

## Advantages of 3D Printing

- ▶ **Complex Geometries**  
3D manufacturing process can create an endless list of possibilities. Geometries that were once difficult can now be achieved, such as interior cavities.
- ▶ **Minimize Waste**  
The manufacturing process can result in a lot of waste, particularly in traditional manufacturing, when a CNC process is used. 3D printing will only use the material that passes through the extruder of the printer, which is used for the assembly of the product.
- ▶ **Reduce Storage Space**  
Using 3D printing makes it possible for goods to be made as they are sold. This means that there will be no overproduction and reduced storage costs.



# Manufacturing Applications

Materials – KODAK 3D Printing Filament

## Engineering Plastics

- ▶ The material most commonly used on desktop FFF 3D printers is **PLA**. PLA is easy to print with and can produce parts with finer details. However, when higher strength, ductility and thermal stability is needed, engineering materials such as **ABS** are commonly used. ABS is more prone to warping (due to shrinkage) and the geometry of the printed part can prohibit its use, especially in machines that do not have an enclosed chamber, heated bed and provide a conditioned environment.
- ▶ The manufacturing industry uses mainly engineering plastics (**ABS, Nylon, PC, Flex, HIPS, PVA** and others). These materials are usually loaded with certain additives that alter their properties and make them particularly useful for certain industrial needs such as high impact strength, thermal stability and chemical resistance.



Improve Productivity  
with **KODAK** 3D Printing



# KODAK Portrait 3D Printer

An excellent solution for enhancing productivity

## What we can do for you

The **KODAK** Portrait 3D Printer is suitable for **prototyping**, producing **grips, jigs and fixtures, tooling, spare parts** and **low-volume production** requirements. It offers short lead times and a wide range of materials at a low cost.





# Common Applications

## Prototyping



PROTOTYPES



FINAL PRODUCTS



# Grips, Jigs and Fixtures



Manufacturing companies working to improve productivity and lower costs, use manufacturing techniques such as the implementation of grips, jigs and fixtures in a production line, to help achieve these goals.

The high level of **customization** and **complexity** that the **KODAK Portrait 3D Printer** allows for in a design, coupled with the **accuracy** which parts can be made, make it an ideal solution for producing grips, jigs and fixtures.



# Common Applications

Grips, Jigs and Fixtures

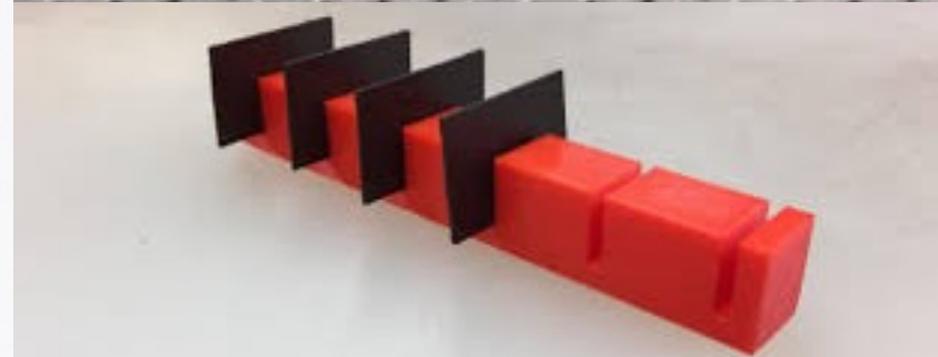
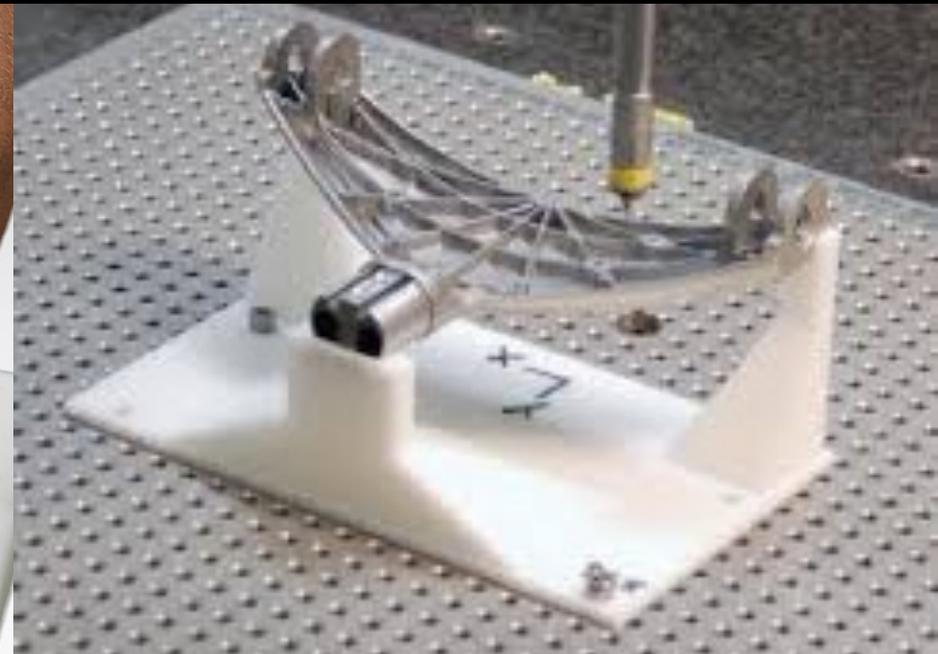
## Benefits using Grips, Jigs and Fixtures

- ▶ Increased productivity
- ▶ Reduction in waste
- ▶ Improved accuracy and repeatability of parts
- ▶ Better worker safety
- ▶ Low skill required



# Common Applications

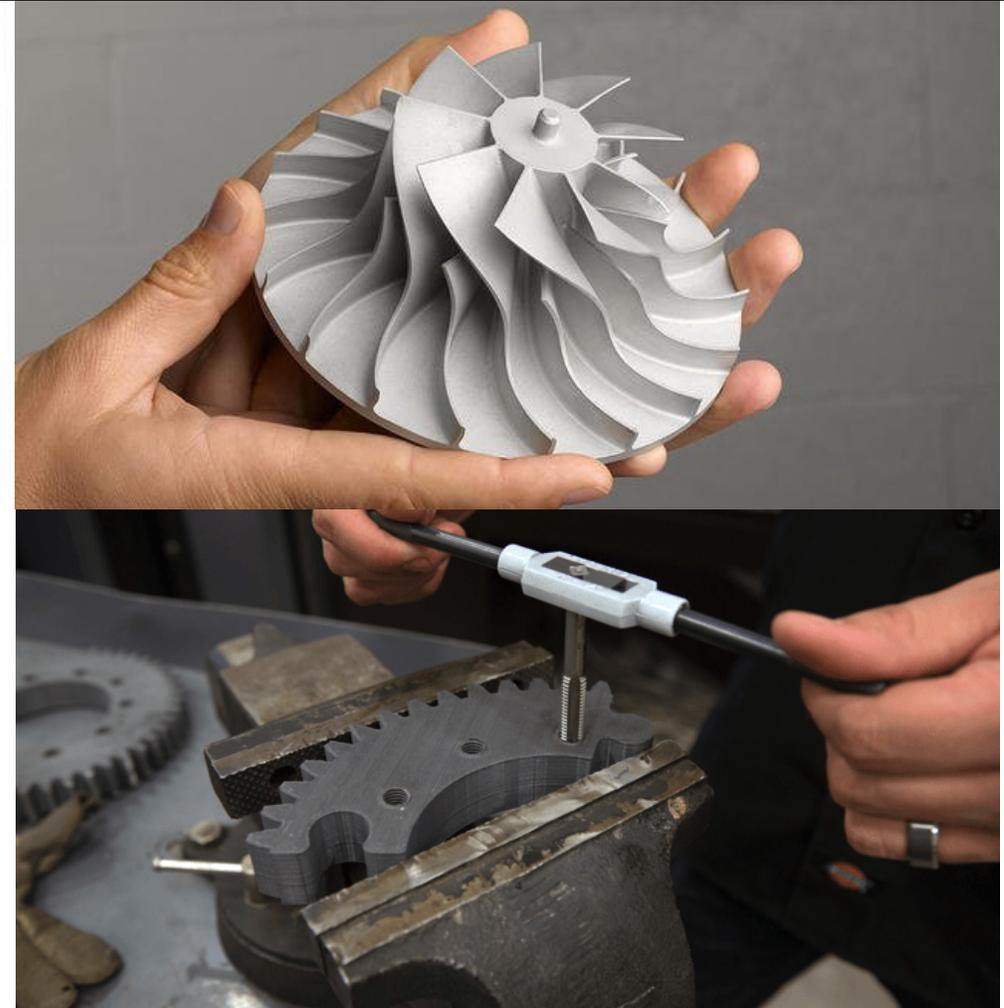
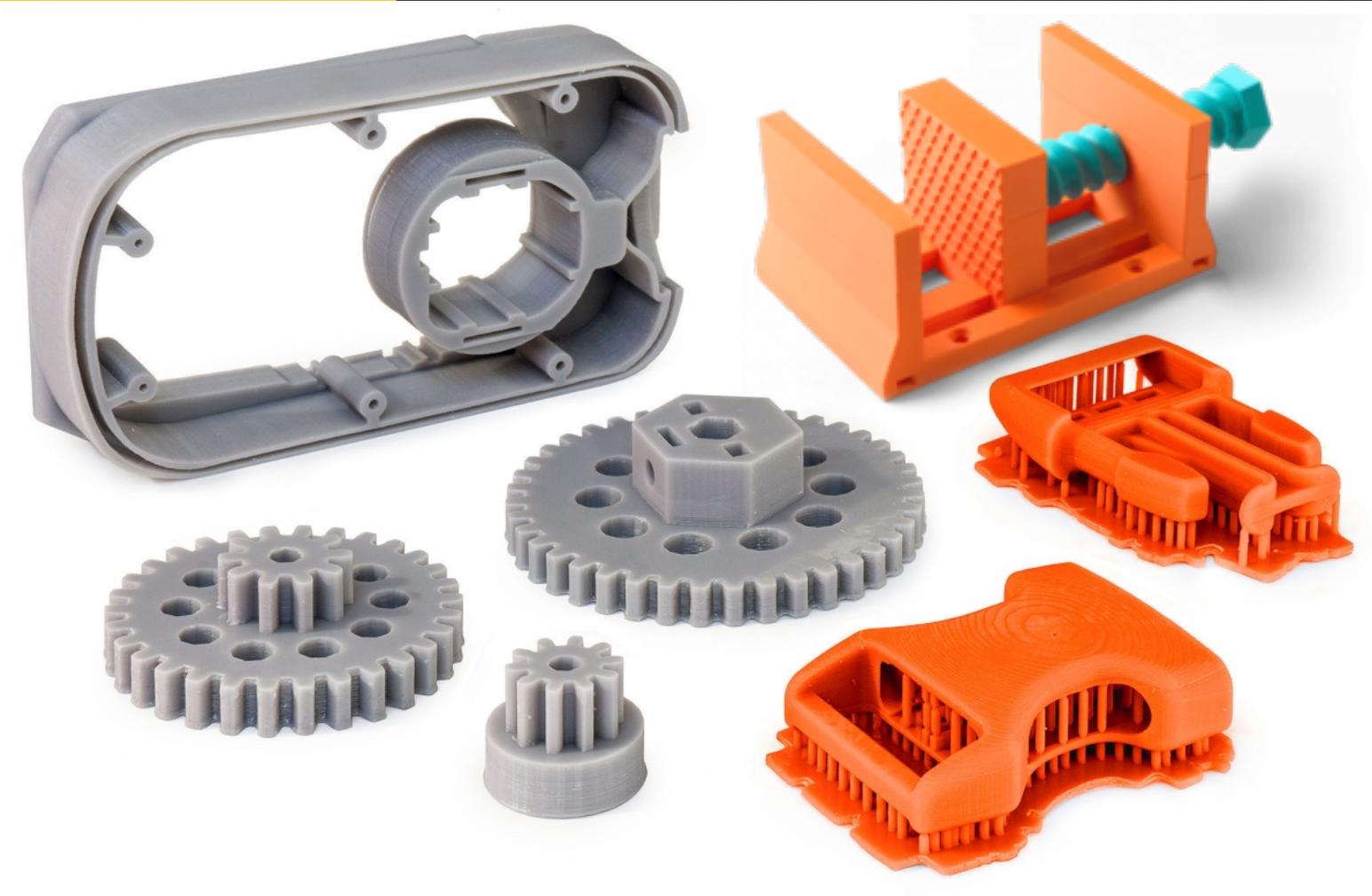
Grips, Jigs and Fixtures





# Common Applications

Tooling and Spare Parts





# Common Applications

## Low Volume Manufacturing





# Enhancing Service Level with **KODAK** 3D Printing Solutions



# KODAK Portrait 3D Printer

The new standard in professional desktop 3D printing



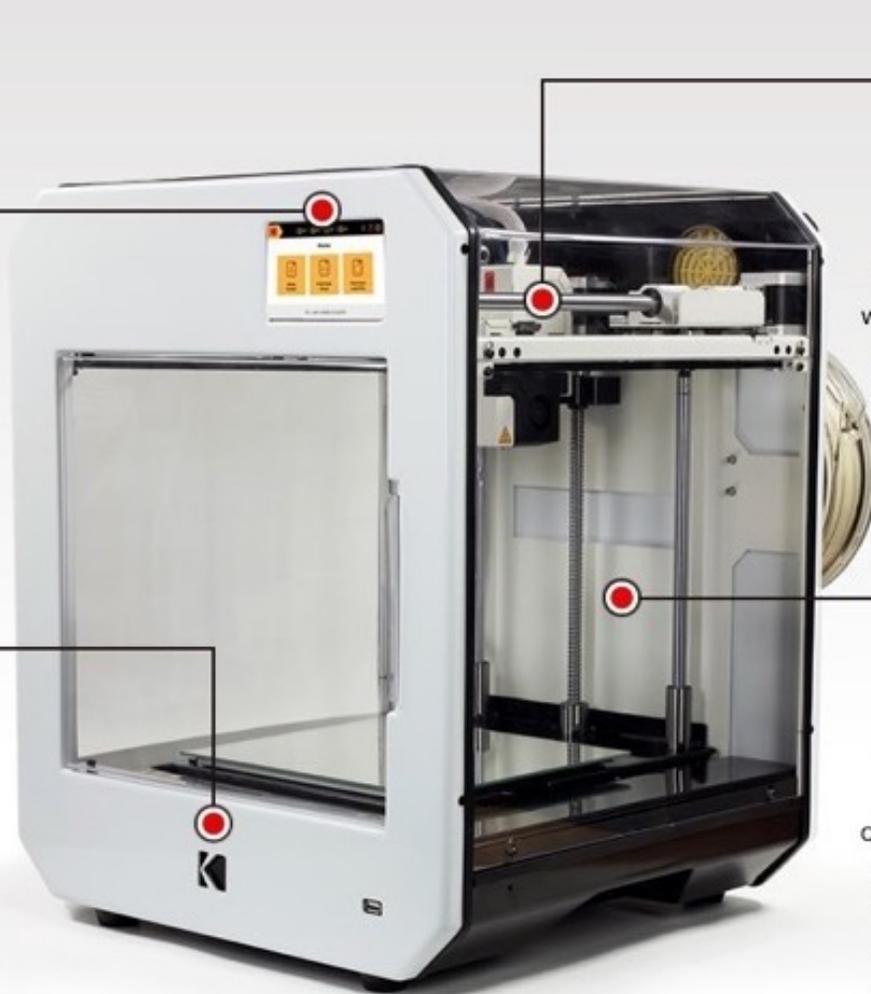
## A professional 3D printer platform

Experience free access to the KODAK 3D Cloud, an IT-compliant printer management software powered by 3DPrinterOS.



## Up to 4-year warranty and world-class support

Our extendable 1-year warranty with annual service check-ups is backed by our +130 years experience in customer satisfaction. Quick response, professional support and well-trained local service partners.



## Reliability in engineering materials (ABS, Nylon)

Only a fully enclosed environment with all-steel components and a lifting dual-extrusion system can ensure a good performance for any technical application; in ABS or Nylon just as like PLA.



## Built for productivity

The KODAK Portrait 3D Printer is a reliable manufacturing system, capable of producing end-use parts in a wide variety of materials. Its solid steel structure, quality components and careful design result in a high uptime with low maintenance costs



# KODAK Portrait 3D Printer

An excellent solution for enhancing productivity

## Why is it so important to have a closed chamber?



- ▶ When printing **engineering materials** such as ABS, PA (polyamide, nylon), PC (polycarbonate) and others, **temperature really matters**. These filaments have a high glass transition point. To be able to print these materials shrink and warp-free, it is essential to keep your printing environment warm and stable.
- ▶ In addition, the ability to prevent the vapors generated during printing from spreading is a fundamental **safety** feature for such thermoplastics. For this purpose, the **KODAK Portrait 3D Printer** has a built-in **HEPA filter with activated carbon**, making it one of the **most safe and reliable** desktop 3D printers on the market.



## **KODAK 3D Printing Filaments**

Top-quality filaments for professional 3D printing



# KODAK 3D Printing

## Materials – KODAK 3D Printing Filament

### ABS



#### Benefits:

- High impact resistance, slightly flexible.
- UV, heat and abrasion resistance.
- Ideal for post-processing for a shiny, smooth surface (advanced users).

#### Main application:

- Functional prototypes.

### HIPS



#### Benefits:

- A filament with some of the best characteristics of PLA and ABS.
- Great interlayer adhesion.
- Resistance to shattering, low warp.

#### Main application:

- High impact resistant and silky surface.
- Rigid limonene-soluble support material.

### PETG



#### Benefits:

- Easy to print.
- Strong and temperature resistant.
- Food-safe.

#### Main application:

- Practical applications including food packaging.

### Flex 98



#### Benefits:

- Semi-flexible.
- Make strong, shatter-resistant objects.
- High abrasive resistance.

#### Main application:

- Semi-rigid with excellent impact and abrasion resistance.

### PLA+



#### Benefits:

- Easy to print.
- Very low shrinkage.
- Wide range of colors.

#### Main application:

- Concept modeling.

### PLA Tough



#### Benefits:

- Ideal ABS substitute for many tasks.
- High strength.
- Very low shrinkage.

#### Main application:

- Prototypes and functional parts not used at high temperature.



# KODAK 3D Printing Materials – KODAK 3D Printing Filament

## Nylon 6



### Benefits:

- Very strong, shatterproof functional objects.
- High abrasive resistance, small friction coefficient (slippery)

### Main application:

- Maximum strength, production-ready functional prints.

## Nylon 12



### Benefits:

- Extremely tough with superior tensile, elongation at break and impact strength, high fatigue endurance and low friction coefficient.
- Very low warping and moisture absorption before and after printing.
- Superior chemical, UV and heat resistance (over 120°C).

### Main application:

- High fatigue, snap fits, functionally strong parts with high resistance to environmental stress.

## PVA



### Benefits:

- Allows you to create support structures for complex prints.
- Dissolvable in water.
- Biodegradable and non-toxic.

### Main application:

- Support material.

## Acrylic



### Benefits:

- A semi-transparent material, ideal for pieces with movable parts.
- Exceptional ability to print bridges.
- Very hard and not very flexible, ideal for those pieces that require a lot of rigidity.
- Very low coefficient of friction.

### Main application:

- Suitable for optical polycarbonate applications.

## Nylon 6/66/12



### Benefits:

- Strong as nylon, but with greater flexibility.
- Low warping, allowing for better printing of fine details and overhangs.
- With possibility to use a layer fan for even finer details or printing long bridges.
- Good adhesion to the printing surface.

### Main application:

- Parts that need to be very strong with tensile resistance, or strong parts with fine details.



# Materials

## KODAK 3D Filament

### Color Chart

	Solid	ABS	Flex98	HIPS	Nylon6	Nylon12	PETG	PLA+	PLA T	PVA	Nylon 6/66/12	Acrylic
Natural		●			●	●	●	●	●	●	●	●
Black - Black 6 C		●	●	●	●		●	●	●			
Gray - 8402 C		●	●				●	●	●			
White - 11-4001 TCX		●	●	●			●	●	●			
Light Blue - 2225 C								●				
Blue - 2935 C		●	●	●	●			●	●			
Green - 17-6153 TCX		●			●			●				
Light Green - 2286 C								●				
Light Yellow - Yellow U		●						●				
Kodak Yellow - 1235 C								●				
Orange - 1505 C		●						●				
Red - 485 C		●	●	●	●			●	●			
Pink - 919 C								●				
Skin - 489 C								●				
Blacklight reactive					●		●					
<b>Metal</b>												
Silver - 427 CP								●				
Bronze - 17-1028 TPX								●				
Copper - 876 C								●				
<b>Neon</b>												
Orange - 804 C								●				
Yellow - 809 C								●				
Green - 802 C								●				
<b>Translucent</b>												
Purple - 228 C							●					
Red - 485 C							●					
Green - 17-6153 TCX							●					
Yellow - 1235 C							●					
Blue - 2935 C							●					
Orange - 1505 C							●					



# **KODAK** Design to Print Service

Save valuable time and maximize print quality

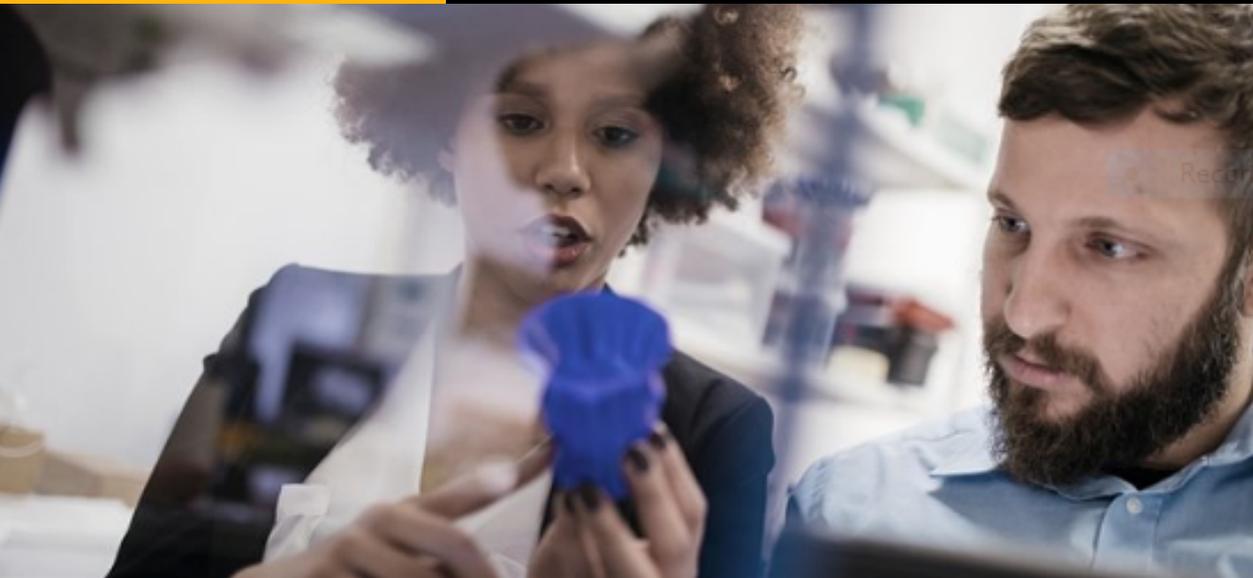


**Convert your 3D design for successful printing on your 3D printer.**



# KODAK Design to Print Service

Save valuable time and maximize print quality



## 3D DESIGNER SERVICE

Modify your 3D design for successful printing on your 3D printer. You will receive an STL file optimized for additive manufacturing.



## PRINT PROFILE CUSTOMIZATION

Create an optimal print file for your KODAK 3D Printer from an STL file. The objective is to reduce print time, maximize print quality, adjust print tolerances, and set the gcode parameters depending on the materials you will print with.

**Convert your 3D design for successful printing on your 3D printer.**



# KODAK Portrait Ecosystem

Comprehensive Solution



## What's included?

- ▶ 1 **KODAK** Portrait 3D Printer
- ▶ 1 **Smart3D** Printer Cabinet
- ▶ Design to Print Services
- ▶ **KODAK** Filaments
- ▶ Installation, Training and support



Thank You