Ultimaker

Ultimaker materials

Enabling innovation with industrial-grade materials

Empower your business with our integrated ecosystem

Our integrated ecosystem of reliable hardware, extensively tested materials, and feature-rich print preparation software form the foundation for a seamless 3D printing experience, from start to finish. Optimized, preconfigured material profiles automatically adjust material and printer settings in Ultimaker Cura, ensuring easier setup and smoother, quicker print results.

Professional, accessible 3D printers

Ultimaker 3D printers offer high uptime, fast changeovers, and reliable, consistent results. Print complex functional prototypes, manufacturing tools, and high-detail mechanical parts – with industrial-grade build and water-soluble support material combinations.

Optimized, industrial-grade materials

Our wide range of materials offer amazing possibilities. Combine two build materials for advanced dual-color printing, or achieve astonishing complexity with build / water-soluble support material combinations (e.g. Nylon and PVA, PLA and PVA, or CPE and PVA). Using Ultimaker's integrated ecosystem, customers enjoy a smoother printing experience, with reliable, impressive results. Our open filament system allows for greater innovation and freedom to experiment with new materials and test the latest market developments.

The world's most advanced 3D printer software

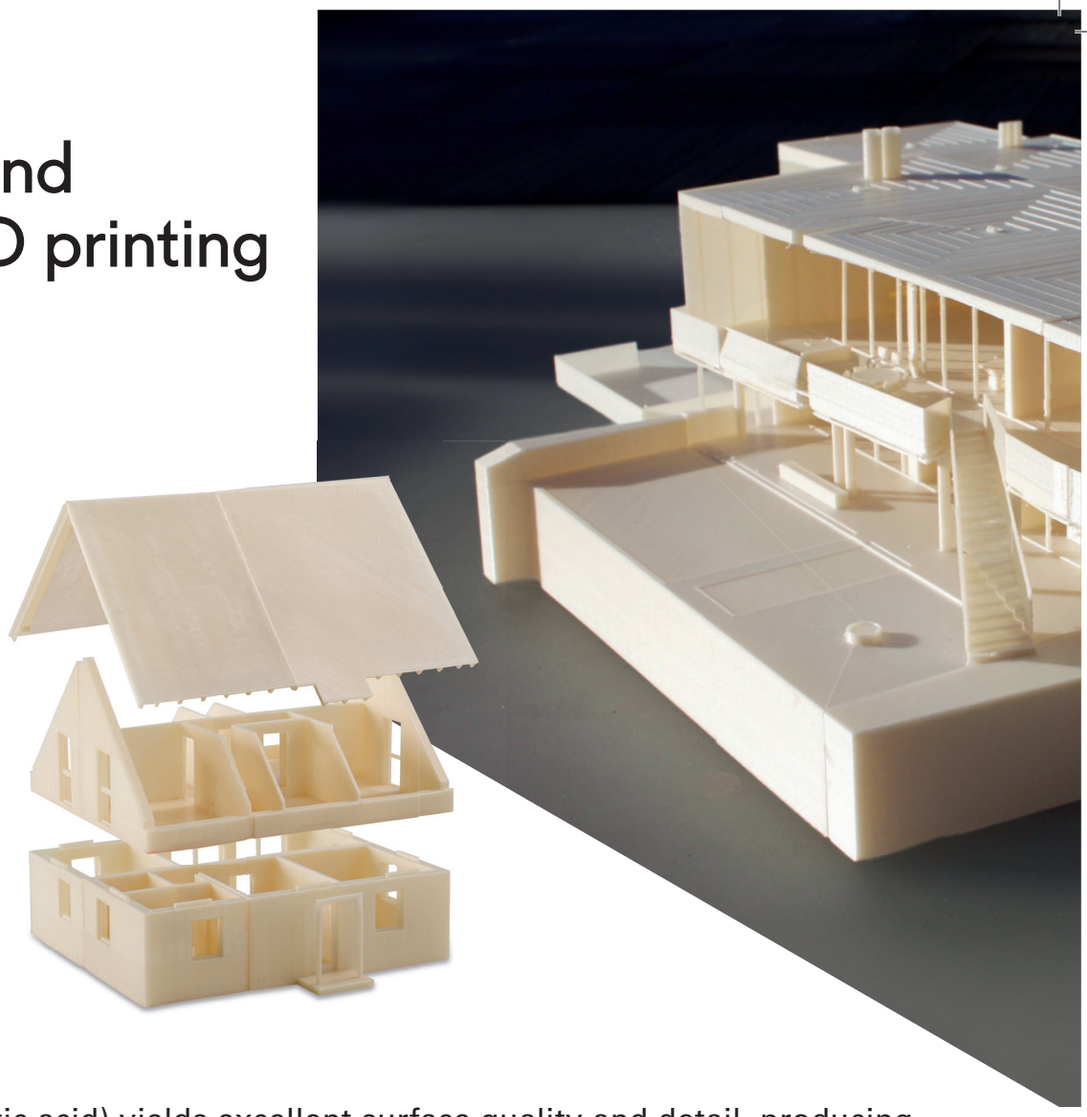
Ultimaker Cura is renowned for producing impressive results. Its preconfigured profiles auto-adjust settings depending on your material and printer setup, ensuring greater print success. The open, flexible system lets you customize values, tailoring your 3D printing experience to your exact requirements.

Global, certified support network

Ultimaker's market-leading 3D printers and software come with lifetime technical support and outstanding customer service. Our global network of professionally trained, certified service partners offer both in-depth industry knowledge and broad technical expertise, providing technical support in your own language and time zone. Moreover, our local partners ensure the necessary spare parts and materials are always in stock to maintain your innovation and production workflow.

Fast, safe, and reliable 3D printing

PLA



Ultimaker PLA (polylactic acid) yields excellent surface quality and detail, producing consistent, reliable results. Create high-resolution concept models in a wide variety of color options, and achieve astonishing complexity with water-soluble PVA support structures.

Key features

- Good tensile strength
- Good surface quality
- Easy to work with at high print speeds
- User-friendly in a variety of environments
- Ideal for creating high-resolution parts
- Ideal for models and prototypes that require aesthetic detail
- Great for lost casting methods to create metal parts
- Wide range of color options available
- Compatible with PVA and Breakaway support materials in dual extrusion prints on the Ultimaker S5 and Ultimaker 3

Applications

- Household tools
- Manufacturing aids
- Visualization aids
- Casts and molds
- Concept models
- Educational projects

Filament specifications

Filament diameter: 2.85 ± 0.1 mm
Net filament weight: 750 g
Filament length: ~ 95 m
Optimized for: Ultimaker S5, Ultimaker 3, and Ultimaker 2+ series

Colors

Learn more at ultimaker.com

Tough like ABS, easy to print like PLA

Tough PLA

Ultimaker Tough PLA is a technical PLA filament with toughness that's comparable to ABS. Offering the same safe and easy use as regular PLA, our Tough PLA is ideal for reliably printing technical models at larger sizes.

Key features

- Impact strength similar to ABS
- Higher stiffness compared with ABS
- Less brittle than regular PLA
- Gives a more matte surface finish than regular PLA
- Heat resistance is similar to standard PLA filaments, so printed parts should not be exposed to temperatures above 60 °C
- More reliable than ABS for larger prints, with no delamination or warping
- Compatible with Ultimaker support materials (PVA and Breakaway) giving full geometric freedom when designing parts

Applications

- Functional prototyping
- Tooling
- Manufacturing aids

Filament specifications

Filament diameter: 2.85 ± 0.05 mm
Net filament weight: 750 g
Filament length: ~ 96 m
Optimized for: Ultimaker S5 and Ultimaker 3 series

Colors

Abrasion-resistant and durable

Nylon

Ultimaker Nylon (polyamide grade based on PA6/66) offers impressive durability, high strength-to-weight ratio, flexibility, low friction, and corrosion resistance. Its reduced humidity absorption ensures a seamless 3D printing experience. Featuring good adhesion to PVA, Ultimaker Nylon allows the creation of detailed structures and complex mechanical parts.

Key features

- Industrial-grade impact and abrasion resistance
- Durable
- High strength-to-weight ratio
- Low friction coefficient
- Good corrosion resistance to alkalis and organic chemicals
- Reduced humidity absorption when compared to other Nylon filaments
- Compatible with PVA and Breakaway support materials in dual extrusion prints on the Ultimaker S5 and Ultimaker 3

Applications

- Functional prototyping
- Tooling
- Industrial modeling
- End-use parts

Filament specifications

Filament diameter: 2.85 ± 0.05 mm
Net filament weight: 750 g
Filament length: ~ 103 m
Optimized for: Ultimaker S5, Ultimaker 3, and Ultimaker 2+ series

Colors

Learn more at ultimaker.com

Tough and durable

ABS

Used by industries worldwide, Ultimaker ABS (acrylonitrile butadiene styrene) has good mechanical properties. Specifically formulated to minimize warping and ensure consistent interlayer adhesion, it's ideal for creating functional prototypes and complex end-use parts.

Key features

- Good mechanical properties
- Good interlayer adhesion, especially when using a 3D printer with an enclosed front (Ultimaker S5, or the add-on provided in the Advanced 3D Printing Kit for other printers)
- Withstands temperatures up to 85 °C
- Great for strong prototypes or end-use parts
- Better aesthetic appearance when compared to other ABS filaments
- Minimal warping and good build plate adhesion
- Compatible with Breakaway support material in dual extrusion prints on the Ultimaker S5 and Ultimaker 3

Applications

- Visual and functional prototyping
- Fit testing
- Tooling
- End-use parts
- Concept models
- Custom components
- Short-run manufacturing

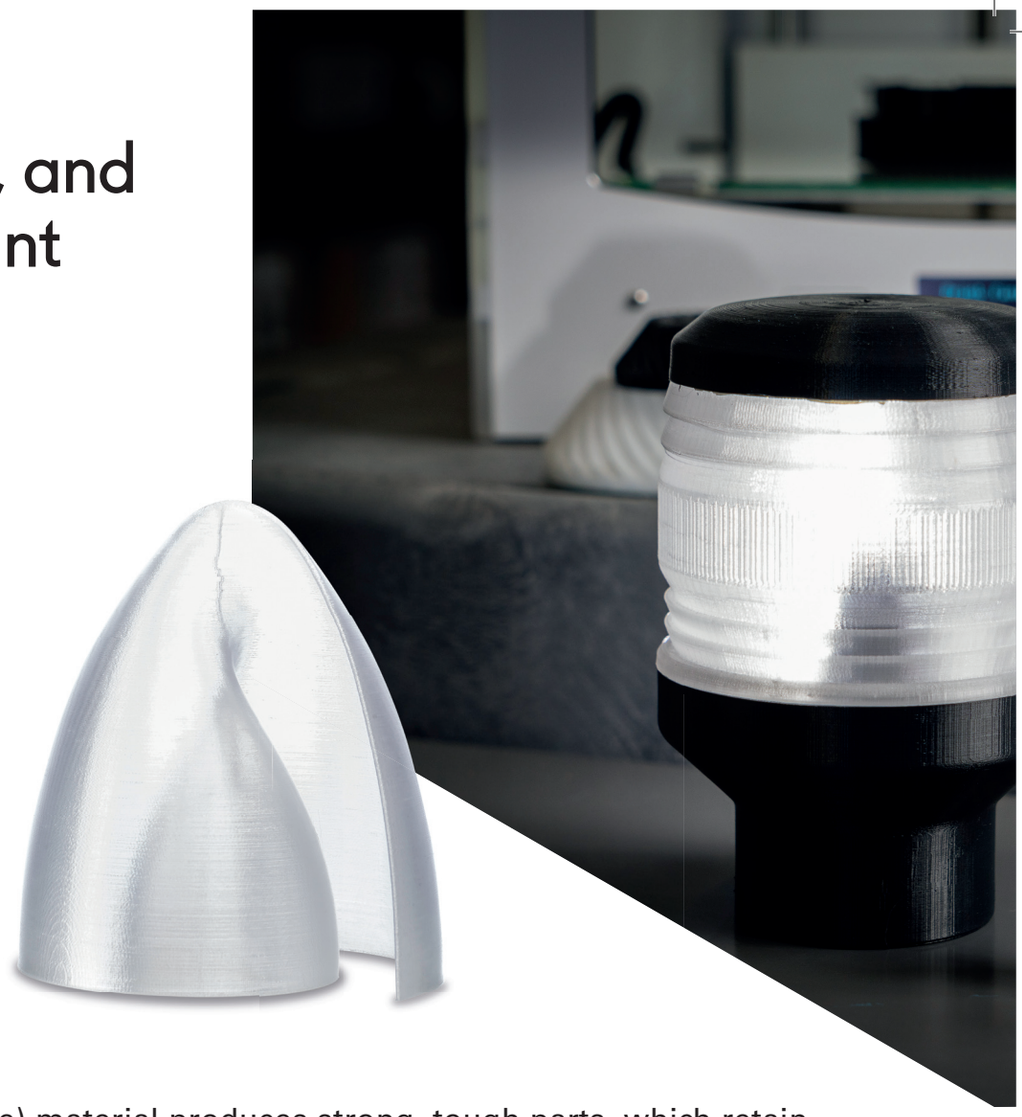
Filament specifications

Filament diameter: 2.85 ± 0.1 mm
Net filament weight: 750 g
Filament length: ~ 107 m
Optimized for: Ultimaker S5, Ultimaker 3, and Ultimaker 2+ series

Colors

Strong, tough, and heat-resistant

PC



Ultimaker PC (polycarbonate) material produces strong, tough parts, which retain dimensional stability when subjected to temperatures up to 110 °C. It's ideal for printing molds, tools, functional prototypes, and parts for short-run manufacturing.

Key features

- High toughness, especially for non-transparent filament options
- Resists temperatures and retains form up to 110 °C
- Flame retardant characteristics
- Dimensionally stable
- Strong interlayer bonding capabilities, especially when using a 3D printer with an enclosed front (Ultimaker S5, or the add-on provided in the Advanced 3D Printing Kit for other printers)
- Good build plate adhesion, especially when using adhesion sheets
- Transparent filament option allows printing of translucent parts for lighting applications

Applications

- Lighting
- Molds
- Engineering parts
- Tooling
- Functional prototyping
- Short-run manufacturing

Filament specifications

Filament diameter: 2.85 ± 0.05 mm
Net filament weight: 750 g
Filament length: ~ 99 m
Optimized for: Ultimaker S5, Ultimaker 3, and Ultimaker 2+ series

Colors

Learn more at ultimaker.com

Wear and tear resistant

TPU 95A

Highly versatile for industrial applications, Ultimaker TPU 95A (thermoplastic polyurethane) is well suited to manufacturing projects that demand the qualities of both rubber and plastic. Semi-flexible and chemical resistant, with strong layer bonding, it is easier and faster to print with than other TPU filaments. TPU 95A's robust material characteristics serve a broad range of functional prototypes where durability and flexibility are essential.

Key features

- Exceptional wear and tear resistance
- High impact strength
- Shore-A hardness of 95
- Up to 580% elongation at break
- Good corrosion resistance to many common industrial oils and chemicals
- Engineered for a fast and seamless 3D printing experience

Applications

- Functional prototyping
- Grips
- Guides
- Hinges
- Sleeves
- Snap-fit parts
- Protective cases

Filament specifications

Filament diameter: 2.90 ± 0.13 mm
Net filament weight: 750 g
Filament length: ~ 96 m
Optimized for: Ultimaker S5, Ultimaker 3, and Ultimaker 2+ series

Colors

Fatigue and chemical-resistant

PP

Ultimaker PP (polypropylene) is durable, with high toughness and fatigue resistance, and low friction. It also has good chemical, temperature, and electrical resistance. From electrical components to living hinges, PP is ideal for prototyping and end-use products.

Key features

- Durable with high toughness and fatigue resistance (retaining shape after torsion, bending, or flexing)
- Low-friction and smooth surfaces
- Semi-flexible
- Chemical resistance to a wide range of bases and acids – including industrial cleaning agents
- High electrical resistance (good electrical insulator)
- Translucent
- Temperature resistance of up to 105 °C
- Low density resulting in lightweight parts (high strength-to-weight ratio)
- Excellent layer bonding
- Adequate build plate adhesion and low warping when using adhesion sheets
- Recyclable, for low environmental impact

Applications

- Functional prototypes
- Living hinges
- Connectors
- Lab equipment
- Moldings
- Stationery folders
- Packaging
- Storage boxes
- Protective covers
- Light shades

Filament specifications

Filament diameter: 2.85 ± 0.05 mm
Net filament weight: 500 g
Filament length: ~ 88 m
Optimized for: Ultimaker S5, Ultimaker 3, and Ultimaker 2+ series

Colors

Learn more at ultimaker.com

Chemical-resistant and tough

CPE

CPE (co-polyester) is chemical-resistant, offering dimensional stability, tensile and flexural strength, and temperature resistance up to 70 °C. It's available in a wide range of colors, including gray scale. Choose CPE for functional prototypes and mechanical parts.

Key features

- Excellent chemical resistance, toughness, and dimensional stability
- Good interlayer adhesion, especially when using a 3D printer with an enclosed front (Ultimaker S5, or the add-on provided in the Advanced 3D Printing Kit for other printers)
- Low levels of ultrafine particles (UFPs) and volatile organic compounds (VOCs)
- Compatible with PVA and Breakaway support materials in dual extrusion prints on the Ultimaker S5 and Ultimaker 3

Applications

- Visual and functional prototyping
- Short-run manufacturing

Filament specifications

Filament diameter: 2.85 ± 0.1 mm
Net filament weight: 750 g
Filament length: ~ 93 m
Optimized for: Ultimaker S5, Ultimaker 3, and Ultimaker 2+ series

Colors

Heat, chemical-resistant, and tough

CPE+

With exceptional toughness and chemical resistance, CPE+ is the preferred choice for both functional prototypes and mechanical parts. It offers higher impact strength and temperature resistance than regular CPE (to 100 °C), and demonstrates good dimensional stability.

Key features

- Excellent chemical resistance, temperature resistance, toughness, and dimensional stability
- Good interlayer adhesion, especially when using a 3D printer with an enclosed front (Ultimaker S5, or the add-on provided in the Advanced 3D Printing Kit for other printers)
- Good build plate adhesion, especially when using adhesion sheets
- Transparent filament option allows printing of translucent parts
- Compatible with Breakaway support material in dual extrusion prints on the Ultimaker S5 and Ultimaker 3

Applications

- Visual and functional prototyping
- Short-run manufacturing

Filament specifications

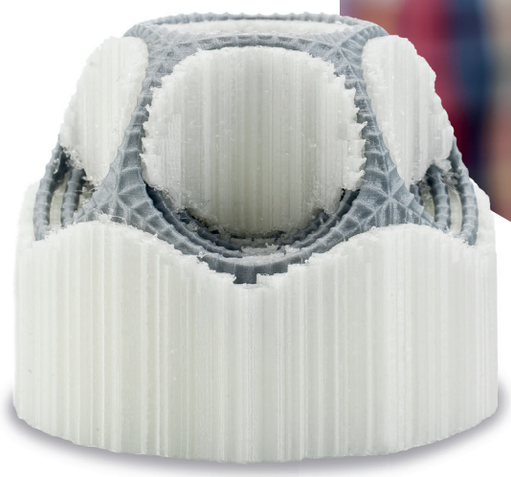
Filament diameter: 2.85 ± 0.1 mm
Net filament weight: 700 g
Filament length: ~ 93 m
Optimized for: Ultimaker S5, Ultimaker 3, and Ultimaker 2+ series

Colors

Learn more at ultimaker.com

Complete design freedom with water-soluble support

PVA



Ultimaker PVA (polyvinyl alcohol) is a water-soluble support material for multi-extrusion 3D printing. With a good thermal stability, it's ideal for printing complex models that require large overhang supports, deep internal cavities, or intricate geometries. It adheres well to PLA, Tough PLA, CPE, and Nylon ensuring astonishing results for versatile applications.

Key features

- Good thermal stability, resulting in better degradation resistance (when compared to other PVA filaments)
- Can be printed and stored in standard office conditions
- Great adhesion to PLA, Tough PLA, CPE, and Nylon
- Safe dissolution in tap water (no harmful chemicals required)
- Biodegradable with no hazardous by-products

Applications

- Reliable 3D printing of water-soluble support structures for PLA, Tough PLA, CPE, and Nylon build materials
- PVA molds

Colors

Filament specifications

Filament diameter: 2.85 ± 0.1 mm
Net filament weight: 350 g / 750 g
Filament length: ~ 45 m / ~ 96 m
Optimized for: Ultimaker S5 and Ultimaker 3 series

How to dissolve PVA

1. Submerge your 3D print in cold or lukewarm water depending on the build material
2. After PVA supports are dissolved, rinse the 3D print to remove any excess PVA solution
3. Let the 3D print dry and apply additional post processing to the build material if necessary

Quick to remove support for accurate parts

Breakaway

Ultimaker Breakaway is a support material for multi-extrusion 3D printing. Breakaway support is quick to remove and does not need further post-processing for a quality finish on your 3D print. Once removed by peeling away the support, you have a dimensionally accurate part, true to your design. Created for a hassle-free 3D printing experience, Breakaway provides good adhesion to ABS, Nylon, PLA, Tough PLA, CPE, or CPE+.

Key features

- No sanding or waiting for support material to dissolve
- Ensures a quality surface finish on your model
- Prints are dimensionally accurate
- Good adhesion to ABS, Nylon, PLA, Tough PLA, CPE, or CPE+
- Longer shelf life and less moisture-sensitive compared to water-soluble support material
- Ideal for use with build materials that could be sensitive to water

Applications

- Support material for ABS, Nylon, PLA, Tough PLA, CPE, and CPE+

Colors

Filament specifications

Filament diameter: 2.85 ± 0.05 mm
Net filament weight: 750 g
Filament length: ~ 96 m
Optimized for: Ultimaker S5 and Ultimaker 3 series

How to remove Breakaway

1. Begin by removing the majority of the inner support structure, using gripping pliers to tear away the interior area
2. Loosen the support from the model around the corners with cutting pliers. Pull the Breakaway support from the model
3. If a layer of support remains, find a loose edge and peel it away from the model. Remove any final traces with pliers or tweezers

Learn more at ultimaker.com

Material compatibility

Ultimaker's broad range of materials are compatible in various combinations, offering plenty of scope for creativity. However, not all materials work well together. The overview below details which Ultimaker materials can be used in which combination, and which should be used separately.

	PLA	Tough PLA	ABS	Nylon	CPE	CPE+	PC	TPU 95A	PP	PVA	Breakaway
PLA	✓	ⓘ	×	×	×	×	×	×	×	✓	✓
Tough PLA		✓	×	×	×	×	×	×	×	✓	✓
ABS			✓	×	×	×	×	ⓘ	×	ⓘ	✓
Nylon				ⓘ	×	×	×	ⓘ	×	✓	✓
CPE					✓	×	×	×	×	✓	✓
CPE+						ⓘ	×	×	×	ⓘ	✓
PC							ⓘ	ⓘ	×	×	ⓘ
TPU 95A								ⓘ	×	ⓘ	ⓘ
PP									ⓘ	×	×
PVA										×	×
Breakaway											×

✓ Officially supported ⓘ Experimental × Not supported

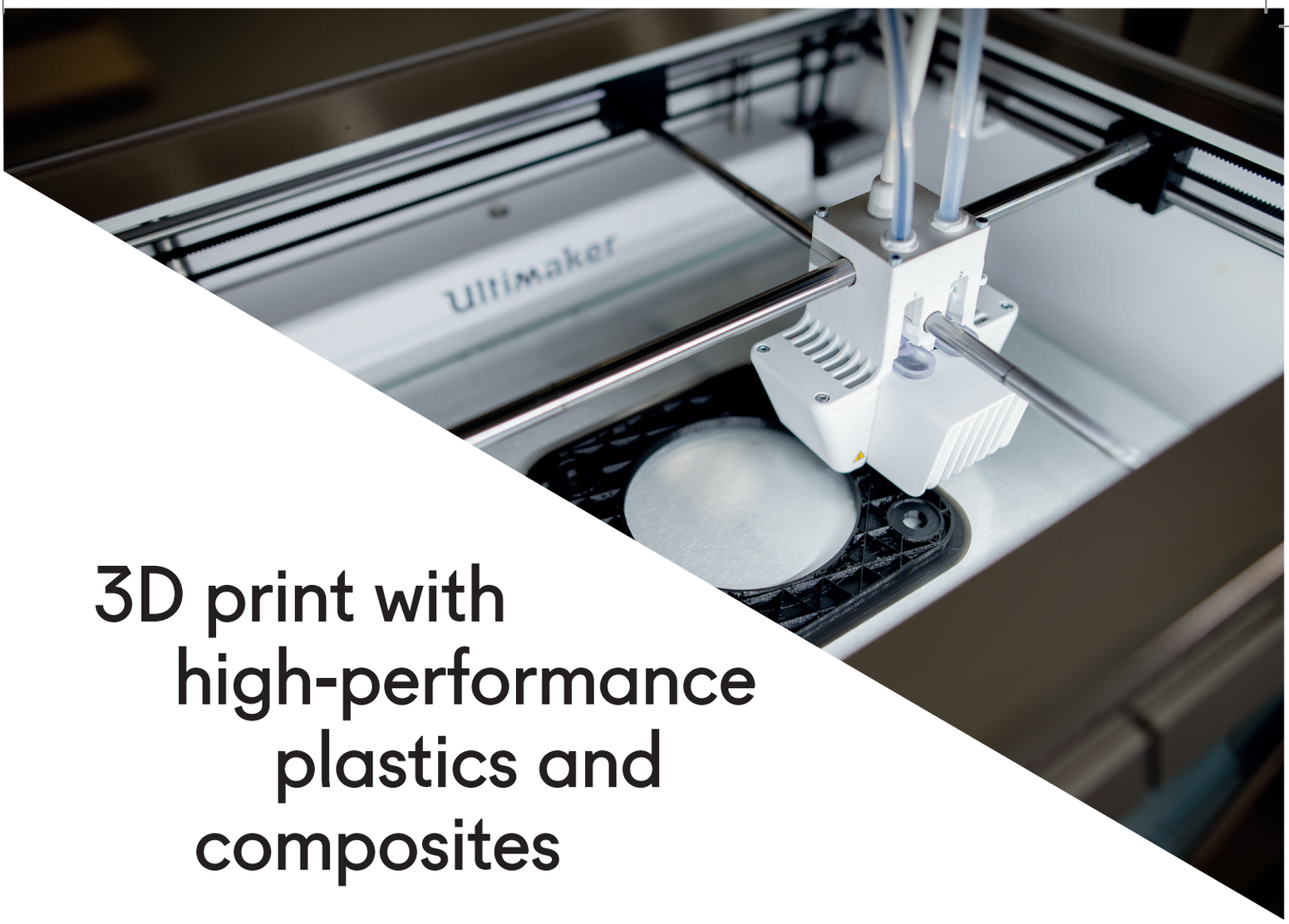
For more information, please visit ultimaker.com/materialcompatibility

Compatibility per printer

Not all printing materials are fully compatible with every Ultimaker 3D printer. This overview details which Ultimaker materials are officially supported, experimental, or not recommended per 3D printer. Please keep in mind that this is applicable for single-extrusion prints only.

	PLA	Tough PLA	ABS	Nylon	CPE	CPE+	PC	TPU 95A	PP	PVA	Breakaway
Ultimaker S5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ultimaker 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ultimaker 2+	✓	ⓘ	✓	✓	✓	✓	✓	✓	✓	ⓘ	×
Ultimaker 2	✓	ⓘ	✓	ⓘ	✓	ⓘ	ⓘ	×	×	×	×
Ultimaker 2 Go	✓	ⓘ	×	×	×	×	×	×	×	×	×
Ultimaker Original+	✓	ⓘ	✓	ⓘ	✓	ⓘ	ⓘ	×	×	×	×
Ultimaker Original	✓	ⓘ	ⓘ*	ⓘ*	ⓘ*	ⓘ*	ⓘ*	×	×	×	×

*These combinations only work experimentally when the heated build plate upgrade is installed.



3D print with high-performance plastics and composites

Ultimaker is the first 3D printer manufacturer in the world to form an alliance with leading materials companies, aligning their advanced third-party materials portfolios with our easy-to-use 3D printing workflow.

With advanced mechanical properties – like increased tensile strength and heat resistance – these advanced polymers and reinforced composites allow the Ultimaker S5 to print even more functional prototype and end-use applications.

Abrasive-resistant to the core

In combination with the reinforced feeder inside the Ultimaker S5, the print core CC Red 0.6 enables an extended lifetime of reliable 3D printing with abrasive composite materials. The nozzle's precision-machined casing and ruby tip is highly abrasion-resistant, tested to print more than 10 kg of abrasive carbon fiber with no loss of print quality. And the print core's swappable design maximizes print performance and machine uptime

.World-leading material profiles

Ultimaker Cura features a library of downloadable print profiles and plugins. With these, the Ultimaker S5 can print with the world's most advanced third-party materials. Composite material profiles have been developed by their manufacturers, and allow you to get perfect results as easily as when using Ultimaker materials. You can also browse and download a wide range of add-ons to optimize your workflow.

Learn more at ultimaker.com

Ultimaker

General inquiries: info@ultimaker.com
Phone: +31 345 71 20 17
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