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 slicing software sets the foundation for the creation of optimized profiles that guarantee a seamless 3D printing experience, from start to finish. These preconfigured profiles automatically adjust material and Ultimaker 3 print core settings in 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 remarkable 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

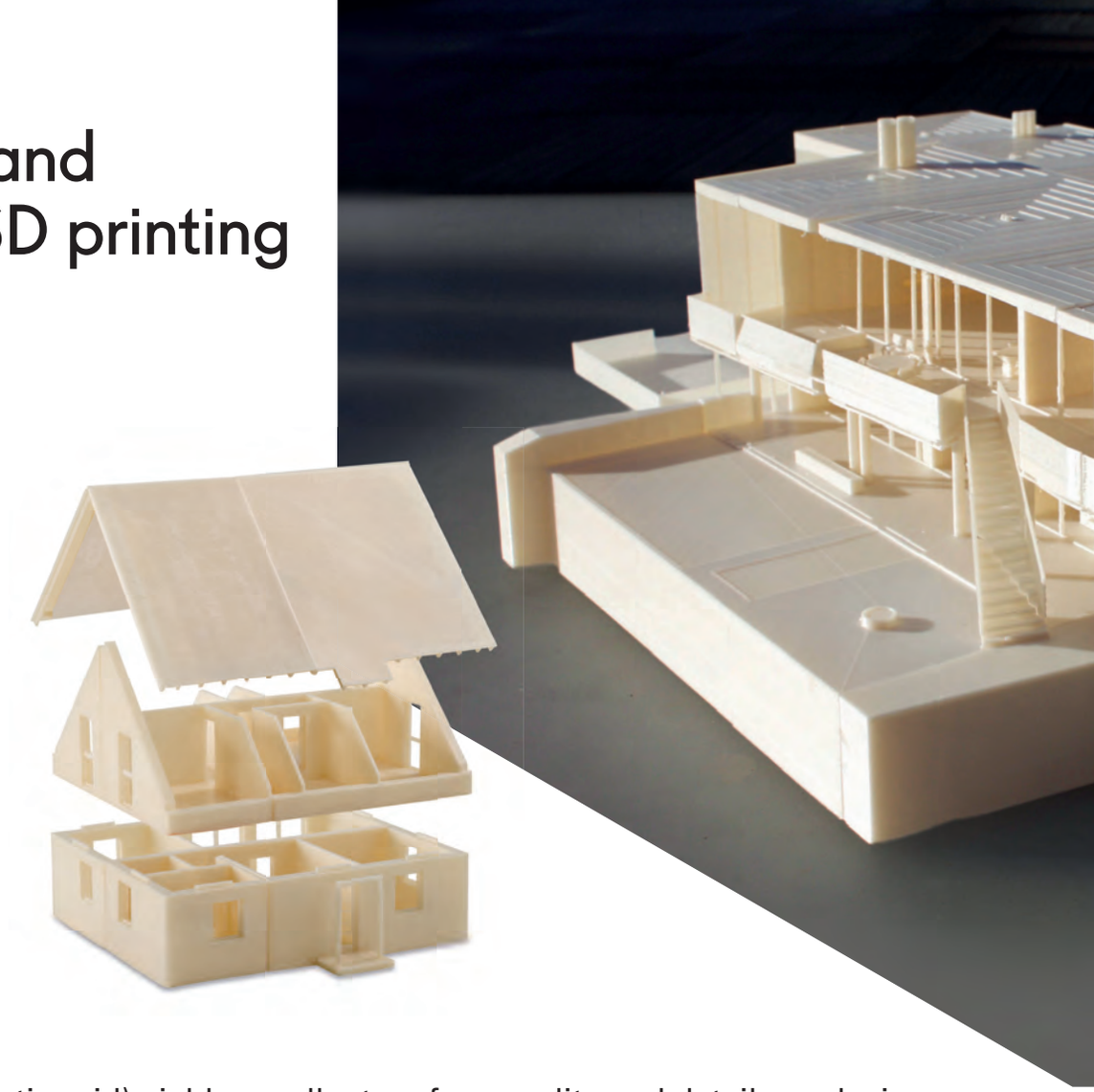
Ultimaker Cura is renowned for producing impressive results. Its preconfigured profiles auto-adjust settings for each material and print core, ensuring greater print success. The open, flexible system lets you customize values, tailoring your 3D printing experience to your exact requirements.

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, and provide technical support in your own language and time zone. Moreover, our local partners ensure the necessary spare part and materials are always in stock for your continuous 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, choose from a wide range 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 as a support material in dual-extrusion prints on the Ultimaker 3

Applications

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

Filament specifications

Filament diameter: 2.85±0.10 mm
Net filament weight: 750 g
Filament length: ~95 m
Optimized for: Ultimaker 3, Ultimaker 2+, and Ultimaker 2 series

Recommended temperatures

Nozzle temperature: 195 - 240 °C
Build plate temperature: 60 °C or on a cold build plate using blue tape

Colors

Learn more at ultimaker.com

Abrasion-resistant and durable

Nylon

Ultimaker Nylon (polyamide grade based on PA6/PA66) 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 a good adhesion to PVA, Ultimaker Nylon allows creating detailed structures and highly 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 as a support material in dual-extrusion prints on the 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 3 and Ultimaker 2+ series

Recommended temperatures

Nozzle temperature: 240 - 260 °C
Build plate temperature: 60 °C

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, and/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 the adhesion sheets supplied in our Advanced 3D Printing Kit
- 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 3 and Ultimaker 2+ series

Recommended temperatures

Nozzle temperature: 205 - 240 °C
Build plate temperature: 85 - 100 °C

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
- Excellent interlayer adhesion, especially when using the front enclosure add-on provided in the Advanced 3D Printing Kit
- 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

Applications

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

Filament specifications

Filament diameter: 2.85±0.10 mm
Net filament weight: 750 g
Filament length: ~107 m
Optimized for: Ultimaker 3 and Ultimaker 2+ series

Recommended temperatures

Nozzle temperature: 225 - 260 °C
Build plate temperature: 80 - 90 °C

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 the front enclosure add-on provided in the Advanced 3D Printing Kit)
- Good build plate adhesion, especially when using the adhesion sheets supplied in our Advanced 3D Printing Kit
- 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 3 and Ultimaker 2+ series

Recommended temperatures

Nozzle temperature: 260 - 280 °C
Build plate temperature: 107 - 115 °C

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 3 and Ultimaker 2+ series

Recommended temperatures

Nozzle temperature: 221 - 235 °C
Build plate temperature: 70 °C or on the cold build plate for the Ultimaker 3

Colors

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 the front enclosure add-on provided in the Advanced 3D Printing Kit)
- Low levels of ultrafine particles (UFPs) and volatile organic compounds (VOCs)
- Compatible with PVA as a support material in dual-extrusion prints on the Ultimaker 3

Applications

- Visual and functional prototyping
- Short-run manufacturing

Filament specifications

Filament diameter: 2.85±0.10 mm
Net filament weight: 750 g
Filament length: ~93 m
Optimized for: Ultimaker 3 and Ultimaker 2+ series

Recommended temperatures

Nozzle temperature: 235 - 260 °C
Build plate temperature: 70 - 80 °C

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 the front enclosure add-on provided in the Advanced 3D Printing Kit)
- Good build plate adhesion (especially when using the adhesion sheet supplied in our Advanced 3D Printing Kit)
- Transparent filament option allows printing of translucent parts

Applications

- Visual and functional prototyping
- Short-run manufacturing

Filament specifications

Filament diameter: 2.85±0.10 mm
Net filament weight: 700 g
Filament length: ~93 m
Optimized for: Ultimaker 3 and Ultimaker 2+ series

Recommended temperatures

Nozzle temperature: 262 - 270 °C
Build plate temperature: 107 - 110 °C

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, 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, 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, CPE, and Nylon build materials
- PVA molds

Colors

Filament specifications

Filament diameter: 2.85±0.10 mm
Net filament weight: 350 g / 750 g
Filament length: ~45 m / ~96 m
Optimized for: Ultimaker 3 and Ultimaker 3 Extended

Recommended temperatures

Nozzle temperature: 215 - 225 °C
Build plate temperature: 60 °C or 70 °C when printing with CPE as a build material

Dissolving steps

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.

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

✓ 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	ABS	CPE	CPE+	Nylon	PC	TPU 95A	PP	PVA
Ultimaker 3 (Extended)	✓	✓	✓	✓[1]	✓	✓[1]	✓	✓	✓
Ultimaker 2+ (Extended)	✓	✓	✓	✓	✓	✓	✓	✓	ⓘ
Ultimaker 2 (Extended)	✓	✓	✓	ⓘ	ⓘ	ⓘ	×	×	×
Ultimaker 2 Go	✓	×	×	×	×	×	×	×	×
Ultimaker Original+	✓	✓	✓	ⓘ	ⓘ	ⓘ	×	×	×
Ultimaker Original	✓	ⓘ[2]	ⓘ[2]	ⓘ[2]	ⓘ[2]	ⓘ[2]	×	×	×

✓ Officially supported ⓘ Experimental × Not supported

(1) These combinations are only officially supported for the 0.40 mm print cores.
(2) These combinations only work experimentally when the heated build plate upgrade is installed.

Learn more at ultimaker.com

Ultimaker

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