PROTOFORM 3D

3D SCANNING, DESIGN & PRINTING SERVICES

CAD, 3D DESIGN AND FILE PREPARATION

We collaborate with you to understand your product design goals.
By utilizing CAD and 3D modelling software, we transform your ideas into final models ready for manufacturing or marketing applications.

CAD / 3D Modelling	Depending on your specific goals and product design ideas, we utilize two main categories of 3D design software to create or modify your models: • CAD (Computer-Aided Design) software: Designed for technical accuracy, CAD tools are ideal when your project requires precise measurements, tolerances, and mechanical functionality. This makes them the go-to choice for parts intended for manufacturing or engineering applications. • General 3D modelling software: These programs are more flexible and artistic, making them better suited for projects where aesthetic form matters more than exact dimensions — for example, sculptures, game assets, or conceptual mock-ups. By selecting the right tool for the job, we ensure your design is created with both its purpose and production method in mind.
3D Rendering	3D rendering transforms digital 3D models into still 2D images, using either photorealistic or stylised visual styles depending on your project's needs. These renders act like virtual photographs — showcasing your product in its intended environment without needing a physical prototype. As a result, they're commonly used for early-stage evaluation, presentations, or digital marketing materials. By using specialised software, we can apply different visual treatments to your model and scene. For example, we might simulate realistic lighting conditions, add material textures to the model, or use stylistic filters to match your brand or mood.
3D Animation	3D animation brings your models to life by creating dynamic video clips that showcase how a product works, moves, or assembles within a digital environment. Unlike traditional 2D animation, this process uses 3D model files and computer-generated scenes to visualise movement, functionality, or key features with cinematic flair. It's a powerful way to convey complex ideas clearly. Depending on your goals, animations can demonstrate the product lifecycle, show step-by-step assembly or disassembly, or highlight critical features from multiple angles — making them ideal for marketing, instruction, or design validation.

CONTACT@PROTOFORM-3D.COM

3D SCANNING

We use a portable 3D scanner to capture real-time scans of physical objects — such as your products — and convert them into accurate digital 3D model files.

These files can be used for a wide range of applications. You might want to:

- Reproduce an object with 3D printing.
- Use the scan as a blueprint to design new components that fit and function precisely.
- Generate digital assets for video games or animations using the scan as a foundation.

We offer flexible post-processing options based on your needs. Whether you just need the raw 3D model file for your own use, or prefer a fully polished result as part of a wider project, we'll tailor our service to suit your workflow.

Minimum Scan Volume:	10 x 10 x 10mm
Maximum Scan Volume:	4000 x 4000 x 4000mm
Working Distance:	100 - 1000mm
Scan Quality:	Up to 0.02mm precision and 0.05mm accuracy
Colour Scanning:	48-megapixel RGB camera with 8K colour capture
3D Light Source:	Class 1 Infrared Light
Scanning Environment:	Indoors and Outdoors possible (avoiding direct sunlight)
Object Tracking Methods:	Feature, Marker
Special Object Scanning:	Scanning spray can be used to assist with scanning some transparent, dark or highly reflective objects in varying degrees of success. Other objects may require painting prior to scanning to improve the quality.
Output Formats:	.PLY, .OBJ or .STL

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3D PRINTING

Whether you already have a finished 3D model or need help getting one ready, we're here to bring your ideas to life with precision 3D printing.

Once your file is good to go, we'll produce your parts in the volumes you need — whether it's a one-off prototype or a small production batch.

FDM PRINTING

FDM (Fused Deposition Modelling) is a 3D printing method that uses a continuous thermoplastic filament to build objects layer by layer. The filament is fed from a spool into a heated extruder, where it melts and is precisely deposited onto the build plate. As it cools, the material solidifies — gradually forming your part or product.

We typically print using grey PLA+ (Polylactic Acid), a popular and versatile material. However, we offer a range of alternative filaments in different colours and materials, and we're always evaluating new options to expand our capabilities.

You can explore our material options in the following table, or if you're not sure which filament suits your project best then we'll help you select the most appropriate material based on your intended use, aesthetics, and required strength. Contact us to discuss your project.

Material	Properties	Positives	Negatives	Potential Applications	Colours Available
PLA+	• Tensile strength – 63 MPa • Elongation at break – 20% • Flexural strength – 74 MPa • Impact strength – 9 kJ/m²	• Biodegradable & corn-based • Non-toxic • Easy to print • Printable at high speed • High visual quality & easy to post-process • Smooth printed surfaces • Good toughness & hard to break	• Low temperature resistance, can become malleable and begin to deform at ~60°C • No/low chemical or water resistance • Not UV resistant • Not fatigue resistant, low durability • Poor longevity • Low flexibility & brittle	• Prototypes • Decorations • Mechanical parts • Cosplay & props Covers & cases • Toys	• Grey • Black • White • Natural • Red • Yellow • Blue • Green • Purple • Pink • Orange
Impact PLA	• Tensile strength – 34.3 MPa • Elongation at break – 90% • Flexural strength – 43 MPa • Impact strength – 63 kJ/m²	• The same as PLA+ • Significantly higher impact resistance compared to PLA+ • Higher stretch before failure compared to PLA+	• More expensive than PLA+ & PETG • The same as PLA+ • Lower tensile strength than PLA+ • Lower flexural strength than PLA+	• Prototypes • Decorations • Mechanical parts • Cosplay & props • Protective covers & cases	• Grey • Black • White

PETG	• Tensile strength – 52.2 MPa • Elongation at break – 83% • Flexural strength – 58.1 MPa • Impact strength – 4.7 kJ/m²	• Transparent colour options are available • Higher temperature resistance than PLA • High chemical & water resistance • Resists repeated stress without cracking • Good durability • Better UV resistance than PLA • Greater flexibility and elongation before breaking (vs PLA+)	• Moderate heat resistance – softens at ~75°C, limiting high-heat applications • Not as impact-resistant as ABS or nylon • More difficult to sand, glue, or paint than PLA • Long-term UV exposure may cause colour fading and reduced structural strength • Surface is prone to scratching, which can reduce clarity and finish over time	• Prototypes • Snap-in parts • Mechanical parts • Waterproof applications • Liquid containers • Display and advertising products • Outdoor & sports applications	• Grey • Black • White • Red • Yellow • Blue • Green • Purple • Orange
TPU (95A)	• Tensile strength – 35 MPa • Elongation at break – ≥800% • Flexural strength – 68 MPa • Impact strength – 7.6 kJ/m² • Shore Hardness – 95A	• Extremely flexible and elastic • High toughness, durability & impact resistance • High abrasion & tear resistance • Resists UV, water, and some chemicals • Stretches far more than most materials before breaking (≥800%)	• Begins to soften at temperatures above ~50°C • Most expensive of our standard materials • Difficult to sand, paint, or bond with adhesives • Not ideal for finishing — prints are best left as-is	• Flexible covers/cases • Vibration dampers/shock absorbers • Cosplay armour & wearable props • Automotive & robotics parts, wheels • Footwear & sporting goods • Soft prosthetic components	• Clear • Grey • Black • White • Red • Yellow • Blue • Green • Purple • Pink • Orange
Other	Our 3D printers can handle a wide range of materials beyond those listed above, including advanced engineering filaments such as: • ABS • ASA • Nylon (various blends) • Carbon fibre-reinforced filaments • And more, on request.				

You may also download our 'FDM Printing Design Guidelines' PDF to learn about the key design elements that require extra consideration when preparing a part for 3D printing.

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PRODUCT FINISHING

Whether you're printing a one-off prototype or a full batch of products for sale, we offer a range of surface finishing options to give your prints the right visual and tactile impact.

Prefer to handle finishing yourself or use a third party? No problem — we can ship your prints exactly as they come off the printer, with no post-processing applied.

Level	Code	Process
None		No post-processing applied. Prints are delivered exactly as they come off the printer — ideal for prototypes, internal parts, or where visual finish is not a priority.
Basic	B1	Printed support material removed.
	B2	Printed support marks smoothed.
	B3	Print seam marks smoothed.
	B4	External surfaces smoothed.
	B5	Print washed in cleaning solution.
	B6	Multi-part assembly and glueing.
Standard	S1	External surfaces coated in filler & smoothed.
	S2	External surfaces polished.
	S3	Print coated in clear lacquer.
Detailed	D1	Surfaces primed for application of paint or speciality coating.
	D2-A	Surfaces coated in paint (satin/gloss/textured).
	D2-B	Surfaces rubberised with plastic-based coating.
	D2-C	Surfaces electro-plated for metallic finish.
	D2-D	Custom coating on surfaces.
	D3	Application of clear lacquer over coatings.
	D4	Further assembly or fitting of additional components.

Material Compatibility Note - the finishing processes above apply fully to prints made in PLA+, Impact PLA, and PETG.

For example, a multi-part PLA+ print finished to level 'D2-A' (decorative paint) would require the following process steps:

- B1 - B6
- S1
- D1 - D2-A

TPU prints are only suitable for Basic finishing, and [B6] (assembly) may be less reliable due to the material's flexibility. We recommend designing TPU prints to minimise the need for post-processing.

For all other materials, we'll be happy to discuss your requirements to determine what's achievable.

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Consultation & Advice

If you're working on a part or product design and need expert guidance to ensure everything is on track, we're here to help.

Whether you're designing for digital workflows, manufacturing, or 3D printing, our team brings the experience and insight needed to help you avoid common pitfalls and get your model production-ready.

From one-off advice to full design reviews, we support you in making sure your final result is functionally sound, fit for purpose, and ready to perform.

Common Questions & Project Scenarios

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FAQS

Can I use Protoform 3D for both scanning and printing, or just one service at a time?	Absolutely — you're free to use as many or as few of our services as your project requires. Some clients come to us with a physical object they need digitised through 3D scanning, while others already have a model and simply need printing. Many projects benefit from the full 3D scanning, design, and printing workflow, but we're happy to support just the parts you need. Our goal is to make the process as seamless and flexible as possible for you.
What if my 3D model file does not meet the requirements listed?	If your model does not meet all of the criteria listed in the Printing Design Guidelines for the selected 3D printing technology, your parts could take longer to print or be more likely to fail during the printing process. Before we print any of your parts, we inspect and analyse your files to identify any issues and pre-emptively detect potential failures. It's not a perfect system, and we're not able to guarantee on-time delivery for parts that don't meet the above criteria. If the model falls short of these guidelines, we are unable to take responsibility for defects in the final print — so please follow them carefully.
Which of the Printing Design Guidelines criteria are most important?	Some of these guidelines are critical — for example, we cannot print single parts that exceed the maximum size listed. Others, such as moving part clearances, may not apply to every design. These criteria only affect features actually present in your model, so it's essential to consider each one carefully during the design phase to ensure successful results.

If my part does not meet the guidelines, will Protoform 3D still print it?	We inspect all parts for major defects that might affect our printing process. However, not every guideline can be automatically checked. If we detect potential issues, we'll get in touch before printing — but we can't guarantee we'll catch everything. If your parts fail to meet the design guidelines, we will not be able to take responsibility for any defects.
What happens if my part is below the minimum wall thickness?	Thin areas of your model that fall below our minimum thickness are much more likely to print incorrectly. Walls that are too thin may disappear or cause missing sections in the final print due to printer limitations.
Can Protoform 3D edit my model to make it fit the guidelines?	Yes — you can use our CAD/3D modelling services to alter and optimise your design for 3D printing. We'll help you prepare your model so it meets the technical requirements. Get in touch through the Contact Us page and let us know what you need. Don't forget to attach your files!

COMMON USE CASES

For SMEs: Part replication, scanning legacy parts	Small and medium enterprises (SMEs) often face challenges sourcing discontinued or obsolete parts. With our high-accuracy 3D scanning services, we help manufacturers, repair engineers, and fabricators reverse engineer mechanical components, housings, jigs, and fixtures. Ideal for industrial part replication, we provide digital twins and printable replacements to reduce downtime and extend the life of valuable equipment.
For Entrepreneurs: MVP prototyping & product iterations	Launching a new product or hardware start-up? Our on-demand 3D printing and scanning services support rapid prototyping, early-stage MVP development, and design validation. With fast turnaround and no minimum order quantities, entrepreneurs can test and iterate affordably. We support everything from ergonomic testing to fit/form trials for functional parts or product mock-ups.
For Hobbyists: Custom parts, cosplay, home repairs	Whether you're restoring a vintage item, making a cosplay masterpiece, or fixing a broken appliance, we make custom 3D scanning and printing accessible for makers and DIYers. We specialise in bespoke parts, fan replicas, and home fix solutions that aren't available off the shelf. No CAD knowledge? No problem — we can digitise and recreate real-world objects from physical samples or sketches.

Ready to start working on your project? Contact us now!