

What 3D printing can do - and what it can't

So your part matches the technology: an honest assessment before you order.
No sugar-coating.

3D printing is often sold as a miracle technology. It isn't - but for many tasks it is **exactly the right choice**. This page says openly what the process is good for and what it isn't. We are a printing service and have an economic interest in your order - **precisely for that reason** we would rather tell you in advance when another solution is better.

THE SHORT ANSWER

Strong for

- ✓ complex shapes that can't be made otherwise
- ✓ one-offs & small series (no tooling needed)
- ✓ prototypes & fast iterations
- ✓ individual parts (each different, no surcharge)
- ✓ spare parts that no longer exist

Weak for

- ✗ mass series (from ~1,000 pcs injection moulding gets cheaper)
- ✗ very tight tolerances & fits (without rework)
- ✗ maximum strength in every direction
- ✗ permanently hot/humid/outdoor use (material-dependent)
- ✗ safety-critical load parts without qualification

THREE HONEST CLARIFICATIONS

"3D-printed means automatically strong enough"

Printed parts are **weaker in the build direction** than across it - often only 40-70 % of the strength. For load-bearing parts we plan the print direction deliberately. Tell us how the part will be loaded.

“It'll fit to the millimetre”

FDM printing typically hits $\pm 0.3-0.5 \text{ mm}$, resin printing is more accurate. For exact fits, threads or sealing faces we rework or add threaded inserts. Please state very tight tolerances up front.

“PLA lasts forever and everywhere”

PLA is great for prototypes and decor, but **softens from $\sim 55-60^\circ\text{C}$** and dislikes sustained load, moisture or sun. For car, outdoor or heat we recommend PETG, ASA, nylon, etc.

GOOD TO KNOW

Surface

FDM has visible layer lines. Smooth is possible via resin printing or rework (sanding/painting).

Reproducibility

Series are possible, but every process varies. For consistent parts we lock the process.

Material matters

Not "3D printing" but the material decides strength, heat and outdoor suitability.

Complexity for free

Elaborate shapes cost barely more – here printing is often unbeatably cheap.

Not sure whether your part fits?

Send us the idea, sketch or file and tell us **how the part will be used and loaded**. We'll say honestly whether 3D printing makes sense, which material fits – or whether another process would be better. office@schicht-werk.eu

MORE DEPTH

The technical background (anisotropy, tolerance classes, test methods, references) is in the scientific paper:

→ [Capabilities and Limits of Additive Manufacturing \(PDF\)](#)

No cooperation with the weapons, military or defence industry

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Information to the best of our knowledge; specific values are process- and material-dependent