



Material Selection Worksheet

You don't have to name a material. Describe the environment the part lives in and we'll suggest options. Fill this in, photograph it, and send it with your files — or just use it to work out what you actually need before you start a quote.

YOU DESCRIBE

The environment — load, heat, chemicals, sunlight, contact

WE SUGGEST

Material and process together, because they're coupled

MINIMUM ORDER

\$25 per order

1 What the part does

The first two boxes do most of the work. Everything after them narrows the answer.

What is the part, and what does it do? — and what it attaches to or fits inside

What can it absolutely not fail at? — the failure that would cost you the most

2 Load

Describe what pushes, pulls, twists or bangs into it. Numbers if you have them, a comparison if you don't.

What load does it carry? — weight, force, pressure, or “about as much as a person leaning on it”

Steady load, or repeated and shock? — cycles and impacts break parts that hold static weight fine

Does it flex, stay rigid, or wear against anything? — sliding, rubbing, pivoting

3 Temperature and environment

Service temperature is where most polymer choices are won or lost. Give the extremes, not the average.

Hottest it gets, and for how long

Coldest it gets

Indoors, outdoors, wet, humid, salt air, submerged? — UV and weather change the shortlist

Anything else in the environment worth knowing — vibration, dust, steam, pressure washing

4 Chemicals and contact

Name the chemicals rather than the category. “Solvent resistant” isn’t a specification; “wiped down with isopropyl alcohol daily” is.

Which chemicals does it touch? — including cleaners, fuels, oils and coolants

At what concentration, and at what temperature?

How long is the exposure? — a wipe, a soak, or permanently immersed

Food, drink or skin contact? — and any standard your buyer requires

5 Appearance

Cosmetic requirements are a separate cost from functional ones. Say if the part will be seen, handled or photographed.

Will anyone see it in use? — hidden, visible, or the whole point

Color, and does it have to match something?

Surface: as-cut, sanded, blasted, polished, coated?

Which surfaces are cosmetic and which aren't? — it changes how the part is fixtured and inspected

6 Quantity and budget

One, ten, a hundred and ten thousand are four different answers, not one answer at four scales.

How many now?

How many later, realistically?

Prototype, first article, or production run?

Is there a target cost per part? — it narrows the material list fast

What worries you most about this part? — the bit you think might be difficult

7 Two things people misread

☐ **Strength is not one number**

Tensile, yield, impact and fatigue are different questions, and an FDM part is weaker between layers than within them. Tell us how it must not fail.

☐ **Chemical resistance is conditional, not a grade**

It depends on the specific chemical, its concentration, the temperature and how long the exposure lasts — which is why supplier charts rate materials chemical by chemical.

☐ **If the environment is aggressive, test a sample in it**

A published compatibility rating is a starting point, not a guarantee for your combination of chemical, heat and time. A sample in the real environment settles it.

If you already have a material in mind

Say so, and say why. Sometimes the reason is a real constraint we have to design around. Sometimes it's a habit, and there's a cheaper or better option once we know what the part actually has to survive.