3D Printing Materials Comparison Chart 2026

The 10 most-used FDM filaments compared side by side: printing settings, physical properties and real-world performance. The 10 are ranked by how widely each polymer family is sold and printed by hobby and prosumer FDM users in 2026 (PLA leads the segment at roughly 23 percent), combined with consistent inclusion across the major filament guides. Performance is shown as bands rather than single lab numbers, because strength, impact and heat figures vary by brand, grade and how a part is printed. Treat every value as a calibrated starting point, not a datasheet guarantee.

Table 1: Printing and cost

#	Material	Best use	Nozzle	Bed	Enclosure	Ease	EUR/kg
1	**PLA**	Models, prototypes, indoor and decorative parts	190-220 C	50-60 C	Not needed	Beginner	18-28
2	**PETG**	Everyday functional parts, watertight and mechanical	230-250 C	70-85 C	Not needed	Intermediate	20-30
3	**ABS**	Heat-resistant functional parts on an enclosed printer	230-255 C	95-110 C	Required	Advanced	20-32
4	**ASA**	Outdoor and UV-exposed parts	240-260 C	95-110 C	Required	Advanced	30-45
5	**TPU**	Flexible parts, gaskets, grips, phone cases	210-235 C	40-60 C	Not needed	Expert	35-55
6	**Nylon (PA)**	Gears, living hinges, high-wear mechanical parts	250-280 C	70-110 C	Recommended	Expert	45-70
7	**PC (Polycarbonate)**	Maximum strength plus heat: fixtures, lighting, helmets	260-310 C	100-130 C	Required	Expert	45-80
8	**Carbon-fiber composites**	Stiff, dimensionally stable structural parts, drone frames	220-290 C	45-120 C	Recommended	Advanced	50-90
9	**PVA**	Water-soluble support for complex overhangs	185-215 C	45-60 C	Not needed	Intermediate	60-110
10	**HIPS**	Dissolvable support for ABS; light, machinable parts	230-245 C	100-110 C	Recommended	Intermediate	25-35

Typical starting settings and indicative 2026 EU retail price for standard 1 kg spools. Carbon-fiber composites need a hardened steel nozzle; PC and nylon need an all-metal hotend and dry filament. Exact values depend on printer, hotend and filament brand.

Table 2: Material performance

Material	Density	Strength	Impact / toughness	Heat resistance	UV resist.	Moisture sens.
PLA	1.24	High but brittle	Low	Low (~55 C)	Poor	Low
PETG	1.27	High	Very high	Medium (~75 C)	Good	Medium
ABS	1.05	Medium to high	High	High (~100 C)	Poor	Low
ASA	1.07	Medium to high	High	High (~100 C)	Excellent	Low
TPU	1.20	Low (flexible)	Extreme	Low (~60 C)	Good	High
Nylon (PA)	1.02-1.15	High	Superb	High (~90 C+)	Medium	Extreme
PC (Polycarbonate)	1.20	Highest	High	Highest (~110 C+)	Good	High
Carbon-fiber comp.	1.10-1.30	Very high, stiff	Medium (< base)	Follows base	Follows base	High
PVA	1.20	Low (support)	Low	Low	Poor	Extreme
HIPS	1.04	Medium	Medium to high	Medium (~90 C)	Poor	Low

Density is in g/cm3 for the base polymer; fillers such as carbon fibre, wood or metal raise it. Heat resistance is the point near the glass transition or deflection temperature at which unsupported parts start to soften, not the maximum survivable temperature.

Quick picks: Learning or decorative -> PLA. One material for most functional work -> PETG. Hot car interior or engine bay -> ABS or PC. Years outdoors in sun -> ASA. Flexible -> TPU. Hard-wearing gears -> nylon. Maximum stiffness for its weight -> a carbon-fiber composite. Soluble support for fine overhangs -> PVA (or HIPS alongside ABS).

Honorable mentions (outside the top 10)

PP (Polypropylene)	Very low density (it floats), excellent chemical and fatigue resistance, natural living-hinge behaviour. Warps badly and is fussy about bed adhesion.
PCTG	A tougher, clearer cousin of PETG with better layer adhesion and impact resistance. A strong upgrade once you are comfortable with PETG.
PVB	Prints like PLA but can be vapour-smoothed with isopropyl alcohol to a glossy, near-transparent finish. Popular for display pieces.
Filled aesthetic PLA	Wood, metal, marble, glow and silk blends. PLA-easy printing with a distinctive look; abrasive ones need a hardened nozzle.
PEEK and PEI (ULTEM)	Aerospace and medical grade, very high heat and chemical resistance. Need 300 C+ hotends, a heated chamber and a hardened nozzle.
PPS and PVDF	Specialist chemical and flame-resistant engineering polymers for demanding industrial parts.

Work the numbers

- Material cost calculator (PLA vs PETG vs ABS): covertitall.com/converters/3d-print-material-cost-calculator.html
- Filament density and weight: covertitall.com/converters/filament-density-weight-calculator.html
- Weight to length converter: covertitall.com/converters/filament-weight-length-calculator.html
- Print time estimator: covertitall.com/converters/print-time-estimator.html
- Interactive sortable comparison: covertitall.com/converters/3d-printing-materials-comparison.html

CovertItAll.com - free printable reference for makers. Full interactive tools and the live web version of this chart at covertitall.com/printables/filament-comparison-chart.html. Values are typical starting points; verify against your filament brand and printer. 2026 edition, reviewed June 2026.