Which filament survives a dishwasher?

Asked 3D Content Team
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Abstract. Manufacturer HDT and Tg figures for PLA, PETG, ABS, ASA, nylon, PC and PP set against the 150 °F dishwasher sanitize rinse, with margins in °C.

Keywords: replacement-parts, home-repair, petg, abs

Table 1. The number

Material	Example product (manufacturer)	HDT (state load)	Tg	Verdict against 66 °C sanitize rinse
Polypropylene (PP)	PP Filament (Fiberlogy)	51 °C at 0.45 MPa	-31 °C	below
PLA	PLA Basic (Bambu Lab)	57 °C at 0.45 MPa (54 °C at 1.8 MPa)	60 °C	below
PETG	PETG Basic (Bambu Lab)	71 °C at 0.45 MPa (68 °C at 1.8 MPa)	69 °C	above by 5 °C
ABS	ABS Extrafill (Fillamentum)	81 °C at 1.8 MPa	not stated on sheet (Vicat 103 °C)	above by 15 °C
ASA	Prusament ASA (Prusa Polymers)	93 °C at 0.45 MPa (86 °C at 1.8 MPa)	not stated on sheet	above by 27 °C
Polycarbonate (PC)	PC (Bambu Lab)	112 °C at 0.45 MPa (117 °C at 1.8 MPa)	145 °C	above by 46 °C
Nylon (PA)	PA6-CF, carbon fiber filled (Bambu Lab)	186 °C at 0.45 MPa (164 °C at 1.8 MPa)	68 °C	above by 120 °C

1 What filament survives dishwasher or under-hood heat?

A residential sanitize rinse reaches about 150 °F (66 °C), and a normal wash runs at roughly 120 to 140 °F (49 to 60 °C). ABS, ASA, polycarbonate (PC) and nylon (PA) carry a heat deflection temperature above 66 °C with margin. PETG clears it by a few degrees. PLA and polypropylene (PP) sit below it.

1.1 The number

Figures from Fiberlogy, Bambu Lab, Fillamentum and Prusa Polymers data sheets, margins on the 0.45 MPa value where given.

1.2 Why

The heat deflection temperature (HDT) is where a loaded test bar bends a set amount. The glass transition temperature (Tg) is where the polymer turns rubbery. A part on a rack carries little load, but it creeps once hot water sits near Tg. Prusa's guide says PLA gets soft and deforms above 60 °C.

Water is the second problem. Nylon is hygroscopic: it takes up water from the air. Prusa says polyamide can absorb water up to 10 % of its weight, and the Bambu Lab PA6-CF sheet lists 2.35 % saturated uptake against 0.43 % for PLA Basic. Wet nylon swells and softens, so its dry HDT overstates what a wet part can take.

ABS, ASA and PC shrink more on cooling, so parts warp and layers split without an enclosure. A weak layer bond opens further under repeated hot and cold cycles. Prusa's food-safety guide also warns that layer grooves hold residue and bacteria.

This page covers dishwasher heat only. No under-hood figure was sourced.

1.3 How to check it on your own print

1. Soak the part in water at the sanitize-rinse temperature, about 66 °C, until it is heated through, then press it while warm. Any give means it will not survive a sanitize rinse.
2. Run one real cycle on the top rack, away from the heating element, touching nothing else.
3. Check for warp on a flat surface and for whitening along layer lines. Repeat the check after a few more cycles before trusting the part.

2 Is 3D printed PLA dishwasher safe?

No. Standard PLA softens at about 60 °C (140 °F), its glass transition temperature (Tg). A normal wash at 120 to 140 °F already reaches that edge. The 150 °F (66 °C) sanitize rinse passes it, and PLA parts warp or sag out of shape. Wash PLA prints by hand in water below 140 °F instead.

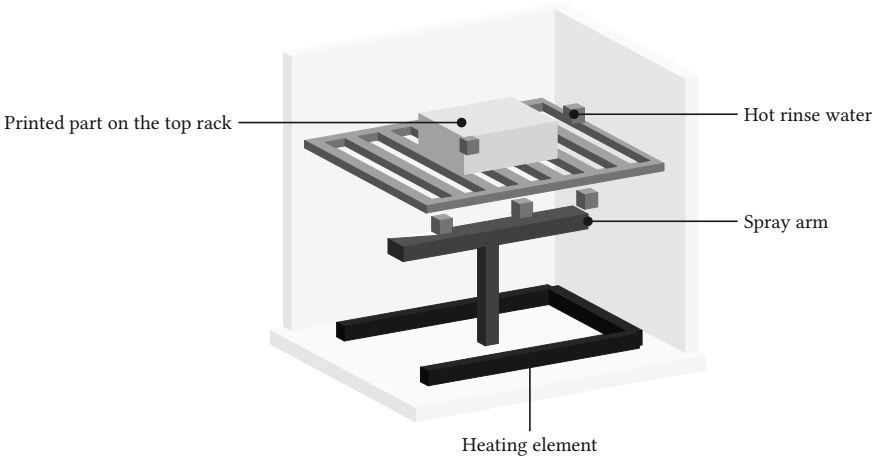


Figure 1. The top rack keeps a print off the heating element, but the hot rinse water still reaches every rack.

2.1 Does the top rack make PLA dishwasher safe?

No. GE sets its sanitize target by the water temperature inside the dishwasher, not at one rack. With Heated Dry on, GE runs the dry cycle after that rinse, so the part stays hot longer. The top rack keeps a print off the heating element. The water still reaches PLA's Tg.

2.2 Does heat-resistant or annealed PLA survive the dishwasher?

Annealed high-temperature PLA clears the rinse. As printed, it falls short.

Table 2. Does heat-resistant or annealed PLA survive the dishwasher?

PLA type	HDT at 0.45 MPa	Against the 66 °C sanitize rinse
PLA Basic (Bambu Lab), as printed	57 °C	below by 9 °C
HT-PLA (Polymaker), as printed	61.4 °C	below by 4.6 °C
HT-PLA (Polymaker), annealed 30 min at 80 to 90 °C	107.2 °C	above by 41 °C

Figures from the Bambu Lab PLA Basic and Polymaker HT-PLA technical data sheets. Polymaker says HT-PLA holds its shape up to 150 °C under its own weight without post-processing. A clip or press-fit carries more load than that, so plan on the annealed figure.

Annealing moves the part's dimensions. CNC Kitchen annealed standard PLA at 100 °C for 45 minutes and measured changes of up to 10 %: shrinkage in X and Y, growth in Z. The change varied too much to correct by scaling the model, so anneal a test copy before the real part.

Heat is one question and food contact another: whether a printed part is safe against food depends on the surface, the nozzle and the material's certification.

2.3 How to wash and test a PLA print

1. Hand-wash in warm, soapy water below 140 °F (60 °C) and let it air dry.
2. To try the dishwasher anyway, print a sacrificial copy and run it through one normal cycle with Sanitize and Heated Dry off.
3. Lay it on a flat surface and test it against its mating part. Any warp or loose fit means the real part gets washed by hand.

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