Can 3D printers print rubber?

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Abstract. Not vulcanized rubber, which never melts. Filament printers print rubber-like TPU and TPE in 60A to 95A Shore grades, spanning Parker's 70A to 80A O-ring range.

Keywords: tpu

Table 1. Flexible filament hardness against rubber

Material	Shore hardness	Maker	Source
Filaflex 60A, TPU filament	60A	Recreus	Product page
Filaflex 70A, TPU filament	70A	Recreus	Product page
Filaflex 82A, TPU filament	82A	Recreus	Product page
NinjaFlex, TPU filament	85A	NinjaTek	Data sheet, ASTM D2240
PolyFlex TPU95, TPU filament	95A	Polymaker	Data sheet, ISO 7619-1
TPU 95A HF, TPU filament	95A grade	Bambu Lab	Data sheet, grade name only
O-ring rubber, Parker's range for most uses	70A to 80A	Parker Hannifin	O-Ring Handbook
Silicone 40A Resin, for resin printers	40A	Formlabs	Product page

1 Can 3D printers print rubber?

Not on a filament printer: vulcanized rubber is a thermoset whose crosslinked chains never melt. Filament printers print rubber-like thermoplastic elastomers (TPE) such as TPU (thermoplastic polyurethane), in grades from 60A to 95A Shore hardness that span the 70A to 80A Parker Hannifin recommends for most O-rings. Printing silicone rubber takes a resin or industrial printer.

1.1 Flexible filament hardness against rubber

Every figure is the maker's own; Bambu Lab's sheet names the 95A grade without a measured value. A higher Shore A number is harder: Parker notes the durometer reads 100 on flat glass or steel.

1.2 Why a filament printer cannot melt rubber

Vulcanizing ties rubber's polymer chains together with bridges of sulfur atoms. The Polymer Science Learning Center explains that once crosslinked, the object "can no longer be shaped", which is why it does not melt. Parker defines vulcanization as a thermosetting reaction.

A TPE flexes like rubber but, in The Madison Group's words, is "melt processable like thermoplastics". NinjaTek lists a melting point of 216 °C (420 °F) for NinjaFlex. The Prusa Knowledge Base treats every flexible filament, whatever its trade name, as a TPE.

Real rubber keeps an edge: The Madison Group says thermoset rubber generally outperforms TPEs on heat, chemicals and sustained stress. For a seal, can you 3D print a gasket covers when printed TPU works and when to buy an O-ring.

1.3 Can you 3D print polyurethane?

Yes, as thermoplastic polyurethane. NinjaTek makes NinjaFlex from "a specially formulated thermoplastic polyurethane (TPU)", and Polymaker and Bambu Lab describe PolyFlex TPU95 and TPU 95A HF the same way. Whether a TPU print holds water is covered in is 3D printed TPU waterproof.

1.4 Softer grades are harder to print

"The softer the filament is, the harder it is to print," says the Prusa Knowledge Base, which gives 20 mm/s as typical for flexibles and 30 to 40 mm/s as the maximum. Recreus does not recommend Filaflex 60A or 70A for Bowden extruders (which push filament down a long tube) and recommends direct extrusion for 82A. Bambu Lab rates the harder TPU 95A HF for under 200 mm/s.

1.5 Silicone: true rubber on other printers

Formlabs sells Silicone 40A Resin for its Form 3 and Form 4 resin printers and calls it "the first accessible 100% silicone 3D printing material". Lynxter builds industrial printers, the S300X and S600D, for liquid materials including silicone.

1.6 How to check a spool or a printed part

Compare a solid printed sample with a rubber part whose hardness you already know.

1. **Read the label.** Look for TPU or TPE in the material name and a Shore rating ending in A, such as 85A. If the box has none, check the maker's data sheet.

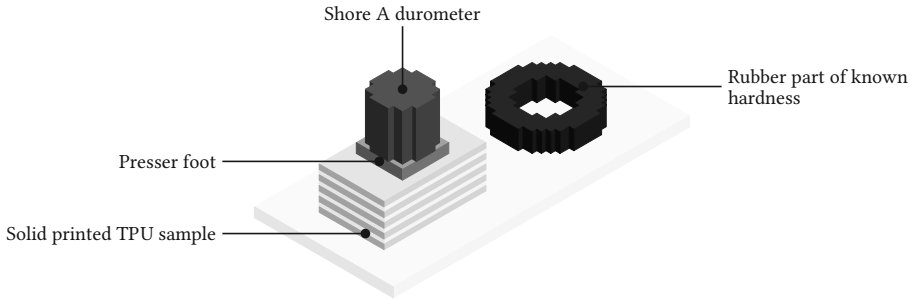


Figure 1. Squeeze a solid printed sample beside a rubber part you know, or press a Shore A durometer flat on each, and compare.

2. **Print a solid sample.** Use 100 percent infill so you test the material, not the infill; NinjaTek measures hardness on a solid block.
3. **Squeeze it beside a rubber part you know.** Pinch each between finger and thumb. On a Parker O-ring the compound suffix gives the hardness: "-70" means 70 ± 5 Shore A.
4. **Use a Shore A durometer if you have one.** Press it flat on the sample, then on the rubber part. Parker recommends micro-hardness testing for parts too thin or small for an accurate reading.

If the sample is stiffer than the part it replaces, step down a grade. If the filament will not feed, step up a grade or move to a direct-drive extruder.

References

[1] Crosslinking (Polymer Science Learning Center, University of Southern Mississippi). https://pslc.ws/macrog/xlink.htm. Accessed October 28, 2026.

[2] Parker O-Ring Handbook ORD 5700 (Parker Hannifin). https://mfc.arizona.edu/sites/default/files/2022-02/parker_o-ring_handbook.pdf. Accessed October 28, 2026.

[3] Comparing Thermoplastic Elastomers and Thermoset Rubber (The Madison Group). https://madisongroup.com/comparing-thermoplastic-elastomers-and-thermoset-rubber/. Accessed October 28, 2026.

[4] NinjaFlex 3D Printing Filament Technical Specifications (NinjaTek). https://ninjatek.com/wp-content/uploads/NinjaFlex-TDS.pdf. Accessed October 28, 2026.

[5] PolyFlex TPU95 Technical Data Sheet (Polymaker). https://wiki.polymaker.com/polymaker-products/more-about-our-products/documents/technical-data-sheets/tpu/polyflex-tm-tpu95. Accessed October 28, 2026.

[6] Bambu Filament Technical Data Sheet V1.0, TPU 95A HF. https://store.bblcdn.com/58df32731eab4c90a7dac9b12e13ba88.pdf. Accessed October 28, 2026.

[7] TPU Filament Filaflex 60A (Recreus). https://recreus.com/en/products/filaflex-60a. Accessed October 28, 2026.

[8] TPU Filament Filaflex 70A (Recreus). https://recreus.com/en/products/filaflex-70a. Accessed October 28, 2026.

[9] TPU Filament Filaflex 82A (Recreus). https://recreus.com/en/products/filaflex-82a. Accessed October 28, 2026.

[10] Flexible materials (Prusa Knowledge Base). https://help.prusa3d.com/article/flexible-materials_2057. Accessed October 28, 2026.

[11] Silicone 40A Resin (Formlabs). https://formlabs.com/store/materials/silicone-40a-resin/. Accessed October 28, 2026.

[12] Silicone 3D printing (Lynxter). https://lynxter.com/en. Accessed October 28, 2026.

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