



ABS

Acrylonitrile
Butadiene
Styrene

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Background

Acrylonitrile Butadiene Styrene (ABS) is another common 3D printing material with popularity that rivals PLA.

ABS's structure contains a long chain on butadiene that crosses with shorter chains of acrylonitrile and styrene.

The proportions of each monomer in ABS can vary. ABS is resistant to heat and to impact damage making it a durable material suitable for the outdoors.

Its mechanical and thermal properties also give parts a cleaner finish compared to PLA.

Due to its chemical nature, printing with ABS usually requires a raft in order to guarantee bed adhesion.

This makes it a suitable material for those who have some experience with 3D printing already.

Applications

ABS's durability and temperature resistance allow it to endure life outside. This makes it a good material for outside piping and enclosures.

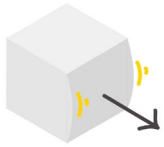
It's a suitable material for handles on devices such as power tools. Can replace automotive trim and endure usage on a car.

ABS is also the material used in LEGOs. For those wanting to replicate or create new LEGOs, ABS is a perfect material

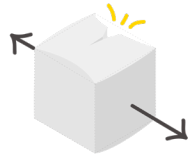
- > Outdoor enclosures
- > Handles
- > Custom LEGOs
- > Automotive trim
- > Piping

Material Properties

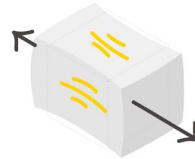
Mechanical



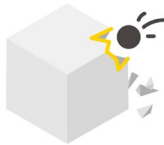
Young's Modulus
2,174 MPa



UTS
33.3 MPa



Tensile Elongation
2.7 %



Impact Strength
12.6 J/m²

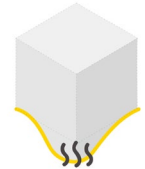


Shrinkage
-

Thermal



Glass Transition
101 °C

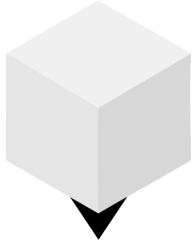


Vicat Softening
104 °C

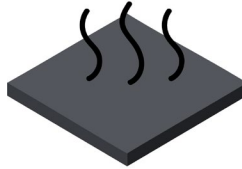


Decomposition
> 380 °C

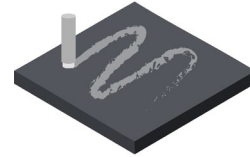
Printer Settings



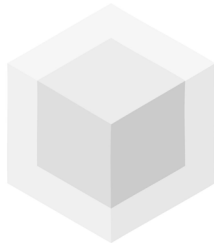
Extruder Temperature
235 °C



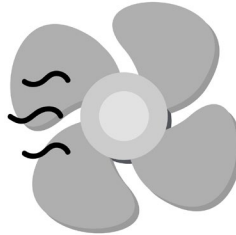
Heated Bed Temperature
105 °C



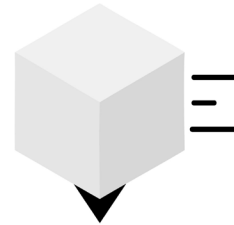
Bed Adhesion
Clean Bed



Enclosure
Required



Fans
Off



Printing Speed
3,600 mm/min

Sustainability

ABS is an easily recyclable and reusable filament.

It is easy to regrind and reuse in pellet extruder printers such as GBX.

It is also easy to mix and reuse with virgin ABS once sorted.

Since ABS is a durable material, it can take the place of many single-use plastics as well.

ABS Validated Suppliers



Coex
ABS



MakeShaper
ABS



Push Plastics
CF ABS



Toner Plastics
ABS

Questions?

Please, do not hesitate to reach out to **support@re3d.org** via email or visit **re3d.org/support** if you have any more questions about ABS.

Want to validate your material?

Would you like to see your material listed as a validated supplier? Our engineers welcome your 2.85mm spools! Email **info@re3d.org** for more information.

Sources

- > <https://www.simplify3d.com/support/materials-guide/abs/>
- > <https://us.polymaker.com/product/polylite-abs/>
- > <https://www.recycledplastic.com/index.html%3Fp=10239.html>
- > <https://www.dhcustomrods.com/product-page/abs-handle-upgrade>
- > <https://3dprintingmentor.com/the-ultimate-guide-to-3d-printing-lego/>
- > <https://www.azom.com/article.aspx?ArticleID=15664>