



Q: Do some materials crack and split more than others?

A: Yes. High temperature materials (such as ABS) will crack & split if they are cooled too quickly or printed under normal temperature.

PRINT QUALITY

The thin object cracks. Other terms for this cracking are layer de-lamination, layer separation, and splitting.

PROBLEM

Poor quality material. Print temperature too low. Printer environment and cooling too quickly can cause layer splitting as well.

CORRECTIVE ACTION

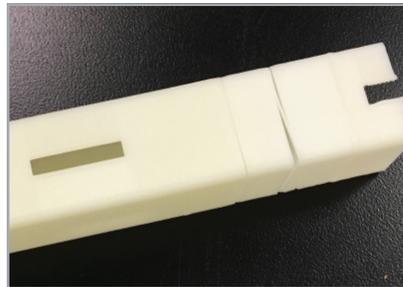
Changing material suppliers. A quality ABS material will minimize the effects of warping, cracking and environmental cooling. Raising the active print temperature to allow better layer adhesion of the ABS material.

(Sometimes, lowering the layer height of the print will allow for better layer adhesion as well. If the print still delaminates, try lowering to .3 mm)

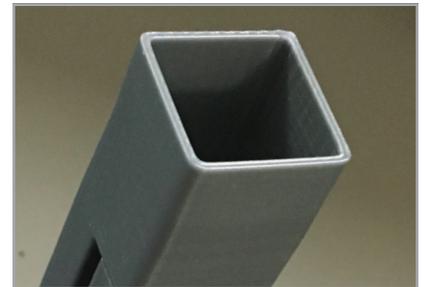


Zoomed View

Failed Print: The ABS material is under the normal print temperature. The layers are not adhering together as well as they would at a higher print temperature. The tension on the print causes cracking.



Failed Print



Fixed Print



Zoomed View

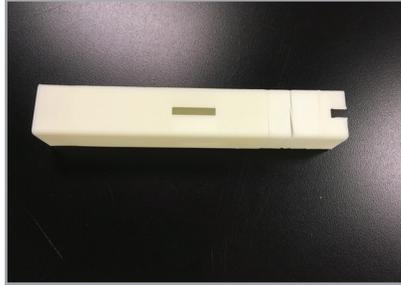
Fixed Print:



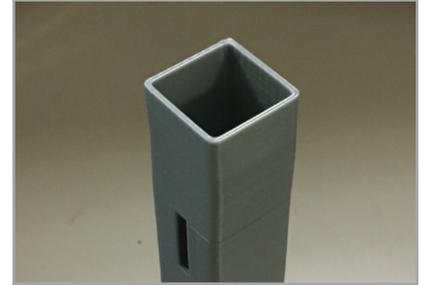
CASE STUDY PROBLEM | SOLUTION



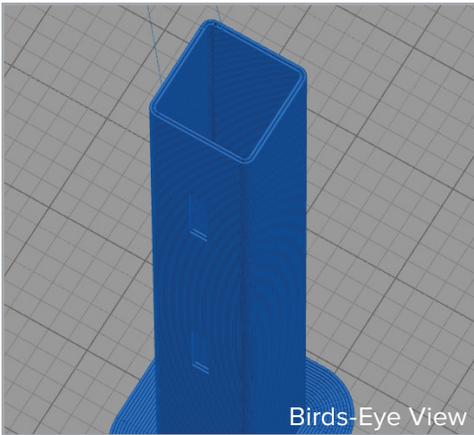
Rule of Thumb: Only make one adjustment at a time, so you can see the result of the change.



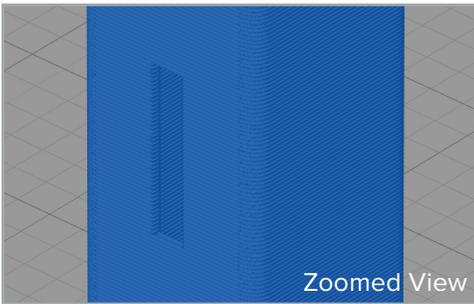
Failed Print: The ABS material is under the normal print temperature. The layers are not adhering together as well as they would at a higher print temperature.



Fixed Print: The material bands together well and does not split or crack.



Model, Sliced:



Model, Sliced: The small gap is able to bridge without support.

KEY POINTS

Printing materials at the proper temperature will prevent weak or cracked walls in the print.

PRINT PROCESS SETTINGS	BEFORE FIX BAD PRINT	AFTER FIX GOOD PRINT
Material Type	ABS	ABS
Bed Temperature	100C	100C
Nozzle Size	.6mm	.6mm
Nozzle Temperature	210C	250C
Flow Rate (Extrusion Multiplier)	1.00	1.00
Extrusion Width	.72mm	.72mm
Print Speed	100mm/s	100mm/s
Layer Height	.5mm	.5mm
Number of Perimeters	2	2
Top Layers	5	5
Bottom Layers	5	5
Infill Percentage	15%	15%
Support Structures	none	none
Material Supplier Changed	Ulti-Machine	3DP Branded

OTHER NOTES

If the material is old or has sat out for several weeks, chances are the filament has become brittle or water logged.