CASE STUDY	PROBLEM	SOLUTION

3DP
3D PLATFORM

PRINT QUALITY

The nozzle leaves spider-web-like strings between prints or portions of the same print.   The printer stops printing to perform a travel move but the nozzle still leaks and slightly strings from one print to the other.

PROBLEM

The retraction settings must be set properly.   Lowering the print temperature slightly in some cases may help, this should not be the first option.   Verify that the retraction settings are properly set before adjusting print temperature.

- Retraction Distance: 0.00mm

CORRECTIVE ACTION

Adjusting the retraction distance to the proper setting allows the extruder to travel between the parts without stringing. The retraction distance is determined by running test "ooze towers" and determining the proper distance before running a production part. This will help with final product quality and reduce post finishing time.
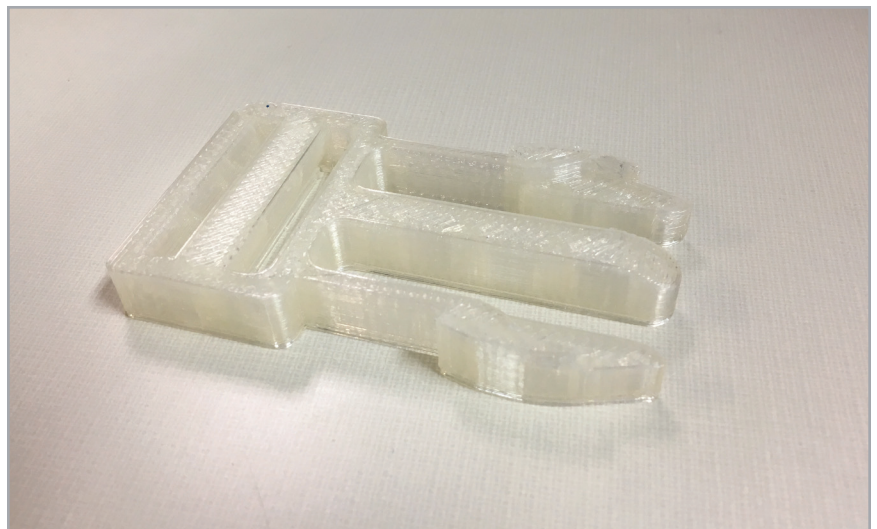
- Retraction Distance: 1.10mm

Zoomed View

Failed Print: The nozzle leaks and strings between prints.
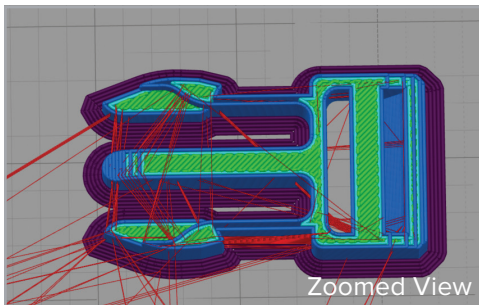

Failed Print

Fixed Print

Fixed Print: The stringing is reduced to very fine "spider web" like strings that are nearly invisible. These are easily cleaned up with minimal post finishing time.   Some material string more than others and the retraction settings will need to be adjusted accordingly.

3DP-LITCS-011

CASE STUDY	PROBLEM	SOLUTION

Rule of Thumb: Only make <u>one</u> adjustment at a time, so you can see the result of the change.
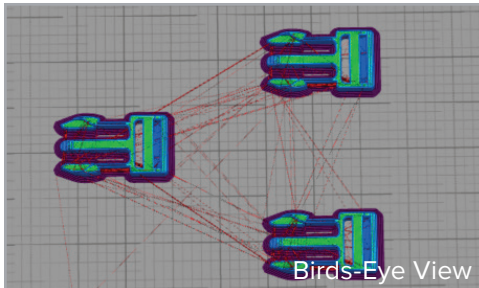
Failed Print: Stringing occurs between each printed piece and between sections of each specific print.

Fixed Print: The stringing is reduced to very fine "spider web" like strings.

Birds-Eye View

Model, Sliced: The red lines indicate the non-print travel movements between parts. Stringing will occur during these movements if the retraction settings are not properly adjusted.

Zoomed View

Model, Sliced: The red lines indicate the non-print travel movements between parts. Stringing will occur during these movements if the retraction settings are not properly adjusted.

PRINT PROCESS SETTINGS	BEFORE FIX BAD PRINT	AFTER FIX GOOD PRINT
Material Type	PETG	PETG
Bed Temperature	80C	80C
Nozzle Size	.6mm	.6mm
Nozzle Temperature	240C	240C
Flow Rate (Extrusion Multiplier)	1.00	1.00
Extrusion Width	.68mm	.68mm
Print Speed	100mm/s	100mm/s
Layer Height	.2mm	.2mm
Number of Perimeters	2	2
Top Layers	10	10
Bottom Layers	10	10
Infill Percentage	15%	15%
Support Structures	none	none
Retraction Distance	0.00mm	1.10mm

KEY POINTS

The proper retraction setting is necessary to eliminate stringing between prints.

OTHER NOTES

Some materials may require a higher retraction setting. Print a few small models to observe stringing and adjust the setting as necessary.