CNSI Microfluidics Laser Cutting Data

Material Vendors

Acrylic sheet, optically clear, from McMaster Carr: part number 8560K239
http://www.mcmaster.com/#catalog/119/3558/=molz4w

Cutting Parameters

Acrylic Sheet

Cutting 1/8”, 100% power, 0.4 ipm, 2000 Hz, (Dave Bothman, 5/5/13 - clean cut)

Cutting 1/4”, 100% power, 0.15 ipm, 1000 Hz, z offset -.125, (Dave Bothman, 5/5/13 - clean cut)

PDMS

250um PDMS with mylar backing on back side and removed from front

Cutting 42% power, 2.0 1ps, 5000Hz (Peter Mage, 5/9/13 - some flash and soot - recipe needs to be refined)

Double Sticky Tape

25% power, 3 ips

Gore Teflon Foam 1/16“ 15% power, 0.5% speed, 1000 Hz (DB 7/9/15)

Silicone Rubber sheet, 1/8” 100% power, 0.1% speed, 2000 Hz - use Nitrogen gas (DB 7/9/15)

Guideline Cutting Recipes

Acrylic

1. 1/8 acrylic

	Color	Power	Speed	PPI/Hz	Passes	Air Assist	Correction	Z-Offset
Engrave	Black	25	20	PPI	-	on	0	0

	Color	Power	Speed	PPI/Hz	Passes	Air Assist	Correction	Z-Offset
Cut	Red	25	0.4	Hz	1	on	10	0
Cut	Blue	100	0.4	PPI	1	on	10	0

-1/10 acrylic

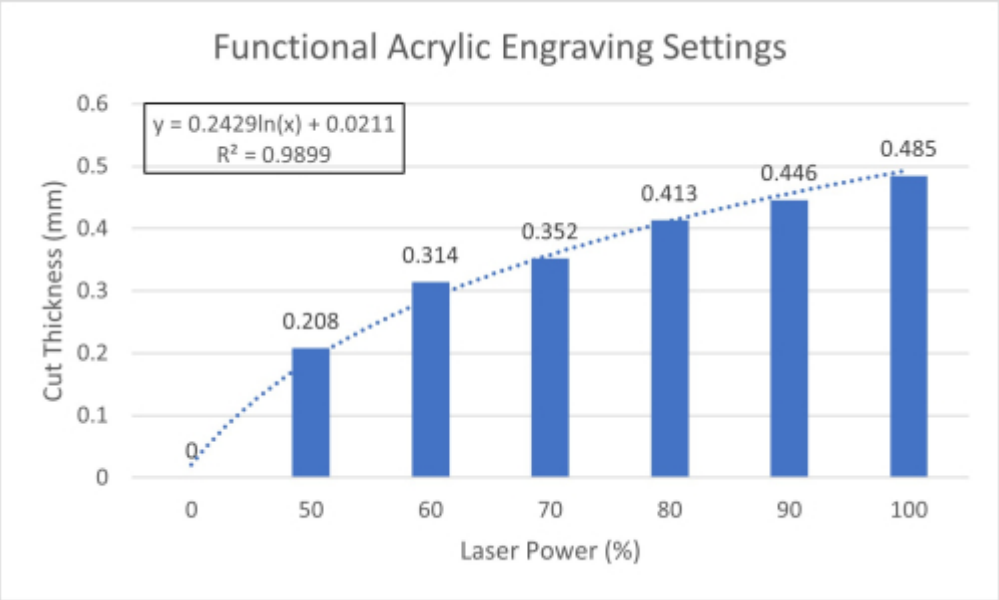
	Color	Power	Speed	PPI/Hz	Passes	Air Assist	Correction	Z-Offset
Skip	Black	-	-	-	-	on	-	-
Cut	Red	2	0.1	Hz	1	Hz	1	0
Cut	Blue	15	0.5	Hz	5	Gas 1	0	0

Functional Engraving Recipes

For users looking to cut acrylic at different depths, these different cut depths were tested at different power settings. Data courtesy of Ph.D. student Sanghun Jee. Thank you Sanghun!

Engraving Cut Thickness	Engraving Settings
0 mm	0% power, 0% speed
0.208 mm	50% power, 30% speed
0.314 mm	60% power, 30% speed
0.352 mm	70% power, 30% speed
0.413 mm	80% power, 30% speed
0.446 mm	90% power, 30% speed
0.485 mm	100% power, 30% speed

For users who wish to engrave at different depths than those listed above, here is a graph and equation that may help out with making estimations of what laser power to use.



Scribing microscope slides for breaking -Dave Bothman - 16 Dec. 2015

- Recipe: 100% power, 3% speed, 1000 Hz, 1 pass

- Focus on top of slide
- Place a paper towel wetted with water on glass in area to be cut
- Cut through the paper
- Break on scribed line