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

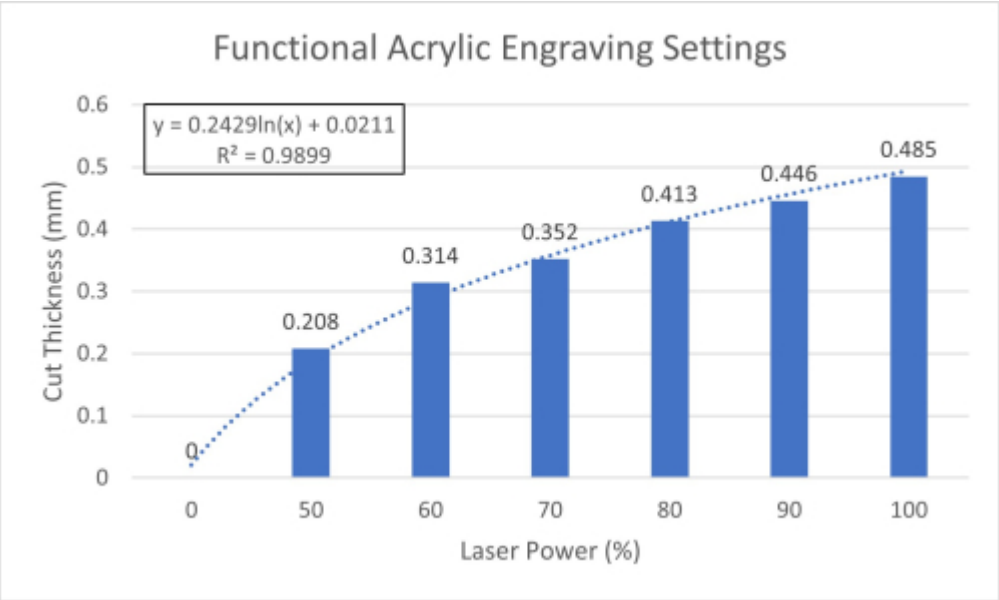
	Color	Power	Speed	PPI/Hz	Passes	Air Assist	Correction	Z-Offset
Skip	Black	-	-	-	-	on	-	-
Cut	Red	2	0.1	Hz	1	Hz	1	0
Cut	Blue	15	0.5	Hz	5	Gas 1	0	0

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 on a Trotec 60W CO2 laser cutter. 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