

APPLICATION NOTE

NanoFoil® Laser Cutting Parameters

Introduction

To cut **NanoFoil®** with a laser, you should use a low-wattage/power-pulsed laser (5–15 watts) with a wavelength approximately 1000nm, cut by making multiple passes along the cut pattern, removing the material by layers. By removing layers at a time, the laser does not build up the necessary localized heat that could activate the **NanoFoil®**.



Equipment

- Yttrium-Based Lasers
 - 8 Watt MD-V9900 YVO₄ Laser Marker
 - YAG Laser
- UV-Based Laser
 - Coherent AVIA – 355-14W Laser

** Note: CO₂ lasers have been tested and have too much power to work with the **NanoFoil®**.*

The following settings are based on experimentation.

Settings	8 Watt MD-V9900 YVO ₄	Coherent AVIA – 355-14W	
NanoFoil® Type	NF40	NF40S10	NF40
Power	70–80% of max	70–80% of max	100% of max
Wavelength/ Frequency	45KHz	38KHz	355nm
Pulse Width			40 nanoseconds
Integrated DC Energy			2.2 watts
Pulse Energy			20 microjoules
Lens Focal Length			100mm
Spot Size			15µm
Repetition Rate			160KHz
Travel Rate	.03m/seconds	.03m/seconds	2m/seconds
#Passes	350	350	25

Details and Settings

- Use a pulsed laser. The frequency affects the edge quality so you may want to experiment to optimize your process.
- To avoid local heating, start Galvo Mirrors scanning prior to turning on the beam and ensure that there is minimal overlap between pulses.
- Drive air flow over the part and vacuum the surface locally.
- Avoid movement or rippling of the **NanoFoil®** as this could cause activation. It is recommended that you hold the **NanoFoil®** or use a vacuum table or tape it down.
- If the foil is not 100% cut, you can scribe or score the foil so you can separate the part from the surrounding foil.

This application note is provided for general information only. It is not intended, and shall not be construed, to warrant or guarantee the performance of the products described which are sold subject exclusively to written warranties and limitations thereon included in product packaging and invoices. All Indium Corporation's products and solutions are designed to be commercially available unless specifically stated otherwise.

All of Indium Corporation's solder paste and preform manufacturing facilities are IATF 16949:2016 certified. Indium Corporation is an ISO 9001:2015 registered company.

From One Engineer To Another®

Contact our engineers: askus@indium.com

Learn more: www.indium.com

Form No. 98620 (A4) R1

ASIA +65 6268 8678 • CHINA +86 (0) 512 628 34900 • EUROPE +44 (0) 1908 580400 • USA +1 315 853 4900



©2021 Indium Corporation