Micromachining of components and assemblies for precise assembly and manufacture processes

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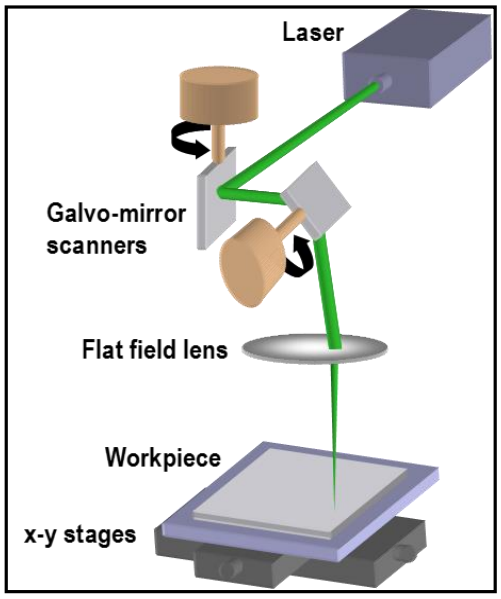
Introduction

Scitech Precision provides close support for high power laser experiments with the provision of high precision laser micromachining. Repeatable, consistent and intricate targets can be produced using the 355nm DPSS (diode pumped solid state) laser or the infra-red Nd:YAG 1064nm laser.
Metals, alloys, borosilicate, ceramics, diamond, polymers and foils can be machined into complex shapes or intricate grids with full characterisation and R&D to support developmental ideas.

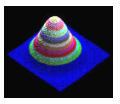
355nm DPSS Nd:YAG machining

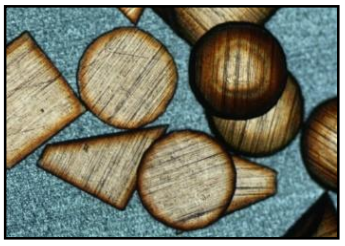
Sub mm CAD/CNC based (dxf files) laser micro machining of intricate grid structures and complex geometries.



Typical laser specification:

20W, 200kHz, 100-500µJ
10µm focused spot
30ns pulse
Gaussian beam
High speed machining
Galvo scanner and/or stages





200µm diameter, 50µm thick copper targets

1064nm Nd:YAG machining

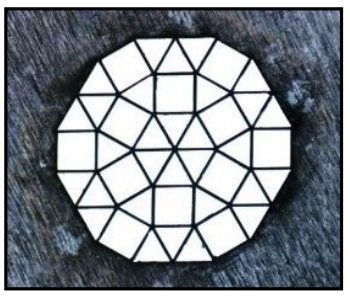
Generically < 1mm thickness CAD/CNC laser machining.

Typical laser specification:

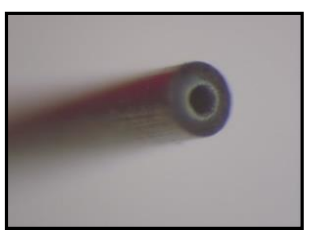
5W, 100kHz, ~100µJ, 18µm focused spot, 70ns pulse
High speed precision machining, Galvo scanner and/or stages

50µm thick metal foil 50µm arm width

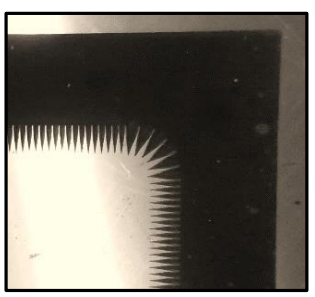
50µm thick silicon 35µm arm width



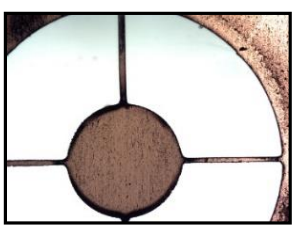
Beam stops and apertures



tungsten rod end beam stop
100µm diameter
300µm depth hole

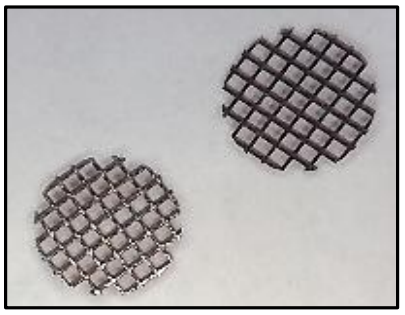


50µm thick tungsten serrated aperture
200µm pitch, 1.2mm height

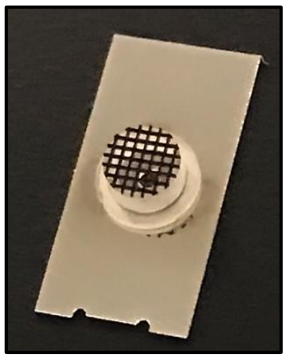


tungsten Schlieren beam stop
100µm thick
20µm arms

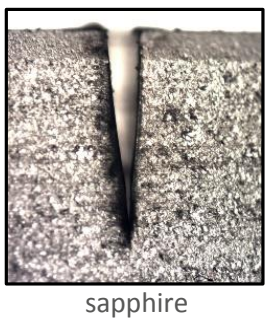
Examples



230µm thick
3mm diameter
100µm arm width
polyimide
grid machining for target assembly

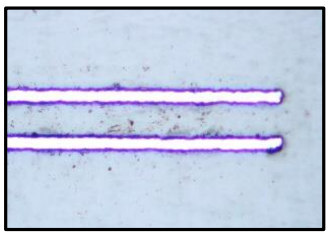


Produced in collaboration with CLF and Micronanics Ltd



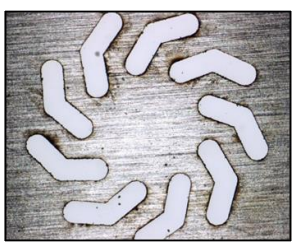
sapphire
1.08mm depth
166µm diameter

200µm thick tungsten
200µm arm width
Inner circle: ID 170 µm
OD 1.3mm



50µm thick tungsten
6µm width slits
20µm gap

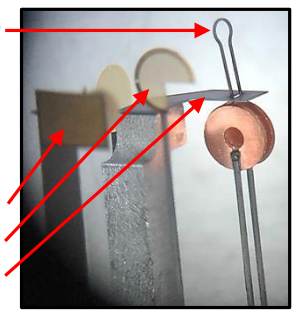
200µm thick copper
100µm arm width



stainless steel
50µm thick
25µm arm width

1mm diameter
100µm thick
aluminium loop

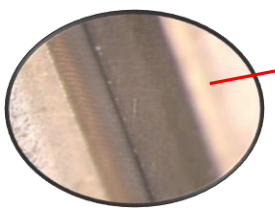
laser cut:
gold foils,
grids
tantalum shields

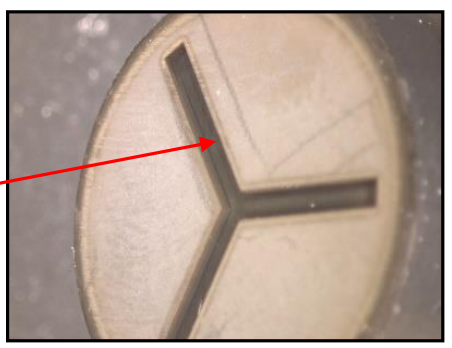


laser profiling:
25µm thick polyimide
4.2mm length
840µm width
150µm diameter
holder with 75µm excimer drilled wells

Machining of Diamond

500µm depth, ~1mm width trench





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diamond