

Manufacturing Fact Sheet



Ultrafast Athermal Laser Processing

Ultrafast athermal lasers, or femtolasers, are revolutionizing medical device manufacturing by literally taking the heat out of the machining process. Until recently found only in top research laboratories, IntriMed's laser technology removes target materials atom by atom using extremely short pulses lasting 50 – 1,000 femtoseconds, or quadrillionths of a second. These pulses, too brief to create the heat damage associated with conventional lasers, are capable of cutting, drilling and machining tiny components made from virtually any material with extreme precision.

This technology is helping medical device manufacturers dramatically shrink the scale of their devices while simultaneously increasing manufacturing efficiency through fewer steps and higher yields.

Key Advantages of Athermal Laser Processing

- Minimizes heat affected zones, recast, and material burrs
- Ablates virtually any material- polymers, bioabsorbables, metals, polymer/metal composites, glass
- Achieves micro-scale precision and tolerances
- Reduces post processing rework
- Increases manufacturing yields

Applications

Vascular stents
Needles
Drug delivery systems
Implantable devices
Microfluidics

Base Materials

Polymers

- Pebax®
- Teflon®
- Polyimide tubing
- Nylon
- Polycarbonate
- Stainless steel + polymer composites

Bioabsorbables

- PLGA
- PLLA
- PLG

Metal + Conductive Materials:

- Nitinol
- Stainless steel
- Gold
- Platinum

Glass

Specifications

Wavelength: 1552 nm
Energy/pulse: 5-50µJ
Pulse width: 800 fs
Avg. power: 5 watts

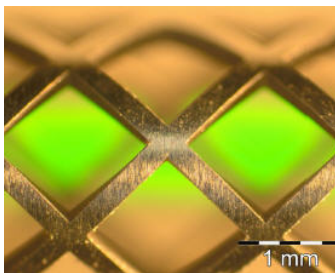


Fig 1. Stent pattern cut from Nitinol tubing with 250 µm wall.



Fig 2. A 210 µm hole machined in 51 µm wall polyimide tubing.

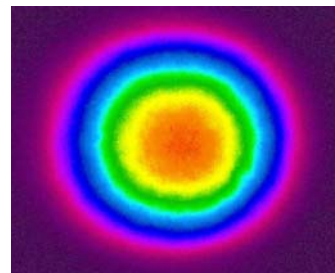


Fig 3. Beam profile of ultrafast pulse athermal laser.