

Femtosecond Micromachining

The use of ultrashort laser pulses is an attractive option for the high quality micromachining of many materials due to their ability for precise processing with minimal damage. Therefore, femtosecond laser micromachining is a rapidly advancing area of deployment of ultrashort pulse lasers. Del Mar Photonics, Inc offers Ti: Sapphire and Cr: Forsterite laser systems that are suitable for micromachining applications.

Teahupoo OA

Femtosecond Ti:Sapphire Regenerative amplifiers with integrated oscillator

Output specifications:

Wavelength: 750-850 nm
Pulse duration: < 50 fs
Repetition rate: 50/100/1000 Hz
Energy: 0.5 - 1 mJ



Wedge OA

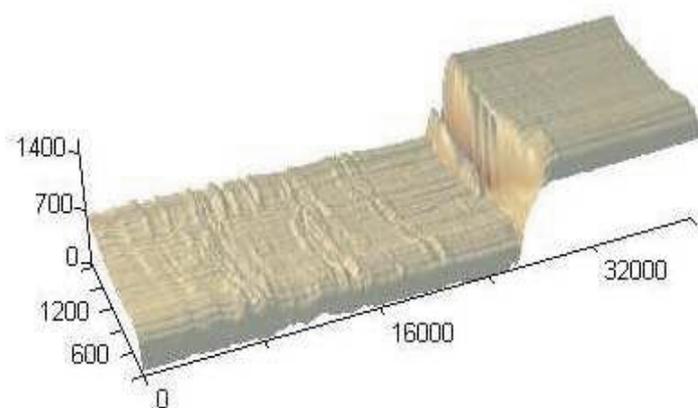
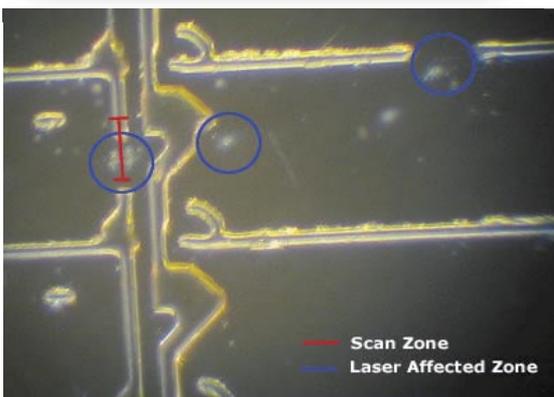
Femtosecond Ti:Sapphire Multipass amplifiers with integrated amplifier

Output Specifications:

Wavelength range: 780-820 nm
Pulse duration: < 50 fs
Repetition rate: Single-shot - 1 kHz
Energy (@ 1 kHz): 0.5- 1 mJ
Contrast ratio: 1000:1
Energy stability (% p/p): < 3%

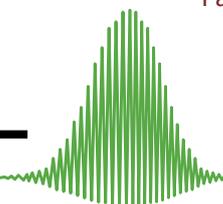
Advantages

- No thermal damage
- High machining quality
- Unmatched accuracy
- Well defined ablation threshold
- No wavelength dependence



Display matrix micromachining. Thin layer of conducting paint removed from aluminum substrate.

Parameters of laser radiation: 100 μ J, 2 kHz, 800 nm, 50fs

DEL  **MAR PHOTONICS**

www.dmp Photonics.com



Pipeline OA

Femtosecond Cr:Forsterite regenerative amplifiers with integrated oscillator

| | Pipeline 1000 | Pipeline 600 | Pipeline 200 |
|------------------|---------------|----------------|--------------|
| Pulse duration: | <100 fs | <100 fs | <100 fs |
| Wavelength: | ~1250 nm | ~1250 nm | ~1250 nm |
| Energy: | > 1.0 mJ | > 0.6 mJ | > 0.2 mJ |
| Pump energy: | 40 mJ | 30 mJ | 10 mJ |
| Repetition rate: | 10,50 Hz | 10, 50, 100 Hz | 1000 Hz |

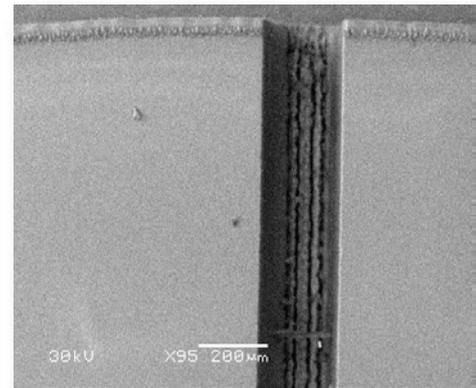
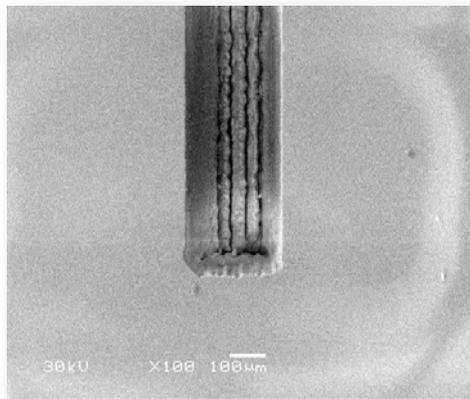
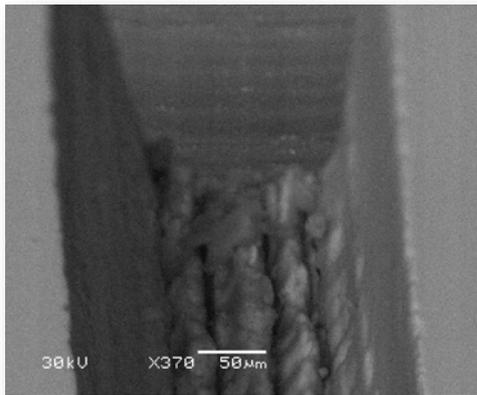


Materials:

- Metals: aluminium, steel etc
- Glass, fused silica
- Diamond, sapphire
- Fluoropolymers
- PMMA
- Lithium niobate, lithium tantalite etc
- Masks for lithography
- Ceramics: zirconia, aluminium carbide etc
- Biodegradable polymers

Applications:

- Biomedicine, biochemistry, lab-on-chip devices, sensors, and MEMS devices
- IR optical applications, detectors, sensors, and thermal management systems
- Telecommunications, optical waveguides
- Production of microoptical components
- Development of high repetition rate solid-state lasers, amplifiers, modulators, and switches
- Semiconductor lithography
- Medical implants



Fused silica micromachining using Pipeline 200/1000 OA

Parameters of laser radiation: 100 µJ, 1 kHz, 50 fs, 1250 nm

DEL MAR PHOTONICS

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