Laser Induced Damage Threshold (LIDT):
(S-on-1 test procedure: ISO 11254 – 2)

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Testing institute

Testing institute:	Vilnius University, Laser Research Center, Saulėtekio al. 10, Vilnius, Lithuania
Tester/date:	E. Pupka / 2013-10-10

Specimen

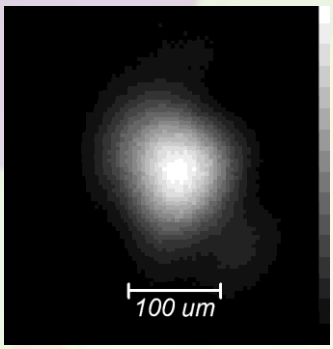
Name of sample:	Track#395745434, pos#1, S1;
Type of specimen:	Crystal;
Storage, cleaning:	Plastic box, no cleaning.

Test specification

First harmonic of pulsed Nd:YAG InnoLas Laser: SpitLight Hybrid laser (λ = 1064 nm, linear polarization, pulse duration 11 ns), λ/2 plate combined with additional polarizer attenuator, online scattered light damage detection, offline inspection of damage detection using Nomarski microscopy (100x).

Laser parameters

Wavelength:	1064 nm;
Angle of incidence:	0 deg;
Polarisation state:	linear;
Pulse repetition frequency:	50 Hz;
Spatial beam profile in target plane:	TEM_{00};
Longitudinal beam profile:	Single mode (SLM);
Beam diameter in target plane$_{(1/e^2)}$:	154 µm (average from 64 pulses);
Pulse duration:	11 ns;



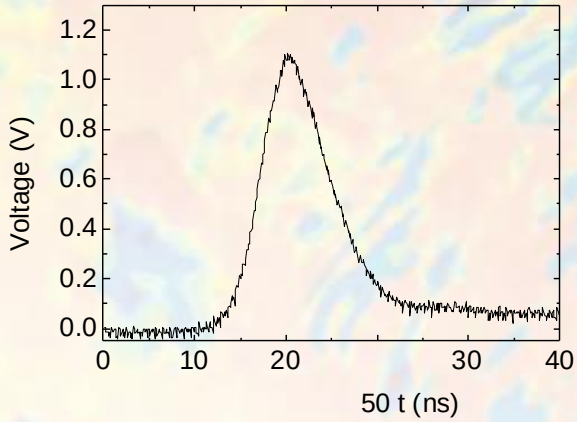


Fig. 1. Spatial beam profile in target plane and pulse duration graph.

Test procedure:	S-on-1 test
Number of sites per specimen:	135;
Arrangement of test sites:	Equally spaced;
Minimum distance between sites:	440 μm;
Damage detection:	Scattered light diode;
Storage of the specimen:	Plastic box;
Test environment:	Industrial environment;
Cleaning:	Compressed air;
Definition of LIDT:	Nonlinear fit to 0% of damage Probability;

Test result:

Table 1. LIDT Results of sample Track#395745434, pos#1, S1.

Test mode	Threshold, J/cm^2
1-on-1	16.12 ≤ 18.56 ≤ 20.86
1000-on-1	13.68 ≤ 14.66 ≤ 15.61

Measured at Vilnius University 2013-10-10
www.lidaris.com

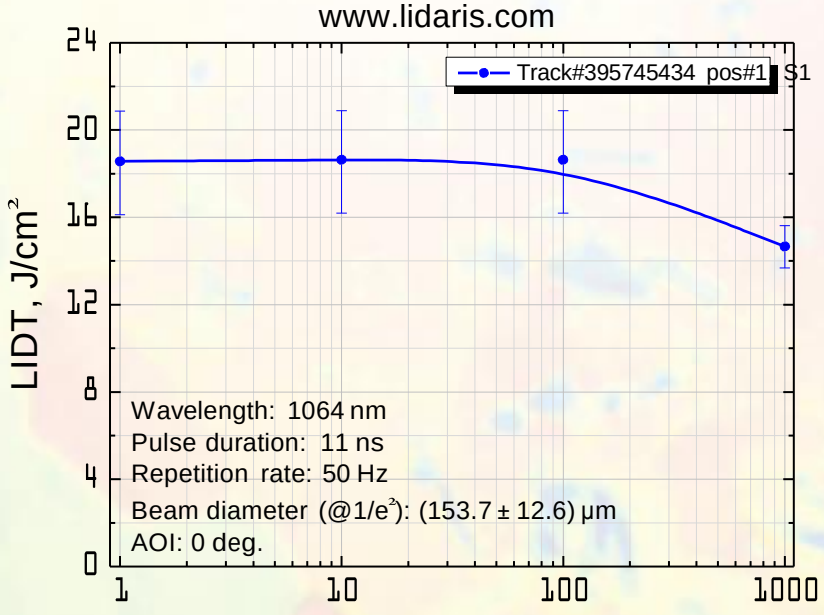


Fig. 2. Characteristic damage curve.

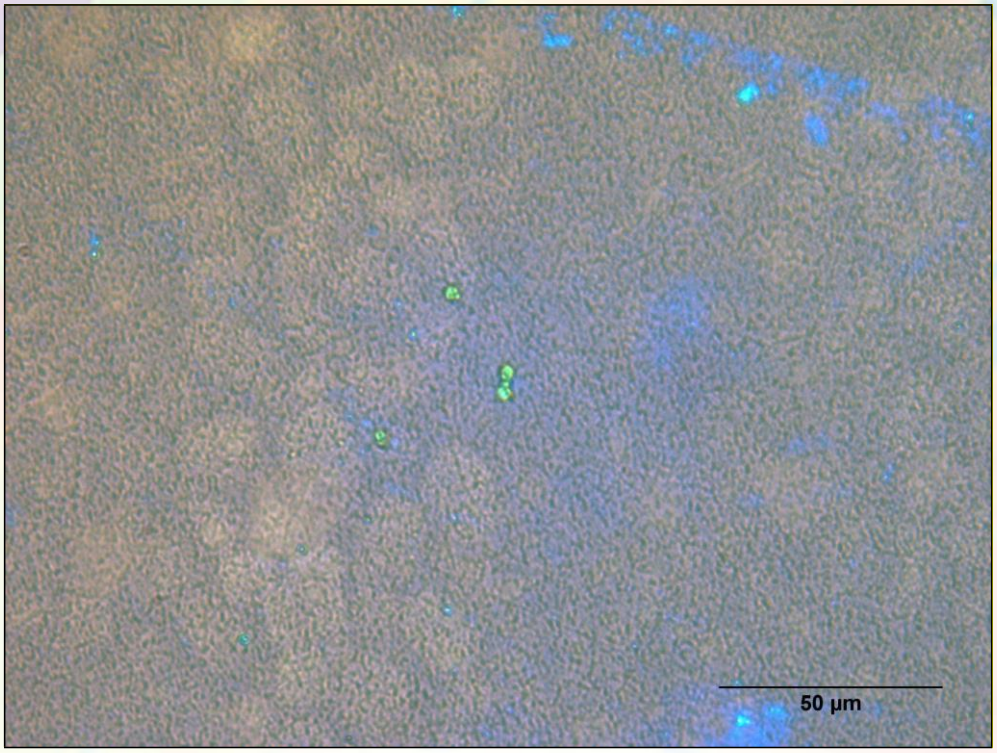


Fig. 3. Typical front surface damage morphology
(Energy density 20.78 J/cm^2, damage after 1 pulse)

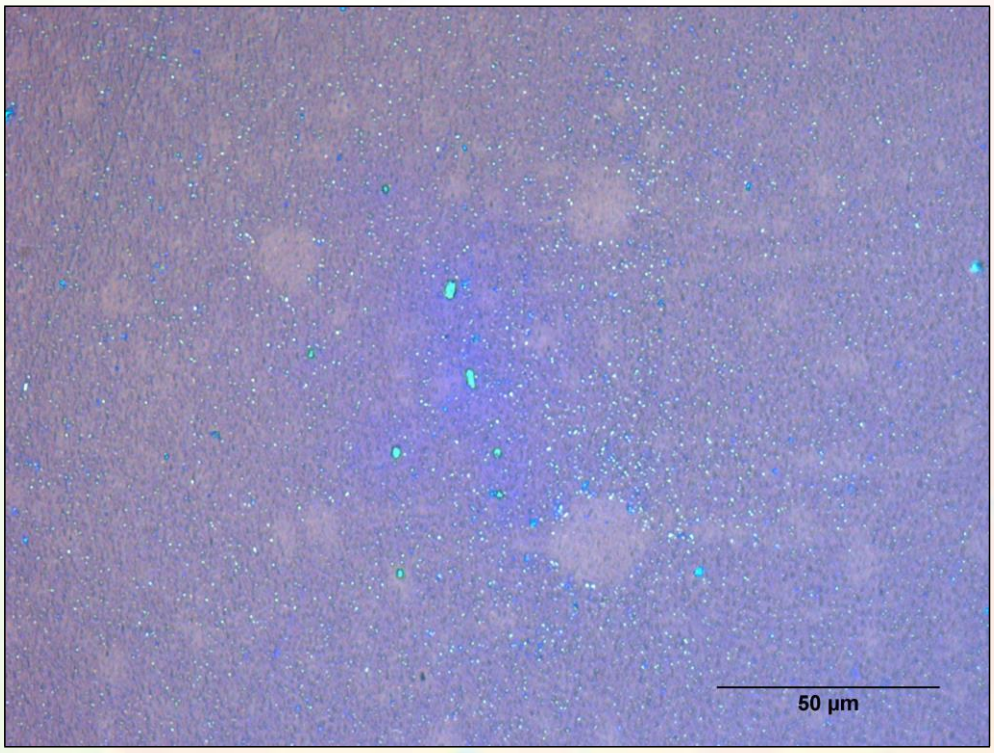


Fig. 4. Typical front surface damage morphology
(Energy density 15.24 J/cm^2, damage after 1000 pulses)