



# Laser-Induced Damage Threshold (LIDT) Measurement Report

## ISO21254-2: S-on-1 Test Procedure

Sample: R14006-14

**Request from:**

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Contact person:

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**Testing institute:**

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Tester/date:

E. Pupka / 2014-12-01

**Specimen**

Name of sample:

R14006-14

Type of specimen:

Glass, uncoated

Storage, cleaning:

Normal laboratory conditions

**Test specification**

First harmonic of pulsed Nd:YAG InnoLas Laser: SpitLight Hybrid laser ( $\lambda = 1064$  nm, linear polarization, pulse duration 9.8 ns),  $\lambda/2$  plate combined with additional polarizer attenuator, online scattered light damage detection, offline inspection of damage detection using Nomarski microscopy (100x).

**Laser parameters used for testing**

Wavelength: 1064 nm  
Angle of incidence: 0 deg  
Polarization state: linear  
Pulse repetition frequency: 100 Hz  
Spatial beam profile in target plane: TEM<sub>00</sub>  
Longitudinal beam profile: Single mode (SLM)  
Beam diameter in target plane ( $1/e^2$ ): 238.2  $\mu$ m (average from 64 pulses)  
Pulse duration: 9.8  $\pm$  1ns

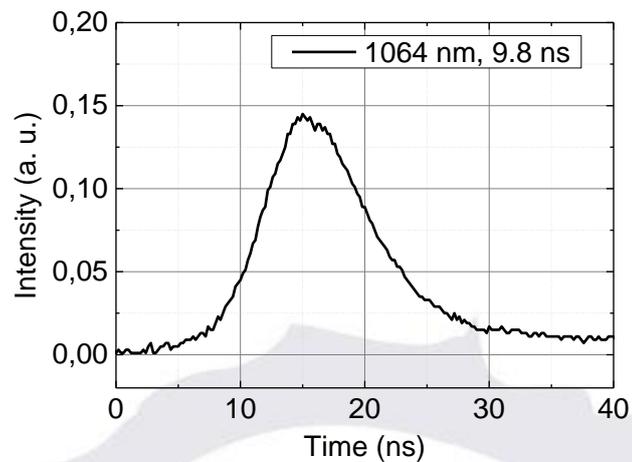
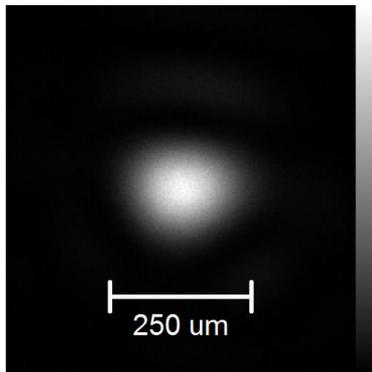


Fig. 1. Spatial beam profile in target plane (left) and oscilloscope curve (right).

**Test procedure:**

Number of sites per specimen:  
Arrangement of test sites:  
Minimum distance between sites:  
Damage detection:  
Storage of the specimen:  
Test environment:  
Cleaning:  
Definition of LIDT:

**S-on-1 test**

247  
equally spaced  
700 μm  
Scattered light diode  
manufacturer's box, PE, normal room conditions  
Industrial environment  
Isopropanol  
Nonlinear fit to 0% of damage Probability

**Test result:**

Table 1. Summarized LIDT's for sample R14006-14

Test mode	Threshold - front surface, J/cm <sup>2</sup>	Threshold - back surface, J/cm <sup>2</sup>
1-on-1	3.69 ≤ 17.38 ≤ 2.82	6.00 ≤ 24.22 ≤ 4.00
1000-on-1	2.66 ≤ 9.54 ≤ 1.74	3.07 ≤ 10.41 ≤ 2.28

Measured at LIDARIS 2014-12-01  
www.lidarisis.com

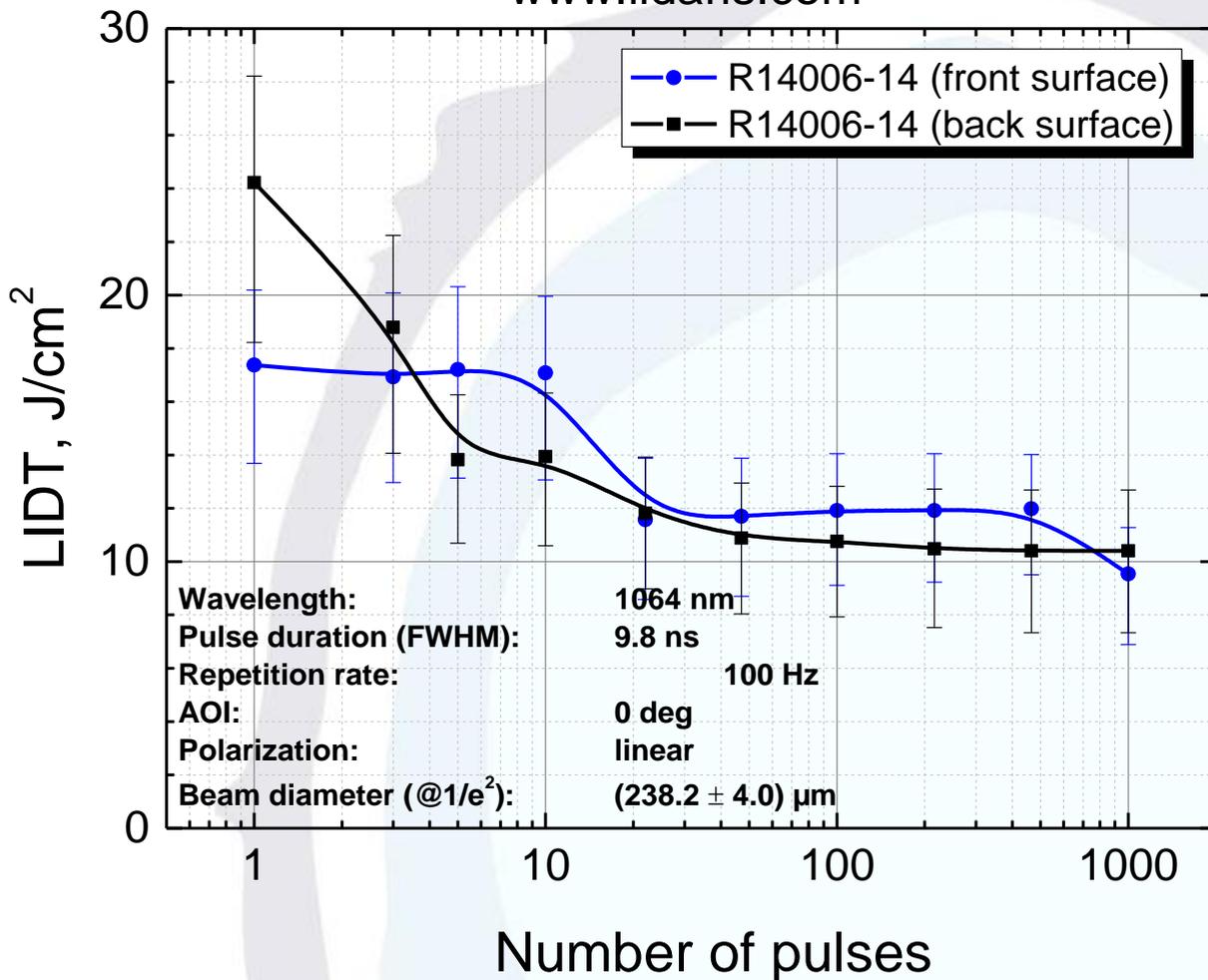


Fig. 2. Characteristic damage curve.

**Typical damage morphology:**

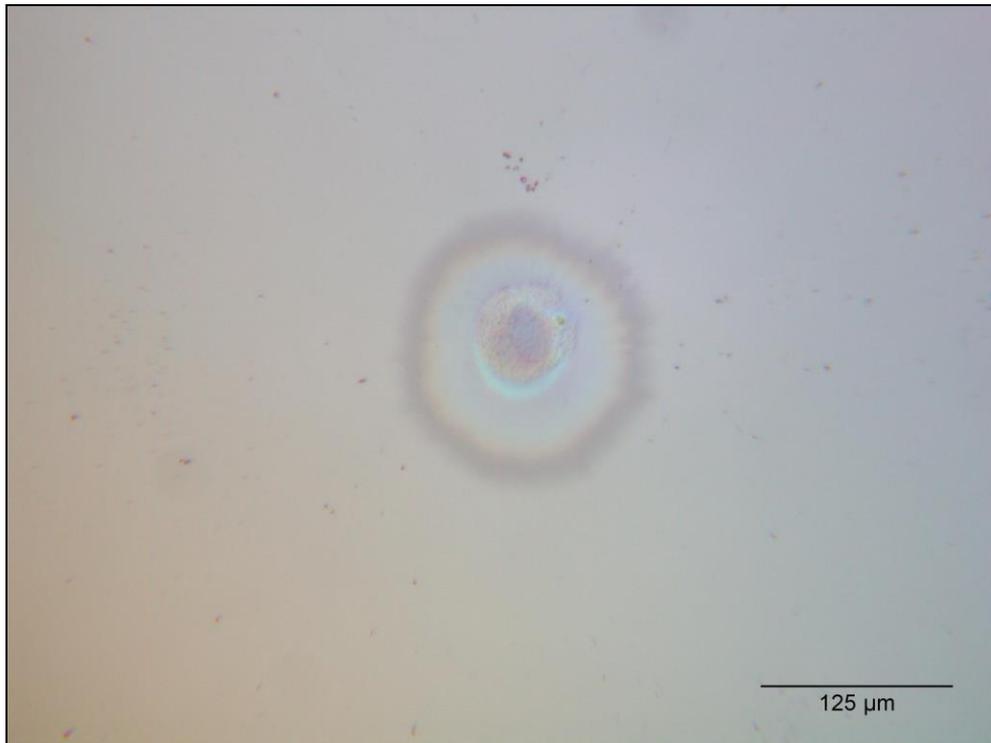


Fig. 3. Typical front surface damage morphology  
(Energy density  $27.64 \text{ J/cm}^2$ , damage after 2 pulses)

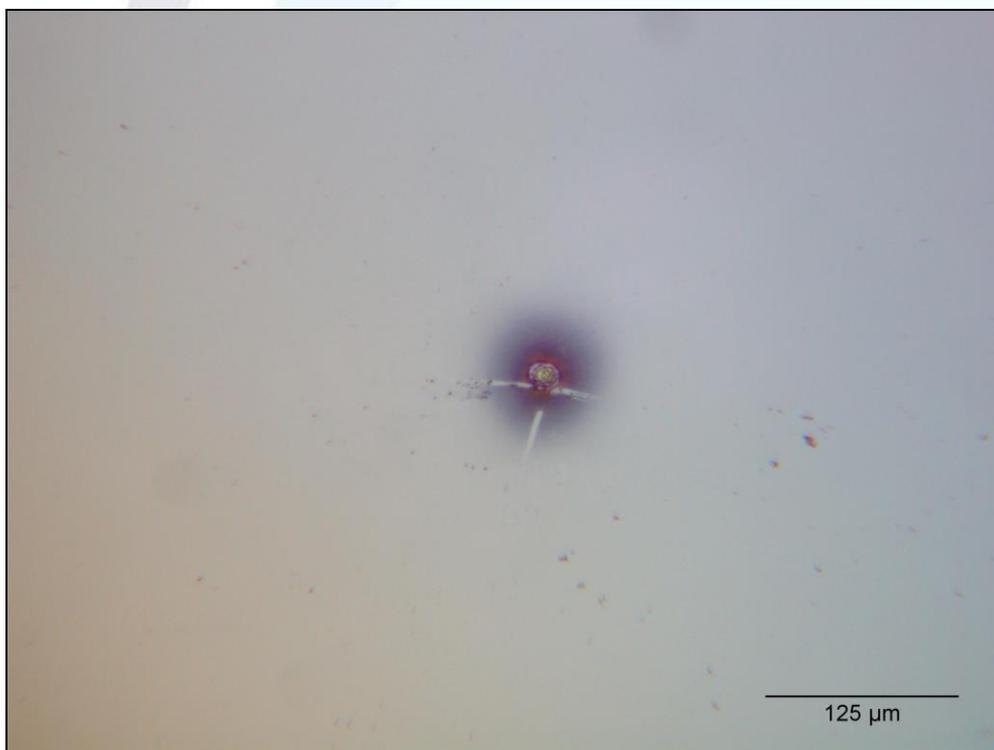


Fig. 4. Typical front surface damage morphology  
(Energy density  $12.92 \text{ J/cm}^2$ , damage after 34 pulses)

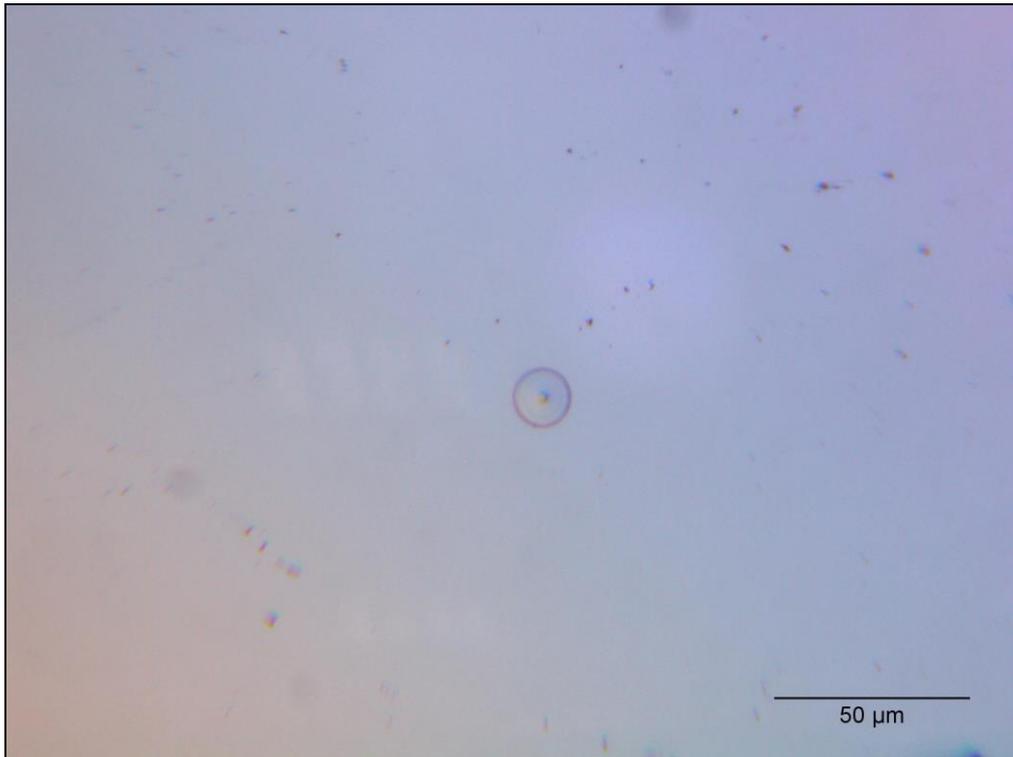


Fig. 5. Typical back surface damage morphology  
(Energy density  $33.14 \text{ J/cm}^2$ , damage after 1 pulse)

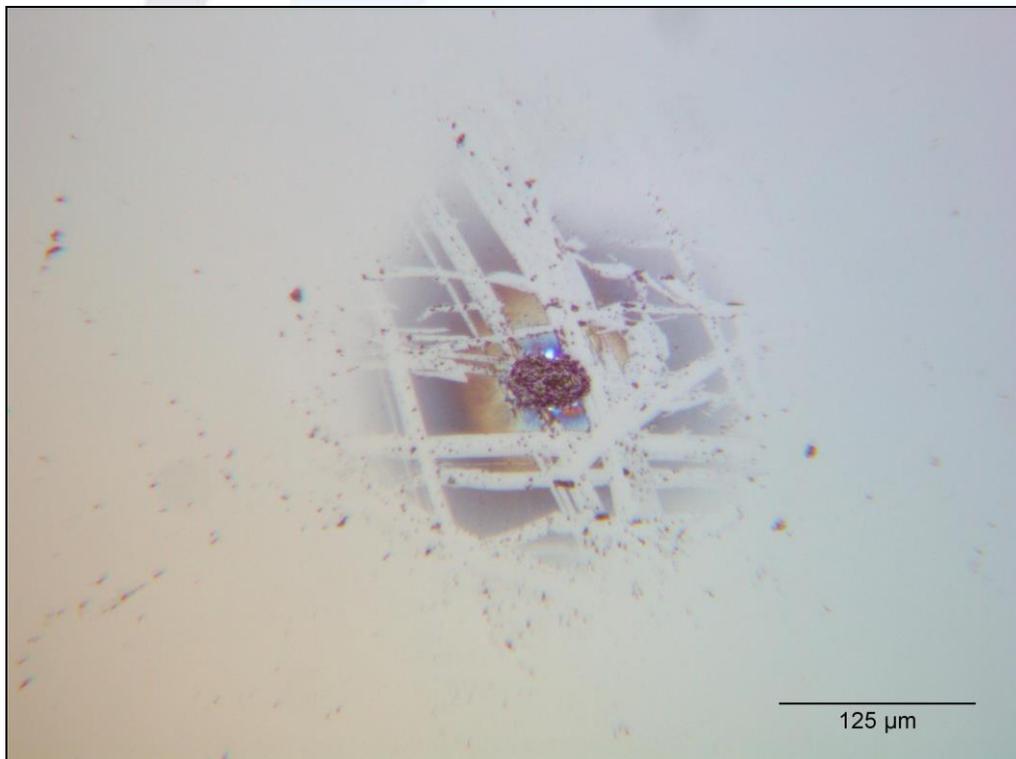


Fig. 6. Typical back surface damage morphology  
(Energy density  $15.65 \text{ J/cm}^2$ , damage after 91 pulses)