Laser-Induced Damage Threshold (LIDT) Measurement Report

R-on-1 Test

Sample: BBO Type I

LIDARIS
LIDT Service

Request/contact person

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Testing institute

Testing institute: UAB Lidaris,
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Tester/date: E. Pupka / 2015-05-28

Specimen

Name of sample: BBO Type I

Type of specimen: Crystal

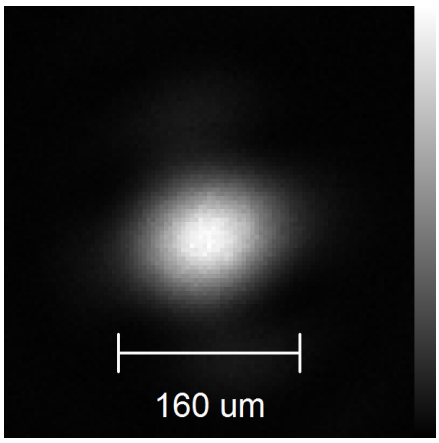
Storage, cleaning: Plastic box, dust blown off with compressed air

Test specification

Fourth harmonic of pulsed Nd:YAG InnoLas Laser: SpitLight Hybrid laser (λ = 266 nm, linear polarization, pulse duration 5.0 ns). $\lambda/2$ plate combined with additional polarizer attenuator, online scattered light damage detection, offline inspection of damage detection using Nomarski microscopy.

Laser parameters used for testing

Wavelength:	266 nm
Angle of incidence:	0 deg.
Polarization state:	linear (e)
Pulse repetition frequency:	100 Hz
Spatial beam profile in target plane:	TEM_{00}
Longitudinal beam profile:	Single mode (SLM)
Beam diameter in target plane$_{(1/e^2)}$:	(157.9 ± 4.4) µm (average from 64 pulses)
Pulse duration:	(5.0 ± 0.5) ns



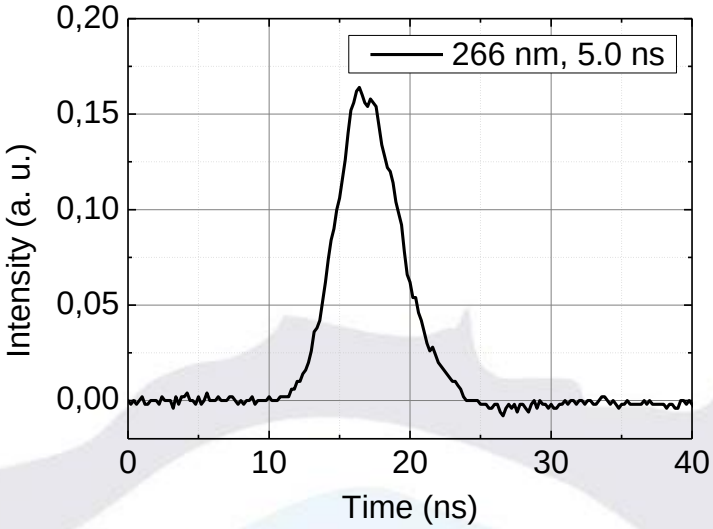


Fig. 1. Spatial beam profile in target plane (left) and oscilloscope trace (right).

Test procedure:	**R-on-1 test**
Number of sites per specimen:	2
Number of pulses:	1000 per fluence level
Fluence step:	0.1 J/cm^2
Damage detection:	Scattered light diode/Nomarski microscopy
Test environment:	Industrial environment
Storage of the specimen:	Normal laboratory conditions
Cleaning:	Compressed air

Test result:

Table 1 Summarized R-on-1 LIDT for sample **BBO Type I**

Test mode	Threshold, J/cm2
R-on-1	0.83 ± 0.14

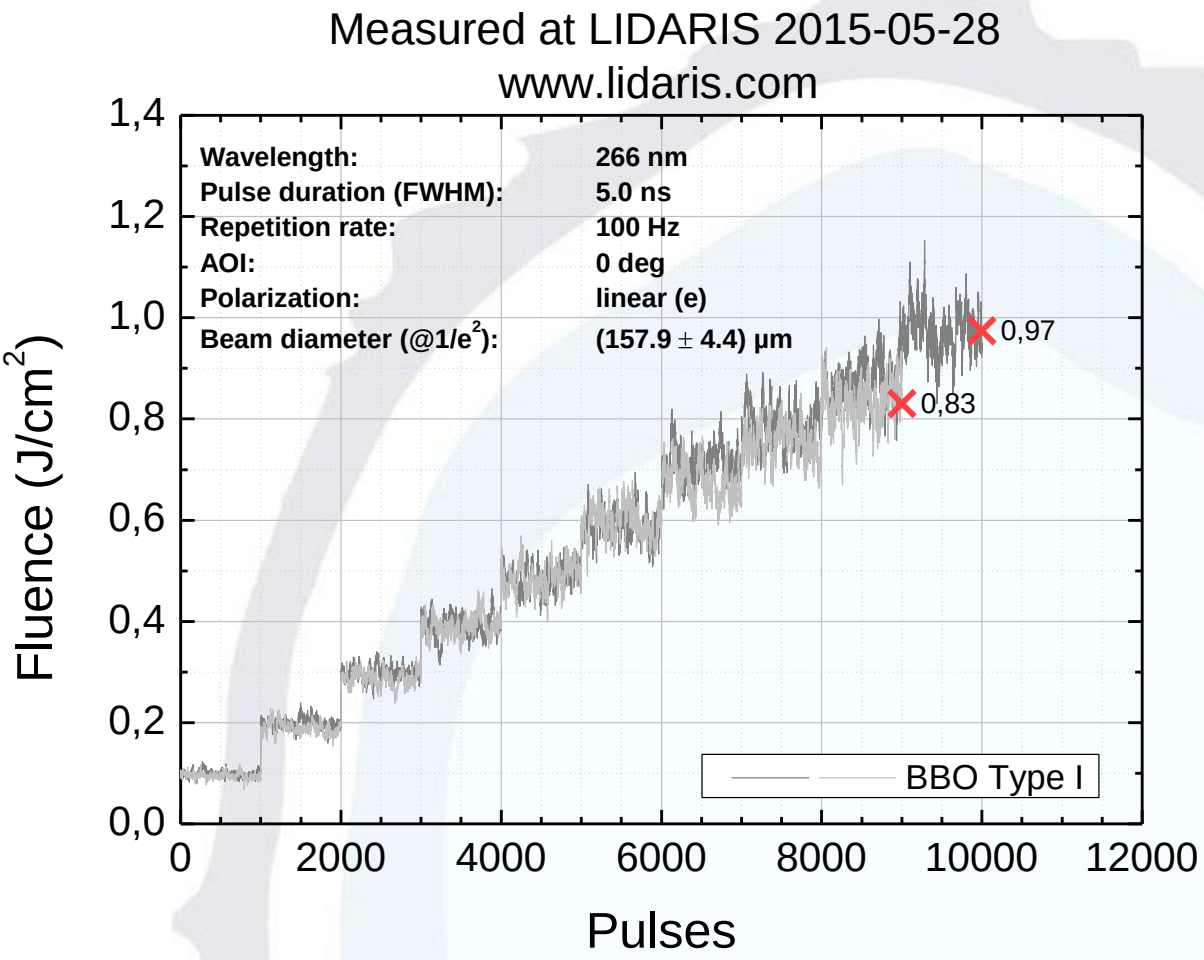


Fig.2. Measured peak fluence during the sample exposure

Typical damage morphology:

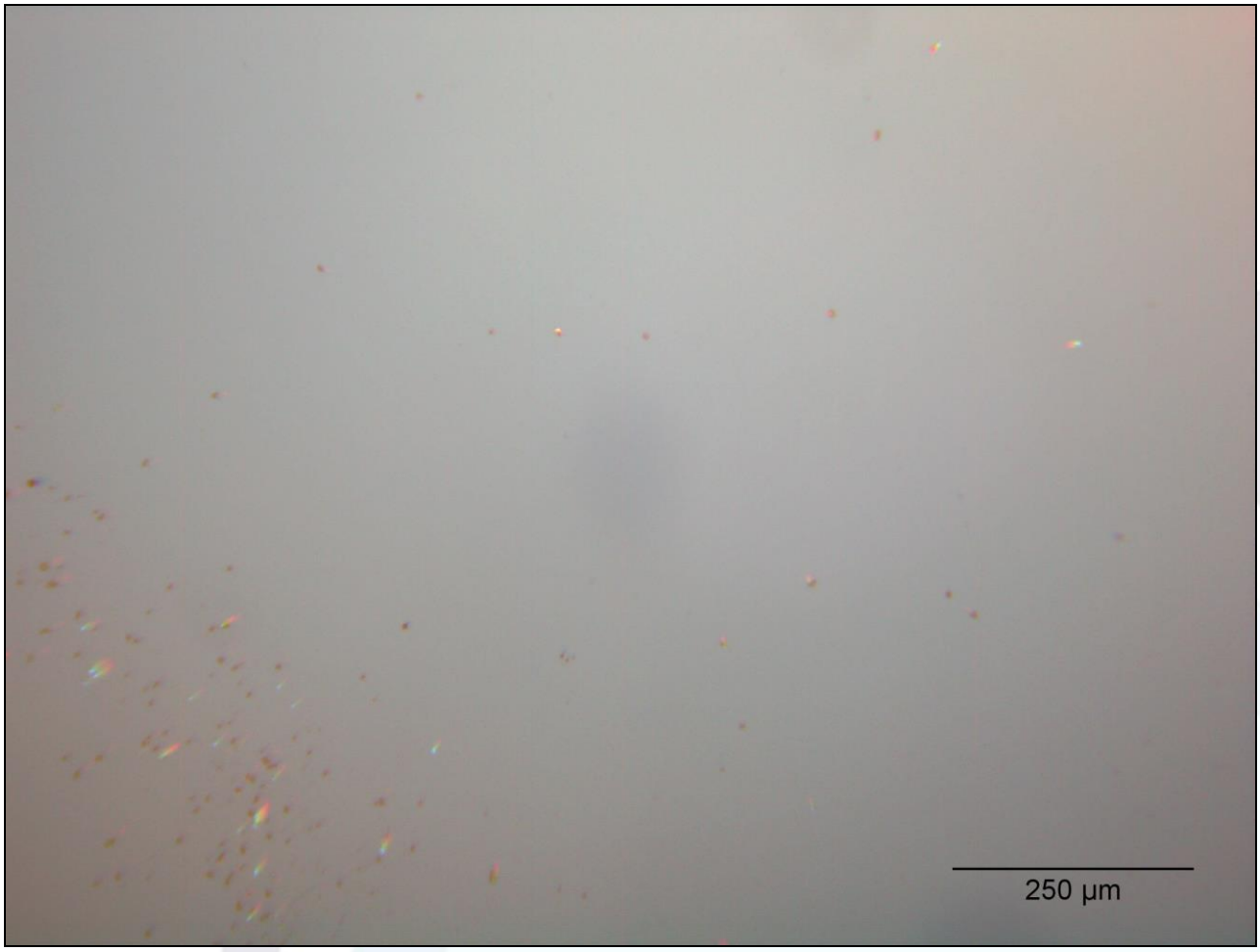


Fig.3. Typical surface damage morphology

Technical note:

Damage occurred only on the front surface of the sample.