

LIDT

LASER-INDUCED DAMAGE THRESHOLD

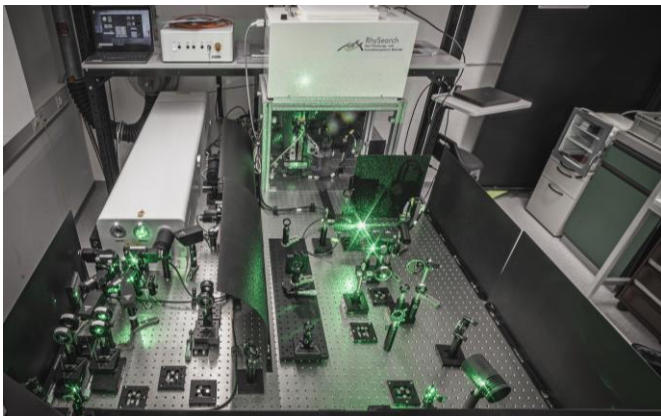
Test method to evaluate the laser induced damage threshold

The LIDT (Laser-Induced Damage Threshold) specifies the threshold value of the maximum energy density (J/cm^2 , pulsed laser) or maximum power (W/cm^2 , CW-laser) with which an optical component can be irradiated by a laser without permanently damaging it.

Laser-induced damage can destroy the functionality of optical components. Manufacturers of optics and laser systems therefore need to know the LIDT in order to be able to qualify the processes and specify the applications.

An optical component is irradiated with different pulse energies or beam powers with a certain number of test points distributed over the sample surface. The component is then examined for visible damage using a light microscope ($\sim 100\times$ magnification). The damage probability curve is typically created by binning the test sites into energy classes. The LIDT can be calculated from the destruction probability curve using a simple linear regression or a more complex model.

RhySearch offers ISO standardized testing but is also open to customize the testing based on your needs. Our measurement setup can also be used for more complex evaluations.



Laser sources

10 ns pulse duration:
1064 nm, 532 nm, 355 nm
40 W / 400 mJ @1064 nm

300 fs pulse duration:

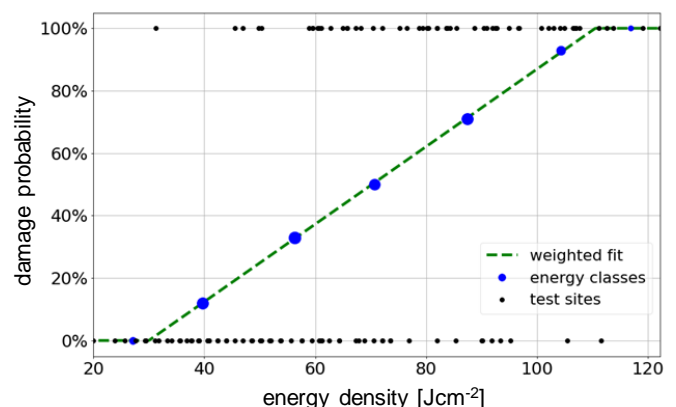
1030 nm
4 W, 10 kHz up to 1 MHz

Test methods

ISO S-on-1
Ramp R-on-1
ISO damage certification
Customized procedures

Standard

ISO 21254



Typical damage probability curve from an S-on-1 LIDT test, using a linear regression to determine the LIDT.

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