

# IBS COATED

Yb:YAG Laser and LBO & BBO  
Nonlinear Crystals

## OPTOMAN LAB NOTEBOOK

### CHALLENGE:

Laser and nonlinear crystals degradation at high power laser applications.

### TASK:

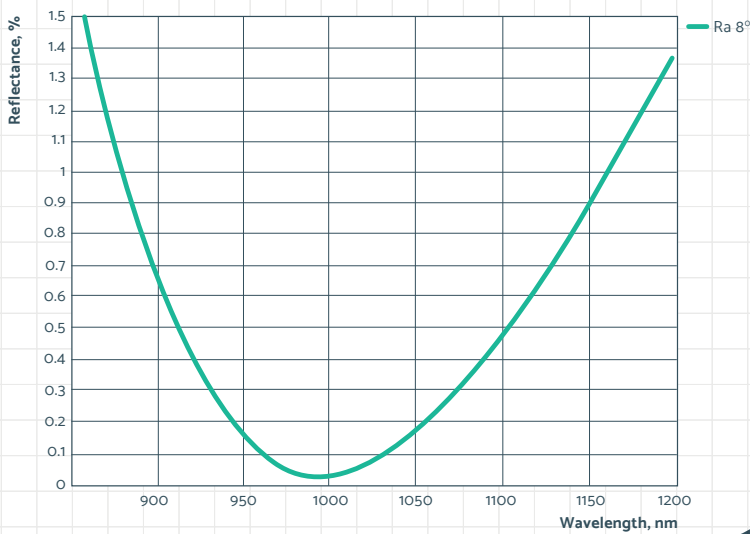
Improve coating design and technology yielding higher LIDT values and improved lifetime.

### LEVEL OF COMPLETION:

Early stage R&D

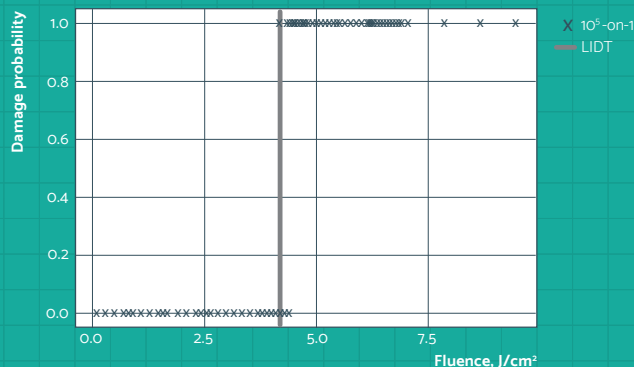
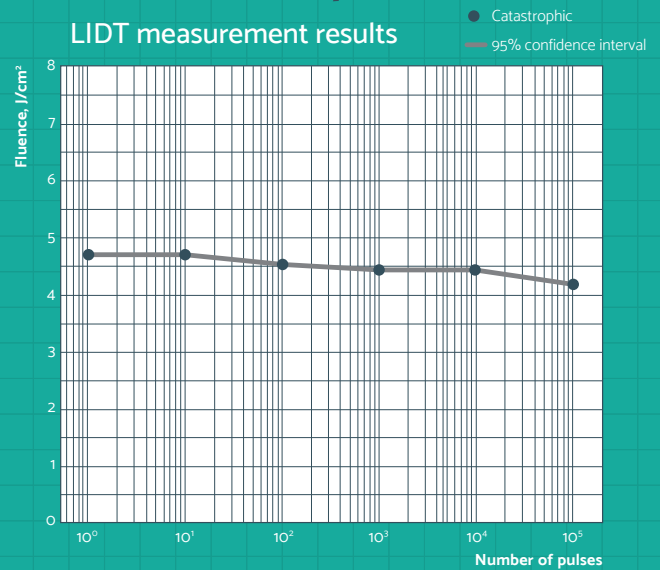
## RESULTS OBTAINED

Yb doped YAG crystal coated with  
AR<0.1% @ 950 nm - 1030 nm, AOI=0°



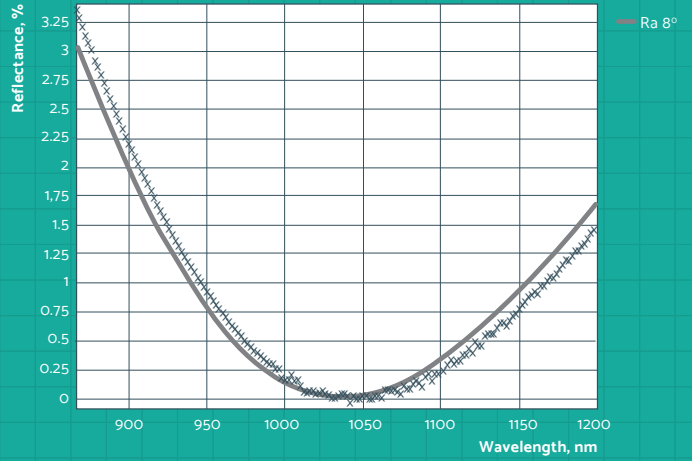
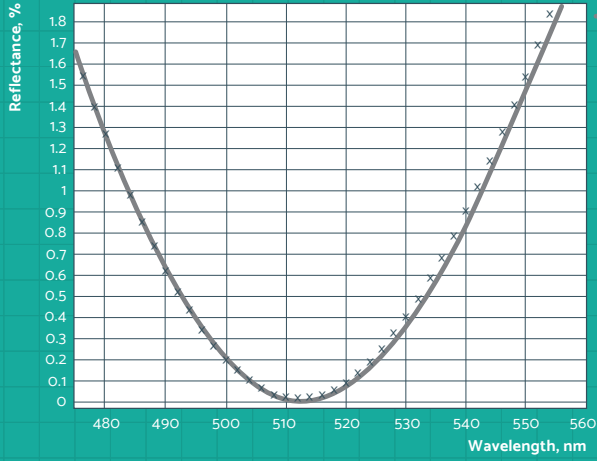
Sample name: Y1  
Wavelength: 1030 nm  
Pulseduration (FWHM): 10.0 ps  
Repetition rate: 10 kHz  
AOI: 0 deg  
Polarization: Linear  
Beam diameter (1/e<sup>2</sup>): (12.4 ± 0.6) μm

### LIDT measurement results

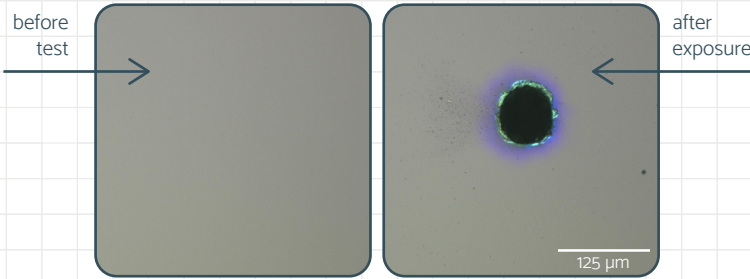


Typical damage morphology: fluence 4.39 J/cm<sup>2</sup>, damage after 100 000 pulse(s).

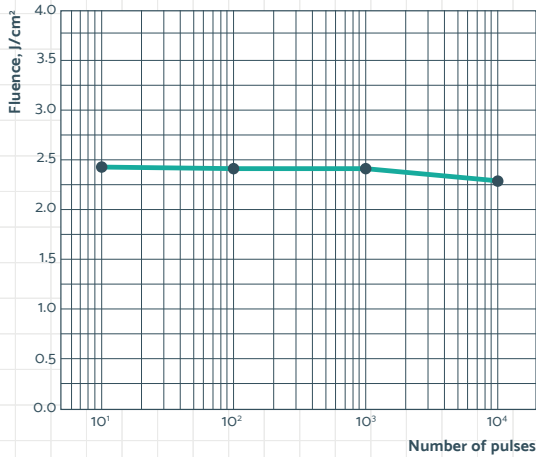
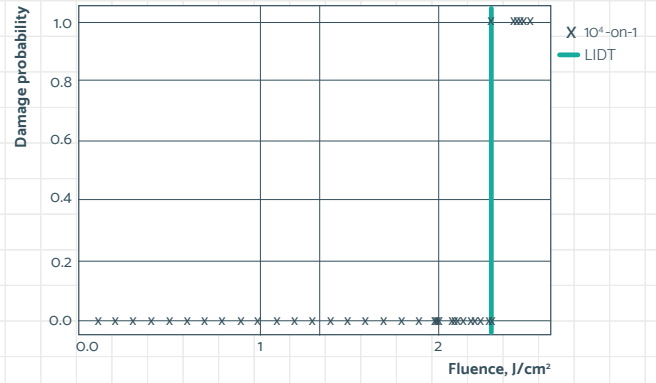
**Nonlinear BBO crystal coated with  
AR<0.1% @ 515 nm + 1030 nm, AOI=0°**



**LIDT measurement results**

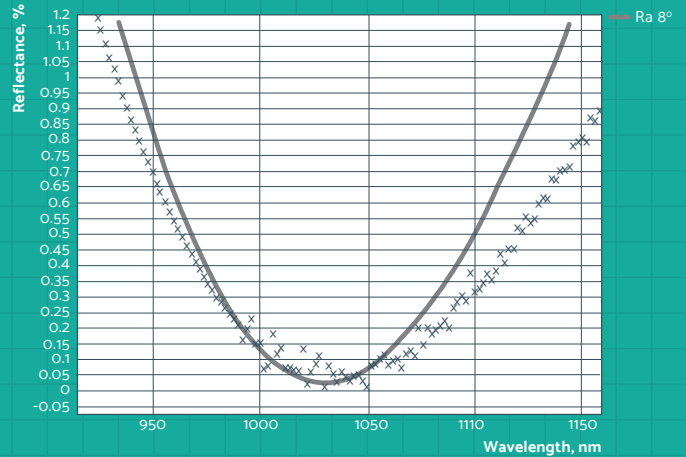
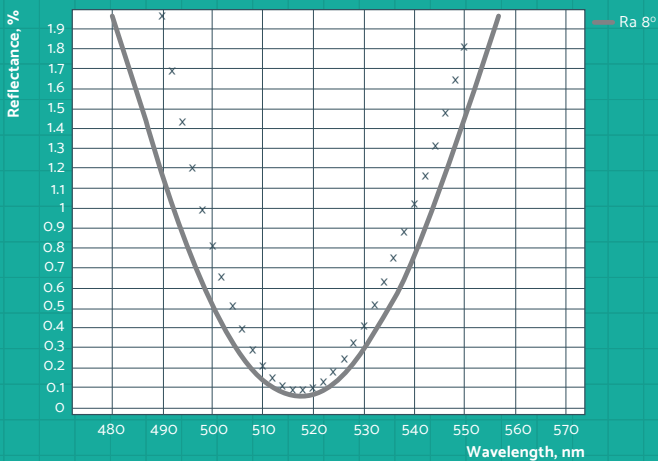


Typical damage morphology: fluence 2.48 J/cm<sup>2</sup>, damage after 100 pulses.

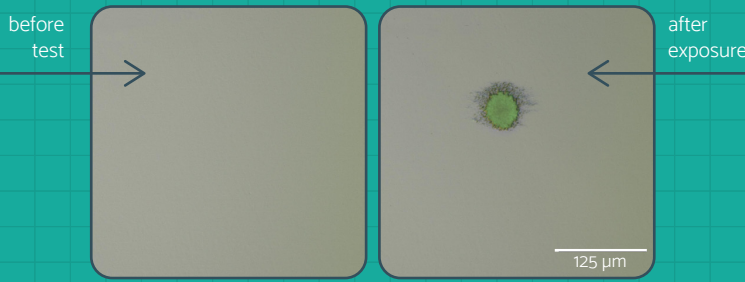


Sample name: B1  
Wavelength: 515 nm  
Pulseduration (FWHM): 10.0 ps  
Repetition rate: 10 kHz  
AOI: 0 deg  
Polarization: Linear  
Beam diameter (1/e²): (110.8 ±0.6) μm

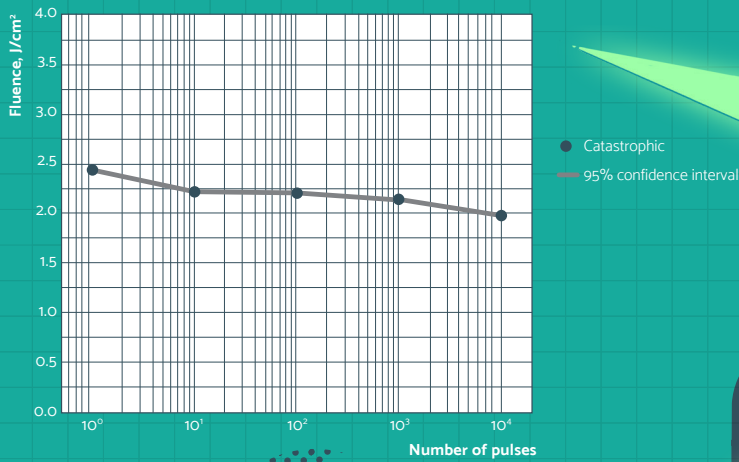
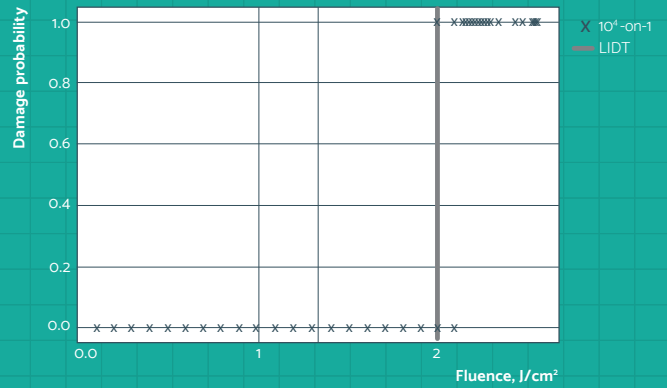
**Nonlinear LBO crystal coated with  
AR<0.1% @ 515 nm + 1030 nm, AOI=0°**



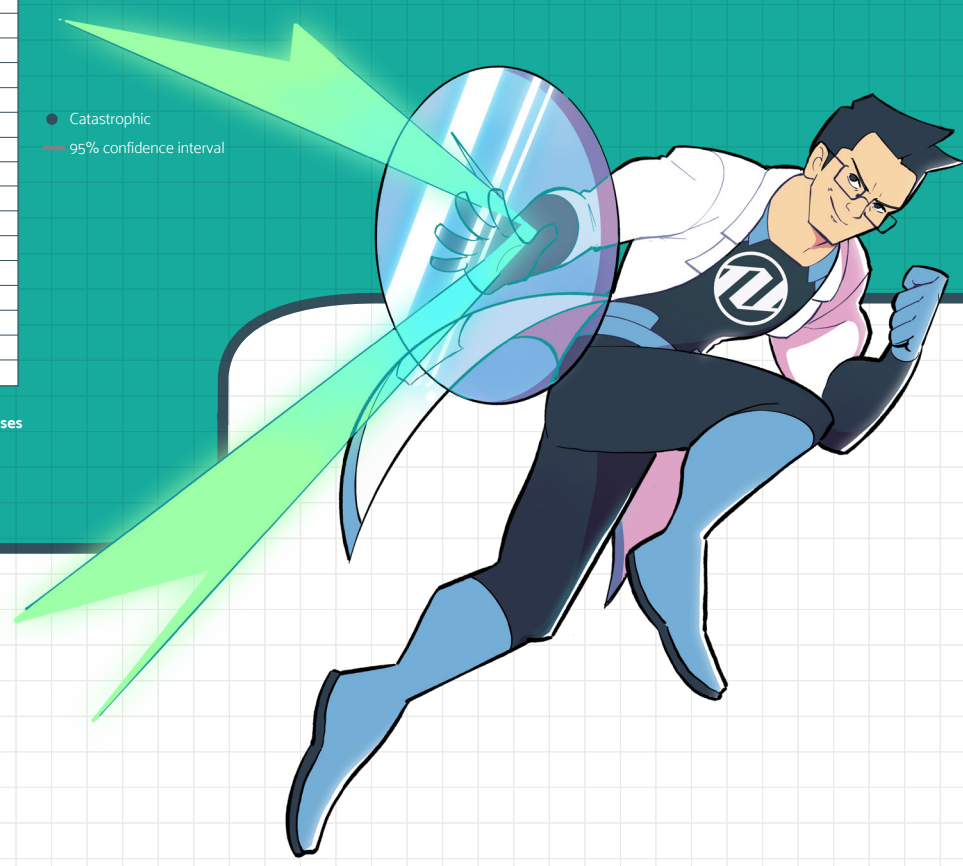
## LIDT measurement results



Typical damage morphology: fluence 2.19 J/cm<sup>2</sup>, damage after 10 000 pulses(s).

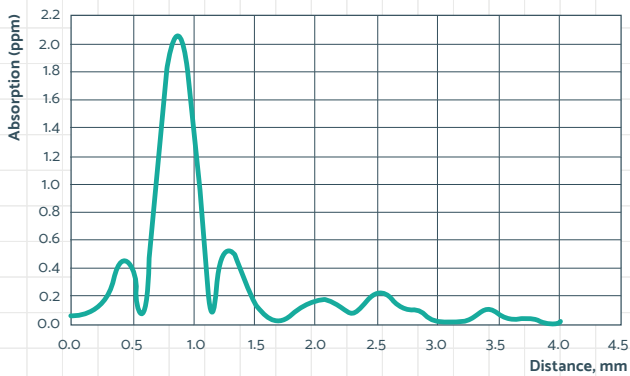


Sample name: L1  
 Wavelength: 515 nm  
 Pulseduration (FWHM): 10.0 ps  
 Repetition rate: 10 kHz  
 AOI: 0 deg  
 Polarization: Linear  
 Beam diameter (1/e<sup>2</sup>): (120.3 ± 0.7) μm



## Absorption measurement results

LBO @ 1064 nm AOI = 0° (L-scan)



LBO @ 1064 nm AOI = 0° (T-scan)

