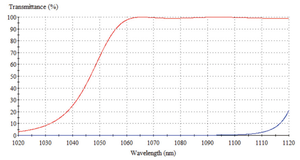
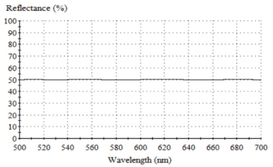
BEAM SPLITTER

Coating category	Wavelength range(nm)	AOI (°)	Technical specification
Metal-dielectric beam splitter	850±5	0°	T:R=1:1
Single beam splitter	1064	0°	T/R=40/60 T/R=50/50; T/R=30/70
Broadband beam splitter	500-700	0°	T/R=50/50
Flat polarization beam splitter	1064	56°	Tp>95%; Rs>99%; Tp/Ts>100:1
Prism polarization beam splitter	532	45°	Tp>98%; Rs>99.5%; Tp/Ts>1000:1
Flat depolarization beam splitter	532	45°	T/R=48:48; IRs-Rpl<5%
Prism depolarization beam splitter	700-1000	45°	T/R=45:45; IRs-Rpl<5%

- Metal and dielectric medium can be selected
- Customization

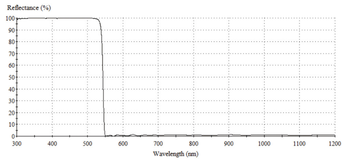


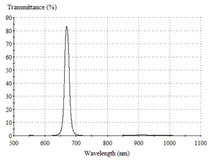


FILTER

Coating category	Technical specification
Cut-off filter	Passband transmittance T>90% The cut-off range can be based on customer requirements Cut off depth OD3
Band-pass filter	CWL: 488nm/905nm/1064nm/1545nm/1575nm FWHM:10nm-200nm Peak transmittance>75% Cut off depth OD3 The cut-off range can be based on customer requirements

- High passband transmittance
- High stability
- Customization





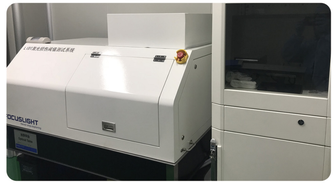
COATING TESTING CAPABILITIES

Instrument	Measurement items	Reference	Instrument	Measurement items	Reference
Cary7000 Spectrophotometer	1.Angle adjustable transmission spectrum measurement 2. Fixed angle reflection spectrum measurement	ISO 9211-2	Cross-cut tester	Coating adhesion test	ISO 9211-4
Weak absorption tester	Weak absorption @532nm, 1064nm	ISO 11551	Constant temperature and humidity box	Coating reliability test	ISO 9022-2
LIDT test platform	355nm，532nm，1064nm pulsed laser damage threshold measurement	ISO 11254-2:2001	Climate chamber	Coating reliability test	ISO 9022-2
Coating hardness tester	Coating hardness test	ISO 15184	Friction resistance tester	Coating friction resistance test	ISO 9211-4
Water bath	Coating solubility test	ISO 9211-4	Temperature rise test platform	Temperature rise test	Simulate actual application conditions

LIDT Measurement Capability & Service

LIDT Measurement Capability

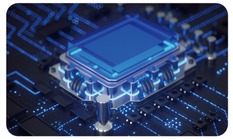
- Wavelength: 355nm/532nm/1064nm
- Laser mode: Pulsed
- Frequency: 10Hz
- Pulse width: 10ns
- Pulse number: 200



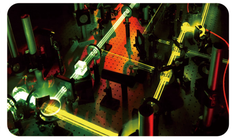
LIDT Testing Service

- Report available within 3 days after receiving samples

Automotive



Advanced Manufacturing



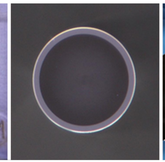
Scientific Research

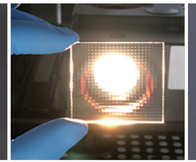
Focuslight Technologies Inc.

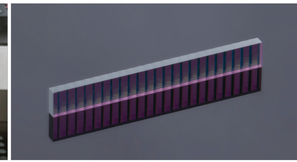
No.56 Zhangba 6th Road, High-Tech Zone, Xi'an, Shaanxi 710077, P.R. China

Website: www.focuslight.com Email: sales@focuslight.com

FOCUSLIGHT
Never stop exploring







- Coating design and R&D capability
- Coating capacity in large volume
- Coating analysis and measurement capabilities
- LIDT testing capabilities and services

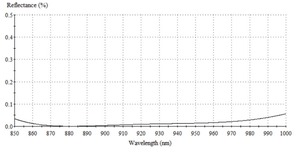
- IAD deposition
- 60 points optical control system
- RF ion source
- Automatic control
- E-type double EB gun
- 6 pieces rotation crystal control system

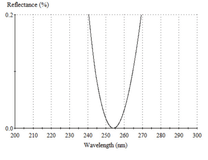
OPTICAL COATING

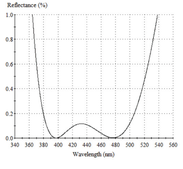
ANTI-REFLECTION COATING

Coating category	Wavelength range(nm)	AOI (°)	Reflectance (%)
UV single wavelength AR coating	266	0-15°	R＜0.2%
UV single wavelength AR coating	355	0-10°	R＜0.2%
DUV AR coating	247-250	0-15°	R＜0.2%
Broadband AR coating	380-480	0-30°	R＜0.5%
Dual wavelength AR coating	355+532	0-15°	R＜0.5%
Dual wavelength AR coating	532+1064	0°	R＜0.2%
Broadband AR coating	770-1070	0-30°	R＜0.5%
Broadband AR coating	1530-1570	0-20°	R＜0.2%
Broadband AR coating	1700-2500	0-30°	R＜0.5%

- High transmittance at target wavelength range
- High damage threshold
- Low absorption at PPM level
- From DUV to Infrared band
- Low reflection
- Customization

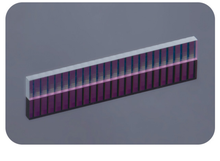






380-3000nm AR Coating - High Power Laser Application

- 380-3000nm anti-reflection coating
- High LIDT ——18J/cm²@10ns, 13.9J/cm²@5.6ns
- Customizable



LASER OPTICAL COLLIMATOR COATING

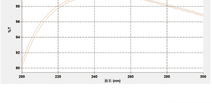
- Customized NIR laser band coatings
- Low absorption levels
- High performance against laser damage
- LIDT：18J/cm² @10ns, 10 HZ, 1064nm

FOCUSLIGHT LIDT Test Reports

Product name	ZL002495	Tester	XXX
Product model	ZL002495	Coating Numble	23081501
Test date	2023/8/15 9:47	Wavelength/nm	1064
Frequency/HZ	10	Pulse width/ns	5.6
Spot diameter/mm	0.316	Pulse number	200
Polarization	Linear	Angle of incidence/°	0
LIDT results	18.57 J/cm² 10ns，13.9 J/cm² 5.6ns		
Target value			
Result	√Pass □Fail	Approver/date	XXX 2023/8/16

Energy density J/cm2 5.6ns	Energy density J/cm2 10ns	probability of damage
4.64	8.2	0
9.3	12.428	0
13.9	18.575	0
18.17	24.281	0.667
22.65	30.267	1
26.92	35.973	1

UV248 COATING - LITHOGRAPHY APPLICATION



UV248 AR coating

- 248-250nm，AOI=0-15°
- R＜0.2% T＞99.5%
- LIDT up to 13J/cm²@266nm

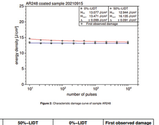


Figure 5: Characteristic damage curve of sample #5266

Number of pulses	50%-LIDT [J/cm²]	0%-LIDT [J/cm²]	First observed damage [J/cm²]
10	14.667	13.467	13.279
50	14.207	13.467	13.279
80	14.029	13.149	13.279
100	13.961	13.096	13.279
220	13.961	13.096	13.279
460	13.961	13.096	13.279
1,000	13.639	13.232	13.279
2,200	13.639	13.232	13.279
4,600	13.639	13.232	13.279
10,000	13.639	13.232	13.279

Table 1: LIDT values for several classes of pulse numbers

1.3.1 Characteristic Damage Plot

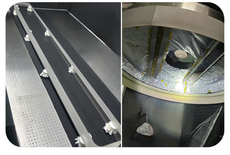
1.3 Test conditions
Wavelength: 266nm
Operating mode: pulsed (0-10Hz)
Pulse duration: 5ns (FWHM)

1.4 Measurement specifications
Beam diameter: 190µm (effective), 277µm (1/e²)
Pulsed laser profile: Gaussian
Age: 20 h
Polarization: linear
Number of spot sites: 10 sites
Spot matrix: hexagonal
Distance between spot sites: 1.5 mm (center-to-center)
Online detection system: scattered light by Si photodiode
Offline detection system: Nomarski microscopy (magnification: 150x)
Environmental conditions: air
Mounting of optical components: commercial kinematic mount

1.5 Error budget
Plasma error: ±10%
Evaluation error: ±1%

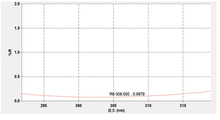
1.6 Lateral beam profile

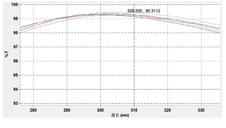
UV308 Coating - Pan Semiconductor Application



UV308 AR coating

- Large size：1200*120mm
- Spectral uniformity＜10nm
- LIDT up to 16J/cm²



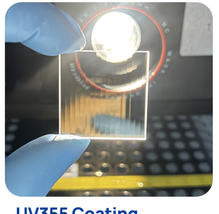


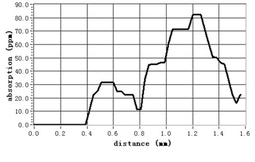
FOCUSLIGHT LIDT Test Reports

Product name	AR308	Tester	XXX
Product model	AR308	Coating Numble	23021603
Test date	2023/2/16 10:36	Wavelength/nm	355
Frequency/HZ	10	Pulse width/ns	5.6
Spot diameter/mm	0.249	Pulse number	200
Polarization	Linear	Angle of incidence/°	0
LIDT results	16.129 J/cm² @10ns，12.07J/cm² @5.6ns,		
Target value	> 10J/cm² @355nm 10Hz 10ns		
Result	√Pass □Fail	Approver/date	XXX 2023/2/16

Energy density J/cm2 5.6ns	Energy density J/cm2 10ns	probability of damage
2.54	3.294	0
4.7	6.281	0
7.14	9.141	0
9.51	12.708	0
12.07	16.129	0
12.98	17.345	1

UV355 AR Coating - Laser Dicing





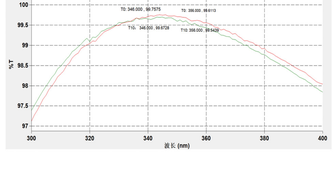
FOCUSLIGHT LIDT Test Reports

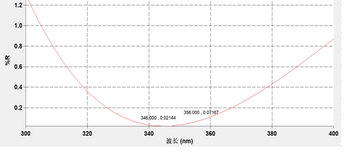
Product name	AR355	Tester	Zhitao Quan
Product model	AR355	Coating Numble	23021604
Test date	2023/2/16 10:36	Wavelength/nm	355
Frequency/HZ	10	Pulse width/ns	5.6
Spot diameter/mm	0.249	Pulse number	200
Polarization	Linear	Angle of incidence/°	0
LIDT results	13.04J/cm2 @10ns，9.76J/cm2 @5.6ns		
Target value	> 10J/cm² @355nm 10Hz 10ns		
Result	√Pass □Fail	Approver/date	Qing Luo 2023/2/16

Energy density J/cm2 5.6ns	Energy density J/cm2 10ns	probability of damage
2.46	3.287	0
4.94	6.601	0
7.38	9.857	0
9.76	13.042	0
12.15	16.276	1
14.69	19.67	1

UV355 Coating

- 346-356nm, AOI=0-10°, R＜0.2%, T＞99%
- Coating absorption ‹ 90PPM
- LIDT up to 13 J/ cm²
- Excellent performance for high power laser application

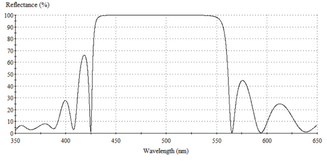


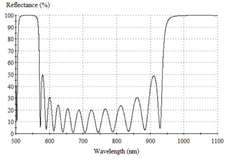


HIGH REFLECTION COATING

Coating category	Wavelength range(nm)	AOI (°)	Reflectance (%)
Single wavelength HR coating	266	45°	＞99.5%
Single wavelength HR coating	355	45°	＞99.5%
Dual wavelength HR coating	343/532	40°	＞60%/99%
Dual wavelength HR coating	633/1064	45°	＞80%/99.5%
Broadband HR coating	440-540	0°	＞99.5%
Broadband HR coating	630-690	40°-50°	＞99%
Broadband HR coating	1020-1085	43-47°	＞99.8%
Broadband HR coating	1450-1550	44-46°	＞99.5%

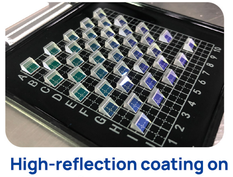
- High reflection at target wavelength range and incident angle
- Metal and dielectric medium can be selected
- High damage threshold
- Customization





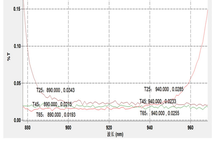
HR coating - Projection/Telecom/Consumer Electronics

- High reflection coating
- High LIDT ——30J/cm²@10ns, 23J/cm²@5.6ns
- Customizable

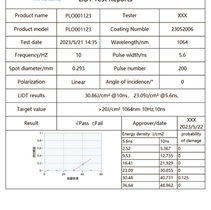


High-reflection coating on micro prisms

- R＞99.8%@915±25nm，AOI=45°±20°
- LIDT up to 30J/cm²



FOCUSLIGHT LIDT Test Reports

Product name	PLC001123	Tester	XXX
Product model	PLC001123	Coating Numble	23052006
Test date	2023/5/21 14:35	Wavelength/nm	1064
Frequency/HZ	10	Pulse width/ns	5.6
Spot diameter/mm	0.293	Pulse number	200
Polarization	Linear	Angle of incidence/°	0
LIDT results	30.86J/cm² @10ns，23.09J/cm² @5.6ns,		
Target value	> 20J/cm² 1064nm 10Hz,10ns		
Result	√Pass □Fail	Approver/date	XXX 2023/5/22

Energy density J/cm2 5.6ns	Energy density J/cm2 10ns	probability of damage
2.52	3.367	0
5.53	12.735	0
16.41	21.929	0
23.09	30.855	0
30.40	40.731	0.125
36.64	48.962	0