

# Protective Windows for Diode Pumped Solid State Lasers



Fiber Lasers, Nd:YAG, Yb:YAG, Yb:KGW/Yb:KYW

Protective Windows For F-Theta Lenses

## ABOUT ALTECHNA

Altechna – Lithuanian laser technology company working in photonics and laser research since 1996.

Altechna is a supplier of laser related products and complex solutions: laser optics, polarization optics, laser and nonlinear crystals, lasers and laser accessories.

## PRODUCT LINES

 <p><b>Optical Components</b></p> <ul style="list-style-type: none"> <li>Laser Mirrors</li> <li>Beamsplitters</li> <li>Lenses</li> <li>Prisms</li> <li>Filters</li> <li>Axicons</li> </ul>	 <p><b>Polarization Optics</b></p> <ul style="list-style-type: none"> <li>Waveplates</li> <li>Brewster Type Polarizers</li> <li>Broadband Thin Film Polarizers</li> <li>Glan Type Polarizers</li> <li>Polarizing Cubes</li> </ul>	 <p><b>Laser &amp; Nonlinear Crystals</b></p> <ul style="list-style-type: none"> <li>Laser Crystals</li> <li>Nonlinear Crystals</li> <li>Passive Q-Switch Crystals</li> <li>Photorefractive Crystals</li> <li>Raman Crystals</li> </ul>	 <p><b>Optomechanics</b></p> <ul style="list-style-type: none"> <li>Optical Tables</li> <li>Optical Mounts</li> <li>Optical Positioners</li> <li>Motion Control</li> <li>Brackets &amp; Rails</li> </ul>	 <p><b>Lasers</b></p> <ul style="list-style-type: none"> <li>Pulsed DPSS Lasers</li> <li>CW DPSS Lasers</li> <li>Diode Lasers</li> <li>Laser Kits</li> </ul>	 <p><b>Lasers Accessories</b></p> <ul style="list-style-type: none"> <li>Laser Beam Attenuators</li> <li>Beam Expanders</li> <li>Laser Beam Shaping Systems</li> <li>Pulse Picking Devices</li> </ul>
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## LENS PROTECTIVE WINDOWS FOR HIGH POWER DIODE PUMPED SOLID STATE LASERS

Every laser cutting, welding and drilling system consist of multiple optical components. Being one of the simplest optical components of the system, protective windows are crucial for securing smooth operation of laser system. Protective windows are highly recommended for shielding more expensive optical components like focusing lenses from splatter and debris during laser processing. All windows are laser grade polished and made of high purity fused silica, thus are suited for usage under power rates exceeding several kW. In order to be sure that every

production batch of windows can be used in high power laser systems, laser induced damage threshold is measured of every coating batch. A typical LIDT value exceeds 30 J/cm<sup>2</sup> (or several tens of MW/cm<sup>2</sup> at continuous exposure).

Anti – reflective (AR) coatings help to prevent back reflections of a laser beam and increase processing efficiency. While uncoated windows reflect 3 % of light per surface, AR coated windows reflect only 0.1 % - 0.2 % per surface. Altechna presents list of lens protective windows for most of commercially available industrial laser machines.

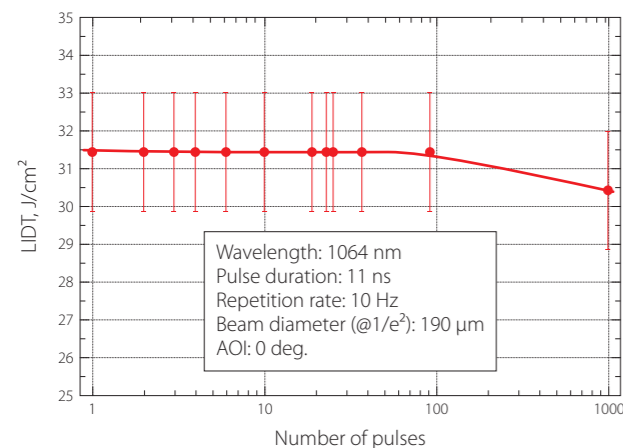


Fig. 1. Laser induced damage threshold measurement according to ISO standard.

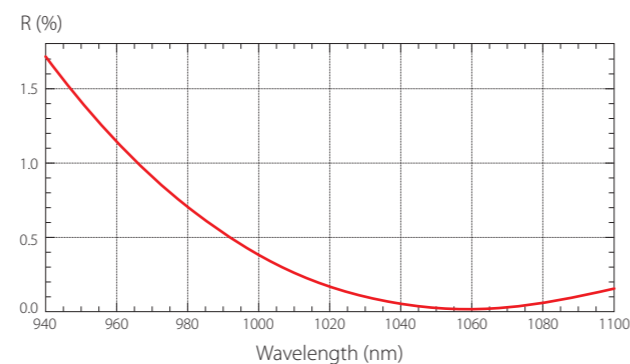


Fig. 2. Residual reflectivity per surface of a window coated with AR@1060 nm – 1090 nm coating.

Herewith in the list below we present lens protective windows for most of commercially available industrial laser machines.

Altechna part number	Systems produced by	Dimensions, mm	Thickness, mm
1-OS-2-32-635-[6R00x]	Salvagnini	32,00	6,35
1-OS-2-254-200-[6R00x]	Salvagnini	25,40	2,00
1-OS-2-38-200-[6R00x]	Alpha Laser, RofinBaasel, Siro Laser	38,00	2,00
1-OS-2-60-200-[6R00x]	Alpha Laser	60,00	2,00
1-OS-2-60-300-[6R00x]	RofinBaasel	60,00	3,00
1-OS-2-75-160-[6R00x]	RofinBaasel, ElectroX	75,00	1,60
1-OS-2-90-500-[6R00x]	RofinBaasel	90,00	5,00
1-OS-2-100-300-[6R00x]	RofinBaasel, General Scanning	100,00	3,00
1-OS-2-113-300-[6R00x]	RofinBaasel, General Scanning	113,00	3,00
1-OS-2-50-200-[6R00x]	Control Laser, Haas Laser Technologies, Triumph	50,00	2,00
1-OS-2-70-325-[6R00x]	Control Laser	70,00	3,25
1-OS-2-825-325-[6R00x]	Control Laser	82,50	3,25
1-OS-2-169-300-[6R00x]	Control Laser	169,00	3,00
1-OS-2-100-187-[6R00x]	General Scanning	100,00	1,87
1-OS-2-2240-150-[6R00x]	Haas Laser Technologies, Triumph	22,40	1,50
1-OS-2-27-150-[6R00x]	Haas Laser Technologies, Triumph	27,00	1,50
1-OS-2-30-150-[6R00x]	Haas Laser Technologies, Triumph	30,00	1,50
1-OS-2-30-300-[6R00x]	Haas Laser Technologies, Triumph	30,00	3,00
1-OS-2-40-150-[6R00x]	Haas Laser Technologies, Triumph	40,00	1,50
1-OS-2-55-150-[6R00x]	Haas Laser Technologies, Triumph	55,00	1,50
1-OS-2-10-100-[6R00x]	JK Lasers	10,00	1,00
1-OS-2-19-115-[6R00x]	JK Lasers	19,00	1,15
1-OS-2-20-115-[6R00x]	JK Lasers	20,00	1,15
1-OS-2-23-115-[6R00x]	JK Lasers	23,00	1,15
1-OS-2-253-115-[6R00x]	JK Lasers	25,30	1,15
1-OS-2-285-115-[6R00x]	JK Lasers	28,50	1,15
1-OS-2-38-115-[6R00x]	JK Lasers	38,00	1,15
1-OS-2-41-115-[6R00x]	JK Lasers	41,00	1,15
1-OS-2-45-115-[6R00x]	JK Lasers, Raytheon	45,00	1,15
1-OS-2-46-115-[6R00x]	JK Lasers	46,00	1,15
1-OS-2-50-115-[6R00x]	JK Lasers, Miyachi	50,00	1,15
1-OS-2-54-115-[6R00x]	JK Lasers	54,00	1,15
1-OS-2-762-115-[6R00x]	JK Lasers	76,20	1,15
1-OS-2-25-400-[6R00x]	Lasag	25,00	4,00
1-OS-2-30-200-[6R00x]	Lasag	30,00	2,00
1-OS-2-40-200-[6R00x]	Lasag	40,00	2,00
1-OS-2-30-115-[6R00x]	Miyachi	30,00	1,15
1-OS-2-38-200-[6R00x]	Orziv	38,00	2,00
1-OS-2-6658-115-[6R00x]	Quantrad	66,00 x 58,00	1,50
1-OS-2-13-254-[6R00x]	Quantum Laser, Sharplan	13,00	2,54
1-OS-2-2794-200-[6R00x]	Raytheon	27,94	2,00
1-OS-2-3175-170-[6R00x]	Raytheon	31,75	1,70
1-OS-2-3175-115-[6R00x]	Raytheon	31,75	1,15
1-OS-2-3810-200-[6R00x]	Raytheon	38,10	2,00
1-OS-2-50-300-[6R00x]	RofinSinar	50,00	3,00
1-OS-2-50-150-[6R00x]	RofinSinar	50,00	1,50
1-OS-2-60-300-[6R00x]	RofinSinar	60,00	3,00
1-OS-2-66-200-[6R00x]	RofinSinar	66,00	2,00
1-OS-2-99-500-[6R00x]	RofinSinar	99,00	5,00
1-OS-2-80-300-[6R00x]	Siemens	80,00	3,00
1-OS-2-40-400-[6R00x]	Spectron	40,00	4,00
1-OS-2-2235-400-[6R00x]	Precitec	22,35	4,00

## F-THETA LENS PROTECTIVE WINDOWS

One of the most commonly tools used for laser beam focusing in laser fabrication equipment is F-Theta lens. Despite of relatively long lens working distance splatter caused lens contamination is significant if metals are being processed. Windows are designed to protect the lens surface from debris. Being ten to

thousand times less expensive than F-Theta lens itself, window is of high importance as protective consumable. Altechna offers variety of standard windows for this purpose. If required protective window is not listed in standard items, please submit request form for the window you need.

Altechna part number	Material	Dimensions, mm	Thickness, mm	Coatings
1-OS-2-70-500-[6R00]	UVFS	70,00	3,25	AR/AR@1064 nm
1-OS-2-75-160-[6R00]	UVFS	75,00	1,60	AR/AR@1064 nm
1-OS-2-70-325-[6R00]	UVFS	75,00	5,00	AR/AR@1064 nm
1-OS-2-80-300-[6R00]	UVFS	80,00	3,00	AR/AR@1064 nm
1-OS-2-825-325-[6R00]	UVFS	82,50	3,25	AR/AR@1064 nm
1-OS-2-84-180-[6R00]	UVFS	84,00	1,80	AR/AR@1064 nm
1-OS-2-90-500-[6R00]	UVFS	90,00	5,00	AR/AR@1064 nm
1-OS-2-100-187-[6R00]	UVFS	100,00	1,87	AR/AR@1064 nm
1-OS-2-100-300-[6R00]	UVFS	100,00	3,00	AR/AR@1064 nm
1-OS-2-100-400-[6R00]	UVFS	100,00	4,00	AR/AR@1064 nm
1-OS-2-112-100-[6R00]	UVFS	112,00	1,00	AR/AR@1064 nm
1-OS-2-112-300-[6R00]	UVFS	112,00	3,00	AR/AR@1064 nm
1-OS-2-113-300-[6R00]	UVFS	113,00	3,00	AR/AR@1064 nm
1-OS-2-120-180-[6R00]	UVFS	120,00	1,80	AR/AR@1064 nm
1-OS-2-122-400-[6R00]	UVFS	122,00	4,00	AR/AR@1064 nm
1-OS-2-169-300-[6R00]	UVFS	169,00	3,00	AR/AR@1064 nm
1-OS-2-285-100-[6R00]	UVFS	285,00	1,00	AR/AR@1064 nm
1-OS-2-45-200-[5J00]	UVFS	45,00	2,00	AR/AR@532 nm + 1064 nm
1-OS-2-65-160-[5J00]	UVFS	65,00	1,60	AR/AR@532 nm + 1064 nm
1-OS-2-75-160-[5J00]	UVFS	75,00	1,60	AR/AR@532 nm + 1064 nm
1-OS-2-82-300-[5J00]	UVFS	82,00	3,00	AR/AR@532 nm + 1064 nm
1-OS-2-93-300-[5J00]	UVFS	93,00	3,00	AR/AR@532 nm + 1064 nm
1-OS-2-96-300-[5J00]	UVFS	96,00	3,00	AR/AR@532 nm + 1064 nm
1-OS-2-105-300-[5J00]	UVFS	105,00	3,00	AR/AR@532 nm + 1064 nm
1-OS-2-123-300-[5J00]	UVFS	123,00	3,00	AR/AR@532 nm + 1064 nm
1-OS-2-73-200-[6B00]	UVFS	42,00	2,00	AR/AR@308 nm – 355 nm
1-OS-2-73-150-[6B00]	UVFS	73,00	1,50	AR/AR@308 nm – 355 nm
1-OS-2-115-300-[6B00]	UVFS	115,00	3,00	AR/AR@308 nm – 355 nm
1-OS-2-42-200-[6B00]	UVFS	73,00	1,50	AR/AR@266 nm
1-OS-2-115-300-[6B00]	UVFS	115,00	3,00	AR/AR@266 nm
1-OS-2-37-100-[6N00x]	UVFS	37,00	1,00	AR/AR@808 nm – 940 nm
1-OS-2-65-160-[6N00x]	UVFS	65,00	1,60	AR/AR@808 nm – 940 nm
1-OS-2-75-160-[6N00x]	UVFS	75,00	1,60	AR/AR@808 nm – 940 nm
1-OS-2-9330-300-[6N00x]	UVFS	93,30	3,00	AR/AR@808 nm – 940 nm
1-OS-2-123-300-[6N00x]	UVFS	123,00	3,00	AR/AR@808 nm – 940 nm
1-OS-2-37-600-[7A00]	UVFS	37,00	6,00	AR/AR@400 nm – 700 nm
1-OS-2-45-200-[7A00]	UVFS	45,00	2,00	AR/AR@400 nm – 700 nm