

# Laser Shield Curtain Guide

These products are intended for protection or shielding from accidental exposure to scattered laser light.

Absorb indirect scattering light of laser light to protect the eye. The type, wavelength and optical density (OD) of laser light to be absorbed are inscribed on these products.

- Apply to windows, inset windows or partitions in laser controlled areas in laboratories and factories.
- Effective as safety measures for expected and unexpected visitors, since laser injuries can occur instantaneously.

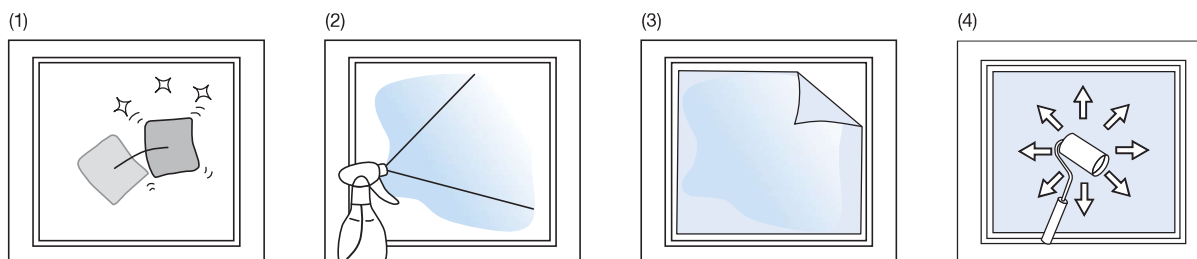
## How to Attach and Install

Replace curtains periodically because the optical density may deteriorate depending on the usage or storage environment (direct sunlight, high temperature and high humidity) or due to scratches.

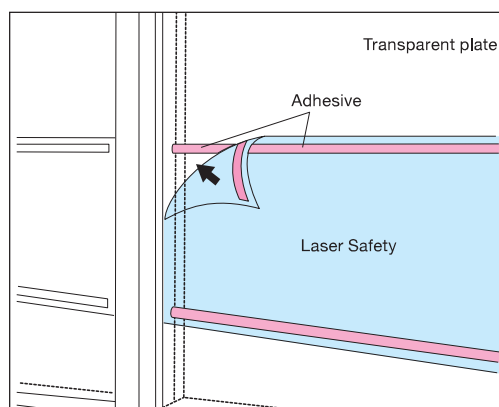
These products are made of flexible PVC, which may be vulnerable to degradation by organic solvents, acids, and alkalies, depending on the solvent type. If stained, wash with water containing a neutral detergent or wipe with alcohol. Also wipe with alcohol when curtains become cloudy over time with oily exudations (plasticizer).

### Installation method of YLC-1 laser shield curtain

- (1) Wipe the glass clean.
- (2) Spray water onto the glass surface.
- (3) Apply the product to the wet glass.
- (4) Push out water and air from underneath the product by moving a rubber spatula on top of the product from the center to its edges.



### Attaching method of YL-600 laser curtain



### Attention

- ▶ Do not use with incompatible lasers or wavelengths. (Even if laser names are the same, their wavelengths might be different.)
- ▶ Do not use products that are damaged or after they have received large laser energy.
- ▶ Never subject laser (shield) curtains to direct laser beam exposure. Direct exposure may damage the curtains.
- ▶ These are not protective equipments that completely absorb laser light. (Refer to the absorption characteristic graph.)
- ▶ Do not directly look into the laser beam through laser (shield) curtains.

Application Systems

Optics &amp; Optical Coatings

Opto-Mechanics

Bases

Manual Stages

Actuators &amp; Adjusters

Motorized Stages

Light Sources &amp; Laser Safety

Index

Guide

Lasers

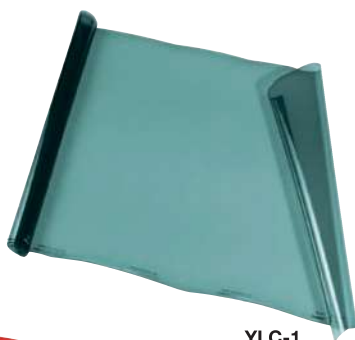
Detectors

Laser Safety Equipments

Light Sources

Protect wider areas (width: 1000mm) compared to conventional YL-600 (effective width: 330mm), and offer excellent antistatic and fire retardant features.

- High visibility with improvements in surface accuracy and transmittance.
- High durability and flexibly used in various shapes since it adheres to water instead of glue.



YLC-1



YLC-2

### Common Specifications

Material	Flexible PVC
Thickness [mm]	0.5
Compatible Wavelength [nm]	YLC-1: 266, 355, 1064, 2100, 10600 YLC-2: 190 – 380, 441 – 532
Color	YLC-1: Clear gray YLC-2: Clear orange
Optical Density [OD]	3<
Visible Light Transmittance [%]	YLC-1: Standard 40 YLC-2: Standard 30
Antistatic Property (Surface resistance value)	YLC-1: $1.1 \times 10^{10}$ (JIS K6911) YLC-2: $1.1 \times 10^{13}$ (JIS K6911)
Fire Retardant	Class 2 fire retardant (JIS A1322)



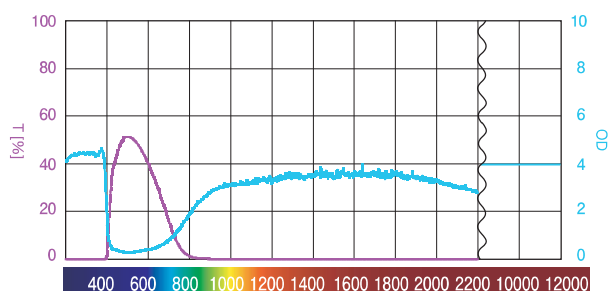
An example of using YLC-1

Part Number	Part Number	Length [mm]
YLC-1(0.5M)	YLC-2(0.5M)	500
YLC-1(1M)	YLC-2(1M)	1,000
YLC-1(2M)	YLC-2(2M)	2,000
YLC-1(3M)	YLC-2(3M)	3,000
YLC-1(4M)	YLC-2(4M)	4,000
YLC-1(5M)	YLC-2(5M)	5,000
YLC-1(6M)	YLC-2(6M)	6,000
YLC-1(7M)	YLC-2(7M)	7,000
YLC-1(8M)	YLC-2(8M)	8,000
YLC-1(9M)	YLC-2(9M)	9,000
YLC-1(10M)	YLC-2(10M)	10,000

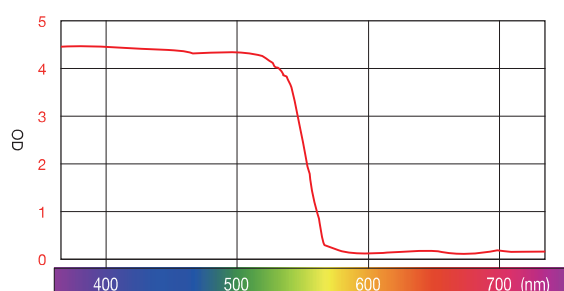
### Absorption characteristic graph

T: Transmittance

#### YLC-1



#### YLC-2



\* Note that the graphs of optical density show measured values, not guaranteed values.

## Laser Safety PVC Films | YL-600

RoHS

Catalog  
Code

W5009

## Protect eyes from accidental exposure to scattered lasers.

- Made of flexible PVC, and can be easily cut and applied to many surfaces including windows, doors and glasses in laboratories and factories.

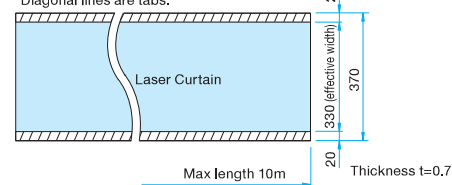


## Outline Drawing

(Units: mm)

YL-600

\* Diagonal lines are tabs.



## Common Specifications


Material	Flexible PVC
Thickness [mm]	0.7
External Dimensions [mm]	Effective width: 330

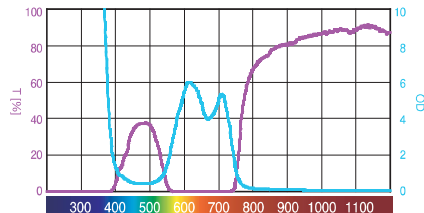
Part Number	Compatible Laser	Wavelength [nm]	Optical Density [OD]	Visible Light Transmittance [%]	Color	Length [mm]	Weight [kg]
YL-600-HN(0.5M)	He-Ne	632.8 570 – 694.3	2<	12	Blue	500	0.18
YL-600-HN(1M)						1,000	0.35
YL-600-HN(2M)						2,000	0.7
YL-600-HN(5M)						5,000	1.75
YL-600-HN(10M)						10,000	3.5
YL-600-LD(0.5M)	LD	740 – 910 700 – 1000	3< (However, Ti-Sapphire 1 – 3<)	12	Green	500	0.18
YL-600-LD(1M)						1,000	0.35
YL-600-LD(2M)						2,000	0.7
YL-600-LD(5M)						5,000	1.75
YL-600-LD(10M)						10,000	3.5
YL-600C-Y2(0.5M)	YAG	266 355 532 1064	3<	7	Amber	500	0.18
YL-600C-Y2(1M)						1,000	0.35
YL-600C-Y2(2M)						2,000	0.7
YL-600C-Y2(5M)						5,000	1.75
YL-600C-Y2(10M)						10,000	3.5

## Absorption characteristic graph \* Note that the graphs of optical density show measured values, not guaranteed values.


T: Transmittance

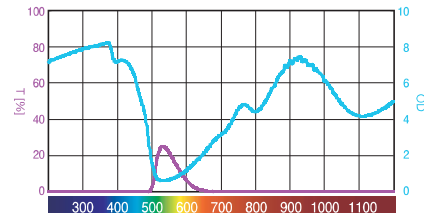
## YL-600-HN

Compatible Laser	He-Ne	
Color	 Blue	
Visible Light Transmittance	12%	
Optical Density [OD]		
He-Ne	632.8nm	2<
DYE	570 – 630nm	
GOLD-VAPOR	627.8nm	
Kr	647.1nm	
	676.4nm	
Ruby	694.3nm	



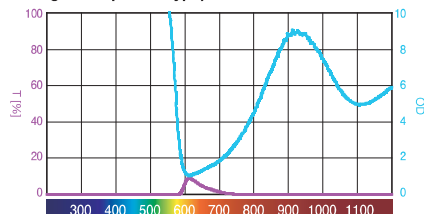
## YL-600-LD

Compatible Laser	LD	
Color	 Green	
Visible Light Transmittance	12%	
Optical Density [OD]		
LD	740 – 910nm	3<
ALEXANDRITE	740 – 820nm	
Ti-Sapphire	700 – 1000nm	



## YL-600C-Y2 (Multi-wavelength compatible type)

Compatible Laser	YAG	
Color	Amber	
Visible Light Transmittance	7%	
Optical Density [OD]		
YAG	226nm	3<
	355nm	
	532nm	
	1064nm	



Protect eyes from accidental exposure to scattered lasers. Appropriate for use in enclosures or laser machine windows.



- Designed for safety and adjustments.
- High optical density blocks lasers.
- Can be applied to partial windows, inset windows or partitions in laser controlled areas.
- Effective safety measure to prevent potential injuries from unexpected visitors.

## Guide

- ▶ Contact us for custom sizes or shapes.
- ▶ Replace laser safety windows periodically.

## Attention

- ▶ Do not use with incompatible lasers or wavelengths (even if laser are same, their wavelengths might be different.)
- ▶ Do not use if damaged or has already been exposed to laser energy.
- ▶ Do not irradiate the laser beam directly at laser safety windows because it may damage them.
- ▶ These are not protective equipments that completely absorb laser light. [Reference](#) Absorption characteristic graph H016
- ▶ Do not directly look into the laser beam through laser safety windows.

Part Number	Compatible Laser	Wavelength [nm]	Optical Density [OD]	Color	Visible Light Transmittance [%]	External Dimensions [mm]	Thickness t [mm]	Weight [kg]
YL-500P-AR(1)	Ar	190 – 380 441.6 488 514.5	4<	Orange	60	100× 100	3	0.04
YL-500P-AR(2)						100× 150	3	0.07
YL-500P-AR(3)						200× 200	3	0.16
YL-500P-AR(4)						250× 300	3	0.3
YL-500P-AR(5)						300× 300	3	0.36
YL-500P-AR(7)						400× 400	3	0.64
YL-500P-Y2(1)	YAG2ω	480 – 540 532	6<	Red	15	100× 100	3	0.04
YL-500P-Y2(2)						100× 150	3	0.07
YL-500P-Y2(3)						200× 200	3	0.16
YL-500P-Y2(4)						250× 300	3	0.3
YL-500P-Y2(5)						300× 300	3	0.36
YL-500P-Y2(7)						400× 400	3	0.64
YL-500P-LD(1)	LD	632.8 760 – 850	5<	Blue	7	100× 100	3	0.04
YL-500P-LD(2)						100× 150	3	0.07
YL-500P-LD(3)						200× 200	3	0.16
YL-500P-LD(4)						250× 300	3	0.3
YL-500P-LD(5)						300× 300	3	0.36
YL-500P-LD(7)						400× 400	3	0.64
YL-500P-Y1(11)	YAG	1064	5<	Green	25	100× 100	3.5	0.04
YL-500P-Y1(12)						100× 150	3.5	0.07
YL-500P-Y1(13)						200× 200	3.5	0.16
YL-500P-Y1(14)						250× 300	3.5	0.3
YL-500P-Y1(15)						300× 300	3.5	0.36
YL-500P-Y1(16)						400× 400	3.5	0.65
YL-500P-Y1(17)						500× 600	3.5	1.2
YL-500P-Y1(18)						1,000×1,200	3.5	4.8
YL-500P-Fiber(11)						100× 100	3.5	0.04
YL-500P-Fiber(12)						100× 150	3.5	0.07
YL-500P-Fiber(13)	NIR	930 – 1170 1060 – 1130	5< 7<	Green	40	200× 200	3.5	0.16
YL-500P-Fiber(14)						250× 300	3.5	0.30
YL-500P-Fiber(15)						300× 300	3.5	0.36
YL-500P-Fiber(16)						400× 400	3.5	0.65
YL-500P-Fiber(17)						500× 600	3.5	1.2
YL-500P-Fiber(18)						1,000×1,200	3.5	4.8
YL-500P-CO2(1)	CO <sub>2</sub>	10600	10<	Green	60	100× 100	4	0.05
YL-500P-CO2(2)						100× 150	4	0.08
YL-500P-CO2(3)						200× 200	4	0.2
YL-500P-CO2(4)						250× 300	4	0.37
YL-500P-CO2(5)						300× 300	4	0.45
YL-500P-CO2(7)						400× 400	4	0.8
YL-550C-Y2(1)	YAG	1064 532 266 – 355	6< 4< 10<	Amber	40	100× 100	3	0.04
YL-550C-Y2(2)						100× 150	3	0.07
YL-550C-Y2(3)						200× 200	3	0.16
YL-550C-Y2(4)						250× 300	3	0.30
YL-550C-Y2(5)						300× 300	3	0.36
YL-550C-Y2(7)						400× 400	3	0.64
YL-550C-Y2(8)						850× 550	3	1.87

Application Systems

Optics & Optical Coatings

Opto-Mechanics

Bases

Manual Stages

Actuators & Adjusters

MotORIZED Stages

Light Sources & Laser Safety

Index

Guide

Lasers

Detectors

Laser Safety Equipments

Light Sources




## Laser Safety Windows (made of acrylic resin)

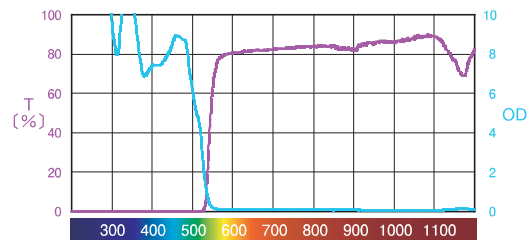
YL-500


Absorption characteristic graph \* Note that the graphs of optical density show measured values, not guaranteed values.

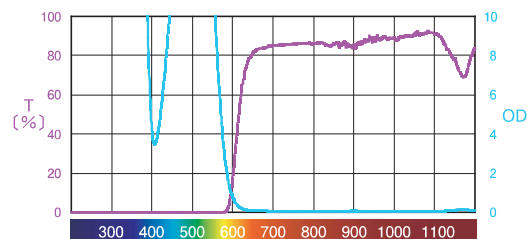
T: Transmittance


## Complete absorption type

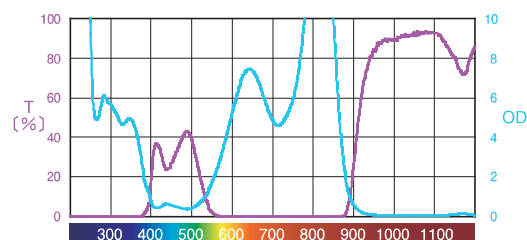
Part Number	YL-500P-AR		
Window Type	Ar		
Color	 Orange		
Visible Light Transmittance	60%		
Optical Density [OD]			
EXCIMER	200 – 514.5nm	4<	
Ar			
He-Cd			




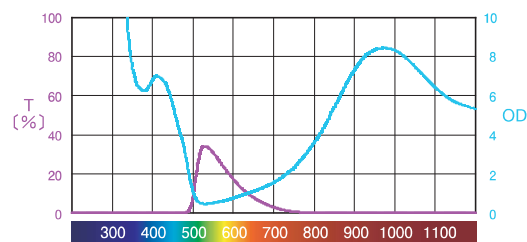
Part Number	YL-500P-Y2		
Window Type	YAG2 $\omega$		
Color	 Red		
Visible Light Transmittance	15%		
Optical Density [OD]			
Ar	480 – 540nm		6<
YAG2 $\omega$	532nm		




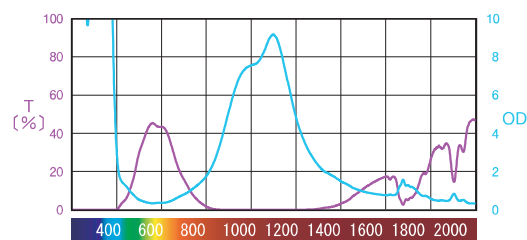
Part Number	YL-500P-LD		
Window Type	LD		
Color	 Blue		
Visible Light Transmittance	7%		
Optical Density [OD]			
LD	760 – 850nm		5<
He-Ne	632.8nm		




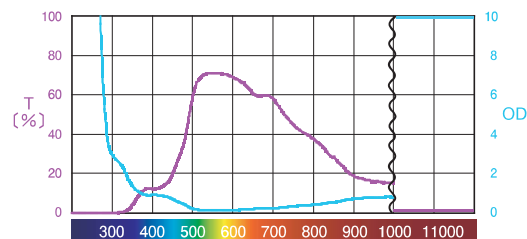
Part Number	YL-500P-Y1		
Window Type	YAG		
Color	 Green		
Visible Light Transmittance	25%		
Optical Density [OD]			
YAG	1064nm		5<
Nd-YVO <sub>4</sub>			




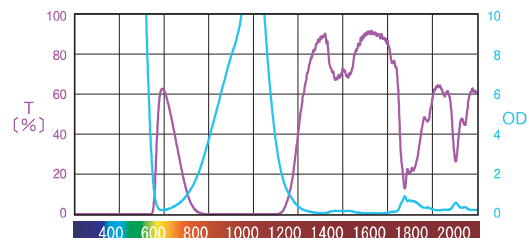
Part Number	YL-500P-Fiber		
Window Type	NIR		
Color	 Green		
Visible Light Transmittance	40%		
Optical Density [OD]			
NIR	930 – 1170nm	5<	
	1060 – 1130nm	7<	



Part Number	YL-500P-CO2		
Window Type	CO2		
Color	 Green		
Visible Light Transmittance	60%		
Optical Density [OD]			
CO2	10600nm	10<	



Part Number	YL-550C-Y2		
Window Type	YAG		
Color	 Amber		
Visible Light Transmittance	40%		
Optical Density [OD]			
YAG	266 – 355nm	10<	
	532nm	6<	
	1064nm	4<	

Application  
SystemsOptics &  
Optical  
CoatingsOpto-  
Mechanics

Bases

Manual  
StagesActuators &  
AdjustersMotorized  
StagesLight Sources &  
Laser Safety

Index

Guide

Lasers

Detectors

Laser Safety  
Equipments

Light Sources

**Protect eyes from accidental exposure to scattered lasers by using laser shield curtains or laser windows.**

- Easy to move fitted with casters.



## Guide

- ▶ Refer to H013 and H015 pages for the specifications of laser shield curtains and laser safety windows.
- ▶ Easy to move fitted with casters.

## Attention

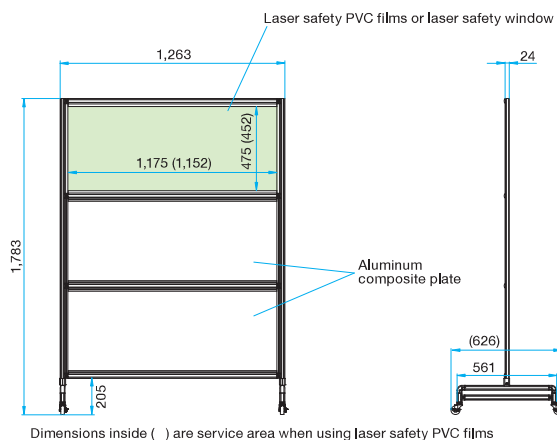
- ▶ Delivery cost will be quoted separately.

## Connection Examples



## Outline Drawing

(Units: mm)



## Laser Shield Curtain Type (YLC type)

Part Number	Wavelength [nm]	Optical Density [OD]	Used Laser Shield Curtain	Color	Visible Light Transmittance [%]	Width [mm]
<b>OFUP2-121750YLC1</b>	266 355 1064 2100 10600	3<	YLC-1	Clear gray	40	1,200
<b>OFUP2-121750YLC2</b>	190 – 380 441 – 532	3<	YLC-2	Clear orange	30	1,200

## Laser Safety Windows Type (YL-500/YL-550 type)

Part Number	Wavelength [nm]	Optical Density [OD]	Used Laser Shield Curtain	Color	Visible Light Transmittance [%]	Width [mm]
<b>OFUP2-121750PAR</b>	200 – 514,5	4<	YL-500P-AR	Orange	60	1,200
<b>OFUP2-121750PY2</b>	480 – 540	6<	YL-500P-Y2	Red	15	1,200
<b>OFUP2-121750OPLD</b>	632,8, 760 – 850	5<	YL-500P-LD	Blue	7	1,200
<b>OFUP2-121750PY1</b>	900 – 1200	5<	YL-500P-Y1	Green	25	1,200
<b>OFUP2-121750PCO2</b>	10600	10<	YL-500P-CO2	Green	60	1,200
<b>OFUP2-121750PFiber</b>	930 – 1170 1060 – 1130	5< 7<	YL-500P-Fiber	Green	40	1,200

# Laser Barrier Curtain | YL-2200

RoHS

Catalog  
Code

W5056

Application  
SystemsOptics &  
Optical  
CoatingsOpto-  
Mechanics

Bases

Manual  
StagesActuators &  
AdjustersMotorized  
StagesLight Sources &  
Laser Safety

Index

Guide

Lasers

Detectors

Laser Safety  
Equipments

Light Sources

**YL-2200 gives protection against the direct irradiation of high power laser at all wavelengths. It is suitable for the safety measure of laser processing and laboratory. It is environment improvement product; carbon fiber is used as material.**

- Protection against unexpected laser hazard such as scattering light
- Class 4 and high power laser compatible; no penetration against 1000W 100sec irradiation, refer to the test result below
- 4 eyelets, available for being hooked on the pipe of dark room
- Connectable design; hook and loop fastener at the both end
- EN12254: 2010 certificated
- Flame-proof qualified by Japan Fire and Disaster Prevention Association



## Guide

- ▶ Only listed size is available

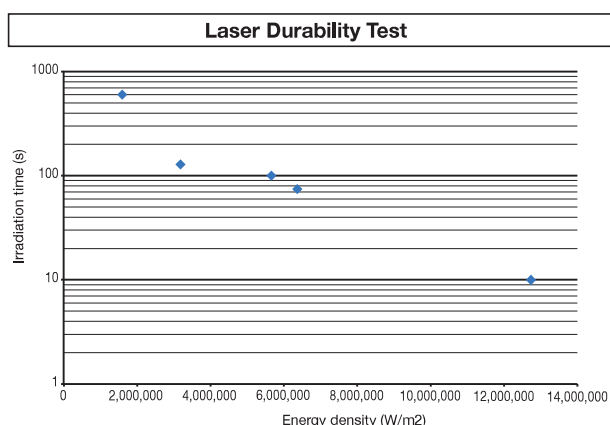
## Attention

- ▶ Since this product is made by flame-proof carbon fiber and aluminum laminated material, it cannot be resized by cutting.

## Specifications

Part Number	Dimension [mm]	Weight [kg]
<b>YL-2200</b>	Approx. 1,800 × 900	Approx. 3.0

## Laser durability test result



100 sec direct irradiation of laser to the Laser Barrier Curtain and check the penetration.

Method: Irradiation test, EN12254:2010  
YAG laser (1064 nm)

Continuous irradiation test, continuous wave laser: 100 sec,  
pulse laser: 1000 pulse

CW	$3.2 \times 10^{-6} \text{ W/m}^2$ (100W)	No penetration after 100 sec
CW	$3.8 \times 10^{-6} \text{ W/m}^2$ (295W)	No penetration after 100 sec
CW	$5.7 \times 10^{-6} \text{ W/m}^2$ (1000W)	No penetration after 100 sec
Pulse	$9.3 \times 10^{-4} \text{ J/m}^2$ (7.3J)	No penetration after 1000 pulse

\*1. Test beam diameter should be larger than 2mm, as per EN12254

\*2. Test beam diameter: 20mm



Application  
Systems

Optics &  
Optical  
Coatings

Opto-  
Mechanics

Bases

Manual  
Stages

Actuators &  
Adjusters

Motoeized  
Stages

Light Sources &  
Laser Safety

Index

Guide

Lasers

Detectors

Laser Safety  
Equipments

Light Sources

# Laser Protective Eyewear Guide

## Use of Laser Protective Eyewear

According to the directives from the Ministry of Health, Labor and Welfare [On Measures to Prevent Injury from Laser Radiation], laser protective eyewear appropriate for the laser type is required in laser controlled areas of the Class 3R laser equipments that emit lasers at wavelengths other than 400 to 700nm, as well as Class 3B and Class 4 laser equipments as safety and preventive measures.

## Selection of Laser Protective Eyewear

- (1) Confirm laser output wavelengths.
- (2) Confirm laser output.  
For CW output: Output power  
For pulse: Energy per pulse, pulse duration, pulse recurrence frequency, etc.
- (3) Calculate MPE (maximum permissible exposure).
- (4) Determine the maximum exposure duration.
- (5) Calculate the maximum radiation exposure value.
- (6) Calculate the required optical density.
- (7) (Confirm whether it is required to see beams in case of visible lasers.)
- (8) (Select the shape of protective eyewear (whether users will wear prescription glasses).)

## What Is MPE (Maximum Permissible Exposure)

The MPE is the value that indicates a safety level for the human body, and defined as 1/10 of the strength of laser output at which probability of causing hazard is 50%.

Although the MPE is determined by two axes, wavelength and exposure time, attention is required since the MPE value is given as power density ( $W/m^2$ ) or energy density ( $J/m^2$ ) per unit surface area.

This area is based on the limiting aperture size, and the value varies according to the wavelength, eye or skin, exposure time and other conditions, considering hazard types.

## What Is OD Value (Optical Density)

Optical transmission is generally indicated by transmittance (%).

It is commonly expressed in percentage, and indicated by logarithm. That is the OD value (optical density).


Optical density (OD) is the attenuation rate of incident light that passes through the optical filter, in this case laser protective eyewear, and calculated with the following formula.

$$OD(\lambda) = \log_{10}(PI(\lambda)/PT(\lambda)) = -\log_{10}T(\lambda)$$

(PI: Incidence PT: Transmission T: Transmittance of characteristic wavelength)

\* The larger the OD value, the larger the attenuation rate of incident light, thus providing higher protective function.

\* If the OD value increases, then the transmittance decreases.

Optical Density (OD value)	Transmittance	Attenuation Rate	Protective Function
0	100%	0	 Weak High
1	10%	1/10	
2	1%	1/100	
3	0.1%	1/1000	
4	0.01%	1/10000	
5	0.001%	1/100000	
6	0.0001%	1/1000000	
7	0.00001%	1/10000000	
8	0.000001%	1/100000000	
9	0.0000001%	1/1000000000	
10	0.00000001%	1/10000000000	

## Differences in Usage of Complete Absorption Type, Multi-wavelength Compatible Type and Partially Transmitting Type

### ■ Complete absorption type

Normally, you cannot see visible laser light because the optical density (OD) is set to high.

### ■ Multi-wavelength compatible type

Appropriate for work involving multiple wavelengths.

### ■ Partially transmitting type for maintenance

Appropriate for maintenance involving 100mW or less (OD 1 – 2), and 10W or less (OD 4). Use this type for checking optical paths or adjusting optical axes.

### ■ Reinforced glass (complete absorption) type

Optical density (OD) and damage threshold are high enough to prevent damage from direct beam exposure.

#### YL-760 model (three-way type)

This model offers improved fitting functions including angle adjustment for the gap with the face and flexible temples. Inner frames (optional) customized according to lens prescriptions are available for people who wear prescription glasses.



Reference > H022

#### YL-717 model (over prescription glasses type)

Can be used over prescription glasses.

This model is fitted with top canopy and sides, and the angle of the front frame and the length of temples are adjustable.



Reference > H023

#### YL-335 model (over prescription glasses type)

Can be used over prescription glasses. This model is well cushioned and comfortable to wear. (Some large glasses may not fit.)



Reference > H024

#### YL-290 model (eyeglass shaped)

Light and compact two-lens type is easy to wear and remove.

This model features a highly protective cover frame and wide temples.



Reference > H024

#### YL-250G model (over prescription glasses, reinforced glass type)

This model uses reinforced glass for lenses, provides high visible light transmittance, and offers improved visibility and permeability of light. Lenses also offer excellent chemical resistance.



Reference > H025

#### YL-130 model (goggle shaped)

This model fits the face snugly, and can be worn over prescription glasses. Appropriate for use when the angle of beam or scattering light cannot be identified.



Reference > H025

#### YL-120H model (goggle shaped)

With its laminated glass structure, this model provides high visible light transmittance and ensures safety with high damage threshold against laser.



Reference > H025

### ■ Attention

- ▶ Do not directly look into the laser beam through laser protective eyewear.
- ▶ Do not irradiate the laser beam directly at laser protective eyewear because it may damage the eyewear.
- ▶ Do not use with incompatible lasers or wavelengths. (Even if laser names are the same, their wavelengths might be different.)
- ▶ Do not take off laser protective eyewear during work.
- ▶ Do not use as protective eyewear for welding.
- ▶ Complete absorption type eyewear is not protective equipments that completely absorb laser light. (Refer to the absorption characteristic graph.)
- ▶ Do not use products with visible light transmittance of 20% or less in a darkroom.
- ▶ Cease use of eyewear that is damaged or once it has received high laser energy.

Application  
Systems

Optics &  
Optical  
Coatings

Opto-  
Mechanics

Bases

Manual  
Stages

Actuators &  
Adjusters

MotORIZED  
Stages

Light Sources &  
Laser Safety

Index

Guide

Lasers

Detectors

Laser Safety  
Equipments

Light Sources



## YL-760 Model (Three-way type) | YL-760

RoHS

Catalog  
Code

W5013

Fit over prescription glasses and inner frame with prescription lenses available.

- Easy fit with adjustable angle and temples.



#### Guide

- ▶ Wearing laser protective eyewear over prescription glasses causes inconvenience. For convenience, optional prescription inner frames are available.
- ▶ Contact our Sales Division for the optional and custom prescriptions.

#### Common Specifications

Frame	Nylon elastomer
Lens	Polycarbonate (hard coated)
Specifications	Compatible with prescription glasses, adjustable angle, soft rubber temple (flexibly adjustable)
External Dimensions [mm]	(W)160×(H)58×(D)170
Weight [kg]	0.05

#### Function Description

##### ■ Rubber Nose Pad



Normal size



Large size

The rubber nose pad keeps eyewear from sliding to provide comfort for extended work. Together with the normal size, the large size is included as standard so that eyewear is easy to fit for women as well as people who use inner frames.

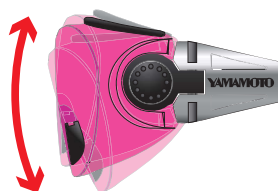
##### Option Inner Frame



With its simple attachment structure, the inner frame can be easily attached or taken off at the time of maintenance. It eliminates the stress of wearing protective eyewear over prescription glasses, providing comfortable work conditions.

(\* Ophthalmic prescription data is required for production.)

##### ■ Angle Adjustment Function



With the angle adjustment function, it is possible to align the eyewear with the line of sight, fit it on the nose and adjust the gap with the face.

##### ■ Adjustable Earpiece



Rubber coated earpieces can be shaped into ear hook type, straight type and other shapes as desired by freely bending them.

Part Number	Type	Compatible Laser	Wavelength [nm]	Optical Density [OD]	Lens Color	Visible Light Transmittance [%]
YL-760-ALX	Complete absorption	ALEXANDRITE	750 – 800 – 850	4–10–4<	Pink	30
YL-760-LDY1	Complete absorption	LD–YAG	800 – 810 940, 1064	7<	Green	35
YL-760-Y1	Complete absorption	YAG	1064	6<	Green	50
YL-760C-Y2	Multi-wavelength compatible type	YAG	266, 355 532 1064	10< 4< 6<	Amber	35
YL-760M-Y2	Partially transmitting for maintenance	YAG2ω	532	2<	Red	30
YL-760M-VLD	Partially transmitting for maintenance	LD	660 – 680 647.1, 676.4	2<	Blue	55

Fit comfortably over the bigger prescription glasses. Soft elastomer cushion bar. Adjustable frame angle.

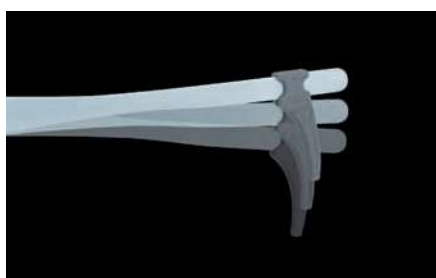
- Side and top shielding for extra protection.
- Easy fit with adjustable earpiece and temples.



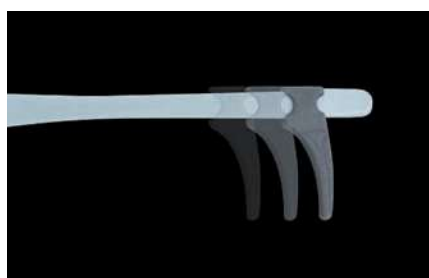
#### Common Specifications

Frame	Nylon elastomer
Lens	Polycarbonate (hard coated)
Specifications	Compatible with prescription glasses, elastomer cushion, adjustable temple angle
External Dimensions [mm]	(W)163×(H)65×(D)167
Weight [kg]	0.04

#### Function Description



Uses a newly designed straight temple. Angle of frame edge is adjustable to fit the face (three adjustment stages).



Newly designed locking rubber ear-piece for improved fit.

Part Number	Type	Compatible Laser	Wavelength [nm]	Optical Density [OD]	Lens Color	Visible Light Transmittance [%]
<b>CE</b> YL-717-EX	Complete absorption	EXCIMER	190 – 380	10<	Clear	85
YL-717-AR(45)	Complete absorption	Ar	488, 514.5	10<	Orange	45
<b>CE</b> YL-717-Y2	Complete absorption	YAG2 $\omega$	532	10<	Red	16
YL-717-DYE	Complete absorption	DYE	590 – 598	6<	Blue	20
<b>CE</b> YL-717-HN	Complete absorption	He-Ne	632.8	5<	Blue	25
<b>CE</b> YL-717-ALX	Complete absorption	ALEXANDRITE	750 – 800 – 850	4–10–4<	Pink	30
<b>CE</b> YL-717-Fiber	Complete absorption	NIR	810 – 1100	7<	Green	35
<b>CE</b> YL-717-Y1(50)	Complete absorption	YAG	1064	6<	Green	50
YL-717-CO2	Complete absorption	CO <sub>2</sub>	10600	5<	Green	60
<b>CE</b> YL-717C-LD2	Complete absorption/multi-wavelength	LD	740 – 840 920 – 1160	6< 6<	Green	4
YL-717C-Y1	Complete absorption/multi-wavelength	YAG	266, 355 532 1064	10< 2< 6<	Amber	35
<b>CE</b> YL-717C-Y2	Complete absorption/multi-wavelength	YAG	266, 355 532 1064	10< 4< 6<	Amber	30
YL-717C-Y3	Complete absorption/multi-wavelength	YAG	266, 355 532 1064	10< 7< 6<	Amber	25
YL-717M-AR	Partially transmitting, OD2	Ar	488, 514.5	3< 2<	Orange	57
<b>CE</b> YL-717M-Y2	Partially transmitting, OD2	YAG2 $\omega$	532	2<	Red	30
YL-717M-HN	Partially transmitting, OD2	He-Ne	627.8, 632.8, 635	2<	Blue	47
<b>CE</b> YL-717M-VLD	Partially transmitting, OD2	LD	660 – 680 647.1, 676.4	2<	Blue	55
YL-717A-AR	Partially transmitting, OD4	Ar	488, 514.5	4<	Orange	50
<b>CE</b> YL-717A-Y2	Partially transmitting, OD4	YAG2 $\omega$	532	4<	Red	25

Application Systems

Optics &amp; Optical Coatings

Opto-Mechanics

Bases

Manual Stages

Actuators &amp; Adjusters

Motorized Stages

Light Sources &amp; Laser Safety

Index

Guide

Lasers

Detectors

Laser Safety Equipments

Light Sources

# YL-335 Model (Over prescription glasses type)

## YL-290 Model (Eyeglass shaped)

YL-335  
YL-290

### YL-335

RoHS

Catalog Code

W5015

Provide high transmittance and visibility. Wide temples and soft nose pad.



- Excellent resistance to breaking and scratches.

#### Common Specifications

Frame	Polycarbonate elastomer
Lens	Polycarbonate (hard coated)
Specifications	Compatible with prescription glasses, wide temple, soft nose pad, flexible temple
External Dimensions [mm]	(W)158×(H)65×(D)168
Weight [kg]	0.05

Part Number	Type	Compatible Laser	Wavelength [nm]	Optical Density [OD]	Lens Color	Visible Light Transmittance [%]
YL-335-EX/He-Cd	Complete absorption	EXCIMER	193 – 442	10<	Yellow	75
YL-335-Y2	Complete absorption	YAG2 $\omega$	532	10<	Red	16
YL-335-ALX	Complete absorption	ALEXANDRITE	750 – 800 – 850	4–10–4<	Pink	30
YL-335-LDY1	Complete absorption	LD–YAG	800 – 810 940, 1064	7<	Green	35
YL-335-Y1(50)	Complete absorption	YAG	1064	6<	Green	50
YL-335-CO2-CLA	Complete absorption	CO <sub>2</sub>	10600	6<	Clear	85
YL-335M-BLD	Partially transmitting, OD2	LD	405	3<	Clear	85
YL-335M-AR	Partially transmitting, OD2	Ar	514.5	2<	Orange	57
YL-335M-Y2	Partially transmitting, OD2	YAG2 $\omega$	532	2<	Red	30
YL-335M-HN	Partially transmitting, OD2	He-Ne	627.8, 632.8, 635	2<	Blue	47
YL-335M-VLD	Partially transmitting, OD2	LD	660 – 680	2<	Blue	55
YL-335M-LD2	Partially transmitting, OD2	LD	635 – 780	0.5 – 1<	Blue	58
YL-335M-RGB	Partially transmitting, OD2	RGB-LED	457, 532, 633	2<	Purple	8
YL-335C-Y2	Complete absorption multi-wavelength	YAG	266, 355 532 1064	10< 4< 6<	Amber	35

### YL-290

RoHS

CE

Catalog Code

W5016

Light and comfort with easy wearing semi-straight temples.



- Appropriate for use when identifying angle of beam and scattering light.
- Optional parts (fasteners for adjustment and hard cases) for use in clean room are available.

#### Common Specifications

Frame	Nylon
Lens	Polycarbonate (hard coated)
Specifications	Round frame, wide temple
External Dimensions [mm]	(W)138×(H)39×(D)155
Weight [kg]	0.03

Part Number	Type	Compatible Laser	Wavelength [nm]	Optical Density [OD]	Lens Color	Visible Light Transmittance [%]
CE YL-290-EX/He-Cd	Complete absorption	EXCIMER, He-Cd	193 – 442	10<	Yellow	75
CE YL-290-Y2	Complete absorption	YAG2 $\omega$	532	10<	Red	16
CE YL-290-ALX	Complete absorption	ALEXANDRITE	750 – 800 – 850	4–10–4<	Pink	30
CE YL-290-Y1(50)	Complete absorption	YAG	1064	6<	Green	50
CE YL-290M-Y2	Partially transmitting, OD2	YAG2 $\omega$	532	2<	Red	30
CE YL-290M-VLD	Partially transmitting, OD2	LD	660 – 680 647.1, 676.4	2<	Blue	55
CE YL-290C-Y2	Complete absorption multi-wavelength	YAG	266, 355 532 1064	10< 4< 6<	Amber	35

# YL-250G Model (Over prescription glasses, reinforced glass type) YL-130 Model (Goggle shaped)/YL-120H Model (Goggle shaped, reinforced glass type)

YL-250G  
YL-130 / YL-120H

## YL-250G

RoHS CE Catalog Code W5017  
\* With exceptions

Provide high transmittance and visibility.



High damage threshold.

- Excellent resistance to breaking and scratches.

### Common Specifications

Frame	Nylon
Lens	Reinforced glass
Specifications	Compatible with prescription glasses
External Dimensions [mm]	(W)155×(H)57×(D)141
Weight [kg]	0.07

Part Number	Type	Compatible Laser	Wavelength [nm]	Optical Density [OD]	Lens Color	Visible Light Transmittance [%]
YL-250G-3Y	Reinforced glass type	Nd-YAG:OD3(3Y)	780	0.8<	Green	80
			980	3<		
			1064	3<		
			1310, 1550	2<		
			2100, 2940	2<		
YL-250G-5Y	Reinforced glass type	Nd-YAG:OD5(5Y)	1064	5<	Green	74
			2100, 2940	3.5<		
YL-250G-7Y	Reinforced glass type	Nd-YAG:OD7(7Y)	1064	7<	Green	69
			2100, 2940	5<		

## YL-130

RoHS CE Catalog Code W5018  
\* With exceptions

Google design for complete protection and fit over prescription glasses.



- Hardened glasses and anti-fog coating.
- Optional parts for supporting use in clean room (fasteners for adjustment, with hard cases) are available. [▶ WEB Reference](#)

### Common Specifications

Frame	PP elastomer
Lens	Polycarbonate (anti-fog hard coated)
Specifications	Compatible with prescription glasses (some glasses do not fit)
External Dimensions [mm]	(W)192×(H)83×(D)92
Weight [kg]	0.09

Part Number	Type	Compatible Laser	Wavelength [nm]	Optical Density [OD]	Lens Color	Visible Light Transmittance [%]
YL-130-EX	Complete absorption	EXCIMER	190 – 380	10<	Clear	85
YL-130-Y2	Complete absorption	YAG2 $\omega$	532	10<	Red	16
YL-130-ALX	Complete absorption	ALEXANDRITE	750 – 800 – 850	4–10–4<	Pink	30
YL-130-Y1(50)	Complete absorption	YAG	1064	6<	Green	50
YL-130C-Y2	Complete absorption multi-wavelength	YAG	266, 355	10<	Amber	35
			532	4<		
			1064	6<		
YL-130M-Y2	Partially transmitting, OD2	YAG2 $\omega$	532	2<	Red	30
YL-130M-VLD	Partially transmitting, OD2	LD	660 – 680	2<	Blue	55
			647.1, 676.4			

## YL-120H

RoHS CE Catalog Code W5019

Provide high transmittance and visibility.  
Both frame and lens have high damage threshold.



### Guide

- ▶ Damage threshold stands for the value of laser power when the lenses and frame start to have damages in case of receiving direct laser beam.

### Common Specifications

Frame	Special laminating resin
Lens	Special laminating glass
Specifications	Compatible with prescription glasses
External Dimensions [mm]	(W)160×(H)80×(D)73
Weight [kg]	0.16

Part Number	Type	Compatible Laser	Wavelength [nm]	Optical Density [OD]	Lens Color	Visible Light Transmittance [%]
YL-120H-Y1	Reinforced glass type	YAG	1064, 1319.5	7<	Green	67
			1060			
			1319.5			
YL-120H-CO2	Reinforced glass type	CO <sub>2</sub>	10600	10<	Clear	86
			193, 248, 308			

\*1 Damage threshold: Value indicating the degree of power at which damage occurs if laser light is irradiated.

Application Systems

Optics & Optical Coatings

Opto-Mechanics

Bases

Manual Stages

Actuators & Adjusters

MotORIZED Stages

Light Sources & Laser Safety

Index

Guide

Lasers


Detectors

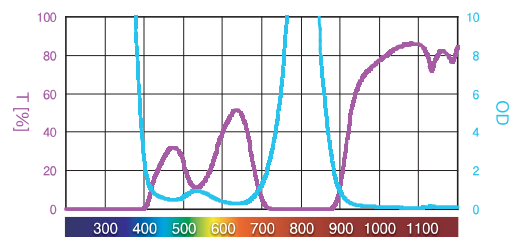
Laser Safety Equipments


Light Sources

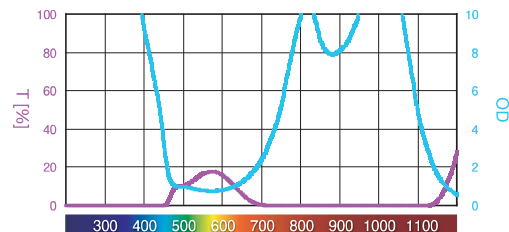
# Laser Protective Eyewear Filter Spectra | Filter Spectra


**Complete absorption type** Normally, you cannot see visible laser light because the optical density is set to high. T: Transmittance

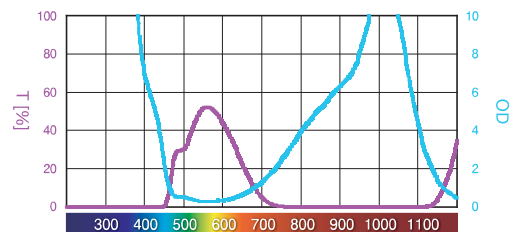
Frame Type	YL-130 YL-760 YL-717 YL-335 YL-290	
Lens Type	ALEXANDRITE	
Color	 Pink	
Visible Light Transmittance	30%	
Optical Density [OD]		
ALEXANDRITE	755nm	6<
LD	750 – 850nm	4 – 10<
	800nm	10<
	750 – 850nm	4<




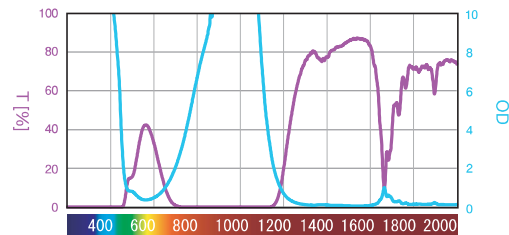
Frame Type	YL-335 YL-760	
Lens Type	LD-YAG	
Color	 Green	
Visible Light Transmittance	35%	
Optical Density [OD]		
FIBER LASER	800 – 1080nm	6<
YAG	1064nm	7<
LD	800 – 810nm	7<
	940nm	7<



Frame Type	YL-130 YL-760 YL-717 YL-335 YL-290		
Lens Type	YAG		
Color	 Green		
Visible Light Transmittance	50%		
Optical Density [OD]			
Nd-YLF	1047nm 1053nm	6<	
YAG	1064nm	6<	

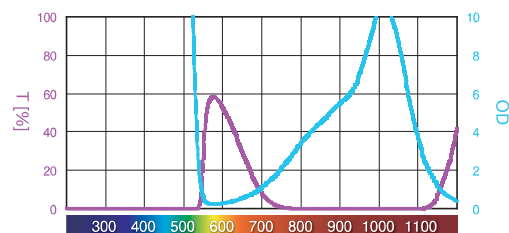


Frame Type	YL-717		
Lens Type	NIR Fiber		
Color	 Green		
Visible Light Transmittance	35%		
Optical Density [OD]			
CO <sub>2</sub>	810 – 1100nm		7<




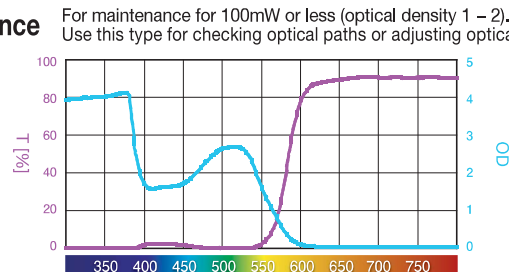
**Multi-wavelength compatible type** One filter handles multiple wavelengths of laser.


Frame Type	YL-130 YL-760 YL-717 YL-335 YL-290	
Lens Type	C-YAG2	
Color	● Amber	
Visible Light Transmittance	40%	
Optical Density [OD]		
YAG	226nm	10<
	355nm	10<
	532nm	4<
	1064nm	6<

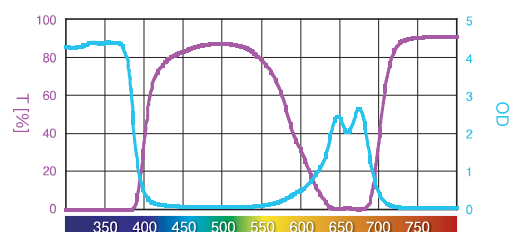


**1/100 attenuation partially transmitting type for maintenance**

Frame Type	YL-130 YL-760 YL-717 YL-335 YL-290		
Lens Type	M-YAG2ω		
Color	 Red		
Visible Light Transmittance	30%		
Optical Density [OD]			
YAG2ω	532nm	2<	



Frame Type	YL-130 YL-760 YL-717 YL-335 YL-290		
Lens Type	M-VLD		
Color	 Blue		
Visible Light Transmittance	55%		
Optical Density [OD]			
LD	660 – 680nm	2<	
Kr	647.1nm	2<	
	676.4nm	2<	



\* Note that the graphs of optical density show measured values, not guaranteed values.

Application Systems

Optics &amp; Optical Coatings

Opto-Mechanics

Bases

Manual Stages

Actuators &amp; Adjusters

Motorized Stages

Light Sources &amp; Laser Safety

Index

Guide

Lasers

Detectors

Laser Safety Equipments

Light Sources