YAMAMOTO

L-003E

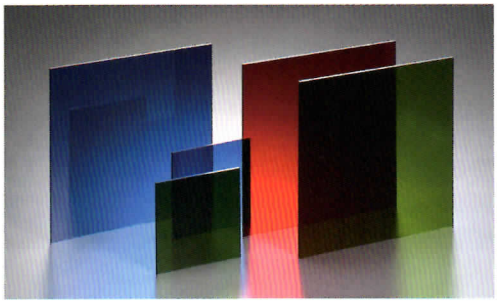
# LASER EYE PROTECTOR & FILTER

## MEDICAL TREATMENT

## OPTICAL FILTER

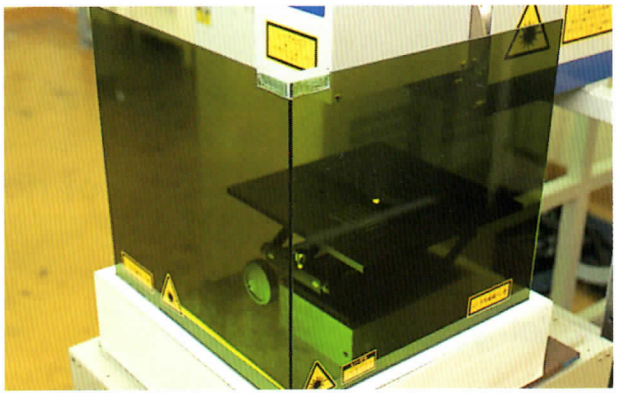
YAMAMOTO KOGAKU CO.,LTD.

# model type YL-500 YL-550



## Outline of product:

- Due to the acrylic material, accurate measurement processing is available. (We do any customized measurement processing including perforation processing.)
- Maximum size : 40 x 40cm except for NdYag(120 x 100cm)
- Sales unit: Any size within above mentioned.
- Thickness 3mm except for CO2 (4mm) and NdYag(3.5mm)
- Material / Polymethyl Meta Acrylate



## D Laser absorption type

| ORDER NAME | COLOR | Visible light transmittance(%) | Wavelength (nm) | Optical Density(OD) | FILTER CODE | Maximum size: within the following size |
|---|---|---|---|---|---|---|
| YL500 Argon | ORANGE | 60% | 200-514.5 | 4< | W-001 | 400×400mm,t≒3.0 |
| YL500 NdYag(SHG) | RED | 15% | 480-540 | 6< | W-002 | 400×400mm,t≒3.0 |
| YL500 Laser Diode | BLUE | 7% | 632.8,760-850 | 5< | W-003 | 400×400mm,t≒3.0 |
| YL500 NdYag | GREEN | 25% | 900-1200 | 5< | W-004 | 1200×1000mm,t≒3.5 |
| YL500 CO2 | GREEN | 60% | 10600 | 10< | W-005 | 400×400mm,t≒4.0 |
| YL500 Fiber CE | GREEN | 40% | 920 -1175 | 7< | W-009 | 1200×1000mm,t≒3.5 |

CE mark EN207, EN12254

180-315 D LB8 +IR LB4 +D AB8 +IR AB3
>315-380 D LB4 +IR LB6 +M LB6Y +D AB5 +IR AB6 +M AB6Y
915-1180 D LB6+IR LB7 +D AB5 +IR AB7
2720-2940 DI LB4 +DI AB2
5000-11000 DI LB3 +D AB2 +I AB3 YL S CE

## C Laser absorption type and Application for Multi band laser

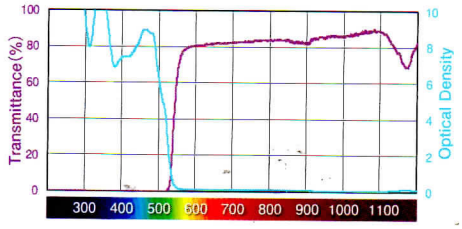
| ORDER NAME | COLOR | Visible light transmittance(%) | Wavelength (nm) | Optical Density(OD) | FILTER CODE | Maximum size: within the following size |
|---|---|---|---|---|---|---|
| YL550C NdYag2 | AMBER | 40% | 266,355<br>532<br>1064 | 10<<br>4<<br>6< | W-008 | 850×550mm,t≒3.0 |

# YL-500

## D Laser absorption type

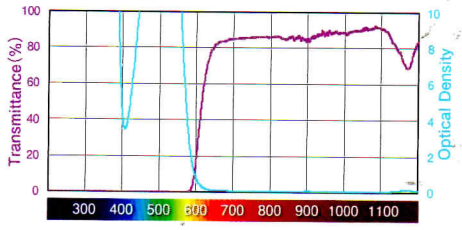
| | |
|---|---|
| Filter Code | W-001 |
| Filter Name | YL500 Argon |
| Color | ORANGE |
| Luminous Transmittance | 60% |

| Optical Density | | |
|---|---|---|
| EXCIMER | 200~514.6nm | 4< |
| ARGON | | |
| He-Cd | | |



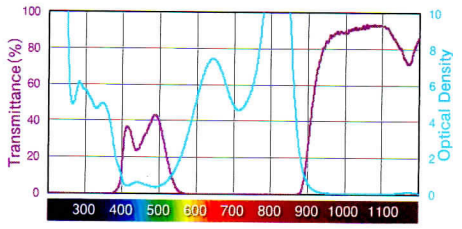

| | |
|---|---|
| Filter Code | W-002 |
| Filter Name | YL500 NdYag(SHG) |
| Color | RED |
| Luminous Transmittance | 15% |

| Optical Density | | |
|---|---|---|
| ARGON | 480~540nm | 6< |
| Nd-YAG(SHG) | | |



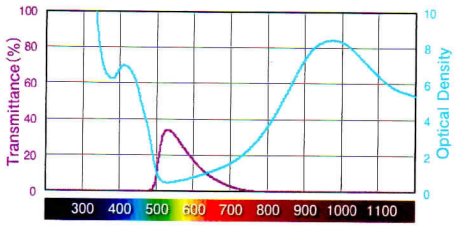

| | |
|---|---|
| Filter Code | W-003 |
| Filter Name | YL500 Laser Diode |
| Color | BLUE |
| Luminous Transmittance | 7% |

| Optical Density | | |
|---|---|---|
| LASER DIODE | 760~850nm | 5< |
| He-Ne | 632.8nm | |



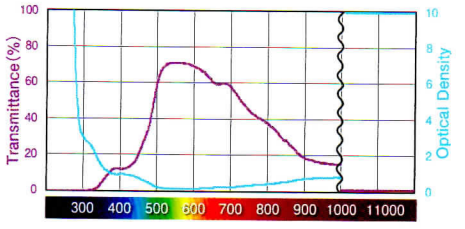

| | |
|---|---|
| Filter Code | W-004 |
| Filter Name | YL500 NdYag |
| Color | GREEN |
| Luminous Transmittance | 25% |

| Optical Density | | |
|---|---|---|
| Nd-YAG | 1064nm | 5< |
| Nd-YUO$_4$ | | |



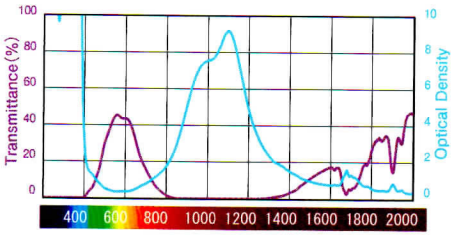

| | |
|---|---|
| Filter Code | W-005 |
| Filter Name | YL500 CO2 |
| Color | GREEN |
| Luminous Transmittance | 60% |

| Optical Density | | |
|---|---|---|
| $CO_2$ | 10600nm | 10< |




| | |
|---|---|
| Filter Code | W-009 |
| Filter Name | YL500 Fiber |
| Color | GREEN |
| Luminous Transmittance | 40% |

| Optical Density | | |
|---|---|---|
| Fiber | 950-1150nm | 7< |

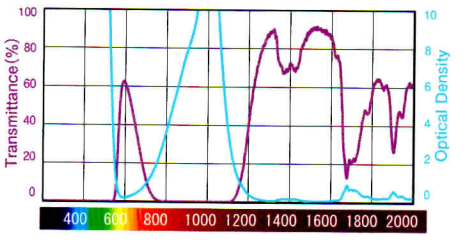



# YL-550

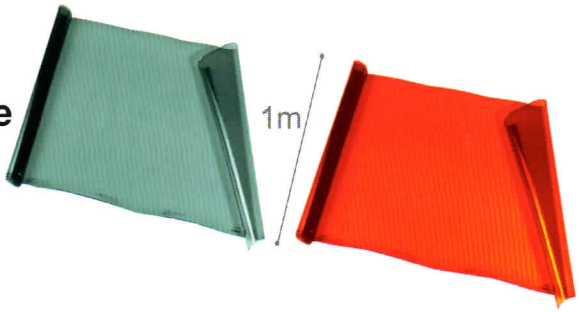
## C Laser absorption type and Application for Multi band laser

| | |
|---|---|
| Filter Code | W-008 |
| Filter Name | YL550C NdYag2 |
| Color | AMBER |
| Luminous Transmittance | 40% |

| Optical Density | | |
|---|---|---|
| YAG(FHG) | 266nm | 10< |
| YAG(THG) | 355nm | 10< |
| YAG(SHG) | 532nm | 4< |
| Nd-YAG | 1064nm | 6< |



## model type
# YLC-1
# YLC-2

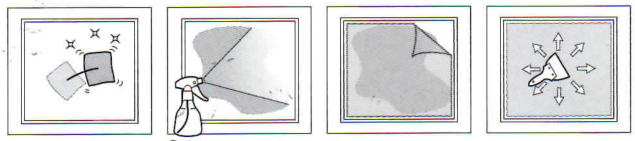



The 1m wide curtain enables protection for a large area.

### YLC-1 YLC-2

- Size : 1m x 0.5m, 1m x 1m to 1m x 10m(unit of 1m) / Thickness 0.5mm
- Material / Polyvinyl cholide(PVC)
- Color / YLC-1 : Clear Gray , YLC-2 : Clear Orange
- Optical Density / over OD3
- Visible Light Transmittance / YLC-1 : 40% , YLC-2 : 30%
- Antistatic Performance (Surface resistivity value) / 1.1 x 10+13(JIS K-6911)
- Flame proof / Lv 2(JISA-1322)

EN12254 YLC-1 : DIR 1064 AB3 DI 10600 AB2 CE
YLC-2 : D 485-514.5 AB3 D1 532 AB3 CE



①Wipe the glass clean. ② Spray water onto the glass so that the product attaches to the surface. ③ Paste the product on to the wet glass. ④ From the center of the product to its edges, use a rubber spatula to push out the water and the air.

## model type
# YL-600

### Outline of product:

- YL600 is made of soft PVC and it is easy to cut by scissors and fit to the required area of the facility.
- Size : Effective width 33cm x 0.5m to 33cm x 10m(unit of 0.5m) / Thickness 0.7mm
- Material / Polyvinyl cholide(PVC)

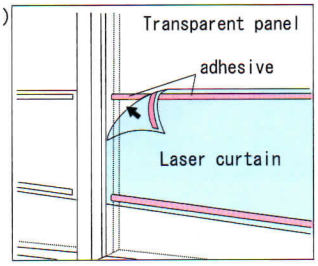
### How to install the Laser Shield Curtain YL600

YL600 is made of PVC, due to its softness and flexibility, it is easy to cut according to the required size. Please draw attention to the following information in order to maximize the performance of the product.

### Installation of the Laser Curtain to transparent panels

The surface of the Laser Curtain is slightly adhesive. Firstly place the Laser Curtain onto the panels and then push out any air bubbles which may exist between the curtain and the panel. Even if any air bubbles still remain, the effectiveness of the curtain will not be reduced. After that, apply 3M multi-purpose adhesive(approx 1cm in width) to the upper and lower edges of both the curtain and panel to fix.(table 1)

(table 1)




## YLC-1 YLC-2

| ORDER NAME | COLOR | Visible light transmittance(%) | Wavelength (nm) | Optical Density(OD) | FILTER CODE | CE mark |
|---|---|---|---|---|---|---|
| YLC-1 CE | CLEAR GRAY | 40% | 266,355,1064 2100,10600 | 3< | YLC-1 | DIR 1064 AB3 DI 10600 AB2 |
| YLC-2 CE | CLEAR ORANGE | 30% | 190-380 488-532 | 3< | YLC-2 | D 485-514.5 AB3 D1 532 AB3 |

## YL-600

| ORDER NAME | COLOR | Visible light transmittance(%) | Wavelength (nm) | Optical Density(OD) | FILTER CODE | CE mark |
|---|---|---|---|---|---|---|
| YL600 HeNe | BLUE | 12% | 632.8 760-850 | 2< | CU-002 | – |
| YL600 Laser Diode | GREEN | 12% | 740-910 700-1000 | 3< 1-3< | CU-003 | – |

## YL-600 Laser absorption type and Application for Multi band laser

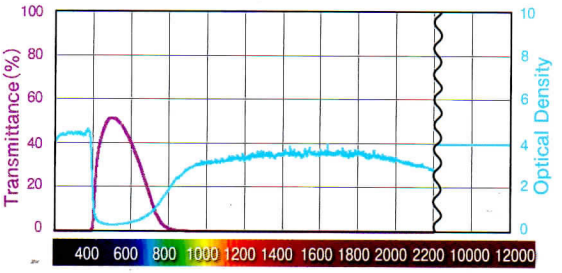
| ORDER NAME | COLOR | Visible light transmittance(%) | Wavelength (nm) | Optical Density(OD) | FILTER CODE | CE mark |
|---|---|---|---|---|---|---|
| YL600C NdYag2 | AMBER | 7% | 266,355 532 1064 | 3< | CU-004 | – |

## YLC-1

| | |
|---|---|
| Filter Code | YLC-1 |
| Filter Name | YLC-1 |
| Color | CLEAR GRAY |
| Luminous Transmittance | 40% |

Optical Density

| | | |
|---|---|---|
| YAG(FHG) | 266nm | 3< |
| YAG(THG) | 355nm | |
| Nd-YAG | 1064nm | |
| $CO_2$ | 10600nm | |

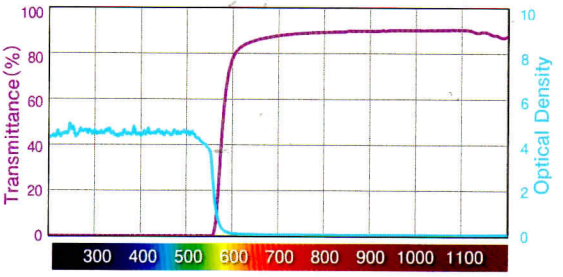



## YLC-2

| | |
|---|---|
| Filter Code | YLC-2 |
| Filter Name | YLC-2 |
| Color | CLEAR ORANGE |
| Luminous Transmittance | 30% |

Optical Density

| | | |
|---|---|---|
| EXCIMER | 190-380nm | 3< |
| ARGON | 488,514.8nm | |
| He-Cd | 441.6nm | |
| Nd-YAG(SHG) | 532nm | |

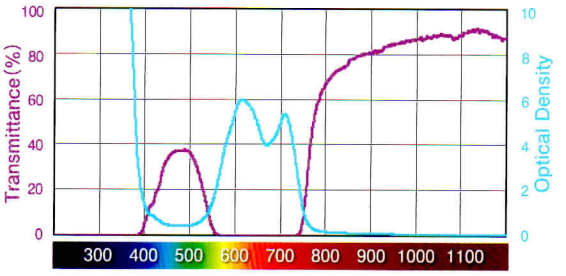



## YL-600

| | |
|---|---|
| Filter Code | CU-002 |
| Filter Name | YL600 HeNe |
| Color | BLUE |
| Luminous Transmittance | 12% |

Optical Density

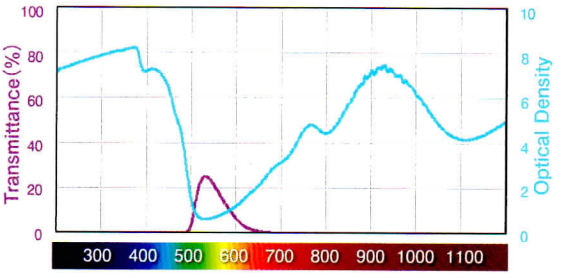
| | | |
|---|---|---|
| He-Ne | 632.8nm | 2< |
| Dye | 570~630nm | |
| GOLD-VAPOR | 627.8nm | |
| KRYPTON | 647.1nm | |
| | 676.4nm | |
| ルビー | 694.3nm | |




| | |
|---|---|
| Filter Code | CU-003 |
| Filter Name | YL600 Laser Diode |
| Color | GREEN |
| Luminous Transmittance | 12% |

Optical Density

| | | |
|---|---|---|
| LASER DIODE | 740~910nm | 3< |
| ALEXANDRITE | 740~820nm | |
| Ti-Sapphire | 700~1000nm | 1~3< |

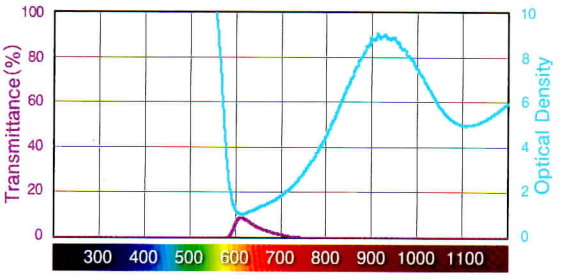



## YL-600C

| | |
|---|---|
| Filter Code | CU-004 |
| Filter Name | YL600C NdYag2 |
| Color | AMBER |
| Luminous Transmittance | 7% |

Optical Density

| | | |
|---|---|---|
| YAG(FHG) | 266nm | 3< |
| YAG(THG) | 355nm | |
| YAG(SHG) | 532nm | |
| Nd-YAG | 1064nm | |



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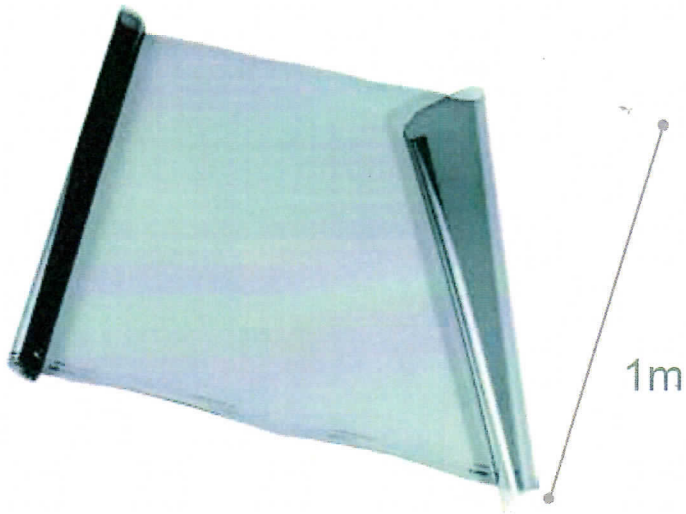
# LASER SHIELD CURTAIN

## YLC-1

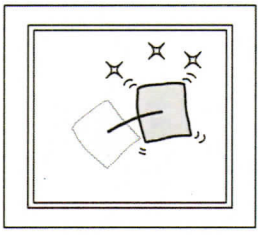
◆Effective width of 1 meter supports protection for a large area

◆High visibility due to improvements in surface precision and VLT

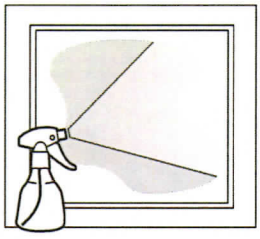


| Product Number | Color | VLT (%) | Wavelength (nm) | Optical Density (OD) |
|---|---|---|---|---|
| YLC-1 | Clear Gray | ◯ 40% | 266<br>355<br>1064<br>10600 | 3< |

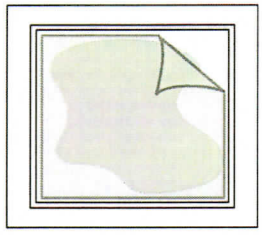
<How to Install>



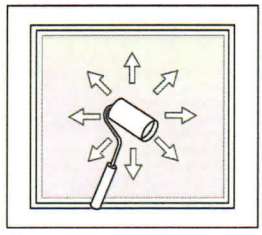
①Wipe the glass clean.



②Spray water onto the glass so it becomes attached to the surface.



③Paste the product on to the wet glass.



④From the center of the product to its edges, use a rubber roller to push out the water and the air.

## Product Number : YLC-1

Material : PVC

Color : CLEAR GRAY

Size : 1m× 1 ～ 10m (unit of1m)、Thickness 0.5,mm

Applicable Wavelengths :266,355,1064 2100, 10600nm

Optical Density : Over OD3

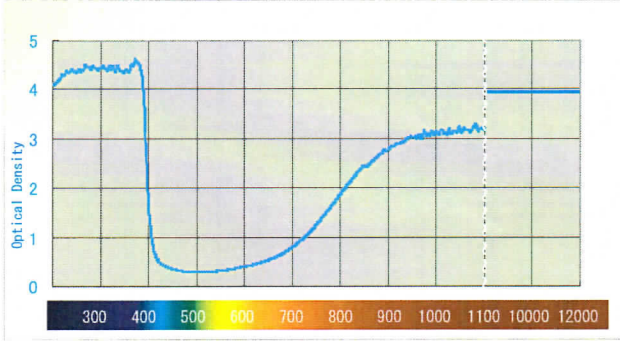
Visible Light Transmitance : 40%

Antistatic Performance (Surface resistivity value)

$1.1\times10^{13}$(JIS K-6911)

Flame proofness : Flame proof Lv 2(JISA-1322)

EN12254 DIR A3 YLC 1064 / DI A2 YLC 10600 CE




Please contact us for further information.

YAMAMOTO KOGAKU CO.,LTD. Safety,LASER Protective Equipment & Optronics Dept.

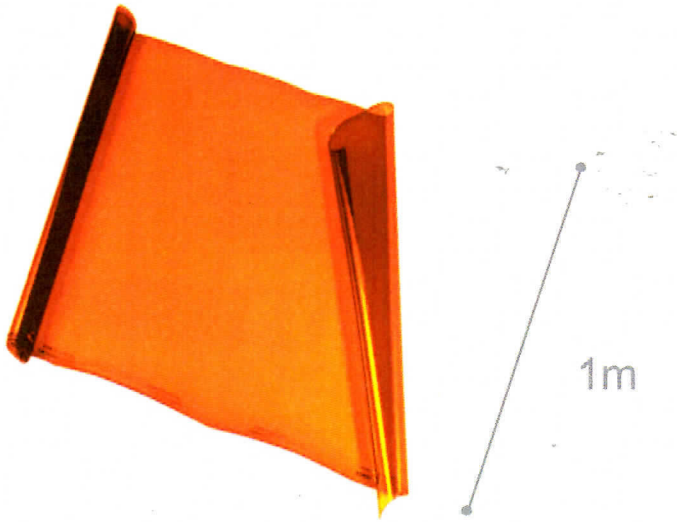
http://www.yamamoto-kogaku.co.jp E-mail : sales@yamamoto-kogaku.co.jp

YAMAMOTO LASER SAFETY

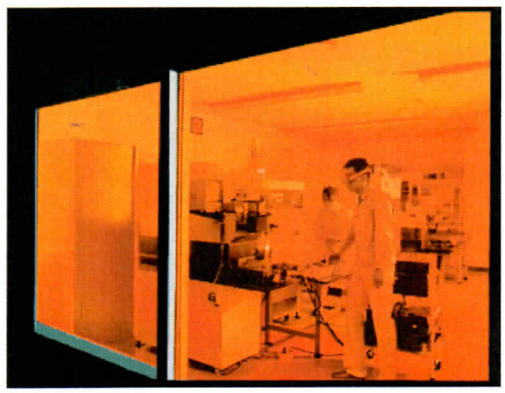
# LASER SHIELD CURTAIN

## YLC-2A

- ◆ Improve the lightfastness against visible light ( retain the color )
- ◆ Improve the optical density ( over3 → 4 )

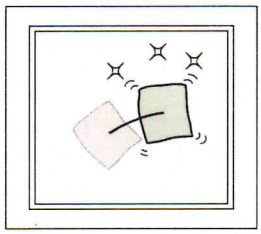



Enlarged to width of 1m
enables protection for a large area

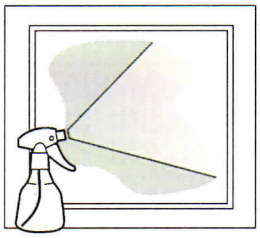


| Product Number | Color | VLT (%) | Wavelength (nm) | Optical Density (OD) |
|---|---|---|---|---|
| YLC-2A | Clear Orange | 30% | 190-540 | 4< |

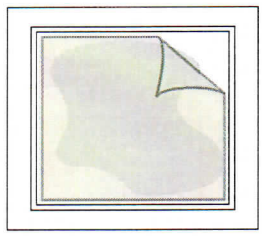
<How to Install>



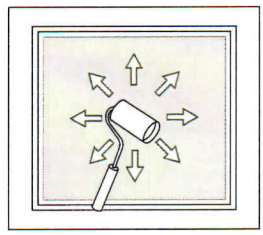
①Wipe the glass clean.



②Spray water onto the glass so it becomes attached to the surface.



③Paste the product on to the wet glass.



④From the center of the product to its edges, use a rubber roller to push out the water and the air.

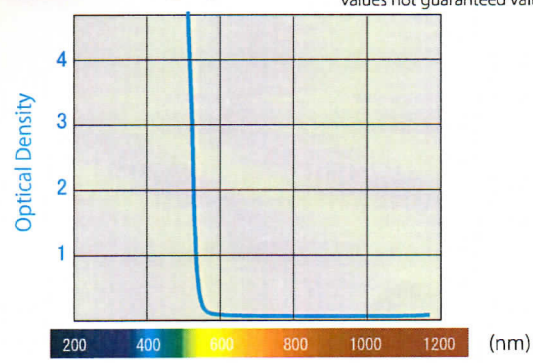
## Product Number : YLC-2A

**Material :** Polyvinyl cholide (PVC)
**Color :** Clear Orange
**Size :** 1m×0.5m, 1m×1m to 1m×10m (unit of 1m) ,
Thickness / 0.5mm
**Wavelength :** 190 ～ 540nm
**Optical Density :** 4<
**Visible Light Transmittance :** 30%
**Antistatic Performance (Surface resistivity value) :** $1.1 \times 10^{13}$(JIS K-6911)
**Flame proof :** Oxygen index 25< (JIS K-7201-A)
EN12254 **R 266 AB3 R 355 AB7 R 532 AB4** CE

<YLC-2A>

**Characteristic graph**

The data of graph are measured values not guaranteed values.




Please contact us for further information.

YAMAMOTO KOGAKU CO.,LTD. Safety,LASER Protective Equipment & Optronics Dept.
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YAMAMOTO LASER SAFETY

# LASER BARRIER CURTAIN

# NEW YL-2300

## Coming Soon !

**The new laser barrier curtain protects you from the scattered light generated in the environment using the laser. Recently, many portable laser devices have been developed, this lightweight design curtain makes it easy to carry for laser safety even if you move to other places.**

### Charactarisitic

- Easy to carry because of lightweight
- Available to customized size accoring to your requirements
- Protection perfprmance against all of wavelengths
- Suitable for laser safety in place where scattered light is generated
- EN12254 (To be Certificated soon)
- To be Certified by Japan Fire Retardant Association

### Specification

- Standard size : 1800×900mm
- Weight : 2.5kg (Standard size)
- Material : Flame proof fiber
- Come with gromments for curtain rail
- Velcro tapes are attached on both side of the curtain edges

### TEST DATA

**NdYAG laser(1064nm) Irradiation test . According to EN12254:2010**

| | Laser irradiaton | Penetration | Protection level | Note: |
|---|---|---|---|---|
| CW Laser 1 | $7.9 \times 10^5$ W / m² | No Penetration after 600 sec | AB4 | Output 10W |
| CW Laser 2 | $1.1 \times 10^6$ W / m² | No Penetration after 100 sec | | Output 10W |
| CW Laser 3 | $3.1 \times 10^6$ W / m² | Penetration in 90 sec | | Output 10W |
| CW Laser 4 | $1.2 \times 10^7$ W / m² | Penetration in 28 sec | | Output 10W |

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