

1. <b>Interference Filters</b>	Narrow band ( $\pm 10\text{nm}$ ), Broadband ( $\pm 50\text{nm}$ and $\pm 80\text{nm}$ ), it has extremely angle sensitive, so carefully mounting is necessary. The highly selective reduce the throughput of the peak wavelength significantly.
2. <b>Color Substrate Filters</b>	They are often used for longpass and bandpass filters, coated substrate cemented with color glass which have different absorption and transmission properties across the spectrum.
3. <b>Dichroic Filters</b>	Substrate are coated with thin-films to acquire the desired transmission and reflection characteristics across the spectrum.
4. <b>Neutral density Filters</b>	It often used to prevent blooming or overexposure of cameras and other detectors. they are designed to reduce transmission evenly across a portion of the spectrum . Two types: absorptive and reflective.
5. <b>Longpass Filters</b>	A filter in which the passband is a wavelength rang higher than the wavelength range that is blocked.
6. <b>Shortpass filters</b>	A filter in which the passband is a wavelength rang lower than the wavelength range that is blocked. it include IR cutoff filters, hot mirror, and heat absorbing filters.

Following is a short review of filter specifications to assist you in formulating requirements for your particular application.

**Center wavelength**

Center wavelength (CWL) is the arithmetic mean of the pass band expressed in nanometers. For example, a HeNe Laser would have a center wavelength of 632.8nm. Center Wavelength tolerance:  $\pm$  FWHM

**Percent Transmission**

Percent transmission is the amount of power received by the detector compared to the total power received. Or Percentage of light pass in particular Wavelength

**Bandpass**

It is the width of the pass band, measured in nm, at the half-power points of the pass band. It is often expressed as Full Width at Half maximum (FWHM).

Tolerance:  $\pm 20\%$  of FWHM.

***Please Give Following information while sending the Order or Enquiry***

Center Wavelength: \_\_\_\_\_ Tolerance \_\_\_\_\_

FWHM \_\_\_\_\_ Tolerance \_\_\_\_\_

Percent Transmission : \_\_\_\_\_ Tolerance \_\_\_\_\_

Size: in Diameter

Dimension \_\_\_\_\_ Tolerance \_\_\_\_\_

Thickness \_\_\_\_\_ Tolerance \_\_\_\_\_

Blocking:

Short side \_\_\_\_\_ nm to pass band \_\_\_\_\_ level \_\_\_\_\_

Long side pass band to \_\_\_\_\_ nm level \_\_\_\_\_

Surface Quality \_\_\_\_\_

Angle of incidence \_\_\_\_\_

Temperature range \_\_\_\_\_

Humidity \_\_\_\_\_

### Bandpass shape

It can vary from triangular to nearly square. The number of cavities in a filter describes the overall spectral shape.

### Out-of-band rejection

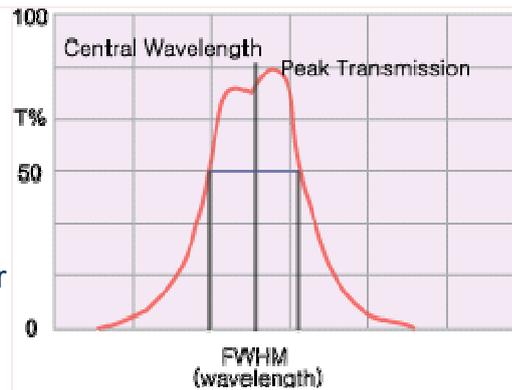
out-of-band rejection (Blocking), is the amount of the energy, outside the filter pass band, transmitted through the filter. it is often expressed as an absolute level.

For example  $10^{-4}$ , means transmission outside the pass band is 0.01%, Unit: Optical Density (O.D.).

### Filter Dimension

Filter dimension are specified in inches or millimeter along with tolerance.

Surface Quality: 80-50 scratch-dig.



OPTICA ' s filter are designed for operation at 23 degrees Celsius, these filters can be used throughout the temperature range of -50 to +100 degrees Celsius as long as thermal shock is avoided.

## Color Glass Filter

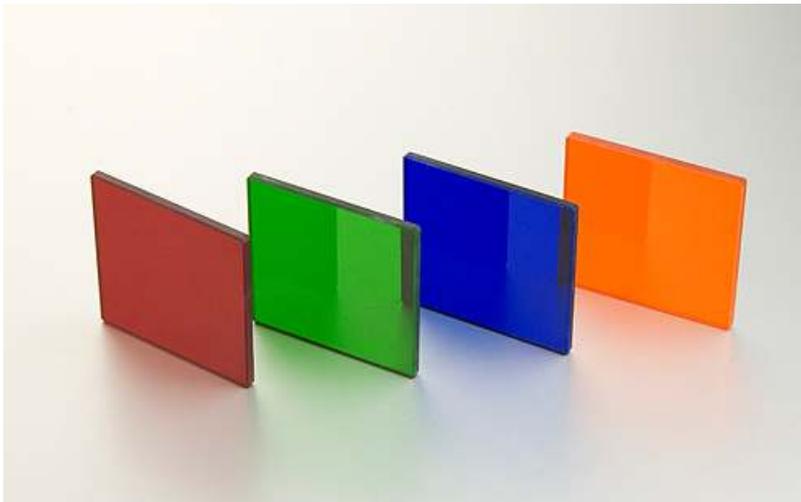
Color glass filter stands out due to its selective absorption in the visible wavelength range. The filters appear to be colored if their filter effect lies within the visible light spectrum.

SCHOTT, one of the leading filter glass manufacturers with a wide product range.

Our range of glass filters with more than 60 types includes the following filter types in the visible wavelength range from 200 nm upwards:

- Band pass filters, which allow required ranges to pass through selectively
- Long pass filters, which block unwanted shorter wave ranges
- Short pass filters, which block unwanted longer wave ranges

Neutral density filters, which have a virtually constant transparency especially in the visible range

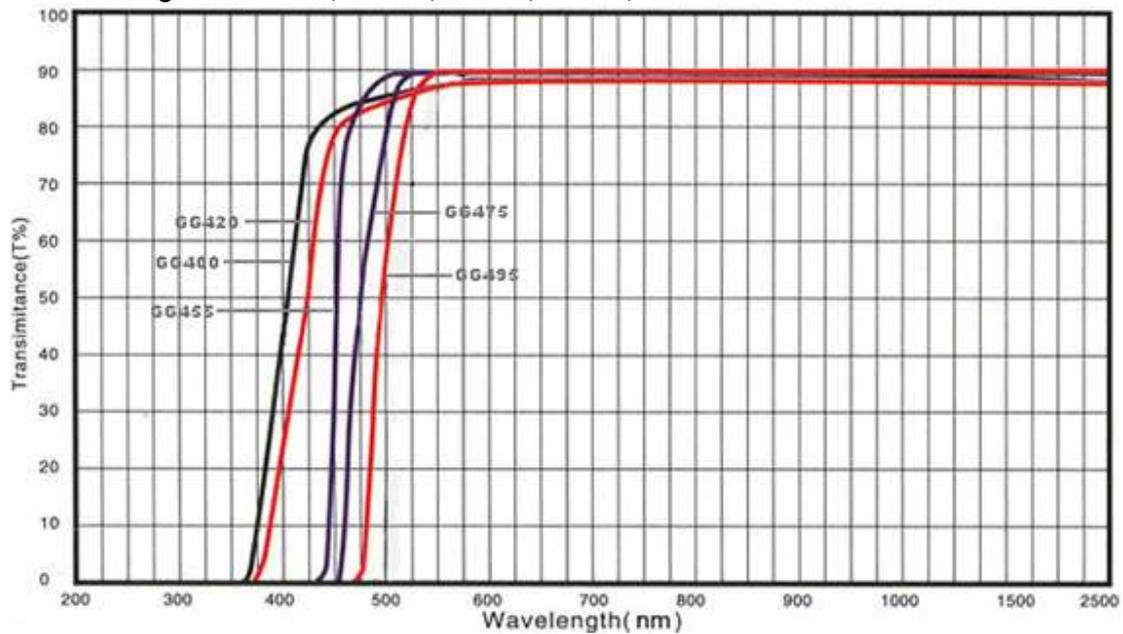


These Filters have wide application in Sensing, Color Sorting, Analytical Instruments, Imaging and Medical

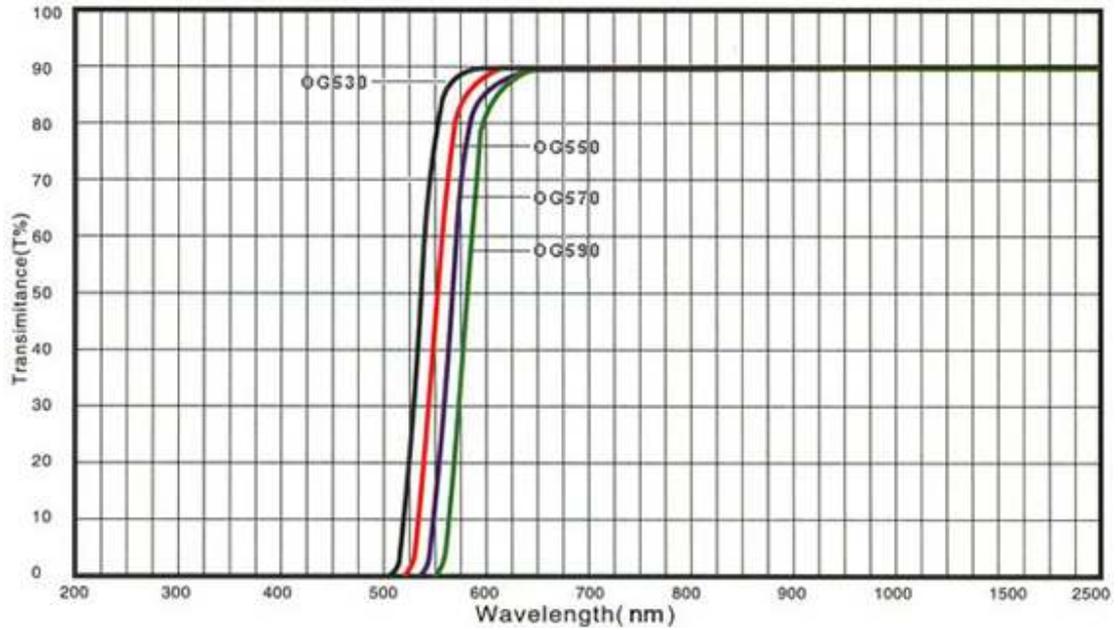
Size: Dia. 3 mm to 160mm, Square 5mm to 160mm

We offer following Std Color Glass Filters as follows

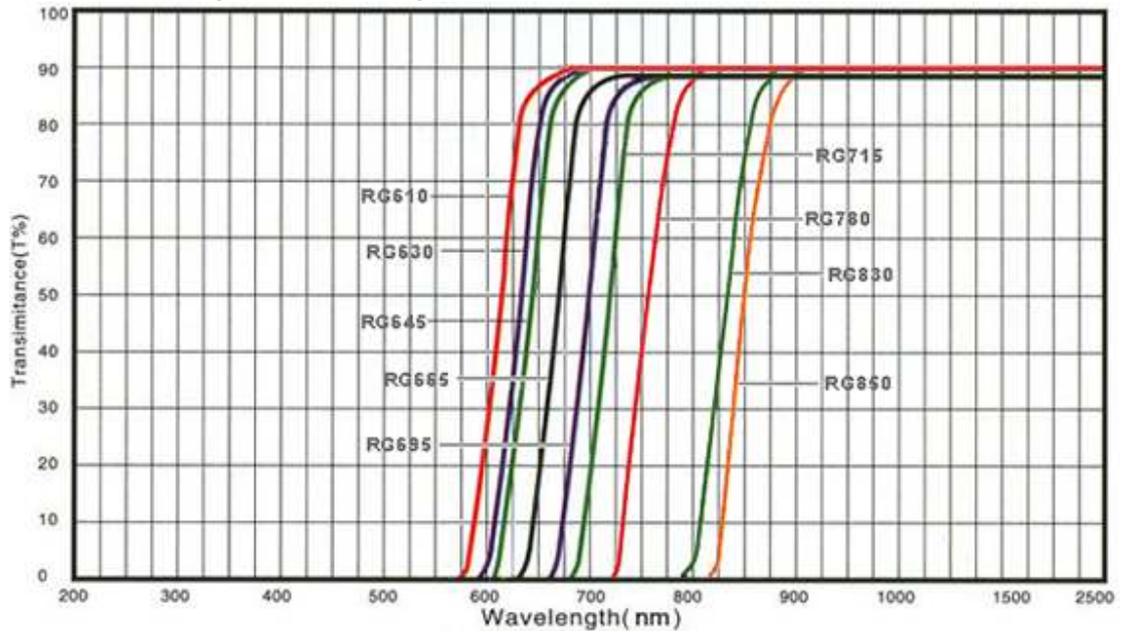
**GG Series: Yellow glass : GG400, GG420, GG455, GG475, GG495**



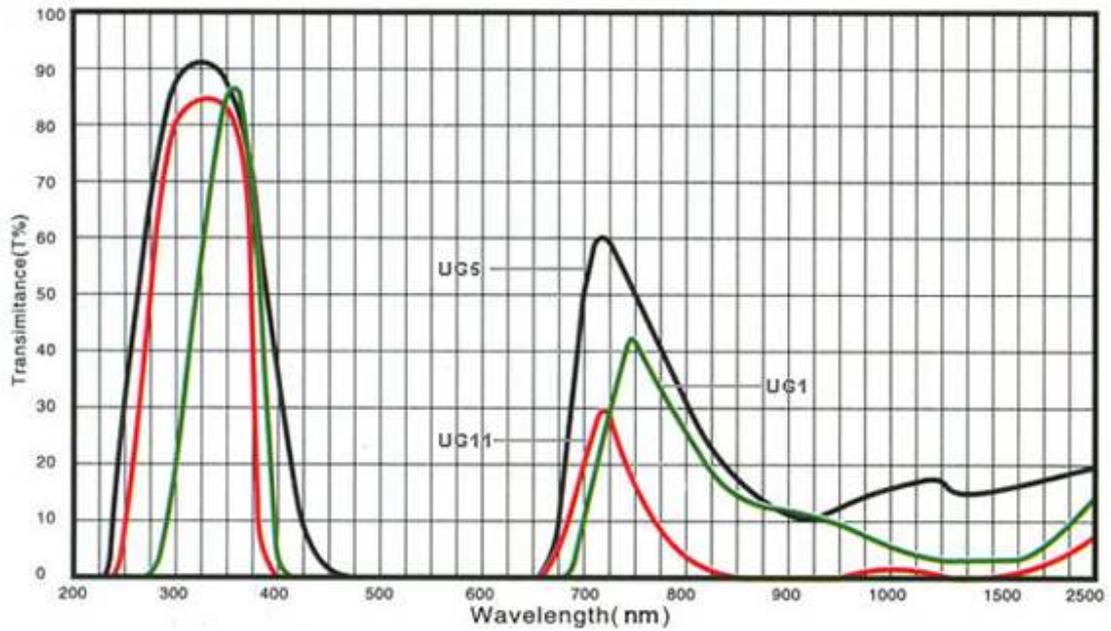
**OG Series: Orange glass : OG530, OG550, OG570, OG590**



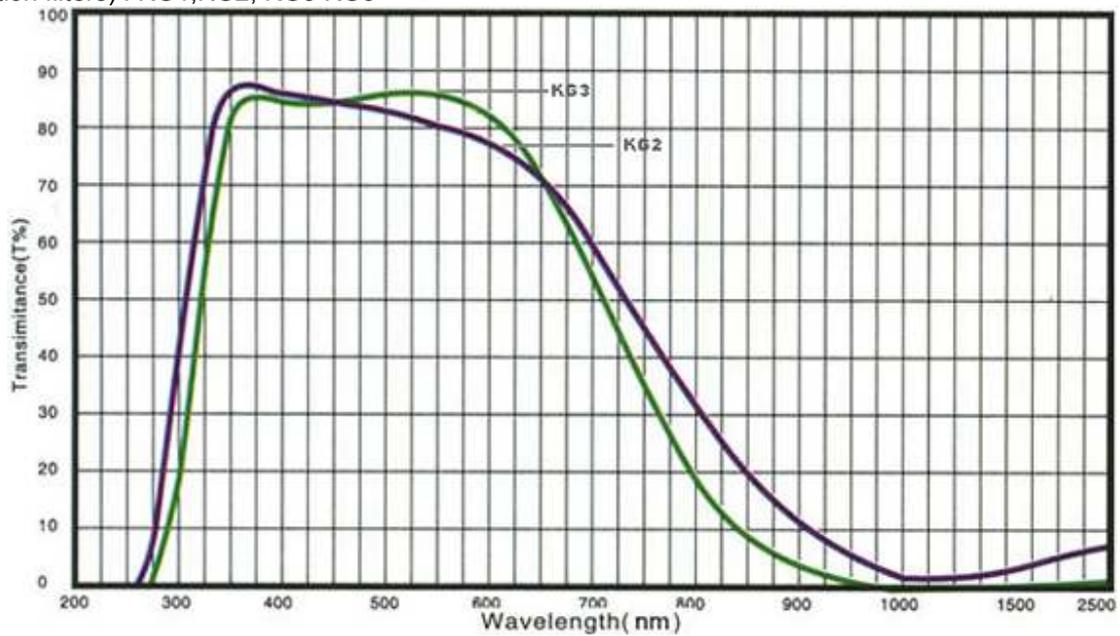
**RG Series: Red and black glass, IR transmitting : RG610, RG630, RG645, RG665, RG695, RG715, RG780, RG830, RG850**



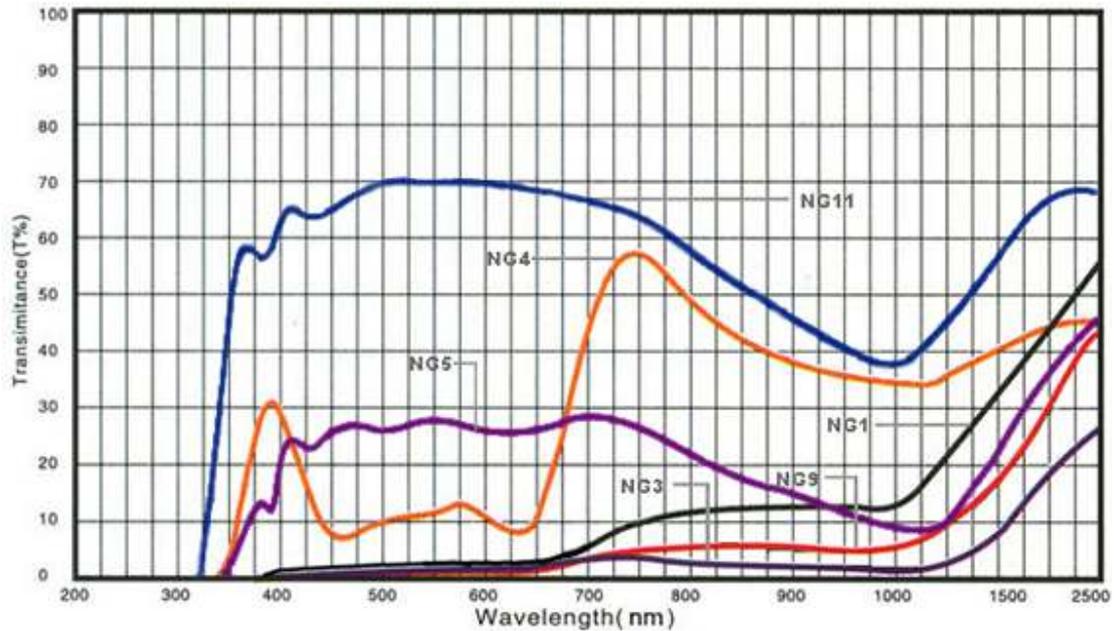
**UG Series: Black blue glasses, ultraviolet transmitting : UG1, UG5, UG11**



**KG Series:** Colorless glass with high transmission in the visible and absorption in the IR range (heat protection filters) : KG1,KG2, KG3 KG5



**NG Series:** Neutral Density Filters: NG1, NG3, NG4, NG5, NG9, NG11



**Other frequently used color filter**

WG Series	WG280, WG295, WG320, WG345, WG360
BG Series	BG38, BG39
VG Series	VG5, VG6, VG8, VG9, VG10, VG11

**Specifications**

Sizes & Tolerance	Size 3mm to 160mm $\pm$ 0.2mm ( Round or Rectangular)
Thickness Tolerance	1mm to 6mm $\pm$ 0.2mm
Flatness	$2\lambda@632.8\text{nm}$
Surface Quality	80/50 scratch and dig
Parallelism	<1 arc minutes
Clear Aperture	>90%

**Ordering Information**

Note: All the color glass materials are from Schott or Equivalent Manufacturer

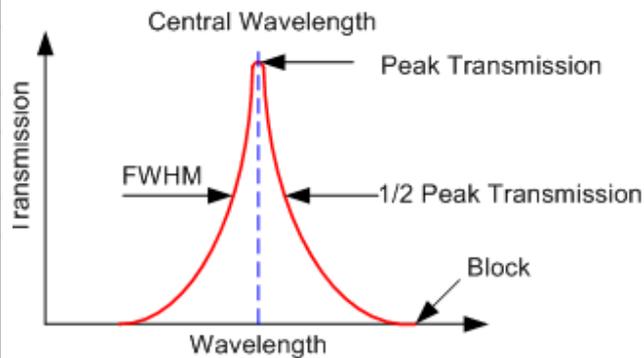
# Interference Filters :

Interference bandpass filters are relatively inexpensive wavelength selectors that allow transmission of a predetermined wavelength while rejecting or blocking other wavelengths. Interference filters are widely used in instrumentation for clinical chemistry, environmental testing, colorimetry, elemental and laser line separation, flame photometry, fluorescence, immunoassays, etc.



## Specifications

Mount Diameter	10mm to 25.4mm +0/-0.2mm
Clear Aperture	>80%
Thickness	<10mm
CWL Tolerance	$\pm 2\text{nm}$
FWHM	10nm
Peak Transmission	>45%
Block	<0.01%(X ray to 1100nm)
CWL Shift	<0.02nm/ $\square$



**Narrow Bandpass Interference filters**

Specifications:

Central Wavelength (CWL)

Tolerance:  $\pm 2\text{nm}$

Full width-half Maximum (FWHM):  
10nm

Operating Temp.Range:  $-10^{\circ}\text{C}$  to  
 $+70^{\circ}\text{C}$

Surface Quality: 80-50

Blocking: 100 nm to 1200nm

**Application:** Water and environmental testing, clinical chemistry, colorimetry, photometry, lasers, color sorting, sensing and detecting

**OPTICA can provide following typical Narrow Bandpass filter:**

**CWL(nm) 340, 405, 420, 430, 450, 470, 480, 492, 500, 505, 510, 520, 532, 540, 546, 550, 580, 590, 600, 610, 630, 650, 690, 730, 780, 830, 900, 940, 1064**

## COLD MIRROR ( HEAT TRANSMISSION FILTER)

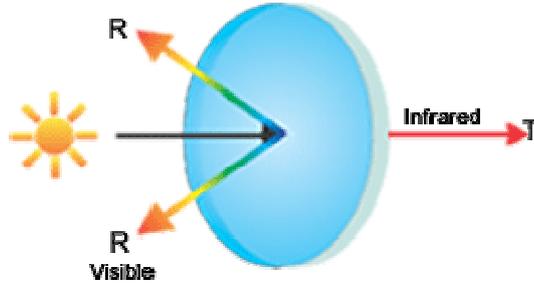
Cold Mirror is used to in certain applications where it is desirable to reflect visible light, but transmit the IR (heat energy) to replace the Hot Mirror.

### Application :

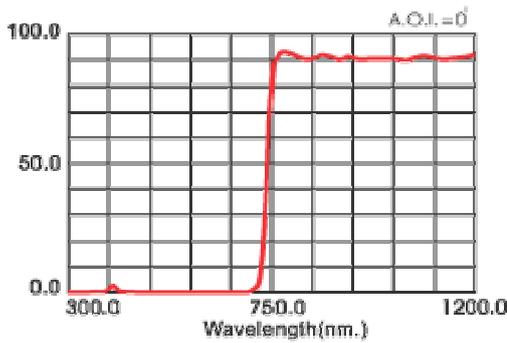
Medical  
Illumination  
Projection  
System  
Photo Copies  
Reflector  
Scanner

### Features :

High infrared  
transmission  
Excellent visible  
light reflection



### Technical Specification



### Standard Spectral Characteristics

- ⊙ Visible Reflection :  
400 - 700nm Ravg > 97%
- ⊙ Infrared Transmission :  
750 - 2500nm Tavg > 88%  
T50% at 740 ± 10nm

Humidity. Adhesion. Abrasion Resistance

### Available Glass Materials

- ⊙ Soda-Lime Glass
  - ⊙ Borofloat Glass
  - ⊙ Tempered Glass
  - ⊙ Borosilicate Glass
- Maximum Operation Temperature
- ⊙ Soda-Lime Material : 150 °C
  - ⊙ Tempered Material : 250 °C
  - ⊙ Borofloat Material : 450 °C

- Available Sizes
- ⊙ Standard Thickness : 1.10mm
  - ⊙ Optional Thickness : 0.55mm 1.86mm 2.86mm
- Cutting Tolerance
- ⊙ ± 0.1mm

# DICHROIC FILTERS

**OAEPL** Dichroic Series have been designed with the assistance of entertainment and architectural lighting designers, which provided a comprehensive selection of consistent shades to express perfect images for both interior and exterior applications.

Some of the subtle, pale colors also offer you a unique alternative to create various aesthetic effects for architectural use and characteristic lighting.

**OAEPL** Dichroic Series provide you the flexibility to choose suitable colors for your projects and the benefits of absolute spectral stability in addition to excellent resistance to environmental degradation.

## OAEPL Dichroic Filters

- ⊙ 28 kinds of standard colors
- ⊙ 6 kinds of color correction filters.
- ⊙ Correspond to LEE and ROSCO
- ⊙ Size : 50 x 50 with 1.10mm thickness
- ⊙ Substrate : Borofloat glass material



## Technical Specification

Humidity. Adhesion. Abrasion Resistance

Available Glass Materials

- ⊙ Soda-Lime Glass
- ⊙ Tempered Glass
- ⊙ Borofloat Glass
- ⊙ Borosilicate Glass

Maximum Operation Temperature

- ⊙ Soda-Lime Material : 150 °C
- ⊙ Tempered Material : 250 °C
- ⊙ Borofloat Material : 450 °C

Available Sizes

- ⊙ Square : 7mm - 300mm
- ⊙ Round : 10mm - 450mm

⊙ Standard Thickness : 1.10mm

⊙ Optional Thickness :

- ⊙ 0.55mm
- ⊙ 1.86mm
- ⊙ 2.86mm

Cutting Tolerance

- ⊙ ± 0.1mm

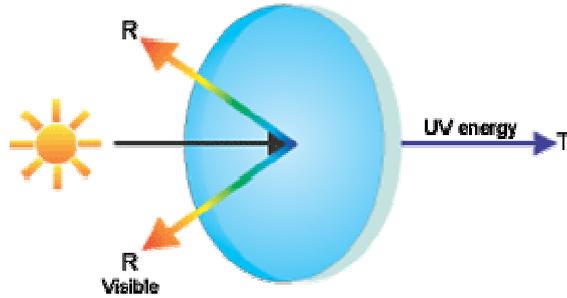
Color Tolerance

- ⊙ ± 5nm of Designed Half Height

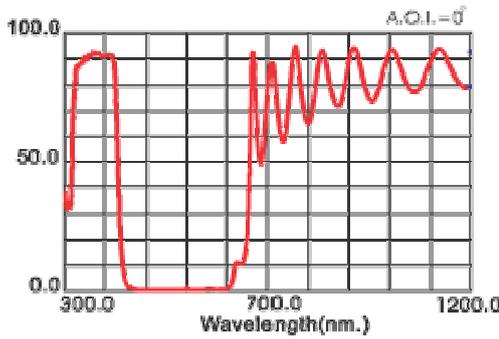
# UV TRANSMISSION FILTER

UV Transmission Filter is used to special applications that need to transmit the UV energy and reflect most visible light to illuminate the subject with any various effects.

- Application :**  
 Fluorescent effect for Lighting and Stage  
 Tanning Bed  
 Lead Detector
- Features :**  
 UV energy transmission  
 Visible light reflection



## Technical Specification



Humidity. Adhesion. Abrasion Resistance

Available Glass Materials

- Soda-Lime Glass
- Borofloat Glass
- Tempered Glass
- Borosilicate Glass

Maximum Operation Temperature

- Soda-Lime Material : 150 °C
- Tempered Material : 250 °C
- Borofloat Material : 450 °C

## Standard Spectral Characteristics

- UV energy Transmission :  
380 - 400nm Tav. > 80%
- Visible Reflection :  
450 - 700nm Rav. > 98%

Available Sizes

- Square : 7mm - 300mm
- Round : 10mm - 450mm

Standard Thickness : 1.10mm

Optional Thickness :

- 0.55mm
- 1.86mm
- 2.86mm

Cutting Tolerance

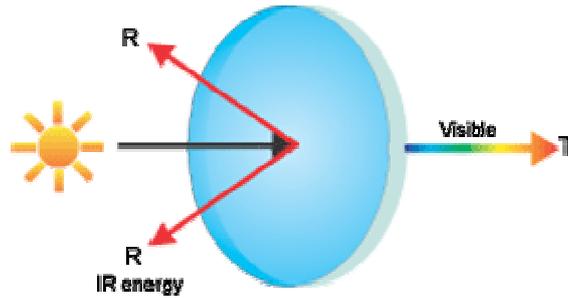
- ± 0.1mm

## IR CUT-OFF FILTER (Dichoric)

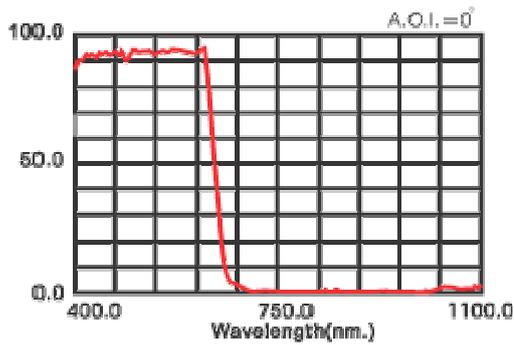
IR cut-off filter blocks the transmission of infrared while passing the visible. It is used with color CCD images to produce true color appearance and avoid the color deviation. Keep the primary colors to display natural and vivid reality.

**Application :** Digital Camera  
CCD Camera  
Color Scanner

**Features :** High IR energy reflection  
Excellent Visible transmission



## Technical Specification



Humidity. Adhesion. Abrasion Resistance

Available Glass Materials

- Soda-Lime Glass
  - Borofloat Glass
  - Tempered Glass
  - Borosilicate Glass
- Maximum Operation Temperature
- Soda-Lime Material: 150 °C
  - Tempered Material: 250 °C
  - Borofloat Material: 450 °C

## Standard Spectral Characteristics With AR Coating

- IR Reflection :
  - 700 - 1000nm  $T_{max} < 3\%$
  - 1000 - 1100nm  $T_{max} < 5\%$
- Visible Transmission:
  - 420 - 620nm  $T_{min} > 85\%$ .  $T_{avg} > 90\%$
  - $T_{50\%}$  at  $645 \pm 15\text{nm}$

Available Sizes  Standard Thickness : 1.10mm

- Square : 7mm - 300mm
- Round: 10mm - 450mm
- Optional Thickness: 0.55mm 1.86mm 2.86mm

Cutting Tolerance

- $\pm 0.1\text{mm}$