

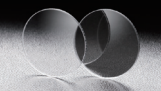


F i l t e r s






Filters Selection Guide

B211

ND Filters

	Absorptive Neutral Density Filter AND/ANDY/MAN/MANY	B213
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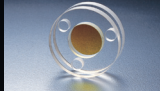
Colored Glass Filters

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	Contact sheet	B261

Other

	Etalon Custom-made	B262
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Filters Selection Guide

There is a large choice of filters, their characteristics are thoroughly differentiated. To choose the right filter characteristic may help you to increase your experimentation efficiency. The filter structure can be simple to be replaced, prepare many filters for replacement to obtain the best optical experimentation condition.

Application	Sample of use	Products		Features
Brightness adjustment	Prevention of saturation of sensor Contrast tuning of interference fringes A proper brightness adjustment Laser security measure			Absorption ND filter Reference > B213
				Reflectance ND filter Reference > B219
				Variable ND filter Reference > B224
Choice of wavelength (color)	Fluorescence observation Select a single color light Infrared and Ultraviolet observation			Color glass filter Reference > B230 - B237
				Dichroic filter Reference > B239 - B248
				Bandpass filter Reference > B250 - B257
Attenuate the scattered light	Uniformize the light Illumination for Observation Screen			Beam shaping diffuser Reference > B227
				Diffuser plate Reference > B228
				Opal diffuser Reference > B229

Selective wavelength filter

Long-pass filter

Wavelength [nm]	Part Number	Reference >	Wavelength [nm]	Part Number	Reference >	
300	274 LOPF-25C-267	B246	550	560 SCF-50S-560	B230	
	306 LOPF-25C-300	B246		567 RSF-25C-561RU	B247	
	327 RSF-25C-325RU	B247		570 SDM570S	B249	
	347 LOPF-25C-341	B246		572 LOPF-25C-561	B246	
	350	359 RSF-25C-355RU		B247	573 YIF-BA575IFS	B253
		367 RSF-25C-364RU		B247	574 RSF-25C-568RU	B247
		370 SCF-50S-37L		B230	580 SCF-50S-580	B230
		380 SCF-50S-38L		B230	590 DIM-50S-RED(Reflection)	B241
		390 SCF-50S-39L		B230	595 SDM595S	B249
		400		410 SDM410S	B249	600 SCF-50S-60R
415 LOPF-25C-409	B246		601 LOPF-25C-593	B246		
416 YIF-BA420IFS	B253		602 YIF-BA600IFS	B253		
418 LOPF-25C-405	B246		610 DIF-50S-RED	B240		
420 SCF-50S-42L	B230		620 SCF-50S-62R	B230		
440 SCF-50S-44Y	B230		637 RSF-25C-633RU	B247		
446 RSF-25C-442RU	B247		640 SCF-50S-64R	B230		
450	455 SDM455S		B249	650	654 RSF-25C-647RU	B247
	460 YIF-BA460IFS		B253	655 LOPF-25C-635	B246	
	463 RSF-25C-458RU		B247	660 SCF-50S-66R	B230	
	466 LOPF-25C-458	B246	671 RSF-25C-664RU	B247		
	476 RSF-25C-473RU	B247	700	700 SCF-50S-70R	B230	
	480 SCF-50S-48Y	B230	720	720 SCF-50S-72R	B230	
	490 SDM490S	B249	723	723 LOPF-25C-715	B246	
	491 RSF-25C-488RU	B247	750	754 LOPF-25C-736	B246	
	500 SCF-50S-50Y	B230		760 ITF-50S-76IR	B231	
	500 LOPF-25C-488	B246		788 RSF-25C-780RU	B247	
501 LOPF-25C-496	B246	791 RSF-25C-785RU		B247		
505 SDM505S	B249	800		800 ITF-50S-80IR	B231	
511 YIF-BA510IFS	B253	805		805 LOPF-25C-785	B246	
515 SDM515S	B249	812		812 LOPF-25C-800	B246	
515 LOPF-25C-500	B246	812		812 RSF-25C-808RU	B247	
518 RSF-25C-514RU	B247	830		830 ITF-50S-83IR	B231	
520 SCF-50S-52Y	B230	838		838 RSF-25C-830RU	B247	
520 DIF-50S-YEL	B240	840	840 LOPF-25C-834	B246		
522 LOPF-25C-515	B246	850	850 ITF-50S-85IR	B231		
526 LOPF-25C-514	B246	985	985 ITF-50S-100RM	B231		
530 LOPF-25C-519	B246	986	986 RSF-25C-980RU	B247		
535 RSF-25C-532RU	B247	1000	1057	1057 LOPF-25C-1020	B246	
540 SCF-50S-540	B230		1071	1071 RSF-25C-1064RU	B247	
542 LOPF-25C-532	B246		1300	1326	1326 RSF-25C-1319RU	B247

Short-pass filter

Wavelength [nm]	Part Number	Reference >	Wavelength [nm]	Part Number	Reference >			
450	430 SHPF-25C-440	B245	700	654 SHPF-25C-680	B245			
	483 SHPF-25C-492	B245		681 SHPF-25C-694	B245			
	488 SHPF-25C-518	B245		698 SHPF-25C-720	B245			
	490 DIM-50S-BLE(Reflection)	B241		700 CLDF-50S	B242			
	495 DIF-50S-BLE	B240		701 HAF-50S-15H	B235			
	500	522 SHPF-25C-533		B245	727 SHPF-25C-750	B245		
		550		590 DIF-50S-CYA	B240	743 HAF-50S-30H	B235	
				599 SHPF-25C-612	B245	747 SHPF-25C-770	B245	
		600		638 SHPF-25C-650	B245	750	760 CLDM-50S(Reflection)	B243
				646 SHPF-25C-655	B245		761 SHPF-25C-775	B245
654 SHPF-25C-680			B245	765 SHPF-25C-790	B245			
681 SHPF-25C-694			B245	777 HAF-50S-50H	B235			
698 SHPF-25C-720			B245	835 SHPF-25C-842	B245			
700 CLDF-50S			B242	875 SHPF-25C-890	B245			
701 HAF-50S-15H			B235	912 SHPF-25C-950	B245			
727 SHPF-25C-750	B245		936 SHPF-25C-945	B245				
743 HAF-50S-30H	B235							
747 SHPF-25C-770	B245							

Nocht type

Wavelength [nm]	Part Number	Reference >
350	355 NF-25C05-27-355	B258
	532 NF-25C05-40-532	B258
400	550 DIF-50S-MAG	B240
500	633 NF-25C05-47-633	B258
	1064 NF-25C05-80-1064	B258
600		
1000		

Filters Selection Guide

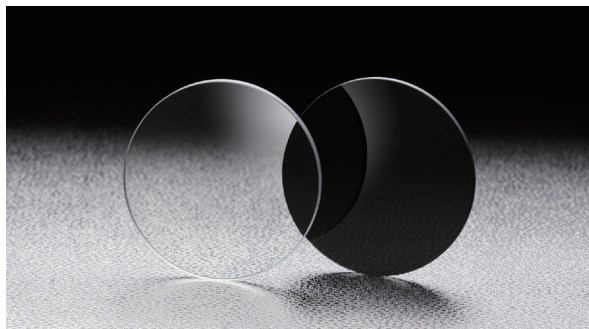
Band-pass type

Application Systems	Wavelength [nm]	Part Number	Reference	Wavelength [nm]	Part Number	Reference	Wavelength [nm]	Part Number	Reference			
Optics & Optical Coatings	200	214	VPF-25C-10-12-21400	B254	500	500	VPF-25C-10-50-50000	B254	700	700	VPF-25C-10-50-70000	B254
		228	VPF-25C-10-15-22800	B254		509	VPF-25C-10-50-50850	B254		710	VPF-50S-12-65-71000	B257
		232	VPF-25C-10-15-23200	B254		510	VPF-50S-10-55-51000	B257		720	VPF-50S-12-65-72000	B257
		239	VPF-25C-10-15-23900	B254		515	VPF-25C-01-40-51450	B254		730	VPF-50S-12-65-73000	B257
Holders	250	254	VPF-25C-10-12-25370	B254	517	517	VPF-25C-03-45-51450	B254	750	740	VPF-50S-12-65-74000	B257
		265	VPF-25C-10-12-26500	B254		520	VPF-25C-10-50-51450	B254		750	VPF-25C-10-45-75000	B254
		280	VPF-25C-10-12-28000	B254		526	VPFHT-5145	B250		760	VPF-25C-40-40-75000	B254
		289	VPF-25C-10-15-28900	B254		530	YIF-BA495-540S	B253		766	VPF-50S-12-65-76000	B257
Bases	300	297	VPF-25C-10-15-29670	B254	532	520	VPF-50S-10-55-52000	B257	800	770	VPF-50S-12-65-77000	B257
		307	VPF-25C-10-15-30710	B254		526	GRF-50S-530G	B234		770	VPF-25C-10-45-76650	B254
		313	VPF-25C-10-15-31300	B254		530	YIF-BA510-550S	B253		780	VPF-50S-12-65-78000	B257
		317	UTVAF-50S-33U	B232		532	VPF-25C-01-40-53200	B254		785	VPF-50S-12-65-78000	B257
Actuators	350	325	VPFHT-3250	B250	533	532	VPF-25C-03-45-53200	B254	850	785	VPFHT-7800	B250
		325	UTVAF-50S-34U	B232		533	VPF-25C-10-50-53200	B254		785	VPFHT-7850	B250
		326	VPF-25C-10-25-32600	B254		533	VPFHT-5320	B250		790	VPF-50S-12-65-79000	B257
		334	VPF-25C-10-25-33400	B254		535	GRF-50S-533G	B234		795	ITF-50S-83RT	B231
Motoeized Stages	350	337	VPF-25C-03-20-33710	B254	537	535	VPF-25C-10-50-53500	B254	900	795	VPF-25C-10-45-79470	B254
		337	VPF-25C-10-25-33710	B254		537	YIF-BA515-560S	B253		800	VPF-25C-10-45-80000	B254
		350	VPF-25C-10-25-35000	B254		540	VPF-50S-10-55-54000	B257		800	VPF-25C-40-45-80000	B254
		350	VPF-25C-40-25-35000	B254		541	DIM-50S-GRE(Reflection)	B241		800	VPF-50S-12-65-80000	B257
Light Sources	350	355	UTVAF-50S-36U	B232	541	541	DIF-50S-GRE	B240	850	808	VPFHT-8080	B250
		355	VPF-25C-10-25-35500	B254		543	GRF-50S-545G	B234		810	VPF-25C-10-45-81000	B254
		355	VPFHT-3550	B250		543	YIF-BP530-550S	B253		810	VPF-50S-12-65-81000	B257
		364	VPFHT-3638	B250		544	VPFHT-5435	B250		820	VPF-50S-12-65-82000	B257
Index	400	365	VPF-25C-10-25-36500	B254	546	544	YIF-BP540-550S	B253	900	820	VPF-25C-10-45-83000	B254
		370	YIF-BP360-370S	B253		546	VPF-25C-10-50-54610	B254		830	VPF-50S-12-65-83000	B257
		370	BLF-50S-370B	B234		548	GRF-50S-550G	B234		840	VPFHT-8300	B250
		372	YIF-BP340-390S	B253		550	VPF-25C-10-50-55000	B254		840	VPF-50S-12-65-84000	B257
Mirrors	400	372	VPFHT-3720	B250	560	550	VPF-25C-40-50-55000	B254	1000	850	VPF-50S-12-65-85000	B257
		390	BLF-50S-390B	B234		561	VPF-50S-10-60-55000	B257		852	VPFHT-8520	B250
		390	VPF-25C-10-40-40000	B254		561	VPF-50S-10-60-56000	B257		860	VPF-50S-12-65-86000	B257
		400	VPF-25C-40-40-40000	B254		562	VPFHT-5614	B250		870	VPF-50S-12-65-87000	B257
Beamsplitters	400	400	VPF-50S-10-45-40000	B257	562	YIF-BP540-585S	B253	880	VPF-50S-12-65-88000	B257		
		405	VPF-25C-10-40-40470	B254	568	VPFHT-5682	B250	890	VPF-50S-12-65-89000	B257		
		405	YIF-BP400-410S	B253	570	VPF-50S-10-60-57000	B257	900	VPF-50S-12-65-90000	B257		
		410	BLF-50S-410B	B234	576	YIF-BP565-585S	B253	905	VPF-25C-10-45-90500	B254		
Polarizers	420	410	VPF-50S-10-45-41000	B257	577	VPF-25C-10-50-57700	B254	1050	976	VPFHT-9760	B250	
		420	YIF-BP400-440S	B253	580	VPF-50S-10-60-58000	B257		980	VPFHT-9800	B250	
		430	VPF-50S-10-45-42000	B257	589	VPF-25C-10-50-58930	B254		1014	VPF-25C-10-40-10140	B254	
		430	VPF-50S-10-45-43000	B257	590	VPF-50S-10-60-59000	B257		1047	VPFHT-10471	B250	
Lenses	450	436	VPF-25C-10-40-43580	B254	600	599	YIF-BA575-625S	B253	1100	1064	VPF-25C-01-30-10640	B254
		440	BLF-50S-440B	B234		599	VPF-25C-10-50-60000	B254		1064	VPF-25C-03-35-10640	B254
		442	VPF-50S-10-45-44000	B257		610	VPF-25C-40-50-60000	B254		1064	VPF-25C-10-40-10640	B254
		442	VPF-25C-01-30-44160	B254		610	VPF-50S-12-60-61000	B257		1550	VPF-25C-10-30-15500	B254
Multi-Element Optics	450	442	VPF-25C-03-35-44160	B254	636	620	VPF-50S-12-60-62000	B257	1100	1300	VPF-25C-10-35-13000	B254
		442	VPF-25C-10-45-44160	B254		630	VPF-50S-12-60-63000	B257		1500	VPF-25C-10-30-15000	B254
		445	VPFHT-4416	B250		633	VPF-25C-10-50-63280	B254		1550	VPF-25C-10-30-15500	B254
		445	YIF-BA420-460S	B253		636	VPF-25C-01-40-63280	B254				
Filters	450	450	VPF-25C-10-45-45000	B254	640	636	VPF-25C-10-50-63620	B254				
		450	VPF-25C-40-50-45000	B254		640	VPF-50S-10-50-64000	B257				
		456	VPF-50S-10-50-45000	B257		644	VPF-50S-12-60-64000	B257				
		456	VPF-25C-10-45-45550	B254		647	YIF-BA600-690S	B253				
Prisms	458	458	VPF-25C-01-30-45790	B254	650	644	VPF-25C-03-45-64710	B254				
		458	VPF-25C-03-35-45790	B254		647	VPF-25C-10-50-64710	B254				
		458	VPF-25C-10-45-45790	B254		650	VPFHT-6471	B250				
		458	VPFHT-4579	B250		650	VPF-25C-10-50-65000	B254				
Substrates/Windows	460	460	BLF-50S-460B	B234	656	650	VPF-25C-40-50-65000	B254				
		460	VPF-50S-10-50-46000	B257		656	VPF-25C-40-50-65000	B254				
		470	VPF-50S-10-50-47000	B257		660	VPF-50S-12-60-65000	B257				
		471	YIF-BP460-480S	B253		660	VPF-50S-12-60-66000	B257				
Optical Data	477	477	YIF-BP460-495S	B253	670	656	VPF-25C-10-50-65630	B254				
		477	VPF-50S-10-50-48000	B257		670	VPF-50S-12-60-67000	B257				
		484	YIF-BP470-495S	B253		671	VPFHT-6710	B250				
		484	VPF-25C-10-45-48610	B254		680	VPF-25C-10-50-67000	B254				
Maintenance	488	484	VPF-25C-10-45-48610	B254	680	670	VPF-25C-10-50-67000	B254				
		487	YIF-BA460-510S	B253		680	VPF-50S-12-60-68000	B257				
		488	VPF-25C-01-40-48800	B254		690	VPF-50S-12-60-69000	B257				
		488	VPF-25C-03-45-48800	B254		694	VPF-25C-10-50-69430	B254				
Selection Guide	495	488	VPFHT-4880	B250	694	671	VPFHT-6710	B250				
		490	VPF-50S-10-50-49000	B257		680	VPF-50S-12-60-68000	B257				
		491	VPFHT-4910	B250		690	VPF-50S-12-60-69000	B257				
		495	YIF-BP490-500S	B253		694	VPF-25C-10-50-69430	B254				



ND filter is a filter that reduces intensity of the visible light or 1064nm YAG laser. As this is an absorptive type of filter, it reduces stray light on reflection, and does not have much difference on transmission characteristic by reduced intensity of the light.

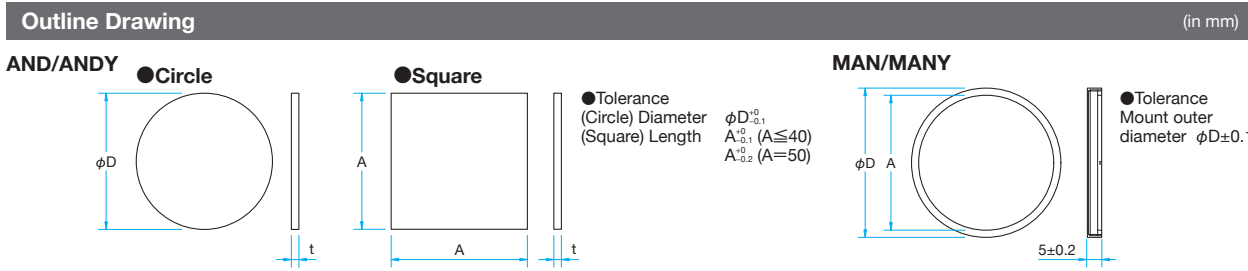
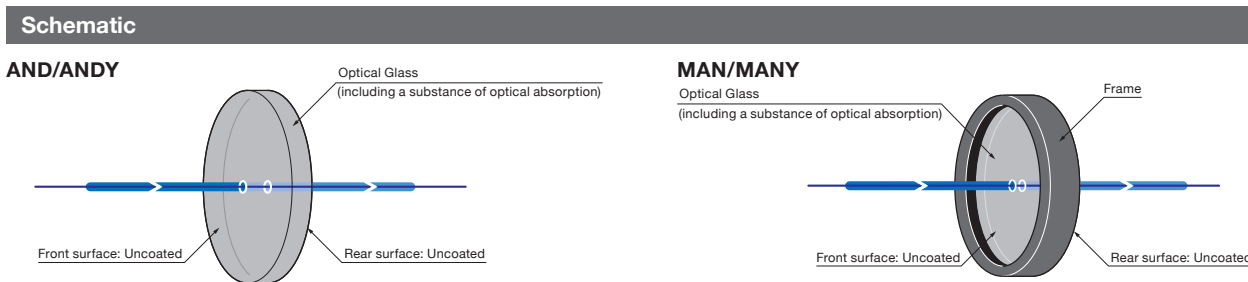
- The transmittance can be fine tuned and it offers the possibility of light intensity adjustment. Moreover, with a multi-filter set up, ultra fine light intensity tuning can be realized.
- The mounted filter (model MAN/MANY) with outer frame can be easily applied with the filter holder (model FH). A diameter of 30mm outer frame does not fit for any filter holder. Please see the lens holder (model LHF-30S) for your reference.



Specifications	
Material	Optical Glass (including a substance of optical absorption)
Wavelength Range	Visible (AND/MAN): 400 – 700nm YAG Laser (ANDY/MANY): 1064nm
Mount (MAN/MANY only)	Material: Aluminum Finishing: Black anodized

- Guide**
- ▶ Absorptive ND filter placed near to a light-source can be broken by the sudden high temperature effect. The filter needed to be treated with thermal reinforcement for heat resistance.
 - ▶ Different size, wavelength and deviation ratio which are not listed in this catalog are available as custom product upon the request.

- Attention**
- ▶ Can not be used with high power laser, the filter can be broken. In that case, please try our Reflective type of ND filter (model FND).
 - ▶ To obtain a better transmittance characteristic as our priority, the thickness of the filter can be changed in accordance. For this reason the thickness of each filter is different. For filter with thickness below 5mm, we recommend to use the mounted filter. (model MAN/MANY).
 - ▶ The filter transmittance characteristic of each production lot is different. The outside wavelength properties of the adaptation wavelength may greatly vary in particular according to production lot. Please refer to reflective filter (model FND) if the use of wavelength is wider than a specified wavelength.
 - ▶ ND filter does not have anti-reflection coating, the reflection of about 4% occurs.
 - ▶ * These prices are valid exclusively for Japan only. For your country prices, please contact your local distributor or our International Sales Division for further information.



Strengthened glass

Glass can be broken under sudden heat effect. Sudden difference of temperature occurs inside of the glass, it is called thermal expansion and the tensile stress of the inside of the glass occurs. The glass will be broken when the stress is beyond machine strength. However, stress is offset, and glass becomes hard to be broken when there is a compression power in the inside of the glass even if tensile stress is caused by heat to glass. Using this principle, heat strengthened glass was made out of compression stress forcibly in inside glass at the beginning of the process. In the polishing process, a strengthened glass must be brought to a familiar softening temperature before to the forcibly cooling process. The inner of the glass is higher in density than the outside of the glass.

Absorptive Neutral Density Filter (Mounted and unmounted)

AND/ANDY/MAN/MANY

Catalog Code W3093

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Etalon

Visible · Circle ($\phi 10 - \phi 25$)		
Part Number	Diameter ϕD [mm]	Visible Transmittance [%]
AND-10C-001	$\phi 10$	0.1±0.07
AND-10C-01	$\phi 10$	1±0.5
AND-10C-05	$\phi 10$	5±1
AND-10C-10	$\phi 10$	10±2
AND-10C-13	$\phi 10$	12.5±2
AND-10C-20	$\phi 10$	20±2
AND-10C-25	$\phi 10$	25±2.5
AND-10C-30	$\phi 10$	30±3
AND-10C-40	$\phi 10$	40±4
AND-10C-50	$\phi 10$	50±5
AND-10C-70	$\phi 10$	70±5
AND-15C-001	$\phi 15$	0.1±0.07
AND-15C-01	$\phi 15$	1±0.5
AND-15C-05	$\phi 15$	5±1
AND-15C-10	$\phi 15$	10±2
AND-15C-13	15	12.5±2
AND-15C-20	$\phi 15$	20±2
AND-15C-25	$\phi 15$	25±2.5
AND-15C-30	$\phi 15$	30±3
AND-15C-40	$\phi 15$	40±4
AND-15C-50	$\phi 15$	50±5
AND-15C-70	$\phi 15$	70±5
AND-20C-001	$\phi 20$	0.1±0.07
AND-20C-01	$\phi 20$	1±0.5
AND-20C-05	$\phi 20$	5±1
AND-20C-10	$\phi 20$	10±2
AND-20C-13	$\phi 20$	12.5±2
AND-20C-20	$\phi 20$	20±2
AND-20C-25	$\phi 20$	25±2.5
AND-20C-30	$\phi 20$	30±3
AND-20C-40	$\phi 20$	40±4
AND-20C-50	$\phi 20$	50±5
AND-20C-70	$\phi 20$	70±5
AND-25C-001	$\phi 25$	0.1±0.07
AND-25C-01	$\phi 25$	1±0.5
AND-25C-05	$\phi 25$	5±1
AND-25C-10	$\phi 25$	10±2
AND-25C-13	$\phi 25$	12.5±2
AND-25C-20	$\phi 25$	20±2
AND-25C-25	$\phi 25$	25±2.5
AND-25C-30	$\phi 25$	30±3
AND-25C-40	$\phi 25$	40±4
AND-25C-50	$\phi 25$	50±5
AND-25C-70	$\phi 25$	70±5

Visible · Circle ($\phi 30 - \phi 50$)		
Part Number	Diameter ϕD [mm]	Visible Transmittance [%]
AND-30C-001	$\phi 30$	0.1±0.07
AND-30C-01	$\phi 30$	1±0.5
AND-30C-05	$\phi 30$	5±1
AND-30C-10	$\phi 30$	10±2
AND-30C-13	$\phi 30$	12.5±2
AND-30C-20	$\phi 30$	20±2
AND-30C-25	$\phi 30$	25±2.5
AND-30C-30	$\phi 30$	30±3
AND-30C-40	$\phi 30$	40±4
AND-30C-50	$\phi 30$	50±5
AND-30C-70	$\phi 30$	70±5
AND-40C-001	$\phi 40$	0.1±0.07
AND-40C-01	$\phi 40$	1±0.5
AND-40C-05	$\phi 40$	5±1
AND-40C-10	$\phi 40$	10±2
AND-40C-13	$\phi 40$	12.5±2
AND-40C-20	$\phi 40$	20±2
AND-40C-25	$\phi 40$	25±2.5
AND-40C-30	$\phi 40$	30±3
AND-40C-40	$\phi 40$	40±4
AND-40C-50	$\phi 40$	50±5
AND-40C-70	$\phi 40$	70±5
AND-50C-001	$\phi 50$	0.1±0.07
AND-50C-01	$\phi 50$	1±0.5
AND-50C-05	$\phi 50$	5±1
AND-50C-10	$\phi 50$	10±2
AND-50C-13	$\phi 50$	12.5±2
AND-50C-20	$\phi 50$	20±2
AND-50C-25	$\phi 50$	25±2.5
AND-50C-30	$\phi 50$	30±3
AND-50C-40	$\phi 50$	40±4
AND-50C-50	$\phi 50$	50±5
AND-50C-70	$\phi 50$	70±5

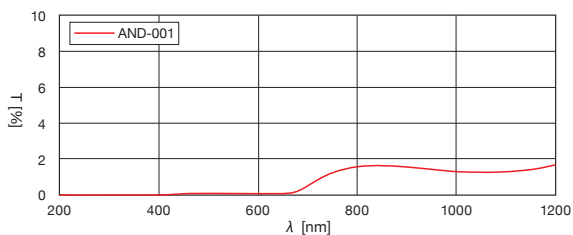
Compatible Optic Mounts

FH-25, -50 / FHS-25, -50 / NDWH-15SRO / FH-10

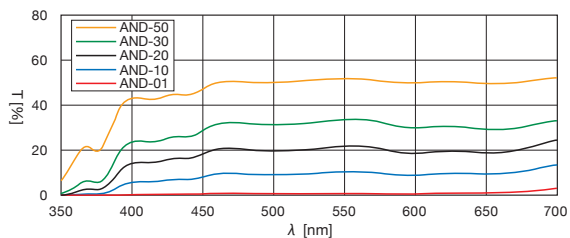
Typical Transmittance Data

T: Transmission

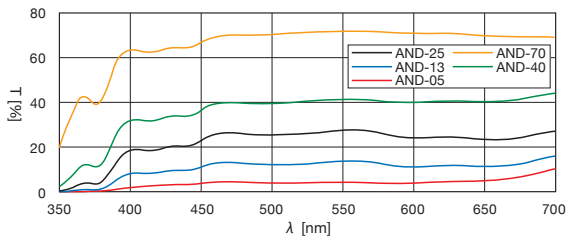
AND-001



AND-01 · 10 · 20 · 30 · 50



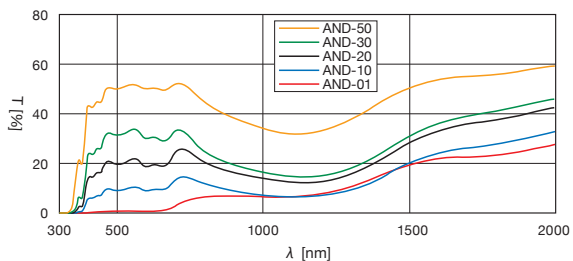
AND-05 · 13 · 25 · 40 · 70



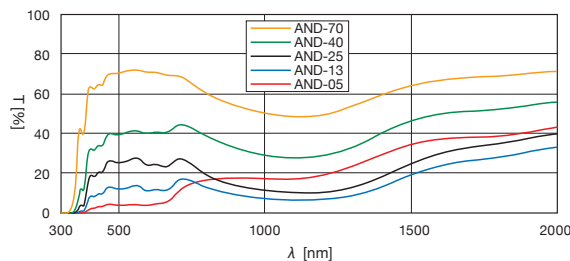
Typical Transmittance Data (300 – 2000nm)

T: Transmission

AND-01 · 10 · 20 · 30 · 50



AND-05 · 13 · 25 · 40 · 70



Visible · Mount type			
Part Number	Frame outer diameter φD [mm]	Clear aperture φA [mm]	Visible Transmittance [%]
MAN-25-0.1	φ25	φ17	0.1±0.07
MAN-25-1	φ25	φ17	1±0.5
MAN-25-5	φ25	φ17	5±1
MAN-25-10	φ25	φ17	10±2
MAN-25-13	φ25	φ17	12.5±2
MAN-25-20	φ25	φ17	20±2
MAN-25-25	φ25	φ17	25±2.5
MAN-25-30	φ25	φ17	30±3
MAN-25-40	φ25	φ17	40±4
MAN-25-50	φ25	φ17	50±5
MAN-25-70	φ25	φ17	70±5
MAN-30-0.1	φ30	φ22	0.1±0.07
MAN-30-1	φ30	φ22	1±0.5
MAN-30-5	φ30	φ22	5±1
MAN-30-10	φ30	φ22	10±2
MAN-30-13	φ30	φ22	12.5±2
MAN-30-20	φ30	φ22	20±2
MAN-30-25	φ30	φ22	25±2.5
MAN-30-30	φ30	φ22	30±3
MAN-30-40	φ30	φ22	40±4
MAN-30-50	φ30	φ22	50±5
MAN-30-70	φ30	φ22	70±5
MAN-52-0.1	φ52	φ47	0.1±0.07
MAN-52-1	φ52	φ47	1±0.5
MAN-52-5	φ52	φ47	5±1
MAN-52-10	φ52	φ47	10±2
MAN-52-13	φ52	φ47	12.5±2
MAN-52-20	φ52	φ47	20±2
MAN-52-25	φ52	φ47	25±2.5
MAN-52-30	φ52	φ47	30±3
MAN-52-40	φ52	φ47	40±4
MAN-52-50	φ52	φ47	50±5
MAN-52-70	φ52	φ47	70±5

Please refer to the chart for transmittance Data (AND).

Transmittance Chart							(Unit: %)
Part Number	Visible 550nm	LD 780nm	LD 830nm	YAG 1064nm	LD 1300nm	LD 1550nm	
AND-01	1	6	6	5	8	17	
AND-05	5	16	17	14	20	32	
AND-10	10	12	10	5	7	19	
AND-13	13	14	11	6	8	20	
AND-20	20	18	15	8	11	25	
AND-25	25	23	20	12	16	30	
AND-30	30	27	23	14	17	33	
AND-40	40	40	35	24	29	43	
AND-50	50	45	40	30	35	49	
AND-70	70	64	60	49	53	64	

The transmittance values are approximate values.

Compatible Optic Mounts

FH-25, -50 / LHF-30S

Square (□10 – □25)		
Part Number	Length A [mm]	Visible Transmittance [%]
AND-10S-001	10×10	0.1±0.07
AND-10S-01	10×10	1±0.5
AND-10S-05	10×10	5±1
AND-10S-10	10×10	10±2
AND-10S-13	10×10	12.5±2
AND-10S-20	10×10	20±2
AND-10S-25	10×10	25±2.5
AND-10S-30	10×10	30±3
AND-10S-40	10×10	40±4
AND-10S-50	10×10	50±5
AND-10S-70	10×10	70±5
AND-15S-001	15×15	0.1±0.07
AND-15S-01	15×15	1±0.5
AND-15S-05	15×15	5±1
AND-15S-10	15×15	10±2
AND-15S-13	15×15	12.5±2
AND-15S-20	15×15	20±2
AND-15S-25	15×15	25±2.5
AND-15S-30	15×15	30±3
AND-15S-40	15×15	40±4
AND-15S-50	15×15	50±5
AND-15S-70	15×15	70±5
AND-20S-001	20×20	0.1±0.07
AND-20S-01	20×20	1±0.5
AND-20S-05	20×20	5±1
AND-20S-10	20×20	10±2
AND-20S-13	20×20	12.5±2
AND-20S-20	20×20	20±2
AND-20S-25	20×20	25±2.5
AND-20S-30	20×20	30±3
AND-20S-40	20×20	40±4
AND-20S-50	20×20	50±5
AND-20S-70	20×20	70±5
AND-25S-001	25×25	0.1±0.07
AND-25S-01	25×25	1±0.5
AND-25S-05	25×25	5±1
AND-25S-10	25×25	10±2
AND-25S-13	25×25	12.5±2
AND-25S-20	25×25	20±2
AND-25S-25	25×25	25±2.5
AND-25S-30	25×25	30±3
AND-25S-40	25×25	40±4
AND-25S-50	25×25	50±5
AND-25S-70	25×25	70±5

Square (□30 – □50)		
Part Number	Length A [mm]	Visible Transmittance [%]
AND-30S-001	30×30	0.1±0.07
AND-30S-01	30×30	1±0.5
AND-30S-05	30×30	5±1
AND-30S-10	30×30	10±2
AND-30S-13	30×30	12.5±2
AND-30S-20	30×30	20±2
AND-30S-25	30×30	25±2.5
AND-30S-30	30×30	30±3
AND-30S-40	30×30	40±4
AND-30S-50	30×30	50±5
AND-30S-70	30×30	70±5
AND-40S-001	40×40	0.1±0.07
AND-40S-01	40×40	1±0.5
AND-40S-05	40×40	5±1
AND-40S-10	40×40	10±2
AND-40S-13	40×40	12.5±2
AND-40S-20	40×40	20±2
AND-40S-25	40×40	25±2.5
AND-40S-30	40×40	30±3
AND-40S-40	40×40	40±4
AND-40S-50	40×40	50±5
AND-40S-70	40×40	70±5
AND-50S-001	50×50	0.1±0.07
AND-50S-01	50×50	1±0.5
AND-50S-05	50×50	5±1
AND-50S-10	50×50	10±2
AND-50S-13	50×50	12.5±2
AND-50S-20	50×50	20±2
AND-50S-25	50×50	25±2.5
AND-50S-30	50×50	30±3
AND-50S-40	50×50	40±4
AND-50S-50	50×50	50±5
AND-50S-70	50×50	70±5

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Catalog Code **W3096**

YAG Laser · Circle (φ10 – φ30 and φ50)		
Part Number	Diameter φD [mm]	Transmittance (1064nm) [%]
ANDY-10C-05	φ10	5
ANDY-10C-10	φ10	10
ANDY-10C-15	φ10	15
ANDY-10C-20	φ10	20
ANDY-10C-25	φ10	25
ANDY-10C-30	φ10	30
ANDY-10C-50	φ10	50
ANDY-15C-05	φ15	5
ANDY-15C-10	φ15	10
ANDY-15C-15	φ15	15
ANDY-15C-20	φ15	20
ANDY-15C-25	φ15	25
ANDY-15C-30	φ15	30
ANDY-15C-50	φ15	50
ANDY-20C-05	φ20	5
ANDY-20C-10	φ20	10
ANDY-20C-15	φ20	15
ANDY-20C-20	φ20	20
ANDY-20C-25	φ20	25
ANDY-20C-30	φ20	30
ANDY-20C-50	φ20	50
ANDY-25C-05	φ25	5
ANDY-25C-10	φ25	10
ANDY-25C-15	φ25	15
ANDY-25C-20	φ25	20
ANDY-25C-25	φ25	25
ANDY-25C-30	φ25	30
ANDY-25C-50	φ25	50
ANDY-30C-05	φ30	5
ANDY-30C-10	φ30	10
ANDY-30C-15	φ30	15
ANDY-30C-20	φ30	20
ANDY-30C-25	φ30	25
ANDY-30C-30	φ30	30
ANDY-30C-50	φ30	50
ANDY-50C-05	φ50	5
ANDY-50C-10	φ50	10
ANDY-50C-15	φ50	15
ANDY-50C-20	φ50	20
ANDY-50C-25	φ50	25
ANDY-50C-30	φ50	30
ANDY-50C-50	φ50	50

Catalog Code **W3097**

YAG Laser · Square		
Part Number	Length A [mm]	Transmittance (1064nm) [%]
ANDY-50S-05	50×50	5
ANDY-50S-10	50×50	10
ANDY-50S-15	50×50	15
ANDY-50S-20	50×50	20
ANDY-50S-25	50×50	25
ANDY-50S-30	50×50	30
ANDY-50S-50	50×50	50

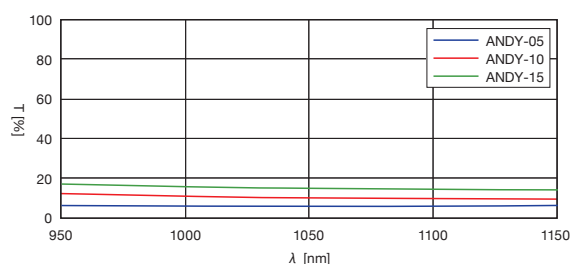
Catalog Code **W3096**

YAG Laser · Mount type			
Part Number	Frame outer diameter φD [mm]	Clear aperture φA [mm]	Transmittance (1064nm) [%]
MANY-25-5	φ25	φ17	5
MANY-25-10	φ25	φ17	10
MANY-25-15	φ25	φ17	15
MANY-25-20	φ25	φ17	20
MANY-25-25	φ25	φ17	25
MANY-25-30	φ25	φ17	30
MANY-25-50	φ25	φ17	50
MANY-30-5	φ30	φ22	5
MANY-30-10	φ30	φ22	10
MANY-30-15	φ30	φ22	15
MANY-30-20	φ30	φ22	20
MANY-30-25	φ30	φ22	25
MANY-30-30	φ30	φ22	30
MANY-30-50	φ30	φ22	50
MANY-52-5	φ52	φ47	5
MANY-52-10	φ52	φ47	10
MANY-52-15	φ52	φ47	15
MANY-52-20	φ52	φ47	20
MANY-52-25	φ52	φ47	25
MANY-52-30	φ52	φ47	30
MANY-52-50	φ52	φ47	50

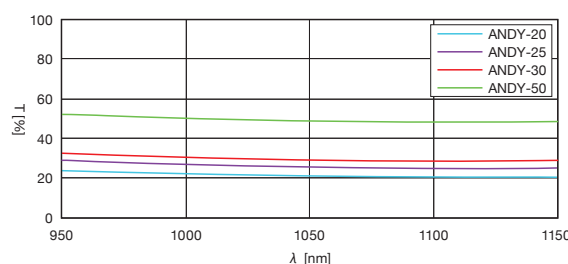
Please refer to the chart for transmittance Data (ANDY).

Typical Transmittance Data T: Transmission

ANDY-05 · 10 · 15

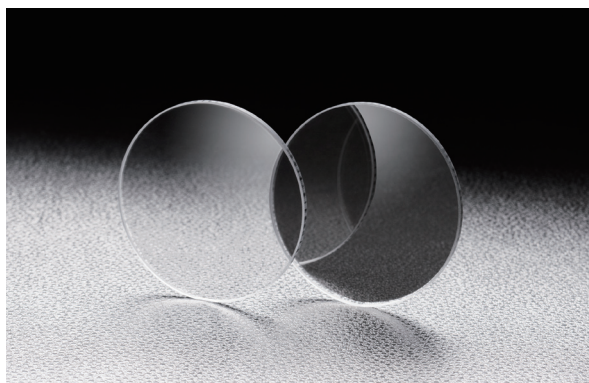


ANDY-20 · 25 · 30 · 50



The reflective ND filter is used in high power and broadband wavelength light density reducing. The untransmitted light would not be absorbed, there is no possibility of glass damaging by the heat.

- The metal coating reflection provides an extremely smooth transmittance wavelength characteristic from the UV to the IR wavelength.
- We are using synthetic fused silica substrates for high transmittance at UV range for the UV ND filter. We can obtain almost the similar transmittance at the Near UV and the visible range.
- The substrate thickness at 2mm +/-0.1mm with no difference with the transmittance.



Specifications		
	Visible (FND)	UV (FNDU)
Material	BK7	Synthetic fused silica
Coating	Chrome coating (Cr) but FND-92, FNDU-92, MFND-92, MFNDU-92 is uncoated	
Wavelength Range	400 - 700nm	200 - 400nm
Parallelism	<1'	<30"
Surface accuracy	λ (Measurement area: ϕ 30mm)	
Surface Quality (Scratch-Dig)	60-40	
Mount (MFND/MFDNU)	Material: Aluminum Finishing: Black anodized	
Clear aperture	90% of Actual Aperture	

Guide

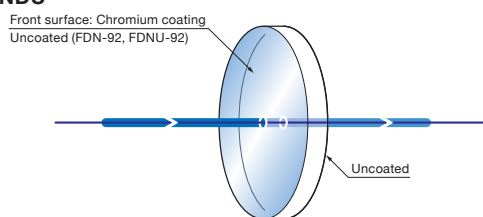
- ▶ Different size, wavelength and deviation ratio are not mentioned in this catalog are available as custom product upon the request.

Attention

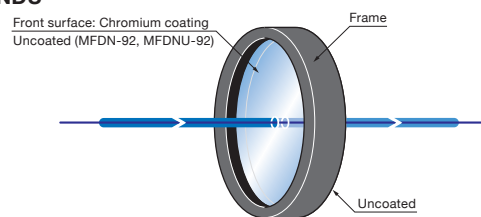
- ▶ Chrome coating is an absorptive material, can not be used with high power pulsed laser.
- ▶ The thermal lens effect may happen on filter with high power laser, for high power laser or high energy laser, please use our variable beamsplitter (model VBS). [Reference](#) B062
- ▶ The reflected light over filter is dangerous for eyes, please make sure a non reflective material at the edge end of the light.
- ▶ A vertical light into the filter may have feedback light back into the laser source, it may occur an instability to the laser oscillator. To avoid this phenomenon please incline the filter at a small angle.
- ▶ The filter with 92% transmittance rate (model FND-92 and others) is non-coated on both surfaces. The reflectance is about 4% on each surface, and so, 8% on both surfaces.

Schematic

FND/FNDU



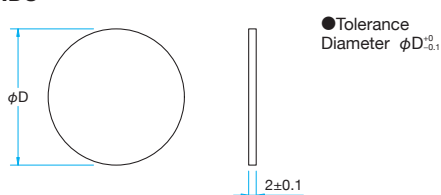
MFND/MFNDU



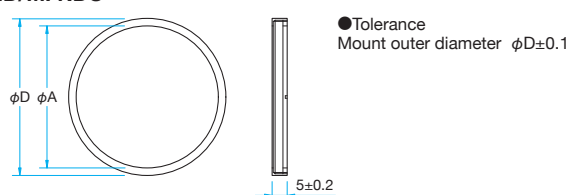
Outline Drawing

(in mm)

FND/FNDU



MFND/MFNDU



Compatible Optic Mounts

FH-10 / FH-25, -50 / FHS-25, -50 / NDWH-15SRO

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Reflective Neutral Density Filter (Mounted and unmounted)

FND/MFND/FNDU/MFNDU

Catalog Code W3098

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Visible		
Part Number	Diameter φD [mm]	Transmittance (550nm) [%]
FND-15C02-0.1	φ15	0.1
FND-15C02-1	φ15	1
FND-15C02-5	φ15	5
FND-15C02-10	φ15	10
FND-15C02-20	φ15	20
FND-15C02-30	φ15	30
FND-15C02-40	φ15	40
FND-15C02-50	φ15	50
FND-15C02-60	φ15	60
FND-15C02-70	φ15	70
FND-15C02-80	φ15	80
FND-15C02-92	φ15	92
FND-20C02-0.1	φ20	0.1
FND-20C02-1	φ20	1
FND-20C02-5	φ20	5
FND-20C02-10	φ20	10
FND-20C02-20	φ20	20
FND-20C02-30	φ20	30
FND-20C02-40	φ20	40
FND-20C02-50	φ20	50
FND-20C02-60	φ20	60
FND-20C02-70	φ20	70
FND-20C02-80	φ20	80
FND-20C02-92	φ20	92
FND-25C02-0.1	φ25	0.1
FND-25C02-1	φ25	1
FND-25C02-5	φ25	5
FND-25C02-10	φ25	10
FND-25C02-20	φ25	20
FND-25C02-30	φ25	30
FND-25C02-40	φ25	40
FND-25C02-50	φ25	50
FND-25C02-60	φ25	60
FND-25C02-70	φ25	70
FND-25C02-80	φ25	80
FND-25C02-92	φ25	92
FND-30C02-0.1	φ30	0.1
FND-30C02-1	φ30	1
FND-30C02-5	φ30	5
FND-30C02-10	φ30	10
FND-30C02-20	φ30	20
FND-30C02-30	φ30	30
FND-30C02-40	φ30	40
FND-30C02-50	φ30	50
FND-30C02-60	φ30	60
FND-30C02-70	φ30	70
FND-30C02-80	φ30	80
FND-30C02-92	φ30	92
FND-50C02-0.1	φ50	0.1
FND-50C02-1	φ50	1
FND-50C02-5	φ50	5
FND-50C02-10	φ50	10
FND-50C02-20	φ50	20
FND-50C02-30	φ50	30
FND-50C02-40	φ50	40
FND-50C02-50	φ50	50
FND-50C02-60	φ50	60
FND-50C02-70	φ50	70
FND-50C02-80	φ50	80
FND-50C02-92	φ50	92

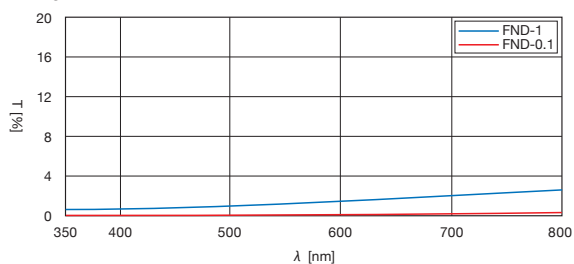
Visible · Mounted

Part Number	Frame outer diameter φD [mm]	Clear aperture φA [mm]	Transmittance (550nm) [%]
MFND-25-0.1	φ25	φ17	0.1
MFND-25-1	φ25	φ17	1
MFND-25-5	φ25	φ17	5
MFND-25-10	φ25	φ17	10
MFND-25-20	φ25	φ17	20
MFND-25-30	φ25	φ17	30
MFND-25-40	φ25	φ17	40
MFND-25-50	φ25	φ17	50
MFND-25-60	φ25	φ17	60
MFND-25-70	φ25	φ17	70
MFND-25-80	φ25	φ17	80
MFND-25-92	φ25	φ17	92
MFND-30-0.1	φ30	φ22	0.1
MFND-30-1	φ30	φ22	1
MFND-30-5	φ30	φ22	5
MFND-30-10	φ30	φ22	10
MFND-30-20	φ30	φ22	20
MFND-30-30	φ30	φ22	30
MFND-30-40	φ30	φ22	40
MFND-30-50	φ30	φ22	50
MFND-30-60	φ30	φ22	60
MFND-30-70	φ30	φ22	70
MFND-30-80	φ30	φ22	80
MFND-30-92	φ30	φ22	92
MFND-52-0.1	φ52	φ47	0.1
MFND-52-1	φ52	φ47	1
MFND-52-5	φ52	φ47	5
MFND-52-10	φ52	φ47	10
MFND-52-20	φ52	φ47	20
MFND-52-30	φ52	φ47	30
MFND-52-40	φ52	φ47	40
MFND-52-50	φ52	φ47	50
MFND-52-60	φ52	φ47	60
MFND-52-70	φ52	φ47	70
MFND-52-80	φ52	φ47	80
MFND-52-92	φ52	φ47	92

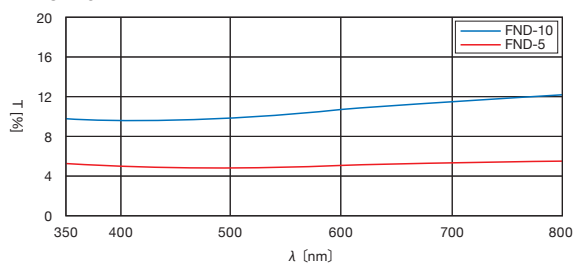
Typical Transmittance Data

T: Transmission

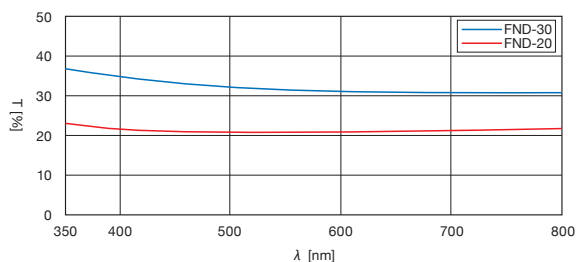
FND-0.1 · 1



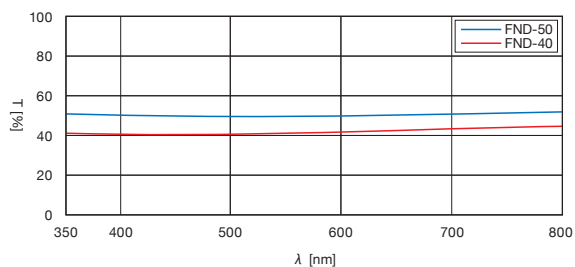
FND-5 · 10



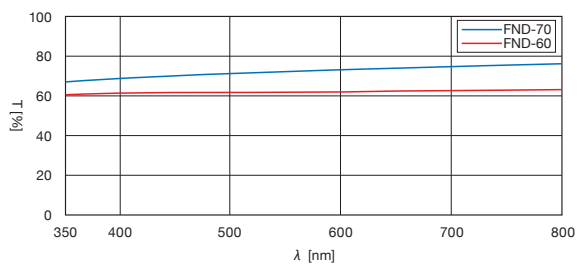
FND-20 · 30



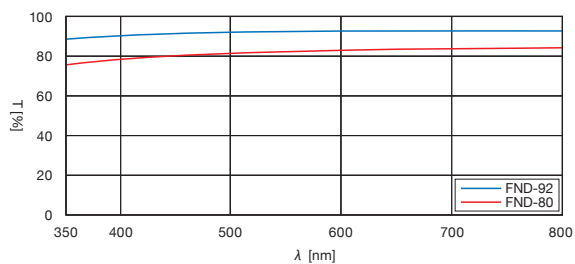
FND-40 · 50



FND-60 · 70



FND-80 · 92



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Etalon

Reflective Neutral Density Filter (Mounted and unmounted)

FND/MFND/FNDU/MFNDU

Catalog Code W3099

Ultraviolet		
Part Number	Diameter φD [mm]	Transmittance (300nm) [%]
FNDU-20C02-0.1	φ20	0.1
FNDU-20C02-1	φ20	1
FNDU-20C02-5	φ20	5
FNDU-20C02-10	φ20	10
FNDU-20C02-20	φ20	20
FNDU-20C02-30	φ20	30
FNDU-20C02-40	φ20	40
FNDU-20C02-50	φ20	50
FNDU-20C02-60	φ20	60
FNDU-20C02-70	φ20	70
FNDU-20C02-80	φ20	80
FNDU-20C02-92	φ20	92
FNDU-25C02-0.1	φ25	0.1
FNDU-25C02-1	φ25	1
FNDU-25C02-5	φ25	5
FNDU-25C02-10	φ25	10
FNDU-25C02-20	φ25	20
FNDU-25C02-30	φ25	30
FNDU-25C02-40	φ25	40
FNDU-25C02-50	φ25	50
FNDU-25C02-60	φ25	60
FNDU-25C02-70	φ25	70
FNDU-25C02-80	φ25	80
FNDU-25C02-92	φ25	92
FNDU-30C02-0.1	φ30	0.1
FNDU-30C02-1	φ30	1
FNDU-30C02-5	φ30	5
FNDU-30C02-10	φ30	10
FNDU-30C02-20	φ30	20
FNDU-30C02-30	φ30	30
FNDU-30C02-40	φ30	40
FNDU-30C02-50	φ30	50
FNDU-30C02-60	φ30	60
FNDU-30C02-70	φ30	70
FNDU-30C02-80	φ30	80
FNDU-30C02-92	φ30	92
FNDU-50C02-0.1	φ50	0.1
FNDU-50C02-1	φ50	1
FNDU-50C02-5	φ50	5
FNDU-50C02-10	φ50	10
FNDU-50C02-20	φ50	20
FNDU-50C02-30	φ50	30
FNDU-50C02-40	φ50	40
FNDU-50C02-50	φ50	50
FNDU-50C02-60	φ50	60
FNDU-50C02-70	φ50	70
FNDU-50C02-80	φ50	80
FNDU-50C02-92	φ50	92

Ultraviolet · Mounted			
Part Number	Frame outer diameter φD [mm]	Clear aperture φA [mm]	Transmittance (300nm) [%]
MFNDU-25-0.1	φ25	φ17	0.1
MFNDU-25-1	φ25	φ17	1
MFNDU-25-5	φ25	φ17	5
MFNDU-25-10	φ25	φ17	10
MFNDU-25-20	φ25	φ17	20
MFNDU-25-30	φ25	φ17	30
MFNDU-25-40	φ25	φ17	40
MFNDU-25-50	φ25	φ17	50
MFNDU-25-60	φ25	φ17	60
MFNDU-25-70	φ25	φ17	70
MFNDU-25-80	φ25	φ17	80
MFNDU-25-92	φ25	φ17	92
MFNDU-30-0.1	φ30	φ22	0.1
MFNDU-30-1	φ30	φ22	1
MFNDU-30-5	φ30	φ22	5
MFNDU-30-10	φ30	φ22	10
MFNDU-30-20	φ30	φ22	20
MFNDU-30-30	φ30	φ22	30
MFNDU-30-40	φ30	φ22	40
MFNDU-30-50	φ30	φ22	50
MFNDU-30-60	φ30	φ22	60
MFNDU-30-70	φ30	φ22	70
MFNDU-30-80	φ30	φ22	80
MFNDU-30-92	φ30	φ22	92
MFNDU-52-0.1	φ52	φ47	0.1
MFNDU-52-1	φ52	φ47	1
MFNDU-52-5	φ52	φ47	5
MFNDU-52-10	φ52	φ47	10
MFNDU-52-20	φ52	φ47	20
MFNDU-52-30	φ52	φ47	30
MFNDU-52-40	φ52	φ47	40
MFNDU-52-50	φ52	φ47	50
MFNDU-52-60	φ52	φ47	60
MFNDU-52-70	φ52	φ47	70
MFNDU-52-80	φ52	φ47	80
MFNDU-52-92	φ52	φ47	92

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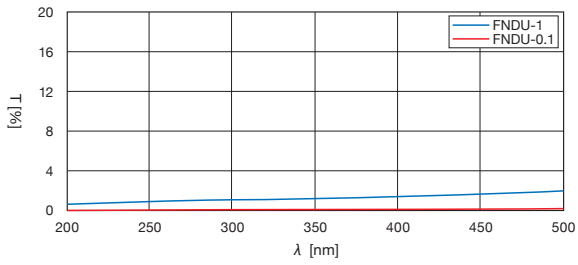
Dielectric Filters

Etalon

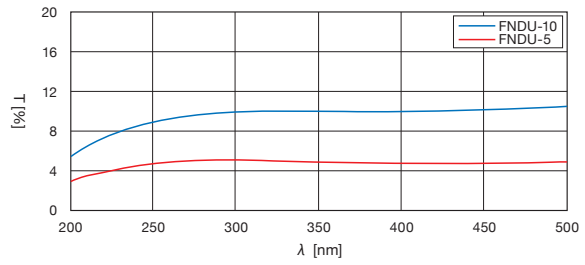
Typical Transmittance Data

T: Transmission

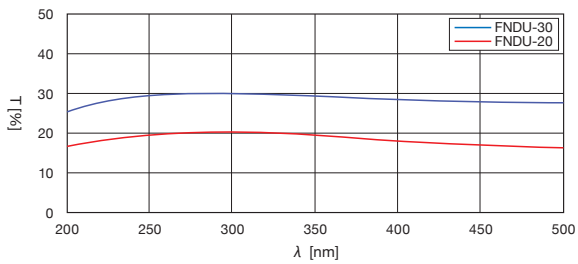
FNDU-0.1 · 1



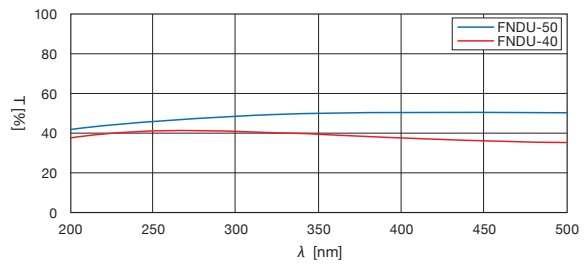
FNDU-5 · 10



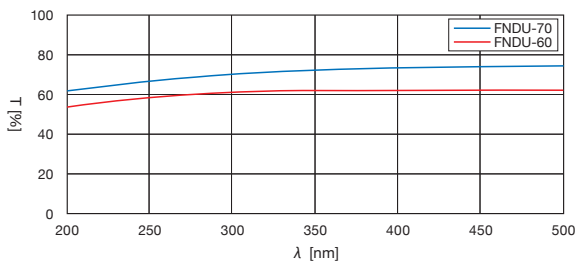
FNDU-20 · 30



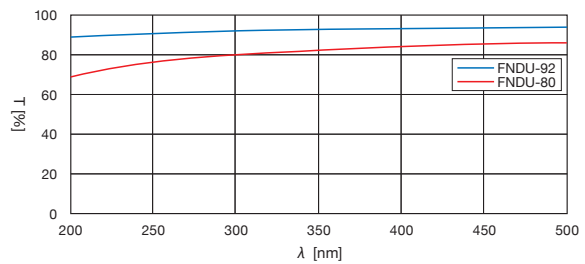
FNDU-40 · 50



FNDU-60 · 70



FNDU-80 · 92



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Reflective type of ND filter

Rotating variable reflective ND filter holder

VND
NDHN

RoHS
RoHS

VND

Catalog Code W3100

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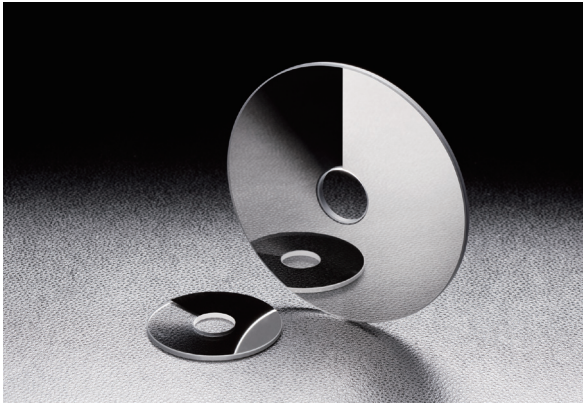
Colored Glass Filters

Dielectric Filters

Etalon

The VND is a reflective ND filter. The reflectivity or the transmittance varies by rotation. They are used mainly for light intensity adjustment in vision or illumination experiments.

- Possible to adjust the intensity by rotation continuously or select light intensity position.
- The transmittance light can be adjusted logarithmically, it makes dynamic light intensity adjustment possible.
- Thin and space saving, it is easy to be placed in a narrow optical test set up.
- The VND-U model is adaptable for use at Ultraviolet bandwidth, it is made of fused silica.



Specifications

Circle

Material	VND: BK7 VND-U: Synthetic fused silica
Coating	Cr (Chrome)
Transmittance	- 92%
Surface flatness of substrate	λ (Measurement area: $\phi 30\text{mm}$)
Parallelism	<1'
Surface Quality (Scratch-Dig)	60-40

Rectangle

Material	Soda Lime Glass
Coating	Cr (Chrome)
Wavelength Range	400 - 700nm
Transmittance	1 - 92%
Surface flatness of substrate	Both side: glossy surface (no polishing)
Surface Quality (Scratch-Dig)	80-50

Guide

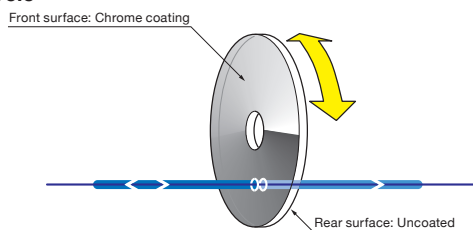
- ▶ For AOI (Angle of Incident) changing, the transmittance can be also changed. We recommend to use with the VBS, Variable Beam Splitter. [Reference](#) B062

Attention

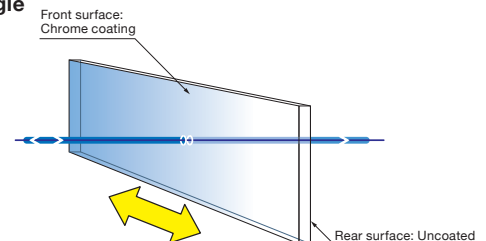
- ▶ The round shape variable ND filter is very fragile. The bore is made of glass. do not force on one surface of the bore when fix it on a holder, it could be broken. For a compatible ND filter holder (NDHN) for your optics replacement onto the holder, please contact our International Sales Division of assistance.
- ▶ The Chromium film coating contents absorptive effects, please avoid to use with high power laser.
- ▶ High power laser light incident can have thermal lens effects, please use (VBS) Variable Beam Splitter for high power and high energy laser application. [Reference](#) B062
- ▶ The reflected laser light onto the filter is dangerous for eyes, the user must be aware and be prepared to use unreflective tools at the end of the laser beam.
- ▶ The normal incident of the laser beam may produce optical feedback, to avoid this situation please use it with a small incident angle.
- ▶ Incident light with large beam onto the Variable ND can produce a laser streak inside of the beam. Use the incident to the filter with a narrow beam.

Schematic

● Circle



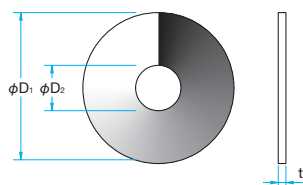
● Rectangle



Outline Drawing

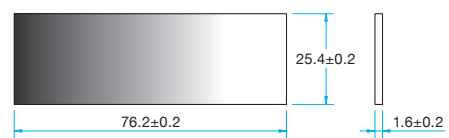
(in mm)

● Circle



● Tolerance	
$\phi 50$	
Diameter	$\phi D1^{+0.10}_{-0.1}$
Inner diameter	$\phi D2^{+0.1}_{-0}$
Thickness	$t \pm 0.1$
$\phi 100$	
Diameter	$\phi D1^{+0.10}_{-0.2}$
Inner diameter	$\phi D2^{+0.1}_{-0}$
Thickness	$t \pm 0.2$

● Rectangle

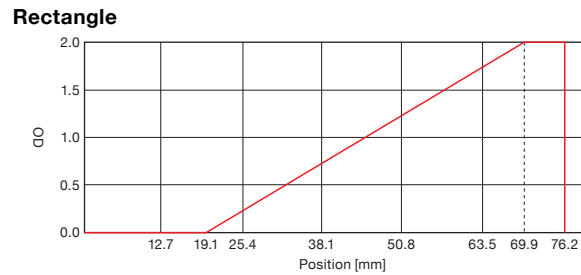
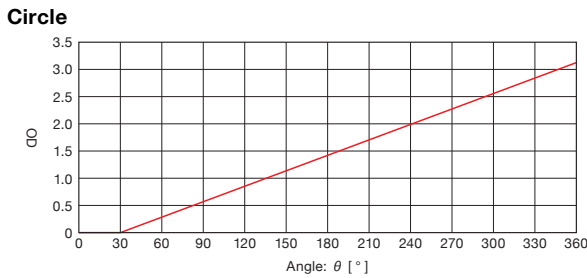




Circle				
Part Number	Wavelength Range [nm]	ϕD_1 [mm]	ϕD_2 [mm]	t [mm]
VND-50	400 - 2000	$\phi 50$	$\phi 15$	2
VND-100	400 - 2000	$\phi 100$	$\phi 20$	3
VND-50U	200 - 2000	$\phi 50$	$\phi 15$	2
VND-100U	200 - 2000	$\phi 100$	$\phi 20$	3

Rectangle	
Part Number	VND-13

Optical Density (Reference data) OD: Optical density

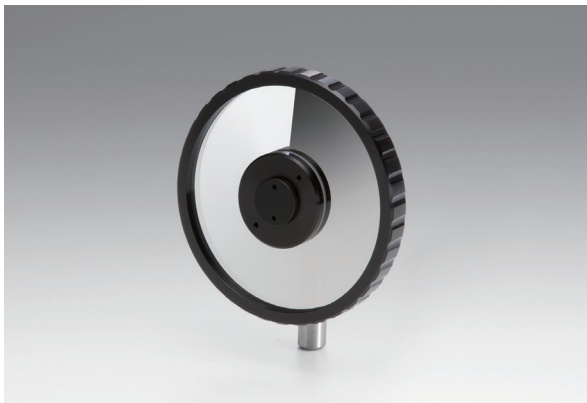


NDHN

Catalog Code **W3101**

Round shape variable reflective ND filter mounted with its holder. Since the weak part of the glass is protected by the metal, it can be used safely.

- The adjusted position can be fixed with a clamp
- The filter can be turned in 360 degrees without break
- NDHN-U is used with VND-U, the Ultraviolet ND filter.



Attention

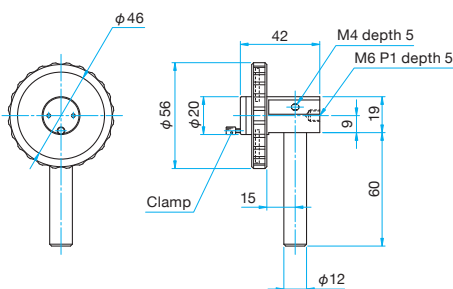
▶ For ND filter change, please contact our International Sales Division.

Specifications		Primary material: Aluminum Finish: Black Anodized
Part Number	ND filter parts number	Weight [kg]
NDHN-50	VND-50	0.09
NDHN-100	VND-100	0.2
NDHN-U50	VND-50U	0.09
NDHN-U100	VND-100U	0.2

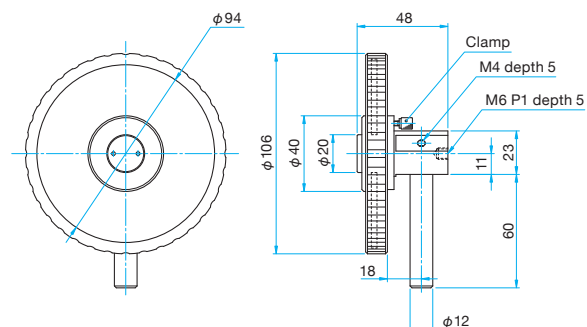
Outline Drawing

(in mm)

NDHN-50/U50 M6 P1



NDHN-100/U100 M6 P1



Reflective Stepping type Variable ND Filter

SND

RoHS

Catalog Code

W3102

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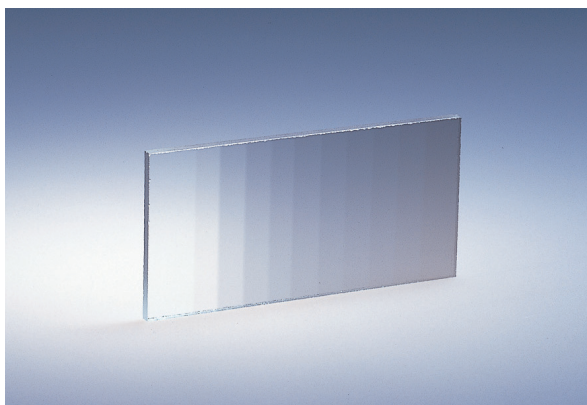
Colored Glass Filters

Dielectric Filters

Etalon

Adjusting the transmitting light at an equal intervals of optical density.
Fit for densitometer and colorimeter calibration use.

- Possible to select 11 steps of optical density intervals on one single plate. It allows to estimate roughly the optical density value that can not be recognized by human eyes.
- With the chromic thin coating, it is applied to laser spot power adjustment.
- With the chromic thin coating, the optical density can not be changed even if the wavelength is changed in the visible light range.



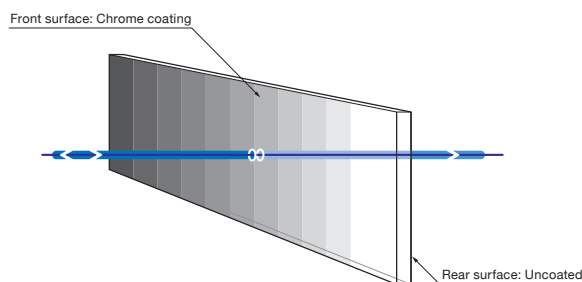
Specifications

Part Number	SND-12
Material	Soda Lime Glass
Surface flatness of substrate	Both side: glossy surface (no polishing)
Coating	Cr (Chrome)
Wavelength Range	400 – 700nm
Transmittance	10 – 91.2% (Divided by 11 step)
Surface Quality (Scratch-Dig)	80-50

Attention

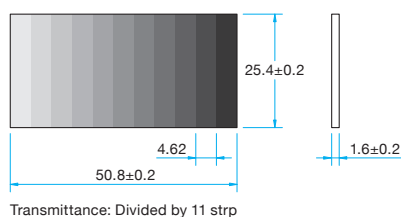
- ▶ The uniformity of the transmitted light is limit at 4.6mm×2.5mm, Please use for the beam size of $\phi 3$ mm or below.
- ▶ The transmittance changes with a logarithm for quantity of movement. It is not a proportional movement.
- ▶ Can not be applied with high energy pulsed laser.

Schematic



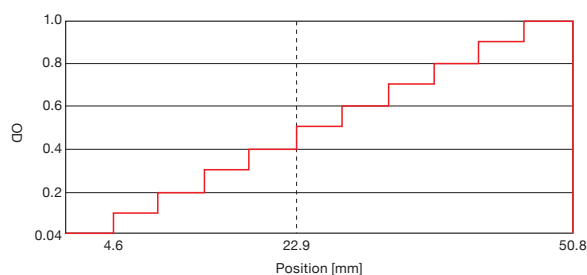
Outline Drawing

(in mm)



Optical Density (Reference data)

OD: Optical density



Position and relation of transmittance

Position [mm]	2.31	6.93	11.55	16.17	20.79	25.41	30.03	34.65	39.27	43.89	48.51
Optical density (OD)	0.04	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
Transmittance [%]	91.2	79.4	63.1	50.1	39.8	31.6	25.1	20.0	15.8	12.6	10.0

Compatible Optic Mounts

CHA-60 / FHS-50

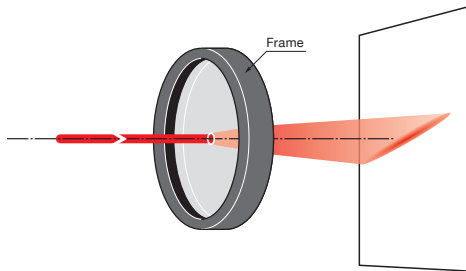
This is a high transmittance diffuser comparing to the other product, we can obtain a wide diffusion light at a single direction.

It is used for sheet light and laser marking system for fluid observation.

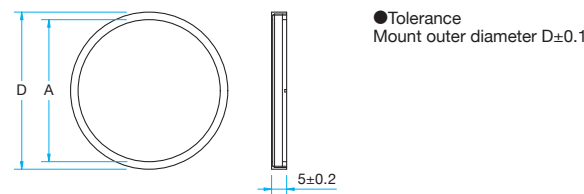
- The beam shaping diffuser is made with many small lenses in random shape on its surface. The emitted light thru the small lenses form the beam into an ellipse shape. It cannot cause a big light quantity loss by dispersion or a reflection in the irrelevant direction.
- There is no necessary to adjust the optical axis like a lens, the light incident can be projected onto anywhere of the beam shaping diffuser surface, the ellipse beam shape can be obtained.
- When rotate the optics, the ellipse shape will rotate too.



Schematic



Outline Drawing (in mm)



Specifications

Material	Polycarbonate
Optics diameter	About 0.25mm
Wavelength Range	400 – 1100nm
Transmittance	85 – 90% (But it depend on the diffusion angle)
Angle tolerance	±15% (Launch angle >10°) ±1.5° (Launch angle ≤10°)
Refractive index	1.586

Guide

- ▶ We accept to produce a product without frame and in different size.
- ▶ We can produce the emitted light in circular distribution form.

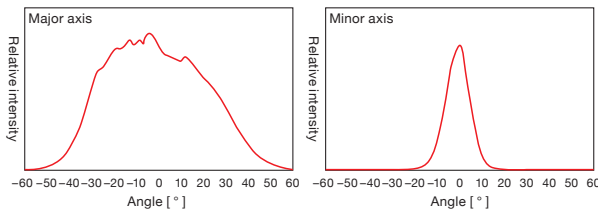
Attention

- ▶ Can be used for laser light but the diffused light can not be returned to one focused spot light.
- ▶ Clean the optics with appropriate lens cleaning alcohol or distilled water only.
- ▶ The surface of the optics is extremely delicate, please avoid any impulsion contact with hard material or rub the surface.
- ▶ The optics can be deformed or melt, please avoid using it with high power laser or high energy pulsed laser.

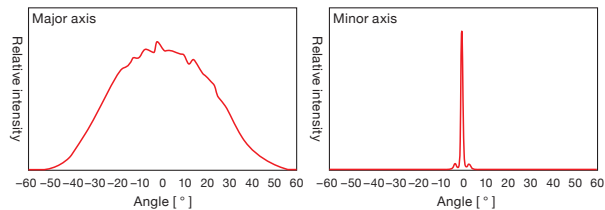
Part Number	Mount outer diameter φD [mm]	Clear aperture φA [mm]	Elliptic diffusion angle (diameter × minor axis) [°]
MDFPC-30-60/10D	φ30	φ22	60×10
MDFPC-30-60/1D	φ30	φ22	60×1
MDFPC-30-40/0.2D	φ30	φ22	40×0.2
MDFPC-30-30/5D	φ30	φ22	30×5
MDFPC-52-60/10D	φ52	φ47	60×10
MDFPC-52-60/1D	φ52	φ47	60×1
MDFPC-52-40/0.2D	φ52	φ47	40×0.2
MDFPC-52-30/5D	φ52	φ47	30×5

Diffusion Angle Characteristics (Reference data)

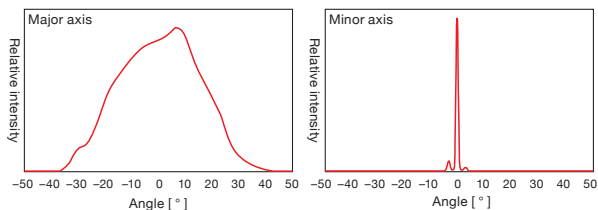
MDFPC-60/10D



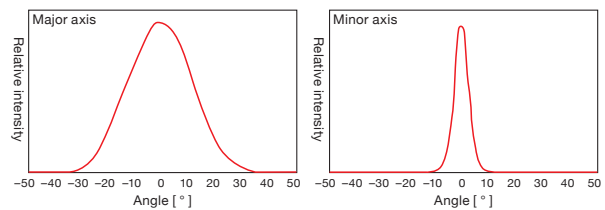
MDFPC-60/1D



MDFPC-40/0.2D



MDFPC-30/5D



Compatible Optic Mounts

FH-50 / LHF-30 / LHA-60

Ground Glass Diffusers | DFB1/DFSQ1

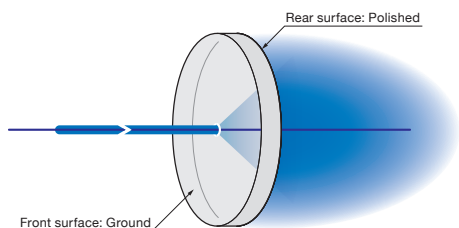
RoHS Catalog Code W3104

Ground glass diffuser has a large area diffusion of an incident light. It is widely used in prevention from imaging of lamp filament or to diffuse in a large area of projected light or used it as a screen.

- The ground glass diffuser with sand abrasive surface at sand number range from #240 to #1500. More the number is big more the sand particle size is fine.
- BK7 for visible and NIR, for Ultraviolet we recommend Synthetic fused silica substrates.



Schematic



Specifications

Material	DFB1: BK7 DFSQ1: Synthetic fused silica	
Surface condition	Front surface	Sand abrasive surface at various sand number range
	Rear surface	Polished (Surface flatness: about 4λ)
Wavelength Range	DFB1: 400 – 2000nm BFSQ1: 200 – 2000nm	
Clear aperture	90% of Actual Aperture	

Guide

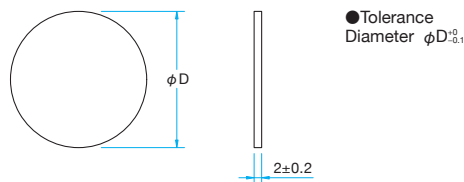
- ▶ Ground glass on both surfaces or specific custom-made size substrates, please contact our International Sales Division.

Attention

- ▶ The characteristic graph shown below is just a reference of a measurement conditions. This is not a measured result of our products.
- ▶ Use the sand abrasive surface for screen application. The backside may have 4% reflectivity and it may cause a ghost imaging phenomena.

Outline Drawing

(in mm)



BK7

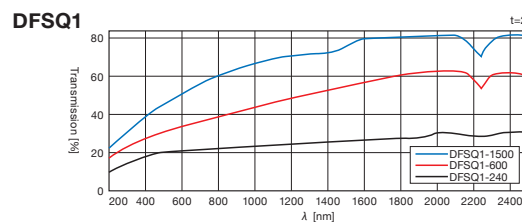
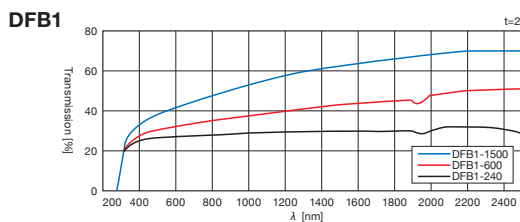
Part Number	Diameter φD [mm]	Sand blasted surface (sand number range)
DFB1-30C02-240	φ30	#240
DFB1-30C02-400	φ30	#400
DFB1-30C02-600	φ30	#600
DFB1-30C02-800	φ30	#800
DFB1-30C02-1000	φ30	#1000
DFB1-30C02-1500	φ30	#1500
DFB1-50C02-240	φ50	#240
DFB1-50C02-400	φ50	#400
DFB1-50C02-600	φ50	#600
DFB1-50C02-800	φ50	#800
DFB1-50C02-1000	φ50	#1000
DFB1-50C02-1500	φ50	#1500

Synthetic fused silica

Part Number	Diameter φD [mm]	Sand blasted surface (sand number range)
DFSQ1-30C02-240	φ30	#240
DFSQ1-30C02-400	φ30	#400
DFSQ1-30C02-600	φ30	#600
DFSQ1-30C02-800	φ30	#800
DFSQ1-30C02-1000	φ30	#1000
DFSQ1-30C02-1500	φ30	#1500
DFSQ1-50C02-240	φ50	#240
DFSQ1-50C02-400	φ50	#400
DFSQ1-50C02-600	φ50	#600
DFSQ1-50C02-800	φ50	#800
DFSQ1-50C02-1000	φ50	#1000
DFSQ1-50C02-1500	φ50	#1500

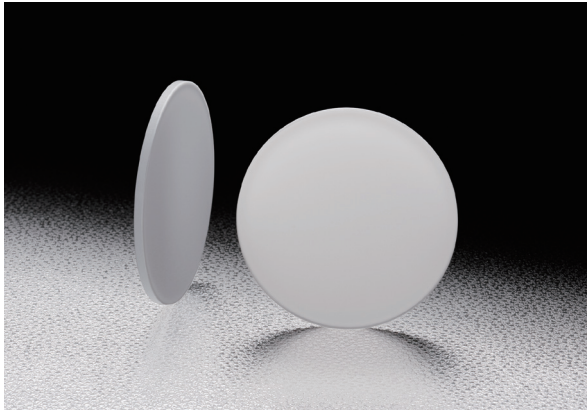
Diffuser characteristics

The characteristic of the diffuser depends on the sandblast grit range. The sand number range at #240 & #400 with large surface roughness the light incident is strongly diffused and the transmitted light is projected onto larger area. The sand number range at #1000 & #1500 with small surface roughness the diffused light is weak and the transmitted beam diffuse gradually the surrounding of the beam. The diffusion of the light is different in accordance with the wavelength, the long wavelength light has lower diffusion capability. Please see the graph here below for your reference:

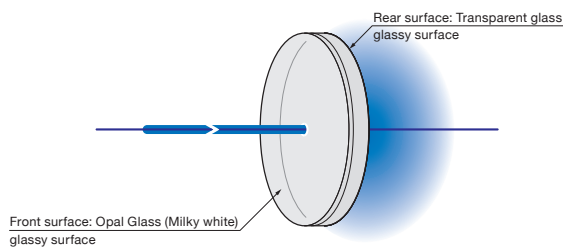


Scattered light into the layer of a milky white opal glass and strongly diffuse evenly. It is widely used in indirect lighting of the observation system or to uniformize brightness distribution of the light source.

- The diffusion area is larger than ground glass diffuser.
- Tough, stable and hard to get scratched
- Opal diffusion glass has an extremely flat surface.



Schematic



Circle		
Part Number	Diameter ϕD [mm]	Thickness t [mm]
DFO-30C03-1	$\phi 30$	3.0
DFO-50C03-1	$\phi 50$	3.0

Specifications	
Material	Opal Glass (Milky white) and transparent glass
Surface condition	Both side: glassy surface (no polishing)
Wavelength Range	400 – 2000nm
Clear aperture	Circle of 90% of the diameter or Circle inscribed in a square of 90% of the dimensions

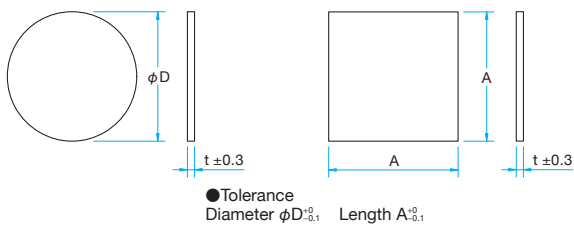
Guide

► We can provide custom-made specification which is not mentioned on our catalog, please contact our International Sales Division.

Attention

- The light diffuse into every directions, the transmitted light density loss is huge.
- For screen application, the distribution of imaging is on the depth direction, a sharp contour will not be obtained.

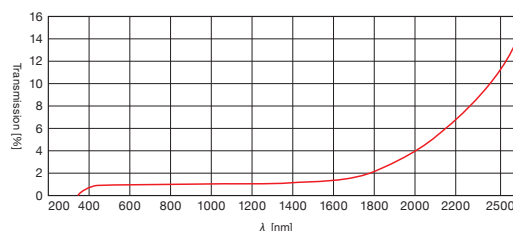
Outline Drawing (in mm)



Square		
	Length A [mm]	Thickness t [mm]
DFO-30S03-1	$\square 30$	3.0
DFO-50S03-1	$\square 50$	3.0

The diffuser characteristics

Scattered light into the layer of a milky white opal glass and strongly diffuse evenly. It is widely used in indirect lighting or to uniformize diffusion of lighting. The transmitted beam will be diffused and lost its beam principle, the light is diffused into different levels in the glass. The opal diffusion glass is different from the ground glass diffuser by its high transmittance at IR zone. Here enclosed a chart of the refractive of the opal diffusion glass and its base material. It shows the transmittance is high on the IR range.



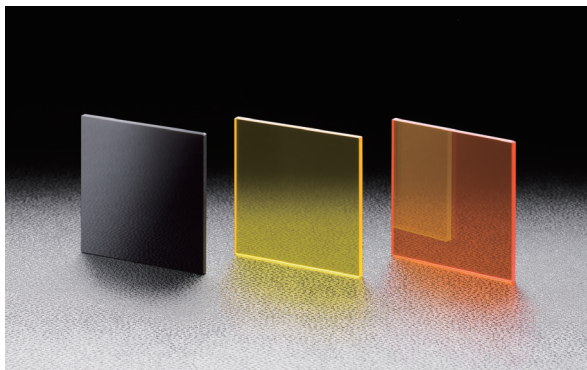
Compatible Optic Mounts

LHA-60 / FHS-50 / CHA-60

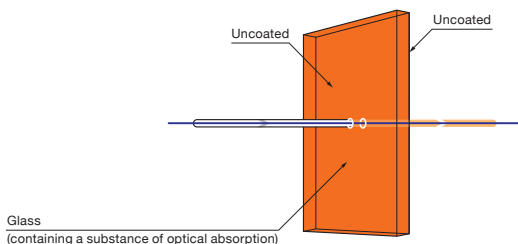
Short Wave Cutoff Filters | SCF

Longpass filter that cuts the short wavelength and let the long wavelength transmit. It is mainly used for cutting the unused wavelength like the UV light when doing inspection and measurement experiments.

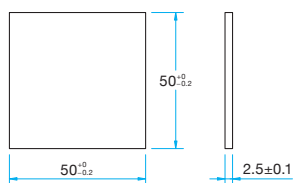
- The cut wavelength range is well absorbed without leaking of transmitted light.
- Can select the transmitted light with an accuracy notch as accurate as 10nm to 20nm.
- The transmitted wavelength range has no low absorption and no ripple, even at 2000nm without absorption, transmittance can be obtained.



Schematic



Outline Drawing (in mm)



Guide

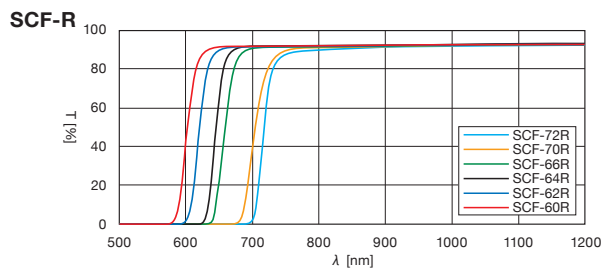
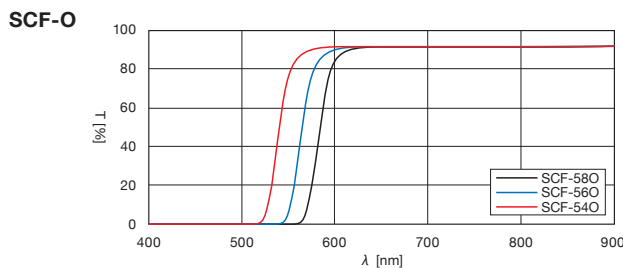
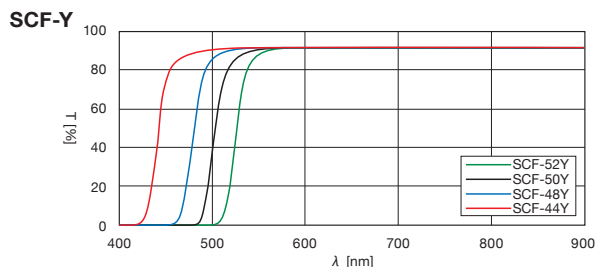
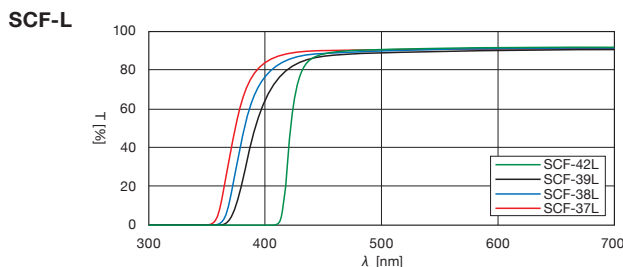
- ▶ For Dichroic filter with smaller wavelength slope we recommend the (model SDM) in our catalog. [Reference](#) B248
- ▶ We can provide custom-made specification which is not mentioned on our catalog, please contact our International Sales Division.

Attention

- ▶ The absorption wavelength range can not be used with high power laser and high energy pulsed laser.
- ▶ There is no coating on both surfaces of the filter, the transmittance loss of about 10% occurs.
- ▶ The model shown with a ★ has been discontinued, serving until the end of our inventory.

370 – 720nm			
Part Number	Transmittance limit wavelength λ_T [nm]	Wavelength slope width $\Delta\lambda$ [nm]	Color tone
SCF-50S-37L	370±5	<35	Colorless
SCF-50S-38L	380±5	<35	Colorless
SCF-50S-39L	390±5	<35	Colorless
SCF-50S-42L	420±5	<25	Colorless
SCF-50S-44Y	440±5	<25	Yellow
SCF-50S-48Y	480±5	<25	Yellow
SCF-50S-50Y	500±5	<25	Yellow
SCF-50S-52Y	520±5	<25	Yellow
SCF-50S-54O	540±5	<25	Orange
SCF-50S-56O	560±5	<25	Orange
SCF-50S-58O	580±5	<25	Orange
SCF-50S-60R	600±5	<25	Red
SCF-50S-62R	620±5	<25	Red
SCF-50S-64R	640±5	<35	Red
★SCF-50S-66R	660±5	<35	Red
SCF-50S-70R	700±10	<45	Black
SCF-50S-72R	720±10	<45	Black

Typical Transmittance Data T: Transmission



Compatible Optic Mounts

FHS-50 / FH-50

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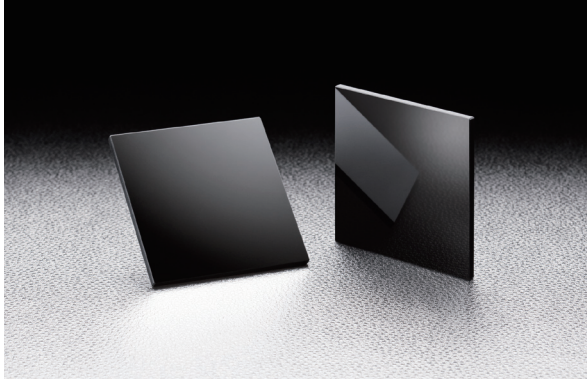
Colored Glass Filters

Dielectric Filters

Etalon

A filter that transmits IR wavelength and absorbs the UV and Visible range. It is widely used in IR light selection from white light source and infrared alarm system or night vision system.

- Transmission limit wavelength selectable at a range from 760nm to 985nm.
- It is used as IR sensing camera by adding an IR transmitting filter to semiconductor image sensor.
- The visible and the UV range can be shut and the sensibility of IR observation get higher by adding it to image sensor.



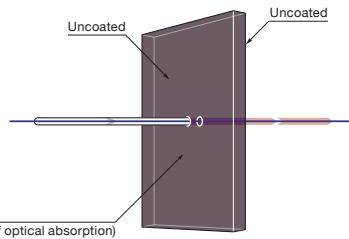
Guide

- ▶ For a reflective type of filter, "cold mirror" we recommend (model CLDM) in our catalog. [Reference](#) B243
- ▶ We can provide custom-made specification which is not mentioned on our catalog, please contact our International Sales Division.

Attention

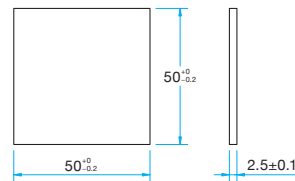
- ▶ The absorption wavelength range can not be used with high power laser and high energy pulsed laser.
- ▶ There is no coating on both surfaces of the filter, the transmittance loss of about 10% occurs.
- ▶ The model shown with a ★ has been discontinued, serving until the end of our inventory.

Schematic



Outline Drawing

(in mm)



760 – 985nm

Part Number	Transmittance limit wavelength λT [nm]	Wavelength slope width $\Delta\lambda$ [nm]	Color tone
ITF-50S-76IR	760±10	<60	Black
ITF-50S-80IR	800±10	<60	Black
ITF-50S-83IR	830±10	<60	Black
ITF-50S-85IR	850±10	<60	Black
ITF-50S-100RM	985±10	<222	Black

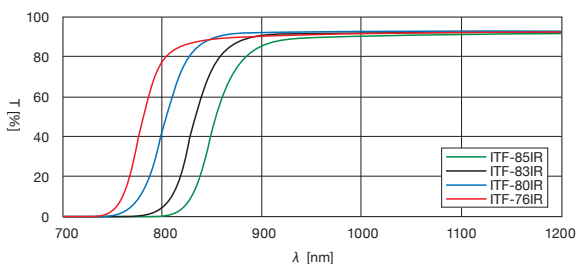
830nm

Part Number	Transmittance limit wavelength λT [nm]	Wavelength slope width $\Delta\lambda$ [nm]	Central wavelength [nm]	Central transmittance rate [%]	Short-pass wavelength [nm]	Short-pass wavelength transmittance rate [%]	Longest wavelength [nm]	Longest wavelength transmittance rate [%]	Color tone
★ITF-50S-83RT	730±10	<40	790±5	85±3	691	<0.1	1225	<0.2	Black

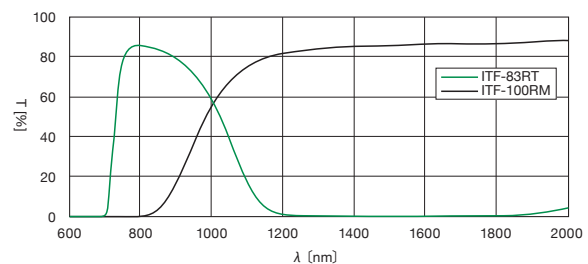
Typical Transmittance Data

T: Transmission

ITF-76IR · 80IR · 83IR · 85IR



ITF-100RM · 83RT



Compatible Optic Mounts

FHS-50 / FH-50

UV Transmitting Filters | UTVAF

RoHS

Catalog Code

W3108

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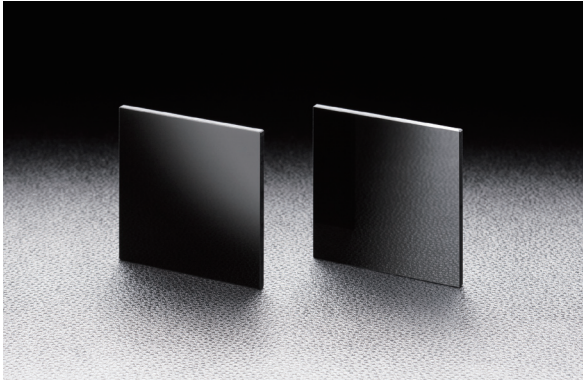
Colored Glass Filters

Dielectric Filters

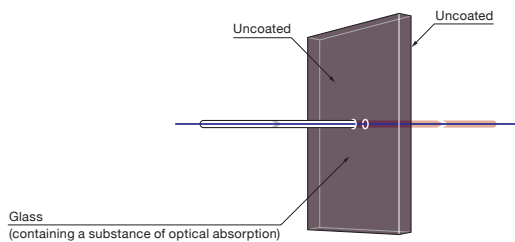
Etalon

A filter that transmits a specific wavelength at the UV range and cuts the visible range. It is used to select UV wavelength from white light source or select a specific wavelength from multi-wavelength.

- It is widely used in fluorescence imaging or select only a UV exposure from a visible light.
- UTVAF-36U is used for selecting the i line (365nm) of a mercury lamp.
- Use the filter in a short wavelength detector and cut off the visible light of high brightness, and can increase the sensibility of the UV light.



Schematic



Guide

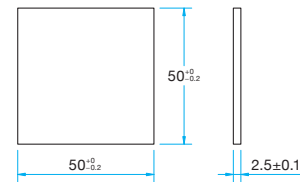
- ▶ We are also providing bandpass filter at narrow wavelength (model VPF). [Reference](#) B254
- ▶ We are also providing high transmittance filter for interference application (model YIF). [Reference](#) B252
- ▶ We can provide custom-made specification which is not mentioned on our catalog, please contact our International Sales Division.

Attention

- ▶ The absorption wavelength range can not be used with high power laser and high energy pulsed laser.
- ▶ There is no coating on both surfaces of the filter, the transmittance loss of about 10% occurs.

Outline Drawing

(in mm)



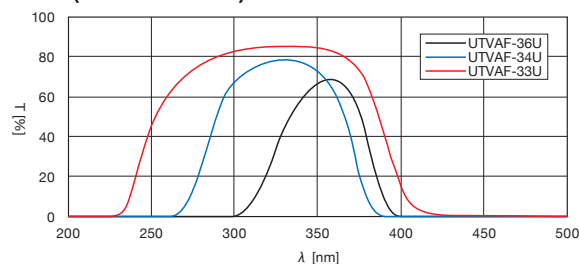
Specifications

Part Number	Central wavelength [nm]	Central transmittance rate [%]	Short-pass wavelength [nm]	Short-pass wavelength transmittance rate [%]	Longest wavelength [nm]	Longest wavelength transmittance rate [%]	Average Transmittance (absorption limit long wavelength - 700nm) [%]
UTVAF-50S-33U	317	>85	233	<5	431	<0.3	<5.0
UTVAF-50S-34U	325	>73	251	<5	398	<0.1	<0.1
UTVAF-50S-36U	350	>72	288	<5	410	<0.1	<0.1

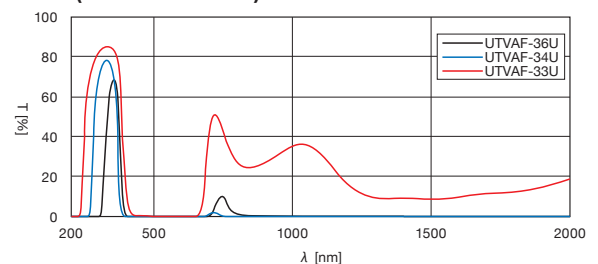
Typical Transmittance Data

T: Transmission

UTVAF (200nm - 500nm)



UTVAF (200nm - 2000nm)

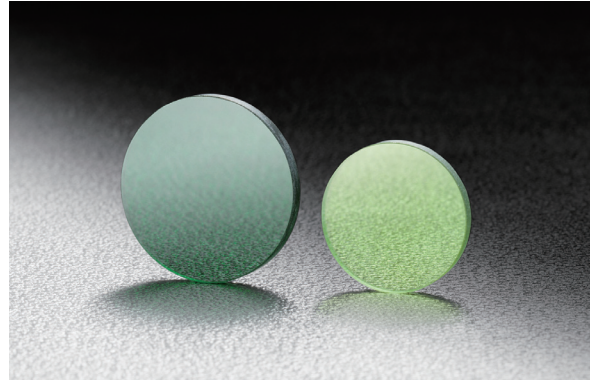
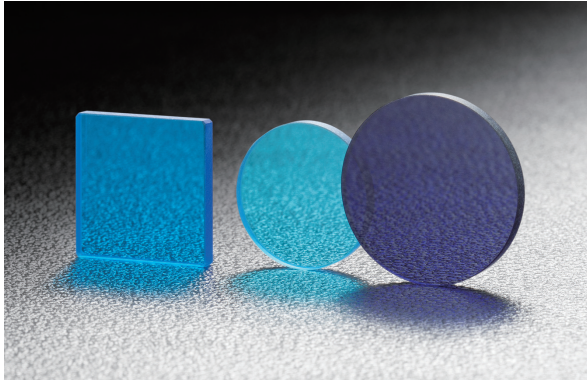


Compatible Optic Mounts

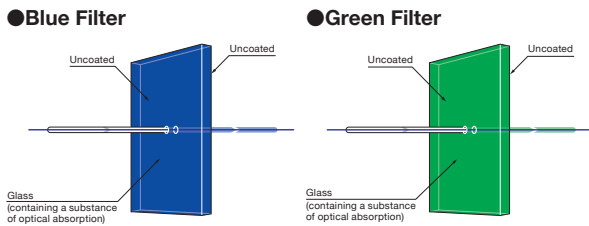
FHS-50 / FH-50

A filter that transmits a specific wavelength at from blue to green wavelength and cuts other wavelength of the visible range. It is used to select blue or green wavelength from white light source or select a specific wavelength from multi-wavelength.

- A selection of various central wavelength and spectral width at the range from 370nm to 550nm.
- To select the emission line of a specific wavelength from various emission lamp.
- By insertion of the filter into microscope or CCD camera can have better contrast in a vision experiments.

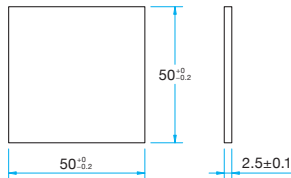


Schematic



Outline Drawing

(in mm)



Guide

- ▶ We are also providing bandpass filter at narrow wavelength (model VPF). [Reference](#) B254
- ▶ We are also providing high transmittance filter for interference application (model YIF). [Reference](#) B252
- ▶ We can provide custom-made specification which is not mentioned on our catalog, please contact our International Sales Division.

Attention

- ▶ The absorption wavelength range can not be used with high power laser and high energy pulsed laser.
- ▶ There is no coating on both surfaces of the filter, the transmittance loss of about 10% occurs.
- ▶ Due to the specifications of the glass material of the green filter, you can not obtain a high and sharp transmittance, we recommend to use the high transmittance interference filter (model YIF). [Reference](#) B252
- ▶ The model shown with a ★ has been discontinued, serving until the end of our inventory.

Blue Filter

Part Number	Central wavelength [nm]	Central transmittance rate [%]	Short-pass wavelength [nm]	Short-pass wavelength transmittance rate [%]	Longest wavelength [nm]	Longest wavelength transmittance rate [%]	Average Transmittance (absorption limit long wavelength - 700nm) [%]
★BLF-50S-370B	370	>82	289	<0.5	486	<0.1	<0.1
BLF-50S-390B	390	>78	309	<5	528	<0.1	<0.1
BLF-50S-410B	410	>92	261	<1	625	<0.5	<5 (555 - 700nm)
BLF-50S-440B	440	>44	358	<1	535	<0.5	<0.3
BLF-50S-460B	460	>84.5	324	<5	718	<1.0	<14 (555 - 700nm)

Green Filter

Part Number	Central wavelength [nm]	Central transmittance rate [%]	Short-pass wavelength [nm]	Short-pass wavelength transmittance rate [%]	Longest wavelength [nm]	Longest wavelength transmittance rate [%]	Average Transmittance (absorption limit long wavelength - 700nm) [%]
GRF-50S-530G	526	>15	452	<0.1	615	<0.1	<0.1
GRF-50S-533G	533	>50	415	<0.1	668	<3.0	<3.0
GRF-50S-545G	541	>13	483	<0.1	621	<0.1	<0.1
GRF-50S-550G	548	>80	406	<0.1	637	<55	<55

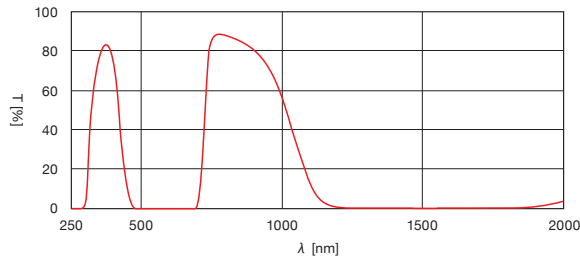
Compatible Optic Mounts

FHS-50 / FH-50

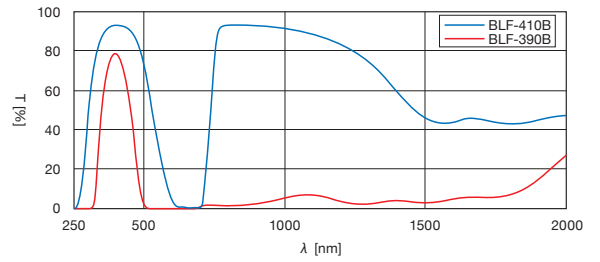
Blue and Green Filters | BLF/GRF

Typical Transmittance Data T: Transmission

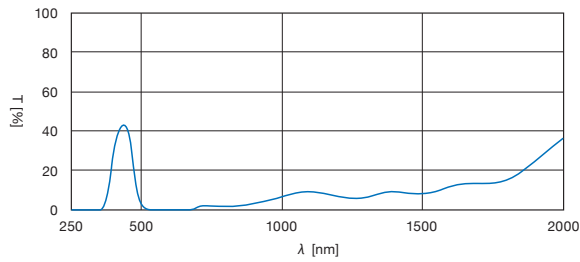
BLF-370B



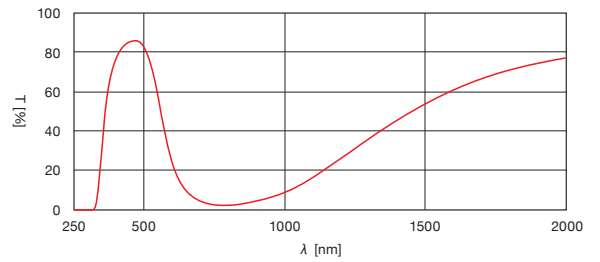
BLF-390B · 410B



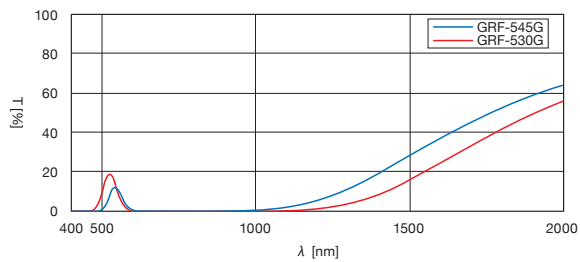
BLF-440B



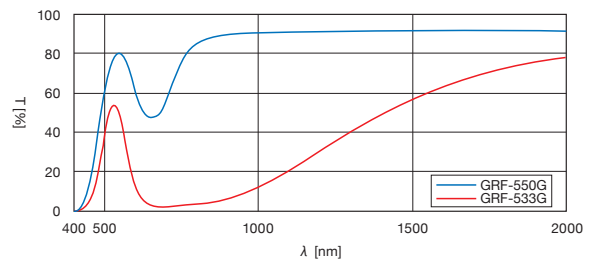
BLF-460B



GRF-530G · 545G



GRF-533G · 550G



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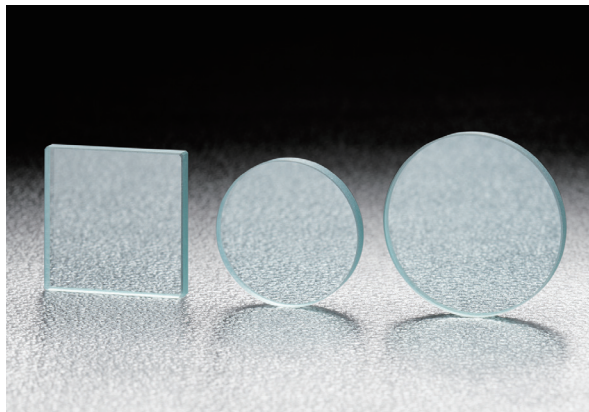
Colored Glass Filters

Dielectric Filters

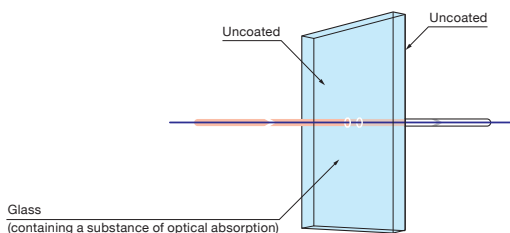
Etalon

This is widely used in absorbing heat from halogen light and xenon light for experiments that need to avoid UV or heat from those lightings.

- Keep away the heat that liberate from the NIR and IR range and cut off the brightness of the NIR and IR light.
- It is also employed to cut-off spot light that liberate heat in microscope illumination.
- Light transmitted through the filter and does not darken the high transmitted visible light.



Schematic



Guide

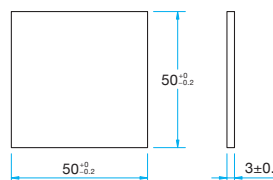
- ▶ The filter can be broken if it is placed too close to a high brightness lamp with its sudden heat affection. We recommend to strengthening the glass before this operation. (Reference ▶ B213 for glass strengthening process)
- ▶ We can provide custom-made specification which is not mentioned on our catalog, please contact our International Sales Division.

Attention

- ▶ The absorption wavelength range can not be used with high power laser and high energy pulsed laser.
- ▶ There is no coating on both surfaces of the filter, the transmittance loss of about 10% occurs.
- ▶ * These prices are valid exclusively for Japan only. For your country prices, please contact your local distributor or our International Sales Division for further information.

Outline Drawing

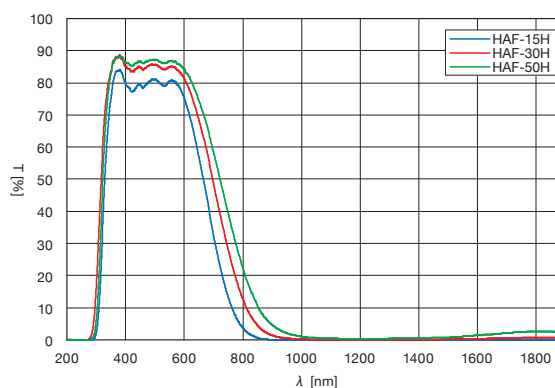
(in mm)



Specifications

Part Number	Average transmittance rate (visible range) [%]	Transmittance range wavelength [nm]	Transmissible range wavelength [nm]	Longest wavelength [nm]	Longest wavelength transmittance rate [%]	Average Transmittance (absorption limit long wavelength - 2000nm) [%]
HAF-50S-15H	>75	573	701±10	867	<0.5	<0.1
HAF-50S-30H	>80	558	743±10	975	<0.5	<0.5
HAF-50S-50H	>81	570	777±10	1052	<1.0	<3.0

Typical Transmittance Data T: Transmission



Compatible Optic Mounts

FHS-50 / FH-50

Color Temperature Conversion Filter

LA/LB

RoHS

Catalog Code

W3111

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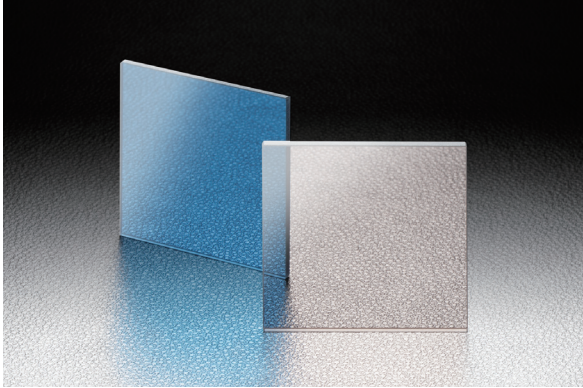
Dielectric Filters

Etalon

Use the LB filter for reducing the reddish light of the Tungsten lamp and use the LA filter for reducing the bluish of the LED lamp.

It keeps the light at a natural color without adjusting the illumination for microscope observation.

- Fit perfectly for image processing with CCD camera without white balance.
- For chromaticity measurement application to enable the color temperature changing.



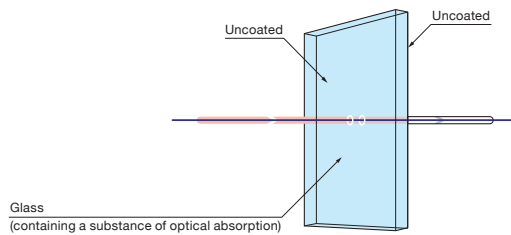
Guide

- ▶ We can produce any kind of size, please contact our International Sales division.
- ▶ We can provide custom-made specification which is not mentioned on our catalog, please contact our International Sales Division.

Attention

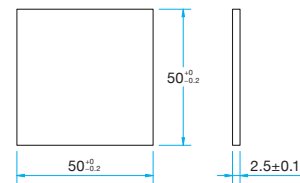
- ▶ To keep the transmittance as our priority, the filter thickness of each filter varies in accordance with the transmittance specifications.
- ▶ There is no coating on both surfaces of the filter, the transmittance loss of about 10% occurs.
- ▶ The filter can be broken if it is placed too close to a high brightness lamp with its sudden heat effect.

Schematic



Outline Drawing

(in mm)



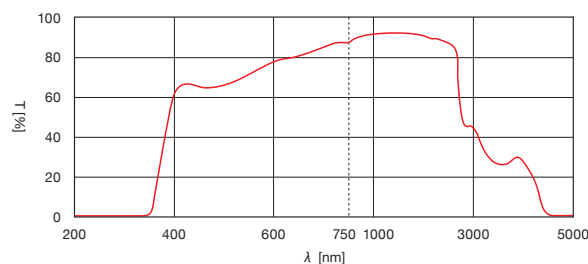
Specifications

Part Number	Thickness t [mm]	Chromaticity X (standard lighting A)	Chromaticity Y (standard lighting A)
LA-50S-20	Please contact	0.467	0.408
LB-50S-120	Please contact	0.370	0.378

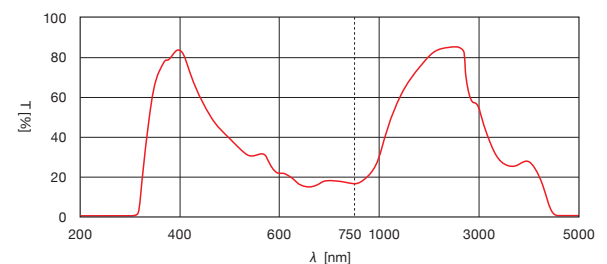
Typical Transmittance Data

T: Transmission

LA-50S-20



LB-50S-120

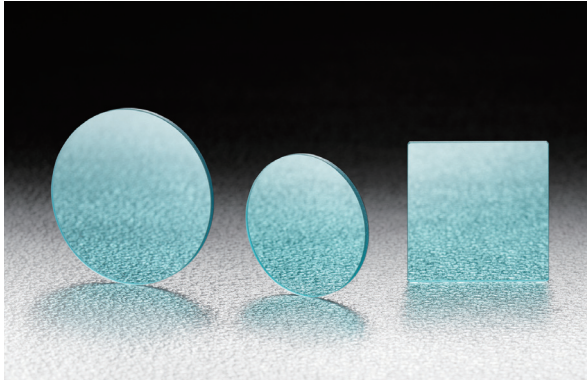


Compatible Optic Mounts

FHS-50 / FH-50

The filter that can simulate the sensing of a human eye which is similar to the silicon pixel detector sensor with a wavelength located at a peak at the NIR range. It is also widely used to stick the filter onto a CCD sensor.

- Use the filter to correct the unnatural color taken with an IR camera.
- The CCF-5000 has water resistance for use in natural environment or outside, the surface of the filter is tough and hard to burn.
- The CCF-500 and CCF-5000 has the same characteristic until 900nm, above 900nm the transmittance is different.
- The color of the ECM-500 is darker than the CCF-500 and CCF-5000, fits to use to cut off the NIR light.



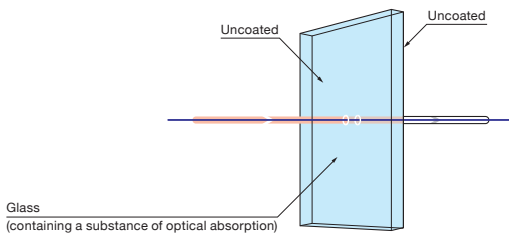
Guide

► We can produce any kind of size, please contact our International Sales Division.

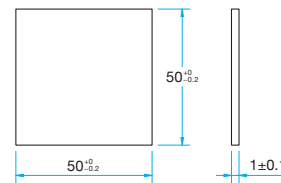
Attention

- The absorption wavelength range can not be used with high power laser and high energy pulsed laser.
- There is no coating on both surfaces of the filter, the transmittance loss of about 10% occurs.
- The ECM-500 and the CCF-500 less water resistance for an outside environment use, it gets burn or smoky easier than the CCF-5000 with time.

Schematic



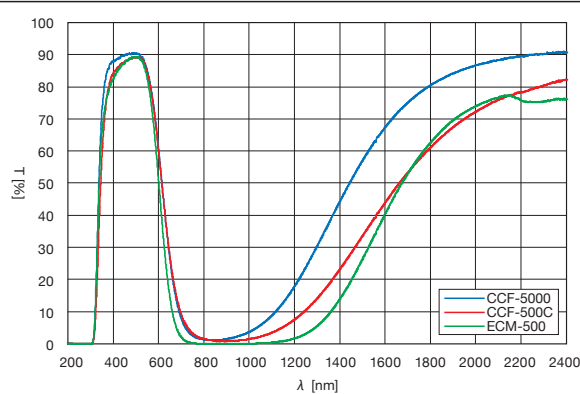
Outline Drawing (in mm)



Specifications

Part Number	Average transmittance rate 400 – 600nm [%]	Transmittance 600nm [%]	Transmissible range wavelength [nm]	Longest wavelength [nm]	Longest wavelength transmittance rate [%]	Average Transmittance (absorption limit long wavelength – 1200nm) [%]
CCF-50S-500C	84.2	About 60	654	829	<3.0	<5.0
CCF-50S-5000	85.7	About 60	651	803	<3.0	<7.0
ECM-50S-500	82.7	About 50	626	766	<0.3	<0.5

Typical Transmittance Data T: Transmission



Compatible Optic Mounts

FHS-50 / FH-50

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- Diffusers
- Colored Glass Filters
- Dielectric Filters
- Etalon

Contact sheet

Contact sheet for Custom-made Color Filter

 Estimation Order

Date

 To: Sigma Koki Co., Ltd. **FAX +81-3-5638-6550**

Affiliation (Organization Name)					
Department			Name		
TEL		FAX		E-mail	
Country/Address					
Name & Designation	(Tentative name is okay)				
Drawing Number			Estimate	<input type="checkbox"/> Yes: by Date <input type="checkbox"/> No	
Desired Delivery Date			Budget	JP Yen	
Type	SCF, ITF, UTVAF, CCF, HAF, BLF, GRF			Pieces	
Filter Number				Heat strengthening	Yes · No
Outside dimension			ϕA	mm	
			a	mm	
			b	mm	
Others	* Write more detailed specifications here. (Rough illustration is acceptable.)				

Sigma Koki Co., Ltd.

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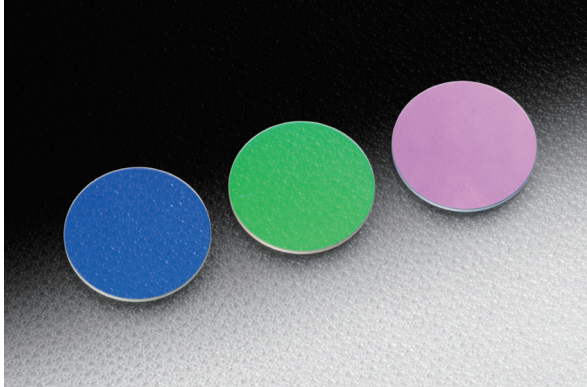
Colored Glass Filters

Dielectric Filters

Etalon

The dielectric multi-layer coating offers a high optical performance result. Provide a wide range of human sense of color quality green, blue, red, yellow, magenta, and cyan.

- The switching of reflecting from transmitting is steep; it fits to use as a wavelength separation filter.
- Easy to be used as a variable wavelength filter by changing the angle of incident.
- Enable to choose from a range of the six fundamental colors, fit perfectly for color vision experiments.



Specifications	
Material	B270® (SuperWhite Glass) or BK7
Incident angle	0°
Wavelength Range	400 – 700nm
Surface Quality (Scratch-Dig)	60-40
Clear aperture	90% of external dimension of the square inscription circle

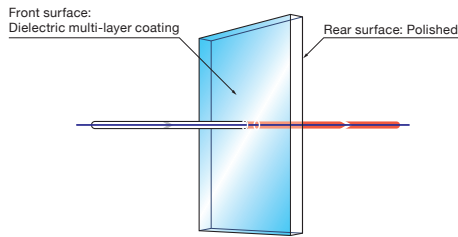
Guide

- ▶ B270® is a registered trademark of SCHOTT AG Inc.
- ▶ Different size, wavelength and deviation ratio are not mentioned in this catalog are available as custom products upon the request.
- ▶ For specific mirror holder, please contact our International Sales Division.

Attention

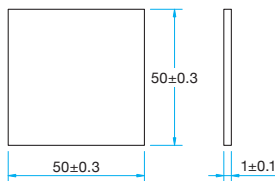
- ▶ Do not use it with high power laser and high energy pulsed laser. We can provide dichroic filters for pulse laser, please contact our International Sales Division.
- ▶ If the reflecting light of the filter is used, the transmittance and the reflectance value may change in accordance to the angle of incident.
- ▶ The color may appears different than expected at 45 degrees of AOI, therefore to obtain the sharp color, please use it at 0 degrees.

Schematic



Outline Drawing

(in mm)



Specifications					
Part Number	Transmittance range wavelength (normal incident) [nm]	Transmittance range transmission rate (normal incident) [%]	Cutoff range wavelength (normal incident) [nm]	Cutoff range transmission rate (normal incident) [%]	Half maximum Wavelength [nm]
DIF-50S-BLE	400 – 470	>85	530 – 700	<1	495±10
DIF-50S-GRE	515 – 560	>85	400 – 460 630 – 700	<1	505±10 575±10
DIF-50S-RED	640 – 700	>85	400 – 565	<1	610±10
DIF-50S-YEL	550 – 700	>85	410 – 475	<1	520±10
DIF-50S-MAG	420 – 470 620 – 700	>80 >85	520 – 565	<1	495±10 605±10
DIF-50S-CYA	400 – 560	>85	640 – 700	<1	590±10

Compatible Optic Mounts

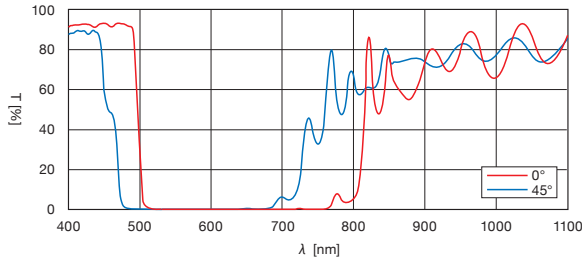
FHS-50 / CHA-60

Visible range dichroic filters | DIF

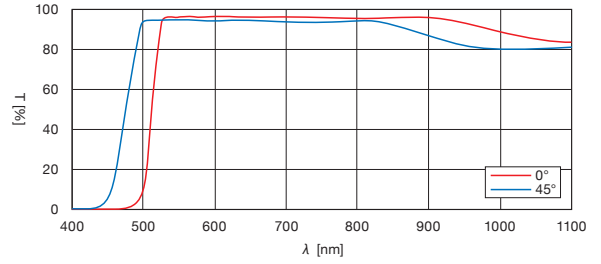
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- Dielectric Filters
- Etalon

Typical Transmittance Data T: Transmission

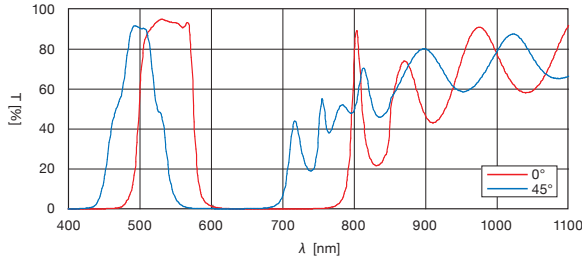
DIF-BLE



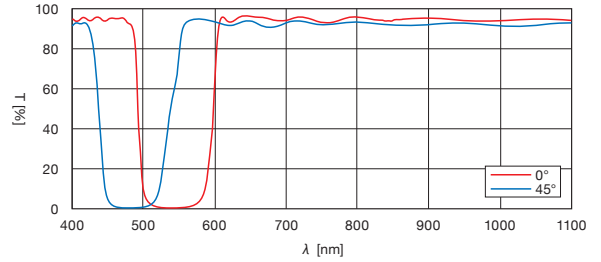
DIF-YEL



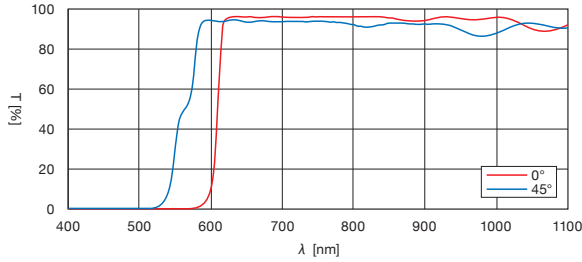
DIF-GRE



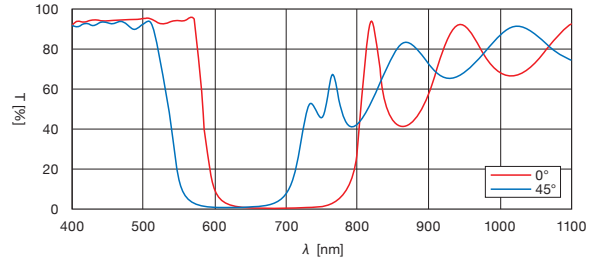
DIF-MAG



DIF-RED

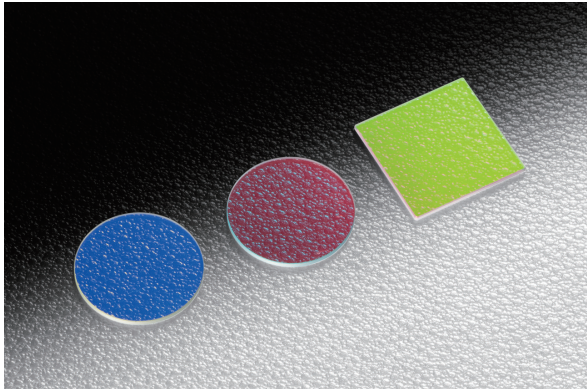


DIF-CYA



Mirrors of 3 fundamentals color RGB for use in color separation. No absorption effects because of the dielectric optical coating, the transmitting and reflecting are applicable. For light transmitting, choose 2 colors out of the RGB dichroic mirror for color separation. (For example: DIM RED + DIM GRE = Reflect red, reflect green, and transmit blue)

- The switching of reflecting from transmitting is steep; it fits to use as a wavelength separation filter.
- Easy to be used as a variable wavelength filter by changing the angle of incident.
- Use the 3 fundamentals color RGB together, a white color can be obtained.



Specifications	
Material	B270® (SuperWhite Glass) or BK7
Incident angle	45°
Wavelength Range	400 – 700nm
Surface Quality (Scratch-Dig)	60-40
Clear aperture	90% of external dimension of the square inscription circle

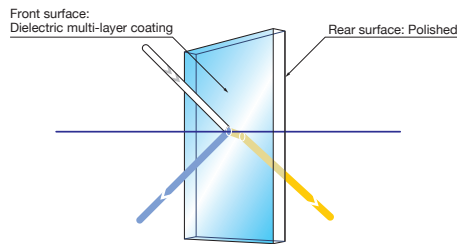
Guide

- ▶ B270® is a registered trademark of SCHOTT AG Inc.
- ▶ Different size, wavelength and deviation ratio are not mentioned in this catalog are available as custom products upon the request.
- ▶ For specific filter holder, please contact our International Sales Division.

Attention

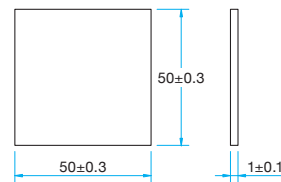
- ▶ Do not use it with high power laser and high energy pulsed laser. We can provide dichroic filters for pulse laser, please contact our International Sales Division.
- ▶ Use the RGB color from 0 to 45 degrees to obtain the correct color separation.

Schematic



Outline Drawing

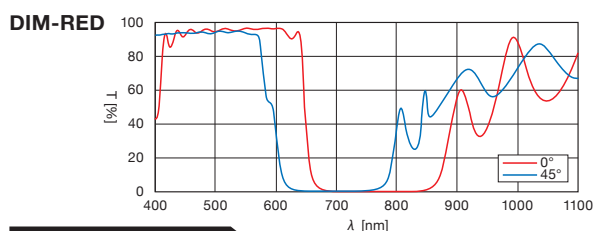
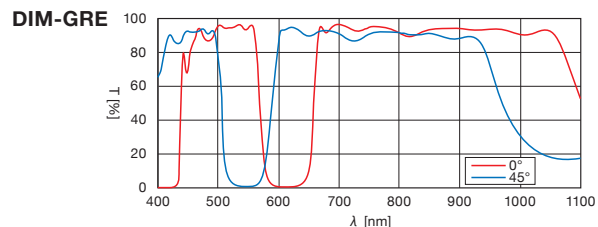
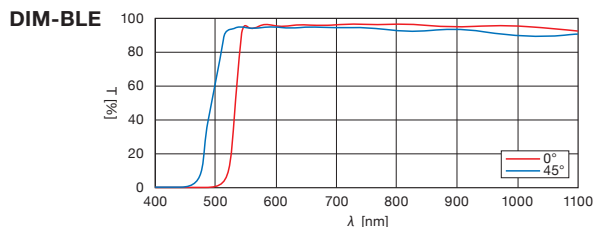
(in mm)



Specifications					
Part Number	Transmittance range wavelength (45 degrees incident) [nm]	Transmittance range transmission rate (45 degrees incident) [%]	Cutoff range wavelength (45 degrees incident) [nm]	Cutoff range transmission rate (45 degrees incident) [%]	Half maximum Wavelength [nm]
DIM-50S-BLE	535 – 700	>85	400 – 450	<5	490±10
DIM-50S-GRE	420 – 470 620 – 700	>80 >80	510 – 550	<5	500±10 580±10
DIM-50S-RED	420 – 550	>85	640 – 700	<5	590±10

Typical Transmittance Data

T: Transmission



Compatible Optic Mounts

FHS-50 / CHA-60

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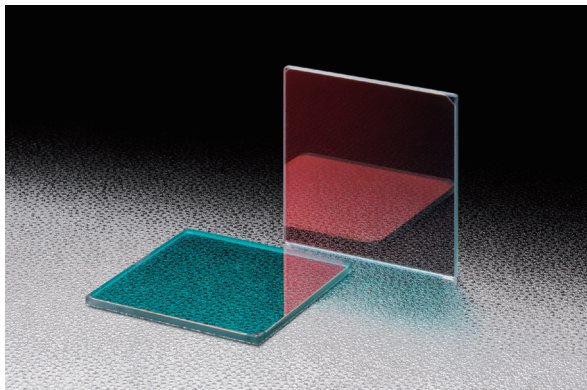
Colored Glass Filters

Dielectric Filters

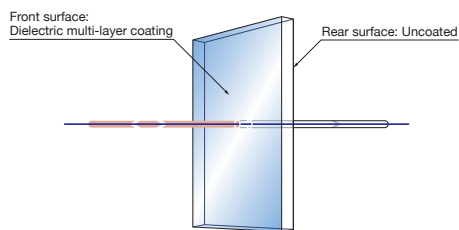
Etalon

The principle of the cold filter is similar to the glass that is used to on the halogen lamp to protect the heat. It enables the visible range to transmit and cut off the IR range (heat).

- The feature of the dielectric optical coating filter is to have a rapid decay on transmittance from the visible range to IR range, in addition to this; the heat absorption filter is efficient for transmitting at the visible range and cutting off the IR range.
- It is frequently used as a IR cut filter on a CCD sensor.
- It is also used as a filter to cut off the heat from the illumination of a biological microscope to avoid heating up the specimen.

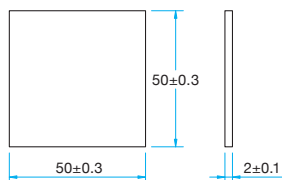


Schematic



Outline Drawing

(in mm)



Specifications

Part Number	Transmittance range wavelength (normal incident) [nm]	Transmittance range transmission rate (normal incident) [%]	Cutoff range wavelength (normal incident) [nm]	Cutoff range transmission rate (normal incident) [%]	Half maximum Wavelength [nm]
CLDF-50S	400 – 600	>80	800 – 2000	<10	700±20

Specifications

Material	Heat-absorbing glass
Incident angle	0°
Wavelength Range	400 – 2000nm (Cut off more than 900nm)
Surface Quality (Scratch-Dig)	60–40
Clear aperture	90% of external dimension of the square inscription circle

Guide

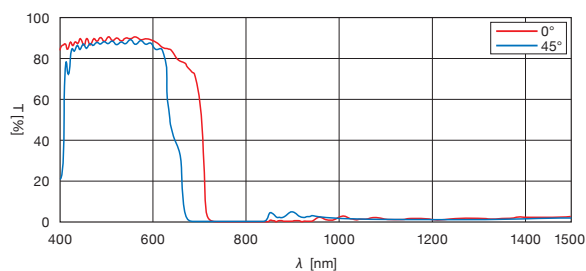
- ▶ Different size, wavelength and deviation ratio are not mentioned in this catalog are available as custom products upon the request.
- ▶ For specific filter holder, please contact our International Sales Division.

Attention

- ▶ The transmittance graph drops on the long side of the visible range when the incident angle is slightly slanting.
- ▶ When placing the filter too close to a light source, the heat absorption may damage the filter with a rapid change of the temperature.
- ▶ The backside of the cold filter is not coated with AR. The absorption filter may have a backside reflectance value of 4%, a total of 20% of loss can be occurred.

Typical Transmittance Data

T: Transmission

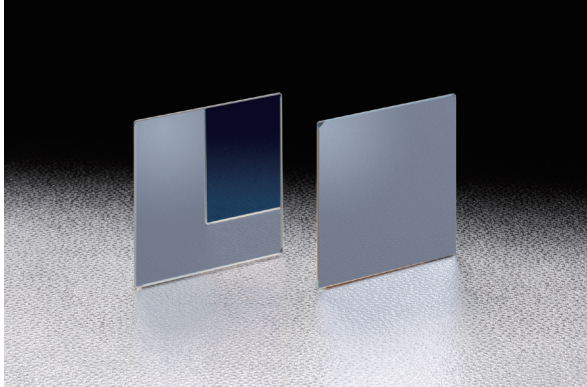


Compatible Optic Mounts

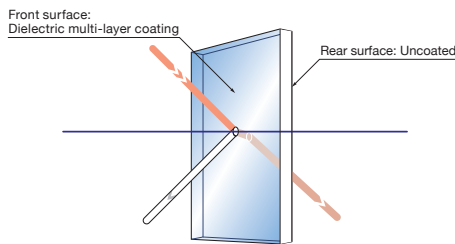
FHS-50 / CHA-60

The principle of the cold mirror is reflecting the visible range light and transmitting the UV range light. It separates the visible and the UV (heat) of the sunlight.

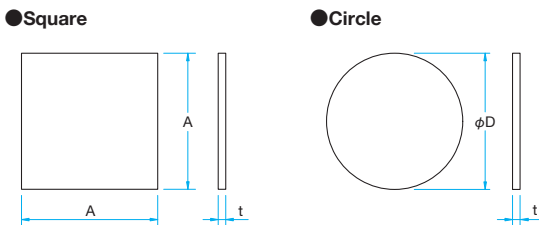
- No absorption with dielectric multi-layer coating using high transmittance glass material, it can be resistant of rapid change in high temperature.
- It is possible to pick out the IR light only.
- Can be used as a NIR filter by changing the angle of Incident.



Schematic



Outline Drawing (in mm)



Square							
Part Number	Lenght A [mm]	Thickness t [mm]	Transmittance range wavelength (45 degrees incident) [nm]	Transmittance range transmission rate (45 degrees incident) [%]	Cutoff range wavelength (45 degrees incident) [nm]	Cutoff range transmission rate (45 degrees incident) [%]	Half maximum Wavelength [nm]
CLDM-25.4S3.3	24.5±0.5	3.3±0.3	800 – 2000	>75	420 – 700	>95	760±10
CLDM-50.8S3.3	50.8±0.5	3.3±0.3	800 – 2000	>75	420 – 700	>95	760±10
CLDM-50S	50.0±0.3	1.0±0.1	800 – 2000	>80	400 – 700	>90	760±10

Circle							
Part Number	Diamefer φD [mm]	Thickness t [mm]	Transmittance range wavelength (45 degrees incident) [nm]	Transmittance range transmission rate (45 degrees incident) [%]	Cutoff range wavelength (45 degrees incident) [nm]	Cutoff range transmission rate (45 degrees incident) [%]	Half maximum Wavelength [nm]
CLDM-25.4S3.3	φ25.4±0.5	3.3±0.3	800 – 2000	>75	420 – 700	>95	760±10
CLDM-50.8S3.3	φ50.8±0.5	3.3±0.3	800 – 2000	>75	420 – 700	>95	760±10

Specifications

Material	B270® (SuperWhite Glass) or BK7
Incident angle	45°
Wavelength Range	400 – 2000nm
Surface Quality (Scratch-Dig)	80-50, 60-40 (CLDM-50S)
Clear aperture	90% of external dimension of the square inscription circle

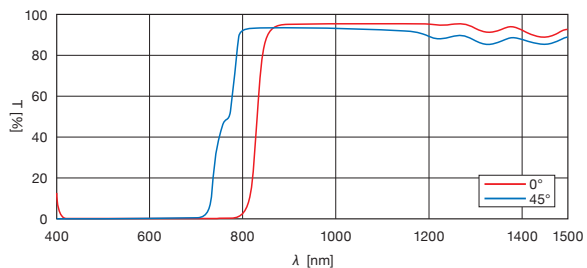
Guide

- ▶ B270® is a registered trademark of SCHOTT AG Inc.
- ▶ Different size, wavelength and deviation ratio are not mentioned in this catalog are available as custom products upon the request.
- ▶ For specific filter holder, please contact our International Sales Division.

Attention

- ▶ Do not use it with high power laser and high energy pulsed laser. We can provide high power mirror for pulse laser, please contact our International Sales Division. [Reference](#) B020
- ▶ The backside of the cold mirror is not coated with AR, please use the dielectric coating side for visible light incident. The backside may have 10% loss of energy and the ghost image may occur.
- ▶ The visible light is reflected, the UV (heat) is transmitted, avoid blocking the transmitted light by a reflective element which may hold the heat.
- ▶ The reflecting light may be mixed with infrared if the incident angle is other than 45 degrees.

Typical Transmittance Data T: Transmission



Compatible Optic Mounts

FHS-50 / CHA-60

Ultra-Violet Hot Mirrors | HOTM

RoHS

Catalog Code

W3205

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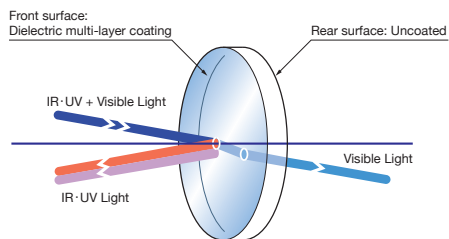
Etalon

It is a dichroic mirror HeatBuster® to transmit only visible light and to reflect ultraviolet and infrared. It is used aim for the such as taking output the only visible light from tungsten halogen lamps and the black body radiation of high temperature furnace.

- It is a excellent optics for environmental resistance that can be used in high temperature and high humidity.
- Super HeatBuster® is a registered trademark of Deposition Sciences, of Inc. (DSI).



Schematic



Circle

Part Number	Diameter ϕD [mm]	Thickness t [mm]
HOTM-25.4C3.3	$\phi 25.4$	3.3
HOTM-50.8C3.3	$\phi 50.8$	3.3

Specifications

Material	Boroflot® Glass
Surface accuracy before Coating	3λ per $\phi 25.4\text{mm}$
Incident angle	$0^\circ - 15^\circ$
Coating	Dielectric multi-layer coating
Max temperature	700°C
Surface Quality (Scratch-Dig)	80-50

Guide

► Boroflot® is a registered trademark of SCHOTT AG Inc.

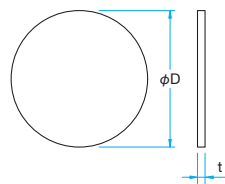
Attention

- Tilting the incident angle to 15 degrees or more, wavelength characteristic of transmittance and reflectance changes, and characteristics of the specifications will not be obtained.
- The backside of the filter is not coated with AR. For this reason, it may occur a ghost image caused by the reflection of the surface and back surface.

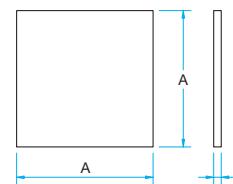
Outline Drawing

(in mm)

● Circle



● Square



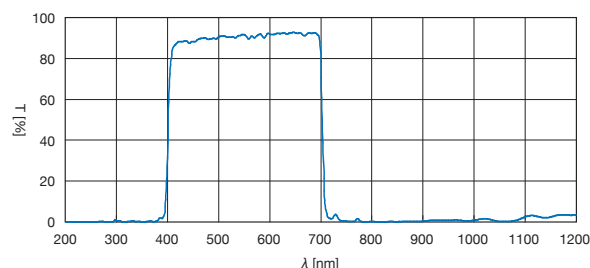
- Tolerance
- Diameter $\phi D \pm 0.5$
- Length $A \pm 0.5$
- Thickness $t \pm 0.3$

Square

Part Number	Length A [mm]	Thickness t [mm]
HOTM-25.4S3.3	25.4	3.3
HOTM-50.8S3.3	50.8	3.3

Typical Transmittance Data

T: Transmission

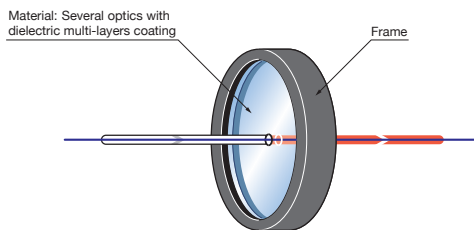


Divide sharply the color of wavelength by transmitting the short wavelength and cutting off the long wavelength. Fit for Bio-imaging and flow cytometry application.

- In the range of blocking wavelength, it has an excellent light-blocking properties as OD5, and in the transmission range it is a filter with a transmittance of more than 90%.
- This filter has a transmittance of more than 90% in the transmission band. Because of the dielectric multilayer coating, there is almost no absorption of light by the coating.



Schematic



Specifications

Coating	Dielectric multi-layer coating
Incident angle	0°
Surface Quality (Scratch-Dig)	60-40

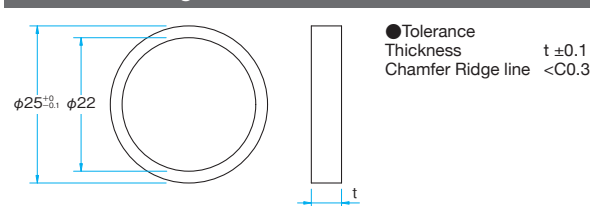
Guide

- ▶ Please contact our International Sales Division for customized products. (customized on outer diameter, wavelength characteristic, etc.)
- ▶ Please contact our international sales division if you require a wavelength characteristics of broadband data or more detailed data.

Attention

- ▶ If the light incident angle is other than 0 degrees, the transmittance characteristics may be changed. In the normal situation, when the incident angle changes, the wavelength may shift to the long-wavelength side.

Outline Drawing



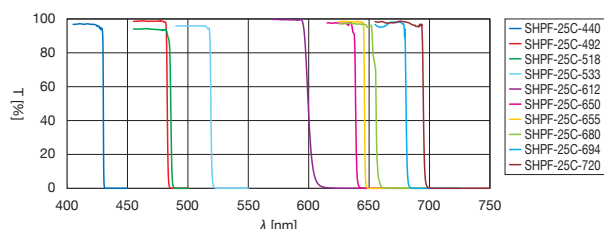
Specifications

Part Number	Transmittance range		Transmittance limit wavelength [nm]	Short-pass cutoff range		Thickness t [mm]
	wavelength [nm]	transmission rate [%]		wavelength [nm]	Optical Density (Average) [%]	
SHPF-25C-440	380 – 427	> Average 93	430	440 – 1010	6	5.0
SHPF-25C-492	400 – 480	> Average 90	483	492 – 1120	6	5.0
SHPF-25C-518	445 – 485	> Average 90	488	518 – 750	5	3.5
SHPF-25C-533	380 – 520	> Average 90	522	533 – 760	6	3.5
SHPF-25C-612	509 – 591	> Average 90	599	612 – 730	4	5.0
SHPF-25C-650	360 – 634	> Average 85	638	650 – 1120	5	3.5
SHPF-25C-655	531 – 642	> Average 93	646	655 – 800	6	3.5
SHPF-25C-680	350 – 650	> Average 90	654	680 – 1080	6	3.5
SHPF-25C-694	481 – 676	> Average 93	681	694 – 955	5	3.5
SHPF-25C-720	350 – 690	> Average 90	698	720 – 1100	6	3.5
SHPF-25C-750	380 – 720	> Average 90	727	750 – 1100	6	3.5
SHPF-25C-770	380 – 740	> Average 90	747	770 – 1400	6	3.5
SHPF-25C-775	481 – 756	> Average 93	761	775 – 1120	6	3.5
SHPF-25C-790	380 – 760	> Average 90	765	790 – 1400	6	3.5
SHPF-25C-842	485 – 831	> Average 95	835	842 – 1050	6	3.5
SHPF-25C-890	380 – 860	> Average 90	875	890 – 1400	5	3.5
SHPF-25C-945	600 – 935	> Average 93	936	945 – 1120	6	3.5
SHPF-25C-950	430 – 908	> Average 90	912	950 – 1100	6	3.5

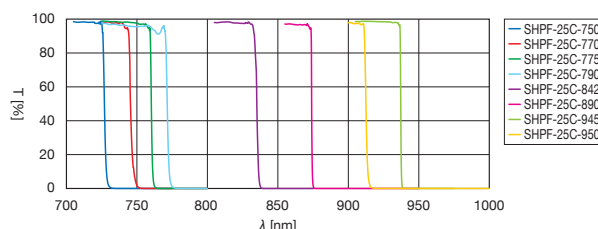
Typical Transmittance Data

T: Transmission

SHPF-440 – 720



SHPF-750 – 950



Long Pass filters | LOPF

RoHS Catalog Code W3207

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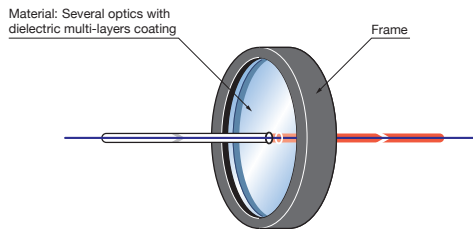
Etaion

Divide sharply the color of wavelength by transmitting the long wavelength and cutting off the short wavelength. Fit for Bio-imaging and flow cytometry application.

- In the range of blocking wavelength, it has an excellent light-blocking properties as OD5, and in the transmission range it is a filter with a transmittance of more than 90%.
- Because it is a dielectric multilayer coating, there is almost no absorption of light by the coating.



Schematic



Specifications

Coating	Dielectric multi-layer coating
Incident angle	0°
Surface Quality (Scratch-Dig)	60-40

Guide

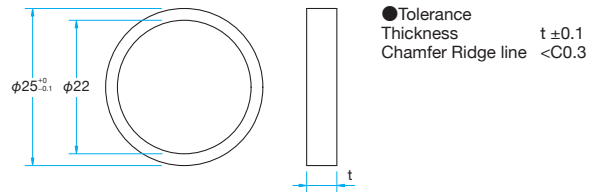
- ▶ Please contact our International Sales Division for customized products. (customized on outer diameter, wavelength characteristic, etc.)
- ▶ Please contact our international sales division if you require a wavelength characteristics of broadband data or more detailed data.

Attention

- ▶ If the light incident angle is other than 0 degrees, the transmittance characteristics may be changed. In the normal situation, when the incident angle changes, the wavelength may shift to the long-wavelength side.

Outline Drawing

(in mm)



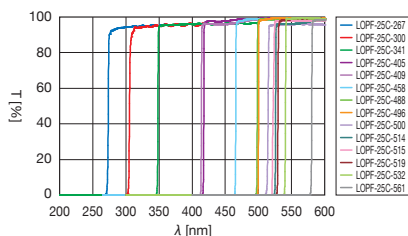
Specifications

Part Number	Transmittance range		Transmittance limit wavelength [nm]	Long-pass cutoff range		Thickness t [mm]
	wavelength [nm]	transmission rate [%]		wavelength [nm]	Optical Density (Average) [%]	
LOPF-25C-267	277 – 358	> Average 85	274	225 – 267	5	3.5
LOPF-25C-300	308 – 420	> Average 85	306	200 – 300	5	5.0
LOPF-25C-341	350 – 500	> Average 90	347	200 – 341	5	3.5
LOPF-25C-405	421.5 – 900	> Average 93	418	270 – 405	5	3.5
LOPF-25C-409	417 – 1100	> Average 93	415	270 – 409	5	3.5
LOPF-25C-458	470.7 – 900	> Average 93	466	270 – 458	5	3.5
LOPF-25C-488	504.7 – 900	> Average 93	500	270 – 488	5	3.5
LOPF-25C-496	503 – 1100	> Average 93	501	270 – 496	5	3.5
LOPF-25C-500	519 – 700	> Average 90	515	270 – 500	5	3.5
LOPF-25C-514	529.4 – 900	> Average 93	526	270 – 514	5	3.5
LOPF-25C-515	525 – 800	> Average 90	522	340 – 515	6	3.5
LOPF-25C-519	534 – 653	> Average 92	530	300 – 519	6	3.5
LOPF-25C-532	546.9 – 900	> Average 93	542	280 – 532	5	3.5
LOPF-25C-561	577.1 – 900	> Average 93	572	300 – 561	6	3.5
LOPF-25C-593	604 – 1100	> Average 93	601	270 – 593	5	3.5
LOPF-25C-635	660 – 1200	> Average 93	655	300 – 635	6	3.5
LOPF-25C-715	725 – 1200	> Average 93	723	290 – 715	5	3.5
LOPF-25C-736	761 – 850	> Average 90	754	300 – 736	4	3.5
LOPF-25C-785	812.1 – 1200	> Average 93	805	270 – 785	5	3.5
LOPF-25C-800	815 – 915	> Average 90	812	635 – 800	6	3.5
LOPF-25C-834	842 – 935	> Average 97	840	790 – 834	5	3.5
LOPF-25C-1020	1064 – 1087	> Average 93	1057	400 – 1020	5	3.5

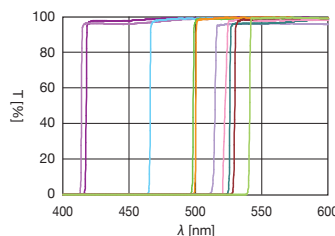
Typical Transmittance Data

T: Transmission

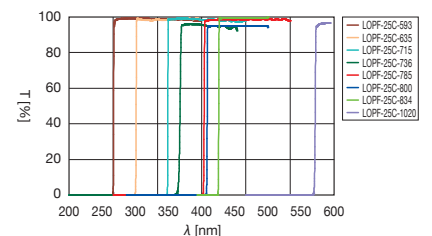
LOPF-267 – 561



SHPF-405 – 532 (Enlargement)



SHPF-593 – 1020

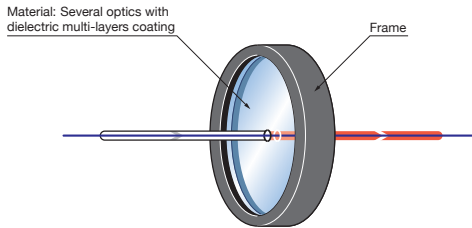


It is available to cut the excitation laser beam and extracted with high transmittance Raman shifted light on the longer wavelength side with a sharp rise. It can be used to detect weak light of the Raman scattering.

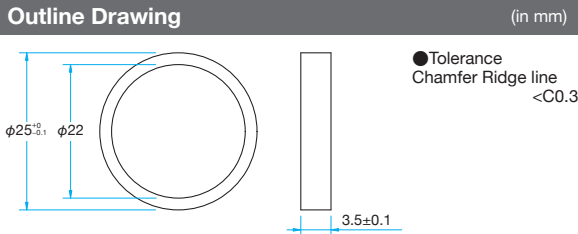
- The wavelength of the laser, it has an excellent light-blocking properties as OD6, and in the transmission range it is a filter with a transmittance of more than 90%.
- Because it is a dielectric multilayer coating, there is almost no absorption of light by the coating.



Schematic



Outline Drawing



Specifications

Coating	Dielectric multi-layer coating
Incident angle	0°
Surface Quality (Scratch-Dig)	60-40

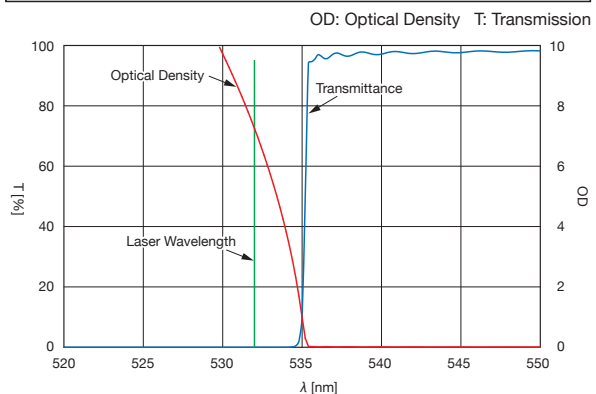
Guide

- ▶ Please contact our International Sales Division for customized products. (customized on outer diameter, wavelength characteristic, etc.)
- ▶ Please contact our international sales division if you require a wavelength characteristics of broadband data or more detailed data.

Attention

- ▶ If the light incident angle is other than 0 degrees, the transmittance characteristics may be changed. In the normal situation, when the incident angle changes, the wavelength may shift to the long-wavelength side.

Typical Transmittance & Optical Density Data



Specifications

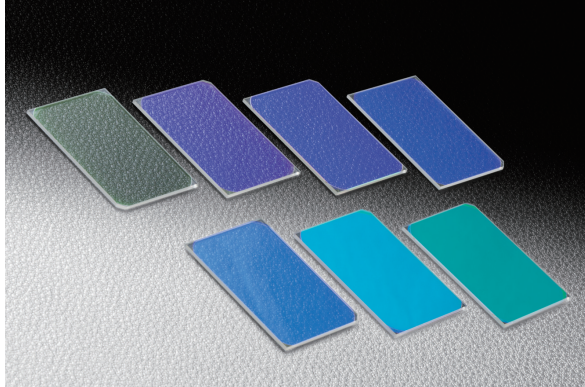
Part Number	Blocking Range		Transmittance Range	
	Laser wavelength [nm]	transmission rate [%]	Wavelength [nm]	Optical Density (Average)
RSF-25C-325RU	329.2 – 733.1	>80	325	6
RSF-25C-355RU	359.6 – 800.8	>90	355	6
RSF-25C-364RU	368.5 – 820.6	>90	363.8	6
RSF-25C-442RU	447.3 – 996.1	>90	441.6	6
RSF-25C-458RU	463.9 – 668.4	>90	457.9	6
RSF-25C-473RU	479.1 – 683.9	>90	473	6
RSF-25C-488RU	494.3 – 1100.8	>90	488	6
RSF-25C-514RU	521.2 – 1160.5	>90	514.5	6
RSF-25C-532RU	538.9 – 1200.0	>90	532	6
RSF-25C-561RU	568.7 – 1266.3	>90	561.4	6
RSF-25C-568RU	575.6 – 1281.7	>90	568.2	6
RSF-25C-633RU	641.0 – 1427.4	>90	632.8	6
RSF-25C-647RU	655.5 – 1459.6	>90	647.1	6
RSF-25C-664RU	672.6 – 1497.7	>90	664	6
RSF-25C-780RU	790.1 – 1008.0	>90	780	6
RSF-25C-785RU	795.2 – 1770.7	>90	785	6
RSF-25C-808RU	818.5 – 1822.6	>90	808	6
RSF-25C-830RU	840.8 – 1872.2	>90	830	6
RSF-25C-980RU	992.7 – 2000.0	>90	980	6
RSF-25C-1064RU	1077.8 – 2000.0	>90	1064	6
RSF-25C-1319RU	1336.1 – 2000.0	>90	1319	6

Sharp cut dichroic mirror | SDM

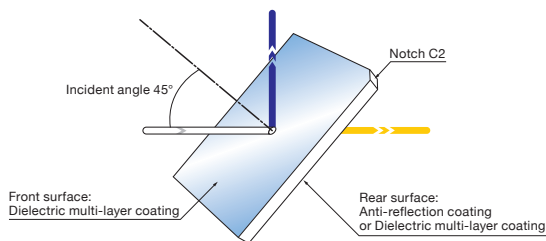
RoHS

Divide sharply the color of wavelength by reflecting the short wavelength and transmitting the long wavelength. Fit for Bio-imaging and flow cytometry application.

- The short wavelength has high reflectance, fit perfectly for use in excitation light and fluorescence imaging.
- The feature of the structure of this mirror is to maintain the distance of the curbs of the P polarization and the S polarization to be close to each other. It narrows the gap of the reflective range and the transmission range to provide a steep rise.
- There is limited absorption due to the dielectric coating.

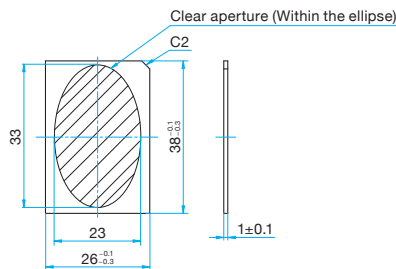


Schematic



Outline Drawing

(in mm)



Specifications

Material	Synthetic fused silica
Incident angle	45°
Surface accuracy before coating	5λ (Optical flat)
Parallelism	20"
Polarization condition of incident beam	Unpolarized beam (or linear polarization of 45° azimuth circular polarization)
Surface Quality (Scratch-Dig)	40-20

Guide

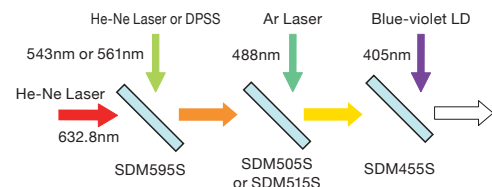
- ▶ Use the SDM mirror with interference filter as a pair for Bio-imaging application.
- ▶ For specific mirror holder, please contact our International Sales Division.
- ▶ Different size, wavelength and deviation ratio are not mentioned in this catalog are available as custom products upon the request.
- ▶ For aluminum mirror, dielectric mirror, TIRF Mirror (Total Internal Reflectance Fluorescence), please contact our International Sales Division.

Attention

- ▶ The transmittance characteristic of the mirror is a combining of the coating value of both sides of the mirror.
- ▶ Using the mirror other than 45 degrees of AOI, the transmittance and the reflectance characteristics may be different than as mentioned.
- ▶ The right reflecting surface appears when you see the notch on the upper right side of the mirror.

Sample of use with multi-wavelength of visible laser

This is a flow cytometry set up with a piling up of different laser beams.



Specifications

Part Number	Transmission spectral	Transmittance limit wavelength [nm]	Reflectance range wavelength [nm]	Reflectance range reflection rate [%]	Transmittance range wavelength [nm]	Transmittance range transmission rate [%]
SDM410S		410	340 – 360 360 – 395	>90 >99	419 – 660 430 – 520	>80 >87
SDM455S		455	390 – 443	>99	465 – 560 560 – 700	> Average 92 > Average 88
SDM490S		490	450 – 482	>99	499 – 630 630 – 655	> Average 90 >75
SDM505S		505	455 – 497	>99	514 – 550 550 – 700	>85 >60
SDM515S		515	462 – 504	>99	522 – 660 660 – 700	> Average 90 >75
SDM570S		570	520 – 558	>99	579 – 620 620 – 700	>85 >60
SDM595S		595	520 – 585	>99	605 – 700 700 – 880	> Average 92 >75

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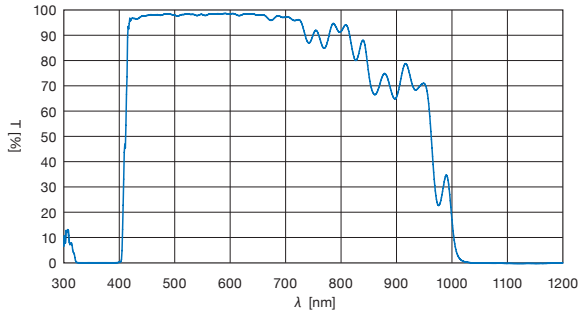
Dielectric Filters

Etalon

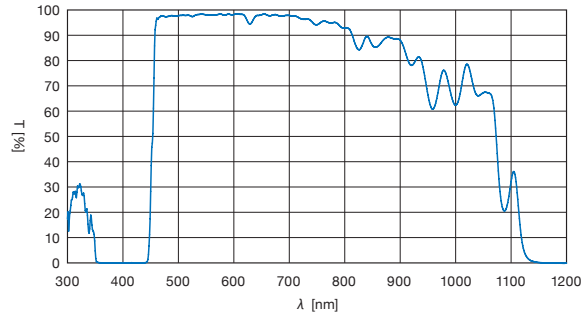
Typical Transmittance Data

T: Transmission

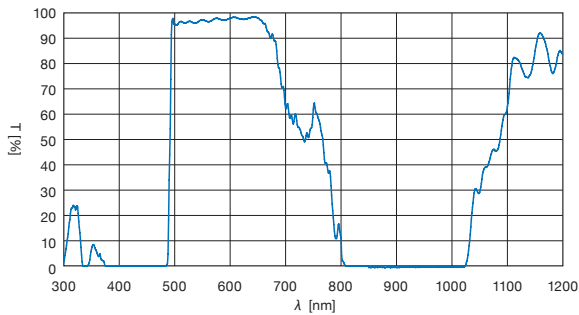
SDM410S



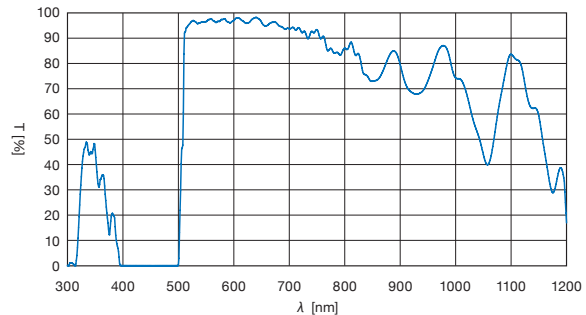
SDM455S



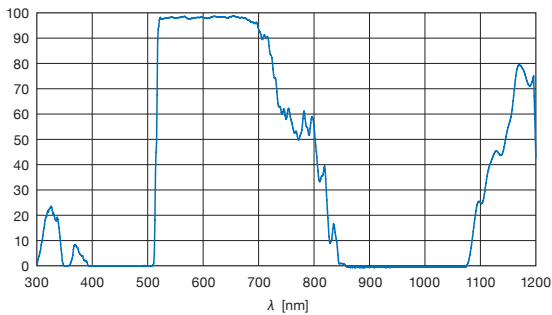
SDM490S



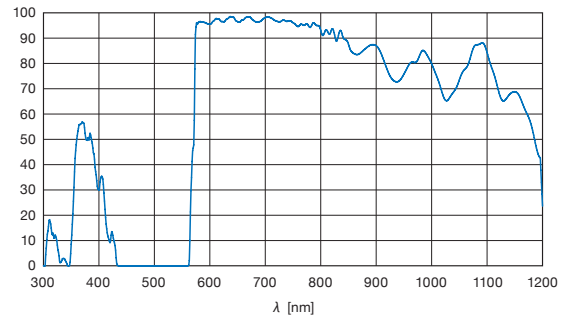
SDM505S



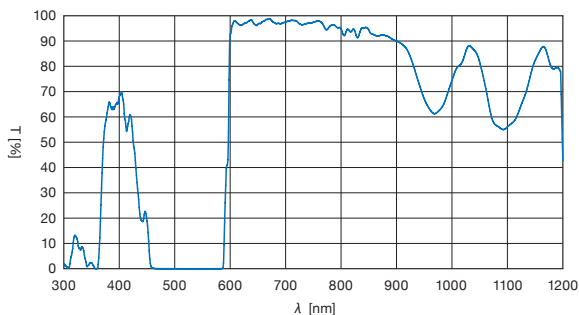
SDM515S



SDM570S



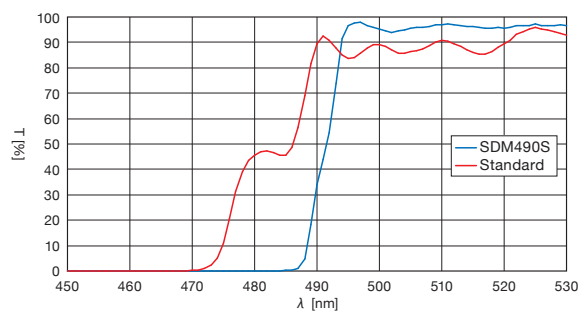
SDM595S



Sharp cutting characteristics value (Reference data)

T: Transmission

The polarization of the SDM mirror was realized with a special coating design to obtain a sharper rise graph than usual. It shows advantage for use in extracting the excitation light for fluorescence imaging application.



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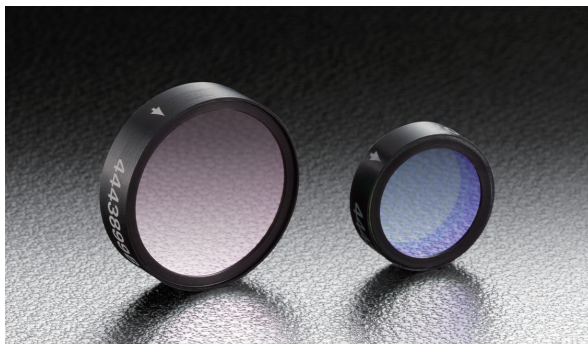
Etalon

Laser Line Filter | VPFHT

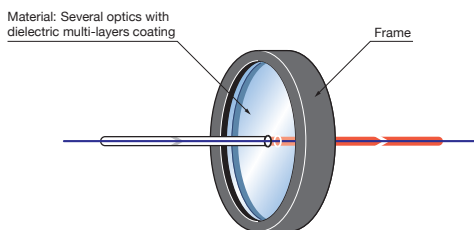
RoHS Catalog Code W3209

This filter can extract light in a specific wavelength range. Very high transmittance can be obtained in the transmission range. Upon leaving a little from the transmission wavelength range, transmission decrease steep and light is not transmitted almost in the vicinity of the transmission range.

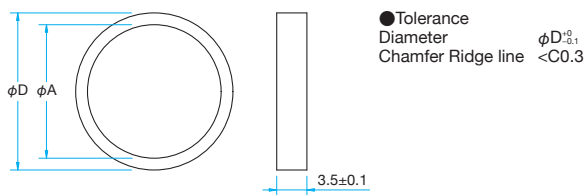
- Since it is used a dielectric multilayer coating, absorption is small and transmittance is high. It enables to separate the wavelength specified light efficiently.
- The filters are metallically framed which make it easy to be mounted onto a holder.
- Large choice of spectrum, range from UV 325nm to IR 1064nm.



Schematic



Outline Drawing



325nm – 561nm

Part Number	Center wavelength [nm]	Diameter φD [mm]	Half bandwidth [nm]	Short wavelength Blocking range OD5 Range (OD6 Range) [nm]	Long wavelength Blocking range OD5 Range (OD6 Range) [nm]
VPFHT-12.5C-3250	325	φ12.5	1.75±0.55	291.0 – 321.8	328.3 – 380.7
VPFHT-25C-3250	325	φ25		(299.0 – 320.1)	(329.9 – 357.5)
VPFHT-12.5C-3550	355	φ12.5	1.9±0.6	314.8 – 351.5	358.6 – 422.5
VPFHT-25C-3550	355	φ25		(326.6 – 349.7)	(360.3 – 390.5)
VPFHT-12.5C-3638	364	φ12.5	1.95±0.55	321.7 – 360.2	367.4 – 435.0
VPFHT-25C-3638	364	φ25		(334.7 – 358.3)	(369.3 – 400.2)
VPFHT-12.5C-3720	372	φ12.5	2.0±0.6	328.1 – 368.3	375.7 – 446.8
VPFHT-25C-3720	372	φ25		(342.0 – 366.4)	(377.6 – 409.2)
VPFHT-12.5C-4416	442	φ12.5	2.4±0.7	381.0 – 437.2	446.0 – 551.1
VPFHT-25C-4416	442	φ25		(406.3 – 435.0)	(448.2 – 485.8)
VPFHT-12.5C-4579	458	φ12.5	2.45±0.75	393.1 – 453.3	462.5 – 576.7
VPFHT-25C-4579	458	φ25		(421.3 – 451.0)	(464.8 – 503.7)
VPFHT-12.5C-4880	488	φ12.5	2.65±0.75	415.1 – 483.1	492.9 – 625.3
VPFHT-25C-4880	488	φ25		(449.0 – 480.7)	(495.3 – 536.8)
VPFHT-12.5C-4910	491	φ12.5	2.65±0.75	417.2 – 486.1	495.9 – 630.3
VPFHT-25C-4910	491	φ25		(451.7 – 483.6)	(498.4 – 540.1)
VPFHT-12.5C-5145	515	φ12.5	2.8±0.8	434.1 – 509.4	519.6 – 669.5
VPFHT-25C-5145	515	φ25		(473.3 – 506.8)	(522.2 – 566.0)
VPFHT-12.5C-5320	532	φ12.5	2.85±0.85	446.5 – 526.7	537.3 – 699.4
VPFHT-25C-5320	532	φ25		(489.4 – 524.0)	(540.0 – 585.2)
VPFHT-12.5C-5435	544	φ12.5	2.95±0.85	454.6 – 538.1	548.9 – 719.5
VPFHT-25C-5435	544	φ25		(500.0 – 535.3)	(551.7 – 597.9)
VPFHT-12.5C-5614	561	φ12.5	3.0±0.9	467.0 – 555.8	567.0 – 751.2
VPFHT-25C-5614	561	φ25		(516.5 – 553.0)	(569.8 – 617.5)

Specifications

Coating	Dielectric multi-layer coating
Incident angle	0°
Maximum transmittance rate	T≥90% T≥80% (VPFHT-3250, -3550) T≥85% (VPFHT-3638, -3720)
Clear aperture	φ8.5mm (φD=φ12.5mm) φ22mm (φD=φ25mm)
Surface Quality (Scratch-Dig)	60-40

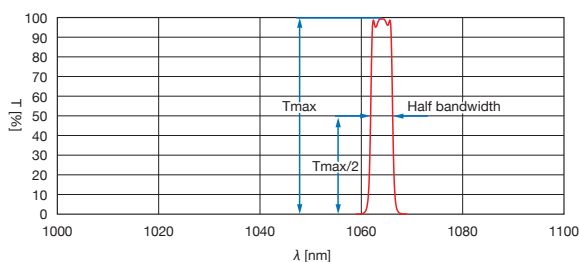
Guide

- ▶ Please contact our International Sales Division for customized products. (customized on outer diameter, wavelength characteristic, etc.)
- ▶ It is also provided interference filter VPF that cutting range is broad. [Reference](#) B254

Attention

- ▶ Characteristics of the interference filter is depending on the incident angle. If it is tilted from the optical axis, then the center transmitting wavelength is shifted toward the short wavelength, and transmittance also decreases. Please make sure to incident at 0 degrees collimated light or close to collimated (parallel) light to the optical axis. Angle dependence will increase as half-width range of transmittance becomes narrow.

Typical Transmittance Data



568nm – 1064nm

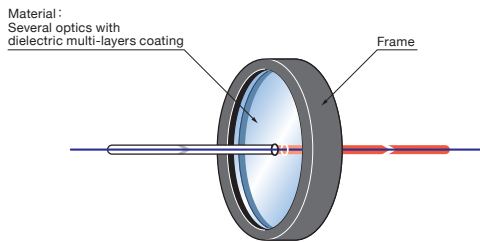
Part Number	Center wavelength [nm]	Diameter φD [mm]	Half bandwidth [nm]	Short wavelength Blocking range OD5 Range (OD6 Range) [nm]	Long wavelength Blocking range OD5 Range (OD6 Range) [nm]
VPFHT-12.5C-5682	568	φ12.5	3.1±0.9	471.7 – 562.5	573.9 – 763.4
VPFHT-25C-5682	568	φ25		(522.7 – 559.7)	(576.7 – 625.0)
VPFHT-12.5C-6328	633	φ12.5	3.4±1.0	515.4 – 626.5	639.1 – 884.7
VPFHT-25C-6328	633	φ25		(582.2 – 623.3)	(642.3 – 696.1)
VPFHT-12.5C-6471	647	φ12.5	3.5±1.0	524.8 – 640.6	653.6 – 912.9
VPFHT-25C-6471	647	φ25		(595.3 – 637.4)	(656.8 – 711.8)
VPFHT-12.5C-6710	671	φ12.5	3.65±1.05	540.4 – 664.3	677.7 – 961.2
VPFHT-25C-6710	671	φ25		(617.3 – 660.9)	(681.1 – 738.1)
VPFHT-12.5C-7800	780	φ12.5	4.25±1.25	609.0 – 772.2	787.8 – 1201.8
VPFHT-25C-7800	780	φ25		(717.6 – 768.3)	(791.7 – 858.0)
VPFHT-12.5C-7850	785	φ12.5	4.25±1.25	612.0 – 777.2	792.9 – 1213.8
VPFHT-25C-7850	785	φ25		(722.2 – 773.2)	(796.8 – 863.5)
VPFHT-12.5C-8080	808	φ12.5	4.4±1.3	625.9 – 799.9	816.1 – 1033.5
VPFHT-25C-8080	808	φ25		(743.4 – 795.9)	(820.1 – 888.8)
VPFHT-12.5C-8300	830	φ12.5	4.5±1.3	639.1 – 821.7	838.3 – 1067.9
VPFHT-25C-8300	830	φ25		(763.6 – 817.6)	(842.5 – 913.0)
VPFHT-12.5C-8520	852	φ12.5	4.6±1.4	652.0 – 843.5	860.5 – 1106.6
VPFHT-25C-8520	852	φ25		(783.8 – 839.2)	(864.8 – 937.2)
VPFHT-12.5C-9760	976	φ12.5	5.25±1.55	722.2 – 966.2	985.8 – 1325.2
VPFHT-25C-9760	976	φ25		(897.9 – 961.4)	(990.6 – 1073.6)
VPFHT-12.5C-9800	980	φ12.5	5.3±1.6	724.4 – 970.2	989.8 – 1332.6
VPFHT-25C-9800	980	φ25		(901.6 – 965.3)	(994.7 – 1078.0)
VPFHT-12.5C-10471	1047	φ12.5	5.65±1.65	963.3 – 1036.6	1057.6 – 1398.6
VPFHT-25C-10471	1047	φ25		(963.3 – 1031.4)	(1062.8 – 1151.8)
VPFHT-12.5C-10640	1064	φ12.5	5.7±1.7	978.9 – 1053.4	1074.6 – 1428.9
VPFHT-25C-10640	1064	φ25		(978.9 – 1048.0)	(1080.0 – 1170.4)

YIF is a filter that can extract a selected light from the wavelength range. Its feature is enabling to pick out a high transmittance wavelength at the same time cutting off a wavelength.

- The filters are made by Ion Beam assisted dielectric coating process which can assure an extremely high environment resistance and high stability.
- Using high absorption glass material and heat absorption optics coating, it assures a low deterioration with any types of light-source.
- The filters were designed as the BP type light blocking characteristics of high OD7 at the long wavelength side than the pass band and the BA type light blocking characteristics of high OD7 at the short wavelength side of than the transmission bandwidth.
- The filters can be used to cut the non-irradiated light wavelength excitation in fluorescence observation and cut the non fluorescence wavelength excitation light in sample observation.
- In addition to the BP type filter and the BA type filter, there are broadband type and narrowband type can be chose according to your application.



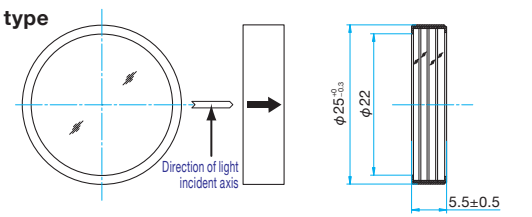
Schematic



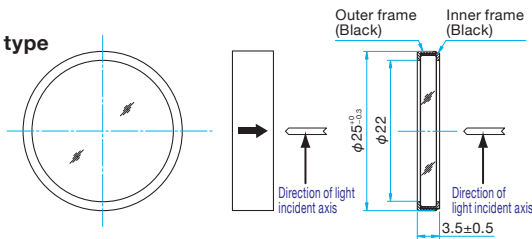
Outline Drawing

(in mm)

●BP type



●BA type



Compatible Optic Mounts

LHF-25.4 / LHA-25

Specifications

Material	B270® (SuperWhite Glass) or Synthetic fused silica
Incident angle	0°
Surface Quality (Scratch-Dig)	40-20

Guide

- ▶ B270® is registered trademark of Schott AG.
- ▶ For specific filter holder, please contact our International Sales Division.
- ▶ Different size and wavelength which are not mentioned in this catalog are available as custom products upon the request.

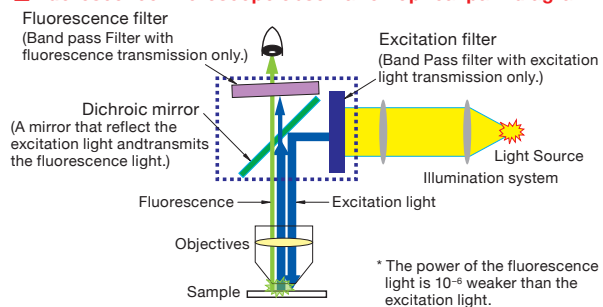
Attention

- ▶ The filter transmittance wavelength characteristics are on the surface and the backside of the filter. It happens to have multi-filter with different coating characteristics pilling together and mounted into a optics frame.
- ▶ If the light incident angle is other than 0 degrees, the transmittance characteristics may be changed. In the normal situation, when the incident angle changes, the wavelength may shift to the long-wavelength side.
- ▶ An arrow indicating the light incident direction of the BP filter and the BA filter is different.
- ▶ The filters are made for use in high temperature environment but for a usage of high power exposure UV lamp, the stability and the efficiency of the filters are not guaranteed.

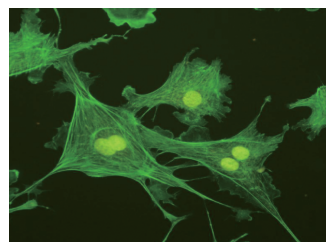
Sample of use of the Bio-imaging

Irradiation with excitation light onto a bound biological fluorescent reagent. A weak fluorescence light appears and the reaction of the biological specimen is visible.

■ Fluorescence microscope observation optical path diagram



■ Fluorescent observation image



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BP broadband type

Part Number	Transmission spectral	Short-wavelength cutoff range wavelength [nm]	Short-wavelength cutoff range transmittance [%]	Transmittance range wavelength [nm]	Transmittance range transmission rate [%]	Long-wavelength cutoff range wavelength [nm]	Long-wavelength cutoff range transmittance [%]
YIF-BP340-390S		300	<0.01	360 – 380	>75 > Average 80	414 – 800	>OD7
YIF-BP400-440S		300 – 383	<0.01	403 – 436	>80 > Average 85	460 – 800 800 – 960	>OD7 >OD6
YIF-BP460-495S		300 – 442	<0.01	464 – 489	>80 > Average 85	514 – 800 800 – 960	>OD7 >OD6
YIF-BP540-585S		300 – 522	<0.01	545 – 579	>80 > Average 85	600 – 800 800 – 960	>OD7 >OD6

BP narrowband type

Part Number	Transmission spectral	Short-wavelength cutoff range wavelength [nm]	Short-wavelength cutoff range transmittance [%]	Transmittance range wavelength [nm]	Transmittance range transmission rate [%]	Long-wavelength cutoff range wavelength [nm]	Long-wavelength cutoff range transmittance [%]
YIF-BP360-370S		300 – 340	<0.01	365	>78	414 – 800	>OD7
YIF-BP400-410S		300 – 383	<0.01	403 – 407	>80 > Average 85	435 – 800 800 – 960	>OD7 >OD6
YIF-BP460-480S		300 – 448	<0.01	465 – 476	>80 > Average 85	493 – 800 800 – 960	>OD7 >OD6
YIF-BP470-495S		300 – 453	<0.01	478 – 489	>80 > Average 85	514 – 800 800 – 960	>OD7 >OD6
YIF-BP490-500S		300 – 475	<0.01	492 – 498	>80 > Average 85	516 – 800 800 – 960	>OD7 >OD6
YIF-BP530-550S		300 – 514	<0.01	538 – 547	>80 > Average 85	582 – 800 800 – 960	>OD7 >OD6
YIF-BP540-550S		300 – 522	<0.01	546	>80	582 – 800 800 – 960	>OD7 >OD6
YIF-BP565-585S		300 – 545	<0.01	572 – 579	>80 > Average 85	600 – 800 800 – 960	>OD7 >OD6

BA broadband type

Part Number	Transmission spectral	Short-wavelength cutoff range wavelength [nm]	Short-wavelength cutoff range transmittance [%]	Transmittance range wavelength [nm]	Transmittance range transmission rate [%]	Long-wavelength cutoff range wavelength [nm]	Long-wavelength cutoff range transmittance [%]
YIF-BA420IFS		340 – 380 380 – 390	>OD7 >OD6	430 – 520	>90 > Average 95	–	–
YIF-BA460IFS		400 – 440	>OD7	470 – 650	>90 > Average 95	–	–
YIF-BA510IFS		420 – 488	>OD7	517 – 700	>90 > Average 95	–	–
YIF-BA575IFS		546 – 550	>OD7	580 – 700	>90 > Average 95	–	–
YIF-BA600IFS		535 – 582	>OD7	607 – 700	>90 > Average 95	–	–

BA narrowband type

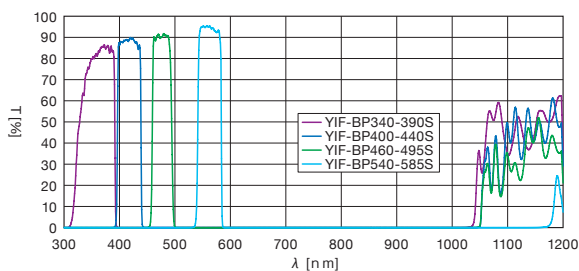
Part Number	Transmission spectral	Short-wavelength cutoff range wavelength [nm]	Short-wavelength cutoff range transmittance [%]	Transmittance range wavelength [nm]	Transmittance range transmission rate [%]	Long-wavelength cutoff range wavelength [nm]	Long-wavelength cutoff range transmittance [%]
YIF-BA420-460S		340 – 380 380 – 390	>OD7 >OD6	430 – 460	>88 > Average 93	495 – 620	<0.1
YIF-BA460-510S		400 – 442	>OD7	470 – 503	>90 > Average 95	529 – 650	<0.1
YIF-BA495-540S		410 – 480	>OD7	499 – 535	>90 > Average 95	565 – 680	<0.1
YIF-BA510-550S		420 – 488	>OD7	517 – 542	>90 > Average 95	569 – 705	<0.1
YIF-BA515-560S		420 – 502	>OD7	522 – 552	>90 > Average 95	577 – 700	<0.1
YIF-BA575-625S		546 – 550	>OD7	580 – 618	>90 > Average 95	640 – 780	<0.1
YIF-BA600-690S		535 – 582	>OD7	607 – 680	>90 > Average 95	703 – 880	<0.1

Typical Transmittance Data

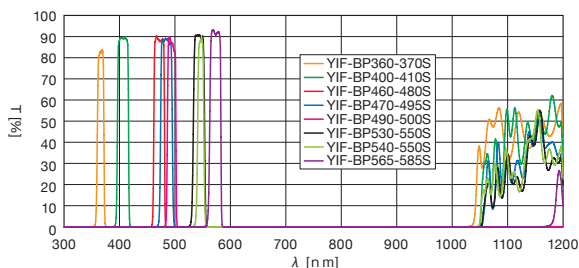
T: Transmission

BP type

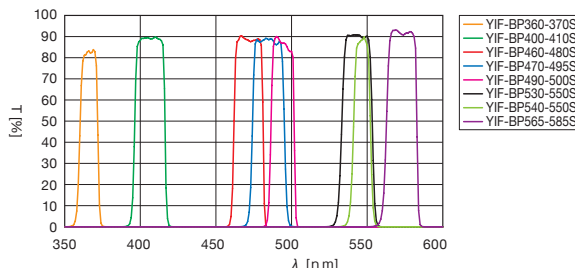
Broadband type (300 – 1200nm)



Narrowband type (300 – 1200nm)

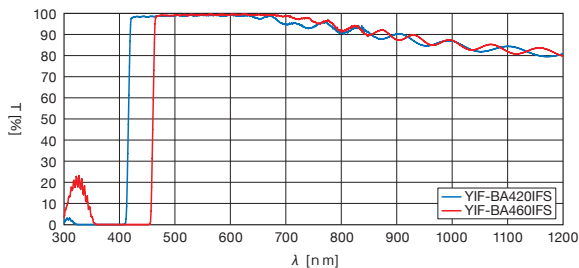


Enlargement of Narrowband type (350 – 600nm)

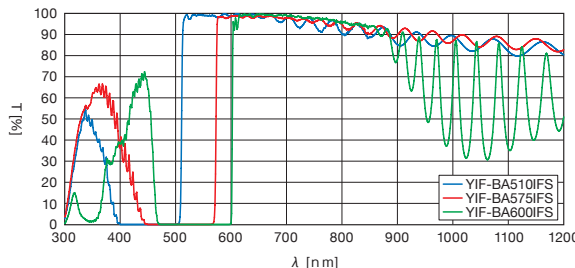


BA type

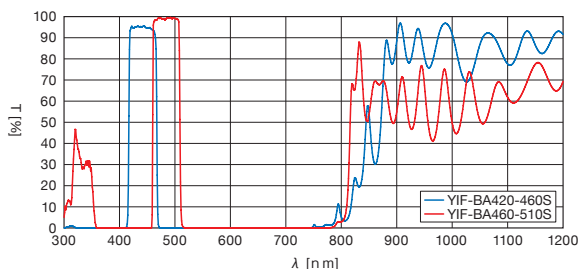
Broadband type 1 (300 – 1200nm)



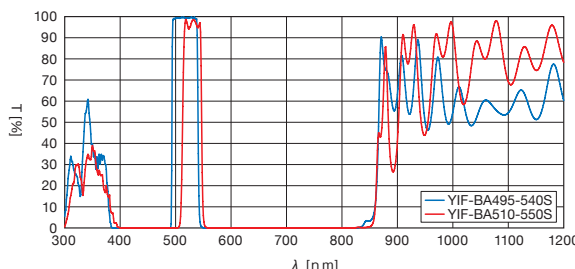
Broadband type 2 (300 – 1200nm)



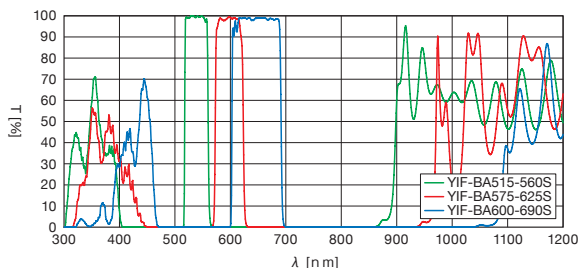
Narrowband type 1 (300 – 1200nm)



Narrowband type 2 (300 – 1200nm)



Narrowband type 3 (300 – 1200nm)



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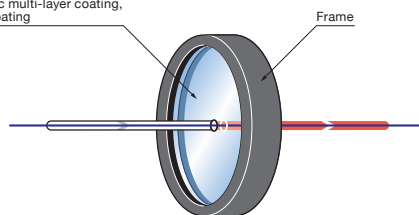
VPF can transmit a specified wavelength range at a spectrum width (half-width) as precise as 1nm to 40nm. It is used to select spectral line from light-sources range from discharge lamp to different lasers wavelength.

- The filters are made of dielectric coating and metallic coating which assure a steep rise and a sharp cut-off spectrum.
- The filters are metallically framed which make it easy to be mounted onto a holder.
- Large choice of spectrum, range from UV 214nm to IR 1550nm.



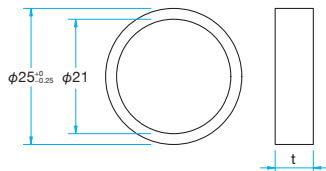
Schematic

Material:
Several optics with dielectric multi-layer coating,
Metal coating



Outline Drawing

(in mm)



Specifications

Blocking range	<0.01% (1 nm – 3.0 μm)
Surface Quality (Scratch-Dig)	80-50
Incident angle	0°
Coating	Dielectric multi-layer coating, Metal coating

Guide

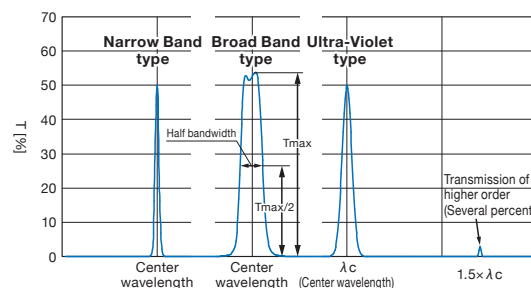
- ▶ For filter size of 50 mm, please see VPF-50S at page B257 or see the high transmittance filter interference filter at page B251.
- ▶ For custom-made size or center wavelength or specified spectrum half-width which is not mentioned in this catalog, please contact our International Sales Division.

Attention

- ▶ The filters characteristic depends on the angle of incident. The angle of the light axis is tilted, the center wavelength is shifted to short-wavelength side and the transmittance may decrease too. More the selected spectrum width is precise more the inclination tolerance is small. Make sure that the incident angle is set at 0 degrees for an efficient experiment.
- ▶ The filters usage temperature of environment is set at 23°C (Celsius), more the temperature is high more the center wavelength switch to the long-wavelength side.
- ▶ Therefore a high precision set up is required for obtaining an efficient experiment each filter thickness is different.
- ▶ Interference filters are heat absorptive, therefore they are not fit to use with high power laser and high energy pulsed laser.

Explanation about spectrum half bandwidth

The feature of a band pass filter is valued by Spectrum half-width as an index. It is shown on the graph located at the right side. It exist in 3 different types; the narrow band, the broadband and the UV spectrum.



Compatible Optic Mounts

MHG-HS25

214.0nm – 647.1nm						
Part Number	Central wavelength [nm]	Laser or Emission line spectrum	Half bandwidth [nm]	Maximum transmittance [%]	Thickness t [mm]	Type
VPF-25C-10-12-21400	214.0 ^{+3.0} _{-0.0}	Zn	10.0±2.0	>12	<4	UV
VPF-25C-10-15-22800	228.0 ^{+3.0} _{-0.0}	Cd	10.0±2.0	>15	<4	UV
VPF-25C-10-15-23200	232.0 ^{+3.0} _{-0.0}	Ni	10.0±2.0	>15	<4	UV
VPF-25C-10-15-23900	239.0 ^{+3.0} _{-0.0}	Co	10.0±2.0	>15	<4	UV
VPF-25C-10-12-25370	253.7 ^{+3.0} _{-0.0}	Hg	10.0±2.0	>12	<4	UV
VPF-25C-10-12-26500	265.0 ^{+3.0} _{-0.0}	Hg	10.0±2.0	>12	<4	UV
VPF-25C-10-12-28000	280.0 ^{+3.0} _{-0.0}	Hg	10.0±2.0	>12	<4	UV
VPF-25C-10-15-28900	289.0 ^{+3.0} _{-0.0}	Hg	10.0±2.0	>15	<4	UV
VPF-25C-10-15-29670	296.7 ^{+3.0} _{-0.0}	Hg	10.0±2.0	>15	<4	UV
VPF-25C-10-15-30710	307.1 ^{+3.0} _{-0.0}	Zn	10.0±2.0	>15	<4	UV
VPF-25C-10-15-31300	313.0 ^{+3.0} _{-0.0}	Hg	10.0±2.0	>15	<4	UV
VPF-25C-10-25-32600	326.0 ^{+3.0} _{-0.0}	Cd	10.0±2.0	>25	<8	Broad Band
VPF-25C-10-25-33400	334.0 ^{+3.0} _{-0.0}	Hg	10.0±2.0	>25	<8	Broad Band
VPF-25C-03-20-33710	337.1 ^{+0.5} _{-0.0}	N ₂	3.0±0.5	>20	<7	Narrow Band
VPF-25C-10-25-33710	337.1 ^{+3.0} _{-0.0}	N ₂	10.0±2.0	>25	<7	Broad Band
VPF-25C-10-25-35000	350.0 ^{+3.0} _{-0.0}	—	10.0±2.0	>25	<7	Broad Band
VPF-25C-40-25-35000	350.0 ^{+10.0} _{-0.0}	—	40.0±8.0	>25	<7	Broad Band
VPF-25C-10-25-35500	355.0 ^{+3.0} _{-0.0}	YAG3 ω	10.0±2.0	>25	<7	Broad Band
VPF-25C-10-25-36500	365.0 ^{+3.0} _{-0.0}	Hg	10.0±2.0	>25	<7	Broad Band
VPF-25C-10-40-40000	400.0 ^{+3.0} _{-0.0}	—	10.0±2.0	>40	<7	Broad Band
VPF-25C-40-40-40000	400.0 ^{+10.0} _{-0.0}	—	40.0±8.0	>40	<7	Broad Band
VPF-25C-10-40-40470	404.7 ^{+3.0} _{-0.0}	Hg	10.0±2.0	>40	<7	Broad Band
VPF-25C-10-40-43580	435.8 ^{+3.0} _{-0.0}	Hg	10.0±2.0	>40	<7	Broad Band
VPF-25C-01-30-44160	441.6 ^{+0.2} _{-0.0}	He-Cd	1.0±0.2	>30	<8.5	Narrow Band
VPF-25C-03-35-44160	441.6 ^{+0.5} _{-0.0}	He-Cd	3.0±0.5	>35	<8.5	Narrow Band
VPF-25C-10-45-44160	441.6 ^{+3.0} _{-0.0}	He-Cd	10.0±2.0	>45	<7	Broad Band
VPF-25C-10-45-45000	450.0 ^{+3.0} _{-0.0}	—	10.0±2.0	>45	<7	Broad Band
VPF-25C-40-50-45000	450.0 ^{+10.0} _{-0.0}	—	40.0±8.0	>50	<7	Broad Band
VPF-25C-10-45-45550	455.5 ^{+3.0} _{-0.0}	Cs	10.0±2.0	>45	<7	Broad Band
VPF-25C-01-30-45790	457.9 ^{+0.2} _{-0.0}	Ar	1.0±0.2	>30	<8.5	Narrow Band
VPF-25C-03-35-45790	457.9 ^{+0.5} _{-0.0}	Ar	3.0±0.5	>35	<8.5	Narrow Band
VPF-25C-10-45-45790	457.9 ^{+3.0} _{-0.0}	Ar	10.0±2.0	>45	<7	Broad Band
VPF-25C-10-45-48610	486.1 ^{+3.0} _{-0.0}	H	10.0±2.0	>45	<7	Broad Band
VPF-25C-01-40-48800	488.0 ^{+0.2} _{-0.0}	Ar	1.0±0.2	>40	<8.5	Narrow Band
VPF-25C-03-45-48800	488.0 ^{+0.5} _{-0.0}	Ar	3.0±0.5	>45	<8.5	Narrow Band
VPF-25C-10-50-48800	488.0 ^{+3.0} _{-0.0}	Ar	10.0±2.0	>50	<7	Broad Band
VPF-25C-10-50-50000	500.0 ^{+3.0} _{-0.0}	—	10.0±2.0	>50	<7	Broad Band
VPF-25C-40-50-50000	500.0 ^{+10.0} _{-0.0}	—	40.0±8.0	>50	<7	Broad Band
VPF-25C-10-50-50850	508.5 ^{+3.0} _{-0.0}	Cd	10.0±2.0	>50	<7	Broad Band
VPF-25C-01-40-51450	514.5 ^{+0.2} _{-0.0}	Ar	1.0±0.2	>40	<8.5	Narrow Band
VPF-25C-03-45-51450	514.5 ^{+0.5} _{-0.0}	Ar	3.0±0.5	>45	<8.5	Narrow Band
VPF-25C-10-50-51450	514.5 ^{+3.0} _{-0.0}	Ar	10.0±2.0	>50	<7	Broad Band
VPF-25C-01-40-53200	532.0 ^{+0.2} _{-0.0}	YAG2 ω	1.0±0.2	>40	<8.5	Narrow Band
VPF-25C-03-45-53200	532.0 ^{+0.5} _{-0.0}	YAG2 ω	3.0±0.5	>45	<8.5	Narrow Band
VPF-25C-10-50-53200	532.0 ^{+3.0} _{-0.0}	YAG2 ω	10.0±2.0	>50	<7	Broad Band
VPF-25C-10-50-53500	535.0 ^{+3.0} _{-0.0}	Ti	10.0±2.0	>50	<7	Broad Band
VPF-25C-10-50-54610	546.1 ^{+3.0} _{-0.0}	Hg	10.0±2.0	>50	<7	Broad Band
VPF-25C-10-50-55000	550.0 ^{+3.0} _{-0.0}	—	10.0±2.0	>50	<7	Broad Band
VPF-25C-40-50-55000	550.0 ^{+10.0} _{-0.0}	—	40.0±8.0	>50	<7	Broad Band
VPF-25C-10-50-57700	577.0 ^{+3.0} _{-0.0}	Hg	10.0±2.0	>50	<7	Broad Band
VPF-25C-10-50-58930	589.3 ^{+3.0} _{-0.0}	Na	10.0±2.0	>50	<7	Broad Band
VPF-25C-10-50-60000	600.0 ^{+3.0} _{-0.0}	—	10.0±2.0	>50	<7	Broad Band
VPF-25C-40-50-60000	600.0 ^{+10.0} _{-0.0}	—	40.0±8.0	>50	<7	Broad Band
VPF-25C-01-40-63280	632.8 ^{+0.2} _{-0.0}	He-Ne	1.0±0.2	>40	<8.5	Narrow Band
VPF-25C-03-45-63280	632.8 ^{+0.5} _{-0.0}	He-Ne	3.0±0.5	>45	<8.5	Narrow Band
VPF-25C-10-50-63280	632.8 ^{+3.0} _{-0.0}	He-Ne	10.0±2.0	>50	<7	Broad Band
VPF-25C-10-50-63620	636.2 ^{+3.0} _{-0.0}	Zn	10.0±2.0	>50	<7	Broad Band
VPF-25C-03-45-64710	647.1 ^{+0.5} _{-0.0}	Kr	3.0±0.5	>45	<8.5	Narrow Band
VPF-25C-10-50-64710	647.1 ^{+3.0} _{-0.0}	Kr	10.0±2.0	>50	<7	Broad Band

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Bandpass Interference filters | VPF

Catalog Code W3120

650.0nm – 1550.0nm						
Part Number	Central wavelength [nm]	Laser or Emission line spectrum	Half bandwidth [nm]	Maximum transmittance [%]	Thickness t [mm]	Type
VPF-25C-10-50-65000	650.0 ^{+3.0} _{-0.0}	—	10.0±2.0	>50	<7	Broad Band
VPF-25C-40-50-65000	650.0 ^{+10.0} _{-0.0}	—	40.0±8.0	>50	<7	Broad Band
VPF-25C-10-50-65630	656.3 ^{+3.0} _{-0.0}	H	10.0±2.0	>50	<7	Broad Band
VPF-25C-10-50-67000	670.0 ^{+3.0} _{-0.0}	LD	10.0±2.0	>50	<7	Broad Band
VPF-25C-10-50-69430	694.3 ^{+3.0} _{-0.0}	Ruby	10.0±2.0	>50	<7	Broad Band
VPF-25C-10-50-70000	700.0 ^{+3.0} _{-0.0}	—	10.0±2.0	>50	<7	Broad Band
VPF-25C-40-50-70000	700.0 ^{+10.0} _{-0.0}	—	40.0±8.0	>50	<7	Broad Band
VPF-25C-10-45-75000	750.0 ^{+3.0} _{-0.0}	—	10.0±2.0	>45	<7	Broad Band
VPF-25C-40-40-75000	750.0 ^{+10.0} _{-0.0}	—	40.0±8.0	>40	<7	Broad Band
VPF-25C-10-45-76650	766.5 ^{+3.0} _{-0.0}	K	10.0±2.0	>45	<7	Broad Band
VPF-25C-10-45-78000	780.0 ^{+3.0} _{-0.0}	LD	10.0±2.0	>45	<7	Broad Band
VPF-25C-10-45-79470	794.7 ^{+3.0} _{-0.0}	Rb	10.0±2.0	>45	<7	Broad Band
VPF-25C-10-45-80000	800.0 ^{+3.0} _{-0.0}	—	10.0±2.0	>45	<7	Broad Band
VPF-25C-40-45-80000	800.0 ^{+10.0} _{-0.0}	—	40.0±8.0	>45	<7	Broad Band
VPF-25C-10-45-81000	810.0 ^{+3.0} _{-0.0}	LD	10.0±2.0	>45	<7	Broad Band
VPF-25C-10-45-83000	830.0 ^{+3.0} _{-0.0}	LD	10.0±2.0	>45	<7	Broad Band
VPF-25C-10-45-90500	905.0 ^{+3.0} _{-0.0}	LD	10.0±2.0	>45	<7	Broad Band
VPF-25C-10-40-10140	1014.0 ^{+3.0} _{-0.0}	Hg	10.0±2.0	>40	<8.5	Broad Band
VPF-25C-01-30-10640	1064.0 ^{+0.2} _{-0.0}	YAG	1.0±0.2	>30	<8.5	Narrow Band
VPF-25C-03-35-10640	1064.0 ^{+0.5} _{-0.0}	YAG	3.0±0.5	>35	<8.5	Narrow Band
VPF-25C-10-40-10640	1064.0 ^{+3.0} _{-0.0}	YAG	10.0±2.0	>40	<8.5	Broad Band
VPF-25C-10-35-13000	1300.0 ^{+3.0} _{-0.0}	LD	10.0±2.0	>35	<8.5	Narrow Band
VPF-25C-10-30-15000	1500.0 ^{+3.0} _{-0.0}	LD	10.0±2.0	>30	<8.5	Narrow Band
VPF-25C-10-30-15500	1550.0 ^{+3.0} _{-0.0}	LD	10.0±2.0	>30	<8.5	Narrow Band

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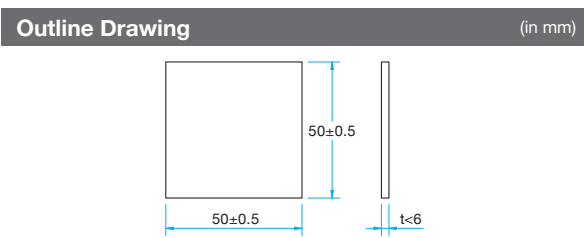
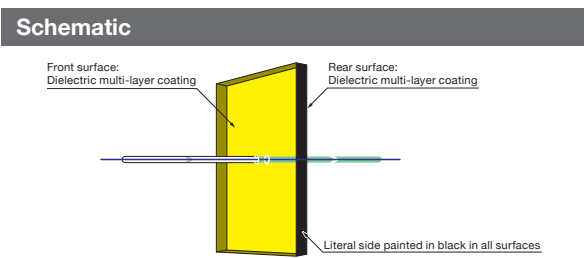
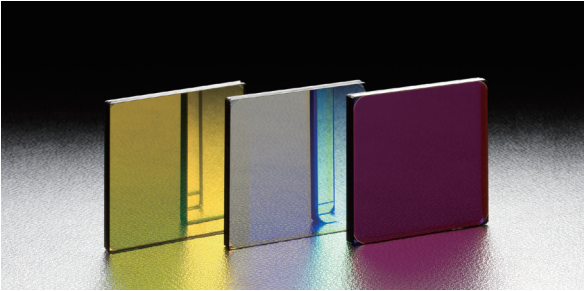
Colored Glass Filters

Dielectric Filters

Etalon

VPF band pass filter with effective diameter at 45mm square or larger.
Fit for experimentation that needs large collimated light incident on sample or on a large diverges light where requires a larger size band pass filter.

- The filters are made of dielectric coating and metallic coating which assure a steep rise and a sharp cut-off spectrum.
- A selection of filter from the spectrum half bandwidth from 10nm to 12nm, the center spectrum from 400nm to 900nm with 10nm increments.
- The whole lateral side of the filter is painted in black for avoiding scattered light effects.



400nm – 650nm			
Part Number	Central wavelength [nm]	Half bandwidth [nm]	Maximum transmittance [%]
VPF-50S-10-45-40000	400±2	10±2	>45
VPF-50S-10-45-41000	410±2	10±2	>45
VPF-50S-10-45-42000	420±2	10±2	>45
VPF-50S-10-45-43000	430±2	10±2	>45
VPF-50S-10-45-44000	440±2	10±2	>45
VPF-50S-10-50-45000	450±2	10±2	>50
VPF-50S-10-50-46000	460±2	10±2	>50
VPF-50S-10-50-47000	470±2	10±2	>50
VPF-50S-10-50-48000	480±2	10±2	>50
VPF-50S-10-50-49000	490±2	10±2	>50
VPF-50S-10-55-50000	500±2	10±2	>55
VPF-50S-10-55-51000	510±2	10±2	>55
VPF-50S-10-55-52000	520±2	10±2	>55
VPF-50S-10-55-53000	530±2	10±2	>55
VPF-50S-10-55-54000	540±2	10±2	>55
VPF-50S-10-60-55000	550±2	10±2	>60
VPF-50S-10-60-56000	560±2	10±2	>60
VPF-50S-10-60-57000	570±2	10±2	>60
VPF-50S-10-60-58000	580±2	10±2	>60
VPF-50S-10-60-59000	590±2	10±2	>60
VPF-50S-12-60-60000	600±2	12±2	>60
VPF-50S-12-60-61000	610±2	12±2	>60
VPF-50S-12-60-62000	620±2	12±2	>60
VPF-50S-12-60-63000	630±2	12±2	>60
VPF-50S-12-60-64000	640±2	12±2	>60
VPF-50S-12-60-65000	650±2	12±2	>60

Compatible Optic Mounts

CHA-60

Specifications

Material	Optical Glass
Clear aperture	≥45×45mm
Blocking range	0.01% (1 – 1200nm)
Incident angle	0°
Coating	Dielectric multi-layer coating

- Guide**
- ▶ For filter size of diameter 25mm, please see VPF-25C at page B254 or see the high transmittance filter interference filter at page B251.
 - ▶ For customized size or form which is not mentioned in this catalog or for any specific holder for this filter, please contact our International Sales Division.

- Attention**
- ▶ Heatproof temperature at 80°C (Celsius) as maximum, please avoid using it to high temperature light-source.
 - ▶ The filters are heat absorptive, therefore they are not fit to use with high power laser and high energy pulsed laser.
 - ▶ The filters characteristic depends on the angle of incident. The angle of the light axis is tilted, the center wavelength is shifted to short-wavelength side and the transmittance may decrease too. More the selected spectrum width is precise more the inclination tolerance is small. Make sure that the incident angle is set at 0 degrees for an efficient experiment.
 - ▶ The filters usage temperature of environment is set at 23°C (Celsius), more the temperature is high more the center wavelength switch to the long-wavelength side.
 - ▶ Therefore a high precision set up is required for obtaining an efficient experiment each filter thickness is different.

660nm – 900nm			
Part Number	Central wavelength [nm]	Half bandwidth [nm]	Maximum transmittance [%]
VPF-50S-12-60-66000	660±2	12±2	>60
VPF-50S-12-60-67000	670±2	12±2	>60
VPF-50S-12-60-68000	680±2	12±2	>60
VPF-50S-12-60-69000	690±2	12±2	>60
VPF-50S-12-65-70000	700±2	12±3	>65
VPF-50S-12-65-71000	710±3	12±3	>65
VPF-50S-12-65-72000	720±3	12±3	>65
VPF-50S-12-65-73000	730±3	12±3	>65
VPF-50S-12-65-74000	740±3	12±3	>65
VPF-50S-12-65-75000	750±3	12±3	>65
VPF-50S-12-65-76000	760±3	12±3	>65
VPF-50S-12-65-77000	770±3	12±3	>65
VPF-50S-12-65-78000	780±3	12±3	>65
VPF-50S-12-65-79000	790±3	12±3	>65
VPF-50S-12-65-80000	800±3	12±3	>65
VPF-50S-12-65-81000	810±3	12±3	>65
VPF-50S-12-65-82000	820±3	12±3	>65
VPF-50S-12-65-83000	830±3	12±3	>65
VPF-50S-12-65-84000	840±3	12±3	>65
VPF-50S-12-65-85000	850±3	12±3	>65
VPF-50S-12-65-86000	860±3	12±3	>65
VPF-50S-12-65-87000	870±3	12±3	>65
VPF-50S-12-65-88000	880±3	12±3	>65
VPF-50S-12-65-89000	890±3	12±3	>65
VPF-50S-12-65-90000	900±3	12±3	>65

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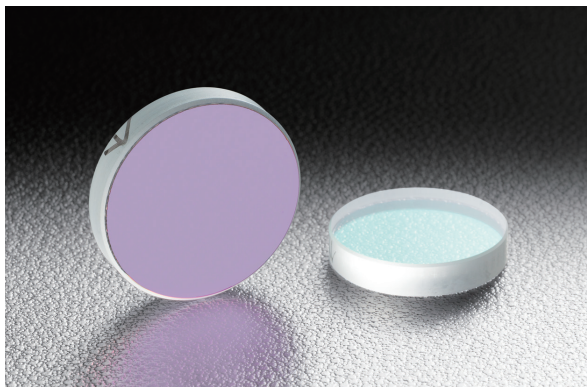
Colored Glass Filters

Dielectric Filters

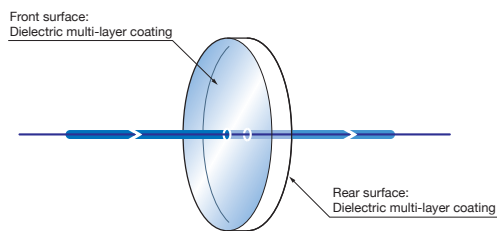
Etalon

Notch filter is a filter that cuts only a specific wavelength. It is not the same as the interference filter which transmits only a specific wavelength. By adopting a dielectric multilayer coating, very high stability and environmental resistance has been obtained.

- Four types is available for 355nm, 532nm, 633nm and 1064nm.
- Because it is a dielectric multilayer coating, there is almost no absorption of light by the coating.
- By using in combination with other filters, it can also be used as filter sets for Bio-Imaging.

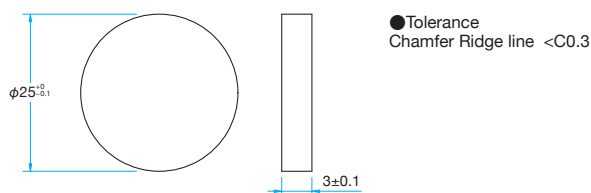


Schematic



Outline Drawing

(in mm)



Specifications

Material	Synthetic fused silica, BK7
Coating	Dielectric multi-layer coating
Incident angle	0°
Surface Quality (Scratch-Dig)	60-40
Clear aperture	90% of Actual Aperture

Guide

- ▶ Please contact our International Sales Division for customized products. (customized on outer diameter, wavelength characteristic, etc.)

Attention

- ▶ If the light incident angle is other than 0 degrees, the transmittance characteristics may be changed. In the normal situation, when the incident angle changes, the wavelength may shift to the long-wavelength side.
- ▶ Notch filter has a durable structure to the high temperature, but if it is put in the vicinity of the lamp that emits a powerful heat ray (e.g. mercury lamp), it will not be guaranteed for the performance of the filter and safety.

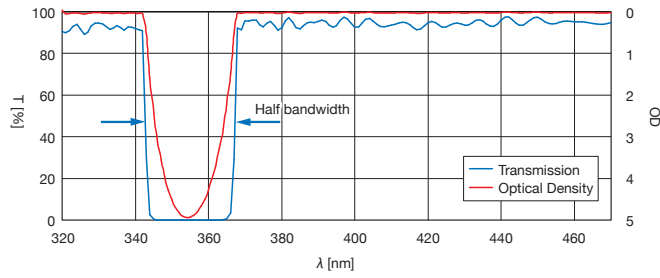
Specifications

Part Number	Cutoff wavelength [nm]	Optical Density OD	Half bandwidth [nm]	Transmittance Wavelength Ranges [nm]		transmission rate [%]	Material
NF-25C05-27-355	355	>4	27±2.7	320 – 335	375 – 500	Average 90	Synthetic fused silica
NF-25C05-40-532	532	>4	40±4.0	400 – 502	562 – 700	Average 90	BK7
NF-25C05-47-633	633	>4	47±4.7	475 – 597	669 – 850	Average 90	BK7
NF-25C05-80-1064	1064	>4	80±8.0	800 – 1004	1124 – 1400	Average 90	BK7

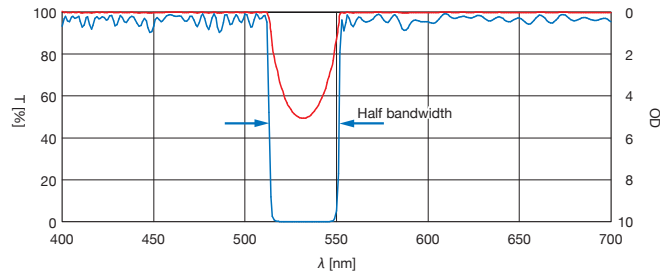
Typical Transmittance & Optical Density Data

OD: Optical Density T: Transmission

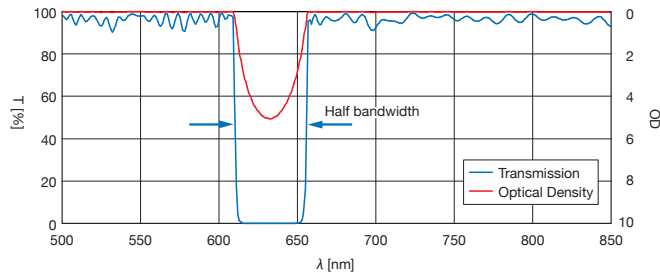
NF-25C05-27-355



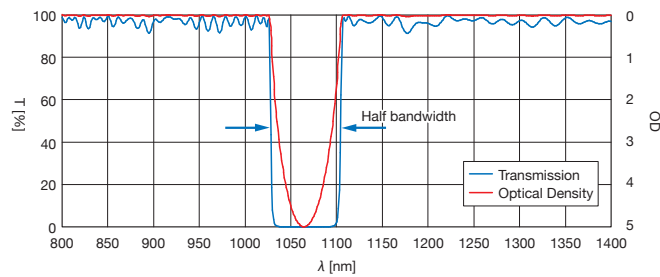
NF-25C05-40-532



NF-25C05-47-633



NF-25C05-80-1064



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Etaion

Polymer Notch Filter | Custom-made

RoHS Catalog Code W3211

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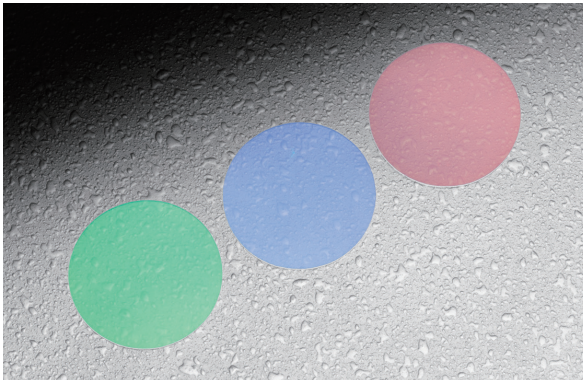
Colored Glass Filters

Dielectric Filters

Etalon

It is a polymer made notch filter that can be used for fluorescence microscopy, such as Raman spectroscopy. It blocks sharply so as not to transmit only a specific wavelength. Achieved that wavelength in the vicinity is a high transmittance. It is developed a notch filter of new ideas that is not using expensive materials and glasses, achieved comparable half-width and OD with the coated optics. It is a product in which novel new usage is possible. For technical matters related to this product, Hamamatsu Photonics Co., Ltd. has applied a patent application.

- Since the substrate is not necessary, it realized 0.3mm thickness. And it realize space saving by combining with other elements.
- Because it is a transparent synthetic polymer material which is chemically stable, it can be equivalent to the treatment of the optical element product.
- It can be used for Raman spectroscopy, and the excitation light cut of the fluorescence microscope.
- It is also available a filter with frame for easy handling.



Specifications

Material	Macromolecule (Block copolymers of Poliestireno-Acrylic resin)
Coating	Uncoated
Incident angle	0°
Ripple	≤2.5%

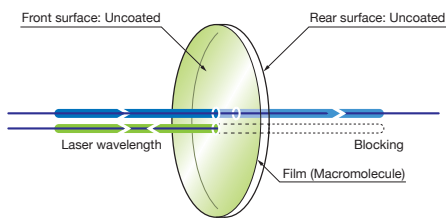
Guide

- ▶ If irregular shape or a large size is required, please consult our International Sales Division.
- ▶ For the custom wavelength filter which is not listed in catalog, please contact our International Sales Division.

Attention

- ▶ Because it is a flammable material, it can not be used for high-power laser.
- ▶ If it is used with tilted the filter, it will not be able to cut off the light of wavelength cut. If the incident angle increases, the cut wavelength is shifted to the short wavelength side.
- ▶ As filter is thin, it may surface distribution will occur or cutting off wavelength is changed if it is used in a state of being distorted and bent.
- ▶ Because material is so soft it is easy to be scratched if rubbed with a cloth or paper, use an air duster to blow off the dust or dirt.

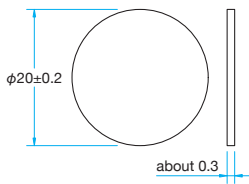
Schematic



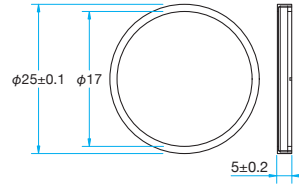
Outline Drawing

(in mm)

● Film type



● Mount type



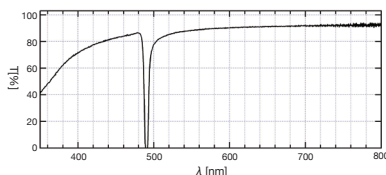
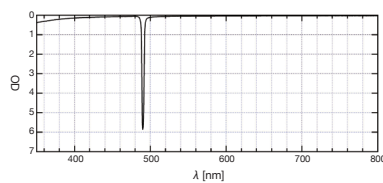
Specifications (Reference data)

Blocking wavelength [nm]	Optical Density OD	Half bandwidth [nm]	Long wavelength Ranges transmission rate [%]	transmission rate at 400nm [%]	Short wavelength Ranges [%]
488	>4	<40	> Average 82	> about 50	Ave about 60
532	>4	<40	> Average 82	> about 40	Ave about 60
633	>4	<40	> Average 82	> about 30	Ave about 60

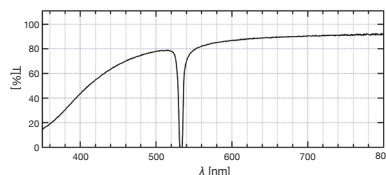
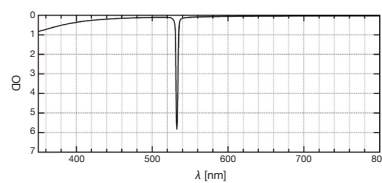
Typical Transmittance & Optical Density Data

OD: Optical Density T: Transmission

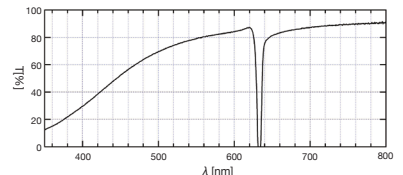
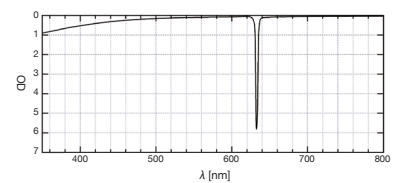
■ Blocking wavelength 488nm



■ Blocking wavelength 532nm



■ Blocking wavelength 633nm



Filter Case



Please contact to our sales division when convenient filter case is required for storage of filter products in the catalog.

Specifications			
Part Number	Compatible Optics Size	Maximum number of filters	Size [mm]
Case-25C-20-SET	φ25mm	20 pieces	(W)240 × (D)100 × (H)67
Case-50C-15-SET	□50mm	15 pieces	(W)240 × (D)100 × (H)67

Contact sheet for Custom-made Color Filter

Estimation Order

Date

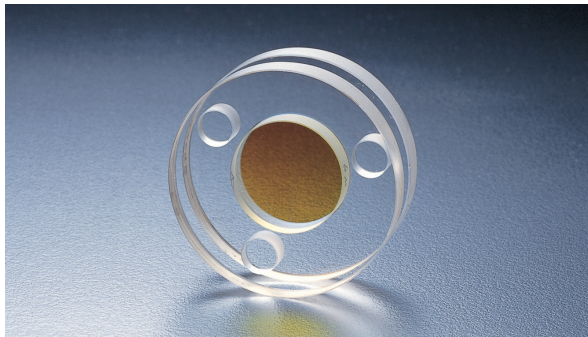
To: Sigma Koki Co., Ltd. **FAX +81-3-5638-6550**

Affiliation (Organization Name)				
Department		Name		
TEL	FAX	E-mail		
Country/Address				
Name & Designation		(Tentative name is okay)		
Drawing Number		Estimate	<input type="checkbox"/> Yes: by Date <input type="checkbox"/> No	
Desired Delivery Date		Budget	JP Yen	
Mount	<input type="checkbox"/> Yes <input type="checkbox"/> No	Pieces		
Central wavelength	nm	Half bandwidth	nm	
Transmittance Range	nm	Optical Density	%	
Outside dimension			φA	mm
			a	mm
			b	mm
* Write more detailed specifications here. (Rough illustration is acceptable.)				
Others				

Sigma Koki Co., Ltd.

Etalon is made of two parallel high reflecting mirrors and used as a narrow band filter. Widely used in astronomical observation and interferometer measurement.

- The etalons are customized according to your application; we are proposing 4 basic choices. Please see the illustrations.
- Please fill your requirement details onto the following inquiry form; our sales division personnel will contact you for a quotation.



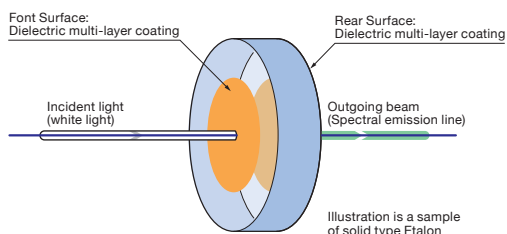
Specifications

Material	Synthetic fused silica
Surface flatness of substrate	$\lambda/20 (\lambda=632.8\text{nm})$
Incident angle	0°

Attention

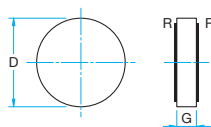
- ▶ If the angle of incident is not correctly set the transmittance wavelength may be displaced or the light does not transmit as planned.
- ▶ Question about the characteristic of the finesse or the transmission of the Etalon, please contact our International Sales Division.
- ▶ The lead time of some model are expected to be long for further information, please contact our International Sales Division.

Schematic



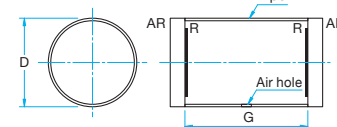
Outline Drawing (in mm)

● **Solid Etalon**



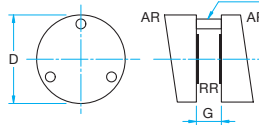
Simple structure and easy to use but the characteristic depends on the refractive index of the glass.

● **Tube type: pair Etalon**



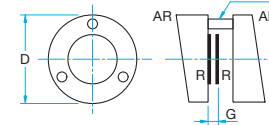
Air spaced with no effects from refractivity of the glass. The resonator is covered, less noise effects from outside.

● **3 pieces pair Etalon**



Air spaced with no effects from refractivity of the glass. The resonator is uncovered, easy to be effected by noise.

● **4 pieces pair Etalon**



Air spaced with no effects from refractivity of the glass. The resonator length is narrow which enable to get a wider FSR (Free Spectral Range).

R = Dielectric multi-layer coating (high reflectance) AR = Anti-reflective coating

Contact sheet for Etalon

Estimation Order

Date

To: **Sigma Koki Co., Ltd. FAX +81-3-5638-6550**

Affiliation (Organization Name)			
Department		Name	
TEL	FAX	E-mail	
Country/Address			
Name & Designation		(Tentative name is okay)	
Drawing Number		Estimate	<input type="checkbox"/> Yes: by Date
Desired Delivery Date			<input type="checkbox"/> No
Type		Budget	JP Yen
Wavelength	nm	Diameter (D)	nm
Reflectance	nm	Incident beam	%
Others			

* Write more detailed specifications here. (Rough illustration is acceptable.)

Sigma Koki Co., Ltd.