

Neutral Density (ND) Filters

Neutral Density (ND) Filters

ND filters reduce evenly the transmittance of light over the entire VIS spectrum. They decrease the brightness of an image without changing the depth of field (DoF). They attenuate light by absorbing a part of the energy of the VIS wavelength, without influence on the color balance. ND filters are used to control the intensity of light going through an optical system to avoid over-exposure, blooming on imaging sensors and prevent damages on light sensitive measuring sensors.

ND filters are available unmounted in sizes 8 mm to 74 mm diameter and mounted with common thread sizes M 25.5 to M 67.



Call us to discuss your OEM and custom requirements.

Key Features

- Sizes 8 mm to 74 mm diameter.
- Mounted with common thread sizes M 25.5 to M 67 available
- Insensitive to angle of incidence
- Decrease brightness without changing Depth of Field
- Optical density range 0.3 to 3.0
- Stackable, combine ND-filters to achieve OD needed
- Even attenuate avoid effects on color balance

Applications

- Welding
- Measuring Instruments
- R&D
- Laser Measurement

Technical Specifications

Filter type	IF 101, IF 102, IF 103, IF 106, IF 110
Surface ¹	5/2 × 0.16
Wave front distortion ¹	13/1 (0.5)
Parallelism	1 arc minute
Diameter tolerance	+0 - 0.3 mm
Thickness ²	1.65 – 2.30 ± 0.1 mm

¹ Specification according to ISO 10110

² Depending on filter type

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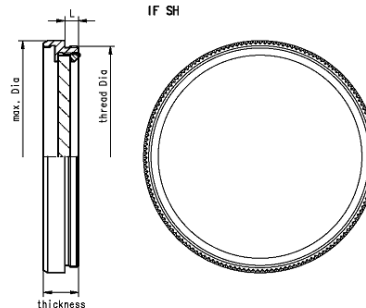
Neutral Density (ND) Filters

IF 101, IF 102, IF 103, IF 106, IF 110

Neutral Density (ND) Filters

ND filters decrease the brightness of an image without changing the depth of field (DoF). They attenuate light by absorbing a part of the energy of the VIS wavelength, without influence on the color balance. The optical density (OD) is a function of the thickness of the glass. ODs are additive, achieve a higher value by adding several ODs together, than stack according filters until needed OD is reached. Filters IF 101 (OD 0.3), IF 102 (OD 0.6) and IF 103 (OD 0.9) come with broadband AR coating E.

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Applications

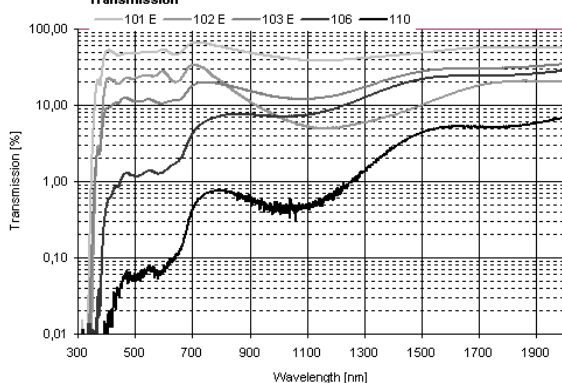
- Welding
- Measuring Instruments
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Technical Specifications

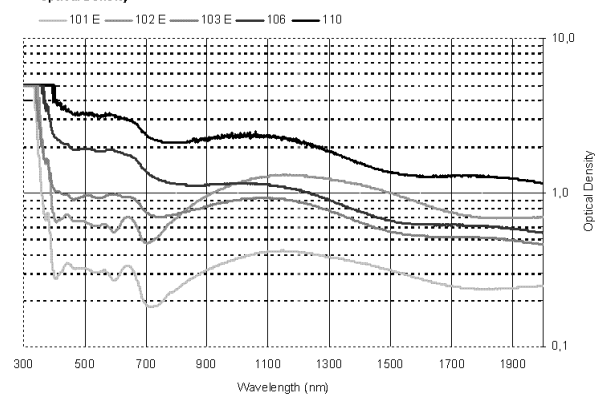
Filter type	IF 101	IF 102	IF 103	IF 106	IF 110		
Wavelength range	380 nm - 580 nm					Wave front distortion ¹	13/1 (0.5)
Optical density	0.3	0.6	0.9	1.8	3.0	Parallelism	1 arc minute
Transmittance	50 %	25 %	12.5 %	1.6 %	0.1 %	Diameter	8 - 74 mm
Thickness	2.0 mm	2.3 mm	1.65 mm	1.8 mm	2.15 mm	Diameter tolerance	+0 - 0.3 mm
Surface ¹	5/2 × 0.16					Thickness	2.0 ± 0.2 mm

¹ Specification according to ISO 10110

Neutral Density Filters 101, 102, 103, 106, 110
Transmission



Neutral Density Filters 101, 102, 103, 106, 110
Optical Density



Order Instructions:																										
Mounted filter:	IF																									
Unmounted filter glass:	IFG																									
Type:	101, 102, 103, 106, 110																									
Coating:	E single broadband coating (only for IF 101, IF 102 and IF 103) Uncoated (IF 106 and IF 110)																									
Mount:	SH (standard M- thread mounts) SN-1 (only for 30.5mm) CMT (C-mount)																									
Size:	Thread of mount for mounted filters (IF) or Diameter in mm for unmounted glass (IFG)																									
Examples:	<table border="0"> <tr> <td>IFx</td> <td>type</td> <td>coating</td> <td>mount</td> <td>size</td> </tr> <tr> <td>IF</td> <td>102</td> <td>E</td> <td>SN1</td> <td>30.5</td> </tr> <tr> <td>Mounted filter,</td> <td>ND 0.6,</td> <td>single layer AR,</td> <td>thread size</td> <td>M 30.5</td> </tr> <tr> <td>IFG</td> <td>110</td> <td></td> <td></td> <td>34.0</td> </tr> <tr> <td>Unmounted filter, ND 3.0,</td> <td>uncoated,</td> <td></td> <td></td> <td>diameter 34.0 mm</td> </tr> </table>	IFx	type	coating	mount	size	IF	102	E	SN1	30.5	Mounted filter,	ND 0.6,	single layer AR,	thread size	M 30.5	IFG	110			34.0	Unmounted filter, ND 3.0,	uncoated,			diameter 34.0 mm
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Standard Filters

Part Number	Filter Description	Part Number	Filter Description
1001935	IF 101 E SH 025.5	1001938	IF 102 E SH 025.5
1001936	IF 101 E SH 027.0	1001939	IF 102 E SH 027.0
1006983	IF 101 E SN1 030.5	1006984	IF 102 E SN1 030.5
1053794	IF 101 E SH 040.5	1053795	IF 102 E SH 040.5
1053793	IF 101 E SH 049.0	1012481	IF 102 E SH 046.0
1001937	IF 101 E SH 052.0	1001947	IF 102 E SH 049.0
		1001940	IF 102 E SH 052.0

1001941	IF 103 E SH 025.5	1013282	IF 106 SH 025.5
1001942	IF 103 E SH 027.0	1001944	IF 106 SH 027.0
1006985	IF 103 E SN1 030.5	1009109	IF 106 SH 034.0
1053796	IF 103 E SH 037.0	1019191	IF 106 SH 040.5
1011654	IF 103 E SH 040.5	1012483	IF 106 SH 046.0
1012482	IF 103 E SH 046.0	1036561	IF 106 SH 049.0
1001943	IF 103 E SH 049.0	1001945	IF 106 SH 052.0
1011926	IF 103 E SH 052.0	1005751	IF 106 SH 055.0
1011927	IF 103 E SH 055.0		

15422	IF 110 SN1 030.5
1011928	IF 110 SH 052.0

Other mounts and as unmounted versions from 8 - 74 mm diameter on request available.
Call us for OEM and custom requirements.