



## SELECTION GUIDE

DIAGRAM	PRODUCT TYPE	FWHM	TRANSMISSION (%)	BLOCKING OPTICAL DENSITY	APPLICATIONS	PAGE
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### Transmission Filters

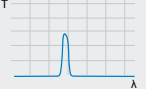
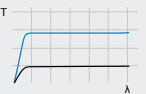
	<b>INTERFERENCE FILTERS:</b> F-UV, F-VIS, F-NIR	1.5 – 70nm depending on CWL	12–70 (peak) depending on CWL	3 - 4	Laser-line clean-up	151
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DIAGRAM	PRODUCT TYPE	TRANSMISSION (%)	BLOCKING OPTICAL DENSITY	APPLICATIONS	PAGE
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### Neutral Density and Specialty Filters

	<b>METALLIC NEUTRAL DENSITY FILTERS:</b> NDQ, FSQ	0.01 – 79.43	0.1 - 4.0	Broadband attenuation	153
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# BANDPASS INTERFERENCE FILTERS, UV & VISIBLE (355 – 749NM): F-UV, F-VIS



## Specifications

Product Code: **F-UV, F-VIS**

Bandpass Interference Filters: Visible (355 - 749nm)

Diameter Tolerance: +0/-0.25mm

Thickness Tolerance: 6.35mm (nominal)

Surface Figure: Commercial Polish

Surface Quality: 80-50 scratch-dig per MIL-PRF-13830b

Center Wavelength:  $\lambda_c \pm 0.2 \times \text{FWHM}$

Bandwidth Tolerance:  $\text{FWHM} \pm 20\%$

Blocking Minimum: x-ray to 1200nm

Clear Aperture:  $\varnothing = 12.5\text{mm}$ : 9.0mm,  $\varnothing = 25.0\text{mm}$ : 21.0mm,  $\varnothing = 50.0\text{mm}$ : 45.0mm

Mounting: Black-anodized aluminum ring

- ▶ Out of band rejection of Optical Density (OD)  $\geq 4$  average and  $\geq \text{OD } 3$  absolute
- ▶ Custom options are available for center wavelength, bandwidth, optical blocking, and size
- ▶ Unmounted option also available

Visit [cvilaseroptics.com](http://cvilaseroptics.com) for additional traces.

### BANDPASS INTERFERENCE FILTERS, VISIBLE (355 - 749nm)

$\lambda_c$ (nm)	FWHM (nm)	Minimum $T_{\text{peak}}$ (%)	25.0 (mm)
355	10 ± 2	25	F10-355.0-4-25.0M
400	10 ± 2	25	F10-400.0-4-25.0M
400	40 ± 8.0	35	F40-400.0-4-25.0M
405	10 ± 2	30	F10-405.0-4-25.0M
420	10 ± 2	40	F10-420.0-4-25.0M
430	10 ± 2	40	F10-430.0-4-25.0M
435.8	10 ± 2	40	F10-435.8-4-25.0M
450	10 ± 2	45	F10-450.0-4-25.0M
450	40 ± 8.0	45	F40-450.0-4-25.0M
470	10 ± 2	45	F10-470.0-4-25.0M
500	10 ± 2	45	F10-500.0-4-25.0M
510	10 ± 2	45	F10-510.0-4-25.0M
514.5	10 ± 2	50	F10-514.5-4-25.0M
527	10 ± 2	45	F10-527.0-4-25.0M
532	1.5 ± 0.3	30	F1.5-532.0-4-25.0M
532	3 ± 0.6	35	F03-532.0-4-25.0M
532	10 ± 2	45	F10-532.0-4-25.0M
550	40 ± 8.0	50	F40-550.0-4-25.0M
550	70 ± 14.0	60	F70-550.0-4-25.0M
560	10 ± 2	50	F10-560.0-4-25.0M
570	10 ± 2	50	F10-570.0-4-25.0M
577	10 ± 2	50	F10-577.0-4-25.0M
580	10 ± 2	50	F10-580.0-4-25.0M
589.6	1.5 ± 0.3	35	F1.5-589.6-4-25.0M
600	10 ± 2	50	F10-600.0-4-25.0M
600	40 ± 8.0	50	F40-600.0-4-25.0M
630	10 ± 2	50	F10-630.0-4-25.0M
632.8	10 ± 2	50	F10-632.8-4-25.0M
635	10 ± 2	50	F10-635.0-4-25.0M
650	40 ± 8.0	50	F40-650.0-4-25.0M
656.2	1.5 ± 0.3	35	F1.5-656.2-4-25.0M
656.2	10 ± 2	50	F10-656.2-4-25.0M
660	10 ± 2	50	F10-660.0-4-25.0M
670	10 ± 2	50	F10-670.0-4-25.0M
700	10 ± 2	50	F10-700.0-4-25.0M
700	40 ± 8.0	50	F40-700.0-4-25.0M

## BANDPASS INTERFERENCE FILTERS, NEAR IR (701 – 1200nm): F-NIR



- ▶ Out of band rejection of Optical Density (OD)  $\geq 4$  average and  $\geq 3$  absolute
- ▶ Custom options are available for center wavelength, bandwidth, optical blocking, and size
- ▶ Contact an applications engineer for more information on custom parts

Visit [cvilaseroptics.com](http://cvilaseroptics.com) for additional traces.

### Specifications

Product Code: **F-NIR**

Bandpass Interference Filters: Near IR (750 - 1200nm)

Diameter Tolerance:  $\pm 0/-0.25$ mm

Thickness Tolerance: 6.35mm (nominal)

Surface Figure: Commercial Polish

Surface Quality: 80-50 scratch-dig per MIL-PRF-13830b

Center Wavelength:  $\lambda_c \pm 0.2 \times \text{FWHM}$

Bandwidth Tolerance:  $\text{FWHM} \pm 20\%$

Blocking Minimum: x-ray to 3500+nm

Clear Aperture:  $\varnothing=12.5$ mm: 9.0mm,  $\varnothing=25.0$ mm: 21.0mm,  $\varnothing=50.0$ mm: 45.0mm

Mounting: Black-anodized aluminum ring

### BANDPASS INTERFERENCE FILTERS, NEAR IR (750 - 1200nm)

$\lambda_c$ (nm)	FWHM (nm)	Minimum $T_{\text{peak}}$ (%)	25.0 (mm)
750	$40 \pm 8$	.0 50	<a href="#">F40-750.0-4-25.0M</a>
780	$10 \pm 2$	50	<a href="#">F10-780.0-4-25.0M</a>
785	$10 \pm 2$	50	<a href="#">F10-785.0-4-25.0M</a>
794.7	$1.5 \pm 0.3$	35	<a href="#">F1.5-794.7-4-25.0M</a>
794.7	$3 \pm 0.6$	40	<a href="#">F03-794.7-4-25.0M</a>
800	$10 \pm 2$	45	<a href="#">F10-800.0-4-25.0M</a>
800	$40 \pm 8$	60	<a href="#">F40-800.0-4-25.0M</a>
830	$10 \pm 2$	50	<a href="#">F10-830.0-4-25.0M</a>
850	$10 \pm 2$	50	<a href="#">F10-850.0-4-25.0M</a>
850	$40 \pm 8$	50	<a href="#">F40-850.0-4-25.0M</a>
900	$10 \pm 2$	45	<a href="#">F10-900.0-4-25.0M</a>
950	$10 \pm 2$	45	<a href="#">F10-950.0-4-25.0M</a>
950	$40 \pm 8.0$	45	<a href="#">F40-950.0-4-25.0M</a>
1000	$10 \pm 2$	45	<a href="#">F10-1000.0-4-25.0M</a>
1064	$3 \pm 0.6$	40	<a href="#">F03-1064.0-4-25.0M</a>
1064	$10 \pm 2$	50	<a href="#">F10-1064.0-4-25.0M</a>
1200	$10 \pm 2$	40	<a href="#">F10-1200.0-4-25.0M</a>

## METALLIC NEUTRAL DENSITY FILTERS: NDQ



### Specifications

Product Code: **NDQ**

**Material:** Standard Grade Corning 7980 1-F or equivalent (Fused Silica)

**Dimension Tolerance:**  $\pm 0.2\text{mm}$

**Diameter Tolerance:**  $\pm 0/-0.25\text{mm}$

**Thickness Tolerance:**  $2.0 \pm 0.2\text{mm}$

**Surface Quality:** 80-50 scratch-dig per MIL-PRF-13830b

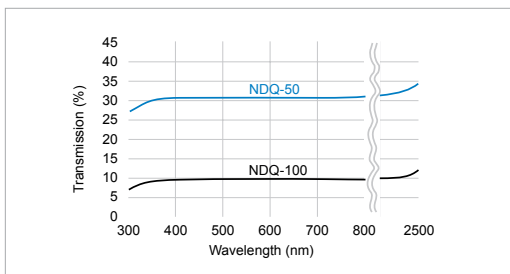
**Surface Flatness:**  $< 3\lambda$  p-v at 633nm per 25mm

**Density Tolerance:**  $\pm 5\%$  of optical density at 546nm

**Accuracy of Spectrophotometer Curves:** Between 200nm and 700nm  $\pm 1\%$  of full scale

**Parallelism:**  $< 3$  arc minutes

**Clear Aperture:**  $> 85\%$



Transmission vs. wavelength for NDQ-50 and NDQ-100 metallic neutral density filters

CVI Laser Optics metallic neutral density filters attenuate light through a combination of reflection and absorption. The alloy Inconel® creates a spectral-density curve that is flatter over a wider range than the curves of most pure metals and therefore allows the relative spectral distribution to be maintained.

- ▶ Uniform light attenuation over a broad spectrum
- ▶ Operational temperature range:  $-73^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$
- ▶ Typical Laser Damage Threshold  $\leq 25$  Watts/cm<sup>2</sup>
- ▶ Ideal for wide aperture applications

### BUILD YOUR PART NUMBER

STEP-1	STEP-2	STEP-3
PRODUCT CODE	OPTICAL DENSITY CODE	SIZE CODE
<b>NDQ</b>	<b>100</b>	<b>50.0 X 50.0 M</b>
<b>EXAMPLE: NDQ-100-50.0 X 50.0 M</b>		

### CHOOSE FROM THE OPTIONS BELOW.

1. PRODUCT CODE	SUBSTRATE MATERIAL
<b>NDQ</b>	Fused Silica

2. OPTICAL DENSITY CODE	OPTICAL DENSITY	~ % T
<b>10</b>	0.10	79.4
<b>20</b>	0.20	63.1
<b>30</b>	0.30	50.1
<b>40</b>	0.40	39.8
<b>50</b>	0.50	31.6
<b>60</b>	0.60	25.1
<b>70</b>	0.70	20.0
<b>80</b>	0.80	15.8
<b>90</b>	0.90	12.6
<b>100</b>	1.00	10.0
<b>150</b>	1.50	3.2
<b>200</b>	2.00	1.0
<b>300</b>	3.00	0.1
<b>400</b>	4.00	0.01

3. SIZE CODE	SIZE
<b>0.50</b>	12.7mm
<b>25.0 M</b>	25.0mm
<b>1.00</b>	25.4mm
<b>50.0 X 50.0 M</b>	50.0mm x 50.0mm

Visit [cvilaseroptics.com](http://cvilaseroptics.com) for additional traces.

## METALLIC NEUTRAL DENSITY FILTER SETS: FSQ



- ▶ CVI Laser Optics offers a selection of metallic ND filter sets to provide a broad range of filter options.
- ▶ Filters include individual density curves and wooden storage box

### Specifications

Product Code: **FSQ**

**Optical Material:**

Standard Grade Corning 7980 (Fused Silica)

**Density Tolerance:**  $\pm 5\%$  of optical density at 546nm,  
 $\pm 0.02$  density for density  $>1.0$

**Thickness:**  $2.0 \pm 0.2$ mm

**Surface Flatness:**  $< 3 \lambda$  p-v at 633nm per 25mm

**Surface Quality:** 80-50 scratch-dig per MIL-PRF-13830b

#### METALLIC NEUTRAL DENSITY FILTER SETS:

Standard Grade Corning 7980 (Fused Silica)

Size (mm)	Number of Elements	Included Optical Densities (at 550nm)	PART NUMBER
□50.0 x 50	7	0.03*, 0.1, 0.3, 0.5, 1.0, 2.0, 3.0	<b>FSQ-50.0X50.0M</b>

\* This includes a blank substrate of N-BK7 (D0=0.0376) or fused silica (D0=0.0309), as appropriate.