

SELECTION GUIDE

DIAGRAM	PRODUCT TYPE	FWHM	TRANSMISSION (%)	BLOCKING OPTICAL DENSITY	APPLICATIONS	PAGE
---------	--------------	------	------------------	--------------------------	--------------	------

Transmission Filters

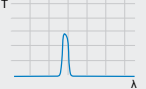
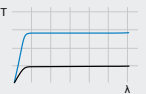
	INTERFERENCE FILTERS: F-UV, F-VIS, F-NIR	1.5 – 70nm depending on CWL	12–70 (peak) depending on CWL	3 - 4	Laser-line clean-up	151
-----------------------------------------------------------------------------------	-------------------------------------------------	-----------------------------	-------------------------------	-------	---------------------	------------

DIAGRAM	PRODUCT TYPE	TRANSMISSION (%)	BLOCKING OPTICAL DENSITY	APPLICATIONS	PAGE
---------	--------------	------------------	--------------------------	--------------	------

Neutral Density and Specialty Filters

	METALLIC NEUTRAL DENSITY FILTERS: NDQ, FSQ	0.01 – 79.43	0.1 - 4.0	Broadband attenuation	153
-----------------------------------------------------------------------------------	---------------------------------------------------	--------------	-----------	-----------------------	------------

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) ≥ 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 for additional traces.

BANDPASS INTERFERENCE FILTERS, VISIBLE (355 - 749nm)

λ_c (nm)	FWHM (nm)	Minimum T_{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) ≥ 4 average and ≥ 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 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)

λ_c (nm)	FWHM (nm)	Minimum T_{peak} (%)	25.0 (mm)
750	40 ± 8	.0 50	F40-750.0-4-25.0M
780	10 ± 2	50	F10-780.0-4-25.0M
785	10 ± 2	50	F10-785.0-4-25.0M
794.7	1.5 ± 0.3	35	F1.5-794.7-4-25.0M
794.7	3 ± 0.6	40	F03-794.7-4-25.0M
800	10 ± 2	45	F10-800.0-4-25.0M
800	40 ± 8	60	F40-800.0-4-25.0M
830	10 ± 2	50	F10-830.0-4-25.0M
850	10 ± 2	50	F10-850.0-4-25.0M
850	40 ± 8	50	F40-850.0-4-25.0M
900	10 ± 2	45	F10-900.0-4-25.0M
950	10 ± 2	45	F10-950.0-4-25.0M
950	40 ± 8.0	45	F40-950.0-4-25.0M
1000	10 ± 2	45	F10-1000.0-4-25.0M
1064	3 ± 0.6	40	F03-1064.0-4-25.0M
1064	10 ± 2	50	F10-1064.0-4-25.0M
1200	10 ± 2	40	F10-1200.0-4-25.0M

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

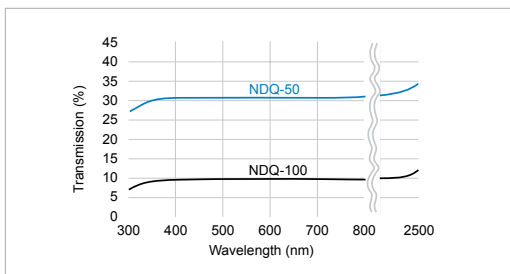
Surface Flatness: $< 3\lambda$ p-v at 633nm per 25mm

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°C to $+150^{\circ}\text{C}$
- ▶ Typical Laser Damage Threshold ≤ 25 Watts/cm²
- ▶ Ideal for wide aperture applications

BUILD YOUR PART NUMBER

STEP-1	STEP-2	STEP-3
PRODUCT CODE	OPTICAL DENSITY CODE	SIZE CODE
NDQ	100	50.0 X 50.0 M

EXAMPLE: NDQ-100-50.0 X 50.0 M

CHOOSE FROM THE OPTIONS BELOW.

1. PRODUCT CODE	SUBSTRATE MATERIAL
NDQ	Fused Silica

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

3. SIZE CODE	SIZE
0.50	12.7mm
25.0 M	25.0mm
1.00	25.4mm
50.0 X 50.0 M	50.0mm x 50.0mm

Visit 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,
 ± 0.02 density for density >1.0

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

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	FSQ-50.0X50.0M

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