

NEUTRAL DENSITY FILTERS for INFRARED LASER BEAMS

THz QCL CO₂ FEL OPO HF Telcom Nd:YAG Ti:S



GF 01

fixed attenuation
high power
broadband IR

LASNIX neutral density filters are precision components to reduce laser beam power. All beam parameters apart from power stay unaffected. The filters are designed for simple alignment and ease of use.

The attenuation principle is based on proprietary **free-standing metal grid** technology introduced by LASNIX in 1984. Originally developed for high-power CO₂ lasers, these grids have been tailored to accommodate the complete infrared spectrum from 0.7 to 1200 μm . Remarkably high power handling up to 30 kW c.w. has been achieved.

Since the grids are freely suspended, i.e. have **no substrate**, they can not deviate or offset the beam—in contrast to usual, substrate-based optical elements. Dispersion and phase effects on femtosecond pulses are negligible.

In the filter, a precision fabricated metal grid diffracts a calibrated percentage of power out of the beam. The rejected power is absorbed in the walls of the water-coolable housing. The attenuated output beam passes undeviated (in diffraction terms, this beam represents the zeroth order). The mode structure and all other beam properties, including the divergence and M^2 parameters are fully preserved, as well as the (arbitrary) polarization.

Applications:
easy power setting
beam quality assurance
nonlinear interactions
detector calibration
heterodyne systems

LASNIX

LASNIX NEUTRAL DENSITY FILTERS

beam quality guarantee:

- angular beam deviation < 5 μ rad
- wavefront distortion < 1/100 λ
- beam offset < 1 μ m
- mode distortion < 0.2 db
- polarization distortion < 0.05 db
- back reflection < -30 db

attenuator specifications:

- spectral flatness +/- 0.5 db
- resettability of step +/- 0.05 db
- additivity of steps +/- 0.03 db

Standard filters cover wide infrared bands between 0.7 and 1200 μ m.

The power loss of a standard filter is 10 db, corresponding to a transmittance between of 10%. Other values between 3 db and 10 db can be supplied on a custom basis.

Input powers up to 200 W c.w. (or quasi-c.w.) are allowed. The specified limits apply to relatively wide beams which fill at least half the specified aperture area in a smooth manner. This corresponds to a fundamental mode having a $1/e^2$ beam width of about 2/3 of the aper-

ture diameter. For narrower beams the power limits scale down linearly. For example, a limit of 200 W reduces to 100 W when the $1/e^2$ width narrows from 2/3 to 1/3 of the aperture diameter.

The angular alignment within the clear aperture is un-critical. The laser beam input can be from either side.

A tapped hole M8 is provided at the base. We also supply a transition post with 1/4-20 thread.

Cooling water flow is necessary only when the input power exceeds 10 W.

Model No.	Wavelength Range	Attenuation (nom.) per element	Attenuation total	Power Limit	Fluence Limit	Clear Aperture	Length	Weight
	μ m	db	db	W	J/cm ²	mm	mm	kg
GF 01	8 - 36*	10	10	200	20	11	83	0.1

* inquire for other wavelength ranges

For ordering write or call

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