

## INTERFERENCE FILTER TERMINOLOGY

**Interference Filter:** A interference filter is used to isolate and transmit a narrow wavelength that is required and block all other wavelengths.

**Bandpass:** The wavelength range (or band) where transmission is allowed to be passed by a wavelength selective optical component. Transmission above or below the wavelength is restricted through absorption and/or reflection.

**Blocking:** The undesired filter transmittance outside the pass-band/ band-pass region. Absolute blocking is the transmittance level not exceeded at any point in the specified wavelength range. Average blocking is a value averaged over a range.

**Full-width Half-Maximum (HBW, FWHM):** The bandwidth as measured at half-power points.

**Centre Wavelength (CWL):** The wavelength at the midpoint of the half power bandwidth (FWHM).

**Filter Cavity:** An optical "sandwich" of two evaporated stacks of dielectric reflective layers separated by a dielectric spacer layer. Interference filters can be constructed with one or several cavities arranged in series. Our standard range of interference filters are 3 cavity type.

**Peak Transmission (T):** The guaranteed transmission percentage in the passband. Not necessarily at the centre wavelength but over the pass band.

### Technical Notes

To estimate the transmittance near the passband, use the bandwidth ratios given in "specifications" e.g. 340FIB12 has HBW-10; for FIB range  $1\%BW/HBW=1.99$ , so  $1\%BW=19.9$ ; i.e transmittance will be 1% of peak (about 0.3% absolute) at  $340nm \pm (19.9/2)$ , i.e. about 30nm and 350nm.

For light incident at an angle the centre wavelength  $\lambda(\theta)=\lambda (1-k \sin^2\theta)$  where k is approximately 0.24 for FIW filters and 0.11 for all others.

The CWL shifts towards the longer wavelengths with increasing temperature at about 0.1nm/K