Interference bandpass 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/ Out-of-band 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. Out-of-band blocking is often termed as “OD value”

- OD1 = 10% transmission
- OD2 = 1% transmission
- OD3 = 0.1% transmission
- OD4 = 0.01% transmission
- OD5 = 0.001% transmission

**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.

**Scribing:**
Removal of the outer diameter of coating layer, outside of the clear aperture. This process is carried out prior to critical bonding process.

**Temperature effect on Interference band pass filters**
%T will not change with temperature. The CWL drift is approximately 0.02nm/Degree C. Cooling will decrease CWL, heating will increase CWL.

**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 ±(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