

Temperature Coefficients for CCPR Key Comparison Neutral Density Filters

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Below please find the relative temperature coefficients, κ , measured at MSL for filter set 19 from the first CCPR-K6 comparison. If the transmittance at x °C, τ_x , is known, the transmittance at 23 °C, τ_{23} , is given by

$$\tau_{23} = \tau_x + \kappa(23 - x)\tau_x$$

For details of the measurements from which these coefficients were derived, please refer to Metrologia **49** (2012) S68-S72.

Temperature Coefficient, κ , at 23°C (Relative change in transmittance per degree Celsius)

Wavelength (nm)	Filter Type 2	Filter Type 3	Filter Type 4	Filter Type 5
	NG 11, 1.7 mm	NG 5, 3.9 mm	NG 4, 3.9 mm	NG3, 3.1 mm
380	-1.14E-04	-5.23E-04	-1.09E-03	-1.58E-03
400	-1.67E-04	-9.00E-04	-2.05E-03	-3.16E-03
500	6.42E-05	3.72E-04	7.58E-04	1.12E-03
600	1.72E-04	1.02E-03	1.94E-03	2.84E-03
700	8.54E-05	4.00E-04	8.13E-04	1.21E-03
800	4.47E-05	1.72E-04	3.17E-04	4.36E-04
900	1.93E-05	6.93E-05	1.17E-04	1.50E-04
1000	-7.31E-05	-2.55E-04	-4.10E-04	-8.00E-04

Standard Absolute Uncertainty ($k = 1, \nu = 9$)

Wavelength (nm)	Filter Type 2	Filter Type 3	Filter Type 4	Filter Type 5
	NG 11, 1.7 mm	NG 5, 3.9 mm	NG 4, 3.9 mm	NG3, 3.1 mm
380	2.5E-05	1.1E-04	2.4E-04	3.5E-04
400	1.4E-05	7.2E-05	1.6E-04	2.6E-04
500	1.2E-05	7.0E-05	1.4E-04	2.1E-04
600	1.4E-05	7.9E-05	1.5E-04	2.3E-04
700	1.2E-05	5.4E-05	1.1E-04	1.6E-04
800	1.4E-05	5.5E-05	1.0E-04	1.4E-04
900	1.8E-05	6.6E-05	1.1E-04	1.4E-04
1000	2.2E-05	7.5E-05	1.2E-04	1.5E-04