

**Photometry and Radiometry, China, NIM (National Institute of Metrology)**

Note: Approval dates are shown only for the CMCs published after 24 May 2004

Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty					Comments
Quantity	Instrument or Artifact	Instrument Type or Method	Minimum value	Maximum value	Units	Parameter	Specifications	Value	Units	Coverage factor	Level of Confidence	Is the expanded uncertainty a relative one?	
Luminous intensity	Tungsten lamp	Standard lamps and photometer, equal distance method	1	5000	cd	Correlated colour temperature	2300 K to 2900 K	0.50	%	2	95%	Yes	Bromine tungsten lamps can also be measured
Illuminance responsivity, tungsten source	Illuminance meter	Standard lamp			A/lx	Illuminance	1 lx to 2000 lx	0.50	%	2	95%	Yes	
						Correlated colour temperature	2856 K						
Luminous flux	Tungsten lamp	Goniophotometer or integrating sphere	3	1500	lm	Correlated colour temperature	2300 K to 2900 K	0.7	%	2	95%	Yes	
Luminous flux	Tungsten lamp	Goniophotometer or integrating sphere	1500	20000	lm	Correlated colour temperature	2300 K to 2900 K	1.0	%	2	95%	Yes	
Illuminance	Tungsten lamp	Standard lamps	0.2	3000	lx	Correlated colour temperature	2856 K	0.5	%	2	95%	Yes	
Luminance	Tungsten-based source	Standard luminous intensity lamps and standard reflectance plate	3	1500	cd/m <sup>2</sup>	Correlated colour temperature	2856 K	1	%	2	95%	Yes	
Responsivity, spectral, power	Broad band detector	Double grating monochromometer			A/W	Wavelength range	300 nm to 400 nm	5	%	2	95%	Yes	General detectors can also be measured

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						Bandwidth	< 10 nm						
						Power level	0.1 $\mu$ W to 10 $\mu$ W						
Responsivity, spectral, power	Broad band detector	Double grating monochrometer			A/W	Wavelength range	400 nm to 1000 nm	2, varies with wavelength	%	2	95%	Yes	General detectors can also be measured
						Bandwidth	1 nm to 9 nm						
						Power level	0.1 $\mu$ W to 100 $\mu$ W						
Irradiance, spectral	Tungsten lamp	Spectroradiometer	2.00E-05	4.00E-01	Wm <sup>-2</sup> nm <sup>-1</sup>	Wavelength range	250 nm to 400 nm	8.2 to 5.2, varies with wavelength	%	2	95%	Yes	
						Bandwidth	UV, 2 nm						
Irradiance, spectral	Tungsten lamp	Spectroradiometer	2.00E-05	4.00E-01	Wm <sup>-2</sup> nm <sup>-1</sup>	Wavelength range	400 nm to 800 nm	5.2 to 3.8, varies with wavelength	%	2	95%	Yes	
						Bandwidth	VIS, 1 nm						

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Irradiance, spectral	Tungsten lamp	Spectroradiometer	2.00E-05	4.00E-01	Wm <sup>-2</sup> nm <sup>-1</sup>	Wavelength range	800 nm to 2500 nm	3.8 to 6, varies with wavelength	%	2	95%	Yes	
						Bandwidth	IR, 3 nm						
Reflectance, diffuse, spectral	Spectrally-neutral material	Integrating sphere spectrophotometer	1.00E-02	1		Wavelength range	380 nm to 780 nm	1.6	%	2	95%	Yes	General material can also be measured
						Bandwidth	2 nm to 3 nm						
						Specific measurement conditions	0/d						
Reflectance, diffuse, spectral	Spectrally-neutral material	Spectrophotometer	1.00E-01	1		Wavelength range	800 nm to 2000 nm	1.0	%	2	95%	Yes	General material can also be measured
						Bandwidth	2 nm to 20 nm						
						Specific measurement conditions	0/d						

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Correlated color temperature	Tungsten lamp	Standard color temperature lamps	2300	3200	K			20	K	2	95%	No	Bromine tungsten lamps and fluorescent lamps can also be measured
Responsivity	Fiber optical power meter	Laser power calibration facility	1	-60	dBm	Wavelengths	850 nm, 1310 nm and 1550 nm	3	%	2	95%	Yes	
						Power level	1 dBm to -60dBm						
Responsivity, laser, power	General detector	Comparison			A/W, V/W, Reading/W, W	Wavelengths	532 nm, 632.8 nm, 650 nm, 670 nm, 780 nm, 850 nm, 1064 nm, 1310 nm, 1550 nm	2	%	2	95%	Yes	Approved on 27 September 2004
						Power level	0.1 mW to 100 mW						
						Type of detector	photodiode or broadband						
Responsivity, laser, power	General detector	Comparison			A/W, V/W, Reading/W, W	Wavelengths	1064 nm, 10600 nm	2	%	2	95%	Yes	Approved on 27 September 2004
						Power level	0.1 W to 70 W						

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Quantity	Instrument or Artifact	Instrument Type or Method	Minimum value	Maximum value	Units	Parameter	Specifications	Value	Units	Coverage factor	Level of Confidence	Is the expanded uncertainty a relative one?	
						Type of detector	broadband						
Laser power, spectral total radiant	Laser	Radiometer	0.1	100	mW	Wavelength range	300 nm to 2000 nm	2	%	2	95%	Yes	Approved on 27 September 2004
						Type of laser	gas, solid state, semiconductor						
Laser power, spectral total radiant	Laser	Laser power meter	0.1	70	W	Wavelength range	300 nm to 11000 nm	2	%	2	95%	Yes	Approved on 27 September 2004
						Type of laser	gas, solid state, semiconductor						
Responsivity, laser, energy	General detector	Comparison			A/J, V/J, Reading/J, J	Wavelengths	532 nm, 1064 nm	2	%	2	95%	Yes	Approved on 27 September 2004
						Energy level	0.1 J to 30 J						
						Type of detector	photodiode or broadband						