

Photometry and Radiometry, Republic of Korea, KRISS (Korea Research Institute of Standards and Science)



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	Illuminance meter and inverse square law	0.1	2000	cd	Correlated color temperature	2000 K to 3200 K	2.0	%	2	95%	Yes	Other types of source can be measured Approved on 27 September 2004
Illuminance responsivity	Tungsten lamp	Illuminance meter			A/lx, V/lx, Reading/lx	Illuminance	0.01 lx to 3000 lx	2.0	%	2	95%	Yes	Approved on 27 September 2004
Luminous flux	Tungsten lamp	Integrating sphere	1	10000	lm	Correlated color temperature	2000 K to 3200 K	2.0	%	2	95%	Yes	Other types of source can be measured Approved on 27 September 2004
Luminance	Tungsten-based source	Reference lamps and calibrated diffuser, telephotometer	200	1500	cd/m ²	Correlated color temperature	2200 K to 3100 K	3	%	2	95%	Yes	
Luminance	Tungsten based source	Luminance meter	5	3000	cd/m ²	Correlated color temperature	2000 K to 3200 K	2.0	%	2	95%	Yes	Other types of source can be measured Approved on 27 September 2004
Illuminance	Tungsten lamp	Illuminance meter	0.01	10000	lx	Correlated color temperature	2000 K to 3200 K	2.0	%	2	95%	Yes	Other types of source can be measured Approved on 27 September 2004
Luminance responsivity	Luminance meter	Luminance meter			A/(cd/m ²), V/(cd/m ²), Reading/(cd/m ²)	Luminance	5 cd/m ² to 3000 cd/m ²	2.0	%	2	95%	Yes	Tungsten based source Approved on 27 September 2004
Luminous exposure	General source	Illuminance meter and Coulomb meter	1E-08	1E-04	A s	Type of source	CW light source with shutter	3.0	%	2	95%	Yes	CW source with shutter and flashing light sources for photography Approved on 27 September 2004

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Luminous exposure responsivity	Flash photometer	Illuminance meter and Coulomb meter			A/(lx s), V/(lx s), Reading/(lx s)	Luminous exposure	10 nA s to 0.1 mA s	3.0	%	2	95%	Yes	Approved on 27 September 2004
Responsivity, laser, power	General detector	Laser			reading/W	Wavelengths	476 nm, 488 nm, 514 nm, 568 nm, 633 nm, 647 nm	0.5	%	2	95%	Yes	
						Power level	1.0E-05 W to 1.0E-03 W						
						Type of detector	laser power meter						
Transmittance, regular, spectral	Spectrally-neutral material	Scanning spectrophotometer	0.1	1.0		Wavelength range	250 nm to 800 nm	1.0	%	2	95%	Yes	
						Bandwidth	2 nm						
Transmittance, regular, spectral	Spectrally-neutral material	Scanning spectrophotometer	0.001	0.1		Wavelength range	250 nm to 800 nm	5.0	%	2	95%	Yes	
						Bandwidth	2 nm						
						Specific measurement conditions	material below 10% transmittance cascaded by 10:1 steps						
Transmittance, regular, spectral	Spectrally-neutral material	Scanning spectrophotometer	0.0001	0.001		Wavelength range	250 nm to 800 nm	10.0	%	2	95%	Yes	
						Bandwidth	2 nm						
						Specific measurement conditions	material below 10% transmittance cascaded by 10:1 steps						
Absorbance, regular, spectral	Spectrally-neutral material	Scanning spectrophotometer	0.0	1.0		Wavelength range	250 nm to 800 nm	0.004		2	95%	Yes	

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Absorbance, regular, spectral	Spectrally-neutral material	Scanning spectrophotometer	1.0	3.0		Bandwidth	2 nm							
						Wavelength range	250 nm to 800 nm	0.021		2	95%	Yes		
						Bandwidth	2 nm							
						Specific measurement conditions	material below 10% transmittance cascaded by 10:1 steps							
Absorbance, regular, spectral	Spectrally-neutral material	Scanning spectrophotometer	3.0	4.0		Wavelength range	250 nm to 800 nm	0.042		2	95%	Yes		
						Bandwidth	2 nm							
						Specific measurement conditions	material below 10% transmittance cascaded by 10:1 steps							
Responsivity, spectral, power	Broad band detector	Double grating monochromator			A/W, V/W	Wavelength range	300 nm to 400 nm	1.0	%	2	95%	Yes	Other types of detector can be measured Approved on 27 September 2004	
						Bandwidth	< 10 nm							
						Power level	< 20 µW							
Responsivity, spectral, power	Broad band detector	Double grating monochromator			A/W, V/W	Wavelength range	400 nm to 750 nm	0.2	%	2	95%	Yes	Other types of detector can be measured Approved on 27 September 2004	
						Bandwidth	< 10 nm							
						Power level	< 40 µW							

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Responsivity, spectral, power	Broad band detector	Double grating monochromator			A/W, V/W	Wavelength range	750 nm to 1000 nm	1.0	%	2	95%	Yes	Other types of detector can be measured Approved on 27 September 2004	
						Bandwidth	< 10 nm							
						Power level	< 40 µW							
Responsivity, spectral, irradiance	Broad band detector	Double grating monochromator with reference detector			A/(W/m ²), V/(W/m ²)	Wavelength range	300 nm to 400 nm	1.2	%	2	95%	Yes	Other types of detector can be measured Approved on 27 September 2004	
						Bandwidth	< 10 nm							
						Power level	< 20 µW							
Responsivity, spectral, irradiance	Broad band detector	Double grating monochromator with reference detector			A/(W/m ²), V/(W/m ²)	Wavelength range	400 nm to 750 nm	0.3	%	2	95%	Yes	Other types of detector can be measured Approved on 27 September 2004	
						Bandwidth	< 10 nm							
						Power level	< 40 µW							
Responsivity, spectral, irradiance	Broad band detector	Double grating monochromator with reference detector			A/(W/m ²), V/(W/m ²)	Wavelength range	750 nm to 1000 nm	1.2	%	2	95%	Yes	Other types of detector can be measured Approved on 27 September 2004	
						Bandwidth	< 10 nm							
						Power level	< 40 µW							

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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?	
Responsivity, spectral, irradiance	Spectroradiometer	Reference tungsten lamp			$A/\{(W/m^2)/nm\}$, $V/\{(W/m^2)/nm\}$, Reading/ $\{(W/m^2)/nm\}$	Wavelength range	250 nm to 350 nm	4 to 2, varies with wavelength	%	2	95%	Yes	Approved on 27 September 2004
						Bandwidth	> 0.1 nm						
Irradiance, spectral	Tungsten lamp	Spectroradiometer	2.5E-04	2.5E-02	$(W/m^2)/nm$	Wavelength range	250 nm to 350 nm	3 to 2, varies with wavelength	%	2	95%	Yes	Other types of source can be measured Approved on 27 September 2004
						Bandwidth	10 nm						
Irradiance, spectral	Tungsten lamp	Spectroradiometer	4E-03	4E-01	$(W/m^2)/nm$	Wavelength range	350 nm to 2500 nm	2	%	2	95%	Yes	Other types of source can be measured Approved on 27 September 2004
						Bandwidth	10 nm						
Radiance, spectral	Tungsten lamp	Spectroradiometer	4E-01	4	$(W/m^2/sr)/nm$	Wavelength range	250 nm to 350 nm	4 to 2, varies with wavelength	%	2	95%	Yes	Other types of source can be measured Approved on 27 September 2004
						Bandwidth	10 nm						
Radiance, spectral	Tungsten lamp	Spectroradiometer	1	1E+02	$(W/m^2/sr)/nm$	Wavelength range	350 nm to 2500 nm	2 to 1, varies with wavelength	%	2	95%	Yes	Other types of source can be measured Approved on 27 September 2004
						Bandwidth	10 nm						
Radiant intensity, spectral	Tungsten lamp	Spectroradiometer	7.5E-04	7.5E-02	$(W/sr)/nm$	Wavelength range	250 nm to 350 nm	3 to 2, varies with wavelength	%	2	95%	Yes	Other types of source can be measured Approved on 27 September 2004

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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?	
						Bandwidth	10 nm						
Radiant intensity, spectral	Tungsten lamp	Spectroradiometer	1.2E-02	1.2	(W/sr)/nm	Wavelength range	350 nm to 2500 nm	2	%	2	95%	Yes	Other types of source can be measured Approved on 27 September 2004
						Bandwidth	10 nm						
Distribution temperature	Tungsten lamp	Spectroradiometer	2000	3200	K			10	K	2	95%	No	Tungsten lamp Approved on 27 September 2004
Correlated colour temperature	Tungsten lamp	Spectroradiometer	2000	3200	K			10	K	2	95%	No	Tungsten lamp Approved on 27 September 2004
Colour, emitted, x, y	General source	Spectroradiometer	x, y: 0	0.9		Bandwidth	10 nm	0.001 to 0.0005, varies with measurand		2	95%	No	Tungsten lamp Approved on 27 September 2004
Colour, emitted, u, v	General source	Spectroradiometer	u, v: 0	0.6		Bandwidth	10 nm	0.0007 to 0.0004, varies with measurand		2	95%	No	Tungsten lamp Approved on 27 September 2004
Colour, emitted, u', v'	General source	Spectroradiometer	u', v': 0	0.6		Bandwidth	10 nm	0.0007 to 0.0004, varies with measurand		2	95%	No	Approved on 27 September 2004
Colour, emitted, L*a*b*	Display	Spectroradiometer	a*, b*: -200	200		Bandwidth	1 nm	0.8 to 0.2, varies with measurand		2	95%	No	CRT, flat panel display, LED Approved on 27 September 2004
Responsivity	Fibre optic power meter	Fibre optic light source	-20	0	dBm	Wavelength	1300 nm	0.09	dBm	2	95%	No	
						Bandwidth	0.1 nm						
						Power level	0.01 mW to 1.0 mW						

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Responsivity	Fibre optic power meter	Comparison with reference detector	-60	0	dBm	Wavelength	1300 nm	1	%	2	95%	Yes	Approved on 27 September 2004
						Bandwidth	1 nm						
						Power level	0.01 mW to 1.0 mW						
Responsivity	Fibre optic power meter	Comparison with reference detector	-60	0	dBm	Wavelength	1550 nm	1	%	2	95%	Yes	Approved on 27 September 2004
						Bandwidth	1 nm						
						Power level	0.01 mW to 1.0 mW						
Wavelength	Fibre optic source	Spectrum analyzer	1000	1450	nm	Wavelength range	1000 nm to 1450 nm	0.22	nm	2	95%	No	Approved on 27 September 2004
Wavelength	Fibre optic source	Spectrum analyzer	1450	1600	nm	Wavelength range	1450 nm to 1600 nm	0.22	nm	2	95%	No	Approved on 27 September 2004
Wavelength	Optical spectrum analyzer	Lamp	1000	1450	nm	Wavelength range	1000 nm to 1450 nm	0.04	nm	2	95%	No	Approved on 27 September 2004
Wavelength	Optical spectrum analyzer	Standard absorption cell	1450	1600	nm	Wavelength range	1450 nm to 1600 nm	0.04	nm	2	95%	No	Approved on 27 September 2004