

## Photometry and Radiometry, France, LNE (Laboratoire national de métrologie et d'essais)



Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty						Service provider	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	Reference photometer	1	10000	cd	Colour temperature	2800 K to 2900 K	1	%	2	95%	Yes	Service provided by the LNE-INM/Cnam		
Illuminance responsivity, tungsten source	Illuminance meter	Reference photometer			A/lx	Colour temperature	2800 K to 2900 K	1	%	2	95%	Yes	Service provided by the LNE-INM/Cnam		
						Illuminance	1 lx to 10000 lx								
Luminous flux	Tungsten lamp	Gonio-photometer	10	10 000	lm	Colour temperature	2800 K to 2900 K	1	%	2	95%	Yes	Service provided by the LNE-INM/Cnam	Approved on 20 March 2009	
Illuminance	Tungsten lamp	Standard photometer	10	5000	lx	Color temperature	2800 K to 2900 K	1	%	2	95%	Yes	Service provided by LNE	Approved in October 2002	
Illuminance	Tungsten lamp	Reference photometer	1	3000	lx			1.4	%	2	95%	Yes	Service provided by LNE	Approved in October 2002	
Luminance	Tungsten-based source	Luminance meter, luminance source	0.1	5	cd/m <sup>2</sup>	Correlated colour temperature	2800 K to 2900 K	3	%	2	95%	Yes	Service provided by LNE	Approved on 13 January 2015	
Luminance	Tungsten-based source	Luminance meter, luminance source	5	50000	cd/m <sup>2</sup>	Correlated colour temperature	2800 K to 2900 K	2	%	2	95%	Yes	Service provided by LNE	Approved on 13 January 2015	
Responsivity, spectral, power	Broadband detector	Mono-chromator, cavity detector			A/W or V/W	Wavelength	280 nm to 350 nm	2	%	2	95%	Yes	Service provided by the LNE-INM/Cnam		
						Bandwidth	3 nm								
						Power level	0.005 mW to 0.1 mW								

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Responsivity, spectral, power	Broadband detector	Mono-chromator, cavity detector			A/W or V/W	Wavelength	350 nm to 900 nm	0.6	%	2	95%	Yes	Service provided by the LNE-INM/Cnam		
						Bandwidth	6 nm								
						Power level	0.005 mW to 0.1 mW								
Responsivity, spectral, power	Broadband detector	Mono-chromator, cavity detector			A/W or V/W	Wavelength	900 nm to 1600 nm	1	%	2	95%	Yes	Service provided by the LNE-INM/Cnam		
						Bandwidth	12 nm								
						Power level	0.005 mW to 0.1 mW								
Responsivity, laser, power	Laser power meter	Comparison with primary standard			A/W or V/W or Reading/W	Wavelengths	laser lines between 488 nm and 633 nm	0.04	%	2	95%	Yes	Service provided by LNE-INM/Cnam	Approved in October 2002	
						Power level	10 $\mu$ W to 1mW								
Irradiance, spectral	Deuterium lamp	Spectro-radiometer	0.000 1	0.003	(W/m <sup>2</sup> )/nm	Wavelength range	200 nm to 210 nm	26	%	2	95%	Yes	Service provided by the LNE-INM/Cnam	Approved on 30 September 2010	
						Bandwidth	4 nm								
Irradiance, spectral	Deuterium lamp	Spectro-radiometer	0.000 1	0.003	(W/m <sup>2</sup> )/nm	Wavelength range	220 nm to 310 nm	8	%	2	95%	Yes	Service provided by the LNE-INM/Cnam	Approved on 30 September 2010	
						Bandwidth	4 nm								
Irradiance, spectral	Deuterium lamp	Spectro-radiometer	0.000 1	0.003	(W/m <sup>2</sup> )/nm	Wavelength range	320 nm to 350 nm	5.2	%	2	95%	Yes	Service provided by the LNE-INM/Cnam	Approved on 30 September 2010	
						Bandwidth	4 nm								

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Irradiance, spectral	Tugsten lamps	Spectroradiometer	0.001	3	(W/m <sup>2</sup> )/nm	Wavelength range	300 nm to 320 nm	3.9	%	2	95%	Yes	Service provided by the LNE-INM/Cnam	Approved on 30 September 2010	
						Bandwidth	4 nm								
Irradiance, spectral	Tugsten lamps	Spectroradiometer	0.001	1	(W/m <sup>2</sup> )/nm	Wavelength	320 nm to 390 nm	2.6	%	2	95%	Yes	Service provided by the LNE-INM/Cnam	Approved on 30 September 2010	
						Bandwidth	1 nm								
Irradiance, spectral	Tugsten lamps	Spectroradiometer	0.001	1	(W/m <sup>2</sup> )/nm	Wavelength	400 nm to 1400 nm	2.2	%	2	95%	Yes	Service provided by the LNE-INM/Cnam	Approved on 30 September 2010	
						Bandwidth	1 nm								
Irradiance, spectral	Tugsten lamps	Spectroradiometer	0.001	1	(W/m <sup>2</sup> )/nm	Wavelength	1500 nm to 2500 nm	2.6	%	2	95%	Yes	Service provided by the LNE-INM/Cnam	Approved on 30 September 2010	
						Bandwidth	4 nm								
Radiance, spectral	Tugsten lamps	Spectroradiometer	0.01	100	(W/sr/m <sup>2</sup> )/nm	Wavelength	300 nm to 350 nm	3.8	%	2	95%	Yes	Service provided by the LNE-INM/Cnam	Approved on 30 September 2010	
						Bandwidth	1 nm								
Radiance, spectral	Tugsten lamps	Spectroradiometer	0.01	100	(W/sr/m <sup>2</sup> )/nm	Wavelength	400 nm to 600 nm	1.8	%	2	95%	Yes	Service provided by the LNE-INM/Cnam	Approved on 30 September 2010	
						Bandwidth	1 nm								
Radiance, spectral	Tugsten lamps	Spectroradiometer	0.01	100	(W/sr/m <sup>2</sup> )/nm	Wavelength	650 nm to 1000 nm	1	%	2	95%	Yes	Service provided by the LNE-INM/Cnam	Approved on 30 September 2010	

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						Bandwidth	1 nm								
Radiance, spectral	Tungsten lamps	Spectroradiometer	0.01	100	(W/sr/m <sup>2</sup> )/nm	Wavelength	1100 nm to 2500 nm	1.2	%	2	95%	Yes	Service provided by the LNE-INM/Cnam	Approved on 30 September 2010	
						Bandwidth	4 nm								
Transmittance, regular, spectral	Spectrally-neutral material	Direct / cascading	0.0001	1		Wavelength	250 nm to 800 nm	0.2(1 - log <i>t</i> ), <i>t</i> transmittance	%	2	95%	Yes	Service provided by the LNE-INM/Cnam		
						Bandwidth	0.52 nm								
Transmittance, regular, spectral	Spectrally-neutral material	Direct / cascading	0.0001	1		Wavelength	800 nm to 1600 nm	0.2(1 - log <i>t</i> ), <i>t</i> transmittance	%	2	95%	Yes	Service provided by the LNE-INM/Cnam		
						Bandwidth	0.85 nm								
Transmittance, regular, spectral	Spectrally-neutral material	Direct / cascading	0.001	1		Wavelength	1600 nm to 2500 nm	0.2(1 - log <i>t</i> ), <i>t</i> transmittance	%	2	95%	Yes	Service provided by the LNE-INM/Cnam		
						Bandwidth	1.7 nm								
Responsivity	Fibre optic power meter	Comparison with reference detector			Reading/W	Wavelength	850 nm	1.6	%	2	95%	Yes	Service provided by the LNE		
						Bandwidth	< 3nm								
Responsivity	Fibre optic power meter	Comparison with reference detector			Reading/W	Wavelength	1310 nm	1.7	%	2	95%	Yes	Service provided by the LNE		
						Bandwidth	0.1 nm to 0.3 nm								

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Responsivity	Fibre optic power meter	Comparison with reference detector			Reading/W	Wavelength	1550 nm	1.8	%	2	95%	Yes	Service provided by the LNE	
						Bandwidth	0.1 nm to 0.3 nm							
Wavelength	Fibre optic source	Spectrum analyser	600	1700	nm			0.3	nm	2	95%	No	Service provided by LNE	Approved in October 2002
Wavelength	Optical spectrum analyser	Wavemeter, laser sources	600	1700	nm			0.03	nm	2	95%	No	Service provided by LNE	Approved in October 2002