Thermometry, France, LNE (Laboratoire national de métrologie et d'essais)

Services provided by the LNE, the LNE-INM or the LNE-CETIAT

Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Oxygen triple-point for CSPRT	Comparison with a cell	54.3584	54.3584	K	Adiabatic calorimeter		0.36	mK	2	95 %	No	CBT	Service provided by the LNE-INM Approved on 18 May 2004
Temperature	Argon triple-point for CSPRT	Comparison with a cell	83.8058	83.8058	K	Adiabatic calorimeter		0.31	mK	2	95 %	No	CBT	Service provided by the LNE-INM Approved on 18 May 2004
Temperature	Argon triple-point for SPRT	Comparison with a cell	83.8058	83.8058	K	Temperature-controlled bath		0.5	mK	2	95 %	No	CBT	Service provided by the LNE-INM Approved on 18 May 2004
Temperature	Mercury triple-point for SPRT	Comparison with a cell	234.3156	234.3156	K	Temperature-controlled bath		0.23	mK	2	95 %	No	CBT	Service provided by the LNE-INM Approved on 18 May 2004
Temperature	Gallium for SPRT	Comparison with a cell	29.7646	29.7646	°C	Air flow furnace		0.2	mK	2	95 %	No	CMT	Service provided by the LNE-INM Approved on 18 May 2004
Temperature	Indium for SPRT	Comparison with a cell	156.5985	156.5985	°C	Air flow furnace		0.7	mK	2	95 %	No	CMT	Service provided by the LNE-INM Approved on 18 May 2004
Temperature	Tin for SPRT	Comparison with a cell	231.928	231.928	°C	Air flow furnace		0.7	mK	2	95 %	No	CMT	Service provided by the LNE-INM Approved on 18 May 2004
Temperature	Zinc for SPRT	Comparison with a cell	419.527	419.527	°C	Air flow furnace		1	mK	2	95 %	No	CMT	Service provided by the LNE-INM Approved on 18 May 2004
Temperature	Aluminium for SPRT	Comparison with a cell	660.323	660.323	°C	Pressure-controlled heat pipe furnace		2.4	mK	2	95 %	No	CMT	Service provided by the LNE-INM Approved on 18 May 2004

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Mercury triple-point for CSPRT	Comparison with a cell	234.3156	234.3156	K	Adiabatic calorimeter		0.54	mK	2	95%	No		Service provided by the LNE-INM Approved on 17 January 2013
Temperature	Fixed-point blackbody radiator, Ag	Comparison with a fixed-point blackbody radiator	961.78	961.78	°C	Spectral comparison through radiance comparator	0.65 µm to 2.5 µm	0.09	°C	2	95 %	No	CPYR	Service provided by the LNE-INM Approved on 18 May 2004
Temperature	Capsule type SPRTs	By measurement at Water triple-point	273.16	273.16	K	Adiabatic calorimeter		0.39	mK	2	95 %	No	CBT	Service provided by the LNE-INM Approved on 18 May 2004
Temperature	Capsule type SPRTs	By measurement at Argon fixed point	83.8058	83.8058	K	Adiabatic calorimeter		0.44	mK	2	95 %	No	CBT	Service provided by the LNE-INM Approved on 18 May 2004
Temperature	Capsule type SPRTs	By measurement at Oxygen fixed point	54.3584	54.3584	K	Adiabatic calorimeter		0.52	mK	2	95 %	No	CBT	Service provided by the LNE-INM Approved on 18 May 2004
Temperature	Capsule type SPRTs	By measurement at Mercury fixed point	234.3156	234.3156	K	Adiabatic calorimeter		0.54	mK	2	95%	No		Service provided by the LNE-INM Approved on 17 January 2013
Temperature	Capsule type SPRTs	By direct comparison	13	24	K	Adiabatic calorimeter		4.5	mK	2	95%	No		Service provided by the LNE-INM Approved on 17 January 2013
Temperature	Capsule type SPRTs	By direct comparison	24	54	K	Adiabatic calorimeter		2	mK	2	95%	No		Service provided by the LNE-INM Approved on 17 January 2013
Temperature	Capsule type SPRTs	By direct comparison	54	83	K	Adiabatic calorimeter		1.5	mK	2	95%	No		Service provided by the LNE-INM Approved on 17 January 2013

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Capsule type SPRTs	By direct comparison	83	303	K	Adiabatic calorimeter		1.2	mK	2	95%	No		Service provided by the LNE-INM Approved on 17 January 2013
Temperature	Long stem SPRTs	By measurement at Mercury fixed point	234.3156	234.3156	K	Temperature-controlled bath		0.61	mK	2	95 %	No	CBT	Service provided by the LNE-INM Approved on 18 May 2004
Temperature	Long stem SPRTs	By measurement at Argon fixed point	83.8058	83.8058	K	Temperature-controlled bath		0.69	mK	2	95 %	No	CBT	Service provided by the LNE-INM Approved on 18 May 2004
Temperature	Long stem SPRTs	By measurement at Gallium fixed point	29.7646	29.7646	°C	Air flow furnace		0.26	mK	2	95 %	No	CMT	Service provided by the LNE-INM Approved on 18 May 2004
Temperature	Long stem SPRTs	By measurement at Indium fixed point	156.5985	156.5985	°C	Air flow furnace		0.7	mK	2	95 %	No	CMT	Service provided by the LNE-INM Approved on 18 May 2004
Temperature	Long stem SPRTs	By measurement at Tin fixed point	231.928	231.928	°C	Air flow furnace		0.75	mK	2	95 %	No	CMT	Service provided by the LNE-INM Approved on 18 May 2004
Temperature	Long stem SPRTs	By measurement at Zinc fixed point	419.527	419.527	°C	Air flow furnace		1.1	mK	2	95 %	No	CMT	Service provided by the LNE-INM Approved on 18 May 2004
Temperature	Long stem SPRTs	By measurement at Aluminium fixed point	660.323	660.323	°C	Pressure-controlled heat pipe		2.6	mK	2	95 %	No	CMT	Service provided by the LNE-INM Approved on 18 May 2004
Temperature	Long stem SPRTs	By measurement at Silver fixed point	961.78	961.78	°C	Pressure-controlled heat pipe		4	mK	2	95 %	No	CMT	Service provided by the LNE-INM Approved on 18 May 2004

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Long stem SPRTs	Calibration at fixed point	83.8058	234.3156	K	Temperature-controlled bath		1.2	mK	2	95%	No		Service provided by the LNE-INM Approved on 17 January 2013
Temperature	Long stem SPRTs	Calibration at fixed point	234.3156	273.16	K	Temperature-controlled bath		0.65	mK	2	95%	No		Service provided by the LNE-INM Approved on 17 January 2013
Temperature	Long stem SPRTs	Calibration at fixed point	0	29.7646	°C	Air flow furnace		0.28	mK	2	95%	No		Service provided by the LNE-INM Approved on 17 January 2013
Temperature	Long stem SPRTs	Calibration at fixed point	29.7646	156.5985	°C	Air flow furnace		0.3 to 0.80	mK	2	95%	No		Service provided by the LNE-INM Approved on 17 January 2013
Temperature	Long stem SPRTs	Calibration at fixed point	156.5985	231.928	°C	Air flow furnace		0.8 to 1.1	mK	2	95%	No		Service provided by the LNE-INM Approved on 17 January 2013
Temperature	Long stem SPRTs	Calibration at fixed point	231.928	419.527	°C	Air flow furnace		1.1 to 1.3	mK	2	95%	No		Service provided by the LNE-INM Approved on 17 January 2013
Temperature	Long stem SPRTs	Calibration at fixed point	419.527	660.323	°C	Air flow furnace, pressure-controlled heat pipe		1.3 to 3	mK	2	95%	No		Service provided by the LNE-INM Approved on 17 January 2013
Temperature	Long stem SPRTs	Calibration at fixed point	660.323	961.78	°C	Air flow furnace, pressure-controlled heat pipe		3 to 4.5	mK	2	95%	No		Service provided by the LNE-INM Approved on 17 January 2013

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Standard radiation thermometer	Fixed-point blackbody	1084.62	1084.62	°C	Wavelength	0.65 µm	0.45	K	2	95 %	No	CPYR	Service provided by the LNE-INM Approved on 18 May 2004
						Ambient temperature	(23 ± 1) °C							
						Humidity	(50 ± 10) %							
Temperature	Radiation thermometer	Blackbodies monochromatic radiance comparator	962	1500	°C	Wavelength	0.6 µm to 8 µm	1	K	2	95 %	No	CPYR	Service provided by the LNE-INM Approved on 18 May 2004
						Ambient temperature	(23 ± 1) °C							
						Humidity	(50 ± 10) %							
Temperature	Platinum resistance thermometer	Calibration by comparison	-196	-196	°C	Liquid nitrogen bath at atmospheric pressure		9	mK	2	95%	No	LMT	Service provided by the LNE Approved on 03 November 2009
Temperature	Platinum resistance thermometer	Calibration by comparison	-80	0	°C	Alcohol liquid bath		6	mK	2	95%	No	LMT	Service provided by the LNE Approved on 03 November 2009
Temperature	Platinum resistance thermometer	Calibration by comparison at ice point	0	0	°C	Melting ice bath		4	mK	2	95%	No	LMT	Service provided by the LNE Approved on 03 November 2009
Temperature	Platinum resistance thermometer	Calibration by comparison	0	100	°C	Water and oil liquid bath		6	mK	2	95%	No	LMT	Service provided by the LNE Approved on 03 November 2009
Temperature	Platinum resistance thermometer	Calibration by comparison	100	250	°C	Oil liquid bath		10	mK	2	95%	No	LMT	Service provided by the LNE Approved on 03 November 2009

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Platinum resistance thermometer	Calibration by comparison	250	550	°C	Nitrite salts bath		20	mK	2	95%	No	LMT	Service provided by the LNE Approved on 03 November 2009
Temperature	Standard platinum resistance thermometer	Calibration by comparison	550	600	°C	Heat pipe furnace		0.03	°C	2	95%	No	LMT	Service provided by the LNE Approved on 14 december 2018
Temperature	Platinum resistance thermometer	Calibration by comparison	600	660	°C	Heat pipe furnace		0.15	°C	2	95%	No	LMT	Service provided by the LNE Approved on 14 december 2018
Temperature	Noble metal thermocouples type S	By measurement at Gallium melting point	29.7646	29.7646	°C	Air flow furnace		0.21	°C	2	95%	No	LMT	Pre-determined value of inhomogeneity included in the CMC entry Specific thermal treatment before calibration Service provided by the LNE Approved on 03 November 2009
Temperature	Noble metal thermocouples type S	By measurement at Indium melting point	156.5985	156.5985	°C	Air flow furnace		0.2	°C	2	95%	No	LMT	Pre-determined value of inhomogeneity included in the CMC entry Specific thermal treatment before calibration Service provided by the LNE Approved on 03 November 2009

Thermometry, France, LNE (Laboratoire national de métrologie et d'essais)

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Noble metal thermocouples type S	By measurement at Tin melting point	231.928	231.928	°C	3 zones furnace		0.2	°C	2	95%	No	LMT	Pre-determined value of inhomogeneity included in the CMC entry Specific thermal treatment before calibration Service provided by the LNE Approved on 03 November 2009
Temperature	Noble metal thermocouples type S	By measurement at Zinc melting point	419.527	419.527	°C	Air flow furnace		0.22	°C	2	95%	No	LMT	Pre-determined value of inhomogeneity included in the CMC entry Specific thermal treatment before calibration Service provided by the LNE Approved on 03 November 2009
Temperature	Noble metal thermocouples type S	By measurement at Aluminum melting point	660.323	660.323	°C	Heat pipe furnace		0.24	°C	2	95%	No	LMT	Pre-determined value of inhomogeneity included in the CMC entry Specific thermal treatment before calibration Service provided by the LNE Approved on 03 November 2009

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Noble metal thermocouples type S	By measurement at Silver melting point	961.78	961.78	°C	Heat pipe furnace		0.26	°C	2	95%	No	LMT	Pre-determined value of inhomogeneity included in the CMC entry Specific thermal treatment before calibration Service provided by the LNE Approved on 03 November 2009
Temperature	Noble metal thermocouples type S	By measurement at fixed point (Gold mini cell)	1064.18	1064.18	°C	Tubular single heater furnace		0.4	°C	2	95%	No	LMT	Pre-determined value of inhomogeneity included in the CMC entry Specific thermal treatment before calibration Service provided by the LNE Approved on 03 November 2009
Temperature	Noble metal thermocouples type S	Calibration by wire bridge method (Pd)	1553.5	1553.5	°C	Tubular single heater furnace		0.7	°C	2	95%	No	LMT	Pre-determined value of inhomogeneity included in the CMC entry Specific thermal treatment before calibration Service provided by the LNE Approved on 03 November 2009

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Noble metal thermocouples type S	Calibration at fixed point	0	1064.18	ºC	3 zones, heat pipe and tubular furnace		0.35 to 0.45	°C	2	95%	No	LMT	Pre-determined value of inhomogeneity included in the CMC entry 7-point cubic fit to deviations from CEI 60584 Service provided by the LNE Approved on 03 November 2009
Temperature	Noble metal thermocouples type S	Calibration at fixed point	0	1553.5	ºC	3 zones, heat pipe and tubular furnace		0.35 to 0.9	°C	2	95%	No	LMT	Pre-determined value of inhomogeneity included in the CMC entry 7-point cubic fit to deviations from CEI 60584 Service provided by the LNE Approved on 03 November 2009

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Noble metal thermocouples type Pt/Pd	Calibration at fixed point	961.78	961.78	ºC	Heat pipe furnace		80	mK	2	95%	No	LMT	Inhomomgeneity uncertainty for each pure metal TC must be added to the combined uncertainty quoted in the calibration report Service provided by the LNE Approved on 03 November 2009
Temperature	Noble metal thermocouples type Pt/Pd	Calibration at fixed point	1084.62	1084.62	ºC	3 zones furnace		0.11	K	2	95%	No	LMT	Inhomomgeneity uncertainty for each pure metal TC must be added to the combined uncertainty quoted in the calibration report Service provided by the LNE Approved on 03 November 2009

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Noble metal thermocouples type Au/Pt	Calibration at fixed point	961.78	961.78	ºC	Heat pipe furnace		60	mK	2	95%	No	LMT	Inhomomgeneity uncertainty for each pure metal TC must be added to the combined uncertainty quoted in the calibration report Service provided by the LNE Approved on 03 November 2009
Temperature	Noble metal thermocouples type S	Calibration by comparison	0	550	ºC	Water, oil or nitrite salt liquid bath		0.3 to 0.5	°C	2	95%	No	LMT	Inhomomgeneity uncertainty for each pure metal TC must be added to the combined uncertainty quoted in the calibration report Calibration at any temperature in the range Service provided by the LNE Approved on 03 November 2009

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Noble metal thermocouples type S	Calibration by comparison	550	960	ºC	Heat pipe furnace		0.7	°C	2	95%	No	LMT	Inhomomgeneity uncertainty for each pure metal TC must be added to the combined uncertainty quoted in the calibration report Calibration at any temperature in the range Service provided by the LNE Approved on 03 November 2009
Temperature	Noble metal thermocouples type S	Calibration by comparison	960	1100	ºC	3 zones furnace		0.8	°C	2	95%	No	LMT	Inhomomgeneity uncertainty for each pure metal TC must be added to the combined uncertainty quoted in the calibration report Calibration at any temperature in the range Service provided by the LNE Approved on 03 November 2009

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Noble metal thermocouples type S	Calibration by comparison	1100	1300	ºC	3 zones furnace		1.0	°C	2	95%	No	LMT	Inhomomgeneity uncertainty for each pure metal TC must be added to the combined uncertainty quoted in the calibration report Calibration at any temperature in the range Service provided by the LNE Approved on 03 November 2009
Temperature	Noble metal thermocouples type S	Calibration by comparison	1300	1500	ºC	3 zones furnace		1.8	°C	2	95%	No	LMT	Inhomomgeneity uncertainty for each pure metal TC must be added to the combined uncertainty quoted in the calibration report Calibration at any temperature in the range Service provided by the LNE Approved on 03 November 2009

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Base-metal thermocouples (K, N, J, E, T)	Calibration by comparison	-80	250	°C	Water, oil or nitrite salt liquid bath		0.4	°C	2	95%	No	LMT	Inhomomgeneity uncertainty for each pure metal TC must be added to the combined uncertainty quoted in the calibration report Service provided by the LNE Approved on 03 November 2009
Temperature	Liquid in glass thermometer	By measurement at ice point	0	0	°C	Melting ice bath		10	mK	2	95%	No	LMT	Total immersion Graduation 0,01 °C Interpolation 1/5th of the graduation At any temperature in the range Service provided by the LNE Approved on 03 November 2009
Temperature	Liquid in glass thermometer	Calibration by comparison	-60	100	°C	Alcohol, water or oil liquid bath		15	mK	2	95%	No	LMT	Total immersion Graduation 0,01 °C Interpolation 1/5th of the graduation At any temperature in the range Service provided by the LNE Approved on 03 November 2009

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Liquid in glass thermometer	Calibration by comparison	100	200	°C	Oil liquid bath		30	mK	2	95%	No	LMT	Total immersion Graduation 0,01 °C Interpolation 1/5th of the graduation At any temperature in the range Service provided by the LNE Approved on 03 November 2009
Humidity	Dew-point hygrometer	Measurement against humidity generator	-60	80	°C	Ambient temperature	20 °C to 26 °C	0.09 to 0.06	°C	2	95 %	No	CET	Service provided by the LNE-CETIAT Approved on 03 November 2009
Temperature	Water Triple Point cell for SPRT	Direct comparison	0.01	0.01	°C	Temperature-controlled bath		0.1	mK	2	95 %	No	CMT	Service provided by the LNE-INM Approved on 20 January 2010
Temperature	Long stem SPRTs	Calibration at water triple-point	0.01	0.01	°C	Temperature-controlled bath		0.29	mK	2	95%	No	CMT	Service provided by the LNE-INM Approved on 20 January 2010
Temperature	Silver for SPRT	Comparison with a cell	961.78	961.78	°C	Pressure-controlled heat pipe furnace		4	mK	2	95%	No	CMT	Service provided by the LNE-INM Approved on 20 May 2010
Temperature	Hydrogen triple-point for CSPRT	Comparison with a cell	13.8033	13.8033	K	Adiabatic calorimeter		0.74	mK	2	95%	No	CBT	Service provided by the LNE-INM Approved on 20 May 2010
Temperature	Neon triple-point for CSPRT	Comparison with a cell	24.5561	24.5561	K	Adiabatic calorimeter		0.6	mK	2	95%	No	CBT	Service provided by the LNE-INM Approved on 20 May 2010

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Capsule type SPRTs	By measurement at Hydrogen fixed point	13.8033	13.8033	K	Adiabatic calorimeter		0.74	mK	2	95%	No	CBT	Service provided by the LNE-INM Approved on 20 May 2010
Temperature	Capsule type SPRTs	By measurement at Neon fixed point	24.5561	24.5561	K	Adiabatic calorimeter		0.6	mK	2	95%	No	CBT	Service provided by the LNE-INM Approved on 20 May 2010
Temperature	Rhodium/Iron thermometer	Calibration by comparison	13	300	K	Cryogenic comparator		6	mK	2	95%	No	CBT	Service provided by the LNE-INM Approved on 19 March 2012
Temperature	Noble metal thermocouples type Pt/Pd	Calibration at fixed point	231.928	231.928	ºC	Furnace		100	mK	2	95%	No	LMT	Service provided by the LNE Approved on 19 March 2012
Temperature	Noble metal thermocouples type Pt/Pd	Calibration at fixed point	419.527	419.527	ºC	Furnace		100	mK	2	95%	No	LMT	Service provided by the LNE Approved on 19 March 2012
Temperature	Noble metal thermocouples type Pt/Pd	Calibration at fixed point	660.323	660.323	ºC	Furnace		110	mK	2	95%	No	LMT	Inhomomgeneity uncertainty for each pure metal TC must be added to the combined uncertainty quoted in the calibration report Service provided by the LNE Approved on 19 March 2012

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Noble metal thermocouples type Au/Pt	Calibration at fixed point	231.928	231.928	ºC	Furnace		76	mK	2	95%	No	LMT	Inhomomgeneity uncertainty for each pure metal TC must be added to the combined uncertainty quoted in the calibration report Service provided by the LNE Approved on 19 March 2012
Temperature	Noble metal thermocouples type Au/Pt	Calibration at fixed point	419.527	419.527	ºC	Furnace		50	mK	2	95%	No	LMT	Inhomomgeneity uncertainty for each pure metal TC must be added to the combined uncertainty quoted in the calibration report Service provided by the LNE Approved on 19 March 2012

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Noble metal thermocouples type Au/Pt	Calibration at fixed point	660.323	660.323	ºC	Furnace		52	mK	2	95%	No	LMT	Inhomomgeneity uncertainty for each pure metal TC must be added to the combined uncertainty quoted in the calibration report Service provided by the LNE Approved on 19 March 2012
Temperature	Base-metal thermocouples (K, N, J, E, T)	Calibration by comparison	300	600	°C	Heat pipe furnace		0.25	°C	2	95%	No	LMT	Inhomomgeneity uncertainty for each pure metal TC must be added to the combined uncertainty quoted in the calibration report Service provided by the LNE Approved on 14 December 2018

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Base-metal thermocouples (K, N, J, E, T)	Calibration by comparison	600	960	°C	Heat pipe furnace		0.5 to 0.9	°C	2	95%	No	LMT	Inhomomgeneity uncertainty for each pure metal TC must be added to the combined uncertainty quoted in the calibration report Service provided by the LNE Approved on 14 December 2018
Temperature	Base-metal thermocouples (K, N, J, E, T)	Calibration by comparison	960	1300	°C	3 zones furnace		0.9 to 1.1	°C	2	95%	No	LMT	Inhomomgeneity uncertainty for each pure metal TC must be added to the combined uncertainty quoted in the calibration report Service provided by the LNE Approved on 19 March 2012

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Base-metal thermocouples (Tungsten/Rhenium)	Calibration by comparison	1300	1500	°C	3 zones furnace		1.9	°C	2	95 %	No	LMT	Inhomomgeneity uncertainty for each pure metal TC must be added to the combined uncertainty quoted in the calibration report Service provided by the LNE Approved on 19 March 2012
Temperature	Variable temperature blackbody radiation sources	Comparison	-20	150	°C	Wavelength	3 µm to 5 µm band	1.4 to 0.25	°C	2	95 %	No	LPYR	Service provided by the LNE Approved on 06 September 2013
Temperature	Variable temperature blackbody radiation sources	Comparison	150	600	°C	Wavelength	8 µm to 14 µm band	0.4 to 1.3	°C	2	95 %	No	LPYR	Service provided by the LNE Approved on 06 September 2013
Temperature	Variable temperature blackbody radiation sources	Comparison	150	600	°C	Wavelength	3 µm to 5 µm band	0.4 to 0.5	°C	2	95 %	No	LPYR	Service provided by the LNE Approved on 06 September 2013
Temperature	Variable temperature blackbody radiation sources	Comparison	600	950	°C	Wavelength	3 µm to 5 µm band	1.5 to 1.7	°C	2	95 %	No	LPYR	Service provided by the LNE Approved on 06 September 2013

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Variable temperature blackbody radiation sources	Comparison	600	950	°C	Wavelength	8 µm to 14 µm band	2.1 to 2.9	°C	2	95 %	No	LPYR	Service provided by the LNE Approved on 06 September 2013
Temperature	Variable temperature blackbody radiation sources	Comparison	960	1500	°C	Wavelength	3 µm to 5 µm band	3 to 3.5	°C	2	95 %	No	LPYR	Service provided by the LNE Approved on 06 September 2013
Temperature	Variable temperature blackbody radiation sources	Comparison	600	1500	°C	Wavelength	0.8 µm to 1.1 µm band	1.4 to 3.0	°C	2	95 %	No	LPYR	Service provided by the LNE Approved on 06 September 2013
Temperature	Variable temperature blackbody radiation sources	Comparison	300	600	°C	Wavelength	1.8 µm to 2.6 µm band	2.3 to 0.4	°C	2	1'95 %	No	LPYR	Service provided by the LNE Approved on 06 September 2013
Temperature	Variable temperature blackbody radiation sources	Comparison	600	1500	°C	Wavelength	1.8 µm to 2.6 µm band	1.5 to 2.7	°C	2	1'95 %	No	LPYR	Service provided by the LNE Approved on 06 September 2013
Temperature	Radiation thermometer	Blackbody	250	600	°C	Wavelength	up to 14 µm	0.4 to 1.3	°C	2	95 %	No	LPYR	Service provided by the LNE Approved on 06 September 2013
						Target diameter	< 63 mm							

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Radiation thermometer	Blackbody	600	950	°C	Wavelength	up to 5 µm	1.4 to 1.6	°C	2	95 %	No	LPYR	Service provided by the LNE Approved on 06 September 2013
						Target diameter	< 63 mm							
Temperature	Radiation thermometer	Blackbody	600	950	°C	Wavelength	8 µm to 14 µm band	2.1 to 2.9	°C	2	95 %	No	LPYR	Service provided by the LNE Approved on 06 September 2013
						Target diameter	< 63 mm							
Temperature	Radiation thermometer	Blackbody	600	1500	°C	Wavelength	up to 5 µm	1.9 to 2.6	°C	2	95 %	No	LPYR	Service provided by the LNE Approved on 06 September 2013
						Target diameter	< 28 mm							
Temperature	Radiation thermometer	Blackbody	150	350	°C	Wavelength	up to 14 µm	1.1	°C	2	95%	No	LPYR	Service provided by the LNE Approved on 06 January 2012
						Target diameter	< 40 mm							
Temperature	Radiation thermometer	Blackbody	-20	150	°C	Wavelength	up to 14 µm	0.5	°C	2	95%	No	LPYR	Service provided by the LNE Approved on 06 January 2012
						Target diameter	< 30 mm							

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty						
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?**	**NMI Internal Service Identifier**	**Comments**
Temperature	Radiation thermometer	Blackbody	960	1500	°C	Wavelength	up to 8 µm	1.7 to 2.1	°C	2	95%	No	LPYR	Service provided by the LNE Approved on 06 January 2012
						Target diameter	< 38 mm							