Form NSC/TISI 2

(Garuda)

Certificate No. 12132/C0217

Certificate of Accreditation Laboratory

By virtue of National Standardization Act B.E. 2551 (2008)
Secretary-General, Thai Industrial Standards Institute
Issue this Certificate for

Inctech Metrological Center co.,ltd

Laboratory address :
11/22, Soi Saimai 56/1, SaiMai Rd., SaiMai, SaiMai,Bangkok

This laboratory is accredited for calibration in accordance with
the Thai Industrial Standard TIS 17025-2548 (2005) (ISO/IEC 17025:2005)
General Requirements for the Competence of Testing and Calibration Laboratories.

Accreditation No. CALIBRATION 0217

The scope of accreditation is as annexed hereto.

Issue Date : 23 August B.E. 2555 (2012)
Valid until : 22 August B.E. 2558 (2015)

Signature :

(Urit Srinongkote)
Secretary - General
Thai Industrial Standards Institute

Translation approved

(Yannapat Uthongsap)
Director,
Office of the National Accreditation Council
Date: 6 October 2014

Date of Initial Issue 23 August B.E. 2555 (2012)
Ministry of Industry, Thai Industrial Standards Institute

Translation Note: In the event of doubt or misunderstanding, the original in Thai shall be the authoritative.

Scope of Accreditation for Calibration

Certificate No. 12132/C0217

Laboratory Name : Inctech Metrological Center co.,ltd

Address : 11/22, Soi Saimai 56/1, SaiMai Rd., SaiMai, SaiMai, Bangkok

Accreditation No. : Calibration 0217

Laboratory Status ☑ Permanent ☐ Site ☐ Temporary ☐ Mobile

Field of Calibration	Parameter/Rage/Item	Calibration and Measurement Capability*	Method/Technique
1. Electrical	Measuring instrument		
	DC voltage		In - house method : CP - DMM – 01A by direct measurement with multi – function calibrator
	0 mV to < 320 mV	70 µV/V + 7.7 µV	
	320 mV to < 3.2 V	70 µV/V + 50 µV	
	3.2 mV to < 32 V	77 µV/V + 0.50 mV	
	32 V to < 320 V	77 µV/V + 5.3 mV	
	32 V to < 1 kV	71 µV/V + 24 mV	
	AC voltage		In - house method : CP - DMM – 01A by direct measurement with multi – function calibrator
	10 mV to < 32 mV		
	@ 40 Hz to < 3 kHz	0.53 mV/V + 0.12 mV	
	@ 3 kHz to < 10 kHz	0.52 mV/V + 0.15 mV	
	@ 10 kHz to < 30 kHz	0.84 mV/V + 0.28 mV	
	@ 30 kHz to < 50 kHz	1.4 mV/V + 0.56 mV	
	@ 50 kHz to 100 kHz	2.5 mV/V + 1.5 mV	
	32 mV to < 320 mV		
	@ 40 Hz to < 3 kHz	0.51 mV/V + 27 µV	
	@ 3 kHz to < 10 kHz	0.50 mV/V + 33 µV	
	@ 10 kHz to < 30 kHz	0.76 mV/V + 61 µV	
	@ 30 kHz to < 50 kHz	1.2 mV/V + 0.17 mV	
	@ 50 kHz to 100 kHz	2.4 mV/V + 0.30 mV	

* express as an uncertainty (±), providing a level of confidence of approximately 95%

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Field of Calibration	Parameter/Rage/Item	Calibration and Measurement Capability*	Method/Technique
1. Electrical (cont.)	Measuring Instrument		
	AC voltage (cont.)		In - house method : CP - DMM – 01A by direct measurement with multi – function calibrator
	320 mV to < 3.2 V		
	@ 40 Hz to < 3 kHz	0.51 mV/V + 0.26 mV	
	@ 3 kHz to < 10 kHz	0.50 mV/V + 0.33 mV	
	@ 10 kHz to < 30 kHz	0.76 mV/V + 0.58 mV	
	@ 30 kHz to < 50 kHz	1.2 mV/V + 1.7 mV	
	@ 50 kHz to 100 kHz	2.4 mV/V + 3.2 mV	
	3.2 V to < 32 V		
	@ 40 Hz to < 3 kHz	0.51 mV/V + 2.7 mV	
	@ 3 kHz to < 10 kHz	0.72 mV/V + 3.3 mV	
	@ 10 kHz to < 30 kHz	0.97 mV/V + 6.1 mV	
	@ 30 kHz to < 50 kHz	1.9 mV/V + 17 mV	
	@ 50 kHz to 100 kHz	4.1 mV/V + 39 mV	
	32 V to < 105 V		
	@ 40 Hz to < 3 kHz	0.51 mV/V + 9.4 mV	
	@ 3 kHz to < 10 kHz	0.72 mV/V + 12 mV	
	@ 10 kHz to < 30 kHz	0.97 mV/V + 20 mV	
	@ 30 kHz to < 50 kHz	1.9 mV/V + 39 mV	
	@ 50 kHz to 100 kHz	4.1 mV/V + 0.13 V	
	105 V to < 320 V		
	@ 55 Hz to < 100 Hz	0.61 mV/V + 28 mV	
	@ 100 kHz to < 1 kHz	0.61 mV/V + 28 mV	
	@ 1 kHz to < 3 kHz	0.95 mV/V + 28 mV	
	@ 3 kHz to < 10 kHz	0.95 mV/V + 40 mV	
	@ 10 kHz to < 20 kHz	1.4 mV/V + 58 mV	
	@ 20 kHz to 30 kHz	1.8 mV/V + 75 mV	

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Field of Calibration	Parameter/Rage/Item	Calibration and Measurement Capability*	Method/Technique
1. Electrical (cont.)	Measuring Instrument		
	AC voltage (cont.)		In - house method : CP - DMM – 01A by direct measurement with multi – function calibrator
	320 V to < 800 V		
	@ 40 Hz to < 100 Hz	0.61 mV/V + 75 mV	
	@ 100 kHz to < 1 kHz	0.61 mV/V + 75 mV	
	@ 1 kHz to < 3 kHz	0.95 mV/V + 75 mV	
	@ 3 kHz to < 10 kHz	0.95 mV/V + 0.13 V	
	@ 10 kHz to 20 kHz	1.5 mV/V + 0.19 V	
	800 V to 1 050 V		
	@ 40 Hz to < 100 Hz	0.61 mV/V + 0.16 V	
	@ 100 Hz to < 1 kHz	0.61 mV/V + 0.16 V	
	@ 1 kHz to < 3 kHz	0.95 mV/V + 0.16 V	
	AC current		In - house method : CP - DMM – 01A by direct measurement with multi – function calibrator
	32 µA to < 32 µA		
	@ 55 Hz to < 3 kHz	0.89 mA/A + 1.1 µA	
	@ 3 kHz to < 5 kHz	1.3 mA/A + 2.1 µA	
	32 µA to < 3.2 mA		
	@ 55 Hz to < 3 kHz	0.89 mA/A + 3.5 µA	
	@ 3 kHz to < 5 kHz	1.3 mA/A + 7.0 µA	
	3.2 mA to < 32 mA		
	@ 55 Hz to < 3 kHz	0.89 mA/A + 13 µA	
	@ 3 kHz to < 5 kHz	1.3 mA/A + 15 µA	
	32 mA to < 320 mA		
	@ 55 Hz to < 3 kHz	1.2 mA/A + 0.24 mA	
	@ 3 kHz to < 5 kHz	2.7 mA/A + 0.47 Ma	
	320 mA to < 3.2 A		
	@ 55 Hz to < 3 kHz	1.2 mA/A + 0.63 mA	
	3.2 A to < 10 A		
	@ 55 Hz to < 3 kHz	2.4 mA/A + 3.7 mA	

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Field of Calibration	Parameter/Rage/Item	Calibration and Measurement Capability*	Method/Technique
1. Electrical (cont.)	Measuring instrument		
	DC current		In - house method : CP - DMM – 01A by direct measurement with multi – function calibrator
	0 µA to < 320 µA	2.6 mA/A + 20 nA	
	320 µA to < 3.2 mA	2.6 mA/A + 0.13 µA	
	3.2 mA to < 32 mA	2.6 mA/A + 1.7 µA	
	32 mA to < 320 mA	3.3 mA/A + 18 µA	
	0.320 A to < 3.2 A	12.1 mA/A + 1.9 mA	
	3.2 A to 10 A	11.8 mA/A + 1.4 mA	
	Resistance 4 wire		In - house method : CP - DMM – 01A by direct measurement with multi –function calibrator
	10 Ω to < 40 Ω	0.29 mΩ/Ω + 12 mΩ	
	40 Ω to < 400 Ω	0.24 mΩ/Ω + 24 mΩ	
	400 Ω to < 4 kΩ	0.18 mΩ/Ω + 93 mΩ	
	4 kΩ to 40 kΩ	0.29 mΩ/Ω + 1.1 Ω	
	Resistance 2 wire		
	40 kΩ to < 400 kΩ	0.29 mΩ/Ω + 11 Ω	
	400 kΩ to < 4 MΩ	0.75 mΩ/Ω + 0.3 kΩ	
	4 MΩ to < 40 MΩ	1.8 mΩ/Ω + 2.4 kΩ	
	40 MΩ to 100 MΩ	3.1 mΩ/Ω + 64 kΩ	
	Quart stop watch		In – house method : CP-ELE-01A by direct measurement with frequency counter
	Quart time base Oscillator		
	32 768 ($=2^{15}$) Hz	0.76 ms/s	

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1. Electrical (cont.)	Electronic counter		In-house method : CP-ELE-03A by direct measurement with multi-function calibrator
	1 to 9 999 count	0.29 count	
	Digital tachometer		In-house method : CP-ELE-02A by direct measurement with multi-function calibrator
	Photo Type		
	6 rpm to 999.9 rpm	0.060 rpm	
	1 000 rpm to 99 999 rpm	0.58 rpm	
	Digital tachometer		In-house method : CP-ELE-02A by direct measurement with multi-function calibrator (*display unit only , not include effect of sensor)
	Contact type		
	6 rpm to 999.9 rpm	0.060 rpm	
	1 000 rpm to 99 999 rpm	0.58 rpm	
	Temperature indicator		In - house method : CP-TEM-01A by direct measurement with documenting process calibrator based on EA10/11
	Thermocouple		
	Type J		
	-200 °C to 700 °C	0.40 °C	
	> 700 °C to 1200 °C	0.39 °C	
	Type T		
	0 °C to 400 °C	0.33 °C	
	Type K		
	-200 °C to 300 °C	0.40 °C	
	> 300 °C to 700 °C	0.37 °C	
	> 700 °C to 1 370 °C	0.38 °C	
	Type R		
	0 °C to 900 °C	1.2 °C	
	> 900 °C to 1 750 °C	0.70 °C	

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Field of Calibration	Parameter/Rage/Item	Calibration and Measurement Capability*	Method/Technique
1. Electrical (cont.)	Resistance temperature detector Pt 100 Ω (385) 2 wire, 3 wire, 4 wire -200 °C to 800 °C	0.18 °C	In - house method : CP-TEM-15A based on EA10/11 by direct measurement
2.Dimension	Vernier caliper (Digital and Analog) - External		In - house method : CP-VER-01A based on JIS B 7507 : 1993
	0 mm to 200 mm	14 µm	
	>200 mm to 400 mm	17 µm	
	>400 mm to 600 mm	21 µm	
	- Internal		
	20 mm to 200 mm	14 µm	
	>200 mm to 300 mm	16 µm	
	>300 mm to 600 mm	21 µm	
	External micrometer (Digital and Analog)		In - house method : CP-MIC-01A based on JIS B 7502 : 1994
	0 mm to 25 mm	0.74 µm	
	>25 mm to 50 mm	0.73 µm	
	>50 mm to 75 mm	0.74 µm	
	>75 mm to 100 mm	0.75 µm	
	>100 mm to 125 mm	1.3 µm	
	Dial thickness gauge (Digital and Analog) 0 mm to 10 mm	5.8 µm	In - house method : CP-DTG-05A by direct measurement with dial gauge tester

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Laboratory Status ☑ Permanent ☐ Site ☐ Temporary ☐ Mobile

Field of Calibration	Parameter/Rage/Item	Calibration and Measurement Capability*	Method/Technique
2.Dimension (cont.)	Dial gauge (Digital and Analog)		In - house method : CP-DIA-01A based on JIS B 7503 : 1997
	0 mm to 10 mm	6.4 µm	
	>10 mm to 30 mm	6.5 µm	
	>30 mm to 50 mm	6.6 µm	
	Dial test indicator (Digital and Analog)		In - house method : CP-DIA-02A based on JIS B 7533 : 1990
	0 mm to 1 mm	6.0 µm	
	Bore gauge (Digital and Analog)		In - house method : CP-DIA-04A based on JIS B 7515 : 1982
	0 mm to 1.4 mm.	5.9 µm	
	Height gauge (Digital and Analog)		In - house method : CP-DIA-05A based on JIS B 7517 : 1993
	0 mm to 150 mm	8 µm	
	>150 mm to 300 mm	11 µm	
	>300 mm to 450 mm	14 µm	
	>450 mm to 600 mm	18 µm	
	Plain plug gauge		In - house method : CP-DIA-06A based on ISO 286-1(E):1988 direct measurement by ULM using knife edged anvils probe
	0.1 mm to 15 mm	1.1 µm	
	>15 mm to 100 mm	2.1 µm	
	>100 mm to 200 mm (0.1 mm to 200 mm)	2.2 µm	
	Plain Ring Gauge		In - house method : CP-DIA-07A And CP-DIA-08A based on ISO 286-1(E):1988 direct measurement by ULM using ruby ball probe and L-shaped probe
	1 mm to 15 mm	1.2 µm	
	>15 mm to 90 mm	1.7 µm	
	>90 mm to 250 mm (1 mm to 250 mm)	1.8 µm	

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Laboratory Status ☑ Permanent ☐ Site ☐ Temporary ☐ Mobile

Field of Calibration	Parameter/Rage/Item	Calibration and Measurement Capability*	Method/Technique
2.Dimension (cont.)	Pin Gauge /Thread Measuring wire		In - house method : CP-DIA-09A based on ISO 286-1(E):1988 direct measurement by ULM using knife edged anvils probe
	0.1 mm to 1 mm	1.1 µm	
	>1 mm to 5 mm	1.1 µm	
	>5 mm to 10 mm	1.2 µm	
	>10 mm to 20 mm	1.2 µm	
	>20 mm to 30 mm	1.2 µm	
	>30 mm to 40 mm	1.2 µm	
	>40 mm to 50 mm	1.2 µm	
	(0.1 mm to 50 mm)		
	Thread plug gauge		In - house method : CP-DIA-10A based on EA-10/10 : 1999 direct measurement by ULM using set 3-wires on holders
	M 1	1.9 µm	
	≤ M 3	1.9 µm	
	≤ M 30	1.9 µm	
	≤ M 68	2.1 µm	
	(1 mm to 68 mm)		
	Thread ring gauge		In - house method : CP-DIA-11A based on EA-10/10 : 1999 direct measurement by ULM using T-shape probe
	M 3	2.1 µm	
	≤ M 30	2.1 µm	
	≤ M 68	2.2 µm	
	(3 mm to 68 mm)		

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Field of Calibration	Parameter/Rage/Item	Calibration and Measurement Capability*	Method/Technique
3. Mass	Electronic balance and Mechanical balance		In - house method : CP-BAL-01A based on UKAS LAB 14 : 2006
	up to 20 g	0.13 mg	
	> 20 g to 40 g	0.25 mg	
	> 40 g to 60 g	0.26 mg	
	> 60 g to 100 g	0.38 mg	
	> 100 g to 200 g	0.65 mg	
	> 200 g to 300 g	1.5 mg	
	> 300 g to 400 g	1.6 mg	
	> 400 g to 500 g	1.9 mg	
	> 500 g to 600 g	2.1 mg	
	> 600 g to 700 g	2.3 mg	
	> 700 g to 800 g	2.5 mg	
	> 800 g to 900 g	2.7 mg	
	> 900 g to 1 kg	3.0 mg	
	> 1 kg to 10 kg	0.13 g	
	> 10 kg to 20 kg	0.53 g	
	> 20 kg to 400 kg	82 g	
	> 400 kg to 600 kg	83 g	
	> 600 kg to 800 kg	84 g	
	> 800 kg to 900 kg	85 g	
	> 900 kg to 1 000 kg	86 g	

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Laboratory Status ☑ Permanent ☐ Site ☐ Temporary ☐ Mobile

Field of Calibration	Parameter/Rage/Item	Calibration and Measurement Capability*	Method/Technique
4. Mechanical	Pressure measuring instrument (Analog and digital)		
	Pneumatic type		In – house method : CP-PRE-01A based on DKD-R6-1,2003
	0 kPa to 200 kPa	0.19 kPa	
	Water type		In – house method : CP-PRE-02A based on DKD-R6-1,2003
	0 MPa to 70 MPa	58 kPa	
	Vacuum measuring instrument (Analog and digital)		In – house method : CP-PRE-03A based on DKD-R6-1,2003
	-95 kPa to 0 kPa	0.33 kPa	
	Hand torque tools : Screw Driver		In – house method : CP-TOR-01A based on ISO 6789-2003
	- Type I Class D , E		
	- Type II Class D , E, F		
	0.5 N·M to 20 N·M	2.0 %	
	Hand torque tools : Torque wrench		In – house method : CP-TOR-01A based on ISO 6789-2003
	- Type I Class A, B, C		
	- Type II Class A, B, C, G		
	10 N·M to 1500 N·M	2.0 %	

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Field of Calibration	Parameter/Rage/Item	Calibration and Measurement Capability*	Method/Technique
5. Temperature	Temperature sensor		In - house method : CP-TEM-03A by comparison with thermometer standard
	Thermocouple		
	Type J		
	-20 °C to 100 °C	0.55 °C	
	>100 °C to 200 °C	0.89 °C	
	>200 °C to 400 °C	1.9 °C	
	>400 °C to 600 °C	2.9 °C	
	Type K		
	-20 °C to 100 °C	0.73 °C	
	>100 °C to 200 °C	0.99 °C	
	>200 °C to 300 °C	1.4 °C	
	>300 °C to 400 °C	1.7 °C	
	>400 °C to 500 °C	2.1 °C	
	>400 °C to 600 °C	2.4 °C	
	Type T		
	-20 °C to 150 °C	1.2 °C	
	>150 °C to 250 °C	2.3 °C	
	Resistance temperature detector		In - house method : CP-TEM-30A by comparison with thermometer standard
	(Pt 100 Ω) 2, 3, 4 wire		
	-20 °C to 200 °C	0.25 °C	
	>200 °C to 300 °C	1.0 °C	
	>300 °C to 400 °C	1.3 °C	
	>400 °C to 500 °C	1.6 °C	
	>500 °C to 600 °C	1.9 °C	

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Field of Calibration	Parameter/Rage/Item	Calibration and Measurement Capability*	Method/Technique
5. Temperature (cont.)	Temperature indicator with sensor		
	Thermocouple Type E, J, K, N, T		In - house Method : CP-TEM-13A by comparison with thermometer standard
	-20 °C to 100 °C	0.44 °C	
	>100 °C to 200 °C	0.76 °C	
	>200 °C to 300 °C	1.4 °C	
	>300 °C to 400 °C	1.9 °C	
	Thermocouple Type E, J, K, N		
	>400 °C to 500 °C	2.4 °C	
	>500 °C to 600 °C	2.9 °C	
	Resistance temperature detector (Pt 100 Ω) 2, 3, 4 wire		In - house method : CP-TEM-17A by comparison with thermometer standard
	-20 °C to 200 °C	0.13 °C	
	>200 °C to 300 °C	0.38 °C	
	>300 °C to 400 °C	0.57 °C	
	>400 °C to 500 °C	0.86 °C	
	>500 °C to 600 °C	0.89 °C	
	Dial Thermometer		In - house method : CP-TEM-05A by comparison with thermometer standard
	-20 °C to 200 °C	0.60 °C	
	>200 °C to 600 °C	1.1 °C	

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Field of Calibration	Parameter/Rage/Item	Calibration and Measurement Capability*	Method/Technique
5. Temperature (cont.)	Liquid in glass thermometer Total immersion -20 °C to 100 °C Partial immersion -20 °C to 100 °C	 0.60 °C 0.61 °C	In - house method : CP-TEM-10A by comparison with thermometer standard
	Digital thermo – hygrometer Temperature 20 °C to 25 °C >25 °C to 30 °C Relative humidity 35 % to 50 % >50 % to 65 %	 1.2 °C 1.3 °C 3.1 % 4.1 %	In – house method : CP-TEM-09A based on NPL : A guide to the measurement of humidity Temperature calculated @ relative humidity 50 % . Humidity calculated @ temperature 25°C
	Analog thermo - hygrometer / Thermo-hygrograph Temperature 20 °C to 25 °C >25 °C to 30 °C Relative humidity 35 % to 50 % >50 % to 65 %	 1.4 °C 1.5 °C 3.2 % 4.2 %	In – House Method : CP-TEM-08A based on NPL : A guide to the measurement of humidity Temperature calculated @ relative humidity 50 % Humidity calculated @ temperature 25°C

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Field of Calibration	Parameter/Rage/Item	Calibration and Measurement Capability*	Method/Technique
1. Balance	Electronic balance and Mechanical balance		In - house method : CP-BAL-01A based on UKAS LAB 14 : 2006
	up to 20 g	0.13 mg	
	> 20 g to 40 g	0.25 mg	
	> 40 g to 60 g	0.26 mg	
	> 60 g to 100 g	0.38 mg	
	> 100 g to 200 g	0.65 mg	
	> 200 g to 300 g	1.5 mg	
	> 300 g to 400 g	1.6 mg	
	> 400 g to 500 g	1.9 mg	
	> 500 g to 600 g	2.1 mg	
	> 600 g to 700 g	2.3 mg	
	> 700 g to 800 g	2.5 mg	
	> 800 g to 900 g	2.7 mg	
	> 900 g to 1 kg	3.0 mg	
	> 1 kg to 10 kg	0.13 g	
	> 10 kg to 20 kg	0.53 g	
	> 20 kg to 400 kg	82 g	
	> 400 kg to 600 kg	83 g	
	> 600 kg to 800 kg	84 g	
	> 800 kg to 900 kg	85 g	
	> 900 kg to 1 000 kg	86 g	

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Field of Calibration	Parameter/Rage/Item	Calibration and Measurement Capability*	Method/Technique
2. Mechanical	Pressure measuring instrument (Analog and digital)		
	Pneumatic type		In – house method : CP-PRE-01A based on DKD-R6-1,2003
	0 kPa to 200 kPa	0.19 kPa	
	Water type		In – house method : CP-PRE-02A based on DKD-R6-1,2003
	0 MPa to 70 MPa	58 kPa	
	Vacuum measuring instrument (Analog and digital)		In – house method : CP-PRE-03A based on DKD-R6-1,2003
	-95 kPa to 0 kPa	0.33 kPa	
3. Electrical	Temperature Indicator		
	Thermocouple		In - house Method : CP-TEM-02AS by direct measurement with documenting process calibrator based on EA10/11
	Type J		
	-200 °C to 700 °C	0.40 °C	
	> 700 °C to 1 200 °C	0.39 °C	
	Type T		
	0 °C to 400 °C	0.33 °C	
	Type K		
	-200 °C to 300 °C	0.40 °C	
	> 300 °C to 700 °C	0.37 °C	
	> 700 °C to 1 370 °C	0.38 °C	
	Type R		
	0 °C to 900 °C	1.2 °C	
	> 900 °C to 1 750 °C	0.70 °C	

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Field of Calibration	Parameter/Rage/Item	Calibration and Measurement Capability*	Method/Technique
3. Electrical (cont.)	Temperature Indicator Resistance temperature detector Pt 100 Ω (385) 2, 3, 4 wire -200 °C to 800 °C	0.18 °C	In - house method : CP-TEM-22AS based on EA10/11 by direct measurement with documenting process calibrator
4. Temperature	Temperature sensor Thermocouple Type J -20 °C to 100 °C >100 °C to 200 °C >200 °C to 400 °C >400 °C to 600 °C Type K -20 °C to 100 °C >100 °C to 200 °C >200 °C to 300 °C >300 °C to 400 °C >400 °C to 500 °C >400 °C to 600 °C Type T -20 °C to 150 °C >150 °C to 250 °C	 0.55 °C 0.89 °C 1.9 °C 2.9 °C 0.73 °C 0.99 °C 1.4 °C 1.7 °C 2.1 °C 2.4 °C 1.2 °C 1.7 °C	In - house method : CP-TEM-04AS by comparison with thermometer standard

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Field of Calibration	Parameter/Rage/Item	Calibration and Measurement Capability*	Method/Technique
4. Temperature (cont.)	Temperature sensor		
	Resistance temperature detector		In - house method : CP-TEM-16AS
	(Pt 100 Ω) 2, 3, 4 wire		by comparison with
	-20 °C to 200 °C	0.25 °C	thermometer standard
	>200 °C to 300 °C	0.88 °C	
	>300 °C to 400 °C	1.3 °C	
	>400 °C to 500 °C	1.6 °C	
	>500 °C to 600 °C	1.9 °C	
	Temperature indicator with sensor		
	Thermocouple Type E, J, K, N, T		In - house method : CP-TEM-14AS by comparison
	-20 °C to 100 °C	0.44 °C	with thermometer
	>100 °C to 200 °C	0.76 °C	standard
	>200 °C to 300 °C	1.4 °C	
	>300 °C to 400 °C	1.9 °C	
	Thermocouple Type E, J, K, N		
	>400 °C to 500 °C	2.4 °C	
	>500 °C to 600 °C	2.8 °C	
	Resistance temperature detector		In - house Method : CP-TEM-12AS by comparison
	(Pt 100 Ω) 2, 3, 4 wire		with thermometer
	-20 °C to 200 °C	0.14 °C	standard
	>200 °C to 300 °C	0.38 °C	
	>300 °C to 400 °C	0.57 °C	
	>400 °C to 500 °C	0.86 °C	
	>500 °C to 600 °C	0.89 °C	

* express as an uncertainty (±), providing a level of confidence of approximately 95%

Accreditation No. : Calibration 0217

Laboratory Status ☐ Permanent ☑ Site ☐ Temporary ☐ Mobile

Field of Calibration	Parameter/Rage/Item	Calibration and Measurement Capability*	Method/Technique
4. Temperature (cont.)	Dial Thermometer		In - house method : CP-TEM-06AS by comparison with thermometer standard
	-20 °C to 200 °C	0.60 °C	
	>200 °C to 600 °C	1.1 °C	
	Liquid in glass thermometer		In - house method : CP-TEM-11AS by comparison with thermometer standard
	Total immersion		
	-20 °C to 100 °C	0.60 °C	
	Partial immersion		
	-20 °C to 100 °C	0.61 °C	
	Water bath		In - house method : CP-TEM-19AS based on ASTM E715-80 : (Reapproved 2001) by comparison with data acquisition
	20 °C to 80 °C	0.13 °C	
	Autoclave		In - house method : CP-TEM-20AS based on BS 2646 : 1993 Part 5 by comparison with data acquisition
	110 °C to 125 °C	0.60 °C	
	Hot air oven		In - house method : CP-TEM-21AS based on TLAS G-20 (Guidelines for calibration and check of temperature controlled enclosures)
	37 °C to 50 °C	0.40 °C	
	>50 °C to 100 °C	0.41 °C	
	>100 °C to 250 °C	0.52 °C	

* express as an uncertainty (±), providing a level of confidence of approximately 95%

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Field of Calibration	Parameter/Rage/Item	Calibration and Measurement Capability*	Method/Technique
4. Temperature (cont.)	Freezer -40 °C to 0 °C	0.52 °C	In - house method : CP-TEM-21AS based on TLAS G-20 (Guidelines for calibration and check of temperature controlled enclosures)
	Low Temp. Incubator 0 °C to 30 °C	0.33 °C	
	Incubator 30 °C to 100 °C	0.31 °C	
	Refrigerator 0 °C to 10 °C	0.33 °C	

* express as an uncertainty (±), providing a level of confidence of approximately 95%

Scope of Accreditation for Calibration

Certificate No. 12132/C0217

Accreditation No. : Calibration 0217

Laboratory Status ☐ Permanent ☑ Site ☐ Temporary ☐ Mobile

Field of Calibration	Parameter/Rage/Item	Calibration and Measurement Capability*	Method/Technique
4. Temperature (cont.)	Furnace 300 °C to 900 °C	3.6 °C	In - house method : CP-TEM-18AS based on BS 4309 : 1968by comparison with Data acquisition
* express as an uncertainty (±), providing a level of confidence of approximately 95%			

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Signature :

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Secretary – General

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