CERTIFICATE OF ACCREDITATION

In terms of section 22(2) (b) of the Accreditation for Conformity Assessment, Calibration and Good Laboratory Practice Act, 2006 (Act 19 of 2006), read with sections 23(1), (2) and (3) of the said Act, I hereby certify that:-

LMC SOLUTIONS (PTY) LTD
Co. Reg. No.: 2015/145753/07
TEMPERATURE CALIBRATION LABORATORY

Accreditation Number: **375**

is a South African National Accreditation System accredited Calibration laboratory provided that all SANAS conditions and requirements are complied with

This certificate is valid as per the scope as stated in the accompanying scope of accreditation Annexure "A", bearing the above accreditation number for

TEMPERATURE METROLOGY

The facility is accredited in accordance with the recognised International Standard

ISO/IEC 17025:2017

The accreditation demonstrates technical competency for a defined scope and the operation of a laboratory quality management system

While this certificate remains valid, the Accredited Facility named above is authorised to use the relevant SANAS accreditation symbol to issue facility reports and/or certificates

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Mr T Baleni
Acting Chief Executive Officer

Effective Date: 10 October 2021
Certificate Expires: 09 October 2026

ANNEXURE A

SCOPE OF ACCREDITATION

TEMPERATURE METROLOGY

Accreditation Number 375

Permanent Address of Laboratory:
LMC Solutions (Pty) Ltd
Temperature Calibration Laboratory
56 Rubida Street
Lynnwood Ridge
Pretoria
0081

Postal Address:
56 Rubida Street
Lynnwood Ridge
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Cell: +2782 740-6557
Fax: n/a
E-mail: info@LMC-Solutions.co.za

Technical Signatories: Mr M Sakharov (Item 1)
Mr H Liedberg

Nominated Representative: Mr H Liedberg

Issue No.: 05
Date of Issue: 10 October 2021
Expiry Date: 09 October 2026

ITEM	MEASURED QUANTITY OR TYPE OF GAUGE OR INSTRUMENT	RANGE OF MEASURED QUANTITY	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	METHOD/ PROCEDURE
1	**THERMOMETRY**			
1.1	**Thermocouples**			
1.1.1	Noble Metal	- 40 °C to 0 °C 0 °C to 250 °C 250 °C to 450 °C 450 °C to 1200 °C	0,75 K + (0,009 * |t|) K 0,75 K - (0,0012 * |t|) K 0,5 K 0,35 K + (0,0013*|t|) K	Calibration by comparison with a reference thermometer in a bath, drywell, or furnace.
1.1.2	Base Metal	- 80 °C to 0 °C 0 °C to 250 °C 250 °C to 450 °C 450 °C to 1200 °C	0,11 K + (0,00065 * |t|) K 0,11 K + (0,00025 * |t|) K 0,5 K 0,35 K + (0,0013*|t|) K	
1.2	**Resistance Thermometers**			
1.2.1	Platinum Resistance Thermometers (PT 100)	- 80 °C to 250 °C 250 °C to 450 °C	0,05 K + (0,0004 * |t|) K 0,07 K + (0,0004*|t|) K	Calibration by comparison with a reference thermometer in a bath, drywell, or furnace
1.3	**Thermometers**			
1.3.1	Liquid–in-glass	- 40 °C to 0 °C 0 °C to 250 °C	0,05 K + (0,0005 * |t|) K 0,05 K + (0,00045 * |t|) K	Calibration by comparison with a reference thermometer in a bath, drywell, or furnace

The CMC, expressed as an expanded uncertainty of measurement, is stated as the standard uncertainty of measurement multiplied by a coverage factor $k = 2$, corresponding to a confidence level of approximately 95%

Accreditation Manager

ANNEXURE A

Accreditation No.: 375
Date of Issue: 10 October 2021
Expiry Date: 09 October 2026

ITEM	MEASURED QUANTITY OR TYPE OF GAUGE OR INSTRUMENT	RANGE OF MEASURED QUANTITY	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	METHOD / PROCEDURE
1.3.2	Digital Thermometers	- 80 °C to 250 °C 250 °C to 450 °C 450 °C to 1 200 °C	0,05 K + (0,0004 * |t|) K 0,07 K + (0,0004*|t|) K 0,35 K + (0,0013*|t|) K	Calibration by comparison with a reference thermometer in a bath, drywell, or furnace.
1.3.5	Radiation Thermometers	0 °C to 20 °C 20 °C to 40 °C 40 °C to 80 °C	1,0 K 0,5 K 0,6 K	Calibration using a radiation source and reference thermometer.
1.4	**Reference Temperature Sources**			
1.4.1	Ice Point Reference	0,0 °C	0,02 K	Prepared in a thermally insulated flask using distilled water and Ice.
1.5	**Temperature Measuring and Recording**			
1.5.2	Data Loggers	- 80 °C to 250 °C 250 °C to 450 °C 450 °C to 1 200 °C	0,2 K 0,25 K 0,35 K + (0,0013*|t|) K	Calibration by comparison with a reference thermometer in a chamber.
4	**TEMPERATURE INSTALLATIONS AND DEVICES**			
4.1	**Iso-thermal Media evaluation (multi point over time monitoring)**			
4.1.2 4.1.3 4.1.4 4.1.5 4.1.6	Environmental Chambers Furnaces / Drying Ovens Fridges / Freezers Incubators Liquid Baths	- 80 °C to 121 °C 121 °C to 150 °C 150 °C to 450 °C 450 °C to 1 200 °C	0,2 K 0,22 K 1,0 K 0,4 K + (0,0015*|t|) K	Calibration by temperature mapping over time using reference thermometers and/or loggers.
5	On-site calibration for items 1 and 4 above			

The CMC, expressed as an expanded uncertainty of measurement, is stated as the standard uncertainty of measurement multiplied by a coverage factor $k = 2$, corresponding to a confidence level of approximately 95%

ISSUED BY THE SOUTH AFRICAN NATIONAL ACCREDITATION SYSTEM

Accreditation Manager