

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:-

HARDS LABORATORIES CC
Co. Reg No: 2009/164219/23
TRADING AS
TECHNOLOGY SOLUTIONS

Facility Accreditation Number: **905**

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 schedule of accreditation Annexure "A", bearing the above accreditation number for

FLUID FLOW METROLOGY

The facility is accredited in accordance with the recognised International Standard

ISO/IEC 17025:2005

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

Mr R Josias
Chief Executive Officer

Effective Date: 21 October 2015
Certificate Expires: 22 September 2020

ANNEXURE A

SCHEDULE OF ACCREDITATION

FLUID FLOW METROLOGY

Facility Number: 905

<p><u>Permanent Address of Laboratory:</u> Technology Solutions C3 Prospect Close 311 Regency Drive R21 Corporate Park Irene, Pretoria 0157</p> <p><u>Postal Address:</u> PO Box 60508 Pierre Van Ryneveld 0045</p> <p>Tel: (012) 345-5358 Fax: (012) 345-3263 E-mail: luke@technologysolutions.co.za</p>	<p><u>Technical Signatories:</u> Mr L Hards Ms Y Volschenk Ms I Jooste</p> <p><u>Nominated Representative:</u> Mr L Hards</p> <p>Issue No.: 07 Date of Issue: 21 October 2015 Expiry Date: 22 September 2020</p>		
ITEM	MEASURED QUANTITY OR TYPE OF GAUGE OR INSTRUMENT	RANGE OF MEASURED QUANTITY	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)
9.7	FLOW SPEED		
9.7.1	Gas Flow Speed	0 m/s to 2 m/s 2 m/s to 25 m/s	$\pm (0,02 \cdot U + 0,01 \text{ m/s})$ $\pm 0,025 \cdot U$

Original Date of Accreditation: 21 August 2009

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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

Field Manager

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:-

HARDS LABORATORIES CC
Co. Reg No: 2009/164219/23
TRADING AS
TECHNOLOGY SOLUTIONS

Facility Accreditation Number: **1105**

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 schedule of accreditation Annexure "A", bearing the above accreditation number for

PHOTOMETRY METROLOGY

The facility is accredited in accordance with the recognised International Standard

ISO/IEC 17025:2005

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

Mr R Josias
Chief Executive Officer

Effective Date: 21 October 2015
Certificate Expires: 22 September 2020

ANNEXURE A

SCHEDULE OF ACCREDITATION

PHOTOMETRY METROLOGY

Facility Number: 1105

Permanent Address of Laboratory: Technology Solutions C3 Prospect Close 311 Regency Drive R21 Corporate Park Irene, Pretoria 0157 Postal Address: PO Box 60508 Pierre Van Ryneveld 0045 Tel: (012) 345-5358 Fax: (012) 345-3263 E-mail: luke@technologysolutions.co.za		Technical Signatories: Mr L Hards Mr T Appenroth Ms I Jooste Nominated Representative: Mr L Hards Issue No.: 11 Date of Issue: 21 October 2015 Expiry Date: 22 September 2020		
ITEM	MEASURED QUANTITY OR TYPE OF GAUGE OR INSTRUMENT	NOMINAL WAVE LENGTH	RANGE OF MEASURED QUANTITY	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)
PHOTOMETRY				
1.2.1.1	Illuminance responsivity - Illuminance meter calibration (meter against meter)		(50 to 3 200) lux	1,0 %
1.2.1.2	Illuminance responsivity - Illuminance meter calibration (meter against lamp)		(50 to 3 200) lux	0,9 %
PROPERTIES OF DETECTORS				
2.2.2	Spectral Irradiance	400 nm to 500 nm (Bilirubin)	(0 to 500) $\mu\text{W}/\text{cm}^2$	7,2 %
2.9.0	Spectral Irradiance	315 nm to 400 nm (UV-A)	(50 to 1 000) $\mu\text{W}/\text{cm}^2$	9,2 %
		280 nm to 315 nm (UV-B)	(0 to 930) $\mu\text{W}/\text{cm}^2$	9,2 %
		100 nm to 280 nm (UV-C)	(0 to 2 160) $\mu\text{W}/\text{cm}^2$	9,2 %

Original Date of Accreditation: 31 August 2005

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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

Field Manager

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:-

**HARDS LABORATORIES CC
TRADING AS
TECHNOLOGY SOLUTIONS
Co. Reg No: 2009/164219/23**

Facility Accreditation Number: **305**

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 schedule 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 17025:2005

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

**Mr R Josias
Chief Executive Officer**

**Effective Date: 21 October 2015
Certificate Expires: 22 September 2020**

ANNEXURE A

SCHEDULE OF ACCREDITATION TEMPERATURE METROLOGY

Facility Number: 305

<p>Permanent Address of Laboratory: Technology Solutions C3 Prospect Close 311 Regency Drive R21 Corporate Park Irene, Pretoria 0157</p> <p>Postal Address: P O Box 60508 Pierre Van Ryneveld 0045</p> <p>Tel: (012) 345-5358 Fax: (012) 345-3263 E-mail: luke@technologysolutions.co.za</p>	<p>Technical Signatories: Ms Y Volschenk Ms I Jooste (Items 2, 5 & 11) Mr L Hards (Items 2, 3, 4 & 5.2)</p> <p>Nominated Representative: Mr L Hards</p> <p>Issue No.: 06 Date of Issue: 11 November 2015 Expiry Date: 22 September 2020</p>		
ITEM	MEASURED QUANTITY OR TYPE OF GAUGE OR INSTRUMENT	RANGE OF MEASURED QUANTITY	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)
2	Ice Point Reference	0,00 °C	0,003 K
3	Gallium Fixed Point Cell	29,7646 °C	0,003 K
4	Platinum Resistance Thermometers	-50 °C to 0 °C 0 °C to 250 °C	0,023 K 0,021 K
5.1	Thermometers Liquid-in-glass	-50 °C to -20 °C -20 °C to 100 °C 100 °C to 250 °C	0,04 K 0,04 K 0,04 K
5.2	Digital Thermometers	-50 °C to 0 °C 0 °C to 250 °C	0,023 K 0,021 K
11	Heat Stress Monitors (WBGT Monitors)	0 °C to 60 °C	0,082 K

Original Date of Accreditation: 10 June 2010

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Field Manager