CERTIFICATE OF ACCREDITATION

This is to attest

FUGRO SUHAIMI CO LTD

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DAMMAM 31451, SAUDI ARABIA 2165

Calibration Laboratory CL-291

has met the requirements of AC204, *IAS Accreditation Criteria for Calibration Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories*. This organization is accredited to provide the services specified in the scope of accreditation.

Expires December 1, 2025
Effective Date November 27, 2024

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Accredited to ISO/IEC 17025:2017 *Effective Date November 27, 2024*

CALIBRATION AND MEASUREMENT CAPABILITY (CMC)*

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Dimensional			
Vernier Caliper	Up to 150 mm Up to 200 mm Up to 300 mm	11 µm 12 µm 20 µm	Using gage block set GRADE 1 by direct measurement method as per ASME B89.1.149 (FSL CP A 01)
Dial Caliper	Up to 150 mm Up to 200 mm Up to 300 mm	5 µm 6 µm 7 µm	Using gage block set GRADE 1 by direct measurement method as per ASME B89.1.14 (FSL CP A 01)
Digital Caliper	Up to 150 mm Up to 200 mm Up to 300 mm	5 µm 7 µm 16 µm	Using gage block set GRADE 1 by direct measurement method as per ASME B89.1.14 (FSL CP A 01)
Depth Gauge	Up to 150 mm Up to 200 mm Up to 300 mm	5 µm 7 µm 8 µm	Using gage block set GRADE 1 by direct measurement method as per ASME B89.1.14 (FSL CP A 01)
External/Outside Micrometer	Up to 25 mm 25 mm to 50 mm 50 mm to 75 mm 75 mm to 100 mm 100 mm to 125 mm 125 mm to 150 mm 150 mm to 300 mm	1.4 µm 1.5 µm 1.7 µm 2.0 µm 2.3 µm 2.7 µm 3.1 µm	Using Micrometer checker, Gauge block by direct measurement as per ASME B89.1.13 (FSL CP A 02)
Internal/Inside Micrometer	50 mm to 75 mm 75 mm to100 mm 100 mm to125 mm 125 mm to 150 mm 150 mm to 300 mm	1.8 µm 3.2 µm 4.9 µm 8.0 µm 10 µm	Using Inside Micrometer checker, Gauge block by direct measurement as per ASME B89.1.13 (FSL CP A 02)
Depth Micrometer (Digital, Analogue)	Up to 25 mm	2 µm	Using gage block set GRADE 1, Granite Surface by direct measurement as per ASME B89.1.13 (FSL CP A 02)

** If information in this CMC is presented in non-SI units, the conversion factors stated in NIST Special Publication 811 "Guide for the Use of the International System of Units (SI)" apply.*

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Dial and Digital Indicators	Up to 25 mm	1.7 µm	Using Dial calibration tester by direct measurement method as per ASME 89.1.10 (FSL CP A 05)
Measuring Tape / Steel Rule	Up to 1000 mm	17 µm	Using scale & tape Calibrator by direct measurement method as per ASME 89.1.7 (FSL CP A 03)
Height Gauge	Up to 300 mm	11 µm	Using gage block set GRADE 1 by direct measurement method as per ISO 13225:2012 (FSL CP A 06)
Feeler gauge	Up to 1 mm	1.1 µm	Using Digimatic micrometer by direct measurement method as per BS 957:2008 (FSL CP A 04)
Digital Thickness Gauge	Up to 60 mm	1.7 µm	FSL CP A 04 / ISO 19840 Using gage block set GRADE 1 by direct measurement method as per ISO 19840 (FSL CP A 04)
Coating Thickness Gauge	Up to 2900 µm	1.7 µm	FSL CP A 04 / ISO 19840 Using Thickness foils set by direct measurement method as per ISO 19840 (FSL CP A 04)
Theodolite, Total Station & Auto Level Level Distance	 0º 34.6 m	 2.0º 2.5 mm	Using Optical collimator & Laser Distance Meter by direct measurement method as per ISO 1712-2/ ISO 1712-3 / ISO 1712-5 (FSL CP A 07)
Molds Cylinder – Dimensions	Up to 300 mm	0.02 mm	Using Caliper by direct measurement method as per ASTM C470 (FSL CP G 02)
Molds Marshall – Dimensions	Up to 100 mm	0.01 mm	Using Caliper by direct measurement method as per ASTM D6926 (FSL CP G 02)
Molds Mortar Cube – Dimensions	Up to 150 mm	0.01 mm	Using Caliper by direct measurement method as per ASTM C109 (FSL CP G 13)
Proctor Straightedge Beveled Thickness Length	 Up to 3 mm Up to 300 mm	 0.01 mm 0.02 mm	Using Caliper by direct measurement method as per ASTM D698/ D1557
Slump Cone and Rod Diameters Heights/Lengths	 Up to 200 mm Up to 600 mm	 0.02 mm 0.04 mm	Using Caliper and Measuring Tape by direct measurement method as per ASTM C143 (FSL CP G 08)
Sieves	2 mm to 100 mm	0.01 mm	Using Caliper by direct measurement method as per ASTM E11 (FSL CP G 11)

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Mechanical			
Force- Load cell[5]	Up to 100 kN	0.51 kN	Using Proving Ring by direct measurement method as per BS EN 10002-3(FSL CP C 03)
Universal Testing Machine[5] (Compression mode)	Up to 3000 kN	0.52 kN	Using Matest load cell & digital indicator by direct measurement method as per ASTM E4-21 (FSL CP C 01)
Torque – Measuring Equipment[5]	10 N·m to 500 N·m Up to 1000 N·m Up to 2000 N·m	0.28 % 0.32 % 0.43 %	Using Torque Tester by direct measurement method as per ASME B107.300 (FSL CP C 02)
Indirect Verification of Brinell Hardness Machines[5]	414.4 HBW (10/3000)	2.8 HBW	Using Hardness Blocks by direct measurement method as per ASTM E10 (FSL CP C 04)
Indirect Verification of Rockwell Superficial Hardness Machines[5]	HRBW Low Medium High HRC Low Medium	 1.0 HRBW 1.1 HRBW 1.2 HRBW 1.2 HRC 1.2 HRC	Using Hardness Blocks by direct measurement method as per ASTM E18-20 (FSL CP C 05)
Indirect Verification of Microindentation Hardness Machines – Vickers[5]	200.2 HV /5 428.4 HV/5 203.2 HV/10 422.0 HV/10	2.1 % HV 1.9 % HV 3.2 % HV 3.1 % HV	Using Hardness Blocks by direct measurement method as per ASTM E384 & ASTM E92 (FSL CP C 06)
Impact Testing Machines[5] – Metals Distance Between Anvils Striker Centered on Anvils Striking Bit Parallel to Anvils Machine Level Free Swing Zero Check	 ≈ 40.00 mm ≈ 0.406 mm Up to 0.127 mm/mm Up to 0.076 mm/mm Up to 10 lbf·ft	 0.12 mm 0.16 mm 0.17 mm 0.11 mm/mm 1.1 lbf·ft	Using Level and Caliper by direct measurement method as per ASTM E23 (FSL CP C 07)
Schmidt Hammer[5]	80 HRC	2.8 HRC	Using Hardness Anvil by direct measurement method as per

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
			ASTM C805 (FSL CP G 06)
Sound Level Meters[5], Fixed Point	114 dB, 1 kHz	0.77 dB	Using Sound Level Calibrator by direct measurement method as per Mfg speciificaion(Casella model CEL-110/2)
Volumetric[5](Beakers, Flask, pipette, dispenser and Glassware)	Up to 200 mL 200 mL to 700 mL 700 mL to 5000 mL	0.5 µL 2.0 µL 28 µL	ASTM E542 Using Analytical balance, thermometer by direct measurement method as per Mfg speciificaion(Casella model
Hydraulic Pressure – Pressure Gage[5]	0 psi to 10000 psi 10000 psi to 30000 psi	14 psi 100 psi	Using deadweight tester, high pressure comparator, and gauge by direct measurement as per DKD-R6.1/ASME B40 (FSL CP E 01)
Pneumatic Pressure-Pressure Gauges[5]	-12 psi to 300 psi	0.58 psi	Using Pressure Calibrator by direct measurement as per DKD-R6.1/ASME B40 (FSL CP E 01)
Scales & Balances[5]	Up to 220 g Up to 5 kg Up to 10 kg Up to 20 kg Up to 30 kg	0.4 mg + 0.6 R 6.5 mg + 0.6 R 7.5 mg + 0.6 R 21 mg + 0.6 R 30 mg + 0.6 R	Standard Mass set by direct measurement as per (OIML R76)
Asphalt & Concrete Batch Plants and weighing scales[5]	Up to 200 kg 200 kg to 400 kg 400 kg to 600 kg 600 kg to 6000 kg	0.55 kg 0.58 kg 1.8 kg 6 kg	Using M2 class weights and by Substitution Method
CBR Equipment[5] – Spacer Weights Volume	 Up to 180 mm Up to 10 kg Up to 3000 mL	 0.16 mm 0.4 kg 2.5 mL	Using Caliper, Balance by direct measurement method as per ASTM D1883 (FSL CP G 07)
Compactor Marshall or Proctor[5] – Drop Weights Hammer Diameter Hammer Bevel Thickness	 Up to 458 mm Up to 4.5 kg Up to 101 mm Up to 15 mm	 0.01 mm 0.03 kg 0.01 mm 0.01 mm	FSL CP G 12 / ASTM D6926/D698/D1557 Using Caliper, Balance, Measuring Tape by direct measurement method as per ASTM D6926/ D698/ D1557 (FSL CP G 12)
Conical Mold and Tamper[5] – Weight Diameters Height	 Up to 340 g Up to 90 mm Up to 75 mm	 1.2 g 0.01 mm 0.01 mm	Using Balance, Caliper, Depth Gage by direct measurement method as per ASTM C143 (FSL CP G 08)

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Flakiness & Elongation Gauge[5] – Openings	Up to 63 mm	0.01 mm	Using Caliper by direct measurement method as per BS 812 (FSL CP G 05)
LA Abrasion Machine[5] Inside Diameter Inside Length Average Dia of Charge Average Mass of Charge Revolutions per Min.	 Up to 711 mm Up to 508 mm Up to 47 mm Up to 445 g Up to 33 rpm	 1.2 mm 1.2 mm 0.01 mm 0.7 g 1.3 rpm	Using Measuring Tape, Caliper Balance & Tachometer by direct measurement method as per ASTM C131/ ASTM C535 (FSL CP G 01)
Liquid Limit Device and Groover and Hight block[5] – Height of drop weight of cup+ Rate	 Up to 10 mm Up to 215 g Up to 2 rps	 0.06 mm 0.51 g 0.24 rps	Using Gage block set GRADE 1, Balance, Caliper. Tachometer, Resilience Tester by direct measurement method as per ASTM D4318 (FSL CP G 04)
Molds Proctor[5] – Dimensions Volume	 Up to 154 mm Up to 2200 mL	 0.11 mm 2.5 mL	Using Caliper and Balance by direct measurement method as per ASTM D698/ D1557 (FSL CP G 02)
Unit weight Mold[5] – Volume	 Up to 28 L	 0.10 L	Using Balance by direct measurement method as per ASTM C29 (FSL CP G 13)
Penetrometer[5] Weight of needle and spindle assembly Needle diameter Provided Wight	 50 g 1 mm Up to 100 g	 0.08 g 0.01 mm 0.08 g	Using Balance, Caliper by direct measurement method as per ASTM D5
Pycnometer Gravimetric[5]	Up to 250 mL Up to 500 mL Up to 4000 mL	0.15 mL 0.17 mL 2.5 mL	Using Balance by direct measurement method as per ASTM D854/ ASTM C128 / ASTM D2041
Concrete Air Meter[5] (Pressure Method)	Up to 10 % of air in concrete	2.6 % of air in concrete	Using Balance by direct measurement method as per ASTM C231 (FSL CP G 14)

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Thermal			
Temp Indicator with or without Sensor/ Thermometers[5]	-30 °C to 140 °C 140 °C to 200 °C	0.06 °C 0.07 °C	Using Temp Indicator with Sensor and temp bath/Dry Block by comparison measurement method as per ASTM E77/ ASTM E644 ASME B40.200 / ASTM D6927 (FSL CP D 01) & ASTM E145 (FSL CP D 02)
	200 °C to 500 °C 500 °C to 650 °C	1.45 °C 1.45 °C	
Curing Room/Cabinet[5]– Temperature Humidity	 10 °C to 25 °C 10 %RH to 75 %RH	 0.4 °C 3.6 %RH	Using Psychrometer with IR Thermometer by direct measurement method as per ASTM C511 (FSL CP D 02)
Curing Tank[5] – Temperature	 10 °C to 25 °C	 0.13 °C	Using Thermometer by direct measurement method as per ASTM C511 – Multipoint Sensor Method
Oven / incubator[5]	20 °C to 270 °C	0.46 °C	Using Thermometer by direct measurement method as per ASTM D2216/ ASTM D 2216 and ASTM E145 Section 4 (FSL CP D 02) – Multipoint Sensor Method
Temperature – Generating Equipment[5]	-50 °C to 300 °C 301 °C to 650 °C	0.49 °C 0.55 °C	Using PRT, Type K thermocouple and Temp Dry Block/ Temp Bath by direct measurement method as per ASTM E77 (FSL CP D 01)
Temperature Non-Contact Measuring Equipment [5] – IR Thermometer/ Thermal Scanner	35 °C to 100 °C 100 °C to 200 °C 200 °C to 350 °C 350 °C to 500 °C	0.21 °C 0.26 °C 0.74 °C 0.78 °C	Using Infrared thermometer calibrator by direct measurement method as per ASTM E2847-13 (FSL CP D 07)
Temperature & Humidity – Measuring Equipment[5] Temperature Humidity	 (10 to 40) ºC @ 50 %RH (25 to 75) %RH @ 25 ºC	 1.3 ºC 3.2 %RH	Using Temperature & humidity meter and Chember by comparison method (FSL CP D 06)
Electrical – DC/LF			
DC Voltage – Measure[3]	200 mV to 2 V 2 V to 1000 V	0.0012 % 0.00079 %	Using 6.5 Digit Precision Multimeter by direct measurement method (FSL CP I 01)

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
DC Voltage – Generate[4]	Up to 330 mV 330 mV to 3 V 3 V to 300 V 300 V to 1020 V	0.0063 % 0.00053 % 0.00072 % 0.00047 %	Using Multifunction Electrical Calibrator by direct measurement method (FSL CP I 01)
DC High Voltage – Measure[3]	1 kV to 40 kV	0.5 kV	Using High voltage tester by direct measurement method (FSL CP I 08)
DC Current – Generate[4]	Up to 329.999 µA 0.33 mA to 3 mA 3 mA to 300 mA 300 mA to 3 A 3 A to 20 A	0.022 % 0.016 % 0.007 % 0.09 % 0.12 %	Using Multifunction Electrical Calibrator by direct measurement method (FSL CP I 01)
Clamp-On Ammeters DC current	Up to 1000 A	0.92 %	Using Multifunction Electrical Calibrator and Current Coil (50 Turns) by direct measurement metho (FSL CP I 02)
DC Current – Measure[3]	200 µA to 2 A 2 A to 10 A	0.008 % 0.1 %	Using 6.5 Digit Precision Multimeter by direct measurement method (FSL CP I 01)
DC Resistance – Generate[4]	Up to 1 Ω 1 Ω to 300 Ω 300 Ω to 3 kΩ 1100 MΩ	0.063 % 0.0062 % 0.0062 % 1 %	Using Multifunction Electrical Calibrator by direct measurement method (FSL CP I 03)
DC Resistance – Fixed Points	1 MΩ to 10 MΩ 10 MΩ to 100 MΩ 100 MΩ to 1000 MΩ 1 GΩ to 10 GΩ 10 GΩ to 100 GΩ 100 GΩ to 500 GΩ 500 GΩ to 1000 GΩ	0.8 % 0.8 % 0.8 % 1.2 % 1.8 % 2.2 % 4.0 %	Using Decade Megohm Box by direct measurement method (FSL CP I 03)
DC Resistance – Measure[3]	1 Ω to 1 GΩ	0.29 %	Using 6.5 Digit Precision Multimeter by direct measurement method (FSL CP I 03)
AC Voltage – Generate[4]	33 mV to 329.999 mV (10 Hz to 45 Hz) (46 Hz to 10 kHz) (11 kHz to 20 kHz) (21 kHz to 50 kHz) (51 kHz to 100 kHz) (101 kHz to 500 kHz)	0.10 % + 14 µV 0.067 % + 14 µV 0.10 % + 14 µV 0.13 % + 16 µV 0.23 % + 26 µV 0.67 % + 58 µV	Using Multifunction Electrical Calibrator by direct measurement method (FSL CP I 03)

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
AC Voltage – Generate[4] (continued)	3.3 V to 32.9999 V (10 Hz to 45 Hz) (46 Hz to 10 kHz) (11 kHz to 20 kHz) (21 kHz to 50 kHz) (51 kHz to 100 kHz) (101 kHz to 500 kHz) 33 V to 329.999 V (10 Hz to 45 Hz) (0.045 kHz to 10 kHz) (10 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) 330 V to 1020 V (0.045 kHz to 1 kHz) (1 kHz to 5 kHz) (5 kHz to 10 kHz)	 0.033 % + 17 µV 0.020 % + 17 µV 0.047 % + 18 µV 0.067 % + 32 µV 0.15 % + 0.12 mV 0.33 % + 0.46 mV 0.029 % + 0.8 mV 0.015 % + 0.7 mV 0.026 % + 0.8 mV 0.035 % + 0.8 mV 0.087 % + 21 mV 0.029 % + 18 mV 0.024 % + 18 mV 0.029 % + 25 mV	Using Multifunction Electrical Calibrator by direct measurement method (FSL CP I 03)
AC Voltage – Measure[3]	Up to 200 mV (Up to 20 Hz) (21 Hz to 55 Hz) (55 Hz to 1 kHz) (1 kHz to 10 kHz) Up to 2 V (Up to 20 Hz) (21 Hz to 55 Hz) (55 Hz to 1 kHz) (1 kHz to 10 kHz) Up to 20 V (Up to 20 Hz) (21 Hz to 55 Hz) (55 Hz to 10 kHz) Up to 200 V (Up to 20 Hz) (21 Hz to 55 Hz) (55 Hz to 1 kHz) (1 kHz to 10 kHz) Up to 500 V (55 Hz to 10 kHz) 501 V to 1000 V (1 kHz)	 0.0048 mV 0.0043 mV 0.0037 mV 0.0043 mV 0.000036 V 0.000029 V 0.000024 V 0.000029 V 0.00036 V 0.00024 V 0.00029 V 0.0036 V 0.0029 V 0.0024 V 0.0029 V 0.022 V 0.082V	Using 6.5 Digit Precision Multimeter by direct measurement method (FSL CP I 01)

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
AC Current – Generate[4]	29.00 µA to 0.33 mA 0.33 mA to 3.29999 mA 3.29999 mA to 329.999 mA 329.999 mA to 20A (10 Hz to 5 kHz)	0.12 µA to 0.71 µA 0.71 µA to 19 µA 19 µA to 0.25 mA 0.25 mA to 0.40 A	Using Multifunction Electrical Calibrator by direct measurement method (FSL CP I 01)
Clamp-On Ammeters	Up to 1000 A (50 Hz to 400 Hz)	0.14 %	Using Multifunction Electrical Calibrator and Current Coil (50 Turns) by direct measurement metho (FSL CP I 02)
AC Current – Measure[3]	Up to 200 µA (300 Hz to 10 kHz) Up to 2 mA (300 Hz to 10 kHz) Up to 20 mA (300 Hz to 10 kHz) Up to 200 mA (300 Hz to 1 kHz) Up to 2 A (1 kHz to 10 kHz) (300 Hz to 1 kHz) Up to 20 A (1 kHz to 10 kHz) Up to 200 A, 60 Hz 201 A to 400 A, 60 Hz 401 A to 600 A, 60 Hz 601 A to 800 A, 60 Hz 801 A to 1000 A, 60 Hz	0.015 µA 0.00015 mA 0.0015 mA 0.014 mA 0.0026 A 0.0029 A 0.0069 A 0.28 A 0.56 A 0.84 A 1.12 A 1.4 A	Using 6.5 Digit Precision Multimeter and Clampmeter by direct measurement method (FSL CP I 01)
Capacitance – Generate[4]	220.0 pF to 399.9 pF (10 Hz to 10 kHz) 0.4 nF to 1.0999 nF (10 Hz to 10 kHz) 1.1 nF to 3.2999 nF (10 Hz to 3 kHz) 3.3 nF to 10.9999 nF (10 Hz to 1 kHz)	0.60 % + 15 pF 0.60 % + 0.63 nF 0.60 % + 0.58 nF 0.30 % + 0.63 nF	Using Multifunction Electrical Calibrator by direct measurement method (FSL CP I 01) Using Multifunction Electrical Calibrator by direct measurement method (FSL CP I 01)

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Capacitance – Generate[4] (continued)	11 nF to 32.9999 nF (10 Hz to 1 kHz)	0.30 % + 0.77 nF	Using Multifunction Electrical Calibrator by direct measurement method (FSL CP I 01)
	33 nF to 109.999 nF 10 Hz to 1 kHz	0.30 % + 2.8 nF	Using Multifunction Electrical Calibrator by direct measurement method (FSL CP I 01)
	110 nF to 329.999 nF (10 Hz to 1 kHz)	0.30 % + 7.5 nF	
	0.33 µF to 1.099 99 µF (10 Hz to 600 Hz)	0.30 % + 27 nF	
	1.1 µF to 3.299 99 µF (10 Hz to 300 Hz)	0.30 % + 50 nF	
	3.3 µF to 10.9999 µF (10 Hz to 150 Hz)	0.30 % + 250 nF	
	11 µF to 32.9999 µF (10 Hz to 120 Hz)	0.50 % + 750 nF	
	33 µF to 109.999 µF (10 Hz to 80 Hz)	0.50 % + 2.8 µF	
	110 µF to 329.999 µF (0 Hz to 50 Hz)	0.50 % + 2.8 µF	
	0.33 mF to 1.09999 mF (0 Hz to 20 Hz)	0.50 % + 3.0 µF	
	1.1 mF to 3.299 99 mF (0 Hz to 6 Hz)	0.52 % + 3 µF	
	3.3 mF to 10.9999 mF (0 Hz to 2 Hz)	0.52 % + 10 µF	
	11 mF to 32.9999 mF (0 Hz to 0.6 Hz)	0.90 % + 100 µF	
Temperature Simulation – Measure Type K	-180 °C to 1372 °C	0.65 °C	Using Documenting Process calibrator, Type K TC by direct measurement method (FSL CP I 09)

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Temperature Simulation- Generate –			Using Multifunction Electrical Calibrator by direct measurement method (FSL CP I 09)
Type B	600 °C to 1820 °C	0.55 °C	
Type E	-200 °C to 1000 °C	0.50 °C	
Type J	-200 °C to 1200 °C	0.33 °C	
Type K	-200 °C to 1372 °C	0.59 °C	
Type N	-200 °C to 1300 °C	0.52 °C	
Type R	0 °C to 1767 °C	0.94 °C	
Type S	0 °C to 1767 °C	0.94 °C	
Type T	-250 °C to 400°C	0.74 °C	
Type U	-200 °C to 600 °C	0.56 °C	
Temperature Simulation- Generate –			Using Multifunction Electrical Calibrator by direct measurement method (FSL CP I 09)
Pt 385 100 Ω, Pt 385 200 Ω, Pt 385 500 Ω, Pt 385 1000 Ω	-200 °C to 100 °C 100 °C to 630 °C	0.061 °C 0.27 °C	
Pt 3926 100 Ω,	-200 °C to 100 °C	0.05 °C	
Pt 3916 100 Ω	100 °C to 630 °C	0.15 °C	
Cu 427 10 Ω	-100 to 260 °C	0.34 °C	
Welding Machine			Using Welding machine calibrator and Current Clamp by direct measurement method, as per BS EN 50504 (FSL CP J 01)
DC Voltage – Measure[3]	10 V to 80 V	92 mV	
AC Voltage – Measure[3]	10 V to 80 V @ 60 Hz	95 mV	Using Welding machine calibrator and Current Clamp by direct measurement method, as per BS EN 50504 (FSL CP J 01)
DC Current – Measure[3]	10 A to 600 A	0.98 A	
AC Current – Measure[3]	10 A to 600 A @ 60 Hz	1.0 A	

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Time and Frequency			
Rotation Frequency – Contact – Measure	28 rpm to 9000 rpm	1.3 rpm	Using Tachometer with Rotation source by direct measurement method (FSL CP I 07)
Digital Tachometers & Non-contact Photo – Measure	28 rpm to 90000 rpm	1.5 rpm	Using Tachometer with Rotation source with LED by direct measurement method (FSL CP I 07)
Timers and Stopwatches	Up to 24 h	0.49 s	Using Stopwatch comparison measurement method as per NIST SP 960-12 (FSL CP L 01)
Chemical/Gas			
pH Measuring Equipment[5], (Fixed Points)	4 pH 7 pH 10 pH	0.02 pH 0.01 pH 0.03 pH	pH buffer solutions by Direct measurement (FSL CP G 15)
TDS Measuring Equipment[5] (Fixed Points)	500 mg/L	2.3 mg/L	TDS Reference Solution by direct measurement (FSL CP G 15)
Conductivity, Liquid[5] (Fixed Points)	456 µmhos/cm at 20 °C 11660 mhos/cm at 20 °C	2.1 µmhos/cm 50 mhos /cm	Conductivity solutions by direct measurement (FSL CP G 15)
XRF Analyzer[5]	Cu (0.0077 to 93.95) % Sn (0.00051 to 0.270) % Pb (0.0018 to 0.33) % Zn (0.111 to 0.656) % Ni (0.012 to 4.17) % P (0.001 to 0.318) % Fe (0.060 to 2.87) % Si (0.0065 to 0.35) % Mn (0.001 to 8.33) % As (0.001 to 0.44) % Al (5.27 to 8.42) % C (0.0026 to 1.18) % S (0.0093 to 0.020) % Cr (1.076 to 16.36) % Mo (0.00077 to 1.318) % Al 0.131 %	5.4 % 0.2 % 0.2 % 0.22 % 0.4 % 0.2 % 0.22 % 0.26 % 0.41 % 0.2 % 0.4 % 0.6 % 0.2 % 2.0 % 0.4 % 0.2 %	Standard reference material by direct measurement (FSL CP K 01)

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
XRF Analyzer[5] (continued)	Co (0.0027 to 0.0048) % N (0.0026 to 0.0225) % Ti 0.0024 % As 0.0036 % Nb (0.0146 % to 0.00015 %)	0.4 % 0.4 % 0.3 % 0.01 % 0.01 %	Standard reference material by direct measurement (FSL CP K 01)
Fixed-Gas Analyzer[5] H_2S CO CH4 O Multi-Gas Analyzer [5] H_2S CO CH4 O	 0 ppm to 200 ppm 0 ppm to 100 ppm 0 % to 200 % 0 % to 25 % Up to 200 ppm Up to 1000 ppm Up to100 % Up to 30 %	 1.8 part per 10^6 5.8 part per 10^6 1.6 % 1.5 % 5.3 % 5.3 % 5.3 % 5.3 %	Fixed/Mixed Reference Gases by Direct measurement as per FSL CP O 01

[1]The uncertainty covered by the Calibration and Measurement Capability (CMC) is expressed as the expanded uncertainty having a coverage probability of approximately 95 %. It is the smallest measurement uncertainty that a laboratory can achieve within its scope of accreditation when performing calibrations of a best existing device. The measurement uncertainty reported on a calibration certificate may be greater than that provided in the CMC due to the behavior of the calibration item and other factors that may contribute to the uncertainty of a specific calibration.

[2]When uncertainty is stated in relative terms (such as percent, a multiplier expressed as a decimal fraction or in scientific notation), it is in relation to instrument reading or instrument output, as appropriate, unless otherwise indicated.

[3]Capability is suitable for the calibration of measuring devices in the stated ranges.

[4]Capability is suitable for the calibration of devices intended to generate the indicated quantity in the stated ranges.

[5]Also available as on-site calibration. Note that actual measurement uncertainties achievable at site outside the laboratory can normally be expected to be larger than the uncertainties listed on this Scope of Accreditation.

Notes:

rps= revolutions per second
1 µmhos/cm = 1 µS/cm
1 mho/cm = 1000 µS/cm
ppm = parts per million