CERTIFICATE OF ACCREDITATION

This is to attest

FUGRO SUHAIMI CO LTD

LOT # 012, BLOCK # 03 SHAREH NAHAWAND, HAII AL-MEHAN, MADINAT YANBU AL-SINAIYAH
YANBU, 31270, SAUDI ARABIA

Calibration Laboratory CL-301

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.

Expiry Date February 1, 2026
Effective Date January 20, 2025

International Accreditation Service
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SCOPE OF ACCREDITATION

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FUGRO SUHAIMI CO LTD

www.fugro-suhaimi.com

Contact Name Smijith VS **Contact Phone** +966-554264474

Accredited to ISO/IEC 17025:2017 *Effective Date January 20, 2025*

CALIBRATION AND MEASUREMENT CAPABILITY (CMC)*

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Dimensional			
Caliper – (Vernier, Digital, Dial)	1 mm to 300 mm 300 mm to 600 mm	7.7 µm 8.5 µm	Using Slip Gauge set and caliper checker by Direct method
Outside Micrometer	1 mm to 25 mm 25 mm to 150 mm	2.1 µm 6.7 µm	Using Slip Gauge Set by Direct method
Depth Micrometers	1 mm to 25 mm 25 mm to 300 mm	2.1 µm 6.7 µm	Using Slip Gauge Set by Direct method
Dial Indicators (Plunger)	0 mm to 50 mm	5.8 µm	Using Dial indicator calibrator by Direct method
Measuring Tape/Steel Rule	0 mm to 1000 mm	0.58 mm	Using Scale & Tape calibrator by Direct method
Coating Thickness Gauge	25 µm to 5245 µm	3.3 µm	Using Thickness foils set by Direct method
Thickness Gauge	0 mm to 1 mm 1 mm to 100 mm	3.3 µm 5.9 µm	Using Gauge block set & foils set by Direct method
Height Guage	10 mm to 600 mm	9.5 µm	Using Slip Gauge set and caliper checker by Direct Method
Marshall & Soil Compactor[5]	Hammer Fall Height 455.90 mm to 448.50 mm Hammer Diameter 50.67 mm to 50.93 mm	0.91 mm 0.01 mm	Direct measurement by Using Vernier Caliper and Steel Scale
Conical Cone &Tamping Rod[5]	Dimensions 20 mm to 95 mm	0.02 mm	Direct measurement by Using Vernier Caliper and Steel Scale
Flakiness Gauge[5]	5 mm to 80 mm	0.01 mm	Direct measurement by Using Vernier Caliper

** 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)
Elongation Gauge[5]	5 mm to 80 mm	0.01 mm	Direct measurement by Using Vernier Caliper
LA Abrasion Machine	Insider Dia 706 mm to 716 mm Inside Length Drum 503 mm to 513 mm Average Dia of charge 46 mm to 48 mm	1.1 mm 1.1 mm 0.012 mm	Using Vernier Caliper, Steel Ruler, Laser Meter by Direct method
Cylinder Mold[5]	Dimensions 295 mm to 305 mm	0.01 mm	Direct measurement by Using Vernier Caliper
Marshall Mold[5]	Dimensions 85 mm to 105 mm	0.03 mm	Direct measurement by Using Vernier Caliper
Mortar Cube Mold[5]	Dimensions 45 mm to 55 mm	0.04 mm	Direct measurement by Using Vernier Caliper
Proctor Mold / CBR Mould[5]	Diameter 151.7 mm to 153.1 mm Height 115.9 mm to 116.9 mm Spacer Diameter 150.8 mm Spacer Height 61.24 mm to 61.5 mm	0.019 mm 0.019 mm 0.013 mm 0.019 mm	Direct measurement by Using Vernier Caliper
Sample Splitter[5]	Dimensions 5 mm to 100 mm	0.01 mm	Direct measurement by Using Vernier Caliper
Sand Equivalent Tester[5]	Horizontal Throw 203.2 ± 1 mm Sand Reading Indicator length from Foot 10 ± 0.1 inch	0.01 mm 0.009 inch	Direct measurement by Using Vernier Caliper
Aggregate Impact Value Apparatus[5]	Cylindrical Metal Cup Internal Diameter 102 ± 0.5 mm Internal Depth 50 ± 0.25 mm Wall Thickness 6 mm minimum	0.013 mm 0.013 mm 0.013 mm	Direct measurement by Using Vernier Caliper

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Aggregate Impact Value Apparatus[5] (continued)	Metal Hammer Diameter at lower end 100 ± 0.5 mm Height at Lower end 50 ± 0.15 mm Cylindrical Metal Measure Internal Diameter 75 ± 1 mm Internal Depth 50 ± 1 mm Tamping Rod Diameter of rod 16 ± 1 mm Length of rod 600 ± 5 mm Free fall Height of hammer 380 ± 5 mm	 0.013 mm 0.013 mm 0.013 mm 0.013 mm 0.013 mm 0.013 mm 0.97 mm	Direct measurement by Using Vernier Caliper
Slump Cone and Tamping Rod Dimension[5]	Slump Cone Top Diameter 100 ± 3 mm Base Diameter 200 ± 3 mm Height 300 ± 3 mm Thickness 1.5 mm minimum Tamping Rod Diameter of rod 16 ± 2 mm Length 600 mm	 0.013 mm 0.013 mm 0.013 mm 0.013 mm 0.96 mm	Using Vernier Caliper by Direct measurement Method
Test Sieves	0.075 mm to 125 mm	22 µm	By Tape and Scale calibrator and Vernier caliper by direct method

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Liquid Limit Device[5]	Dimension 8 mm to 12 mm	0.02 mm	Direct measurement by Using Vernier Caliper and Gauge Block
Unit Weight Mold[5]	Wall & Bottom Thickness 1 mm to 10 mm	0.013 mm	Direct measurement by Using Vernier Caliper
Penetrometer[5]	Needle Diameter 1 mm to 1.02 mm Needle Travel 0 to 40 mm	0.013 mm 0.013 mm	Direct measurement by Using Vernier Caliper and Gauge block
Vicat Apparatus Dimension[5]	Needle Diameter 1 mm to 1.02 mm Needle Travel 0 to 40 mm Mould Bottom Diameter 70 ± 3 mm Mould Top Diameter 60 ± 3 mm Height of mould 40 ± 1 mm	0.013 mm 0.013 mm 0.013 mm 0.013 mm 0.013 mm	Direct measurement by Using Vernier Caliper
Flow Table Mold & Table Dimension[5]	Flow Mold Inside Diameter at top 70 ± 1.3 mm Inside Diameter at bottom 100 ± 0.5 mm Height of Cone 50 ± 0.5 mm Flow Table Table Diameter 255 ± 2.5 mm Height of Drops 12.7 ± 0.13 mm	0.013 mm 0.013 mm 0.013 mm 0.013 mm 0.013 mm	Direct measurement by Using Verniner Caliper
Mechanical			
Marshall & Soil Compactor[5]	Hammer Weight 4.5274 kg to 4.5454 kg	0.37 g	Using weighing scale by direct method
Conical Cone &Tamping Rod[5]	Weight 32 g to 355 g	0.06 g	Using weighing scale by direct method

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
LA Abrasion Machine[5]	Speed of Rotation 30 rpm to 33 rpm Average weight of charge 4975 g to 5025 g	1.3 rpm 0.08 g	Using Weighing scale and Tachometer by Direct method
Sand Equivalent Tester Foot Assembly Weight[5]	Throw per Minute 175 ± 2 rpm Weight of Foot Assembly 1000 ± 5 g	1.6 rpm 0.06 g	Using Balance and Tachometer by Direct Method
Aggregate Impact Value Apparatus[5]	Metal Hammer, Weight of Hammer 13.5 kg to 14 kg	0.39 g	Using weighing scale by direct method
Liquid Limit Device[5]	Weight of Cup with Hanger 185 g to 215 g	0.06 g	Using weighing scale by direct method
Penetrometer[5]	Weight of needle and Spindle Assembly 50 ± 0.05 g Weights 50 g & 100 g ± 0.05 g	0.06 g 0.06 g	Direct measurement by Using Weighing Balance
Vicat Apparatus[5]	Weight of needle and Spindle Assembly 300 ± 0.5 g	0.06 g	Direct measurement by Using Weighing Balance
Flow Table[5]	Weight of Table 4.08 ± 0.05 kg	0.37 g	Direct measurement by Using Weighing Balance
Air Meter[5]	Volume of Air Content 5 %	0.37 %	Direct measurement by Using Weighing Balance
Weighing Scales, Concrete Batch Plant Asphalt Batch Plant[5]	1 kg to 100 kg 100 kg to 500 kg 500 kg to 1000 kg 1000 kg to 10000 kg	0.01 kg 0.03 kg 0.17 kg 1.7 kg	By substitution method (up to 10000 kg as per ASTM C94)
Weighing Balances and Scales[5]	1 mg to 220 g 220 g to 50000 g	0.16 mg 90 mg	Using Standard Weight by Direct Method

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Mass – Fixed Points	1 mg 2 mg 5 mg 10 mg 20 mg 50 mg 100 mg 200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g 500 g 1000 g 2000 g 5000 g 10000 g 20000 g	0.06 mg 0.06 mg 0.06 mg 0.06 mg 0.06 mg 0.06 mg 0.06 mg 0.06 mg 0.06 mg 0.06 mg 0.06 mg 0.06 mg 0.07 mg 0.09 mg 0.11 mg 0.25 mg 0.37 mg 24 mg 29 mg 33 mg 0.09 g 0.18 g 0.33 g	Standard Weights Analytical Balance Mass Comparator as per ABBA Method
Unit Weight Mold Volume[5]	2800 cm^3 to 14000 cm^3	0.44 cm^3	Using Balance & Thermometer by Direct measurement-
Proctor Mold / CBR Mould[5]	Volume 2099 cm^3 to 2149 cm^3	0.39 cm^3	Using Balance & Thermometer by Direct measurement-
Pycnometer	Up to 100 mL	0.16 mL	Using Weighing balance and weight by comparison method
GMM Test Container[5]	Up to 20000 cm^3	0.39 g	Using Balance & Thermometer by Direct measurement
Graduated Cylinder	20 mL 50 mL to 200 mL 500 mL 1000 mL 2000 mL	0.08 mL 0.58 mL 2.9 mL 5.8 mL 12 mL	Using Weighing balance and weight by comparison method
Burette	1 mL to 25 mL	0.08 mL	Using Weighing balance and weight by comparison method
Pipette	2 mL to 10 mL	0.16 mL	Using Weighing balance and weight by comparison method
Compression Testing Machine[5]	100 kN to 3000 kN	0.17 %	Using Load Cell with Indicator by Direct method

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Load Measuring Device - Load Cell	1 kN to 100 kN	0.48 %	Using Load Cell with Indicator by comparison method
Torque Wrenches	50 Nm to 400 Nm 400 Nm to 1000 Nm	0.90 Nm 6.5 Nm	Using Torque Tester by direct measurement
Pressure Measuring Devices- Pressure Indicators Pressure Transducers Pressure Transmitters Pressure Recorders	5 bar to 40 bar 40 bar to 700 bar 700 bar 1200 bar	5.8 mbar 0.19 bar 2.9 bar	Dead Weight Pressure Tester by direct method
Low pressure	-0.90 bar to +1 bar 1 bar to 5 bar	0.6 mbar 3.6 mbar	Using Pressure/ Vacuum Indicator and compactor by comparison method
Pressure Relief Valves	1 bar to 50 bar 50 bar to 200 bar	0.18 bar 0.92 bar	Using Pressure Gauge and compactor by comparison method
Thermal			
Melting Pot[5]	50 °C to 200 °C	0.66 °C	Using reference Thermometer by comparison method FSL CP D01/ FSL CP G21
Temperature Indicators Temperature Element Temperature Transmitters Temperature Recorder	-25 °C to 150 °C 150 °C to 400 °C 400 °C to 650 °C	0.30 °C 0.30 °C 0.85 °C	Using Reference Thermometer and Dry Block Calibrator by comparison method
Infrared Thermometer	50 °C to 100 °C 100 °C to 200 °C 200 °C to 400 °C 400 °C to 500 °C	0.60 °C 0.85 °C 1.5 °C 2.1 °C	Using Precision Infrared Calibrator by Direct method
Oven & Furnace[5]	50 °C to 400 °C 400 °C to 1100 °C	2.9 °C 5.5 °C	Using Digital Thermometer by mapping method
Temperature Bath[5]	25 °C to 100 °C	0.31 °C	Using digital Thermometer by direct measurement (Single sensor method)
Incubator[5]	10 °C to 100 °C	2.9 °C	Using Digital Thermometer by direct measurement (Single sensor method)
Hot Plate[5]	50 °C to 500 °C	0.98 °C	Using Digital Thermometer by direct measurement (Single sensor method)
Thermo-Hygrometer	10 °C to 50 °C 40 %RH to 80 %RH	0.72 °C 3.4 %RH	Using Reference Hygrometer and Environmental Chamber by comparison method

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Electrical			
Resistance- Generate[3] Fixed Points (Earth Resistance Testers, Insulation Testers & Megger Tester)	1 Ω to 10 Ω 10 Ω to 10 MΩ 10 MΩ to 100 GΩ	0.12 % 0.17 % 0.14 %	Using Decade resistance box by direct method
DC Voltage – Measure[4]	100 mV to 1 V 1 V to 1000 V	0.009 % 0.006 %	Using precision multimeter by direct method
AC Voltage – Measure[4] @ 50 Hz to 100 kHz	100 mV to 750 V	0.19 %	Using precision multimeter by direct method
Resistance – Measure[4]	0.1 kΩ to 1 MΩ 1 MΩ to 10 MΩ 10 MΩ to 100 MΩ	0.016 % 0.05 % 0.92 %	Using precision multimeter by direct method
DC Current – Measure[4]	0.1 mA to 100 mA 100 mA to 1 A 1 A to 10 A	0.08 % 0.12 % 0.2 %	Using precision multimeter by direct method
AC Current – Measure[4] Up to 10 kHz	10 mA to 10 A	0.2 %	Using precision multimeter by direct method
Welding Machine Measure, Volt & Ampere[5]	20 V to 80 V DC 50 A to 100 A DC 20 V to 80 V @ 60 Hz 50 A to 100 A @ 60 Hz	0.11 V 1.2 A 0.11 V 1.2 A	Using SMP welding machine calibrator by direct method
DC High Voltage – Measure[4] Holiday Detector	1 kV to 30 kV	0.12 kV	Using Brandenburg DC HV tester by direct method
DC Voltage – Generate[3]	3 mV to 1000 V	0.002 %	Using Multi-Product Electrical Calibrator by direct method
AC Voltage – Generate[3] 45 Hz – 8 kHz	3 mV to 1000 V	0.04 %	Using Multi-Product Electrical Calibrator by direct method
DC Current – Generate[3]	329 µA to 20 A	0.08 %	Using Multi-Product Electrical Calibrator by direct method
DC Current – Generate[3] Clampmeter	10 A to 100 A 100 A to 1000 A	0.9 % 0.08 %	Using Multi-Product Electrical Calibrator and 10 and 50 turn coil by direct method
AC Current – Generate[3] @ 20 Hz to 30 kHz	29 µA to 329.999 µA 330 µA to 20 A	0.62 % 0.14 %	Using Multi-Product Electrical Calibrator by direct method

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
AC Current – Generate[3] Clampmeter @ 45 Hz	10 A to 100 A 100 A to 1000 A	0.9 % 0.0 8%	Using Multi-Product Electrical Calibrator and 10 and 50 turn coil by direct method
Resistance – Generate[3]	0.1 Ω to 10.999 Ω 11 Ω to 100 MΩ 100 MΩ to 1090 MΩ	0.07 % 1 % 2 %	Using Multi-Product Electrical Calibrator by direct method
Capacitance – Generate[3]	11 nF to 300 nF 0.3 µF to 1.09999 mF	1.9 % 0.07 %	Using Multi-Product Electrical Calibrator by direct method
Frequency Generate[3] @ 3 V	120 Hz to 100 kHz	0.01 %	Using Multi-Product Electrical Calibrator by direct method
Sound Level Meter	94 dBA 114 dBA	0.62 dBA 0.62 dBA	Using Sound level calibrator by direct method
Time and Frequency			
LA Abrasion Machine Rotation[5]	30 rpm to 35 rpm	2.2 rpm	Using Tachometer by Direct measurement
Sand Equivalent Test Throw per minutes[5]	170 rpm to 200 rpm	2.2 rpm	Using Tachometer by Direct measurement
Extraction Machine Rotation[5]	30 rpm to 3800 rpm	2.2 rpm	Using Tachometer by Direct measurement
Stop Watch	10800 s	0.42 s	Using Reference Stop watch by comparison
Chemical/Gas			
pH – Measuring Equipment, Fixed Points at 25 °C	4 pH 7 pH 10 pH	0.03 pH 0.03 pH 0.03 pH	Using pH buffer solutions direct measurement
Conductivity Measuring Equipment, Fixed Point at 25 °C	496 µmhos/cm 1413 µmhos/cm	4.2 µmhos/cm 5.3 µmhos/cm	Using Conductivity Reference solutions direct measurement

[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 site calibration. Note that actual measurement uncertainties achievable at a customer's site can normally be expected to be larger than the uncertainties listed on this Scope of Accreditation.