CERTIFICATE OF ACCREDITATION

This is to attest that

HONG KONG AERO ENGINE SERVICES LIMITED – COMPONENT REPAIR LABORATORY

70 CHUN CHOI STREET, TSEUNG KWAN O INDUSTRIAL ESTATE
HONG KONG

Calibration Laboratory CL-199

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.

Effective Date February 27, 2024

Expiration Date March 1, 2026

President

Visit www.iasonline.org for current accreditation information.

SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | www.iasonline.org

HONG KONG AERO ENGINE SERVICES LIMITED – COMPONENT REPAIR LABORATORY

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Accredited to ISO/IEC 17025:2017 *Effective Date February 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			
Mechanical outside micrometer	0 in to 12 in 0 mm to 25 mm 25 mm to 50 mm	120 µin 0.7 µm 4.4 µm	ASME B89.1.13
Digital outside micrometer	0 in to 4 in 4 in to 12 in 0 mm to 25 mm	48 µin 120 µin 0.6 µm	
Mechanical depth micrometer	0 in to 12 in 0 mm to 150 mm	180 µin 7.2 µm	
Digimatic depth micrometer	0 in to 6 in 0 mm to 300 mm	84 µin 4.4 µm	
Mechanical caliper gauge	0 in to 24 in 0 mm to 600 mm	1200 µin 23 µm	BS887
Digital caliper gauge	0 in to 24 in 0 mm to 600 mm	360 µin 8 µm	
Mechanical holtest	0.275 in to 0.5 in 0.5 in to 4 in	57 µin 75 µin	JJF1411
Digimatic holtest	0.25 in to 1.6 in	57 µin	
Analog dial indicator	0 in to 1 in 1 in to 2 in 0 mm to 30 mm	62 µin 150 µin 1.6 µm	ASME B89.1.10M
Digital dial indicator	0 in to 2 in 0 mm to 50 mm	60 µin 1.0 µm	
Analog dial test indicator	0 in to 0.04 in 0 mm to 1.6 mm	42 µin 1.4 µm	ASME B89.1.10M
Digital dial test indicator	0 in to 0.04 in 0 mm to 1 mm	75 µin 1.2 µm	
Step wedge	0.015 in to 0.440 in	240 µin	ASTM E797/E797M

** 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)
	0.5 mm to 9.0 mm	2.8 µm	
Microscope	0 mm to 1 mm 1 mm to 10 mm	1.9 µm 16 µm	ASTM E1951
Surface plate	4 in x 4 in to 60 in x 60 in 100 mm x 100 mm to 1525 mm x 1525 mm	(1.5 L + 43) µin (L is diagonal length in inches) (1.5 L + 1.1) µm (L is diagonal length in meters)	JJG 117
Straight edge	4 in to 60 in 100 mm to 1525 mm	(20 + L) µin (L is length in inches) (0.5 + L) µm (L is length in meters)	JJF 1097
Height gauge	0 in to 24 in 0 mm to 600 mm	(8.5 L + 1.7) µin (L is length in inches) (7.5 L + 0.2) µm (L is length in meters)	BS EN ISO 13225
Caliper depth gauge	0 in to 24 in 0 mm to 600 mm	(4.1 L + 264) µin (L is length in inches) (3.6 L + 5.4) µm (L is length in meters)	BS EN ISO 13385-2
Mechanical			
Rockwell hardness testing machine	HRC HRBW HR15N HR15YW	0.3 HRC 0.8 HRBW 0.2 HR15N 0.8 HR15YW	ASTM E18
Vickers hardness testing machine	HV 0.1 HV 0.3 HV 0.5 HV 10 HV 30 HV 50 HV 10 HV 30 HV 50	7.3 %HV 5.0 %HV 5.1 %HV 1.9 %HV 1.2 %HV 0.9 %HV 2.0 %HV 1.3 %HV 1.0 %HV	BS EN ISO 6507-2

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Pressure gauge (Pneumatic)	0 bar to 20 bar 0 psi to 10 psi 10 psi to 300 psi	0.1 % 0.03 psi 0.1 %	BS EN 837-1
Vacuum gauge	3.5×10^{-5} Torr to 1×10^{-3} Torr 1×10^{-3} Torr to 1×10^{-2} Torr 1×10^{-2} Torr to 1×10^{-1} Torr 1×10^{-1} Torr to 7.5 Torr	15 % 6.6 % 3.9 % 1.5 %	SAE ARP 7446
Electronic balance	1 g to 200 g 200 g to 3 kg 3 kg to 6.2 kg	0.2 mg 7 mg 9 mg	E2 class weights
Rotation speed indicator (Optical) (Mechanical)	 1 rpm to 1000 rpm 1000 rpm to 5000 rpm 1 rpm to 500 rpm 500 rpm to 2000 rpm	 0.6 rpm 1.3 rpm 1.5 rpm 2.2 rpm	JJG 105
Thermal			
Liquid bath	10 ºC to 110 ºC	0.8 ºC	JJF 1030
Furnace /oven	50 ºC to 500 ºC 500 ºC to 1190 ºC	5.4 ºC 11 ºC	AMS2750
Refrigerator / temperature chamber	-25 ºC to 30 ºC	0.12 ºC	AMS2750
Thermohygrometer	15 ºC to 30 ºC 40 %RH to 80 %RH	0.3 ºC 1.3 %RH	JJG 205 & JJF 1076
Time and Frequency			
Timer	Up to 24 h	0.58 s	JJG 237
Chemical/Gas			
pH meter	pH 4 pH 7 pH 10	0.02 pH 0.02 pH 0.02 pH	Certified pH standard solutions CAL-TPM-E001
Conductivity meter	10 µS/cm 100 µS/cm 1000 µS/cm 1413 µS/cm	0.64 µS/cm 2.5 µS/cm 13 µS/cm 17 µS/cm	Certified conductivity standard solutions CAL-TPM-E002

[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.