



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

Horiba Instruments Incorporated – Contract Testing Services

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CALIBRATION and TESTING

Valid to: February 24, 2014

Certificate Number: ACT-1312

I. Mechanical

FIELD OF TEST	ITEMS, MATERIALS OR PRODUCTS TESTED	SPECIFIC TESTS OR PROPERTIES MEASURED	SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED	*DETECTION LIMIT/ RANGE/ EQUIPMENT
Radial Loading (force / strain)	Customer Supplied	Fatigue and/or durability	Customer Supplied and/or F12-LMS-Test- Acceptance-Document	Hydraulic Actuator up to 100 000 pounds-force / 2 500 $\mu\epsilon$ (micro-strain)
Axial Loading (force / strain)	Customer Supplied	Fatigue and/or durability	Customer Supplied and/or F12-LMS-Test- Acceptance-Document	Hydraulic Actuator up to 100 000 pounds-force / 2 500 $\mu\epsilon$ (micro-strain)
Torsional Loading	Customer Supplied	Fatigue and/or durability	Customer Supplied and/or F12-LMS-Test- Acceptance-Document	Rotary Hydraulic Actuation up to 5 000 pound-feet; Dynamometer up to 5 000 pound-feet
Dynamic Loading (Force/Acceleration/ Strain)	Customer Supplied	Fatigue and/or durability	Customer Supplied and/or F12-LMS-Test- Acceptance-Document	Hydraulic Actuator up to 100 G's/measure up to 500 G's / 2 500 $\mu\epsilon$ (micro-strain)
Dynamic Torsional Loading	Customer Supplied	Fatigue and/or durability	Customer Supplied and/or F12-LMS-Test- Acceptance-Document	Rotary Hydraulic Actuator up to 2 500 pound-feet; Dynamometer up to 5 000 pound-feet
Static Pressure	Customer Supplied	Fatigue and/or durability	Customer Supplied and/or F12-LMS-Test- Acceptance-Document	Hydraulic Pressure up to 20 000 psi
Dynamic Pressure	Customer Supplied	Fatigue and/or durability	Customer Supplied and/or F12-LMS-Test- Acceptance-Document	Hydraulic Pressure up to 10 000 psi



II. Dimensional Inspection / Measurement

FIELD OF TEST	ITEMS, MATERIALS OR PRODUCTS TESTED	SPECIFIC TESTS OR PROPERTIES MEASURED	SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED	*DETECTION LIMIT/ RANGE/ EQUIPMENT
Linear Displacement	Customer Supplied	Fatigue and/or durability	Customer Supplied and/or F12-LMS-Test-Acceptance-Document	Hydraulic Actuator – up to 20 in / measure –up to 20 in
Angular/Rotary Displacement	Customer Supplied	Fatigue and/or durability	Customer Supplied and/or F12-LMS-Test-Acceptance-Document	Encoder: +/- 2 880 ° Inclinometer: +/- 90 ° (Digital Gage)

III. Thermodynamic / Environmental

FIELD OF TEST	ITEMS, MATERIALS OR PRODUCTS TESTED	SPECIFIC TESTS OR PROPERTIES MEASURED	SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED	*DETECTION LIMIT/ RANGE/ EQUIPMENT
Temperature (Static and Dynamic)	Customer Supplied	Fatigue and/or durability	Customer Supplied and/or F12-LMS-Test-Acceptance-Document	Thermal Chambers (- 100 to 250) °F Natural Gas Burners up to 2 000 °F
Relative Humidity (Static and Dynamic)	Customer Supplied	Fatigue and/or durability	Customer Supplied and/or F12-LMS-Test-Acceptance-Document	Thermal Chamber Humidifier/Steam Generator (25 to 95) %RH

IV. Mechanical Calibration

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Flow ²	Up to 30 slm (Standard Liters/Minute)	21.881 mL/min	Gas Divider-Checker (GDC)	WI-QM-B-009 WI-QM-B-019
Flow ²	Up to 30 slm (Standard Liters/Minute)	0.006 mL/min	Span Gas Divider (SGD)	WI-QM-B-010 WI-QM-B-020

Notes:

- * = As Applicable
- Flow calibration is only available at the laboratory's satellite site located at 5900 Hines Drive, Ann Arbor, MI 48108
- Calibration and Measurement Uncertainties (Expanded Uncertainty) are based on approximately a 95% confidence interval, using a coverage of k=2
- This scope is part of and must be included with the Certificate of Accreditation No. ACT - 1312

Karl Greenaway

Vice President

