PERRY JOHNSON LABORATORY ACCREDITATION INC.

Certificate of Accreditation

Perry Johnson Laboratory Accreditation Inc. has assessed the Laboratory of:

Michigan Scientific Corporation (MSC)

8500 Ance Road, Charlevoix, MI 49720

(Hereinafter called the Organization) and hereby declares that Organization is accredited in accordance with the recognized International Standard:

ISO/IEC 17025:2017

This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system
(as outlined by the joint ISO-ILAC-IAF Communiqué April 2017):

Mass, Force and Weighing Devices and Mechanical Calibration

(As detailed in the supplement)

Accreditation claims for such testing and/or calibration services shall only be made from addresses referenced within this certificate. This Accreditation is granted subject to the system rules governing the Accreditation referred to above and the Organization hereby covenants with the Accreditation body's duty to observe and comply with the said rules.

For PJLA:

Tracy Szerszen
President

Perry Johnson Laboratory
Accreditation Inc. (PJLA)
755 W. Big Beaver Suite 1325
Troy Michigan 48084

Initial Accreditation Date:	*Issue Date:*	*Expiration Date:*
September 4 2020	February 07, 2023	February 07, 2025

Accreditation No.:	*Certificate No.:*
91699	L23-134-1

The validity of this certificate is maintained through ongoing assessments based on a continuous accreditation cycle. The validity of this certificate should be confirmed through the PJLA website: www.pjlabs.com

Certificate of Accreditation: Supplement

Michigan Scientific Corporation (MSC)
8500 Ance Road, Charlevoix, MI 49720
Contact Name : Steve Jarema Phone: 231-547-5511

Accreditation is granted to the facility to perform the following calibrations:

Mass Force and Weighing Devices

MEASURED INSTRUMENT QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Equipment to Measure Force – Compression & Tension [F]	5 000 lb to 10 000 lb	5.9 lb	Screw Press transducer – Interface 1610AJH-10K, ISOMSC-2110501851-1114, ASTM E74 Class A
	3 500 lb to 10 000 lb	6.3 lb	TCAT transducer– Fx, ISOMSC-2110501851-1116, ASTM E74 Class A
	1 200 lb to 15 000 lb	8 lb	TCAT transducer– Fy, ISOMSC-2110501851-1116, ASTM E74 Class A
	3 500 lb to 10 000 lb	3 lb	TCAT transducer– Fz, ISOMSC-2110501851-1116, ASTM E74 Class A
	100 lb to 1 000 lb	3.1 lb	Screw Press transducer- Interface 1010ACK-1K-B, ISOMSC-2110501851-1114, ASTM E74 Class A
	1 001 lb to 5 000 lb	4.1 lb	Screw Press transducer- Interface 1210ACK-5K-B, ISOMSC-2110501851-1114. ASTM E74 Class A
	5 001 lb to 12 500 lb	9.4 lb	Screw Press transducer- Interface 1020ACK-12.5K-B, ISOMSC-2110501851-1114, ASTM E74 Class A
	12 501 lb to 25 000 lb	16 lb	Screw Press transducer- Interface 1020ACK-25K-B, ISOMSC-2110501851-1114, ASTM E74 Class A
	25 001 lb to 50 000 lb	37 lb	Screw Press transducer- Interface 1220ACK-50K-B, ISOMSC-2110501851-1114, ASTM E74 Class A
	4 000 lb to 20 000 lb	18 lb	WFT2-A Transducer (Fx), ISOMSC-695603924-51
	2 000 lb to 10 000 lb	23 lb	WFT2-A Transducer (Fy), ISOMSC-695603924-51
	4 000 lb to 20 000 lb	22 lb	WFT2-A Transducer (Fz), ISOMSC-695603924-51
	20 001 lb to 40 000 lb	48 lb	WFT2-B Transducer (Fx), ISOMSC-695603924-51
	10 001 lb to 20 000 lb	32 lb	WFT2-B Transducer (Fy), ISOMSC-695603924-51
	20 001 lb to 40 000 lb	55 lb	WFT2-B Transducer (Fz), ISOMSC-695603924-51

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Equipment to Measure Force – Compression & Tension [F]	50 000 lb to 100 000 lb	43 lb	SP4 Transducer – Interface 1332ACK-100K-B, ISOMSC-2110501851-1114, ASTM E74 Class A
	40 001 lb to 150 000 lb	200 lb	WFT3 Transducer (Fx), ISOMSC-695603924-50
	20 001 lb to 150 000 lb	78 lb	WFT3 Transducer (Fy), ISOMSC-695603924-50
	40 001 lb to 150 000 lb	130 lb	WFT3 Transducer (Fz), ISOMSC-695603924-50

Mechanical

MEASURED INSTRUMENT QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Torque Transducer – Clockwise & Counterclockwise [F]	7 001 ft•lb to 12 000 ft•lb	33 ft•lb	Torque machine transducer – 12K-LBFT Reference, ISOMSC-2110501851-1057, ASTM E2428
	801 ft•lb to 7 000 ft•lb	5.9 ft•lb	Torque machine transducer – TW15.0, ISOMSC-2110501851-1057, ASTM E2428
	176 ft•lb to 800 ft•lb	1.1 ft•lb	Torque machine transducer – TW12.8HRMS800, ISOMCS-2110501851-1057, ASTM E2428
	80 ft•lb to 175 f ft•lb	0.9 ft•lb	Torque machine transducer – TW12.8HRMS175, ISOMSC-2110501851-1057, ASTM E2428
	1 200 ft•lb to 7 000 ft•lb	4.2 ft•lb	TCAT transducer – (Mx), ISOMSC-2110501851-1116, ASTM E2428
	2 500 ft•lb to 7 000 ft•lb	3.5 ft•lb	TCAT transducer – (My), ISOMSC-2110501851-1116, ASTM E2428
	1 200 ft•lb to 7 000 ft•lb	11 ft•lb	TCAT transducer– (Mz), ISOMSC-2110501851-1116, ASTM E2428
	2 200 ft•lb to 11 000 ft•lb	29 ft•lb	WFT2-A transducer (Mx), ISOMSC-695603924-51, ASTM E2428
	3 000 ft•lb to 15 000 ft•lb	25 ft•lb	WFT2-A transducer (My), ISOMSC-695603924-51, ASTM E2428

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Mechanical

MEASURED INSTRUMENT QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Torque Transducer – Clockwise & Counterclockwise [F]	2 200 ft•lb to 11 000 ft•lb	33 ft•lb	WFT2-A transducer (Mz), ISOMSC-695603924-51, ASTM E2428
	11 001ft•lb to 30 000 ft•lb	29 ft•lb	WFT2-B transducer (Mx), ISOMSC-695603924-51, ASTM E2428
	15 001ft•lb to 30 000 ft•lb	25 ft•lb	WFT2-B transducer (My), ISOMSC-695603924-51, ASTM E2428
	11 001ft•lb to 30 000 ft•lb	33 ft•lb	WFT2-B transducer (Mz), ISOMSC-695603924-51, ASTM E2428
	30 001ft•lb to 150 000 ft•lb	230 ft•lb	WFT3 transducer (Mx), ISOMSC-695603924-50, ASTM E2428
	30 001 ft•lb to 150 000 ft•lb	150 ft•lb	WFT3 transducer (My), ISOMSC-695603924-50, ASTM E2428
	30 001 ft•lb to 150 000 ft•lb	310 ft•lb	WFT3 transducer (Mz), ISOMSC-695603924-50, ASTM E2428

1. The CMC (Calibration and Measurement Capability) stated for calibrations included on this scope of accreditation represents the smallest measurement uncertainty attainable by the laboratory when performing a more or less routine calibration of a nearly ideal device under nearly ideal conditions. It is typically expressed at a confidence level of 95 % using a coverage factor *k* (usually equal to 2). The actual measurement uncertainty associated with a specific calibration performed by the laboratory will typically be larger than the CMC for the same calibration since capability and performance of the device being calibrated and the conditions related to the calibration may reasonably be expected to deviate from ideal to some degree.

2. The laboratories range of calibration capability for all disciplines for which they are accredited is the interval from the smallest calibrated standard to the largest calibrated standard used in performing the calibration. The low end of this range must be an attainable value for which the laboratory has or has access to the standard referenced. Verification of an indicated value of zero in the absence of a standard is common practice in the procedure for many calibrations but by its definition it does not constitute calibration of zero capacity.

3. The presence of a superscript F means that the laboratory performs calibration of the indicated parameter at its fixed location. Example: Outside Micrometer[F] would mean that the laboratory performs this calibration at its fixed location.

4. Measurement uncertainties obtained for calibrations performed at customer sites can be expected to be larger than the measurement uncertainties obtained at the laboratories fixed location for similar calibrations. This is due to the effects of transportation of the standards and equipment and upon environmental conditions at the customer site which are typically not controlled as closely as at the laboratories fixed location.