



PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Middlesex Gases & Technologies, Inc.
292 Second Street, Everett, MA 02149

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

ISO/IEC 17025:2005

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 dated January 2009):

Calibration of Specialty Gases
(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/Operations Manager

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

Initial Accreditation Date:

August 23, 2010

Issue Date:

October 19, 2016

Expiration Date:

January 31, 2019

Accreditation No.:

68528

Certificate No.:

L16-429

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.pjllabs.com



Certificate of Accreditation: Supplement

Middlesex Gases & Technologies, Inc.

292 Second Street, Everett, MA 02149

Contact Name: Mike Beaulieu Phone: 617-387-5050

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

Chemical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Calibration Gas Cylinder Chemical Assay - Trace Moisture Concentration ^F	0.000 01 % mol fraction to 0.1 % mol fraction (0.1 ppm to 1 000 ppm)	0.000 021 % mol fraction (0.21 ppm)	Electrolytic Hygrometer
Calibration Gas Cylinder Chemical Assay - Trace Hydrocarbon Concentration ^F	0.000 01 % mol fraction to 10 % mol fraction (0.1 ppm to 10 %)	0.000 012 % mol fraction (0.12 ppm)	Flame Ionization Detector
Calibration Gas Cylinder Chemical Assay - Trace Oxygen Concentration ^F	0.000 001 % mol fraction to 23.0 % mol fraction (0.01 ppm to 23 %)	0.000 012 % mol fraction (0.12 ppm)	Electrochemical Oxygen Analyzer
Calibration Gas Cylinder Chemical Assay - Gas Mixture Concentration ^F	0.01 % mol fraction to 100 % mol fraction (100 ppm to 100 %)	0.023 % mol fraction (230 ppm)	Binary Gas Analyzer (Thermal Conductivity Detector)
Calibration Gas Cylinder Chemical Assay - Percent Oxygen Concentration ^F	0.1 % mol fraction to 100 % mol fraction	0.023 % mol fraction (230 ppm)	Paramagnetic Oxygen Analyzer
Gravimetric Balance Chemical Assay - Gas Mixture Concentration ^F	0.000 01 % mol fraction to 100 % mol fraction (0.1 pp to 100 %)	0.000 031 % mol fraction (0.31 ppm)	Mettler Toledo
Calibration Gas Cylinder Chemical Assay - Trace Carbon Monoxide Concentration ^F	0.000 01% mol fraction to 0.10 % mol fraction (0.1 ppm to 1 000 ppm)	0.000 012 % mol fraction (0.12 ppm)	Non-Dispersive Infrared Analyzer
Calibration Gas Cylinder Chemical Assay - Percent Carbon Monoxide Concentration ^F	0.01 % mol fraction to 50 % mol fraction (100 ppm to 50 %)	0.01 % mol fraction (100 ppm)	Non-Dispersive Infrared Analyzer
Calibration Gas Cylinder Chemical Assay - Carbon Dioxide Concentration ^F	0.01 % mol fraction to 90 % mol fraction (100 ppm to 90 %)	0.01 % mol fraction (100 ppm)	Non-Dispersive Infrared Analyzer

- 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.



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

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.

