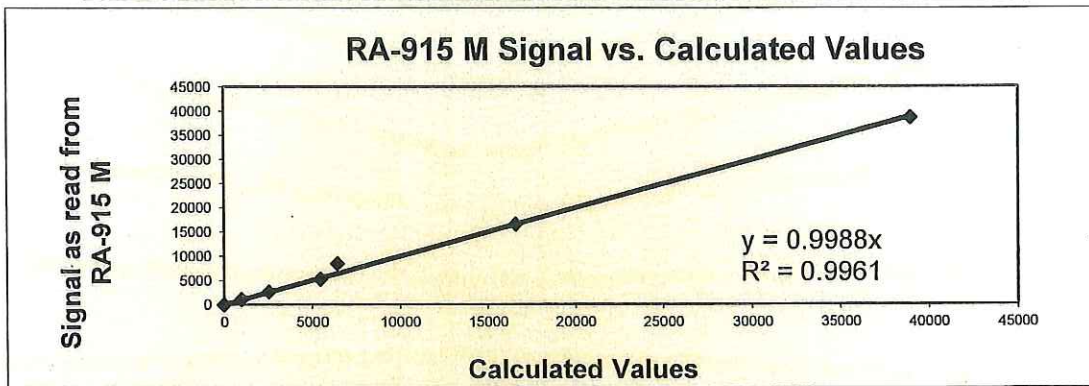




Spectrometer Calibration Certificate

RA-915 M #1904

Standard #	Temp °C	Calculated Value	Signal (10m cell)
1	22	0	0
2	22	999	1046
3	22	2557	2636
4	22	5486	5257
5	22	6415	8474
6	22	16610	16559
7	22	38976	38628



Calibration Gas certified value: 4.7µg/m3
Calibration Parameter A: 62275

Reading observed: 4.7µg/m3
Calibration Parameter B: 37600

CALIBRATION DATE: 04/12/2018 NEXT CALIBRATION DUE: 04/13/2019

ON THE DATE CALIBRATED, THIS UNIT OPERATED WITHIN SPECIFIED TOLERANCES

Digital Barometer: Cert. #1081-8782151, Cal. Due.: 09/01/2019
Digital Thermometer: Cert. #1081-8782151, Cal. Due.: 09/01/2019
Gas NIST Traceable Standard Themo Hg Calibrator Serial #0712322224
Concentration: 4.7µg/m3, Analytical Accuracy, +/- 10%. Recertification Date: 06/29/2018

Service Technician: V. S. [Signature]
QA/QC Manager: _____
Technical Director: _____

RECOMMENDATION NOTE: INSTRUMENT SHOULD BE RECALIBRATED EVERY 12 MONTHS OR SOONER, IF EXPOSED TO EXTREME CONDITIONS OR DAMAGE IS SUSPECTED

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1.888.876.2611

Thermo Scientific Model 81i Calibrator Certification Report

Certification Date: 6/29/2016

	<i>Candidate</i>		<i>Reference</i>
Location:	<u>Franklin, MA</u>	ID:	<u>NISTA</u>
Device:	<u>81i-Ohio Lmuex</u>	S/N:	<u>0712322224</u>
S/N:	<u>1021143493</u>		
Chiller S/N 548	Chiller Temp 6 DEG C	RA 57492	

As Found Data: As Left Data:

Candidate User Information		Candidate User Generator Certification					Reference Generator
		Certification Values		Certifications Uncertainties			Uncertainties
Setpoint	Value	Setpoint	Certified	1 σ	2 σ	Relative	Expanded
$\mu\text{g}/\text{scm}$	$\mu\text{g}/\text{scm}$	$\mu\text{g}/\text{scm}$	$\mu\text{g}/\text{scm}$	$\mu\text{g}/\text{scm}$	$\mu\text{g}/\text{scm}$	2 σ %	2 σ %
1.2	1.05	1.2	1.18	0.0140	0.0280	2.38%	1.13%
2.7	2.41	2.7	2.72	0.0179	0.0358	1.32%	0.98%
4.7	4.23	4.7	4.73	0.0299	0.0598	1.26%	1.03%

At each concentration level, the results of the bracketing certification procedure are acceptable if the expanded uncertainty of the elemental mercury generator concentration, calculated in accordance with Section 6.3 in the Interim EPA Traceability Protocol for Qualification and Certification of Elemental Mercury Gas Generators, does not exceed 5.0 percent of the certified value, or is not more than 2.0 percent above the Vendor Prime uncertainty at the closest set point, whichever is less restrictive. (Source Interim EPA Traceability Protocol for Qualification and Certification of Elemental Mercury Gas Generators: Section 6.4)

Protocol applies only to Hg monitoring system span values greater than or equal to 5.0 micrograms per cubic meter
 (Source Interim EPA Traceability Protocol for Qualification and Certification of Elemental Mercury Gas Generators: Section 1.0)

This document certifies that the above instrument has been calibrated and tested in accordance with Thermo Fisher Scientific procedure conducted under the conditions noted with standards, which are certified traceable to the National Institute of Standards and Technology (NIST). This Calibration Certificate may not be reproduced expect in full, without written permissions from Thermo Fisher Scientific. The results of this report relate only to the instrument tested and calibrated as identified on this certificate.

Calibration

Certification