



**NO SEND  
WITNESSED**

# RELATIVE ACCURACY TEST AUDIT



ILLINOIS ENVIRONMENTAL  
PROTECTION AGENCY

ID No.:	097190AFG	Test Date:	3/5/2020
Source Name:	Medline Industries		
Location	1160 South Northpoint Boulevard, Waukegan, Illinois 60085		
Permit No.	19020013	<b>TYPE OF TEST PROGRAM:</b>	
<input type="checkbox"/> FESOP <input type="checkbox"/> Title V <input type="checkbox"/> Lifetime <input checked="" type="checkbox"/> Construction		<input type="checkbox"/> Initial Performance <input checked="" type="checkbox"/> CEMS Certification	<input type="checkbox"/> Annual/Periodic <input type="checkbox"/> Other: _____
Emission Unit(s):	Commercial Sterilizer		
Control Equipment:	<ul style="list-style-type: none"> <li>• Permanent Total Enclosure (PTE)</li> <li>• Acid Scrubbers</li> <li>• Catalytic Oxidizer</li> <li>• Dry Bed Scrubber</li> </ul>		
<b>APPLICABLE RULE:</b>	<input checked="" type="checkbox"/> 415 ILCS 5-9.16 <input type="checkbox"/> 35 IAC PART ____ <input type="checkbox"/> 40 CFR PART 60, SUBPART ____ <input checked="" type="checkbox"/> 40 CFR PART 63, SUBPART O		
<b>SOURCE</b>	Contact	Jasper Titus	
	Phone Number	Office: 847-837-2784 Cell: 201-887-2034	
	Email	<a href="mailto:JTitus@medline.com">JTitus@medline.com</a>	
<b>TESTING COMPANY</b>	Company Name	Montrose Air Quality Services, LLC (Montrose)	
	Contact	Don Chapman	
	Phone Number	847-487-1580	
	Email	<a href="mailto:dchapman@montrose-env.com">dchapman@montrose-env.com</a>	
	Report No.	M928ET-663754-RT-414	

Parameters	USEPA REFERENCE METHODS	Yes	No
<input type="checkbox"/> PS-1 <input type="checkbox"/> PS-2 <input type="checkbox"/> PS-3 <input type="checkbox"/> PS-4 <input type="checkbox"/> PS-5 <input checked="" type="checkbox"/> PS-6 <input type="checkbox"/> PS-7 <input type="checkbox"/> PS-8 <input type="checkbox"/> PS-9 <input type="checkbox"/> PS-10 <input type="checkbox"/> PS-11 <input type="checkbox"/> PS-12 <input type="checkbox"/> PS-13 <input type="checkbox"/> PS-14 <input checked="" type="checkbox"/> PS-15 <input type="checkbox"/> PS-16 <input type="checkbox"/> PS-17 <input type="checkbox"/> PS-18	<input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 3_ <input type="checkbox"/> 4 <input type="checkbox"/> 5_ <input type="checkbox"/> 6_ <input type="checkbox"/> 7_ <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/> 12 <input type="checkbox"/> 18 <input type="checkbox"/> 19 <input type="checkbox"/> 20 <input type="checkbox"/> 23 <input type="checkbox"/> 24 <input type="checkbox"/> 25 <input type="checkbox"/> 25_ <input type="checkbox"/> 26 <input type="checkbox"/> 29 <input type="checkbox"/> 201_ <input type="checkbox"/> 202 <input type="checkbox"/> 204 <input checked="" type="checkbox"/> 205 <input checked="" type="checkbox"/> 320 <input type="checkbox"/> ____		
Alternative method(s)	See Comment Section		
Did Permittee propose or use proper method(s)?		✓	

Process Information	Yes	No
Process rate allowed in permit or unit capacity:	15 Lbs./Month and 150 Lbs./Year	
Process rate during stack test:	The RA test runs were performed over an approximate 8-hour period where multiple chambers were evacuated of EtO. A total of 508.2 lbs of EtO were used in the chambers evacuated in this testing window. At the beginning of the first RA test run, aeration was at 88.1% full based on pallet capacity and ended at 89.6% at the end of the last run.	
Was the process rate during the RATA ≥ 50%?	✓	



COMPLIANCE DEMONSTRATION			Yes	No
<b>Protocol</b>	Submitted?	Date: October 24, 2019 Original January 27, 2020 Revised	✓	
	Submitted timely?	45 days prior to test	✓	
	Approved?		✓	
Did testing follow the approved protocol?			✓	
Were raw field & laboratory sheets included with the final report?			✓	
Were nine test runs performed?			✓	
Were runs performed for appropriate length of time?			✓	

<b>CEMS Components:</b>	Pollutant	Manufacturer	Model	Serial No.
	Ethylene Oxide	MKS-MAX Analytical	EMS-10TM	110383419
	Volumetric Flow Rate	EMRC, Inc.	EMRC S-type Pitot Flow Monitor	644

Parameter	RA	Performance Specification Allowable
Ethylene Oxide (ppmv wb)	1.48%	≤ 10%, Based on the Applicable Standard (0.200 ppmv wb)
Ethylene Oxide (lb/hr)	4.69%	≤ 10%, Based on the Applicable Standard (0.0205 lb/hr)
Volumetric Flow (scfm)	1.98%	≤ 20%, Based on the Mean Reference Method (RM) Value

<b>7-Day Calibration Drift</b>	Zero (0.000 H <sub>2</sub> O)		Span (2.0000 in H <sub>2</sub> O)	
	Stack ΔP, Raw (in H <sub>2</sub> O)	Difference (% of Span)	Stack ΔP, Raw (in H <sub>2</sub> O)	Difference (% of Span)
Volumetric Flow, scfm (Allowed ± 3% of span)	0.0088	0.439%	2.0000	0.00%
<b>7-Day Calibration Drift</b>	Zero (0.00 ppm)		Span (2.103 ppm)	
	Stack EtO (ppbv wb)	Difference (% of Span)	Stack EtO (ppbv wb)	Difference (% of Span)
Ethylene Oxide, ppbv wb (Allowed ± %)	-0.376	-0.02%	2447.57	0.08%

Are test results in compliance with applicable requirements, permit special conditions, and Agency averaging policy/rule?	Yes	No
	✓	

**Comments:**

Medline Industries (Medline) contracted with Montrose to perform the continuous emissions monitoring certification, which includes a relative accuracy test audit (RATA) in which USEPA Test Methods data is compared to the CEMS data.



As noted in the protocol and discussed with U.S. EPA, the following modifications to the methods were utilized during the RATA:

1. EtO cylinders were only available in  $\pm 5\%$  certifications without an alternative (Alt) testing procedure ALT-114 and ALT-118; "Alternative Approaches to NIST-Traceable Reference Gases".

[https://cfpub.epa.gov/si/si\\_public\\_record\\_report.cfm?Lab=NRMRL&dirEntryId=336073](https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NRMRL&dirEntryId=336073)

Ryan, J. ALT-114 and ALT-118 Alternative Approaches to NIST-Traceable Reference Gases. Presented at "The 41st Stationary Source Sampling and Analysis for Air Pollutants Conference, Tucson, AZ, April 9 - 14, 2017."

2. As time was of the essence and the availability of a vendor who would perform Alt 114 was limited, an EtO cylinder gas accuracy of  $\pm 5\%$  was used in lieu of the required protocol gas accuracy certification of  $\pm 2\%$ . Additionally, because of Montrose's experience with EtO and discussions with EPA Office of Air Quality Planning and Standards (OAQPS) who also indicated *instability of EtO in cylinders below 2 ppmv*, a 50 ppmv cylinder was used to determine calibration stability as per PS-15, Sections 10 and 11. Another 2 ppmv cylinder of EtO with a tracer gas of 500 ppm ethane was used to determine the dynamic spike dilution factor (Method 320) and was transported directly to the FTIR sample cell initially to provide an accurate cylinder tag value for the cylinder used for the dynamic spiking.
3. The CTS used for the path length and associated quality control measurements in Method 320 was 50 to 500 ppm methane. This was not a modification to the method; however, it is mentioned due to the difference between CTS and the tracer gas used.
4. Due to the variable EtO concentration in the stack, dynamic spiking as required by Method 320 was conducted into ambient air and not into the sample stream. Because the sample streams are essentially ambient air, the sample streams have similar potential interferences.

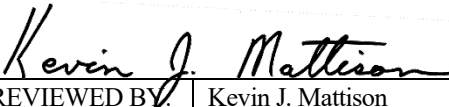
The RATA was witnessed by the author. No issues were noted with the test methods or CEMS during the RATA.

A spot check of the calibration data and calculations was performed; no deviations were noted.

Max Analytical Technologies performed a Method 301 validation of the FTIR and the 7-day drift test.

It is recommended that the Illinois EPA accept the RATA verification test report, which confirms the CEMS met the criteria of PS-6 and PS-15.

Please contact the undersigned if you have any questions.

 REVIEWED BY: Kevin J. Mattison		March 26, 2020 Date	RATA Report Approved RATA within Allowable Criteria?	Yes	No
				✓	
				✓	