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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	**TYPE OF TEST PROGRAM:**	
☐ FESOP ☐ Title V ☐ Lifetime ☑ Construction		☐ Initial Performance	☐ Annual/Periodic
		☑ CEMS Certification	☐ Other: _____

Emission Unit(s):	Commercial Sterilizer	
Control Equipment:	• Permanent Total Enclosure (PTE) • Acid Scrubbers	• Catalytic Oxidizer • Dry Bed Scrubber
APPLICABLE RULE:	☑ 415 ILCS 5-9.16 ☐ 35 IAC PART ___ ☐ 40 CFR PART 60, SUBPART ___ ☑ 40 CFR PART 63, SUBPART O	
SOURCE	Contact	Jasper Titus
	Phone Number	Office: 847-837-2784 Cell: 201-887-2034
	Email	JTitus@medline.com
TESTING COMPANY	Company Name	Montrose Air Quality Services, LLC (Montrose)
	Contact	Don Chapman
	Phone Number	847-487-1580
	Email	dchapman@montrose-env.com
	Report No.	M928ET-663754-RT-414

Parameters	**USEPA Reference Methods**	Yes	No
☐ PS-1 ☐ PS-2 ☐ PS-3 ☐ PS-4 ☐ PS-5 ☑ PS-6 ☐ PS-7 ☐ PS-8 ☐ PS-9 ☐ PS-10 ☐ PS-11 ☐ PS-12 ☐ PS-13 ☐ PS-14 ☑ PS-15 ☐ PS-16 ☐ PS-17 ☐ PS-18	☑ 1 ☑ 2 ☑ 3_ ☐ 4 ☐ 5_ ☐ 6_ ☐ 7_ ☐ 9 ☐ 10 ☐ 12 ☐ 18 ☐ 19 ☐ 20 ☐ 23 ☐ 24 ☐ 25 ☐ 25_ ☐ 26 ☐ 29 ☐ 201_ ☐ 202 ☐ 204 ☑ 205 ☑ 320 ☐ ____		
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%?		✓	

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COMPLIANCE DEMONSTRATION			Yes	No
Protocol	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?			✓	

	Pollutant	Manufacturer	Model	Serial No.
CEMS Components:	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

7-Day Calibration Drift	Zero (0.000 H_2O)		Span (2.0000 in H_2O)	
	Stack ΔP, Raw (in H_2O)	Difference (% of Span)	Stack ΔP, Raw (in H_2O)	Difference (% of Span)
Volumetric Flow, scfm (Allowed ± 3% of span)	0.0088	0.439%	2.0000	0.00%
7-Day Calibration Drift	Zero (0.00 ppm)		Span (2.103 ppm)	
	Stack EtO (ppbv wb)	Difference (% of Span)	Stack EtO (ppbv wb)	Difference (% of Span)
Ethylene Oixde, 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.

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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 ± 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

   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 ± 5% was used in lieu of the required protocol gas accuracy certification of ± 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.

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