Compliance Stack Emission Test Report

Determination of Total Gaseous Organics Emissions and Permanent Total Enclosure Verification

EPA Methods 1, 2, 3, 4, 25A, and 204

Surface Coating Operation (EUPLASTICCOATING)

Test Date(s): April 28, 2015 Source Location: Lansing, Michigan

Report Number: 150413.1.0 Report Date: June 3, 2015

RECEIVED

JUL 2 9 2015 AIR QUALITY DIV.

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1.0 INTRODUCTION

1.1 Summary of Test Program

Magna DexSys (Delta Exterior Systems) (State Registration No.: P0429), located in Lansing, Michigan contracted Air Compliance Testing, Inc. of Cleveland, Ohio to conduct compliance stack emission testing for their Surface Coating Operation of Plastic Automotive Front and Rear Bumpers (EUPLASTICCOATING). Testing was performed to satisfy the emissions testing requirements pursuant to Michigan Department of Environmental Quality (MDEQ) Permit-To-Install (PTI) No. 38-13A. Testing was performed on April 28, 2015.

Simultaneous sampling was performed at the EUPLASTICCOATING Regenerative Thermal Oxidizer (SVRTO) Inlet Duct and SVRTO Exhaust Stack to determine the total gaseous organic (TGO) destruction efficiency (DE) of the SVRTO. Testing was conducted during normal operations. During this test, emissions from the EUPLASTICCOATING were controlled by the SVRTO.

In addition to the sampling noted above, the permanent total enclosure (PTE) associated with the EUPLASTICCOATING was evaluated against EPA Method 204 criteria to verify 100% capture efficiency (CE) of the volatile organic compound (VOC) emissions within the enclosures.

The test methods that were conducted during this test were EPA Methods 1, 2, 3, 4, 25A, and 204.

1.2 Key Personnel

The key personnel who coordinated this test program (and their phone numbers) were:

Kristen Zielinski, EHS Coordinator, Magna DexSys (Delta Exterior Systems), 517-899-2544 Karen Kajiya-Mills, TPU Supervisor, Air Quality Division, Michigan Department of Environmental Quality

(MDEQ), 517-284-6780

Tom Gasloli, Technical Programs Unit, Michigan Department of Environmental Quality (MDEQ), 517-335-4861 Robert Lisy QSTI, District Manager, Air Compliance Testing, Inc., 800-372-2471

Peter Becker, Project Manager, Air Compliance Testing, Inc., 800-372-2471



2.0 SUMMARY AND DISCUSSION OF TEST RESULTS

2.1 Objectives and Test Matrix

The purpose of this test was also to determine the TGO DE of the SVRTO associated with the EUPLASTICCOATING during normal operations. The purpose of this test was also to evaluate the PTE associated with EUPLASTICCOATING against EPA Method 204A criteria to verify 100% VOC CE. Testing was performed to satisfy the emissions testing requirements pursuant to MDEQ PTI No. 38-13A.

The specific test objectives for this test were to:

Simultaneously measure the concentration of TGO at the SVRTO Inlet Duct and the SVRTO Exhaust Stack.

Simultaneously measure the actual and dry standard volumetric flow rate of the stack gas a the SVRTO Inlet Duct and SVRTO Exhaust Stack.

Utilize the above variables to determine the TGO DE of the SVRTO associated with the EUPLASTICCOATING during normal operations.

Evaluate the PTE associated with the EUPLASTICCOATING against EPA Method 204 criteria to verify 100% VOC CE during normal operations.

Table 2.1 presents the sampling and analytical matrix log for this test.

2.2 Field Test Changes and Problems

Due to the size and complexity of the PTE associated with the EUPLASTICCOATING, no measurements were performed for total surface area determination by ACT personnel. However, Magna DexSys (Delta Exterior Systems) personnel, provided rough schematics and measurements of the PTE which were approved by the onsite MDEQ administrator, Tom Gasloli. Only the NDOs of the PTE were measured by ACT personnel. The PTE and NDO schematics and measurements provided by the Magna DexSys (Delta Exterior Systems) are located in the Field Data section of the Appendix.

2.3 Presentation of Results

Two (2) sampling trains were utilized at the SVRTO RTO Inlet Duct and Exhaust Stack to determine the TGO DE of the SVRTO associated with the EUPLASTICCOATING. At each location, one sampling train measured the stack gas concentration of TGO, and the second sampling train measured the stack gas dry molecular weight and moisture content. Stack gas volumetric flow rate measurements were performed prior to each concentration run at both the inlet and exhaust.

Table 2.2 displays the TGO DE of the SVRTO associated with EUPLASTICCOATING.

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The graphs that present the raw, uncorrected concentration data measured in the field by the EPA Method 25A sampling systems at the SVRTO Inlet Duct and the SVRTO Exhaust Stack are located in the Field Data section of the Appendix.

Table 2.3 displays the results of the EPA Method 204 PTE verifications. As displayed, the PTEs associated with EUPLASTICCOATING met EPA Method 204, Section 5.1-5.5 criteria. Continuous inward flow through each of the NDOs was verified by pressure drop satisfying EPA Method 204, Section 8.4 criteria. Therefore, the VOC CE for the PTE satisfies the 100% CE criteria as outlined in EPA Method 204, Section 2.

Figures 2.3.1 and 2.3.2 display the plan and elevation views of the PTE associated with EUPLASTICCOATING.

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			EPA TEST METHODS UTILIZED							
			M1/M2 (Flow)	M3 (Dry Mol. Wt.)	M4 (%H ₂ O)	M25A (TGOs)				
Date	Run No.	Sampling Location	Sampling Time / Duration (min)							
4/28/2015	1	SVRTO Inlet Duct	10:38 - 10:45 7	11:05 - 12:05 60	11:05 - 12:05 60	11:05 - 12:05 60				
4/28/2015	2	SVRTO Inlet Duct	12:47 - 12:56 9	13:20 - 14:20 60	13:20 - 14:20 60	13:20 - 14:20 60				
4/28/2015	3	SVRTO Inlet Duct	14:55 - 15:01 6	15:11 - 16:11 60	15:11 - 16:11 60	15:11 - 16:11 60				
4/28/2015	1	SVRTO Exhaust Stack	10:38 - 10:44 6	11:05 - 12:05 60	11:05 - 12:05 60	11:05 - 12:05 60				
4/28/2015	2	SVRTO Exhaust Stack	12:47 - 12:53 6	13:20 - 14:20 60	13:20 - 14:20 60	13:20 - 14:20 60				
4/28/2015	3	SVRTO Exhaust Stack	15:04 - 15:08	15:11 - 16:11 60	15:11 - 16:11	15:11 - 16:11 60				

All times are Eastern Daylight Time.

Table 2.1 - Sampling and Analytical Matrix

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	SVRTO Inlet Duct				SVRTO Exhaust Stack			
	Run 1	Run 2	Run 3	Average	Run 1	Run 2	Run 3	Average
TGO Destruction Efficiency (%)	-	-	-	-	95.0	95.1	95.5	95.2
TGO Mass Emission Rate (lb/hr as propane)	126	126	122	125	6.28	6.15	5.54	5.99
TGO Concentration (ppmvd as propane)	656	663	644	654	31.5	30.7	29.0	30.4
Stack Gas Average Flow Rate (acfm)	30,992	30,792	30,471	30,751	39,202	39,560	37,434	38,732
Stack Gas Average Flow Rate (scfin)	28,661	28,445	28,262	28,456	29,703	29,971	28,568	29,414
Stack Gas Average Flow Rate (dscfin)	28,050	27,778	27,684	27,838	29,002	29,173	27,832	28,669
Stack Gas Average Velocity (fpm)	1,467	1,458	1,443	1,456	3,254	3,283	3,107	3,215
Stack Gas Average Static Pressure (in-H ₂ O)	-1.20	-1.10	-1.20	-1.17	-0.64	-0.69	-0.58	-0.64
Stack Gas Average Temperature (°F)	95	96	93	95	218	218	213	217
Stack Gas Percent by Volume Moisture (% H_2O)†	2.13	2.34	2.04	2.17	2.36	2.66	2.58	2.53
Measured Stack Inner Diameter (in)	55 X 55.3	55 X 55.3	55 X 55.3	55 X 55.3	47.0	47.0	47.0	47.0
Percent by Volume Carbon Dioxide in Stack Gas (%-dry)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Percent by Volume Oxygen in Stack Gas (%-dry)	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00
Percent by Volume Nitrogen in Stack Gas (%-dry)	79.00	79.00	79.00	79.00	79.00	79.00	79.00	79.00

* Process data was provided by Magna DexSys (Delta Exterior Systems) personnel.

† The SVRTO Inlet Duct was rectangular in shape.

Table 2.2 - Emission Results

	EUPLASTICCOATING						
	Minimum Differential Pressure Required for Compliance with EPA Method 204 (in. of H ₂ O)	Differential Pressure Across NDO (in. of H ₂ O)	ls Minimum Differential Pressure Requirement Met	Equivalent Diameter of NDO (in.)	Minimum Distance Required from NDO to Nearest VOC Emitting Point for Compliance with EPA Method 204 (in.)	Actual Distance from NDO to Nearest VOC Emitting Point (in.)	Is NDO >4 Equivalent Diameters From Nearest VOC Emitting Source
NDO 1 East Elevation*	0.0070	0.0224	YES	106.97	427.89	96.0	NO*
NDO 2 West Elevation	0.0070	0.0151	YES	110.72	442.89	NA	NA
Total Area of NDO's (ft. ²)	73.97	-	-	4	-	-	-
Total Surface Area of Enclosure (ft. ²)†	53,203.7	_	-	*	-	-	-
NEAR Ratio	0.00139	-	-	**	-	-	-
Is NEAR ≤ 0.05 (yes/no)	YES						
NEAR Ratio	YES						

* Approved by Tom Gasloli, MDEQ

† Total Surface Area of Enclosure measurements were provided by Magna DexSys (Delta Exterior Systems) personnel see Section 2.1 for details

Table 2.3 - EPA Method 204 PTE Verification

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Figure 2.3.1 - EUPLASTICCOATING PTE PLAN View



Figure 2.3.2 - EUPLASTICCOATING PTE Elevation Views