Report of...

VOC Destruction Efficiency Testing

performed for...

ADAC Automotive, Inc.
Muskegon, Michigan

on the

Regenerative Thermal Oxidizer

December 3, 2013

204.07

Network Environmental, Inc.
Grand Rapids, MI

Performed For:

ADAC Automotive, Inc.
2050 Port City Blvd.
Muskegon, MI 49422
Contact: Jacob Rupert
Phone: (231) 777-2645 ext. 5733
Email: jrupert@adacautomotive.com

Performed by:

Network Environmental, Inc.
2629 Remico, Suite B
Grand Rapids, MI 49519
Contact: Stephan K. Byrd
Phone: (616) 530-6330
Fax: (616) 530-0001

TABLE OF CONTENTS

Appendices

I. INTRODUCTION

Network Environmental, Inc. was retained by ADAC Automotive, Inc. of Muskegon, Michigan to conduct a volatile organic compound (VOC) destruction efficiency study (DE) on the Regenerative Thermal Oxidizer (RTO) at their Muskegon, Michigan facility located at 1801 Keating Avenue. The purpose of the study was to determine the destruction efficiency of the Regenerative Thermal Oxidizer (RTO) in accordance with their Permit to Install 2-12.

The sampling was conducted on December 3, 2013 by Stephan K. Byrd and R. Scott Cargill of Network Environmental, Inc. Mr. Jake Rupert and Ms. Lisa Purcell, of ADAC Automotive, coordinated production and source operation during the testing. Mr. Nathan Hude and Ms. Jenifer Dixon of the MDEQ Air Quality Division were present to observe the testing and source operation.

II. PRESENTATION OF RESULTS

II.1 TABLE 1
VOC DESTRUCTION EFFICIENCY RESULTS (as Propane)
ADAC AUTOMOTIVE, INC.
RTO
MUSKEGON, MICHIGAN
DECEMBER 3, 2013

Sample	Time	Concentration PPM[1]		Mass Emission Rate Lbs./Hr		Destruction Efficiency %[2]
		Inlet	Exhaust	Inlet	Exhaust	
1	11:36-12:36	180.0	2.8	23.14	0.349	98.49
2	13:40-14:40	142.5	2.5	17.99	0.310	98.28
3	15:57-17:08	150.8	2.6	19.21	0.323	98.32
Average		**157.8**	**2.6**	**20.11**	**0.327**	**98.36**

(1) PPM = Parts Per Million (v/v) on an actual (wet) basis
(2) Destruction Efficiencies were calculated using the mass emission rates

III. DISCUSSION OF RESULTS

The results of the destruction efficiency sampling are presented in Section II., Table 1. The destruction efficiency was calculated using the mass loading rates at the inlet and outlet of the RTO, as propane. Flow rate measurements were taken after the first and second test run and were used to calculate each mass loading rate at the inlet and outlet for those runs respectively. The average flow rate for runs one and two was used to calculate the mass loading rate at the inlet and outlet for run three.

The destruction efficiencies for the three samples taken were 98.49% for sample one, 98.28% for sample two and 98.32% for sample three. The average of the three samples was 98.36%.

IV. SOURCE DESCRIPTION

The source sampled was the inlet and exhaust of the RTO on the Flatrackline process located at the Muskegon, Michigan facility. The process coats plastic interior and exterior automotive parts.. The process consists of prime, base and clear coat booths. The complete line is totally enclosed and vents to the RTO.

The RTO controls VOC emissions from the booths and conveyor lines leading in and out of the spray booths. The coating lines were operated at normal production rates in terms of the parts coated and the coatings used during the testing, with the exception of the third run. During the third run painting was performed with empty racks traveling through the booths. Process information can be found in Appendix B.

V. SAMPLING AND ANALYTICAL PROTOCOL

The RTO exhaust sampling was conducted on the 30-inch I.D. exhaust stack, at a location that is greater than eight duct diameters downstream and greater than two-duct diameter upstream from the nearest disturbances. The RTO inlet sampling was conducted on the 36-inch I.D. inlet duct at a location approximately three duct-diameters downstream and one duct diameter upstream from the nearest disturbances.

The following reference test methods were employed to conduct the sampling:

* Destruction Efficiency - U.S. EPA Method 25A
* Exhaust Gas Parameters (flowrate, temperature, moisture and density) - U.S. EPA Methods 1 - 4

V.1 Destruction Efficiency - The total hydrocarbon (VOC) sampling was conducted in accordance with U.S. EPA Reference Method 25A. The sample gas was extracted from the sources through heated teflon sample lines which led to a Thermo Environmental Model 51 (on the inlet) and a J.U.M Model 3-300 A (on the exhaust) portable flame ionization detectors (FIDs). These analyzers produce instantaneous readouts of the total hydrocarbon concentrations (PPM). Three (3) samples were collected from each of the sources. Each sample was sixty (60) minutes in duration. The sampling on the inlet and exhaust was conducted simultaneously.

A systems (from the back of the stack probe to the analyzer) calibration was conducted for the analyzers prior to the testing. Span gases of 85.78 PPM and 4500 PPM propane were used to establish the initial instrument calibration for the analyzers. Propane calibration gases of 50.19 PPM, 30.37 PPM, 2510 PPM and 1500.0 PPM were used to determine the calibration error of the analyzers. After each sample (60 minute sample period), a system zero and system injections of 1500 PPM and 30.37 PPM propane were performed to establish system drift of both analyzers during the test period. All calibration gases used were EPA Protocol 1 Certified. All the results were calibration corrected using Equation 7E-1 from U.S. EPA Method 7E.

The analyzers were calibrated to the output of the data acquisition system (DAS) used to collect the data from the incinerator. All quality assurance and quality control requirements specified in the method were incorporated in the performance of this determination. A diagram of the sampling train is shown in Figure 1.

V.2 Exhaust Gas Parameters - The exhaust gas parameters (airflow rate, temperature, moisture and density) were determined in conjunction with the other sampling by employing U.S. EPA Reference Methods 1 through 4. Velocity traverses were performed after the first and second DE test run. Moisture was determined by employing the wet bulb/dry bulb measurement technique. Oxygen and carbon dioxide concentrations (%) were determined by collecting a bag sample (grab

sample) and Orsat analysis. All the quality assurance and quality control procedures listed in the methods were incorporated in the sampling and analysis.

This report was prepared by:

Stephan K. Byrd
President

This report was reviewed by:

R. Scott Cargill
Vice President

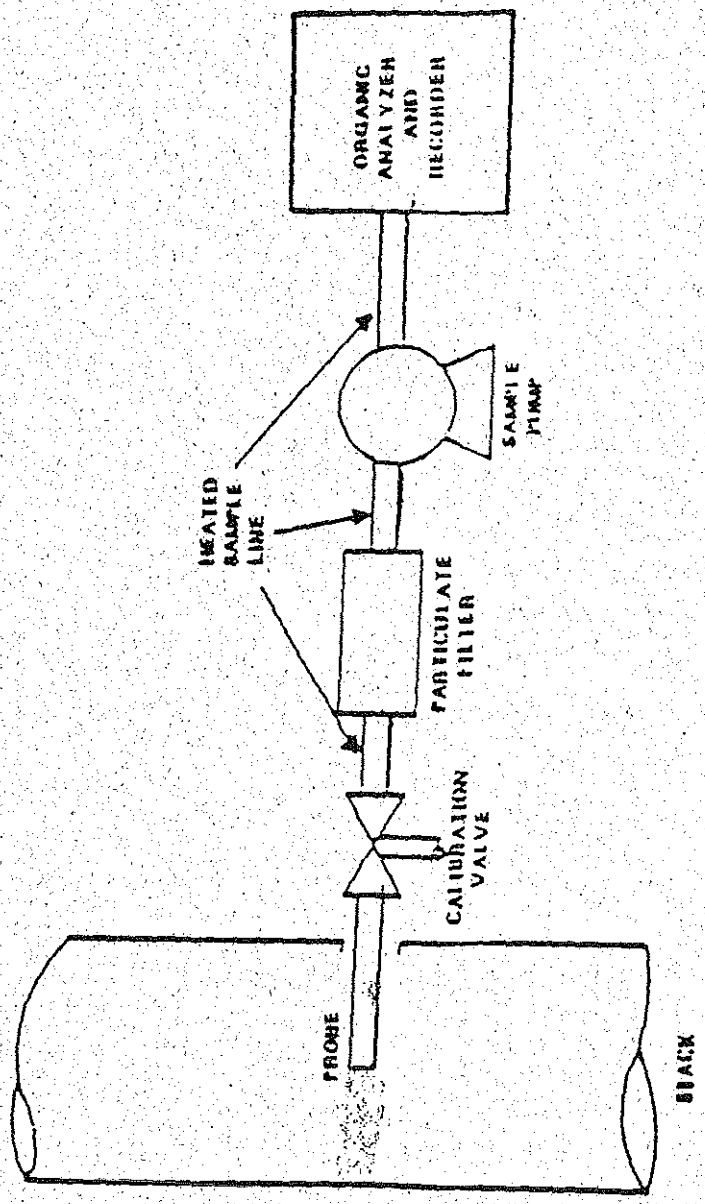

Figure 1
VOC Sampling Train