

**REPORT FOR THE VOC EMISSION TESTING ON THE EUM-2000 (ECOCOOL)
EXHAUST STACK ASSOCIATED WITH THE GROSS SUNDAY 2000 SINGLE WEB
PRINTING PRESS SYSTEM AT THE WALSWORTH PUBLISHING COMPANY
FACILITY LOCATED IN SAINT JOSEPH, MI**

Prepared for:

WALSWORTH PUBLISHING COMPANY
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SAINT JOSEPH, MI 49085

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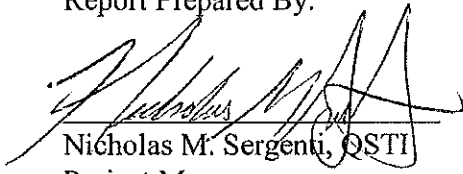
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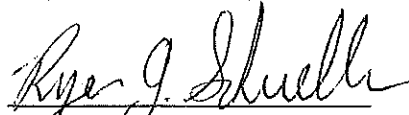
STACK TEST GROUP, INC.
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SEPTEMBER 15, 2016
STACK TEST GROUP, INC. PROJECT NO. 16-2825

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1.0 EXECUTIVE SUMMARY

On September 15, 2016, The Stack Test Group, Inc. performed volatile organic compound (VOC) testing on the EUM-2000 (ECOCOOL) exhaust stack at the Walsworth Publishing Company facility located in Saint Joseph, MI. Three one-hour tests were conducted on this source for the above mentioned parameters. Presented below are the average results of these tests.

EUM-2000 (ECOCOOL):

VOC Concentration:	0.3 Parts per Million
VOC Emission Rate:	0.0029 Pounds per Hour

2.0 INTRODUCTION

On September, 15, 2016, The Stack Test Group, Inc. performed VOC emissions testing on the EUM-2000 (ECOCOOL) exhaust stack at the Walsworth Publishing Company facility located in Saint Joseph, MI. Three one-hour tests were conducted on this source.

Testing was conducted while Walsworth Publishing Company personnel operated the Gross Sunday Press 2000 system at maximum rate and normal conditions. A copy of the operating data is included in Appendix F.

Testing was supervised by:
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The facility contact for the testing was:
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All testing followed the guidelines of U.S. EPA Reference Methods 1 through 4 and 25A. This report contains a summary of results for the above mentioned tests and all the supporting field, process, and computer generated data.

3.0 SAMPLING AND ANALYTICAL PROCEDURES

3.1 **Exhaust Gas Parameters**

3.1.1 *Traverse and Sampling Points*

Testing was conducted on the exhaust stack of the EUM-2000 (ECOCOOL). The number of velocity traverse and sample measurement points for the exhaust stack was determined using EPA Method 1. The sampling location was located greater than 2.0 diameters downstream and 0.5 diameters upstream of the nearest flow disturbance. Velocity measurements were taken at each of 16 points, 8 points in the two ports set at 90 degrees.

3.1.2 *Velocity Traverse*

Velocity measurements were performed during each VOC test in accordance with EPA Method 2. An "S" type Pitot Tube with an attached type "K" thermocouple was used to conduct the velocity traverse

3.1.3 *Gas Composition*

Gas composition for oxygen, carbon dioxide, and nitrogen was determined employing EPA Method 3. An integrated gas sample was collected during each VOC test. Gas analysis was conducted using a Fyrite.

3.1.4 *Moisture Content*

The exhaust gas moisture content was determined using EPA Method 4 for all tests. The exhaust stack moisture content was determined by drawing the gas sample through four impingers in the sample train. Volumetric analysis was used to measure the condensed moisture in the first three impingers while gravimetric analysis of silica gel was used to measure moisture collected in the fourth impinger.

3.2 **VOC TESTING**

3.2.1 *Sample Collection*

Testing on the EUM-2000 (ECOCOOL) was performed using U.S. EPA Reference Method 25A. A J.U.M. Model 3-300 Flame Ionization Detector (FID) was used to determine the emission concentrations. A sample was transported through a heated Teflon line from the exhaust stack to the FID which analyzed the samples continuously. The output signal from the FIDs was then recorded at one minute averages throughout the test. Copies of this data may be found in Appendix E.

At the beginning of the test series, the analyzers were calibrated and then checked for calibration error by introducing zero, mid-range and high-range calibration gases to the back of the analyzers. Before and after each individual test run, a system bias was performed by introducing a zero and mid-range propane calibration gas to the outlet of the probes. Calibration gases used were U.S. EPA Protocol 1 certified.

3.2.2 Sample Duration and Frequency

The Method 25A train sample was collected in a single test lasting 60 minutes in duration.

3.2.3 Calibrations

All sampling equipment was calibrated according to the procedures outlined in EPA Reference Method 25A. Copies of the FID calibrations are included in Appendix D.

5.0 TEST RESULTS

Presented in this section are the results of this test series. Test results are reported in Tables 4.1. Table 4.1 reports the EUM-2000 (ECOCOOL) exhaust stack results including stack gas temperature, percent carbon dioxide and oxygen, percent moisture, molecular weight of the stack gas dry and wet, velocity in feet per second (fps), and flow rate in actual cubic feet per minute (acfm), standard cubic feet per minute (scfm), and dry standard cubic feet per minute (dscfm).

Table 4.1 also presents the VOC results in parts per million as propane and pounds per hour (lb/hr) as propane.

Copies of the calculations used to determine these emission rates may be found in Appendix A. Copies of the field data sheets are presented in Appendix B. Copies of the analytical results are presented in Appendix D. Copies of equipment calibrations are presented in Appendix E.

Table 4.1

VOC Test Results
Walsworth Publishing Company
Saint Joseph, MI
09/15/16

EUM02000 (ECOCOOL)

	<u>T1</u>	<u>T2</u>	<u>T3</u>	<u>Avg.</u>
Test No:				
Start Time:	08:25 AM	10:11 AM	11:22 AM	
Finish Time:	09:25 AM	11:11 AM	12:22 PM	
Stack Gas Temperature, degrees F:	549	560.1	562.6	557.2
% Carbon Dioxide:	1.5	2.0	2.0	1.8
% Oxygen:	19.0	19.0	19.0	19.0
% Moisture:	6.47	6.60	6.55	6.54
Molecular Weight dry, lb/lb-Mole:	29.00	29.08	29.08	29.05
Molecular Weight wet, lb/lb-Mole:	28.29	28.35	28.35	28.33
Velocity and Flow Results:				
Average Stack Gas Velocity FPS:	19.29	19.90	20.07	19.76
Stack Gas Flow Rate, ACFM:	2,917	3,009	3,035	2,987
Stack Gas Flow Rate, SCFM:	1,538	1,569	1,579	1,562
Stack Gas Flow Rate, DSCF/HR:	86,309	87,947	88,558	87,604
Stack Gas Flow Rate, DSCFM:	1,438	1,466	1,476	1,460
VOC Results:				
PPMvw as Propane:	0.2	0.3	0.3	0.3
LBS/DSCF:	2.28E-08	3.43E-08	3.43E-08	3.05E-08
LBS/HR:	0.0021	0.0032	0.0032	0.0029