

GHD Services Inc.

6400 Shafer Court, Suite 400
Rosemont, Illinois 60018

Vantage Specialty Chemicals

Gurnee, IL
Project #11197003

Analytical Report (0619-135)

EPA Method TO-15 Analysis

Ethylene oxide



Enthalpy Analytical, LLC

Phone: (919) 850 - 4392 / Fax: (919) 850 - 9012 / www.enthalpy.com
800-1 Capitola Drive Durham, NC 27713-4385

Summary of Results

Enthalpy Analytical

Job No.: 0619-135 EPA Mod. Method TO-15 - Ethylene Oxide

GHD Services, Inc. - Rosemont, IL 11197003 Vantage Specialty Chemicals - Gurnee, IL

Summary Table

Sample ID	ppbv	ug/m3
AIR-11197003-6/12/2019-011	0.21	0.38
AIR-11197003-6/12/2019-012	0.13	0.24
AIR-11197003-6/12/2019-013	0.23	0.42
AIR-11197003-6/12/2019-014	0.12	0.22
AIR-11197003-6/12/2019-015	0.071	0.13
AIR-11197003-6/12/2019-016	0.14	0.25

Narrative Summary

Enthalpy Analytical Narrative Summary

Company	GHD Services, Inc.
SGS Login	L484351
Parameters	EPA TO-15 – Ethylene oxide

Client #	11197003
Enthalpy Job #	0619-135
# Samples	6

Custody

David Myers received the samples on 6/14/19 after being relinquished by Youa Yang of GHD Services, Inc. of Rosemont, IL. The samples were received at ambient temperature and in good condition.

The samples were relinquished for subcontract analysis to SGS Galson of East Syracuse, NY by Melanie Bethea on 6/27/19. Samples were received by Brett Grenert-Fischer of SGS on 6/28/19.

Prior to being sent to SGS Galson, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, LLC.

Analysis

The samples were analyzed for ethylene oxide using modified methods OSHA PV2120 and EPA TO-15. Samples were pressurized with nitrogen prior to shipment to SGS for analysis.

QC Notes

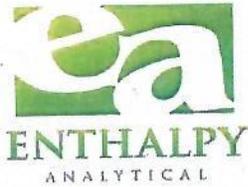
None.

Reporting Notes

Samples were originally analyzed by SGS Galson on 7/1/19. However, the results reported for the original analysis were suspect because they were mostly non-detect values. The samples were reanalyzed on 7/9/19, per request, utilizing a larger sample aliquot. The results presented in this report are representative of the sample results as provided by SGS Galson sample reanalysis on 7/9/19 with the exception of sample AIR-11197003-6/12/2019-011.



Sample Custody



Chain of Custody Record

Special Handling:
 Standard Turn Around Time
 Rush Turn Around Time -- Date Needed _____
 • All TATs Subject to Approval by Enthalpy Analytical
 • All Bag/Can Samples Disposed of 1 Month from Receipt.
 • All Other Samples Disposed of 4 Months from Receipt.

Sample(s) Collected by: Youa Yang
 Client Name: GHD
 Project Manager: Matt Lazaric

Project Number: 11197003
 Site Name: Vantage
 Location: Gorree, IL

PO#: _____
 Telephone#: 773-380-9933
 Email: matthew.lazaric@ghd.com

For split or duplicate samples: please provide sample volumes for recovery calculations. For Particulates: please provide tare weights and/or condensed water volumes.

Special Instructions:

Sample Containers **Analyses:**

A=Air 1=H2SO4 2=NaOH W=Water O=Other
 X=XAD C=Charcoal SG=Silica Gel

G=Grab C=Composite Q=Quality Control O=Other

Sample ID	Date	Time	Sample Volume	Type	Matrix	# of VOA Vials	# of Glass	# of Plastic	# of Bags	# of Canisters	# of Tubes	# Other	Enthalpy Oxide	Can ID #	END TIME	Notes:
Air-11197003-6/12/19-011	6/12/19	13:16	6L	C	A					1			X	1476	12:16	6/13/2019
Air-11197003-6/12/19-012	6/12/19	13:31	6L	C	A					1			X	0792	12:28	6/13/2019
Air-11197003-6/12/19-013	6/12/19	13:48	6L	C	A					1			X	0076	12:35	6/13/2019
Air-11197003-6/12/19-014	6/12/19	13:48	6L	C	A					1			X	0727	12:35	6/13/2019
Air-11197003-6/12/19-015	6/12/19	14:17	6L	C	A					1			X	0016	12:53	6/13/2019
Air-11197003-6/12/19-016	6/12/19	14:40	6L	C	A					1			X	0721	13:13	6/13/2019

Relinquished By:	Date:	Received By:	Date:	Time:	Sample Condition Upon Receipt:
	6/13/2019		06-14-19	3:44PM	<input type="checkbox"/> Iced <input type="checkbox"/> Ambient <input type="checkbox"/> °C _____
					<input type="checkbox"/> Iced <input type="checkbox"/> Ambient <input type="checkbox"/> °C _____
					<input type="checkbox"/> Iced <input type="checkbox"/> Ambient <input type="checkbox"/> °C _____

Good Condition Ambient temp 15M 06-14-19

L484351

0619-088.00X samples reported on L484351
0619-135.01X samples reported on L486698
per client. ZRK 7/23/19

Cart #2



Chain of Custody Record

Page 1 of 1

Special Handling:

- Standard Turn Around Time (10 business days)
- Rush Turn Around Time -- Date Needed 3 Day turn
- All TATs Subject to Approval by Enthalpy Analytical, Inc.
- All Bag/Can Samples Disposed of 1 Month from Receipt.
- All Other Samples Disposed of 4 Months from Receipt.

For spiked or duplicate samples: please provide sample volumes for recovery calculations. For Particulates: please provide tare weights and/or condensed water volumes.

Client Name: Enthalpy Analytical
 Project Manager: David Berkowitz
 Report To: David Berkowitz

Project Number: 0618-088/135
 Site Name: _____
 Location: _____

PO#: _____
 Telephone#: 919-491-9841
 Email: david.berkowitz@enthalpy.com

Special Instructions:
 Analyze for EtO - 0.04 ppb RL - already pressurized for analysis

A=Air 1=H2SO4 2=NaOH W=Water O=Other
 X=XAD C=Charcoal SG=Silica Gel

G=Grab C=Composite Q=Quality Control O=Other

Sample ID	Date	Time	Sample Volume	Type	Matrix	Sample Containers							TO-15 /EtO	Analyses:	Notes:
						# of VOA Vials	# of Glass	# of Plastic	# of Bags	# of Canisters	# of Tubes	# Other			
0619-088.001	06/09/19	9:59	6L	C	A					1					Can 0089 - 1.72 dilution factor
0619-088.002	06/09/19	10:19	6L	C	A					1					Can 0750 - 1.76 dilution factor
0619-088.003	06/09/19	10:39	6L	C	A					1					Can 0071 - 1.71 dilution factor
0619-088.004	06/09/19	11:17	6L	C	A					1					Can 0095 - 1.73 dilution factor
0619-088.005	06/09/19	11:19	6L	C	A					1					Can 0707 - 1.72 dilution factor
0619-088.006	06/09/19	11:50	6L	C	A					1					Can 0077 - 1.73 dilution factor
0619-135.011	6/12/19	13:16	6L	C	A					1					Can 1476 - 1.73 dilution factor
0619-135.012	6/12/19	13:31	6L	C	A					1					Can 0752 - 1.72 dilution factor
0619-135.013	6/12/19	13:48	6L	C	A					1					Can 0076 - 1.71 dilution factor
0619-135.014	6/12/19	13:48	6L	C	A					1					Can 0727 - 1.73 dilution factor
0619-135.015	6/12/19	14:17	6L	C	A					1					Can 0016 - 1.69 dilution factor
0619-135.016	6/12/19	14:40	6L	C	A					1					Can 0721 - 1.72 dilution factor

ETO only
KMS 06/28/19

all
summa
cans
all
N6
B&F
6/28/19

Relinquished By:	Date:	Received By:	Date:	Time:	Sample Condition Upon Receipt:
<u>M. Bell</u>	<u>6/27/19</u>	<u>Brett Grenert-Fischer</u>	<u>6/28/19</u>	<u>0914</u>	<input type="checkbox"/> Iced <input type="checkbox"/> Ambient <input type="checkbox"/> °C _____
					<input type="checkbox"/> Iced <input type="checkbox"/> Ambient <input type="checkbox"/> °C _____
					<input type="checkbox"/> Iced <input type="checkbox"/> Ambient <input type="checkbox"/> °C _____

Client Name: GHD (Lazaric)

Client #:

Enthalpy Job #: 0619-135

Canister Data

Canister ID	Sample ID	Canister Pressure Pre-Sample (mmHg)	Canister Pressure Post-Sample (mmHg)	Canister Pressure Final (mmHg)	Canister Pressurization Factor
1478	T1901850(B)	-706	4	557	1.728
0752	T1901846/T1901847(B)	-706	-7	532	1.720
0727	T1901870/T1901871(B)	-706	-12	529	1.728
0721	T1901870/T1901871(B)	-706	-7	532	1.720
000076	T1901870/T1901871(B)	-706	-8	525	1.713
000016	T1901870/T1901871(B)	-706	1	526	1.694

Date Prepared: 6/6/19
 Date Received: 6/14/19

Prepared By: WRC
 Received By: DSM

SGS Galson Report

Mr. David Berkowitz
Enthalpy Analytical, Inc.
800 Capitola Drive
Suite 1
Durham, NC 27713

July 26, 2019

Account# 32042

Login# L486698

Dear David Berkowitz:

Enclosed are the analytical results for the samples received by our laboratory on June 28, 2019. All samples on the chain of custody were received in good condition unless otherwise noted. Any additional observations will be noted on the chain of custody.

Please contact client services at (888) 432-5227 if you would like any additional information regarding this report. Thank you for using SGS Galson.

Sincerely,

SGS Galson



Lisa Swab
Laboratory Director

Enclosure(s)

Terms and Conditions & General Disclaimers

- This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.
- Any holder of this document is advised that information contained herein reflects the Company’s findings at the time of its intervention only and within the limits of Client’s instructions, if any. The Company’s sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

Analytical Disclaimers

- Unless otherwise noted within the report, all quality control results associated with the samples were within established control limits or did not impact reported results.
- Note: The findings recorded within this report were drawn from analysis of the sample(s) provided to the laboratory by the Client (or a third party acting at the Client’s direction). The laboratory does not have control over the sampling process, including but not limited to the use of field equipment and collection media, as well as the sampling duration, collection volume or any other collection parameter used by the Client. The findings herein constitute no warranty of the sample’s representativeness of any sampled environment, and strictly relate to the samples as they were presented to the laboratory. For recommended sampling collection parameters, please refer to the Sampling and Analysis Guide at www.sgs.com.
- Unrounded results are carried through the calculations that yield the final result and the final result is rounded to the number of significant figures appropriate to the accuracy of the analytical method. Please note that results appearing in the columns preceding the final result column may have been rounded and therefore, if carried through the calculations, may not yield an identical final result to the one reported.
- The stated LOQs for each analyte represent the demonstrated LOQ concentrations prior to correction for desorption efficiency (if applicable).
- Unless otherwise noted within the report, results have not been blank corrected for any field blank or method blank data.

Accreditations SGS Galson holds a variety of accreditations and recognitions. Our quality management system conforms with the requirements of ISO/IEC 17025. Where applicable, samples may also be analyzed in accordance with the requirements of ELAP, NELAC, or LELAP under one of the state accrediting bodies listed below. Current Scopes of Accreditation can be viewed at <http://www.sgs.com> in the accreditations section of the "About" page. To determine if the analyte tested falls under our scope of accreditation, please visit our website or call Client Services at (888) 432-5227.

National/International	Accreditation/Recognition	Lab ID#	Program/Sector
AIHA-LAP, LLC - IHLAP, ELLAP, EMLAP	ISO/IEC 17025 and USEPA NLLAP	Lab ID 100324	Industrial Hygiene, Environmental Lead, Environmental Microbiology

State	Accreditation/Recognition	Lab ID#	Program/Sector
New York (NYSDOH)	ELAP and NELAC (TNI)	Lab ID: 11626	Air Analysis, Solid and Hazardous Waste
New Jersey (NJDEP)	NELAC (TNI)	Lab ID: NY024	Air Analysis
Louisiana (LDEQ)	LELAP	Lab ID: 04083	Air Analysis, Solid Chemical Materials
Texas	Texas Dept. of Licensing and Regulation	Lab ID: 1042	Mold Analysis Laboratory license

Legend

< - Less than	mg - Milligrams	MDL - Method Detection Limit	ppb - Parts per Billion
> - Greater than	ug - Micrograms	NA - Not Applicable	ppm - Parts per Million
l - Liters	m3 - Cubic Meters	NS - Not Specified	ppbv - ppb Volume
LOQ - Limit of Quantitation	kg - Kilograms	ND - Not Detected	ppmv - ppm Volume
ft2 - Square Feet	cm2 - Square Centimeters	in2 - Square Inches	ng - Nanograms



GALSON

LABORATORY ANALYSIS REPORT

LELAP Lab ID #04083

6601 Kirkville Road
East Syracuse, NY 13057
(315) 432-5227
FAX: (315) 437-0571
www.sgsgalson.com

Client : Enthalpy Analytical, Inc.
Site : NS
Project No. : 0619-135
Date Sampled : 12-JUN-19
Date Received : 28-JUN-19

Account No.: 32042
Login No. : L486698
Date Analyzed : 01-JUL-19 - 09-JUL-19
Report ID : 1149314

Ethylene Oxide

Galson ID:	L486698-1	L486698-2	L486698-3
Client ID:	0619-135.011	0619-135.012	0619-135.013

	LOQ ppbv	LOQ ug/m3	ppbv	ug/m3	ppbv	ug/m3	ppbv	ug/m3
Ethylene oxide	0.040	0.072	0.21	0.38	0.13	0.24	0.23	0.42

Analytical Method: mod. OSHA PV2120/mod. EPA TO15; GC/MS
Collection Media : 6L Canister
Submitted by : BLD

Approved by : SAP
Date : 26-JUL-19

Supervisor: SAP



GALSON

LABORATORY ANALYSIS REPORT

LELAP Lab ID #04083

6601 Kirkville Road
East Syracuse, NY 13057
(315) 432-5227
FAX: (315) 437-0571
www.sgsgalson.com

Client : Enthalpy Analytical, Inc.
Site : NS
Project No. : 0619-135
Date Sampled : 12-JUN-19
Date Received : 28-JUN-19

Account No.: 32042
Login No. : L486698
Date Analyzed : 01-JUL-19 - 09-JUL-19
Report ID : 1149314

Ethylene Oxide

Galson ID:	L486698-4	L486698-5	L486698-6
Client ID:	0619-135.014	0619-135.015	0619-135.016

	LOQ ppbv	LOQ ug/m3	ppbv	ug/m3	ppbv	ug/m3	ppbv	ug/m3
Ethylene oxide	0.040	0.072	0.12	0.22	0.071	0.13	0.14	0.25

Analytical Method: mod. OSHA PV2120/mod. EPA TO15; GC/MS
Collection Media : 6L Canister
Submitted by : BLD

Approved by : SAP
Date : 26-JUL-19

Supervisor: SAP



GALSON

LABORATORY FOOTNOTE REPORT

6601 Kirkville Road
East Syracuse, NY 13057
(315) 432-5227
FAX: (315) 437-0571
www.sgsgalson.com

Client Name : Enthalpy Analytical, Inc.
Site :
Project No. : 0619-135

Date Sampled : 12-JUN-19 Account No.: 32042
Date Received: 28-JUN-19 Login No. : L486698
Date Analyzed: 01-JUL-19 - 09-JUL-19

L486698 (Report ID: 1149314):
SOPs: in-vocs(36)

L486698-2-6 (Report ID: 1149314):
Samples were pressurized by client before receipt by lab. Injection volumes were increased to compensate for dilution factor provided by client.

L486698 (Report ID: 1149314):
Accuracy and mean recovery data presented below is based on a 95% confidence interval (k=2). The estimated accuracy applies to the media, technology, and SOP referenced in this report and does not account for the uncertainty associated with the sampling process. The accuracy is based solely on spike recovery data from internal quality control samples. Where N/A appears below, insufficient data is available to provide statistical accuracy and mean recovery values for the associated analyte.

<u>Parameter</u>	<u>Accuracy</u>	<u>Mean Recovery</u>
Ethylene oxide	+/-34.6%	103%