Ektimo

Experts in air quality, odour and emission monitoring.

Annual Emission Testing

Report: R018996[DRAFT 2]

Henkel Australia Pty Ltd, Seven Hills

ilac-MRA NATA

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Document Information

Client Name:	Henkel Australia Pty Ltd
Report Number:	R018996[DRAFT 2]
Date of Issue:	9 October 2025
Attention:	Nader Khalaf
Address:	7 Stanton Rd Seven Hills NSW 2147
Testing Laboratory:	Ektimo Pty Ltd, ABN 86 600 381 413

Report Authorisation

Rick Peralta
Air Monitoring Consultant

NATA Accredited Laboratory
No. 14601

Aaron Davis
Ektimo Signatory

Please note that only numerical results pertaining to measurements conducted directly by Ektimo are covered by Ektimo terms of NATA accreditation as described in the Test Methods table. This does not include calculations that use data supplied by third-parties, comments, conclusions, or recommendations based upon the results. Refer to Test Methods section for full details of testing covered by NATA accreditation.

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1 Executive Summary

1.1 Background

Ektimo was engaged by Henkel Australia Pty Ltd to perform emission testing at their Seven Hills plant. Testing was carried out in accordance with Environment Protection Licence 258.

1.2 Project Objective & Overview

The objective of the project is to quantify emissions from five (5) discharge points to enable the load of assessable pollutants to be calculated pursuant to Henkel Australia Pty Ltd's Environmental Licence.

Monitoring was performed as follows:

Location	Test Date	Test Parameters*
Hot Melt Belt Cooler Exhaust	02 September 2025	Volatile Organic Compounds (VOCs) Particulate matter <10µm (PM_{10}) Oxygen (O_2) and carbon dioxide (CO_2)
Hot Melt Scrubber	02 September 2025	
Glue Bench - PVE Scrubber	03 September 2025	
Radco Oil Heater	03 September 2025	Particulate matter <10µm (PM_{10}) Nitrogen oxides (as NO_2), carbon monoxide (CO), oxygen (O_2) and carbon dioxide (CO_2)
PVE - Charcoal Filter	03 September 2025	Total Particulate Matter (TPM)[1] Particulate matter <10µm (PM_{10}) Oxygen (O_2) and carbon dioxide (CO_2) Volatile Organic Compounds (VOCs)

* Flow rate, velocity, temperature, and moisture were also determined.

[1]Due to the insufficient port size (1-inch) at the PVE – Charcoal Filter exhaust stack, PM10 measurements could not be performed. By definition, PM10 (particulate matter <10 microns in aerodynamic size) forms a fraction of total particulate matter (TPM). The approved sampling method used to determine TPM in NSW is EPA TM-15, which can achieve lower concentration detection limits than the method used to determine PM10, namely NSW EPA OM-5. On this occasion, due to PVE-Charcoal Filter exhaust stack porthole configuration, Ektimo utilised NSW EPA TM-15 to measure the TPM concentration and thus estimate PM10.

All volume-based concentrations are reported on a dry basis at STP.

1.3 Results Summary

The following table summarises the results of the testing programme.

Location	Pollutant	Detected Values mg/m^3	Mass Rate g/min
Hot Melt Scrubber	Volatile organic compounds (VOCs)	19	3.3
	Particulate matter <10 µm (PM_{10})*	<3	<0.5
Hot Melt Belt Cooler Exhaust	Volatile organic compounds (VOCs)	2	0.63
	Particulate matter <10 µm (PM_{10})*	<3	<0.9
Glue Bench - PVE Scrubber	Volatile organic compounds (VOCs)	6.6	0.54
	Particulate matter <10 µm (PM_{10})*	<3	<0.2
PVE - Charcoal Filter	Volatile organic compounds (VOCs)	150	0.21
	Total Particulate Matter (TPM)*	<3	<0.004
Radco Oil Heater	Particulate matter <10 µm (PM_{10})*	<3	<0.04
	Nitrogen Dioxide (NO_x as NO_2)	58	0.8

Please note that the measurement uncertainty associated with the test results was not considered when determining whether the results were compliant or non-compliant.

*** Note:** Probe wash sample compromised.

2 Results

2.1 Hot Melt Scrubber

Date	2/09/2025	**Client**	Henkel Australia Pty Ltd
Report	R018996	**Stack ID**	Hot Melt Scrubber
Licence No.	258	**Location**	Seven Hills, NSW 2147
Ektimo Staff	Rick Peralta, Muhammad Usman	**State**	NSW
Process Conditions	Normal Operation: Please refer to client records.		250822

Stack Parameters		
Moisture content, %v/v	1	
Gas molecular weight, g/g mole	28.9 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.29 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	1.21	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1239 & 1346	
Temperature, °C	20	
Temperature, K	293	
Ambient pressure, kPa	102	
Stack pressure, kPa	102	
Velocity at sampling plane, m/s	7.8	
Volumetric flow rate, actual, m³/s	3	
Volumetric flow rate (wet STP), m³/s	2.8	
Volumetric flow rate (dry STP), m³/s	2.8	
Mass flow rate (wet basis), kg/h	13000	

Gas Analyser Results	Average
Sampling time	1245 - 1345
	Concentration % v/v
Carbon dioxide	<0.4
Oxygen	20.9

Isokinetic Results	Results	
Sampling time	1245-1345 (PM10)	
	Concentration mg/m³	Mass Rate g/min
Fine particulates (PM10)*	<3	<0.5
D50 cut size, 10µm	10.0	
Isokinetic Sampling Parameters		
Sampling time, min	60	
Isokinetic rate, %	105	
Gravimetric analysis date (PM_{10})	09-09-2025	

*** Note:** Probe wash sample compromised.

Date	2/09/2025	**Client**	Henkel Australia Pty Ltd
Report	R018996	**Stack ID**	Hot Melt Scrubber
Licence No.	258	**Location**	Seven Hills, NSW 2147
Ektimo Staff	Rick Peralta, Muhammad Usman	**State**	NSW
Process Conditions	Normal Operation: Please refer to client records.		250822

Total VOCs (as n-Propane)	Results	
Sampling time	1245-1345	
	Concentration mg/m³	Mass Rate g/min
Total	19	3.3

VOC (speciated)	Results	
Sampling time	1245-1345	
( )	Concentration mg/m³	Mass Rate g/min
Detection limit [1]	<0.03	<0.006
Acetone	0.12	0.02
Benzene	<0.03	<0.006
Toluene	0.26	0.043
Decane	0.058	0.0099
Dodecane	0.038	0.0064
Residuals as Toluene	19	3.2

(1) Unless otherwise reported, the following target compounds were found to be below detection:
Ethanol, Isopropanol, Pentane, 1,1-Dichloroethene, Acrylonitrile, Dichloromethane, trans-1,2-Dichloroethene, Methyl ethyl ketone, n-Hexane, cis-1,2-Dichloroethene, Ethyl acetate, Chloroform, 1,1,1-Trichloroethane, 1,2-Dichloroethane, Cyclohexane, Benzene, Carbon tetrachloride, Butanol, Isopropyl acetate, 2-Methylhexane, 2,3-Dimethylpentane, 1-Methoxy-2-propanol, 3-Methylhexane, Heptane, Trichloroethylene, Ethyl acrylate, Methyl methacrylate, Propyl acetate, Methylcyclohexane, Methyl Isobutyl Ketone, 1,1,2-Trichloroethane, 2-Hexanone, Octane, Tetrachloroethene, Butyl acetate, Chlorobenzene, Ethylbenzene, m + p-Xylene, 1-Methoxy-2-propyl acetate, Styrene, o-Xylene, Butyl acrylate, Nonane, 2-Butoxyethanol, Cellosolve acetate, 1,1,2,2-Tetrachloroethane, Isopropylbenzene, alpha-Pinene, Propylbenzene, 1,3,5-Trimethylbenzene, beta-Pinene, tert-Butylbenzene, 1,2,4-Trimethylbenzene, 3-Carene, 1,2,3-Trimethylbenzene, D-Limonene, Undecane, Tridecane, Tetradecane

2.2 Hot Melt Belt Cooler Exhaust

Date	2/09/2025	**Client**	Henkel Australia Pty Ltd
Report	R018996	**Stack ID**	Hot Melt Belt Cooler Exhaust
Licence No.	258	**Location**	Seven Hills, NSW 2147
Ektimo Staff	Rick Peralta, Muhammad Usman	**State**	NSW
Process Conditions	Load: 300 Bags/Batch/5 hrs; Product (S130A)		250822

Stack Parameters		
Moisture content, %v/v	0.91	
Gas molecular weight, g/g mole	28.9 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.29 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	1.22	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1034 & 1157	
Temperature, °C	19	
Temperature, K	292	
Ambient pressure, kPa	102	
Stack pressure, kPa	102	
Velocity at sampling plane, m/s	12	
Volumetric flow rate, actual, m³/s	5.7	
Volumetric flow rate (wet STP), m³/s	5.4	
Volumetric flow rate (dry STP), m³/s	5.4	
Mass flow rate (wet basis), kg/h	25000	

Gas Analyser Results	Average
Sampling time	1055 - 1155
	Concentration % v/v
Carbon dioxide	<0.4
Oxygen	20.9

Isokinetic Results	Results	
Sampling time	1055-1155 (PM10)	
	Concentration mg/m³	Mass Rate g/min
Fine particulates (PM10)*	<3	<0.9
D50 cut size, 10µm	10.1	
Isokinetic Sampling Parameters		
Sampling time, min	60	
Isokinetic rate, %	88	
Gravimetric analysis date (PM_{10})	09-09-2025	

*** Note:** Probe wash sample compromised.

Date	2/09/2025	**Client**	Henkel Australia Pty Ltd
Report	R018996	**Stack ID**	Hot Melt Belt Cooler Exhaust
Licence No.	258	**Location**	Seven Hills, NSW 2147
Ektimo Staff	Rick Peralta, Muhammad Usman	**State**	NSW
Process Conditions	Load: 300 Bags/Batch/5 hrs; Product (S130A)		250822

Total VOCs (as n-Propane)	Results	
Sampling time	1055-1155	
	Concentration mg/m³	Mass Rate g/min
Total	2	0.63

VOC (speciated)	Results	
Sampling time	1055-1155	
( )	Concentration mg/m³	Mass Rate g/min
Detection limit [1]	<0.04	<0.01
Acetone	0.059	0.019
Benzene	<0.04	<0.01
Toluene	1.7	0.55
Residuals as Toluene	0.21	0.069

(1) Unless otherwise reported, the following target compounds were found to be below detection:
Ethanol, Isopropanol, Pentane, 1,1-Dichloroethene, Acrylonitrile, Dichloromethane, trans-1,2-Dichloroethene, Methyl ethyl ketone, n-Hexane, cis-1,2-Dichloroethene, Ethyl acetate, Chloroform, 1,1,1-Trichloroethane, 1,2-Dichloroethane, Cyclohexane, Benzene, Carbon tetrachloride, Butanol, Isopropyl acetate, 2-Methylhexane, 2,3-Dimethylpentane, 1-Methoxy-2-propanol, 3-Methylhexane, Heptane, Trichloroethylene, Ethyl acrylate, Methyl methacrylate, Propyl acetate, Methylcyclohexane, Methyl Isobutyl Ketone, 1,1,2-Trichloroethane, 2-Hexanone, Octane, Tetrachloroethene, Butyl acetate, Chlorobenzene, Ethylbenzene, m + p-Xylene, 1-Methoxy-2-propyl acetate, Styrene, o-Xylene, Butyl acrylate, Nonane, 2-Butoxyethanol, Cellosolve acetate, 1,1,2,2-Tetrachloroethane, Isopropylbenzene, alpha-Pinene, Propylbenzene, 1,3,5-Trimethylbenzene, beta-Pinene, tert-Butylbenzene, 1,2,4-Trimethylbenzene, Decane, 3-Carene, 1,2,3-Trimethylbenzene, D-Limonene, Undecane, Dodecane, Tridecane, Tetradecane

2.3 Glue Bench – PVE Scrubber

Date	3/09/2025	**Client**	Henkel Australia Pty Ltd
Report	R018996	**Stack ID**	Glue Bench Scrubber
Licence No.	258	**Location**	Seven Hills, NSW 2147
Ektimo Staff	Rick Peralta, Muhammad Usman	**State**	NSW
Process Conditions	Please refer to client records.		250822

Stack Parameters		
Moisture content, %v/v	2.6 (saturated)	
Gas molecular weight, g/g mole	28.7 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.28 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	1.20	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1142 & 1305	
Temperature, °C	22	
Temperature, K	295	
Ambient pressure, kPa	102	
Stack pressure, kPa	102	
Velocity at sampling plane, m/s	7	
Volumetric flow rate, actual, m³/s	1.5	
Volumetric flow rate (wet STP), m³/s	1.4	
Volumetric flow rate (dry STP), m³/s	1.3	
Mass flow rate (wet basis), kg/h	6400	

Gas Analyser Results	Average
Sampling time	1201 - 1301
	Concentration % v/v
Carbon dioxide	<0.4
Oxygen	20.9

Isokinetic Results	Results	
Sampling time	1201-1303 (PM10)	
	Concentration mg/m³	Mass Rate g/min
Fine particulates (PM10)*	<3	<0.2
D50 cut size, 10µm	9.8	
Isokinetic Sampling Parameters		
Sampling time, min	60	
Isokinetic rate, %	92	
Gravimetric analysis date (PM_{10})	09-09-2025	

*** Note:** Probe wash sample compromised.

Date	3/09/2025	**Client**	Henkel Australia Pty Ltd
Report	R018996	**Stack ID**	Glue Bench Scrubber
Licence No.	258	**Location**	Seven Hills, NSW 2147
Ektimo Staff	Rick Peralta, Muhammad Usman	**State**	NSW
Process Conditions	Please refer to client records.		250822

Total VOCs (as n-Propane)	Results	
Sampling time	1203-1303	
	Concentration mg/m³	Mass Rate g/min
Total	6.6	0.54

VOC (speciated) [1]	Results	
Sampling time	1203-1303	
	Concentration mg/m³	Mass Rate g/min
Detection limit [2]	<0.03	<0.003
Acetone	0.047	0.0038
Ethyl acetate	0.41	0.033
Benzene	<0.03	<0.003
Toluene	4.7	0.38
Residuals as Toluene	1.2	0.099
Vinyl acetate as Toluene*	0.22	0.018

(1) Compounds marked with an asterisk have been semi-quantified (refer to Definitions) and are therefore not covered by the scope of Ektimo's NATA accreditation.

(2) Unless otherwise reported, the following target compounds were found to be below detection:

Ethanol, Isopropanol, Pentane, 1,1-Dichloroethene, Acrylonitrile, Dichloromethane, trans-1,2-Dichloroethene, Methyl ethyl ketone, n-Hexane, cis-1,2-Dichloroethene, Chloroform, 1,1,1-Trichloroethane,1,2-Dichloroethane, Cyclohexane, Benzene, Carbon tetrachloride, Butanol, Isopropyl acetate, 2-Methylhexane, 2,3-Dimethylpentane, 1-Methoxy-2-propanol, 3-Methylhexane, Heptane, Trichloroethylene, Ethyl acrylate, Methyl methacrylate, Propyl acetate, Methylcyclohexane, Methyl Isobutyl Ketone, 1,1,2 Trichloroethane, 2-Hexanone, Octane, Tetrachloroethene, Butyl acetate, Chlorobenzene, Ethylbenzene, m + p-Xylene, 1-Methoxy-2-propyl acetate, Styrene, o-Xylene, Butyl acrylate, Nonane, 2-Butoxyethanol, Cellosolve acetate, 1,1,2,2-Tetrachloroethane, Isopropylbenzene, alpha-Pinene, Propylbenzene, 1,3,5-Trimethylbenzene,beta-Pinene, tert-Butylbenzene, 1,2,4-Trimethylbenzene, Decane, 3-Carene, 1,2,3-Trimethylbenzene, D-Limonene, Undecane, Dodecane, Tridecane, Tetradecane

2.4 PVE – Charcoal Filter

Date	3/09/2025	**Client**	Henkel Australia Pty Ltd
Report	R018996	**Stack ID**	PVE Charcoal Filter
Licence No.	258	**Location**	Seven Hills, NSW 2147
Ektimo Staff	Rick Peralta, Muhammad Usman	**State**	NSW
Process Conditions	Please refer to client records.		250822

Stack Parameters		
Moisture content, %v/v	1.8	
Gas molecular weight, g/g mole	28.8 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.29 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	1.17	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1224 & 1335	
Temperature, °C	29	
Temperature, K	302	
Ambient pressure, kPa	102	
Stack pressure, kPa	102	
Velocity at sampling plane, m/s	3.3	
Volumetric flow rate, actual, m³/s	0.026	
Volumetric flow rate (wet STP), m³/s	0.024	
Volumetric flow rate (dry STP), m³/s	0.023	
Mass flow rate (wet basis), kg/h	110	

Gas Analyser Results	Average
Sampling time	1234 - 1334
	Concentration % v/v
Carbon dioxide	<0.4
Oxygen	20.9

Isokinetic Results	Results	
Sampling time	1234-1334	
	Concentration mg/m³	Mass Rate g/min
Solid Particles*	<3	<0.004
Isokinetic Sampling Parameters		
Sampling time, min	60	
Isokinetic rate, %	100	
Gravimetric analysis date (total particulate)	09-09-2025	

[1]Due to the insufficient port size (1-inch) at the PVE – Charcoal Filter exhaust stack, PM_{10} measurements could not be performed. By definition, PM_{10} (particulate matter <10 microns in aerodynamic size) forms a fraction of total particulate matter (TPM). The approved sampling method used to determine TPM in NSW is EPA TM-15, which can achieve lower concentration detection limits than the method used to determine PM_{10}, namely NSW EPA OM-5. On this occasion, due to PVE-Charcoal Filter exhaust stack porthole configuration, Ektimo utilised NSW EPA TM-15 to measure the TPM concentration and thus estimate PM10.

*** Note:** Probe wash sample compromised.

Date	3/09/2025	**Client**	Henkel Australia Pty Ltd
Report	R018996	**Stack ID**	PVE Charcoal Filter
Licence No.	258	**Location**	Seven Hills, NSW 2147
Ektimo Staff	Rick Peralta, Muhammad Usman	**State**	NSW
Process Conditions	Please refer to client records.		*250822*

Total VOCs (as n-Propane)	Results	
Sampling time	1233-1235	
	Concentration mg/m³	Mass Rate g/min
Total ( )	160	0.22

VOC (speciated) [1]	Results	
Sampling time	1233-1235	
( )	Concentration mg/m³	Mass Rate g/min
Detection limit [2]	<0.07	<0.0001
Acetone	1.6	0.0023
Ethyl acetate	15	0.021
Benzene	<0.07	<0.0001
Toluene	0.62	0.00086
Residuals as Toluene	5.3	0.0073
Vinyl acetate as Toluene*	140	0.19

(1) Compounds marked with an asterisk have been semi-quantified (refer to Definitions) and are therefore not covered by the scope of Ektimo's NATA accreditation.

(2) Unless otherwise reported, the following target compounds were found to be below detection:

Ethanol, Isopropanol, Pentane, 1,1-Dichloroethene, Acrylonitrile, Dichloromethane, trans-1,2-Dichloroethene, Methyl ethyl ketone, n-Hexane, cis-1,2-Dichloroethene, Chloroform, 1,1,1-Trichloroethane,1,2-Dichloroethane, Cyclohexane, Benzene, Carbon tetrachloride, Butanol, Isopropyl acetate, 2-Methylhexane, 2,3-Dimethylpentane, 1-Methoxy-2-propanol, 3-Methylhexane, Heptane, Trichloroethylene, Ethyl acrylate, Methyl methacrylate, Propyl acetate, Methylcyclohexane, Methyl Isobutyl Ketone, 1,1,2 Trichloroethane, 2-Hexanone, Octane, Tetrachloroethene, Butyl acetate, Chlorobenzene, Ethylbenzene, m + p-Xylene, 1-Methoxy-2-propyl acetate, Styrene, o-Xylene, Butyl acrylate, Nonane, 2-Butoxyethanol, Cellosolve acetate, 1,1,2,2-Tetrachloroethane, Isopropylbenzene, alpha-Pinene, Propylbenzene, 1,3,5-Trimethylbenzene,beta-Pinene, tert-Butylbenzene, 1,2,4-Trimethylbenzene, Decane, 3-Carene, 1,2,3-Trimethylbenzene, D-Limonene, Undecane, Dodecane, Tridecane, Tetradecane

2.5 Radco Oil Heater

Date	3/09/2025	**Client**	Henkel Australia Pty Ltd
Report	R018996	**Stack ID**	Radco Oil Heater
Licence No.	258	**Location**	Seven Hills, NSW 2147
Ektimo Staff	Rick Peralta, Muhammad Usman	**State**	NSW
Process Conditions	Operating Condition: Boiler Modulating (Temp. Settting cut-off 234°C)		250822

Stack Parameters		
Moisture content, %v/v	4.6	
Gas molecular weight, g/g mole	29.0 (wet)	29.5 (dry)
Gas density at STP, kg/m³	1.29 (wet)	1.32 (dry)
Gas density at discharge conditions, kg/m³	0.76	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	0910 & 1040	
Temperature, °C	194	
Temperature, K	467	
Ambient pressure, kPa	102	
Stack pressure, kPa	102	
Velocity at sampling plane, m/s	8.3	
Volumetric flow rate, actual, m³/s	0.41	
Volumetric flow rate (wet STP), m³/s	0.24	
Volumetric flow rate (dry STP), m³/s	0.23	
Mass flow rate (wet basis), kg/h	1100	

Gas Analyser Results	Average	
Sampling time	0936 - 1036	
	Concentration mg/m³	Mass Rate g/min
Combustion Gases		
Nitrogen oxides (as NO_2)	58	0.8
Carbon monoxide	36	0.5
	Concentration % v/v	
Carbon dioxide	5.7	
Oxygen	11.3	

Isokinetic Results	Results	
Sampling time	0936-1037 (PM10)	
	Concentration mg/m³	Mass Rate g/min
Fine particulates (PM10)*	<3	<0.04
D50 cut size, 10µm	10.2	
Isokinetic Sampling Parameters		
Sampling time, min	60	
Isokinetic rate, %	95	
Velocity difference, %[1]	<1	
Gravimetric analysis date (PM_{10})	09-09-2025	

[1] The Radco Oil Heater oscillates to maintain a set point temperature and as such the velocity of exhaust gas will vary considerably.

*** Note:** Probe wash sample compromised.

3 Sample Plane Compliance

3.1 Hot Melt Scrubber

Sampling Plane Details	
Source tested	Exhaust vent
Pollution control equipment	Filter baghouse
Sampling plane dimensions	700 mm
Sampling plane area	0.385 m²
Sampling port size, number & depth	4" BSP (x2), 45 mm
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 3.4 D
Upstream disturbance	Bend 1.6 D
No. traverses & points sampled	2 12
Sample plane conformance to AS 4323.1	Non-conforming

The sampling plane is deemed to be non-conforming due to the following reasons:
The upstream disturbance is <2D from the sampling plane

3.2 Hot Melt Belt Cooler Exhaust

Sampling Plane Details	
Source tested	Exhaust vent
Pollution control equipment	Filter baghouse
Sampling plane dimensions	600 x 830 mm
Sampling plane area	0.498 m²
Sampling port size, number & depth	4" BSP (x2), 0 mm
Duct orientation & shape	Vertical Rectangular
Downstream disturbance	Exit 0.71 D
Upstream disturbance	Bend 5 D
No. traverses & points sampled	1 6
Sample plane conformance to AS 4323.1	Non-conforming

Comments
The number of traverses sampled is less than the requirement

The sampling plane is deemed to be non-conforming due to the following reasons:
The downstream disturbance is <1D from the sampling plane
The stack or duct does not have the required number of access holes (ports)
The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D

3.3 Glue Bench – PVE Scrubber

Sampling Plane Details	
Source tested	Exhaust vent
Pollution control equipment	Wet scrubber
Sampling plane dimensions	520 mm
Sampling plane area	0.212 m²
Sampling port size, number & depth	4" BSP (x2), 320 mm
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 4.2 D
Upstream disturbance	Axial fan 5.3 D
No. traverses & points sampled	2 12
Sample plane conformance to AS 4323.1	Conforming but non-ideal

Comments

The gas temperature of the sampling plane is below the dew point

The sampling plane is deemed to be non-ideal due to the following reasons:

The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D

3.4 PVE – Charcoal Filter

Sampling Plane Details	
Source tested	Exhaust vent
Pollution control equipment	Activated carbon filtration
Sampling plane dimensions	100 mm
Sampling plane area	0.00785 m²
Sampling port size, number & depth	2" BSP (x4), 20 mm
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 11 D
Upstream disturbance	Junction 5 D
No. traverses & points sampled	1 2
Sample plane conformance to AS 4323.1	Conforming but non-ideal

The sampling plane is deemed to be non-ideal due to the following reasons:

The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D

3.5 Radco Oil Heater

Sampling Plane Details	
Source tested	Exhaust vent
Sampling plane dimensions	250 mm
Sampling plane area	0.0491 m²
Sampling port size, number & depth	4" BSP (x2), 90 mm
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 1.6 D
Upstream disturbance	Inlet 3.6 D
No. traverses & points sampled	2 8
Sample plane conformance to AS 4323.1	Conforming but non-ideal

The sampling plane is deemed to be non-ideal due to the following reasons:

The sampling plane is too near to the downstream disturbance but is greater than or equal to 1D

The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D

4 Plant Operating Conditions

The below plant operating conditions have been supplied by Henkel Australia Pty Ltd personnel. See Henkel Australia Pty Ltd records for complete process conditions.

Location	Test Date	Operating Conditions
Hot Melt Belt Cooler Exhaust	02 September 2025	Load: 300 Bags/Batch/5 hours (S130A)
Radco Oil Heater	03 September 2025	Boiler modulating (Temperature setting cut-off 234°C)

5 Test Methods

All sampling and analysis were performed by Ektimo unless otherwise specified. Specific details of the methods are available upon request.

Parameter	Sampling method	Analysis method	Uncertainty*	NATA accredited Sampling	NATA accredited Analysis
Sampling points - Selection	NSW EPA TM-1 (AS 4323.1)	NA	NA	✓	NA
Flow rate, temperature & velocity	NSW EPA TM-2 (USEPA Method 2)	NSW EPA TM-2 (USEPA Method 2)	8%, 2%, 7%	NA	✓
Moisture (stacks <60°C)	Ektimo 050	Ektimo 050	not specified	✓	✓[j]
Moisture content	NSW EPA TM-22 (USEPA Method 4)	NSW EPA TM-22 (USEPA Method 4)	8%	✓	✓
Molecular weight	NA	NSW EPA TM-23 (USEPA Method 3)	not specified	NA	✓
Dry gas density	NA	NSW EPA TM-23 (USEPA Method 3)	not specified	NA	✓
Carbon dioxide	NSW EPA TM-24 (USEPA Method 3A)	NSW EPA TM-24 (USEPA Method 3A)	13%	✓	✓
Carbon monoxide	NSW EPA TM-32 (USEPA Method 10)	NSW EPA TM-32 (USEPA Method 10)	12%	✓	✓
Nitrogen oxides	NSW EPA TM-11 (USEPA Method 7E)	NSW EPA TM-11 (USEPA Method 7E)	12%	✓	✓
Oxygen	NSW EPA TM-25 (USEPA Method 3A)	NSW EPA TM-25 (USEPA Method 3A)	13%	✓	✓
Speciated volatile organic compounds (VOCs)	NSW EPA TM-34[d] (USEPA Method 18)	Ektimo 344	19%	✓	✓[†]
Particulate matter (PM_{10} & $PM_{2.5}$)	NSW EPA OM-5 (USEPA Method 201A)	NSW EPA OM-5 (USEPA Method 201A)	6%	✓	✓[††]
Solid particles (total)	NSW EPA TM-15 (AS 4323.2)	NSW EPA TM-15 (AS 4323.2)	3%	✓	✓[††]

020925

* Uncertainties cited in this table are estimated using typical values and are calculated at the 95% confidence level (coverage factor = 2).

† Analysis performed by Ektimo. Results were reported to Ektimo on:

- 19 September 2025 in report LV-007829.

†† Gravimetric analysis conducted at the Ektimo NSW laboratory.

d Excludes recovery study as specified in section 8.4.3 of USEPA Test Method 18.

j Includes analysis of moisture content by Ektimo 050 which uses the same principle as ASTM E337.

6 Deviations to Test Methods

NSW EPA TM-34 (USEPA 18)

Ektimo notes that the sampling and analysis of Volatile Organic Compounds (VOCs), per USEPA Method 18 has excluded the recovery study as specified in Section 8.4.3. Performing the recovery study described in Section 8.4.3 of USEPA Method 18 for analytes present at low levels is problematic. Given this, Ektimo applies a threshold of 50µg as a lower-bound mass, below which the 'spiking' of specific volatile organic compounds is not performed. For the purposes of this round of monitoring, the following compounds were present above the detection limit (0.1 µg) but were below 50 µg (unless **bolded**). Therefore, recovery studies for the following analytes were not performed:

Hot Melt Scrubber

Acetone	(3.4 µg)
Toluene	(7.5 µg)
Decane	(1.7 µg)
Dodecane	(1.1 µg)

Hot Melt Belt Cooler Exhaust

Acetone	(1.6 µg)
Toluene	(46 µg)

PVE – Charcoal Filter

Acetone	(24 µg)
Ethyl acetate	**(220 µg)**
Toluene	(9 µg)

Glue Bench Scrubber

Acetone	(1.5 µg)
Ethyl acetate	(13 µg)
Toluene	**(150 µg)**

Regarding the above compounds, Ektimo refers to guidance within USEPA Method 18 (8.2.4) in relation to choosing appropriate adsorbent tube media for each detected compound above 50 µg.

NIOSH 1300-Ketones I

Acetone is specifically referred as a compound to be sampled under this method, and the recommended adsorbent media for sampling is 'Solid Sorbent Tube, coconut shell charcoal'; Ektimo used the recommended sampling media (SKC brand 226-01). Since the adsorbent media is deemed appropriate by NIOSH 1300, Ektimo opted not to perform the recovery study for this compound.

NIOSH 1501 – Hydrocarbons, Aromatic

Toluene is specifically referred as a compound to be sampled under this method, and the recommended adsorbent media for sampling is 'Solid Sorbent Tube, coconut shell charcoal'; Ektimo used the recommended sampling media (SKC brand 226-01). Since the adsorbent media is deemed appropriate by NIOSH 1501, Ektimo opted not to perform the recovery study for this compound.

NIOSH 1457-Ethyl Acetate

Ethyl Acetate is specifically referred as compounds to be sampled under this method, and the recommended adsorbent media for sampling is 'Solid Sorbent Tube, coconut shell charcoal'; Ektimo used the recommended sampling media (SKC brand 226-01). Since the adsorbent media is deemed appropriate by NIOSH 1457, Ektimo opted not to perform the recovery study for this compound.

NIOSH 1500 – Hydrocarbons, BP 36° - 216°C (Nonane, Decane, Dodecane)

Nonane, Decane and Dodecane are specifically referred as compounds to be sampled under this method. The recommended adsorbent media for sampling is 'Solid Sorbent Tube, coconut shell charcoal'. Ektimo used this recommended sampling media (SKC brand 226-01). Since the adsorbent media is deemed appropriate by NIOSH 1500, Ektimo opted not to perform the recovery study for this compound.

7 Quality Assurance/Quality Control Information

Ektimo is accredited by the National Association of Testing Authorities (NATA) for the sampling and analysis of air pollutants from industrial sources. Unless otherwise stated test methods used are accredited with the National Association of Testing Authorities. For full details, search for Ektimo at NATA's website www.nata.com.au.

Ektimo is accredited by NATA to ISO/IEC 17025 - Testing. ISO/IEC 17025 - Testing requires that a laboratory have adequate equipment to perform the testing, as well as laboratory personnel with the competence to perform the testing. This quality assurance system is administered and maintained by the Quality Director.

NATA is a member of APAC (Asia Pacific Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through mutual recognition arrangements with these organisations, NATA accreditation is recognised worldwide.

Unless specifically noted, all samples were collected and handled in accordance with Ektimo's QA/QC standards.

8 Definitions

The following symbols and abbreviations may be used in this test report:

% v/v	Volume to volume ratio, dry basis (except moisture)
~	Approximately
<	Less than
>	Greater than
≥	Greater than or equal to
AS	Australian Standard
BaP-TEQ	Benzo(a)pyrene toxic equivalents
BSP	British standard pipe
CEM/CEMS	Continuous emission monitoring/Continuous emission monitoring system
CTM	Conditional test method
D	Duct diameter or equivalent duct diameter for rectangular ducts
D_{50}	'Cut size' of a cyclone is defined as the particle diameter at which the cyclone achieves a 50% collection efficiency i.e. half of the particles are retained by the cyclone and half pass through it. The D_{50} method simplifies the capture efficiency distribution by assuming that a given cyclone stage captures all of the particles with a diameter equal to or greater than the D_{50} of that cyclone and less than the D_{50} of the preceding cyclone.
DECC	Department of Environment & Climate Change (NSW)
Disturbance	A flow obstruction or instability in the direction of the flow which may impede accurate flow determination. This includes centrifugal fans, axial fans, partially closed or closed dampers, louvres, bends, connections, junctions, direction changes or changes in pipe diameter.
DWER	Department of Water and Environmental Regulation (WA)
DEHP	Department of Environment and Heritage Protection (QLD)
EPA	Environment Protection Authority
FTIR	Fourier transform infra-red
ISC	Intersociety Committee, Methods of Air Sampling and Analysis
ISO	International Organisation for Standardisation
ITE	Individual threshold estimate
I-TEQ	International toxic equivalents
Lower bound	When an analyte is not present above the detection limit, the result is assumed to be equal to zero.
Medium bound	When an analyte is not present above the detection limit, the result is assumed to be equal to half of the detection limit.
NA	Not applicable
NATA	National Association of Testing Authorities
NIOSH	National Institute of Occupational Safety and Health
NT	Not tested or results not required
OM	Other approved method
OU	Odour unit. One OU is that concentration of odorant(s) at standard conditions that elicits a physiological response from a panel equivalent to that elicited by one Reference Odour Mass (ROM), evaporated in one cubic metre of neutral gas at standard conditions.
PM_{10}	Particulate matter having an equivalent aerodynamic diameter less than or equal to 10 microns (µm).
$PM_{2.5}$	Particulate matter having an equivalent aerodynamic diameter less than or equal to 2.5 microns (µm).
PSA	Particle size analysis. PSA provides a distribution of geometric diameters, for a given sample, determined using laser diffraction.
RATA	Relative accuracy test audit
Semi-quantified VOCs	Unknown VOCs (those for which an analytical standard is not available), are identified by matching the mass spectrum of the chromatographic peak to the NIST Standard Reference Database (version 14.0), with a match quality exceeding 70%. An estimated concentration is determined by matching the area of the peak with the nearest suitable compound in the analytical calibration standard mixture.
STP	Standard temperature and pressure. Gas volumes and concentrations are expressed on a dry basis at 0 °C, at discharge oxygen concentration and an absolute pressure of 101.325 kPa.
TM	Test method
TOC	Total organic carbon. This is the sum of all compounds of carbon which contain at least one carbon-to-carbon bond, plus methane and its derivatives.
USEPA	United States Environmental Protection Agency
VDI	Verein Deutscher Ingenieure (Association of German Engineers)
Velocity difference	The percentage difference between the average of initial flows and after flows.
Vic EPA	Victorian Environment Protection Authority
VOC	Volatile organic compound. A carbon-based chemical compound with a vapour pressure of at least 0.010 kPa at 25°C or having a corresponding volatility under the given conditions of use. VOCs may contain oxygen, nitrogen and other elements. VOCs do not include carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonate salts.
WHO05-TEQ	World Health Organisation toxic equivalents
XRD	X-ray diffractometry
Upper bound	When an analyte is not present above the detection limit, the result is assumed to be equal to the detection limit.
95% confidence interval	Range of values that contains the true result with 95% certainty. This means there is a 5% risk that the true result is outside this range

9 Appendices

Appendix A: Site Image

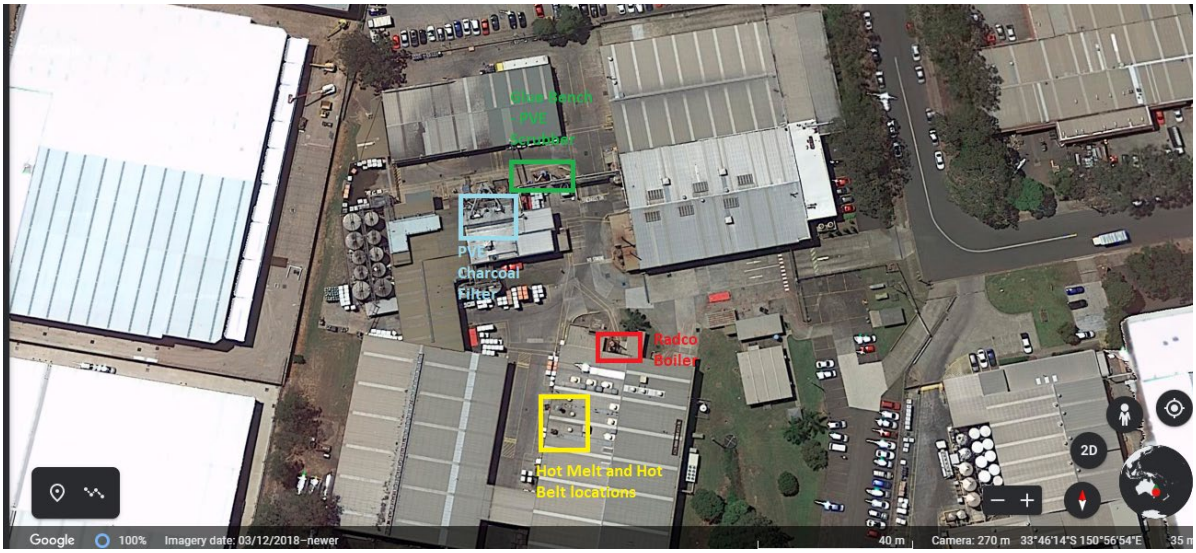
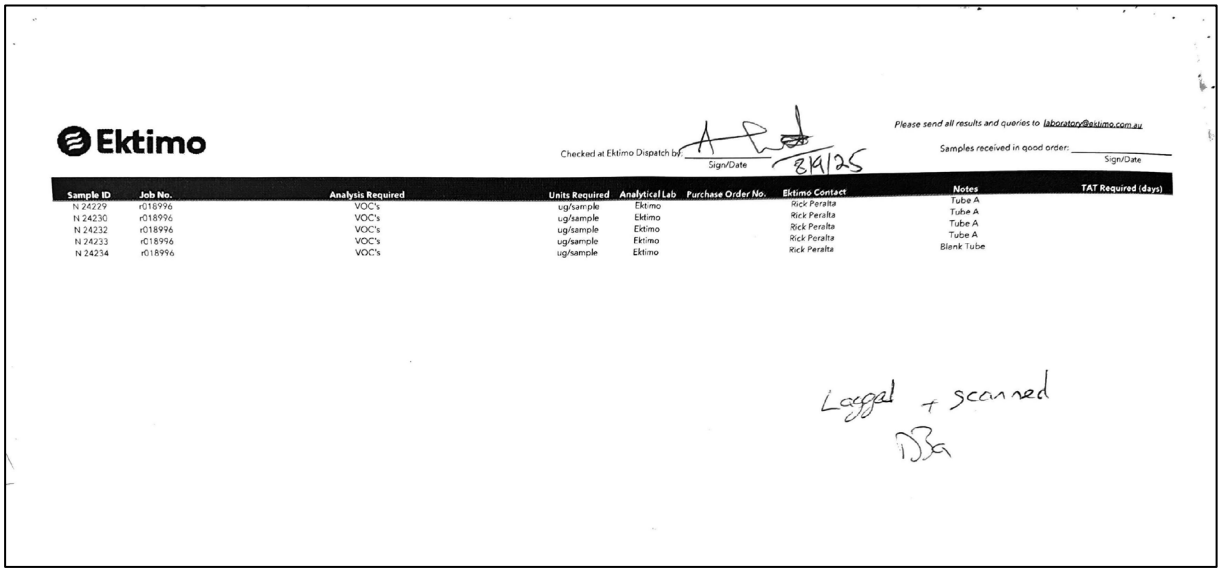


Image 1. Site Map

Appendix B: Chain of Custody



Ektimo

Checked at Ektimo Dispatch by: _____ Sign/Date 8/9/25

Please send all results and queries to laboratory@ektimo.com.au

Samples received in good order: _____ Sign/Date

Sample ID	Job No.	Analysis Required	Units Required	Analytical Lab	Purchase Order No.	Ektimo Contact	Notes	TAT Required (days)
N 24229	r018996	VOC's	ug/sample	Ektimo		Rick Peralta	Tube A	
N 24230	r018996	VOC's	ug/sample	Ektimo		Rick Peralta	Tube A	
N 24232	r018996	VOC's	ug/sample	Ektimo		Rick Peralta	Tube A	
N 24233	r018996	VOC's	ug/sample	Ektimo		Rick Peralta	Tube A	
N 24234	r018996	VOC's	ug/sample	Ektimo		Rick Peralta	Blank Tube	

Legal + scanned
DJG

Appendix C: Laboratory Results

1300 364 005
+61 2 4003 3296
info@ektimo.com.au
ektimo.com.au
ABN 86 600 381 413

CERTIFICATE OF ANALYSIS

Testing Laboratory:	Ektimo 26 Redland Drive Mitcham, VIC 3132
Report Number:	LV-007829
Job Number:	R018996
Date of Issue:	19/09/2025
Attention:	Henkel Australia Pty Ltd
Address:	7 Stanton Rd Seven Hills NSW 2147
Date samples received:	12/9/2025
Number of samples received:	5
Date samples analysed:	16/09/2025
No of samples analysed:	5
Test method(s) used:	Ektimo 344

Comments

QC Acceptance Criteria:

Parameter	Criteria	Pass/Fail
Standard Curve	$R^2 > 0.99$	Pass
Range	All samples <110% of highest standard	Pass
Repeat samples	Between 80% - 120%	Pass
Method Blanks	All method blanks < PQL	Pass
QC sample	2 standard deviations of theoretical	Pass
Chemical Expiry	All chemicals within expiry date	Pass

This report supersedes any previous report(s) with this reference. Sample(s) have been analysed as received.

Ektimo is accredited by the National Association of Testing Authorities (NATA) for the sampling and analysis of air pollutants from industrial sources. Unless otherwise stated test methods used are accredited with the National Association of Testing Authorities. For full details, search for Ektimo at NATA's website www.nata.com.au.
Ektimo is accredited by NATA (National Association of Testing Authorities) to ISO/IEC 17025 - Testing. ISO/IEC 17025 - Testing requires that a laboratory have adequate equipment to perform the testing, as well as laboratory personnel with the competence to perform the testing. This quality assurance system is administered and maintained by the Quality Director.
NATA is a member of APAC (Asia Pacific Laboratory Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through the mutual recognition arrangements with both of these organisations, NATA accreditation is recognised world -wide.
A formal Quality Control program is in place at Ektimo to monitor analyses performed in the laboratory and sampling conducted in the field. The program is designed to check where appropriate; the sampling reproducibility, analytical method, accuracy, precision and the performance of the analyst. The Laboratory Manager is responsible for the administration and maintenance of this program.

REPORT AUTHORISATION

Version: 040825

Matthew Cook
Laboratory Manager

Daniel Balaam
Senior Laboratory Chemist

NATA Accredited Laboratory 14601

Accredited for compliance with ISO/IEC 17025. NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.

Ektimo

Ektimo Analytical Results

Report No. LV-007829
Job No. R018996
Client Name: Henkel

Parameter	Units	N24229 R018996	N24230 R018996	N24232 R018996	N24233 R018996
	PQL	1	1	1	1
Ethanol	µg	<1	<1	<1	<1
Acetone	µg	1.6	3.4	1.5	24
Isopropanol	µg	<1	<1	<1	<1
Pentane	µg	<1	<1	<1	<1
1,1-Dichloroethene	µg	<1	<1	<1	<1
Acrylonitrile	µg	<1	<1	<1	<1
Dichloromethane	µg	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg	<1	<1	<1	<1
Methyl ethyl ketone	µg	<1	<1	<1	<1
n-Hexane	µg	<1	<1	<1	<1
cis-1,2-Dichloroethene	µg	<1	<1	<1	<1
Ethyl acetate	µg	<1	<1	13	220
Chloroform	µg	<1	<1	<1	<1
1,1,1-Trichloroethane	µg	<1	<1	<1	<1
1,2-Dichloroethane	µg	<1	<1	<1	<1
Cyclohexane	µg	<1	<1	<1	<1
Benzene	µg	<1	<1	<1	<1
Carbon tetrachloride	µg	<1	<1	<1	<1
Butanol	µg	<1	<1	<1	<1
Isopropyl acetate	µg	<1	<1	<1	<1
2-Methylhexane	µg	<1	<1	<1	<1
2,3-Dimethylpentane	µg	<1	<1	<1	<1
1-Methoxy-2-propanol	µg	<1	<1	<1	<1
3-Methylhexane	µg	<1	<1	<1	<1
Heptane	µg	<1	<1	<1	<1
Trichloroethylene	µg	<1	<1	<1	<1
Ethyl acrylate	µg	<1	<1	<1	<1
Methyl methacrylate	µg	<1	<1	<1	<1
Propyl acetate	µg	<1	<1	<1	<1
Methylcyclohexane	µg	<1	<1	<1	<1
Methyl Isobutyl Ketone	µg	<1	<1	<1	<1
Toluene	µg	46	7.5	150	9
1,1,2-Trichloroethane	µg	<1	<1	<1	<1
2-Hexanone	µg	<1	<1	<1	<1
Octane	µg	<1	<1	<1	<1
Tetrachloroethene	µg	<1	<1	<1	<1
Butyl acetate	µg	<1	<1	<1	<1
Chlorobenzene	µg	<1	<1	<1	<1
Ethylbenzene	µg	<1	<1	<1	<1
m + p-Xylene	µg	<1	<1	<1	<1
1-Methoxy-2-propyl acetate	µg	<1	<1	<1	<1
Styrene	µg	<1	<1	<1	<1
o-Xylene	µg	<1	<1	<1	<1
Butyl acrylate	µg	<1	<1	<1	<1
Nonane	µg	<1	<1	<1	<1

* Results marked with an asterisk are outside the acceptable calibration range of the instrument.

ilac-MRA NATA

NATA Accredited Laboratory 14601

Ektimo

Ektimo

Analytical Results

Report No. LV-007829
Job No. R018996
Client Name: Henkel

Parameter	Units	N24229 R018996	N24230 R018996	N24232 R018996	N24233 R018996
	PQL	1	1	1	1
2-Butoxyethanol	µg	<1	<1	<1	<1
Cellosolve acetate	µg	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	µg	<1	<1	<1	<1
Isopropylbenzene	µg	<1	<1	<1	<1
alpha-Pinene	µg	<1	<1	<1	<1
Propylbenzene	µg	<1	<1	<1	<1
1,3,5-Trimethylbenzene	µg	<1	<1	<1	<1
beta-Pinene	µg	<1	<1	<1	<1
tert-Butylbenzene	µg	<1	<1	<1	<1
1,2,4-Trimethylbenzene	µg	<1	<1	<1	<1
Decane	µg	<1	1.7	<1	<1
3-Carene	µg	<1	<1	<1	<1
1,2,3-Trimethylbenzene	µg	<1	<1	<1	<1
D-Limonene	µg	<1	<1	<1	<1
Undecane	µg	<1	<1	<1	<1
Dodecane	µg	<1	1.1	<1	<1
Tridecane	µg	<1	<1	<1	<1
Tetradecane	µg	<1	<1	<1	<1
Residuals as Toluene	µg	5.8	550	39	77
Vinyl acetate as Toluene	µg	<1	<1	7	2000

* Results marked with an asterisk are outside the acceptable calibration range of the instrument.

NATA Accredited Laboratory 14601

Ektimo

Analytical Results

Report No. LV-007829
Job No. R018996
Client Name: Henkel

Parameter	Units	N24234 R018996
	PQL	1
Ethanol	µg	<1
Acetone	µg	<1
Isopropanol	µg	<1
Pentane	µg	<1
1,1-Dichloroethene	µg	<1
Acrylonitrile	µg	<1
Dichloromethane	µg	<1
trans-1,2-Dichloroethene	µg	<1
Methyl ethyl ketone	µg	<1
n-Hexane	µg	<1
cis-1,2-Dichloroethene	µg	<1
Ethyl acetate	µg	<1
Chloroform	µg	<1
1,1,1-Trichloroethane	µg	<1
1,2-Dichloroethane	µg	<1
Cyclohexane	µg	<1
Benzene	µg	<1
Carbon tetrachloride	µg	<1
Butanol	µg	<1
Isopropyl acetate	µg	<1
2-Methylhexane	µg	<1
2,3-Dimethylpentane	µg	<1
1-Methoxy-2-propanol	µg	<1
3-Methylhexane	µg	<1
Heptane	µg	<1
Trichloroethylene	µg	<1
Ethyl acrylate	µg	<1
Methyl methacrylate	µg	<1
Propyl acetate	µg	<1
Methylcyclohexane	µg	<1
Methyl Isobutyl Ketone	µg	<1
Toluene	µg	<1
1,1,2-Trichloroethane	µg	<1
2-Hexanone	µg	<1
Octane	µg	<1
Tetrachloroethene	µg	<1
Butyl acetate	µg	<1
Chlorobenzene	µg	<1
Ethylbenzene	µg	<1
m + p-Xylene	µg	<1
1-Methoxy-2-propyl acetate	µg	<1
Styrene	µg	<1
o-Xylene	µg	<1
Butyl acrylate	µg	<1
Nonane	µg	<1

* Results marked with an asterisk are outside the acceptable calibration range of the instrument.

NATA Accredited Laboratory 14601

Ektimo

Ektimo Analytical Results

Report No. LV-007829
Job No. R018996
Client Name: Henkel

Parameter	Units	N24234 R018996
	PQL	1
2-Butoxyethanol	µg	<1
Cellosolve acetate	µg	<1
1,1,2,2-Tetrachloroethane	µg	<1
Isopropylbenzene	µg	<1
alpha-Pinene	µg	<1
Propylbenzene	µg	<1
1,3,5-Trimethylbenzene	µg	<1
beta-Pinene	µg	<1
tert-Butylbenzene	µg	<1
1,2,4-Trimethylbenzene	µg	<1
Decane	µg	<1
3-Carene	µg	<1
1,2,3-Trimethylbenzene	µg	<1
D-Limonene	µg	<1
Undecane	µg	<1
Dodecane	µg	<1
Tridecane	µg	<1
Tetradecane	µg	<1
Residuals as Toluene	µg	<1
Vinyl acetate as Toluene	µg	<1

* Results marked with an asterisk are outside the acceptable calibration range of the instrument.

NATA Accredited Laboratory 14601

Results page 5 of 5

Ektimo

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