Ektimo

Experts in air quality, odour and emission monitoring.

Emission Testing Report

December 2024

Report: R018062

Opal Packaging Australia Pty Ltd, Matraville

ilac-MRA NATA

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

Document Information

Client Name:	Opal Packaging Australia Pty Ltd
Report Number:	R018062
Date of Issue:	14 January 2025
Attention:	Karen Jones
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Testing Laboratory:	Ektimo Pty Ltd, ABN 86 600 381 413

Report Authorisation

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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 Opal Packaging Australia Pty Ltd to perform emission testing at their Matraville plant. Testing was carried out in accordance with Environmental Licence 1594.

1.2 Project Objective & Overview

The objective of the project was to quantify emissions from one (1) discharge point to determine compliance with Opal's Environmental Licence.

Monitoring was performed as follows:

Location	Test Date	Test Parameters*
EPA ID 1 – Gas Engine Exhaust	16 December 2024	Nitrogen oxides (as NO_2) Carbon dioxide (CO_2), oxygen (O_2)

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

All results are reported on a dry basis at STP.

Plant operating conditions have been noted in this report.

1.3 Licence Comparison

The following licence comparison table shows that the analyte is within the licence limit set by the NSW EPA as per licence 1594 (last amended on 20 August 2024).

Location Description	Pollutant	Units	100 Percentile Concentration Limit	Detected Values	Detected values (corrected to 5% O_2)
Gas Engine Exhaust	Nitrogen oxides (as NO_2)	mg/m^3 at STP dry	350	**230**	**290**

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

2 Results

2.1 Gas Engine Exhaust

Date	16/12/2024	**Client**	Opal
Report	R018062	**Stack ID**	EPA ID 1 - Gas Engine Exhaust
Licence No.	1594	**Location**	Matraville
Ektimo Staff	Mohamed Trabelsi & Sahad Musthafa	**State**	NSW
Process Conditions	Please refer to client records.		*241206*

Stack Parameters		
Moisture content, %v/v	12	
Gas molecular weight, g/g mole	28.6 (wet)	30.1 (dry)
Gas density at STP, kg/m³	1.28 (wet)	1.34 (dry)
Gas density at discharge conditions, kg/m³	0.50	
% Oxygen correction & Factor	5 %	1.30
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1048	
Temperature, °C	426	
Temperature, K	699	
Ambient pressure, kPa	102	
Stack pressure, kPa	101	
Velocity at sampling plane, m/s	23	
Volumetric flow rate, actual, m³/s	2.9	
Volumetric flow rate (wet STP), m³/s	1.1	
Volumetric flow rate (dry STP), m³/s	0.99	
Mass flow rate (wet basis), kg/h	5200	

Gas Analyser Results	Average		
Sampling time	1051 - 1151		
	Concentration mg/m³	Corrected to 5% O2 mg/m³	Mass Rate g/min
Combustion Gases			
Nitrogen oxides (as NO_2)	230	290	13
		Concentration % v/v	
Carbon dioxide		10.1	
Oxygen		8.7	

3 Sample Plane Compliance

3.1 Gas Engine Exhaust

Sampling Plane Details	
Sampling plane dimensions	400 mm
Sampling plane area	0.126 m²
Sampling port size, number & depth	4" Flange (x2), 310 mm
Access & height of ports	Elevated work platform 7 m
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 2 D
Upstream disturbance	Junction 10 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

4 Plant Operating Conditions

See Opal Packaging Australia Pty Ltd records for complete process conditions.

Based on information received from Opal Packaging Australia Pty Ltd personnel, it is our understanding that samples were collected during typical plant operations.

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 content	NSW EPA TM-22 (USEPA Alt-Method 008)	NSW EPA TM-22 (USEPA Alt-Method 008)	19%	✓	✓
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%	✓	✓
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%	✓	✓

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

6 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.

7 Definitions

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

% v/v	Volume to volume ratio, dry basis
~	Approximately
<	Less than
>	Greater than
≥	Greater than or equal to
AS	Australian Standard
BSP	British standard pipe
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.
EPA	Environment Protection Authority
ISC	Intersociety Committee, Methods of Air Sampling and Analysis
ISO	International Organisation for Standardisation
ITE	Individual threshold estimate
NA	Not applicable
NATA	National Association of Testing Authorities
NT	Not tested or results not required
OM	Other approved method
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
USEPA	United States Environmental Protection Agency
Velocity difference	The percentage difference between the average of initial flows and after flows.
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

8 Appendix: Site Image

Image 1. Gas Engine Exhaust

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