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Report Number R001920r

Emission Testing Report
Clingcast Metals, Kirrawee Plant

Document Information

Client Name: Clingcast Metals
Report Number: R001920r
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Attention: Chris Harden
Address: 98 Bath Rd
KIRRAWEE NSW 2232
Testing Laboratory: Ektimo (EML) ABN 98 006 878 342

Report Status

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Amendment Record

Document Number	Initiator	Report Date	Section	Reason
Nil	-	-	2	Standards Comparison Table added

Report Authorisation



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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

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1 EXECUTIVE SUMMARY

Ektimo was engaged by Cling cast Metals to determine emissions to air as detailed below;

Location	Test Date	Test Parameters*
Baghouse Stack	3 November 2015	Total solid particles, type 1 & 2 substances (metals or metal compounds), nitrogen oxides, carbon dioxide, oxygen, carbon monoxide, volatile organic compounds (VOC's)

* Flow rate, velocity, temperature and moisture were determined unless otherwise stated

The methodologies chosen by Ektimo are those recommended by the NSW Office of Environment and Heritage (as specified in the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales, January 2007*).

All results are reported on a dry basis at STP. Unless otherwise indicated, the methods cited in this report have been performed without deviation.

2 STANDARDS COMPARISON TABLE

EPA No.	Location Description	Pollutant	Units	POEO Reg Group C Limits ¹	POEO Reg Group 6 Limits ²	Detected Values 3/11/15
-	Baghouse Stack	Total solid particles	mg/m ³	100	50	<0.73
		Type 1 & 2 substances in aggregate	mg/m ³	-	1	0.0082
		Nitrogen oxides	mg/m ³	-	350	<4.1
		Volatile organic compounds	mg/m ³	-	40	0.39

1. The standards below are derived from the Protection of the Environment Operations (Clean Air) Regulation NSW 2010 Schedule 6 "Standards of concentration for non-scheduled premises". It is considered that these standards apply to the Clingcast Baghouse Stack.
2. The standards below are derived from the Protection of the Environment Operations (Clean Air) Regulation NSW 2010 Schedule 4 "Standards of concentration for scheduled premises: general activities and plant", Group 6. These represent the most stringent standards that are routinely applied in NSW for new plant. It is considered that these standards do not apply to the Clingcast Baghouse and have been displayed in this table for comparison purposes only.

3 RESULTS

3.1 Baghouse Stack

Date	3/11/2015	Client	Cling Cast Metals
Report	R001920	Stack ID	Baghouse Stack
Licence No.	-	Location	Kirrawee
Ektime Staff	Swe, Ada	State	NSW
Process Conditions	Please refer to client records.		
Reason for testing:	Client requested testing to determine emissions to air		

Sampling Plane Details

Sampling plane dimensions	1355 mm
Sampling plane area	1.44 m ²
Sampling port size, number & depth	2" Flange (x4)
Access & height of ports	Fixed ladder 12 m
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 1.5 D
Upstream disturbance	Centrifugal fan 8 D
No. traverses & points sampled	2 16
Compliance to AS4323.1	Compliant but non-ideal

Comments

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

Stack Parameters

Moisture content, %v/v	2.2	
Gas molecular weight, g/g mole	28.8 (wet)	29.0 (dry)
Gas density at STP, kg/m ³	1.28 (wet)	1.29 (dry)

Gas Flow Parameters

Temperature, °C	21
Velocity at sampling plane, m/s	9.1
Volumetric flow rate, discharge, m ³ /s	13
Volumetric flow rate (wet STP), m ³ /s	12
Volumetric flow rate (dry STP), m ³ /s	12
Mass flow rate (wet basis), kg/hour	56000
Sampling time, min	80
Isokinetic rate, %	105
Velocity difference, %	-1

Isokinetic	Sampling time	Results	
		825-945	
		Concentration mg/m ³	Mass Rate g/min
Total solid particles		<0.73	<0.52
Antimony		<0.0037	<0.0026
Arsenic		<0.0015	<0.001
Cadmium		0.00069	0.00049
Lead		0.0067	0.0047
Mercury		<0.00022	<0.00016
Beryllium		<0.00073	<0.00052
Chromium		0.00022	0.00016
Cobalt		<0.00037	<0.00026
Manganese		0.00066	0.00047
Nickel		<0.00073	<0.00052
Selenium		<0.0037	<0.0026
Tin		<0.0015	<0.001
Vanadium		<0.00073	<0.00052
Type 1 substances		0.0074	0.0052
Type 2 substances		0.00088	0.00062
Type 1 & 2 substances		0.0082	0.0058

Date	3/11/2015	Client	Cling Cast Metals
Report	R001920	Stack ID	Baghouse Stack
Licence No.	-	Location	Kirrawee
Ektimo Staff	Swe, Ada	State	NSW
Process Conditions	Please refer to client records.		
Reason for testing:	Client requested testing to determine emissions to air		

Gases	Sampling time	Average 835-934		Minimum 835-934		Maximum 835-934	
		Concentration mg/m ³	Mass Rate g/min	Concentration mg/m ³	Mass Rate g/min	Concentration mg/m ³	Mass Rate g/min
Nitrogen oxides (as NO ₂)		<4.1	<2.9	<4.1	<2.9	<4.1	<2.9
Carbon monoxide		3.7	2.6	<2.5	<1.8	42	30
		Concentration %		Concentration %		Concentration %	
Carbon dioxide		<0.3		<0.3		<0.3	
Oxygen		20.9		20.9		20.9	

Total VOCs* (as n-Propane)	Sampling time	Results 845-945	
		Concentration mg/m ³	Mass Rate g/min
Total		0.39	0.28

*Total VOCs does not include methane

VOC's (speciated)	Sampling time	Results 845-945	
		Concentration mg/m ³	Mass Rate g/min
Detection limit ⁽¹⁾		<0.054	<0.038
Ethanol		0.29	0.2
Toluene		0.25	0.18

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

Ethanol, Isopropanol, Isobutanol, Butanol, 1-Methoxy-2-propanol, Cyclohexanol, 2-Butoxyethanol, Pentane, Hexane, Heptane, Octane, Nonane, Decane, Undecane, Dodecane, Tridecane, Tetradecane, Cyclohexane, 2-Methylhexane, 2,3-Dimethylpentane, 3-Methylhexane, Isooctane, Methylcyclohexane, alpha-Pinene, beta-Pinene, d-Limonene, 3-Carene, Acetone, Methyl ethyl ketone, Ethyl acetate, Isopropyl acetate, Propyl acetate, MIBK, 2-Hexanone, Butyl acetate, 1-Methoxy-2-propyl acetate, Cyclohexanone, Cellosolve acetate, 2-Butoxyethyl acetate, Ethyldiglycol acetate, Diacetone alcohol, Isophorone, Benzene, Toluene, Ethylbenzene, m-p-Xylene, Styrene, o-Xylene, Isopropylbenzene, Propylbenzene, 1,3,5-Trimethylbenzene, alpha-Methylstyrene, tert-Butylbenzene, 1,2,4-Trimethylbenzene, 1,2,3-Trimethylbenzene, m-Diethylbenzene, o-Diethylbenzene, p-Diethylbenzene, Dichloromethane, Chloroform, 1,1,1-Trichloroethane, 1,2-Dichloroethane, Carbon tetrachloride, 1,1-Dichloroethene, cis-1,2-Dichloroethene, trans-1,2-Dichloroethene, Trichloroethene, Tetrachloroethene, 1,1,2-Trichloroethane, 1,1,2,2-Tetrachloroethane, Chlorobenzene, Fluorobenzene

4 PLANT OPERATING CONDITIONS

Unless otherwise stated, the plant operating conditions were normal at the time of testing. See Clingcast Metals's records for complete process conditions.

5 TEST METHODS

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

Parameter	Test Method	Method Detection Limit	Uncertainty*	NATA Accredited	
				Sampling	Analysis
Molecular weight	NSW TM-23	-	not specified	✓	✓
Sample plane criteria	NSW TM-1	NA	-	✓	NA
Velocity	NSW TM-2	2ms ⁻¹	7%	✓	NA
Moisture content	NSW TM-22	0.4%	8%	✓	✓
Temperature	NSW TM-2	0°C	2%	✓	NA
Flow rate	NSW TM-2	Location	8%	✓	NA
Nitrogen oxides (NO _x)	NSW TM-11	4mg/m ³	12%	✓	✓
Type 1 substances (Sb, As, Cd, Pb, Hg)	NSW TM-12	Analyte	15%	✓	✓ ¹
Type 2 substances (Be, Cr, Co, Mn, Ni, Se, Sn, V)	NSW TM-13	Analyte specific	15%	✓	✓ ¹
Total solid particles	NSW TM-15	0.001g/m ³	5%	✓	✓
Carbon dioxide	NSW TM-24	0.1%	13%	✓	✓
Oxygen	NSW TM-25	0.1%	13%	✓	✓
Carbon monoxide	NSW TM-32	0.0025g/m ³	12%	✓	✓
Speciated volatile organic compounds (VOC's)	NSW TM-34	0.33mg/m ³	19%	✓	✓

* Uncertainty values cited in this table are calculated at the 95% confidence level (coverage factor = 2)

1. Analysis was performed by Envirolab, NATA accreditation number 2901. Results were reported to Ektimo on 13 November 2015 in report number 137008.

6 QUALITY ASSURANCE/ QUALITY CONTROL INFORMATION

Ektimo (EML), Ektimo (ETC) and Ektimo (ECS) are 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 (EML), Ektimo (ETC) and Ektimo (ECS) are accredited by NATA (National Association of Testing Authorities) to ISO/IEC 17025. – General Requirements for the Competence of Testing and Calibration Laboratories. ISO/IEC 17025 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 Compliance Manager.

NATA is a member of APLAC (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.

7 DEFINITIONS

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

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, unless otherwise specified.
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.
VOC	Any chemical compound based on carbon with a vapour pressure of at least 0.010 kPa at 25°C or having a corresponding volatility under the particular conditions of use. These compounds may contain oxygen, nitrogen and other elements, but specifically excluded are carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonate salts.
TOC	The sum of all compounds of carbon which contain at least one carbon to carbon bond, plus methane and its derivatives.
OU	The number of odour units per unit of volume. The numerical value of the odour concentration is equal to the number of dilutions to arrive at the odour threshold (50% panel response).
PM _{2.5}	Atmospheric suspended particulate matter having an equivalent aerodynamic diameter of less than approximately 2.5 microns (µm).
PM ₁₀	Atmospheric suspended particulate matter having an equivalent aerodynamic diameter of less than approximately 10 microns (µm).
BSP	British standard pipe
NT	Not tested or results not required
NA	Not applicable
D ₅₀	'Cut size' of a cyclone defined as the particle diameter at which the cyclone achieves a 50% collection efficiency ie. half of the particles are retained by the cyclone and half are not and pass through it to the next stage. 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.
D	Duct diameter or equivalent duct diameter for rectangular ducts
<	Less than
>	Greater than
≥	Greater than or equal to
~	Approximately
CEM	Continuous Emission Monitoring
CEMS	Continuous Emission Monitoring System
DER	WA Department of Environment & Regulation
DECC	Department of Environment & Climate Change (NSW)
EPA	Environment Protection Authority
FTIR	Fourier Transform Infra Red
NATA	National Association of Testing Authorities
RATA	Relative Accuracy Test Audit
AS	Australian Standard
USEPA	United States Environmental Protection Agency
Vic EPA	Victorian Environment Protection Authority
ISC	Intersociety committee, Methods of Air Sampling and Analysis
ISO	International Organisation for Standardisation
APHA	American public health association, Standard Methods for the Examination of Water and Waste Water
CARB	Californian Air Resources Board
TM	Test Method
OM	Other approved method
CTM	Conditional test method
VDI	Verein Deutscher Ingenieure (Association of German Engineers)
NIOSH	National Institute of Occupational Safety and Health
XRD	X-ray Diffractometry