7 East Bank Road, Sheffield, S2 3PT, UK
Tel: +44 (0)114 272 8647

UKAS Testing Laboratory No 0144

REPORT OF PERIODIC MONITORING OF EMISSIONS TO AIR

PART A2 PROCESS: A09/09

EAST ANGLIAN GALVANIZING LTD.

Old North Road
Sawtry
Cambridgeshire
PE28 5XN

Monitoring Date: 23rd March 2016

Cti Ref: E51806-E
Customer Ref: PE10584

Report Written By: Neil Adshead
MCERTS Registration No.: SIRA MM 04 554
Function: Monitoring Technician

Signed: _____

Date: 19/04/16

Report Approved By: Trevor Halliday
MCERTS Registration No.: SIRA MM 05 656
Function: Monitoring Consultant

Signed: _____

The University Of Sheffield.
Advanced Manufacturing Research Centre

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EXECUTIVE SUMMARY REPORT

1.0 MONITORING OBJECTIVES

Sampling of emissions at East Anglian Galvanizing was undertaken at the request of Mr Mark Hammond.

The aim of the monitoring campaign was to:

- undertake annual compliance monitoring

in accordance with the Site Specific Protocol issued on 11th March 2016 (Cti Ref: E51806SSP).

The company is regulated as a Part A2 Process. The available guidance notes applicable to the process are:

Sector Guidance Note IPPC SG5 Secretary of State's Guidance for the A2 Galvanising Sector

Emission limits given in the results tables are taken from the requirements given in Permit No. A09/09.

Tests were performed to quantify the levels of emissions from the following process:

Stack Ref	Emission Source	Substances Monitored
EAG 1	Galvanizing Bath	Particulates

There were no special requirements applicable to the monitoring.

2.0 MONITORING RESULTS

Note: Uncertainty figures quote in this section represent the uncertainty at the 95% confidence level

Stack Ref.: EAG 1 Galvanizing Bath

Particulates	Test 1	Test 2	Emission Limit Value
Concentration:	18 mg m^{-3}	18 mg m^{-3}	< 15 mg m^{-3}
Mass Release:	180 g hr^{-1}	180 g hr^{-1}	-
Uncertainty:	± 0.92 mg m^{-3}	± 0.95 mg m^{-3}	-
Reference Conditions:	273K and 101.3kPa, without correction for water vapour content		
Date:	23/03/16	23/03/16	-
Test Period:	10:47 to 11:03 11:05 to 11:21	11:33 to 11:49 11:51 to 12:07	-
Duration:	32 mins	32 mins	-
Velocity:	5.2 m s^{-1}	5.1 m s^{-1}	-
Process Status:	Bath in continuous use throughout test periods		-
Visibility:	Periodic short-term visible emission		Free from persistent visible emission
Monitoring Method:	BS EN 13284-1:2002 Determination of low range mass concentrations of dust		
Isokinetic Rate:	102 %	104 %	95 % to 115 %
Blank Value:	0.08 mg m^{-3}		< 10 % ELV
Cti Accreditation for Use of Method:	MCERTS	MCERTS	-
Accreditation Status of Test:	MCERTS	MCERTS	-

3.0 OPERATING INFORMATION

Stack Ref.	Date	Process Type	Fuel	Feedstock	Abatement Type & operational status if abnormal	Load	Substance	Periodic Monitoring Result	Units
EAG 1	23/03/16	Continuous	N/a	Molten zinc	None	Normal	Particulates [M]	18	mg m^{-3}

Accreditation Status of test – (M) MCERTS

4.0 MONITORING DEVIATIONS

There were no deviations from planned monitoring methods

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APPENDIX I

GENERAL INFORMATION

A) Monitoring Organisation Staff Details

The following Cti staff were involved in the monitoring work reported:

Name	MCERTS Registration	Personnel Competency					Function
			TE1	TE2	TE3	TE4	
Trevor Halliday	SIRA MM 05 656	L2	✓	✓	✓	✓	Monitoring Consultant

B) Monitoring Organisation Method Details

The following methods were used for the monitoring work reported:

Substance	Standard Method	Cti OP	Accreditation
All	-	300, 303, 310	-
Moisture (Water Vapour)	BS EN 14790:2005	334	MCERTS
Velocity, Temperature & Pressure	BS EN ISO 16911-1:2013	311, 331 – 336, 361, 396	MCERTS
Particulates	BS EN 13284-1:2002	311, 331 – 336, 361	MCERTS

C) Monitoring Organisation Equipment Check List References

Specific equipment items used were recorded on site sampling datasheets during the monitoring campaign which are held in the Cti environmental monitoring files alongside the associated report

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APPENDIX II

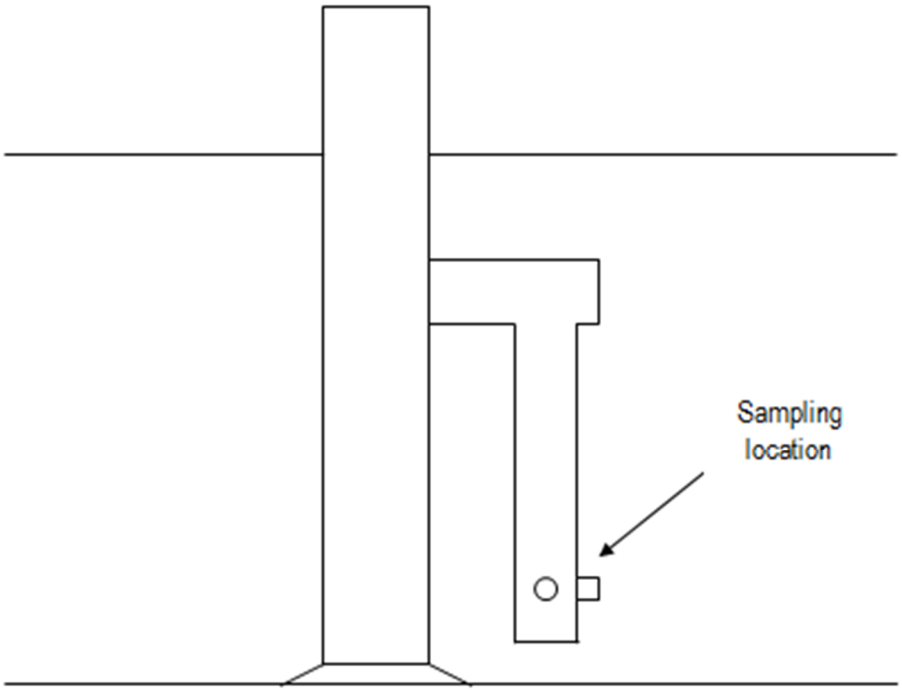
Stack Ref.: EAG 1 Galvanizing Bath

Emission Source EAG 1 Galvanizing Bath

Substances monitored: Particulates

Arrestment: None

	Emission Point Description:		13284 Compliant
	Duct dimensions:	0.855 m diameter	-
	Location of sampling plane:	In vertical outlet stack	✓
	Type of sampling port:	2 x 4 ” BSP	✓
	Number of sample lines:	Two	✓
	Arrangement of sample lines:	90°	✓
	Orientation of sample lines:	Horizontal	✓
	Gas flow parameters	Flow: angle < 15°, > 5Pa, Ratio < 3:1, no –ve flow	✓



PARTICULATES Template Version 4 / Feb15 / TH

VELOCITY CALCULATION

Site: Wedge East Anglian Galvanizing — Plant: EAG 1 Galvanizing Bath — Date: 23/03/2016

	Units			
Stack diameter(Ds):	m	0.86		
Stack dimensions(L,W):	m		0.00	
Stack area(As):	m^2	0.574		
Reference temp(Tr):	K	273		
Reference Pressure (Pr):	Pa	101300		
Barometric Pressure (Pb):	mb	1018	101800	Pa
Static Pressure (Ps):	"H_2O	0.07	17	Pa
	mmH_2O		0	Pa
Pitot coefficient(Cp):		0.825	Note: Use 1 if raw data corrected	

TEST ONE:

Delta Hs (mm)	Pitot mm H_2O	Pa	Stack Temp, °C	DGM in	DGM out	V(m/s)	Vol Flow m^3/s	STP V(m/s)	Vol Flow m^3/s	Vol Flow m^3/min
86	2.3	15.4	28	14	14	5.2	3.0	4.7	2.7	163
97	2.6	17.4	25	15	15					
97	2.6	17.4	26	15	15					
86	2.3	15.4	33	17	15		Vol Flow		Vol Flow	
82	2.2	14.7	23	18	15		cfm		cfm	
82	2.2	14.7	24	19	15					
93	2.5	16.7	29	21	16		6315		5759	
90	2.4	16.0	35	21	16					
	Mean	16	28		16					
	Std	1.0	4.0							
		Pa	Temp, °C		DGM					

TEST TWO:

Barometric Pressure (Pb):	mb	1018	101800	Pa
Static Pressure (Ps):	"H_2O	0.07	17	Pa
	mmH_2O		0	Pa
Pitot coefficient(Cp):		0.825		

Delta Hs (mm)	Pitot mm H_2O	Pa	Temp, °C	DGM in	DGM out	V(m/s)	Vol Flow m^3/s	STP V(m/s)	Vol Flow m^3/s	Vol Flow m^3/min
81	2.1	14.0	31	18	17	5.1	2.9	4.6	2.7	160
77	2.0	13.3	35	19	17					
89	2.3	15.4	36	21	17					
100	2.6	17.4	23	22	17		Vol Flow		Vol Flow	
96	2.5	16.7	27	21	17		cfm		cfm	
104	2.7	18.0	22	23	17					
81	2.1	14.0	25	23	18		6205		5635	
81	2.1	14.0	34	23	18					
	Mean	15	29		19					
	Std	1.7	5.2							
		Pa	Temp, °C		DGM					

EFFLUX VELOCITY CALCULATIONS

Performed in accordance with HMIP Technical Guidance Note D1

				Heat Release	Momentum	Minimum Velocity
Stack area (As)		0.57				
Efflux velocity		5.2	m/s			
Discharge gas temperature		302	°K	0.1	10	10
Vol discharge rate of gases		3.0	m^3s^1	0.2	20	11
Ambient temperature(K)		283	°K	0.3	30	11
				0.4	40	12
				0.5	50	12
Heat release.				0.6	60	13
Q=	0.065	*MW*		0.7	70	13
				0.8	80	14
Momentum.				0.9	90	14
M=	14			1	100	15

Use max of either Q or M

PARTICULATES		Template Version 4 / Feb15 / TH											
: Wedge East Anglian Galvanizing			Plant:	EAG 1 Galvanizing Bath				Date:	23-Mar-16				
	Units												
Stack diameter(Ds):	m	0.86	0.43										
Stack dimensions(Ds):	m	0.00	0.00										
Stack area(As):	m^2	0.574											
Standard 9096 or 13284:		13284											
Filter ID:		1143		1144		1145							
Filter Size 37, 47, 110 or 4:		47		47		47							
Sample Ref:		EAG 1-1		EAG 1-2		EAG 1-B							
Filter weights:						**Blank**							
Tare Test One:		0.14431	*Tare Test Two:*	0.14559		0.14500							
Gross Test One:		0.15950	*Gross Test Two:*	0.16134		0.14502							
mass collected:		0.01519		0.01574		0.00002							
Wash Out Weights:						**Blank**							
Tare Test One:		46.82765	*Tare Test Two:*	48.05952		60.38256							
Gross Test One:		46.82822	*Gross Test Two:*	48.05985		60.38242							
mass collected:		0.0006		0.0003		-0.0001							
Control Weights:		**Test 1**		**Test 2**		**Blank**							
Mass Change:	***Filter:***	-0.00001		-0.00001		-0.00001							
Mass Change:	***Beaker:***	-0.00019		-0.00019		-0.00019							
									Mass Emission with or without blank correction				
DGM Cal factor(Yd):			1.0096		1.0096								
Avg Delta H(DH):	Pa		874		869				With = Y Without = N:		n		
Barometric pressure(Pba):	Pa		101800		101800								
Reference pressure(Pr):	Pa	101325									18	18	
Avg DGM temp(Tm):	K		289.3		292.3								
Reference temp (Tr):	K	273								Mass Emission			
Duct O2(Od):	%									Test One	Test Two		
Ref O2(Or):	%												
Moisture(Bws):	%		0.92		0.69					49	49	mg/s	
Gas vol sampled(Vm):	m^3		0.92		0.92								
Gas vol corrected(Vc):	m^3		0.89		0.88					175	176	g/hr	
Moles Dry Gas(Mdg):	M		40		39								
										1398	1411	g/8 hr day	
Particulates collected, (Mass):	mg		16		16								
Concentration at STP dry(Cm):	mg/m^3		18	18	19					7.0	7.1	kg/5 day week	
Concentration at STP wet(Cw):	mg/m^3		18	18	18								
Concentration at ref O2(C-O2):	mg/m^3		18		19					335	339	kg/48 week year	
Minus Blank:	mg		16		16								
	mg/m^3		18	18	18								
	mg/m^3		18	18	18								
	mg/m^3		18		18								
								% of limit Value					
Overall Test Blank	mg		0.07		0.07								
	mg/m^3		0.08	0.08	0.09	0.56%	0.57%						
	mg/m^3		0.08	0.08	0.08	0.56%	0.56%						
	mg/m^3		0.08		0.09	0.56%	0.57%						
Acetone Blank	mg		0.04		0.04								
	mg/m^3		0.05	0.05	0.05								
	mg/m^3		0.05	0.05	0.05								
	mg/m^3		0.05		0.05								
Emission Limit:	mg/m^3	15											
Test Detection limit:													
Particulates collected, (Mass):	mg		0.29		0.29								
Concentration at STP dry(Cm):	mg/m^3		0.32		0.32								
Concentration at STP wet(Cw):	mg/m^3		0.32		0.32								
Concentration at ref O2(C-O2):	mg/m^3		0.32		0.32								
Impinger weights:	g	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**						
Before Test One:		582.8											
After Test One:		589.4											
H2O collected:		6.6	*Moles H_2O:*	0.37									
		Imp 1	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**						
Before Test Two:		589.4											
After Test Two:		594.3											
H2O collected:		4.9	*Moles H_2O:*	0.27									
Test DGM readings:	l												
Before Test One:		9557.400	*Before Test Two:*	485.100	Metric Millenium Inst								
After Test One:		10474.250	*After Test Two:*	1403.610	Meter								
Sampled vol :		916.850		918.510									
% Isokinetic		*Test One:*		*Test Two:*									
Nozzle Dia:	"	0.4352		0.4352									
Sampl time / point	mins	8		8									
Sample Duration:	mins	32		32									
Theoretical vol @ STP:	m^3	0.872		0.854									
% Isokinetic:		102	In Range	104	In Range								
Number of traverses:		2		2									
Theoretical Number of Traverses:		2		2									
Theoretical Points / Traverse		2		2									
Acuual Points / Traverse		2		2									
Standard Uncertainty	+/-	0.46	mg/m3	0.47									
Expanded Uncertainty:	+/-	0.92	mg/m^3	0.95									
% of ELV		6.2		6.3									