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APPENDIX A

Following table provides emission standards for some selected equipment under Tier 1 - Equipment Based Emission Standards

Source/Equipment	Fuel/ Rated Output Capacity (C)	Pollutant to be controlled	Emission Limit [Combustion] ^{(1), (2), (3)}	Emission Limit [Non-Combustion]	Monitoring Requirement ⁽⁴⁾	
Thermal Power Plants:	Oil C < 1 MWe	PM, SO _x , NO _x	Stack height H > h + 2 m and H ≥ 15 m	-	None	
		Smoke	20% Opacity	-		
Oil Fired	Oil 1 ≤ C < 3 MWe (i) Steam Turbine (ii) Gas Turbine / Combine Cycle (iii) IC Engine	SO _x	Stack height H > h + 5 m and H ≥ 15 m	-	None	
			Uncontrolled emission level based on fuel quality (presently 6100 mg/Nm ³)	-	None	
		NO _x	(i) 650 ; (ii) 550; (iii) 850 mg/Nm ³	-		
		PM	200 mg/Nm ³	-		
		Smoke	20% Opacity	-		
		SO _x	Minimum stack height to be specified on a case by case basis	-	None	
	Oil 3 ≤ C < 25 MWe (i) Steam Turbine (ii) Gas Turbine / Combine Cycle (iii) IC Engine			Uncontrolled emission level based on fuel quality (presently 6100 mg/Nm ³)	-	None
		NO _x	(i) 600 ; (ii) 500; (iii) 750 mg/Nm ³	-		
		PM	150 mg/Nm ³	-		
		Smoke	20% Opacity	-	CEM	
		SO _x	Minimum stack height to be specified on a case by case basis	-	None	
				3500 mg/Nm ³	-	CEM
Oil 25 ≤ C < 100 MWe From year 2020 25 ≤ C < 50 MWe (i) Steam Turbine (ii) Gas Turbine / Combine Cycle (iii) IC Engine			(i) 550 ; (ii) 450; (iii) 700 mg/Nm ³	-	CEM	
	PM	150 mg/Nm ³	-	None		
	Smoke	20% Opacity	-	CEM		
	SO _x	Minimum stack height to be specified on a case by case basis	-	None		
			850 mg/Nm ³	-	CEM	
	NO _x	(i) 500 mg/Nm ³ (ii) 450 mg/Nm ³ (iii) 650 mg/Nm ³	-	CEM		
Oil C ≥ 100 MWe From year 2020 C ≥ 50 MWe (i) Steam Turbine (ii) Gas Turbine / Combine Cycle (iii) IC Engine		PM, SO _x , NO _x	Minimum stack height to be specified on a case by case basis	-	None	
		SO _x	850 mg/Nm ³	-	CEM	
		NO _x	(i) 500 mg/Nm ³ (ii) 450 mg/Nm ³ (iii) 650 mg/Nm ³	-	CEM	
		PM	150 mg/Nm ³	-	None	
		Smoke	20% Opacity	-	CEM	
		SO _x	Minimum stack height to be specified on a case by case basis	-	None	

Source/Equipment	Fuel/ Rated Output Capacity (C)	Pollutant to be controlled	Emission Limit [Combustion] ^{(1), (2), (3)}	Emission Limit [Non-Combustion]	Monitoring Requirement ⁽⁴⁾	
Standby Generators	C < 500 kVA	PM, SO _x , NO _x	Stack height H > h + 2 m and H > 1m + height of the installation building	-	None	
	500 ≤ C < 1000 kVA	PM, SO _x , NO _x	Stack height H > h + 5 m and H > 1m + height of the installation building	-	None	
	C ≥ 1000 kVA	PM, SO _x , NO _x	Stack height H > h + 8 m and H > 1m + height of the installation building	-	None	
Oil Fired Boilers	C < 2 metric tonnes of steam/hour	PM, SO _x , NO _x	Stack height H > h + 2 m and H ≥ 15 m	-	None	
		Smoke	20% Opacity	-		
	C ≥ 2 metric tonnes of steam/hour	PM, SO _x , NO _x	Stack height H > h + 5 m and H ≥ 15 m	-	None	
		SO _x	Uncontrolled emission level based on fuel quality	-		
		NO _x	550 mg/Nm ³	-		
		PM	200 mg/Nm ³	-		
Incinerators ⁽⁵⁾	C < 1 tonne/hour	Smoke	15% Opacity	-		
		SO _x	70 mg/Nm ³	-	None	
		NO _x	400 mg/Nm ³	-		
		PM	350 mg/Nm ³	-		
		Smoke	20% Opacity	-		
		CO	50 mg/Nm ³	-		
		HCl	80 mg/Nm ³	-		
		Dioxin ⁽⁶⁾	0.2 ng I-TEQ/Nm ³	-		
		Total Heavy metals	1 mg/Nm ³	-		
		C ≥ 1 tonne/hour	SO _x	70 mg/Nm ³	-	None
			NO _x	300 mg/Nm ³	-	
			PM	100 mg/Nm ³	-	
Smoke	10% Opacity		-			
CO	50 mg/Nm ³		-			
HCl	15 mg/Nm ³		-			
Dioxin ⁽⁶⁾	0.1 ng I-TEQ/Nm ³		-			
Total Heavy metals	1 mg/Nm ³		-			

- Notes:
- (1) h is the height of the tallest building within a 25 m radius of the stack.
 - (2) All emission limits are stated at normal conditions defined as follows: Temperature: 0°C; Pressure: 760 mm Hg.
 - (3) Emission limits are defined at the following excess air levels: Oil: 3% ; Gas: 3%; All solid fuels: 6%.
 - (4) CEM means Continuous Emissions Monitoring.
 - (5) For Incinerators and Infected Waste Incinerators, reference O₂ level is 10% for smoke gas.
 - (6) "I-TEQ" means International Toxicity Equivalent, which is the sum of the total concentrations of the dioxin and furan compounds.

Source- Air Quality and Co-Benefits Implementation of Emission Standards for Stationary Sources in Sri Lanka by Dr. AGT Sugathapala - <http://cleanairinitiative.org/portal/index.php>

APPENDIX B

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ANALYSIS REPORT

REFERENCE NO : CS/12/021, CS/12/022, CS/12/023, CS/12/024, CS/12/025,
CS/12/026, CS/12/027, CS/12/028 & CS/12/029, CS/12/30,
CS/12/39, CS/12/040, CS/12/042.

CLIENT : MAS ACTIVE (Pvt) Ltd Linea Intimo,
Lot 89 A,



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TL 006-01

13th March 2012.

Pg. 01 of 05

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QUALITY IS SUCCESS

LINDEL INDUSTRIAL LABORATORIES LIMITED.

ANALYSIS REPORT

REFERENCE NO : CS/12/021, CS/12/022, CS/12/023, CS/12/024, CS/12/025,
CS/12/026, CS/12/027, CS/12/028 & CS/12/029,CS/12/30,
CS/12/39,CS/12/040,CS/12/042.

CLIENT : MAS ACTIVE (Pvt) Ltd Linea Intimo,
Lot 89 A,
EPZ,
Biyagama.

SPECIMEN : Solid waste samples.

PARTICULARS OF THE SPECIMEN : **Sampling Carried Out By** :- The client.



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27/01/2012 at 12.20 p.m.

Date of Issue :- 13/03/2012

TEST REQUIRED : Requested by the client,e-mail Dated on 03rd February 2012 and
as per the given annexure page 03 of 05.

METHOD OF ANALYSIS : Standard Methods for the Examination of Water & Wastewater,
APHA 21st Edition and ASTM D 240.

CONDITIONS : The results given in this report relate only to the same sample tested.
• This report shall not be reproduced except in full without the written approval of the laboratory.

A handwritten signature in blue ink, appearing to be the initials 'A' or 'J' with a flourish.

LINDEL INDUSTRIAL LABORATORIES LIMITED.**ANALYSIS REPORT**

Your Sample No	Our Reference No	Sample Description	Test Requested
1	CS/12/026	Dye sludge water per. 10%	Calorific value
2	CS/12/028	Dye sludge water per. 20%	Calorific value
3	CS/12/039	Dye sludge water per. 30%	Calorific value
4	CS/12/025	Dye sludge water per. 40%	Calorific value
5	CS/12/027	Dye sludge water per. 50%	Calorific value
6	CS/12/030	Dye sludge sample -1	Metal analysis
7	CS/12/029	Dye sludge sample -2	Metal analysis
8	CS/12/024	Dye sludge & other waste mixture (4)	Calorific value
9	CS/12/021	Dye sludge & other waste mixture (3)	Calorific value
10	CS/12/023	Dye sludge & other waste mixture (2)	Calorific value
11	CS/12/022	Dye sludge & other waste mixture (1)	Calorific value
12	CS/12/042	Chemical sample	Sulphate ions, Chlorides, Nitrates
13	CS/12/040	Dye sludge sample	Supher, Chloride content



Results

Our Ref.	Sample Description	Test Results	Test Method
CS/12/021	Paper -10%, sludge-10%, saw dust-50%, fabric-30%	20.04 M J/Kg	ASTM D 240
CS/12/022	Paper -10%, sludge-40%, saw dust-10%, fabric-40%	20.40 M J/Kg	ASTM D 240
CS/12/023	Paper -10%, sludge-30%, saw dust-10%, fabric-50%	22.69 M J/Kg	ASTM D 240
CS/12/024	Paper -10%, sludge-50%, saw dust-30%, fabric-10%	15.51 M J/Kg	ASTM D 240
CS/12/025	Pure dye sludge (water 40%)	8.29 M J/Kg	ASTM D 240
CS/12/026	Pure dye sludge (water 10%)	14.82 M J/Kg	ASTM D 240
CS/12/027	Pure dye sludge (water 50%)	7.66 M J/Kg	ASTM D 240
CS/12/028	Pure dye sludge (water 20%)	12.18 M J/Kg	ASTM D 240
CS/12/039	Pure dye sludge (water 30%)	11.24 M J/Kg	ASTM D 240
CS/12/029	Dye sludge – sample -1	Cu – 42 mg/kg	Digestion & AAS
		Pb - 22 mg/kg	Digestion & AAS
		Cr - 414 mg/kg	Digestion & AAS
		Zn – 315 mg/kg	Digestion & AAS
		Ni - 24 mg/kg	Digestion & AAS
		Hg - 0.22 mg/kg	Digestion & cold vapour
CS/12/030	Dye sludge – sample -2	Cu – 36 mg/kg	Digestion & AAS
		Pb - 2 mg/kg	Digestion & AAS
		Cr - 30 mg/kg	Digestion & AAS
		Zn – 310 mg/kg	Digestion & AAS
		Ni - 26 mg/kg	Digestion & AAS
		Hg - 0.13 mg/kg	Digestion & cold vapour

LILL Continuation Sheet.....

Our Ref.	Sample Description	Test Results	Test Method
CS/12/040	Dye sludge sample -13	Ash – 50.19 % (w/w)	Gravimetric @ 600 °C
		Sulphide as S – 1.2 %	Turbidity metric method
		Chloride as Cl - < 100 mg/kg	Argentonometric
CS/12/042	Chemical sample Sample 12	Nitrate as NO ₃ - 1.9 g/kg	UV screen method
		Sulphate as SO ₄ – 97.8 g/kg	Turbidity metric method
		Chloride as Cl -< 100mg/kg	Argentonometric
			Above 03 method from APHA 21 st Edition


Note :

AAS = Atomic Absorption Spectrophotometer
 MJ/kg = Mega joule per kilogram
 mg/kg = Milgram per kilogram



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 13th March 2012.


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