

Test Report
On
Stack Air Emission Analysis of Boiler

Prepared

For

Vertex RMG Division

Vertex Wear Limited, Dress World Limited, Neo Fashion Limited

Varari, Rajfulbaria, Tetuljhora, Hemayetpur, Savar, Dhaka, Bangladesh

Report No. XSB-3RECL-2017-1224



Prepared by



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At

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Report No.	XSB-3RECL-2017-1224
Sampling Date	November 26, 2017
Sampling Time	02:30 p.m.- 03:00 p.m.
Reporting Date	November 27, 2017

Basic Information of Boiler	
Location	Production Building, , 4 th Floor
Brand	MEL
Model	MEL 350 TL-100N
Boiler Registration No	বাঃ বঃ 9440
Serial Number	350TL-104
Manufacturing Date	2017
Fuel Type	Diesel (Light Oil)
Capacity (kg/hr or ton/hr)	350 Kg
Operating Pressure	5.5 kg
Design Pressure	7 kg
Last Servicing Date	New Installation
Physical Structure	Vertical Landed

Environmental Conditions	
Temperature	28.1°C
Humidity	52% RH
Visibility/Season	Winter & Sunny Atmosphere

Method of Sampling

Analysis of the exhaust flue was done using direct reading instruments. So, there was no separate sampling used for this analysis. During the analysis, a standard work instruction stated in the SWI-03 was followed.

Description of Instruments

A calibrated direct reading instrument designed to measure the stack parameters was used with following specifications.

Parameter	Resolution	Accuracy	Range
Temp Measurement			
Flue Temperature with probe	1.0°C/F	±2.0°C±0.3%reading	0-600°C 32-1112°F
Inlet temperature	0.1°C/F	±1°C±0.3%reading	0-50°/32-122°F
Pressure	0.01mbar	± 2% of full scale	+150mbar to -150mbar
Gas Measurement			
Carbon Monoxide (standard: H compensated)	0.1% 1ppm	± 2% ± 20ppm <400ppm ± 5% <5000ppm ± 10% >5000ppm	0-21% 0-10000ppm
Carbon Monoxide (high range)	0.01%	± 5% reading from 0.1% to 10%	0-10%
Nitric Oxide (standard)	1ppm	± 5ppm <100ppm ± 5% >100ppm	0-5000ppm
Nitric Oxide (Low range)	1ppm	±2ppm <30ppm ±5ppm >30ppm	0-100ppm
Nitrogen Dioxide	1ppm	±5ppm <100ppm ±10ppm <500ppm ±5%500ppm	0-1000ppm
Sulphur Dioxide	1ppm	±5ppm <100ppm ±5% >100ppm	0-5000ppm
SPM	0.1 mg/m ³	±0.01 mg/m ³	0.1-2500 mg/m ³
Ambient operating range		0°C to 45°C/10% to 90% RH non condensing	

Method of Analysis

The following methods were used to analyze the stack emission parameters.

Parameters	Methods
SO ₂ (Sulfur Dioxide)	Electrochemical
CO (Carbon Monoxide)	Electrochemical
CO ₂ (Carbon Dioxide)	Calculated
O ₂ (Oxygen)	Electrochemical
NO _x (Oxides of Nitrogen)	Calculated
SPM(Suspended Particular Matter)	Laser
Flue Temperature	Thermocouple
Flue Pressure	Pressure Sensor

Measurement Uncertainties

The following measurement uncertainties were assigned to the respected parameters.

Gases	±2%
Temperature	2 °C
Pressure	0.05%

Team

All the experiments and reporting have been done under the supervision of **Mohammad Kabir Hossain** (MSc in Environment & Sustainable Technology, Manchester, UK).

Team members involved in field experiments and reporting:

- ❖ **Md. Sarwar Kabir** (BSc in Electrical and Electronics Engineering)
Chief Technical officer, 3R Environmental Consulting Limited
- ❖ **Mohammad Faridul Islam** (BSc & MSc in Environment Science)
Lab Analyst, 3R Environmental Consulting Limited
- ❖ **Mohammad Mosarof Hossain**
Assistant Technical officer, 3R Environmental Consulting Limited

Results of Analysis

The result of analysis is expressed in the following table:

Observations	Parameters						
	SPM	CO	CO ₂	SO ₂	NO	NO _x	O ₂
	µg/m ³	mg/m ³	%	mg/m ³	mg/m ³	mg/m ³	%
Run-01							
01	38	20	6.2	0	82	84	9.9
02	33	16	6.4	0	79	81	10.1
03	40	21	6.1	0	80	83	10.2
Run-02							
01	41	19	5.9	0	85	88	10.3
02	37	21	6.1	0	81	83	9.8
03	31	17	6.2	0	82	85	10.2
Run-03							
01	33	21	5.8	0	79	81	9.7
02	31	17	6.0	0	78	80	10.3
03	35	19	6.1	0	77	79	10.1

Reference Standards					
Parameters	SPM	CO	CO ₂	SO ₂	NO _x
Units	µg/m ³	mg/m ³	mg/m ³	mg/m ³	mg/m ³
DOE Standard (National)	100 (Gas) 300 (Oil)	NYS	NYS	NYS	150 (Gas) 300 (Oil)
World Bank/ IFC Standard (International)	NYS (Gas) 50 (Liquid)	NYS	NYS	NYS (Gas) 2000 (Liquid)	320 (Gas) 460 (Liquid)

*NYS= Not Yet Set



Expert Comments and Recommendations

The Stack Emission from the stack point of the BOILER has been analyzed for the parameter of SPM, CO, CO₂, SO₂, NO, NO_x and O₂ to evaluate the effect of the plant's emission while running on 100% **Diesel (Light Oil)** on the air environment. From the analysis, it has been observed that the factory emission of SPM, CO, CO₂, SO₂, NO, NO_x and O₂ is within the standard limit of DoE and IFC/World Bank.

Prepared by

Checked by

Approved by

<p align="center">Boiler Stack Air Emission Picture</p>	<p align="center">Boiler Stack Air Emission Picture</p>
	
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