

Test Report
On
Stack Air Emission Analysis of Generator
Prepared
For
Cotton Clothing (BD) Ltd.

Kazi Tower, 27 Road, Gazipura, Tungi, Gazipur, Bangladesh.

Report No. XSG-3RECL-2017-106189



Prepared by

Stack Air Emission Analysis of Generator At Cotton Clothing (BD) Ltd.

Kazi Tower, 27 Road, Gazipura, Tungi, Gazipur, Bangladesh.

Report No.	XSG-3RECL-2017-1089
Sampling Date	May 11, 2017
Sampling Time	04:00 p.m.- 04:30 p.m.
Reporting Date	May 15, 2017

Basic Information of Generator	
Location	Production Building, Ground Floor
Brand	PERKINS
Model	TGDF5314U13641W
Serial Number	2206A-E13TAG3
Fuel Type	Diesel (Light Oil)
Capacity	400KVA
RPM	1500
Voltage	400V
Frequency	50 Hz
Manufacturing Date	Not Found
Last Servicing Date	07/04/2017
Physical Structure	Horizontal Landed

Environmental Conditions	
Temperature	33.1°C
Humidity	52.3% RH
Visibility/Season	Summer & Sunny Atmosphere

Method of Sampling

Analysis of the exhaust flue was done using direct reading instruments. So, there was no separate sampling 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% 1ppm	± 5% reading from 0.1% to 10% ± 5ppm <100ppm ± 5% >100ppm	0-10% 0-5000ppm
Nitric Oxide (standard)	 1ppm	 ±2ppm <30ppm ±5ppm >30ppm	 0-100ppm
Nitric Oxide (Low range)	1ppm	±5ppm <100ppm ±10ppm <500ppm ±5% 500ppm	0-1000ppm
Nitrogen Dioxide	1ppm	±5ppm <100ppm ±10ppm <500ppm ±5% 500ppm	0-5000ppm
Sulphur Dioxide	1ppm	±5ppm <100ppm ±5% >100ppm	0-5000ppm
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)
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- ❖ **Mohammad Mosarof Hossain**
Assistant Technical officer, 3R Environmental Consulting Limited

Results of Analysis

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	308	415	4.6	0	221	232	15.9
02	297	423	4.7	0	211	226	16.0
03	301	456	4.3	0	236	245	15.7
Run-02							
01	316	434	4.7	0	246	258	15.7
02	309	451	5.0	0	249	262	15.5
03	293	460	5.1	0	253	268	15.4
Run-03							
01	289	470	4.5	0	237	244	15.2
02	295	498	4.7	0	223	231	15.4
03	307	486	4.8	0	216	224	15.5

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)	350	NYS	NYS	NYS	150
World Bank/ IFC Standard	50	NYS	NYS	2000	320

*NYS= Not Yet Set

Expert Comments and Recommendations

The Stack Emission from the stack point of the GENERATOR 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, and O₂ is within the standard limit DoE or IFC/World Bank.

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