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Stack Air Emission Inspection

Norp Knit Industries Ltd. (Unit-2)

Inspection Ref. No.: **A/S 11889**

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CERTIFIED ISO 17020:2012 COMPANY

BAB

General Information		
Invoice Reference No: GB/2025/01/82		Inspection Date: 01.02.2025
Inspection Reference No: **A/S 11889**		Inspection Duration: 11am-5pm
Report Generation Date:	06.02.2025	Inspection location: Exhaust outlet
Report Submission Date:	08.02.2025	Inspection Description: Stack/Point source emission
Inspection Standards: 2004/108/EEC		
Company Name: **Norp Knit Industries Ltd. (Unit-2)** *Address: Shi-152/2 (Old), B-01/1 (New), Islampur, Kodda Nandun, Bason, Gazipur.*		Contact Person: **Md. Shahidul Islam** *Manager-Compliance*

On Site Inspection Team	
Toriqul Islam *Executive (Operation)* *B.Sc. in Civil & Environmental Engineering*	**Ulfat Rabbani** *Intern (Operation)* *B. Sc. in ESDM*
Report Prepared by:	**Quality Checked:**
Tanzir Hosen *Chemist (Operation)* *B.Sc. in Chemistry*	**Imran Hossen** *Sr. Executive (Operation)* *B.Sc. in Civil Engineering*

Report Approved by:

Engr. Syed Tasnem Mahmood
Chief Environmental Engineer & CEO,
B.Sc. & M.Sc. (Civil and Environmental Engineering)
MIEB No.: M/35960

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 TP-GB-01 was followed.

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)	Electrochemical
O_2 (Oxygen)	Electrochemical
NO_x (Oxides of Nitrogen)	Calculated
SPM (Suspended Particular Matter)	Gravimetric
Flue Temperature	Thermocouple
Flue Pressure	Pressure Sensor

Measurement Uncertainties:

The following measurement uncertainties were assigned to the respected parameters:

Gases	±2%
Temperature	$\pm 2^0$C
Pressure	0.05%

Description of Utilities:

Sl. No.	Brand Name	Model No	Serial No	Made By	Fuel	Capacity	License No
Generator-1	CATERPILLAR	G-3512	CTM 00368	USA	GAS	962 KVA	CPP-0759
Generator-2	CATERPILLAR	G-3508	CPJ00479	USA	GAS	631 KVA	CPP-0759
Generator-3	CUMMINS	C550 D5E	B12K300117	ENLAND	DIESEL	550 KVA	CPP-0759
Generator-4	CUMMINS	C550 D5E	L15K899923	ENLAND	DIESEL	550 KVA	CPP-0759
Generator-5	CUMMINS	C1460D5	C 23D009537	ENLAND	DIESEL	1400KVA	CPP-0759
Boiler-1	SHELLMAX	SM-30DH / 10.54 / 73	N/A	INDIA	DIESEL	3000 Kg	6836
Boiler-2	SHELLMAX	SM-40DH / 10.54 / 83E	N/A	INDIA	DIESEL	4000 Kg	9873
Boiler-3	MEL	500TL - 166	N/A	BANGLA DESH	GAS	500 KG	8393
Boiler-4	SHELLMAX	SM-10DL/ 10.54 /19	N/A	INDIA	GAS / DIESEL	1000 KG	6190
Oven Machine	Metod	IDOC-ECO8	CE09-16-337	TURKEY	CNG	BURNER : WGL30	Not in use

Standard Permissible limit:

Relevant Standard Permissible limit for Generator air emission is shown below:

Reference of Relevant Standard			Standards for Stack Emission from Industries or Projects (Generator)		
			SPM (mg/Nm^3)	NO_x	SO_2
Air Pollution Control Rules-2022[1]	Diesel	New (Running after 2020)	50	200	200
		Existing (Running before 2020)	80	400	400
	Natural Gas	New (Running after 2020)	-	200	-
		Existing (Running before 2020)	-	400	-
	LPG, LNG etc.	-	50	200	400
IFC/World Bank1F[2] (mg/Nm^3)		Gas	*NYS*	200 (spark ignition) 400 (Dual Fuel) 1600 (Compressed ignition)	*NYS*
		Liquid	*NYS*	1460	*NYS*
		Solid	*NYS*	*NYS*	*NYS*

[NYS= Not Yet Set]

Relevant Standard Permissible limit for Boiler air emission is shown below:

Reference of Relevant Standard		Boiler of Industrial unit (Parameter Standard)		
		SPM (mg/Nm^3)	NOx (mg/Nm^3)	SO_2 (mg/Nm^3)
DoE (Air Pollution Control)[3] (mg/Nm^3)	Gas	-	150	250
	Oil	200	300	
	Coal	250	400	
	Husk	250	400	
IFC/World Bank[4] (mg/Nm^3)	Gas	N/A	320	*NYS*
	Liquid	150	460	2000
	Solid	150	650	2000

[NYS= Not Yet Set; N/A= Not Applicable]

STeP-OEKO TEX STANDARD PERMISSIBLE LIMIT			
For Gas/ Diesel Generator >0.3MW			
Parameter	Minimum	Advanced	Excellent
(Carbon Monoxide) CO: (mg/Nm^3)			
Gaseous Fuel	500	250	150
Diesel Fuel	500	250	150
(Nitrogen oxides) NO_X: (mg/Nm^3)			
Gaseous Fuel	500	300	100
Diesel Fuel	1000	500	200
(Sulphur Dioxide) SO_2: (mg/Nm^3)			
Gaseous Fuel	200	100	30
Diesel Fuel	900	400	60

[1] Air Pollution Control Rules (2022), Schedule-05, Department of Environment, Govt. of Bangladesh
[2] IFC (2007), Environmental, Health and Safety Guidelines: Environmental Air Emissions and Ambient Air Quality, IFC/World Bank Group
[3] Air Pollution Control Rules (2022), Schedule-05, Department of Environment, Govt. of Bangladesh
[4] IFC (2007), Environmental, Health and Safety Guidelines: Environmental Air Emissions and Ambient Air Quality, IFC/World Bank Group

Facility Operations - Equipment/Combustion. Parameters and Limit values for facilities - WHO and Globally Regulated Pollutants[5]:

ZDHC Air Emission Guidelines							
Sl. No.	Parameter	Source	Fuel Type	Foundational	Progressive	Aspirational	Concentrations Unit
1	Facility Combustion	NOx	Solid	650	300	200	mg/Nm^3
2			Liquid	460	250	85	mg/Nm^3
3			Gas	400	150	40	mg/Nm^3
4		CO	Solid	800	500	100	mg/Nm^3
5			Liquid	650	400	100	mg/Nm^3
6			Gas	500	300	100	mg/Nm^3
7		SOx	Solid	750	650	300	mg/Nm^3
8			Liquid	600	450	300	mg/Nm^3
9			Gas	400	300	100	mg/Nm^3
10		PM	Solid	500	300	100	mg/Nm^3
11			Liquid	300	100	50	mg/Nm^3
12			Gas	100	50	20	mg/Nm^3

[5] ZDHC Air Emissions Position Paper (Version 1.0) January 2021

Stack Air Emission Inspection Results:

SL. No	Obtained result from Utilities									
	SPM	$PM_{2.5}$	PM_{10}	O_2	CO	NO	NO_2	CO_2	NO_x	SO_2
	(mg/Nm^3)	(mg/Nm^3)	(mg/Nm^3)	(%)	(mg/Nm^3)	(mg/Nm^3)	(mg/Nm^3)	(%)	(mg/Nm^3)	(mg/Nm^3)
Generator-1	23.1	10.5	13.4	7.2	235.1	115.2	65.2	5.8	188.3	0
Generator-2	19.2	8.7	11.5	5.6	218.3	101.2	52.5	5.6	153.5	0
Generator-3	18.1	7.1	11.6	5.2	206.7	98.8	49.7	5.0	147.4	05
Generator-4	17.8	7.3	10.6	5.1	201.7	98.8	50.7	5.0	148.6	06
Generator-5	24.7	10.3	14.2	6.7	220.4	114.7	67.3	5.5	198.2	09
Boiler-1	17.3	7.9	10.7	5.7	182.1	67.3	39.2	4.5	106.2	05
Boiler-2	18.8	7.4	11.1	5.5	187.2	68.9	40.1	4.4	108.3	07
Boiler-3	14.5	5.1	9.4	4.1	131.4	54.1	26.9	4.1	80.2	0
Boiler-4	16.5	6.1	10.4	4.4	177.4	67.1	36.9	4.3	103.2	0

Sl./No	Flue Temperature (°C)	Inner Diameter of Stack pipe (m)	Flow (m/s)	Running Hour of 2024
Generator-1	421.7	0.4572	5.5	4916
Generator-2	416.8	0.3556	5.3	4605
Generator-3	402.3	0.1524	5.1	1496.12
Generator-4	401.1	0.1524	5.0	1564.34
Generator-5	434.2	0.254	5.3	527.6
Boiler-1	218.5	0.6096	4.3	5408
Boiler-2	231.2	0.8128	4.5	6064
Boiler-3	201.4	0.3048	4.1	597
Boiler-4	213.7	0.8128	4.4	525

***Abbreviations and Acronyms: CO = Carbon monoxide; CO_2 = Carbon dioxide; O_2 = Oxygen; SO_2= Sulfur dioxide; SPM = Suspended Particulate Matter, $PM_{2.5}$= Particulate Matter 2.5, PM_{10}= Particulate Matter 10, NOx = Oxides of Nitrogen, NO_2 = Nitrogen Dioxide, mg/Nm^3 = milligram per normal cubic meter*

Mass Emission rate[6] (Hourly):

SL./No	Pollutants				
	SPM (Kg/hr.)	NO_x (Kg/hr.)	SO_2 (Kg/hr.)	CO (Kg/hr.)	CO_2 (Kg/hr.)
Generator-1	0.02922	0.242	0.000	0.302	144.01
Generator-2	0.01426	0.116	0.000	0.165	81.633
Generator-3	0.00243	0.020	0.001	0.028	13.159
Generator-4	0.00234	0.020	0.001	0.027	12.924
Generator-5	0.00913	0.074	0.003	0.083	39.899
Boiler-1	0.043	0.268	0.013	0.460	219.488
Boiler-2	0.084729672	0.495	0.032	0.857	389.221
Boiler-3	0.00890	0.050	0.000	0.082	49.387
Boiler-4	0.07532	0.478	0.000	0.822	385.29

Mass Emission rate[7] (Yearly):

SL./No	Pollutants				
	SPM (Kg/yr.)	NO_x (Kg/ yr.)	SO_2 (Kg/ yr.)	CO (Kg/ yr.)	CO_2 (Kg/yr.)
Generator-1	143.660	1187.359	0.000	1484.911	707976.95
Generator-2	65.6663	532.299	0.000	758.258	375919.28
Generator-3	3.6310	29.981	1.016	42.112	19686.95
Generator-4	3.6669	31.039	1.252	42.200	20216.93
Generator-5	4.8166	39.188	1.778	43.649	21050.94
Boiler-1	232.496	1447.103	68.075	2485.426	1186989.042
Boiler-2	513.81	3001.037	193.815	5195.947	2360233.291
Boiler-3	5.3126	29.793	0.000	48.894	29483.91
Boiler-4	39.545	250.784	0.000	431.807	202277.62

[6] *https://www.researchgate.net/post/How_can_I_calculate_estimation_of_air_pollutants_load_per_year_in_tons_for_the_Stack_emission*

[7] *https://www.researchgate.net/post/How_can_I_calculate_estimation_of_air_pollutants_load_per_year_in_tons_for_the_Stack_emission*

Discussion and Recommendation:

Norp Knit Industries Ltd. (Unit-2) has hired GREENBUD Testing & Inspection Services Private Limited to inspect their stack air emission of five generators and four boilers. GREENBUD has inspected all the required air quality parameter according to the Air Pollution Control Rules-2022, ZDHC Air Emission Guidelines'2021 where parameters were found in progressive level, STeP BY OEKO-TEX and the IFC/World Bank emission standard. According to the inspection result the findings are given below:

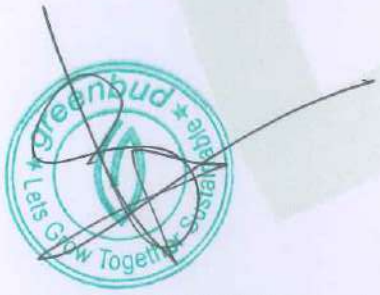
- Oxides of Nitrogen, Sulphur Dioxide & Carbon Monoxide emission from the generators and boilers has been found within the Air Pollution Control Rules-2022, ZDHC Air Emission Guidelines'2021, STeP BY OEKO-TEX, IFC/World Bank standard emission limit.

However, the proponent needs to consider that the concentration of parameters presented in this report is instantaneous data which had been found during inspection and may vary over the period of time.

Obtaining above results, for further improvement recommendations are given below:

- ✓ Periodic maintenance of utilities according to manufacturer's instruction
- ✓ Installation of on-site abatement measures to control the emission level.
- ✓ Control air-fuel mixing ratio and excess air to reduce the nitrogen oxides emission.
- ✓ Factory must check Air emission quality periodically.

Factory is suggested to assess the Air Emission Quality at least annually if all other setups are constant.



Engr. Syed Tasnem Mahmood
CEO and Chief Environmental Engineer
GREENBUD Testing & Inspection Services Private Ltd.
MIEB No.: M/35960
ISO 14001 Certification No: EA/15/IN/16050
ISO 50001 Certification No: ENMS/16/IN/533

APPENDIX

Figure: Stack Air Emission Sampling

Instrument Description:

Parameter	Resolution	Accuracy	Range
Temp Measurement			
Flue Temperature	0.1°C/F	+2.0°C +0.3% reading	0-1200°C/32 -2200°F
Inlet Temperature	0.1°C/F	+1°C +0.3% reading	with suitable probe 0-50°C/32-122°F
Gas Measurement			
Oxygen	0.1%	+0.2%*1	0-25%
Carbon Monoxide,	1 ppm	+20ppm <400ppm*1 +5% <5000ppm +10% >5000ppm	0-100000ppm
Nitric Oxide (optional)	1 ppm	+5ppm <100ppm*1 +5% >100ppm	0-5000ppm
Nitrogen Dioxide (optional)	1 ppm	+3ppm<20ppm +5ppm<100ppm	100ppm
Sulphur Dioxide (optional)	1 ppm	+5ppm<100ppm +5%>100ppm	0-5000ppm
Pressure	0.1mbar	+0.5% full scale	150 mbar
Carbon Dioxide	0.1%	+0.3% reading	0-99.9%
Losses	0.1%	+1.0% reading	0-99.9%
Efficiency	0.1%	+1.0% reading	0-99.9%
Excess Air	0.1%	+0.2%	0-2885.0%
CO/CO2 ratio*2	0.0001	+0.0001	0-0.9999
Poison Index *2	0.01%	+0.01	0-99.99
Ambient Operating Range		-5^{0}C to +50^{0}C/10% to 90% RH non condensing	

High Volume Sampler:

Parameter	Measuring Range
SPM	0 – 1000 mg
PM_{10}	0 – 1000 mg
$PM_{2.5}$	0 – 1000 mg
Air flow	0-40 lpm
Flue Temperature	0-650°C

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Indoor Air Quality Inspection

Norp Knit Industries Ltd. (Unit-2)

Inspection Ref. No.: **G/I 11813**

Contact Us

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General Information		
Invoice Reference No: GB/2025/01/82		Inspection Date: 01.02.2025
Inspection Reference No: **G/I 11813**		Inspection Duration: 11am-5pm
Report Generation Date:	06.02.2025	Inspection Description: Indoor Air Quality
Report Submission Date:	08.02.2025	Inspection Location: Inside Factory Building
Inspection Standards: 2004/108/EEC		
Company Name: **Norp Knit Industries Ltd. (Unit-2)** *Address: Shi-152/2 (Old), B-01/1 (New), Islampur, Kodda Nandun, Bason, Gazipur.*		Contact Person: **Md. Shahidul Islam** *Manager-Compliance*

On Site Inspection Team	
Toriqul Islam *Executive (Operation)* *B.Sc. in Civil & Environmental Engineering*	**Ulfat Rabbani** *Intern (Operation)* *B. Sc. in ESDM*
Report Prepared by	**Quality Checked**
Tanzir Hosen *Chemist (Operation)* *B.Sc. in Chemistry*	**Imran Hossen** *Sr. Executive (Operation)* *B.Sc. in Civil Engineering*

Report Approved by

Engr. Syed Tasnem Mahmood
Chief Environmental Engineer & CEO
B.Sc. & M.Sc. (Civil and Environmental Engineering)
MIEB No.: M/35960

Introduction:

Indoor air quality (IAQ) is a term which refers to the air quality within buildings and structures, especially as it relates to the health and comfort of building occupants. IAQ can be affected by gases (including carbon monoxide, radon, volatile organic compounds), particulates, microbial contaminants (mold, bacteria), or any mass or energy stressor that can induce adverse health conditions. Source control, filtration and the use of ventilation to dilute contaminants are the primary methods for improving indoor air quality in most buildings. Residential units can further improve indoor air quality by routine cleaning of carpets and area rugs. EPA has guidelines for frequency of cleaning based on traffic, number of household members, pets, children and smokers. Carpets and rugs act like an air filter and must be cleaned.

Determination of IAQ involves the collection of air samples, monitoring human exposure to pollutants, collection of samples on building surfaces, and computer modeling of air flow inside buildings.

IAQ is part of Indoor Environmental Quality (IEQ), which includes IAQ as well as other physical and psychological aspects of life indoors (e.g. lighting, visual quality, acoustics, and thermal comfort).

GREENBUD Testing & Inspection Services Private Limited has been hired to inspect the indoor air quality of **Norp Knit Industries Ltd. (Unit-2).** GREENBUD has covered all the production section for the inspection of the indoor air quality and generated report according to the activity occupancy of the area.

In this report, indoor air quality has been checked for all the production section of the factory. For different area of operation, the result has been stated as an average of our collected indoor air quality data.

Method of Sampling:

Analysis of the indoor air quality 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 TP-GB-04 was followed.

Indoor Air Quality Inspection Result :

Inspection Area					Inspections Status													
Sl No	Building No	Floor/Level	Section	Condition	PM_1 (µg/m³)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	VOC (mg/m³)	CH_2O (mg/m³)	CO (ppm)	CO_2 (ppm)	NO_2 (µg/m³)	SO_2 (µg/m³)	O_3 (ppm)	NH_3 (mg/m³)	H_2S (mg/m³)	Air flow (m/s)
1	Building-1 (Production Building)	Ground Floor	Sewing Knit	Working	34	45	68	0	0	0	395	0	0	0	0	0	0.1
2			Needle Distribution Room	Working	21	34	56	0	0	0	389	0	0	0	0	0	0.1
3			Sewing Woven	Working	24	32	42	0	0	0	404	0	0	0	0	0	0.1
4			Cutting Section	Working	21	36	50	0	0	0	423	0	0	0	0	0	0.2
5			CAD Room	Working	22	31	49	0	0	0	399	0	0	0	0	0	0.1
6			Embroidery Section	Working	35	49	63	0	0	0	416	0	0	0	0	0	0.1
7			Maintenance Room	Working	33	43	54	0	0	0	397	0	0	0	0	0	0.2
8			Office Room	Working	26	39	57	0	0	0	417	0	0	0	0	0	0.1
9			Cut Panel Room	Working	35	47	66	0	0	0	393	0	0	0	0	0	0.2
10			Automation Room	Working	31	42	58	0	0	0	419	0	0	0	0	0	0.2
11			Finishing Section	Working	33	55	62	0	0	0	417	0	0	0	0	0	0.2
12			Packing Area	Working	25	50	68	0	0	0	420	0	0	0	0	0	0.1
13			Spot Removing	Working	27	53	73	0	0	0	432	0	0	0	0	0	0.1
14		1st Floor	Finishing Section	Working	29	45	52	0	0	0	403	0	0	0	0	0	0.2
15			Moisture Room	Working	25	42	67	0	0	0	390	0	0	0	0	0	0.1
16			Heat Seal	Working	15	35	45	0	0	0	412	0	0	0	0	0	0.1
17			Snap Button	Working	26	35	56	0	0	0	421	0	0	0	0	0	0.1
18			Hang Tag	Working	21	32	48	0	0	0	409	0	0	0	0	0	0.1
19			Iron	Working	25	36	58	0	0	0	412	0	0	0	0	0	0.1
20			Thread Sucker	Working	15	26	46	0	0	0	402	0	0	0	0	0	0.1
21			Packing Area	Working	31	44	65	0	0	0	414	0	0	0	0	0	0.1
22			Office Room	Working	33	47	58	0	0	0	419	0	0	0	0	0	0.2
23			Spot Removing-1	Working	32	45	64	0.01	0.002	0	433	0	0	0	0	0	0.1
24			Spot Removing-2	Working	42	58	67	0.01	0.001	0	398	0	0	0	0	0	0.2
25		2nd Floor	Sewing (Woven)	Working	34	44	61	0	0	0	418	0	0	0	0	0	0.1
26			Needle Distribution Room	Working	21	34	43	0	0	0	421	0	0	0	0	0	0.2
27			Maintenance Room	Working	15	32	48	0	0	0	411	0	0	0	0	0	0.2
28	Building-2 (Fire Sefety Building)	Ground Floor	Medical Room	Working	35	51	60	0	0	0	417	0	0	0	0	0	0.1
29			Child Care	Working	32	47	60	0	0	0	424	0	0	0	0	0	0.2
30			HR & Admin Office	Working	32	44	52	0	0	0	403	0	0	0	0	0	0.1
31		1st Floor	Audit Room	Working	26	42	56	0	0	0	415	0	0	0	0	0	0.2
32			Office Room	Working	25	43	52	0	0	0	412	0	0	0	0	0	0.1
33			Training Room	Working	23	35	52	0	0	0	420	0	0	0	0	0	0.1
34			Laser Room	Working	21	37	55	0	0	0	418	0	0	0	0	0	0.2

Inspection Area					Inspections Status												
Sl No	Building No	Floor/Level	Section	Condition	PM_1 (µg/m³)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	VOC (mg/m³)	CH_2O (mg/m³)	CO (ppm)	CO_2 (ppm)	NO_2 (µg/m³)	SO_2 (µg/m³)	O_3 (ppm)	NH_3 (mg/m³)	H_2S (mg/m³)	Air flow (m/s)
35	Building -3 (Wash Building)	Ground Floor	Washing Section	Working	33	45	58	0.01	0.001	0	415	0	0	0	0	0	0.1
36			R&D	Working	12	23	45	0	0	0	408	0	0	0	0	0	0.2
37			Quality	Working	23	34	56	0	0	0	411	0	0	0	0	0	0.2
38			Sample Wash	Working	16	35	47	0	0	0	414	0	0	0	0	0	0.2
39			PP Spray	Working	32	48	62	0.02	0.002	0	432	0	0	0	0	0	0.1
40			Chemical Distribution Room	Working	42	58	67	0.01	0.002	0	392	0	0	0	0	0	0.1
41			Color Lab	Working	34	44	61	0.01	0.001	0	423	0	0	0	0	0	0.2
42			Physical Lab	Working	35	51	60	0.01	0.001	0	399	0	0	0	0	0	0.1
43		1st Floor	Finishing Section	Working	32	47	60	0	0	0	416	0	0	0	0	0	0.1
44			Quality Table	Working	12	25	45	0	0	0	423	0	0	0	0	0	0.1
45			Sewing (Muji)	Working	15	26	42	0	0	0	416	0	0	0	0	0	0.1
46			Spot Removing	Working	39	53	63	0.01	0.002	0	397	0	0	0	0	0	0.2
47			Packing Area	Working	32	40	55	0	0	0	417	0	0	0	0	0	0.1
48		2nd Floor	Finished Goods Store	Working	22	36	49	0	0	0	393	0	0	0	0	0	0.2
49			Inspection Room	Working	31	42	57	0	0	0	419	0	0	0	0	0	0.1
50	Building-4 (Dry Process Building)	Ground Floor	Dry Process Section	Working	30	48	67	0	0	0	417	0	0	0	0	0	0.1
51			Chemical Store	Working	33	50	62	0.01	0.002	0	420	0	0	0	0	0	0.2
52			Lazer Room	Working	39	53	63	0	0	0	432	0	0	0	0	0	0.1
53			Garments Drying	Working	32	40	55	0	0	0	403	0	0	0	0	0	0.1
54		1st Floor	Sample Room	Working	22	36	49	0	0	0	414	0	0	0	0	0	0.2
55			R&D	Working	17	32	43	0	0	0	407	0	0	0	0	0	0.2
56		2nd Floor	Worker Dining	Working	15	39	51	0	0	0	419	0	0	0	0	0	0.1
57			Canteen	Working	28	35	53	0	0	0	433	0	0	0	0	0	0.1
58			Prayer Room	Working	26	47	64	0	0	0	398	0	0	0	0	0	0.1
59			Staff Dining	Working	29	51	63	0	0	0	418	0	0	0	0	0	0.2
60		3rd Floor	Finished Goods Store	Working	26	44	48	0	0	0	417	0	0	0	0	0	0.1
61	Building-5 (New Admin Building)	Ground Floor	Accounts Office	Working	18	32	52	0	0	0	388	0	0	0	0	0	0.1
62			MIS Office	Working	21	34	56	0	0	0	389	0	0	0	0	0	0.1
63			SAP office	Working	19	28	54	0	0	0	390	0	0	0	0	0	0.1
64			Purchase office	Working	14	25	53	0	0	0	411	0	0	0	0	0	0.1
65			IT Office	Working	21	35	57	0	0	0	413	0	0	0	0	0	0.1
66		1st Floor	Marchandising Office	Working	39	51	63	0	0	0	389	0	0	0	0	0	0.2
67		2nd Floor	Marchandising Office	Working	27	40	56	0	0	0	412	0	0	0	0	0	0.1
68		3rd Floor	Design Office	Working	28	39	56	0	0	0	435	0	0	0	0	0	0.2
69		4th Floor	Sample Showroom	Working	26	48	52	0	0	0	455	0	0	0	0	0	0.2
70	Building-6 (Fire Pump House)		Fire Pump Room (1 & 2)	Working	18	28	52	0	0	0	386	0	0	0	0	0	0.2
71	Building-7	Ground Floor	Compressor Room	Working	21	29	36	0	0	0	385	0	0	0	0	0	0.1
72		1st Floor	Compressor Room	Working	20	29	32	0	0	0	386	0	0	0	0	0	0.1

Inspection Area					Inspections Status												
Sl No	Building No	Floor/Level	Section	Condition	PM_1 (µg/m³)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	VOC (mg/m³)	CH_2O (mg/m³)	CO (ppm)	CO_2 (ppm)	NO_2 (µg/m³)	SO_2 (µg/m³)	O_3 (ppm)	NH_3 (mg/m³)	H_2S (mg/m³)	Air flow (m/s)
73	Building-8 (ETP Area		ETP 1	Working	17	27	36	0.02	0.002	0	453	0	0	0	0	0	0.2
74			ETP 2	Working	15	31	56	0	0	0	407	0	0	0	0	0	0.2
75			ETP Lab	Working	12	31	46	0	0	0	412	0	0	0	0	0	0.2
76	Building-9 (Boiler Building)		Boiler Room	Working	18	31	51	0	0	0	412	0	0	0	0	0	0.1
77	Building-10 (Store Building)	Ground Floor	Fabric Lab	Working	29	42	59	0	0	0	399	0	0	0	0	0	0.2
78			Fabric Inspection	Working	14	24	36	0	0	0	411	0	0	0	0	0	0.2
79			Fabric Relaxation Room	Working	25	42	65	0	0	0	395	0	0	0	0	0	0.1
80			Store Office	Working	27	38	71	0	0	0	404	0	0	0	0	0	0.2
81			Fabric Store	Working	24	39	65	0	0	0	399	0	0	0	0	0	0.1
82		1st Floor	Fabric Store	Working	27	46	61	0	0	0	416	0	0	0	0	0	0.1
83		2nd Floor	Woven Cutting	Working	27	36	65	0	0	0	397	0	0	0	0	0	0.2
84			Relaxation Area	Working	21	36	62	0	0	0	393	0	0	0	0	0	0.1
85		3rd Floor	Woven Cutting	Working	25	40	59	0	0	0	419	0	0	0	0	0	0.2
86		4th Floor	Accessories Store	Working	28	37	71	0	0	0	417	0	0	0	0	0	0.1
87		5th Floor	Finished Goods Store	Working	23	46	59	0	0	0	420	0	0	0	0	0	0.1
88			General Store	Working	29	41	66	0	0	0	432	0	0	0	0	0	0.2
89			Utility Store	Working	27	46	69	0	0	0	403	0	0	0	0	0	0.1
90			Cut to Ship Room	Working	26	48	52	0	0	0	455	0	0	0	0	0	0.1
91	Building-11 (Security Building)		Security Room	Working	28	42	56	0	0	0	412	0	0	0	0	0	0.1
92	Building-12 (Wastage Building)		Wastage Store	Working	25	40	59	0	0	0	419	0	0	0	0	0	0.2
93	Building-13 (Panal Control Building)		Fire Panel Room	Working	28	37	71	0	0	0	417	0	0	0	0	0	0.1
94			CCTV Monitoring Room	Working	23	46	59	0	0	0	420	0	0	0	0	0	0.1
95	Shed-1 (Utility Shed)		Boiler Room	Working	29	41	66	0	0	0	432	0	0	0	0	0	0.2
96			Generator Room	Working	24	36	56	0	0	0	390	0	0	0	0	0	0.2
97			Control Room	Working	31	45	67	0	0	0	391	0	0	0	0	0	0.2

****Abbreviations and Acronyms:** *CO=Carbon Monoxide; CO_2=Carbon dioxide; O_2=Oxygen; SPM= Suspended Particulate Matter; PM_{10}=Particulate Matter 10; $PM_{2.5}$= Particulate Matter 2.5; PM_1= Particulate Matter 1; VOC=Volatile organic compound, NYS= Not Yet Se*

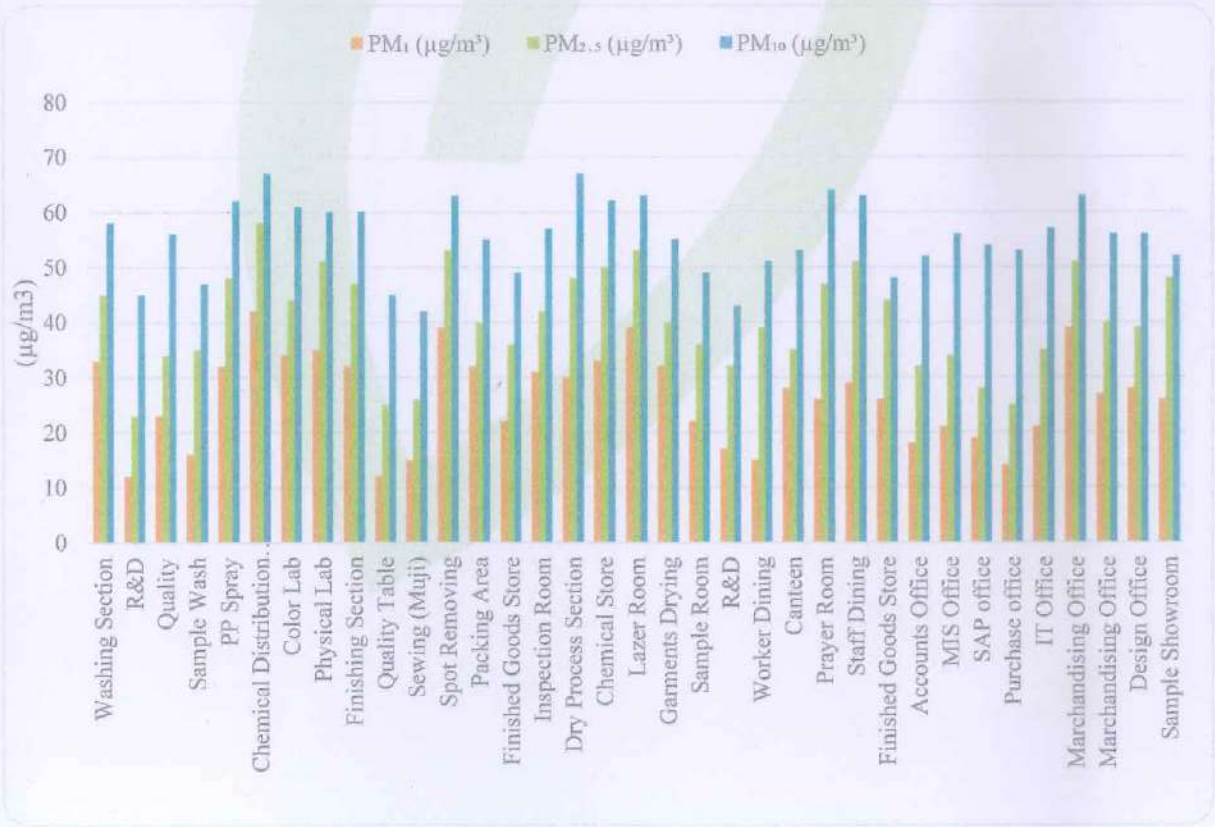
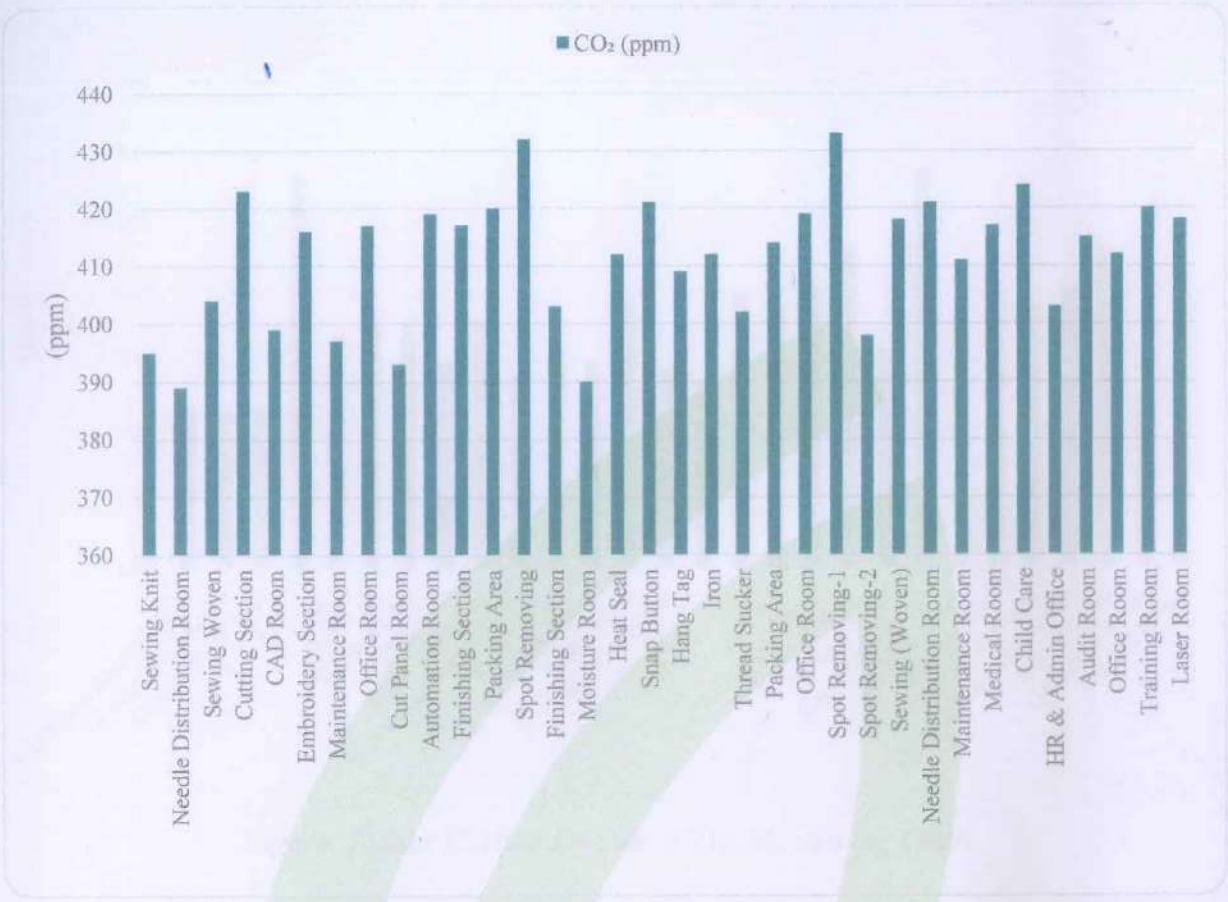


Figure: Indoor Particulate level Monitoring Chart

Figure: Indoor Particulate level Monitoring Chart



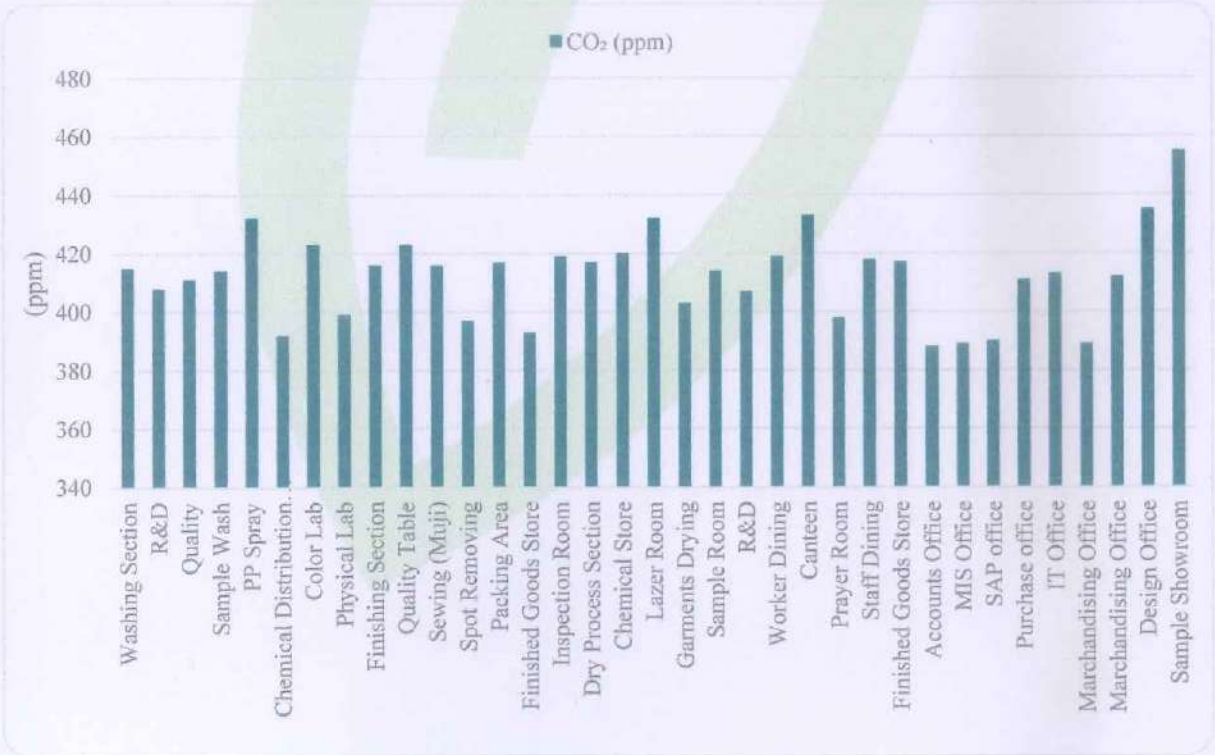


Figure: Indoor Carbon Dioxide (CO_2) Monitoring Chart

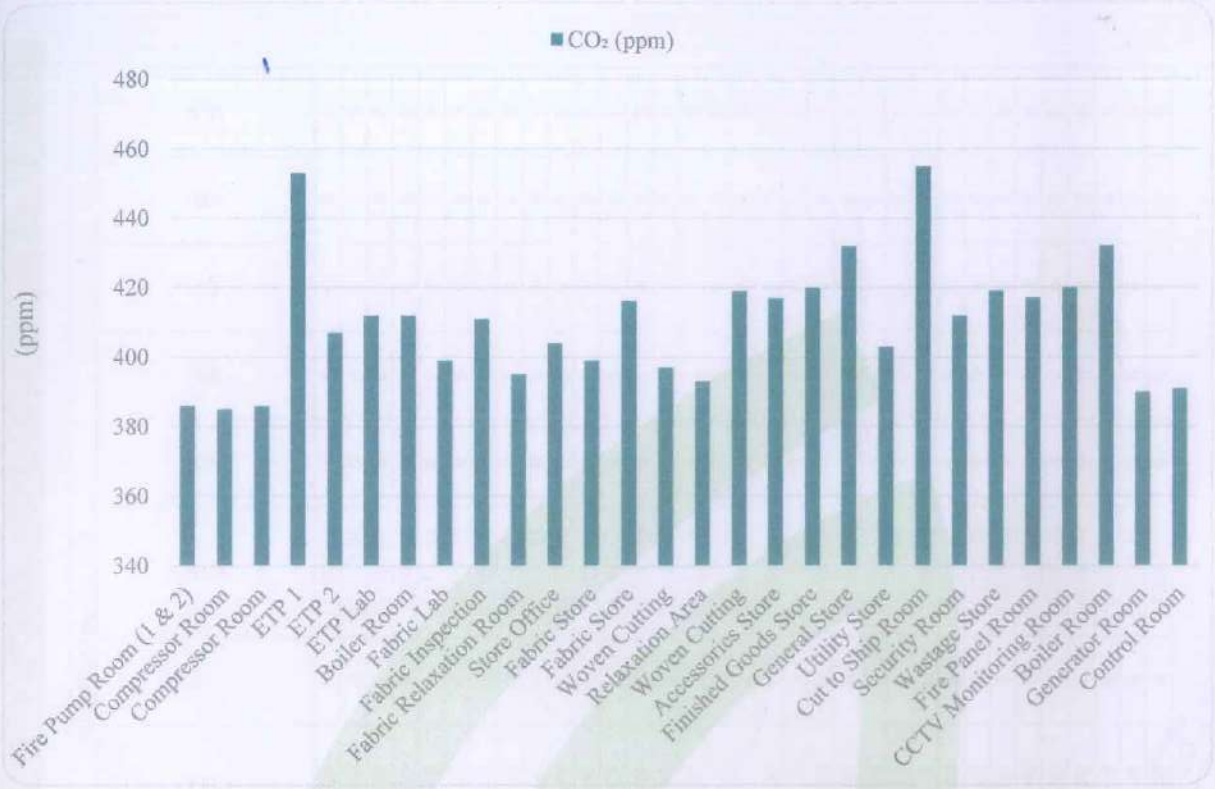


Figure: Indoor Carbon Dioxide (CO_2) Monitoring Chart

Hourly Mass Emission Rate :

Inspection Area					Mass Flux (mg/hr.-m2)											
SL. NO.	Building No	Floor/Level	Section	Condition	PM 1.0	PM 2.5	PM 10	VOC	CH_2O	CO	CO_2	NO_2	SO_2	O_3	NH_3	H_2S
1	Building-1 (Production Building)	Ground Floor	Sewing Knit	Working	12.24	16.20	24.48	0.00	0.00	0	255903.12	0	0	0	0	0
2			Needle Distribution Room	Working	7.56	12.24	20.16	0.00	0.00	0	252015.98	0	0	0	0	0
3			Sewing Woven	Working	17.28	23.04	30.24	0.00	0.00	0	523467.65	0	0	0	0	0
4			Cutting Section	Working	7.56	12.96	18.00	0.00	0.00	0	274043.09	0	0	0	0	0
5			CAD Room	Working	7.92	11.16	17.64	0.00	0.00	0	258494.54	0	0	0	0	0
6			Embroidery Section	Working	25.20	35.28	45.36	0.00	0.00	0	539016.19	0	0	0	0	0
7			Maintenance Room	Working	11.88	15.48	19.44	0.00	0.00	0	257198.83	0	0	0	0	0
8			Office Room	Working	18.72	28.08	41.04	0.00	0.00	0	540311.90	0	0	0	0	0
9			Cut Panel Room	Working	25.20	33.84	47.52	0.00	0.00	0	509214.82	0	0	0	0	0
10			Automation Room	Working	22.32	30.24	41.76	0.00	0.00	0	542903.33	0	0	0	0	0
11			Finishing Section	Working	11.88	19.80	22.32	0.00	0.00	0	270155.95	0	0	0	0	0
12			Packing Area	Working	9.00	18.00	24.48	0.00	0.00	0	272099.52	0	0	0	0	0
13			Spot Removing	Working	19.44	38.16	52.56	0.00	0.00	0	559747.58	0	0	0	0	0
14		1st Floor	Finishing Section	Working	10.44	16.20	18.72	0.00	0.00	0	261085.97	0	0	0	0	0
15			Moisture Room	Working	18.00	30.24	48.24	0.00	0.00	0	505327.68	0	0	0	0	0
16			Heat Seal	Working	5.40	12.60	16.20	0.00	0.00	0	266916.67	0	0	0	0	0
17			Snap Button	Working	18.72	25.20	40.32	0.00	0.00	0	545494.75	0	0	0	0	0
18			Hang Tag	Working	7.56	11.52	17.28	0.00	0.00	0	264973.10	0	0	0	0	0
19			Iron	Working	9.00	12.96	20.88	0.00	0.00	0	266916.67	0	0	0	0	0
20			Thread Sucker	Working	10.80	18.72	33.12	0.00	0.00	0	520876.22	0	0	0	0	0
21			Packing Area	Working	11.16	15.84	23.40	0.00	0.00	0	268212.38	0	0	0	0	0
22			Office Room	Working	23.76	33.84	41.76	0.00	0.00	0	542903.33	0	0	0	0	0
23			Spot Removing-1	Working	11.52	16.20	23.04	3.60	0.72	0	280521.65	0	0	0	0	0
24			Spot Removing-2	Working	15.12	20.88	24.12	3.60	0.36	0	257846.69	0	0	0	0	0
25		2nd Floor	Sewing (Woven)	Working	24.48	31.68	43.92	0.00	0.00	0	541607.62	0	0	0	0	0
26			Needle Distribution Room	Working	7.56	12.24	15.48	0.00	0.00	0	272747.38	0	0	0	0	0
27			Maintenance Room	Working	5.40	11.52	17.28	0.00	0.00	0	266268.82	0	0	0	0	0
28	Building-2 (Fire Safety Building)	Ground Floor	Medical Room	Working	12.60	18.36	21.60	0.00	0.00	0	270155.95	0	0	0	0	0
29			Child Care	Working	23.04	33.84	43.20	0.00	0.00	0	549381.89	0	0	0	0	0
30			HR & Admin Office	Working	11.52	15.84	18.72	0.00	0.00	0	261085.97	0	0	0	0	0
31		1st Floor	Audit Room	Working	9.36	15.12	20.16	0.00	0.00	0	268860.24	0	0	0	0	0
32			Office Room	Working	18.00	30.96	37.44	0.00	0.00	0	533833.34	0	0	0	0	0
33			Training Room	Working	8.28	12.60	18.72	0.00	0.00	0	272099.52	0	0	0	0	0

Inspection Area					Mass Flux (mg/hr.-m2)											
SL. NO.	Building No	Floor/Level	Section	Condition	PM 1.0	PM 2.5	PM 10	VOC	CH_2O	CO	CO_2	NO_2	SO_2	O_3	NH_3	H_2S
34			Laser Room	Working	15.12	33.84	39.60	0.00	0.00	0	541607.62	0	0	0	0	0
35	Building -3 (Wash Building)	Ground Floor	Washing Section	Working	11.88	16.20	20.88	3.60	0.36	0	268860.24	0	0	0	0	0
36			R&D	Working	4.32	8.28	16.20	0.00	0.00	0	264325.25	0	0	0	0	0
37			Quality	Working	16.56	24.48	40.32	0.00	0.00	0	532537.63	0	0	0	0	0
38			Sample Wash	Working	5.76	12.60	16.92	0.00	0.00	0	268212.38	0	0	0	0	0
39			PP Spray	Working	11.52	17.28	22.32	7.20	0.72	0	279873.79	0	0	0	0	0
40			Chemical Distribution Room	Working	30.24	41.76	48.24	7.20	1.44	0	507919.10	0	0	0	0	0
41			Color Lab	Working	12.24	15.84	21.96	3.60	0.36	0	274043.09	0	0	0	0	0
42			Physical Lab	Working	12.60	18.36	21.60	3.60	0.36	0	258494.54	0	0	0	0	0
43		1st Floor	Finishing Section	Working	11.52	16.92	21.60	0.00	0.00	0	269508.10	0	0	0	0	0
44			Quality Table	Working	8.64	18.00	32.40	0.00	0.00	0	548086.18	0	0	0	0	0
45			Sewing (Muji)	Working	5.40	9.36	15.12	0.00	0.00	0	269508.10	0	0	0	0	0
46			Spot Removing	Working	14.04	19.08	22.68	3.60	0.72	0	257198.83	0	0	0	0	0
47			Packing Area	Working	23.04	28.80	39.60	0.00	0.00	0	540311.90	0	0	0	0	0
48		2nd Floor	Finished Goods Store	Working	7.92	12.96	17.64	0.00	0.00	0	254607.41	0	0	0	0	0
49			Inspection Room	Working	22.32	30.24	41.04	0.00	0.00	0	542903.33	0	0	0	0	0
50	Building-4 (Dry Process Building)	Ground Floor	Dry Process Section	Working	21.60	34.56	48.24	0.00	0.00	0	540311.90	0	0	0	0	0
51			Chemical Store	Working	23.76	36.00	44.64	7.20	1.44	0	544199.04	0	0	0	0	0
52			Lazer Room	Working	14.04	19.08	22.68	0.00	0.00	0	279873.79	0	0	0	0	0
53			Garments Drying	Working	11.52	14.40	19.80	0.00	0.00	0	261085.97	0	0	0	0	0
54		1st Floor	Sample Room	Working	15.84	25.92	35.28	0.00	0.00	0	536424.77	0	0	0	0	0
55			R&D	Working	6.12	11.52	15.48	0.00	0.00	0	263677.39	0	0	0	0	0
56		2nd Floor	Worker Dining	Working	10.80	28.08	36.72	0.00	0.00	0	542903.33	0	0	0	0	0
57			Canteen	Working	10.08	12.60	19.08	0.00	0.00	0	280521.65	0	0	0	0	0
58			Prayer Room	Working	18.72	33.84	46.08	0.00	0.00	0	515693.38	0	0	0	0	0
59			Staff Dining	Working	10.44	18.36	22.68	0.00	0.00	0	270803.81	0	0	0	0	0
60		3rd Floor	Finished Goods Store	Working	9.36	15.84	17.28	0.00	0.00	0	270155.95	0	0	0	0	0
61	Building-5 (New Admin Building)	Ground Floor	Accounts Office	Working	12.96	23.04	37.44	0.00	0.00	0	502736.26	0	0	0	0	0
62			MIS Office	Working	7.56	12.24	20.16	0.00	0.00	0	252015.98	0	0	0	0	0
63			SAP office	Working	13.68	20.16	38.88	0.00	0.00	0	505327.68	0	0	0	0	0
64			Purchase office	Working	5.04	9.00	19.08	0.00	0.00	0	266268.82	0	0	0	0	0
65			IT Office	Working	7.56	12.60	20.52	0.00	0.00	0	267564.53	0	0	0	0	0
66		1st Floor	Marchandising Office	Working	28.08	36.72	45.36	0.00	0.00	0	504031.97	0	0	0	0	0
67		2nd Floor	Marchandising Office	Working	9.72	14.40	20.16	0.00	0.00	0	266916.67	0	0	0	0	0
68		3rd Floor	Design Office	Working	10.08	14.04	20.16	0.00	0.00	0	281817.36	0	0	0	0	0

Inspection Area					Mass Flux (mg/hr.-m2)											
SL. NO.	Building No	Floor/Level	Section	Condition	PM 1.0	PM 2.5	PM 10	VOC	CH_2O	CO	CO_2	NO_2	SO_2	O_3	NH_3	H_2S
69		4th Floor	Sample Showroom	Working	9.36	17.28	18.72	0.00	0.00	0	294774.48	0	0	0	0	0
70	Building-6 (Fire Pump House)		Fire Pump Room (1 & 2)	Working	12.96	20.16	37.44	0.00	0.00	0	500144.83	0	0	0	0	0
71	Building-7	Ground Floor	Compressor Room	Working	7.56	10.44	12.96	0.00	0.00	0	249424.56	0	0	0	0	0
72		1st Floor	Compressor Room	Working	7.20	10.44	11.52	0.00	0.00	0	250072.42	0	0	0	0	0
73	Building-8 (ETP Area)		ETP 1	Working	12.24	19.44	25.92	14.40	1.44	0	586957.54	0	0	0	0	0
74			ETP 2	Working	10.80	22.32	40.32	0.00	0.00	0	527354.78	0	0	0	0	0
75			ETP Lab	Working	8.64	22.32	33.12	0.00	0.00	0	533833.34	0	0	0	0	0
76	Building-9 (Boiler Building)		Boiler Room	Working	12.96	22.32	36.72	0.00	0.00	0	533833.34	0	0	0	0	0
77	Building-10 (Store Building)	Ground Floor	Fabric Lab	Working	20.88	30.24	42.48	0.00	0.00	0	516989.09	0	0	0	0	0
78			Fabric Inspection	Working	10.08	17.28	25.92	0.00	0.00	0	532537.63	0	0	0	0	0
79			Fabric Relaxation Room	Working	18.00	30.24	46.80	0.00	0.00	0	511806.24	0	0	0	0	0
80			Store Office	Working	19.44	27.36	51.12	0.00	0.00	0	523467.65	0	0	0	0	0
81			Fabric Store	Working	17.28	28.08	46.80	0.00	0.00	0	516989.09	0	0	0	0	0
82		1st Floor	Fabric Store	Working	19.44	33.12	43.92	0.00	0.00	0	539016.19	0	0	0	0	0
83		2nd Floor	Woven Cutting	Working	19.44	25.92	46.80	0.00	0.00	0	514397.66	0	0	0	0	0
84			Relaxation Area	Working	15.12	25.92	44.64	0.00	0.00	0	509214.82	0	0	0	0	0
85		3rd Floor	Woven Cutting	Working	18.00	28.80	42.48	0.00	0.00	0	542903.33	0	0	0	0	0
86		4th Floor	Accessories Store	Working	20.16	26.64	51.12	0.00	0.00	0	540311.90	0	0	0	0	0
87		5th Floor	Finished Goods Store	Working	16.56	33.12	42.48	0.00	0.00	0	544199.04	0	0	0	0	0
88			General Store	Working	20.88	29.52	47.52	0.00	0.00	0	559747.58	0	0	0	0	0
89			Utility Store	Working	19.44	33.12	49.68	0.00	0.00	0	522171.94	0	0	0	0	0
90			Cut to Ship Room	Working	18.72	34.56	37.44	0.00	0.00	0	589548.96	0	0	0	0	0
91	Building-11 (Security Building)		Security Room	Working	20.16	30.24	40.32	0.00	0.00	0	533833.34	0	0	0	0	0
92	Building-12 (Wastage Building)		Wastage Store	Working	18.00	28.80	42.48	0.00	0.00	0	542903.33	0	0	0	0	0
93	Building-13 (Panal Control Building)		Fire Panel Room	Working	20.16	26.64	51.12	0.00	0.00	0	540311.90	0	0	0	0	0
94			CCTV Monitoring Room	Working	16.56	33.12	42.48	0.00	0.00	0	544199.04	0	0	0	0	0
95	Shed-1 (Utility Shed)		Boiler Room	Working	20.88	29.52	47.52	0.00	0.00	0	559747.58	0	0	0	0	0
96			Generator Room	Working	17.28	25.92	40.32	0.00	0.00	0	505327.68	0	0	0	0	0
97			Control Room	Working	22.32	32.40	48.24	0.00	0.00	0	506623.39	0	0	0	0	0
Avg. Mass Emission in mg/hr:					**14.315**	**22.294**	**31.802**	**0.594**	**0.082**	**0.000**	**412109.884**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Total Mass Emission in mg/hr:					**1388.5**	**2162.5**	**3084.8**	**57.6**	**7.9**	**0.0**	**39974658.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Mass Emission in Kg/hr:					**0.0014**	**0.0022**	**0.0031**	**0.0001**	**0.0000**	**0.0000**	**39.9747**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Inspection Area					Mass Flux (mg/hr.-m2)											
SL. NO.	Building No	Floor/Level	Section	Condition	PM 1.0	PM 2.5	PM 10	VOC	CH_2O	CO	CO_2	NO_2	SO_2	O_3	NH_3	H_2S
Total Mass Emission in Kg/yr:					3.2436	5.0516	7.2062	0.1346	0.0185	0.0000	93380.8029	0.0000	0.0000	0.0000	0.0000	0.0000
Total Mass Emission in ton/yr:					0.0032	0.0051	0.0072	0.00013	0.0000185	0	93.380803	0	0	0	0	0

**Abbreviations and Acronyms: *CO=Carbon Monoxide; CO_2=Carbon dioxide; O_3=Oxygen; PM_{10}=Particulate Matter 10; $PM_{2.5}$= Particulate Matter 2.5; PM_1= Particulate Matter 1; VOC=Volatile organic compound, NYS= Not Yet Set.*

Discussion and Recommendation:

GREENBUD Testing & Inspection Services Private Limited has inspected the indoor air quality of **Norp Knit Industries Ltd. (Unit-2)** and ensured that all the production sections are covered. As standard limits for indoor air quality is yet to set by the national guideline, therefore, it cannot conclude whether these parameters are in compliance with the standard or not. However, the proponent needs to consider that the concentration of parameters presented in this report is instantaneous data which had found during inspection and may vary over the period of time.

The factory management may follow the below mentioned recommendation for further improvement of the existing air quality:

- ✓ Restrict any kind of onsite waste disposal, incineration or open burning
- ✓ Improve existing ventilation system
- ✓ Use household products according to manufacturer's directions.
- ✓ Dispose unused or little-used containers safely; buy in quantities that you will use soon.

Factory is suggested to assess the indoor air quality at least once annually if all other setups remain constant.

Engr. Syed Tasnem Mahmood
CEO and Chief Environmental Engineer
GREENBUD Testing & Inspection Services Private Ltd.
MIEB No.: MI35960
ISO 14001 Certification No.: EA/15/IN/16050
ISO 50001 Certification No.: ENMS/16/IN/533

Inspection Instrument:

Air Quality Meter – JD-3002

Air Quality Meter -DM106

Multi Gas detector-BH-4S

Carbon Monoxide Meter- pyle pcmm05

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Ambient Air Quality Inspection

Norp Knit Industries Ltd. (Unit-2)

Inspection Ref.: H/A 11726

Contact Us

Corporate Head Office:
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CERTIFIED ISO 17020:2012 COMPANY

BAB

General Information		
Invoice Reference No: GB/2025/01/82		Inspection Date: 01.02.2025
Inspection Reference No: **H/A 11726**		Inspection Duration: 11am-5pm
Report Generation Date:	06.02.2025	Inspection location: Around of factory premises
Report Submission Date:	08.02.2025	Inspection Description: Ambient Air Quality Inspection
Inspection Standards: 2004/108/EEC		
Company Name: **Norp Knit Industries Ltd. (Unit-2)** *Address: Shi-152/2 (Old), B-01/1 (New), Islampur, Kodda Nandun, Bason, Gazipur.*		Contact Person: **Md. Shahidul Islam** *Manager-Compliance*

On Site Inspection Team	
Toriqul Islam *Executive (Operation)* *B.Sc. in Civil & Environmental Engineering*	**Ulfat Rabbani** *Intern (Operation)* *B. Sc. in ESDM*
Report Prepared by	**Quality Checked**
Tanzir Hosen *Chemist (Operation)* *B.Sc. in Chemistry*	**Imran Hossen** *Sr. Executive (Operation)* *B.Sc. in Civil Engineering*

Report Approved by:

Engr. Syed Tasnem Mahmood
Chief Environmental Engineer & CEO,
B.Sc. & M.Sc. (Civil and Environmental Engineering)
MIEB No.: M/35960

Introduction:

Ambient Air Quality (AAQ) is a term which refers to the air quality around buildings and structures, especially as it relates to the health and comfort of building occupants. AAQ can be affected by gases (including carbon monoxide, radon, volatile organic compounds), particulates, microbial contaminants (mold, bacteria), or any mass or energy stressor that can induce adverse health conditions. Source control, filtration and the use of ventilation to dilute contaminants are the primary methods for improving ambient air quality. Residential units can further improve ambient air quality by routine cleaning of carpets and area rugs.

Determination of AAQ involves the collection of air samples, monitoring human exposure to pollutants, collection of samples on building surfaces, and computer modeling of air flow inside buildings.

AAQ is part of Ambient Environmental Quality (AEQ), which includes AAQ as well as other physical and psychological aspects of life Ambient (e.g., lighting, visual quality, acoustics, and thermal comfort).

Norp Knit Industries Ltd. (Unit-2) has hired GREENBUD Testing & Inspection Services Private Limited to inspect the ambient air quality. GREENBUD has covered four different points around the premises for the inspection of the ambient air quality and generated the report according to the condition of the area.

Method of Sampling:

Analysis of the ambient air quality parameters was done using direct reading instruments. So, there was no separate sampling conducted for this analysis. During the analysis, a standard work instruction stated in the TP-GB-04 was followed.

Method of Analysis:

The following methods were used to analyze the air quality parameters:

Parameters	Methods
SO_2 (Sulfur Dioxide)	Electrochemical
CO (Carbon Monoxide)	Electrochemical
CO_2 (Carbon Dioxide)	Non-Dispersive Infrared (NDIR)
NH_3 (Ammonia)	Indophenol
Pb (Lead)	AAS method after sampling on filter paper
Suspended Particulate Matter (SPM)	Calculated
Nitrogen Dioxide (NO_2)	Electrochemical
Particulate Matter	Electrochemical
Volatile Organic Compound (VOC)	Electrochemical
Formaldehyde (CH_2O)	Electrochemical

Reference Standard:

Parameters	$PM_{2.5}$	PM_{10}	VOC	CH_2O	NO_2	SO_2	CO	CO_2	O_3	NH_3	Pb
Air Pollution Control Rules 2022[1]	65 ($\mu g/m^3$)	150 ($\mu g/m^3$)	*NYS* (mg/m^3)	*NYS* (mg/m^3)	80$\mu g/m^3$ (0.043 ppm)	80 $\mu g/m^3$ (0 0.031 ppm)	5mg/m^3 (4.36) ppm	*NYS* (ppm)	100 $\mu g/m^3$ (0.051) ppm	100 $\mu g/m^3$ (0.051) ppm	0.25 $\mu g/m^3$ (2.5E-7 ppm)

Ambient Air Quality Inspection Result:

Sl. No	Inspection Area		SPM	PM_1	$PM_{2.5}$	PM_{10}	VOC	CH_2O	NO_2	SO_2	CO	CO_2	O_3	NH_3	Pb
	Point	Sample	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	(mg/m^3)	(mg/m^3)	($\mu g/m^3$)	($\mu g/m^3$)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
1	Location - 01 (North Side)	Sample-01	81	27	41	62	0	0	0	0	0	409	0	0	0
2		Sample-02	77	26	39	59	0	0	0	0	0	411	0	0	0
3	Location - 02 (East Side)	Sample-01	92	38	54	71	0	0	0	0	0	432	0	0	0
4		Sample-02	90	39	53	69	0	0	0	0	0	429	0	0	0
5	Location - 03 (South Side)	Sample-01	68	23	36	52	0	0	0	0	0	401	0	0	0
6		Sample-02	64	24	35	49	0	0	0	0	0	403	0	0	0
7	Location - 04 (West Side)	Sample-01	94	41	56	72	0	0	0	0	0	422	0	0	0
8		Sample-02	95	42	55	73	0	0	0	0	0	421	0	0	0

****Abbreviations & Acronyms:** *PM_1 = Particulate Matter 1; $PM_{2.5}$ = Particulate Matter 2.5; PM_{10} = Particulate Matter 10; CO = Carbon monoxide; CO_2 = Carbon dioxide; SO_2 = Sulfur Dioxide; NO_2 = Nitrogen Dioxide.*

[1] DOE, "Air Pollution Control Rules'2022" Schedule-01, Department of Environment, Govt. of Bangladesh

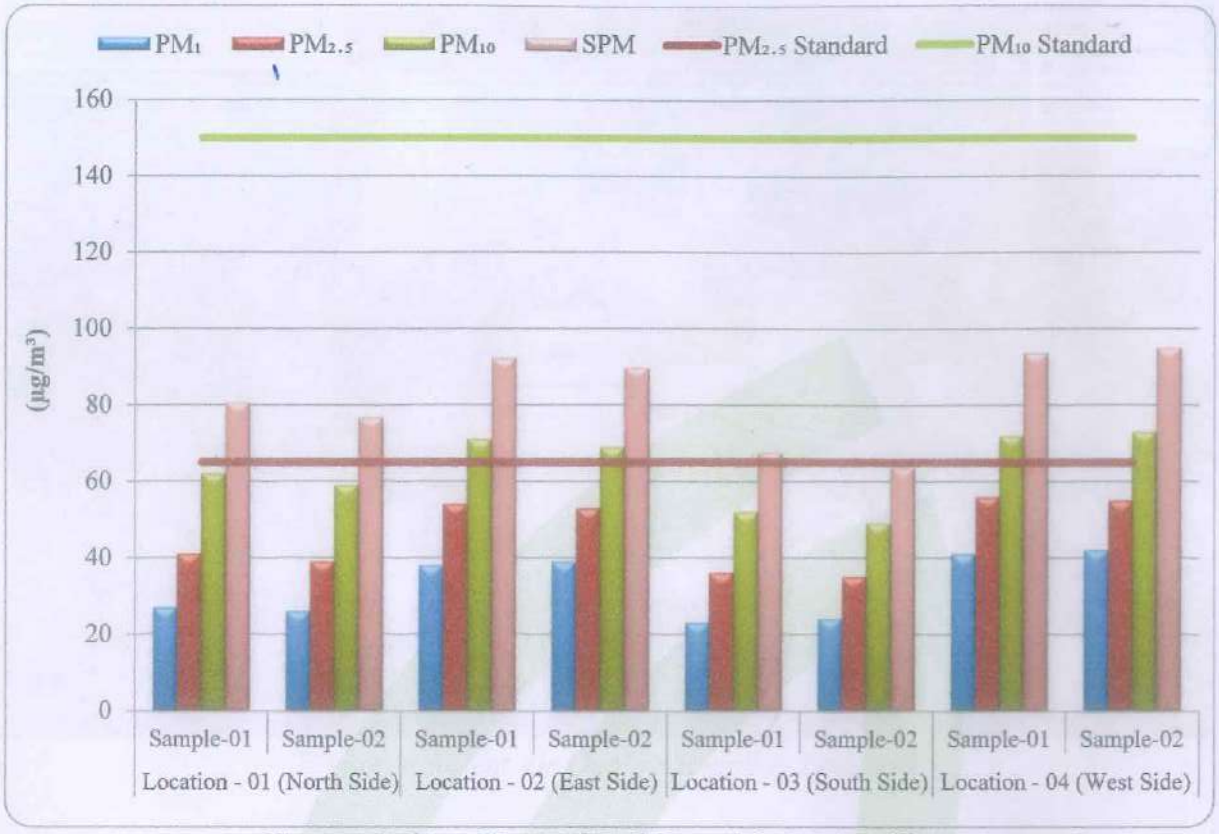

Figure: Ambient Particulate Matter Monitoring Chart

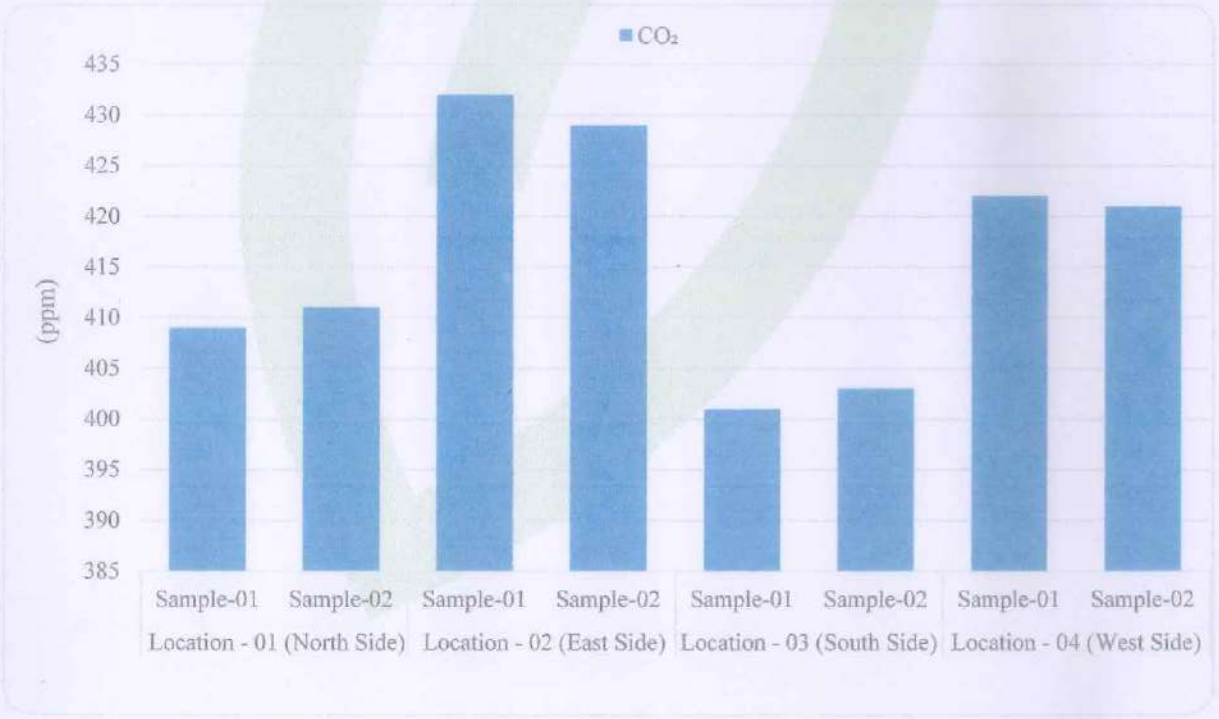

Figure: Ambient Carbon Dioxide (CO_2) Monitoring Chart

Figure: Ambient Air Quality Sampling Location

Discussion and Recommendation:

GREENBUD Testing & Inspection Services Private Limited has adopted the **Air Pollution Control Rules-2022** guidelines for testing ambient air quality of the **Norp Knit Industries Ltd. (Unit-2).** During inspection, it has been found that all of the parameters were within the standard limit, given by **Air Pollution Control Rules-2022**. However, no traces of VOC, CH_2O, NO_2, SO_2, O_3, Pb and NH_3 were found during the inspection. As standard limit for CO_2, VOC and CH_2O has not yet set in the **Air Pollution Control Rules-2022**. Therefore, it was not possible to conclude whether these parameters were within or exceeded the limit.

The management may follow the following recommendation for further improvement:

- ✓ More Tree plantation around the factory premises
- ✓ Restrict any kind of onsite waste disposal, incineration or open burning
- ✓ Control factory vehicle movement
- ✓ Road watering/road paving with stone to reduce dust generation
- ✓ Regular Air quality monitoring.

Factory is suggested to assess the ambient air quality at least once annually if all other setups remain constant.

Engr. Syed Tasnem Mahmood
CEO and Chief Environmental Engineer
GREENBUD Testing & Inspection Services Private Limited
MIEB No.: M/35960
ISO 14001 Certification No: EA/15/IN/16050
ISO 50001 Certification No: ENMS/16/IN/533

ANNEXURE

Figure: Ambient Air Quality Inspection

Inspection Instrument:

Air Quality Meter – JD-3002

Air Quality Meter -DM106

Multi Gas detector-BH-4S

Carbon Monoxide Meter- pyle pcmm05

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Indoor Noise Level Inspection

Norp Knit Industries Ltd. (Unit-2)

Inspection Ref. No.: **B/N 11768**

Contact Us

Corporate Head Office:
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CERTIFIED ISO 17020:2012 COMPANY

BAB

General Information		
Invoice Reference No: GB/2025/01/82		Inspection Date: 01.02.2025
Inspection Reference No: **B/N 11768**		Inspection Duration: 11am-5pm
Report Generation Date:	06.02.2025	Inspection Description: Indoor Noise Level
Report Submission Date:	08.02.2025	Inspection Location: Inside Factory Building
Inspection Standards: 2004/108/EEC		
Company Name: **Norp Knit Industries Ltd. (Unit-2)** *Address: Shi-152/2 (Old), B-01/1 (New), Islampur, Kodda Nandun, Bason, Gazipur.*		Contact Person: **Md. Shahidul Islam** *Manager-Compliance*

On Site Inspection Team	
Toriqul Islam *Executive (Operation)* *B.Sc. in Civil & Environmental Engineering*	**Ulfat Rabbani** *Intern (Operation)* *B. Sc. in ESDM*
Report Prepared by	**Quality Checked**
Tanzir Hosen *Chemist (Operation)* *B.Sc. in Chemistry*	**Imran Hossen** *Sr. Executive (Operation)* *B.Sc. in Civil Engineering*

Report Approved by:

Engr. Syed Tasnem Mahmood
Chief Environmental Engineer & CEO
B.Sc. & M.Sc. (Civil and Environmental Engineering)
MIEB No.: M/35960

Indoor Noise Level Inspection Result:

Inspection Area					Inspection Status			
Sl. No	Building No	Floor/Level	Section	Condition	Reference Standard	Obtained Result (dB)	NIOSH	BLR
1	Building-1 (Production Building)	Ground Floor	Sewing Knit	Working	NIOSH (REL) = 85dB (8 hours TWA) Bangladesh Labor Rules, 2015 (Sec: 68) = 80dB	77	√	√
2			Needle Distribution Room	Working		60	√	√
3			Sewing Woven	Working		66	√	√
4			Cutting Section	Working		63	√	√
5			CAD Room	Working		59	√	√
6			Embroidery Section	Working		78	√	√
7			Maintenance Room	Working		61	√	√
8			Office Room	Working		59	√	√
9			Cut Panel Room	Working		52	√	√
10			Automation Room	Working		65	√	√
11			Finishing Section	Working		71	√	√
12			Packing Area	Working		65	√	√
13			Spot Removing	Working		78	√	√
14		1st Floor	Finishing Section	Working		67	√	√
15			Moisture Room	Working		47	√	√
16			Heat Seal	Working		56	√	√
17			Snap Button	Working		71	√	√
18			Hang Tag	Working		69	√	√
19			Iron	Working		71	√	√
20			Thread Sucker	Working		74	√	√
21			Packing Area	Working		65	√	√
22			Office Room	Working		54	√	√
23			Spot Removing-1	Working		77	√	√
24			Spot Removing-2	Working		78	√	√
25		2nd Floor	Needle Distribution Room	Working		56	√	√
26			Maintenance Room	Working		51	√	√
27			Sewing (Woven)	Working		71	√	√
28	Building-2 (Fire Safety Building)	Ground Floor	Medical Room	Working		59	√	√
29			Child Care	Working		61	√	√
30			HR & Admin Office	Working		59	√	√
31		1st Floor	Audit Room	Working		52	√	√
32			Office Room	Working		53	√	√
33			Training Room	Working		56	√	√
34			Laser Room	Working		66	√	√
35	Building -3 (Wash Building)	Ground Floor	Washing Section	Working		69	√	√
36			R&D	Working		61	√	√
37			Quality	Working		58	√	√
38			Sample Wash	Working		68	√	√
39			PP Spray	Working		73	√	√
40			Chemical Distribution Room	Working		62	√	√
41			Color Lab	Working		61	√	√
42			Physical Lab	Working		56	√	√
43		1st Floor	Finishing Section	Working		61	√	√
44			Quality Table	Working		51	√	√
45			Sewing (Muji)	Working		76	√	√
46			Spot Removing	Working		78	√	√
47			Packing Area	Working		71	√	√
48		2nd Floor	Finished Goods Store	Working		54	√	√
49			Inspection Room	Working		56	√	√
50	Building-4 (Dry Process Building)	Ground Floor	Dry Process Section	Working		71	√	√
51			Chemical Store	Working		59	√	√
52			Lazer Room	Working		62	√	√
53			Garments Drying	Working		71	√	√
54		1st Floor	R&D	Working		68	√	√
55			Sample Room	Working		56	√	√

Inspection Area					Inspection Status			
Sl. No	Building No	Floor/Level	Section	Condition	Reference Standard	Obtained Result (dB)	NIOSH	BLR
56	Building-4 (Dry Process Building)	2nd Floor	Worker Dining	Working		61	√	√
57			Canteen	Working		59	√	√
58			Prayer Room	Working		55	√	√
59			Staff Dining	Working		62	√	√
60		3rd Floor	Finished Goods Store	Working		55	√	√
61	Building-5 (New Admin Building)	Ground Floor	Accounts Office	Working		56	√	√
62			MIS Office	Working		56	√	√
63			SAP office	Working		58	√	√
64			Purchase office	Working		61	√	√
65			IT Office	Working		62	√	√
66		1st Floor	Merchandising Office	Working		61	√	√
67		2nd Floor	Merchandising Office	Working		59	√	√
68		3rd Floor	Design Office	Working		56	√	√
69		4th Floor	Sample Showroom	Working		52	√	√
70	Building-6 (Fire Pump House)		Fire Pump Room (1 & 2)	Working		54	√	√
71	Building-7	Ground Floor	Compressor Room	Working		74	√	√
72		1st Floor	Compressor Room	Working		78	√	√
73	Building-8 (ETP Area)		ETP 1	Working		64	√	√
74			ETP 2	Working		65	√	√
75			ETP Lab	Working		56	√	√
76	Building-9 (Boiler Building)		Boiler Room	Working		79	√	√
77	Building-10 (Store Building)	Ground Floor	Fabric Lab	Working		56	√	√
78			Fabric Inspection	Working		53	√	√
79			Fabric Relaxation Room	Working		61	√	√
80			Store Office	Working		59	√	√
81			Fabric Store	Working		56	√	√
82		1st Floor	Fabric Store	Working		53	√	√
83		2nd Floor	Woven Cutting	Working		77	√	√
84			Relaxation Area	Working		62	√	√
85		3rd Floor	Woven Cutting	Working		71	√	√
86		4th Floor	Accessories Store	Working		56	√	√
87		5th Floor	Finished Goods Store	Working		61	√	√
88			General Store	Working		54	√	√
89			Utility Store	Working		58	√	√
90			Cut to Ship Room	Working		66	√	√
91	Building-11 (Security Building)		Security Room	Working		61	√	√
92	Building-12 (Wastage Building)		Wastage Store	Working		59	√	√
93	Building-13 (Panel Control Building)		Fire Panel Room	Working		56	√	√
94			CCTV Monitoring Room	Working		54	√	√
95	Shed-1 (Utility Shed)		Boiler Room	Working		86	x	x
96			Generator Room	Working		89	x	x
97			Control Room	Working		78	√	√

****Abbreviations and Acronyms:** *dB=Decibel, BLR= Bangladesh Labor Rules, NIOSH= National Institute for Occupational Safety and Health.*

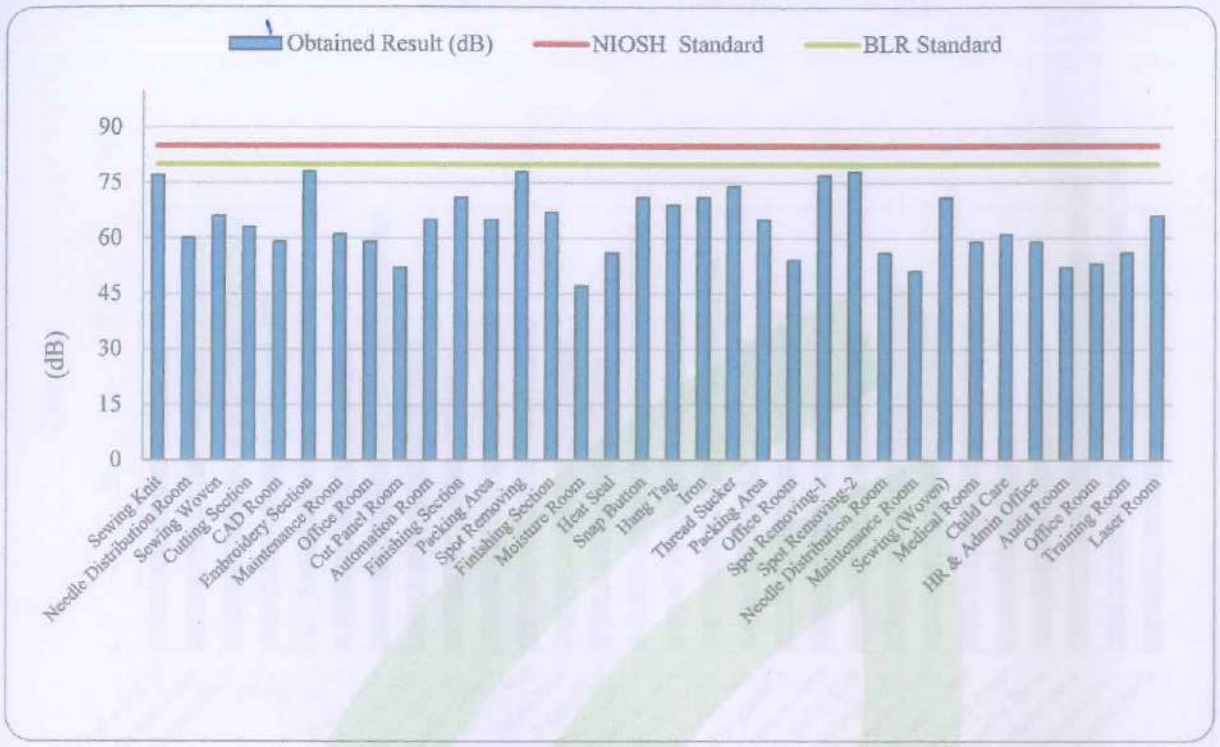

Figure: Indoor Noise Level Monitoring Chart

Figure: Indoor Noise Level Monitoring Chart

Discussion and Recommendation:

GREENBUD Testing & Inspection Services Private Limited has inspected the indoor Noise level of **Norp Knit Industries Ltd. (Unit-2)** ensuring all the production sections are covered. During inspection, noise level in most of the sections were found in compliance with both the NIOSH and Labor Rules standard limit. However, noise level in generator & boiler area has been found higher compared standard. Use of ear plug/ear muff has been recommended here.

For further improvement of above-mentioned sections, following recommendations are suggested to reduce the adverse effect:

- ✓ Repair faulty equipment that pumps noise such as loose bolts and nuts from vibration.
- ✓ Change the activity related to the generated noise so that the sound level is reduced; for example, reducing motor power or speed of rotating drum of equipment.
- ✓ Employee who exposed to a noise level greater than 85 dB for duration of more than 8 hours per day must use hearing protection.
- ✓ Although hearing protection is preferred for any period of noise exposure in excess of 85 dB, an equivalent level of protection can be obtained, but less easily managed, by limiting the duration of noise exposure. For every 3 dB increase in sound levels, the 'allowed' exposure period or duration should be reduced by 50 percent.
- ✓ Use of acoustic insulating materials, isolation of the noise source, and other engineering controls should be investigated and implemented where feasible.

Factory is suggested to assess the indoor noise level at least once annually if all other setups remain constant.

Engr. Syed Tasnem Mahmood
CEO and Chief Environmental Engineer
GREENBUD Testing & Inspection Services Private Limited
MIEB No.: M/35960
ISO 14001 Certification No: EA/15/IN/16050
ISO 50001 Certification No: ENMS/16/IN/533

ANNEXURE

Figure: Indoor Noise level Inspection

Instrument Description:

In Bangladesh noise pollution (also termed as NOISE pollution) is a major health hazard. In fact, due to noise pollution millions of people in Bangladesh are exposed to a number of health risks - from deafness to heart attack. On city streets noise pollution can be caused by hydraulic horns of vehicles, microphones and cassette players. The hydraulic horns used by buses, trucks and scooters in the crowded city streets are dangerous for human being. This is also how noise pollution in Bangladesh is affecting the hearing power of thousands of children every day. The horns especially cause serious damage to children. Experts say, if a child below three years of age hears a horn emitting 100 dB of noise from a close range, he or she might lose his or her hearing power.

GREENBUD Testing & Inspection Services Private Ltd. high quality equipment is available to assess your NOISE Level. We have used "SLM-25", GREENBUD is also committed to assess your NOISE inside the factory premises with transparency & Quality. To assess this NOISE level, we have to follow some standards, such as NIOSH and BLR etc.

Technical Specification

Microphone	½ inch Electret Condenser Microphone
Measuring Range	30~130dB
Accuracy	±1.5dB
Frequency Range	31.5Hz ~ 8.5kHz
Frequency Weighting	A&C
Low Battery Indication	Yes
Over Range Indication	Yes
Digit & Resolution	5 Digits & 0.1dB

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Ambient Noise Level Inspection

Norp Knit Industries Ltd. (Unit-2)

Inspection Ref. No: I/N 11365

Contact Us

Corporate Head Office:
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CERTIFIED ISO 17020:2012 COMPANY

BAB

General Information		
Invoice Reference No: GB/2025/01/82		Inspection Date: 01.02.2025
Inspection Reference No: **I/N 11365**		Inspection Duration: 11am-5pm
Report Generation Date:	06.02.2025	Inspection Description: Ambient Noise Level
Report Submission Date:	08.02.2025	Inspection location: Around Factory Building
Inspection Standards: 2004/108/EEC		
Company Name: **Norp Knit Industries Ltd. (Unit-2)** *Address: Shi-152/2 (Old), B-01/1 (New), Islampur, Kodda Nandun, Bason, Gazipur.*		Contact Person: **Md. Shahidul Islam** *Manager-Compliance*

On Site Inspection Team	
Toriqul Islam *Executive (Operation)* *B.Sc. in Civil & Environmental Engineering*	**Ulfat Rabbani** *Intern (Operation)* *B. Sc. in ESDM*
Report Prepared by	**Quality Checked**
Tanzir Hosen *Chemist (Operation)* *B.Sc. in Chemistry*	**Imran Hossen** *Sr. Executive (Operation)* *B.Sc. in Civil Engineering*

Report Approved by:

Engr. Syed Tasnem Mahmood
Chief Environmental Engineer & CEO
B.Sc. & M.Sc. (Civil and Environmental Engineering)
MIEB No.: M/35960

Introduction:

Noise pollution or noise disturbance is the disturbing or excessive noise that may harm the activity or balance of human or animal life. The main source of ambient noise pollution for an industry is the machineries and activities for production, power generation with in-house captive power plant, raw material and goods loading, unloading etc.

Recently, noise pollution has been of increasing concern worldwide, particularly in most garment factories. The noise problems of the modern industrial societies seem incomparable to the past given the larger sources of noise now present outdoors and indoors. According to the World Health Organization, industrial machineries and activity noise is one of the main sources of environmental noise exposure.

Noise levels are measured in decibels (dB). One decibel is the threshold of hearing. Approximately 60 dB is the level of normal talking. According to World Health Organization (WHO), the permissible noise level in industrial environments should not exceed 85 dB. Exposure for more than six hours a day to NOISE in excess of 85 dB is potentially hazardous to health.

Norp Knit Industries Ltd. (Unit-2) has hired GREENBUD Testing & Inspection Services Private Limited to inspect the Ambient Noise level. GREENBUD has covered four locations for testing the noise level and generated report according to the activity occupancy of the area.

Method of Analysis:

Inspection of noise level was done using direct reading instruments. During the analysis, a standard work instruction stated in the **TP-GB-02** was followed.

Ambient Noise Level Inspection Result:

Sl. No	Inspection Area		Inspection Status				
			Reference of Relevant Standard		Obtained Result (dB)	SPCR, 2006 Limit	WHO Limit
	Point	Sample	Sound Pollution Control Rules-2006 (dB)	WHO Guide Line (dB)			
1	Location - 01 (North Side)	Sample-01	60	70	56	√	√
2		Sample-02	60	70	57	√	√
3	Location - 02 (East Side)	Sample-01	60	70	54	√	√
4		Sample-02	60	70	53	√	√
5	Location - 03 (South Side)	Sample-01	60	70	59	√	√
6		Sample-02	60	70	58	√	√
7	Location - 04 (West Side)	Sample-01	60	70	52	√	√
8		Sample-02	60	70	51	√	√

****Abbreviations and Acronyms:** *SPCR=Sound Pollution Control Rules; WHO = World Health Organization; dB = decibel.*

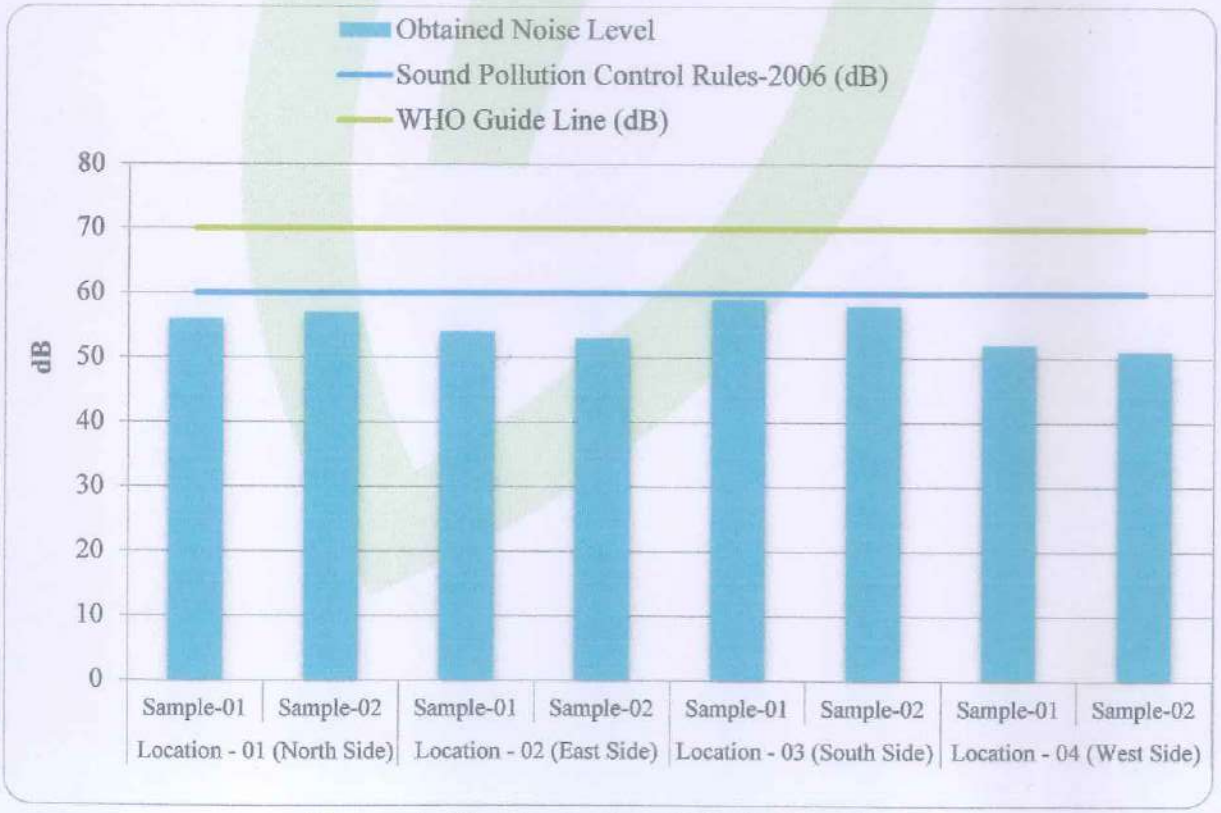

Figure: Ambient Noise Level Monitoring Chart

Figure: Ambient Noise Level Inspection Location

Discussion and Recommendation:

As **Norp Knit Industries Ltd. (Unit-2)** is situated in a mixed zone, therefore the noise level must be within 60 dB according to **Sound Pollution Control Rules-2006**, DoE, Bangladesh. During inspection, noise level in all the inspected locations has been found in compliance with the DoE and WHO standard limit.

Following recommendations are suggested to reduce the adverse effect:

- ✓ Change the activity related to the generated noise so that the sound level is reduced; i.e., reducing motor power or speed of rotating drum of equipment, repair faulty equipment such as loose bolts and nuts etc.
- ✓ Increase greenery around the factory area as green belt act as natural sound barrier.
- ✓ Construct 300 mm thick wall around the generator room and use of fire door as a means of noise baffling measures.
- ✓ Employee who exposed to a noise level greater than 75 dB for duration of more than 8 hours per day must use hearing protection.
- ✓ Use of acoustic insulating materials, isolation of the noise source, and other engineering controls should be investigated and implemented where feasible.

Factory is suggested to assess the Noise level once annually at least if all other set ups are constant.

Engr. Syed Tasnem Mahmood
CEO and Chief Environmental Engineer
GREENBUD Testing & Inspection Services Private Limited
MIEB No.: M/35960
ISO 14001 Certification No: EA/15/IN/16050
ISO 50001 Certification No: ENMS/16/IN/533

Inspection Instrument:

In Bangladesh noise pollution (also termed as NOISE pollution) is a major health hazard. In fact, due to noise pollution millions of people in Bangladesh are exposed to a number of health risks - from deafness to heart attack. On city streets noise pollution can be caused by hydraulic horns of vehicles, microphones and cassette players. The hydraulic horns used by buses, trucks and scooters in the crowded city streets are dangerous for human being. This is also how noise pollution in Bangladesh is affecting the hearing power of thousands of children every day. The horns especially cause serious damage to children. Experts say, if a child below three years of age hears a horn emitting 100 dB of noise from a close range, he or she might lose his or her hearing power.

GREENBUD Testing & Inspection Services Private Ltd. high quality equipment is available to assess your NOISE Level. We have used "SLM-25", GREENBUD is also committed to assess your NOISE inside the factory premises with transparency & Quality. To assess this NOISE level, we have to follow some standards, such as Sound Pollution Control Rules-2006, WHO, DoE etc.

Technical Specification

Microphone	½ inch Electret Condenser Microphone
Measuring Range	30~130dB
Accuracy	±1.5dB
Frequency Range	31.5Hz ~ 8.5kHz
Frequency Weighting	A&C
Low Battery Indication	Yes
Over Range Indication	Yes
Digit & Resolution	5 Digits & 0.1dB

greenbud
Lets Grow Together Sustainable

Ozone Depleting Substance (ODS) Inventory

Norp Knit Industries Ltd. (Unit-2)

Test Ref. No.: D/O 11077

Contact Us

Corporate Head Office:
Flat: 14A, Level: 14, Building No.: 02
Confidence Center, Kha-09
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Chandgaon, Chattogram

CERTIFIED ISO 17020:2012 COMPANY

BAB

General Information		
Invoice Reference No: GB/2025/01/82		Inspection Date: 01.02.2025
Inspection Reference No: **D/O 11077**		Inspection Duration: 11am-5pm
Report Generation Date:	06.02.2025	Inspection Description: Leak Test for AC
Report Submission Date:	08.02.2025	Inspection location: Inside Factory Building
Inspection Standards: 2004/108/EEC		
Company Name: **Norp Knit Industries Ltd. (Unit-2)** *Address: Shi-152/2 (Old), B-01/1 (New), Islampur, Kodda Nandun, Bason, Gazipur.*		Contact Person: **Md. Shahidul Islam** *Manager-Compliance*

On Site Inspection Team	
Toriqul Islam *Executive (Operation)* *B.Sc. in Civil & Environmental Engineering*	**Ulfat Rabbani** *Intern (Operation)* *B. Sc. in ESDM*
Report Prepared by	**Quality Checked**
Tanzir Hosen *Chemist (Operation)* *B.Sc. in Chemistry*	**Imran Hossen** *Sr. Executive (Operation)* *B.Sc. in Civil Engineering*

Report Approved by:

Engr. Syed Tasnem Mahmood
Chief Environmental Engineer & CEO
B.Sc. & M.Sc. (Civil and Environmental Engineering)
MIEB No.: M/35960

Method of Testing and Analysis:

GREENBUD Testing & Inspection Services Private Limited has been hired for the Leak detection of Ozone depleting equipment of **Norp Knit Industries Ltd. (Unit-2).** GREENBUD operation team has tested all possible equipment which can emit Ozone Depleting Substances (ODS) and generated report according to the field assessment and the ODS Inventory.

Leak detection from Ozone depleting equipment was done using "Ultrasonic Leak Detector" following the **ASTM E1002** standard method. During the analysis, a standard work instruction stated in the **TP-GB-06** was followed which is based on the referred standard.

OZONE DEPLETING SUBSTANCE (ODS) INVENTORY

Sl No	Brand	Model	Made By	Capacity	Refrigerant Type	Installation Date	GWP	Installation Location	Yearly Refill (Kg)	CO_2e from Yearly Emission (Kg)	Comments
1	Media (VC Pro)	MVC-670WV2GN1	China	19 Ton	R-410A	7-Sep-2020	1924	New Admin Building	0	0	No Leak Found
2	Media (VC Pro)	MVC-670WV2GN1	China	19 Ton	R-410A	7-Sep-2020	1924	New Admin Building	0	0	No Leak Found
3	Media (VC Pro)	MVC-670WV2GN1	China	19 Ton	R-410A	7-Sep-2020	1924	New Admin Building	0	0	No Leak Found
4	Media (VC Pro)	MVC-615WV2GN1	China	17 Ton	R-410A	7-Sep-2020	1924	New Admin Building	0	0	No Leak Found
5	Media (VC Pro)	MVC-615WV2GN1	China	17 Ton	R-410A	7-Sep-2020	1924	New Admin Building	0	0	No Leak Found
6	Media (VC Pro)	MVC-615WV2GN1	China	17 Ton	R-410A	7-Sep-2020	1924	New Admin Building	0	0	No Leak Found
7	Media (VC Pro)	MVC-615WV2GN1	China	17 Ton	R-410A	7-Sep-2020	1924	New Admin Building	0	0	No Leak Found
8	Media (VC Pro)	MVC-615WV2GN1	China	17 Ton	R-410A	7-Sep-2020	1924	New Admin Building	0	0	No Leak Found
9	Media (VC Pro)	MVC-615WV2GN1	China	17 Ton	R-410A	7-Sep-2020	1924	New Admin Building	0	0	No Leak Found
10	Media (VC Pro)	MVC-850WV2GN1	China	24 Ton	R-410A	15-Apr-2022	1924	1st Floor Packing Section	0	0	No Leak Found
11	Media (VC Pro)	MVC-850WV2GN1	China	24 Ton	R-410A	15-Apr-2022	1924	1st Floor Packing Section	0	0	No Leak Found
12	Media (VC Pro)	MVC-850WV2GN1	China	24 Ton	R-410A	15-Apr-2022	1924	1st Floor Packing Section	0	0	No Leak Found
13	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	5-Feb-2016	1810	G.M Room	0.8	1448	No Leak Found
14	Carrier	FG-6013ES	Malaysia	5 Ton	R-22	5-Feb-2016	1810	Production Room	2	3620	No Leak Found
15	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	5-Feb-2016	1810	Quality AGM Sir Room	0.6	1086	No Leak Found
16	Carrier	24CS048	Malaysia	2 Ton	R-22	5-Feb-2016	1810	American Eagle Inspection Room	0.6	1086	No Leak Found
17	Carrier	24CS048	Malaysia	2 Ton	R-22	5-Feb-2016	1810	New times Inspection Room	1	1810	No Leak Found
18	Carrier	24CS048	Malaysia	2 Ton	R-22	5-Feb-2016	1810	Cutting Manager Room	1	1810	No Leak Found
19	Carrier	FG-6013ES	Malaysia	5 Ton	R-22	5-Feb-2016	1810	CAD Room-1	0.6	1086	No Leak Found
20	Carrier	24CS048	Malaysia	2 Ton	R-22	5-Feb-2016	1810	CAD Room-2	1	1810	No Leak Found
21	Carrier	FG-6013ES	Malaysia	5 Ton	R-22	5-Feb-2016	1810	Embroidery Room	1.5	2715	No Leak Found
22	Toshin	CACRG2406M	China	3 Ton	R-22	25-Dec-2020	1810	EDI Room	1.2	2172	No Leak Found
23	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	10-Jun-2022	1810	Operations VP Sir Room	0.5	905	No Leak Found
24	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	2-May-2021	1810	Quality VP Sir Room	0.6	1086	No Leak Found
25	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	2-May-2021	1810	AVP Sir Room	0	0	No Leak Found
26	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	2-May-2021	1810	Quality GM Sir Room	0	0	No Leak Found
27	Carrier	FG-6013ES	Malaysia	5 Ton	R-22	20-Sep-2016	1810	Production Planning Room	2.7	4887	No Leak Found
28	Carrier	24CS048	Malaysia	2 Ton	R-22	5-Jun-2019	1810	Target Inspection Room	1	1810	No Leak Found
29	Carrier	24CS048	Malaysia	2 Ton	R-22	5-Feb-2020	1810	Technical Room	1	1810	No Leak Found
30	Carrier	FG-6013ES	Malaysia	5 Ton	R-22	4-Aug-2020	1810	Automation Room	2	3620	No Leak Found
31	Transtec	CS24T/EM	Korea	2 Ton	R-22	5-Feb-2018	1810	PM Room	0.7	1267	No Leak Found
32	Carrier	24CS048	Malaysia	2 Ton	R-22	5-Feb-2018	1810	Welfare Room	1	1810	No Leak Found
33	Carrier	24CS048	Malaysia	2 Ton	R-22	10-Sep-2021	1810	AGM Store Room	0	0	No Leak Found

Sl No	Brand	Model	Made By	Capacity	Refrigerant Type	Installation Date	GWP	Installation Location	Yearly Refill (Kg)	COze from Yearly Emission (Kg)	Comments
34	Carrier	FG-6013ES	Malaysia	5 Ton	R-22	5-Feb-2018	1810	Fabric Store	0.6	1086	No Leak Found
35	Carrier	FG-6013ES	Malaysia	5 Ton	R-22	20-Jun-2020	1810	Fabric Lab	2	3620	No Leak Found
36	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	5-Feb-2021	1810	AGM HR Admin	0.5	905	No Leak Found
37	Carrier	24CS048	Malaysia	2 Ton	R-22	5-Feb-2021	1810	Sr. Manager HR Admin	0.6	1086	No Leak Found
38	Carrier	24CS048	Malaysia	2 Ton	R-22	5-Nov-2021	1810	Account Room	0	0	No Leak Found
39	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	5-Nov-2021	1810	Adviser Room	0.6	1086	No Leak Found
40	Carrier	FG-6013ES	Malaysia	5 Ton	R-22	5-Nov-2021	1810	HR MLS Room	1.5	2715	No Leak Found
41	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	5-Nov-2021	1810	Pay Roll	0.6	1086	No Leak Found
42	Carrier	24CS048	Malaysia	2 Ton	R-22	5-Nov-2021	1810	Time Keeper Room	1	1810	No Leak Found
43	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	5-Nov-2021	1810	Medical Room-1	0	0	No Leak Found
44	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	5-Nov-2021	1810	Medical Room-2	0.6	1086	No Leak Found
45	Carrier	24CS048	Malaysia	2 Ton	R-22	15-Jan-2022	1810	Country G.M Sir Room	0	0	No Leak Found
46	Carrier	24CS048	Malaysia	2 Ton	R-22	14-Sep-2020	1810	Finishing Manager Room (Woven Side)	0.6	1086	No Leak Found
47	Carrier	24CS048	Malaysia	2 Ton	R-22	14-Sep-2020	1810	Finishing Manager Room (Knit Side)	0.6	1086	No Leak Found
48	Carrier	24CS048	Malaysia	2 Ton	R-22	20-Mar-2019	1810	Cutting Manager Room	1.6	2896	No Leak Found
49	Carrier	24CS048	Malaysia	2 Ton	R-22	10-Apr-2020	1810	Woven Sr. Quality Manager Room	1	1810	No Leak Found
50	Carrier	24CS048	Malaysia	2 Ton	R-22	10-Apr-2020	1810	PM (Mr. Primal) Room	0.6	1086	No Leak Found
51	General	ASGA24AET	Thailand	2 Ton	R-22	10-Apr-2020	1810	New Fire Control Panel Room	0.8	1448	No Leak Found
52	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	14-Sep-2020	1810	Ozone Room	0	0	No Leak Found
53	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	19-Jul-2020	1810	New Color Lab Room	0.7	1267	No Leak Found
54	Carrier	24CS048	Malaysia	2 Ton	R-22	4-Jul-2020	1810	A.G.M Room-1	1	1810	No Leak Found
55	Carrier	24CS048	Malaysia	2 Ton	R-22	4-Jul-2020	1810	A.G.M Room-2	0.7	1267	No Leak Found
56	Transtec	CS24T/EM	Korea	2 Ton	R-22	4-Jul-2020	1810	P.M Sir Room	0.5	905	No Leak Found
57	Carrier	24CS048	Malaysia	2 Ton	R-22	4-Jul-2020	1810	Planning Room	0.6	1086	No Leak Found
58	Carrier	FG-6013ES	Malaysia	5 Ton	R-22	4-Jul-2020	1810	Lab Room-1	0.8	1448	No Leak Found
59	Carrier	24CS048	Malaysia	2 Ton	R-22	4-Jul-2020	1810	Lab Room-2	0.6	1086	No Leak Found
60	Carrier	FG-6013ES	Malaysia	5 Ton	R-22	4-Jul-2020	1810	Lab Office Room	2.6	4706	No Leak Found
61	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	3-Feb-2021	1810	Lab Light Fastness Room	0	0	No Leak Found
62	Carrier	24CS048	Malaysia	2 Ton	R-22	5-Feb-2020	1810	Khol's Inspection Room	0.6	1086	No Leak Found
63	Carrier	24CS048	Malaysia	2 Ton	R-22	14-Dec-2016	1810	Inspection Room –1	0.8	1448	No Leak Found
64	Carrier	24CS048	Malaysia	2 Ton	R-22	14-Dec-2016	1810	Inspection Room – 2	0.6	1086	No Leak Found
65	Carrier	24CS048	Malaysia	2 Ton	R-22	14-Dec-2016	1810	Inspection Room – 4	0	0	No Leak Found
66	Carrier	24CS048	Malaysia	2 Ton	R-22	14-Dec-2016	1810	Inspection Room – 5	0.5	905	No Leak Found
67	Carrier	24CS048	Malaysia	3 Ton	R-22	5-Feb-2019	1810	Breshka Inspection Room	1.7	3077	No Leak Found
68	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	10-Aug-2021	1810	PVH Inspection Room	0.6	1086	No Leak Found
69	Carrier	24CS048	Malaysia	2 Ton	R-22	10-Aug-2021	1810	PVH Inspection Room	1.4	2534	No Leak Found
70	Carrier	24CS048	Malaysia	2 Ton	R-22	17-May-2020	1810	Zara Inspection Room	0	0	No Leak Found

Sl No	Brand	Model	Made By	Capacity	Refrigerant Type	Installation Date	GWP	Installation Location	Yearly Refill (Kg)	CO2e from Yearly Emission (Kg)	Comments
71	Carrier	24CS048	Malaysia	2 Ton	R-22	25-Sep-2020	1810	New Time Inspection Room	1	1810	No Leak Found
72	General	AOG45APA3L	Thailand	5 Ton	R-22	10-Feb-2021	1810	Chemical Room – 2	0.6	1086	No Leak Found
73	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	23-Jul-2020	1810	G.M Sir Room-1	0.8	1448	No Leak Found
74	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	23-Jul-2020	1810	G.M Sir Room-2	0.6	1086	No Leak Found
75	Carrier	24CS048	Malaysia	2 Ton	R-22	5-Feb-2020	1810	Q.C Room	0.7	1267	No Leak Found
76	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	3-Oct-2019	1810	Generator Room	0.8	1448	No Leak Found
77	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	3-Aug-2021	1810	Sample manager Room	0.6	1086	No Leak Found
78	Carrier	FG-6013ES	Malaysia	5 Ton	R-22	10-Feb-2022	1810	Training Room	0.8	1448	No Leak Found
79	Carrier	24CS048	Malaysia	2 Ton	R-22	10-Feb-2022	1810	General Store	0.6	1086	No Leak Found
80	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	16-Nov-2021	1810	Utility Room	0.6	1086	No Leak Found
81	Carrier	24CS048	Malaysia	2 Ton	R-22	16-Nov-2021	1810	Civil Engineering Room	1.7	3077	No Leak Found
82	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	16-Nov-2021	1810	Manager Compliance	0.7	1267	No Leak Found
83	Carrier	ASG-18CR	Malaysia	1.5 Ton	R-22	16-Nov-2021	1810	G.M Compliance	0.6	1086	No Leak Found
84	Carrier	24CS048	Malaysia	2 Ton	R-22	17-Nov-2021	1810	Compliance Audit Room	1	1810	No Leak Found
85	Carrier	FG-6013ES	Malaysia	5 Ton	R-22	17-Nov-2021	1810	Compliance Working Area	2.6	4706	No Leak Found
86	Carrier	24CS048	Malaysia	2 Ton	R-22	17-Nov-2021	1810	Mak & Co. Audit Room	0.6	1086	No Leak Found
87	Walton	WFD-1F3-GDEL-XX	Bangladesh	176 Ltr	R-600A	18-Nov-2021	3	Admin Section	0	0	No Leak Found
88	Walton	WFA-2BO-GD-XX	Bangladesh	220 Ltr	R-600A	18-Nov-2021	3	New Admin Section	0	0	No Leak Found
89	Walton	WFD-1F3-GDEL-XX	Bangladesh	176 Ltr	R-600A	18-Nov-2021	3	Washing 1st floor	0	0	No Leak Found
90	Toshiba	GR-B-285 UU-C(SS)	Japan	258 Ltr	R-600A	18-Nov-2021	3	Medical room	0	0	No Leak Found
91	Walton	WFE-2N5-GD-XX	Bangladesh	316 Ltr	R-600A	18-Nov-2021	3	Stuff Kitchen Room	0	0	No Leak Found
92	Media	MFGA-48CRN	China	4 Ton	R-410A	11-Jun-2023	1924	Conference Room	0	0	No Leak Found
93	Media	MFGA-48CRN	China	4 Ton	R-410A	11-Jun-2023	1924	Design	0	0	No Leak Found
94	Media	MFGA-48CRN	China	4 Ton	R-410A	11-Jun-2023	1924	Design	0	0	No Leak Found
95	Media	42CJR60703-38CJR60703	China	5 Ton	R-22	11-Jun-2023	1810	Merchant Building 2nd Floor	0	0	No Leak Found
96	Media	42CJR60703-38CJR60703	China	5 Ton	R-22	11-Jun-2023	1810	Merchant Building 2nd Floor	0	0	No Leak Found
97	Media	42CJR60703-38CJR60703	China	5 Ton	R-22	11-Jun-2023	1810	Merchant Building 2nd Floor	0	0	No Leak Found
98	Carrier	42CJ24703-38CJR24703	China	2 Ton	R-22	30-Jun-2023	1810	Laser Manager Room	0	0	No Leak Found
99	Carrier	CRCJR18703	China	1.5 Ton	R-22	1-Jun-2023	1810	UPS Room of laser m/c	0	0	No Leak Found
100	TENT COOL	TCAC-24/HD	China	2 Ton	R-410A	1-Jun-2023	1924	Laser Machine-1	0	0	No Leak Found
101	TENT COOL	TCAC-24/HD	China	2 Ton	R-410A	1-Jun-2023	1924	Laser Machine-2	0	0	No Leak Found
102	TENT COOL	TCAC-24/HD	China	2 Ton	R-410A	1-Jun-2023	1924	Laser Machine-3	0	0	No Leak Found
103	TENT COOL	TCAC-24/HD	China	2 Ton	R-410A	1-Jun-2023	1924	Laser Machine-4	0	0	No Leak Found
104	Carrier	FJ-18GW	Malaysia	1.5 Ton	R-22	1-Jun-2023	1810	M/C UPS ROOM	0	0	No Leak Found
105	ATASHI	NA12F-18CR	China	1.5 Ton	R-22	1-Jun-2023	1810	M/C UPS ROOM	0	0	No Leak Found
106	Carrier	42CJR24703-38CJR24703	Malaysia	2 Ton	R-22	1-Jun-2023	1810	M/C UPS ROOM	0	0	No Leak Found
107	TENT COOL	TCAC-24/HD	China	2 Ton	R-410A	1-Jun-2023	1924	Ozone Room	0	0	No Leak Found

Sl No	Brand	Model	Made By	Capacity	Refrigerant Type	Installation Date	GWP	Installation Location	Yearly Refill (Kg)	CO2e from Yearly Emission (Kg)	Comments
108	Tenello Machine	G1 420LW3	Italy	0.25KG	R-134A	1-Jul-2024	1430	Washing Section	0	0	No Leak Found
109	Tenello Machine	G1 420LW3	Italy	0.25KG	R-134A	1-Jul-2024	1430	Washing Section	0	0	No Leak Found
110	Tenello Machine	G1 420LW3	Italy	0.25KG	R-134A	1-Jul-2024	1430	Washing Section	0	0	No Leak Found
111	Tenello Machine	G1 420LW3	Italy	0.25KG	R-134A	1-Jul-2024	1430	Washing Section	0	0	No Leak Found
112	Tenello Machine	G1 420LW3	Italy	0.25KG	R-134A	1-Jul-2024	1430	Washing Section	0	0	No Leak Found
113	Tenello Machine	G1 420LW3	Italy	0.25KG	R-134A	1-Jul-2024	1430	Washing Section	0	0	No Leak Found
114	Tenello Machine	G1 420LW3	Italy	0.25KG	R-134A	1-Jul-2024	1430	Washing Section	0	0	No Leak Found
115	Tenello Machine	G1 420LW3	Italy	0.25KG	R-134A	1-Jul-2024	1430	Washing Section	0	0	No Leak Found
116	Sample Tonello Machine	G1 130 LW3	Italy	0.13KG	R-134A	1-Jul-2024	1430	Washing Section	0	0	No Leak Found
117	Sample Tonello Machine	G1 130 LW3	Italy	0.13KG	R-134A	1-Jul-2024	1430	Washing Section	0	0	No Leak Found
118	Sample Tonello Machine	G1 130 LW3	Italy	0.13KG	R-134A	1-Jul-2024	1430	Washing Section	0	0	No Leak Found
119	Tonello Washing Mahine	420 EV1	Italy	0.25KG	R-134A	1-Jun-2015	1430	Washing Section	0	0	No Leak Found
Total Emission (kg)									**61**	**110410**	

Discussion and Recommendation:

GREEENBUD Testing & Inspection Services Private Limited has tested all possible equipment, which can emit Ozone Depleting Substances (ODS). The facility uses four types of Refrigerants: **R-410A, R-600A, R-134A & R-22.**

Table 1: List of Refrigerants with ODP & GWP

Refrigerant Type	ODP	GWP
R-410A	0	1924
R-600A	0	3
R-134A	0	1430
R-22	0.05	1810

From Table-1, it can be seen that cooling units equipped with the refrigerant R-410A & R-600A, R-134A can be responsible for Global Warming only if leakage occurs. On the other hand, the refrigerant R-22 can be responsible for both Global Warming and Ozone Depletion if leakage occurs. However, Total refrigerant refill amount is **61 kg** and CO_2e from yearly emission has been found **110410 kg**. Mainly all cooling facility was checked which use refrigerant for cooling.

No mentionable leakage was found during inspection. All equipment is well maintained and conditioned. But factory must conduct this test once in a year and continue its journey through an environment friendly and sustainable path. Factory is also recommended to repair any kind of leakage as soon as that happen to reduce the emission.

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GREEENBUD Testing & Inspection Services Private Ltd.
MIEB No.: M/35960
ISO 14001 Certification Number: EA/15/IN/16050
ISO 50001 Certification Number: ENMS/16/IN/533

Testing Device:

GREENBUD Testing & Inspection Service Private Limited used "**ULD-300 Ultrasonic Leak Detector**". The device equipped with ultrasonic sound detection sensor to detect the ultrasonic sound generated by the turbulence created by air or a gas forced through a small orifice.

Figure: ULD-300 Ultrasonic Leak Detector.

Technical Specification

Operating Temperature	32 °F to 100 °F
Storage Temperature	-40 °F to 150 °F
Weight	6.3 oz with battery
Dimensions	7.3 x 2.5 x 1 in
Frequency Response	35 kHz to 45 kHz + 6 db
Power Consumption	22 mA at 9 Volts DC
Battery Life	33 hours (9 V alkaline battery)
Performance	Meets the ASTM Standard: ASTM E1211-07
Battery Test	LED color indicator (Green-Good; Red-Replace)