Indoor Air Quality Inspection

ACS Textiles (Bangladesh) Ltd. &

ACS Towel Limited

Inspection Ref. No.: **G/I 11639**

Contact Us

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General Information		
Invoice Reference No: GB/2024/08/80		Inspection Date: 09.09.2024
Inspection Reference No: **G/I 11639**		Inspection Duration: 11am-5pm
Report Generation Date:	15.09.2024	Inspection Description: Indoor Air Quality
Report Submission Date:	22.09.2024	Inspection Location: Inside Factory Building
Inspection Standards: 2004/108/EEC		
Company Name: **ACS Textiles (Bangladesh) Ltd. & ACS Towel Limited** *Address: Tetlabo, Barpa, Rupgonj, Narayangonj.*		Contact Person: **Md. Ruhul Alam Sharif** *GM, Compliance*

On Site Inspection Team	
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Report Prepared by	**Quality Checked**
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Report Approved by

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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 and around 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 **ACS Textiles (Bangladesh) Ltd. & ACS Towel Limited.** 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 :(ACS Textiles (Bangladesh) Ltd.)

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)
1	Building No-01	Ground Floor	Embroidery Section	Working	19	27	38	0	0	0	426	0	0	0	0	0
2			Accessories Store	Working	22	33	45	0	0	0	395	0	0	0	0	0
3		1st Floor	Finished Goods Store	Working	22	31	37	0	0	0	513	0	0	0	0	0
4		2nd Floor	Wastage Store	Working	21	39	50	0	0	0	501	0	0	0	0	0
5			prayer Room	Working	22	39	50	0	0	0	502	0	0	0	0	0
6	Building no-02	Ground Floor	Sizing & Weaving	Working	16	27	33	0	0	0	473	0	0	0	0	0
7		1st Floor	Cutting Section	Working	33	55	67	0	0	0	487	0	0	0	0	0
8			Feeding Section	Working	21	35	65	0	0	0	427	0	0	0	0	0
9			Stiching Section	Working	25	41	58	0	0	0	426	0	0	0	0	0
10			Fabrics Inspection	Working	22	39	50	0	0	0	430	0	0	0	0	0
11			Fabrics Folding	Working	21	35	47	0	0	0	467	0	0	0	0	0
12			Packing Section	Working	22	38	46	0	0	0	461	0	0	0	0	0
13			Metal Free Zone	Working	32	55	70	0	0	0	421	0	0	0	0	0
14	Building No-03	Ground Floor	Medical Center	Working	22	39	50	0	0	0	502	0	0	0	0	0
15		1st Floor	Child Care	Working	27	48	60	0	0	0	401	0	0	0	0	0
16			Fire Control Room	Working	25	33	48	0	0	0	422	0	0	0	0	0
17	Building No-04	Ground Floor	Warping Section-01	Working	19	32	41	0	0	0	401	0	0	0	0	0
18			Warping Section-02	Working	24	36	47	0	0	0	456	0	0	0	0	0
19			Twisting & Doubling	Working	22	32	40	0	0	0	419	0	0	0	0	0
20		1st Floor	Finishing Folding Section	Working	32	52	68	0	0	0	479	0	0	0	0	0
21	Building-05	Ground Floor	Sub-Station	Working	22	35	46	0	0	0	421	0	0	0	0	0
22		1st Floor	Office Room	Working	17	34	42	0	0	0	403	0	0	0	0	0
23			Technical Room	Working	17	33	45	0	0	0	426	0	0	0	0	0
24	Building-06	Ground Floor	Bleaching	Working	21	36	46	0.1	0.1	0	411	0	0	0	0	0
25			Dyeing	Working	25	31	44	0.05	0.006	0	455	0	0	0	0	0

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)
26	Building-06	Ground Floor	Mercerizing	Working	29	39	55	0.02	0.006	0	412	0	0	0	0	0
27			Dyeing Finishing	Working	31	38	56	0.3	0.04	0	471	0	0	0	0	0
28			Chemical Sub Store	Working	21	32	45	0.2	0.02	0	421	0	0	0	0	0
29			Printing Section	Working	19	27	41	0.06	0.008	0	510	0	0	0	0	0
30			ETP	Working	18	26	41	0.08	0.009	0	421	0	0	0	0	0
31	Building-07	Ground Floor	Chemical Store	Working	21	29	45	0.01	0.001	0	421	0	0	0	0	0
32			Work-Shop	Working	24	36	47	0	0	0	433	0	0	0	0	0
33		1st Floor	General Store	Working	18	31	41	0	0	0	420	0	0	0	0	0
34			Officer's Dining	Working	22	36	45	0	0	0	477	0	0	0	0	0
35		2nd Floor	Worker's Canteen	Working	24	33	46	0	0	0	483	0	0	0	0	0
36	Building-10	Ground Floor	Washing Area	Working	17	26	36	0	0	0	455	0	0	0	0	0
37			Dryer Machine	Working	11	18	23	0	0	0	406	0	0	0	0	0
38	Building-11	Ground Floor	Chemical Store	Working	26	38	46	0.06	0.008	0	400	0	0	0	0	0
39			Quilting Machine	Working	18	33	42	0	0	0	393	0	0	0	0	0
40		1st Floor	Fabric Store	Working	19	33	42	0	0	0	401	0	0	0	0	0
41		2nd Floor	Mending	Working	13	25	33	0	0	0	391	0	0	0	0	0
42	Building-12	Ground Floor	Weaving Section	Working	15	27	35	0	0	0	411	0	0	0	0	0
43			Sizing Section	Working	18	32	40	0	0	0	397	0	0	0	0	0
44			Warping Section-02	Working	23	37	50	0	0	0	398	0	0	0	0	0
45			Stenter Machine	Working	31	49	61	0	0	0	410	0	0	0	0	0
46			Rasing Section	Working	23	39	47	0	0	0	394	0	0	0	0	0
47		1st Floor	Quilting Section	Working	18	32	41	0	0	0	448	0	0	0	0	0
48			Cutting Section	Working	20	37	47	0	0	0	462	0	0	0	0	0
49			Feeding Section	Working	21	34	46	0	0	0	404	0	0	0	0	0
50			Stiching Section	Working	13	21	25	0	0	0	412	0	0	0	0	0
51			Fabrics Inspection	Working	16	26	32	0	0	0	479	0	0	0	0	0
52			Fabrics Folding Section	Working	12	21	26	0	0	0	425	0	0	0	0	0

Inspection Area					Inspections Status											
Sl No	Building No	Floor/Level	Section	Condition	PM_1 ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	PM_{10} ($\mu g/m^3$)	VOC (mg/m^3)	CH_2O (mg/m^3)	CO (ppm)	CO_2 (ppm)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	O_3 (ppm)	NH_3 (mg/m^3)	H_2S (mg/m^3)
53	Building-12	1st Floor	Packing Section	Working	16	24	28	0	0	0	433	0	0	0	0	0
54			Metal Free Zone	Working	14	26	31	0	0	0	415	0	0	0	0	0
55			Finished Goods Store	Working	23	35	47	0	0	0	386	0	0	0	0	0
56	Building-13	Ground Floor	Office Area	Working	21	40	53	0	0	0	389	0	0	0	0	0
57	Building-14	Ground Floor	Digital Printing	Working	20	37	46	0	0	0	386	0	0	0	0	0
58		1st Floor	Tufting	Working	19	33	47	0	0	0	431	0	0	0	0	0
59		2nd Floor	Tufting	Working	21	34	43	0	0	0	394	0	0	0	0	0
60	Building-15	Ground Floor	Admin & Compliance	Working	22	37	47	0	0	0	431	0	0	0	0	0
61			Accounts & Finance	Working	29	52	70	0	0	0	398	0	0	0	0	0
62			Commercial	Working	13	35	45	0	0	0	396	0	0	0	0	0
63		1st Floor	Show Room	Working	27	44	57	0	0	0	406	0	0	0	0	0
64			Display Center	Working	21	39	51	0	0	0	396	0	0	0	0	0
65			Marketing	Working	25	37	49	0	0	0	385	0	0	0	0	0
66			Commercial	Working	13	24	29	0	0	0	440	0	0	0	0	0
67		2nd Floor	Sample Room	Working	21	37	45	0	0	0	499	0	0	0	0	0
68			IT Room	Working	27	50	69	0	0	0	433	0	0	0	0	0

****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 Set*

Figure: Indoor Particulate level Monitoring Chart

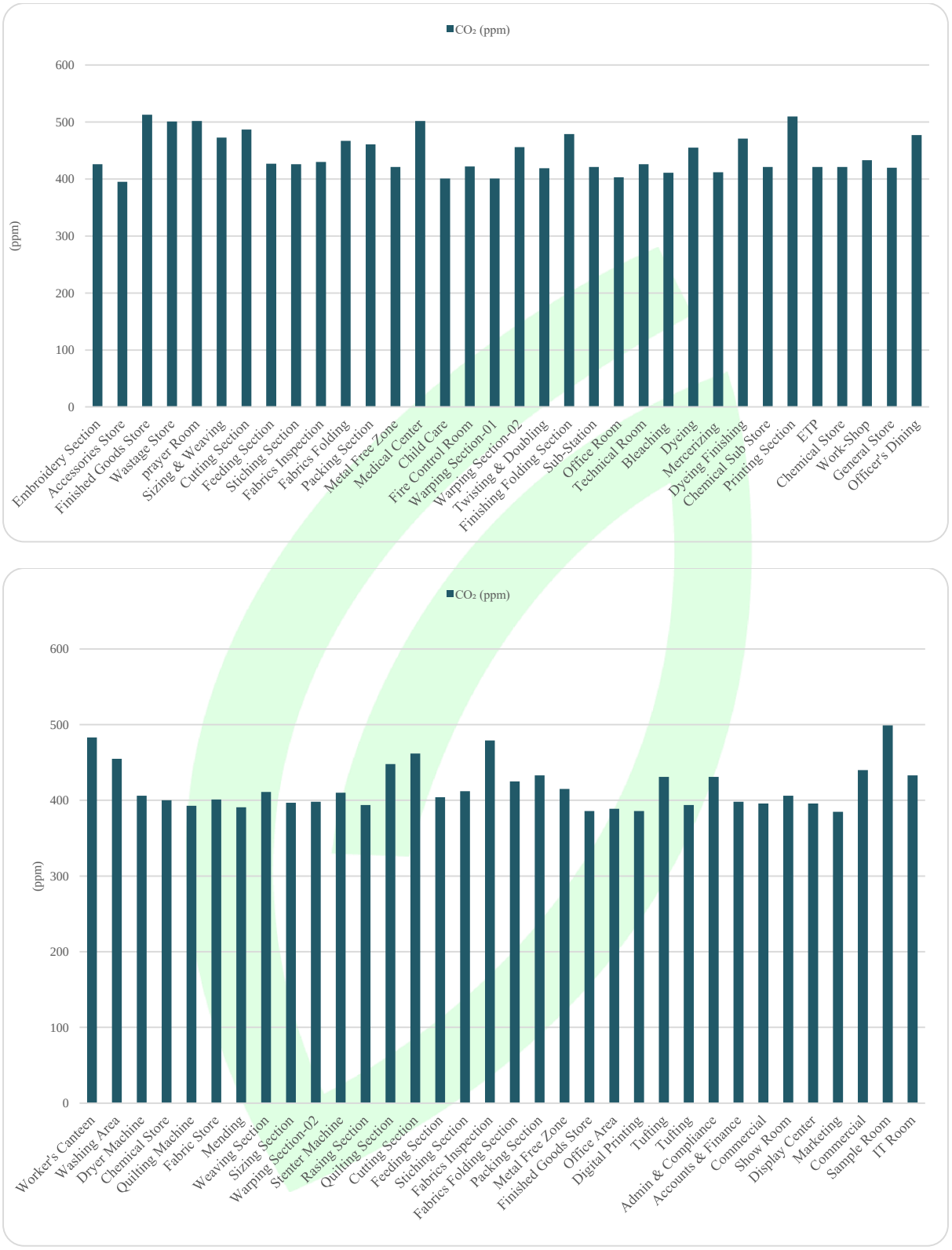

Figure: Indoor Carbon Dioxide (CO_2) Monitoring Chart

Indoor Air Quality Inspection Result :(ACS Towel Limited)

Inspection Area					Inspections Status												
Sl. No	Building No	Floor/Level	Section	Condition	PM 1 ($\mu g/m^3$)	PM $_{2.5}$ ($\mu g/m^3$)	PM $_{10}$ ($\mu g/m^3$)	VOC (mg/m^3)	CH_2O(mg/m^3)	CO (ppm)	CO_2 (ppm)	NO_2 ($\mu g/m3$)	$SO_{2(\mu g/m3)}$	O_3 (ppm)	NH_3 (ppm)	H_2S (ppm)	Air Velocity
1	Building-1	Basement	Yarn Store	Working	27	39	58	0	0	0	417	0	0	0	0	0	0.2
2		Ground Floor	Warping Section	Working	23	35	56	0	0	0	390	0	0	0	0	0	0.1
3			Sizing Section	Working	25	36	51	0	0	0	386	0	0	0	0	0	0.1
4			Weaving Section	Working	31	47	67	0	0	0	411	0	0	0	0	0	0.2
5			Dyeing & Finishing	Working	32	45	63	0.06	0.008	0	443	0	0	0	0	0	0.1
6			Lab Room	Working	22	34	43	0.2	0.03	0	401	0	0	0	0	0	0.1
7			Flatbed Printing Section	Working	26	36	48	0	0	0	419	0	0	0	0	0	0.2
8		1st Floor	Cutting Section	Working	27	42	57	0	0	0	411	0	0	0	0	0	0.1
9			Stitching Section	Working	23	31	49	0	0	0	397	0	0	0	0	0	0.1
10			Inspection Room	Working	22	29	41	0	0	0	497	0	0	0	0	0	0.2
11			Folding Section	Working	19	30	51	0	0	0	467	0	0	0	0	0	0.1
12			Packing Section	Working	17	26	40	0	0	0	401	0	0	0	0	0	0.1
13	Building-2	Ground Floor	Medical Center	Working	24	39	58	0	0	0	455	0	0	0	0	0	0.2
14		1st Floor	Child Care	Working	27	41	53	0	0	0	451	0	0	0	0	0	0.1
15			Fire Control Room	Working	29	43	59	0	0	0	388	0	0	0	0	0	0.2
16	Building-3	Ground Floor	Chemical Store	Working	31	49	70	0.3	0.04	0	489	0	0	0	0	0	0.2
17			Work Shop	Working	26	35	45	0	0	0	412	0	0	0	0	0	0.1
18		1st Floor	General Store	Working	31	47	59	0	0	0	401	0	0	0	0	0	0.1
19			Officer's Dining	Working	38	53	68	0	0	0	475	0	0	0	0	0	0.2
20		2nd Floor	Worker's Dining	Working	34	52	67	0	0	0	456	0	0	0	0	0	0.1
21	Building-4	Ground Floor	Compressor	Working	35	55	63	0	0	0	386	0	0	0	0	0	0.1
22			Generator Room	Working	39	59	78	0	0	0	401	0	0	0	0	0	0.2
23			Boiler Room	Working	34	51	64	0	0	0	435	0	0	0	0	0	0.2
24			Technical Director Office	Working	24	36	49	0	0	0	411	0	0	0	0	0	0.2
25	Building-5	Ground Floor	Chemical Store	Working	39	54	72	0.2	0.06	0	399	0	0	0	0	0	0.1

Inspection Area					Inspections Status													
Sl. No	Building No	Floor/Level	Section	Condition	PM 1 (µg/m^3)	PM $_{2.5}$ (µg/m^3)	PM $_{10}$ (µg/m^3)	VOC (mg/m^3)	CH_2O(mg/m^3)	CO (ppm)	CO_2 (ppm)	NO_2 (µg/m3)	$SO_{2(µg/m3)}$	O_3 (ppm)	NH_3 (ppm)	H_2S (ppm)	Air Velocity
26	Building-5	Ground Floor	Quilting Machine Room	Working	32	49	65	0	0	0	401	0	0	0	0	0	0.1
27		1st Floor	Fabric Store	Working	34	44	4	0	0	0	422	0	0	0	0	0	0.2
28		2nd Floor	Mending Area	Working	36	43	69	0	0	0	426	0	0	0	0	0	0.1
29	Building-6	Ground Floor	ETP	Working	31	49	70	0.1	0.03	0	432	0	0	0	0	0	0.1
30	Building-7	Ground Floor	Security Post	Working	36	51	67	0	0	0	425	0	0	0	0	0	0.2
31	Building-8	Ground Floor	Electrical Sub-Station	Working	27	43	55	0	0	0	399	0	0	0	0	0	0.1
32	Shed-01		Wastage Area	Working	34	48	63	0	0	0	425	0	0	0	0	0	0.1
33	Shed-02		Wastage Area	Working	39	52	75	0	0	0	411	0	0	0	0	0	0.2

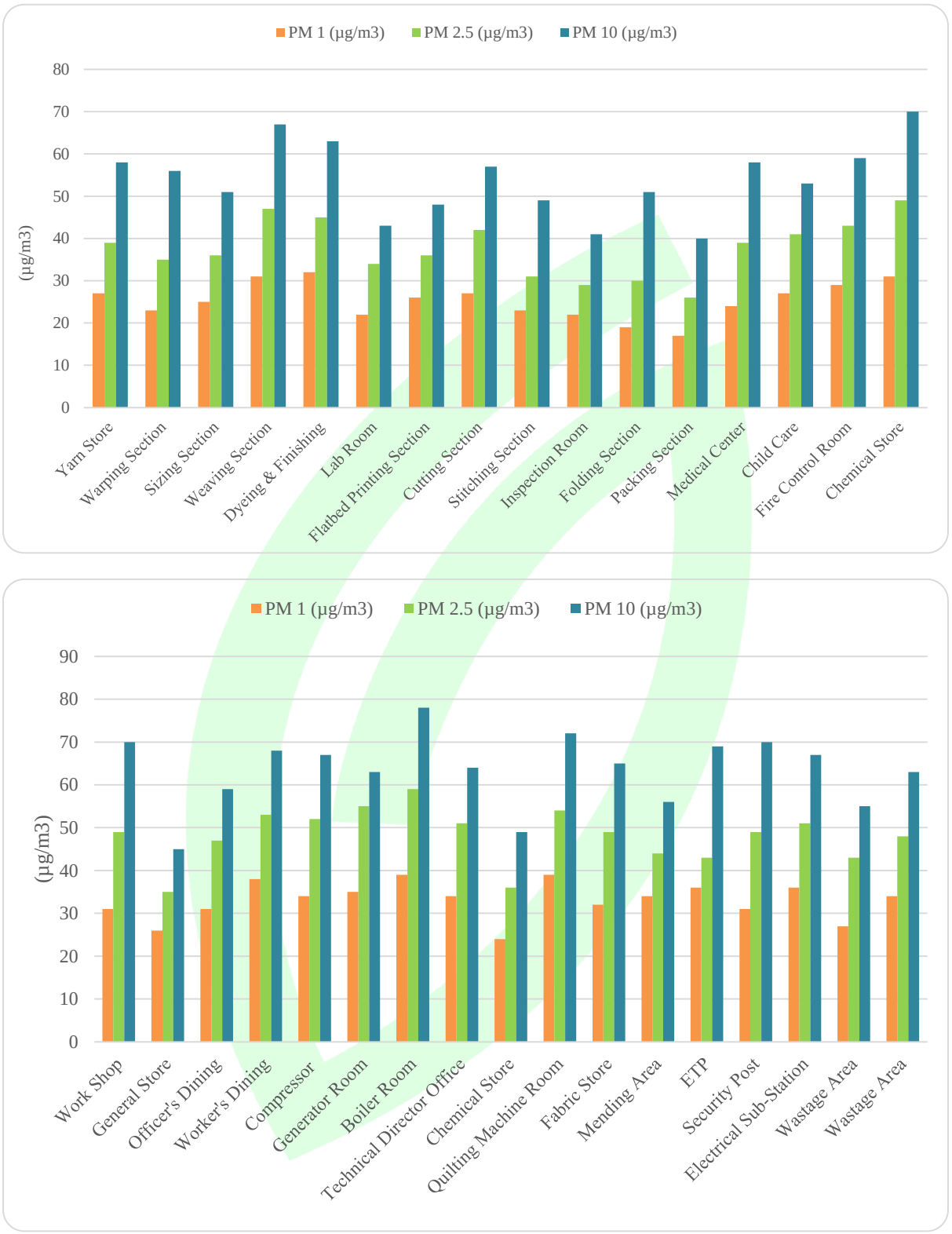

Figure: Indoor Particulate level Monitoring Chart

Figure: Indoor Carbon Dioxide (CO_2) Monitoring Chart

Hourly Mass Emission Rate : (ACS Textiles (Bangladesh) Ltd.)

Inspection Area					Mass Emission (mg/hr)											
SL. NO.	Buiding No.	Floor	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-01	Ground Floor	Embroidery Section	Working	6.84	9.72	13.68	0	0	0	275986.656	0	0	0	0	0
2			Accessories Store	Working	7.92	11.88	16.2	0	0	0	255903.12	0	0	0	0	0
3		1st Floor	Finished Goods Store	Working	15.84	22.32	26.64	0	0	0	664700.256	0	0	0	0	0
4		2nd Floor	Wastage Store	Working	7.56	14.04	18	0	0	0	324575.856	0	0	0	0	0
5			prayer Room	Working	15.84	28.08	36	0	0	0	650447.424	0	0	0	0	0
6	Building-02	Ground Floor	Sizing & Weaving	Working	5.76	9.72	11.88	0	0	0	306435.888	0	0	0	0	0
7		1st Floor	Cutting Section	Working	11.88	19.8	24.12	0	0	0	315505.872	0	0	0	0	0
8			Feeding Section	Working	15.12	25.2	46.8	0	0	0	553269.024	0	0	0	0	0
9			Stiching Section	Working	9	14.76	20.88	0	0	0	275986.656	0	0	0	0	0
10			Fabrics Inspection	Working	7.92	14.04	18	0	0	0	278578.08	0	0	0	0	0
11			Fabrics Folding	Working	15.12	25.2	33.84	0	0	0	605097.504	0	0	0	0	0
12			Packing Section	Working	15.84	27.36	33.12	0	0	0	597323.232	0	0	0	0	0
13			Metal Free Zone	Working	34.56	59.4	75.6	0	0	0	818242.128	0	0	0	0	0
14	Building-03	Ground Floor	Medical Center	Working	7.92	14.04	18	0	0	0	325223.712	0	0	0	0	0
15		1st Floor	Child Care	Working	19.44	34.56	43.2	0	0	0	519580.512	0	0	0	0	0
16			Fire Control Room	Working	27	35.64	51.84	0	0	0	820185.696	0	0	0	0	0
17	Building-04	Ground Floor	Warping Section-01	Working	6.84	11.52	14.76	0	0	0	259790.256	0	0	0	0	0
18			Warping Section-02	Working	43.2	64.8	84.6	0	0	0	1477111.68	0	0	0	0	0
19			Twisting & Doubling	Working	15.84	23.04	28.8	0	0	0	542903.328	0	0	0	0	0
20		1st Floor	Finishing Folding Section	Working	11.52	18.72	24.48	0	0	0	310323.024	0	0	0	0	0
21	Building-05	Ground Floor	Sub-Station	Working	15.84	25.2	33.12	0	0	0	545494.752	0	0	0	0	0
22		1st Floor	Office Room	Working	6.12	12.24	15.12	0	0	0	261085.968	0	0	0	0	0
23			Technical Room	Working	12.24	23.76	32.4	0	0	0	551973.312	0	0	0	0	0
24	Building-06	Ground Floor	Bleaching	Working	7.56	12.96	16.56	36	36	0	266268.816	0	0	0	0	0
25			Dyeing	Working	18	22.32	31.68	36	4.32	0	589548.96	0	0	0	0	0
26			Mercerizing	Working	10.44	14.04	19.8	7.2	2.16	0	266916.672	0	0	0	0	0
27			Dyeing Finishing	Working	22.32	27.36	40.32	216	28.8	0	610280.352	0	0	0	0	0
28			Chemical Sub Store	Working	22.68	34.56	48.6	216	21.6	0	818242.128	0	0	0	0	0
29			Printing Section	Working	6.84	9.72	14.76	21.6	2.88	0	330406.56	0	0	0	0	0
30			ETP	Working	6.48	9.36	14.76	28.8	3.24	0	272747.376	0	0	0	0	0
31	Building-07	Ground Floor	Chemical Store	Working	7.56	10.44	16.2	3.6	0.36	0	272747.376	0	0	0	0	0
32			Work-Shop	Working	17.28	25.92	33.84	0	0	0	561043.296	0	0	0	0	0

Inspection Area					Mass Emission (mg/hr)											
SL. NO.	Buiding No.	Floor	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
33	Building-07	1st Floor	General Store	Working	19.44	33.48	44.28	0	0	0	816298.56	0	0	0	0	0
34			Officer's Dining	Working	15.84	25.92	32.4	0	0	0	618054.624	0	0	0	0	0
35		2nd Floor	Worker's Canteen	Working	17.28	23.76	33.12	0	0	0	625828.896	0	0	0	0	0
36	Building-10	Ground Floor	Washing Area	Working	12.24	18.72	25.92	0	0	0	589548.96	0	0	0	0	0
37			Dryer Machine	Working	3.96	6.48	8.28	0	0	0	263029.536	0	0	0	0	0
38	Building-11	Ground Floor	Chemical Store	Working	28.08	41.04	49.68	64.8	8.64	0	777427.2	0	0	0	0	0
39			Quilting Machine	Working	19.44	35.64	45.36	0	0	0	763822.224	0	0	0	0	0
40		1st Floor	Fabric Store	Working	6.84	11.88	15.12	0	0	0	259790.256	0	0	0	0	0
41		2nd Floor	Mending	Working	4.68	9	11.88	0	0	0	253311.696	0	0	0	0	0
42	Building-12	Ground Floor	Weaving Section	Working	10.8	19.44	25.2	0	0	0	532537.632	0	0	0	0	0
43			Sizing Section	Working	19.44	34.56	43.2	0	0	0	771596.496	0	0	0	0	0
44			Warping Section-02	Working	8.28	13.32	18	0	0	0	257846.688	0	0	0	0	0
45			Stenter Machine	Working	11.16	17.64	21.96	0	0	0	265620.96	0	0	0	0	0
46			Rasing Section	Working	16.56	28.08	33.84	0	0	0	510510.528	0	0	0	0	0
47		1st Floor	Quilting Section	Working	6.48	11.52	14.76	0	0	0	290239.488	0	0	0	0	0
48			Cutting Section	Working	14.4	26.64	33.84	0	0	0	598618.944	0	0	0	0	0
49			Feeding Section	Working	7.56	12.24	16.56	0	0	0	261733.824	0	0	0	0	0
50			Stiching Section	Working	4.68	7.56	9	0	0	0	266916.672	0	0	0	0	0
51			Fabrics Inspection	Working	11.52	18.72	23.04	0	0	0	620646.048	0	0	0	0	0
52			Fabrics Folding Section	Working	4.32	7.56	9.36	0	0	0	275338.8	0	0	0	0	0
53			Packing Section	Working	5.76	8.64	10.08	0	0	0	280521.648	0	0	0	0	0
54			Metal Free Zone	Working	10.08	18.72	22.32	0	0	0	537720.48	0	0	0	0	0
55			Finished Goods Store	Working	16.56	25.2	33.84	0	0	0	500144.832	0	0	0	0	0
56	Building-13	Ground Floor	Office Area	Working	22.68	43.2	57.24	0	0	0	756047.952	0	0	0	0	0
57	Building-14	Ground Floor	Digital Printing	Working	7.2	13.32	16.56	0	0	0	250072.416	0	0	0	0	0
58		1st Floor	Tufting	Working	13.68	23.76	33.84	0	0	0	558451.872	0	0	0	0	0
59		2nd Floor	Tufting	Working	22.68	36.72	46.44	0	0	0	765765.792	0	0	0	0	0
60	Building-15	Ground Floor	Admin & Compliance	Working	7.92	13.32	16.92	0	0	0	279225.936	0	0	0	0	0
61			Accounts & Finance	Working	52.2	93.6	126	0	0	0	1289233.44	0	0	0	0	0
62			Commercial	Working	9.36	25.2	32.4	0	0	0	513101.952	0	0	0	0	0
63		1st Floor	Show Room	Working	9.72	15.84	20.52	0	0	0	263029.536	0	0	0	0	0
64			Display Center	Working	15.12	28.08	36.72	0	0	0	513101.952	0	0	0	0	0
65			Marketing	Working	9	13.32	17.64	0	0	0	249424.56	0	0	0	0	0
66			Commercial	Working	9.36	17.28	20.88	0	0	0	570113.28	0	0	0	0	0

Inspection Area					Mass Emission (mg/hr)											
SL. NO.	Buiding No.	Floor	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
67	Building-15	2nd Floor	Sample Room	Working	7.56	13.32	16.2	0	0	0	323280.144	0	0	0	0	0
68			IT Room	Working	19.44	36	49.68	0	0	0	561043.296	0	0	0	0	0
Avg. Mass Emission in mg/hr:					**13.7594**	**22.6535**	**29.8482**	**9.2647**	**1.5882**	**0**	**490484.156**	**0**	**0**	**0**	**0**	**0.7377**
Total Mass Emission in mg/hr:					**935.64**	**1540.44**	**2029.68**	**630**	**108**	**0**	**33352922.6**	**0**	**0**	**0**	**0**	**50.1646**
Total Mass Emission in Kg/hr:					**0.0009**	**0.002**	**0.002**	**0.00063**	**0.00011**	**0**	**33.3529**	**0**	**0**	**0**	**0**	**5.0164**
Total Mass Emission in Kg/yr:					**7.7696**	**12.7918**	**16.8545**	**5.2315**	**0.8968**	**0**	**276962.6692**	**0**	**0**	**0**	**0**	**0.4166**
Total Mass Emission in ton/yr:					**0.008**	**0.013**	**0.017**	**0.005**	**0.001**	**0**	**276.963**	**0**	**0**	**0**	**0**	**0.000**

****Abbreviations and Acronyms:** *CO=Carbon Monoxide; CO_2=Carbon dioxide; O_2=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.*

Hourly Mass Emission Rate : (ACS Towel Limited)

Inspection Area					Mass Emission (mg/hr)											
SL. NO.	Buiding No.	Floor	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	Basement	Yarn Store	Working	19.44	28.08	41.76	0	0	0	540311.904	0	0	0	0	0
2		Ground Floor	Warping Section	Working	8.28	12.6	20.16	0	0	0	252663.84	0	0	0	0	0
3			Sizing Section	Working	9	12.96	18.36	0	0	0	250072.416	0	0	0	0	0
4			Weaving Section	Working	22.32	33.84	48.24	0	0	0	532537.632	0	0	0	0	0
5			Dyeing & Finishing	Working	11.52	16.2	22.68	21.6	2.88	0	287000.208	0	0	0	0	0
6			Lab Room	Working	7.92	12.24	15.48	72	10.8	0	259790.256	0	0	0	0	0
7			Flatbed Printing Section	Working	18.72	25.92	34.56	0	0	0	542903.328	0	0	0	0	0
8		1st Floor	Cutting Section	Working	9.72	15.12	20.52	0	0	0	266268.816	0	0	0	0	0
9			Stitching Section	Working	8.28	11.16	17.64	0	0	0	257198.832	0	0	0	0	0
10			Inspection Room	Working	15.84	20.88	29.52	0	0	0	643968.864	0	0	0	0	0
11			Folding Section	Working	6.84	10.8	18.36	0	0	0	302548.752	0	0	0	0	0
12			Packing Section	Working	6.12	9.36	14.4	0	0	0	259790.256	0	0	0	0	0
13	Building-2	Ground Floor	Medical Center	Working	17.28	28.08	41.76	0	0	0	589548.96	0	0	0	0	0
14		1st Floor	Child Care	Working	9.72	14.76	19.08	0	0	0	292183.056	0	0	0	0	0
15			Fire Control Room	Working	20.88	30.96	42.48	0	0	0	502736.256	0	0	0	0	0
16	Building-3	Ground Floor	Chemical Store	Working	22.32	35.28	50.4	216	28.8	0	633603.168	0	0	0	0	0
17			Work Shop	Working	9.36	12.6	16.2	0	0	0	266916.672	0	0	0	0	0
18		1st Floor	General Store	Working	11.16	16.92	21.24	0	0	0	259790.256	0	0	0	0	0
19			Officer's Dining	Working	27.36	38.16	48.96	0	0	0	615463.2	0	0	0	0	0
20		2nd Floor	Worker's Dining	Working	12.24	18.72	24.12	0	0	0	295422.336	0	0	0	0	0
21	Building-4	Ground Floor	Compressor	Working	12.6	19.8	22.68	0	0	0	250072.416	0	0	0	0	0
22			Generator Room	Working	28.08	42.48	56.16	0	0	0	519580.512	0	0	0	0	0
23			Boiler Room	Working	24.48	36.72	46.08	0	0	0	563634.72	0	0	0	0	0
24			Technical Director Office	Working	17.28	25.92	35.28	0	0	0	532537.632	0	0	0	0	0
25	Building-5	Ground Floor	Chemical Store	Working	14.04	19.44	25.92	72	21.6	0	258494.544	0	0	0	0	0
26			Quilting Machine Room	Working	11.52	17.64	23.4	0	0	0	259790.256	0	0	0	0	0
27		1st Floor	Fabric Store	Working	24.48	31.68	40.32	0	0	0	546790.464	0	0	0	0	0
28		2nd Floor	Mending Area	Working	12.96	15.48	24.84	0	0	0	275986.656	0	0	0	0	0
29	Building-6	Ground Floor	ETP	Working	11.16	17.64	25.2	36	10.8	0	279873.792	0	0	0	0	0
30	Building-7	Ground Floor	Security Post	Working	25.92	36.72	48.24	0	0	0	550677.6	0	0	0	0	0
31	Building-8	Ground Floor	Electrical Sub-Station	Working	9.72	15.48	19.8	0	0	0	258494.544	0	0	0	0	0

Inspection Area					Mass Emission (mg/hr)											
SL. NO.	**Buiding No.**	**Floor**	**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**
32	Shed-01		Wastage Area	Working	12.24	17.28	22.68	0	0	0	275338.8	0	0	0	0	0
33	Shed-02		Wastage Area	Working	28.08	37.44	54	0	0	0	532537.632	0	0	0	0	0
Avg. Mass Emission in mg/hr:					**15.3600**	**22.38**	**30.622**	**12.6**	**2.26**	0	**392561.472**	0	0	0	0	0
Total Mass Emission in mg/hr:					**522.24**	**738.36**	**1010**	**417**	**74.8**	**0**	**12954528**	**0**	**0**	**0**	**0**	**0**
Total Mass Emission in Kg/hr:					**0.0005**	**0.0007**	**0.0010**	**0.0004**	**0.0001**	**0**	**12.9545**	**0**	**0**	**0**	**0**	**0**
Total Mass Emission in Kg/yr:					**4.34**	**1.95**	**2.67**	**1.10**	**0.20**	**0**	**34277.68**	**0**	**0**	**0**	**0**	**0**
Total Mass Emission in ton/yr:					**0.0043**	**0.0061**	**0.0084**	**0.0035**	**0.0006**	**0**	**107.5744**	**0**	**0**	**0**	**0**	**0**

Discussion and Recommendation:

GREENBUD Testing & Inspection Services Private Limited has inspected the indoor air quality of **ACS Textiles (Bangladesh) Ltd. & ACS Towel Limited** 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
MIEB No.: M/35960
ISO 14001 certification Number.: EA/15/IN/16050
ISO 50001 certification Number.: ENMS/16/IN/533

Appendix

Figure: Indoor Air Quality Inspection

Inspection Instrument:

Air Quality Meter – JD-3002

Air Quality Meter -DM106

Multi Gas detector-BH-4S

Carbon Monoxide Meter- pyle pcmm05

CALIBRATION TECHNOLOGY PVT. LIMITED
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Mobile: +8809643220000; www.caltechbd.com
Accredited to **ISO 9001:2015 & ISO/IEC 17025:2017**

CERTIFICATE OF CALIBRATION

Certificate No. : CTPL(23-24)-6183

Calibration Performed For :

GREENBUD
F14A,L14, Confidence Center(Building 2),Kha-09,
Shajadpur,Gulshan,Dhaka,Bangladesh
Phone : +880 1711084732
Mail Address : jesan@greenbudbd.com
Contact Person : SYEED JESAN MAHMOOD

Equipment Details :

Description : Air Quality Meter
Manufacturer : Dienmer
Model No. : DM106
Serial No. : N/P
Asset /ID No : GB-110-014-001
Range : Ref On Obs
Readability : Ref On Obs

Calibration Statics:

Received On : 06 Dec 2023
Date Serviced : 07 Dec 2023
Due on : 06 Dec 2024
Issued on : 07 Dec 2023
Received Condition : Good
Returned Condition : Good
Interval : 12 Months
Performed By : Md. Mahin Saruar Suton
Performed At : Caltech Laboratory
Environmental Conditions : Temp: 25.2 °C & RH: 57.5%
CalTech Procedure : CTPL-WI-126

Comments/Notes

Declaration of result as per **ILAC-G8:2019 (Binary)**.
The result of calibration is satisfactory.
Any section marked,
N/P= Not Provided,
N/S= Not Submitted,
UUC= Unit Under Calibration.

CalTech hereby certifies that...

The above described instrument met or exceeded all established specifications at the time of calibration specified above; and the calibration results published in this certificate obtained using equipment capable of producing results that are tracable through NIST to the International System of Units (SI) or have been derived from accepted values, physical constants, by ratio or self calibration techniques. All Calibration activities performed are in compliance with **Comparison method** and **ISO 17025:2017** when specified as well as national/ international system guidelines. The quality system is **ISO 9001:2015** certified. This report shall not be reproduced, except in full, without the written permission of CalTech.
All Calibrations, unless otherwise noted, are performed using accuracies of less than or equal to one quarter of the specification of the unit under calibration. The measurement uncertainties include a coverage factor of K=2, having a confidence level of 95%.

Calibration Points — Result Column : P= Pass, F= Fail, A= Adjusted, D= No Result drawn due to tolerance N/S

Sl. No.	Description	Nominal (ppm)	Standard Solution (mg/m³)	As found UUC (mg/m³)	Error(mg/m³)	Tolerance (±)(mg/m³)	Result	Uncertainty (±)
01	HCOC	50.000	1.999	1.998	-0.001	N/A	D	0.02 % Rdg.

Sl. No.	Description	Nominal (mg/m³)	Standard Solution (mg/m³)	As found UUC (mg/m³)	Error(mg/m³)	Tolerance (±) (mg/m³)	Result	Uncertainty (±)
01	TVOC	10.000	10.000	9.999	-0.001	N/A	D	0.02 % Rdg.

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CERTIFICATE OF CALIBRATION

Certificate No. : CTPL(23-24)-6186

Calibration Performed For :

GREENBUD
F14A,L14, Confidence Center(Building 2),Kha-09,
Shajadpur,Gulshan,Dhaka,Bangladesh
Phone : +880 1711084732
Mail Address : jesan@greenbudbd.com
Contact Person : SYEED JESAN MAHMOOD

Equipment Details :

Description : Air Quality Meter
Manufacturer : JLDG
Model No. : JD-3002
Serial No. : N/P
Asset /ID No : GB-110-014-004
Range : Ref On Obs
Readability : Ref On Obs

Calibration Statics:

Received On : 06 Dec 2023
Date Serviced : 09 Dec 2023
Due on : 08 Dec 2024
Issued on : 09 Dec 2023
Received Condition : Good
Returned Condition : Good
Interval : 12 Months
Performed By : Md. Mahin Saruar Suton
Performed At : Caltech Laboratory
Environmental Conditions : Temp: 24.9 °C & RH: 57.6%
CalTech Procedure : CTPL-WI-126

Comments/Notes

Declaration of result as per **ILAC-G8:2019 (Binary)**.
The result of calibration is satisfactory.
Any section marked,
N/P= Not Provided,
N/S= Not Submitted,
UUC= Unit Under Calibration.

CalTech hereby certifies that...

The above described instrument met or exceeded all established specifications at the time of calibration specified above; and the calibration results published in this certificate obtained using equipment capable of producing results that are tracable through NIST to the International System of Units (SI) or have been derived from accepted values, physical constants, by ratio or self calibration techniques. All Calibration activities performed are in compliance with **Comparison method** and **ISO 17025:2017** when specified as well as national/ international system guidelines. The quality system is **ISO 9001:2015** certified. This report shall not be reproduced, except in full, without the written permission of CalTech.
All Calibrations, unless otherwise noted, are performed using accuracies of less than or equal to one quarter of the specification of the unit under calibration. The measurement uncertainties include a coverage factor of K=2, having a confidence level of 95%.

Calibration Points — Result Column : P= Pass, F= Fail, A= Adjusted, D= No Result drawn due to tolerance N/S

Sl. No.	Description	Nominal (ppm)	Standard Solution (mg/m³)	As found UUC (mg/m³)	Error(mg/m³)	Tolerance (±)(mg/m³)	Result	Uncertainty (±)
01	HCOC	50.000	1.999	1.998	-0.001	N/A	D	0.02 % Rdg.

Sl. No.	Description	Nominal (mg/m³)	Standard Solution (mg/m³)	As found UUC (mg/m³)	Error(mg/m³)	Tolerance (±) (mg/m³)	Result	Uncertainty (±)
01	TVOC	2.000	2.000	1.999	-0.001	N/A	D	0.02 % Rdg.

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Accredited to ISO 9001:2015 & ISO/IEC 17025:2017

CERTIFICATE OF CALIBRATION

Certificate No. : CTPL(23-24)-6183

Standard Used to Calibrate Equipment

Sl. No.	Description	Manufacturer	Model	Serial	Calibrated from	Cal. Due on
01	CARBON MONOXIDE,50 PPM	Snaptech Products , UK	Y811255	N/P	NIST Traceable	Nov 2024
02	Certified Gas Mixtures	Snaptech Products , UK	Y112587	N/P	NIST Traceable	Feb 2024

Calibration Performed By :
Calibration Engineer

Authorized By :
Laboratory Manager
Md. Rezaul Hasan

[END]

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CERTIFICATE OF CALIBRATION

Certificate No. : CTPL(23-24)-6186

Sl. No.	Description	Nominal (ppm)	Standard Gas (ppm)	As found UUC (ppm)	Error (ppm)	Tolerence (±) (ppm)	Result	Uncertainty (±) (ppm)
01	CO 2 Gas	50	50	49	-1	1	P	0.59

Standard Used to Calibrate Equipment

Sl. No.	Description	Manufacturer	Model	Serial	Calibrated	Cal. Due on
01	CARBON MONOXIDE,50 PPM	Snaptech Products , UK	Y811255	N/P	NIST Traceable	Nov 2024
02	Certified Gas Mixtures	Snaptech Products , UK	Y112587	N/P	NIST Traceable	Feb 2024
03	Carbon Dioxide Calibration Gas CO2	GASCO	103L-37-50	N/P	NIST Traceable	Feb 2024

Calibration Performed By :
Calibration Engineer

Authorized By :
Laboratory Manager
Md. Rezaul Hasan

[END]

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CERTIFICATE OF CALIBRATION

Certificate No. CTPL(23-24)-6188

Calibration Performed For :

GREENBUD
F14A,L14, Confidence Center(Building 2),Kha-09,
Shajadpur,Gulshan,Dhaka,Bangladesh
Phone : +880 1711084732
Mail Address : jesan@greenbudbd.com
Contact Person : SYEED JESAN MAHMOOD

Equipment Details :

Description : Multi Gas Detector
Manufacturer : HENAN BOSEN ELECTRIC COM. LTD.
Model No. : BH-4S
Serial No. : 202011170
Asset /ID No : **GB-110-014-006**
Range/ readability () : Ref. on obs.

Calibration Statics:

Received On : 06 Dec 2023
Date Serviced : **07 Dec 2023**
Due on : **06 Dec 2024**
Issued on : 07 Dec 2023
Received Condition : Good
Returned Condition : Good
Interval : 12 Months
Performed By : Md. Mahin Saruar Suton
Performed At : Caltech Laboratory
Environmental Conditions : Temp: 25.2 °C & RH: 57.5%
CalTech Procedure : **CTPL-WI-102**

Comments/Notes

Declaration of result as per **ILAC-G8:2019 (Binary).**
The result of calibration is satisfactory.
Any section marked,
N/P= Not Provided ,
N/S= Not Submitted,
N/A= Not Applicable
UUC= Unit Under Calibration.
Tolerance is taken from manufacturer specification.

CalTech hereby certifies that...

The above described instrument met or exceeded all established specifications at the time of calibration specified above; and the calibration results published in this certificate obtained using equipment capable of producing results that are traceble through NIST to the International System of Units (SI) or have been derived from accepted values, physical constants, by ratio or self calibration techniques. All Calibration activities performed are in compliance with **DKD-R6-1** and **ISO 17025:2017** when specified as well as national/ international system guidelines. The quality system is ISO 9001:2015 certified. This report shall not be reproduced, except in full, without the written permission of CalTech.

All Calibrations, unless otherwise noted, are performed using accuracies of less than or equal to one quarter of the specification of the unit under calibration. The measurement uncertainties include a coverage factor of K=2, having a confidence level of 95%.

Calibration Points **Result Column : P= Pass, F= Fail, A= Adjusted, N/S= Not Specified**

Sl. No.	Description	Nominal (ppm)	Standard Gas (ppm)	As found UUC (ppm)	Error (ppm)	Tolerence (±) (ppm)	Result	Uncertainty (±) (ppm)
01	CO Gas	50	50	49	-1	1	P	0.59
02	CO Gas	100	100	99	-1	2	P	0.59

Sl. No.	Description	Nominal (ppm)	Standard Gas (ppm)	As found UUC (ppm)	Error (ppm)	Tolerence (±) (ppm)	Result	Uncertainty (±) (ppm)
01	H_2S Gas	50	50	50	0	1	P	0.59
02	H_2S Gas	100	100	100	0	2	P	0.59

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CERTIFICATE OF CALIBRATION

Certificate No. CTPL(23-24)-6190

Calibration Performed For :

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Shajadpur,Gulshan,Dhaka,Bangladesh
Phone : +880 1711084732
Mail Address : jesan@greenbudbd.com
Contact Person : SYEED JESAN MAHMOOD

Equipment Details :

Description : Carbon Monoxide gas Detector
Manufacturer : PYLE
Model No. : PCMM05
Serial No. : N/P
Asset /ID No : **GB-110-014-008**
Range/ readability () : Ref. on obs.

Calibration Statics:

Rreceived on : 06 Dec 2023
Date Serviced : **09 Dec 2023**
Due on : **08 Dec 2024**
Issued on : 09 Dec 2023
Received Condition : Good
Returned Condition : Good
Interval : 12 Months
Performed By : Md. Mahin Saruar Suton
Performed At : Caltech Laboratory
Conditions : Temp 25.1 °C & RH% 55.3
CalTech Procedure : **CTPL-WI-102**

Comments/Notes

Declaration of result as per **ILAC-G8:2019 (Binary).**
The result of calibration is satisfactory.
Any section marked,
N/P= Not Provided ,
N/S= Not Submitted,
N/A= Not Applicable
UUC= Unit Under Calibration.
Tolerance is taken from manufacturer specification.

CalTech hereby certifies that...

The above described instrument met or exceeded all established specifications at the time of calibration specified above; and the calibration results published in this certificate obtained using equipment capable of producing results that are traceble through NIST to the International System of Units (SI) or have been derived from accepted values, physical constants, by ratio or self calibration techniques. All Calibration activities performed are in compliance with **IS/IEC 60079-29-2 : 2007** and **ISO 17025:2017** when specified as well as national/ international system guidelines. The quality system is ISO 9001:2015 certified. This report shall not be reproduced, except in full, without the written permission of CalTech.

All Calibrations, unless otherwise noted, are performed using accuracies of less than or equal to one quarter of the specification of the unit under calibration. The measurement uncertainties include a coverage factor of K=2, having a confidence level of

Calibration Points **Result Column : P= Pass, F= Fail, A= Adjusted, N/S= Not Specified**

Sl. No.	Description	Nominal (ppm)	Standard Gas (ppm)	As found UUC (ppm)	Error (ppm)	Tolerance (±) (ppm)	Result	Uncertainty (±) (ppm)
01	CO Gas	100	100	102	2	10	P	1
02	CO Gas	200	200	199	-1	10	P	1
03	CO Gas	500	500	506	6	10	P	2

CALIBRATION TECHNOLOGY PVT. LIMITED
Vivek Biponon Tower, Level-2
13/P, Biponon C/A, Mymensing Lane
Banglamotor, Dhaka-1000, Bangladesh.
Mobile: +8809643220000; www.caltechbd.com
Accredited to **ISO 9001:2015 & ISO/IEC 17025:2017**

CERTIFICATE OF CALIBRATION

Certificate No. CTPL(23-24)-6188

Sl. No.	Description	Nominal (% Vol)	Standard Gas (% Vol)	As found UUC (% Vol)	Error (% V	Tolerence (±) (% Vol)	Result	Uncertainty (±)
01	O_2 Gas	20.0	20.00	20.0	0.0	0.05	P	0.4% of rdg.

Standard Used to Calibrate Equipment

Sl. No.	Description	Manufacturer	Model	Serial	Calibrated from	Cal. Due on
01	Standard Gas	Spantech Products, UK	Y123119	N/P	NIST Traceable	August 2024
02	Standard Gas	Spantech Products, UK	Y121250	N/P	NIST Traceable	May 2024
03	Standard Gas	Spantech Products, UK	Y118223	N/P	NIST Traceable	May 2024

Calibration Performed By :
Calibration Engineer

Authorized By :
Laboratory Manager
Md. Reza Hossain

[END]

CALIBRATION TECHNOLOGY PVT. LIMITED
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13/P, Biponon C/A, Mymensing Lane
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CERTIFICATE OF CALIBRATION

Certificate No. CTPL(23-24)-6190

Standard Used to Calibrate Equipment

Sl. No.	Description	Manufacturer	Model	Serial	Calibrated from	Cal. Due on
01	Standard Gas	CASCO	10L-49-100	N/P	NIST Traceable	31 Dec 2024
02	Standard Gas	Spantech Products, UK	Y118200	N/P	NIST Traceable	May 2024
03	Standard Gas	Spantech Products, UK	Y118500	N/P	NIST Traceable	May 2024

Calibration Performed By :
Calibration Engineer

Authorized By :
Laboratory Manager
Md. Reza Hossain

[END]

GLOBAL ACCEPTANCE

BAB

BANGLADESH ACCREDITATION BOARD

ACCREDITATION CERTIFICATE

Issued under the authority of Bangladesh Accreditation Act, 2006
by Bangladesh Accreditation Board (BAB), Ministry of Industries to

GREENBUD Testing & Inspection Services
14A, Level-14, Building 2, Confidence center
Kha-09, Sahajadpur, Gulshan, Dhaka-1212, Bangladesh

This is to certify that this

Inspection Body(Type-A)
is accredited in accordance with the international standard

ISO/IEC 17020:2012
in respect of the associated scope, subject to the terms and conditions governing the relevant conformity assessment body (CAB) accreditation.

Certificate Number	:	05.003.18
Accreditation Date	:	28 June 2018
Date of Issuance	:	18 Aug 2024 (2nd Renewal)
Date of Expiration	:	27 June 2027

CERT. NO. 05.003.18
BAB
BANGLADESH ACCREDITATION BOARD
Accredited for ISO/IEC 17020:2012

GLOBAL
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ACCEPTANCE

18. 08. 2024
Md. Anwarul Alam
Director General

This certificate must be returned on request; reproduction must follow BAB guidelines. For the specific scopes to which this accreditation applies, please refer to the Directory of CABs at BAB website.