



Indoor Air Level Quality Report:

INDESORE SWEATER LTD.



Conducted By

GREENTECH TESTING COMPANY LTD.

Corporate Office:

House: 4 Sobhanbag, Mohammadia Super
Market, Dhanmondi-27, Dhaka-1207
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Date of Testing: January 28, 2019

Date of Report Submitting: February 2, 2019



GREENTECH TESTING COMPANY

Environmental Testing, Inspection, Assessment, Calibration
& Consultancy Organisation.



Certificate Number: GTCL/VER/2019/210

Indoor Air Level Quality Monitoring Report

Issued By	Greentech Testing Company Ltd. (GTCL) House No: 4 Sobhanbag, 123 Mohammadia Super Market (2 nd Floor), Mirpur Road, Dhaka-1207. Contact Number: 01795-333332 E-mail: ceo@gtclbangladesh.com
Date of Issue	: February 2, 2019
Certificate Number	: Certificate Number: GTCL/VER/2019/210
Customer	INDESORE SWEATER LTD. : Deger Chala, National University, Gazipur Sadar, Gazipur-1704, Bangladesh.
Description	: Indoor Air Level Quality Monitoring of INDESORE SWEATER LTD.
Date of Assessment	: January 28, 2019



Prepared By:

Md. Arif Ullah

Environmental Specialist

Greentech Testing Company Ltd.(GTCL)



Approved By:

Md. Atiqur Rahman

Environmental Specialist

Head of- Quality Assurance

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Indoor Air Quality Monitoring Test Report

Environmental Condition:

Ambient Temperature : 25.3 °C
Relative Humidity : 56% RH
Weather Condition : Winter Season

Methodology:

Indoor air quality of the factory has been monitored for the parameters of CO, CO₂, NO₂, H₂O, SO₂, NO, H₂S, VOC, Hydrocarbon & O₂ following Continuous Emission Monitoring System (CEMS) by using an air analyzer. The analyzers are designed to meet BS 8494/ EN 50270:2006 standard. CO, NO₂, SO₂, H₂S & CH₂O are monitored using electrochemical method and CO₂ is monitoring following Non-Dispersive Infra-red (NDIR) method. Hydrocarbon & VOC are monitored using plus-in catalytic bead and O₂ is measured by capillary controlled concentration sensor. O₂ is monitored using automatic span upon activation. The Suspended Particulate Matter (SPM) of different sizes as PM 0.3, PM0.5, PM 1, PM 2.5, PM 5, PM 10, has monitored by handheld particle counter at different sections of the factory. The particle counter utilizes the laser technology for single particle detection. The scattering of light from the particle in the sampling air stream is converted into electrical pulses, which is then measured and calculated as a particle size. The concentration of particulate matter is measured in microgram per cubic meter. Greentech Assessor Mr. Arif Ullah has collected the monitoring data. The entire monitoring process has been conducted following Greentech Work Instruction WI 06, and Greentech Standard operating procedure GTCL SOP 05.

Instrument Specification:

Size Range : 0.3µm~10 µm
Flow range : 2.83 Liter/min (0.1 cfm)
Counting Efficiency : 50±20%@0.3µm; 100±10%@0.5

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Indoor Air Level Quality Monitoring Report

Portable Indoor Air Quality Monitor Specification:

Parameter	Resolution	Specified Range
Carbon-Monoxide	0.1 ppm	0.200 ppm
Carbon di-oxide	1 ppm	5000 ppm
SO ₂	0.1 ppm	0-20 ppm
NO ₂	0.1 ppm	0-20 ppm
Formaldehyde	1 ppb	0-10,000 ppb
H ₂ S	1 ppm	0-200 ppm
NO	0.5 ppm	0-250 ppm
VOC	1 ppm	1-1000 ppm
Hydrocarbon	1% LEL	0-100% LEL
O ₂	0.1	0-30% Vol.

Test Results:

Time & Duration: Inspection has been done between 09.30 AM to 04.15 PM

Test Area Name	Location	Parameters									
		CO PPM	CO ₂ PPM	NO ₂ PPM	SO ₂ PPM	CH ₂ O PPM	NO PPM	H ₂ S PPM	VOC PPM	Hydroc Arbon %	O ₂ %
Dining Hall	8th Floor, Main Building	0.0	906	0.0	0.0	0	0.0	0.0	0	0	20.8
Jacquard Section	7th Floor, Main Building	0.0	860	0.0	0.0	0	0.0	0.0	0	0	20.2
Sewing Section	7th Floor, Main Building	0.0	845	0.0	0.0	0	0.0	0.0	0	0	20.8
Jacquard Section	6th Floor, Main Building	0.0	1056	0.0	0.0	0	0.0	0.0	0	0	20.4
Jacquard Section	5th Floor, Main Building	0.0	1083	0.0	0.0	0	0.0	0.0	0	0	20.3
Finished Goods Area	4th Floor, Main Building	0.0	1230	0.0	0.0	0	0.0	0.0	0	0	20.7
Finishing Section	3rd Floor, Main Building	0.0	851	0.0	0.0	0	0.0	0.0	0	0	20.8
Iron Section	3rd Floor, Main Building	0.0	846	0.0	0.0	0	0.0	0.0	0	0	20.9
Trimming & Mending Section	3rd Floor, Main Building	0.0	867	0.0	0.0	0	0.0	0.0	0	0	20.8
Packing Section	3rd Floor, Main Building	0.0	982	0.0	0.0	0	0.0	0.0	0	0	20.9
Linking Section	2nd Floor, Main Building	0.0	1255	0.0	0.0	0	0.0	0.0	0	0	20.9
Winding Section	2nd Floor, Main Building	0.0	1329	0.0	0.0	0	0.0	0.0	0	0	20.9
Accessories Store	2nd Floor, Main Building	0.0	1230	0.0	0.0	0	0.0	0.0	0	0	20.9
Finishing Section	1st Floor, Main Building	0.0	1045	0.0	0.0	0	0.0	0.0	0	0	20.9
Iron Section	1st Floor, Main Building	0.0	1043	0.0	0.0	0	0.0	0.0	0	0	20.9
Trimming & Mending Section	1st Floor, Main Building	0.0	1038	0.0	0.0	0	0.0	0.0	0	0	20.9
Packing Section	1st Floor, Main Building	0.0	1261	0.0	0.0	0	0.0	0.0	0	0	20.9

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Medical Center	Ground Floor, Main Building	0.0	912	0.0	0.0	0	0.0	0.0	0	0	20.9
Washing Area	Ground Floor, Main Building	0.0	879	0.0	0.0	0	0.0	0.0	0	0	20.9
Yarn Store	Ground Floor, Main Building	0.0	1432	0.0	0.0	0	0.0	0.0	0	0	20.9
Chemical Store	Ground Floor, Main Building	0.0	1245	0.0	0.0	0	0.0	0.0	0	0	20.9
Boiler Room	Ground Floor, Main Building	0.0	1028	0.0	0.0	0	0.0	0.0	0	0	20.9
ETP Area	Ground Floor, ETP Area	0.0	867	0.0	0.0	0	0.0	0.0	0	0	20.9
Basement Area	Basement Floor, Main Building	0.0	1167	0.0	0.0	0	0.0	0.0	0	0	20.9
Generator Room	Basement Floor, Main Building	0.0	1158	0.0	0.0	0	0.0	0.0	0	0	20.9

Suspended Particulate Matter (SPM):

Test Area Name	Location	Suspended Particulate Matter ($\mu\text{g}/\text{m}^3$)						Total Suspended Particles, TSP($\leq 10\mu\text{M}$)
		PM 0.3	PM 0.5	PM 1.0	PM 2.5	PM 5	PM 10	
Dining Hall	8th Floor, Main Building	1	2	2	24	34	48	111
Jacquard Section	7th Floor, Main Building	3	1	2	35	46	63	150
Sewing Section	7th Floor, Main Building	2	3	1	26	36	53	121
Jacquard Section	6th Floor, Main Building	1	2	4	36	48	65	156
Jacquard Section	5th Floor, Main Building	2	3	2	35	45	62	149
Finished Goods Area	4th Floor, Main Building	3	3	1	22	38	47	114
Finishing Section	3rd Floor, Main Building	2	1	3	23	43	47	119
Iron Section	3rd Floor, Main Building	3	1	3	25	38	45	115
Trimming & Mending Section	3rd Floor, Main Building	2	3	2	26	39	50	122
Packing Section	3rd Floor, Main Building	3	2	3	25	35	45	113
Linking Section	2nd Floor, Main Building	4	3	2	28	38	63	138
Winding Section	2nd Floor, Main Building	3	2	1	41	44	72	163
Accessories Store	2nd Floor, Main Building	3	2	1	25	47	40	118
Finishing Section	1st Floor, Main Building	4	3	2	28	45	54	136
Iron Section	1st Floor, Main Building	1	3	3	25	40	55	127
Trimming & Mending Section	1st Floor, Main Building	3	2	4	26	43	50	128
Packing Section	1st Floor, Main Building	2	4	3	23	39	55	126
Medical Center	Ground Floor, Main Building	3	2	4	29	34	54	126
Washing Area	Ground Floor, Main Building	2	3	2	32	46	60	145
Yarn Store	Ground Floor, Main Building	3	3	1	31	40	49	127
Chemical Store	Ground Floor, Main Building	3	2	2	24	41	47	119
Boiler Room	Ground Floor, Main Building	2	1	3	30	40	58	134
ETP Area	Ground Floor, ETP Area	1	3	2	27	42	49	124
Basement Area	Basement Floor, Main Building	2	4	3	30	38	43	120
Generator Room	Basement Floor, Main Building	4	3	2	31	37	50	127

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Standard Permissible Limit (Industrial):

Agency	Pollutant's Concentration				
	CO	CO ₂	NO ₂	SO ₂	CH ₂ O
ECR97, Schedule2, Amendment 2005	35 ppm (1 hr.) 9 ppm (8 hr.)	NYS	0.053 ppm (annual)	0.03 ppm (annual) 0.14 ppm (24 hr.)	NYS
US EPA	35 ppm (1 hr.) 9 ppm (8 hr.)	NYS	100 ppb (1 hr.) 53 ppb (annual)	75 ppb (1 hr.)	NYS
OSHA	50 ppm	5000 ppm	NYS	NYS	750 ppb

*NYS – Not Yet Set

Agency	Pollutants Concentration															
	NO	H ₂ S			VOC	Hydrocarbon	O ₂									
ECR97, Schedule 2, Amendment 2005	NYS	NYS			NYS	NYS	NYS									
US EPA	NYS	<table border="1"><tr><td>AEGL 1</td><td>AEGL 2</td><td>AEGL 3</td></tr><tr><td>0.33</td><td>17</td><td>31</td></tr><tr><td colspan="3">For 8 Hour Monitoring</td></tr></table>			AEGL 1	AEGL 2	AEGL 3	0.33	17	31	For 8 Hour Monitoring			NYS	5% (Assuming a Methane environment)	NYS
		AEGL 1	AEGL 2	AEGL 3												
		0.33	17	31												
		For 8 Hour Monitoring														
		*AEGL- Acute Exposure Guidelines Levels. (AEGLs), which indicate the concentrations of the chemical in air above which different types of health effects could begin to occur in an environment.														
AEGL 1< there may be some discomfort, odor, irritation, but effects, if any, are not impairing and only temporary.																
AEGL 2< effects become more significant and may impair ability to escape, be long lasting, or permanent.																
AEGL 3< increasingly severe effects and possible death without treatment.																
OSHA	25 ppm	20 ppm (50 ppm for 10 min once if no other measurable exposure occurs.)			NYS	NYS	19.5 – 22 % (for employee) 19.5 – 23.5 % (Atmospheric)									

*NYS – Not Yet Set

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Suspended Particulate Matter (SPM) Standard limit

Agency	SPM Density
According to ECR 97 (Amendment 2005), Schedule-2	SPM: 200 $\mu\text{g}/\text{m}^3$ (8hr Average) PM 2.5: 15 $\mu\text{g}/\text{m}^3$ (Annual Average) 65 $\mu\text{g}/\text{m}^3$ (24-hour Average) PM 10: 50 $\mu\text{g}/\text{m}^3$ (Annual Average) 150 $\mu\text{g}/\text{m}^3$ (24 hour Average)
US EPA	PM 2.5-35 $\mu\text{g}/\text{m}^3$ (24-hr) PM 10-150 $\mu\text{g}/\text{m}^3$ (24-hr)

Discussion and Recommendation:

Indoor air quality of "INDESORE SWEATER LTD." factory has been analyzed for the concentration of parameters CO, CO₂, NO₂, and CH₂O & SO₂. The concentration of Suspended Particulate Matter (SPM) of different sizes within the range of 0.3 $\mu\text{g}/\text{m}^3$ -10 $\mu\text{g}/\text{m}^3$ has also measured. From the analysis it has been observed that in most of the sections the value of CO, CO₂, NO₂, CH₂O & SO₂ are within the maximum permissible limit of ECR 97 Schedule 2 (amendment 2005), US EPA and OSHA guidelines.

- For obtaining above result the recommendation are given below:

Factory has to check indoor air quality once in a year.



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