INDOOR AIR QUALITY REPORT

Submitted to DMRC New Delhi, on test conducted at

ilbs
Institute of Liver and Biliary Sciences

Institute of Liver and Biliary Sciences
Vasant Kunj, New Delhi

By

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16th December, 2019

Indoor Air Analysis Report

Report No.	:	IGT/11019/ILBS
Conducted at	:	Institute of Liver and Biliary Sciences
Location	:	D1 ILBS Road, Vasant Kunj, New Delhi, Delhi 110070
Dates of Monitoring	:	26th -30th Nov, 2019 & 3rd -7th Dec, 2019
Purpose	:	**Assessment of Indoor Air Quality in emergency ward at ground floor of ILBS Hospital, where IGTech air purification system has been installed to improve the Indoor Air Quality.**

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Abbreviations

AHU	: Air Handling Unit
ASHRAE	: American Society of Heating, Refrigerating & Air Conditioning Engineers
CO_2	: Carbon Dioxide
HVAC	: Heating Ventilation and Air Conditioning
IAQ	: Indoor Air Quality
$\mu g/m^3$	: Micrograms Per Meter Cube
PM	: Particulate Matter
Ppb	: Parts Per Billion
Ppm	: Parts Per Million
TVOC	: Total Volatile Organic Compounds
IGTech	: IntelliGreen Technologies – (Plasma Air)
CPCB	: Central Pollution Control Board

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1. Introduction

We, Intelligreen Technologies Pvt Ltd. are solution provider of indoor air quality and IAQ monitoring.

We have installed our IGTech Air purification system at ILBS hospital in emergency ward at ground floor to improve the IAQ of the premise.

We also monitored the air quality after providing our solution to check the efficiency and impact of our installed system on-

- PM10
- PM2.5
- PM1
- TVOC

1.1 Acknowledgement

We would like to thank DMRC, Project Management Consultant of ILBS Hospital for involving us in contributing and evaluating one of their most patient centric initiatives.

We would also like to thank Kool Kraft Engineers Pvt Ltd and ILBS Hospital team for their help and support extended to us during the whole project.

1.2 Purpose

The monitoring was conducted to draw comparison & arrive at scientific & evidence based conclusion on the impact and efficiency of IGTech Air Purification System so as to compare the outside air pollution level with the inside air pollution level at the premise, where purification system is installed.

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2. Testing Methodology & Monitoring Equipment used

2.1 Testing Methodology

a) Real-time monitoring of various pollutants was done to analyze the Indoor Air Quality.

b) Emergency ward at ground floor was purposely selected as the air inside this ward was being treated by IGTech IAQ equipment.

c) Level of particulate matter and TVOC was recorded through our IGT2 sensor in Inside and outside air throughout the day (10AM to 5PM).

d) The sensor was placed at a height of 1m to 2 m from the floor, for monitoring breathing zone areas of patients & medical staff, including doctors & visitors.

e) The fact sheet given in the subsequent pages reveals existing air quality in emergency ward of ILBS hospital at Ground floor along with the permissible limits of CPCB.

2.2 Monitoring Equipment Used

IGT2 AIR QUALITY MONITOR-

The Monitor adopts ABS+PC's environmental friendly material, and its surface is treated with etched workmanship. Monitor has ability to detect PM2.5, CO2, HCHO, TVOC, Temperature and Humidity. It can transmit Data by Wi-Fi, GPRS, GSM SIM CARD, RS485, and supports online firmware upgrades and checking data on Android and IOS. It can rapidly access to real-time data value and easy to operate. Monitor accepts 5V DC, 220V AC and 12VDC.

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Measuring Range

- PM2.5 : 0-999ug/m3
- Temperature: 0-55˚ C
- Humidity: 20%-95%
- CO2: 0-5000 PPM
- TVOC: 125-600 PPM

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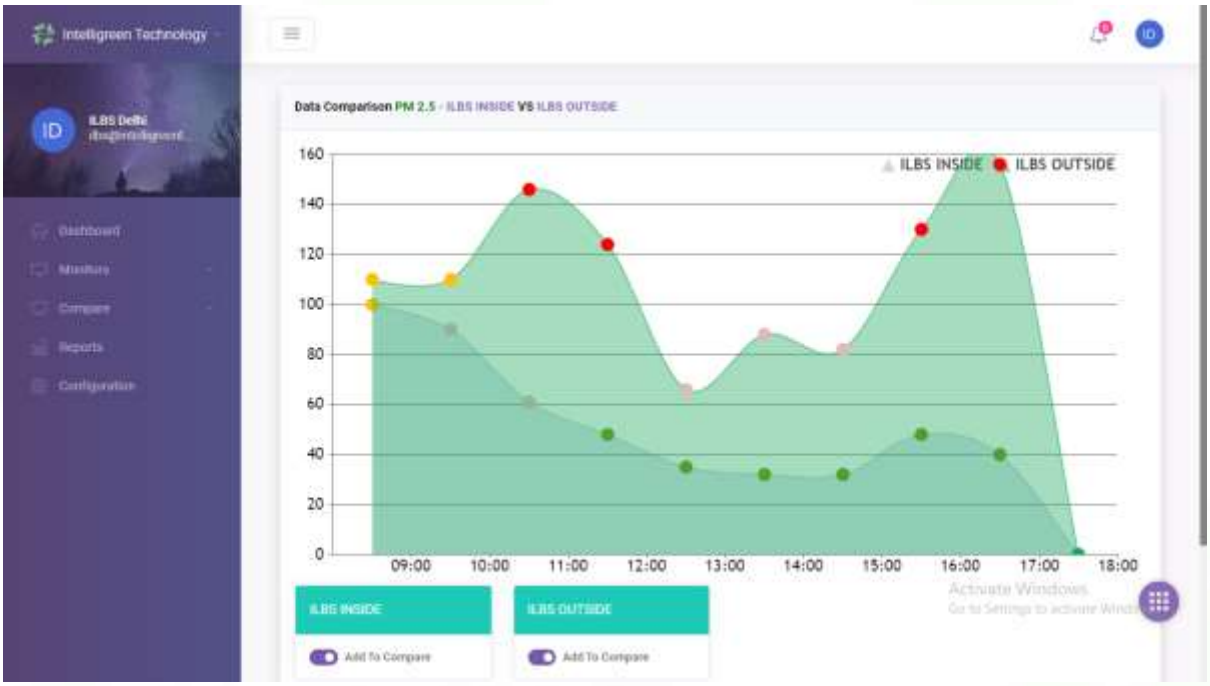
3. Test Results

Comparison between concentration of PM2.5 in inside and outside air-

26th Nov, 2019-



27th Nov, 2019-

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28th Nov, 2019-

29th Nov, 2019-

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30th Nov, 2019-

3rd Dec, 2019-

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4th Dec, 2019-

5th Dec, 2019-

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6th Dec, 2019-

7th Dec, 2019-

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4. OBSERVATION & ANALYSIS

1. We sincerely acknowledge and appreciate DMRC & ILBS Hospital management, for working with a patient centric approach & investing on maintaining the air quality in their hospital.
2. The location surveyed and monitored for indoor air quality inside the ILBS Hospital, was Emergency ward at Ground Floor.
3. Though we monitored all the major parameters, we are furnishing this report on PM2.5. However reports with other parameters recorded, too can be furnished if desired.
4. Throughout the monitoring period inside air continues to remain in Good and Satisfactory level.
5. The cumulative PM2.5 level of inside air in ground floor emergency ward was found to be substantially less in comparison to outside air. **(e.g. by approximate 75% around 4:30 PM)**
6. Overall, there has been a clear & substantial difference in the PM2.5 level, where ions based filter-less AC duct mounted air quality product has been installed,

5. CONCLUSIONS

1. The IAQ monitoring and analysis results of ILBS Hospital, Vasant Kunj indicates that the air purification technology installed in emergency ward at ground floor is able to control the PM level.
2. IGTech Indoor Air Quality Equipment is able to treat PM 2.5 Infiltration from Supply Air of HVAC Duct.
3. IGTech Indoor Air Quality Equipment is able to treat PM 2.5 Infiltration from Doors Opening.
4. IGTech Indoor Air Quality Equipment is able to treat PM 2.5 Infiltration from Human Movement.
5. The trend shows that the PM2.5 level in inside air follow the same pattern as of outside air.

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6. This indicates that there is some sort of infiltration of untreated outside air, which in tern dilutes the effect of treated air flowing inside.
7. By restricting the infiltration of outside air, reduction in PM2.5 level can be increased.
8. Some external factor like condition of the AHUs / Ducts, the relative humidity maintained by them, uses of medicines or infiltration of outside air due to frequent opening and closing of doors are other reason behind the variations of PM2.5 level in hourly data.

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