



IntelliGreen Technologies

INDOOR AIR QUALITY EXPERT

INDOOR AIR QUALITY ASSESSMENT REPORT

Submitted To



ATC INDIA

By



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Indoor Air Analysis Report

Report No. : IGT/030920/ATC

Issued To : ATC India

Location : **Plot No. 14-A Anant Marg Maruti Industrial Complex, Sector 18, Gurugram**

Timeline : 28th Aug, 2020 and 1st Sep, 2020

Purpose : **Assessment of Indoor Air Quality Before and impact of IGTech Air purification system in improving IAQ.**



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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
µg/m ³	: Micrograms Per Meter Cube
PM	: Particulate Matter
Ppb	: Parts Per Billion
Ppm	: Parts Per Million
TVOC	: Total Volatile Organic Compound
IGTech	: IntelliGreen Technologies – (Plasma Air)
CPCB	: Central Pollution Control Board



1. INTRODUCTION

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

We provide one stop comprehensive solution to eliminate all the indoor air contaminants including Viruses and Bacteria. We have been providing our solution to all across India and has rendered our services to Corporates, Hospitals, Residentials, Transportation, etc.

1.1 Acknowledgement

We would like to thank the management of ATC India specially Mr. Pankaj Mittal and Mr. Shammi Vohra for giving us the opportunity to associate with ATC India. We would also like to thank the ATC India Central Covid-19 Task Force, maintenance team and other staff available at site for their help and support.

1.2 Purpose

To assess the IAQ of ATC Sector-18 Office before implementing the IntelliGreen's Comprehensive Solution followed by an after assessment of IAQ to check the impact of IGTech Air Purification system.



2. EQUIPMENT USED-

IGT2 AIR QUALITY MONITOR-

The Monitor adopts ABS+PC's environmental friendly material, and its surface is treated with etched workmanship. The PM2.5 sensor of the product is a B2 module. Monitor shall have ability to detect PM2.5, CO2, HCHO, TVOC, Temperature and Humidity. It can transmit Data by Wi-Fi, 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.

TSI PARTICLE COUNTER-

The TSI Particle counter has 6 channels of PM, it takes 28.3 Litre air per minute in one sample and analyse the counts of 0.3, 0.5, 1, 3, 5 and 10 micron size particles presence in the sampled air.

3. TEST RESULTS

ION CONCENTRATION

Ion Concentration Summary				
Sample	Floor	Location	Pre Ion Concentration (28.8.2020) (ions/cm ³)	Post Ion Concentration (01.09.2020) (ions/cm ³)
1	7th	Board Room-1	221	-14423
2	7th	Bijender Yadav	196	-9420
3	7th	Ashwani Khillan	163	-4013
4	7th	Shyam Iyer	206	-2663
5	7th	Amit sharma	436	-5686
6	7th	Board Room-2	356	-18749
7	7th	Pankaj Mittal	408	-18956
9	7th	L7 Workstation-5	298	-6262
10	7th	L7 Workstation-7	146	-4823
11	6th	L6 Workstation-16	255	-5086
12	6th	L6 Workstation-29	309	-9314
13	6th	L6 Workstation-47	339	-14180
14	6th	L6 Workstation-55	333	-11732
15	6th	L6 Meeting R-2	341	-4482
16	6th	L6 Confrence room	338	-10676



17	5th	L5 Workstation-3	181	-17648
18	5th	L5 Workstation-26	277	-11390
19	5th	L5 Workstation-76	275	-3888
20	5th	L5 meeting R-1	330	-2556
21	5th	Auditor Room	315	-8662
22	5th	Naveen Maheshwari	354	-5497
23	4th	L4 Workstation-16	388	-18918
24	4th	L4 Workstation-37	338	-8720
25	4th	L4 Workstation-52	321	-5153
26	4th	L4 Meeting R-1	236	-3101
27	4th	L4 Meeting R-2	347	-13372
28	4th	Toc Room	362	-1
29	3rd	L3 Workstation-3	387	-6043
30	3rd	L3 Workstation-28	355	-3502
31	3rd	L3Workstation-49	348	-1
32	3rd	L3Workstation-67	280	-7932
33	3rd	L3 Meeting Room	357	-17790
34	3rd	Dhirendra Sajwan	162	-4160
35	1st	Sunil Upadhyay (W/s)	289	-8114
36	1st	L1 Workstation-7	368	-2765
37	1st	Shivika Chaube (W/s)	328	-4966
38	1st	Sanjay Gupta (W/s)	259	-3532
39	1st	L1 Meeting R-1	297	-19294
40	1st	Soumen Bhattacharya	352	-4005
41	1st	TR Room-1	245	-3128
42	1st	TR Room-2	330	-6972
43	1st	L1 Meeting R-3	274	-3649
44	1st	HR Meeting Room	385	-9858
45	1st	L1 Cabin-2	345	-5042
46	GF	Lift Lobby	192	-8669
47	GF	VHD-1	255	-5790
48	GF	VHD-2	215	-4099
49	GF	Amit Mahajan	148	-3128
50	GF	Canteen Fornt	103	-14121
51	GF	Canteen -1	174	-16490
52	GF	Canteen -2	252	-4309
53	GF	GYM ROOM	165	-9787



Various studies and Test done by OEM's globally, suggest that ion concentration above 1500 ions/cm³ is capable to destroy the hemagglutinin surface (Viral Protein, that trigger the infection) and deactivate the viruses including COVID-19.

-1 means, ion concentration in that particular area is more than 20000 ions/cm³.

REDUCTION IN PM0.3-

Reduction in PM0.3 Count				
SN	Floor	Pre Installation (28.8.2020)	Post Installation (01.09.2020)	Reduction % in PM0.3 Count
1	7th	53838130	17178750	68
2	6th	46534210	14909010	68
3	5th	46903390	15241560	68
4	4th	51977000	13033220	75
5	3rd	53409360	20483460	62
6	1st	42459050	17788730	58
7	GF	48488620	16606360	66

REDUCTION IN COUNT OF PM1 & PM10-

Reduction in PM1 Count				
SN	Floor	Pre Installation (28.8.2020)	Post Installation (01.09.2020)	Reduction %
1	7th	2708162	379619	86
2	6th	1464735	267809	82
3	5th	1917597	382191	80
4	4th	1557526	391237	75
5	3rd	1441237	547244	62
6	1st	682368	359682	47
7	GF	1115477	359541	68

Reduction in PM10 Count				
SN	Floor	Pre Installation (28.8.2020)	Post Installation (01.09.2020)	Reduction %
1	7th	31449	2612	92
2	6th	2191	1625	26
3	5th	4735	2014	57
4	4th	6042	2650	56
5	3rd	2580	2014	22
6	1st	2120	1852	13
7	GF	3463	742	79



It shall be noted here that as particle count reduction in Bi-Polar Ionization System is based on agglomeration principle, where it coalesce the particles so that they can be trapped on to the filter. Due to this, sometimes count of particles having bigger diameter increases. Once the Bi-Polar ionization system remains in continuous operation bigger particles will be eliminated from the Indoor Air as well.

4. OBSERVATION AND FINDINGS

- There are 7 floors in ATC sector-18 office.
- We carried out Pre IAQ assessment on 28th Aug and Post IAQ assessment on 1st Sep.
- During pre assessment we checked ion concentration on each floor, approximately 7 to 8 samples of ion concentration were taken on each floor.
- We measured particle count levels through particle count by taking one air sample on each floor.
- We replicated the same at the time of post IAQ assessment.
- Ion concentration after installing IGTech Air Purification system, was found above 2500 ions/cm³ in whole building.
- A great reduction in PM0.3 count (from 58 to 75%) (toughest particle size to be arrested) at each floor was observed after incorporating IntelliGreen Comprehensive Solution.
- Other IAQ parameters such as PM1, PM2.5, PM10, TVOCs are being monitored continuously.
- Pattern suggest that PM1, PM2.5, PM10 and TVOCs has been continuously in good zone after incorporating IntelliGreen Comprehensive Solution.
- Snapshot of other IAQ Parameters are shared in subsequent pages.

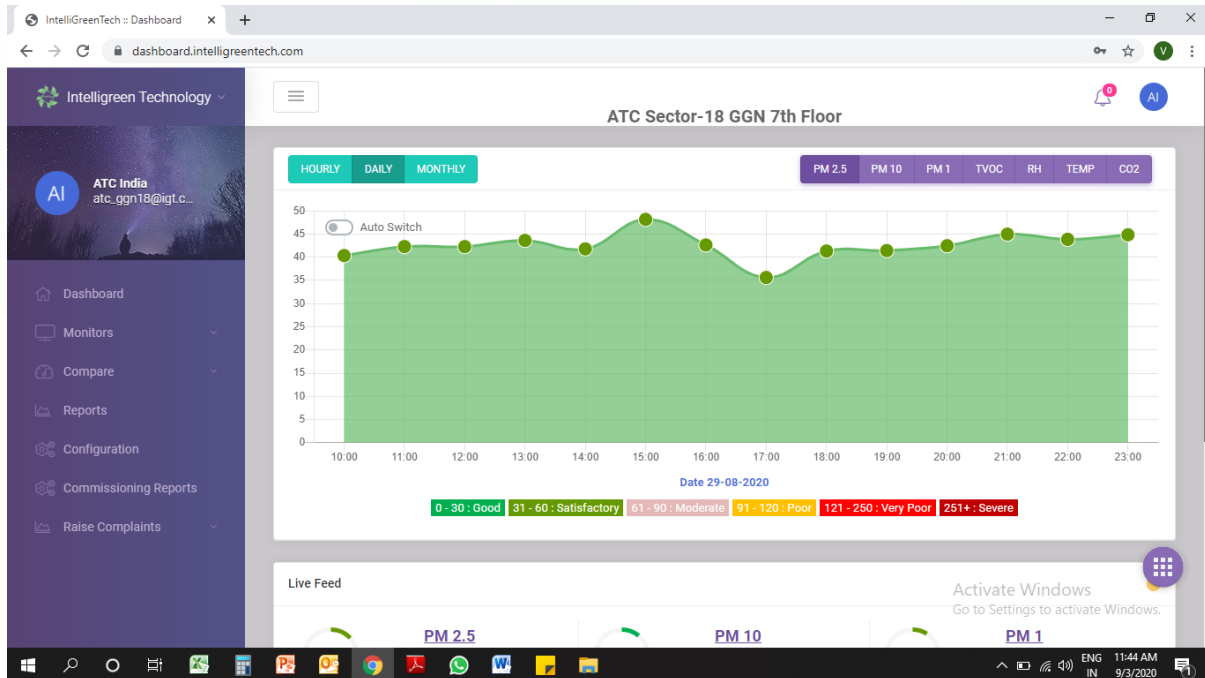
5. RECOMMENDATION

1. We recommend to maintain continuous and proper air flow so that an ion rich environment remain maintained inside the building.
2. Introduction of any untreated air shall be avoided as it will dilute the effect of ion concentration.
3. Any infiltration of outside air shall be avoided.
4. We recommend to start the HVAC before 1 hour of operational time of office, so that when the staff comes, they get an ion rich environment.



IAQ Parameter

Concentration of PM2.5 (Pre)-

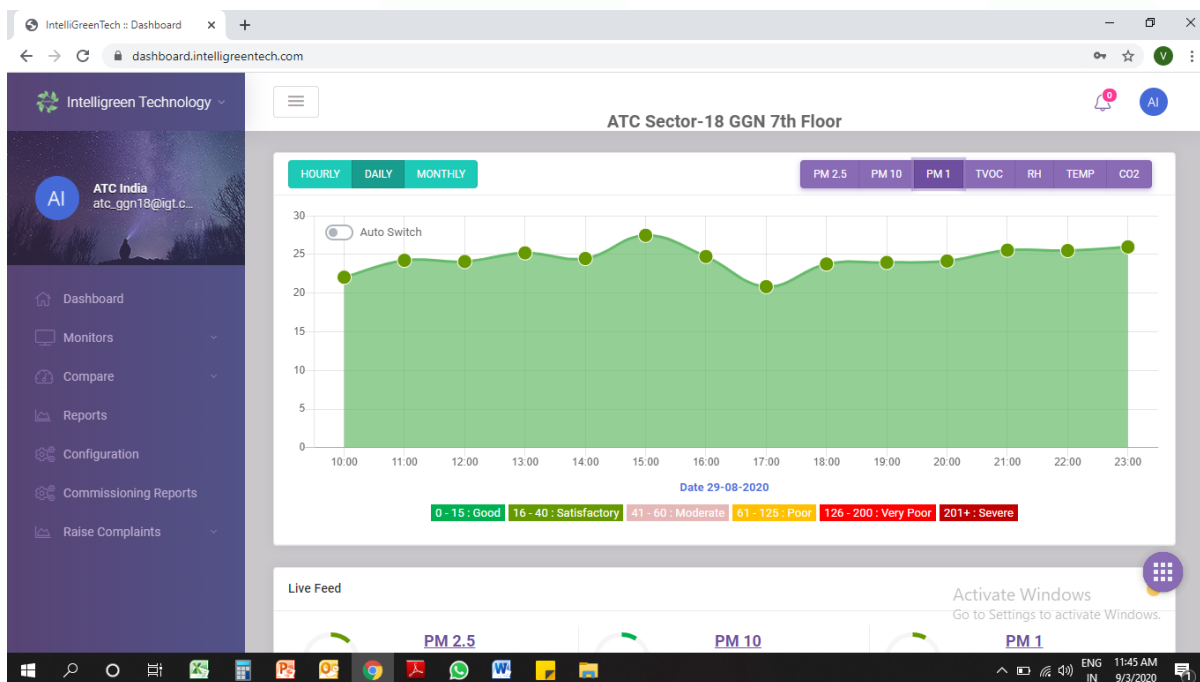


Concentration of PM2.5 (Post)-

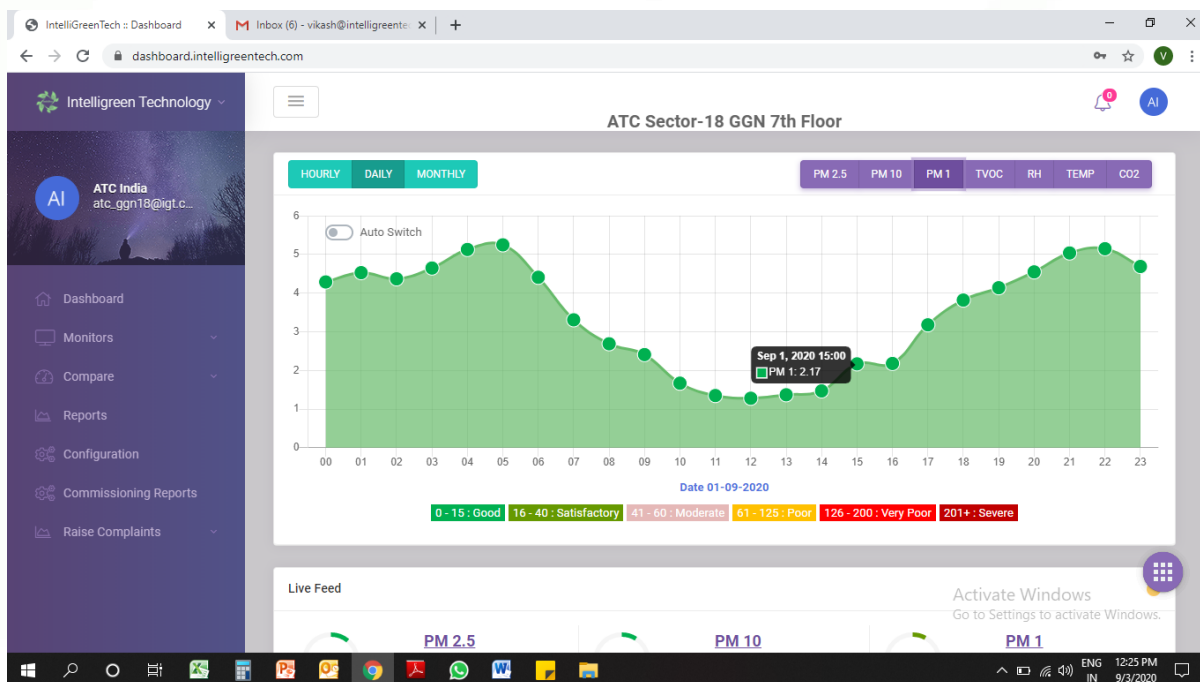




Concentration of PM1 (Pre)-

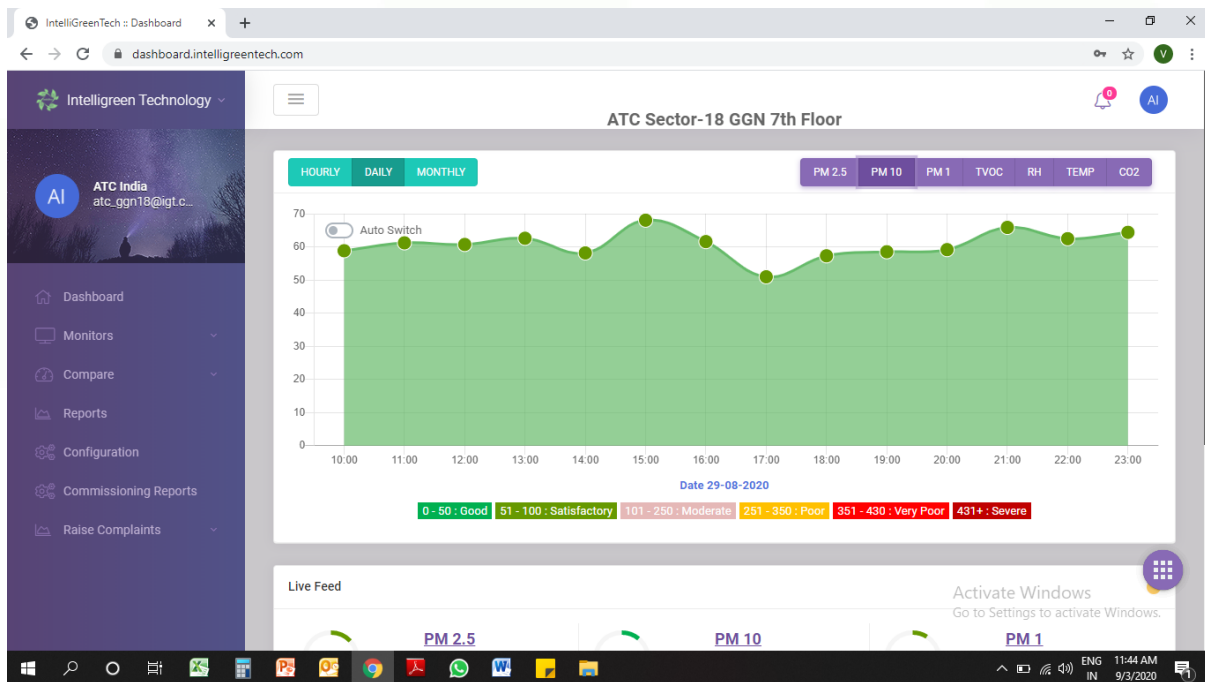


Concentration of PM1 (Post)-

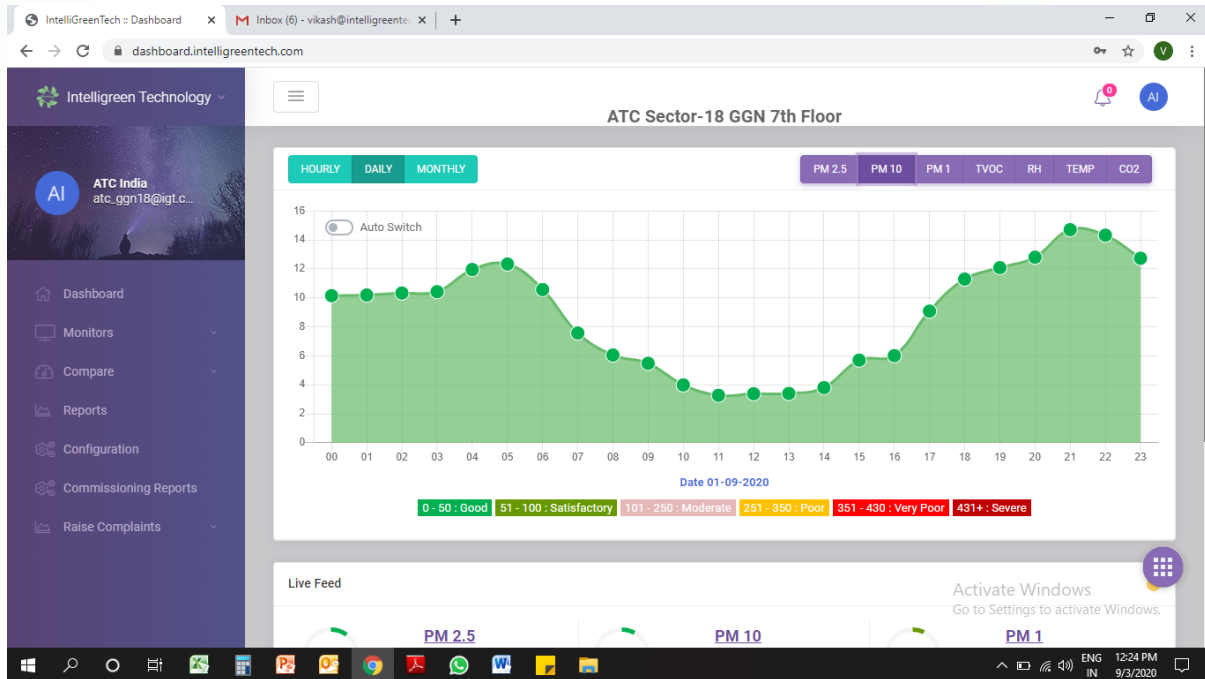




Concentration of PM 10 (Pre)-

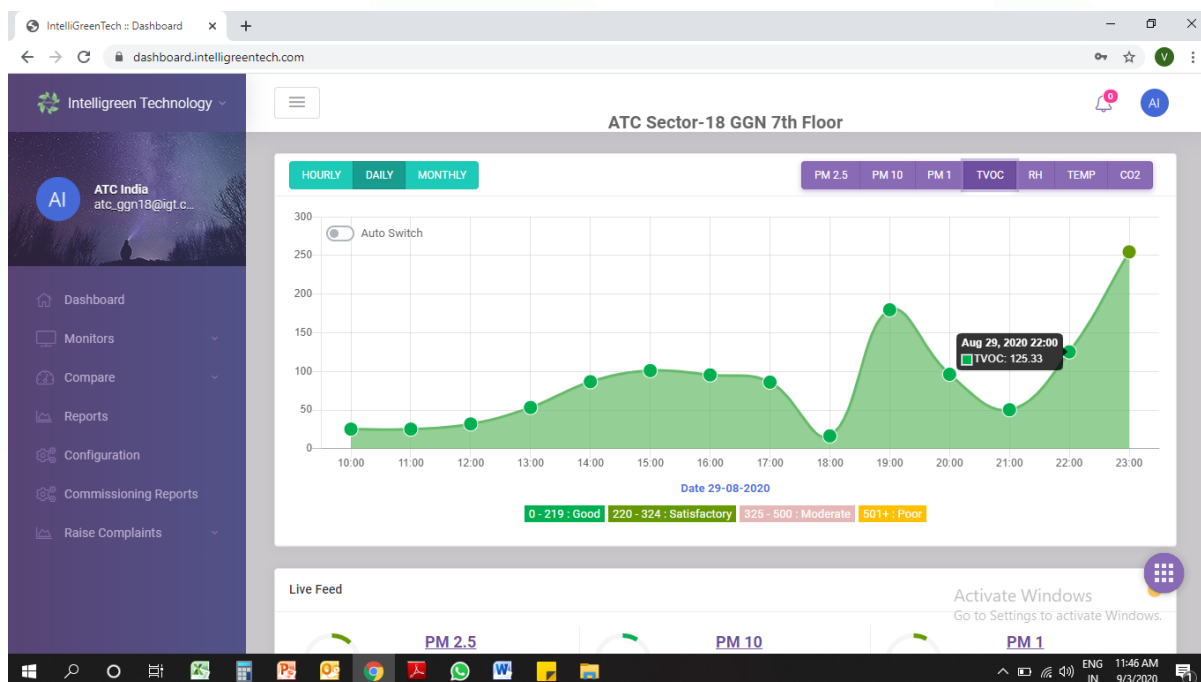


Concentration of PM 10 (Post)-

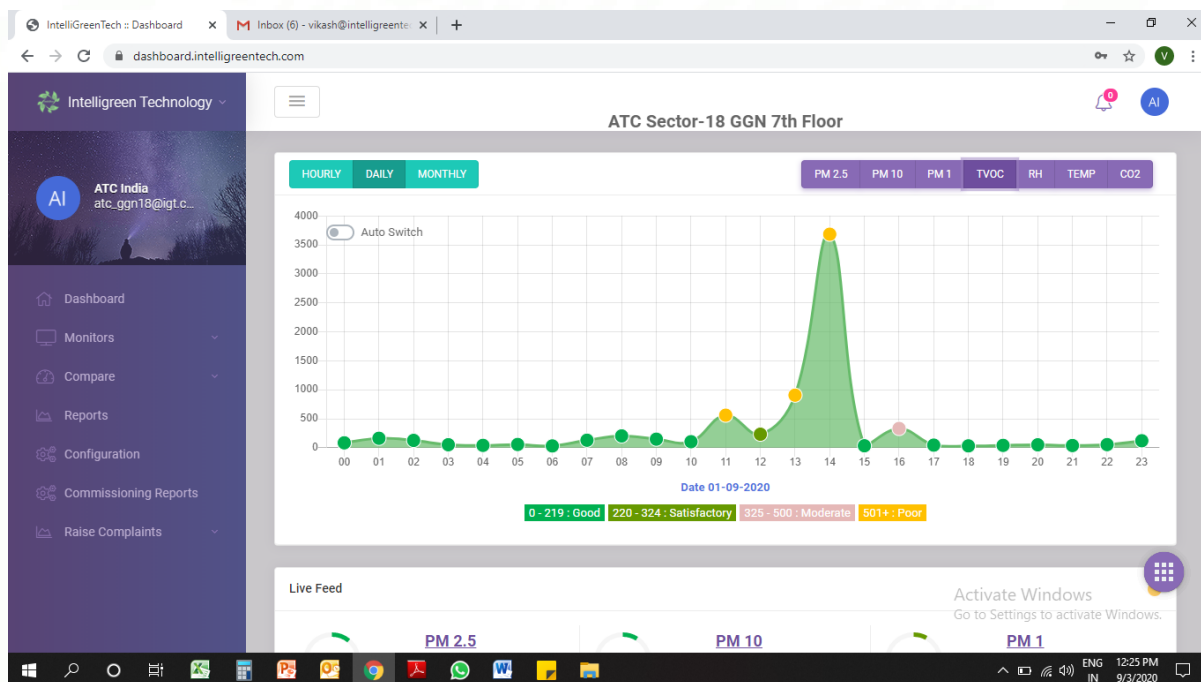




Concentration of TVOCs (Pre)-



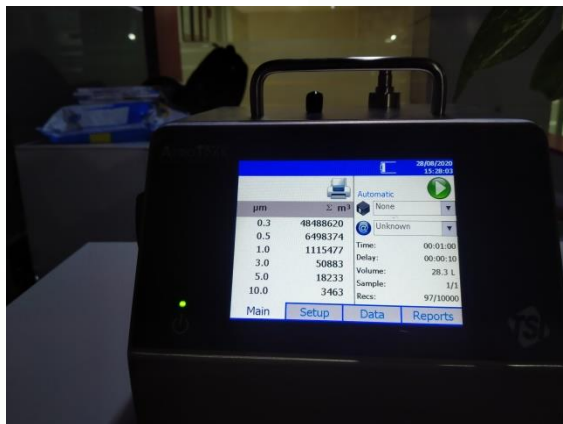
Concentration of TVOCs (Post)-



The sudden spike in TVOCs could be due to use of cleaning chemical nearby or mass gathering of people who have applied perfume. It can be seen in graph that IGTech Air Purification System was able to bring down the level of TVOCs.



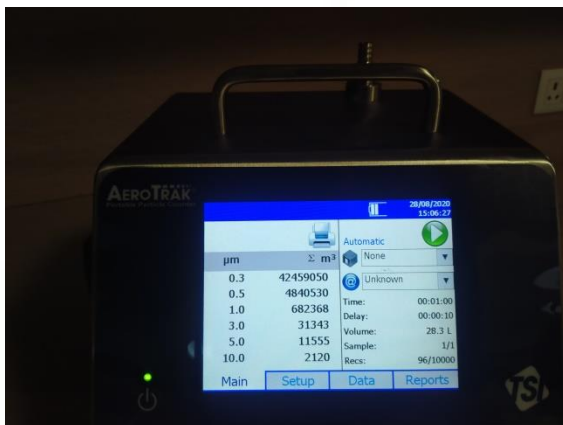
CONCENTRATIONS OF PARTICULATE MATTER ON PARTICLE COUNTER



GF (PRE)



GF (POST)



FF (PRE)



FF (POST)



3F (PRE)



3F (POST)



4F (PRE)



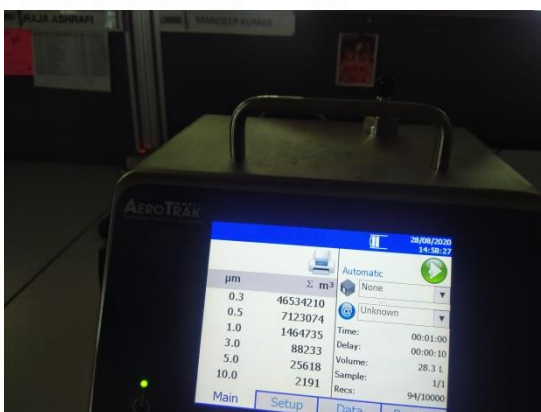
4F (POST)



5F (PRE)



5F (POST)



6F (PRE)



6F (POST)



7F (PRE)



7F (POST)