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Indoor Air Quality Measurement Report for Smoking Room, Grand Lisboa Palace

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1. Scope of IAQ Measurement

The purpose of this report is to describe the findings for the Indoor Air Quality (IAQ) measurement and the results at smoking room, Grand Lisboa Palace, which is performed by iPurifi Environment Company Limited.

The IAQ measurement was taken on 09/07/2024. The tests were performed at 1 point indoor sampling location for 3 parameter of Particulate matter (PM10 and PM2.5) and Total Volatile Organic Compounds (TVOC) at smoking room, Grand Lisboa Palace.

2. Measurement Method

The measurement and assessment methods for IAQ measurement are conformed to the IAQ assessment procedure as stipulated in the "Guidance Notes for The Management of IAQ in Offices and Public Places" which is published by IAQ Management Group, HKSAR. The measurement equipment's shown in **Appendix A** for reference.

During the IAQ measurement, continuous measurement method was taken in this project.

3. IAQ Objective (For reference only)

A 2-level IAQ Objective is established for evaluating and assessing indoor air quality. These objectives are comparable to the international health-based air quality standards and can encourage building owners to aim at the best indoor air quality. They are classified as follows:

"Excellent" Class	Represents an excellent indoor air quality that a high-class and comfortable building should have.
"Good" Class	Represents the indoor air quality that provides protection to the public at large including the very young and the aged.

Recommended Indoor Air Quality Objectives in Hong Kong (with reference to "A Guide on Indoor Air Quality Certification Scheme for Offices and Public Places" issued by Indoor Air Quality Management Group, HKSAR)

4. **Measurement Result**

The result of 3 parameter at the designated location was measured to analysis the indoor air quality is shown as following table:

Location: Smoking room, Grand Lisboa Palace
Date: July 09, 2024

Parameters		TVOC	PM2.5	PM 10
Unit		ppbv	µg/m3	µg/m3
Description	Survey Time	Readings	Readings	Readings
Close for public Air Purifier: Off	15:16	170	<1	<1
Open for public use at 15:20 Air Purifier: Off	15:22	170	118	234
Open for public use Air Purifier: Off	15:28	240	211	339
Open for public use Air Purifier: Off	15:37	750	341	496
Open for public use Air Purifier: On at 15:40	15:42	160	42	85
Open for public use Air Purifier: On	15:46	130	40	70
Open for public use Air Purifier: On	15:53	120	36	66
Open for public use Air Purifier: On	15:57	110	18	37
Close for public at 16:02 Air Purifier: On	16:05	80	10	19
Close for public Air Purifier: On	16:10	70	2	4
Close for public Air Purifier: On	16:15	50	1	2
Close for public Air Purifier: On	16:20	40	2	3

5. **Conclusion**

It can see from the measurement result that the reading of 3 parameters (TVOC, PM2.5 and PM10) drop significantly when air purifier turned on within a short period of time. The cigarette smell is strong before turning on the air purifier, and after turning on the air purifier it can feel the smoke smell gone fast. We do recommend installing an air purifier in the smoking room for public's health issue and sustainability environments concern. Also, it can help to raise corporate reputation and public awareness for a healthier smoking area.

Contribute to SDG Goals of installing air purifier in smoking room:

Appendix A – Photos of Measurement

Close for public, Air Purifier: Off, 15:16

Open for public use,Air Purifier: Off, 15:20 – 15:40

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Open for public use, Air Purifier: Off, 15:20 – 15:40

Open for public use, Air Purifier: On, 15:40 – 16:02

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Open for public use, Air Purifier: On, 15:40 – 16:02

Close for public use, Air Purifier: On, 16:02 – 16:20

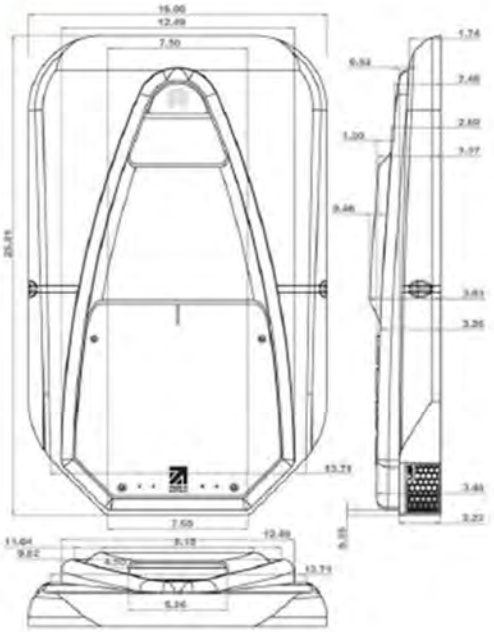
Appendix B – Air Purifier

AFL Building Sanifier

CLINICAL WHITE

AFLBLD1 PRODUCT SPECS

MADE IN BRITAIN



Electrical Specifications	
Input Voltage	230V AC
Max Watts	35W

Mechanical Specifications			
Material:	V0 rated PC and Aluminium	Weight	4.7Kg
Coverage:	3000 Sq ft (commercial use)	Shipping Weight	5.7Kg

Electrical Specifications			
Power Supply:	110V - 220V AC 50/60Hz Max Current 3A UK Plug to C7 CE, UKCA, RoHS listed	Ballast:	2 x 34V DC Ballast Lamp status indicator Lamp faulty indicator Lamp replace indicator
AFL Plasma:	Negative & Positive ions: 360 million PCS/cm^2		
Blower Fan:	2 x 24V DC - 0.20A Low noise - 86.4CFM	PCO Cell:	AFL PCO Technology

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Appendix C – Table of IAQ Objectives for Office & Public Places

Parameter	Unit	8-hour average [a]	
		Excellent Class	Good Class
Room Temperature	°C	20 to < 25.5 [b]	< 25.5 [b]
Relative Humidity	%	40 to < 70 [c]	< 70
Air movement	m/s	< 0.2	< 0.3
Carbon Dioxide (CO_2)	ppmv	< 800 [d]	< 1,000 [e]
Carbon Monoxide (CO)	$\mu g/m^3$	< 2,000 [f]	< 10,000 [g]
	ppmv	< 1.7	< 8.7
Respirable Suspended Particulates (PM_{10})	$\mu g/m^3$	< 20 [f]	< 180 [h]
Nitrogen Dioxide (NO_2)	$\mu g/m^3$	< 40 [g]	< 150 [h]
	ppbv	< 21	< 80
Ozone (O_3)	$\mu g/m^3$	< 50 [f]	< 120 [g]
	ppbv	< 25	< 61
Formaldehyde (HCHO)	$\mu g/m^3$	< 30 [f]	< 100 [f, g]
	ppbv	< 24	< 81
Total Volatile Organic Compounds (TVOC)	$\mu g/m^3$	< 200 [f]	< 600 [f]
	ppbv	< 87	< 261
Radon (Rn)	Bq/m^3	< 150 [i]	< 200 [f]
Airborne Bacteria	cfu/m^3	< 500 [j, k]	< 1,000 [j, k]

Refer to the "A Guide on Indoor Air Quality Certification Scheme for Offices and Public Places" by Indoor Air Quality Management Group, HKSAR

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Appendix D - Equipment method statement

VOC

Equipment: AreoQUAL Series 500 + TVOC sensor
Sensor type: VOC PID sensor head, 0-20 ppm
Detectable range: 0-20 ppm
Resolution: 10 ppb
Accuracy: ±10% of reading whichever is greater

PM2.5 and PM10

Equipment: AreoQUAL Series 500 + Particulate Matter Sensor PM10 / PM2.5
Sensor type: Particulate Matter sensor head, 0.001-1000 mg/m3
Detectable range: 0.001-1000 mg/m3
Resolution: 0.001 mg/m3
Accuracy: ±15% of reading whichever is greater