HEALTHY INTERIORS

RESET
STANDARD

**CERTIFICATION FOR
HEALTH & REGENERATION
focused on Indoor Air Quality**

The biosphere builds on incremental success.
It builds on positive feedback.

There is no end destination, only evolution.
There are no rules, only system constraints
that drive innovation.

There is only one driving force: life, as much
and varied as possible.

These simple principles are what make
nature incredibly diverse and innovative.

Rethinking project certification from the inside out, one measurable step at a time.

RESET重生
REGENERATIVE ECOLOGICAL SOCIAL & ECONOMIC TARGETS
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Introduction

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1.1.1 What is **RESET™**?

RESET™ stands for:
Regenerative
Ecological,
Social &
Economic
Targets.

RESET™ is an international performance based building standard and certification for healthy buildings measured in real-time with a focus on occupant health.

RESET™ puts a pulse on indoor spaces, communicated directly to users in real-time.

RESET™ builds on industry best practices and innovations that have proven to deliver results. There are no prescribed paths or checklists.

1.1.2 **RESET**™ History - Western vs. Eastern

The construction industry approach to Chinese green building had been entirely borrowed from the Western world, where green design emerged as part of a greater movement to protect the environment. In a culture where the word "environment" is typically synonymous with ecology, the principal mission of building green became that of protecting natural resources. As a result, Western green buildings have traditionally maintained a strong focus on the building itself and the efficient use of resources: energy, water, and materials.

In Asia, the word "environment" is more closely tied to built and social environs. Building green in Asia is first and foremost about the surrounding people and culture. Had the practice evolved without Western influence, the Eastern world would be speaking of healthy buildings as opposed to green ones. Focus has already shifted in Asia towards humanistic cities, social stability, and especially the protection of human health. This should not be a surprise for a part of the world with a culture which has prioritized health for thousands of years.

Whether we speak of ecological health or human health they both ultimately lead to the same place. However, speaking the same language increases understanding and accelerates change. Personal health and well being is a language that is well understood in Asia. But health is just the beginning. Above all it empowers life's greatest force - the ability to regenerate - and Asia is first and foremost a culture of regeneration.

In 2009, the principles which drive **RESET**™ were established. By focusing on health, **RESET**™ enables the regeneration of our social, ecological and economic environments as byproducts.

1.1.3 **RESET**™ Mission & Approach

Our Mission

To regenerate our ecological, social and economic environments via human health.
To make occupant health a measurable deliverable for all buildings and spaces.

Our Approach

To catalyze a rich diversity of solutions adapted to place, by:

– Shifting focus away from prescriptive design to measured results.
– Simplifying building certification by integrating it with existing project workflows and building operations.
– Leveraging cloud software to enable access, scale and affordability.
– Making building data social and creating positive feedback loops.

1.1.4 Why RESET™? What makes RESET™ different?

The **RESET**™ Standard combines monitoring hardware and cloud-based tools to measure, analyze, and communicate the health performance of indoor spaces and buildings, while optimizing the risk/return profile of assets and investments.

Figure 3: Typical Business Operating Costs

- **1%** Energy Costs
- **9%** Rental Costs
- **90%** Staff Costs (Salaries and Benefits)

10% Variation
A 10% variation applied equally to each cost has a far from equal impact

+/- 0.1%
Energy Costs

+/- 0.9%
Rental Costs

+/- 9.0%
Staff Costs
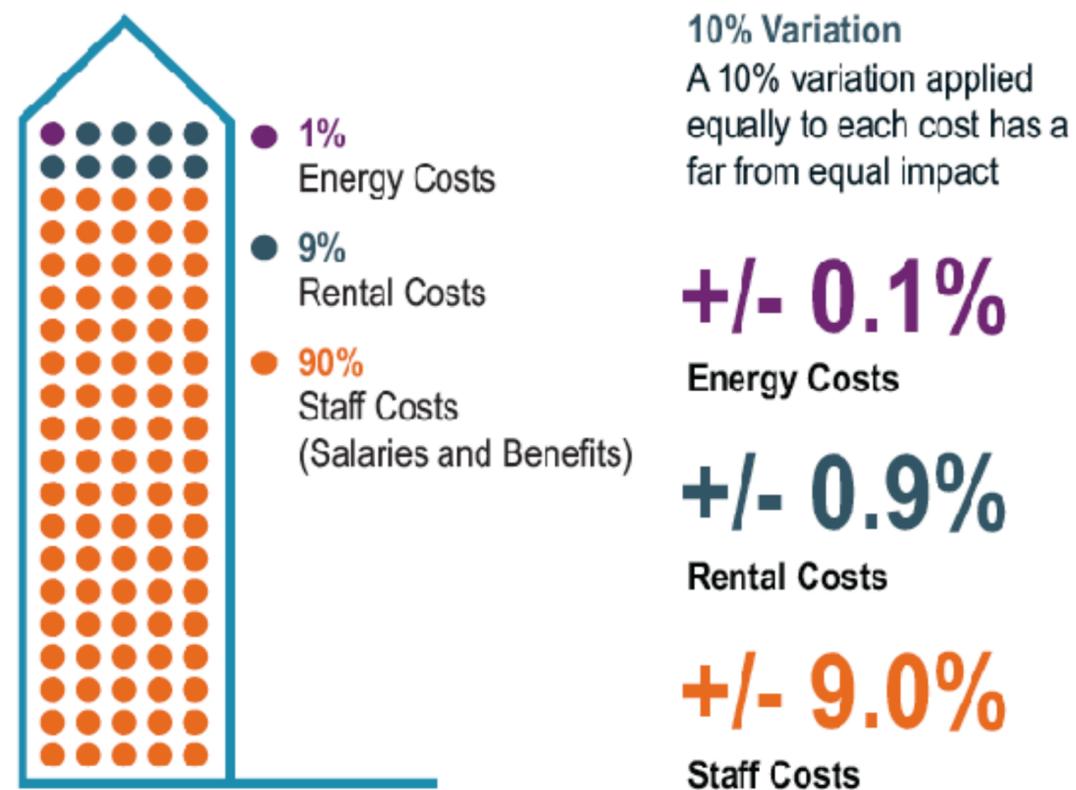
Source: World Green Building Council's Health, Wellbeing & Productivity in Offices Report. 2014.

With a focus on occupant health, **RESET**™ prioritizes the greatest asset of any space: its occupants.

Not only is there value in providing a healthy space for the occupants, there are productivity gains for better indoor spaces.

With staff accounting for 90% of operating costs of typical offices, healthy indoor air yields the highest productivity gains and financial returns when compared to rent and energy savings.

By doubling the health level of an office, it can also double productivity.

RESET™ can be applied to the following project types: Commercial Interiors and/or Core & Shell.

COMMERCIAL INTERIOR

CORE & SHELL
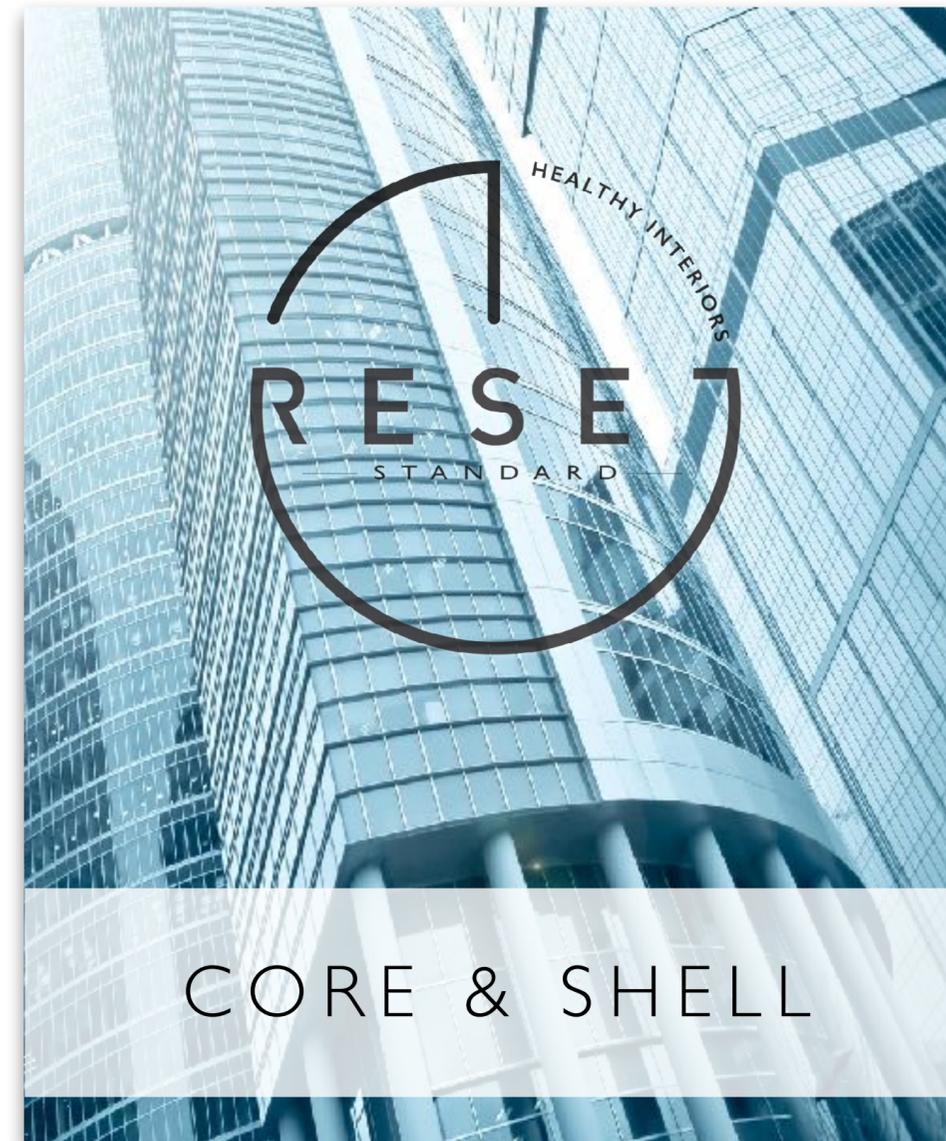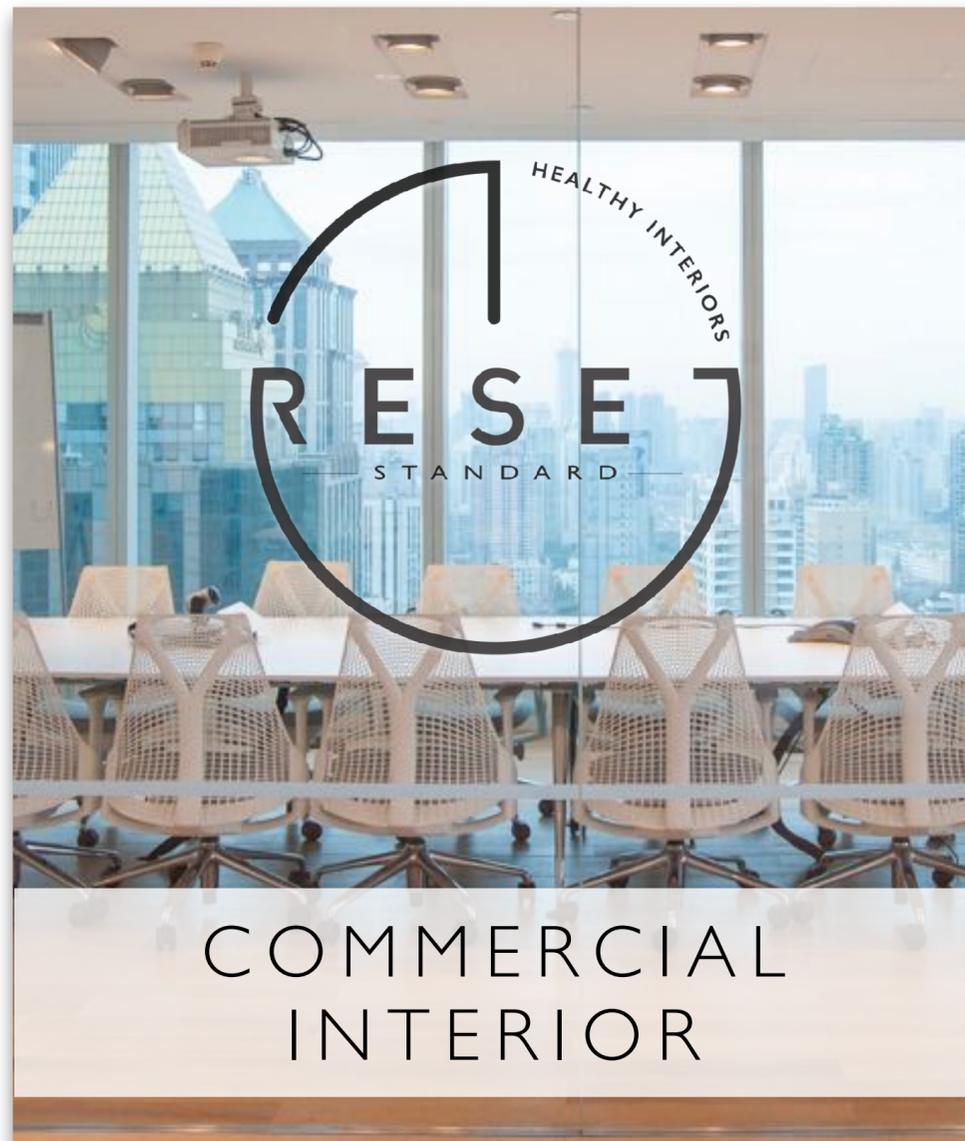
1.1.6 **RESET**™ Certification Modules

RESET™ can be implemented over time, module by module. It does not attempt to do everything at once. Rather, it focuses on mastering and deploying one field of research at a time, starting with Air.

Air

Materials

Comfort
IN DEVELOPMENT

End of **RESET**™ Introduction

HEALTHY INTERIORS

RESET
STANDARD

Air

We can survive for weeks without food.
We can survive for days without water.
We can only survive a few minutes without air.

Health begins with Air.

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2.1.1 What is **RESET**™ Air?

RESET™ targets the environmental health for occupants, starting with people and indoor air quality.

Indoor air quality changes continuously as buildings are pressurized and depressurized by mechanical systems, as ventilation, heating, and cooling power up and down, and as occupant activity impacts CO_2, CO, Particulates and VOCs (chemical gases). The construction industry is entering a new era in which buildings are becoming responsive to these changes and performance is tracked in real-time.

RESET™ Air is the world's first sensor based building standard and certification program. It focuses on results and communicating the 'pulse' of buildings, measured via real-time monitors and communicated directly to users through mobile devices.

Because the quality of sensors used, their installation, calibration, and reporting methodology are of critical importance, **RESET**™ Air sets standards for monitor performance, density and location of installation, calibration, reporting methodology, and overall project performance.

2.1.2 How does **RESET**™ Air work?

RESET™ Air rethinks and simplifies IAQ project certification by documenting, communicating, and certifying indoor air quality in real-time.

There are no mandatory mechanical design submittals. There are no required air exchange rates. There are no checklists, prescribed paths, exceptions, or alternative paths.

There are simply air quality targets across 5 parameters which must be monitored in real-time during all hours of occupancy. These parameters include: PM2.5, TVOC, CO_2, Temperature, and Humidity.

Design can follow any path as long as it leads to healthy results. This approach maximizes the opportunity for innovation and adaptation to place. It also gives experts design flexibility and reduces overall project and certification costs.

Air Quality

|	
PM2.5	**Particulate Matter** *Indoor / Outdoor*
TVOC	**Chemical Off-gassing**
CO_2	**Carbon Dioxide**
T	**Temperature**
RH	**Relative Humidity**

*RESET™ continuously tests sensors that detect other parameters of interest such as formaldehyde, Ozone and NO_2. New parameters are added as sensors are proven to meet the RESET™ Standard.

2.1.3 Dangers of PM2.5

PM2.5 can get down into the deepest (alveolar) portions of the lungs where gas exchange occurs between the air and your blood stream when you breathe.

However, the alveolar portion of the lungs has no efficient means of removing PM2.5 and if the particulates are water soluble, they can pass into the blood stream within minutes. If some particulates are not water soluble, they remain in the alveolar portion of the lungs.

When particulates go into the lungs, it can cause lung disease, emphysema and/or lung cancer [1].
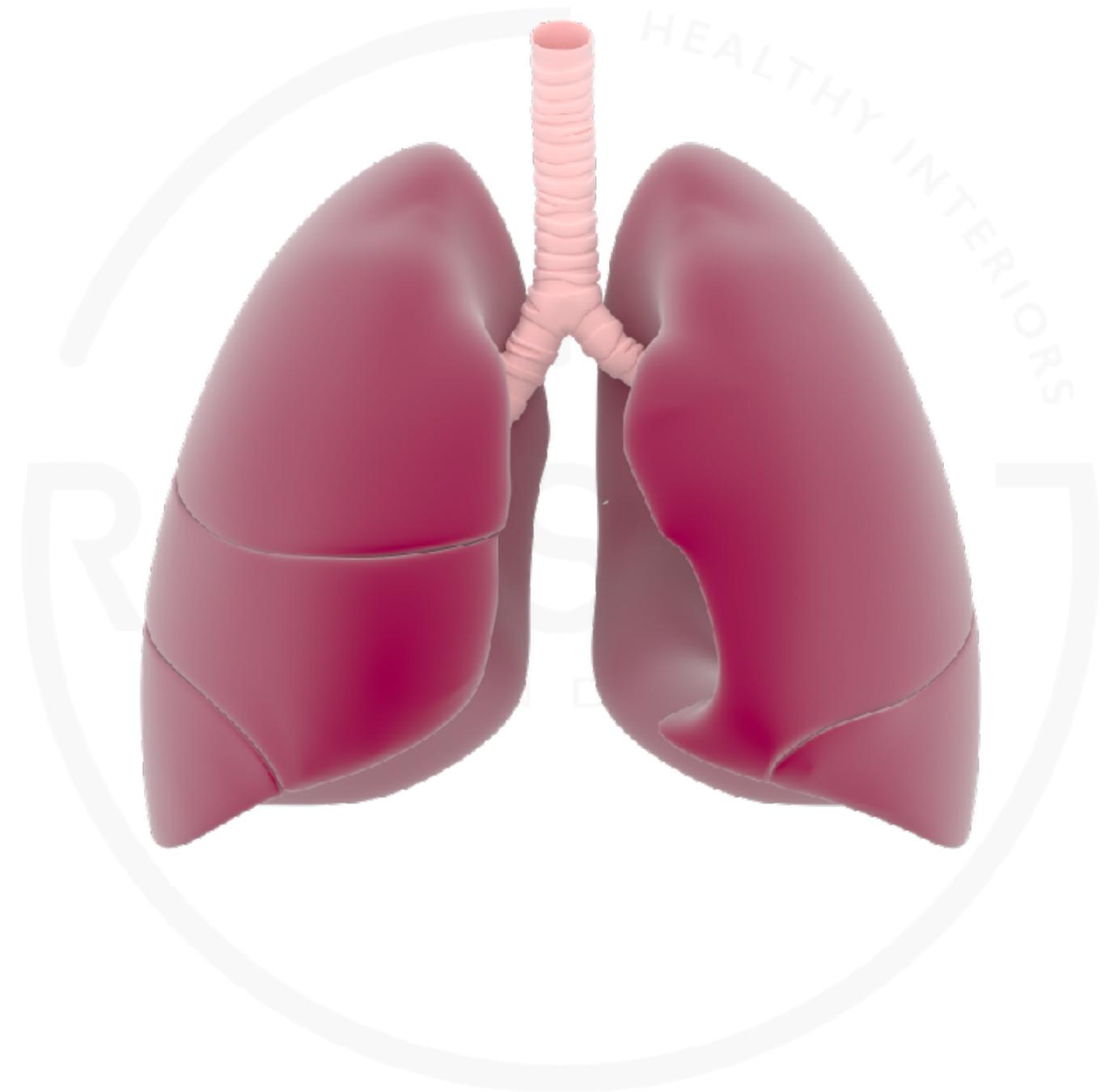
[1] Dylos Corporation. What Is Particulate Matter. [Website]. n.d.

2.1.4 How Much PM2.5 Do We Breath In?

We inhale 500 mL of air per breathe, and each minute we breathe approximately 10 times at resting level[1]. That is 7200 L (or 1902.04 gallons) of air in one day. Under exercise condition, we inhale 2.5 L air per breathe, and a maximum of 60 breathes in a minute can be tolerated by human body[1], which is 9000 L (or 2377.55 gallons) air inhaled in an hour.

When average PM2.5 reaches **75 µg/m³,** people with a respiratory rate of 8 L per minute can inhale **314.8 mg** of particulates in a year. In 2013, Nanjing, China, had an yearly average PM2.5 of 75.3 µg/m³ [2].

If the average PM2.5 level stays at 75 µg/m³ for 40 years, people will inhale approximately 12.592 g of PM2.5 particulates, equivalent to the mass of **two RMB coins** (each RMB coin weight 6.1g[3])!
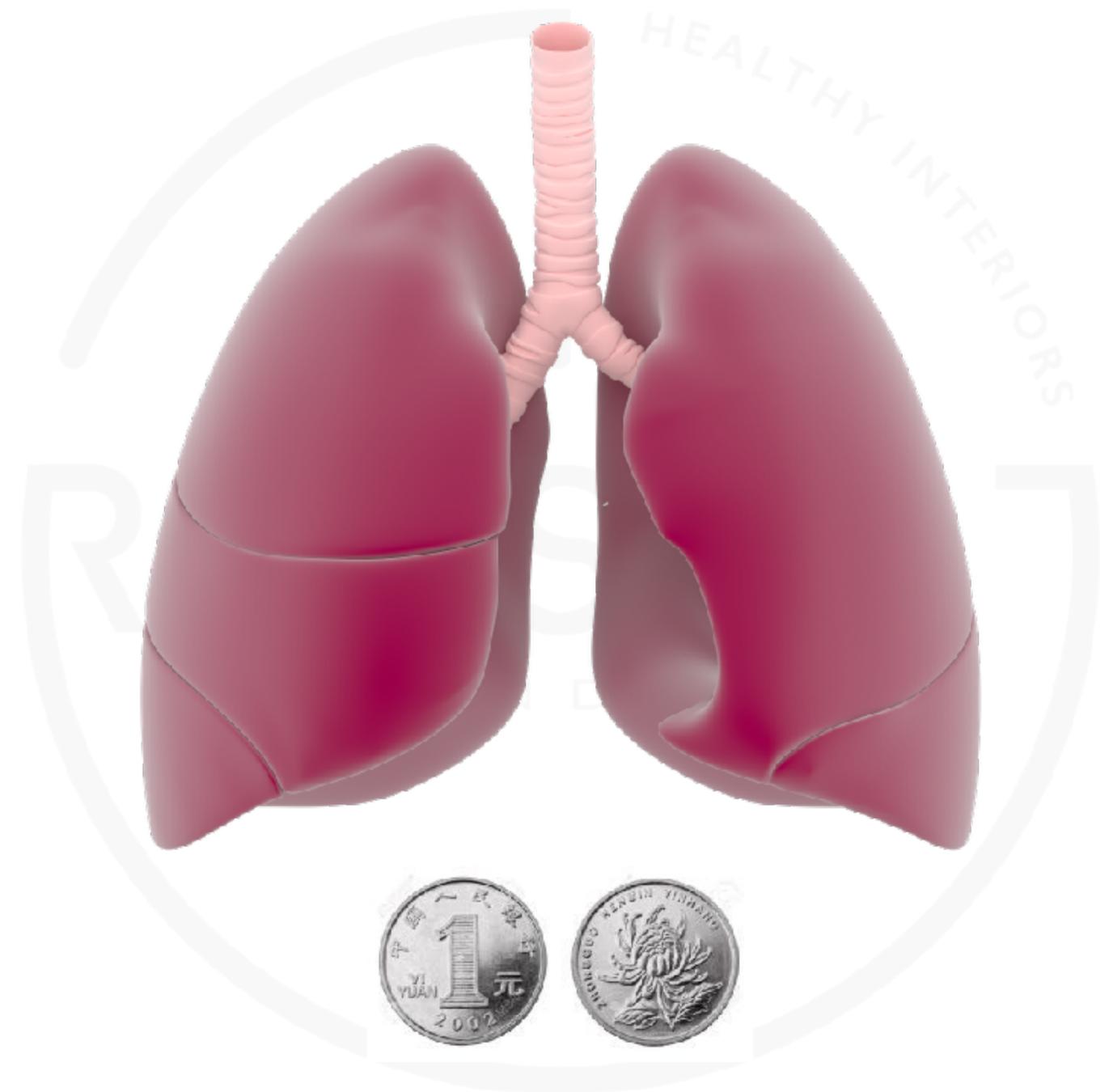
[1] The Respiratory System. [Website]. n.d.
[2] Tan, M. Bad to worse: Ranking 74 Chinese Cities by Air Pollution. [Website]. February 19, 2014.
[3] 1 Yuan: Features. [Website].

2.1.5 Effects of CO_2

CO_2 can significantly impact productivity and decision making capabilities. CO_2 is a factor in indoor spaces, especially with air tight spaces.

To equate ventilation rates with CO_2 concentration:

If ventilation rates at 20 cubic feet per meter/person, the indoor space has a CO_2 concentration of approximately 945 ppm.

If ventilation rates at 40 cubic feet per meter/person, the indoor space has a CO_2 concentration of approximately 550 ppm.

It is not uncommon to find indoor spaces that average up to a CO_2 concentration of 1,400 ppm[1].

Impact of Better Air Quality on Productivity Increases in Analytical Tasks
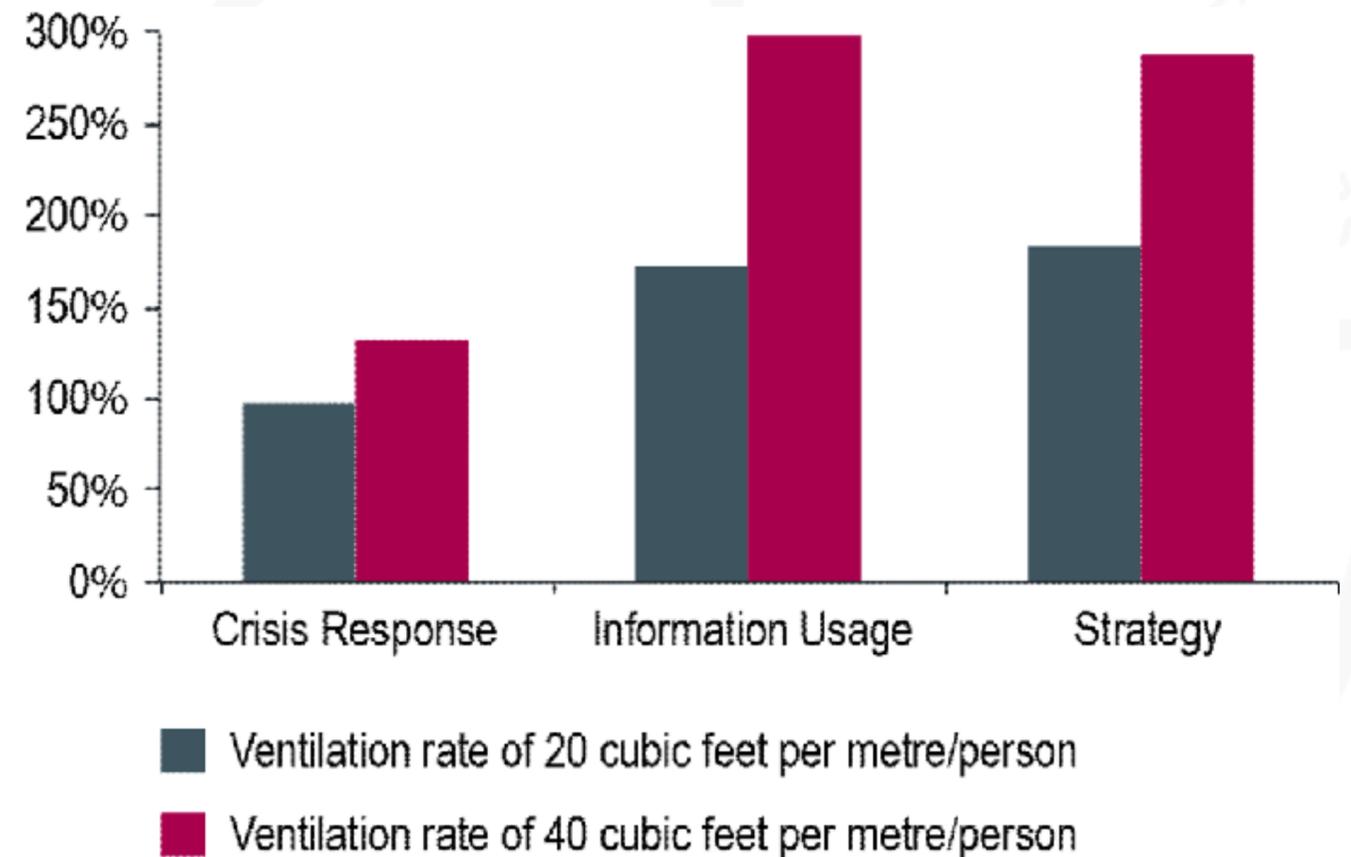
Source: Harvard T.H. Chan School of Public Health's Center for Health and the Global Environment

[1] Allen, J.G. et al. Associations of Cognitive Function Scores with Carbon Dioxide, Ventilation, and Volatile Organic Compound Exposures in Office Workers: A Controlled Exposure Study of Green and Conventional Office Environments. June 2016.

# 2.1.6 Impact of CO_2 on the Office Productivity
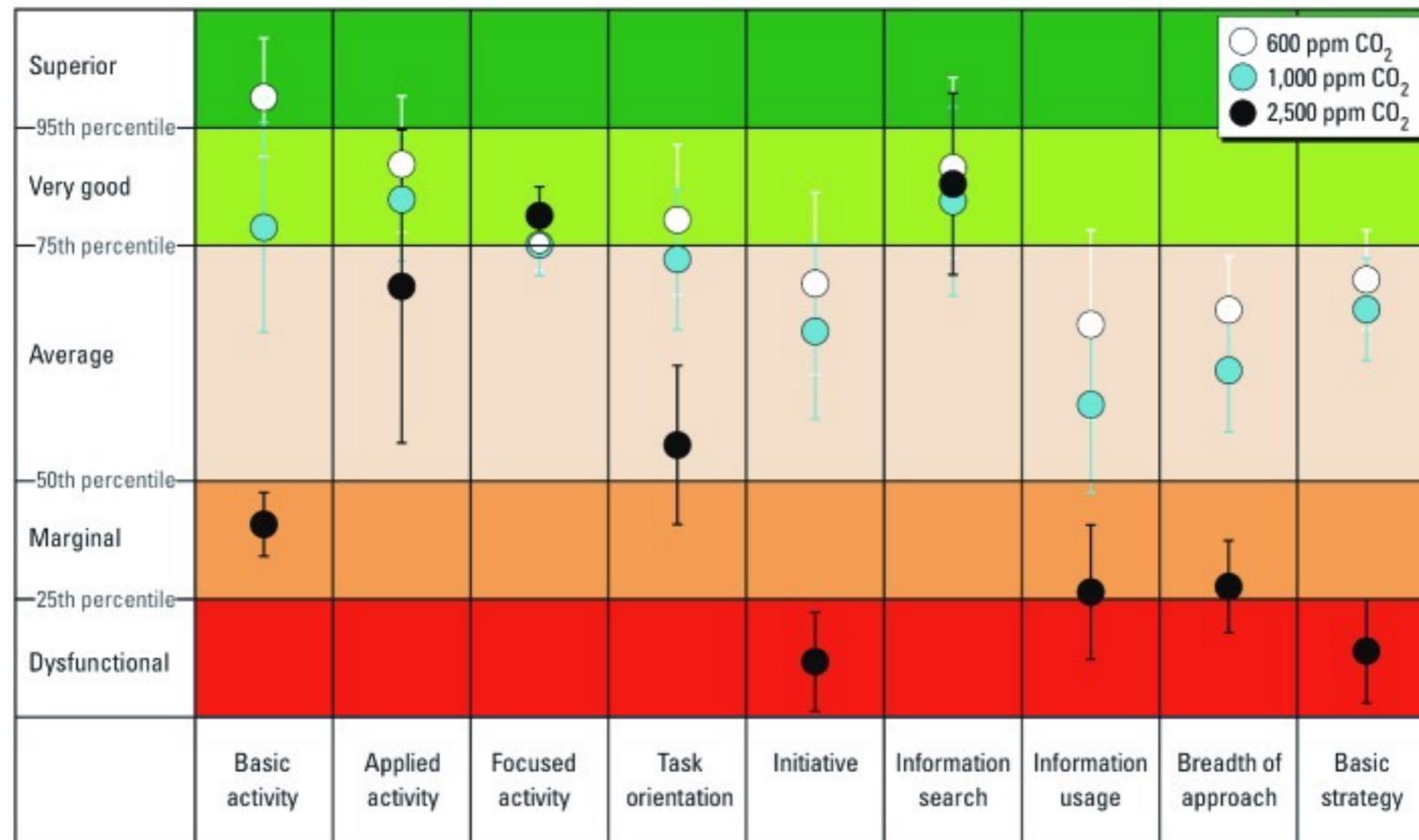
With a CO_2 level of 600 ppm or under, people feel most comfortable[1] and workers showcase the best performance.

When CO_2 levels hit 1,000 ppm, workers start to feel light headaches, slight fatigue, and difficulty to concentrate[2], therefore performance effectiveness starts to drop[1].

When indoor CO_2 level reaches 2,500 ppm, workers begin displaying unsatisfactory performance[1], with certain people starting to show significant impairment of cognitive function including fatigue, especially when they stay in the room for 2.5 hours or more[2].

[1] Satish, U. et al. Is CO2 an Indoor Pollutant? Direct Effects of Low-to-Moderate CO2 Concentrations on Human Decision-Making Performance. [Website]. December 2012.
[2] Bierwirth, P.N. Carbon dioxide toxicity and climate change: a serious unapprehended risk for human health. [Website]. December 23, 2016.

2.1.7 VOC Off-gassing

VOC stands for Volatile Organic Compounds. VOCs are a class of organic chemicals, typically found in and slowly emitted from manufactured materials. They are extremely common in building materials: particle board, glues, paints, and carpet backing. VOCs can cause headaches, rashes, nausea, vomiting, nose bleeding, or eye, nose, or throat irritation.

To measure the total off-gassing of VOCs from a material, TVOC, which stands for Total Volatile Organic Compounds, is used to calculate the concentration of the off-gassing VOCs.

Indoor air quality is often more dangerous because of VOCs. Many VOCs cannot be detected by smell and is prominent source of indoor air pollution that can affect occupant health and comfort.

2.1.8 TVOC Issues

TVOC is typically strongest after new construction and a flush out phase is required before occupants move in to remove the TVOC. Unfortunately, often times, a flush-out phase does not solve the TVOC issue.

With long term monitoring, **RESET**™ Air provides an alternative to standard industry practice in which spaces are flushed out, tested, certified, and unknowingly left to climb back up to hazardous levels.

Hazardous: Beyond measurable level

CONSTRUCTION PHASE

FLUSH-OUT PHASE (PASS)

OCCUPANCY PHASE

Healthy level

0

Time
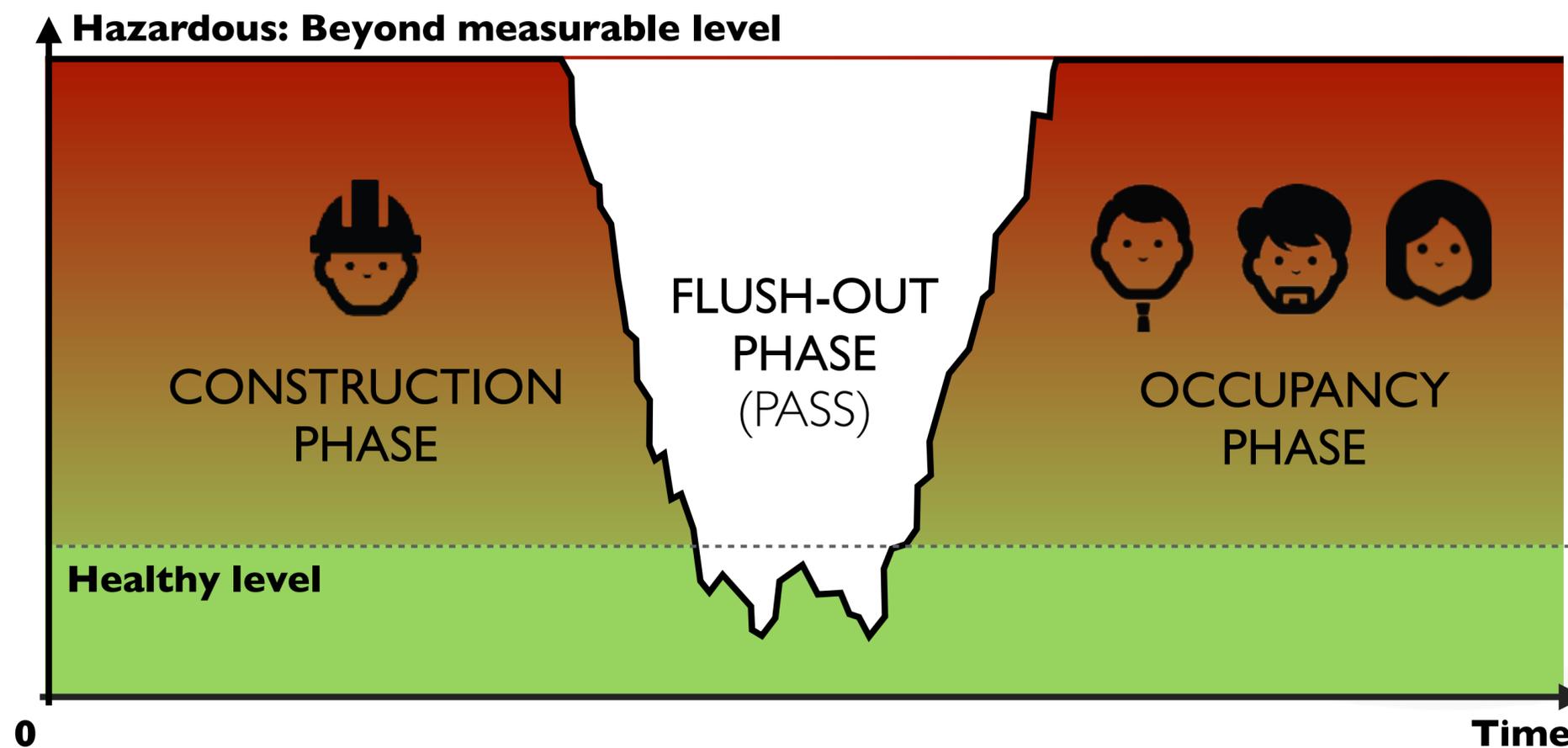
2.1.9 Why RESET™ Air?

RESET™ Air is the beginning to a healthy building. It is a building standard and certification that focuses on indoor air quality with 24/7 monitoring to give occupants the real results of the air that they are breathing.

Indoor air quality is something that is nuanced and not obviously detectable by human senses. Long term monitoring will make indoor air quality an actionable item to better protect the health of occupants.

In addition, RESET™ Air provides an extremely good return on investment for offices and property owners. For offices, RESET™ Air not only provides a space with better health, it will provide a space with increased productivity. For property owners, RESET™ Air will provide an increase in property value due to the guarantee of a space that provides health and productivity benefits to potential tenants.

The RESET™ Air Certification is designed to be easily implemented the entire process can be found on the next page.

2.1.10 The **RESET**™ **Air** Certification Process

RESET™ Air does not require preliminary registration to participate. Projects may be self-guided or led by a RESET™ Accredited Solutions Provider (ASP).

1	Select Project Type
2	Interior Space Analysis
3	Monitoring and Software Selection
4	Pre-installation Considerations
5	Installation and Maintenance

For **RESET**™ Certification, the last step is to get audited.

6	Certification Audit

2.1.11 **RESET**™ **Air** Certification Project Types

RESET™ Air Certification can be applied to the following project types:
Commercial Interiors and/or Core & Shell.

COMMERCIAL INTERIOR

CORE & SHELL
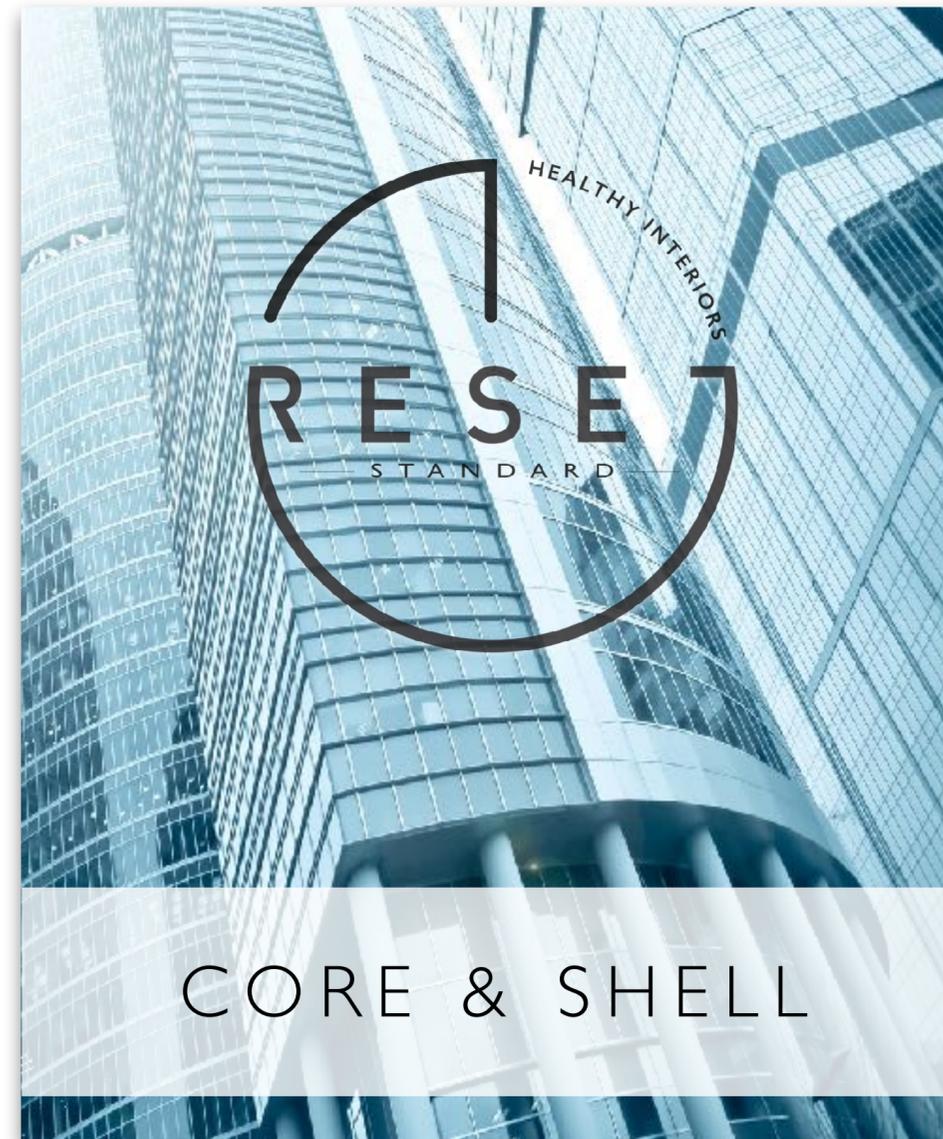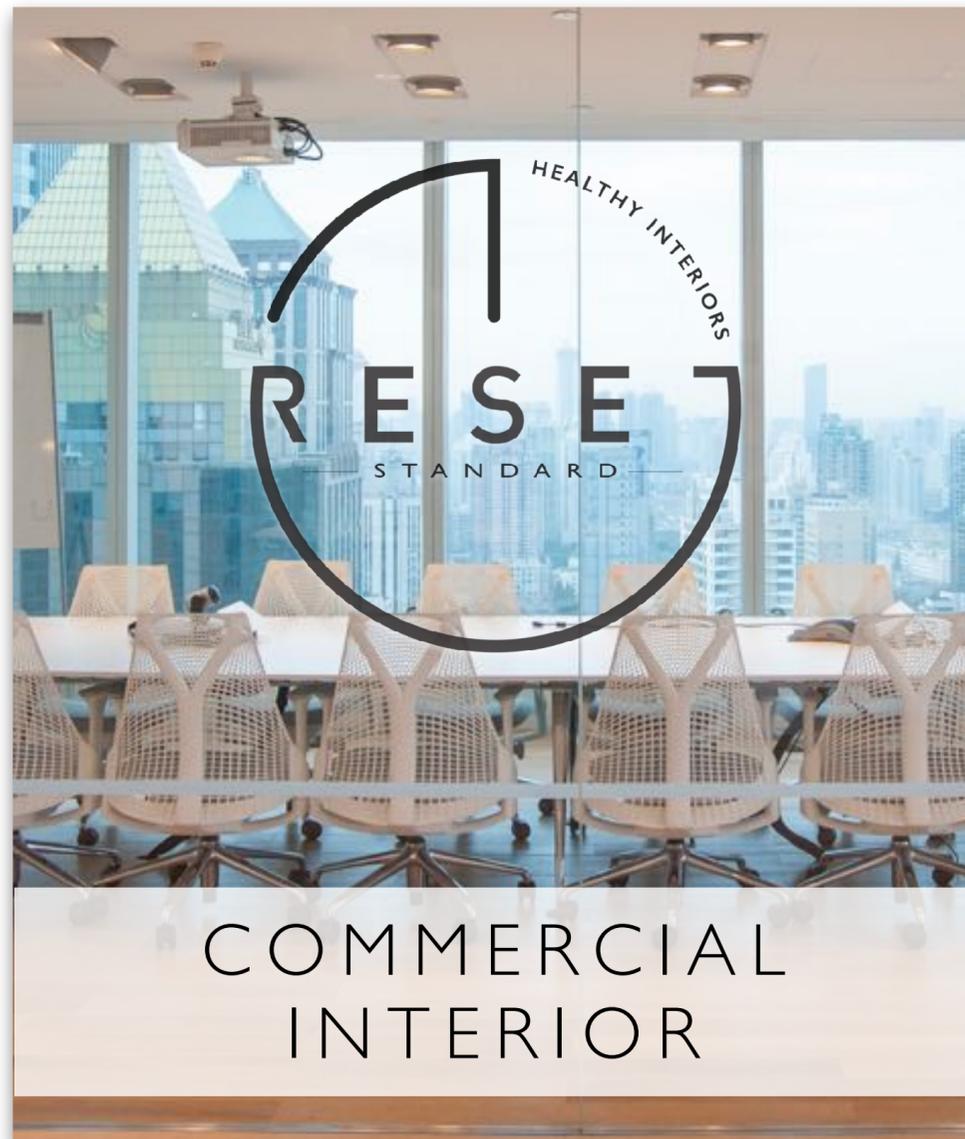
2.1.12 Appendix: References

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Satish, U. et al. Is CO2 an Indoor Pollutant? Direct Effects of Low-to-Moderate CO2 Concentrations on Human Decision-Making Performance. [Website]. December 2012. Retrieved from https://ehp.niehs.nih.gov/1104789/

Tan, M. Bad to worse: Ranking 74 Chinese Cities by Air Pollution. [Website]. February 19, 2014. Retrieved from http://www.greenpeace.org/eastasia/news/blog/bad-to-worse-ranking-74-chinese-cities-by-air/blog/48181/

End of **RESET**™ **Air** Introduction

RESET

HEALTHY INTERIORS

STANDARD

Air

STANDARD

FOR

COMMERCIAL INTERIORS v2.0

PRE-RELEASE

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2.2.1 Preface

RESET™ **Air** for Commercial Interiors is a real-time measurement and communication standard for indoor air quality that defines monitor performance, installation, maintenance and reporting requirements. Interior spaces become **RESET**™ **Air** certified when operational performance targets are achieved.

Intent:

- Measure PM2.5, TVOC, and CO_2 in real-time and report results to occupants of tenant spaces and/or public areas.
- Standardize how indoor air-quality performance is measured and communicated.
- Dramatically raise public awareness to indoor air quality and its relationship to environmental and occupant health.

Application:

- All new or existing commercial interiors.

RESET™ **Air** for Commercial Interiors sets targets for daily IAQ performance as well as standards for air quality monitor performance, installation, data reporting and calibration.

2.2.2 Indoor Air Quality Performance Targets

RESET™ **Air** is a performance based building standard. In order for projects to achieve **RESET**™ **Air** Certification for Commercial Interiors, indoor air pollutant levels - as tracked continuously via real-time monitoring - must be maintained within the limits listed below.

Daily averages are calculated from all occupancy hours and are compared against international IAQ health limits. To qualify for initial certification, results must not exceed Acceptable limits for a minimum of 90 consecutive days. To maintain **RESET**™ **Air** Certification, 90% of daily average results cannot exceed Acceptable limits.

PM2.5 Particulate Matter	TVOC Total Volatile Organic Compounds	CO$_2$ Carbon Dioxide	Temp Temperature	RH Relative Humidity
Acceptable < 35 µg/m^3	Acceptable < 0.5 mg/m^3	Acceptable < 1000 ppm	Monitored	Monitored
High Performance < 15 µg/m^3	High Performance < 0.4 mg/m^3	High Performance < 600 ppm	*Although there are no requirements for temperature and humidity under the RESET™ Air Target, both must be monitored given their impact on sensor readings for PM2.5 and TVOC.*	

*Note: **RESET**™ continuously tests sensors that detect other parameters of interest such as formaldehyde, Ozone and NO$_2$. New parameters are added as sensors are proven to meet the **RESET**™ Air Standard.*

2.2.2.1 IAQ Performance Targets - PM2.5

Particulate matter 2.5 (PM2.5) refers to particles with diameter 2.5 μm or less. It contains heavy metal, toxic gases, and it is also able to carry bacterias and viruses. Exposure to high index of PM2.5 can cause diseases in respiratory and cardiovascular systems.

PM2.5 Requirements:
- The indoor PM2.5 level should not exceed 35 $\mu g/m^3$, calculated on a daily basis and taken as an average of levels attained during occupational hours.
- PM2.5 less than 15 $\mu g/m^3$ indicates a high performance of indoor air quality, calculated on a daily basis and taken as an average of levels attained during occupational hours.

Sensor Density:
- Minimum of one (1) monitor every 500 m^2 of open space.

2.2.2.2 IAQ Performance Targets - TVOC

Volatile organic compounds (VOCs) are composed of various chemical compounds and elements such as carbon, hydrogen, oxygen, fluorine, chlorine, boron, sulphur or nitrogen. Long-term exposure to VOCs can cause damage to the liver, kidneys and the central nervous system.

TVOC Requirements:
  – The indoor TVOC index should be no more than 0.5 mg/m^3 to be not hazardous to the human body, calculated on a daily basis and taken as an average of levels attained during occupational hours.
  – High performance TVOC index is less than 0.4 mg/m^3 in the air, calculated on a daily basis and taken as an average of levels attained during occupational hours.

Sensor Density:
- Minimum of one (1) monitor every 500 m^2 of open space.

2.2.2.3 IAQ Performance Targets - CO$_2$

Carbon Dioxide (CO$_2$) concentration has a direct impact on productivity, comfort and health. Elevated CO$_2$ levels lead to drowsiness, dizziness and cognitive disfunction.

Carbon Dioxide Requirements:
- Carbon dioxide levels in open work spaces must be kept below 1000 ppm, calculated on a daily basis and taken as an average of levels attained during occupational hours.
- Projects targeting high performance levels must keep carbon dioxide levels below 600 ppm, calculated on a daily basis and taken as an average of levels attained during occupational hours.

Sensor Density:
- Minimum of one (1) monitor every 500 m^2 of open space.

2.2.2.4 IAQ Performance Targets - Temp and Humidity

RESET™ Air prioritizes the indoor air quality. The indices of temperature and relative humidity helps the estimation of the VOCs and PM2.5 indices. The requirements for temperature and relative humidity under RESET™ Air are identical to those within RESET™ Comfort.

Temperature Requirements:

- When outdoor air is above 24°C, temperature differential between inside and outside can be no more than 8°C for mechanically conditioned indoor spaces that connect directly to outdoors. For spaces not directly connected to outdoors, indoor temperatures can be no lower than 24°C.
- When outdoor air is below 18°C, indoor air can be no higher than 21°C.
- When outdoor temperature is between 18-26°C, indoor air should be within the same range.

## Relative Humidity Requirements:

- For mechanically conditioned interiors, relative humidity must be kept between 30 and 60% in order to maximize comfort while minimizing heating and cooling loads.

Sensor Density:

- Minimum of one (1) monitor every 500 m^2 of open space.

2.2.3 Monitor Standards

The accuracy of monitors is of critical importance to determine the impact that IAQ has on occupant health and to appropriately guide HVAC operations and maintenance. Given the wide range in the quality of market-available monitors, **RESET**™ **Air** sets standards for sensor performance and calibration. Only Grades A & B are acceptable for use in **RESET**™ **Air** projects.

GRADE

A

RESET重生™

Scientific grade monitors:
Used in labs and manufacturing.

GRADE

B

RESET重生™

Building grade monitors:
Used in commercial projects.

GRADE

C

RESET重生™
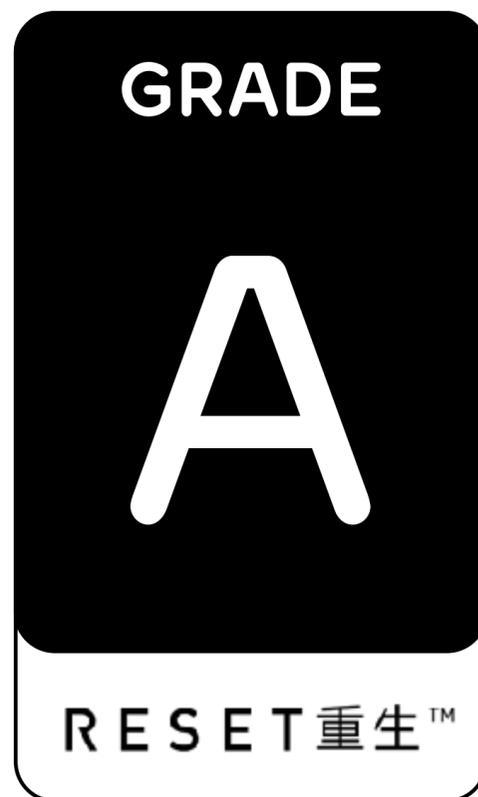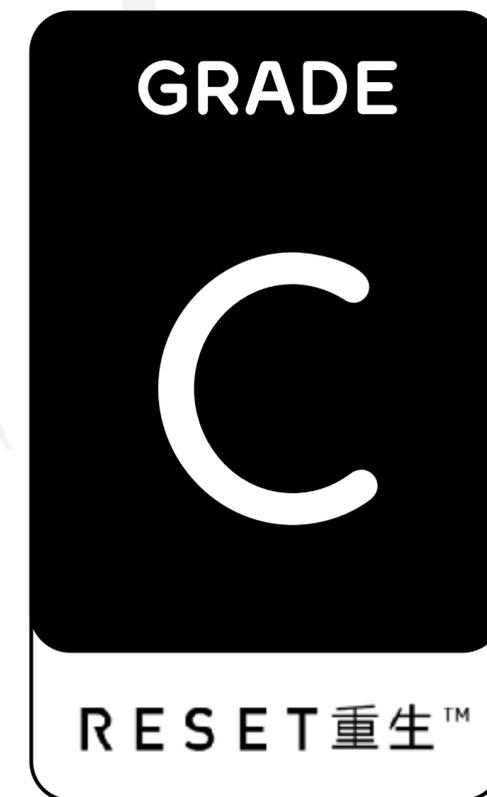
Consumer grade monitors:
Portable mass market monitors.

2.2.4 Monitor Specifications

RESET™ Air categorizes monitors according to three performance based tiers: Grade A (scientific), Grade B (building grade) and Grade C (consumer grade). Only Grade A and Grade B are acceptable for use in RESET™ Air projects. Below is an abbreviated portion of the Standard for Grade B monitors. Refer to the full RESET™ Air Standard for Air Quality Monitors for the full specification.

RESET™ Air Standard for IAQ Monitors - Grade B

Particulate Matter (PM2.5)

Measuring Range	0-300 ug/m^3
Output Resolution	1 ug/m^3
Sensitivity	1 ug/m^3
Accuracy	±20%

Carbon Dioxide (CO2)

Measuring Range	300-2000 ppm
Output Resolution	5 ppm
Sensitivity	5 ppm
Accuracy	±100 ppm, ±3% of reading

Total Volatile Organic Compound (TVOC)

Measuring Range	0.15-1.5 mg/m^3
Output Resolution	0.001 mg/m^3
Sensitivity	0.001 mg/m^3
Accuracy	±0.02 mg/m^3, ±10% of reading

Relative Humidity (RH)

Measuring Range	10-85 %RH
Output Resolution	1 %RH
Sensitivity	1 %RH
Accuracy	< ±5 @20-80% RH

Temperature

Measuring Range	0-40 °C
Output Resolution	1 °C
Sensitivity	1 °C
Accuracy	2 °C

Note: In order to provide health and certification analytics, monitors must be able to stream real-time data to the RESET™ Cloud directly or via an RESET™ accredited software provider.

2.2.5 Installation Standard

Monitors must meet the following minimum installation requirements:

1. Wall-mounted and centrally located within monitored spaces, away from operable windows.

2. Mounted within the breathing zone: between 750 - 1800 mm from the ground.

3. Located, at a minimum, of 5 meters from air filters and fresh air diffusers. In areas where this is not possible, monitors must be located closer to air returns than air diffusers.

4. Capable of reporting data in real-time to the **RESET™ Cloud** either directly or via an approved cloud ware provider.

Recommendations:

To ensure data continuity and achievement of **RESET™ Air** Certified status, the following is highly recommended:

- Use a permanent power source for monitors over plug type power solutions to avoid connectivity lapses and data loss.

- Use ethernet cabling or other hard-wired data transfer methods over WiFi to avoid connectivity lapses and data loss.

2.2.6 Required Documentation

The following project documents must be submitted prior to being considered for **RESET**™ **Air** Certification. Documents may be submitted at any time during the project life-cycle, however; it is highly recommended that they be submitted and approved at the design stage, thereby minimizing the risk of incurring construction change orders or the purchase of unqualified monitors.

1. Required Documentation Checklist Document.
   a) Brand and product number of the monitoring hardware being used, as well as the reporting software (if different from the hardware). At a minimum, hardware and software must meet **RESET**™ **Air** Standard for Building Grade monitors.
2. Floor layout plan including wall and furniture layouts and the proposed location of indoor air quality monitors.
3. Reflected ceiling plan including wall layouts, fresh air diffusers and returns, recirculation filter diffusers and returns (where applicable) as well as the proposed location of indoor air quality monitors.
4. Area calculations (in square meters) of zones which will be monitored.
5. Monitor certificate(s) of calibration from a qualified **RESET**™ ASP.
6. Picture(s) of the monitor(s), installed, with a reference to location within the plan.
7. Project Pictures (Optional)

Note: Additional documents may be required for clarification.

2.2.7.1 Certification Requirements

Step 1: RESET™ Air Document Audit

To be eligible for certification, all documents required in Section 2.2.6 Required Documentation must be approved by **RESET™**.

Step 2: RESET™ Air Site Audit

A site audit must be conducted by an independent **RESET™** ASP, assigned by **RESET™**. The audit consists of a site inspection, verifying that all monitors have been installed as per the **RESET™** Standard and submitted documents.

Step 3: RESET™ Air Certification

- **Initial Certification (First year):**

  Air quality results must be within the healthy limits of **RESET™ Air** performance targets for PM2.5, CO_2, and TVOC, calculated as a daily average during hours of occupancy, for 3 audit cycles.

- **Ongoing Certification (Second year and onwards):**

  Air quality results must be maintained within healthy limits for PM2.5, CO_2, and TVOC, calculated as a daily average during hours of occupancy.

Note: For new projects, it is recommended that monitors be in place and reporting data after all major dust generating activities have been completed and prior to FF&E (fittings, furniture & equipment) installation.

2.2.7.2 Certification Requirements *(continued part 1)*

Certification Specifics
Below are a few additional specifics in regards to certification.

- An audit cycle is 4 weeks. There is a total of 13 audit cycles in a year.
- To pass certification, every monitor in the Documentation Audit needs to pass,
- Only the daily average data during the assigned working hours will be used.
- If a client passes the certification audit, certification will be granted immediately.
- Certification lasts for a year. Client should contact **RESET**™ to re-certify before the end of 13 audit cycles.
- If certification is revoked, the client will need to re-certify, including Documentation Audit, Site audit, and the initial 3 audit cycle certification audit.
- Special days or holidays can be manually removed from the audit via a direct request to **RESET**™.

Certification Failure Conditions
Below are the conditions where one would lose their certification.

- 2 failure days are allowed in each audit cycle.
- A monitor with 4 consecutive hours of missing data in a day fails for that day.
- If the client fails 3 consecutive audit cycles, certification is revoked.
- If the client does not re-certify before the certification expires, certification will be revoked.

Annual Re-certification

RESET™ Air projects are re-assessed and re-certified on an annual basis. As a results driven program, re-certification is primarily data driven and consists of a semi-automated data review. This review ensures that the IAQ results have stayed within healthy limits. Site audits, performed by an independent RESET™ ASP, are required every 3 years.

Recalibration

Monitors must be re-calibrated annually by a qualified RESET™ ASP. Certificates attesting to the re-calibration of monitors must be submitted annually.

Communication and Education

– Real-time results must be made available to all occupants via publicly available screens, desktop or mobile app. Non-occupants do not need to have access to the data.
– Publicly available data must include PM2.5, CO_2, TVOC, Temperature, and Relative Humidity.

2.2.8.1 Requirements for Different Space Types

Office Interiors

Offices must adhere to the following standard.

- Five parameter monitors (PM2.5, TVOC, CO_2, RH, Temperature) are required for all open work spaces, including lounges and similar common office areas used as work spaces. Five parameter monitors are not required in conference rooms, private offices, lobbies, pantries, washrooms or copy rooms.
- A minimum of one (1) monitor is required per 500 m^2 of open space with ceiling heights that do not exceed 3 m.
- CO_2 monitors must be installed within each conference room.
- Areas with indoor combustion, such as cafeterias with open / connected kitchens using gas-fired equipment, must also include carbon monoxide sensors, installed and reporting as per **RESET**™ **Air** Standard.

Hotels

Hotels owners can certify a minimum number of rooms (partial certification) or all rooms (full certification). All other public areas such as restaurants, lounges, gyms and conference facilities must be individually monitored, communicated, and certified. Only rooms and areas monitored and performing according to the **RESET**™ **Air** Standard may be communicated as being **RESET**™ **Air** Certified.

Partial Room Certification:

Five parameter monitors (PM2.5, TVOC, CO_2, Temperature, Relative Humidity) are required for individual rooms, with the minimum number of rooms defined below:

- For 0-50 room hotels, a minimum of 5 rooms must be monitored. A minimum of 3 out of 5 must be standard guest rooms.
- For 51+ room hotels, a minimum of 5 rooms must be monitored + an additional 5% of total rooms (partial numbers must be rounded up). A minimum of 60% of rooms being monitored must be standard guest rooms. *(i.e. a hotel with 120 rooms = 5 + (5% of 120) = 11 rooms with monitors, 7 of which must be standard guest rooms.)*

Hotels *(continued)*

Full Room Certification:
– Follow all Partial Room Certification requirements.
– All guest rooms must be provided with real-time monitoring and reporting of PM2.5 and CO_2 at a minimum.

All monitors must be installed in sleeping zones, within a maximum of 3 meters of the bed (laterally) and a minimum of 2 meters from windows (laterally). All monitors and sensors must meet the performance specifications defined by the **RESET**™ **Air** Standard for Building Grade monitors.

Conference rooms, Restaurants, Lounges, Gyms, etc:
– All other spaces within hotels wishing to pursue **RESET**™ **Air** Certification must include a minimum of one (1) five-parameter air quality monitor (PM2.5, CO_2, TVOC, Temperature, Relative Humidity) for each 500 m^2 of open space.
– Areas with indoor combustion, such as restaurants with open / connected kitchens using gas-fired equipment, must also include carbon monoxide sensors, installed and reporting as per the **RESET**™ **Air** Standard.

Hospitals and Health Clinics

Hospitals and Health Clinics can have a minimum number of rooms (partial certification) or all rooms (full certification) **RESET**™ **Air** Certified. All other areas such as lounges and cafeterias must be individually monitored, communicated, and certified. to qualify for partial or full certification. Only rooms and areas monitored and performing according to the **RESET**™ **Air** Standard may be communicated as being **RESET**™ **Air** Certified.

Partial Room Certification:

Five parameter monitors (PM2.5, TVOC, CO_2, Temperature, Relative Humidity) are required for individual rooms, with the minimum number of rooms defined as follows:

- For 0-50 room clinics, a minimum of 5 rooms must be monitored. A minimum of 3 out of 5 must be standard patient rooms.
- For 51+ room clinics and hospitals, a minimum of 5 rooms must be monitored + an additional 5% of total rooms (partial numbers must be rounded up). A minimum of 60% of rooms being monitored must be standard patient rooms. *(Example a hospital with 120 rooms = 5 + (5% of 120) = 11 rooms with monitors, 7 of which must be standard patient rooms.)*

Hospitals and Health Clinics *(cont'd)*

Full Room Certification:
- Follow all Partial Room Certification requirements.
- At a minimum, all other rooms must monitor and report PM2.5 and CO_2 in real-time.

Monitors must be installed in all patient rooms, within a maximum of 3 meters of the bed (and/or centrally located with respect to multiple beds) and a minimum of 2 meters from windows (laterally). All monitors and sensors must meet the performance specifications defined by the **RESET™ Air** Standard for Building Grade monitors.

Lounges, Cafeterias and other areas:
- All other spaces within hospitals or health clinics wishing to pursue **RESET™ Air** Certification must include a minimum of one (1) five-parameter air quality monitor (PM2.5, CO_2, TVOC, Temperature, Relative Humidity) for each 500 m^2 of open space with ceiling heights that do not exceed 3 m.
- Areas with indoor combustion, such as cafeterias with open / connected kitchens using gas-fired equipment, must also include carbon monoxide sensors, installed and reporting as per **RESET™ Air** Standard.

Schools

Schools can have a minimum number of classrooms (partial certification) or all classrooms (full certification) **RESET**™ **Air** Certified. All other areas such as gyms, libraries and cafeterias must be individually monitored, communicated and certified. Only classrooms and areas monitored and performing according to the **RESET**™ **Air** Standard may be communicated as being **RESET**™ **Air** Certified.

Partial Classroom Certification:

Five parameter monitors (PM2.5, TVOC, CO_2, Temperature, Relative Humidity) are required for individual classrooms, with the minimum number of rooms defined as follows:

- For 0-25 classrooms, a minimum of 5 classrooms must be monitored. A minimum of 3 out of 5 must be standard classrooms.
- For 25+ room clinics and hospitals, a minimum of 5 classrooms must be monitored + an additional 5% of total classrooms (partial numbers must be rounded up). A minimum of 60% of rooms being monitored must be standard classrooms. *(Example a school with 50 classrooms = 5 + (5% of 50) = 8 rooms with monitors, 5 of which must be standard classrooms.)*

Schools *(continued)*

Full Classroom Certification:

– Follow all Partial Room Certification requirements.

– All other classrooms must be provided with real-time monitoring and reporting of PM2.5 and CO_2 at a minimum.

All monitors must be installed a minimum of 2 meters from windows. All monitors and sensors must meet the performance specifications defined by the **RESET**™ **Air** Standard for Building Grade monitors.

Libraries, Cafeterias, Gyms, Auditoriums, and other areas:

– All other spaces within schools wishing to pursue **RESET**™ **Air** Certification must include a minimum of one (1) five-parameter air quality monitor (PM2.5, CO_2, TVOC, Temperature, Relative Humidity) for each 500 m^2 of open space with ceiling heights that do not exceed 3 m.

– Areas with indoor combustion, such as science labs or cafeterias with open / connected kitchens using gas-fired equipment, must also include carbon monoxide sensors, installed and reporting as per **RESET**™ **Air** Standard.

Shopping Malls

Shopping malls must adhere to the following requirements to achieve **RESET**™ **Air** Certification:

- All major entrances must include a five-parameter monitor (PM2.5, TVOC, CO_2, Temperature and Relative Humidity) within 3 meters of doors leading to outside. Entrances next to covered car drop-off / pick-up areas and/or underground parking must include a carbon monoxide sensor, installed and reporting as per the **RESET**™ **Air** Standard.

- Each floor must contain a minimum of one (1) five-parameter monitor (PM2.5, TVOC, CO_2, Temperature and Relative Humidity) centrally located, away from all major entrances. Each monitor may cover no more than 1000 m^2 of continuous floor area.

- All monitoring zones directly adjacent to F&B (food & beverage) outlets using gas-fired equipment, must include a carbon monoxide sensor, installed and reporting as per the **RESET**™ **Air** Standard.

Other

To pursue **RESET**™ **Air** Certification Space Types, such as retail stores, fitness centers and restaurants must adhere to the following requirements:

- Minimum of one (1) five-parameter air quality monitor (PM2.5, CO_2, TVOC, Temperature, Relative Humidity) for each 500 m^2 of open space with ceiling heights that do not exceed 3 m.
- Space types with indoor combustion, such as restaurants using gas-fired equipment, must also include carbon monoxide sensors, installed and reporting as per **RESET**™ **Air** Standard.

2.2.9 Appendix: Recommended Considerations

Sources of Airborne Pollution

Smoking: Indoor spaces must be non-smoking. It is recommended that signage for outdoor non-smoking areas, extends 7.5 m beyond all entrances, operable windows and fresh air intakes. Submission of documentation is not required. Tobacco smoke is destructive to human health and can cause projects to fail **RESET**™ **Air** requirements for real-time monitoring.

Direct Exhaust: It is recommended to exhaust washrooms, copy-rooms, individual copiers and laser printers directly outdoors or to a stale air duct that leads to outdoor. Gasses emitted by these rooms and equipment can cause projects to fail **RESET**™ **Air** Standards.

End of **RESET**™ **Air** Standard
for Commercial Interiors

Air

CERTIFICATION PROCESS

FOR
COMMERCIAL INTERIORS v2.0

PRE-RELEASE

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2.3.1 Space Type

Commercial Interiors applies to the following types of spaces:

Office Interiors

Hotel Rooms

Hospital Rooms

Classrooms

Gyms

Retail
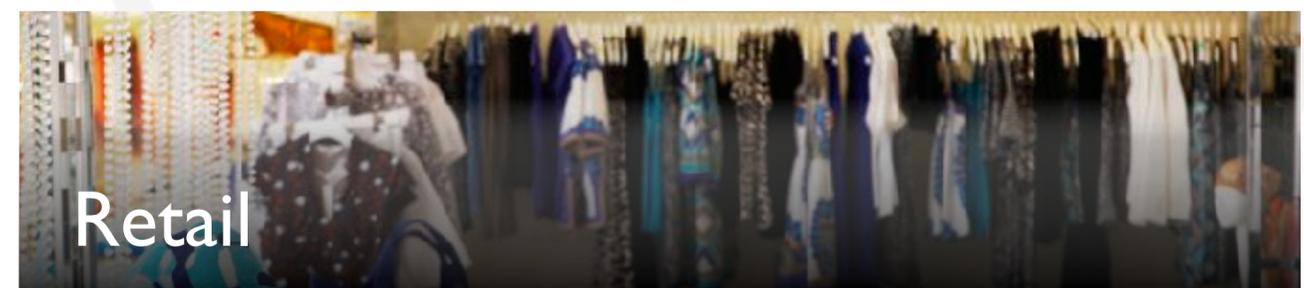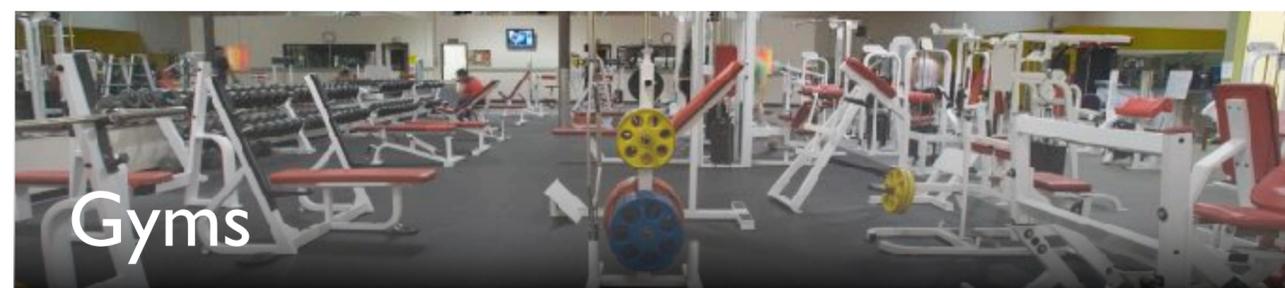
Note: Each Space Type may have slightly different certification requirements. Please refer to the RESET™ Air Standard (below) for space-specific certification rules.

2.3.2 Interior Space Analysis

After identifying your Space Type, determine the number of monitors needed to adequately measure its IAQ.
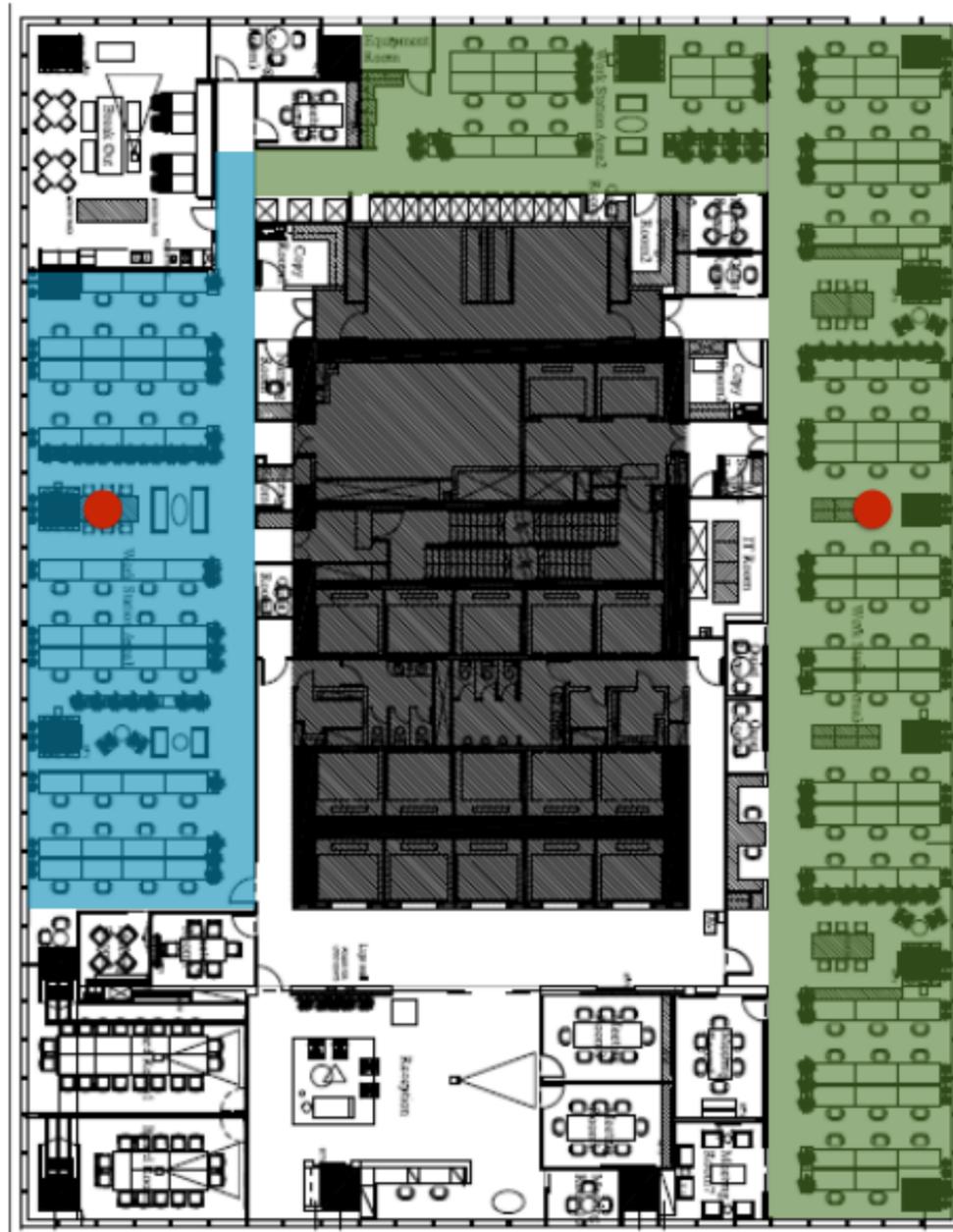
One monitor should be deployed per 500 m^2 of open space with floor to ceiling heights that do not exceed 3 m.

Monitors should be deployed within spaces enclosed with partitions or operable doors.

i.e. **Office Interiors**

To comply with the **RESET**™ **Air** Standard, full parameter **Air** monitors (with PM2.5, TVOC, CO_2, Temperature, and Humidity) are only required in open work spaces. Monitors are not required in conference rooms, private offices, lobbies, pantries, washrooms, or copy rooms.

For further specifics, you can refer to the **RESET**™ **Air** Standard for Commercial Interiors, 2.2.5: Installation Standard, to determine the number of monitors required to adequately measure indoor air quality (IAQ).

2.3.3 Monitor and Software Selection

RESET™ Air requires ongoing, real-time monitoring of interior spaces and access for occupants to view the measured data. Air Monitors and Software are both required to achieve RESET™ Air.

Monitors

Monitors must meet RESET™ Air standards Grade A or Grade B to qualify for certification.

GRADE

A

RESET 重生™

GRADE

B

RESET 重生™

Software

Software is required to collect IAQ data and make it accessible to the RESET™ Cloud.

The software provider must be able to push the collected data to the RESET™ Cloud.

i.e.

QLEAR·清度™

www.qlear.build

Note: RESET™ does not sponsor any specific brand of Monitors or Software and is always looking for more hardware and software providers. Please contact us to suggest additional solution providers for consideration.

2.3.4 Pre-installation Considerations

Once monitors and software are selected, plan for installation and set-up.

Power

Recommended: Permanent
For a permanent installation, connect monitors to conduit within wall cavities. Permanent connections reduce the risk of accidental disconnection.

Temporary (Not RESET™ Compliant)
For temporary installation, most users will opt to use power units as provided by hardware manufacturers. This is acceptable for testing purposes, but comes with the risk monitors being unplugged accidentally.
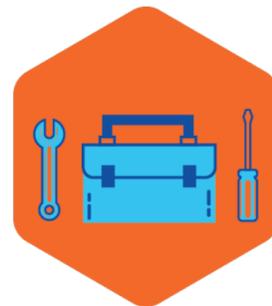
Mounting

Recommended: Wall Mounted
For best results, monitors should be wall mounted between 750 mm and 1800 mm above the floor. This location provides a good representation of the breathing zone.

Ceiling or Table Mounted (Not RESET™ Compliant)
Ceiling mounted monitors do not provide an accurate depiction of the IAQ which occupants breathe and create (CO_2 and TVOC both sink).

Measurements from table mounted monitors can be disproportionately affected by occupant movement and activity.
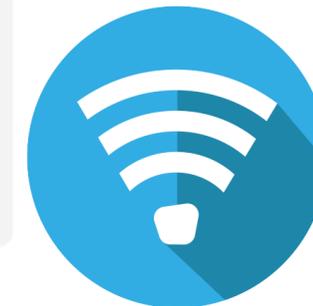
Network Connectivity

Recommended: Wired Installation
Wired installation is the most fail-safe option for data exchange. It requires the most amount of installation work, including pulling cables to the various monitor locations and installing a router to handle all connections.

WiFi Installation
WiFi offers varying degrees of stability due to interference and distance limitations. Monitors tend to have weaker WiFi reception than computers and phones. WiFi connections are, however, much easier to set up and install as compared to wired connections. Mobile WiFi / GPRS are also connection options.

2.3.5 Installation & Maintenance

Once monitors and software are selected, consider how to install them within the space. Follow the requirements as listed in the **RESET**™ Air Standard for Commercial Interiors v2.0.

Installation

Refer to the **RESET**™ **Air** Standard for Commercial Interiors v2.0, Section 2.2.5: Installation Standard, for installation rules and requirements.

Maintenance

Refer to the **RESET**™ **Air** Standard for Commercial Interiors v2.0, 2.2.7.3: Certification Requirements, under Recalibration, for maintenance rules and requirements.

Monitors must be re-calibrated annually. Calibration must be performed by a certified **RESET**™ ASP.

2.3.6 Certification for Commercial Interiors

After hardware is installed and transmitting IAQ data, how is RESET™ Air Certification achieved?

The process includes 3 steps.

1. Establish hours of occupancy. This should include all times which the space is regularly occupied by staff. In cases where staff regularly work overtime, hours of occupancy may be longer than 8 hours.
2. Gather 12 weeks (3 audit cycles) of continuous data during all hours of occupancy.
3. Compare measured IAQ data to **RESET™ Air** Standards (see Section 2.2.2 for specifics).
    A. If the measured daily average meets or exceeds healthy standards during 100% of occupancy hours, the space qualifies for **RESET™ Air** Certification for Commercial Interiors.
    B. If the measured daily average is below healthy standards during 100% of occupancy hours, the space does not qualify for **RESET™ Air** Certification for Commercial Interiors (see Section 2.2.7 for specifics).

To qualify for **RESET™ Air** Certification for Commercial Interiors, the following are required:

1. **RESET™ Air** Documentation Audit (one-time)
2. **RESET™ Air** Site Audit (one-time)
3. **RESET™ Air** Annual Review and Certification (annual)

2.3.7 Certification Fees

RESET™ Air for Commercial Interiors Certification fees include the following:

1. **RESET™ Air** Documentation Audit *(One Time)*
2. **RESET™ Air** Site Audit *(One Time)*
3. **RESET™ Air** Annual Review and Certification *(Annual)*

In addition to the above, there should be consideration for the auxiliary fees including hardware for monitoring, software for retrieving and storing monitor data, and yearly hardware calibration.

For exact pricing, please visit https://reset.build/certification for the pricing calculator.

End of **RESET**™ **Air** PROCESS for Commercial Interiors

Air

STANDARD

FOR
CORE & SHELL v2.0
PRE-RELEASE

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2.4.1 Preface

RESET™ Air for Core & Shell is a real-time measurement and communication standard for indoor air quality that defines monitor performance, installation, maintenance and reporting requirements. Buildings may also be certified when operational performance targets are achieved.

Intent:

- Measure the quality of air being delivered by a building's fresh-air system - including filtration levels of outdoor particulates, CO_2, and TVOC that may be re-introduced from recirculation of indoor air - in real-time and report results to occupants of tenant spaces and/or public areas.
- Standardize how building air-quality performance is measured and communicated, thereby protecting occupants from false claims and creating a level playing field for building owners and operators.
- Dramatically raise public awareness to indoor air quality and its relationship to environmental and occupant health.

*Note: The intent is **not** to indicate the quality of mixed air breathed by individuals within tenant spaces and/or public occupant spaces. Air quality within those spaces is covered by **RESET**™ Air for Commercial Interiors.*

Application:

- All buildings with central mechanical ventilation systems, delivering fresh-air to tenant spaces, and/or public occupant spaces. This includes, but is not limited to, office towers and shopping malls.
- New or existing buildings.

2.4.2.1 Mechanical Ventilation Typologies and Monitor Locations

RESET™ Air for Core & Shell considers two types of mechanical ventilation typologies:
Dedicated Mechanical Floor (supplying multiple floors) and **Floor-by-Floor** (supplying single floors).

Dedicated Mechanical Floor

In buildings with dedicated mechanical floors, through which fresh air is treated centrally and distributed to multiple occupied floors, monitors must be located within the principal supply duct of the air handling unit, post filtration, post mixing (of return air, if applicable) and prior to dampers that may limit air flow to a branch of a supply duct.* All air handling units supplying fresh-air to occupied spaces must be monitored**.

> *Example: In an office tower with two air handling units within a mechanical floor, supplying 'X' floors up and/or down, two monitors must be provided: one for each air handling unit. The monitors must be located in the supply duct, post filtration, post mixing (of return air, if applicable) and prior to the supply duct branching off to 'X' floors*.*

If supply air is mixed with return air on a floor-by-floor or zone-by-zone basis, the requirements for **Floor-by-Floor** must be applied in lieu of those mentioned above.

* Monitors may be installed outside the duct, within a dedicated air-tight case, having a minimum of two openings (minimum 1cm diameter) between the case and the duct, enabling air flow into the case.
** Air handling units supplying office tower lobbies are exempt from this requirement.

2.4.2.2 Mechanical Ventilation Typologies and Monitor Locations *(continued)*

Floor-by-Floor

In buildings with one or several air handling units on each floor, monitors must be located within the principal supply duct of selected air handling units, post filtration, post mixing (of return air, if applicable) and prior to dampers that may limit air flow to a branch of a supply duct.* Air supply being monitored must cover at least 1/3 of total occupied building volume.

Monitors may be installed outside the duct, within a dedicated air-tight case, having a minimum of two openings (minimum 1 cm diameter) between the case and the duct, enabling air flow into the case.

Outdoor Monitors

Every building must include a minimum of one (1) exterior grade monitor, measuring and communicating outdoor air quality in real-time. The monitor must be located within a 5 meter radius (maximum) of the fresh air intake for mechanical ventilation. The monitor may also be located directly within the supply air duct, prior to filtration. Monitors, at a minimum, must measure particulate matter (PM2.5), temperature, and humidity.

Number of exterior grade monitors required per building:
- Dedicated Mechanical Floors: One (1) per mechanical floor.
- Floor-by-Floor: One (1) per supply air representing 1/9 of total occupied building volume.
  Example: In a building with 9 floors of equal volume and 2 air handling units per floor, only 1 exterior grade monitor is required.

2.4.3 Required Monitoring Parameters

Indoor Monitors

The following parameters must be measured, post filtration and post air mixing (of return air, if applicable):

- PM2.5
- CO_2
- TVOC
- Temperature
- Relative Humidity

Outdoor Monitors

Pre Filtration:

- PM2.5
- Temperature
- Relative Humidity

All monitors must meet the **RESET**™ **Air** Standard for Grade A (scientific grade) or Grade B (building grade) air quality monitoring devices. All monitors must be connected to a permanent power source and have the capability of communicating data to the **RESET**™ cloud in real-time, either directly or via an approved provider. More information about monitors can be found in section 2.4.5.

2.4.4 Indoor Air Quality Targets

RESET™ Air for Core & Shell is a performance based building standard. In order for a project to be certified, indoor air pollutant levels - as tracked continually thru real-time monitoring - must be maintained within the limits listed below.

Daily IAQ averages are calculated from all occupancy hours and are compared against international IAQ health limits. To pass the initial certification, all results must fall below the required limits for a minimum of 3 consecutive months. Results must be kept within required limits and continually reported in order to maintain certification.

PM2.5 Particulate Matter	TVOC Total Volatile Organic Compounds	CO$_2$ Carbon Dioxide	Temp Temperature	RH Relative Humidity
Required ≤15µg/m^3 or ≥75% Reduction*	**Required** < 0.4 mg/m^3	**Required** < 600 ppm	**Required** Monitored**	**Required** Monitored**

*When outdoor PM2.5 is ≤60µg/m^3, indoor levels can be no more than 15µg/m^3. When outdoor PM2.5 is >60µg/m^3, filtration at the level of the air handling unit should remove 75% of PM2.5.

**Although there are no requirements for temperature and humidity under the RESET™ Air Target (see the Comfort Target), both must be monitored given their impact on sensor readings for PM2.5 and TVOC.

2.4.4.1 IAQ Performance Targets - PM2.5

Particulate matter 2.5 (PM2.5) refers to particles with diameter 2.5 μm or less. It contains heavy metal, toxic gases, and it is also able to carry bacterias and viruses. Exposure to high index of PM2.5 can cause diseases in respiratory and cardiovascular systems.

PM2.5 Requirements:

- When outdoor PM2.5 is less than or equal to 60 μg/m^3, indoor levels must be no more than 15 μg/m^3, calculated on a daily basis and taken as an average of levels attained during occupational hours.
- When outdoor PM2.5 exceed 60 μg/m^3, filtration at the level of the air handling unit have to remove 75% of PM2.5, calculated on a daily basis and taken as an average of levels attained during occupational hours.

Monitor Locations for Different Ventilation Typologies:

- Floor-by-floor: Monitors must be located within the principal supply duct of selected air handling units, post filtration, post mixing (of return air, if applicable) and prior to dampers that may limit air flow to a branch of a supply duct. Air supply being monitored must cover at least 1/3 of total occupied building volume.
- Dedicated Mechanical Floor: monitors must be located within the principal supply duct of the air handling unit, post filtration, post mixing (of return air, if applicable) and prior to dampers that may limit air flow to a branch of a supply duct. All air handling units supplying fresh-air to occupied spaces must be monitored.

Sensor Density:

- Minimum of one (1) monitor every 500 m^2 of open space.

2.4.4.2 IAQ Performance Targets - TVOC

Volatile organic compounds (VOCs) are composed of various chemical compounds and elements such as carbon, hydrogen, oxygen, fluorine, chlorine, boron, sulphur or nitrogen. Long-term exposure to VOCs can cause damage to the liver, kidneys and the central nervous system.

TVOC Requirements:
– The indoor TVOC index should be no more than 0.4 mg/m^3 to be not hazardous to the human body, calculated on a daily basis and taken as an average of levels attained during occupational hours.

Monitor Locations for Different Ventilation Typologies:
– Floor-by-floor: Monitors must be located within the principal supply duct of selected air handling units, post filtration, post mixing (of return air, if applicable) and prior to dampers that may limit air flow to a branch of a supply duct. Air supply being monitored must cover at least 1/3 of total occupied building volume.
– Dedicated Mechanical Floor: monitors must be located within the principal supply duct of the air handling unit, post filtration, post mixing (of return air, if applicable) and prior to dampers that may limit air flow to a branch of a supply duct. All air handling units supplying fresh-air to occupied spaces must be monitored.

Sensor Density:
- Minimum of one (1) monitor every 500 m^2 of open space.

2.4.4.3 IAQ Performance Targets - CO_2

Carbon Dioxide (CO_2) concentration has a direct impact on productivity, comfort and health. Elevated CO_2 levels lead to drowsiness, dizziness and cognitive disfunction.

Carbon Dioxide Requirements:
– Carbon dioxide levels in Core & Shell spaces must be kept below 600 ppm, calculated on a daily basis and taken as an average of levels attained during occupational hours.

Monitor Locations for Different Ventilation Typologies:
– Floor-by-floor: Monitors must be located within the principal supply duct of selected air handling units, post filtration, post mixing (of return air, if applicable) and prior to dampers that may limit air flow to a branch of a supply duct. Air supply being monitored must cover at least 1/3 of total occupied building volume.
– Dedicated Mechanical Floor: monitors must be located within the principal supply duct of the air handling unit, post filtration, post mixing (of return air, if applicable) and prior to dampers that may limit air flow to a branch of a supply duct. All air handling units supplying fresh-air to occupied spaces must be monitored.

Sensor Density:
- Minimum of one (1) monitor every 500 m^2 of open space.

2.4.4.4 IAQ Performance Targets - Temp and Humidity

RESET™ Air prioritizes the indoor air quality. The indices of temperature and relative humidity helps the estimation of the VOCs and PM2.5 indices. The requirements for temperature and relative humidity under RESET™ Air are identical to those within RESET™ Comfort.

Temperature Requirements:
- When outdoor air is above 24°C, temperature differential between inside and outside can be no more than 8°C for mechanically conditioned indoor spaces that connect directly to outdoors. For spaces not directly connected to outdoors, indoor temperatures can be no lower than 24°C.
- When outdoor air is below 18°C, indoor air can be no higher than 21°C.
- When outdoor temperature is between 18-26°C, indoor air should be within the same range.

**Relative Humidity Requirements:**
- For mechanically conditioned interiors, relative humidity must be kept between 30 and 60% in order to maximize comfort while minimizing heating and cooling loads.

Sensor Density:
- Minimum of one (1) monitor every 500 m^2 of open space.

2.4.5 Monitor Standards

The accuracy of monitors is of critical importance to determine the impact that IAQ has on occupant health and to appropriately guide HVAC operations and maintenance. Given the wide range in the quality of market-available monitors, **RESET**™ Air sets standards for sensor performance and calibration. Only Grades A & B are acceptable for use in **RESET**™ Air projects.

GRADE

A

RESET重生™

Scientific grade monitors:
Used in labs and manufacturing.

GRADE

B

RESET重生™

Building grade monitors:
Used in commercial projects.

GRADE

C

RESET重生™
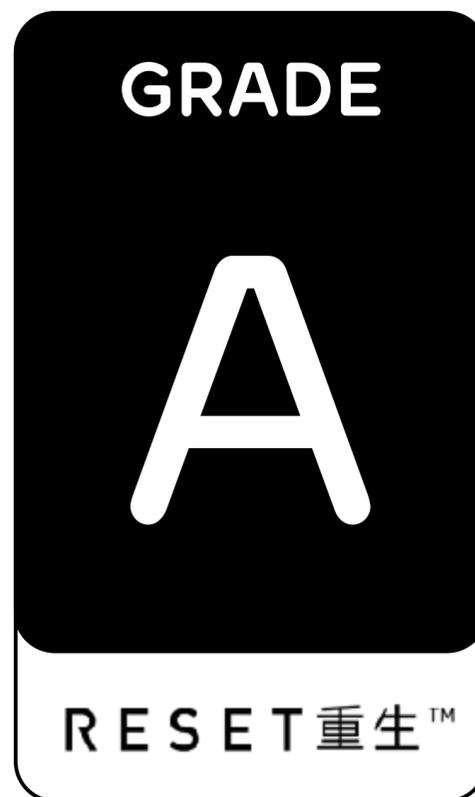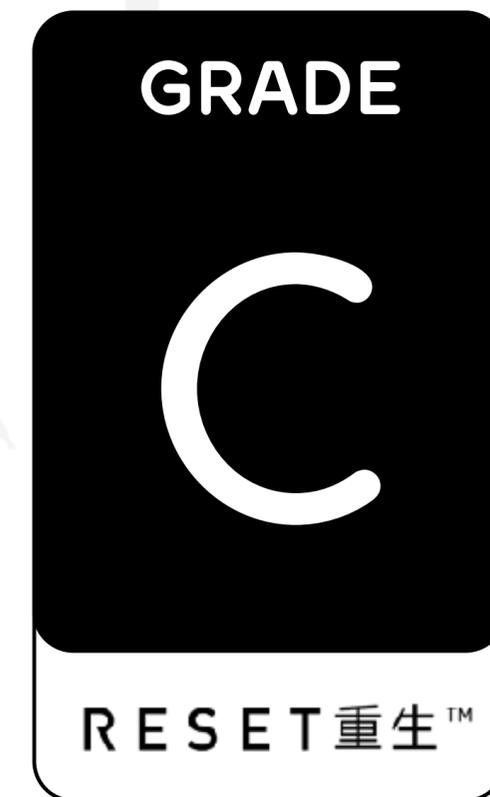
Consumer grade monitors:
Portable mass market monitors.

2.4.6 Monitor Specifications

RESET™ Air categorizes monitors according to three performance based tiers: Grade A (scientific), Grade B (building grade) and Grade C (consumer grade). Only Grade A and Grade B are acceptable for use in RESET™ Air projects. Below is an abbreviated portion of the Standard for Grade B monitors. Refer to the full RESET™ Air Standard for Air Quality Monitors for the full specification.

RESET™ Air Standard for IAQ Monitors - Grade B

Particulate Matter (PM2.5)

Measuring Range	0-300 ug/m^3
Output Resolution	1 ug/m^3
Sensitivity	1 ug/m^3
Accuracy	±20%

Carbon Dioxide (CO2)

Measuring Range	300-2000 ppm
Output Resolution	5 ppm
Sensitivity	5 ppm
Accuracy	±100 ppm, ±3% of reading

Total Volatile Organic Compound (TVOC)

Measuring Range	0.15-1.5 mg/m^3
Output Resolution	0.001 mg/m^3
Sensitivity	0.001 mg/m^3
Accuracy	±0.02 mg/m^3, ±10% of reading

Relative Humidity (RH)

Measuring Range	10-85 %RH
Output Resolution	1 %RH
Sensitivity	1 %RH
Accuracy	< ±5 @20-80% RH

Temperature

Measuring Range	0-40 °C
Output Resolution	1 °C
Sensitivity	1 °C
Accuracy	2 °C

Note: In order to provide health and certification analytics, monitors must be able to stream real-time data to the RESET™ Cloud directly or via an RESET™ accredited software provider.

2.4.7 Installation Requirements

Monitors must meet the following minimum installation requirements:

1. Air quality monitors must be mounted to principal supply ducts, post filtration, post mixing (of return air, where applicable) and prior to dampers within the supply duct that may limit the flow of air.
2. Monitors may be installed on the outside surface of the duct, within a dedicated air-tight case, having a minimum of two openings (minimum 1cm diameter each) between the case and the duct, enabling air flow into the case.
3. Exterior grade air quality monitors must be located within a 5 meter radius (maximum) of the fresh air intake for mechanical ventilation and must be sheltered from direct exposure to sun, rain and snow. Monitors may also be located directly within the supply air duct, prior to filtration.

Recommendations

To ensure data continuity and achievement of **RESET**™ **Air** Certified status, the following is highly recommended:.

-   Use a permanent power source for monitors over plug type power solutions to avoid connectivity lapses and data loss.
-   Use ethernet cabling or other hard-wired data transfer methods over WiFi to avoid connectivity lapses and data loss.

2.4.8 Installation Standard

Application
Office levels within commercial office buildings. Office lobbies are not required.

Monitoring Locations
PAU (Primary Air Handling Units): Monitors to be placed on the supply duct, post filtration and prior to it being distributed and sent into each tenant space. Each floor is to be monitored independently. At least one monitor per project must be located in the PAU, prior to filtration, with others to be located every 10 floors.

AHU (Air Handling Unit - floor by floor): Monitors to be placed on the supply duct, post filtration and prior to it being distributed and sent into each tenant space. At least one monitor per 10 floors located prior to filtration, with a minimum of 1 monitor per project.

Recommended: Monitor to be placed on the PAU, prior to filtration. For more than 5 units, 1 for every 5. Monitor to be placed on the AHU prior to filtration. In a floor by floor system, one for every 5 floors.
Intent: this enables calculation of the performance of the filtration system and the communication of filtered supply air quality as a factor of outdoor air quality. For example, should outdoor be 200 and indoor 50, the indoor air can be communicated as being 4x better than outdoor, or 75% reduction.

2.4.9 Required Documentation

The following documents must be submitted prior to being considered for **RESET**™ **Air** Certification. Documents may be submitted at any time during the project life-cycle, however; it is highly recommended that they be submitted and approved at the design stage, thereby minimizing the risk of incurring construction change orders and the purchase of unqualified monitors:

1. Required Documentation Checklist Document.
   a) Brand and product number of the monitoring hardware being used, as well as the reporting software (if different from the hardware). At a minimum, hardware and software must meet **RESET**™ **Air** Standard for Building Grade monitors.
2. A mechanical plan showing the location of air handling unit(s), supply duct(s), and location of monitor(s), both indoor (post filtration and air mixing) and outdoor (pre-filtration).
3. A list of the air handling units being monitored, indicating which floor they are located on and the volume of space being supplied.
4. The total building area, building volume, and % calculation of the building volume being monitored (accounting only for occupied areas).
5. Monitor certificate(s) of calibration from a qualified **RESET**™ ASP.
6. Picture(s) of the monitor(s), installed, with a reference to location within the plan.
7. Project Pictures (Optional)

2.4.10.1 Certification Requirements

Step 1: RESET™ Air Document Audit
To be eligible for certification, all documents required in section 2.4.9 must be approved by **RESET™**.

Step 2: RESET™ Air Site Audit
A site audit must be conducted by an independent **RESET™** ASP, assigned by **RESET™**. The audit consists of a site inspection, verifying that all monitors have been installed as per the **RESET™ Air** Standard and submitted documents.

Step 3: RESET™ Air Certification
- **Initial Certification (First year):**
  Air quality results must be within the healthy limits of **RESET™ Air** performance targets for PM2.5, CO_2, and TVOC, calculated as a daily average during hours of occupancy, for 3 audit cycles.
- **Ongoing Certification (Second year and onwards):**
  Air quality results must be maintained within healthy limits for PM2.5, CO_2, and TVOC, calculated as a daily average during hours of occupancy.

2.4.10.2 Certification Requirements *(continued part 1)*

Certification Specifics
Below are a few additional specifics in regards to certification.

- An audit cycle is 4 weeks. There is a total of 13 audit cycles in a year.
- To pass certification, every monitor in the Documentation Audit needs to pass,
- Only the daily average data during the assigned working hours will be used.
- If a client passes the certification audit, certification will be granted immediately.
- Certification lasts for a year. Client should contact **RESET**™ to re-certify before the end of 13 audit cycles.
- If certification is revoked, the client will need to re-certify, including Documentation Audit, Site audit, and the initial 3 audit cycle certification audit.
- Special days or holidays can be manually removed from the audit via a direct request to **RESET**™.

Certification Failure Conditions
Below are the conditions where one would lose their certification.

- 2 failure days are allowed in each audit cycle.
- A monitor with 4 consecutive hours of missing data in a day fails for that day.
- If the client fails 3 consecutive audit cycles, certification is revoked.
- If the client does not re-certify before the certification expires, certification will be revoked.

2.4.10.3 Certification Requirements *(continued part 2)*

Annual Re-certification

RESET™ Air projects are re-assessed and re-certified on an annual basis. As a results driven program, re-certification is primarily data driven and consists of a semi-automated data review. This review ensures that the IAQ results have stayed within healthy limits. Site audits, performed by an independent **RESET**™ ASP, are required every 3 years.

Recalibration

Monitors must be re-calibrated annually by a qualified **RESET**™ ASP. Certificates attesting to the re-calibration of monitors must be submitted annually.

Communication and Education

- Real-time results must be made available to all occupants via publicly available screens, desktop or mobile app. Non-occupants do not need to have access to the data.
- Publicly available data must include indoor and outdoor PM2.5 in areas where outdoor PM2.5 levels exceed an annual average of 15**μ**g/m^3.
- For buildings with tenants pursuing **RESET**™ Air for Commercial Interiors, the average tenant performance must be displayed, including the % of the building that the monitored volume represents.
- Publicly available data must also include a list of the floors and/or zones being monitored. This data is not required to be displayed within at a primary level, but must be publicly accessible at a secondary level*.

*Note: Primary level refers to data that is visible on a display screen. Secondary level refers to data that requires users to click in order to be accessed.

2.4.11 Appendix

End of **RESET**™ **Air** Standard
for Core & Shell

Air

CERTIFICATION PROCESS

FOR

CORE & SHELL v2.0

PRE-RELEASE

Table of Contents

2.5.1.1 Core & Shell System Analysis

Core & Shell applies to two types of systems:

Dedicated Mechanical Floor

Fresh air is treated centrally and distributed to multiple occupied floors.

Monitors must be located in 2 places:
1. in the principal supply duct of the air handling unit, post filtration and post mixing (of return air, if applicable), and prior to dampers that may limit air flow to a branch of a supply duct.
2. all air handling units supplying fresh-air to occupied spaces must be monitored.

Note: Please refer to 6.2 for specific details.

Floor-by-Floor

Buildings with one or several air handling units on each floor.

Monitors must be located in the principal supply duct of the air handling unit, post filtration and post mixing (of return air, if applicable), and prior to dampers that may limit air flow to a branch of a supply duct.*

Note that total air supply being monitored must cover at least 1/3 of total occupied building volume for **RESET**™ **Air** for Core & Shell - **Floor-by-Floor**.

Additional Requirements: Outdoor Monitors

Every building must include a minimum of one (1) exterior grade monitor

Monitors must be:
1. located within a 5 meter radius of fresh air intake for mechanical ventilation,
2. located directly within the supply air duct prior to filtration.

Number of exterior grade monitors required per building:
   - Dedicated Mechanical Floors: One (1) per mechanical floor.
   - Floor-by-Floor: One (1) per supply air representing 1/9 of total occupied building volume.

Note: Please refer to 6.2 for specific details.

2.5.2 Monitor and Software Selection

RESET™ Air requires ongoing, real-time monitoring of interior spaces and access for occupants to view the measured data. Air Monitors and Software are both required to achieve RESET™ Air.

Monitors

Monitors must meet RESET™ Air standards Grade A or Grade B to qualify for certification.

GRADE

A

RESET重生™

GRADE

B

RESET重生™

Software

Software is required to collect IAQ data and make it accessible to the RESET™ Cloud.

The software provider must be able to push the collected data to the RESET™ Cloud.

i.e.

QLEAR·清度™

www.qlear.build

Note: RESET™ does not sponsor any specific brand of Monitors or Software and is always looking for more hardware and software providers. Please contact us to suggest additional solution providers for consideration.

2.5.3 Pre-installation Considerations

Once monitors and software are selected, plan for installation and set-up.

Power

Recommended: Permanent
For a permanent installation, connect monitors to conduit within wall cavities. Permanent connections reduce the risk of accidental disconnection.

Temporary (Not RESET™ Compliant)
For temporary installation, most users will opt to use power units as provided by hardware manufacturers. This is acceptable for testing purposes, but comes with the risk monitors being unplugged accidentally.

Mounting

Recommended: Indoor
For best results, use an external grade monitor in the ducts for the best performance as air ducts can vary in humidity.

Network Connectivity

Recommended: Wired Installation
Wired installation is the most fail-safe option for data exchange. It requires the most amount of installation work, including pulling cables to the various monitor locations and installing a router to handle all connections.

It is worth noting that wireless reception of any kind is spotty at best in the air ducts.

2.5.4 Installation & Maintenance

Once monitors and software are selected, consider how to install them within the space. Follow the requirements as listed in the **RESET**™ Air Standard for Core & Shell v2.0.

Installation

Refer to the **RESET**™ **Air** Standard for Core & Shell v2.0, Section 2.4.8: Installation Standard, for installation rules and requirements.

Maintenance

Refer to the **RESET**™ **Air** Standard for Core & Shell v2.0, Section 2.4.10.3: Certification Requirements, under Recalibration, for maintenance rules and requirements.

Monitors must be re-calibrated annually. Calibration must be performed by a certified **RESET**™ ASP.

2.5.5 Certification for Core & Shell

After hardware is installed and transmitting IAQ data, how is RESET™ Air Certification achieved?

The process includes 3 steps.

1. Establish hours of occupancy. This should include all times which the space is regularly occupied by staff. In cases where staff regularly work overtime, hours of occupancy may be longer than 8 hours.
2. Gather 12 weeks (3 audit cycles) of continuous data during all hours of occupancy.
3. Compare measured IAQ data to RESET™ Air Standards (see section 2.4.4 for specifics).
    A. If the measured daily average meets or exceeds healthy standards during 100% of occupancy hours, the space qualifies for RESET™ Air Certification for Core & Shell.
    B. If the measured daily average is below healthy standards during 100% of occupancy hours, the space will not qualify for RESET™ Air Certification for Core & Shell (see 2.4.10 for specifics).

To qualify for RESET™ Air Certification for Core & Shell, the following are required:

1. RESET™ Air Documentation Audit (one-time)
2. RESET™ Air Site Audit (one-time)
3. RESET™ Air Annual Review and Certification (annual)

2.5.6 Certification Fees

RESET™ Air for Core & Shell Certification fees include the following:

1. **RESET**™ **Air** Documentation Audit *(One Time)*
2. **RESET**™ **Air** Site Audit *(One Time)*
3. **RESET**™ **Air** Annual Review and Certification *(Annual)*

In addition to the above, there should be consideration for the auxiliary fees including hardware for monitoring, software for retrieving and storing monitor data, and yearly hardware calibration.

For exact pricing, please visit https://reset.build/certification for the pricing calculator.

2.5.7 Appendix

End of **RESET**™ Air PROCESS for Commercial Interiors

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