Air

STANDARD

FOR
COMMERCIAL INTERIORS v2.0

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2.2.0 Preface

RESET™ Air for Commercial Interiors is a continuous monitoring and communication standard for indoor air quality that defines monitor deployment, installation, performance, maintenance, and reporting requirements. Commercial interiors become RESET™ Air Certified when operational performance targets are achieved. The RESET™ Air Standard for Commercial Interiors can be applied to new or existing buildings.

Intent:
- Continuously monitor particulate matter (PM2.5), TVOC, CO_2, and CO*, covering 80% of occupants representing all regularly occupied space types according to their function.
- Report the data to project occupants to foster education and promote social equity.
- Standardize how indoor air quality performance is measured and communicated.
- Raise public awareness of indoor air quality and its impacts on environmental and occupant health.

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.

* CO monitoring is only required in areas with combustion

2.2.1 Certification Approach

RESET™ Air for Commercial Interiors is a performance-based standard. Its intent is to monitor, track and report the quality of air breathed by the building's occupants.

Given the wide variety of space types occurring in the built environment and myriad ways occupants use these spaces, applying a prescriptive methodology across all projects would be ineffective.

Influencing factors such as workplace dynamics, company policies, technological advancements, even cultural pressures have redefined how we engage in our environments. Spaces are dynamic and frequently defy traditional naming conventions. Room names appearing on floor plans are therefore highly contextual. Mandating a prescriptive methodology be applied to every project, would potentially deny the true function of a space from being accounted for.

RESET™ Air employs a non-prescriptive approach for certification. Project teams must define and defend their inclusion or exclusion of space types as applicable based on their individual project(s) and specific use criteria.

Refer to **RESET™ Air Certification Process for Commercial Interiors** (Section 2.3) for documentation requirements.

2.2.2 Indoor Air Quality Performance Targets

RESET™ Air is a performance-based building standard. In order for a project to achieve **RESET™ Air Certification for Commercial Interiors**, indoor air quality parameters, as tracked through continuous monitoring and calculated into a daily average according to hours of occupancy, must be maintained within the limits listed below.

Targets are based on industry best-practices and international standards.* Acceptable targets are requisite; all projects must meet the limits as listed.

High Performance targets are listed as a reference for projects striving for more rigorous IAQ goals and/or for projects located in regions where ambient outdoor air quality levels typically stay within recommended health limits.

PM2.5 Particulate Matter	TVOC Total Volatile Organic Compounds	CO$_2$ Carbon Dioxide	Temp Temperature	RH Relative Humidity	CO Carbon Monoxide
Acceptable < 35 μg/m³	Acceptable < 500 μg/m³	Acceptable < 1000 ppm	Monitored	Monitored	Acceptable < 9 ppm
High Performance < 12 μg/m³	High Performance < 400 μg/m³	High Performance < 600 ppm	*Although there are no requirements for temperature and humidity under RESET™ Air, both must be monitored given their impact on sensor readings for PM2.5 and TVOC.*		*CO monitors are only required in spaces with combustion.*

✳ Refer to section(s) 2.1.2 -2.1.11, "How Does **RESET™** Air Work"

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. Exposure to high concentrations of PM2.5 can cause diseases in respiratory and cardiovascular systems.

PM2.5 Target Requirement:
    a.   Indoor PM2.5 levels do not exceed 35 μg/m^3. [1]

PM2.5 High Performance:
    b.   Indoor PM2.5 levels do not exceed 12 μg/m^3. [1]

[1] U.S. Environmental Protection Agency. National Ambient Air Quality Standards. https://www.epa.gov/pm-pollution/table-historical-particulate-matter-pm-national-ambient-air-quality-standards-naaqs

2.2.2.2 IAQ Performance Targets - TVOC

Volatile organic compounds (VOCs) are organic compounds that easily become vapors or gases. Common VOCs include formaldehyde, benzene, toluene, and styrene. Long-term exposure to VOCs can cause damage to the liver, kidneys, and the central nervous system.

TVOC Target Requirement:
   a.   Indoor TVOC levels do not exceed 500µg/m^3. [2]

TVOC High Performance:
   b.   Indoor TVOC levels do not exceed 400µg/m^3. [2]

[2] ILFI Living Building Challenge 3.1, Petal: Health and Happiness, Imperative: 08., IWBI WELL Building Standard, Feature 01, Part 01, Q4 2017 and USGBC LEEDv 4, USGBC's LEED v4: Reference Guide for Building Design and Construction EQ Credit: Indoor Air Quality Assessment, all require demonstration of total VOC levels less than 500 µg/m³.

2.2.2.3 IAQ Performance Targets - CO_2

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

CO_2 Target Requirement:
   a. The indoor CO_2 levels do not exceed 1000 ppm. [3]

CO_2 High Performance:
   b. Indoor CO_2 level do not exceed 600 ppm. [3][4]

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

2.2.2.4 IAQ Performance Targets - CO

Carbon monoxide (CO), is an odorless, colorless and toxic gas that results from combustion. Called "the silent killer", levels of CO can build up quickly in improperly ventilated spaces and linger long after infiltration has occurred. High levels of CO can cause dizziness, confusion, unconsciousness, and death.

Note: CO monitors are only required in spaces with combustion.

CO Target Requirement:
a. The indoor CO levels do not exceed 9 ppm.

2.2.3 Data Analysis Algorithm

RESET™ Air for Commercial Interiors uses a multi-tier algorithm to parse through data submitted to the **RESET™ Assessment Cloud** for data analysis. The **RESET™ Assessment Cloud** is **RESET™**'s data analysis platform.

The data analysis algorithm compiles daily averages calculated from hours of occupancy and compares it against the indoor air quality limits in **RESET™ Air for Commercial Interiors's Indoor Air Quality Performance Targets** (Section 2.2.2).

To qualify for initial certification for **RESET™ Air for Commercial Interiors**, results from the data analysis must not exceed acceptable limits for a period of 3 consecutive months.

Refer to **RESET™ Air Data Analysis Methodology** (Section 2.9) for more information.

2.2.4 Data Provider Requirements

Data Providers are responsible for collecting and aggregating IAQ data according to **RESET**™ requirements. The required data is to be collected and transferred to the **RESET**™ **Assessment Cloud** for assessment purposes.

Indoor air quality data must report to the RESET™ **Assessment Cloud:**
   a. Projects must use a **RESET**™ **Air** **Accredited Data Provider** (Section 2.8) that reports to the **RESET**™ **Assessment Cloud**.

Air quality data must be displayed to project occupants:
   b. **RESET**™ **Air** **Projects** must provide project occupants access to hourly indoor air quality data. Project occupants include tenants, employees (full and part-time as well as maintenance and cleaning staff), guests and visitors who at any time occupy the project for more than one hour per day.
   c. Acceptable methods of data access include, visual display screens in public, community or shared work areas, phone apps, web apps, graphic signage with http address or QR code that directly connects users to the app or website where the data can be viewed.

For more information, please refer to the **RESET**™ **Air** **Accredited Data Provider** (Section 2.8).

2.2.5 Monitor Requirements

RESET™ Air requires continuous monitoring of regularly occupied spaces. The accuracy of air quality monitors is of critical importance to determine how IAQ is impacting occupant health and to appropriately guide HVAC operations and maintenance. Market-available monitors range widely in quality, accuracy and reliability, therefore, RESET™ Air sets standards for sensor performance, maintenance, and calibration.

Only Grades A & B are acceptable for use in RESET™ Air projects. Grade C are not acceptable.

Refer to the **RESET™ Air Accredited Monitor Standard** (Section 2.6) for full requirements.
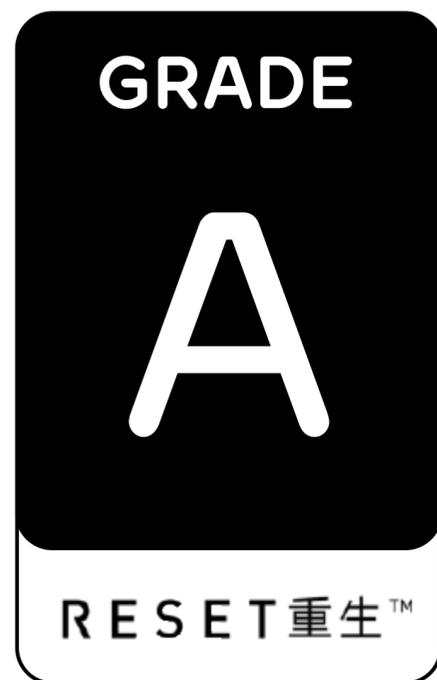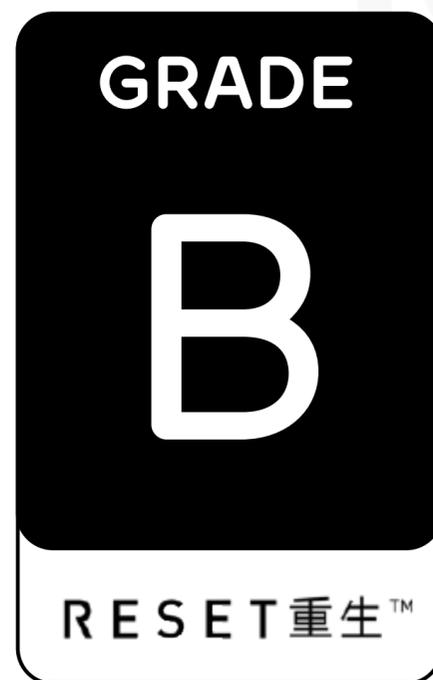
GRADE A	GRADE B	GRADE C
RESET重生™	RESET重生™	RESET重生™
Calibration grade monitors	Commercial grade monitors	Consumer grade monitors

2.2.6 Monitor Installation Requirements

In order to certify for **RESET™ Air for Commercial Interiors**, projects must be able to demonstrate that the air in the breathing zone of building occupants adheres to **RESET™ Air** performance targets.

In order to do so, **RESET™ Air Accredited Monitors** (Section 2.6) must be installed according to the following requirements:

  a. Wall-mounted and centrally-located within monitored spaces
  b. Mounted within the breathing zone: between 900 - 1800 mm (3 - 6 feet) from the ground (after finished floor to underside of finished ceiling)*.
  c. Located at least 5 meters (16 feet) away from operable windows. In areas where this is not possible, monitors must be located no closer to windows than half the width of the space, measured linearly from the windows inwards.
  d. Located at least 5 meters (16 feet) away 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.
  e. Hard-wired to a permanent power source, (recommended but not mandatory).

 * Aligns with ASHRAE 62.1

2.2.7 Steps for Calculating Monitor Deployment

The following section provides a step-by-step process to determine monitor deployment for a **RESET™ Air for Commercial Interiors Project**. The steps are as follows:

1. **Step One**
   Define the project boundary

2. **Step Two**
   Determine total number of occupants within project boundary

3. **Step Three**
   Calculate percentage of occupants required for monitoring based on desired certification: Full or Partial

4. **Step Four**
   Create an itemized list of regularly occupied space types within the project boundary

5. **Step Five**
   Deploy a minimum of one (1) monitor in each regularly occupied space type

6. **Step Six**
   Ensure monitor range of 500 m^2 (5,382 square feet)

2.2.7.1 Step One
Define Project Boundary

1. **Define the project boundary.**

The project should be defined by a clear boundary such that the project is physically distinct from other interior spaces within the building. Included in the boundary are spaces associated with the project that support its typical operations.

A project boundary, once defined, must remain consistent for all subsequent calculations and are not permitted to unnecessarily meander or exclude portions of the building, HVAC system or interior spaces, that would unfairly allow the project to achieve any or all of the **RESET™ Air** Standard requirements (see glossary for full description).

Project teams must submit a detailed statement that defines and clarifies what is deemed a project boundary for their specific project. The statement must include sufficient information to substantiate the boundary as selected.

Refer to **RESET™ Air Certification Process for Commercial Interiors** (Section 2.3) for full documentation requirements

2.2.7.1 Step One
Define Project Boundary

2.2.7.2 Step Two
Total Number of Occupants

2. Determine total number of occupants within project boundary.

Calculate total number of occupants.

Occupants are any individuals, be they employees, visitors, clients, or other users inhabiting a space within the project boundary for more than one hour per day.

Indicate occupant totals on the plan. This should be based on where each occupant spends the majority of their time.

Project teams must submit a brief, yet detailed statement that defines and clarifies the total number of occupants for the specific project. The statement must include sufficient information to substantiate how the team arrived at their totals.

Refer to **RESET™ Air Certification Process for Commercial Interiors** (Section 2.3) for full documentation requirements

Total Occupants = 129

2.2.7.3 Step Three
Calculate Percent Occupants

3. Calculate percentage of occupants required for monitoring based on desired certification: Full or Partial.

- Full Certification - 80% of occupants or more
- Partial Certification - 30% of occupants or more

Calculations for occupants are to be rounded up to the nearest whole number. Project teams must submit their calculations in their statement of compliance.

Refer to **RESET™ Air Certification Process for Commercial Interiors** (Section 2.3) for full documentation requirements.

Total Occupants = 129	
Full Certification	Partial Certification
Requirement of 80% $0.8 \times 129 = 103.2$ **104 occupants**	Requirement of 30% $0.3 \times 129 = 38.7$ **39 occupants**

2.2.7.4 Step Four
Itemized, Regularly Occupied Space Types

4. Create an itemized list of regularly occupied space types based on their function within the project boundary

A regularly occupied space is any space that is occupied for more than one (1) hour per day.

Space types are defined by their use and function. Depending on individual project scenarios, transient spaces such as corridors, elevators, stairways, or other non-regularly occupied spaces potentially will not be necessary for inclusion in a project's monitor deployment calculation.

Due to the complexity, variety, and uniqueness of the functional use of spaces within the built environment, project teams must define and defend their inclusion or exclusion of these spaces types.

Refer to **RESET™ Air Certification Process for Commercial Interiors** (Section 2.3) for full documentation requirements

Itemized, Regularly Occupied Space Types

Space Types

- Reception
- Conference Room
- Tele Conf Room
- Open Workstations
- Private Office
- Cafe
- Break Out Area

2.2.7.5 Step Five
Monitor Deployment

5. Deploy one (1) monitor in each regularly occupied space type.

Only one (1) monitor needs to be installed per space type appearing on the project's itemized list of regularly occupied spaces.

Monitors must be a **RESET™ Air Accredited Monitor** (Section 2.6) and must be installed according to **RESET™ Air for Commercial Interiors: Monitor Installation Requirements** (Section 2.2.5).

Refer to **RESET™ Air Certification Process for Commercial Interiors** (Section 2.3) for full documentation requirements

2.2.7.5 Step Five
Monitor Deployment

Space Types

- Reception
- Conference Room
- Tele Conf Room
- Open Workstations
- Private Office
- Cafe
- Break Out Area

In this example, monitors needed to cover the requisite space types = 7

▲ = Covers requisite space types

2.2.7.5 Step Five
Monitor Deployment (Full Certification)

Monitors must cover total number of occupants as calculated in Step 3 for Full Certification.

Monitors must be a **RESET™ Air Accredited Monitor** (Section 2.6) and must be installed according to **RESET™ Air for Commercial Interiors: Monitor Installation Requirements** (Section 2.2.5).

Refer to **RESET™ Air Certification Process for Commercial Interiors** (Section 2.3) for full documentation requirements

Monitor Deployment Plan

Full Certification =
104 total occupants

Monitors currently cover 103
occupants. Needs to cover
one more occupant, thus an
additional monitor is needed.

Total monitors
required = 8

▲ = Covers requisite space types

▲ = Additional for Full Certification

2.2.7.5 Step Five
Monitor Deployment (Partial Certification)

Monitors must cover total number of occupants as calculated in Step 3 for Partial Certification.

Monitors must be a **RESET™ Air Accredited Monitor** (Section 2.6) and must be installed according to **RESET™ Air for Commercial Interiors: Monitor Installation Requirements** (Section 2.2.5).

Refer to **RESET™ Air Certification Process for Commercial Interiors** (Section 2.3) for full documentation requirements

Monitor Deployment (Partial Certification)

Monitor Deployment Plan

Partial Certification =
39 total occupants

The initial 7 monitors
already covers all the
occupants, so no changes
needed.

Total monitors
required = 7

2.2.7.6 Step Six
Monitor Range

The final step to the monitor deployment plan is to calculate the number of monitors required per space.

One (1) monitor is allowed per 500 square meters (5,382 square feet) of project space.

Space types that exceed 500 square meters (5,382 square feet) require additional monitors in order to ensure complete coverage. The only exception to this rule is via a proof of air uniformity test. A proof of uniformity test permits teams to submit test results to potentially extend the 500 square meter monitor range to a maximum of 1,000 square meters (10,764 square feet) (refer to Glossary for details.).

Monitors must be a **RESET™ Air Accredited Monitor** (Section 2.6) and must be installed according to **RESET™ Air for Commercial Interiors: Monitor Installation Requirements** (Section 2.2.5).

Refer to **RESET™ Air Certification Process for Commercial Interiors** (Section 2.3) for full documentation requirements

2.2.7.6 Step Six
Monitor Range

Confirm Monitor Deployment Plan

In this example, the space type, Open Workstations, is bigger than the 500 m² (5,382 square feet) size limit.

One (1) additional monitor is deployed to satisfy the range requirement for monitoring.

Total monitors required for:
Partial = 8
Full = 9

2.2.8 Glossary

ASHRAE
American Society of Heating, Refrigerating, and Air-Conditioning Engineers www.ashrae.org

monitor
A device designed to hold individual sensors within it for the purposes of monitoring. A monitor typically consists of an outer housing in order to protect the sensors employed inside. Monitors may also be designed to include electrical ports, wiring and/or cabling for connection to electrical sources, including but not limited to, wifi, ethernet, LED screens, visual display screens and other vendor-specific features. In order to be utilized in a RESET Air project, a monitor must be Grade A or Grade B accredited. (Refer to RESET Air Accredited Monitor Standard)

occupant
Occupants are any individuals, be they employees, visitors, clients, or other users inhabiting a space within the project boundary for more than one hour per day.

occupied space
An enclosed space intended for human activities, excluding those spaces that are intended primarily for other purposes, such as storage rooms and equipment rooms, and that are occupied only occasionally and for short periods of time (ASHRAE 62.1–2010)

2.2.8 Glossary

project boundary
The project boundary is not permitted to unnecessarily meander or exclude portions of the building, HVAC system or interior spaces, that would purposefully and/or unfairly allow the project to achieve any or all of the **RESET™** Air **Standard** requirements. Included in the boundary are spaces associated with the project that support its typical operations.

For **RESET™** Air **Standard for Commercial Interior**, the boundary should include the entire space the tenant/owner/lease holder is responsible for under a rental/leasing contract, legal sales agreement, or other similar property arrangement. The project team must define the boundary in a clear and distinct manner to communicate how the space is physically separate from other spaces within the building.

proof of uniformity
For unobstructed expanses in a **RESET™** Air **Standard for Commercial Interior** project exceeding 500 square meters (5,382 square feet) project teams are permitted to submit proof of air uniformity as exception to the 500 square meter (5,382 square feet) monitor range limit, extending the 500 square meter (5,382 square feet) limit to a maximum of 1,000 square meters (10,763 square feet).

2.2.8 Glossary

proof of uniformity (continued)

Uniformity testing must be performed by an accredited air quality assessment lab technician or other qualified indoor air quality professional. Documentation for submission to **RESET™** must clearly outline the test methodology, approach, and evaluation results as performed by the technician.

In order to meet uniformity requirements, all pollutants (parameters) as outlined in the **RESET™ Air Standard for Commercial Interiors** must be monitored. Uniformity tests must be conducted using Grade A (calibration-grade) monitoring device(s) adhering to the following protocols:

- Within the project boundary and in the open space subject to the proof of uniformity test, identify three (3) test locations that will serve as fixed sampling points.
- The three (3) sampling points shall be the furthest distance from one another and positioned within the breathing zone as per **RESET™ Air Standard for Commercial Interiors**.
- Sequentially, between 3-10 minutes, record a minimum of 3 data intervals, (one (1) per minute) with a Grade A monitor at each sampling point.
- Calculate the average of each sampling point.
- The calculated average of the three (3) sampling points is not permitted to have a standard deviation more than 10%.
- Using the same fixed sampling points, repeat the process of interval sampling as outlined, three times during a normal day of operations: morning, early afternoon and end of day with a minimum of three (3) hours between each test sequence.
- Submit the report to the **RESET™ Assessment Cloud**.

2.2.8 Glossary

regularly occupied space
An area where one or more individuals normally spend time (more than one hour per person per day on average) seated or standing as they work, study, or perform other focused activities inside a building. The one-hour timeframe is continuous and should be based on the time a typical occupant uses the space. For spaces that are not used daily, the one-hour timeframe should be based on the time a typical occupant spends in the space when it is in use. (USGBC LEEDv4)

sensors
Individual technology uniquely developed for the detection of specific air pollutants. A wide variety of sensor technology exists. Some examples include Tapered Element Oscillating Microbalance (TEOM), Beta Attenuation Mass (BAM), Non-dispersive Infrared Gas Detectors (NDIR), Photoionisation Detection (PID) etc.

space types
In the context of **RESET™ Air**, space types are those areas within a project boundary that are defined based on their function. For example, a conference room, irrespective of size, serves the function of a space where a group of people convene. Varying sizes of conference rooms for the purpose of **RESET™ Air**, do not necessarily require individual itemization on a project's space type list. The space type methodology is meant to ensure that a cross-section of unique space types based on their function are represented in the monitor deployment plan.

End of **RESET**™ Air STANDARD

for Commercial Interiors