



INDOOR AIR QUALITY

INDUSTRIAL HYGIENE TEAM SERVICES

Noelia Estevez de Rosario, IH Safety Manager
Environmental Health and Safety

Lab Safety Awareness Week

February 2025



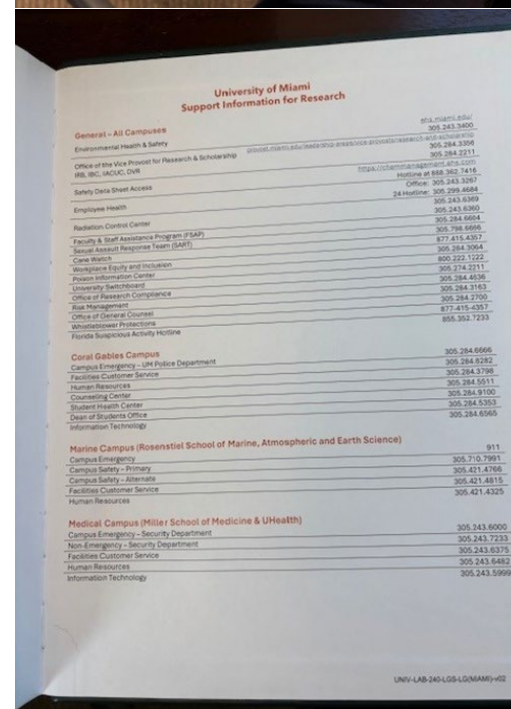
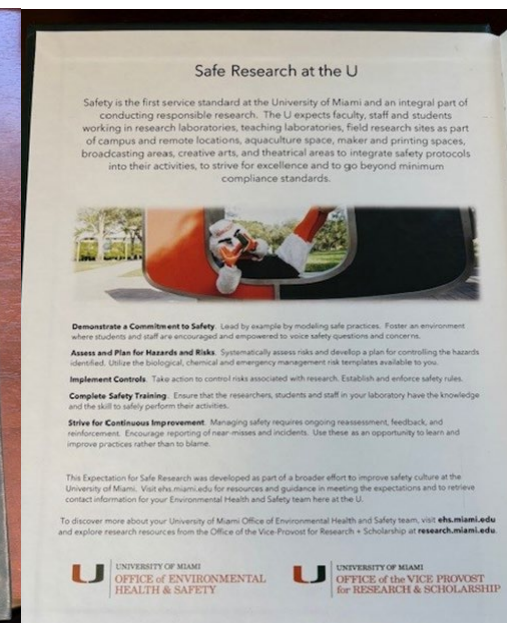
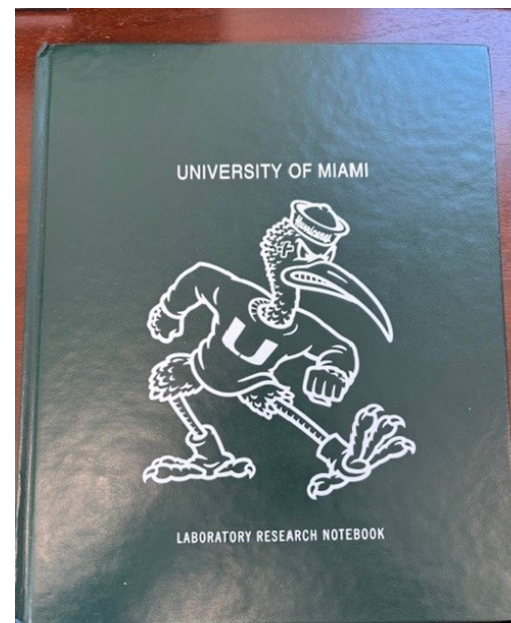
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GIVEAWAY!

February 13th, 2025

- Branded Laboratory Research Notebook
- Sebastian on front cover
- Hardcover
- 232 pages
- Brought to you by:
 - Office of Environmental Health & Safety
 - Office of the Vice Provost for Research & Scholarship

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INDOOR AIR QUALITY

Indoor Air Quality (IAQ)

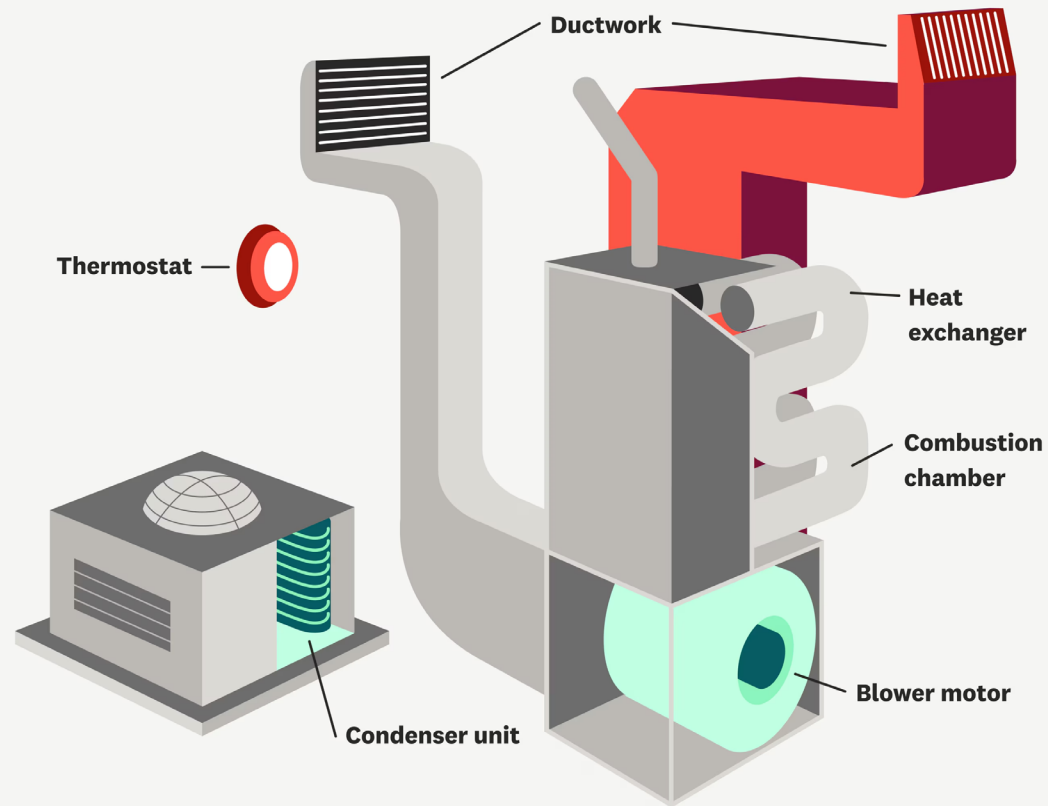
- refers to the air quality within and around buildings and structures, especially as it relates to the health and comfort of building occupants.

Outdoor Air Quality

- Air quality is a measure of how clean the air is, and how much it contains harmful pollutants. Poor air quality can have serious health consequences.

HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)

Parts of an HVAC system



Angi

*Stylized illustration; does not depict actual size ratio of items.

Outdoor air
quality

Indoor Air
Quality

AIR QUALITY INDEX (AQI) BASICS

Miami
77° | Sunny

10-DAY FORECAST

Sun		70°		80°
Mon		69°		79°
Tue		70°		79°
Wed		71°		81°
Thu		71°		83°
Fri		72°		80°
Sat		72°		79°

AIR QUALITY

40
Good

Air quality index is 40, which is similar to yesterday at about this time.

AirNow

AQI & Health

Fires

Maps & Data

Education

International

Resources

Español Beta

81° F

ZIP Code, City, or State

Miami, FL

Miami Reporting Area

Monitors Near Me

Recent Trends

Forecast AQI

Today: Good

Tomorrow: Not Available

More

EPA and PARTNERS

Data courtesy of Florida Dept. of Environmental Protection

Current Air Quality

Air Quality Index Scale	
0 - 50	Good
51 - 100	Moderate
101 - 150	Unhealthy for Sensitive Groups (USG)
151 - 200	Unhealthy
201 - 300	Very Unhealthy
301 +	Hazardous



Primary Pollutant
This pollutant currently has the highest AQI in the area.

▼	PM2.5	33	Good
Enjoy your outdoor activities.			
▶	OZONE	27	Good
▶	PM10	20	Good

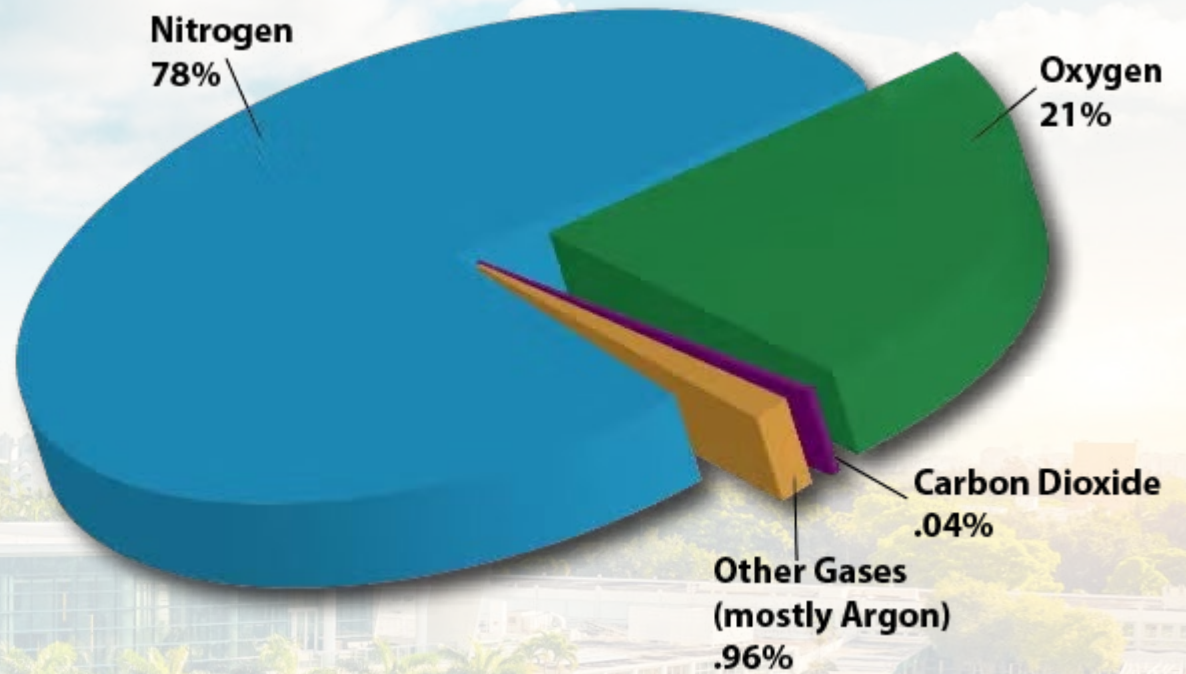
Air Quality Forecast

CLEAN AIR

The air we breathe

Molecules in the air include primarily nitrogen and oxygen as well as water, carbon dioxide, ozone, and many other compounds in trace amounts, some created naturally, others the result of human activity.

Since 1970, implementation of the Clean Air Act and technological advances from industries have dramatically improved air quality in the U.S. Cleaner air provides important public health benefits.



AIR POLLUTANT



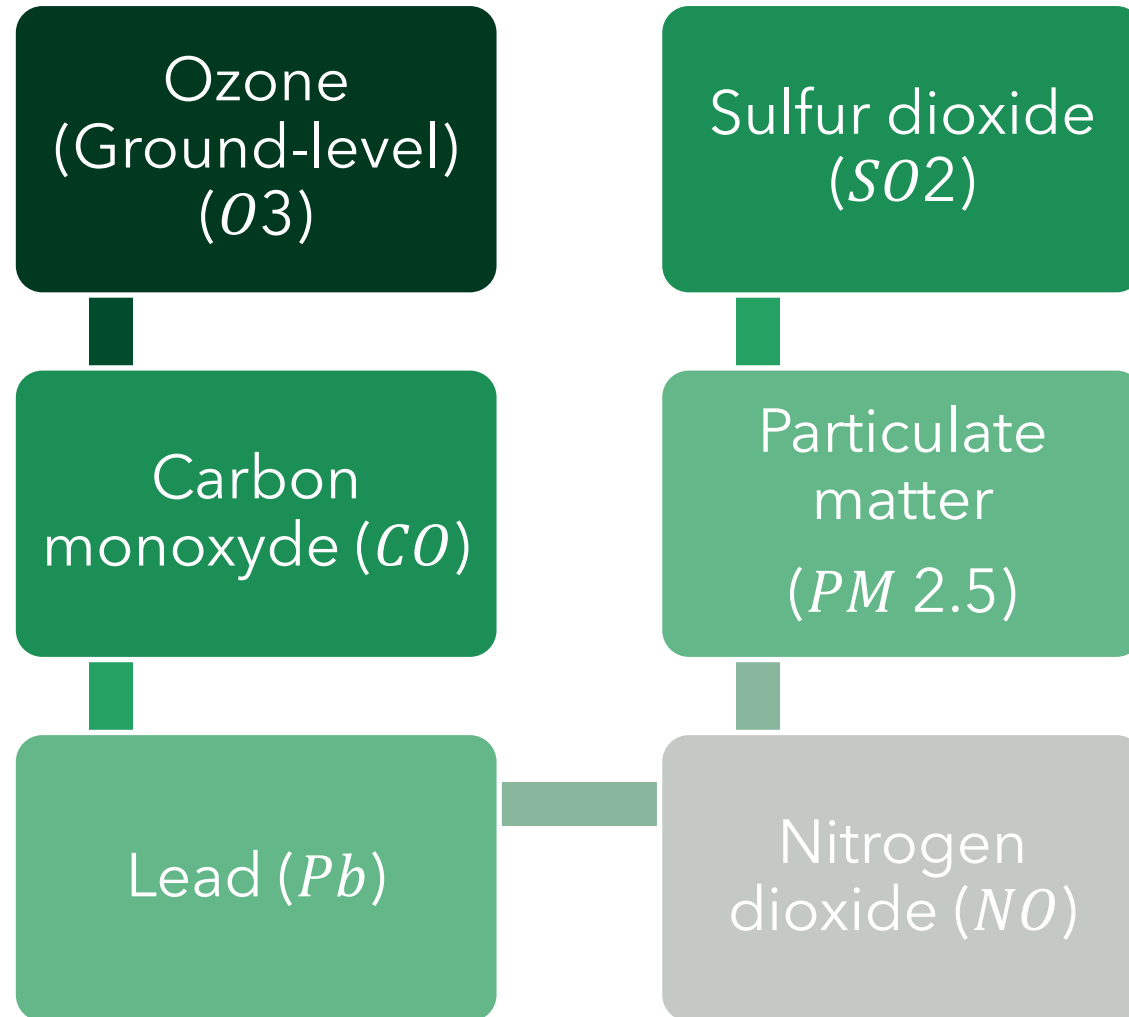
Air pollution is the presence of substances in the atmosphere that are harmful to humans and other living beings, or cause damage to the environment.

Air pollution can be chemical, physical or biological

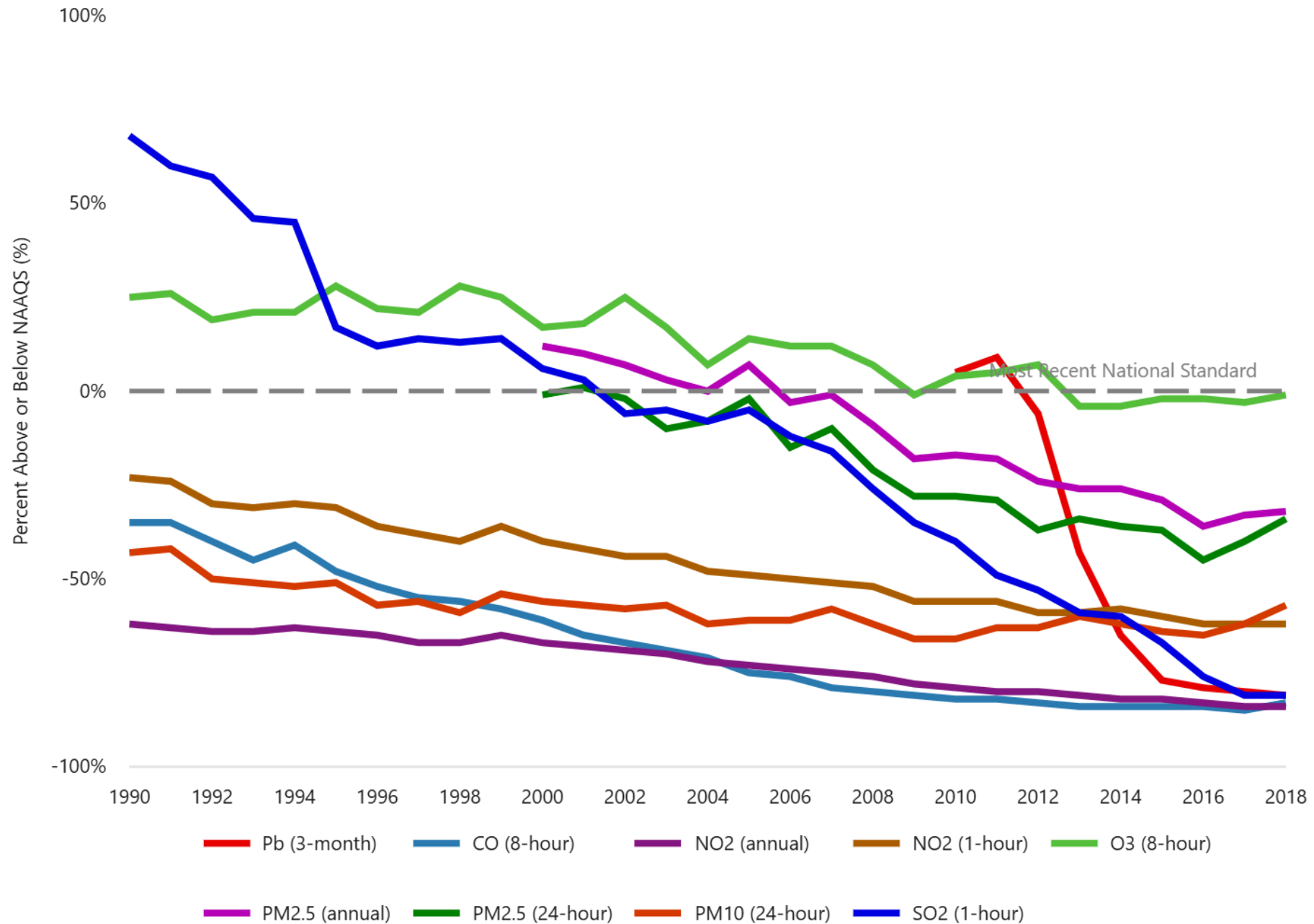
Some pollutants of indoor air include secondhand tobacco smoke, combustion products, radon, mold, legionella and other bacteria and allergens, volatile organic compounds, fibers (asbestos).

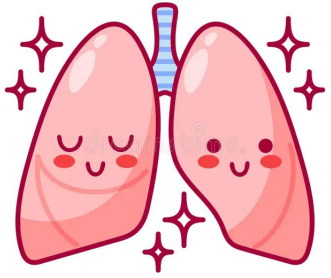
AIR POLLUTANT

The Environmental Protection Agency set National Ambient Air Quality Standards (NAAQS) for six commonly found air pollutants known as criteria air pollutants



Declining National Air Pollutant Concentration Averages





DAILY HUMAN CONSUMPTION NEEDS

12-20 b/min

6 lt/min

**8,640 lt/24
hrs**



HEALTH EFFECTS

Acute

irritation of the eyes, nose, and throat, headaches, dizziness, and fatigue

symptoms of some diseases such as asthma may show up, be aggravated or worsened.

Chronic

respiratory diseases, heart disease and cancer

Concentration, physical properties, type of pollutant

It is estimated that humans spend approximately 90% of their lifetime indoors and that indoor air pollution in some places can be much worse than that of the ambient air.

WHEN IT COMES TO DROPLETS, SIZE MATTERS

THE RELATIVE SIZE OF PARTICLES

From the COVID-19 pandemic to the U.S. West Coast wildfires, some of the biggest threats now are also the most microscopic.

A particle needs to be 10 microns (μm) or less before it can be inhaled into your respiratory tract. But just how small are these specks?

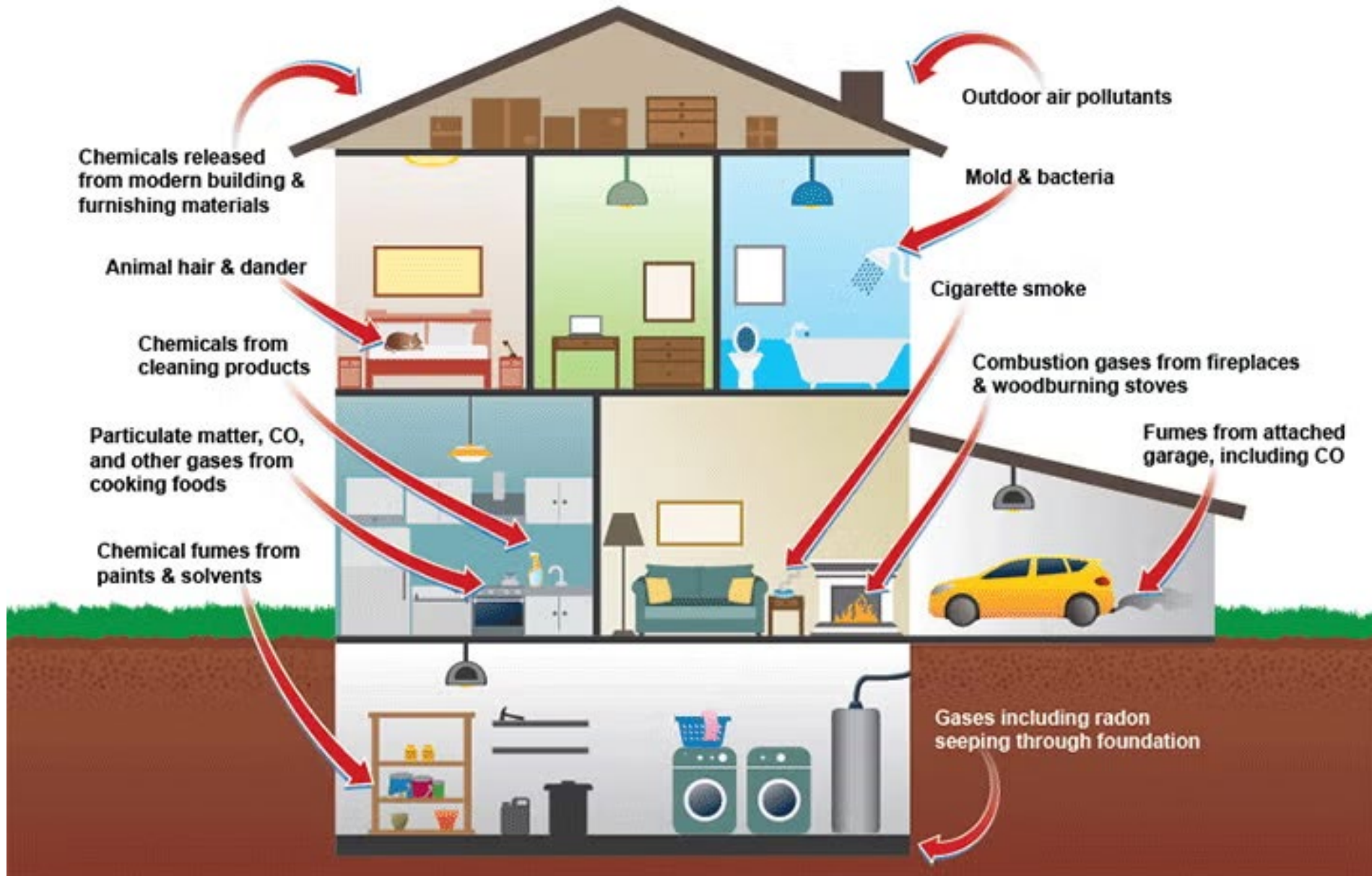
Here's a look at the relative sizes of some familiar particles >



SOURCES: Carotween, Daniel Lowrey, EPA, Financial Times, News Medical, Science Direct, SCMS, Susan Sokolowski, Patrocinio, U.S. Dept. of Energy
COLLABORATORS: RESEARCH + WRITING: Carotween, Sean Green | DESIGN + ART DIRECTION: Harrison Schell

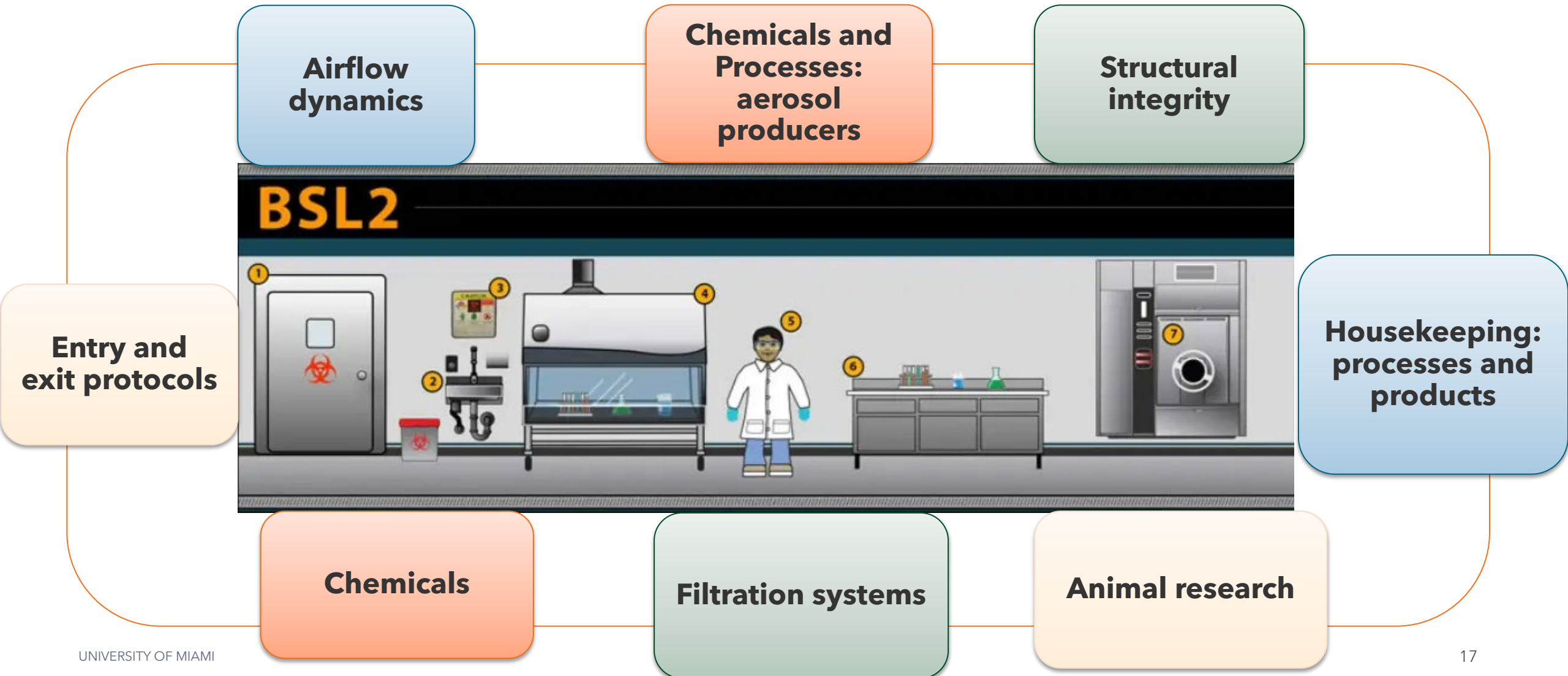


INDOOR AIR POLLUTANTS



AIR POLLUTION SOURCES IN A LAB

Internal factors



Particulate Matter:

Bunsen burners and powders used in experiments.

Trace Elements:

Metals and biologics can be released into the atmosphere from solid materials, powders and chemicals used during research. Inorganic gases such as sulfur dioxide (SO₂) and carbon dioxide (CO₂) can be produced by specific equipment and compounding processes.

VOCs:

solvents, cleaning agents and chemical agents. These can emit gases into the environment due to bottle leakage, spills, evaporation from open sources and mixing processes.

Water vapors

breathing, washing... increasing the humidity level within the space; this can lead to condensation on cool surfaces if the humidity becomes too high

Other Contaminants:

water and ultrasonic baths, organic wastes, deionized or ultrapure water systems, unsterilized equipment, sample oven drying, bioaerosols and germs from staff.



REGULATORY STANDARDS AND GUIDELINES

The **O**ccupational **S**afety and **H**ealth **A**ct of 1970 requires companies to provide a place of employment free from recognized hazards that can harm employees. It also lists regulated air contaminants.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers-**ASHRAE** Standard 62.1 is the recognized standard for Ventilation and Acceptable Indoor Air Quality for commercial and institutional buildings

ACGIH: American Conference of Governmental Industrial Hygienists. It's a scientific association that promotes workplace health and safety. Annual editions of the "Threshold Limit Values" TLVs and "BEIs" stands for "Biological Exposure Indices"

Environmental **P**rotection **A**gency: Clean Air Act, Asbestos Hazard Emergency Response Act-AHERA



OSHA THRESHOLD LIMIT VALUES (TLVS) FOR CHEMICAL SUBSTANCES

- **TLV-TWA (Time-Weighted Average):** The average exposure over an 8-hour workday.
- **TLV-STEL (Short-Term Exposure Limit):** A 15-minute exposure that should not be exceeded at any time during a workday.
- **TLV-C (Ceiling Limit):** The concentration that should not be exceeded during any part of the working exposure.

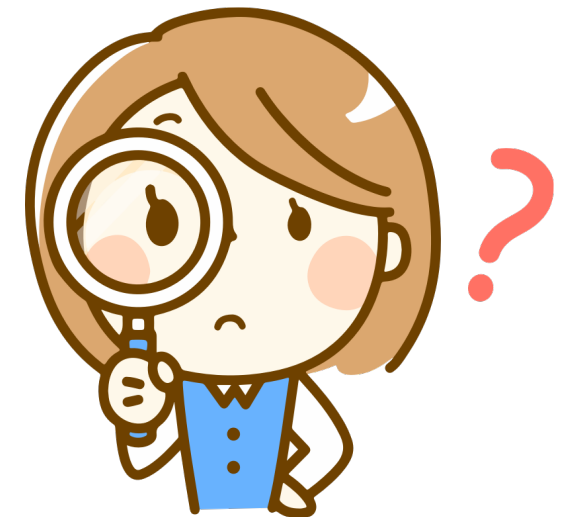


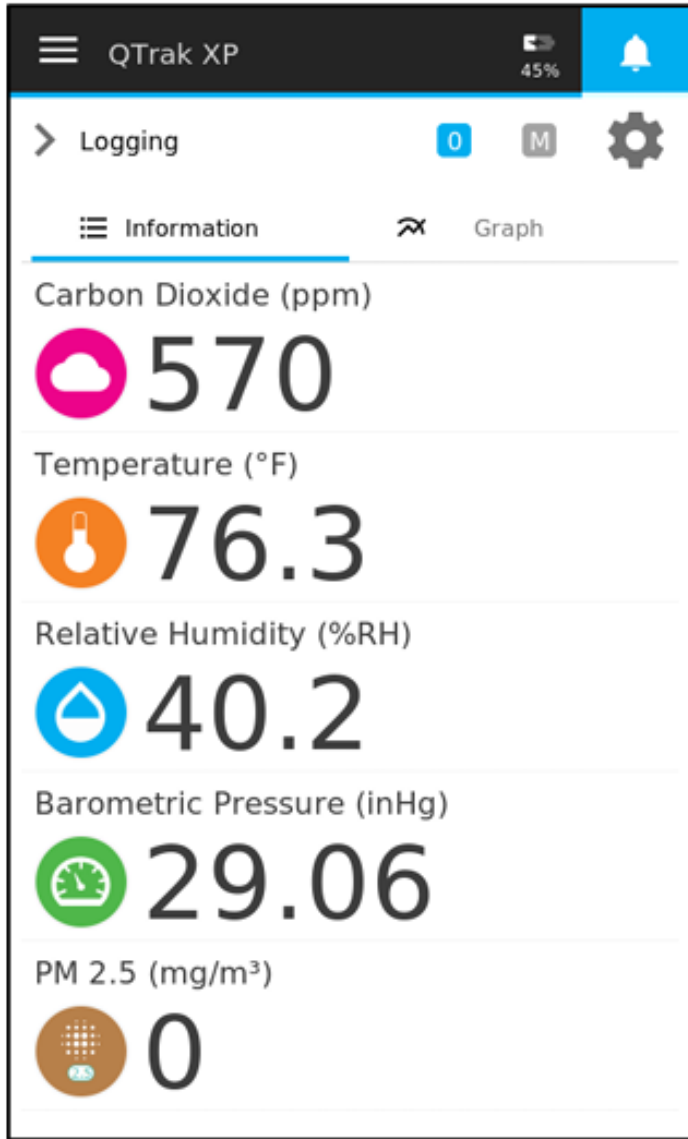
Permissible
Exposure
Limits

INDOOR AIR QUALITY ASSESSMENTS

There is no single test to find an IAQ problem

Monitoring air quality in a laboratory involves tracking several critical parameters to ensure a clean and controlled environment.

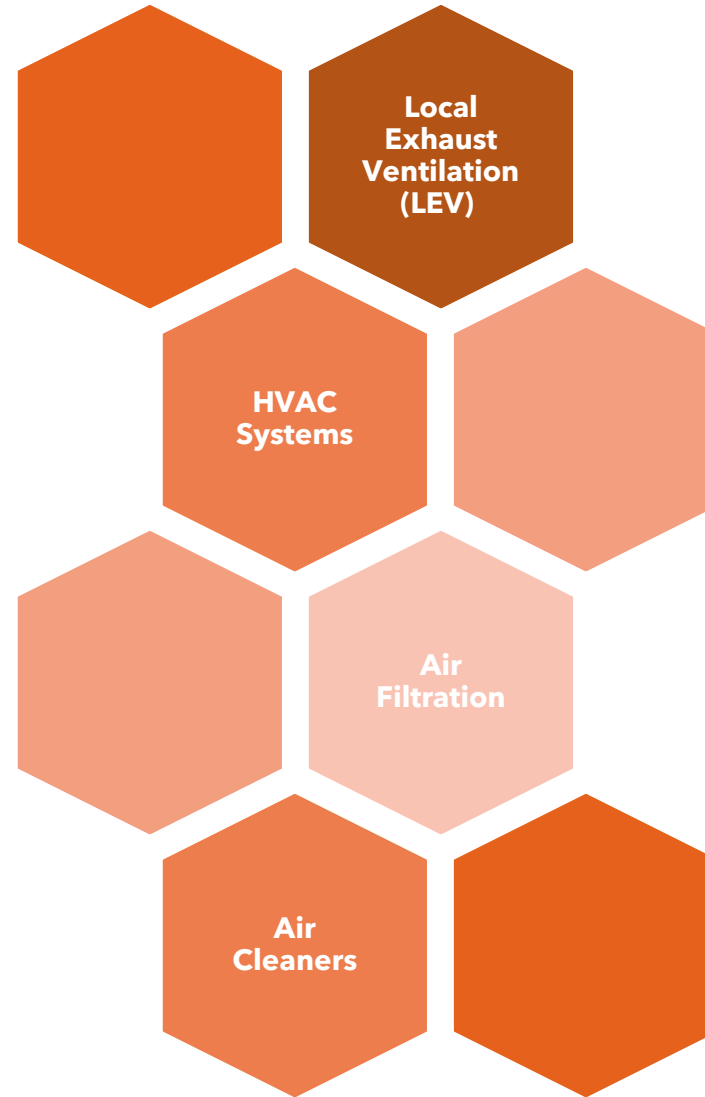




MOLD ASSESSMENTS



AIR QUALITY IMPROVEMENT



REPORT TO US

- Odors (chemical, gas...)
- Concerns with chemicals you're working with
- Do you have symptoms that just occur at work and go away when you get home? What are these symptoms?
- Are these symptoms related to a certain time of day, a certain season or certain location at work?
- Did the symptoms start when something new happened at work, such as renovation or construction projects?
- Are there other people at work with similar complaints?
- Did you already see a doctor for your symptoms, and if so, did the doctor diagnose an illness related to IAQ?
- Exacerbation of respiratory/allergic
- Mold concerns



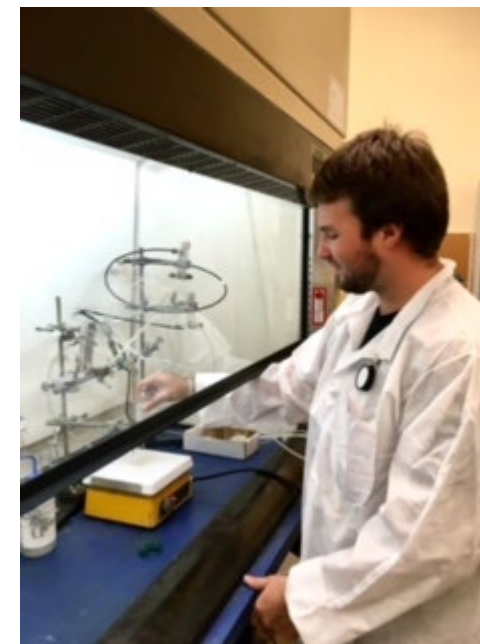
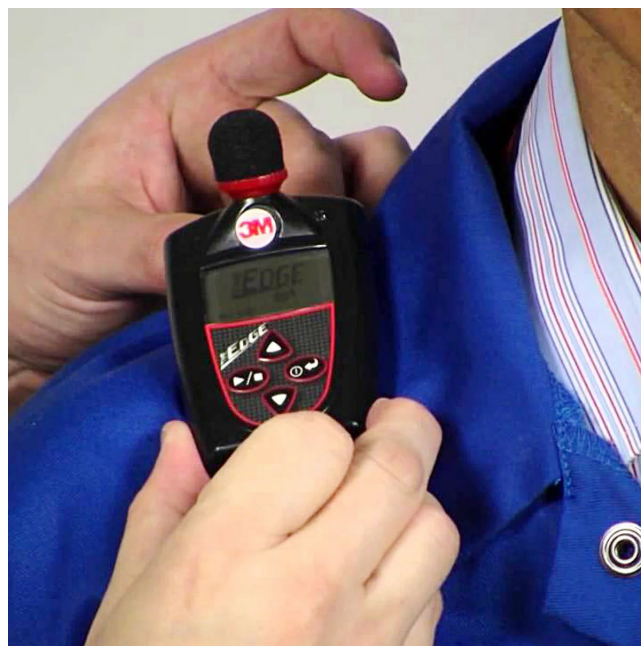


FACILITIES OPERATIONS & PLANNING

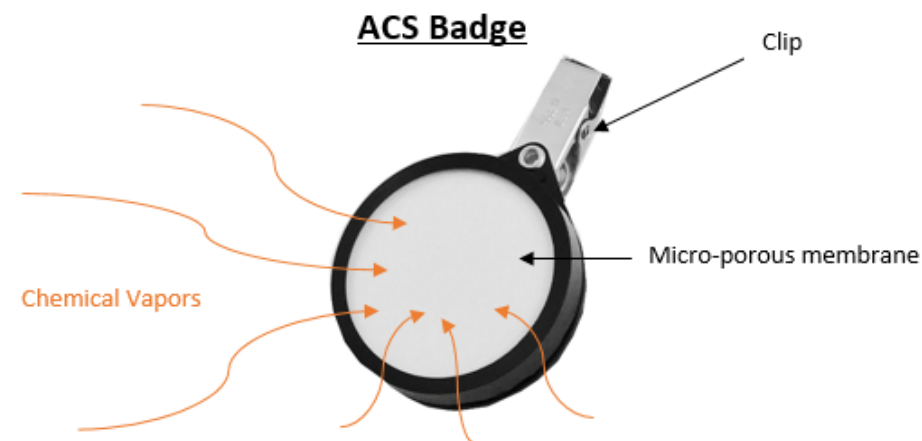
For requests related to room temperatures or water intrusion, please submit a service request to Facilities
<http://www.miami.edu/sro>



OCCUPATIONAL EXPOSURE ASSESSMENT



Common chemicals monitored:
Formaldehyde, Xylene Isoflurane,
Organic Vapors.



RESPIRATORY PROTECTION PROGRAM

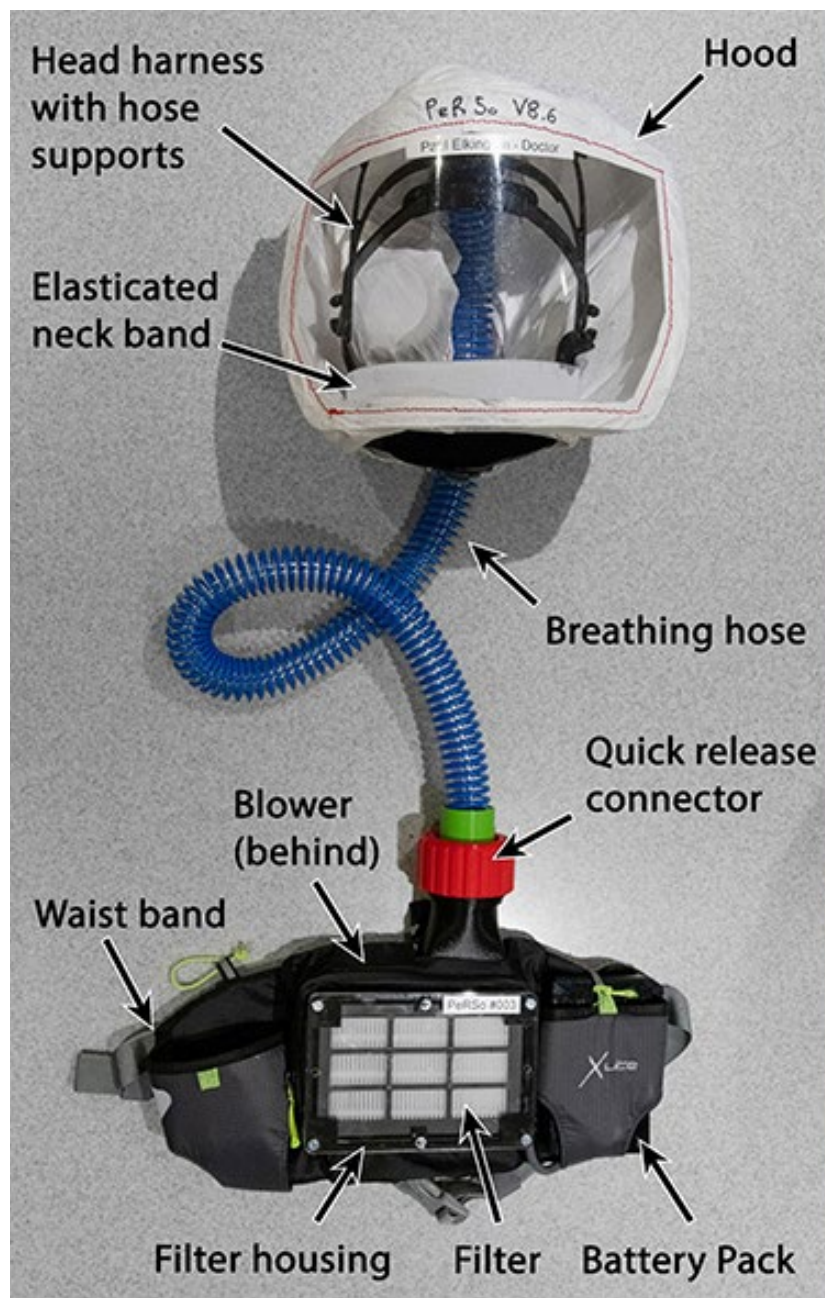


Users encountering respiratory hazards
(harmful dusts, fibers, biological hazards, fumes, mists, gases, smokes, sprays, or vapors)

FIT TESTING

- Designed to test the facepiece-to-face seal of the respirator.
- Your respirator must be fit tested before you use it in the workplace and must be retested at least annually to ensure a continued good fit.
- You also must be retested if you have significant weight change, dental work such as new dentures, significant facial surgery or facial scarring in the area of the seal. Also, if you find that your current respirator becomes uncomfortable.
- At the end of the test, you will know the specific make, model and size of your respirator.





Training

ERGONOMICS

Our services

- Our goal is to help reduce or minimize work-related musculoskeletal disorders and injuries by identifying and addressing ergonomic hazards.
- In Ergonomic hazard identification we look at existing conditions which can be corrected by environmental relationships, the exertions by workers and movement to determine potential hazards.
- Musculoskeletal risk factors include time, repetition, force, exertion, range of motion, awkward postures and body's condition.



SAFETY TRAININGS

- Heat stress
- Ladder safety
- Asbestos
- Mold awareness
- Arc Flash
- Confined spaces
- Scaffolding
- Fall prevention
- Ergonomics
- Respiratory Protection



FOR MORE INFORMATION CONTACT:

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- Noelia Estevez de Rosario, Safety Manager
- Patricia Bouza, EHS Specialist



Thank you