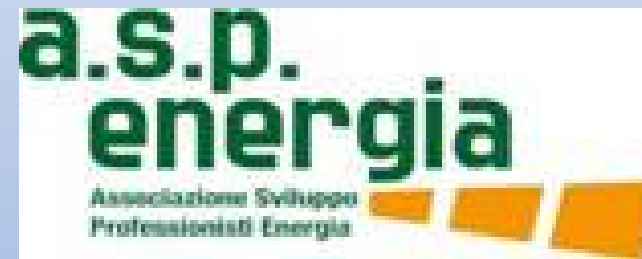




# L'aria che respiriamo... gli ambienti che viviamo, attuali normative ib




@ bativ@labservice.it

**Dott. Chim. Ivano Battaglia**



# Qualità dell'Aria

- PM 10
- PM 2.5
- VOC
- CO2
- HCHO
- ODORI
- ... 



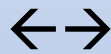
# Un Capello, la Sabbia e ... le microParticelle PM 10-2.5



Image courtesy of the U.S. EPA

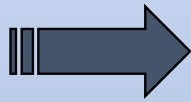


# Misurare...per MIGLIORARE

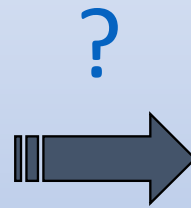


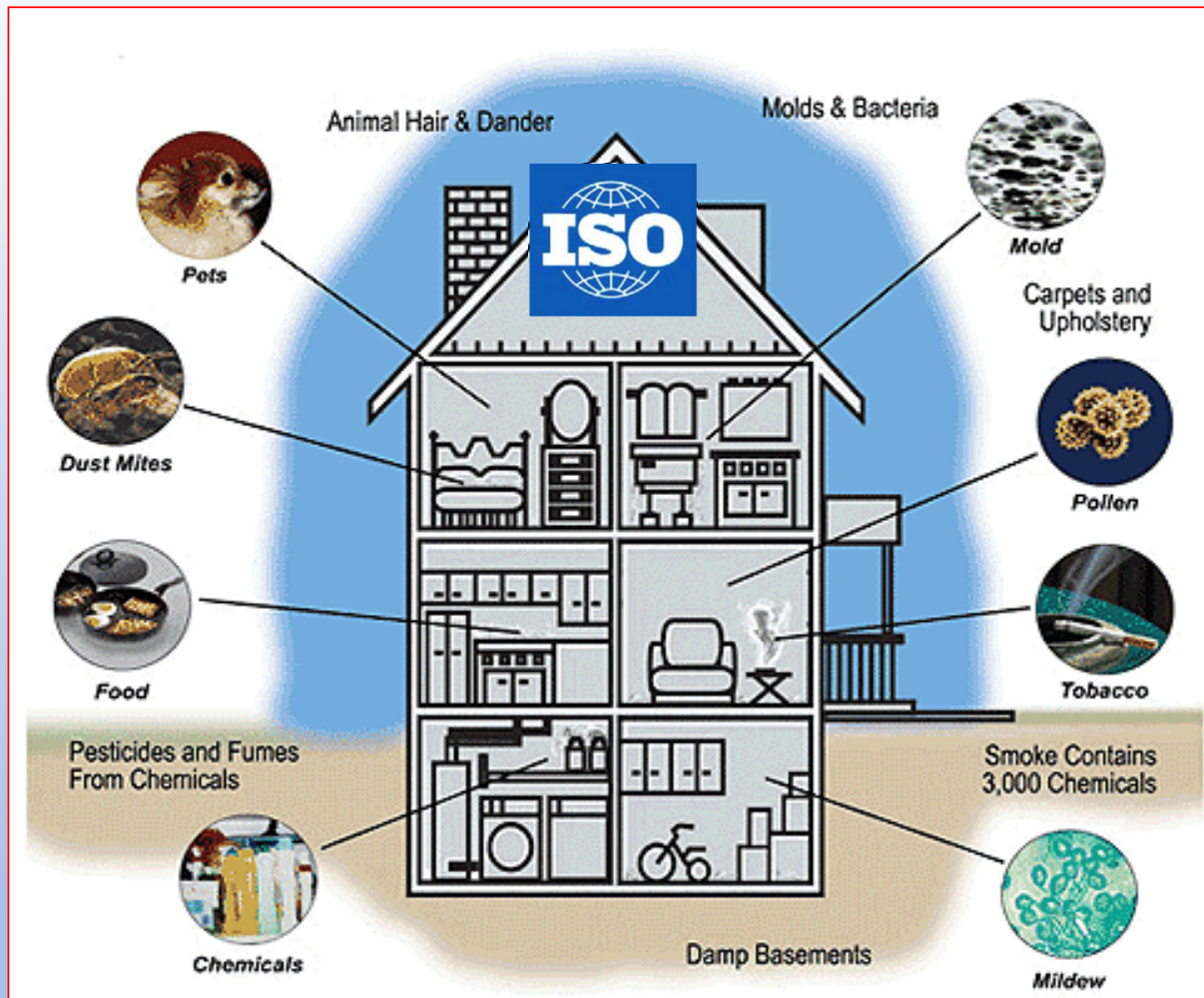
1 nanometro (10<sup>-9</sup> mt)

1 mt



Ivano Battaglia





# BUILDING <> CHEMICAL REACTOR

Ivano Battaglia

*' ..IT IS NOT A MATTER OF OVERREACTION  
IT IS ABOUT QUALITY OF LIFE'*



Ivano Battaglia





Qualità del dato



...

III° LIVELLO

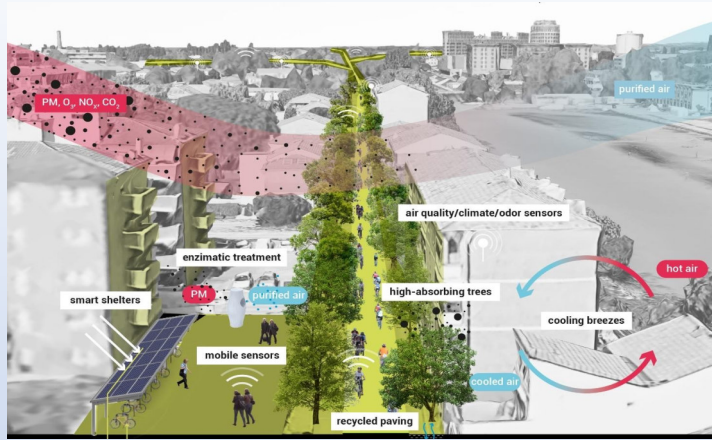
II° LIVELLO

I° LIVELLO

Misurazioni effettuate

Valore economico





7/2020

3 Yrs

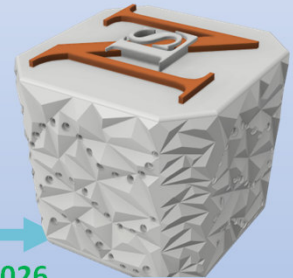
12/2023

EDIAQ | Evidence Driven Indoor Air Quality Improvement

12/2022

4 Yrs

12/2026



Outdoor and Indoor air quality monitoring network in Ferrara

Outdoor Air Quality

Indoor Air Quality



What's next?

## Ferrara Pilot – Main Target

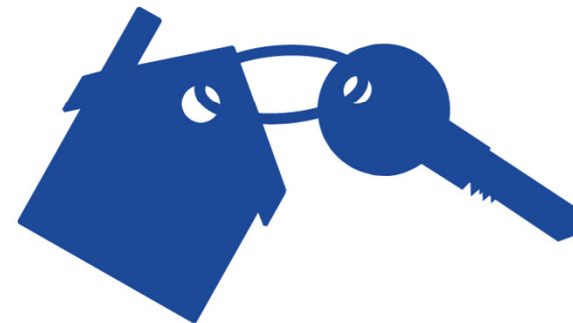
### Schools



### Offices



### Entertainment



### Living spaces



- **UNI** - Ente Nazionale Italiano di Unificazione –  
associazione privata senza scopo di lucro , riconosciuta dallo Stato e dall'Unione Europea. Elabora, approva e pubblica le **Norme Tecniche** volontarie – “**Norme UNI**” – per i settori industriali, commerciali e del terziario (tranne in quelli elettrico ed elettrotecnico).  
Le principali tipologie di soci UNI sono Imprese, Professionisti, Associazioni, Enti pubblici, Centri di ricerca e Istituti .
- **UNI** rappresenta l'Italia presso le **Organizzazioni di Normazione**
  - **CEN** (Comunità Europea ) e
  - **ISO** (Int.Stand.Organ.,Mondiale ).



ISO/FDIS 16000-41



# Indoor air —Part 41: Assessment and classification

*Air intérieur —Partie 41:  
Évaluation et classification*

**ISO/TC 146/SC 6  
Secretariat: DIN  
Voting terminates**

# Classification in quality classes

- [Table 1](#) provides an overview of the **quality classes** and describes the requirements on the room air quality on which these classes are based. The designations and descriptions of the requirements according to [Table 1](#) are only partly applicable for the parameter “Mould – microbial infestation”.

Quality class	Designation	Description
A	High room air quality	Room air with low substance concentrations
B	Medium room air quality	Room air with average substance concentrations
C	Low room air quality	Room air with above-average substance concentrations
Exceedance of quality classes		Substance concentrations above the class limits of quality class C

**Table 1 — Indoor air — Quality classes**

If any main criteria permanently exceed quality class C, the indoor air shall not be classified, but is considered to be “outside quality class”.

# Classification in quality classes

## 1. Classification in quality classes

### Example of quality classes for CO<sub>2</sub>



Quality class	Arithmetic mean for class limits for CO <sub>2</sub> ppm absolute	Description of the quality classes
A	≤1 000	Requirements for indoor rooms for the continuous stay of persons in which intellectual activities are carried out or which are used for regeneration
B	1 001 to 1 400	General requirements for indoor rooms for the continuous stay of persons
C	1 401 to 5 000	Requirements for indoor rooms with brief use by persons
Outside the quality classes Li <sub>c</sub>	>5 000	Not acceptable for use by persons

[Table A.2](#) shows an example of quality classes for the assessment value for the main parameter CO<sub>2</sub> during the assessment period.

# Main parameters

- Parameters most frequently giving rise for complaints due to the quality of indoor air are defined as **main parameters** in this document.
- In the framework of the overall assessment, the expert shall assess all these main parameters, however a measurement of every parameter is not always necessary

Table 2 — Main parameters

Parameter	Clause
Formaldehyde	<a href="#">A.2</a>
Volatile organic compounds (VOC)	<a href="#">A.3</a>
Radon	<a href="#">A.4</a>
Carbon dioxide	<a href="#">A.5</a>
Mould - microbial infestation	<a href="#">A.6</a>
Odour	<a href="#">A.7</a>
Fine dust (PM1, PM2.5, PM10), ultrafine particles (UFP)	—







# THE ISO APPROACH

INDOOR AIR QUALITY DIAGNOSTIC

INDOOR AIR QUALITY INSPECTIONS

OUTDOOR AIR QUALITY  
**ODA**

BUILDING STRUCTURE

BUILDING INSTALLATIONS

ACTIVITIES  
(INCLUDING MAINTENANCE AND MANAGEMENT)

INDOOR AIR QUALITY **IDA**

HYGIENE OF HVAC SYSTEMS

ISO MSS INDOOR AIR QUALITY MANAGEMENT SYSTEM

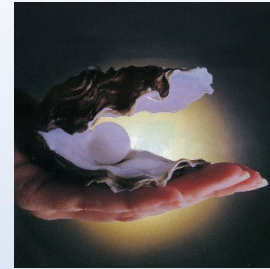
## ISTISAN GS → I 5 criteri che guidano gli ambienti *indoor*: sono priorità reali per la salute??

- Le basi di una sana alfabetizzazione edilizia-costruttiva.
- Efficienza energetica e qualità dell'aria *indoor* devono essere affrontate contemporaneamente e con la stessa priorità.



[www.iss.it/ambiente-e-salute](http://www.iss.it/ambiente-e-salute)

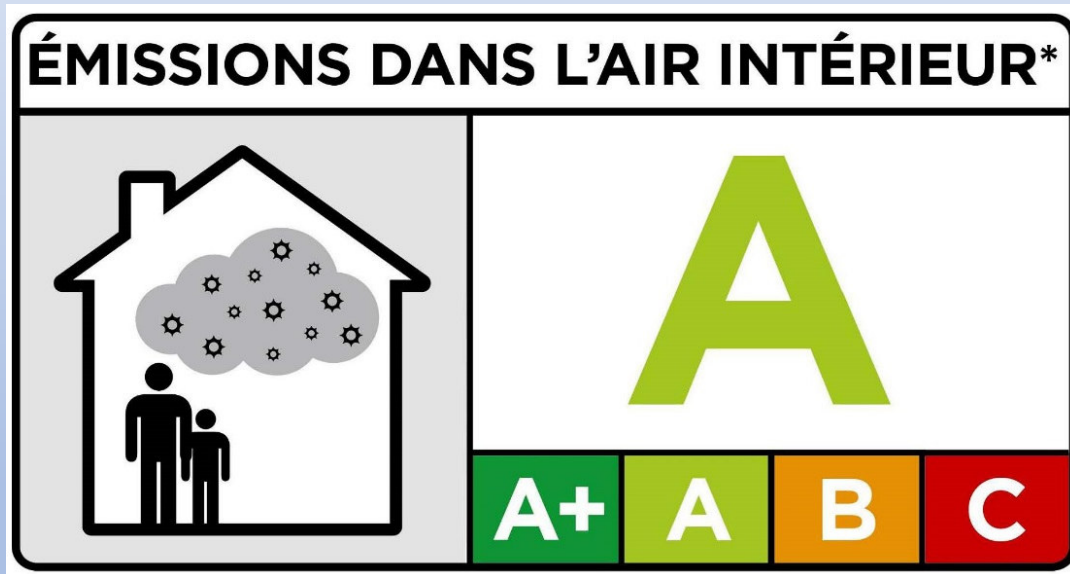
“ Indoor Air Quality ” ... →



- Migliorare le **condizioni abitative**,
  - Migliorare la **qualità della vita**
  - **Diminuire le patologie**
- e
- **PRODURRE SALUTE.**



# SCOPE → DIMINISH THE EMISIONS OF THE MATERIALS, INSTALLATIONS, ACTIVITIES, ...

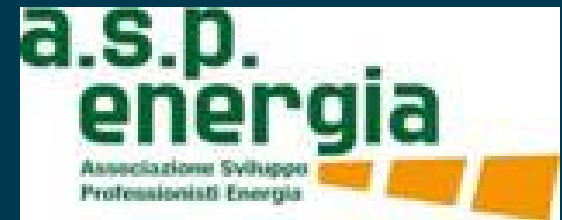


# EDIA Evidence Driven Indoor Air Quality Improvement

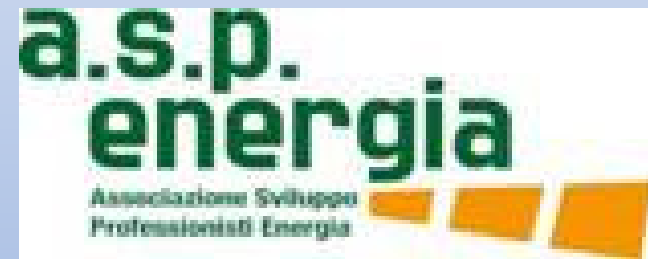




To be continued...



Dr. Alessandro Battaglia  
EDIAQI Project Manager  
Tel. +39 349 0732896  
[alessandro.battaglia@labservice.it](mailto:alessandro.battaglia@labservice.it)



@ [bativ@labservice.it](mailto:bativ@labservice.it)

Dott. Chim. Ivano Battaglia

