QUICK FACTS:

INDOOR AIR QUALITY

Why improving Indoor air quality is needed?

Background

- 80% of urban Europeans live in areas exceeding the current WHO guideline values for particle matters[1]
- 95% of the urban Europeans are exposed to excessive ozone levels, above the WHO guidelines values[1]
- We spend 90% of our time indoors[2]
- Indoor air can be 2 to 50 times more polluted than outdoor air[2]
- Every day, we eat 1kg of food, drink 2 liters of water and… breathe between 15 and 25 liters of air

What's in the air?

Outdoor air pollution infiltrates into buildings. Without appropriate ventilation, it accumulates and can even react with other indoor air pollutants.

Indoor air pollution is made of outdoor air pollutants, including heating and traffic particles and gases that infiltrate into our buildings as well as chemicals emissions from building materials, furniture, electronics and office appliances offgasing, cleaning products, air fresheners, combustion particles from heating, cooking and candles, pets allergens, …

Health impact of air pollution

Air pollution, both outdoors and Indoors, impact on health results from acute or chronicle exposure. It causes or aggravates eye, nose and throat irritation, headaches, respiratory diseases or asthma, impairs lung function and children lung development.

Recent research confirmed PM and O_3 can cause cardiovascular diseases. PM can cause lung cancer and impact endocrine system and brain function and development[1].

- Living near busy roads is responsible of 15 to 30% of all asthma and respiratory diseases[3]
- WHO confirmed in 2013 diesel engines exhausts cause cancer[4]
- 450 000 Europeans die prematurely from health impact of air pollution[6]
- European population loses close to 9 months life expectancy on average due to health impact of air pollution[6]

What is the cost of poor air quality?

- Every working European is on sick leave 0,5 days per year[5]
- Out of 239 million work force, it could represent between 7 to 14 billion € per year to European businesses[6]
- Poor IAQ causes 2 millions healthy years loss /year in Europe (Daly)[7].

REFERENCES:

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(3) APHEKOM Project http://www.aphekom.org

(4) WHO Press release n°213 12 June 2012

(5) European Union -CAFEProject data: download http://ec.europa.eu/environment/air/index_en.htm

(6) according to INSEE 2009 data

(7) European Union Envie Report: download http://www.envie-iaq.eu/

(8) Rehva guidebook n° 6 - Indoor Climate and productivity in offices

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(12) Shaughnessy, R.J., et al.,A preliminary study on the association between ventilation rates in classrooms and student performance. Indoor Air, 2006. 16(5): p. 465-468.

Improving IAQ protects health, enhances productivity and saves money !

In Office buildings, employees' salaries account for 84% of building operation costs[8]

Financial Benefits of improving IAQ in the workplace exceeds building utility and maintenance costs

- Better IAQ increases productivity in offices by 10% thanks to higher air supply rate and or appropriate filters' maintenance[9]
- Polaroid managed to reduce sick leave by 35% and save 400$ per employee by upgrading buildings HVAC Systems, equaling close to 1,5Million $ total savings per year[10].
- According to an Australian study, improving IAQ reduces sick leave rate by 39% and costs by 44%[11]
- Schoolchildren can benefit of Better IAQ and improve reading test results by 13%[12].
- Improving by 1% productivity with better ventilation system can save between **20 to 60€/m²**, with benefit to cost ratio of 9.4 (productivity/HVAC investment, Energy and maintenance cost). Payback time less than 2 years[8].

Want to know more about the air you breathe?
Perform a CityCheck

Office building with 4 000m² → Savings from 80k€ to 240k€ with 1% productivity improvement

How to improve IAQ ?

1. Indoor pollutants source emission control
2. Appropriate ventilation system design and improvement
3. Air filter selection at air inlets according to EN13779
4. Additional molecular filtration or air cleaning for specific locations and pollutions

EN 13779 recommendations

Outdoor Air Quality	Indoor Air Quality			
	IDA 1 (High)	**IDA 2** (Medium)	**IDA 3** (Moderate)	**IDA 4** (Low)
ODA 1 (pure air)	F9	F8	F7	M5
ODA 2 (dust)	F7+F9	M6+F8	M5+F7	M5+M6
ODA 3 (Very high conc. of dust/gases)	F7+FG+F9[(a)]	F7+FG+F9[(a)]	M5+F7	M5+M6

[(a)] GF = Gas filter (carbon filter) and/or chemical filter
Recommended minimum filter classes per filter section (definitinon of filter classes according to EN 779)

Product range for a better IAQ

Hi-Flo XLT7 A50+
Protection on particules 50+
Eurovent energy rating A

Opakfil Energy F7 A50+
Protection on particules 50+
Eurovent energy rating A

City-Flo XLT7 A50+
Protection on particules 50+
Eurovent energy rating A
Protection on gas : Oz3

CityCarb
Protection on particules 40+
Eurovent energy rating A
Protection on gas : Oz9

No mechanical ventilation or specific indoor air pollutant ?
Go for air cleaning with Cam-Cleaner City!