



INDOOR ENVIRONMENTAL QUALITY IS A STRATEGIC ASSET



INDOOR POLLUTION

The World Health Organization has issued guidelines about indoor air quality, specifying that clean air is an essential requirement of human health.

The hazardous substances emitted by buildings, building materials and internal equipment, or produced by human activities, are the cause of a wide range of disorders, which compromise health, well-being and productivity.

The entire population is subject to these risks, but some groups of individuals are particularly sensitive (children, patients, the elderly, pregnant women).

A greater awareness of indoor environmental quality enables the promotion of a substantial health culture.

Since it is not possible to manage what cannot be measured, Nuvap has developed a platform for monitoring indoor environmental quality, which enables a dynamic and continuous assessment of the internal environmental healthiness, going beyond the simple air quality and including several important pollutants such as radon gas, electromagnetic emissions and formaldehyde, among the monitored parameters.

Furthermore, Nuvap has developed the Nuvap Index (indoor environmental quality index), which has a value between 1 and 10 and takes into account all the monitored parameters and various aspects related to each pollutant.



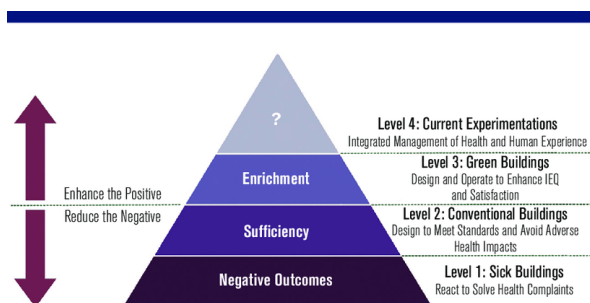
HEALTHY BUILDINGS

The issue of environmental healthiness can be faced by two main perspectives: the quality of buildings and people's health.

Discussing about the built environment, the market looks for buildings that have superior performances and occupant's well-being is emerging among all the metrics (healthiness, comfort, user experience).

Benchmarking agencies already considers this metric. An example is the "Health & Well-being" module of the Dutch agency GRESB, recently integrated into the GRESB Real Estate Assessment 2019.

Environmental well-being is therefore an increasingly important requirement, which goes beyond mere adherence to environmental hygiene standards.



The "health performance pyramid" from "Occupant Health & Well-Being in Green Buildings" |by Dusan Licina, Ashrae Journal, April 2019

The 'health performance pyramid' summarises the different approaches to environmental health. Conventional buildings, which also adhere to the standards in force, are a starting point and not a point of arrival.

The experience of the occupants and the performance of the buildings can be greatly improved with proactive and

integrative interventions, which are becoming best practices in the transformation of indoor spaces. According to the cited publication, moreover, today there is still a much higher emphasis on energy consumption, rather than on the indoor environmental quality: analysing 100 Green Buildings, 80% of them have achieved energy saving goals, but only 30 % reports high levels of indoor air quality.

WELL CERTIFICATION

WELL certification is the reference standard for buildings, interior spaces and communities that promote human health and well-being.

The certification process covers ten concepts: Air, Water, Food, Light, Movement, Thermal Comfort, Sound, Materials, Mental Wellbeing and Community. The WELL Aria concept guarantees high levels of indoor air quality throughout the life of a building.

The Nuvap ProSystem technology fully complies with the requirements of the WELL certification, allowing continuous monitoring of the parameters required by the certification during the life of the building.

Information about pollutants are updated regularly and presented in a simple and complete manner. To further customise the experience of the occupants, it is possible to integrate the information produced by Nuvap systems into third parties' portals, applications or dashboards, thanks to the complete set of available APIs.

Pollutants can be grouped into chemical, physical and biological pollutants.

Nuvap offers an effective solution for the continuous monitoring of chemical and physical pollutants. The most important are electromagnetic fields, radioactivity and radon gas emissions, formaldehyde, powders, carbon monoxide, methane and Volatile Organic Compounds (VOC).



INDOOR ENVIRONMENTAL QUALITY IN 100 OFFICES

Nuvap conducted a comparative IEQ analysis in 100 Italian offices belonging to 11 different vertical markets in the tertiary sector. The analysis considered 20 environmental quality parameters.

20% of the offices presented an insufficient Nuvap IEQ Index (in 5 cases it was lower than 4); only 19 companies reported an Index greater than 8 and the highest recorded value was 9.17.

A high variability of each parameter has been observed. The differences between periods of occupancy and periods of closure of offices (day / night and weekdays / weekends) were up to 80%.

Some pollutants have had a greater impact in compromising the value of the Nuvap Index: Gas Radon (26 offices), VOC (33 offices) and Formaldehyde are the parameters that have exceeded the alert values for more than 25% of the days of monitoring. Even the noise was too high in 11 offices.

It is not possible to define a pollution profile typical of a type of office, or a sector or a geographical area

It is clear that indoor pollution is influenced by a mix of conditions that change on a case by case basis, mainly related to the human activities and the operations of the building systems.

Continuous monitoring enables improvement programs and innovation initiatives, offering:

- ▶ greater awareness about the highlighted problems;
- ▶ support for the implementation of best practices and behavioural solutions at zero cost;
- ▶ support for the communication of high indoor environmental quality conditions.

The project won the first prize of the "eHealth4ALL - Technologies for health and wellness" Award (edition 2017-19).

The Company

Nuvap's aim is to redefine the standards of quality of life and safety for all its customers, through an innovative platform for monitoring indoor pollutants. .

Thanks to Nuvap's solutions, it is possible to detect and monitor, in a simple and comprehensive manner, the presence of both chemical and physical pollutants in workplaces, schools, health care facilities or other private and public buildings where people spend regularly several hours per day.

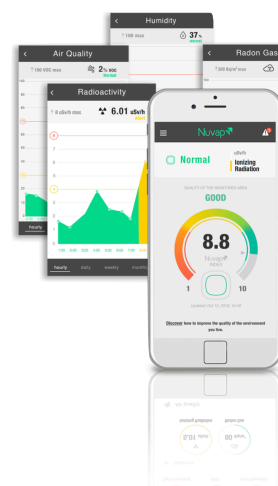
The Nuvap ProSystem solution consists of the My.Nuvap multi-tenant platform and a range of extremely compact, multi-sensor devices with a simple design and uncomplicated activation and management.

The devices are connected to the company WiFi and require a simple discovery and registration procedure on My.Nuvap cloud platform. Once the connection is made, no further configuration is required.

All the environmental parameters are accessible in real time, via web and app. API is available to integrate Nuvap's data into third party platforms.

Nuvap's technology is protected by international patents, relating to the exclusive combined and constant monitoring system for polluting agents, which may be present in the environments in which we live. Nuvap Engineering Labs are in Pisa and the sales offices are in Milan.

Nuvap won Pulse 2017 Award, as Best Smart Home Technology. Moreover, the company won 2 open innovation projects with Generali Insurance and the International Oil company ENI. In the biennium 2018-2019, Nuvap is partner of the European Campaign Healthy Workplaces - Manage Dangerous Substances by EU-OSHA.



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