

Modern History of Indoor Air Quality (1973-Present)

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SUMMARY

This presentation will summarize the last forty-five years of indoor air quality (IAQ) studies, investigations and research from the first energy crisis in the USA in the 1970's to the latest issues with regards to climate change and its effect on IAQ. The initial occupant complaints about the quality of the air in buildings coincided with changes in infiltration and ventilation in buildings. In particular, the first ASHRAE 62 Standard was issued in 1973, and then substantially changed in the 1981 version. Subsequent versions of the ASHRAE 62 Standard have varied the ventilation flow rate that is acceptable for acceptable indoor air quality. The latest version (62.1-2016) will also be discussed in detail.

Many of the initial building-related illnesses such as Legionella, lung cancer from asbestos and lead poisoning were highlighted by industrial hygienists and health care professionals in the 1970's and earlier. Changes in governmental regulations sought to reduce the potential for exposure to these building contaminants. In some cases, outright bans of asbestos and lead paint were implemented to reduce possible exposures to these materials. Also, the initial conferences on indoor air quality in the late 1970's (Indoor Climate - Copenhagen in 1978; AIVC in 1979) led to an increase in IAQ research, particularly focussed on office buildings.

In the 1980's due to increased tightness of building envelopes and lower ventilation flow rates, there was the beginner of the indoor air quality inspection and investigation field. In 1983, the American Industrial Hygiene Association (AIHA) formed the Indoor Environmental Quality (IEQ) Committee. This Committee in turn began a series of International Symposia on Indoor Air Quality in 1987. Also, the first Healthy Buildings Conference was held in 1988 in Stockholm.

In the 1990's, ISIAQ was founded in 1992 following the 1990 Indoor Air conference in Toronto, Canada. 109 international scientists, researchers and practitioners were the initial members of ISIAQ. The Indoor Air Journal, a publication of ISIAQ, was started to publish research papers from the leading scientists in the IAQ field. Microbial contamination in buildings, particularly residential, was becoming an issue of major concern. Governmental health agencies also began to regulate the use of tobacco-based products in public areas, such as restaurants, concert halls and schools. In 1993, the United States Green Building Council (USGBC) was created, and the development of the LEED certification began. The emphasis in LEED on energy savings and indoor air quality in the LEED documents was a new phenomenon, and it resulted in the development of companies that specialized in the construction of green buildings. In 1995, the Indoor Air Quality Association (IAQA) was begun in the US for IAQ practitioners, remediation companies and building owners.

In the 2000's in the US, intense public interest in microbial contamination, particularly in schools and private homes, led to the growth of the IAQ field, specifically for mould remediators and mould inspectors. This development tended to overshadow the other IAQ issues that were present in buildings, such as an increase in Legionella, and continued use of asbestos and lead paint in dwellings throughout the world. The Green Building movement became mainstream with newer versions of LEED and other building evaluation methods such as WELL, ASHRAE BEQ, BOMA BEST and the Living Building Challenge as alternatives. Many of these evaluation methods were focussed on energy efficiency and not indoor air quality. This emphasis resulted in buildings with ineffective and insufficient ventilation, and an increase in IAQ complaints from occupants.

In the 2010's, high performance buildings, air tightness of buildings, net zero and low energy buildings, building sustainability, the relationship between IAQ and productivity, and effective ventilation have been a focus of IAQ research papers. There was also increased interest in indoor environmental quality, including unwanted and excessive noise, radiant heating near windows in buildings and inadequate lighting in office building.

The presentation will wrap up with a peak at the future of IAQ in the 2020's.

KEYWORDS

Indoor air quality; history; ventilation standards

1 ACKNOWLEDGEMENTS

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2 REFERENCES

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