



Human IC Workshop - Industrial Comments

**Healthcare specific standards and guidelines, Multidisciplinary nature
of Healthcare, Sustainability Burden – Need for User understanding
and Target-specific ventilation**

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Healthcare specific standards and guidelines

- There are multiple national and regional standards and guidelines giving guidance for hospital ventilation
 - E.g. HTM, DIN, NF, ASHRAE, GB, SIS, R3 Nordic etc.
- Some of the guidance focus on specific environments, while some have broader focus
- The given recommendations differ from generic standards due to
 - They include healthcare specific insights and learnings
 - Alternatively, they document current practise



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Example; Patient Rooms

- Suggested airflow rates in different guidances vary from 25-100 dm³/s, person (Compare to EN 16798-1 ~15 dm³/s, person)
 - WHY – Justification?
 - There are both patient and treatment specific emissions (VOC's)
 - Patients are given treatments within patient rooms, too
 - There is increased infection risk in patient rooms, also patients are more vulnerable
 - Varying occupancy (Visitors, HCW)
- Temperature levels - EN 16798-1 currently give different temperature suggestions for Summer/Winter
 - However, in practise the thermal conditions and boundary conditions are quite constant throughout the year
 - E.g. sedentary patient comfort temperature is relatively constant (23°C-24°C)

Standards and guidelines – The Challenge

- Healthcare specific standards/guidance are necessary to capture specific needs
- Most of the national and regional standards and guidelines are overly focused on individual product performance
 - This makes it almost impossible to align requirements within the EU marketplace
 - Consequently, introduction of new - even verified - innovations is very difficult
- The way forward is to focus on performance-based requirements
 - Performance **in-operation** - taking into account user processes
 - Also product/system verification principles are needed for commissioning, but they are secondary

Multidisciplinary nature of Healthcare – How to get new ideas to market ?

- It is imperative Primarily to Fit your solution to User's processes - not to require users to adjust on your solution boundaries
- Various disciplines need to be accounted for in one's promotion
- Discrepancy between Engineers & Medical professionals' logic; Scientifically Proven vs Evidence Based - may delay adoption easily 10 years
 - A Smooth track from “Scientifically proven” to “Field demonstrations and use” needs to be developed prior to the creation of “Evidence Based”
 - Allow risk-taking, promote Public Sector Innovation Purchasing programs

Healthcare Sustainability Burden – Target-specific Ventilation an opportunity?

- General room ventilation aims to provide uniform airflow pattern/ conditions within the whole room space
 - No or little consideration of the effect of room loads to air movement
 - There is expected variation/efficiency deficit in general room ventilation, typically considered 25-30%
 - Target-specific ventilation
 - The target is to optimize conditions in specific zone/sub-space within the ventilated room (Contaminant -, Thermal -, IAQ conditions) - locally and timely
- Target-specific Ventilation has potential for enhanced safety and sustainability performance

Target-Specific ventilation

- When to use Target-specific ventilation ?
 - A specific sub-zone which need to be focused is identified, for example:
 - Zone of principal emissions
 - Zone of principal occupancy (Location, time)
 - Zone of especial concern – personal exposure
- When to consider Time-specific ventilation modes?
 - Whole room use case - Use of the room is intermittent
 - High impact/ energy is used only upon specific time intervals of high activity
 - Operational mode variation
 - When different operational modes have variable user requirements
 - When different operational modes have different usage conditions

Knowledge needed to develop Target-specific ventilation

- Understanding user processes
 - Location and movement of occupants and their interactions
- Identifying special challenges and zones, where value may be added
- Understanding characteristics and factors of the emissions
 - Source strength, dispersion characteristics; initial speed and direction, physical form (gaseous, Particulate/-size, etc.)
- There are no short-cuts – we need to learn basics 1st

Summary

- Performance-based standards are necessary
- Time from research to end-use must be shortened
- Sustainability burden of Healthcare is huge
 - New thinking is needed to find ways to dramatically reduce consumption while simultaneously improving safety and comfort of healthcare workers and patients.
 - Target-specific and time-specific ventilation are promising paths to look at



THANK YOU!

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