

Introduction to IEA EBC Annex 78

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SUMMARY

International Energy Agency (IEA) Annex 78 was launched in 2018. The title of the Annex is “Supplementing Ventilation with Gas-phase Air Cleaning, Implementation, and Energy Implications.” The objective of the Annex is to bring researchers and industry together to investigate the possible energy benefits of using gas-phase air cleaners (partial substitute for ventilation) and establish procedures for improving indoor air quality or reducing the prescribed ventilation rates by gas-phase air cleaning; a test method for air cleaners that considers perceived air quality ratings is also included in the activities with the potential of developing a new standard.

KEYWORDS

Air Cleaning; Gas-phase; Energy; Standard; Clean air delivery rate

1 INTRODUCTION

Ventilation accounts for approximately 20% of the global energy use for providing an acceptable indoor environment. The requirements for ventilation in most standards and guidelines assume acceptable quality of (clean) outdoor air. Worldwide, there is an increasing number of publications related to air cleaning and there is also an increasing sale of gas phase air cleaning products. This puts a demand for verifying the influence of using air cleaning on indoor air quality, comfort, well-being, and health. It is thus important to learn whether air cleaning can supplement ventilation with respect to improving air quality i.e., whether it can partly substitute the ventilation rates required by standards. Finally, the energy impact of using air cleaning as supplement of ventilation needs to be estimated. This topical session will provide an introduction to the objective/scope, activities, and intended outputs of the annex.

2 MAIN ACTIVITIES

The annex comprises five subtasks, and their activities are described in the following sections.

2.1 Subtask A: Energy benefits using gas phase air cleaning

The subtask aims at quantifying the energy performance of using air cleaning as part of the ventilation requirements. The baseline for calculating the energy benefits is the energy used to heat/cool the required ventilation air and the electrical energy to drive the fans. Possible energy reduction by decreasing the amount of outside air by use of air cleaning will be studied. The subtask will also establish a metric of assessing air cleaner efficiency in relation to energy: CADR/kWh where CADR is the clean air delivery rate

2.2 Subtask B: How to partly substitute ventilation by air cleaning.

This subtask will analyse how air cleaning can partly substitute for ventilation. Existing standards for IAQ-Ventilation and for testing air cleaners will be investigated. Measurement of perceived air quality and chemicals will be studied.

2.3 Subtask C: Selection and testing standards for air cleaners.

The main criteria for establishing required ventilation rates are based on perceived air quality. This subtask focuses on the need for standard testing procedures for air cleaners.

2.4 Subtask D: Performance modelling and long-term field validation of gas phase air cleaning technologies

The subtask will include activities like review of available models for predicting the performance of gas phase air cleaning technologies and perform long term field experiments to validate the selected gas phase air cleaning technologies.

2.5 Subtask E: Gas Phase Air cleaning Technologies

3 INTENDED OUTPUTS AND TARGET AUDIENCE

All subtasks will provide input to the final deliverables A-E

A: Energy benefits using gas phase air cleaning: A method for predicting the energy performance of gas phase air cleaning technologies and the possible reduction of energy use for ventilation. This will be of interest for consultants, manufacturers, government building codes in the goal to design and operate near zero energy buildings

B: How to partly substitute ventilation by air cleaning: A validated procedure for supplementing (partly substituting) required ventilation rates with gas phase air cleaning. This will be of interest for standards and guidelines setting requirements for indoor air quality and ventilation. This will also be of significant interest for manufacturers of air cleaning technologies

C: Selection and testing standards for air cleaners: A test method for air cleaning technologies that besides chemical measurements include perceived air quality as a measure of performance. This will be of interest for standard bodies writing test standards (ISO TC142/ CEN TC 195 and ISO TC 146) and related certification bodies. This will also be of significant interest for manufacturers of air cleaning technologies.

D: Performance modelling and long-term field validation of gas phase air cleaning technologies: A report on the long-term performance of air cleaning and model for the performance of gas phase air cleaning technologies. This will also be of significant interest for manufacturers, consultants, standard writing experts.

4 REFERENCES

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