# Introduction to IEA EBC Annex 87

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**SUMMARY**

Personalized Environmental Control Systems (PECS) have advantages of controlling the localized environment at occupants' workstation by their preference instead of conditioning an entire room. A new IEA EBC Annex (Annex 87 - Energy and Indoor Environmental Quality Performance of Personalised Environmental Control Systems) has recently started to establish design criteria and operation guidelines for PECS and to quantify their benefits. This topical session will provide an introduction to the objective/scope, activities, and intended outputs of the annex.

**KEYWORDS**

Personalized Environmental Control System, Indoor environmental quality, Thermal Comfort, Indoor Air Quality

## 1 INTRODUCTION

A new IEA EBC Annex (Annex 87 - Energy and Indoor Environmental Quality Performance of Personalised Environmental Control Systems) has recently started and has the overall objective to establish design criteria and operation guidelines for PECS and to quantify the benefits regarding health, comfort, energy, and cost performance. The scope of the annex includes all types of PECS for local heating, cooling, ventilation, air cleaning, lighting, and acoustics. Various types of PECS such as desktop systems, which are mounted on desks or integrated in a furniture, or chairs with heating/cooling and ventilation, will be covered. The annex will also include wearables, where heating, cooling, and ventilation are included in garments or devices attached to the occupants' body. This topical session will provide an overview to the activities and intended outputs planned for the annex.

## 2 MAIN ACTIVITIES

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

### 2.1 Subtask A: Fundamentals

This subtask aims to define and identify requirements of PECS in terms of Indoor Environmental Quality (IEQ), i.e., thermal, air quality, lighting, and acoustics. The benefits of PECS regarding comfort, health and productivity and energy performance based on literature and new research will be shown.

### 2.2 Subtask B: Applications and technologies

Subtask B will summarize the working principles, capabilities and limitations of existing PECS, based on literature. Future development and improvement suggestions for PECS for optimal energy, IEQ and cost performance will be identified.

## 2.3    Subtask C: Control, operation and system integration

In Subtask C, existing methods for controlling PECS (including sensors used for control) will be identified and summarized. Guidelines on integrating PECS with ambient conditioning systems in buildings will be developed.

## 2.4    Subtask D: IEQ and Energy Performance evaluation

Existing methods of studying and testing PECS will be collected in this subtask. Generic power requirements for PECS to achieve energy savings compared to ambient conditioning systems will be identified. Universal and standardized ways of evaluating and reporting the performance of PECS will be developed.

## 2.5    Subtask E: Policy and marketing actions

In Subtask E, national and international building codes and standards regarding PECS will be summarized. Ways of overcoming current barriers for a wide implementation of PECS in buildings will be developed. The subtask will provide input to existing national and international standards about requirements, characteristics, and performance of PECS.

## 3    INTENDED OUTPUTS AND TARGET AUDIENCE

The intended outputs of the annex are as follows:
- Guidebook on requirements for PECS (Subtask A)
- State-of-the-art report on PECS (Subtask B)
- Guidebook on PECS design, operation and implementation in buildings (Subtasks C & E)
- Report on test methods for performance evaluation of PECS (Subtask D)
- Universal criteria about requirements, characteristics, and performance of PECS to be used in national and international standards (Subtask E)

The intended audience of the outputs would be consulting engineers/companies, heating, ventilation, and air-conditioning (HVAC) system and component manufacturers, researchers, building owners and tenants, and standardization bodies. Input will be given to revise relevant standards such as EN 16798 and ISO 17772 on required criteria for PECS (CEN, 2019; ISO, 2017). Development of new standards is also foreseen.

## 4    REFERENCES

CEN. (2019). *EN 16798-1: Energy performance of buildings - Ventilation for buildings - Part 1: Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics*. European Committee for Standardization.

ISO. (2017). *ISO 17772-1:2017 Energy performance of buildings - Indoor environmental quality - Part 1: Indoor environmental input parameters for the design and assessment of energy performance of buildings*. International Organization For Standardization.