EUROVENT
EUROPEAN INDUSTRY ASSOCIATION

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# Position Paper

## In a nutshell

**Eurovent requests the inclusion of air curtains in the Ecodesign and Energy Labelling Working Plan 2020-2024. Ecodesign requirements for air curtains could significantly reduce building energy usage by reducing the amount of energy required to maintain a difference in temperature between two zones: either zones inside the building or between the building and the outside world.**

## Preamble

The Ecodesign Directive 2009/125/EC and the Energy Labelling Regulation (EU) 2017/1369 are crucial instruments to lower the environmental externalities of products placed on the Single Market, improve energy efficiency, and ultimately move to a circular and carbon neutral economy. In addition, a transparent future-oriented Ecodesign and Energy Labelling framework can form the basis of a new growth strategy for Europe and boost competitiveness and innovation in the EU with spill over effects on global markets.

Eurovent therefore supports the ambitious further development of the Ecodesign and Energy Labelling framework, and hereby provides input to the EC Consortium for the upcoming Ecodesign and Energy Labelling Working Plan 2020-2024.

## Position

Based on the analysis below, Eurovent recommends including air curtains in the upcoming Ecodesign and Energy Labelling Working Plan 2020-2024. Any policy option covering air curtains would need to include requirements that take into account the energy saving due to the products' control systems.

## Policy background

### DG ENER Ecodesign LOT 20: 2012 preparatory study

The 2012 preparatory study of DG ENER Ecodesign LOT 20 'Local room heating products' assessed air curtains. They were included in the preparatory study as Base Case 9 for possible inclusion in Regulation (EU) 2015/1188. As only a small portion of these appliances are equipped with an electric internal heat generator, they were finally not included in the Regulation.

### DG ENER Ecodesign LOT 20: 2018 review study

The 2018 review study assessed air curtains and concluded:

*"Even though the air curtain may include a heater that contributes to the secondary heating of a room, it is not its primary purpose and it is not marketed as a local space heater. From a technical point of view, the focus on its primary purpose to establish an "air wall" or "air door" would require potential policy measures more related to effectively establishing air streams and to the prevention of transmission and ventilation losses, rather than to the heating function itself. If air curtains should be included in scope, the efficiency of this main function should also be included in the Regulation, which would require a major change of scope and.* [sic] *The low sales also indicate that energy saving potentials are low, especially when focusing on the heating capability.*

*It is therefore proposed not to propose inclusion of air curtains in the regulation and go on with defining a base case."*

Currently air curtains are not covered by any Ecodesign regulation.

# Product definition and field of application

## Product definition

According to ISO 27327-1 'Laboratory methods of testing for aerodynamic performance rating', an air curtain unit is:

*"Air-moving device which produces an air curtain airstream"*

Where an air curtain airstream is:

*"Directionally-controlled airstream, moving across the entire height and width of an opening, which can reduce the infiltration or transfer of air from one side of the opening to the other and/or inhibit the passage of insects, dust and debris"*

## Field of application

Air curtains are most commonly used for commercial, industrial and refrigeration environments, although their use is not limited to these applications. The usage of this technology varies depending on application but on the whole the concept is similar throughout.

### Commercial/comfort air curtain units

Air curtain units used to reduce physical barriers to entry for customers; shops & stores, public buildings, shopping malls, banks & office buildings, hotels, etc. Their main purpose is to create a climate division between two areas, or between an area and the outdoor air where comfort requirements for people are mandatory for the supply air temperature and speed. The barrier created by the air curtain unit allows a significant reduction of the heat losses through the opening and increases building energy savings.

### Industrial air curtain units

Air curtain units used in the large opening of an industrial building for production and/or transportation processes. Their main purpose is to protect the internal (working environment) from the external conditions to maintain comfort for staff and reduce the ingress of dirt and other particulates. The barrier created by the air curtain unit allows a significant reduction of the heat losses through the opening and significantly increases building energy savings.

### Cold storage air curtains

Air curtain units used for chilled or cold storage applications. They are placed on the warm side of the doorway into the cold space to create a barrier of air to reduce warm air entering the refrigerated space and cold air leaving the space. Their main purpose is to create a non-obstructive barrier to limit refrigeration energy losses, ice forming on the cold room cooling system which increases maintenance, and ice forming on the floor of the doorway which is a slip hazard.

# Key benefits

## Significant energy savings

The correct use of an air curtain solution can lead to significant savings in terms of building energy usage, running costs, carbon footprint and environmental impact. It does so by reducing the amount of energy required to maintain a difference in temperature between two zones: either zones inside the building or between the building and the outside world.

### Improved indoor air quality

The ability of an air curtain to create a non-obstructive stream of air preventing the ingress of particulates, dirt and dust across an open entry substantially improves the quality of the air within the building. This improves comfort and health, particularly in industrial areas and polluted city centres.

### Increased building performance

The flexibility available for combining air curtain solutions with a building's existing heating and cooling system allows for a more complete control of overall building energy consumption.

### Enhanced safety

In cold storage applications an air curtain supplying a transparent stream of air across the exit of an open-door freezer has an obvious advantage over the alternative thick non-transparent plastic strips. The latter can lead to workplace accidents as a result of limited visibility into and out of the space.

## Types of products

The internal/external heating element defines the type of air curtain:

- Ambient only (unheated/Uncooled) units
- Electrically heated units (the unit has integrated electrical heating element)
- Hydronic coils (the unit has an integrated hydronic coil)
- Direct expansion heat pump coil (the unit acts as the condenser of a refrigeration cycle)
- Direct/indirect gas fired (the unit has an integrated burner, or the unit has an external gas fired air-to-air heat exchanger)

## Efficiency

By using air curtains, it is possible to significantly reduce the building energy usage. This saving is assessed by the climate separation efficiency indexes. These indexes describe how much heat energy is saved through a door opening if an air curtain unit is correctly installed and maintained. These indexes take into account the two different forces which influence the air curtain unit, namely temperature difference and wind action. The two indexes are defined as the $CSE_T$ and the $CSE_W$ and represent the efficiency (or effectiveness) of an air curtain unit subjected to temperature differences and wind action respectively.

### Climate Separation Efficiency index due to temperature difference ($CSE_T$)

Climate Separation Efficiency index due to temperature difference being the ratio described by the difference in energy loss through an opening subjected to a temperature difference, without and with an air curtain, divided by the energy loss without an air curtain.

### Climate Separation Efficiency index due to wind action ($CSE_W$)

Climate Separation Efficiency index due to wind action being the ratio described by the difference in energy loss through an opening subjected to wind action, without and with an air curtain, divided by the energy loss without an air curtain.

## Additional technical info

### Control options

A control system for the regulation of the discharged air is essential for the efficient operation of an air curtain. There are a number of control options available, but at the very least an air curtain should be able to regulate air speed and, if the air curtain is capable of conditioning the jet of air, the level of heat/cooling available. By regulating those parameters, energy can be saved, and the overall energy

efficiency of the unit is increased. Air curtain systems can also accept zone control and linked system commands as well as receiving remote instructions from a central building management system (BMS).

Localised control can be implemented to modulate an air curtain's activity by placing various sensors in the vicinity of the opening that the air curtain screens (door contactors, proximity sensors, etc.). Using these control systems, it is possible to achieve higher levels of performance and efficiency.

### Filtering

The main task for an air curtain filter is to protect a water coil against contamination. Therefore, a coarse air curtain filter can be used to maintain the required air flow rate. However, even a coarse filter will become contaminated and must be cleaned or replaced eventually. The frequency of the cleaning depends on the environment the air curtain is installed in. In a dusty environment (like a clothes shop) the filters will need to be cleaned much more frequently than in a cleaner office style environment.

## Market and industry data

### Estimated number of manufacturers in Europe

The European air curtain industry is almost entirely made up of SMEs (Small and Medium Enterprises). By considering manufacturers coming from EU28, Russia, and Turkey, it is possible to estimate a final number of about 50 manufacturers active in Europe

### Production sites all over Europe

According to the above estimated number of manufacturers active in Europe, it is possible to estimate that in EU28, Russia, and Turkey there about 60 production sites.

### Estimated combined annual turnover

Based on declared and reassessed data, the EU air curtain industry has a direct yearly combined turnover of about 90 MEUR.

### Employment figures

Based on declared and reassessed data, the EU air curtain industry has an aggregated direct number of employees of about 800 people

### Products installed in Europe per year

In the table below the sales from 2016-2019 is presented.

| Air curtains | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|
| Ambient only | 15.291 | 18.863 | 20.357 | 21.876 |
| Electrically heated units | 37.555 | 46.925 | 46.731 | 42.997 |
| Hydronic coil units | 35.297 | 27.680 | 26.414 | 25.841 |
| Direct expansion heat pump coil units | 4.268 | 2.058 | 2.308 | 2.162 |
| TOTAL | 92.411 | 95.526 | 95.810 | 92.876 |

## Final proposals

Based on the above analyses, Eurovent recommends including air curtains in the upcoming Ecodesign and Energy Labelling Working Plan 2020-2024.

Eurovent would also like to suggest that any possible policy option **covering air curtains would include requirements taking into account the energy/CO2 saving due to the products' control system**

Enclosed:

Eurovent Recommendation 16/1

Eurovent Air curtains Guidebook

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# Eurovent and transparency

## When assessing position papers, are you aware whom you are dealing with?

Eurovent's structure rests upon democratic decision-making procedures between its members and their representatives. The more than 1.000 organisations within the Eurovent network count on us to represent their needs in a fair and transparent manner. Accordingly, we can answer policy makers' questions regarding our representativeness and decisions-making processes as follows:

**1. Who receives which number of votes?**
At Eurovent, the number of votes is never determined by organisation sizes, country sizes, or membership fee levels. SMEs and large multinationals receive the same number of votes within our technical working groups: 2 votes if belonging to a national Member Association, 1 vote if not. In our General Assembly and Eurovent Commission ('steering committee'), our national Member Associations receive two votes per country.

**2. Who has the final decision-making power?**
The Eurovent Commission acts as the association's 'steering committee'. It defines the overall association roadmap, makes decisions on horizontal topics, and mediates in case manufacturers cannot agree within technical working groups. The Commission consists of national Member Associations, receiving two votes per country independent from its size or economic weight.

**3. How European is the association?**
More than 90 per cent of manufacturers within Eurovent manufacture in and come from Europe. They employ around 150.000 people in Europe largely within the secondary sector. Our structure as an umbrella enables us to consolidate manufacturers' positions across the industry, ensuring a broad and credible representation.

**4. How representative is the organisation?**
Eurovent represents more than 1.000 companies of all sizes spread widely across 20+ European countries, which are treated equally. As each country receives the same number of votes, there is no 'leading' country. Our national Member Associations ensure a wide-ranging national outreach also to remote locations.

Check on us in the European Union Transparency Register under identification no. 89424237848-89.

## We are Europe's Industry Association for Indoor Climate (HVAC), Process Cooling, and Food Cold Chain Technologies – thinking 'Beyond HVACR'

Eurovent is Europe's Industry Association for Indoor Climate (HVAC), Process Cooling, and Food Cold Chain Technologies. Its members from throughout Europe represent more than 1.000 companies, the majority small and medium-sized manufacturers. Based on objective and verifiable data, these account for a combined annual turnover of more than 30bn EUR, employing around 150.000 people within the association's geographic area. This makes Eurovent one of the largest cross-regional industry committees of its kind. The organisation's activities are based on highly valued democratic decision-making principles, ensuring a level playing field for the entire industry independent from organisation sizes or membership fees.

Eurovent's roots date back to 1958. Over the years, the Brussels-based organisation has become a well-respected and known stakeholder that builds bridges between the manufacturers it represents, associations, legislators and standardisation bodies on a national, regional and international level. While Eurovent strongly supports energy efficient and sustainable technologies, it advocates a holistic approach that also integrates health, life and work quality as well as safety aspects. Eurovent holds in-depth relations with partner associations around the globe. It is a founding member of the ICARHMA network, supporter of REHVA, and contributor to various EU and UN initiatives.

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