CommONEnergy

HVAC SUPPLY DIFFUSERS

AGAINST MIST FORMATION ON DISPLAY CABINETS

There is a strong interaction between refrigerated cabinets and Heating, Ventilation and Air-Conditioning (HVAC) supply air diffusers, which has an influence on the energy performance of the store / area where they are installed.

Refrigerated cabinets with remote condensing units contribute to cooling and dehumidification of the space where they are located.

The cabinets' energy performance is influenced by the room air temperature, humidity and velocity. The recent trend in food stores is to adopt display cabinets closed by means of glass doors to reduce drastically the energy consumption compared to open display cabinets, as well as to improve customers' comfort.

However, the product visibility can be affected by mist formation on the glass. This effect happens when the temperature on the external surface of the glass falls below the ambient dew temperature, which is a quite common situation in humid climate during the mid-season, when neither indoor air heating nor cooling is performed.

Reduction or prevention of the risk of mist formation can be exploited by controlling the relative humidity in the selling area or by heating glass doors. Adopting both strategies with an effective heating control can reduce the running costs but implies higher investment costs. In this context, the use of specific air diffusers is proposed to prevent mist formation on cabinet doors by promoting the air movement on the proximity of glass surfaces.

TECHNOLOGY

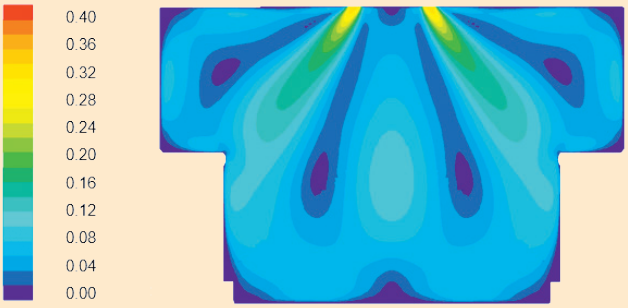
Installation in the Italian demo case of Modena

USE

The aim is to "wash" the external surface of the glass doors of display cabinets with dehumidified air, so as to reduce the risk of mist formation.
This solution can be applied when performing a refurbishment but also to existing supermarkets, with limited modifications to the air conditioning supply ducts and diffusers.
Locations with humid climate and low temperature cabinets have greater advantage.

FEATURES

The linear air supply diffusers are located in front of the cabinet. Adjustable deflectors are used, to point air towards the door with an appropriate angle.



Air velocity contours in the aisle between two opposite vertical display cabinets

BENEFITS

- Reduced use of electrical heaters
- Energy and costs saving
- Negligible extra costs for installation and operation

CASE STUDIES

In CommON*Energy,* the simulations were performed in the Modena (Italy) demo case.

COMPATIBILITY WITH OTHER TECHNOLOGIES

Full compatibility with all technologies.

CONTACT DETAILS

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The project CommON*Energy* (2013-2017) focuses on transforming shopping centres into energy efficient buildings, by developing smart renovation strategies and solutions to support their implementation as well as assess their environmental and social impact.

- 3 demo cases, 8 reference buildings & 23 partners from across Europe
- 25 technologies developed and installed in 4 years
- Up to 75% reduction of energy demand, leading to costs reduction
- A payback time of maximum 7 years

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