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ESSMANN Case Study Ventilation concept for a plastics processing company

Dürmann is a company with a long tradition in the manufacture of individual quality packaging for the pharmaceuticals and food industries. The production halls, which house numerous plastic injection moulding machines, are equipped with arcade rooflights to provide natural daylight illumination without the expense of energy. Although the rooflights guarantee bright and friendly workstations, they also result in considerable sunlight and heat radiation in summer. Added to which, the injection moulding machines exude heat of their own, which pushes the temperature up to extremely high levels. In the case of high-precision manufacturing equipment, this can result in waste products or even production downtimes. Not to mention the adverse impacts on the motivation and productivity of the staff.

ESSMANN Complete Solution



High-volume ESSMANN all-weather double flaps with ESSMANN HDS system

→ Project definition

- Improvement of the ventilation in the hall and lower temperatures in the work area
- Ventilation without incurring electricity expenses
- Reduced sun and heat radiation
- Glare-free lighting
- SHE for fire protection
- Renovation without interrupting operations

→ ESSMANN Solution

An analysis of the status quo was performed to examine the conditions and temperatures in the building. Temperatures of 42° at the work level and 48° in the roof area were measured at an outdoor temperature of 30°. The existing arcade rooflight measured 160 m² surface area and allowed sunlight and heat to penetrate virtually unhindered. In light of their age and the weather influences, the arcade rooflights were already in very poor condition. The evaluation of the data recorded by ESSMANN produced the following values:

The total thermal load amounted to nearly 350 kW, producing a specific thermal load of 42 W/m³ hall volume. This thermal load is more or less equivalent to two and a half times the heating requirement in winter.

As such, the interior of the hall really did reveal a heat problem.

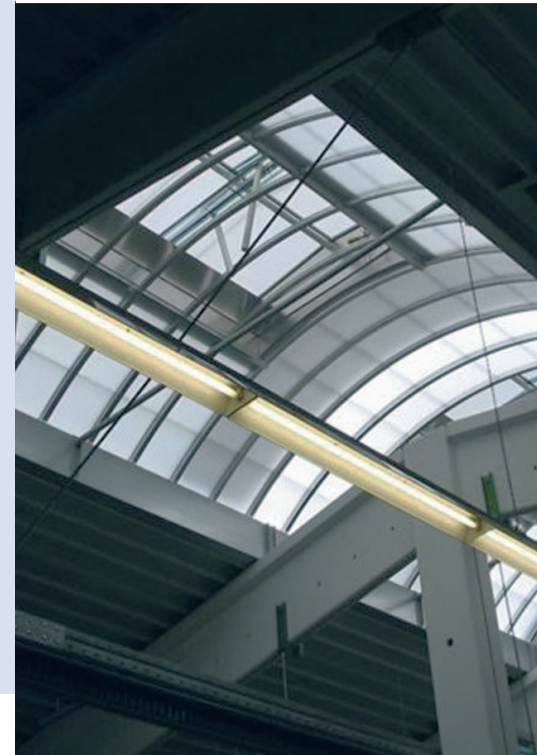
In order to avoid cost-intensive ventilation and air conditioning systems, the ventilation experts at ESSMANN recommended the installation of thermal ventilators. Warm air is light and rises. The right equipment can use this physical principle to effectively ventilate the hall.

ESSMANN Case Study

Ventilation concept for a plastics processing company

→ Customer benefits

- **Improvement of the temperatures in the work area**
When the weather is fine, the 7 ESSMANN all-weather double flaps transport some 100,000 m³/h of waste hot air to the outside and effectively discharge the existing thermal load by releasing the pressure. The butterfly valves on the inside lengthwise side of the equipment ensure that the hall is ventilated when it is raining.
- **Reduction of sunlight radiation, glare-free lighting, hail protection**
ESSMANN's tried and trusted HDS system was installed to reduce sunlight and heat radiation. This specially perforated aluminium sheeting is mounted above the polycarbonate rooflight sheets at a pre-defined distance and reduces heat radiation by 80%. Or 110 kW, in the case of this hall. Glare-free natural daylight can nevertheless penetrate to a level of 80%.
The system also shields against hail and provides permanent fall-through protection.
- **Implementation of the fire protection requirement**
ESSMANN all-weather double flaps are equipped with SHE function and therefore comply with the fire protection requirements.
- **Subsequent measurement to verify the planning**
The service provided by ESSMANN GmbH also includes post-installation measurement of the resulting temperatures and air condition.
The temperatures in the work area were reduced by between 8 and 10 degrees and therefore complied with the planned values and proved the effectiveness of the installed system.
- **Ventilation without incurring electricity expenses**
ESSMANN's use of thermal ventilation eliminated the electricity costs for running the ventilators. The savings in electricity costs amount to about € 30,000 each year. As such, the investment has a payback time of about 2 years.



New ESSMANN arcade rooflight with ventilation function and ESSMANN HDS system.

→ Result

A cost-efficient system was planned for the company that was designed as an individualised solution and dimensioned on the basis of measured values.

Nowadays, Dürrmann has a thermal ventilation system from ESSMANN that ensures optimum production and work conditions, while at the same time complying with the fire protection requirements.

Further information can be found at www.essmann.de

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