HEATEX

Commercial Ventilation

Double Cross Flow

Industry

Heating, ventilation, and air conditioning (HVAC) is the use of various technologies to control the temperature, humidity, and purity of the air in an enclosed space. Its goal is to provide thermal comfort and acceptable indoor air quality.

Company

Started by two Swedish innovators in the early 60s. Pegust's business idea is to develop and manufacture solutions for drying, indoor climate and environment. Innovative thinking is behind the company succes to this day.

Application

Commercial ventilation systems play a key role to maintain healthy and comfortable indoor air quality (IAQ) in almost all buildings. At the heart of the system, you have an air handling unit and inside a heat exchanger for heat recovery.

CASE STUDY

with Pegust, Sweden.

"The greater the customized challenge, the more we thrive on designing the optimal solution."
Göran Gustafsson, CEO Pegust

Introduction

Pegust is a pioneer in the industry and has been working on innovative products to create better indoor air quality for many years.

Pegust's customers' requirements and wishes vary depending on the premises and business. Therefore, the company supports its customers with planning and drawings, from simple supply air units to advanced air treatment facilities.

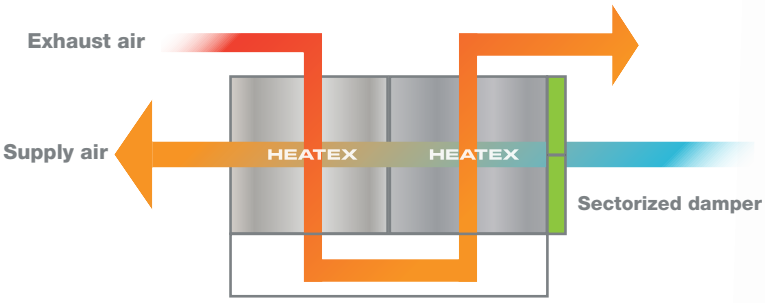
In Sweden, energy-efficient ventilation has become essential to comply with environmental building standards, especially residential buildings, schools, and shopping malls with large airflows have a great potential for heat recovery solutions.

Pegust decided to equip its most modern and environmentally friendly air handling unit, "PrimAir XX," with double air-to-air plate heat exchangers for the highest efficiency possible.

Heatex specializes in air-to-air heat exchangers aiming to maximize the heat transfer between airflows. All products are custom-made and designed to match customer's technical specifications.

Problems

1. Poor indoor air quality can result in health issues and damage to buildings.
2. Odors and other contaminants might transfer to the supply air if not completely separated from the exhaust air.
3. Cold climates create condensation and icing in the ventilation system. Defrosting takes additional energy, adding to the total energy consumption.
4. Fans are needed to move the air through the ventilation system, which adds to the total energy consumption.



Challenges

The primary challenge was to ensure that as much heat as possible was transferred from the exhaust air to the supply air, meaning heat recovery efficiencies around 90%.

Also, sometimes, due to the harsh Swedish climate, different degrees of freezing might occur inside the air handling unit and plate heat exchanger.

Additionally, the heat exchanger had to provide:

- High levels of tightness
- Low pressure drop
- Low maintenance requirements
- Long lifespan

Solution

By mounting two cross-flow plate heat exchangers after each other in a 2-step configuration, 90-95% of the heat from the exhaust air is transferred to the supply air. Consequently, the heating coil is needed less, which lowers the total energy consumption of the unit.

If any freezing is detected, defrosting can be done in sections, maintaining the efficiency of the AHU.

In addition, defrosting requires no additional energy. The exhaust and supply air is completely separated thanks to airtight heat exchangers eliminating the transfer of odors or particles between the air flows.

The slightly higher pressure drop resulting from the 2-step configuration is reduced by the optimized plate pattern of Heatex's Model H2 cross-flow plate heat exchanger.

Ask an Expert

Heatex's skilled and experienced application engineers support you throughout the development process, finding the right solution for your unique needs. Ask our experts for a consultation.

heatex.com

Results

For the heat exchanger only, not for the system as a whole. Based on 24 hours of service, 7 days a week, all year around. Location: Malmö, Sweden.

Installed Power Reduction

129 kW

of heating power saved versus not using an air-to-air heat exchanger.

Energy Savings

185 027 kWh

of energy saved versus not using an air-to-air heat exchanger.

Return on Investment

3 months

of operation will cover the costs of the heat exchanger in this particular case.

HEATEX