



Troldtekt® Ventilation

Unparalleled indoor climate and low energy bills

Before renovating the Grønløkke School near the city of Aarhus in Denmark, the consultancy firm Ekolab analysed six ventilation solutions. Troldtekt ventilation stood out as being the most energy-efficient, and also scored highest in terms of the indoor climate. Now the solution has been installed in 32 classrooms.

Lots of careful homework was necessary before the Grønløkke School in Tranbjerg, a suburb of Aarhus, initiated an extensive energy renovation project for the school's buildings. In particular, engineers from the consultant firm Ekolab closely studied the possible ventilation solutions which accounted for the bulk of the work.

"The school was built in 1976, and the existing ventilation system was either defective or completely dysfunctional. Consequently, teachers and pupils used the

30% less energy

With decentralised ventilation via Troldtekt ventilation ceilings, Grønløkke School uses approx. 30 per cent less energy for transporting air than a new central ventilation solution. This is the conclusion after examining six possible scenarios.

Top marks

In the analysis, the Trolldtekt ventilation solution scored top marks according to all the indoor climate parameters. This includes, among other things, air distribution, the risk of draughts and improving the acoustics.

windows, but this usually happened only once the air inside the classrooms had become so heavy that they were suffering from headaches and other discomforts," says Mike Vinge, an engineer and project manager from Ekolab.

Holistic analysis

To address the problems with the poor indoor climate, Ekolab examined six possible scenarios for the school's new ventilation system.

"It was important for us to conduct a holistic analysis rather than looking at minor optimisations in isolation. Otherwise, there was a risk of spending the available money unwisely. We gave the six different solutions points according to a wide range of parameters within, for example, operating economy, operation, durability and indoor climate," says Mike Vinge.

"I would like to stress that all six solutions were of a good quality and modern, otherwise they wouldn't have been included in the study," he adds.

The most economical solution

Ekolab has calculated the total operating economy of the six possible scenarios over a 15-year period. Decentralised ventilation using Trolldtekt ventilation ceilings was the most economical solution.

Lowest possible energy consumption

The solution with Trolldtekt ventilation came out best in the comparison. Among other things, because it consumes approx. 30 per cent less energy than the alternatives. This makes it the best choice in terms of its total operating economy.

In practice, it is a decentralised ventilation system which is easy to operate and maintain in all 32 classrooms. The air is blown in at low pressure through the Trolldtekt ceiling surface, which also ensures good acoustics in the room.

"The solution is good at injecting fresh air without causing uncomfortable draughts, even though the outdoor temperature is low. This means that there is no need for heating coils or ductwork. In addition, the solution offers certain advantages in terms of fire protection and the spread of smoke, because it's not necessary to penetrate walls to run ducts between the classrooms," says Mike Vinge, adding:

"As regards energy consumption, Trolldtekt ventilation consumes the least, because the air does not have to pass through the long ducts which are typical of a central system. It just has to flow through the inlet in the wall and down through the ceiling. In fact, the amount of energy



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engineer and CEO, Ekolab*

used for air transport could not be any less than it is given that the solution also includes heat recovery."

Does more than any other solution

Jørgen Lange, an engineer and CEO at Ekolab, sees a number of advantages with the Trolldtekt ventilation solution which has been chosen for the Grønløkke School.

"In addition to its low energy consumption, it's smart that Trolldtekt's ventilation ceiling can do so many different things and more than any other solution on the market. The ceiling provides fresh air, has good air-conditioning properties, improves the acoustics and regulates the humidity. It's even possible to integrate lighting and audio systems. The solution is just one example of a building element which is truly multifunctional, and where indoor climate control is integrated into the building. And it's proving increasingly popular," he says.

"Furthermore, the Trolldtekt ceiling is certified according to the Cradle to Cradle concept, and has an Environmental Product Declaration (EPD) that is very much in line with a sustainable agenda. This aspect should also be included when local authorities analyse various solutions before they start renovating their schools," says Jørgen Lange.

FACTS

Project: Energy renovation of Grønløkke School

Client: City of Aarhus (under the auspices of project Aa+)

Consultants: Ekolab

Ceiling: Trolldtekt acoustic panels and Trolldtekt ventilation

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