

HOW CAN WE MAXIMISE THE ENERGY EFFICIENCY OF VENTILATION SYSTEMS FOR THE BENEFIT OF OPERATORS AND THE ENVIRONMENT?



The key is a fan that harnesses both static and dynamic pressures to achieve optimum energy utilisation. The results include higher efficiency, lower energy consumption, reduced operating costs and lower carbon emissions.

By Lars Erik Knaack, CEO, NOVENCO Building & Industry

When we talk about the energy efficiency of a fan, one factor is absolutely pivotal: whether the fan only uses the static pressure, or both the static and dynamic

pressure. It is well known that a system which only utilises the static pressure will probably never achieve an efficiency above 90%, as the motion energy goes to

waste – and, ultimately, operators and the environment pay the price.

When we in the industry talk about the efficiency of a fan, it is important to understand how the efficiency of different types of fans is calculated. The decisive factor is whether the fan utilises or wastes the dynamic pressure.

UTILISING THE MOTION ENERGY IS KEY

We can compare it with cars: When a standard car brakes, the energy is converted into heat. When a hybrid car brakes, the energy is channelled back to the engine. The standard car does not use the motion energy for anything, whereas the hybrid car puts this energy to a beneficial use.

The same principle applies for fans. To achieve the most energy-efficient ventilation system, you have to choose a fan that does not waste the motion energy – that is, the dynamic pressure – but instead uses this energy optimally.

SIGNIFICANT SAVINGS POTENTIAL

The efficiency of a plug fan and some centrifugal fans is calculated solely on the basis of the static pressure. This is because the system is unable to utilise the dynamic pressure, which literally disappears into thin air. This corresponds to the principle of the standard car, which brakes without putting the resulting heat to use.

But an axial fan utilises both the static and dynamic pressure, which means that the efficiency is based on the total pressure. This is how we can achieve efficiencies above 90%. Simply put, it uses the energy better than other types of fans. It is the same principle as the hybrid car, which uses the motion energy to its own advantage.

THE PREFERRED CHOICE FOR ENERGY EFFICIENCY

There are countless examples of operators significantly reducing their energy consumption by replacing plug or centrifugal fans with axial fans.

One prominent example in Denmark is Carlsberg, which achieved energy savings of more than 40% by changing to modern axial fans.

In Singapore, Keppel Bay Tower and One Raffles Quay both achieved energy savings of more than 40%, far surpassing the government requirement of 20% savings.



In Germany, a major carmaker conducted extensive testing at TÜV Süd Test Laboratory. These tests compared the best plug fans on the market with a ZerAx® axial fan installed in an air handling unit. The results showed ZerAx® as the clear winner in terms of energy efficiency, delivering total energy savings of 21%.

THE ENVIRONMENT AND OPERATORS PAY THE PRICE

Although plug and centrifugal fans can be tempting because they appear to be simpler and more flexible than axial fans, they are an expensive choice in the long run – both in terms of operating costs and environmental impact.

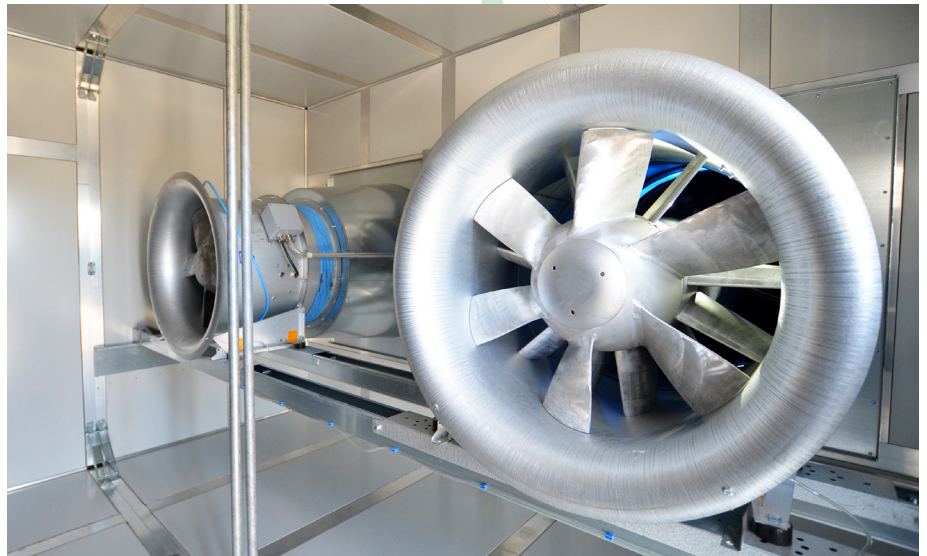
A high efficiency fan consumes less energy, reducing both costs and carbon emissions. In other words, there are important reasons that efficiency is one of the most critical parameters in the choice of fan solutions.

SET AMBITIOUS GOALS

It was certainly a step in the right direction when the ErP 2015 Directive set goals for reducing energy consumption and carbon emissions, but these goals could be even more ambitious. If we truly want to optimise energy efficiency, we should only permit the calculation of efficiency based on the total pressure, i.e. both the static and dynamic pressure. It should be a requirement in our industry that the most energy-efficient solutions are also the standard solutions. We can raise the bar for the energy efficiency of fans. Such a decision would be beneficial in every respect.

ACT ON KNOWLEDGE – CONTINUE IMPROVING

Dedication, development and self-regulation are keys to our ongoing development of new and improved fan solutions. The best solution 20 years ago has been sur-



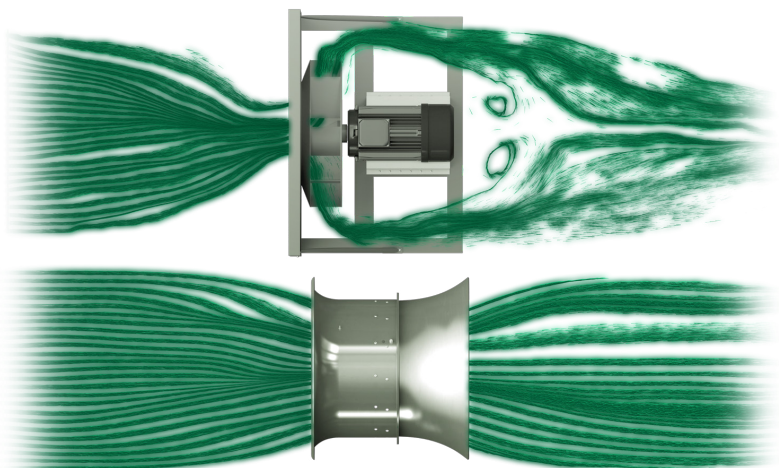
Highly efficient ZerAx® axial fans

passed by newer models because we in the industry have gained new knowledge and experience.

We believe in a duty to act based on this knowledge. We have a responsibility to continue developing fans with even greater efficiency. And, of course, these new solutions must meet all of the market's standards, regulatory requirements

and norms – just as NOVENCO's fans always do.

We hope that our industry remains committed to the most important goal: making the most energy-efficient fans, which includes optimum utilisation of the dynamic pressure. The environment will come out a winner, and the operators will benefit as well.



Different in air flow between centrifugal fan and ZerAx® axial fan

