

Overall application in focus

Centrifugal fans for AHUs usually the better choice

When it comes to fans, it is not easy to decide which actually has the best degree of efficiency and works with the greatest possible energy efficiency. The complex flow machines react to every change in the installation situation, speed variations, or changed pressure conditions. Centrifugal fans are the better choice for AHUs. But why?

By definition, energy efficiency describes the ratio of output of performance to input of energy. It is often the case that individual efficiency levels of the various fan components are simply multiplied at the optimum point. However, it cannot be expected that all components work in the optimum efficiency range when they are assembled. To ensure realistic information about the efficiency, the fan unit must be measured as a whole. Instead of using percentages of efficiency, it is better to compare fans for a defined air conveying task using the expected power consumption.

Axial fans efficient at low back pressures

Theoretically, both centrifugal and axial fans can be used in air handling units (AHUs). Axial fans are the most efficient when they convey air to the outside parallel to the axis at low back pressures. The outflow characteristics of axial fans are very focused, which is a disadvantage when applying air to downstream filters or heat exchangers.

Centrifugal fans: the better choice for AHUs

In centrifugal fans, the air is mainly output from the central point outwards. Centrifugal impellers are intrinsically less sensitive than axial fans to influences on the inflow and outflow sides. Since the centrifugal fans apply air to a pressure chamber (pressure plenum), it is possible to connect to a duct network in virtually all directions without significant losses. The development of RadiPac centrifugal fans from ebm-papst, specially designed for use in AHUs, not only involved optimizing the energy efficiency and noise emissions of the impeller, motor, control electronics, and housing – it also involved considering the actual installation conditions in AHUs. As a result, no major reserves need to be factored in for installation losses when selecting a fan.

Interactions when installed crucial

When considering the interactions with the area around the fan when installed, axial fans do much worse than centrifugal fans. Measurements by ebm-papst have shown that even the best axial fans available on the market do not achieve the overall efficiency of centrifugal fans. Axial fans cannot achieve the low noise values either, even when sound absorbers are mounted on the outlet side.

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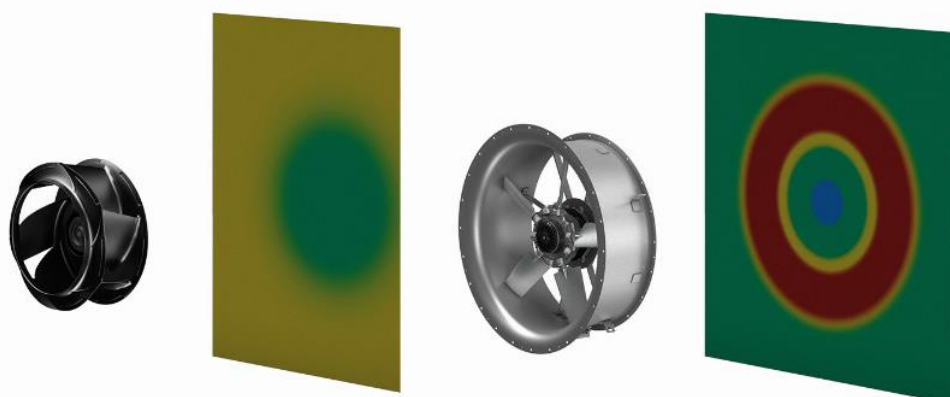


Image: Centrifugal fans (image, left) ensure a more uniform application of air to downstream components (filters, heat exchangers) than axial fans (image, right). The axial speed is presented in color.

Image ebm-papst
Characters approx. 2,600, including headings and sub-headings
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About ebm-papst

The ebm-papst Group, a family-owned company in Mulfingen, Germany, is the world market leader in fans and drives. Founded in 1963, the technology leader with its core competences motor technology, electronics and aerodynamics, has set international market standards ever since. With over 20,000 products, ebm-papst offers customized, energy-efficient and intelligent solutions for virtually any ventilation and drive technology requirements.

In fiscal year 2019/20, the hidden champion achieved a turnover of 2.188 billion euros and employed almost 15,000 people in 29 production sites (e.g. in Germany, China and the US) as well as in 48 sales locations. With their fan and drive solutions, ebm-papst defines and sets the benchmark in practically all industries, such as ventilation, air-conditioning and refrigeration, heating, automotive, IT, mechanical engineering, catering and household appliances, intralogistics and medical engineering.

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