

# Efficiency and benefits of direct driven fans



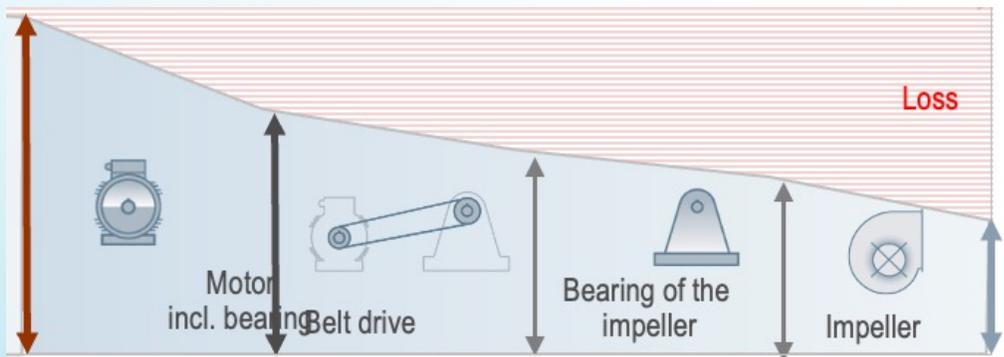
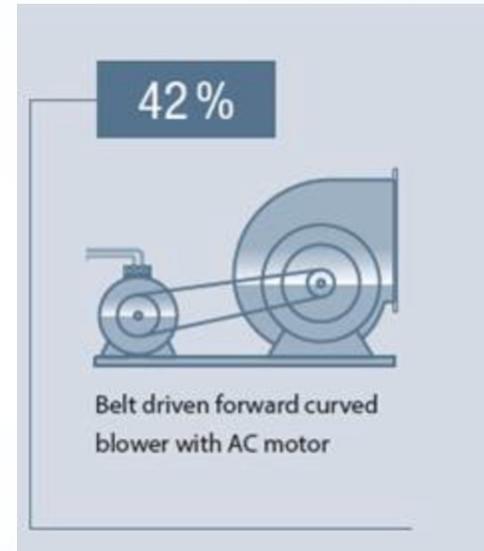
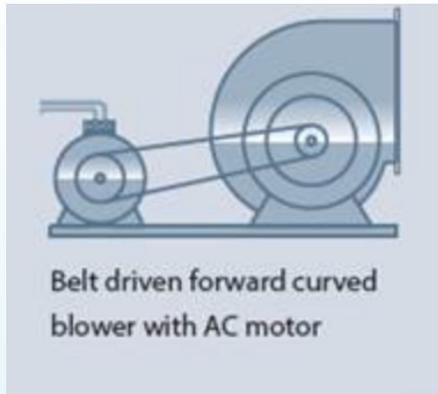
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# Overview

- Belt driven fans
- Direct driven fans
- Benefits of direct driven fans
- Fan efficiencies

# Belt driven fans

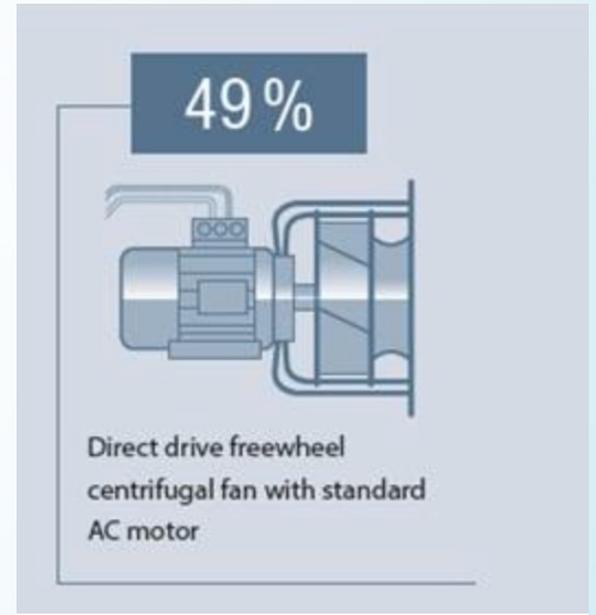
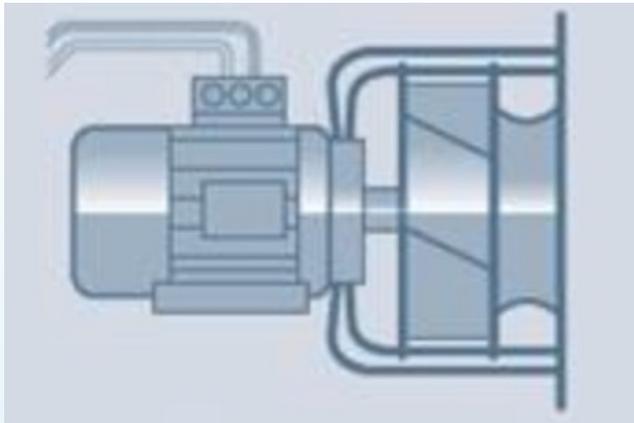
# Belt driven fans



- Transmission loss
- Higher maintenance: belt and pulley
- Higher footprint

# Direct driven fans

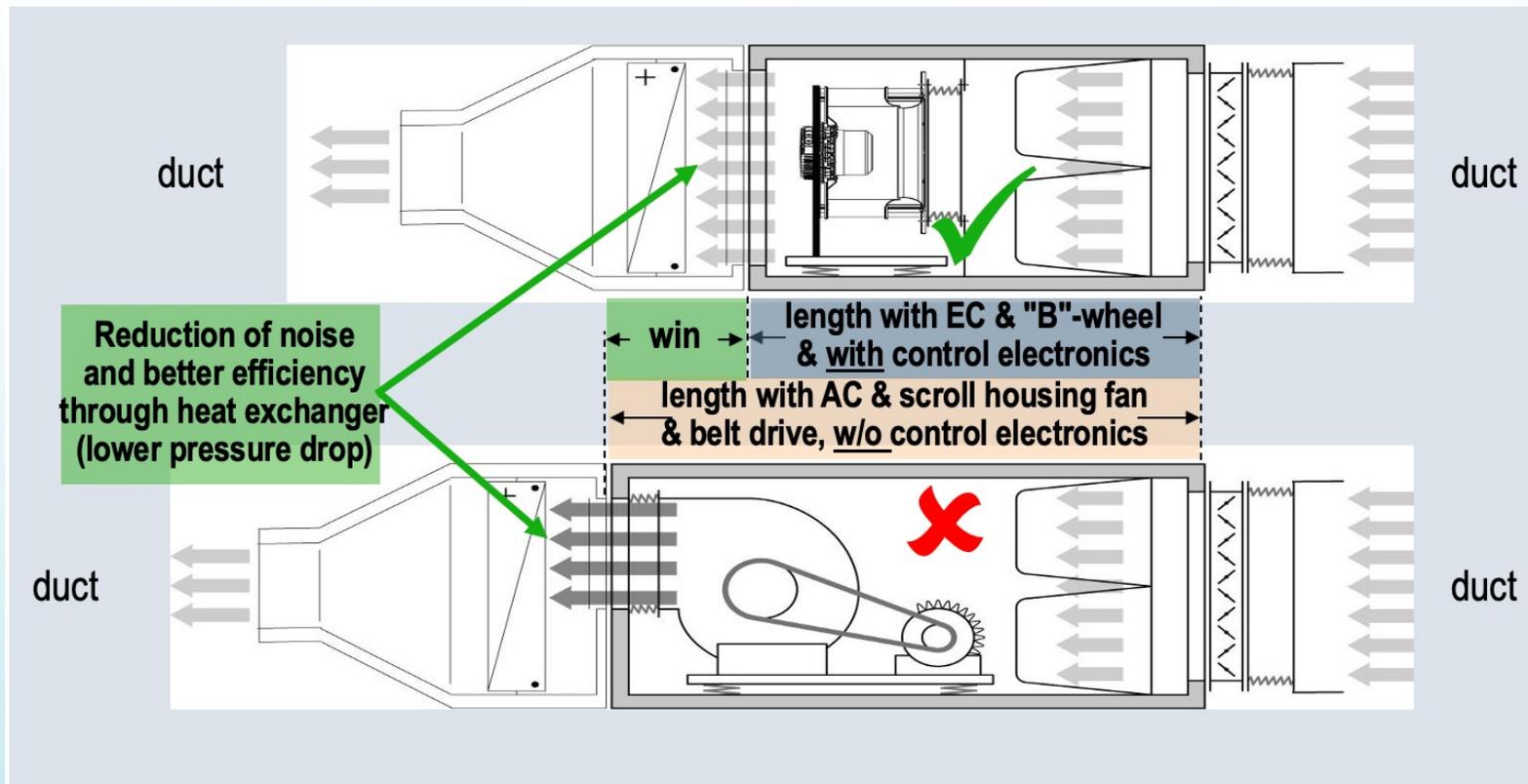
# Direct driven fans



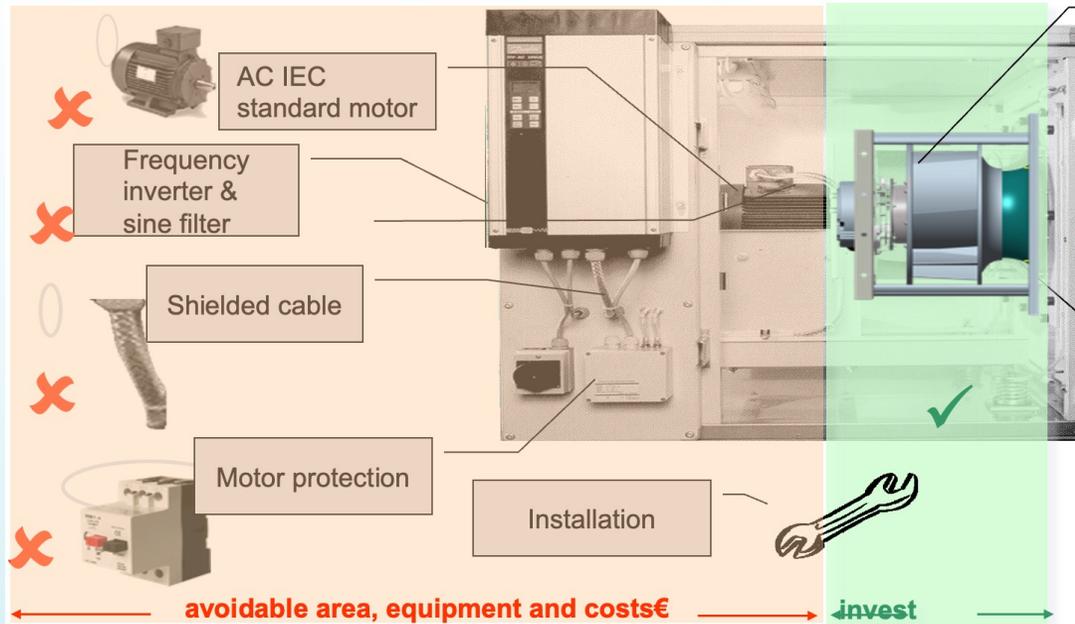
- Relatively lower losses
- Still high losses in the air side

# Benefits of direct driven fans

# Compactness: Space saving



# Benefits of direct driven fans



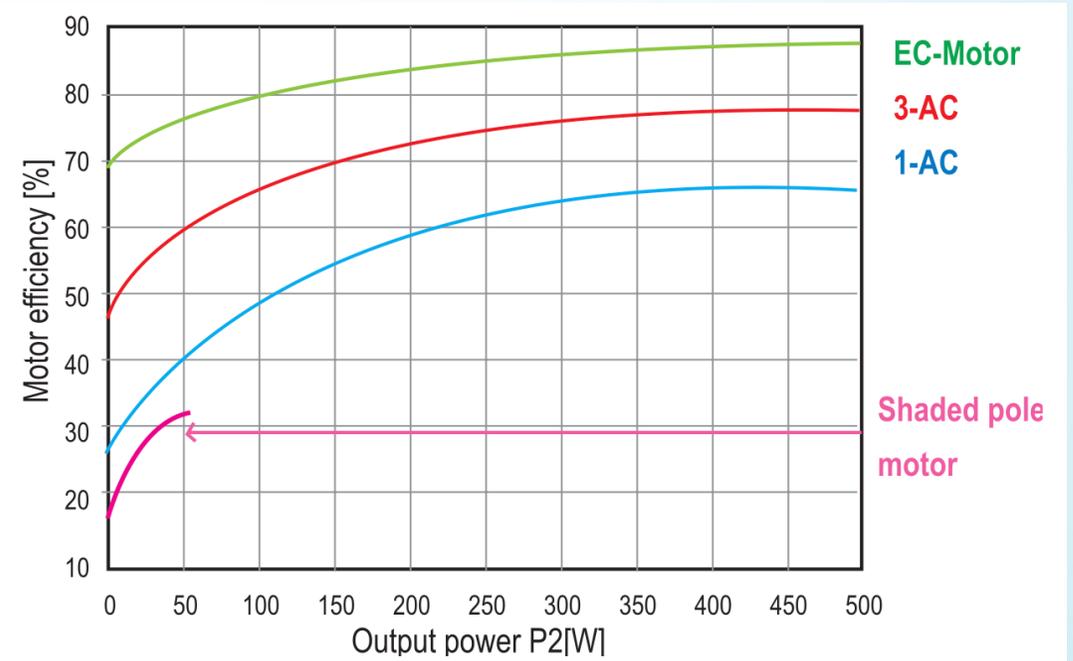
## Direct driven fan

- Lower losses
- Better efficiency
- Easy installation (plug & play)
- Space Saving

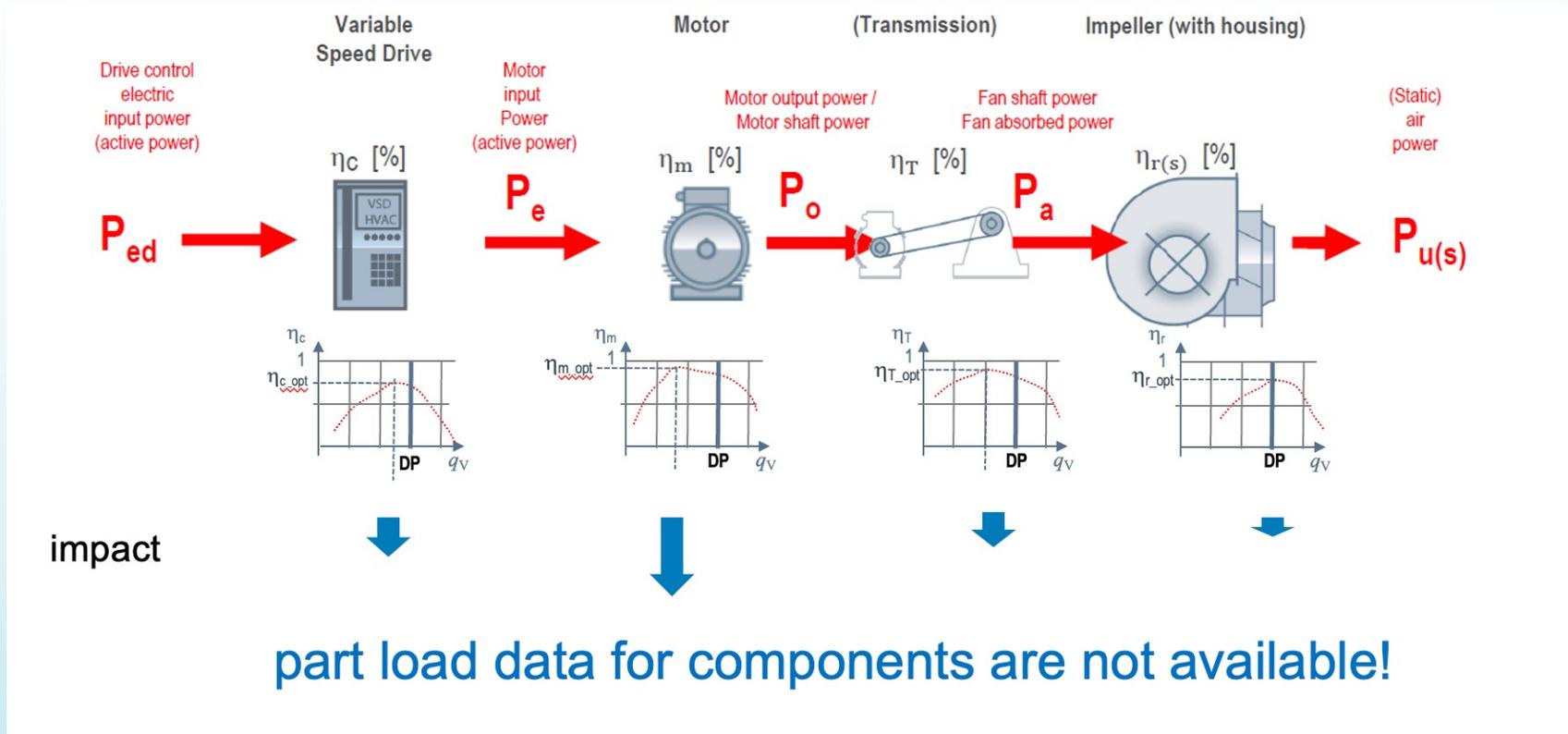
# Fan efficiencies

# Motor efficiency

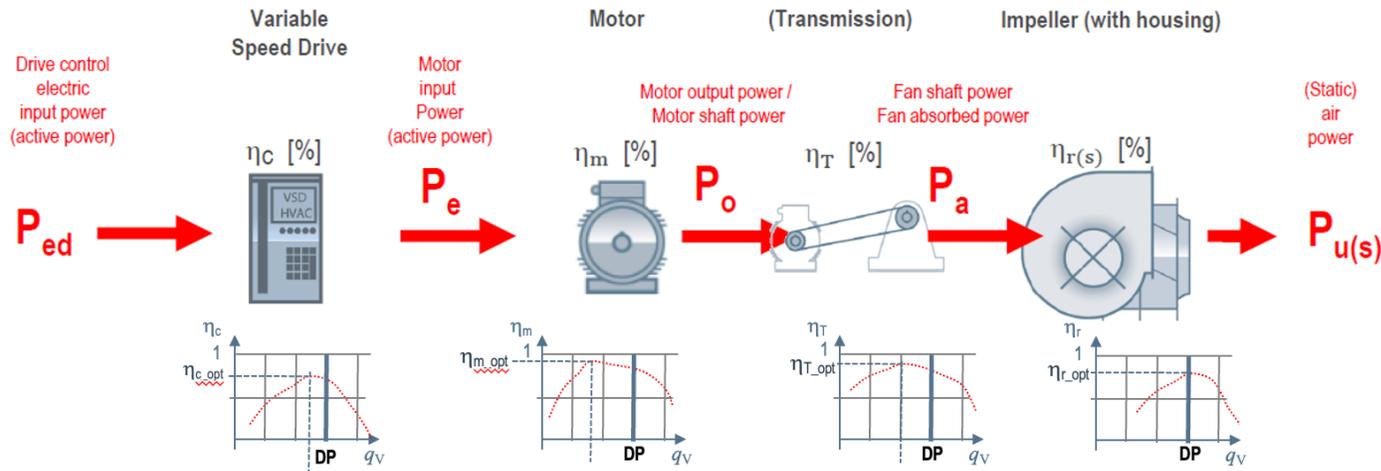
$$\text{Efficiency (\%)} = \frac{\text{Output power (Watts)}}{\text{Input power (Watts)}} \times 100$$



# System efficiency



# Wire-2-air efficiency vs. component efficiency



$\eta_{(static) fan} \neq \eta_{c\_max} \times \eta_{m\_max} \times \eta_{T\_max} \times \eta_{r(s)\_max}$

→ use tested data

ISO standard committee understands that all components bought individually are NOT capable of running in peak rated efficiency (ALL of them at the same time)

# THANK YOU

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