aldes air&people
euroregister

Aldes ME Flash

N°8 – September 2010

Technical Information

Different models of fans

Axial fans

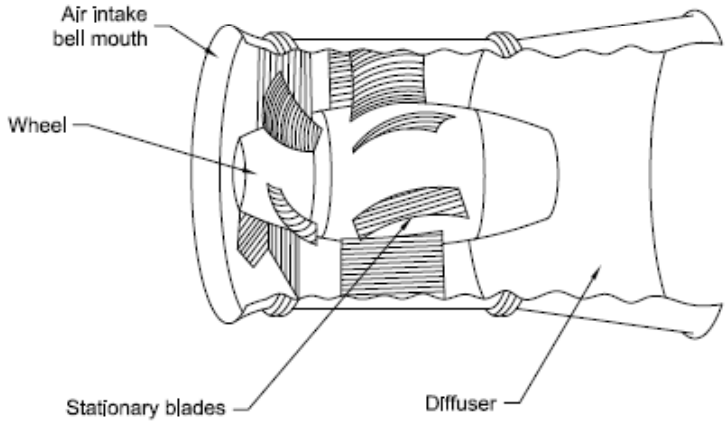
Principle: air is sucked and then propelled in parallel to the propeller rotation axis. The motor is mounted on the shaft.

Advantages: these fans can operate at very high airflows.

Drawbacks: they are noisy and adapted for low pressure only .

Aldes axial fans: HELIONE, HELICA, THELIA.

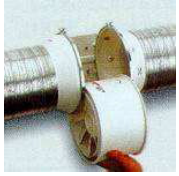
Axial fans can be :
• **With only a single shell:** the performance is between 35 and 50%.
• **With shell, stationary blades and diffuser:** the stationary blade is installed downstream and enables the increase in the performance guiding the swirling air behind the wheel. The performance is between 60 to 90%.



The wheel can be:
• **With fixing blades:** operates within a given operating curve (airflow/pressure).
• **With mobile blades:** the orientation can be modified either automatically during the operation with a servomotor, manually before the first operation, or just after the industrial manufacture (for instance HELIONE). This manipulation consists of modifying the blade setting angle. The angle reduction will lead to a pressure decrease, and thus to an airflow increase.

Areas best suited for use

Axial fans are often used in installations comprising short ductwork. They can be put directly into ducts if sizing is a problem. They cans also be used for computer server room cooling, for storeroom and warehouse heating or for car park ventilation.



Radial and centrifugal fans

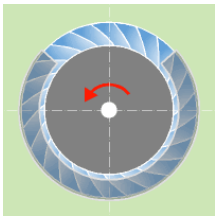
Principle: air is sucked in parallel to the wheel rotation axis and then perpendicularly propelled to the same axis given the centrifugal force.
For the same wheel diameter, centrifugal fans operate at lower airflows than axial fans, but pressures are much higher.

They can be :
• **Single air inlet :** air inlet is sucked in at only one side of the wheel, the other side remains closed.
• **Double air inlets :** with two air inlets, the air is sucked in on both sides of the wheel, allowing a higher airflow for the same size of an air caisson than with a single-inlet.

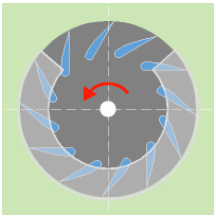
Centrifugal fans exist :
• **With forward-curved blades:** the fan wheel is composed of many small blades that curve in the same direction as the wheel rotation. The operating curves are relatively flat and with a low pressure variation, the airflow varies greatly.
The fan performance is between 55 and 70%.
Aldes fans: VEC, CVEC, VEKITA+, VIK, TVEC GII.

• **With backward-curved blades:** the fan wheel is composed of fewer bigger blades that curve in the opposite direction to the wheel rotation. The efficiency is better than that of forward-curved blade fans, but backward-curved blade fans are noisier. With a high pressure variation, the airflow variation is quite small. The operation curves are sloping.
The fan performance is between 75 and 85%.
Aldes fans: VELONE.

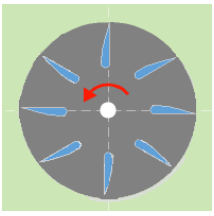
• **With radial blades:** the fan wheel is composed of straight blades. This kind of fan performs badly and is not often used for ventilation and cooling installations. This wheel shape prevents clogging, so is often used to move light elements such as dust and shavings/particles etc.



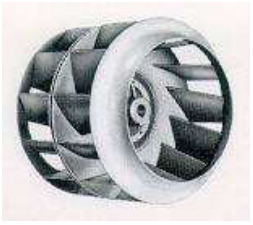
Forward-curved blades



Backward-curved blades



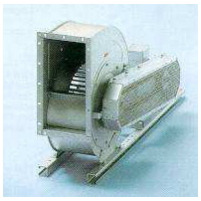
Radial blades



Areas best suited for use
Forward-curved blades: cooling systems, Controlled Mechanical Ventilation and anywhere pressure has to be as steady as possible.
Backward-curved blades: HVAC, industrial systems where high pressure is necessary and anywhere airflow has to be as steady as possible (for eg. surgical units, pharmaceutical factories etc.).
Radial blades: textile industry, maritime industry, dusty atmosphere.

.

Different types of drive mechanisms exist:



• **Belt drive:** consisting of pulley, hub, and belt that are mounted between the motor shaft and the fan wheel shaft.
Advantages: flexibility for the modification of the operating point by changing the pulley belt system. The handling of the spare parts is easier because motor and fan are separate. This differs to the direct drive (see below), where motor and fan are inseparable.
Drawbacks: specialized and important maintenance, lowered efficiency because of belt friction (5%), belt dust.
Aldes fans: VIK, TVEC, CYCLONE

• **Direct drive:** the wheel is directly mounted on the motor shaft.
Advantages: low maintenance costs, compact, losses suppression due to belt friction, no belt break.
Drawbacks: very noisy. The motor size is limited by the mounting design that reduces the fan power. In addition, changing a motor is more complicated given it's mounted directly on the fan.
Aldes fans manfactured in Europe (not supplied in the UAE): DFE, Dee Fly

• **Direct drive without housing:** direct drive fan perpendicular to the flow without housing (the unit shell is used as housing). Often used for hygiene air-handling units (such as surgical units) or as roof fans.
Advantages: easy blade cleaning, precise airflows.
Drawbacks: noisy, mounting problems, use of frequency regulation advised. Also, this type of fan is often more expensive.
Aldes fans: VELONE

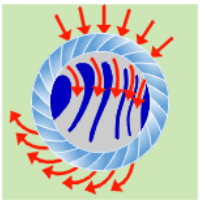
Tangential fans

Principle: air is sucked and perpendicularly propelled to the rotation axis. These fans are mainly used for low pressure and low airflow installations.

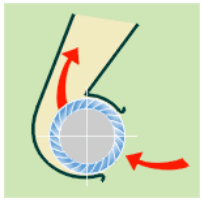
Advantages: do not need a lot of space, low noise emission.

Drawbacks: bad performance, low pressure and airflow.

Two types of tangential fans exist:



• **With stationary blades in the wheel:** these blades guide the airflow through the wheel and avoid turbulence areas.



• **Without stationary blades but with a special housing:** the housing covers a section of the wheel, helping to guide the flow through the outlet.

Areas best suited for use
Best suited for installations with a small available space (floor air-convector, air curtains etc.). The main drawback for this kind of fans is its poor performance, which is around 60%.