



Terminology for Centrifugal and Axial Fans

Common Terminology

Access Door: Door(s) mounted on a fan to provide access to the fan interior for maintenance inspection.

Air Horsepower: The work done by a fan on the gas it moves. This value also may be thought of as the power required to drive the fan if it was 100% efficient.

AMCA: Air Movement Control Association.

Arrangement: A convention for specifying the drive and bearing location on a fan.

Axial Fan: Fans characterized by flow through the impeller, which is generally parallel to the shaft axis.

Belt Drive: A power transfer mechanism consisting of belts and sheaves, or pulleys.

Belt Guard: A component designed to cover a belt drive mechanism in order to prevent human injury.

Brake Horsepower: Net Horsepower. One (1) horsepower is developed when working at the rate of 550 ft-lb per second. The brake horsepower is generally taken as the power required at the fan shaft.

Centrifugal Fan: Any fan with a scroll shaped housing geometry. The airflow enters the impeller axially and exits radially outward.

Class: A numerical description of the construction of the fan, based on minimum operating characteristics. The larger the class numeral, the greater the minimum performance capability and price of a fan.

Cooling Wheel: A heat-dissipating device formed in a circular shape with radial fins. It is usually constructed from a highly conductive alloy, such as aluminum, and is attached to the fan shaft. It protects fan bearings from shaft conveyed heat in high temperature applications.

Cubic Feet per Minute: (abbr. cfm) A description of volume flow rate in Imperial units.

Damper: A mechanical device that regulates the volume of air passing through a fan.



Decibels (dB): A logarithmic unit used to express levels of sound power or sound pressure.

Density Factor: A dimensionless ratio of the density of standard air to the actual gas density.

Design Point: The rating point that establishes the size and speed of the fan.

Dry Bulb Temperature: The temperature of the atmosphere as measured by a dry temperature sensor.

Efficiency: The ratio of useful energy delivered by a dynamic system to the energy supplied to it.

Entry Loss: A pressure drop caused by mechanical energy losses as air decelerates at the entrance of a duct or a pipe. This loss can be minimized by providing a smooth rounded orifice at the duct opening.

Evasé: An expansion transition located directly on the fan discharge. It is used to convert some of the kinetic energy (velocity pressure) of the air into potential energy (static pressure).

Fan: A device designed to move air, which uses a power driven rotating impeller and has at least one inlet opening and one outlet opening.

Fan Characteristic Curve: A curve plot of the Pressure vs. Volume characteristics of a fan running at a given speed handling a gas of a given density. It is usually accompanied by a power consumption curve and may be combined with an efficiency curve. The fan curve is one of the most useful analytical tools available when selecting a fan.

Fan Shaft Power: The power delivered to the input end of the fan shaft and does not include any drive losses other than the fan bearings.

Gas Density: Mass per unit volume of the gas being handled.

Impeller: The rotating device that transmits energy to the air or gas through which it moves. Also called wheel or rotor.

Inch of Water: (abbr. in wg) The pressure exerted by a column of water one inch high at 68°F. It is the most common unit of pressure measurement used in the fan industry.

Inlet box: Inlet boxes can be considered to be a special type of duct elbow that directs air into the inlet(s) of the fan. They are used to turn the airflow and/or protect the fan bearings from the airstream.

Integral base: A frame made from structural steel channels designed to provide a common mounting platform for a fan and its electric motor. If the integral base is supported on vibration isolators, it is referred to as a Vibration Isolation Base.

Isolator: An elastic media placed between the fan and its foundation for the purpose of reducing vibration transmission.



Maximum Continuous Rating: (abbr. MCR) The maximum continuous rating point at which the fan is expected to operate.

Pressure: Force per unit area, typically expressed in inches of water.

Relative Humidity: The ratio of the partial pressure of the water vapour in a mixture to the partial pressure of the water vapour in a saturated mixture at the same temperature.

Spark Resistant Construction: Various construction techniques utilized to reduce the probability of an explosion which might be caused when two ferrous fan parts strike in a volatile gaseous environment.

Static Efficiency: The ratio of the static air power to the fan input power. This can be calculated by multiplying the fan total efficiency by the ratio of fan static pressure to fan total pressure.

Static Pressure: (abbr. SP) The energy carried in the air or gas used to overcome frictional resistance and acts at right angles to a surface. It exists by virtue of the degree of compression only.

TEAO: "Totally Enclosed Air Over" motor enclosure.

TEFC: "Totally Enclosed Fan Cooled" motor enclosure.

Test Block: The point above and beyond the MCR demonstrating the fan margin to the customer.

Tip Speed: The peripheral speed of a fan impeller.

Total Efficiency: The ratio of the total air power to the fan input power. This value is usually expressed as a percentage. Power losses can be due to turbulence, leakage, and friction.

Total Pressure: (abbr. TP) The sum of the static pressure and velocity pressure at any given point in a system. It exists by virtue of the degree of compression and the rate of motion.

Tube Axial: Cylindrical housing that fits closely to the outside diameter of the wheel.

Vane Axial: Cylindrical housing that fits closely to the outside diameter of the blade tips. The straightening vanes allow for greater efficiency and pressure capacity.

Velocity Pressure: (abbr. VP) The pressure necessary to maintain the movement of air (kinetic energy). Fan velocity pressure corresponds to the average velocity at the fan outlet. It exists by virtue of the rate of motion only and is always positive.

Vibration: Periodic motion about an object's position of equilibrium with relatively small amplitude with respect to frequency (peak-to-peak displacement).

Wet Bulb Temperature: The temperature sensed by a thermometer, whose bulb is wrapped with a water-soaked wick, in rapidly moving air.