

0066 _ The AMCA Vocabulary: Definitions

Absolute Pressure

Pressure above a perfect vacuum; the sum of gauge pressure and atmospheric pressure.

Absolute Roughness

A measure of surface unevenness; the distance between high and low points on a surface.

ACFM (Actual Cubic Feet Per Minute)

Actual volume airflow rate through a plane of measurement, at the existing air density, expressed in ft³/min.

ACMS (Actual Cubic Meters Per Second)

Actual volume airflow rate through a plane of measurement, at the existing air density, expressed in m³/s.

Actuator (Operator)

A mechanism attached to a damper or adjustable louver to move its blades, or attached to a vaneaxial fan to change impeller blade pitch. An actuator may be manually, electrically, pneumatically or hydraulically powered.

Acoustic Attenuation Device

Any component having sound absorption as its primary function.

Adjustable Pitch

The ability to mechanically alter the angle (pitch) of an impeller blade with the impeller at rest.

Air Curtain (Airstream)

A directionally-controlled stream of air, moving across the entire height and width of an opening, which reduces the infiltration or transfer of air from one side of the opening to the other and/or inhibits the passage of insects, dust, or debris.

Air Curtain Average Core Velocity

The average of several air curtain core velocities measured along the width of the air curtain.

Air Curtain Core Velocity

The peak air velocity of the air curtain as measured across the air curtain depth at a specified distance from the discharge nozzle.

Air Curtain Depth

The airstream dimension perpendicular to both the height and width of the opening being protected.

Air Curtain Unit Efficiency

The ratio of the air curtain output air power to the power input to the motor, expressed as a percentage.

Air Curtain Unit Rated Throw

The distance away from an air curtain unit discharge nozzle to a point where a specified minimum air velocity is achieved.

Air Curtain Unit Velocity Projection

The average air curtain core velocity at specified distances from the air curtain unit discharge nozzle.

Air Curtain Width

The airstream dimension perpendicular to the direction of airflow and parallel to the width of the opening being protected.

Air (Gas) Density

The mass per unit volume of air or gas.

Airflow Rate – See Volume Airflow Rate or Mass Airflow Rate**Airfoil**

- (1) A shape such that, when it is moved through air, has greater lift than drag.
- (2) A blade or vane having a streamlined shape.

Air System

An assembly of connected ducts, filters, conditioning devices, dampers, louvers and fans for the purpose of moving air from one place to another in a controlled fashion.

Air Throw

The horizontal or vertical axis distance an air stream travels after leaving an air outlet before the air velocity is reduced to a specific terminal value.

AMCA Testing Laboratory

The association's testing laboratory, currently located in Arlington Heights, Illinois, or an independent laboratory licensed by AMCA to perform pre-certification performance tests and performance check tests.

AMCA Accredited Laboratory

A laboratory equipped and staffed to conduct tests according to the appropriate AMCA-accepted test method, and which has been inspected by an AMCA staff engineer and duly approved for such testing.

Anechoic Termination

A device placed at the end of a test duct to prevent excessive reflection of sound waves back into the duct, thus reducing interference with the sound waves being measured.

Attenuate

To weaken a signal by reducing its amplitude.

Attenuation

The amount by which sound amplitude is decreased as it travels from a sound source to a receiver located at a given point.

Average Outlet Velocity

- (1) The airflow rate of a fan per unit area of the fan discharge, calculated by dividing the airflow rate by the area of the fan discharge.
- (2) The free-delivery airflow rate of an air curtain unit divided by the face area of the discharge nozzle.

Axle

A shaft on which a damper or louver blade rotates.

Backplate

A circular plate, a component of a centrifugal fan impeller, which is attached to the fan hub and serves as the major attachment for the impeller blades and as the means of transmitting torque to them.

Backplate / Centerplate Liner

A narrow strip of steel, ceramic or synthetic material, installed in sets, each attached to the backplate / centerplate of an impeller, adjacent to an impeller blade, for the purpose of protection against erosion.

Balancing

The process of adding or removing mass on a rotor to move the center of gravity toward the axis of rotation so as to reduce the unbalanced forces.

Barometric

Pertaining to a barometer or the results obtained by using a barometer.

Barometric Pressure

The absolute pressure exerted by the atmosphere at a location of measurement.

Bearing Loss

The power loss resulting from friction in the main bearings of a fan or motor.

Blade

- (1) The flow element of an impeller, which, by its shape and motion, generates airflow inside a fan, transforming impeller rotational energy to kinetic energy of airflow;
- (2) A movable surface in a damper or louver that can be rotated to control airflow;
- (3) A stationary louver surface intended to restrict the passage of water, sound or other airborne materials, or to limit visual see-through.

Blade Entry Seal

The sealing arrangement through which a damper blade passes in a guillotine damper.

Blade Liner

A steel, ceramic or synthetic material piece having the same size and shape as the fan blade, which covers the fan blade face in part or completely for the purpose of protection against erosion.

Blade Passage Frequency (BPF)

The tone generated by the fan's blades passing a fixed object and having a frequency given by: $f(\text{Hz}) = (\text{number of blades} \times \text{fan revolutions per minute}) / 60$.

Blade Support

- (1) A structural member, located inside the duct section of a guillotine damper frame, which supports the blade load when the damper is in the closed position;
- (2) A bracket that connects a stationary louver blade to a rear-mounted structural support.

Blast Area

The outlet area of a centrifugal fan less the projected area of its cut-off.

Bonnet

The portion of a guillotine damper that supports the damper blade when the damper is in the open position.

- (1) Open Type: The damper blade is exposed to the atmosphere when blade is withdrawn from the duct.
- (2) Fully Enclosed (Sealed) Type: The entire bonnet encloses the damper blade when the damper is in the open position.

Casing – See Housing**Centerline Support**

A method of supporting a fan housing at its centerline when necessary to control differential thermal growth of the housing.

Centerplate – see Backplate**Certified Rating**

A published performance rating of a product which AMCA has licensed to bear the AMCA Certified Performance

Rating Seal. The seller of the product certifies that the rating is in accordance with the appropriate AMCA-approved test method and that the requirements of the AMCA Certified Ratings Program have been met.

Certified Ratings Program (CRP)

The testing and licensing program established by AMCA International to verify the published performance ratings of a product produced by a seller.

Chamber

- (1) A test enclosure having a means for settling airflow, a cross sectional area larger than the inlet/outlet of test equipment connected to it, and the capability for measuring airflow rate and pressure.
- (2) An enclosure used to regulate airflow and to absorb sound.

Class Standard

An established minimum performance level of fan aerodynamic performance in terms of pressure and airflow rate.

Compressibility

The characteristic of air or a gas whereby its density is a function of pressure.

Compressibility Coefficient

A thermodynamic coefficient used to correct the perfect gas equation when applied to air or gas.

Continuous Line (Continuous Blade)

A term describing a louver constructed with blades that present an uninterrupted horizontal or vertical line to complement or enhance architectural features.

Controllable Pitch Impeller

An axial impeller having a mechanism by which the pitch angle of all the impeller blades can be changed while the impeller is rotating.

Core Area

The front cross-sectional area (product of minimum width and minimum height) of the front opening of a louver assembly with the blades removed.

Core Area Velocity

The airflow rate through a louver divided by its core area.

Corrosion Resistant

A term descriptive of materials or surface treatments that reduce corrosive attack.

Counterbalance

Weights or springs that offset the unbalanced weight of an eccentrically pivoted damper blade.

Counterweight

An adjustable or variable weight used to offset (counterbalance) an eccentrically pivoted damper blade.

Critical Speed, First

The rotational speed of a fan corresponding to the lowest natural frequency of the rotating fan impeller and shaft assembly when mounted on rigid supports without benefit of damping.

Cut-Off

A baffle or plate at the narrowest radial distance between the impeller and the housing near the outlet of a centrifugal fan, and which directs air away from the impeller and minimizes recirculation of air.

Curb

A roof penetration with a raised perimeter to seal against the weather and to facilitate installation of roof mounted ventilation equipment such as a fan or hood.

Decibel

A dimensionless number expressing, in logarithmic terms, a level of sound pressure or power.

Density

The mass per unit volume of a gas, liquid, or solid.

Determination

The complete set of measurements for a particular point of operation for a product under test. The measurements must be sufficient to determine all performance variables.

Diffuser

- (1) A duct discharge termination through a ceiling for the control and discharge of air;
- (2) A gradual transition of a duct, located at a fan outlet, which increases in cross sectional area and permits a portion of velocity pressure to be regained as static pressure; also known as an evasé.

Discharge Angle

- (1) The angle formed by the plane of an opening and the direction of an air curtain;
- (2) The angle of air or other gas flow exiting an impeller.

Discharge Nozzle

An air curtain unit component that directs and controls the airstream.

Discharge Nozzle Depth

The inside nozzle dimension perpendicular to both the direction of airflow and the width of the airstream.

Discharge Nozzle Width

The inside nozzle dimension perpendicular to the direction of airflow and parallel to the width of the airstream.

Discharge Static Pressure – see Fan Static Pressure**Dry-Bulb Temperature**

Air temperature measured by a temperature-sensing device without modification to compensate for the effect of humidity.

Dry-Bulb Thermometer

An ordinary thermometer, especially one with an un-moistened bulb; not influenced by atmospheric humidity.

Duct

A passageway used primarily for conveying air or other gas at low pressure.

Ducted Fan

A fan having ductwork connected to the fan inlet, the fan outlet, or both.

Dynamic Similarity

A comparison that uses ratios of forces due to elasticity, viscosity, gravity, surface tension, inertia and pressure to show equivalence between two similar fans. The variables compared are fan Reynolds number, point of operation, compressibility, gas specific heat ratio, and tip speed Mach parameter.

Efficiency

A ratio of the useful energy provided by a dynamic application to the energy supplied to the system at a specific point of operation.

End Reflection

A phenomenon that occurs whenever sound is transmitted across an abrupt change in area, such as from the end of a duct into a room. When end reflection occurs, some of the sound is reflected back into the smaller area of the duct and does not escape into the room.

Energy Factor

The ratio of the total kinetic energy of airflow to the kinetic energy corresponding to the average air velocity.

Equivalent Diameter

The diameter of a circle having the same area as another geometric shape. For a rectangular cross-section having width (a) and height (b), the equivalent diameter is given by: $D_e = (4ab/\pi)^{0.5}$

Explosion-Proof Apparatus

Apparatus enclosed in a case that is capable of withstanding an explosion of a specified gas or vapor which may occur within it, and of preventing the ignition of a specified gas or vapor surrounding the enclosure by sparks, flashes, or explosion of the gas or vapor within, and which operates at such an external temperature that a surrounding flammable atmosphere will not thereby be ignited.

External Static Pressure – see Fan Static Pressure Rise**Evasé – See Diffuser****Expansion Joint (Flexible Connector)**

A flexible member used to attach a fan inlet and/or outlet to a connecting duct.

Face Area

The total cross-sectional area of an air curtain unit discharge, a damper, louver, or duct.

Fan

- (1) A device that uses a power-driven rotating impeller to move air or gas. The internal energy increase imparted by a fan to air or a gas is limited to 25 kJ/kg (10.75 BTU/lbm).
- (2) A device having a power-driven rotating impeller, without a housing, for circulating air in a room.

Fan Air (Gas) Density

The density of air or gas corresponding to the total pressure, total temperature, and composition of the air or gas at a fan inlet.

Fan Airflow Rate

The volume airflow rate at a fan inlet at fan air density.

Fan Appurtenances

Accessories added to a fan for the purpose of control, isolation, safety, static pressure regain, erosion protection, etc. Common appurtenances include inlet box(es), inlet box damper, variable inlet vane, outlet damper, vibration isolation base, inlet screen, belt guard, evasé or diffuser, sound attenuator, erosion protection, and turning gear.

Fan Boundaries

Limits defining the interfaces between the fan and the remainder of the air system and delineated as the planes perpendicular to the airstream as it enters and leaves a fan. Various appurtenances, such as an inlet box, inlet vane, inlet cone, silencer, screen, rain hood, damper, evasé or diffuser, may be included as part of a fan between the inlet and outlet boundaries.

Fan Efficiency, Static – see Fan Static Efficiency**Fan Efficiency, Total – see Fan Total Efficiency**