04. *DEFINITIONS & TERMINOLOGY*

Air Density (ρ): The mass per unit volume of the air, expressed in Kg/M^3 or Lbs/Ft^3

Air Flow Rate (Q): The volume of air moved by the fan per unit of time, expressed in CFM (cubic feet per minute) or M^3/S.

Air Power (Static): That part of the energy, per unit time, imparted by the fan to the air in overcoming Static Pressure (P_S) from that at the inlet to that at the outlet.

Air Power (Total): That part of the energy , per unit time, imparted by the fan to the air by increasing its Total Pressure (P_t) from that at the inlet to that at the outlet.

Axial Flow Fan: A fan in which the flow of air is substantially parallel to the axis of the impeller rotation.

Fan: A device for moving air, which utilizes a power, driven rotating impeller. A fan shall have at least one inlet and one outlet.

Fan Characteristics: The curves depicting the relationship between air flow rate, total pressure, fan power input and fan total efficiency at a specified pitch angle and RPM.

Fan Duty (Static): The volume of air to be moved, by the fan, at a specified static pressure (P_s)

Fan Duty (Total): The volume of air to be moved, by a fan, at a specified total pressure (P_t).

Fan Power Input (H_I): The energy input, per unit time, required to drive a fan, expressed in Break Horse Power (BHP) or Break Kilowatt (BKW).

Fan Speed (N): The number of revolutions of the fan about its axis per unit time, expressed in revolutions per minute (RPM).

Fan Total Efficiency (η_t): The ratio of air power (total) to the fan power input.

Fan Static Efficiency (η_s): The ratio of the air power (static) to the fan power input.

Stall: The region of instability in fan performance caused by the separation of the air flow from the surface of the fan blade. The stall condition is depicted by a dip in the performance curve.

Standard Air: Atmospheric air having a specific weight of 1.2 $Kg./M^3$ which is dry air at 20° C and 50% relative humidity with a barometric pressure of 760 MM Hg.

Static Pressure Margin: The pitch angle margin available between the selected operating point and stall point on the performance curve.

Static Pressure (P_s): The sum of all resistance to the path of air flow in a given system which a fan must overcome to move a specific volume of air, expressed in MM or inches of water column, or, Pascals (N/M^2).

Tip Clearance: The clearance between the fan blade tip and the fan casing wall.

Tip Speed (T_S): The linear speed at the fan blade tip at a given fan RPM, expressed in ft./min. or M/S.

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

Velocity (V): The rate of air flow divided by the net area of the air flow, and is expressed in M/S or ft/min.

Velocity Pressure (P_V): The portion of air pressure which exists by virtue of the rate of motion only, expressed in MM or inches of water column, or, Pascals (Pa).