

Terminology

Glossary of Physical and Heating, Ventilating, Refrigerating and Air Conditioning Terms Used in the Text

- Absolute Humidity:** See *Humidity*.
- Absolute Pressure:** The pressure referred to that of a perfect vacuum. It is the sum of gage pressure and barometric pressure.
- Absolute Temperature:** A reading on the absolute temperature scale. Absolute temperature is obtained by adding 459.70 degrees to the Fahrenheit temperature.
- Absolute Zero:** The zero point on the absolute scale 459.70 F below the zero of the Fahrenheit scale.
- Acceleration:** The rate of change of velocity. In the fps system this is expressed in units of one foot per second. $a = V \div t$.
- Acceleration Due to Gravity:** The rate of gain in velocity of a freely falling body, the value of which varies with latitude and elevation. The international gravity standard has the value of 980.665 cm per second per second or 32.174 ft per second per second, which is the actual value of this acceleration at sea level and about 45 deg latitude.
- Adiabatic:** An adjective descriptive of a process in which no heat is added to or extracted from the system executing the process.
- Air Cleaner:** A device designed for the purpose of removing air-borne impurities such as dusts, fumes and smokes. (Air cleaners include air washers and air filters.)
- Air Conditioning:** The simultaneous control of all or at least the first three of those factors affecting both the physical and chemical conditions of the atmosphere within any structure. These factors include temperature, humidity, motion, distribution, dust, bacteria, odors and toxic gases, most of which affect in greater or lesser degree human health or comfort. (See *Comfort Air Conditioning*.)
- Air Washer:** An enclosure in which air is forced through a spray of water in order to cleanse, humidify, or dehumidify the air.
- Anemometer:** An instrument for measuring the velocity of moving air.
- Atmospheric Pressure:** The pressure indicated by a barometer. *Standard atmospheric pressure* is a pressure of 76 cm mercury (density 13.5951 grams per cubic centimeter, gravity 980.665 cm per second per second). It is equivalent to 14.696 lb per square inch or 29.921 in. of mercury at 32 F.
- Baffle:** A plate or wall for deflecting gases or fluids.
- Blast Heater:** A set of heat transfer coils or sections used to heat air which is drawn or forced through it by a fan.
- Boiler Heating Surface:** That portion of the surface of the heat-transfer apparatus in contact with the fluid being heated on one side and the gas or refractory being cooled on the other, in which the fluid being heated forms part of the circulating system; this surface shall be measured on the side receiving heat. This includes the boiler, water walls, water screens, and water floor. (*A.S.M.E. Power Test Codes, Series 1929*.)
- Boiler Horsepower:** The equivalent evaporation of 34.5 lb of water per hour from and at 212 F. This is equal to a heat output of $970.3 \times 34.5 = 33,475$ Btu per hour.
- British Thermal Unit:** A unit of energy defined in terms of the international steam-table calorie through the convenient relation 1 Btu per pound per degree Fahrenheit = 1 cal per gram per degree Centigrade. It is approximately the quantity of heat required to raise the temperature of 1 lb of liquid water from 63 to 64 F.
- By-pass:** A pipe or duct, usually controlled by valve or damper, for conveying a fluid around a main control valve or damper.
- Calorie:** (Large calorie or I. T. kilocalorie) is equal to 1000 international steam-table calories = 1/860 international kilowatt-hour. For practical purposes it may be con-

sidered as 1/100 of the heat required to raise the temperature of 1 kilogram of water from 0 to 100 C.

Central Fan System: A mechanical indirect system of heating, ventilating, or air conditioning, in which the air is treated or handled by equipment located outside the rooms served, usually at a central location, and is conveyed to and from the rooms by means of a fan and a system of distributing ducts. (See Chapter 20.)

Chimney Effect: The tendency in a duct or other vertical air passage for air to rise when heated, owing to its decrease in density.

Coefficient of Heat Transmission: The amount of heat (Btu) transmitted from air to air in one hour per square foot of the wall, floor, roof or ceiling for a difference in temperature of 1 F between the air on the inside and that on the outside of the wall, floor, roof or ceiling.

Comfort Air Conditioning: The process by which simultaneously the temperature, moisture content, movement and quality of the air in enclosed spaces intended for human occupancy may be maintained within required limits. (See *Air Conditioning*.)

Comfort Line: The effective temperature at which the largest percentage of adults feels comfortable.

Comfort Zone (Average): The range of effective temperatures over which the majority (50 per cent or more) of adults feel comfortable. **Comfort Zone (Extreme):** The range of effective temperatures over which one or more adults feel comfortable. (See Chapter 2.)

Concealed Radiator: A heating device located within, adjacent to, or exterior to the room being heated but so covered or enclosed or concealed that the heat transfer surface of the device, which may be either a radiator or a convector, is not visible from the room. Such a device transfers its heat to the room largely by convection air currents.

Conductance: The amount of heat (Btu) transmitted from surface to surface in one hour through one square foot of a material or construction, whatever its thickness, when the temperature difference is 1 F between the two surfaces.

Conduction: The transmission of heat through and by means of matter unaccompanied by any obvious motion of the matter.

Conductivity: The amount of heat (Btu) transmitted in one hour through one square foot of a homogeneous material 1 in. thick (or 1 ft) for a difference in temperature of 1 F between the two surfaces of the material.

Conductor (Heat): A material capable of readily conducting heat. The opposite of an insulator or insulation.

Constant Relative Humidity Line: Any line on the psychrometric chart representing a series of conditions which may be evaluated by one percentage of relative humidity; there are also constant dry-bulb lines, wet-bulb lines, effective temperature lines, vapor pressure lines, and lines showing other physical properties of air mixed with water vapor.

Convection: The transmission of heat by the circulation of a liquid or a gas such as air. Convection may be *natural* or *forced*.

Convector: A heat transfer surface designed to transfer its heat to surrounding air largely or wholly by convection. Such a surface may or may not be enclosed or concealed. When concealed and enclosed the resulting device is sometimes referred to as a concealed radiator. (See also definition of *Radiator*.) (See also Chapter 13.)

Decibel: A unit commonly used for expressing sound or noise intensities referred to an arbitrary reference level. It is defined by the relation $db = 10 \log_{10} \frac{P_1}{P_0}$, where P_1 is the unknown intensity, and P_0 is the reference level which is commonly taken as 10^{-12} watts per square centimeter.

Degree-Day: A unit, based upon temperature difference and time, used in specifying the nominal heating load in winter. For any one day there exists as many degree-days as there are degrees Fahrenheit difference in temperature between the mean temperature for the day and 65 F.

Degree of Saturation or Per Cent Saturation: The ratio of actual humidity ratio W to the saturation humidity ratio W_s corresponding to the actual temperature and the