

inlet from exceeding a selected value. It is used primarily to prevent overload on compressor motors.

valve, thermal: a valve controlled by a thermally responsive element; for example, a thermostatic expansion valve which is usually responsive to suction or evaporator temperature.

valve, water regulator: an automatic valve to control the flow of cooling water through a condenser.

valve seat: the stationary portion of the valve which, when in contact with the movable portion, stops flow completely.

vane ratio: in air distributing devices the ratio of depth of vane to shortest opening width between two adjacent grille bars.

vapor: a gas, particularly one near to equilibrium with the liquid phase of the substance and which does not follow the gas laws. Usually used instead of gas for a refrigerant, and in general for any gas below the critical temperature.

vapor, saturated: vapor in equilibrium with its liquid; that is, when the numbers, per unit time, of molecules passing in two directions through the surface dividing the two phases, are equal.

vapor, superheated: vapor at a temperature which is higher than the saturation temperature (i.e., boiling point) at the existing pressure.

vapor, water: used commonly in air conditioning practice to refer to steam in the atmosphere.

vapor, wet, quality of: fraction by weight of vapor in mixture of liquid and vapor.

vapor barrier: a moisture-imperious layer applied to the surfaces enclosing a humid space to prevent moisture travel to a point where it may condense due to lower temperature.

vapor lock: formation of some vapor or all vapor in a liquid line reducing weight flow as compared to weight flow in liquid phase with the same pressure differential.

vapor lock device: an orifice, capillary tube, or other device having a restricted passage of fixed size for liquid refrigerant. It restricts flow of vapor of that same liquid to a lower rate of flow (in lb per min) with the same pressure difference.

velocity: a vector quantity which denotes at once the time rate and the direction of a linear motion.

velocity, outlet: the average discharge velocity of primary air being discharged from the outlet; normally measured in the plane of the opening.

velocity, room: the average sustained residual air velocity level in the occupied zone of the conditioned space, e.g., 65, 50, 35 fpm.

velocity, terminal: the highest sustained air stream velocity existing in the mixed air path at the end of the throw.

ventilation: the process of supplying or removing air, by natural or mechanical means, to or from any space. Such air may or may not have been conditioned.

viscosity: that property of semifluids, fluids, and gases by virtue of which they resist an instantaneous change of shape or arrangement of parts. It is the cause of fluid friction whenever adjacent layers of fluid move with relation to each other.

viscosity, absolute: the force per unit area required to produce

unit relative velocity between two parallel areas of fluid unit distance apart.

viscosity, coefficient of: same as absolute viscosity.

viscosity, kinematic: the ratio of absolute viscosity to density of a fluid.

volatile liquid: one which evaporates readily at atmospheric pressure and room temperatures.

volume, specific: the volume of a substance per unit mass; the reciprocal of density.

water, jacket: in a compressor, the water used for cooling the cylinder head and/or walls.

water, makeup: water supplied to replenish, as water replacing that lost by evaporation.

water, raw: in ice making, any water used for ice making except distilled water.

water cooler: evaporator for cooling water in an indirect refrigerating system.

water-cooling tower: an enclosed device for evaporatively cooling water by contact with air.

water-cooling tower, atmospheric: one in which the air movement through the tower is dependent only upon atmospheric conditions. Also known as natural draft cooling tower.

water-cooling tower, forced draft: a mechanical draft water-cooling tower having one or more fans located in the air entering the tower.

water-cooling tower, induced draft: a mechanical draft water-cooling tower having one or more fans located in the air leaving the tower.

water-cooling tower, mechanical draft: one utilizing one or more fans to move the air through the tower, the fans being an integral part of the tower.

wax: a solid material which may separate on cooling of oil-refrigerant mixtures.

weep: drip from frozen foods.

wet-bulb depression: difference between dry-bulb and wet-bulb temperatures.

wire-drawing: restriction of area for a flowing fluid, causing a loss in pressure by (internal and external) friction without loss of heat or performance of work; throttling.

work, effective: net mechanical energy required by, or load imparted to, piston of compressor.

work, indicated: work equivalent of indicator card area for a reciprocating compressor or engine.

wort: the unfermented infusion of malt which, when fermented, produces beer.

zone, comfort (average): the range of effective temperatures over which the majority (50 percent or more) of adults feel comfortable. (extreme): the range of effective temperatures over which one or more adults feel comfortable.

zone of maximum crystal formation: temperature range in freezing in which most of the freezing takes place (about 25 to 30 F for water).

ABBREVIATIONS AND SYMBOLS

Standard Abbreviations; Letter Symbols; Graphical Symbols for Piping, Ductwork, Heating and Ventilating, Refrigerating, Identification of Piping by Color

THIS chapter contains information regarding abbreviations and symbols which are of particular interest to the engineer engaged in heating, ventilating, refrigerating, and air conditioning.

ABBREVIATIONS FOR TEXT AND DRAWINGS

Abbreviations are shortened forms of names and expressions employed in texts and tabulations, and should not generally be used as symbols in equations. Most of the following abbreviations have been compiled from a list of approved standards.^{1,2,3} In general, the period has been omitted in all abbreviations, except where the omission results in the formation of an English word.

Term	Text	Drawings
absolute	abs	ABS
accumulator		ACCUM
adapter		ADPT
agitator		AGTR
air circuit breaker		ACB
air condition		AIR COND
(-ing, -ed, -er)		AHP
air horsepower	ahp	ALM
alarm		ALTN
alteration		AC
alternating current	ac	ALT
altitude	alt	AMB
ambient	amb	Amer Std
American Standard		AWG
American wire gage	AWG	AMP
ampere	amp	AMP-HR
ampere-hour	amp-hr	ANHYD
anhydrous		A
Angstrom unit	A	A
apparatus dew point	adp	ADP
apartment		APPD
approved		APPROX
approximate	approx	ARC/W
arc weld		ATM
atmosphere	atm	ATO
automatic		ACV
automatic check valve		AVG
average	avg	AVDP
avordupois	avdp	BARO
barometer	baro	BBL
barrel	bbl	BSMT
basement		BE
Baume	be	B/M
bill of material		

The general responsibility for this chapter is assigned to TC 1.14, Definitions and Nomenclature.

Term	Text	Drawings
boiler		BLR
boiling point	bp	BP
brake horsepower	bhp	BHP
brake horsepower-hour	bhp-hr	BHP-HR
British thermal unit(s)	Btu	BTU
British thermal units per hour	Btuh	BTUH
British thermal units per hour (thousands)	MBh	MBH
Brown & Sharpe wire gage	B&S	B&S
bushel	bu	bu
B-X cable		BX
calorie	cal	CAL
center-to-center	c to c	C to C
centigrade heat unit	chu	CHU
centigram	cg	CG
centimeter	cm	CM
centimeter-grain-second (system)	cg	CGS
check valve		CV
clockwise		CW
condenser		COND
corporation		CORP
counterclockwise		CCW
cubic	cu	CU
cubic centimeter	cc	CC
cubic feet per minute	cfm	CFM
cubic feet per second	cfs	CFS
cubic foot	cu ft	CU FT
cubic inch	cu in.	CU IN.
cylinder	cyl	CYL
decibel	db	DB
degree	deg or °	DEG or °
degree Centigrade	C	C
degree Fahrenheit	F	F
degree Kelvin	K	K
degree Rankine	R	R
dew point temperature	dpt	DPT
diameter	dia	DIA
direct connected		DIR CONN
direct current	dc	DC
discharge		DISCH
dry-bulb temperature	dbt	DBT

¹ Abbreviations for Scientific and Engineering Terms, Z19.1-1941 (American Standards Association).

² Abbreviations for Use on Drawings, Z32.13-1950 (American Standards Association).

³ Refrigeration Nomenclature for Text and Drawings, (Proposed American Standard B33, Part B) (Published in Refrigerating Engineering, August 1950, p. 770).

⁴ It is recommended that the abbreviation for the temperature scale, F, C, K, R, be included in expressions for numerical temperatures but, wherever feasible, the abbreviation for degree be omitted e.g., 65 F.