

index which combines the readings of temperature, humidity, and air motion into a single value. The numerical value of the effective temperature scale has been fixed by the temperature of saturated air which induces an identical sensation of warmth.

Humidity: The water vapor (either saturated or superheated steam) occupying any space, which may or may not contain other vapors and gases at the same time.

Relative Humidity: A ratio, although usually expressed in per cent, used to indicate the degree of saturation existing in any given space resulting from the water vapor present in that space. The presence of air or other gases in the same space at the same time has nothing to do with the relative humidity of the space, which depends merely on the temperature and partial pressure of the vapor.

Spaces in Which the Only Source of Contamination Is the Occupant: Spaces in which the atmospheric contamination results entirely from the respiratory processes of the occupant, including heat, moisture, and odors given off by the body. No manufacturing or industrial processes or other sources of atmospheric contamination, including heat and moisture, than people are considered under this title.

TABLE A.—EFFECTIVE TEMPERATURES RANGING FROM 64 DEG TO 69 DEG FOR VARIOUS DRY-BULB TEMPERATURES AND RELATIVE HUMIDITIES FOR STILL AIR FOR PERSONS NORMALLY CLOTHED AND SLIGHTLY ACTIVE^a

(For use when heating or humidification is required)

DRY-BULB TEMPERATURES (DEG FAHR)	RELATIVE HUMIDITIES (PER CENT)						
	30	35	40	45	50	55	60
	EFFECTIVE TEMPERATURES (DEGREES)						
67							
68							
69	64.1	64.4	64.0	64.2	64.5	64.0	64.3
70	64.8	65.1	64.8	65.1	65.4	64.8	65.1
71	65.5	65.8	65.4	65.8	66.2	65.5	65.8
72	66.2	66.5	66.0	66.4	66.8	66.2	66.5
73	67.0	67.3	66.7	67.1	67.5	66.9	67.2
74	67.7	68.0	67.4	67.8	68.2	67.6	67.9
75	68.4	68.7	68.1	68.5	68.9	68.3	68.6
76	69.0						

^aSee Fig. 3.

TABLE B. EFFECTIVE TEMPERATURES RANGING FROM 69 DEG TO 73 DEG FOR VARIOUS DRY-BULB TEMPERATURES AND RELATIVE HUMIDITIES FOR STILL AIR FOR PERSONS NORMALLY CLOTHED AND SLIGHTLY ACTIVE^{a,b}

(For use when cooling or dehumidification is required)

DRY-BULB TEMPERATURES (DEG FAHR)	RELATIVE HUMIDITIES (PER CENT)						
	30	35	40	45	50	55	60
	EFFECTIVE TEMPERATURES (DEGREES)						
73							
74							
75							
76	69.0	69.4	69.1	69.5	69.3	69.7	69.3
77	69.7	70.2	69.9	70.5	70.0	70.5	70.1
78	70.4	70.9	70.7	71.2	70.8	71.3	70.8
79	71.1	71.6	71.4	71.9	71.6	72.1	71.6
80	71.8	72.4	72.2	72.6	72.4	72.8	72.4
81	72.5						

^aSee Fig. 3.

^bThis table applies primarily to cases in which the human body has reached equilibrium with the surrounding air. A higher plane of summer effective temperatures is required in places of public assembly where the period of occupancy is short, than is required for offices and industrial plants where the period of occupancy is of longer duration. When the period of occupancy is two hours or less, the dry-bulb temperature shall be 72 F plus one-third of the difference between the outside dry-bulb temperature and 70 F, and the relative humidity shall not exceed 60 per cent. (See also Table 2.)

FACTORS INFLUENCING APPLICATIONS

The conditions and limitations outlined under the heading Application of Comfort Chart should be noted in applying the temperatures and relative humidities specified in Tables A and B of the preceding A.S.H.V.E. Ventilation Standards.

Air Quality

In occupied spaces in which the vitiation is entirely of human origin, the chemical composition of the air, the dust, and bacteria content may be dismissed from consideration so that the problem consists in maintaining a suitable temperature with a moderate humidity, and in keeping the atmosphere free from objectionable odors. Such unpleasant odors, human or otherwise, can be easily detected by persons entering the room from clean, odorless air. A further discussion of air quality will be found in Chapters 15 and 16.

Air Motion

As a result of studies by Baetjer³⁴ and work carried on by the A.S.H.V.E. Research Laboratory, it is now recognized that the importance of air motion in air conditioning ranks only second to temperature. Air in an occupied space having all the other essential qualities but lacking in air motion feels stagnant, stuffy, and depressing, because the vitiated air next to the body is not replaced by the surrounding air possessing the satisfactory qualities. Hence, air motion is absolutely essential that an occupant may realize the other desired qualities of the atmosphere. Possible limits in variation in air motion may range from 5 fpm to 50 fpm, as measured by the Kata thermometer. (See Chapter 40.) However, satisfactory results are more likely to be insured by air velocities ranging from 15 to 30 fpm. The limit of 5 fpm may be taken as the minimum during the heating season, and 50 fpm as the maximum for the cooling season.

Air Distribution

Variation in concentration of carbon dioxide in different parts of an occupied room has been used as a measure of satisfactory distribution of the outside or conditioned air supply. For satisfactory air distribution, the carbon dioxide concentration at the 36-in. level should not vary by more than one part in 10,000 parts of air. Recent work² by the A.S.H.V.E. Research Laboratory demonstrates that variations in dry-bulb temperature, wet-bulb temperature, or moisture content of the air are equally good indices of air distribution. This work also indicates that the presence of satisfactory air motion within the room (15 to 30 fpm as measured by the Kata thermometer) insures satisfactory distribution. Because of the laborious and exacting technique involved in making carbon dioxide determinations, it is recommended that satisfactory distribution can be amply insured by the presence of such air velocities in all parts of the room together with dry-bulb temperature variations of not to exceed 3 deg at the 36-in. level.

³⁴Threshold Air Currents in Ventilation (*American Journal of Hygiene*, Vol. IV, No. 6, p. 650, 1924).