

symbols found necessary in the individual chapters will be found in a list at the end of Chapters 3, 4, 5, 7, 15, 16, 39, and 41.

|                                                                                                                                                 |                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Acceleration, due to gravity.....                                                                                                               | <i>g</i>                                      |
| Acceleration, linear.....                                                                                                                       | <i>a</i>                                      |
| Area.....                                                                                                                                       | <i>A</i>                                      |
| Change in specific volume during vaporization.....                                                                                              | $\Delta v_g$                                  |
| Density, Weight per unit volume, Specific weight.....                                                                                           | <i>d</i> or $\rho$ (rho)                      |
| $d = \frac{1}{v}$                                                                                                                               |                                               |
| Distance, linear.....                                                                                                                           | <i>s</i>                                      |
| Dry saturated vapor, Dry saturated gas at saturation pressure and temperature, vapor in contact with liquid.....                                | Subscript <i>g</i>                            |
| Efficiency.....                                                                                                                                 | $\eta$                                        |
| Elevation above some datum.....                                                                                                                 | <i>z</i> , <i>Z</i>                           |
| Emissivity.....                                                                                                                                 | $\epsilon$                                    |
| Energy in general; work, total; work, molal.....                                                                                                | <i>E</i>                                      |
| Entropy. (The capital should be used for any weight, and the small letter for unit weight).....                                                 | <i>S</i> or <i>s</i>                          |
| Force, total load.....                                                                                                                          | <i>F</i>                                      |
| Gas Constant, in equation $pV = nRT$ .....                                                                                                      | <i>R</i>                                      |
| Head.....                                                                                                                                       | <i>H</i> or <i>h</i>                          |
| Heat content, Total heat, Enthalpy. (The capital should be used for any weight and the small letter for unit weight).....                       | <i>H</i> or <i>h</i>                          |
| Heat content of saturated liquid, Total heat of saturated liquid, Enthalpy of saturated liquid, sometimes called heat of the liquid.....        | <i>h_f</i>                                    |
| Heat content of dry saturated vapor, Total heat of dry saturated vapor, Enthalpy of dry saturated vapor.....                                    | <i>h_g</i>                                    |
| Heat of vaporization at constant pressure.....                                                                                                  | <i>L</i> or $h_{fg}$                          |
| Hydraulic radius.....                                                                                                                           | <i>R_H</i>                                    |
| Internal energy, Intrinsic energy. (The capital should be used for any weight and the small letter for unit weight).....                        | <i>U</i> or <i>u</i>                          |
| Length of path of heat flow, thickness.....                                                                                                     | <i>L</i>                                      |
| Load, total.....                                                                                                                                | <i>W</i>                                      |
| Mechanical efficiency.....                                                                                                                      | $\epsilon_m$                                  |
| Mechanical equivalent of heat.....                                                                                                              | <i>J</i>                                      |
| Power, Horsepower, Work per unit time.....                                                                                                      | <i>P</i>                                      |
| Pressure, Absolute pressure, Gage pressure, Force per unit area.....                                                                            | <i>p</i>                                      |
| Quantity (total) of fluid, water, gas, heat; Quantity by volume; Total quantity of heat transferred.....                                        | <i>Q</i>                                      |
| Quality of steam, Pounds of dry steam per pound of mixture.....                                                                                 | <i>x</i>                                      |
| Reynolds Number.....                                                                                                                            | <i>N_{Re}</i>                                 |
| Saturated liquid at saturation pressure and temperature, Liquid in contact with vapor.....                                                      | Subscript <i>f</i>                            |
| Specific heat.....                                                                                                                              | <i>c</i>                                      |
| Specific heat at constant pressure.....                                                                                                         | $c_p$                                         |
| Specific heat at constant volume.....                                                                                                           | $c_v$                                         |
| Specific volume, Volume per unit weight, Volume per unit mass.....                                                                              | <i>v</i>                                      |
| Temperature (ordinary) F or C. ( <i>Theta</i> is used preferably only when <i>t</i> is used for Time in the same discussion).....               | <i>t</i> or $\theta$ ( <i>theta</i> )         |
| Temperature (absolute) F abs or K. (Capital <i>theta</i> is used preferably only when small <i>theta</i> is used for ordinary temperature)..... | <i>T</i> or $\Theta$ ( <i>capital theta</i> ) |

Thermal conductance<sup>4</sup>: heat transferred per (unit time) (degree).....*C*

$$C = \frac{1}{R} = \frac{kA}{L} = \frac{q}{t_1 - t_2}$$

Thermal conductance per unit area, Unit conductance: heat transferred per (unit time) (unit area) (degree).....*C<sub>a</sub>*

$$C_a = \frac{C}{A} = \frac{1}{RA} = \frac{q}{A(t_1 - t_2)} = \frac{k}{L}$$

Thermal conductivity: heat transferred per (unit time) (unit area) (degree per unit length).....*k*

$$k = \frac{\frac{q}{A}}{(t_1 - t_2)/L}$$

Surface coefficient of heat transfer, Film coefficient of heat transfer, Individual coefficient of heat transfer: heat transferred per (unit time) (unit area) (degree).....*f*

$$f = \frac{\frac{q}{A}}{t_1 - t_2}$$

(In general *f* is not equal to  $k/L$ , where *L* is the actual thickness of the fluid film.)

Over-all coefficient of heat transfer, Thermal transmittance per unit area: heat transferred per (unit time) (unit area) (degree over-all).....*U*

$$U = \frac{\frac{q}{A}}{t_1 - t_2}$$

Thermal transmission (heat transferred per unit time).....*q*

$$q = \frac{Q}{t}$$

Thermal resistance (degree per unit of heat transferred per unit time).....*R*

$$R = \frac{t_1 - t_2}{q} = \frac{L}{kA}$$

Thermal resistivity..... $1/k$

Vaporization values at constant pressure, Differences between values for saturated vapor and saturated liquid at the same pressure.....Subscript *fg*

Velocity.....*V*

Viscosity, absolute..... $\mu$

Viscosity, kinematic..... $\mu/\rho$

Volume (total).....*V*

Volume per unit time, Rate at which quantity of material passes through a machine, Quantity of heat per unit time, Quantity of heat per unit weight.....*q*

Weight of a major item, Total weight.....*W*

Weight rate, Weight per unit of power, Weight per unit of time.....*w*

Work (total).....*W*

<sup>4</sup>Terms ending *ivity* designate properties independent of size or shape, sometimes called *specific properties*. Examples: conductivity, resistivity. Terms ending *once* designate quantities depending not only on the material, but also upon size and shape, sometimes called *total quantities*. Examples: conductance, transmittance. Terms ending *ion* designate rate of heat transfer. Examples: conduction, transmission.