

SI - British Conversion Factors

MASS

$$1 \text{ kg} = \frac{1}{0.452\ 592\ 37} \text{ lb}$$

$$= 2.205 \text{ lb}$$

LENGTH

$$1 \text{ m} = \frac{1}{0.3048} \text{ ft}$$

$$= 3.281 \text{ ft}$$

VOLUME

$$1 \text{ m}^3 = 10^3 \text{ dm}^3 \text{ (litre)}$$

$$= 35.31 \text{ ft}^3$$

$$= 220.0 \text{ UK gal}$$

$$= 264.2 \text{ US gal}$$

TIME

$$1 \text{ s} = \frac{1}{60} \text{ min}$$

$$= \frac{1}{3600} \text{ hour}$$

TEMPERATURE UNIT

$$1 \text{ K} = 1.8 \text{ R}$$

(R : Gas Constant)

FORCE

$$1 \text{ N (or kg.m/s}^2) = 10^5 \text{ dyn} = \frac{1}{9.806\ 65} \text{ kgf}$$

$$= 7.233 \text{ pdl}$$

$$= \frac{7.233}{32.174} \text{ or } 0.2248 \text{ lbf}$$

PRESSURE

$$1 \text{ bar} = 10^5 \text{ N/m}^2 \text{ (or Pa)}$$

$$= 14.50 \text{ lbf/in}^2$$

$$= 750 \text{ mmHg}$$

$$= 10.20 \text{ mH}_2\text{O}$$

SPECIFIC VOLUME

$$1 \text{ m}^3/\text{kg} = 16.02 \text{ ft}^3/\text{lb}$$

DENSITY

$$1 \text{ kg/m}^3 = 0.06243 \text{ lb/ft}^3$$

ENERGY

$$1 \text{ kJ} = 10^3 \text{ N m}$$

$$= \frac{1}{4.1868} \text{ kcal}_{IT}$$

$$= 0.9478 \text{ Btu}$$

$$= 737.6 \text{ ft lbf}$$

POWER

$$1 \text{ kW} = 1 \text{ kJ/s}$$

$$= \frac{10^3}{9.806\ 65} \text{ kgf m/s}$$

$$= \frac{10^3}{9.806\ 65 \times 75} \text{ metric hp}$$

$$= 737.6 \text{ ft lbf/s}$$

$$= \frac{737.6}{550} \text{ or } \frac{1}{0.7457} \text{ British hp}$$

$$= 3412 \text{ Btu/h}$$

SPECIFIC ENERGY (etc.)

$$1 \text{ kJ/kg} = \frac{1}{2.326} \text{ Btu/lb}$$

$$= 0.4299 \text{ Btu/lb}$$

SPECIFIC HEAT CAPACITY (etc.)

$$1 \text{ kJ/kg K} = \frac{1}{4.1868} \text{ Btu/lb R}$$

$$= 0.2388 \text{ Btu/lb R}$$

THERMAL CONDUCTIVITY

$$1 \text{ kW/m K} = 577.8 \text{ Btu/ft h R}$$

HEAT TRANSFER COEFFICIENT

$$1 \text{ kW/m}^2 \text{ K} = 176.1 \text{ Btu/ft}^2 \text{ h R}$$

DYNAMIC VISCOSITY

$$1 \text{ kg/m s} = 1 \text{ N s/m}^2 = 1 \text{ Pa s}$$

$$= 10 \text{ dyn s/cm}^2 \text{ (or poise)}$$

$$= 2419 \text{ lb/ft h}$$

$$= 18.67 \times 10^{-5} \text{ pdl h/ft}^2$$

KINEMATIC VISCOSITY

$$1 \text{ m}^2/\text{s} = 10^4 \text{ cm}^2/\text{s (or stokes)}$$

$$= 38\ 750 \text{ ft}^2/\text{h}$$

REFERENCES

BSI, 1944 – British Standard 350: 1944 Conversion Factors and Tables
 HMSO, 1986 – The International System of Units
 Rogers & Mayhew, 1995 – Thermodynamic and Transport Properties of Fluids