

APPENDIX A

Units and Conversion Factors

THE INTERNATIONAL SYSTEM OF UNITS

A new system of units is being adopted worldwide. This system of measure, the most accurate ever devised, is called the International System of Units and officially abbreviated as SI (for *Système International*) in all languages. Established by the 11th General Conference of Weights and Measures in 1960, SI is intended as the basis for a global standardization of measurement.

In January of 1970, the Canadian Government introduced its *White Paper on Metric Conversion*, followed by the passage in April 1971 of its Weights and Measures Act. Canada's Metric Commission was established in June of 1971 and a target date of 1 January 1979 was set for the exclusive use of SI. Although this goal was not fully achieved, Canada nonetheless stood well along the road to SI conversion as the 1980s began.

Table A-1: SI BASE AND SUPPLEMENTARY UNITS

Quantity	Name	Symbol
BASE UNITS		
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin ^(a)	K
Amount of substance	mole	mol
Luminous intensity	candela	cd
SUPPLEMENTARY UNITS		
Plane angle	radian	rad
Solid angle	steradian	sr

^(a) Although the SI unit of thermodynamic temperature is the kelvin, the Celsius scale will continue to be most commonly used for temperature measurements. Application of the Kelvin scale is generally restricted to scientific work.

Source: Pedde *et al*, 1978, p. 2.

SI, while based upon the decimal system with its multiples of 10, is not synonymous with the metric system since it excludes many metric units that have become obsolete and includes a few units, such as the second, which are not metric. SI units are divided into three classes: (1) base units, (2) supplementary units and (3) derived units. The base and supplementary units were adopted by the International Organization of Weights and Measures at its 10th (1954) and 11th (1960) General Conferences. Derived units are formed by algebraic relations between base units, supplementary units and other derived units. Table A-1 gives the SI base and supplementary units; Table A-2 lists commonly used derived units.

Table A-2: COMMONLY USED SI DERIVED UNITS

Quantity	Unit	Symbol
Area	square metre	m ²
Volume	cubic metre	m ³
Density	kilogram per cubic metre	kg/m ³
Energy	joule	J
Power	watt	W
Pressure	pascal	Pa
Speed, velocity	metre per second	m/s
Acceleration	metre per second squared	m/s ²
Thermal flux density	watt per square metre	W/m ²
Frequency	hertz	Hz

The SI package allows for continued use of certain non-SI units. Again we consider only the most frequently occurring examples. The hectare (ha) generally replaces the acre as the measure of land and water areas, with the square metre being the preferred SI unit for other measures of area. Although the second is the SI base unit for time, other units such as the hour (h), day (d) and year (a) will continue to be used. Degrees Celsius (°C) will continue as the common measure of tempera-