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THE INTERNATIONAL SYSTEM OF UNITS (SI) AND ITS APPLICATION

STANDARDS ASSOCIATION OF AUSTRALIA
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THE FOLLOWING SCIENTIFIC, INDUSTRIAL AND GOVERNMENTAL organizations and departments were officially represented on the committee interested with the preparation of this standard:

Bureau of Steel Manufacturers

CSIRO, National Measurement Laboratory

Electricity Supply Association of Australia

Metric Conversion Board

National Association of Testing Authorities

National Standards Commission

Universities

This standard, prepared by Committee MS/10 Quantities, Units and Conversions, was approved on behalf of the Council of the Standards Association of Australia on 3 April 1979, and was published on 1 July 1979.

To keep abreast of progress in industry, Australian standards are regularly reviewed. Suggestions for improvements to published standards, addressed to the head office of the Association, are welcomed.

AUSTRALIAN STANDARD

THE INTERNATIONAL SYSTEM OF UNITS (SI) AND ITS APPLICATION

AS 1000 - 1979

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PREFACE

AS 1000 was first published in 1970 and was revised in 1974. The main features of the present revision are—

(a) a reversion to the point as the decimal marker instead of the comma;

(b) the adoption of L as the preferred symbol for litre (l is still permitted); and

(c) the introduction of units for the measurement of ionizing radiation.

The 1974 revision of AS 1000 adopted the comma as the preferred decimal marker partly for consistency with ISO 1000—1973* but mainly in the expectation that the comma would gain wide acceptance in Australia. However, this has not eventuated and it appears unrealistic to maintain in a standard of such basic significance as AS 1000 a convention which has not gained any substantial degree of acceptance even in other major English-speaking countries. This was confirmed when SAA late in 1978 carried out a comprehensive survey of all its supporting bodies to determine their preference for the point or comma as a decimal marker. There was an overwhelming response which indicated that the comma would not be accepted voluntarily in Australia.

The deprecation of the use of the comma as a means of breaking figures into groups of three counting from the decimal marker remains (see Clause 8.4).

Two symbols for litre (L and l) are legally prescribed in regulations under the Commonwealth Weights and Measures (National Standards) Act. However, the Metric Conversion Board recommends L as the preferred symbol. It is the only officially recommended symbol in the U.S.A. and is preferred in Canada. It is also being used increasingly in other countries.

Units for ionizing radiation now given in the standard are the gray (replacing the rad), the becquerel (replacing the curie) and the coulomb per kilogram (replacing the roentgen).

NOTE: Full information about the International System of Units is given in a publication from the International Bureau of Weights and Measures: 'Le Système International d'Unités'. Authorized English translations have been published in the United Kingdom through the National Physical Laboratory, and in the United States of America through the National Bureau of Standards.

* ISO 1000—1973,SI Units and Recommendations for the Use of Their Multiples and of Certain Other Units.

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

for

THE INTERNATIONAL SYSTEM OF UNITS (SI) AND ITS APPLICATION

1 SCOPE. This standard provides a summary of the International System of Units (SI), gives rules on how derived units may be formed, and affords a selection of multiples and sub-multiples of SI units for application in the various fields of technology.

It includes reference also to certain non-SI units of measurement which at this stage have been recognized for use in association with SI units.

2 THE INTERNATIONAL SYSTEM OF UNITS. The name 'Système International d'Unités' (International System of Units), with the abbreviation SI, was adopted by the Eleventh General Conference on Weights and Measures in 1960.

The system includes three classes of units—

- base units
- supplementary units
- derived units.

One of the advantages of SI is its coherence (that is, that all derived units are formed from base units and/or supplementary units using the numerical factor of one.

Example: The unit of velocity is the metre per second equal to $\frac{1 \text{ metre}}{1 \text{ second}}$ exactly.

3 BASE UNITS. The base units of SI, together with their definitions and symbols, are given in Table 1.

4 SUPPLEMENTARY UNITS. In the SI, the quantities plane angle and solid angle are treated as independent quantities with the units radian and steradian respectively. These are described as supplementary units and are listed and defined in Table 2.

5 DERIVED UNITS. Derived units are expressed in terms of base units and/or supplementary units. Symbols for derived units are obtained by associating the symbols for base and/or supplementary units algebraically using, as appropriate, the mathematical signs of multiplication and division. See Clause 9 for details and examples.

Derived units may be divided into three classes as described below; examples of each are given in Tables 3, 4 and 5 respectively:

(a) units derived from base and supplementary units (other than those in (b) and (c) below) (see Table 3);

(b) derived units having special names (see Table 4);

(c) units derived from derived units having special names and from base and supplementary units (see Table 5).