AS 1514, Part 1—1980
UDC 001.4:389

Australian Standard 1514, Part 1—1980

GLOSSARY OF TERMS USED IN METROLOGY

Part 1—GENERAL TERMS AND DEFINITIONS

[Title Allocated by Defence Cataloguing Authority:
GLOSSARY OF TERMS USED IN METROLOGY.
PART 1—GENERAL TERMS AND DEFINITIONS]

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

Confederation of Australian Industry

CSIRO, Division of Applied Physics

CSIRO, National Measurement Laboratory

Department of Defence

Department of Productivity

Department of Technical and Further Education, N.S.W.

Federal Chamber of Automotive Industries

Institute of Technology, South Australia

Institution of Engineers, Australia

Institution of Production Engineers

Metal Trades Industry Association of Australia

National Standards Commission

Railways of Australia Committee

Royal Melbourne Institute of Technology

Society of Manufacturing Engineers

University of New England

University of New South Wales

University of Queensland

This standard, prepared by Committee ME/27, Metrology, was approved on behalf of the Council of the Standards Association of Australia on 10 January 1980, and was published on 1 April 1980.

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This standard was issued in draft form for public review as DR 79051.

AUSTRALIAN STANDARD

GLOSSARY OF TERMS USED IN METROLOGY

Part 1

GENERAL TERMS AND DEFINITIONS

AS 1514, Part 1—1980

First published........................1980

PUBLISHED BY THE STANDARDS ASSOCIATION OF AUSTRALIA
STANDARDS HOUSE, 80 ARTHUR ST, NORTH SYDNEY, N.S.W.

ISBN 0 7262 1865 0

PREFACE

This standard was prepared by the Association's Committee on Metrology at the request of the Department of Defence and with the active support of the National Standards Commission and the National Measurement Laboratory.

It is one standard in a series of glossaries of terms covering individual disciplines, and its preparation stems from the differences that have developed in relation to the use and meaning of metrological terms, differences which range from subtle changes of meaning of well used terms to the misuse of terms by ascribing to them unique meanings that are confined to areas of specific use. As scientific and technical advances call for closer interworking of many disciplines, the need for coordination of metrological terminology assumes greater importance.

The entire aim of this work is to make available in Australia standards that are of a definitive nature and which, as far as possible, will present a completely harmonized set of terms for all disciplines. In short, one term will have only one meaning ascribed to it irrespective of the discipline from whence it comes.

This standard gives terms and definitions common to many disciplines. It is envisaged that standards-drafting committees having an inter-related measurement interest will accept, as basic to metrology, the terms and definitions given in this standard and will coordinate their more specific language around it, elaborating and expanding to meet individual needs, as appropriate; thus the way is open for other SAA committees to prepare specific sections for their area of concern. It is suggested, therefore, that any other committee having an interest in metrology should, in liaison with Committee ME/27, prepare separate relevant Parts as required. Part 2 of this standard will be a glossary of terms which are specifically oriented towards the measurement of length and angle.

This standard is largely based on the work of the Organization Internationale de Metrologie Legale (OIML) PD 6461—Vocabulary of Legal Metrology, Fundamental Terms, which was accepted by the third international conference of legal metrology in 1968 and published by the International Bureau of Legal Metrology. In addition account was also taken of BS 5233, Terms Used in Metrology, and acknowledgement is made of the assistance received from these sources. Also considered by the committee was AS Z23, Glossary of Terms Relating to the Performance of Measuring Instruments.

The editorial format of this standard is such that the terms are listed in their order of association, each term or group of terms having a discrete number which indicates the Part, Section, principal term and subsidiary terms, as appropriate. Where more than one term is (or can be) associated with a particular definition, the preferred term is the first one listed and is printed in bold type. The non-preferred term or terms are printed in light type.

This standard makes reference to the following standard:

AS 1000 The International System of Units (SI) and its Application

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard for GLOSSARY OF TERMS USED IN METROLOGY

PART 1—GENERAL TERMS AND DEFINITIONS

SECTION 1. GENERAL TERMS

No	*Term*	*Definition*
111	**metrology**	The field of knowledge concerned with measurement. NOTE: Metrology includes all aspects both theoretical and practical with reference to measurements, whatever their accuracy and in whatever fields of science or technology they occur.
112	**legal metrology**	That part of metrology dealing with units of measurement, methods of measurement and measuring instruments, in relation to the metrological requirements imposed by law.
113	**engineering dimensional metrology**	That field of metrology which primarily covers the measurement of length, angle, and geometric relationships.
114	**electrical metrology**	That field of metrology which primarily covers the measurement of electrical quantities.
115	**physical metrology**	That field of metrology which primarily covers the measurement of mass, volume and density, pressure and temperature.

SECTION 2. QUANTITIES AND UNITS

No	*Term*	*Definition*
121	**quantity**	An attribute of a phenomenon or body which may be identified and measured. NOTE: The term 'quantity' means quantity in the general sense, e.g. length, mass, time, as well as a specific quantity, e.g. Length of a rod, electrical resistance of wire.
	.1 measurand	A physical quantity, property or condition which is measured. NOTE: The term 'measurand' is preferred to 'quantity measured', 'measured quantity', and 'quantity to be measured'.
	.2 influence quantity	A quantity which is not the subject of the measurement but which influences the value of the measurand, or the indications of the measuring instrument or the value of the material measure reproducing the quantity. NOTE: The influence quantity can arise from the ambient conditions or from the instrument itself. Examples: Temperature, attitude of the instrument, frequency of a measured voltage, elapsed time.
	.3 value (of a quantity)	A quantity expressed as the product of a number and the unit of measurement. Examples: 5.3 mm; 12 kg; 20°C.
	.1 true value	The value which characterizes a quantity perfectly defined. NOTE: The true value of a quantity is an ideal concept and, in general it cannot be known.
	.2 accepted true value	A value approximating to the true value of a quantity such that, for the purpose for which that value is used, the difference between the two values can be neglected. NOTE: The accepted true value of a quantity is generally determined by means of methods and by the use of measuring systems which will give a corrected result (of measurement) to an accuracy suitable for the required application. Example: When an electrical energy meter, the maximum permissible error for which is ± 2 percent is verified by means of a standard meter, for which the error of indication in the same range does not exceed ± 0.2 percent, the standard meter may be considered to indicate the accepted true value of electrical energy for the purpose of the calibration.
122	**system of quantities**	A group comprising a particular set of base quantities and corresponding derived quantities and covering one or more fields of science.
	.1 base quantity	A quantity conventionally accepted as independent of other quantities.
	.2 derived quantity	A quantity expressed as a factor of one or more base quantities. Examples: (a) Force F is defined in the system of quantities, length *(l)*, mass *(m)*, time *(t)*, by the equation— $F = m\left(\frac{d^2l}{dt^2}\right)$ (b) The intensity of magnetic field H at a distance r from an infinitely long straight conductor carrying a current I, in the rationalized system of quantities l, m, t, I, is defined by the equation— $H = \frac{I}{2\pi r}$
	.3 dimension of a quantity	An expression which represents a quantity of a system as the product of powers of the base quantities of the system with a numerical coefficient equal to 1. Example: LM/T^2 = dimension of force in the system of quantities l, m, t.
	.4 dimensionless quantity	A quantity in the expression of which the exponents of the base quantities concerned are zero. NOTE: The value of a dimensionless quantity differs however from a pure number by having the character of a quantity. Examples: (a) Strain. (b) Angle.
	.5 reference-value scale of a quantity	A set of values of a quantity determined in a prescribed manner and accepted by convention. Examples: (a) The International Practical Temperature Scale based on the freezing and boiling points of an accepted group of pure substances and on the use of specified measuring instruments and interpolation formulas. (b) The Moh's hardness scale based on the hardness of a series of specified minerals.