1976/239

THE NATIONAL STANDARDS REGULATIONS 1976

DENIS BLUNDELL, Governor-General

ORDER IN COUNCIL

At the Government House at Wellington this 23rd day of August 1976

Present:

HIS EXCELLENCY THE GOVERNOR-GENERAL IN COUNCIL

PURSUANT to the Scientific and Industrial Research Act 1974, His Excellency the Governor-General, acting by and with the advice and consent of the Executive Council, hereby makes the following regulations.

REGULATIONS

1. Title and commencement—(1) These regulations may be cited as the National Standards Regulations 1976.

(2) These regulations shall come into force on the 1st day of September 1976.

2. Interpretation—In these regulations, unless the context otherwise requires,—

"Base unit" means one of the units specified in Part I of the Schedule hereto:

"Derived unit" means a compound unit expressed algebraically in terms of base units or supplementary units or both; and includes the derived units with the special names specified in Part III of the Schedule hereto:

"Instrument" means a thing, or a combination of things, by means of which a measurement of a physical quantity may be made; and includes a thing, or combination of things, by which a grading may be effected by reference to the measurement of a physical quantity:

"Physical quantity" includes a time element that is not related to the calendar, but does not include a time element that is related to the calendar:

"Prefix" means a verbal element placed at the beginning of a unit name to quantify a multiple or submultiple of that unit:

"Supplementary unit" means one of the units specified in Part II of the Schedule hereto.

3. Standards of measurement—It is hereby declared that a standard of measurement may—

(a) Be associated with a particular material object; or

(b) Be based on the bulk properties of a pure material, or the atomic properties of a single isotope; or

(c) Result from a series of measurements made by means of an instrument, or instruments, of stable and proven characteristics; or

(d) Result from measurements made by means of an instrument that has been calibrated by an overseas national laboratory in terms of units that are of the same magnitude as units for the time being accepted by the nations adhering to the Convention of the Metre 1875.

4. Matters prescribed in Schedule—(1) For each of the physical quantities specified in Parts I, II, and III of the Schedule hereto, a unit of measurement of the quantity is prescribed in relation thereto in the second column of that Schedule.

(2) The abbreviation specified in the third column of Parts I, II, and III of the Schedule hereto in relation to each of those units shall be the abbreviation by which reference may be made to that unit.

(3) In the case of each of the base units specified in Part I of the Schedule hereto, the standard of measurement for the unit shall be that specified in relation thereto in the fourth column of that Schedule.

(4) In the case of each of the supplementary units specified in Part II of the Schedule hereto, the definition of the unit shall be that specified in relation thereto in the fourth column of that Schedule.

(5) In the case of each of the derived units specified in Part III of the Schedule hereto, the unit of measurement shall be defined in the manner specified in the fourth column of that Schedule.

(6) The prefixes specified in Part IV of the Schedule hereto may be used to form the names and symbols of the decimal multiples and submultiples of the units. The prefix is combined with the unit name, and the combination thereof is written as one word. The factor by which the unit is to be multiplied for each prefix is given in the first column of the said Part IV in relation to that prefix.

(7) Notwithstanding subclause (6) of this regulation, in the case of the base unit "kilogram", which relates to mass and contains the prefix "kilo", the names of the decimal multiples and submultiples of the unit of mass are formed by adding the appropriate prefixes to the word "gram". As an example but without restricting this subclause, milligram (mg) is used instead of microkilogram (μkg).

5. Usage—Except in the case of anything to the contrary in these regulations, the usage of metric units in New Zealand shall be as set out in the version for the time being current of NZS 6501, "The International System (SI) Units and their application".

6. Preservation of Imperial standards—Nothing in these regulations shall prevent the use in trade of a weight or measure of the Imperial system for the purpose of selling by weight or measure according to that system.

7. Appointment of a verifying authority—(1) The Minister may, in writing, appoint a person to be a verifying authority in relation to the verification and reverification of any standard or standards of measurement (including the comparison of principal standard measures with corresponding standard measures outside New Zealand).

(2) An appointment under this regulation shall be of—

(a) The person for the time being holding the office or performing the duties of—

(i) The Director of the Physics and Engineering Laboratory of the Department of Scientific and Industrial Research; or

(ii) A specified office in any Department of State that has responsibility for a particular class or particular classes of standards of measurement; or

(b) A named person who for the time being holds any office to which subparagraph (ii) of paragraph (a) of this subclause relates or performs the duties of any such office.

(3) An appointment under this regulation may be in relation to the verification and reverification of standards of measurement generally, or the verification and reverification of the standards of measurement included in a particular class or particular classes of standards of measurement.

8. Powers of a verifying authority—(1) A verifying authority may—

(a) Determine the value of standards of measurement in terms of New Zealand units of measurement of physical quantities for those classes of standards of measurement for which he has been appointed:

(b) Determine the accuracy, in terms of the New Zealand unit of measurement, with which standards of measurement referred to in paragraph (a) of this subclause have been verified or reverified:

(c) Determine the nature of any distinguishing mark that should be stamped or otherwise legibly or permanently affixed on or to a standard of measurement, and stamp or affix that distinguishing mark on or to any such standard of measurement:

Provided that this paragraph shall not apply in relation to a standard of measurement if it is impractical, by reason of its size or nature, so to stamp or affix a mark on or to the standard of measurement:

(d) Sign and issue certificates or documents in relation to the verification and reverification of standards of measurement.

(2) A verifying authority may, in writing, delegate to an officer or employee of the verifying authority's Department all or any of his powers under subclause (1) of this regulation.

9. Revocation—The Electrical Standards Regulations 1952* are hereby revoked.

*S.R. 1952/154

Regs. 3 and 4

SCHEDULE

New Zealand Units of Measurement of Physical Quantities

Part I—Base Units

Physical Quantity	Unit of Measurement	Authorised Abbreviation	Standard of Measurement
Length	metre	m	The New Zealand standard of measurement of the metre, and compound units derived from it, shall be the same magnitude as the standard of measurement thereof for the time being accepted by the nations adhering to the Convention of the Metre 1875. The yard is 0.9144 metre.
Mass	kilogram	kg	The New Zealand standard of measurement of the kilogram, and compound units derived from it, shall be the same magnitude as the standard of measurement thereof for the time being accepted by the nations adhering to the Convention of the Metre 1875. The pound is 0.45359237 kilogram.
Time	second	s	The New Zealand standards of measurement of the second, the ampere, the kelvin, the candela, and the mole, and compound units derived from them, shall be the same magnitude as the standards of measurement of those units for the time being accepted by the nations adhering to the Convention of the Metre 1875.
Electric current	ampere	A	
Thermodynamic temperature	kelvin*	K	
Luminous intensity	candela	cd	
Amount of substance	mole	mol	

*In addition to the thermodynamic temperature (symbol T) expressed in kelvins, use is made of Celsius temperature (symbol t) defined by the equation $t = T - T_0$ where $T_0 = 273.15$ K by definition.

Part II—Supplementary Units

Physical Quantity	Unit of Measurement	Authorised Abbreviation	Definition
Plane angle	radian	rad	The radian is the plane angle between 2 radii of a circle that cut off on the circumference an arc equal in length to the radius.
Solid angle	steradian	sr	The steradian is the solid angle that, having its vertex in the centre of a sphere, cuts off an area of the surface of the sphere equal to that of a square with sides of length equal to the radius of the sphere.

Part III—Derived Units with Special Names

Frequency	hertz	Hz	The hertz is the frequency of a periodic phenomenon of which the period is one second.
Force	newton	N	The newton is the force that, when applied to a body having a mass of one kilogram, causes an acceleration of one metre per second per second in the direction of application of the force.
Pressure and stress	pascal	Pa	The pascal is the pressure, or compressive or tensile stress, that arises when a force of one newton is applied normal to, and uniformly over, an area of 1 square metre. The pascal is also the shear stress that arises when a force of one newton is applied in the plane of, and uniformly over an area of 1 square metre.
Work, energy, quantity of heat	joule	J	The joule is the work done or the energy expended when a force of one newton moves the point of application a distance of one metre in the direction of that force.

Part III—Derived Units with Special Names—continued

Physical Quantity	Unit of Measurement	Authorised Abbreviation	Definition
Power	watt	W	The watt is the power used when work is done or energy is expended at the rate of one joule per second.
Electric charge, quantity of electricity	coulomb	C	The coulomb is the quantity of electric charge that is transferred each second by an electric current of one ampere.
Electric potential, potential difference, electromotive force	volt	V	The volt is the potential difference that exists between 2 points on a conductor carrying an unvarying electric current of one ampere when the power dissipated between the points is equal to one watt.
Electric capacitance	farad	F	The farad is the electric capacitance that exists between 2 conductors when the transfer of an electric charge of one coulomb from one to the other changes the potential difference between them by one volt.
Electric resistance	ohm	Ω	The ohm is the electric resistance between 2 points on a conductor, which does not contain any source of electromotive force between those two points, when a constant potential difference of one volt maintained between those points results in a current of one ampere in the conductor.
Electric conductance	siemens	S	The siemens is the electric conductance of a conductor that has an electrical resistance of one ohm.
Magnetic flux, flux of magnetic induction	weber	Wb	The weber is the flux that, linking a circuit of one turn, produces in it an electromotive force of one volt as the flux is reduced to zero at a uniform rate in one second.

Magnetic flux density, magnetic induction	tesla ..	T ..	The tesla is the density of one weber of magnetic flux per square metre.
Inductance	henry ..	H ..	The henry is the electric inductance of a closed circuit in which an electromotive force of one volt is produced when an electric current that traverses the circuit varies uniformly at the rate of one ampere per second.
Luminous flux	lumen ..	lm ..	The lumen is the luminous flux emitted into unit solid angle by an isotropic point source having a luminous intensity of one candela.
Illumination	lux ..	lx ..	The lux is an illumination of one lumen per square metre.

Part IV—Prefixes

Factor by Which the Unit is Multiplied	Prefix	
	Name	Symbol
10^{18}	exa	E
10^{15}	peta	P
10^{12}	tera	T
10^{9}	giga	G
10^{6}	mega	M
10^{3}	kilo	k
10^{2}	hecto	h
10	deca	da
10^{-1}	deci	d
10^{-2}	centi	c
10^{-3}	milli	m
10^{-6}	micro	μ
10^{-9}	nano	n
10^{-12}	pico	p
10^{-15}	femto	f
10^{-18}	atto	a

The symbol of a prefix is considered to be combined with the unit symbol to which it is directly attached, forming with it a symbol for a new unit that can be provided with a positive or negative exponent (index) and that can be combined with other unit symbols to form symbols for compound units.

Compound prefixes should not be used; for example, write "nm" (nanometre) instead of "mμm".

P. G. MILLEN,
Clerk of the Executive Council.

EXPLANATORY NOTE

This note is not part of the regulations, but is intended to indicate their general effect.

These regulations prescribe units of measurement of physical quantities and standards of measurement or definitions thereof. They make provision for the appointment of verifying authorities and define their powers.

Issued under the authority of the Regulations Act 1936.
Date of notification in *Gazette*: 26 August 1976.
These regulations are administered in the Department of Scientific and Industrial Research.