L.N. 167 of 2019

Metrication Ordinance (Amendment of Schedules) Order 2019

Contents

Metrication Ordinance (Amendment of Schedules) Order 2019

(Made by the Chief Executive under section 4 of the Metrication Ordinance (Cap. 214) after consultation with the Executive Council)

1. Commencement

This Order comes into operation on 1 April 2020.

2. Metrication Ordinance amended

The Metrication Ordinance (Cap. 214) is amended as set out in sections 3, 4 and 5.

3. First Schedule substituted

First Schedule—

Repeal the Schedule

Substitute

"First Schedule

[ss. 2 & 4]

International System of Units

Part I

SI Base Units

	First Column	Second Column	Third Column	Fourth Column
	Quantity	Name	Symbol	Definition
1.	time	second	s	It is defined by taking the fixed numerical value of the caesium frequency $\Delta\nu_{Cs}$, the unperturbed ground-state hyperfine transition frequency of the caesium 133 atom, to be 9 192 631 770 when expressed in the unit Hz, which is equal to s^{-1}.

	First Column	Second Column	Third Column	Fourth Column
	Quantity	Name	Symbol	Definition
2.	length	metre	m	It is defined by taking the fixed numerical value of the speed of light in vacuum c to be 299 792 458 when expressed in the unit m s^{-1}, where the second is defined in terms of the caesium frequency Δv_{Cs}.
3.	mass	kilogram	kg	It is defined by taking the fixed numerical value of the Planck constant h to be $6.626\ 070\ 15 \times 10^{-34}$ when expressed in the unit J s, which is equal to kg m^2 s^{-1}, where the metre and the second are defined in terms of c and Δv_{Cs}.

	First Column	Second Column	Third Column	Fourth Column
	Quantity	Name	Symbol	Definition
4.	electric current	ampere	A	It is defined by taking the fixed numerical value of the elementary charge e to be $1.602\ 176\ 634 \times 10^{-19}$ when expressed in the unit C, which is equal to A s, where the second is defined in terms of Δv_{Cs}.
5.	thermodynamic temperature	kelvin	K	It is defined by taking the fixed numerical value of the Boltzmann constant k to be $1.380\ 649 \times 10^{-23}$ when expressed in the unit J K^{-1}, which is equal to kg m^2 s^{-2} K^{-1}, where the kilogram, metre and second are defined in terms of h, c and Δv_{Cs}.

	First Column	Second Column	Third Column	Fourth Column
	Quantity	Name	Symbol	Definition
6.	amount of substance	mole	mol	One mole contains exactly $6.022\ 140\ 76 \times 10^{23}$ elementary entities. This number is the fixed numerical value of the Avogadro constant N_A, when expressed in the unit mol^{-1} and is called the Avogadro number. The amount of substance, symbol *n*, of a system is a measure of the number of specified elementary entities. An elementary entity may be an atom, a molecule, an ion, an electron, any other particle or specified group of particles.

	First Column	Second Column	Third Column	Fourth Column
	Quantity	Name	Symbol	Definition
7.	luminous intensity	candela	cd	It is defined by taking the fixed numerical value of the luminous efficacy of monochromatic radiation of frequency 540×10^{12} Hz, K_{cd}, to be 683 when expressed in the unit lm W^{-1}, which is equal to cd sr W^{-1}, or cd sr kg^{-1} m^{-2} s^3, where the kilogram, metre and second are defined in terms of h, c and Δv_{Cs}.

Notes—

1. The SI derived units are defined as products of powers of the SI base units.
2. The 7 SI base units in this Part and the 22 SI derived units with special names and symbols in Part III may be used in combination to express the units of other derived quantities. All other SI units are combinations of some of these 29 units.

Part II

SI Supplementary Units

Part III

SI Derived Units Having Special Names and Symbols

	First Column	Second Column	Third Column	
	Quantity	Special Name	Symbol (unit expressed in terms of base units)	
1.	plane angle	radian	rad	(= m/m)
2.	solid angle	steradian	sr	(= m^2/m^2)
3.	frequency	hertz	Hz	(= s^{-1})
4.	force	newton	N	(= kg m s^{-2})
5.	pressure, stress	pascal	Pa	(= kg m^{-1} s^{-2})
6.	energy, work, amount of heat	joule	J	(= kg m^2 s^{-2})
7.	power, radiant flux	watt	W	(= kg m^2 s^{-3})
8.	electric charge	coulomb	C	(= A s)
9.	electric potential difference	volt	V	(= kg m^2 s^{-3} A^{-1})
10.	capacitance	farad	F	(= kg^{-1} m^{-2} s^4 A^2)
11.	electric resistance	ohm	Ω	(= kg m^2 s^{-3} A^{-2})
12.	electric conductance	siemens	S	(= kg^{-1} m^{-2} s^3 A^2)

	First Column	Second Column	Third Column	
	Quantity	Special Name	Symbol (unit expressed in terms of base units)	
13.	magnetic flux	weber	Wb	(= kg m^2 s^{-2} A^{-1})
14.	magnetic flux density	tesla	T	(= kg s^{-2} A^{-1})
15.	inductance	henry	H	(= kg m^2 s^{-2} A^{-2})
16.	Celsius temperature	degree Celsius	°C	(= K)
17.	luminous flux	lumen	lm	(= cd sr)
18.	illuminance	lux	lx	(= cd sr m^{-2})
19.	activity referred to a radionuclide	becquerel	Bq	(= s^{-1})
20.	absorbed dose, kerma	gray	Gy	(= m^2 s^{-2})
21.	dose equivalent	sievert	Sv	(= m^2 s^{-2})
22.	catalytic activity	katal	kat	(= mol s^{-1})

Notes—

1. The SI derived units are defined as products of powers of the SI base units.
2. The 7 SI base units in Part I and the 22 SI derived units with special names and symbols in this Part may be used in combination to express the units of other derived quantities. All other SI units are combinations of some of these 29 units.

Part IV

SI Prefixes

First Column	Second Column	Third Column
Factor by which the unit is multiplied	Name	Symbol
10^{24}	yotta	Y
10^{21}	zetta	Z
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^{1}	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
10^{-21}	zepto	z
10^{-24}	yocto	y

Note—

The SI prefixes are used to form names and symbols of decimal multiples and sub-multiples of the SI units.".

4. Second Schedule substituted

Second Schedule—

Repeal the Schedule

Substitute

"Second Schedule

[ss. 2 & 4]

Non-SI Units in General International Use

	First Column	Second Column	Third Column	Fourth Column
	Quantity	Name	Symbol	Value in SI units
1.	time	minute	min	60 s
2.	time	hour	h	3 600 s
3.	time	day	d	86 400 s
4.	plane and phase angle	degree	°	(π /180) rad
5.	plane and phase angle	minute	’	(π /10 800) rad
6.	plane and phase angle	second	”	(π /648 000) rad
7.	area	hectare	ha	10^4 m^2
8.	volume	litre	l, L	10^{-3} m^3
9.	mass	tonne	t	10^3 kg

	First Column	Second Column	Third Column	Fourth Column
	Quantity	Name	Symbol	Value in SI units
10.	mass per unit length (Note 1)	tex	tex	10^{-6} kg/m
11.	length (Note 2)	nautical mile (international)		1 852 m
12.	speed velocity (Note 2)	knot (international)		(1 852/3 600) m/s

Notes—

1. This unit is used in the textile industry for the measurement of the linear density of yarn.
2. Related to nautical and aeronautical navigation and meteorology. One knot is equal to one nautical mile per hour.".

5. Third Schedule substituted

Third Schedule—

Repeal the Schedule

Substitute

"Third Schedule

[ss. 3 & 4]

Values of Non-metric Basic Units Expressed in terms of SI Base Units

	First Column	Second Column	Third Column
	Quantity	Non-metric basic unit	Value in SI base unit
1.	length	yard	0.914 4 m
2.	mass	pound	0.453 592 37 kg
3.	capacity	gallon	$4.546\ 09 \times 10^{-3}$ m^3 (Note 1)
4.	temperature interval	degree Fahrenheit	5/9 K (Note 2)

Notes—

1. Correct to 6 significant figures.
2. A formal definition of the Fahrenheit scale of temperature is not thought to exist, but for most practical purposes Fahrenheit temperature may be defined by the equation $f = 1.8T – 459.67$ where f is the Fahrenheit temperature expressed in degrees Fahrenheit (symbol °F) and T is the thermodynamic temperature expressed in kelvins (symbol K)."

Carrie LAM
Chief Executive

14 November 2019

Explanatory Note

On 16 November 2018, the 26th General Conference on Weights and Measures (***CGPM***) reviewed the International System of Units (***SI***). The Member States of CGPM voted to adopt the Resolution that 4 of the 7 SI base units, namely kilogram, ampere, kelvin and mole, would be re-defined by fixing the values of the Planck constant (h), the elementary charge (e), the Boltzmann constant (k) and the Avogadro constant (N_A).

2. The definitions of the remaining 3 SI base units have been amended by CGPM to align with the presentation of the 4 SI base units mentioned in paragraph 1.

3. The Metrication Ordinance (Cap. 214) provides for metric units. This Order amends the First Schedule to the Ordinance to reflect the new international definitions.

4. This Order also—

(a) updates the First and Second Schedules to the Ordinance to reflect some minor changes in SI supplementary units, SI derived units, SI prefixes and non-SI units in general international use over the past decades; and

(b) makes minor amendments to the format and style of the Third Schedule to the Ordinance.