

2019 No. 1211

WEIGHTS AND MEASURES

The Weights and Measures Act 1985 (Amendment) and Units of Measurement Regulations 1986 (Amendment) Regulations 2019

<i>Made</i> - - - -	<i>3rd September 2019</i>
<i>Laid before Parliament</i>	<i>4th September 2019</i>
<i>Coming into force</i> - -	<i>13th June 2020</i>

The Secretary of State makes the following Regulations in exercise of the powers conferred by section 2(2) of the European Communities Act 1972(a).

The Secretary of State is a Minister designated(b) for the purposes of section 2(2) of that Act in relation to units of measurement to be used for economic, health, safety, or administrative purposes.

Citation and commencement

1. These Regulations—

- (a) may be cited as the Weights and Measures Act 1985 (Amendment) and Units of Measurement Regulations 1986 (Amendment) Regulations 2019; and
- (b) come into force on 13th June 2020.

Amendment of the Weights and Measures Act 1985

2. In the third column of the table in Part 7 of Schedule 1 to the Weights and Measures Act 1985(c) (definitions of units of measurement of electricity)—

(a) for the definition given for “AMPERE” substitute—

“for which the symbol “A” is used, is the SI unit of electric current, 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 by taking the fixed numerical value of the caesium frequency $\Delta\nu_{\text{Cs}}$, 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} .”;

- (b) in the definition given for “WATT”, after “joule”, insert “, where the second has the meaning given in the definition of “AMPERE””.

(a) 1972 c.68. Section 2(2) was amended by section 27(1) of the Legislative and Regulatory Reform Act 2006 (c.51) and by Part 1 of the Schedule to the European Union (Amendment) Act 2008 (c.7). It is prospectively repealed by section 1 of the European Union (Withdrawal) Act 2018 (c.16), with effect from exit day (see section 20 of that Act).

(b) S.I. 1976/897, to which there are amendments not relevant to these Regulations.

(c) 1985 c.72.

Amendment of the Units of Measurement Regulations 1986

3. For paragraph 1 of Schedule 1 to the Units of Measurement Regulations 1986(a) (definitions of SI base units(b)) substitute—

“SI base units.

Quantity	Unit	
	Name	Symbol
Time	second	s
Length	metre	m
Mass	kilogram	kg
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Amount of substance	mole	mol
Luminous intensity	candela	cd

Definitions of SI base units

Unit of time

The second, symbol s, is the SI unit of time. It is defined by taking the fixed numerical value of the caesium frequency $\Delta\nu_{\text{Cs}}$, 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} .

Unit of length

The metre, symbol m, is the SI unit of length. 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, where the second is defined in terms of $\Delta\nu_{\text{Cs}}$.

Unit of mass

The kilogram, symbol kg, is the SI unit of mass. 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 $\text{kg m}^2 \text{s}^{-1}$, where the metre and the second are defined in terms of c and $\Delta\nu_{\text{Cs}}$.

Unit of electric current

The ampere, symbol A, is the SI unit of electric current. 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 $\Delta\nu_{\text{Cs}}$.

Unit of thermodynamic temperature

The kelvin, symbol K, is the SI unit of thermodynamic temperature. 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 $\text{kg m}^2 \text{s}^{-2} \text{K}^{-1}$, where the kilogram, metre and second are defined in terms of h , c and $\Delta\nu_{\text{Cs}}$.

Unit of amount of substance

The mole, symbol mol, is the SI unit of amount of substance. 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.

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- (a) S.I. 1986/1082. Paragraph 1 of Schedule 1 was amended by S.I. 2001/55 to amend the definition of Celsius temperature and by S.I. 2009/3046 to update the definition of Kelvin and to adjust the italic heading of the definition of Celsius temperature.
- (b) The term “SI” refers to the International System of Units (“the SI”) adopted by the eleventh meeting of the General Conference on Weights and Measures in 1960. See The International System of Units (9th edition 2019) edited by the International Bureau of Weights and Measures, Pavillon de Breteuil, F-92312 Sèvres Cedex France, ISBN 978-92-822-2272-0.

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.

Unit of luminous intensity

The candela, symbol cd, is the SI unit of luminous intensity in a given direction. 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 $\text{cd sr kg}^{-1} \text{m}^{-2} \text{s}^3$, where the kilogram, metre and second are defined in terms of h , c and $\Delta\nu_{Cs}$.

Special name and symbol of the SI derived unit of temperature for expressing Celsius temperature

Quantity	Unit	
	Name	Symbol
Celsius temperature	degree Celsius	°C

Celsius temperature t is defined as the difference $t = T - T_0$ between the two thermodynamic temperatures T and T_0 where $T_0 = 273.15$ K. An interval or difference of temperature may be expressed either in kelvins or in degrees Celsius. The unit “degree Celsius” is equal to the unit “kelvin”.

Kelly Tolhurst

Parliamentary Under Secretary of State

Department for Business, Energy and Industrial Strategy

3rd September 2019

EXPLANATORY NOTE

(This note is not part of the Regulations)

These Regulations amend the Weights and Measures Act 1985 and the Units of Measurement Regulations 1986, both of which make provision for legal units of measurement for use in the United Kingdom. These Regulations partly implement Commission Directive 2019/1258 amending, for the purpose of its adaptation to technical progress, the Annex to Council Directive 80/181/EEC as regards the definitions of SI base units (OJ L 196, 24.7.2019, p. 6), which relates to the definition of units of measurement. The amendments in the Commission Directive update European law to reflect seven new definitions of expressions of measurement and indications of quantity of the International System of Units (SI) adopted by the General Conference on Weights and Measures at its 26th meeting which took place from 13th to 16th November 2018 (see The International System of Units (9th edition 2019) edited by the International Bureau of Weights and Measures, Pavillon de Breteuil, F-92312 Sèvres Cedex France, ISBN 978-92-822-2272-0). The amendments do not alter the value of those units of measurement, but substitute new definitions expressed in terms of natural constants.

Regulation 2 amends the definition of the ampere in Part 7 of Schedule 1 to the Weights and Measures Act 1985, and amends the definition, in the same Part, of the watt in relation to the reference to the second, to ensure consistency of interpretation.

Regulation 3 amends the Units of Measurement Regulations 1986 by substituting a new paragraph 1 in Schedule 1 to those Regulations to reflect the substitution made by the Commission Directive of section 1.1, Chapter 1 of the Annex to Council Directive 80/181/EEC. New definitions are provided for the second, metre, kilogram, ampere, kelvin, mole and the candela. A small amendment is made in the representation of the decimal point in the definition for the degree Celsius.

An impact assessment has not been produced for this instrument as no, or no significant, impact on the private, voluntary or public sector is foreseen.

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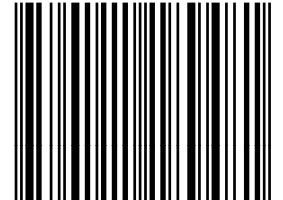
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