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SOME BASIC RULES FOR USE AND WRITING OF SI SYMBOLS AND UNITS

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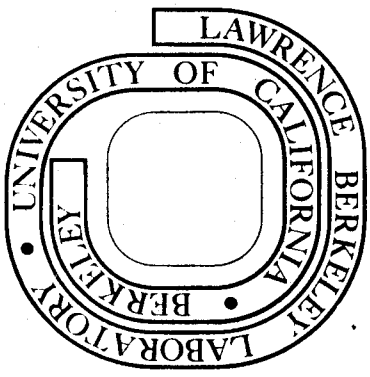

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LAWRENCE BERKELEY LABORATORY - UNIVERSITY OF CALIFORNIA
ENGINEERING NOTE

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Mechanical Department Metrication

TITLE
Some Basic Rules for Use and Writing of SI Symbols and Units

1. Metric symbols are the same in all languages.

2. When pronouncing SI units, always use an accent on the first syllable.
   e.g. kilometer, centimeter, celsius, kilowatt

3. Most single units will be written in one word.
   e.g. centimeter, millimeter, kilogram, kilowatt (not: centi meter, kilo gram, etc.)

4. Symbols are written in lower case, except when the unit is derived from a proper name.
   e.g. m = meter N = Newton
   s = second A = Ampere
   g = gram W = Watt
   Exception: L = liter (to avoid any confusion with Figure 1 or I or l.)
   Some symbols are seldom used by the public, but rather by technicians or scientists.
   e.g. (Ohm) Ω 1 Ω = 1 V/A,
   μ (micro) 1 μm = 0.000 001 m
   1 μs = one millionth of a second.

5. Prefix symbols are printed in Roman (upright) type. No spacing allowed between unit and prefix.
   e.g. kg - km - cm - mm (not: k g, k m, c m, etc.)

6. Symbols are never pluralized.
   e.g. 65 g (not: 65 gs); 15 km (not: 15 kms)

7. Never use a period after a symbol (except at the end of a sentence).
   e.g. m (not: m.); kg (not: kg.); mL (not: mL.)

8. Never begin a sentence with a symbol.
   e.g. The new symbol for kilogram is kg.
   (not: kg is the symbol for . . .)

9. Preference should be given to decimal notation over the use of fractions.
   e.g. Use 3.25% rather than 3 1/4; 0.5 km or 500 m rather than 1/2 km.
   However, you would still say: I walked about 3 km in half an hour.
   (not: in 0.5 h)

10. Always use a zero before a decimal marker when value is less than one (1).
    e.g. 0.63 (not: .63)

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11. There is always a space between the last digit of a number and the first letter of the symbol.
    e.g. 25 kg (not: 25kg); 6.7 km (not: 6.7km)
    With temperature, however, there is no space.
    e.g. 22°C (not: 22° C or 22 °C)

12. Do not use a dot (period) as the multiplication symbol in conjunction with numbers or symbols, but rather the symbol x.
    e.g. 5 x 7; 13 x 8 (not: 5 . 7 or 13 · 8)

13. Never use compound prefixes.
    e.g. 1 mg (not: 1 μkg-microkilogram)

14. Use spaces instead of commas to put digits into easily reading blocks of three.
    e.g. 3 407 359.38 (not: 3,407,359.38)
    However, this does not apply to years, telephone numbers, street numbers, etc.
    e.g. 1985 (not: 1 985) "4711" Main (not: 4 711)
    Note: This avoids confusion, since in some foreign countries the comma is used instead of the period for the decimal marker, and the period is used instead of the comma to divide digits into groups of three.

15. Only one unit shall be used to designate a quantity.
    e.g. 5.36 m (not: 5 m, 36 cm); 3.7 kg (not: 3 kg 700 g)

16. An oblique stroke (/) is always used with symbols rather than the word "per".
    e.g. km/h (not: km per h).
    However, kilometer per hour (not: kilometer/hour, when writing units out in full)

17. Time - The SI unit of time is the second. This unit is preferred and should be used if practical, particularly when technical calculations are involved. In cases where time relates to life customs or calendar cycles, the minute, hour, day and other calendar units may be necessary. For example, vehicle speed will normally be expressed in kilometers per hour. When writing a time, always start with the largest unit. Use the 24-hour system.

	year	month	day	hour	minute	second
e.g.	1985	08	06	18	21	08

    Becomes: 1985-08-06 18:21:08

18. Never hyphenate a numeral.
    (Do not write: the population of California is about 22-
    000 000.)

19. When indicating a specific physical quantity, the numeral and symbol should be shown on the same line, not separated on two different lines. (Do not write: From Oakland to Fresno the distance is 500 km when traveling by car.)

20. The choice of the appropriate multiple of an SI unit is governed by the application. The multiple should be chosen so that the numerical values will be between 0.1 and 1 000 when practical.
    e.g. 3.94 mm - instead of 0.003 94 m

21. Always place the symbol behind the numeral.
    e.g. 15.7 km; 370 g; 300 mL (not: km 15.7; g 370; mL 300)
    Note: This rule does not apply to the monetary system because the latter is not ruled by SI. You still would write: $17.50.

22. Temperature will be expressed in "degrees celsius" with the symbol ^{o}C. (not: Centigrade or Degrees C)
    Temperature measured below the (water) freezing point will be symbolized with a minus (-) symbol.
    e.g. $-4^{o}C$ (not: minus $4^{o}C$ or M$4^{o}C$ or $4^{o}C$ minus)
    Temperature above freezing point will be without a plus (+) symbol.
    e.g. $2^{o}C$ (not: $+2^{o}C$), $5.7^{o}C$ (not: $+5.7^{o}C$); $0^{o}C$ (not: $-0^{o}C$ or $+0^{o}C$)

23. In text, symbols are to be used associated with a number. When no numbers are involved, the unit is to be spelled out.
    e.g. The area of the room is 250 m^2.
    The area of the room is measured in square meters.

24. A number and a symbol should never be separated by an adjective.
    e.g. You get 200 km free with you car rental fee. Or; You get 200 free kilometers with your . . . (not: You get 200 free km with your . . .)

25. If a presentation in dual values is unavoidable (as in the future stages of conversion) give preference to the metric value followed by customary units in parentheses.
    e.g. 20 kg (44 lbs.); 5.7 m^2 (61.36 sq. ft.)

26. Former units of area and volume will be changed as follows:
    e.g. square meter (formerly sq. m.) now becomes m^2 (pronounced "square meter", not "meter square"). Similarly, cubic centimeter (formerly c.c. or cu. cm. is now cm^3.
    Former symbols such as sec., hr., and cc. should be discontinued.

27. Use appropriate units wherever possible.
    e.g. 23 mm rainfall; 7 cm snowfall; 17.34 m^2 room size; 6 mm plywood; 190 x 190 x 390 mm concrete block; 24 x 36 mm film; 3.6 m^3 sand; 40 kg cement bag; 500 g butter; 700 mL soda bottle; 150 mL toothpaste; 52.7 L gasoline; 20 m/s = 72 km/h; 124.5 m^2 floor area; 40.5 ha farm (= 405 000 m^2 = 100 acres); a touch tone telephone button has an area of 1 cm^2; a liter (L) of water has a mass of one kilogram (kg).

The data given in this note was compiled from different sources. Credit is given to ASTM Standards, Section 14, the U.S. Metric Association, and Mr. Carl B. Nolte, member of the Speakers Bureau of the Metric Commission of Canada.

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