International system of unit (SI) and its usage. Excerpt from JIS Z 8000 - 1:2014

1. Scope of application — This standard defines the international system of unit (SI), recommends use of some specifically-selected units for general use from among units in the table for integral power of ten units, further specifies other units that may be used with the SI and provides the definition of SI basic unit.

2. Reference standards — Standards listed below constitute the provisions of this standard by being referenced herein. The latest version of the reference standards applies.
IEC 27-1: 1971, Letter symbols to be used in electrical technology - Part 1: General

3. SI unit — The name international system of unit (SI) and its internationally-used abbreviation "SI" were officially adopted in the 11th CGPM (Conference General des Poides et Mesures) in 1960. This unit system consists of the following units to constitute a consistent unit system.
- Basic units
- Derived units

3.1 Basic units — There are 7 basic international units as indicated in Table 1.

● Table 1 SI basic units

Basic amount	SI basic units	
	Name	Symbol
Length	m	m
Mass	kg	kg
Time	Second	s
Current	Ampere	A
Thermodynamic temperature	Kelvin	K
Substance quantity	Mol	mol
Brightness	Candela	cd

● Table 3 SI derived units with specific names appreciated to protect human health

Derived amount	SI derived units		
	Specific name	Symbol	Indications by SI basic units and SI derived units
Radioactivity (of radionuclide)	Becquerel	Bq	1 Bq=1 s^{-1}
Absorbed dose mass energy allocation, kerma, absorbed dose rate	Gray	Gy	1 Gy=1 J/kg
Dose equivalent	Sievert	Sv	1 Sv=1 J/kg

● Table 2 SI derived units with specific names

Derived amount	SI derived units		
	Specific name	Symbol	Indications by SI basic units and SI derived units
Plane angle	Radian	rad	1rad=1m/m=1
Solid angle	Steradian	sr	1sr=1m^2/m^2=1
Frequency	Herz	Hz	1 Hz=1 s^{-1}
Force	Newton	N	1 N=1 kg・m/s^2
Pressure and stress	Pascal	Pa	1 Pa=1 N/m^2
Energy, work and heat quantity	Joule	J	1 J=1 N・m
Power and flux	Watt	W	1 W=1 J/s
Charge and electric quantity	Coulomb	C	1 C=1 A・s
Electric potential, electric potential difference, voltage and electromotive force	Bolt	V	1 V=1 W/A
Capacitance	Farad	F	1 F=1 C/V
Electric resistance	Ohm	Ω	1 Ω=1 V/A
Conductance	Siemens	S	1 S=1 $Ω^{-1}$
Magnetic flux	Weber	Wb	1 Wb=1 V・s
Magnetic flux density	Tesla	T	1 T=1 Wb/m^2
Inductance	Henry	H	1 H=1 Wb/A
Celsius temperature	Celsius degree*	℃	t ℃=t+273.15 K
Beam	Lumen	lm	1 lm=1 cd・sr
Illuminance	Lux	lx	1 lx=1lm/m^2

∗ Celsius degree is a specific name that replaces the Kelvin unit to indicate the Celsius temperature value.

● Table 4 SI prefix

Multiples applied to unit	Prefix	
	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	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

4. Integral power of ten units for SI units
Names and symbols of integral power of ten units for SI units are indicated with prefixes indicated in Table 4. Prefix symbols are to be jointed with main symbols to which they are directly connected. Therefore, this coupling forms the integral power of ten units and this new symbol may have positive/negative power index. Further, this may constitute derived units formed by coupling with other unit symbols.
The prefixes may not be combined. For example, nanometer should be represented as nm, not mμm.

Table of conversion rate to primary SI units

Force

N	dyn	kgf
1	$1×10^5$	$1.019\ 72×10^{-1}$
$1×10^{-5}$	1	$1.019\ 72×10^{-6}$
9.806 65	$9.806\ 65×10^5$	1

Viscosity

Pa・s	cP	P
1	$1×10^3$	$1×10$
$1×10^{-3}$	1	$1×10^{-2}$
$1×10^{-1}$	$1×10^2$	1

● 1 P = 1 dyn•s/cm^2 = 1 g/cm•s, 1 Pa•s = 1 N•s/m^2, 1 cP = 1 mPa•s

Stress

Pa or N/m^2	MPa or N/mm^2	kgf/mm^2	kgf/cm^2
1	$1×10^{-6}$	$1.019\ 72×10^{-7}$	$1.019\ 72×10^{-5}$
$1×10^6$	1	$1.019\ 72×10^{-1}$	$1.019\ 72×10$
$9.806\ 65×10^6$	9.806 65	1	$1×10^2$
$9.806\ 65×10^4$	$9.806\ 65×10^{-2}$	$1×10^{-2}$	1

● 1 Pa = 1 N/m^2, 1 MPa = 1 N/mm^2

Kinetic viscosity

m^2/s	cSt	St
1	$1×10^6$	$1×10^4$
$1×10^{-6}$	1	$1×10^{-2}$
$1×10^{-4}$	$1×10^2$	1

● 1 St = 1 cm^2/s, 1 cSt = 1 mm^2/s

Pressure

Pa	kPa	MPa	bar	kgf/cm^2	atm	mmH_2O	mmHg or Torr
1	$1×10^{-3}$	$1×10^{-6}$	$1×10^{-5}$	$1.019\ 72×10^{-5}$	$9.869\ 23×10^{-6}$	$1.019\ 72×10^{-1}$	$7.500\ 62×10^{-3}$
$1×10^3$	1	$1×10^{-3}$	$1×10^{-2}$	$1.019\ 72×10^{-2}$	$9.869\ 23×10^{-3}$	$1.019\ 72×10^2$	7.500 62
$1×10^6$	$1×10^3$	1	$1×10$	$1.019\ 72×10$	9.869 23	$1.019\ 72×10^5$	$7.500\ 62×10^3$
$1×10^5$	$1×10^2$	$1×10^{-1}$	1	1.019 72	$9.869\ 23×10^{-1}$	$1.019\ 72×10^4$	$7.500\ 62×10^2$
$9.806\ 65×10^4$	$9.806\ 65×10$	$9.806\ 65×10^{-2}$	$9.806\ 65×10^{-1}$	1	$9.678\ 41×10^{-1}$	$1×10^4$	$7.355\ 59×10^2$
$1.013\ 25×10^5$	$1.013\ 25×10^2$	$1.013\ 25×10^{-1}$	1.013 25	1.033 23	1	$1.033\ 23×10^4$	$7.600\ 00×10^2$
9.806 65	$9.806\ 65×10^{-3}$	$9.806\ 65×10^{-6}$	$9.806\ 65×10^{-5}$	$1×10^{-4}$	$9.678\ 41×10^{-5}$	1	$7.355\ 59×10^{-2}$
$1.333\ 22×10^2$	$1.333\ 22×10^{-1}$	$1.333\ 22×10^{-4}$	$1.333\ 22×10^{-3}$	$1.359\ 51×10^{-3}$	$1.315\ 79×10^{-3}$	1.359 51×10	1

● 1 Pa = 1 N/m^2

Work, energy and heat quantity

J	kW・h	kgf・m	kcal
1	$2.777\ 78×10^{-7}$	$1.019\ 72×10^{-1}$	$2.388\ 89×10^{-4}$
$3.600\ ×10^6$	1	$3.670\ 98×10^5$	$8.600\ 0×10^2$
9.806 65	$2.724\ 07×10^{-6}$	1	$2.342\ 70×10^{-3}$
$4.186\ 05×10^3$	$1.162\ 79×10^{-3}$	$4.268\ 58×10^2$	1

● 1 J = 1 W•s, 1 J = 1 N•m

Power (advantage and power) heat current

W	kgf・m/s	PS	kcal/h
1	$1.019\ 72×10^{-1}$	$1.359\ 62×10^{-3}$	$8.600\ 0×10^{-1}$
9.806 65	1	$1.333\ 33×10^{-2}$	8.433 71
$7.355\ ×10^2$	7.5 ×10	1	$6.325\ 29×10^2$
1.162 79	$1.185\ 72×10^{-1}$	$1.580\ 95×10^{-3}$	1

● 1 W = 1 J/s, PS: French horse-power

Heat thermal conductivity

W/(m・k)	kcal/(h・m・℃)
1	$8.600\ 0×10^{-1}$
1.162 79	1

Thermal conductivity factor

$W(m^2・K)$	kcal/(h・m^2・℃)
1	$8.600\ 0×10^{-1}$
1.162 79	1

Specific heat

J/(kg・K)	kcal/(kg・℃) cal/(g・℃)
1	$2.388\ 89×10^{-4}$
$4.186\ 05×10^3$	1

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