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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION

R 31

PART III

QUANTITIES AND UNITS OF MECHANICS

1st EDITION

December 1960

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BRIEF HISTORY

The ISO Recommendation R 31, Part III, *Quantities and Units of Mechanics*, was drawn up by Technical Committee ISO/TC 12, *Quantities, Units, Symbols, Conversion Factors and Conversion Tables*, the Secretariat of which is held by the Danish Standards Association, Dansk Standardiseringsråd (DS).

The ISO/TC 12 Secretariat drew up two drafts in succession, the second of which was studied in detail by the Technical Committee during its fourth meeting, held in Copenhagen in November 1957. The Secretariat then prepared a third draft proposal, which was approved as a Draft ISO Recommendation.

It should be noted that the following international organizations have had these draft proposals sent to them and have taken part in the discussions at the meetings of Technical Committee ISO/TC 12:

International Commission on Illumination
International Committee on Weights and Measures
International Electrotechnical Commission
International Union of Pure and Applied Chemistry
International Union of Pure and Applied Physics
and its Sub-Committee SUN
Organisation Internationale de Métrologie Légale

On 31 March 1959, the Draft ISO Recommendation (No. 276) was distributed to all the ISO Member Bodies and was approved by the following Member Bodies:

Australia	Hungary	Poland
Austria	India	Portugal
Belgium	Ireland	Sweden
Burma	Israel	Switzerland
Czechoslovakia	Japan	United Kingdom
Denmark	Netherlands	U. S. A.
France	New Zealand	U. S. S. R.
Germany	Norway	
Greece	Pakistan	

Two Member Bodies opposed the approval of the Draft:

Italy, Romania

The Draft ISO Recommendation was submitted by correspondence to the ISO Council, which decided, in December 1960, to accept it as an ISO RECOMMENDATION.

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Introduction

This document, containing a table of *Quantities and Units of Mechanics*, is part of a more comprehensive publication dealing with quantities and units in various fields of science and technology.

Parts of this more comprehensive publication are the ISO Recommendation R 31/Part I (2nd edition):

The International System of Units
and Quantities and Units of Space and Time[1]),

the ISO Recommendation R 31/Part II:

Quantities and Units of Periodic and Related Phenomena

and the ISO Recommendation R 31/Part IV:

Quantities and Units of Heat.

General information regarding the arrangement of the tables and the symbols and abbreviations used is to be found in the introduction to ISO/R 31/Part I, where the full definitions of basic units are given as an appendix.

The statements in the definition column for quantities are given merely for identification; they are not intended to be complete definitions.

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[1]) The title of the first edition of this document was: "Fundamental Quantities and Units of the MKSA System and Quantities and Units of Space and Time".

3. Mechanics

Quantities
3-1.1

Item No.	Quantity	Symbol	Definition	Remarks
3-1.1	mass	m		

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3. Mechanics

Units
3-1.a . . . 3-1.h

Item No.	Name of unit and in certain cases abbreviation for this name	International symbolic abbreviation for unit	Definition	Conversion factors	Remarks
3-1.a	**kilogramme**	kg	The kilogramme is the unit of mass defined under that name by the Conférence Générale des Poids et Mesures.		For details, see ISO/R 31/Part I.
3-1.b	gramme	g	1 g = 10^{-3} kg		
3-1.c	tonne	t	1 t = 1000 kg		
3-1.d	metric carat		1 metric carat = 200 mg		Adopted by the 4th Conférence Générale des Poids et Mesures (1907) for commercial transactions in diamonds, fine pearls and precious stones.
3-1.e	metric technical unit of mass		1 metric technical unit of mass is the mass that acquires an acceleration of 1 m/s² under the influence of a force equal to 1 kilogramme-force. (See 3-8d).	1 metric technical unit of mass = **9.806 56** kg (exactly)	
3-1.f	pound (UK) (avoirdupois), lb (UK)		1 lb (UK) is the fundamental unit of mass in the British Imperial System as defined in law (Weights and Measures Acts).	1 lb (UK) = **0.453 592 338** kg (determined experimentally in 1933).	For details, see ISO/R 31/Part I. See also remark 3-1.h
3-1.g	pound (US) (avoirdupois), lb avdp (US)		The avoirdupois pound (US) is derived from the international kilogramme as authorised in the Mendenhall Order of 5th April, 1893. The relation used is 1 avoirdupois pound = 0.453 592 427 7 kg	1 lb avdp (US) = **0.453 592 427 7** kg (exactly)	The relation given in the definition was officially adopted on or before March 21, 1894. The factor therein is the result of an experimental determination in 1883 of the mass at that time of the United Kingdom Standards. See also remark 3-1.h
3-1.h	pound (avoirdupois)	lb		1 lb = **0.453 592 37** kg	Consideration has been given to the possibility of redefining the U.K. and U.S. pounds (avoirdupois) on a common legal basis by reference to the kilogramme, and the following values have been proposed: 1 pound = 0.453 592 3 kg or 0.453 592 37 kg Both these values are such that the ratio of the grain (1/7000 lb) to the kilogramme would be exactly expressible as a terminating decimal. No decision, however, has so far been reached. Throughout these tables the term pound, with its symbolic abbreviation lb, not followed by the affix (UK) or (US), relates to a unit of mass which is treated here as if it were exactly equivalent to 0.453 592 37 kg, but the adoption of this relationship should not be regarded as giving it any special status; nor does it prejudice the choice of a common definitive value for the pound in the future. The same common relationship applies to multiples and sub-multiples of the pound whenever they are not followed by an affix having some other significance. The value of the pound given under 3-1.h coincides with that adopted in 1959 for precise measurement for science and technology by the following 6 national laboratories: (continued)

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Quantities
3-2.1 . . . 3-7.1

3. Mechanics (continued)

Item No.	Quantity	Symbol	Definition [1])	Remarks
3-2.1	density (mass density)	ϱ, ρ	Mass divided by volume.	
3-3.1	relative density	d	Ratio of the density of a substance to the density of a reference substance under conditions that should be specified for both substances.	This quantity is dimensionless. When the reference substance is water, the name specific gravity is often used in English.
3-4.1	specific volume	v	Volume divided by mass.	
3-5.1	momentum	p	Product of mass and velocity.	
3-6.1	moment of momentum, angular momentum	b, p_θ, p_ϑ	The moment of momentum of a particle about a point is equal to the vector product of the radius vector from this point to the particle and the momentum of the particle.	
3-7.1	moment of inertia (dynamic moment of inertia)	I, J	The (dynamic) moment of inertia of a body about an axis is the sum (integral) of the products of its mass-elements and the squares of their distances from the axis.	To be distinguished from 3-16.1 and 3-16.2

[1]) The statements in this column are given merely for identification and they are not intended to be complete definitions.

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3. Mechanics (continued)

Units
3-1.i ... 3-7.a

Item No.	Name of unit and in certain cases abbreviation for this name	International symbolic abbreviation for unit	Definition	Conversion factors	Remarks
					Applied Physics Division, National Research Council, Ottawa, Canada. Dominion Physical Laboratory, Lower Hutt, New Zealand. National Bureau of Standards, Washington, United States. National Physical Laboratory, Teddington, United Kingdom. National Physical Research Laboratory, Pretoria, South Africa. National Standards Laboratory, Sydney, Australia.
3-1.i	slug		1 slug is the mass that acquires an acceleration of 1 ft/s² under the influence of a force equal to 1 pound-force.	1 slug = (980.665/30.48) lb (exactly) = 32.1740 lb = 14.5939 kg	This unit is the British technical unit of mass. See 3-8.f
3-1.j	grain, gr		1 grain = (1/7000) lb	1 grain = 64.798 91 mg (exactly)	16 dram = 1 ounce 16 ounce = 1 pound } UK and US avoirdupois units
3-1.k	ounce (avoirdupois), oz		1 oz = 437.5 grain	1 oz = 28.3495 g	
3-1.l	hundredweight, cwt		1 cwt = 112 lb	1 cwt = 50.8023 kg	UK unit
3-1.m	ton		1 ton = 2240 lb	1 ton = 1016.05 kg = 1.016 05 t	UK unit } In the US when the word ton is used alone the reference is to the short ton of 2000 lb unless there is specific reference to the long ton or gross ton. The ton of 2240 lb and the hundredweight of 112 lb are also used to some extent in US. They are then called "long ton" and "long hundredweight" respectively.
3-1.n	short hundredweight, sh cwt		1 sh cwt = 100 lb avdp (US)	1 sh cwt = 45.3592 kg	US unit
3-1.o	short ton, sh tn		1 sh tn = 2000 lb avdp (US)	1 sh tn = 907.185 kg = 0.907 185 t	US unit
3-1.p	troy ounce, oz tr in UK, oz t in US		1 troy ounce = 480 grain	1 troy ounce = 31.1035 g	The troy pound is not a legal unit in the UK, but is legalised in the US, where it is defined as equal to 5760 grain.
3-1.q	apothecaries' ounce, oz apoth in UK, oz ap in US		1 apothecaries' ounce = 480 grain	1 apothecaries' ounce = 31.1035 g	3 scruple (UK) = 1 drachm (UK) 3 scruple (US) = 1 dram ap (US) 8 drachm (UK) = 1 oz apoth (UK) 8 dram ap (US) = 1 oz ap (US)
3-2.a	kilogramme per cubic metre	kg/m³			
3-2.b	tonne per cubic metre	t/m³		1 t/m³ = 1000 kg/m³	1 t/m³ = 1 g/cm³
3-2.c	gramme per millilitre	g/ml		1 g/ml = 999.972 kg/m³	
3-2.d	pound per cubic foot	lb/ft³		1 lb/ft³ = 16.0185 kg/m³	
3-4.a	cubic metre per kilogramme	m³/kg			
3-5.a	kilogramme metre per second	kg · m/s			
3-6.a	kilogramme metre squared per second	kg · m²/s			
3-7.a	kilogramme metre squared	kg · m²			

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Quantities
3-8.1 . . . 3-11.3

3. Mechanics (continued)

Item No.	Quantity	Symbol	Definition [1])	Remarks
3-8.1	force	F		
3-8.2	weight	G (P, W)	The weight of a body is that force which, when applied to the body, would give it an acceleration equal to the local acceleration of free fall.	The quantity here defined has commonly been called the local "gravitational" force on the body. It is noteworthy that the "weight" arises not only from the resultant of the gravitational forces existing at the place where the body is, but also from the local centrifugal force. The effect of atmospheric buoyancy is excluded, and consequently the weight defined is the weight in vacuo. (See also Comptes Rendus, 3e Conférence Générale des Poids et Mesures, 1901, p. 70).
3-9.1	specific weight (weight density)	γ	Weight divided by volume.	Varies with the acceleration of free fall.
3-10.1	moment of force	M	The moment of a force about a point is equal to the vector product of the radius vector, from this point to any point on the line of action of the force, and the force.	
3-10.2	bending moment	M		
3-10.3	torque, moment of a couple	T		When the resultant of a system of forces is zero, this system can be replaced by a couple.
3-11.1	pressure	p		
3-11.2	normal stress	σ		
3-11.3	shear stress	τ		

[1]) See footnote on page 6.

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3. Mechanics (continued)

Item No.	Name of unit and in certain cases abbreviation for this name	International symbolic abbreviation for unit	Definition	Conversion factors	Remarks
3-8.a	newton	N	1 N is that force which, when applied to a body having a mass of 1 kg, gives it an acceleration of 1 m/s².		
3-8.b	dyne	dyn	1 dyn is that force which, when applied to a body having a mass of 1 g, gives it an acceleration of 1 cm/s².	1 dyn = 10^{-5} N (exactly)	
3-8.c	sthène, sn		1 sn is that force which, when applied to a body having a mass of 1 t, gives it an acceleration of 1 m/s².	1 sn = 10^{3} N (exactly)	1 sn = 1 kN
3-8.d	kilogramme-force, kgf		This is the force which, when applied to a body having a mass of 1 kg, gives it an acceleration of 9.806 65 m/s².	1 kilogramme-force = **9.806 65** N (exactly)	This is the metric technical unit of force. The abbreviations kgf (kilogramme-force) and kp (kilopond) are both widely used. This unit must be distinguished from the(inconstant)local weight of a body having a mass of 1 kg.
3-8.e	poundal	pdl	1 pdl is that force which, when applied to a body having a mass of 1 lb, gives it an acceleration of 1 ft/s².	1 pdl = 0.138 255 N	
3-8.f	pound-force, lbf		1 lbf is that force which, when applied to a body having a mass of 1 lb, gives it an acceleration of 9.806 65 m/s².	1 lbf = 4.448 22 N = 32.1740 pdl	This is the British technical unit of force. This unit must be distinguished from the (inconstant) local weight of a body having a mass of 1 lb. This would be called "pound-weight".
3-9.a	newton per cubic metre	N/m³			
3-9.b	kilogramme-force per cubic metre, kgf/m³			1 kilogramme-force per cubic metre = 9.806 65 N/m³ (exactly)	See remark 3-8.d
3-9.c	pound-force per cubic foot, lbf/ft³			1 lbf/ft³ = 157.087 N/m³	See remark 3-8.f
3-10.a	newton metre	N·m			The symbolic abbreviation may also be written m·N, but not mN.
3-10.b	kilogramme-force metre, kgf·m			1 kilogramme-force metre = 9.806 65 N·m (exactly)	See remark 3-8.d
3-10.c	pound-force foot, lbf·ft			1 lbf·ft = 1.355 82 N·m	See remark 3-8.f
3-11.a	newton per square metre	N/m²			This unit is also called pascal.
3-11.b	pièze, pz		1 pz = 1 sn/m²	1 pz = 10^{3} N/m² (exactly)	
3-11.c	bar	bar	1 bar = 10^{5} N/m²	1 bar = 10^{5} N/m² (exactly) = 10^{6} dyn/cm² (exactly) = 1 hpz (exactly)	The microbar (1 µbar = 1 dyn/cm²) is also called barye. The millibar is widely used in meteorological barometry, and its name is then often abbreviated to mb.

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Quantities
3-12.1...3-14.3

3. Mechanics (continued)

Item No.	Quantity	Symbol	Definition [1])	Remarks
3-12.1	linear strain (relative elongation)	e, ε	$\varepsilon = \frac{\Delta l}{l_0}$ (l_0 = length in a reference state to be specified, Δl = increase in length)	These quantities are dimensionless.
3-12.2	shear strain (shear angle)	γ		
3-12.3	volume strain (bulk strain)	θ, ϑ	$\theta = \frac{\Delta V}{V_0}$ (V_0 = volume in a reference state to be specified, ΔV = increase in volume)	
3-13.1	Poisson's ratio, Poisson's number	μ, ν	Lateral contraction divided by elongation.	This quantity is dimensionless. This definition applies only to small deformations of elastic bodies. The quantity defined by Poisson was the reciprocal: $m = \frac{1}{\mu}$
3-14.1	Young's modulus (modulus of elasticity)	E	$E = \sigma/\varepsilon$	These definitions apply only to small deformations of elastic bodies. The strains ε, γ and θ in these definitions are those corresponding to the excess stresses σ, τ and the excess pressure, p.
3-14.2	shear modulus (modulus of rigidity)	G	$G = \tau/\gamma$	
3-14.3	bulk modulus (modulus of compression)	K	$K = -p/\theta$	

[1]) See footnote on page 6.

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3. Mechanics (continued)

Item No.	Name of unit and in certain cases abbreviation for this name	International symbolic abbreviation for unit	Definition	Conversion factors	Remarks
3-11.d	kilogramme-force per square metre, kgf/m²			1 kilogramme-force per square metre = 9.806 65 N/m² (exactly) = 98.0665 µbar (exactly)	See remark 3-8.d
3-11.e	normal atmosphere	atm	1 atm = 101 325 N/m²	1 atm = **101 325** N/m² (exactly)	Definition adopted by the 10th Conférence Générale des Poids et Mesures (1954).
3-11.f	torr		1 torr = $\frac{1}{760}$ atm	1 torr = 133.322 N/m² = 1333.22 µbar = 0.001 315 79 atm	
3-11.g	technical atmosphere	at	1 at = 1 kilogramme-force per square centimetre	1 at = 98 066.5 N/m² (exactly) = 0.967 841 atm	1 at = 10^4 mmH_2O = 10 mH_2O See remark 3-8.d
3-11.h	poundal per square foot	pdl/ft²		1 pdl/ft² = 1.488 16 N/m²	
3-11.i	pound-force per square foot, lbf/ft²			1 lbf/ft² = 47.8803 N/m²	See remark 3-8.f
3-11.j	pound-force per square inch, lbf/in²			1 lbf/in² = 6894.76 N/m² = 0.070 307 0 at = 0.068 046 0 atm	See remark 3-8.f
3-11.k	ton-force per square inch, tonf/in²		1 tonf/in² = 2240 lbf/in²	1 tonf/in² = 15.4443 MN/m² = 157.488 at	The ton-force here mentioned is the force which gives a mass of 1 (long) ton an acceleration of 9.806 65 m/s², i.e. 32.1740 ft/s² approximately.
3-11.l	conventional millimetre of water, mmH_2O		1 mmH_2O = 9.806 65 N/m² = 0.0001 at	1 mmH_2O = 9.806 65 N/m² (exactly) = 9.678 41 × 10^{-5} atm	This is equal to the unit in 3-11.d
3-11.m	conventional millimetre of mercury, mmHg		1 mmHg = 13.5951 mmH_2O	1 mmHg = 133.322 N/m² = 1333.22 µbar = 0.001 315 79 atm	Used in meteorological barometry. It follows from this definition that a pressure of 760 mmHg exceeds 1 atm by less than 2 × 10^{-7} atm.
3-11.n	conventional foot of water, ftH_2O		1 ftH_2O = 0.030 48 at	1 ftH_2O = 2989.07 N/m²	
3-11.o	conventional inch of water, inH_2O		1 inH_2O = 0.002 54 at	1 inH_2O = 249.089 N/m²	
3-11.p	conventional inch of mercury, inHg		1 inHg = 25.4 mmHg	1 inHg = 3386.39 N/m²	
3-14.a	newton per square metre	N/m²			For other units, see 3-11.b...p.

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Quantities
3-15.1 . . . 3-20.1

3. Mechanics (continued)

Item No.	Quantity	Symbol	Definition [1])	Remarks
3-15.1	compressibility (bulk compressibility)	$\varkappa$, κ	$\varkappa = -\frac{1}{V} \cdot \frac{dV}{dp}$	
3-16.1	second moment of area (second axial moment of area)	I, I_a	The second axial moment of area of a plane area (section) about an axis in its plane is the sum (integral) of the products of its elements of area and the squares of their distances from the axis.	These quantities should be distinguished from 3-7.1. They have often been given the name "moment of inertia".
3-16.2	second polar moment of area	I_p, J	The second polar moment of area of a plane area (section) about a point in its plane is the sum (integral) of the products of its elements of area and the squares of their distances from the point.	
3-17.1	section modulus	Z, W, $\left(\frac{I}{v}\right)$	The section modulus of a plane area (section) about an axis in its plane is the second moment of area divided by the distance from the axis to the most remote point of the area.	
3-18.1	coefficient of friction (factor of friction)	μ, (f)	Ratio of frictional force to normal force, for a sliding body.	This quantity is dimensionless.
3-19.1	viscosity (dynamic viscosity)	η, (μ)	$\tau_{xz} = \eta \frac{dv_x}{dz}$	This definition applies to laminar flow for which v_z is zero.
3-20.1	kinematic viscosity	ν	$\nu = \eta/\varrho$	

[1]) See footnote on page 6.

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3. Mechanics (continued)

Units
3-15.a . . . 3-20.c

Item No.	Name of unit and in certain cases abbreviation for this name	International symbolic abbreviation for unit	Definition	Conversion factors	Remarks
3-15.a	square metre per newton	m^2/N			Note that the units of compressibility are the reciprocals of the units of bulk modulus.
3-16.a	metre to the fourth	m^4			
3-16.b	inch to the fourth	in^4		$1\ in^4 = 41.6231 \times 10^{-8}\ m^4$	
3-17.a	metre cubed	m^3			
3-17.b	inch cubed	in^3		$1\ in^3 = 16.3871 \times 10^{-6}\ m^3$	
3-19.a	newton second per square metre	$N \cdot s/m^2$	1 $N \cdot s/m^2$ is the viscosity of a fluid in which the velocity under a shear stress of 1 N/m^2 has a gradient of 1 m/s per metre perpendicular to the plane of shear.		$1\ N \cdot s/m^2 = 1\ kg \cdot m^{-1} \cdot s^{-1}$
3-19.b	poise	P	1 P is the viscosity of a fluid in which the velocity under a shear stress of 1 dyn/cm^2 has a gradient of 1 cm/s per centimetre perpendicular to the plane of shear.	$1\ P = 0.1\ N \cdot s/m^2$ (exactly)	$1\ P = 1\ dyn \cdot s/cm^2 = 1\ g \cdot cm^{-1} \cdot s^{-1}$
3-19.c	kilogramme-force second per square metre, $kgf \cdot s/m^2$			1 kilogramme-force second per square metre = 9.806 65 $N \cdot s/m^2$ (exactly)	See remark 3-8.d
3-19.d	poundal second per square foot	$pdl \cdot s/ft^2$		$1\ pdl \cdot s/ft^2 = 1.488\ 16\ N \cdot s/m^2$	$1\ pdl \cdot s/ft^2 = 1\ lb \cdot ft^{-1} \cdot s^{-1}$
3-19.e	pound-force second per square foot, $lbf \cdot s/ft^2$			$1\ lbf \cdot s/ft^2 = 47.8803\ N \cdot s/m^2$	See remark 3-8.f
3-20.a	square metre per second	m^2/s	1 m^2/s is the kinematic viscosity of a fluid with dynamic viscosity 1 $N \cdot s/m^2$ and density 1 kg/m^3.		
3-20.b	stokes	St	1 St is the kinematic viscosity of a fluid with dynamic viscosity 1 P and density 1 g/cm^3.	$1\ St = 0.0001\ m^2/s$	
3-20.c	square foot per second	ft^2/s		$1\ ft^2/s = 0.092\ 903\ 0\ m^2/s$	

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Quantities
3-21.1 . . . 3-22.4

3. Mechanics (continued)

Item No.	Quantity	Symbol	Definition [1])	Remarks
3-21.1	surface tension	$\sigma, (\gamma)$	Force across a line element in a surface divided by the length of the line element.	
3-22.1	work	A, W		See also ISO/R 31/Part IV
3-22.2	energy	E, W		
3-22.3	potential energy	E_p, U, V, Φ		
3-22.4	kinetic energy	E_k, K, T		

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[1]) See footnote on page 6.

3. Mechanics (continued)

Item No.	Name of unit and in certain cases abbreviation for this name	International symbolic abbreviation for unit	Definition	Conversion factors	Remarks
3-21.a	newton per metre	N/m			1 N/m = 1 J/m²
3-21.b	dyne per centimetre	dyn/cm		1 dyn/cm = 10^{-3} N/m	1 dyn/cm = 1 erg/cm²
3-22.a	joule	J	1 J is the work done when the point of application of a force of 1 N is displaced through a distance of 1 m in the direction of the force.		1 J = 1 N·m = 1 W·s The 9th Conférence Générale des Poids et Mesures (1948) adopted this unit for electrical work and for heat as well as for mechanical work and for energy. This unit was sometimes called the "absolute joule". Until 1948 the "international joule" was also used for electrical work and sometimes for heat. The "international" units were abandoned by the 9th Conférence Générale des Poids et Mesures (1948). The conversion factors given by the Comité International des Poids et Mesures (1946) lead to the approximate relation: 1 "mean international joule" = $\frac{(1.000\,34)^2}{1.000\,49}$ J = 1.000 19 J
3-22.b	erg	erg	1 erg = 1 dyn·cm	1 erg = 10^{-7} J (exactly)	
3-22.c	kilogramme-force metre, kgf·m			1 kilogramme-force metre = 9.806 65 J (exactly)	See remark 3-8.d
3-22.d	kilowatt hour	kWh	1 kWh is the energy delivered in 1 h by an energy source of 1 kW power.	1 kWh = 3.6×10^6 J (exactly) = 3.6 MJ (exactly) = 859.845 $kcal_{IT}$ = 3412.14 Btu	
3-22.e	electronvolt	eV	1 eV is the energy acquired by an electron by passing through a potential difference of 1 volt in vacuo.	1 eV = 1.602×10^{-19} J	1 eV = $1.602\,06 \times 10^{-19}$ J ("standard error" ± $0.000\,03 \times 10^{-19}$ J) Du Mond, Cohen, Layton and Rollett, Rev. mod. Phys. 27. (No. 4) October 1955.
3-22.f	15 °C calorie	cal_{15}	1 cal_{15} is the amount of heat required to warm 1 g of air-free water from 14.5 °C to 15.5 °C at a constant pressure of 1 normal atmosphere.	1 cal_{15} = 4.1855 J	See remark 3-22.a The International Union of Pure and Applied Physics in 1934 published a similar definition for the "gramme-calorie". The conversion factor shown was proposed by the Comité Consultatif de Thermométrie et Calorimétrie and adopted by the Comité International des Poids et Mesures (1950) as being the most accurate value which could then be deduced from experiment. This factor is uncertain by 0.0005 J.
3-22.g	I. T. calorie	cal_{IT}	1 cal_{IT} = 4.1868 J	1 cal_{IT} = 4.1868 J (exactly) 1 $Mcal_{IT}$ = 1.163 kWh (exactly)	See remark 3-22.a For this I.T. calorie (International Table calorie) the Fifth International Conference on Properties of Steam (London, July 1956) adopted the definition 1 cal_{IT} = 4.1868 J
3-22.h	thermochemical calorie cal (thermochem.)			1 cal (thermochem.) = 4.1840 J	At the National Bureau of Standards the statement 1 cal (thermochem.) = 4.1840 J is considered as the definitive relation.
					Remark to 3-22.f, g and h. The 9th Conférence Générale des Poids et Mesures has adopted the joule as the unit of heat, avoiding the calorie as far as possible.

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Quantities
3-23.1

3. Mechanics (continued)

Item No.	Quantity	Symbol	Definition[1])	Remarks
3-23.1	power	P	Energy transferred in a certain time-interval, divided by the duration of that interval.	

[1]) See footnote on page 6.

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