

25 Conversion Tables and Abbreviations

25.1 Technical Units of the *Système International* Relevant to Wheat Science and Technology

The International System of Units, abbreviated SI (from the French *Le Système International d'Unités*), represents the metric system of measurement. The SI was established in 1960 by the 11th General Conference on Weights and Measures (CGPM, Conférence Générale des Poids et Mesures). The CGPM is the international authority that ensures wide dissemination of the SI and modifies the SI as necessary to reflect the latest advances in science and technology (NIST, 2005). The following tables have been selected and modified to suit the needs of millers, bakers and other cereal technologists.

Tab. 149: SI base units

Base quantity	Name	Symbol
Length	meter	m
Mass	kilogram ^a	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Amount of substance	mole	mol

^a The kilogram is the only SI unit with a prefix as part of its name and symbol.

Tab. 150: SI derived units with special names and symbols

Derived quantity	Name	Symbol	Expression in terms of other SI units	Expression in terms of SI base units
Frequency	hertz	Hz	-	s ⁻¹
Force	newton	N	-	m·kg·s ⁻²
Pressure, stress	pascal	Pa	N/m ²	m ⁻¹ ·kg·s ⁻²
Energy, work, quantity of heat	joule	J	N·m	m ² ·kg·s ⁻²
Power, radiant flux	watt	W	J/s	m ² ·kg·s ⁻³
Electric charge, quantity of electricity	coulomb	C	-	s·A
Electric potential difference, electromotive force	volt	V	W/A	m ² ·kg·s ⁻³ ·A ⁻¹
Capacitance	farad	F	C/V	m ⁻² ·kg ⁻¹ ·s ⁴ ·A ²
Electric resistance	ohm	Ω	V/A	m ² ·kg·s ⁻³ ·A ⁻²
Celsius temperature	degree Celsius	°C	-	K

25.1 Technical Units

Tab. 151: SI derived units whose names and symbols include SI derived units with special names and symbols

Derived quantity	Name	Symbol
Dynamic viscosity	pascal second	Pa·s
Moment of force	newton meter	N·m
Angular velocity	radian per second	rad/s
Angular acceleration	radian per second squared	rad/s ²
Heat flux density, irradiance	watt per square meter	W/m ²
Thermal conductivity	watt per meter kelvin	W/(m·K)

Tab. 152: Units outside the SI that are accepted for use with the SI

Name	Symbol	Value in SI units
Minute (time)	min	1 min = 60 s
Hour	h	1 h = 60 min = 3,600 s
Day	d	1 d = 24 h = 86,400 s
Liter	L	1 L = 1 dm ³ = 10 ⁻³ m ³
Metric ton ^a	t	1 t = 10 ³ kg
hectare	ha	1 ha = 1 hm ² = 10 ⁴ m ²

^a In many countries, this unit is called "tonne".

Tab. 153: SI prefixes

Multiples			Submultiples		
Factor	Name	Symbol	Factor	Name	Symbol
10 ²⁴	yotta	Y	10 ⁻¹	deci	d
10 ²¹	zetta	Z	10 ⁻²	centi	c
10 ¹⁸	exa	E	10 ⁻³	milli	m
10 ¹⁵	peta	P	10 ⁻⁶	micro	
10 ¹²	tera	T	10 ⁻⁹	nano	n
10 ⁹	giga	G	10 ⁻¹²	pico	p
10 ⁶	mega	M	10 ⁻¹⁵	femto	f
10 ³	kilo	k	10 ⁻¹⁸	atto	a
10 ²	hecto	h	10 ⁻²¹	zepto	z
10 ¹	deka	da	10 ⁻²⁴	yocto	y

25.2 U.S. Conversion Factors

Tab. 154: Conversion of weight and area

Wheat Equivalents	
1 bushel (bu)	= 60 pounds (27.2 kg)
36.74 bushels	= 1 metric ton
37.33 bushels	= 1 long ton
33.33 bushels	= 1 short ton
3.67 bushels	= 1 quintal
1 ton/ha	= 0.06725 bu/acre
Durum kg/hl	= lb/bu x 1.292 + 0.630
Other wheat kg/hl	= lb/bu x 1.292 + 1.419
Metric Equivalents	
1 pound (lb)	= 0.4536 kg
1 metric ton (MT)	= 2204.6 lb
1 short ton (2000 lb)	= 0.9072 MT, or 907.2 kg
1 long ton (2240 lb)	= 1.016 MT, or 1016 kg
1 metric ton	= 10 quintals
1 hectare	= 2.47 acres
1 acre	= 0.40 hectare
1 hundredweight	= 100 pounds or 45.36 kg
1 metric ton/ha	= 14.87 bu/acre

25.3 Mesh Size of Sieves

Tab. 155: Conversion of U.S. mesh and micrometer

m	U.S. mesh	m	U.S. mesh
1000	18	180	80
850	20	150	100
710	25	125	120
600	30	106	140
500	35	90	170
425	40	75	200
355	45	63	230
300	50	53	270
250	60	45	325
212	70	38	400

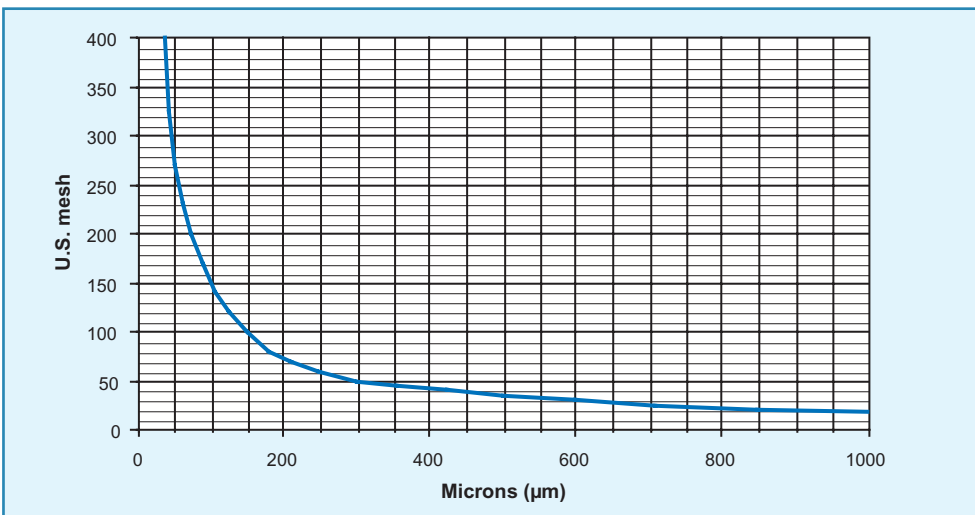


Fig. 265: Conversion curve for U.S. mesh and micrometer

25.4 Temperature

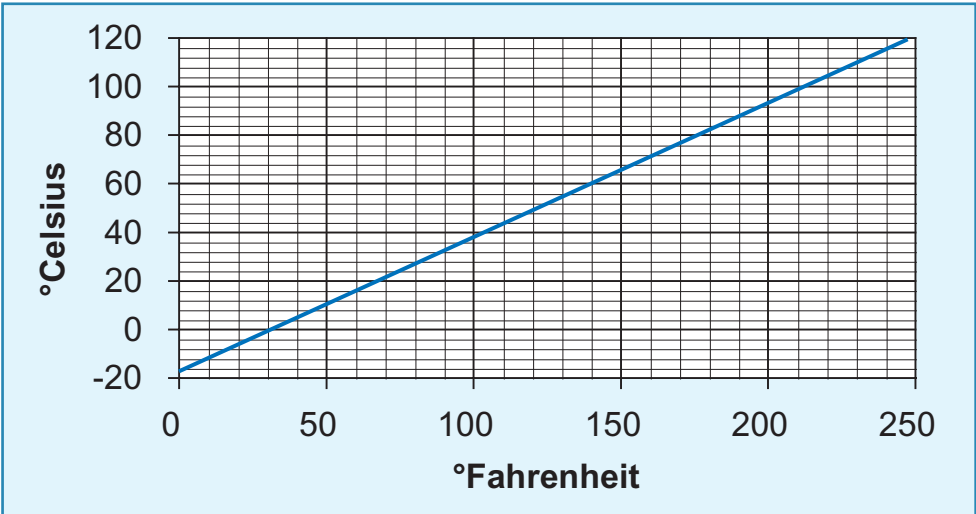


Fig. 266: Conversion curve of degree Celsius and degree Fahrenheit

Tab. 156: Conversion of degree Celsius and degree Fahrenheit

°F	°C	°F	°C	°C	°F	°C	°F
250	121	92	33	120	248	40	104
212	100	90	32	110	230	37	99
200	93	80	27	100	212	35	95
175	79	70	21	95	203	30	86
150	66	60	16	90	194	25	77
140	60	50	10	80	176	20	68
130	54	40	4	70	158	15	59
120	49	30	-1	60	140	10	50
110	43	20	-7	55	131	5	41
100	38	10	-12	50	122	0	32
95	35	0	-18	45	113	-5	23

25.5 References

- Taylor BN (ed.), 2001. *The International System of Units (SI)*. NIST Special Publication 330, National Institute of Standards and Technology, Gaithersburg, MD, USA.
- NIST, accessed August 2005. <http://physics.nist.gov/cuu/Units/>
- US Wheat Associates, accessed August 2005. <http://www.uswheat.org/everyNeed/wheatStandards>.