2 Conversion Tables

SI QUICK REFERENCE GUIDE

Symbol	Name	Quantity	Formula
A	ampere	electric current	base
Bq	becquerel	activity (of a radio nuclide)	unit 1/s
C	coulomb	electric charge	A·s
˚C	degree Celsius	temperature interval	˚C = K
cd	candela	luminous intensity	base unit
F	farad	electric capacitance	C/V
Gy	gray	absorbed dose	J/kg
g	gram	mass	kg/1,000
H	henry	inductance	Wb/A
Hz	hertz	frequency	1/s
ha	hectare*	area	10,000 m^2
J	joule	energy, work, heat	N·m
K	kelvin	temperature	base unit
kg	kilogram	mass	base unit
L	liter	volume	m^3/1,000

lm lx	lumen lux	luminous flux illuminance	cd·sr lm/m^2
m	meter	length	base unit
mol	mole	amount of substance	base unit
N	newton ohm	force electric resistance	kg·m/s^2V/A
Pa	pascal	pressure, stress	N/m^2
rad	radian	plane angle	m/m (dimensionless)
S	siemens	electric conductance	A/V
Sv	sievert	dose equivalent	J/kg
s	second	time	base unit
sr	steradian	solid angle	m^2/m^2 (dimensionless)
T	tesla	magnetic flux density	Wb/m^2
t	tonne, metric ton	mass	1,000 kg; Mg
V	volt	electric potential	W/A
W	watt	power, radiant flux	J/s
Wb	weber *allowed with SI	magnetic flux	V·s

Source: Book of Standards, vol. 03.02 "Corrosion of Metals; Wear and Erosion" (West Conshohocken, PA, USA: ASTM International, 2000), p. 656. Reprinted with permission, copyright ASTM.

INTERNATIONAL SYSTEM OF UNITS

The Modernized Metric System

The International System of Units (SI) is based on seven fundamental (base) units:

Base Units

Quantity	Name	Symbol
length	meter	m
mass	kilogram	kg
time	second	s
electric current	ampere	A
thermodynamic temperature	kelvin	K
amount of substance	mole	mol
luminous intensity	candela	cd

and a number of derived units which are combinations of base units and which may have special names and symbols:

Examples of Derived Units

Quantity	Expression	Name	Symbol
acceleration			
angular	rad/s^2		
linear	m/s^2		
angle			
plane	dimensionless	radian	rad
solid	dimensionless	steradian	sr
area	m^2		
Celsius temperature	K	degree Celsius	°C
density			
heat flux	W/m^2		
mass	kg/m^3		
current	A/m^2		
energy, enthalpy			
work, heat	N·m	joule	J
specific	J/kg		
entropy			
heat capacity	J/K		
specific	J/(kg·K)		
flow, mass	kg/s		
flow, volume	m^3/s		
force	$kg·m/s^2$	newton	N
frequency			
periodic	1/s	hertz	Hz
rotating	rev/s		
inductance	Wb/A	henry	H
magnetic flux	V·s	weber	Wb
mass flow	kg/s		
moment of a force	N·m		
potential,electric	W/A	volt	V
power, radiant flux	J/s	watt	W
pressure, stress	N/m^2	pascal	Pa
resistance, electric	V/A	ohm	Ω
thermal conductivity	W/(m·K)		
velocity			
angular	rad/s		
linear	m/s		
viscosity			
dynamic (absolute)(μ)	Pa·s		
kinematic (ν)	m^2/s		
volume	m^3		
volume, specific	m^3/kg		

Source: Book of Standards, vol. 03.02 "Corrosion of Metals; Wear and Erosion" (West Conshohocken, PA, USA: ASTM International, 2000), p. 966. Reprinted with permission, copyright ASTM.

PREFIXES

Most prefixes indicate orders of magnitude in increments of 1,000 and simplify very large and very small numbers. Prefixes eliminate nonsignificant digits and leading zeros in decimal fractions.

Examples: 64,000 watts is the same as 64 kilowatts*
0.057 meter is the same as 57 millimeters
16,000 meters is the same as 16 kilometers*
*except for intended accuracy

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

The best practice is to choose a prefix so that the numerical value lies between 0.1 and 1,000. For simplicity, give preference to prefixes representing 1,000 raised to an integral power (i.e., μm, mm, km).

Source: Book of Standards, vol. 03.02, "Corrosion of Metals; Wear and Erosion" (West Conshohocken, PA, USA: ASTM International, 2000), p. 967. Reprinted with permission, copyright ASTM.

GENERAL CONVERSION FACTORS

Unit	Conversion to	Multiply by	Reciprocal
Linear Measure			
mil (0.001 inch)	micrometer	25.4	0.03937
mil (0.001 inch)	millimeter	0.0254	39.37
inch	millimeter	25.4	0.03937
foot	meter	0.3048	3.281
yard	meter	0.9144	1.0936
mile	kilometer	1.6093	0.6214
nautical mile	kilometer	1.8532	0.5396
Square Measure			
square inch	square millimeter	645.2	0.00155
square inch	square centimeter	6.452	0.155
square foot	square meter	0.0929	10.764
square yard	square meter	0.8361	1.196
acre	hectare	0.4047	2.471
acre	square meter	4,047	0.0002471
acre	square foot	43,560	0.00002296
square mile	acre	640	0.001562
square mile	square kilometer	2.590	0.3863
Volume			
cubic inch	cubic centimeter	16.387	0.06102
cubic foot	cubic meter	0.02832	35.31
cubic foot	gallon (U.S.)	7.48	0.1337
cubic foot	liter	28.32	0.03531
cubic yard	cubic meter	0.7646	1.3079
ounce (U.S. liq.)	cubic centimeter	29.57	0.03382
quart (U.S. liq.)	liter	0.9464	1.0566
gallon (U.S.)	gallon (Imperial)	0.8327	1.2009
gallon (U.S.)	liter	3.785	0.2642
barrel (U.S. Petroleum)	gallon (U.S.)	42	0.0238
barrel (U.S. Petroleum)	liter	158.98	0.00629

Mass			
grain	milligram	64.8	0.01543
ounce (avoirdupois)	gram	28.35	0.03527
pound (avoirdupois)	kilogram	0.4536	2.205
short ton	metric ton	0.9072	1.1023
long ton	metric ton	1.0161	0.9842
Pressure or Stress			
atmosphere	mm Hg @ 0 °C	760	0.001316
atmosphere	pound force per inch^2	14.696	0.06805
atmosphere	bar	1.013	0.9872
atmosphere	megapascal (MPa)	0.1013	9.872
torr (mm Hg)	pascal	133.32	0.007501
inch of water	pascal	248.8	0.004019
foot of water	pound force per inch^2	0.4335	2.307
dyne per centimeter^2	pascal	0.1000	10.00
pound force per inch^2 (psi)	kilopascal (kPa)	6.895	0.1450
kip per inch^2 (ksi)	megapascal (MPa)	6.895	0.1450
pound force per inch^2	bar	0.06895	14.50
kip per inch^2	kilogram per millimeter^2	0.7031	1.4223
Work, Heat, and Energy			
British thermal unit (Btu)	joule	1,055	0.0009479
foot pound -force	joule	1.356	0.7375
calorie	joule	4.187	0.2389
Btu	foot pound -force	778	0.001285
kilocalorie	Btu	3.968	0.252
Btu	kilogram meter	107.56	0.009297
Btu per hour	watt	0.2929	3.414
watthour	joule	3,600	0.0002778
horse power	kilowatt	0.7457	1.341

Thermal Properties			
(Btu per foot^2, hour, $^\circ$F) per inch	(kilocalorie per meter^2, hour, $^\circ$C) per meter	0.1240	8.064
(Btu per foot^2, hour, $^\circ$F) per inch	watt per meter, K	0.144	6.944
Btu per foot^2, $^\circ$F per inch	kilocalorie per meter^2, hour, $^\circ$C	4.882	0.2048
Btu per foot^2, hour, $^\circ$F	watt per meter^2, K	5.674	0.1762
Btu per foot^2	kilocalorie per meter^2	2.712	0.3687
Btu per foot^2	joule per meter^2	11,360	0.00008803
Miscellaneous			
pound per foot^3	kilogram per meter^3	16.02	0.06242
pound per gallon (U.S.)	gram per liter	119.8	0.00835
grains per 100 foot^3	milligram per meter^3	22.88	0.0437
ounces per foot^2	gram per meter^2	305.2	0.003277
pound mole (gas)	cubic foot (STP)	359.	0.00279
gram mole (gas)	liter (STP)	22.4	0.0446
day	minute	1,440	0.000694
week	hour	168	0.00595
year	hour	8,766	0.0001141
U.S. bag cement	kilogram	42.63	0.02346
gallon (U.S.) per bag cement	liter per kilogram	0.0888	11.26
ksi (inch)^{12}	megapascal (meter)^{12}	1.0989	0.9100
cubic foot of water (60 $^\circ$F)	pound of water	62.37	0.01603
board foot	cubic meter	0.00236	423.7
milliampere per foot^2	milliampere per meter^2	10.76	0.0929
gallons (U.S.) per minute	meter^3 per day	5.451	0.1835
pound -force	newton	4.448	0.2248

METRIC AND DECIMAL EQUIVALENTS OF FRACTIONS OF AN INCH

Inches		mm	Inches		mm
1/64	0.015	0.3968	33/64	0.516	13.0966
1/32	0.031	0.7937	17/32	0.531	13.4934
3/64	0.047	1.1906	35/64	0.547	13.8903
1/16	0.063	1.5876	9/16	0.563	14.2872
5/64	0.078	1.9843	37/64	0.578	14.6841
3/32	0.094	2.3812	19/32	0.594	15.0809
7/64	0.109	2.7780	39/64	0.609	15.4778
1/8	0.125	3.1749	5/8	0.625	15.8747
9/64	0.141	3.5718	41/64	0.641	16.2715
5/32	0.156	3.9686	21/32	0.656	16.6684
11/64	0.172	4.3655	43/64	0.672	17.0653
3/16	0.188	4.7624	11/16	0.688	17.4621
13/64	0.203	5.1592	45/64	0.703	17.8590
7/32	0.219	5.5561	23/32	0.719	18.2559
15/64	0.234	5.9530	47/64	0.734	18.6527
1/4	0.250	6.3498	3/4	0.750	19.0496
17/64	0.266	6.7467	49/64	0.766	19.4465
9/32	0.281	7.1436	25/32	0.781	19.8433
19/64	0.297	7.5404	51/64	0.797	20.2402
5/16	0.313	7.9373	13/16	0.813	20.6371
21/64	0.328	8.3342	53/64	0.828	21.0339
11/32	0.344	8.7310	27/32	0.844	21.4308
13/64	0.359	9.1279	55/64	0.859	21.8277
3/8	0.375	9.5248	7/8	0.875	22.2245
25/64	0.391	9.9216	57/64	0.891	22.6214
13/32	0.406	10.3185	29/32	0.906	23.0183
27/64	0.422	10.7154	59/64	0.922	23.4151
7/16	0.438	11.1122	15/16	0.938	23.8120
29/64	0.453	11.5091	61/64	0.953	24.2089
15/32	0.469	11.9060	31/32	0.969	24.6057
31/64	0.484	12.3029	63/64	0.984	25.0026
1/2	0.500	12.6997	-	1.000	25.3995

CONDENSED METRIC PRACTICE GUIDE FOR CORROSION[1],[2]

Multiply	By	To Convert to SI Units:
Area		
inch^2	645.2	millimeter^2 (mm^2)
inch^2	6.452	centimeter^2 (cm^2)
foot^2	0.09290	meter^2 (m^2)
foot^2	929.0	centimeter^2 (cm^2)
yard^2	0.8361	meter^2 (m^2)
Bending Moment (Torque)		
dyne centimeter	0.0000001	newton meter (N·m)
pound-force inch	0.1130	newton meter (N·m)
pound-force foot	1.356	newton meter (N·m)
Corrosion Rate		
mil per year (mpy)	0.02540	millimeter per year (mm/y)[a]
mil per year	25.40	micrometer per year (µm/y)
inch per year (ipy)	25.40	millimeter per year (mm/y)
inch per month (ipm)	304.8	millimeter per year (mm/y)
milligram per decimeter^2 day (mdd)	0.1000	gram per meter^2 day (g/m^2·d)[a]
milligram per decimeter^2 day	0.004167	gram per meter^2 hour (g/m^2 ·h)
milligram per decimeter^2 day	100.0	milligram per meter^2 day (mg/m^2·d)
Current Density		
milliampere per millimeter^2	1,000	ampere per meter^2 (A/m^2)
milliampere per centimeter^2	10.00	ampere per meter^2 (A/m^2)
microampere per centimeter^2	0.01000	ampere per meter^2 (A/m^2)
milliampere per meter^2	0.001000	ampere per meter^2 (A/m^2)
microampere per millimeter^2	1.000	ampere per meter^2 (A/m^2)
milliampere per foot^2	10.76	milliampere per meter^2 (mA/m^2)
ampere per inch^2	1,550	ampere per meter^2 (A/m^2)

ampere per foot^2	10.76	ampere per meter^2 (A/m^2)
ampere per centimeter^2	10,000	ampere per meter^2 (A/m^2)
ampere per decimeter^2	100.0	ampere per meter^2 (A/m^2)
Energy		
British thermal unit (Btu) (60 ˚F)	1,055	joule (J)
calorie (mean)	4.190	joule (J)
foot-pound-force	1.356	joule (J)
kilocalorie (mean)	4,190	joule (J)
kilowatt hour	3.600	megajoule (MJ)
Flow, Volume Per UnitTime		
foot^3 persecond	0.02832	meter^3 per second (m^3/s)
foot^3 persecond	2,445	meter^3 per day (m^3/d)
foot^3 per minute	40.78	meter^3 per day (m^3/d)
gallon (U.S. liquid) per minute	5.451	meter^3 per day (m^3/d)
gallon (U.S. liquid) per hour	0.09085	meter^3 per day (m^3/d)
gallon (U.S. liquid) per day	0.003785	meter^3 per day (m^3/d)
Force		
dyne	0.00001	newton (N)
kilogram-force	9.807	newton (N)
ounce-force	0.2780	newton (N)
pound-force	4.448	newton (N)
Length		
angstrom	1×10^{-10}	meter (m)
angstrom	0.1000	nanometer (nm)
micron	0.0010	millimeter (mm)
micron	1.000	micrometer (µm)
mil	0.02540	millimeter (mm)
mil	25.40	micrometer (µm)
inch	2.540	centimeter (cm)
inch	25.40	millimeter (mm)
inch	25,400	micrometer (µm)

foot	0.3048	meter (m)
yard	0.9144	meter (m)
mile	1.609	kilometer (km)
Mass		
grain	64.80	milligram (mg)
ounce	28.35	gram (g)
pound	0.4536	kilogram (kg)
pound	453.6	gram (g)
ton (short, 2,000 lb.)	907.2	kilogram (kg)
Mass Per Unit Area		
ounce-mass per foot^2	305.1	gram per meter^2 (g/m^2)
pound-mass per foot^2	4.882	kilogram per meter^2 (kg/m^2)
pound-mass per foot^2	4,882	gram per meter^2 (g/m^2)
pound-mass per inch^2	703.1	kilogram per meter^2 (kg/m^2)
Mass Per Unit Volume (Density)		
gram per centimeter^3	1,000	kilogram per meter^3 (kg/m^3)
ounce (mass) per inch^3	1,730	kilogram per meter^3 (kg/m^3)
ounce (mass) per gallon (U.S. liquid)	7.489	kilogram per meter^3 (kg/m^3)
ounce (mass) per gallon (U.S. liquid)	7.489	gram per liter (g/L)
pound (mass) per foot^3	16.02	kilogram per meter^3 (kg/m^3)
pound (mass) per gallon (U.S. liquid)	119.8	kilogram per meter^3 (kg/m^3)
Power		
Btu (thermochemical) per second	1,054	watt (W)
horsepower (electric)	746.0	watt (W)
kilocalorie (thermochemical) per second	4,184	watt (W)

Pressure or Stress		
atmosphere (normal = 760 torr)	101,300	pascal (Pa)
centimeter of mercury (0 °C)	1,333	pascal (Pa)
dyne per centimeter^2	0.1000	pascal (Pa)
inch of mercury (60 °F)	3,377	pascal (Pa)
inch of water (60 °F)	248.8	pascal (Pa)
kilogram-force per meter^2	9.807	pascal (Pa)
kip per inch^2	6.895	megapascal (MPa)
pound-force per inch^2	6.895	kilopascal (kPa)
pound-force per foot^2	47.88	pascal (Pa)
Stress Intensity		
(pound-force per inch^2) inch$^{1/2}$	0.03475	newton per millimeter$^{3/2}$ (N/mm$^{3/2}$)
(kip per inch^2) inch$^{1/2}$	34.75	newton per millimeter$^{3/2}$ (N/mm$^{3/2}$)
(pound-force per inch^2) inch$^{1/2}$	0.001099	megapascal meter$^{1/2}$ (MPa·m$^{1/2}$)[a]
(kip per inch^2) inch$^{1/2}$	1.099	megapascal meter$^{1/2}$ (MPa·m$^{1/2}$)[a]
Temperature		
degree Celsius	$T_K = T_C + 273.15$	kelvin (k)
degree Fahrenheit	$T_C = (T_K - 32)/1.8$	degree Celsius (°C)
Time		
hour (mean solar)	3,600	second (s)
day (mean solar)	86,400	second (s)
month (calendar)	2.628	megasecond (Ms)
year (calendar)	31.54	megasecond (Ms)
Velocity (Speed)		
inch per second	25.40	millimeter per second (mm/s)
foot per second	0.3048	meter per second (m/s)
inch per minute	0.4233	millimeter per second (mm/s)
mile per hour	1.609	kilometer per hour (km/h)
mile per hour	0.4470	meter per second (m/s)

Volume		
$inch^3$	16.39	centimeter^3 (cm^3)
fluid ounce (U.S.)	29.57	centimeter^3 (cm^3)
pint (U.S. liquid)	473.2	centimeter^3 (cm^3)
quart (U.S. liquid)	946.4	centimeter^3 (cm^3)
gallon (U.S. liquid)	0.003785	meter^3 (m^3)
gallon (U.S. liquid)	3.785	liter (L)

(1) This condensed guide is under the jurisdiction of ASTM Committee G-1 on Corrosion of Metals.

(2) This guide is based on ASTM E380.

(a) Preferred units.

Source: ASTM E380, "Standard for Metric Practice" (West Conshohocken, PA, USA: ASTM International). Reprinted with permission, copyright ASTM.

RELATIONSHIPS AMONG SOME OF THE UNITS COMMONLY USED FOR CORROSION RATES

	Factor for Conversion to					
Unit	**mdd**	**g/m²/d**	**μm/yr.**	**mm/yr.**	**mils/yr.**	**in./yr.**
Milligrams per square decimeter per day (mdd)	1	0.1	36.5/*d*	0.365/*d*	1.144/*d*	0.00144/*d*
Grams per square meter per day (g/m²/d)	10	1	365/*d*	0.365/*d*	14.4/*d*	0.0144/*d*
Micrometers per year (μm/yr.)	0.0274*d*	0.00274*d*	1	0.001	0.0394	0.0000394
Millimeters per year (mm/yr.)	27.4*d*	2.74*d*	1,000	1	39.4	0.0394
Mils per year (mils/yr.)	0.696*d*	0.0696*d*	25.4	0.0254	1	0.001
Inches per year (in./yr.)	696*d*	69.6*d*	25,400	25.4	1,000	1

Note: *d* is metal density in grams per cubic centimeter (g/cm³).

Source: Manual 20, *Corrosion Tests and Standards: Application and Interpretation* (West Conshohocken, PA, USA: ASTM International, 1995), pp. 19–20. Reprinted with permission, copyright ASTM.

APPROXIMATE EQUIVALENT HARDNESS NUMBERS AND TENSILE STRENGTHS FOR STEEL

Brinell Hardness No. 3,000 kg, 10-mm ball Load	Vickers Hardness No.	Rockwell Hardness No. B Scale, 100-kg Load, 1/16-in. diam. ball	Rockwell Hardness No. C Scale, 150 kg Load, Brale Indenter	Knoop Hardness No., 500 g Load and Greater	Shore Sclero-Scope Hardness No.	Tensile Strength (Approx.) ksi	Tensile Strength (Approx.) MPa
(745)	840	–	65.3	852	91	–	–
(712)	783	–	63.4	808	–	–	–
(682)	737	–	61.7	768	84	–	–
(653)	697	–	60.0	732	81	–	–
627	667	–	58.7	703	79	347	2,392
601	640	–	57.3	677	77	328	2,261
578	615	–	56.0	652	75	313	2,158
555	591	–	54.7	626	73	298	2,055
534	569	–	53.5	604	71	288	1,986
514	547	–	52.1	579	70	273	1,882
–	539	–	51.6	571	–	269	1,855
495	528	–	51.0	558	68	263	1,818
–	516	–	50.3	545	–	257	1,782
477	508	–	49.6	537	66	252	1,737
–	495	–	48.8	523	–	244	1,682
461	491	–	48.5	518	65	242	1,669
–	474	–	47.2	499	–	231	1,593
444	472	–	47.1	496	63	229	1,579
429	455	–	45.7	476	61	220	1,517
415	440	–	44.5	459	59	212	1,462
401	425	–	43.1	441	58	202	1,393
388	410	–	41.8	423	56	193	1,331
375	396	–	40.4	407	54	184	1,269
363	383	–	39.1	392	52	177	1,220
352	372	–	37.9	379	51	172	1,186
341	360	–	36.6	367	50	164	1,131
331	350	–	35.5	356	48	159	1,096
321	339	–	34.3	345	47	154	1,062
311	328	–	33.1	336	46	149	1,027
302	319	–	32.1	327	45	146	1,007
293	309	–	30.9	318	43	142	979
285	301	–	29.9	310	42	138	952
277	292	–	28.8	302	41	134	924
269	284	–	27.6	294	40	131	903
262	276	–	26.6	286	39	127	876

Brinell Hardness No. 3,000 kg, 10-mm ball Load	Vickers Hardness No.	Rockwell Hardness No. B Scale, 100-kg Load, 1/16-in. diam. ball	Rockwell Hardness No. C Scale, 150 kg Load, Brale Indenter	Knoop Hardness No., 500 g Load and Greater	Shore Sclero-Scope Hardness No.	Tensile Strength (Approx.) ksi	Tensile Strength (Approx.) MPa
255	269	-	25.4	279	38	123	848
248	261	-	24.2	272	37	120	827
241	253	100.0	22.8	265	36	116	800
235	247	99.0	21.7	259	35	114	786
229	241	98.2	20.5	253	34	111	765
223	234	97.3	-	247	-	107	738
217	228	96.4	-	242	33	105	724
212	222	95.5	-	237	32	102	703
207	218	94.6	-	232	31	100	690
201	212	93.7	-	227	-	98	676
197	207	92.8	-	222	30	95	655
192	202	91.9	-	217	29	93	641
187	196	90.9	-	212	-	90	621
183	192	90.0	-	207	28	89	614
179	188	89.0	-	202	27	87	600
174	182	88.0	-	198	-	85	586
170	178	87.0	-	194	26	83	572
167	175	86.0	-	190	-	81	559
163	171	85.0	-	186	25	79	545
159	167	83.9	-	182	-	78	538
156	163	82.9	-	178	24	76	524
152	159	81.9	-	174	-	75	517
149	156	80.8	-	170	23	73	503
146	153	79.7	-	166	-	72	496
143	150	78.6	-	163	22	71	490
137	143	76.4	-	157	21	67	462
131	137	74.2	-	151	-	65	448
126	132	72.0	-	145	20	63	434
121	127	69.8	-	140	19	60	414
116	122	67.6	-	135	18	58	400
111	117	65.4	-	131	17	56	386

Source: H.E. Boyer, T.L. Gall, eds., *Metals Handbook*, Desk Edition (Materials Park, OH, USA: ASM International, 1985), pp. 1–61. Reprinted with permission, copyright ASM International.

COMMON GAGE SERIES USED FOR SHEET THICKNESS

Name	Acronym	Identical with
American Wire Gage	AWG	B&S
Birmingham Wire Gage	BWG	Stubs Iron Wire Gage[1] A
Brown and Sharp	B&S	WG
Galvanized Iron	GSG	
Standard Wire Gage (British)	SWG	Imperial St., British Std.
Manufacture's Standard (U.S.)	MSG	
U.S. Standard Plate	USG	
Zinc (American Zinc Gage)	AZG	

[1] But Not Stubs Steel Wire Gage.

SHEET GAGE – THICKNESS CONVERSIONS (INCHES)

Gage No.	Al (U.S.) Copper Brass B&S AWG	Galv. Iron GSG	Al (U.K.) SWG	Sheet MSG	Stainless Steel Strip USG	Stainless Steel Zinc BWG	AZG
1	0.289		0.300		0.281		
2	0.258		0.276		0.266		
3	0.229		0.252	0.239	0.250		0.006
4	0.204		0.232	0.224	0.234		0.008
5	0.182		0.212	0.209	0.219		0.010
6	0.162		0.192	0.194	0.203		0.012
7	0.144		0.176	0.179	0.188	0.180	0.014
8	0.128	0.168	0.160	0.164	0.172	0.165	0.016
9	0.114	0.153	0.144	0.149	0.156	0.148	0.018
10	0.102	0.138	0.128	0.134	0.141	0.134	0.020
11	0.091	0.125	0.116	0.120	0.125	0.120	0.024
12	0.081	0.110	0.104	0.105	0.109	0.109	0.028

Gage No.	Al (U.S.) Copper Brass B&S AWG	Galv. Iron GSG	Al (U.K.) SWG	Sheet MSG	Stainless Steel Strip USG	Stainless Steel Zinc BWG	AZG
13	0.072	0.095	0.092	0.090	0.094	0.095	0.032
14	0.064	0.080	0.080	0.075	0.078	0.083	0.036
15	0.057	0.071	0.072	0.067	0.070	0.072	0.040
16	0.051	0.064	0.064	0.060	0.062	0.065	0.045
17	0.045	0.058	0.056	0.054	0.056	0.058	0.050
18	0.040	0.052	0.048	0.048	0.050	0.049	0.055
19	0.036	0.046	0.040	0.042	0.044	0.042	0.060
20	0.032	0.040	0.036	0.036	0.038	0.035	0.070
21	0.028	0.037	0.032	0.033	0.034	0.032	0.080
22	0.025	0.034	0.028	0.030	0.031	0.028	0.090
23	0.023	0.031	0.024	0.027	0.028	0.025	0.100
24	0.020	0.028	0.022	0.024	0.025	0.022	0.125
25	0.018	0.025	0.020	0.021	0.022	0.020	0.250

Source: *Materials Performance* 14, 12 (1975): p. 75.

TEMPERATURE CONVERSIONS

Celsius—Fahrenheit

The central figures in **bold** type refer to the temperatures either in degrees Celsius or degrees Fahrenheit which require conversion. The corresponding temperatures in degrees Fahrenheit or degrees Celsius will be found to the right or left respectively.

$$^{\circ}C = 5/9\,(^{\circ}F - 32^{\circ}) \qquad ^{\circ}F = 9/5\,(^{\circ}C) + 32^{\circ}$$

°C		°F	°C		°F	°C		°F	°C		°F	°C		°F	°C		°F	°C		°F
−273	**−459**		−129	**−200**	−328	−71.0	**−95**	−139	−37.2	**−35**	−31	−14.4	**6**	43	−7.8	**18**	64	−0.6	**31**	88
−262	**−440**		−123	**−190**	−310	−67.8	**−90**	−130	−34.4	**−30**	−22	−13.9	**7**	45	−7.2	**19**	66	0	**32**	90
−251	**−420**		−118	**−180**	−292	−65.0	**−85**	−121	−31.7	**−25**	−13	−13.3	**8**	46	−6.7	**20**	68	0.6	**33**	91
−240	**−400**		−112	**−170**	−274	−62.2	**−80**	−112	−26.1	**−15**	5	−12.9	**9**	48	−6.1	**21**	70	1.1	**34**	93
−229	**−380**		−107	**−160**	−256	−59.3	**−75**	−103	−23.3	**−10**	14	−12.2	**10**	50	−5.6	**22**	72	1.7	**35**	95
−218	**−360**		−101	**−150**	−238	−56.7	**−70**	−94	−20.6	**−5**	23	−11.7	**11**	52	−5	**23**	73	2.2	**36**	97
−207	**−340**		−96	**−140**	−220	−53.9	**−65**	−85	−17.8	**0**	32	−11.1	**12**	54	−3.9	**25**	77	2.8	**37**	99
−196	**−320**		−90	**−130**	−202	−51.1	**−60**	−76	−17.2	**1**	34	−10.6	**13**	55	−3.3	**26**	79	3.3	**38**	100
−184	**−300**		−84	**−120**	−184	−48.3	**−55**	−67	−16.7	**2**	36	−10	**14**	57	−2.8	**27**	81	3.9	**39**	102
−173	**−280**		−79	**−110**	−166	−45.5	**−50**	−58	−16.1	**3**	37	−9.4	**15**	59	−2.2	**28**	82	4.4	**40**	104
−162	**−260**	−436	−76	**−105**	−157	−42.8	**−45**	−49	−15.6	**4**	39	−8.9	**16**	61	−1.7	**29**	84	5	**41**	106
−151	**−240**	−400	−73.3	**−100**	−148	−40.0	**−40**	−40	−15	**5**	41	−8.3	**17**	63	−1.1	**30**	86	5.6	**42**	108

˚C		˚F	˚C		˚F	˚C		˚F	˚C		˚F	˚C		˚F	˚C		˚F	˚C		˚F
6.1	**43**	109	17.8	**64**	147	29.4	**85**	185	52	**125**	257	127	**260**	500	243	**470**	878	354	**670**	1,238
6.7	**44**	111	18.3	**65**	149	30	**86**	187	54	**130**	266	132	**270**	518	249	**480**	896	360	**680**	1,256
7.2	**45**	113	18.9	**66**	151	30.6	**87**	189	57	**135**	275	138	**280**	536	254	**490**	914	365	**690**	1,274
7.8	**46**	115	19.4	**67**	153	31.1	**88**	190	63	**145**	293	143	**290**	554	260	**500**	932	371	**700**	1,292
8.3	**47**	117	20	**68**	154	31.7	**89**	192	66	**150**	302	149	**300**	572	265	**510**	950	376	**710**	1,310
8.9	**48**	118	20.6	**69**	156	32.2	**90**	194	68	**155**	311	154	**310**	590	271	**520**	968	382	**720**	1,328
9.4	**49**	120	21.1	**70**	158	32.8	**91**	196	71	**160**	320	160	**320**	608	276	**530**	986	387	**730**	1,346
10	**50**	122	21.7	**71**	160	33.3	**92**	198	74	**165**	329	165	**330**	626	282	**540**	1,004	393	**740**	1,364
10.6	**51**	124	22.2	**72**	162	33.9	**93**	199	77	**170**	338	171	**340**	644	288	**550**	1,022	399	**750**	1,382
11.7	**53**	127	22.8	**73**	163	34.4	**94**	201	79	**175**	347	177	**350**	662	293	**560**	1,040	404	**760**	1,400
12.2	**54**	129	23.3	**74**	165	35	**95**	203	82	**180**	356	188	**370**	696	299	**570**	1,058	410	**770**	1,418
12.8	**55**	131	23.9	**75**	167	35.6	**96**	205	85	**185**	365	193	**380**	716	304	**580**	1,076	415	**780**	1,436
13.3	**56**	133	24.4	**76**	169	36.1	**97**	207	88	**190**	374	199	**390**	734	310	**590**	1,094	421	**790**	1,454
13.9	**57**	135	25	**77**	171	36.7	**98**	208	91	**195**	383	204	**400**	752	315	**600**	1,112	426	**800**	1,471
14.4	**58**	136	25.6	**78**	172	37.2	**99**	210	93	**200**	392	210	**410**	770	321	**610**	1,130	432	**810**	1,490
15	**59**	138	26.1	**79**	174	37.8	**100**	212	99	**210**	410	215	**420**	788	326	**620**	1,148	438	**820**	1,508
15.6	**60**	140	27.2	**81**	178	41	**105**	221	104	**220**	428	221	**430**	806	332	**630**	1,166	443	**830**	1,526
16.1	**61**	142	27.8	**82**	180	43	**110**	230	110	**230**	446	226	**440**	824	338	**640**	1,184	449	**840**	1,544
16.7	**62**	144	28.3	**83**	181	46	**115**	230	115	**240**	464	232	**450**	842	343	**650**	1,202	454	**850**	1,562
17.2	**63**	145	28.9	**84**	183	49	**120**	248	121	**250**	482	238	**460**	860	349	**660**	1,220	460	**860**	1,580

°C		°F	°C		°F	°C		°F	°C		°F	°C		°F	°C		°F	°C		°F
465	**870**	1,598	576	**1,070**	1,958	688	**1,270**	2,318	799	**1,470**	2,678	910	**1,670**	3,038	1,021	**1,870**	3,398	1,132	**2,070**	3,758
471	**880**	1,616	582	**1,080**	1,976	693	**1,280**	2,336	804	**1,480**	2,696	916	**1,680**	3,056	,1027	**1,880**	3,344	1,138	**2,080**	3,776
476	**890**	1,634	587	**1,090**	1,994	699	**1,290**	2,354	810	**1,490**	2,714	921	**1,690**	3,074	1,032	**1,890**	3,434	1,143	**2,090**	3,794
482	**900**	1,652	593	**1,100**	2,012	704	**1,300**	2,372	816	**1,500**	2,732	927	**1,700**	3,092	1,038	**1,900**	3,452	1,149	**2,100**	3,812
487	**910**	1,670	598	**1,110**	2,030	710	**1,310**	2,390	821	**1,510**	2,750	932	**1,710**	3,110	1,043	**1,910**	3,470	1,154	**2,110**	3,830
493	**920**	1,688	604	**1,120**	2,048	716	**1,320**	2,408	827	**1,520**	2,768	938	**1,720**	3,128	1,049	**1,920**	3,488	1,160	**2,120**	3,848
498	**930**	1,706	610	**1,130**	2,066	721	**1,330**	2,426	832	**1,530**	2,786	943	**1,730**	3,146	1,054	**1,930**	3,506	1,166	**2,130**	3,866
504	**940**	1,724	615	**1,140**	2,084	727	**1,340**	2,444	838	**1,540**	2,804	949	**1,740**	3,164	1,060	**1,940**	3,524	1,171	**2,140**	3,884
510	**950**	1,743	620	**1,150**	2,102	732	**1,350**	2,462	843	**1,550**	2,822	954	**1,750**	3,182	1,066	**1,950**	3,542	1,177	**2,150**	3,902
515	**960**	1,760	626	**1,160**	2,120	738	**1,360**	2,480	849	**1,560**	2,840	960	**1,760**	3,200	1,071	**1,960**	3,560	1,182	**2,160**	3,920
520	**970**	1,778	631	**1,170**	2,138	743	**1,370**	2,498	854	**1,570**	2,858	966	**1,770**	3,218	1,077	**1,970**	3,578	1,188	**2,170**	3,938
526	**980**	1,796	637	**1,180**	2,156	749	**,1380**	2,516	860	**1,580**	2,876	971	**1,780**	3,236	1,082	**1,980**	3,596	1,193	**2,180**	3,956
532	**990**	1,814	642	**1,190**	2,174	754	**1,390**	2,534	866	**1,590**	2,894	977	**1,790**	3,254	1,088	**1,990**	3,614	1,199	**2,190**	3,974
538	**1,000**	1,832	648	**1,200**	2,192	760	**1,400**	2,552	871	**1,600**	2,912	982	**1,800**	3,272	1,093	**2,000**	3,632	1,204	**2,200**	3,992
543	**1,010**	1,850	653	**1,210**	2,210	766	**1,410**	2,570	877	**1,610**	2,930	988	**1,810**	3,290	1,099	**2,010**	3,650	1,210	**2,210**	4,010
549	**1,020**	1,868	660	**1,220**	2,228	771	**1,420**	2,588	882	**1,620**	2,948	993	**1,820**	3,308	1,104	**2,020**	3,668	1,216	**2,220**	4,028
554	**1,030**	1,886	666	**1,230**	2,246	777	**1,430**	2,606	888	**1,630**	2,966	999	**1,830**	3,326	1,110	**2,030**	3,686	1,221	**2,230**	4,046
560	**1,040**	1,904	671	**1,240**	2,264	782	**1,440**	2,624	893	**1,640**	2,984	1,004	**1,840**	3,344	1,116	**2,040**	3,704	1,227	**2,240**	4,064
565	**1,050**	1,922	677	**1,250**	2,282	788	**1,450**	2,642	899	**1,650**	3,002	1,010	**1,850**	3,362	1,121	**2,050**	3,722	1,232	**2,250**	4,082
571	**1,060**	1,940	682	**1,260**	2,300	793	**1,460**	2,660	904	**1,660**	3,020	1,016	**1,860**	3,380	1,127	**2,060**	3,740	1,258	**2,260**	4,100

°C		°F	°C		°F	°C		°F	°C		°F	°C		°F	°C		°F	°C		°F
1,243	**2,270**	4,118	1,304	**2,380**	4,316	1,366	**2,490**	4,514	,1427	**2,600**	4,712	1,488	**2,710**	4,910	1,549	**2,820**	5,108	1,604	**2,920**	5,288
1,249	**,2280**	4,136	1,310	**2,390**	4,334	1,371	**2,500**	4,532	1,432	**2,610**	4,730	1,493	**2,720**	4,928	1,554	**2,830**	5,126	1,610	**2,930**	5,306
1,254	**2,290**	4,154	1,316	**2,400**	4,352	1,377	**2,510**	4,550	1,438	**2,620**	4,748	1,499	**2,730**	4,946	1,560	**2,840**	5,144	1,616	**2,940**	5,324
1,260	**2,300**	4,172	1,321	**2,410**	4,370	1,382	**2,520**	4,568	1,443	**2,630**	4,766	1,504	**2,740**	4,964	1,566	**2,850**	5,162	1,621	**2,950**	5,342
,1266	**2,310**	4,190	1,327	**2,420**	4,388	1,388	**2,530**	4,586	1,449	**2,640**	4,784	1,510	**2,750**	4,982	1,571	**2,860**	5,180	1,627	**2,960**	5,360
1,271	**2,320**	4,208	1,332	**2,430**	4,406	1,393	**2,540**	4,604	1,454	**2,650**	4,802	1,516	**2,760**	5,000	1,577	**2,870**	5,198	1,632	**2,970**	5,378
1,277	**2,330**	4,226	1,338	**2,440**	4,424	1,399	**2,550**	4,622	1,460	**2,660**	4,820	1,521	**2,770**	5,018	1,582	**2,880**	5,216	1,638	**2,980**	5,396
1,282	**2,340**	4,244	1,343	**2,450**	4,442	1,404	**2,560**	4,640	1,466	**2,670**	4,838	1,527	**2,780**	5,036	1,588	**2,890**	5,234	1,643	**2,990**	5,414
1,288	**2,350**	4,262	1,349	**2,460**	4,460	1,410	**2,570**	4,658	1,471	**2,680**	4,856	1,532	**2,790**	5,054	1,593	**2,900**	5,252	1,649	**3,000**	5,432
1,293	**2,360**	4,280	1,354	**2,470**	4,478	1,416	**2,580**	4,676	1,477	**2,690**	4,874	1,538	**2,800**	5,072	1,599	**2,910**	5,270			
1,299	**2,370**	4,298	1,360	**2,480**	4,496	1,421	**2,590**	4,694	1,482	**2,700**	4,892	1,543	**2,810**	5,090						

ENGLISH/METRIC (SI) STRESS CONVERSION FACTORS

Look up stress to be converted in **bold** type column. If in ksi (1,000 psi), read kg/mm² and MPa in right-hand column. If in kg/mm², read ksi in left-hand column. Note: 1 MPa (megapascal) = 1 MN per m² (meganewton per square meter).

ksi		kg/mm²	MPa	ksi		kg/mm²	MPa	ksi		kg/mm²	MPa	ksi		kg/mm²	MPa
-	**0**	-	-	19.91	**14**	9.85	96.53	−2.2	**28**	82	13.3	5.6	**42**	108	21.1
1.42	**1**	0.70	6.89	21.33	**15**	10.55	103.4	−1.7	**29**	84	13.9	6.1	**43**	109	21.7
2.84	**2**	1.41	13.79	22.75	**16**	11.25	110.3	−1.1	**30**	86	14.4	6.7	**44**	111	22.2
4.27	**3**	2.11	20.68	24.17	**17**	11.95	117.2	−0.6	**31**	88	15	7.2	**45**	113	22.8
5.69	**4**	2.81	27.57	25.60	**18**	12.66	124.1	0	**32**	90	15.6	7.8	**46**	115	23.3
7.11	**5**	3.52	34.47	27.02	**19**	13.36	131.0	0.6	**33**	91	16.1	8.3	**47**	117	23.9
8.53	**6**	4.22	41.37	28.44	**20**	14.06	137.9	1.1	**34**	93	16.7	8.9	**48**	118	24.4
9.95	**7**	4.92	48.26	29.86	**21**	14.77	144.8	1.7	**35**	95	17.2	9.4	**49**	120	25
11.38	**8**	5.63	55.16	31.28	**22**	15.47	151.7	2.2	**36**	97	17.8	10	**50**	122	25.6
12.80	**9**	6.33	62.05	32.71	**23**	16.17	158.6	2.8	**37**	99	18.3	10.6	**51**	124	26.1
14.22	**10**	7.03	68.95	34.13	**24**	16.88	165.5	3.3	**38**	100	18.9	11.7	**53**	127	27.2
15.64	**11**	7.74	75.84	−3.9	**25**	77	11.7	3.9	**39**	102	19.4	12.2	**54**	129	27.8
17.06	**12**	8.44	82.74	−3.3	**26**	79	12.2	4.4	**40**	104	20	12.8	**55**	131	28.3
18.49	**13**	9.14	89.63	−2.8	**27**	81	12.8	5	**41**	106	20.6	13.3	**56**	133	28.9

ksi		kg/mm²	MPa	ksi		kg/mm²	MPa	ksi		kg/mm²	MPa	ksi		kg/mm²	MPa
19.91	**14**	9.85	96.53	55.46	**39**	27.43	268.9	91.01	**64**	45.01	441.3	126.55	**89**	62.59	613.6
21.33	**15**	10.55	103.4	56.88	**40**	28.13	275.8	92.43	**65**	45.71	448.2	127.98	**90**	63.29	620.5
22.75	**16**	11.25	110.3	58.30	**41**	28.83	282.7	93.85	**66**	46.41	455.1	129.40	**91**	63.99	627.4
24.17	**17**	11.95	117.2	59.72	**42**	29.54	289.6	95.27	**67**	47.12	462.0	130.82	**92**	64.70	634.3
25.60	**18**	12.66	124.1	61.15	**43**	30.24	296.5	96.70	**68**	47.82	468.8	132.25	**93**	65.40	641.2
27.02	**19**	13.36	131.0	62.57	**44**	30.94	303.4	98.12	**69**	48.52	475.7	133.67	**94**	66.10	648.1
28.44	**20**	14.06	137.9	63.99	**45**	31.65	310.3	99.54	**70**	49.23	482.6	135.09	**95**	66.81	655.0
29.86	**21**	14.77	144.8	65.41	**46**	32.35	317.2	100.96	**71**	49.93	489.5	136.51	**96**	67.51	661.9
31.28	**22**	15.47	151.7	66.83	**47**	33.05	324.1	102.38	**72**	50.63	496.4	137.93	**97**	68.21	668.8
32.71	**23**	16.17	158.6	68.26	**48**	33.76	331.0	103.81	**73**	51.34	503.3	139.36	**98**	68.92	675.7
34.13	**24**	16.88	165.5	69.68	**49**	34.46	337.8	105.23	**74**	52.04	510.2	140.78	**99**	69.62	682.6
142.20	**100**	70.32	689.5	177.75	**125**	87.90	861.8	213.30	**150**	105.49	1.034	248.85	**175**	123.07	1.207
143.62	**101**	71.03	696.4	179.17	**126**	88.61	868.7	214.72	**151**	106.19	1.041	250.27	**176**	123.77	1.213
145.04	**102**	71.73	703.3	180.60	**127**	89.31	875.6	216.14	**152**	106.89	1.048	251.69	**177**	124.47	1.220
146.47	**103**	72.43	710.2	182.02	**128**	90.01	882.5	217.57	**153**	107.59	1.054	253.12	**178**	125.18	1.227
147.89	**104**	73.14	717.1	183.44	**129**	90.72	889.4	218.99	**154**	108.30	1.062	254.54	**179**	125.88	1.234
149.31	**105**	73.84	724.0	184.86	**130**	91.42	896.3	220.41	**155**	109.00	1.069	255.96	**180**	126.58	1.241
150.73	**106**	74.54	730.8	186.28	**131**	92.12	903.2	221.83	**156**	109.70	1.076	257.38	**181**	127.29	1.248
152.15	**107**	75.25	737.7	187.70	**132**	92.83	910.1	223.25	**157**	110.41	1.082	258.80	**182**	127.99	1.255
153.58	**108**	75.95	744.6	189.13	**133**	93.53	917.0	224.68	**158**	111.11	1.089	260.23	**183**	128.69	1.262
155.00	**109**	76.65	751.5	190.55	**134**	94.23	923.9	226.10	**158**	111.81	1.096	261.65	**184**	129.39	1.269

ksi		kg/mm²	MPa	ksi		kg/mm²	MPa	ksi		kg/mm²	MPa	ksi		kg/mm²	MPa
156.42	**110**	77.36	758.4	191.97	**135**	94.94	930.8	227.52	**160**	112.52	1.103	263.07	**185**	130.10	1.276
157.84	**111**	78.06	765.3	193.39	**136**	95.64	937.7	228.94	**161**	113.22	1.110	264.49	**186**	130.80	1.282
159.27	**112**	78.76	772.2	194.81	**137**	96.34	944.6	230.36	**162**	113.92	1.117	265.91	**187**	131.50	1.289
160.69	**113**	79.47	779.1	196.24	**138**	97.05	951.5	231.79	**163**	114.63	1.124	267.34	**188**	132.21	1.296
162.11	**114**	80.17	786.0	197.66	**139**	97.75	958.4	233.21	**164**	115.33	1.131	268.76	**189**	132.91	1.303
163.53	**115**	80.87	792.9	199.08	**140**	98.45	965.3	234.63	**165**	116.03	1.138	270.18	**190**	133.61	1.310
164.95	**116**	81.58	799.8	200.50	**141**	99.16	972.2	236.05	**166**	116.74	1.145	271.60	**191**	134.32	1.317
166.38	**117**	82.28	806.7	201.92	**142**	99.86	979.1	237.47	**167**	117.44	1.151	273.02	**192**	135.02	1.324
167.80	**118**	82.98	813.6	203.35	**143**	100.56	986.0	238.90	**168**	118.14	1.158	274.45	**193**	135.72	1.331
169.22	**119**	83.68	820.5	204.77	**144**	101.27	992.9	240.32	**169**	118.85	1.165	275.87	**194**	136.43	1.338
170.64	**120**	84.39	827.4	206.19	**145**	101.97	999.7	241.74	**170**	119.55	1.172	277.29	**195**	137.13	1.344
172.06	**121**	85.09	834.3	207.61	**146**	102.67	1.007	243.16	**171**	120.25	1.179	278.71	**196**	137.83	1.351
173.48	**122**	85.79	841.2	209.03	**147**	103.38	1.014	244.58	**172**	120.96	1.186	280.13	**197**	138.54	1.358
174.91	**123**	86.50	848.1	210.46	**148**	104.08	1.020	246.01	**173**	121.66	1.193	281.56	**198**	139.24	1.365
176.33	**124**	87.20	855.0	211.88	**149**	104.78	1.027	247.43	**174**	122.36	1.200	282.98	**199**	139.94	1.372
												284.40	**200**	140.65	1.379

SHEET GAGE – THICKNESS CONVERSIONS (mm)

Gage No.	Al (U.S.) Copper Brass B&S AWG	Galv. Iron GSG	Al (U.K.) SWG	Steel MSG	Stainless Steel Sheet USG	Stainless Steel Strip BWG	Zinc AZG
1	7.34		7.62		7.14		
2	6.55		7.71		6.75		
3	5.82		6.40	6.07	6.35		0.15
4	5.18		5.89	5.69	5.95		0.20
5	4.62		5.38	5.31	5.56		0.25
6	4.11		4.88	4.93	5.16		0.30
7	3.66		4.47	4.55	4.76	4.57	0.36
8	3.25	4.27	4.06	4.17	4.37	4.19	0.41
9	2.90	3.89	3.66	3.78	3.97	3.76	0.46
10	2.59	3.50	3.25	3.40	3.57	3.40	0.51
11	2.31	3.18	2.95	3.05	3.18	3.05	0.61
12	2.06	2.79	2.64	2.67	2.78	2.77	0.71
13	1.83	2.41	2.34	2.29	2.38	2.41	0.81
14	1.63	2.03	2.03	1.90	1.98	2.11	0.91
15	1.45	1.80	1.83	1.70	1.79	1.83	1.02
16	1.30	1.63	1.63	1.52	1.59	1.65	1.14
17	1.14	1.47	1.42	1.37	1.42	1.47	1.27
18	1.02	1.32	1.22	1.22	1.27	1.24	1.40
19	0.91	1.17	1.02	1.07	1.11	1.07	1.52
20	0.81	1.02	0.91	0.91	0.95	0.89	1.78
21	0.71	0.94	0.81	0.84	0.87	0.81	2.03
22	0.64	0.86	0.71	0.76	0.79	0.71	2.29
23	0.58	0.79	0.61	0.69	0.71	0.64	2.54
24	0.51	0.71	0.56	0.61	0.64	0.56	3.18
25	0.46	0.64	0.51	0.53	0.56	0.51	6.35

Source: *Materials Performance* 14, 12 (1975): p. 75.