

1 Attachment: Tables

1. Conversion from international system of units (SI)

Comparisons of SI, CGS, and engineering systems of units

Items System of units	Length	Mass	Time	Temperature	Acceleration	Force	Stress	Pressure	Energy	Power
SI	m	kg	s	K, °C	m/s ²	N	Pa	Pa	J	W
CGS system	cm	g	s	°C	Gal	dyn	dyn/cm ²	dyn/cm ²	erg	erg/s
Engineering system	m	kgf · s ² /m	s	°C	m/s ²	kgf	kgf/m ²	kgf/m ²	kgf · m	kgf · m/s

Prefixes for SI units

Powers of 10	Prefix Name	Code	Powers of 10	Prefix Name	Code
10 ¹⁸	exa	E	10 ⁻¹	deci	d
10 ¹⁵	peta	P	10 ⁻²	centi	c
10 ¹²	tera	T	10 ⁻³	milli	m
10 ⁹	giga	G	10 ⁻⁶	micro	μ
10 ⁶	mega	M	10 ⁻⁹	nano	n
10 ³	kilo	k	10 ⁻¹²	pico	p
10 ²	hecto	h	10 ⁻¹⁵	femto	f
10 ¹	deca	da	10 ⁻¹⁸	atto	a

Conversion rates from SI system of units

Item	SI unit		Units other than SI units		Conversion rate from SI unit		
	Name of unit	Abbreviation	Name of unit	Abbreviation			
Angle	Radian	rad	Degree	°	180/π		
			Minute	'	10 800/π		
			Second	"	648 000/π		
Length	Meter	m	Micron	μ	10 ⁶		
			Angstrom	Å	10 ¹⁰		
Area	Square meter	m ²	Are	a	10 ⁻²		
			Hectare	ha	10 ⁻⁴		
Volume	Cubic meter	m ³	Liter	l, L	10 ³		
			Deciliter	dl, dL	10 ⁴		
Time	Second	s	Minute	min	1/60		
			Hour	h	1/3 600		
			Day	d	1/86 400		
			Numbers of vibration numbers of frequency	Hertz	Hz	Cycle	s ⁻¹
Rotational speed	Times per second	s ⁻¹	Times per minute	rpm	60		
Velocity	Meter per second	m/s	Kilometer per hour	km/h	3 600/1 000		
			Knot	kn	3 600/1 852		
Acceleration	Meter per square second	m/s ²	Gal	Gal	10 ²		
			G	G	1/9.806 65		
Mass	Kilogram	kg	Ton	t	10 ³		
Force	Newton	N	Weight kilogram	kgf	1/9.806 65		
			Weight ton	tf	1/ (9.806 65 × 10 ³)		
			Dyne	dyn	10 ⁵		
Torque and moment of force	Newton meter	N · m	Weight kilogram meter	kgf · m	1/9.806 65		
			Stress	Pascal	Pa	Weight kilogram per square centimeter	kgf/cm ²
					Weight kilogram per square millimeter	kgf/mm ²	1/ (9.806 65 × 10 ⁶)

Conversion rates from SI units (continued from previous page)

Item	SI unit		Units other than SI units		Conversion rate from SI unit
	Name of unit	Abbreviation	Name of unit	Abbreviation	
Pressure	Pascal (newton per square meter)	Pa (N/m ²)	Weight kilogram per square meter	kgf/m ²	1/9.806 65
			Water column meter	mH ₂ O	1/ (9.806 65 × 10 ³)
			Mercurial column millimeter	mmHg	760/ (1.013 25 × 10 ⁵)
			Torr	Torr	760/ (1.013 25 × 10 ⁵)
			Bar	bar	10 ⁻⁵
Energy	Joule (newton meter)	J (N · m)	Erg	erg	10 ⁷
			Calorie (international)	cal _I	1/4.186 8
			Weight kilogram meter	kgf · m	1/9.806 65
			Kilowatt hour	kW · h	1/ (3.6 × 10 ⁶)
			Metric horsepower/hour	PS · h	≈3.776 72 × 10 ⁻⁷
Electric power, power	Watt (joules per second)	W (J/s)	Weight kilogram meter per second	kgf · m/s	1/9.806 65
			Kilo calorie per hour	kcal/h	1/1.163
			Metric horsepower	PS	≈1/735.498 8
Viscosity, Viscosity index	Pascal second	Pa · s	Poise	P	10
Kinematic viscosity, Kinematic viscosity index	Square meter per second	m ² /s	Stokes	St	10 ⁴
			Centistokes	cSt	10 ⁶
Temperature, Difference in temperature	Kelvin, Celsius degrees	K, °C	Degree	°C	[See Note (1)]
Electrical current, magnetomotive force	Ampere	A	Ampere	A	1
Electrical power, electromotive force	Volt	V	(Watt per ampere)	(W/A)	1
Magnetic field intensity	Ampere per meter	A/m	Oersted	Oe	4π/10 ³
Magnetic flux density	Tesla	T	Gauss	Gs	10 ⁴
			Gamma	γ	10 ⁹
Electrical resistance	Ohm	Ω	(Volt per ampere)	(V/A)	1

Note (1) Conversion from T K to θ °C is: $\theta = T - 273.15$. To indicate temperature difference: $\Delta T = \Delta \theta$. ΔT and $\Delta \theta$ indicate temperature differences measured by Kelvin and Celsius respectively.

Remarks: Names and abbreviations of the unit in parentheses indicate the definition of the unit shown above the parentheses or left to the parentheses.

Conversion example 1N = 1/9.806 65 kgf

2. Conversion table between N and kgf

[How to read the table]

To convert 10N to kgf, locate 10 in the center column in the first block. Locate a corresponding kgf figure in the right side column. You will find 10N is 1.0197 kgf. To convert 10 kgf to N, locate a figure in N column to its left. You will find 10 kgf is 98.006N.

$$1 \text{ N} = 0.1019716 \text{ kgf}$$

$$1 \text{ kgf} = 9.80665 \text{ N}$$

N		kgf	N		kgf	N		kgf
9.8066	1	0.1020	333.43	34	3.4670	657.05	67	6.8321
19.613	2	0.2039	343.23	35	3.5690	666.85	68	6.9341
29.420	3	0.3059	353.04	36	3.6710	676.66	69	7.0360
39.227	4	0.4079	362.85	37	3.7729	686.47	70	7.1380
49.033	5	0.5099	372.65	38	3.8749	696.27	71	7.2400
58.840	6	0.6118	382.46	39	3.9769	706.08	72	7.3420
68.647	7	0.7138	392.27	40	4.0789	715.89	73	7.4439
78.453	8	0.8158	402.07	41	4.1808	725.69	74	7.5459
88.260	9	0.9177	411.88	42	4.2828	735.50	75	7.6479
98.066	10	1.0197	421.69	43	4.3848	745.31	76	7.7498
107.87	11	1.1217	431.49	44	4.4868	755.11	77	7.8518
117.68	12	1.2237	441.30	45	4.5887	764.92	78	7.9538
127.49	13	1.3256	451.11	46	4.6907	774.73	79	8.0558
137.29	14	1.4279	460.91	47	4.7927	784.53	80	8.1577
147.10	15	1.5296	470.72	48	4.8946	794.34	81	8.2597
156.91	16	1.6315	480.53	49	4.9966	804.15	82	8.3617
166.71	17	1.7335	490.33	50	5.0986	813.95	83	8.4636
176.52	18	1.8355	500.14	51	5.2006	823.76	84	8.5656
186.33	19	1.9375	509.95	52	5.3025	833.57	85	8.6676
196.13	20	2.0394	519.75	53	5.4045	843.37	86	8.7696
205.94	21	2.1414	529.56	54	5.5065	853.18	87	8.8715
215.75	22	2.2434	539.37	55	5.6084	862.99	88	8.9735
225.55	23	2.3453	549.17	56	5.7104	872.79	89	9.0755
235.36	24	2.4473	558.98	57	5.8124	882.60	90	9.1774
245.17	25	2.5493	568.79	58	5.9144	892.41	91	9.2794
254.97	26	2.6513	578.59	59	6.0163	902.21	92	9.3814
264.78	27	2.7532	588.40	60	6.1183	912.02	93	9.4834
274.59	28	2.8552	598.21	61	6.2203	921.83	94	9.5853
284.39	29	2.9572	608.01	62	6.3222	931.63	95	9.6873
294.20	30	3.0591	617.82	63	6.4242	941.44	96	9.7893
304.01	31	3.1611	627.63	64	6.5262	951.25	97	9.8912
313.81	32	3.2631	637.43	65	6.6282	961.05	98	9.9932
323.62	33	3.3651	647.24	66	6.7301	970.86	99	10.095

3. Conversion table between kg and lb

[How to read the table]

To convert 10 kg to lb, locate 10 in the center column in the first block. Locate a corresponding lb figure in right column. You will find 10 kg is 22.046 lb. To convert 10 lb to kg, locate the figure in the kg column to the left. You will find 10 lb is 4.536 kg.

$$1 \text{ kg} = 2.2046226 \text{ lb}$$

$$1 \text{ lb} = 0.45359237 \text{ kg}$$

kg		lb	kg		lb	kg		lb
0.454	1	2.205	15.422	34	74.957	30.391	67	147.71
0.907	2	4.409	15.876	35	77.162	30.844	68	149.91
1.361	3	6.614	16.329	36	79.366	31.298	69	152.12
1.814	4	8.818	16.783	37	81.571	31.751	70	154.32
2.268	5	11.023	17.237	38	83.776	32.205	71	156.53
2.722	6	13.228	17.690	39	85.980	32.659	72	158.73
3.175	7	15.432	18.144	40	88.185	33.112	73	160.94
3.629	8	17.637	18.597	41	90.390	33.566	74	163.14
4.082	9	19.842	19.051	42	92.594	34.019	75	165.35
4.536	10	22.046	19.504	43	94.799	34.473	76	167.55
4.990	11	24.251	19.958	44	97.003	34.927	77	169.76
5.443	12	26.455	20.412	45	99.208	35.380	78	171.96
5.897	13	28.660	20.865	46	101.41	35.834	79	174.17
6.350	14	30.865	21.319	47	103.62	36.287	80	176.37
6.804	15	33.069	21.772	48	105.82	36.741	81	178.57
7.257	16	35.274	22.226	49	108.03	37.195	82	180.78
7.711	17	37.479	22.680	50	110.23	37.648	83	182.98
8.165	18	39.683	23.133	51	112.44	38.102	84	185.19
8.618	19	41.888	23.587	52	114.64	38.555	85	187.39
9.072	20	44.092	24.040	53	116.84	39.009	86	189.60
9.525	21	46.297	24.494	54	119.05	39.463	87	191.80
9.979	22	48.502	24.948	55	121.25	39.916	88	194.01
10.433	23	50.706	25.401	56	123.46	40.370	89	196.21
10.886	24	52.911	25.855	57	125.66	40.823	90	198.42
11.340	25	55.116	26.308	58	127.87	41.277	91	200.62
11.793	26	57.320	26.762	59	130.07	41.730	92	202.83
12.247	27	59.525	27.216	60	132.28	42.184	93	205.03
12.701	28	61.729	27.669	61	134.48	42.638	94	207.23
13.154	29	63.934	28.123	62	136.69	43.091	95	209.44
13.608	30	66.139	28.576	63	138.89	43.545	96	211.64
14.061	31	68.343	29.030	64	141.10	43.998	97	213.85
14.515	32	70.548	29.484	65	143.30	44.452	98	216.05
14.969	33	72.753	29.937	66	145.51	44.906	99	218.26

4. Conversion table of hardness

Rockwell C Scale hardness (1 471N)	Vickers hardness	Brinell hardness		Rockwell hardness		Shore hardness
		Standard ball	Tungsten carbide ball	A Scale Load 588.4N brale penetrator	B Scale Load 980.7N Diameter 1.5888 mm {1/16 in} sphere	
68	940	—	—	85.6	—	97
67	900	—	—	85.0	—	95
66	865	—	—	84.5	—	92
65	832	—	739	83.9	—	91
64	800	—	722	83.4	—	88
63	772	—	705	82.8	—	87
62	746	—	688	82.3	—	85
61	720	—	670	81.8	—	83
60	697	—	654	81.2	—	81
59	674	—	634	80.7	—	80
58	653	—	615	80.1	—	78
57	633	—	595	79.6	—	76
56	613	—	577	79.0	—	75
55	595	—	560	78.5	—	74
54	577	—	543	78.0	—	72
53	560	—	525	77.4	—	71
52	544	500	512	76.8	—	69
51	528	487	496	76.3	—	68
50	513	475	481	75.9	—	67
49	498	464	469	75.2	—	66
48	484	451	455	74.7	—	64
47	471	442	443	74.1	—	63
46	458	432	432	73.6	—	62
45	446	421	421	73.1	—	60
44	434	409	409	72.5	—	58
43	423	400	400	72.0	—	57
42	412	390	390	71.5	—	56
41	402	381	381	70.9	—	55
40	392	371	371	70.4	—	54
39	382	362	362	69.9	—	52

Rockwell C Scale hardness (1 471N)	Vickers hardness	Brinell hardness		Rockwell hardness		Shore hardness
		Standard ball	Tungsten carbide ball	A Scale Load 588.4N brale penetrator	B Scale Load 980.7N Diameter 1.5888 mm {1/16 in} sphere	
38	372	353	353	69.4	—	51
37	363	344	344	68.9	—	50
36	354	336	336	68.4	(109.0)	49
35	345	327	327	67.9	(108.5)	48
34	336	319	319	67.4	(108.0)	47
33	327	311	311	66.8	(107.5)	46
32	318	301	301	66.3	(107.0)	44
31	310	294	294	65.8	(106.0)	43
30	302	286	286	65.3	(105.5)	42
29	294	279	279	64.7	(104.5)	41
28	286	271	271	64.3	(104.0)	41
27	279	264	264	63.8	(103.0)	40
26	272	258	258	63.3	(102.5)	38
25	266	253	253	62.8	(101.5)	38
24	260	247	247	62.4	(101.0)	37
23	254	243	243	62.0	100.0	36
22	248	237	237	61.5	99.0	35
21	243	231	231	61.0	98.5	35
20	238	226	226	60.5	97.8	34
(18)	230	219	219	—	96.7	33
(16)	222	212	212	—	95.5	32
(14)	213	203	203	—	93.9	31
(12)	204	194	194	—	92.3	29
(10)	196	187	187	—	90.7	28
(8)	188	179	179	—	89.5	27
(6)	180	171	171	—	87.1	26
(4)	173	165	165	—	85.5	25
(2)	166	158	158	—	83.5	24
(0)	160	152	152	—	81.7	24

5. Deviations of shafts used in common fits

Classification of diameter (mm)		d6	e6	f6	g5	g6	h5	h6	h7	h8	h9	h10	js5	js6
Over	or less													
3	6	-30 -38	-20 -28	-10 -18	-4 -9	-4 -12	0 -5	0 -8	0 -12	0 -18	0 -30	0 -48	± 2.5	± 4
6	10	-40 -49	-25 -34	-13 -22	-5 -11	-5 -14	0 -6	0 -9	0 -15	0 -22	0 -36	0 -58	± 3	± 4.5
10	18	-50 -61	-32 -43	-16 -27	-6 -14	-6 -17	0 -8	0 -11	0 -18	0 -27	0 -43	0 -70	± 4	± 5.5
18	30	-65 -78	-40 -53	-20 -33	-7 -16	-7 -20	0 -9	0 -13	0 -21	0 -33	0 -52	0 -84	± 4.5	± 6.5
30	50	-80 -96	-50 -66	-25 -41	-9 -20	-9 -25	0 -11	0 -16	0 -25	0 -39	0 -62	0 -100	± 5.5	± 8
50	80	-100 -119	-60 -79	-30 -49	-10 -23	-10 -29	0 -13	0 -19	0 -30	0 -46	0 -74	0 -120	± 6.5	± 9.5
80	120	-120 -142	-72 -94	-36 -58	-12 -27	-12 -34	0 -15	0 -22	0 -35	0 -54	0 -87	0 -140	± 7.5	± 11
120	180	-145 -170	-85 -110	-43 -68	-14 -32	-14 -39	0 -18	0 -25	0 -40	0 -63	0 -100	0 -160	± 9	± 12.5
180	250	-170 -199	-100 -129	-50 -79	-15 -35	-15 -44	0 -20	0 -29	0 -46	0 -72	0 -115	0 -185	± 10	± 14.5
250	315	-190 -222	-110 -142	-56 -88	-17 -40	-17 -49	0 -23	0 -32	0 -52	0 -81	0 -130	0 -210	± 11.5	± 16
315	400	-210 -246	-125 -161	-62 -98	-18 -43	-18 -54	0 -25	0 -36	0 -57	0 -89	0 -140	0 -230	± 12.5	± 18
400	500	-230 -270	-135 -175	-68 -108	-20 -47	-20 -60	0 -27	0 -40	0 -63	0 -97	0 -155	0 -250	± 13.5	± 20
500	630	-260 -304	-145 -189	-76 -120	-	-22 -66	-	0 -44	0 -70	0 -110	0 -175	0 -280	-	± 22
630	800	-290 -340	-160 -210	-80 -130	-	-24 -74	-	0 -50	0 -80	0 -125	0 -200	0 -320	-	± 25
800	1000	-320 -376	-170 -226	-86 -142	-	-26 -82	-	0 -56	0 -90	0 -140	0 -230	0 -360	-	± 28
1000	1250	-350 -416	-195 -261	-98 -164	-	-28 -94	-	0 -66	0 -105	0 -165	0 -260	0 -420	-	± 33
1250	1600	-390 -468	-220 -298	-110 -188	-	-30 -108	-	0 -78	0 -125	0 -195	0 -310	0 -500	-	± 39
1600	2000	-430 -522	-240 -332	-120 -212	-	-32 -124	-	0 -92	0 -150	0 -230	0 -370	0 -600	-	± 46

Unit: μm

j5	j6	j7	k5	k6	k7	m5	m6	n6	p6	r6	r7	Classification of diameter (mm)	
												Over	or less
+3 -2	+6 -2	+8 -4	+6 +1	+9 +1	+13 +1	+9 +4	+12 +4	+16 +8	+20 +12	+23 +15	+27 +15	3	6
+4 -2	+7 -2	+10 -5	+7 +1	+10 +1	+16 +1	+12 +6	+15 +6	+19 +10	+24 +15	+28 +19	+34 +19	6	10
+5 -3	+8 -3	+12 -6	+9 +1	+12 +1	+19 +1	+15 +7	+18 +7	+23 +12	+29 +18	+34 +23	+41 +23	10	18
+5 -4	+9 -4	+13 -8	+11 +2	+15 +2	+23 +2	+17 +8	+21 +8	+28 +15	+35 +22	+41 +28	+49 +28	18	30
+6 -5	+11 -5	+15 -10	+13 +2	+18 +2	+27 +2	+20 +9	+25 +9	+33 +17	+42 +26	+50 +34	+59 +34	30	50
+6 -7	+12 -7	+18 -12	+15 +2	+21 +2	+32 +2	+24 +11	+30 +11	+39 +20	+51 +32	+60 +41	+71 +41	50	65
										+62 +43	+73 +43	65	80
+6 -9	+13 -9	+20 -15	+18 +3	+25 +3	+38 +3	+28 +13	+35 +13	+45 +23	+59 +37	+73 +54	+86 +54	80	100
										+76 +54	+89 +54	100	120
										+88 +63	+103 +63	120	140
+7 -11	+14 -11	+22 -18	+21 +3	+28 +3	+43 +3	+33 +15	+40 +15	+52 +27	+68 +43	+90 +65	+105 +65	140	160
										+93 +68	+108 +68	160	180
										+106 +77	+123 +77	180	200
+7 -13	+16 -13	+25 -21	+24 +4	+33 +4	+50 +4	+37 +17	+46 +17	+60 +31	+79 +50	+109 +80	+126 +80	200	225
										+113 +84	+130 +84	225	250
+7 -16	±16	±26	+27 +4	+36 +4	+56 +4	+43 +20	+52 +20	+66 +34	+88 +56	+126 +94	+146 +94	250	280
										+130 +98	+150 +98	280	315
+7 -18	±18	+29 -28	+29 +4	+40 +4	+61 +4	+46 +21	+57 +21	+73 +37	+98 +62	+144 +108	+165 +108	315	355
										+150 +114	+171 +114	355	400
+7 -20	±20	+31 -32	+32 +5	+45 +5	+68 +5	+50 +23	+63 +23	+80 +40	+108 +68	+166 +126	+189 +126	400	450
										+172 +132	+195 +132	450	500
-	-	-	-	+44 0	+70 0	-	+70 +26	+88 +44	+122 +78	+194 +150	+220 +150	500	560
										+199 +155	+225 +155	560	630
-	-	-	-	+50 0	+80 0	-	+80 +30	+100 +50	+138 +88	+225 +175	+255 +175	630	710
										+235 +185	+265 +185	710	800
-	-	-	-	+56 0	+90 0	-	+90 +34	+112 +56	+156 +100	+266 +210	+300 +210	800	900
										+276 +220	+310 +220	900	1000
-	-	-	-	+66 0	+105 0	-	+106 +40	+132 +66	+186 +120	+316 +250	+355 +250	1000	1120
										+326 +260	+365 +260	1120	1250
-	-	-	-	+78 0	+125 0	-	+126 +48	+156 +78	+218 +140	+378 +300	+425 +300	1250	1400
										+408 +330	+455 +330	1400	1600
-	-	-	-	+92 0	+150 0	-	+150 +58	+184 +92	+262 +170	+462 +370	+520 +370	1600	1800
										+492 +400	+550 +400	1800	2000

6. Deviations of holes used in common fits

Unit: μm

Classification of diameter (mm)		E6	F6	F7	G6	G7	H6	H7	H8	J6	J7	JS6	JS7
Over	or less												
10	18	+43 +32	+27 +16	+34 +16	+17 +6	+24 +6	+11 0	+18 0	+27 0	+6 -5	+10 -8	± 5.5	± 9
18	30	+53 +40	+33 +20	+41 +20	+20 +7	+28 +7	+13 0	+21 0	+33 0	+8 -5	+12 -9	± 6.5	± 10.5
30	50	+66 +50	+41 +25	+50 +25	+25 +9	+34 +9	+16 0	+25 0	+39 0	+10 -6	+14 -11	± 8	± 12.5
50	80	+79 +60	+49 +30	+60 +30	+29 +10	+40 +10	+19 0	+30 0	+46 0	+13 -6	+18 -12	± 9.5	± 15
80	120	+94 +72	+58 +36	+71 +36	+34 +12	+47 +12	+22 0	+35 0	+54 0	+16 -6	+22 -13	± 11	± 17.5
120	180	+110 +85	+68 +43	+83 +43	+39 +14	+54 +14	+25 0	+40 0	+63 0	+18 -7	+26 -14	± 12.5	± 20
180	250	+129 +100	+79 +50	+96 +50	+44 +15	+61 +15	+29 0	+46 0	+72 0	+22 -7	+30 -16	± 14.5	± 23
250	315	+142 +110	+88 +56	+108 +56	+49 +17	+69 +17	+32 0	+52 0	+81 0	+25 -7	+36 -16	± 16	± 26
315	400	+161 +125	+98 +62	+119 +62	+54 +18	+75 +18	+36 0	+57 0	+89 0	+29 -7	+39 -18	± 18	± 28.5
400	500	+175 +135	+108 +68	+131 +68	+60 +20	+83 +20	+40 0	+63 0	+97 0	+33 -7	+43 -20	± 20	± 31.5
500	630	+189 +145	+120 +76	+146 +76	+66 +22	+92 +22	+44 0	+70 0	+110 0	—	—	± 22	± 35
630	800	+210 +160	+130 +80	+160 +80	+74 +24	+104 +24	+50 0	+80 0	+125 0	—	—	± 25	± 40
800	1000	+226 +170	+142 +86	+176 +86	+82 +26	+116 +26	+56 0	+90 0	+140 0	—	—	± 28	± 45
1000	1250	+261 +195	+164 +98	+203 +98	+94 +28	+133 +28	+66 0	+105 0	+165 0	—	—	± 33	± 52.5
1250	1600	+298 +220	+188 +110	+235 +110	+108 +30	+155 +30	+78 0	+125 0	+195 0	—	—	± 39	± 62.5
1600	2000	+332 +240	+212 +120	+270 +120	+124 +32	+182 +32	+92 0	+150 0	+230 0	—	—	± 46	± 75
2000	2500	+370 +260	+240 +130	+305 +130	+144 +34	+209 +34	+110 0	+175 0	+280 0	—	—	± 55	± 87.5

K5	K6	K7	M5	M6	M7	N5	N6	N7	P6	P7	Classification of diameter (mm)	
											Over	or less
+2 -6	+2 -9	+6 -12	-4 -12	-4 -15	0 -18	-9 -17	-9 -20	-5 -23	-15 -26	-11 -29	10	18
+1 -8	+2 -11	+6 -15	-5 -14	-4 -17	0 -21	-12 -21	-11 -24	-7 -28	-18 -31	-14 -35	18	30
+2 -9	+3 -13	+7 -18	-5 -16	-4 -20	0 -25	-13 -24	-12 -28	-8 -33	-21 -37	-17 -42	30	50
+3 -10	+4 -15	+9 -21	-6 -19	-5 -24	0 -30	-15 -28	-14 -33	-9 -39	-26 -45	-21 -51	50	80
+2 -13	+4 -18	+10 -25	-8 -23	-6 -28	0 -35	-18 -33	-16 -38	-10 -45	-30 -52	-24 -59	80	120
+3 -15	+4 -21	+12 -28	-9 -27	-8 -33	0 -40	-21 -39	-20 -45	-12 -52	-36 -61	-28 -68	120	180
+2 -18	+5 -24	+13 -33	-11 -31	-8 -37	0 -46	-25 -45	-22 -51	-14 -60	-41 -70	-33 -79	180	250
+3 -20	+5 -27	+16 -36	-13 -36	-9 -41	0 -52	-27 -50	-25 -57	-14 -66	-47 -79	-36 -88	250	315
+3 -22	+7 -29	+17 -40	-14 -39	-10 -46	0 -57	-30 -55	-26 -62	-16 -73	-51 -87	-41 -98	315	400
+2 -25	+8 -32	+18 -45	-16 -43	-10 -50	0 -63	-33 -60	-27 -67	-17 -80	-55 -95	-45 -108	400	500
—	0 -44	0 -70	—	-26 -70	-26 -96	—	-44 -88	-44 -114	-78 -122	-78 -148	500	630
—	0 -50	0 -80	—	-30 -80	-30 -110	—	-50 -100	-50 -130	-88 -138	-88 -168	630	800
—	0 -56	0 -90	—	-34 -90	-34 -124	—	-56 -112	-56 -146	-100 -156	-100 -190	800	1000
—	0 -66	0 -105	—	-40 -106	-40 -145	—	-66 -132	-66 -171	-120 -186	-120 -225	1000	1250
—	0 -78	0 -125	—	-48 -126	-48 -173	—	-78 -156	-78 -203	-140 -218	-140 -265	1250	1600
—	0 -92	0 -150	—	-58 -150	-58 -208	—	-92 -184	-92 -242	-170 -262	-170 -320	1600	2000
—	0 -110	0 -175	—	-68 -178	-68 -243	—	-110 -220	-110 -285	-195 -305	-195 -370	2000	2500