



Men's Neck														
	S		M		L		XL		2XL		3XL		4XL	
Metric (cm)	-	37	38	39	41	42	43	44	46	47	48	50	51	
Imperial (inches)	-	14.5	15	15.5	16	16.5	17	17.5	18	18.5	19	19.5	20	



Men's Chest																											
	XS			S		M		L		XL		2XL		3XL		4XL		5XL		6XL		7XL					
Metric (cm)	80	84	88	92	96	100	104	108	112	116	120	124	128	132	136	140	144	148	152	156	160	164	168	172	176	180	184
Imperial (inches)	32	33	34	36	38	40	41	42	44	46	47	48	50	52	54	55	56	58	60	62	64	65	66	67	69	71	73
Euro	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92
Leisurewear	S			M		L		XL		2XL		3XL															



Men's Waist																				
	XS		S		M		L		XL		2XL		3XL		4XL		5XL			
Metric (cm)	68	72	76	80	84	88	92	96	100	104	108	112	116	120	124	128	132	136	140	
Imperial (inches)	26	28	30	32	33	34	36	38	40	41	42	44	46	47	48	50	52	54	56	
Euro - DE, NL, BE	42	44	46	48		50	52	54	56		58	60	62		64/66	68	70	72	74	
Euro - FR, ES, PT	34	36	38	40	42	44	46	48	50	52	54	56	58		60/62	64	66	68	70	



Ladies' Bust																	
	XS			S		M		L		XL		2XL		3XL		4XL	
UK				8	10	12	14	16		18	20	22	24		26	28	30
Metric (cm)	72	76	80	84	88	92	96	100	104	108	112	116	120	124	128	132	136
Imperial (inches)	28	30	32	33	34	36	38	40		42	44	46	47	48	50	52	54
Euro - DE, BE, NL NO, SV, DK	32	34	36		38	40	42	44		46	48	50		52	54	56	58
Euro - FR, ES, PT	34	36	36/38		40	42	44	46/48		48	50	52		54	56	58	60
Italy - IT	36	38	40		42	44	46	46		50	52	54		56	58	60	62



Ladies' Waist																		
	XS		S		M		L		XL		2XL		3XL		4XL			
UK		6	8	10	12	14	16		18	20	22	24		26	28	30		
Metric (cm)	60	64	68	72	76	80	84	88	92	96	100	104	108	112	116	120	124	128
Imperial (inches)	22	24	26	28	30	32	33	34	36	38	40	41	42	44	46	47	48	50
Euro - DE, BE, NL NO, SV, DK	32/34	36	38	40		42	44	46	48	50	52		54	56	58	60	62	64
Euro - FR, ES, PT	34/36	38	40	42		44	46	48	50	52	54		56	58	60	62	64	66
Italy - IT	36/38	40	42	44		46	48	50	52	54	56		58	60	62	64	66	68

Conversion Table of Cutting Speed

m/min. to r/min.

m/min.		4	6	8	9	10	12	15	18	21	25	27	30	36
Size (mm)	inch	Revolutions per Minute (rpm)												
1.6	1/16"	800	1194	1592	1791	1988	2386	2983	3579	4176	4971	5369	5965	7158
1.8		708	1065	1415	1598	1768	2121	2652	3182	3712	4419	4743	5303	6364
2		637	955	1274	1433	1591	1909	2386	2863	3341	3977	4295	4773	5727
2.2	3/32"	579	869	1158	1303	1446	1736	2169	2603	3037	3616	3905	4339	5207
2.5		510	764	1019	1147	1274	1527	1909	2291	2673	3182	3436	3818	4582
3	1/8"	425	637	849	955	1061	1273	1591	1909	2227	2651	2864	3182	3818
3.5		364	546	728	819	909	1091	1364	1636	1909	2273	2455	2727	3273
4	5/32"	318	478	637	718	796	955	1193	1432	1671	1989	2148	2387	2864
4.5		283	425	566	637	707	849	1061	1273	1485	1768	1919	2122	2546
5	3/16"	255	382	510	573	637	764	955	1146	1337	1591	1719	1909	2292
6	1/4"	212	319	425	477	530	636	795	954	1113	1326	1432	1592	1909
7	9/32"	182	273	364	409	455	546	682	818	955	1136	1227	1364	1636
8	5/16"	159	239	319	358	398	477	597	716	835	994	1074	1193	1432
9		142	212	283	318	354	425	531	637	742	885	955	1061	1293
10	3/8"	127	191	255	286	318	382	477	573	668	795	859	955	1146
11		116	174	232	260	289	347	434	521	608	723	781	868	1041
12	1/2"	106	159	212	238	265	318	398	477	557	663	716	796	955
13		98	147	196	220	245	294	367	441	514	612	661	734	881
14	9/16"	91	136	182	205	227	273	341	409	477	568	614	682	818
16	5/8"	80	119	159	179	199	239	298	358	418	497	537	597	716
18		71	106	141	159	177	212	265	318	371	442	477	530	636
20	3/4"	64	96	127	143	159	191	239	286	334	398	430	477	573
22	7/8"	58	87	116	130	145	174	217	260	304	362	391	434	521
24	1"	53	80	106	119	133	159	199	239	275	331	353	398	477
27		47	71	94	106	118	141	177	212	245	295	318	354	424
30	1 1/8"	43	64	85	95	106	127	159	191	223	265	286	318	382
33	1 1/4"	39	58	77	87	96	116	145	174	203	241	260	289	347
36		35	53	71	80	88	106	133	159	186	221	239	265	318
39	1 1/2"	33	49	65	73	82	98	122	147	171	204	220	245	294
42		30	46	61	68	76	91	114	136	159	189	205	227	273
45	1 3/4"	28	42	57	64	71	85	106	127	149	177	191	212	255
48		27	40	53	60	66	80	99	119	139	166	179	199	239
52		24	37	49	55	61	73	92	110	129	153	165	184	220
56	2"	23	34	46	51	57	68	85	102	119	142	153	170	205

Recommended Cutting Speed

Coolants and Lubricants

Material	Lubricant	Cutting Speed
Steel, unalloyed and low alloyed, short chipping	S/E	10 - 20
non-abrasive material, short chipping	S/E	6 - 15
Steel, heat resistant, long chipping	S	4 - 8
Steel, heat resistant, short chipping	S	4 - 8
Steel, cementation and heat treatable, short chipping	S	4 - 8
Steel, tool steel up to 1200 N/mm ²	S	2 - 5
Steel, tool steel over 1200 N/mm ²	S	2 - 5
Stainless steel, short chipping	S	5 - 10
Stainless steel, long chipping	S	5 - 10
Iron, cast	P/T	6 - 20
Iron, spheroidal graphite	P/T	6 - 20
Iron, malleable cast	E	6 - 12
Brass, short chipping	E	20 - 30
Brass, long chipping	S/E	10 - 15
Bronze, short chipping	S/E	6 - 15
Bronze, long chipping	S/E	6 - 15
Copper	S/E	10 - 15
Aluminium-alloys, short chipping	S/E	15 - 30
Aluminium-alloys, long chipping	E	10 - 20
Zinc alloys	S/E	10 - 15
Magnesium alloys	E/T	10 - 20
Titanium, short chipping	S	3 - 4
Titanium, long chipping	S	3 - 4
Plastics, thermoplastics	E/T	5 - 15
Plastics, thermosetting	T	5 - 15

S = cutting oil

E = emulsion oil

P = kerosene

T = dry

Recommended Tapping Drill Sizes

Mf	Ø mm	BSF Ø mm	UNC Ø mm	UNF Ø mm	8-UN Ø mm	UNEF Ø mm	PG Ø mm
M 105 x 1.5	103.5	BSF 1/4"	No. 1-64 1.5	No. 0-80 1.3	UN 1.1/16-8 23.9	No. 12-32 4.75	PG 7 11.4
M 105 x 2.0	103	BSF 5/16"	No. 2-56 1.8	No. 1-72 1.6	UN 1.1/8-8 25.5	1/4-32 5.6	PG 9 14
M 105 x 3.0	102	BSF 3/8"	No. 3-48 2.1	No. 2-64 1.9	UN 1.3/16-8 27.1	5/16-32 7.2	PG 11 17.25
M 105 x 4.0	101	BSF 7/16"	No. 4-40 2.3	No. 3-56 2.1	UN 1.1/4-8 28.75	3/8-32 8.8	PG 13.5 19
M 110 x 1.5	108.5	BSF 1/2"	No. 5-40 2.6	No. 4-48 2.4	UN 1.5/16-8 30.3	7/16-28 10.25	PG 16 21.25
M 110 x 2.0	108	BSF 5/8"	No. 6-32 2.85	No. 5-44 2.7	UN 1.3/8-8 31.75	1/2-28 11.8	PG 21 26.75
M 110 x 3.0	107	BSF 3/4"	No. 8-32 3.5	No. 6-40 3	UN 1.1/2-8 35	9/16-24 13.3	PG 29 35.5
M 110 x 4.0	106	BSF 7/8"	No. 10-24 3.9	No. 8-36 3.5	UN 1.5/8-8 38	5/8-24 14.9	PG 36 45.5
		BSF 1"	No. 12-24 4.5	No. 10-32 4.1	UN 1.3/4-8 41.5	11/16-24 16.5	PG 42 52.5
			1/4-20 5.2	No. 12-28 4.7	UN 1.7/8-8 44.5	3/4-20 17.75	PG 48 58
BSW	Ø mm	BSP G Ø mm	5/16-18 6.6	1/4-28 5.5	UN 2"-8 47.75	13/16-20 19.5	
			3/8-16 8	5/16-24 6.9	UN 2.1/8-8 50.9	7/8-20 21	NPT Ø mm
W 3/32"	1.8	G 1/8"	7/16-14 9.4	3/8-24 8.5	UN 2.1/4-8 54	15/16-20 22.5	1/16-27 6.3
W 1/8"	2.6	G 1/4"	1/2-13 10.8	7/16-20 9.9	UN 2.1/2-8 60.4	1"-20 24.25	1/8-27 8.5
W 5/32"	3.1	G 3/8"	9/16-12 12.2	1/2-20 11.5	UN 2.3/4-8 66.7	1.1/16-18 25.7	1/4-18 11.2
W 3/16"	3.6	G 1/2"	5/8-11 13.5	9/16-18 12.9	UN 3"-8 73.1	1.1/8-18 27.25	3/8-18 14.5
W 7/32"	4.4	G 5/8"	3/4-10 16.5	5/8-18 14.5	UN 3.1/4-8 79.4	1.3/16-18 28.75	1/2-14 18
W 1/4"	5.1	G 3/4"	7/8-9 19.5	3/4-16 17.5	UN 3.1/2-8 85.8	1.1/4-18 30.5	3/4-14 23
W 5/16"	6.5	G 7/8"	1"-8 22.25	7/8-14 20.25	UN 3.3/4-8 92.1	1.5/16-18 32	1"-11.5 29
W 3/8"	7.9	G 1"	1.1/8-7 25	1"-12 23.25	UN 4"-8 98.5	1.3/8-18 33.5	1.1/4-11.5 38
W 7/16"	9.3	G 1.1/8"	1.1/4-7 28.25	1.1/8-12 26.5		1.7/16-18 35.2	1.1/2-11.5 44
W 1/2"	10.5	G 1.1/4"	1.3/8-6 30.75	1.1/4-12 29.5		1.1/2-18 36.8	2"-11.5 56
W 9/16"	12	G 1.3/8"	1.1/2-6 34	1.3/8-12 32.5		1.9/16-18 38.4	2.1/2-8 67
W 5/8"	13.5	G 1.1/2"	1.3/4-5 39.5	1.1/2-12 36		1.5/8-18 40	3"-8 83
W 3/4"	16.5	G 1.3/4"	2"-4.5 45			1.11/16-18 41.5	
W 7/8"	19.25	G 2"	2.1/4-4.5 51.5	12-UN Ø mm	UN Ø mm	1.3/4-18 43	W Ø mm
W 1"	22	G 2.1/4"	2 1/2-4 57.25	UN 1.5/8-12 39.2	UN 5/16-28 7	2"-18 49.4	DIN 477 Ø mm
W 1 1/8"	24.75	G 2.1/2"	2.3/4-4 63.5	UN 1.3/4-12 42.4	UN 3/8-20 8.		W 19.8 15.1
W 1 1/4"	27.75	G 2.3/4"	3"-4 70	UN 1.7/8-12 45.6	UN 3/8-28 8.6	UNEF Ø mm	W 28.8 23.5
W 1 3/8"	30.2	G 3"	3.1/4-4 76.2	UN 2"-12 48.75	UN 7/16-32 10.3	UNS 1/4-24 5.4	W 31.3 26.0
W 1 1/2"	33.5		3.1/2-4 82.6	UN 2.1/8-12 51.9	UN 1/2-32 11.9	UNS 1/4-36 5.7	
W 1 3/4"	38.5	BA Ø mm		UN 2.1/4-12 55.1	UN 9/16-20 10.9	UNS 1/4-40 5.75	
W 2"	44.5	BA 0 5.1		UN 2.1/2-12 61.5	UN 9/16-28 11.3	UNS 3/8-27 8.35	
		BA 1 4.5		UN 2.3/4-12 67.8	UN 9/16-32 11.4	UNS 7/16-24 10.1	
		BA 2 4		UN 3"-12 74.2	UN 5/8-20 14.6	UNS 1/2-24 11.75	
		BA 3 3.4		UN 3.1/4-12 80.5	UN 5/8-28 15	UNS 5/8-27 14.7	
		BA 4 3		UN 3.1/2-12 86.9	UN 11/16-20 16.2	UNS 3/4-24 18	
		BA 5 2.65		UN 3.3/4-12 93.2	UN 11/16-16 15.9	UNS 7/8-18 21	
		BA 6 2.3		UN 4"-12 99.6	UN 1"-32 24.6	UNS 1"-14 23.75	

Recommended Outside Diameter

M	Ø mm	Mf	Ø mm	Mf	Ø mm	BSW	Ø mm	UNC	Ø mm	UNF	Ø mm	PG	Ø mm	
M 1	0.25	0.97	M 3	x 0.35	2.94	M 24	x 2	22.82	W 1/4	6.16	No. 1 - 64	1.79	PG 7	12.4
M 1.1	0.25	1.07	M 3.5	x 0.35	3.44	M 25	x 1	24.88	W 5/16	7.76	No. 2 - 56	2.12	PG 9	15.1
M 1.2	0.25	1.17	M 4	x 0.35	3.94	M 25	x 1.5	24.85	W 3/8	9.30	No. 3 - 48	2.44	PG 11	18.5
M 1.4	0.3	1.36	M 4	x 0.5	3.93	M 26	x 1	25.88	W 7/16	10.89	No. 4 - 40	2.76	PG 13.5	20.3
M 1.6	0.35	1.54	M 5	x 0.5	4.93	M 26	x 1.5	25.85	W 1/2	12.43	No. 5 - 40	3.09	PG 16	22.4
M (1.7)	0.35	1.64	M 6	x 0.5	5.93	M 27	x 1	26.88	W 9/16	13.92	No. 6 - 32	3.41	PG 21	28.15
M 1.8	0.35	1.74	M 6	x 0.75	5.90	M 27	x 1.5	26.85	W 5/8	15.62	No. 8 - 32	4.07	PG 29	36.85
M 2	0.4	1.93	M 7	x 0.75	6.90	M 27	x 2	26.82	W 3/4	18.76	No. 10 - 24	4.71	PG 36	46.85
M 2.2	0.45	2.13	M 8	x 0.5	7.93	M 28	x 1.5	27.85	W 7/8	21.89	No. 12 - 24	5.37	PG 42	53.85
M (2.3)	0.4	2.23	M 8	x 0.75	7.90	M 28	x 2	27.82	W 1"	25.08	1/4 - 20	6.22	PG 48	59.15
M 2.5	0.45	2.43	M 8	x 1	7.83	M 30	x 1	29.88	W 1.1/8	28.21	5/16 - 18	7.80		
M (2.6)	0.45	2.53	M 9	x 1	8.88	M 30	x 1.5	29.85			3/8 - 16	9.37		
M 3	0.5	2.92	M 10	x 0.5	9.93	M 30	x 2	29.82	BSF	Ø	7/16 - 14	10.95	NPT	Ø
M 3	0.6	2.91	M 10	x 0.75	9.90	M 32	x 1.5	31.85		mm	1/2 - 13	12.52		mm
M 3.5	0.6	3.41	M 10	x 1	9.88	M 33	x 1.5	32.85	BSF 3/16	4.67	9/16 - 12	14.10	1/16	8.17
M 3.5	0.75	3.41	M 10	x 1.25	9.86	M 33	x 2	32.82	BSF 1/4	6.25	5/8 - 11	15.68	1/8	10.55
M 4	0.7	3.91	M 11	x 1	10.88	M 34	x 1.5	33.85	BSF 5/16	7.82	3/4 - 10	18.84	1/4	14.10
M 4	0.75	3.91	M 12	x 0.75	11.90	M 35	x 1.5	34.85	BSF 3/8	9.39	7/8 - 9	22	3/8	17.52
M 4.5	0.75	4.41	M 12	x 1	11.88	M 36	x 1.5	35.85	BSF 7/16	10.97	1" - 8	25.16	1/2	21.85
M 5	0.8	4.90	M 12	x 0.25	11.86	M 36	x 2	35.82	BSF 1/2	12.54	1.1/8 - 7	28.31	3/4	27.16
M 5	0.9	4.89	M 12	x 1.5	11.85	M 36	x 3	35.76	BSF 9/16	14.12	1.1/8 - 7	31.49	1"	34.16
M 6	1	5.88	M 13	x 1	12.88	M 38	x 1.5	37.85	BSF 5/8	15.71	1.1/4 - 7	34.63	1.1/4	42.74
M 7	1	6.88	M 13	x 1.5	12.85	M 39	x 1.5	38.85	BSF 3/4	18.85	1.3/8 - 6	37.81	1.1/2	48.87
M 8	0.25	7.87	M 13	x 1.75	12.83	M 39	x 2	38.82	BSF 7/8	22.02	1.1/2 - 6	44.12	2"	60.95
M 9	0.25	8.87	M 14	x 1	13.88	M 39	x 3	38.76	BSF 1"	25.17	1.3/4 - 5	50.45		
M 10	0.5	9.85	M 14	x 1.25	13.86	M 40	x 1.5	39.85			2" - 4.5	56.80		
M 11	0.5	10.85	M 14	x 1.5	13.85	M 40	x 2	39.82			2.1/4 - 4.5	63.10	BSP	Ø
M 12	0.75	11.83	M 15	x 1	14.88	M 40	x 3	39.76			2.1/2 - 4	69.45	G	mm
M 14	2	13.82	M 15	x 1.5	14.85	M 42	x 1.5	41.85			2.3/4 - 4	75.80	G 1/8	9.62
M 16	2	15.82	M 15	x 2	14.82	M 42	x 2	41.82			3" 4		G 1/4	13.03
M 18	2.5	17.79	M 16	x 1	15.88	M 42	x 3	41.76					G 3/8	16.53
M 20	2.5	19.79	M 16	x 1.5	15.85	M 45	x 1.5	44.85					G 1/2	20.81
M 22	2.5	21.79	M 18	x 1	17.88	M 45	x 2	44.82					G 5/8	22.77
M 24	3	23.77	M 18	x 1.5	17.85	M 45	x 3	44.76					G 3/4	26.30
M 27	3	26.77	M 18	x 2	17.82	M 48	x 1.5	47.85					G 7/8	30.06
M 30	3.5	29.73	M 20	x 1	19.88	M 48	x 2	47.82					G 1"	33.07
M 33	3.5	32.73	M 20	x 1.5	19.85	M 48	x 3	47.46					G 1.1/8	37.71
M 36	4	35.70	M 20	x 2	19.82	M 50	x 1.5	49.85					G 1.1/4	41.73
M 39	4	38.70	M 22	x 1	21.88	M 50	x 2	49.82					G 1.3/8	44.14
M 42	4.5	41.69	M 22	x 1.5	21.85	M 50	x 3	49.76					G 1.1/2	47.62
M 45	4.5	41.69	M 22	x 2	21.82	M 52	x 1.5	51.85					G 1.3/4	53.56
M 48	5	47.66	M 24	x 1	23.88	M 52	x 2	51.82					2"	59.43
M 52	5	51.66	M 24	x 1.5	23.85	M 52	x 3	51.76						