

CL 100



25°-30°



STANDARD



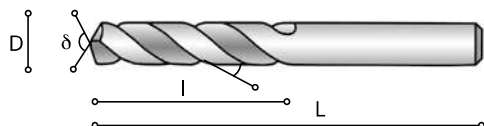
CL 101



35°-40°



DIN 1412 C



Dal Ø 1 al Ø 6 = 10 pz
 Dal Ø 6,1 al Ø 13 = 5 pz
 Dal Ø 13,25 al Ø 31 = 1 pz

CL100



CL101



D h8	L	I	CODE	HSS 5100..... €	HSS+8%Co 5101..... €	HSS+8%Co 6101..... € QUARTZ	HSS+8%Co 7101..... € TITANITE
1	26	6	00100	1,93	3,15	5,25	6,62
1,1	28	7	00110	2,12	3,15	5,25	6,62
1,2	30	8	00120	2,12	3,15	5,25	6,62
1,25	30	8	00125	1,97	3,15	5,25	6,62
1,3	30	8	00130	2,23	3,15	5,25	6,62
1,4	32	9	00140	2,23	3,15	5,25	6,62
1,5	32	9	00150	1,34	2,52	4,56	5,94
1,6	34	9	00160	1,64	2,81	4,87	6,23
1,7	34	10	00170	1,64	2,81	4,87	6,23
1,75	36	11	00175	1,42	2,81	4,87	6,23
1,8	36	11	00180	1,64	2,81	4,87	6,23
1,9	36	11	00190	1,64	2,81	4,87	6,23
2	38	12	00200	1,41	2,00	4,10	5,23
2,1	38	12	00210	1,46	2,18	4,38	5,88
2,2	40	13	00220	1,46	2,18	4,38	5,88
2,25	40	13	00225	1,42	2,40	4,62	6,09
2,3	40	13	00230	1,59	2,41	4,64	6,12
2,4	43	14	00240	1,66	2,57	4,81	6,32
2,5	43	14	00250	1,50	2,43	4,65	6,13
2,6	43	14	00260	1,66	2,57	4,81	6,32
2,7	46	16	00270	1,66	2,57	4,81	6,32
2,75	46	16	00275	1,59	2,56	4,79	6,29
2,8	46	16	00280	1,71	2,57	4,81	6,32
2,9	46	16	00290	1,71	2,57	4,81	6,32
3	46	16	00300	1,50	2,31	4,53	6,02
3,1	49	18	00310	1,67	2,41	4,64	6,12
3,2	49	18	00320	1,59	2,55	4,98	6,63
3,25	49	18	00325	1,50	2,47	4,76	6,29
3,3	49	18	00330	1,59	2,48	4,78	6,32
3,4	52	20	00340	1,82	2,85	5,16	6,67
3,5	52	20	00350	1,59	2,66	4,97	6,53
3,6	52	20	00360	1,82	3,15	5,70	7,37
3,7	52	20	00370	1,82	3,15	5,70	7,37
3,75	52	20	00375	2,05	3,14	5,67	7,34
3,8	55	22	00380	1,98	3,15	5,70	7,37
3,9	55	22	00390	1,98	3,15	5,70	7,37
4	55	22	00400	1,75	3,14	5,67	7,34
4,1	55	22	00410	1,92	3,15	6,50	8,82
4,2	55	22	00420	1,92	3,15	6,50	8,82
4,25	55	22	00425	1,92	3,20	6,20	8,26

D h8	L	I	CODE	HSS 5100..... €	HSS+8%Co 5101..... €	HSS+8%Co 6101..... € QUARTZ	HSS+8%Co 7101..... € TITANITE
4,3	58	24	00430	3,23	4,74	7,91	9,98
4,4	58	24	00440	3,23	4,74	7,91	9,98
4,5	58	24	00450	1,92	3,20	6,20	8,26
4,6	58	24	00460	3,23	4,74	7,91	9,98
4,7	58	24	00470	3,23	4,74	7,91	9,98
4,75	58	24	00475	2,33	3,84	6,89	8,95
4,8	62	26	00480	3,00	5,14	8,34	10,42
4,9	62	26	00490	3,30	5,14	8,34	10,42
5	62	26	00500	2,33	3,84	6,89	8,95
5,1	62	26	00510	3,30	5,04	8,18	10,22
5,2	62	26	00520	3,30	5,04	8,18	10,22
5,25	62	26	00525	2,83	4,57	7,66	9,69
5,3	62	26	00530	3,30	5,04	8,18	10,22
5,4	66	28	00540	4,49	6,85	10,18	12,21
5,5	66	28	00550	2,83	4,57	7,66	9,69
5,6	66	28	00560	4,49	6,85	10,18	12,21
5,7	66	28	00570	4,49	6,85	10,18	12,21
5,75	66	28	00575	3,09	4,74	7,91	9,98
5,8	66	28	00580	4,49	6,85	10,18	12,21
5,9	66	28	00590	4,49	6,85	10,18	12,21
6	66	28	00600	3,09	4,65	7,75	9,78
6,1	70	31	00610	4,65	7,08	10,93	13,33
6,2	70	31	00620	4,65	7,08	10,93	13,33
6,25	70	31	00625	3,15	5,29	8,96	11,36
6,3	70	31	00630	4,65	7,08	10,93	13,33
6,4	70	31	00640	4,89	7,32	11,20	13,60
6,5	70	31	00650	3,15	5,29	8,96	11,36
6,6	70	31	00660	4,89	7,32	11,20	13,60
6,7	70	31	00670	4,89	7,32	11,20	13,60
6,75	74	34	00675	3,78	6,53	10,33	12,73
6,8	74	34	00680	5,59	8,42	12,41	14,80
6,9	74	34	00690	5,59	8,42	12,41	14,80
7	74	34	00700	3,78	6,53	10,33	12,73
7,1	74	34	00710	6,93	10,31	14,48	16,87
7,2	74	34	00720	6,93	10,31	14,48	16,87
7,25	74	34	00725	4,17	7,00	10,84	13,24
7,3	74	34	00730	6,93	10,31	14,48	16,87
7,4	74	34	00740	6,93	10,31	14,48	16,87
7,5	74	34	00750	4,40	7,00	10,84	13,24
7,6	79	37	00760	8,35	12,60	17,83	20,89
7,7	79	37	00770	8,35	12,60	17,83	20,89
7,75	79	37	00775	4,83	7,72	12,47	15,53
7,8	79	37	00780	8,35	12,60	17,83	20,89
7,9	79	37	00790	8,35	12,60	17,83	20,89
8	79	37	00800	4,83	7,72	12,47	15,53
8,1	79	37	00810	8,58	12,99	19,03	22,70
8,2	79	37	00820	8,58	12,99	19,03	22,70
8,25	79	37	00825	6,31	10,63	16,43	20,10
8,3	79	37	00830	8,58	12,99	19,03	22,70
8,4	79	37	00840	8,58	12,99	19,03	22,70
8,5	79	37	00850	6,31	10,63	16,43	20,10
8,6	84	40	00860	8,90	13,47	19,54	23,22
8,7	84	40	00870	8,90	13,47	19,54	23,22
8,75	84	40	00875	6,31	10,63	16,43	20,10
8,8	84	40	00880	8,90	13,47	19,54	23,22
8,9	84	40	00890	8,90	13,47	19,54	23,22
9	84	40	00900	6,31	10,63	16,43	20,10
9,1	84	40	00910	11,88	17,62	24,11	27,80
9,2	84	40	00920	11,88	17,62	24,11	27,80
9,25	84	40	00925	9,45	15,73	22,03	25,72

CL 100



25°-30°



STANDARD



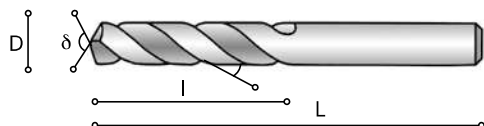
CL 101



35°-40°



DIN 1412 C



Dal Ø 1 al Ø 6 = 10 pz
 Dal Ø 6,1 al Ø 13 = 5 pz
 Dal Ø 13,25 al Ø 31 = 1 pz

CL100



CL101



D h8	L	I	CODE	HSS 5100..... €	HSS+8%Co 5101..... €	HSS+8%Co 6101..... € QUARTZ	HSS+8%Co 7101..... € TITANITE
9,3	84	40	00930	11,88	17,62	24,11	27,80
9,4	84	40	00940	11,88	17,62	24,11	27,80
9,5	84	40	00950	9,45	15,73	22,03	25,72
9,6	89	43	00960	15,03	21,01	27,83	31,51
9,7	89	43	00970	15,03	21,01	27,83	31,51
9,75	89	43	00975	9,45	18,33	24,90	28,58
9,8	89	43	00980	15,03	21,01	27,83	31,51
9,9	89	43	00990	15,03	21,01	27,83	31,51
10	89	43	01000	7,55	12,83	18,83	22,52
10,25	89	43	01025	12,44	20,46	27,23	30,91
10,5	89	43	01050	12,44	20,46	27,23	30,91
10,75	95	47	01075	12,44	20,46	27,23	30,91
11	95	47	01100	12,44	20,46	27,23	30,91
11,25	95	47	01125	12,83	21,33	28,18	31,87
11,5	95	47	01150	12,83	21,33	28,18	31,87
11,75	95	47	01175	16,93	25,96	33,30	36,97
12	102	51	01200	16,93	25,96	34,64	39,34
12,25	102	51	01225	17,25	26,91	36,41	41,67
12,5	102	51	01250	17,25	26,91	36,41	41,67
12,75	102	51	01275	17,25	26,91	36,41	41,67
13	102	51	01300	17,25	26,91	36,41	41,67
13,25	107	54	01325		32,50	42,68	48,03
13,5	107	54	01350		31,01	41,06	46,41
13,75	107	54	01375		31,01	41,06	46,41
14	107	54	01400		31,01	41,06	46,41
14,25	111	56	01425		35,57	46,06	51,41
14,5	111	56	01450		33,95	44,27	49,63
14,75	111	56	01475		33,95	44,27	49,63
15	111	56	01500		33,95	44,27	49,63
15,25	115	58	01525		44,12	55,66	61,18
15,5	115	58	01550		42,11	53,45	58,97
15,75	115	58	01575		44,12	55,66	61,18
16	115	58	01600		42,11	53,45	58,97
16,25	119	60	01625		47,93	60,79	67,00
16,5	119	60	01650		47,93	60,79	67,00
16,75	119	60	01675		47,93	60,79	67,00
17	119	60	01700		47,19	59,98	66,20
17,25	123	62	01725		53,62	67,04	73,26
17,5	123	62	01750		53,62	67,04	73,26
17,75	123	62	01775		53,62	67,04	73,26

D h8	L	I	CODE	HSS 5100..... €	HSS+8%Co 5101..... €	HSS+8%Co 6101..... € QUARTZ	HSS+8%Co 7101..... € TITANITE
18	123	62	01800		51,47	64,68	70,89
18,25	127	64	01825		58,66	74,53	82,25
18,5	127	64	01850		58,66	74,53	82,25
18,75	127	64	01875		58,66	74,53	82,25
19	127	64	01900		57,08	72,80	80,52
19,25	131	66	01925		65,08	81,59	89,31
19,5	131	66	01950		66,38	83,22	91,10
19,75	131	66	01975		66,38	83,22	91,10
20	131	66	02000		61,17	77,50	85,37
20,5	136	68	02050		77,96	95,76	103,48
21	136	68	02100		75,54	93,32	101,19
21,5	141	70	02150		77,96	100,71	112,25
22	141	70	02200		79,34	102,24	113,79
22,5	146	72	02250		95,84	130,90	150,42
23	146	72	02300		95,31	130,32	149,84
23,5	146	72	02350		107,85	144,11	163,63
24	151	75	02400		89,99	125,23	145,33
24,5	151	75	02450		114,75	151,71	171,23
25	151	75	02500		105,41	141,94	161,85
26	156	78	02600		123,40	168,68	194,07
27	162	81	02700		145,52	192,99	218,38
28	162	81	02800		145,52	192,99	218,38
29	168	84	02900		158,74	207,55	232,93
30	168	84	03000		158,74	207,55	232,93
31	174	87	03100		211,65	269,41	297,66



rpm
 $= (\text{mm/min} \times 1000) / (D \times 3,14)$



mm/min
 $= \text{mm/rev} \times \text{rpm}$



= mt/min



= mm/rev
 (vedi tabella - see table page pag. 23)

PUNTE EXTRA CORTE TWIST DRILLS, STUB LENGHT

PUNTE CORTE TWIST DRILLS, JOBBER LENGHT

								
CL100	CL101			CL118			CL104	CL104R
								
HSS	HSS+8%Co			HSS+5%Co			HSS	
								

Pag. 378	TIPO DI ACCIAIO TYPE OF STEEL		N/mm²	HV	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev
ACCIAI COMUNI COMMON STEEL	Acciai teneri Soft steel	1	500	157	30 b	42 d	55 c	60 c	38 c	50 c	57 c	30 b	37 c
	Acciai da costruzione Structural steel	2	700	219	22 c	35 c	45 b	55 b	30 c	40 b	50 b	22 c	30 b
	Acciai da tempra Hardening steel	3	900	280	13 c		35 b	40 b		30 b	38 b	13 c	20 b
	Acciaio automatico Automatic steel	4	1200	373									
ACCIAI INOX STAINLESS STEEL	Acciaio automatico Automatic steel	3	850	265	17 b	26 c	32 b	36 b	22 b	28 b	34 b	17 b	22 b
	Austenitico Austenitic	3	850	265	8 c	18 d	18 c	22 c	12 c	15 c	20 c	8 c	12 c
	Ferritico+austenitico Ferritic austenitic	4	1000	311	10 b		22 c	26 c	15 b	18 c	24 c	10 b	15 b
GHISA CAST IRON	Ghisa fino a 180 hb Cast iron up to 180hb	2	500	157	30 d	38 d	45 c	48 d	36 d	42 c	45 d	30 d	37 d
	Ghisa oltre 180 hb Cast iron over 180hb	3	700	219	20 b	28 c	32 c	35 d	26 b	30 c	32 d	20 b	25 b
TITANIO TITANIUM	Titanio non legato Unalloyed titanium	5	500	157	22 b	33 d	36 d	40 d	28 c	31 c	38 d	22 b	26 b
	Leghe di titanio Titanium alloys	5	900	280	10 a	24 d	27 d	30 d	18 c	21 c	28 d	10 a	14 a
RAME COPPER	Rame Copper	9	350	110	30 c	42 d			40 c			30 c	40 c
	Ottone Brass	9	700	219	33 c	45 d	55 c		43 b	50 c		33 c	43 b
	Bronzo Bronze	9	700	219	15 c	24 d	50 c		22 b	45 c		15 c	23 b
NICHEL NICKEL	Nichel non legato Unalloyed nichel	6	700	219	10 b	18 c	22 c	26 d	16 c	20 c	24 d	10 b	16 c
	Leghe di nichel Nickel alloys	6	900	280	5 a	15 c	12 c	16 d	12 b	10 c	14 d	5 a	11 b
ALLUMINIO ALUMINIUM	Alluminio non legato Unalloyed aluminium	7	350	110	35 d	40 d	70 d		38 d	60 d		35 d	39 d
	Alluminio con leghe Alloyed aluminium	7	400	125	30 d	35 d	60 d		33 d	55 d		30 d	34 d
	Alluminio con leghe Alloyed aluminium	7	500	157	25 c	30 c	45 c		28 c	40 c		25 c	29 c

PUNTE CORTE TWIST DRILLS, JOBBER LENGTH

														
CL107	CL108	CL104CR	CL106			CL105			CL109			CL119		
DIN 338														
HSS			HSS+5%Co			HSS+8%Co			HSS+5%Co					
														
mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev
		30 b	35 c	50 c	57 c	42 d	55 c	60 c	38 c	50 c	57 c	38 c	50 c	57 c
		22 c	28 b	40 b	50 b	35 c	45 b	55 b	30 c	40 b	50 b	30 c	40 b	50 b
		13 c	18 b	30 b	38 b		35 b	40 b		30 b	38 b		30 b	38 b
		17 b	20 b	28 b	34 b	26 c	32 b	36 b	22 b	28 b	34 b	22 b	28 b	34 b
		8 c	10 c	15 c	20 c	18 d	18 c	22 c	12 c	15 c	20 c	12 c	15 c	20 c
		10 b	13 b	18 c	24 c		22 c	26 c	15 b	18 c	24 c	15 b	18 c	24 c
		30 d	35 d	42 c	45 d	38 d	45 c	48 d	36 d	42 c	45 d	36 d	42 c	45 d
		20 b	23 b	30 c	32 d	28 c	32 c	35 d	26 b	30 c	32 d	26 b	30 c	32 d
		22 b	24 b	31 c	38 d	33 d	36 d	40 d	28 c	31 c	38 d	28 c	31 c	38 d
		10 a	12 a	21 c	28 d	24 d	27 d	30 d	18 c	21 c	28 d	18 c	21 c	28 d
	30 c	30 c	38 c			42 d			40 c			40 c		
33 c		33 c	41 b	50 c		45 d	55 c		43 b	50 c		43 b	50 c	
15 c		15 c	20 b	45 c		24 d	50 c		22 b	45 c		22 b	45 c	
		10 b	14 c	20 c	24 d	18 c	22 c	26 d	16 c	20 c	24 d	16 c	20 c	24 d
		5 a	9 b	10 c	14 d	15 c	12 c	16 d	12 b	10 c	14 d	12 b	10 c	14 d
	35 d	35 d	37 d	60 d		40 d	70 d		38 d	60 d		38 d	60 d	
	30 d	30 d	32 d	55 d		35 d	60 d		33 d	55 d		33 d	55 d	
	25 c	25 c	27 c	40 c		30 c	45 c		28 c	40 c		28 c	40 c	



rpm
 $= (\text{mt/min} \times 1000) / (D \times 3,14)$



mm/min
 $= \text{mm/rev} \times \text{rpm}$



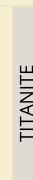
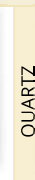
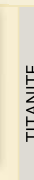
$= \text{mt/min}$



$= \text{mm/rev}$
 (vedi tabella - see table page pag. 23)

PUNTE LUNGHE TWIST DRILLS, LONG SERIES				PUNTE EXTRA LUNGHE TWIST DRILLS, EXTRA LONG SERIES				
								
CL200	CL230			CL111/1	CL110/1			CL111/2
								
HSS	HSS+5%Co			HSS	HSS+5%Co			HSS
								

Pag. 378	TIPO DI ACCIAIO TYPE OF STEEL		N/mm²	HV	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev
ACCIAI COMUNI COMMON STEEL	Acciai teneri Soft steel	1	500	157	30 b	38 c	50 c	57 c	30 b	38 c	50 c	57 c	30 b
	Acciai da costruzione Structural steel	2	700	219	22 c	30 c	40 b	50 b	22 c	30 c	40 b	50 b	22 c
	Acciai da tempra Hardening steel	3	900	280	13 c		30 b	38 b	13 c		30 b	38 b	13 c
	Acciaio automatico Automatic steel	4	1200	373									
ACCIAI INOX STAINLESS STEEL	Acciaio automatico Automatic steel	3	850	265	17 b	22 b	28 b	34 b	17 b	22 b	28 b	34 b	17 b
	Austenitico Austenitic	3	850	265	8 c	12 c	15 c	20 c	8 c	12 c	15 c	20 c	8 c
	Ferritico+austenitico Ferritic austenitic	4	1000	311	10 b	15 b	18 c	24 c	10 b	15 b	18 c	24 c	10 b
GHISA CAST IRON	Ghisa fino a 180 hb Cast iron up to 180hb	2	500	157	30 d	36 d	42 c	45 d	30 d	36 d	42 c	45 d	30 d
	Ghisa oltre 180 hb Cast iron over 180hb	3	700	219	20 b	26 b	30 c	32 d	20 b	26 b	30 c	32 d	20 b
TITANIO TITANIUM	Titanio non legato Unalloyed titanium	5	500	157	22 b	28 c	31 c	38 d	22 b	28 c	31 c	38 d	22 b
	Leghe di titanio Titanium alloys	5	900	280	10 a	18 c	21 c	28 d	10 a	18 c	21 c	28 d	10 a
RAME COPPER	Rame Copper	9	350	110	30 c	40 c			30 c	40 c			30 c
	Ottone Brass	9	700	219	33 c	43 b	50 c		33 c	43 b	50 c		33 c
	Bronzo Bronze	9	700	219	15 c	22 b	45 c		15 c	22 b	45 c		15 c
NICHEL NICKEL	Nichel non legato Unalloyed nichel	6	700	219	10 b	16 c	20 c	24 d	10 b	16 c	20 c	24 d	10 b
	Leghe di nichel Nichel alloys	6	900	280	5 a	12 b	10 c	14 d	5 a	12 b	10 c	14 d	5 a
ALLUMINIO ALUMINIUM	Alluminio non legato Unalloyed aluminium	7	350	110	35 d	38 d	60 d		35 d	38 d	60 d		35 d
	Alluminio con leghe Alloyed aluminium	7	400	125	30 d	33 d	55 d		30 d	33 d	55 d		30 d
	Alluminio con leghe Alloyed aluminium	7	500	157	25 c	28 c	40 c		25 c	28 c	40 c		25 c

PUNTE EXTRA LUNGHE TWIST DRILLS, EXTRA LONG SERIES							PUNTE DOPPIE DOUBLE TWIST DRILLS	PUNTE PER CENTRI NC NC-SPOTTING DRILLS					
													
CL110/2			CL111/3	CL110/3			CL150	CL102			CL103		
													
HSS+5%Co			HSS	HSS+5%Co			HSS	HSS+8% Co					
													
mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev
38 c	50 c	57 c	30 b	38 c	50 c	57 c		35 c	50 c	57 c	35 c	50 c	57 c
30 c	40 b	50 b	22 c	30 c	40 b	50 b		28 b	40 b	50 b	28 b	40 b	50 b
	30 b	38 b	13 c		30 b	38 b		18 b	30 b	38 b	18 b	30 b	38 b
22 b	28 b	34 b	17 b	22 b	28 b	34 b		20 b	28 b	34 b	20 b	28 b	34 b
12 c	15 c	20 c	8 c	12 c	15 c	20 c		10 c	15 c	20 c	10 c	15 c	20 c
15 b	18 c	24 c	10 b	15 b	18 c	24 c		13 b	18 c	24 c	13 b	18 c	24 c
36 d	42 c	45 d	30 d	36 d	42 c	45 d		35 d	42 c	45 d	35 d	42 c	45 d
26 b	30 c	32 d	20 b	26 b	30 c	32 d		23 b	30 c	32 d	23 b	30 c	32 d
28 c	31 c	38 d	22 b	28 c	31 c	38 d		24 b	31 c	38 d	24 b	31 c	38 d
18 c	21 c	28 d	10 a	18 c	21 c	28 d		12 a	21 c	28 d	12 a	21 c	28 d
40 c			30 c	40 c				38 c			38 c		
43 b	50 c		33 c	43 b	50 c			41 b	50 c		41 b	50 c	
22 b	45 c		15 c	22 b	45 c			20 b	45 c		20 b	45 c	
16 c	20 c	24 d	10 b	16 c	20 c	24 d		14 c	20 c	24 d	14 c	20 c	24 d
12 b	10 c	14 d	5 a	12 b	10 c	14 d		9 b	10 c	14 d	9 b	10 c	14 d
38 d	60 d		35 d	38 d	60 d			37 d	60 d		37 d	60 d	
33 d	55 d		30 d	33 d	55 d			32 d	55 d		32 d	55 d	
28 c	40 c		25 c	28 c	40 c			27 c	40 c		27 c	40 c	



rpm
 $= (\text{mm/min} \times 1000) / (D \times 3,14)$



mm/min
 $= \text{mm/rev} \times \text{rpm}$



= mt/min



= mm/rev
 (vedi tabella - see table page pag. 23)

PUNTE DA CENTRO CENTER DRILLS						PUNTE A GRADINO CON ELICHE INDIPENDENTI SUBLAND DRILLS WITH INDEPENDENT SPIRAL		
	QUARTZ		QUARTZ		QUARTZ			
CL910		CL920		CL930		CL270	CL271	CL272
DIN 333/A		DIN 333/R		DIN 333/B		DIN 8376	DIN 8374	DIN 8378
HSS						HSS		

Pag. 378	TIPO DI ACCIAIO TYPE OF STEEL	N/mm ²	HV	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev
ACCIAI COMUNI COMMON STEEL	Acciai teneri Soft steel	1	500	157	30 b	37 c	30 b	37 c	30 b	37 c	30 b	30 b	30 b
	Acciai da costruzione Structural steel	2	700	219	22 c	30 b	22 c	30 b	22 c	30 b	22 c	22 c	22 c
	Acciai da tempra Hardening steel	3	900	280	13 c	20 b	13 c	20 b	13 c	20 b	13 c	13 c	13 c
	Acciaio automatico Automatic steel	4	1200	373									
ACCIAI INOX STAINLESS STEEL	Acciaio automatico Automatic steel	3	850	265	17 b	22 b	17 b	22 b	17 b	22 b	17 b	17 b	17 b
	Austenitico Austenitic	3	850	265	8 c	12 c	8 c	12 c	8 c	12 c	8 c	8 c	8 c
	Ferritico+austenitico Ferritic austenitic	4	1000	311	10 b	15 b	10 b	15 b	10 b	15 b	10 b	10 b	10 b
GHISA CAST IRON	Ghisa fino a 180 hb Cast iron up to 180hb	2	500	157	30 d	37 d	30 d	37 d	30 d	37 d	30 d	30 d	30 d
	Ghisa oltre 180 hb Cast iron over 180hb	3	700	219	20 b	25 b	20 b	25 b	20 b	25 b	20 b	20 b	20 b
TITANIO TITANIUM	Titanio non legato Unalloyed titanium	5	500	157	22 b	26 b	22 b	26 b	22 b	26 b	22 b	22 b	22 b
	Leghe di titanio Titanium alloys	5	900	280	10 a	14 a	10 a	14 a	10 a	14 a	10 a	10 a	10 a
RAME COPPER	Rame Copper	9	350	110	30 c	40 c	30 c	40 c	30 c	40 c	30 c	30 c	30 c
	Ottone Brass	9	700	219	33 c	43 b	33 c	43 b	33 c	43 b	33 c	33 c	33 c
	Bronzo Bronze	9	700	219	15 c	23 b	15 c	23 b	15 c	23 b	15 c	15 c	15 c
NICHEL NICKEL	Nichel non legato Unalloyed nickel	6	700	219	10 b	16 c	10 b	16 c	10 b	16 c	10 b	10 b	10 b
	Leghe di nichel Nickel alloys	6	900	280	5 a	11 b	5 a	11 b	5 a	11 b	5 a	5 a	5 a
ALLUMINIO ALUMINIUM	Alluminio non legato Unalloyed aluminium	7	350	110	35 d	39 d	35 d	39 d	35 d	39 d	35 d	35 d	35 d
	Alluminio con leghe Alloyed aluminium	7	400	125	30 d	34 d	30 d	34 d	30 d	34 d	30 d	30 d	30 d
	Alluminio con leghe Alloyed aluminium	7	500	157	25 c	29 c	25 c	29 c	25 c	29 c	25 c	25 c	25 c

PUNTE CODOLO CONICO TAPER SHANK TWIST DRILLS				PUNTE LUNGHE CODOLO CONICO TAPER SHANK DRILLS, LONG SERIES				PUNTE EXTRA LUNGHE CODOLO CONICO TWIST DRILLS TAPER SHANK EXTRALONG					
													
CM300	CM303			CM301	CM302			CM304	CM306			CM305	CM307
													
HSS	HSS+5% Co			HSS	HSS+5% Co			HSS	HSS+5% Co			HSS	HSS+5% Co
													
mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev
30 c	35 c	50 c	57 c	30 c	38 c	50 c	57 c	30 c	38 c	50 c	57 c	30 c	38 c
22 b	28 b	40 b	50 b	22 b	30 c	40 b	50 b	22 b	30 c	40 b	50 b	22 b	30 c
13 b	18 b	30 b	38 b	13 b		30 b	38 b	13 b		30 b	38 b	13 b	
17 b	20 b	28 b	34 b	17 b	22 b	28 b	34 b	17 b	22 b	28 b	34 b	17 b	22 b
8 c	10 c	15 c	20 c	8 c	12 c	15 c	20 c	8 c	12 c	15 c	20 c	8 c	12 c
10 b	13 b	18 c	24 c	10 b	15 b	18 c	24 c	10 b	15 b	18 c	24 c	10 b	15 b
30 d	35 d	42 c	45 d	30 d	36 d	42 c	45 d	30 d	36 d	42 c	45 d	30 d	36 d
20 b	23 b	30 c	32 d	20 b	26 b	30 c	32 d	20 b	26 b	30 c	32 d	20 b	26 b
22 b	24 b	31 c	38 d	22 b	28 c	31 c	38 d	22 b	28 c	31 c	38 d	22 b	28 c
10 a	12 a	21 c	28 d	10 a	18 c	21 c	28 d	10 a	18 c	21 c	28 d	10 a	18 c
18 c	30 c	40 c		18 c	38 c	40 c		18 c	38 c	40 c		18 c	38 c
20 c	33 c	43 b	50 c	20 c	41 b	43 b	50 c	20 c	41 b	43 b	50 c	20 c	41 b
12 c	15 c	22 b	45 c	12 c	20 b	22 b	45 c	12 c	20 b	22 b	45 c	12 c	20 b
10 b	14 c	20 c	24 d	10 b	16 c	20 c	24 d	10 b	16 c	20 c	24 d	10 b	16 c
5 a	9 b	10 c	14 d	5 a	12 b	10 c	14 d	5 a	12 b	10 c	14 d	5 a	12 b
35 d	37 d	60 d		35 d	38 d	60 d		35 d	38 d	60 d		35 d	38 d
30 d	32 d	55 d		30 d	33 d	55 d		30 d	33 d	55 d		30 d	33 d
25 c	27 c	40 c		25 c	28 c	40 c		25 c	28 c	40 c		25 c	28 c



rpm

$$= (\text{mm/min} \times 1000) / (D \times 3,14)$$



mm/min

$$= \text{mm/rev} \times \text{rpm}$$



= mt/min



= mm/rev
 (vedi tabella - see table page pag. 23)

PUNTE A DUE DIAMETRI SUBLAND TWIST DRILLS



Pag. 378	TIPO DI ACCIAIO TYPE OF STEEL	N/mm ²	HV	mt/min mm/rev	mt/min mm/rev	mt/min mm/rev
ACCIAI COMUNI COMMON STEEL	Acciai teneri Soft steel 1	500	157	30 c	30 c	30 c
	Acciai da costruzione Structural steel 2	700	219	22 b	22 b	22 b
	Acciai da tempra Hardening steel 3	900	280	13 b	13 b	13 b
	Acciaio automatico Automatic steel 4	1200	373			
ACCIAI INOX STAINLESS STEEL	Acciaio automatico Automatic steel 3	850	265	17 b	17 b	17 b
	Austenitico Austenitic 3	850	265	8 c	8 c	8 c
	Ferritico+austenitico Ferritic austenitic 4	1000	311	10 b	10 b	10 b
GHISA CAST IRON	Ghisa fino a 180 hb Cast iron up to 180hb 2	500	157	30 d	30 d	30 d
	Ghisa oltre 180 hb Cast iron over 180hb 3	700	219	20 b	20 b	20 b
TITANIO TITANIUM	Titanio non legato Unalloyed titanium 5	500	157	22 b	22 b	22 b
	Leghe di titanio Titanium alloys 5	900	280	10 a	10 a	10 a
RAME COPPER	Rame Copper 9	350	110	18 c	18 c	18 c
	Ottone Brass 9	700	219	20 c	20 c	20 c
	Bronzo Bronze 9	700	219	12 c	12 c	12 c
NICHEL NICKEL	Nichel non legato Unalloyed nichel 6	700	219	10 b	10 b	10 b
	Leghe di nichel Nichel alloys 6	900	280	5 a	5 a	5 a
ALLUMINIO ALUMINIUM	Alluminio non legato Unalloyed aluminium 7	350	110	35 d	35 d	35 d
	Alluminio con leghe Alloyed aluminium 7	400	125	30 d	30 d	30 d
	Alluminio con leghe Alloyed aluminium 7	500	157	25 c	25 c	25 c

FORATURA DRILLING	TABELLA PARAMETRI DI AVANZAMENTO mm/giro RECOMMENDED FEED DATA mm/rev.																	
	DIAMETRO DELLA PUNTA DRILL DIAMETER																	
LETTERA DI RIFERIMENTO REFERENCE LETTER	D. 1	D. 2	D. 3	D. 4	D. 5	D. 6	D. 8	D. 10	D. 12	D. 14	D. 16	D. 20	D. 25	D. 30	D. 35	D. 40	D. 50	
a	0,015	0,030	0,038	0,047	0,053	0,060	0,075	0,090	0,100	0,120	0,127	0,160	0,200	0,230	0,250	0,300	0,350	
b	0,020	0,050	0,070	0,085	0,100	0,120	0,150	0,180	0,200	0,230	0,250	0,270	0,290	0,330	0,350	0,380	0,400	
c	0,023	0,080	0,100	0,130	0,150	0,180	0,250	0,270	0,280	0,300	0,330	0,370	0,420	0,450	0,470	0,500	0,550	
d	0,030	0,100	0,160	0,180	0,220	0,240	0,300	0,370	0,400	0,450	0,480	0,500	0,530	0,550	0,580	0,600	0,630	
e	0,035	0,120	0,200	0,250	0,270	0,300	0,350	0,450	0,470	0,500	0,530	0,550	0,600	0,640	0,680	0,700	0,730	
f	0,050	0,150	0,220	0,250	0,320	0,400	0,490	0,620	0,650	0,720	0,850	0,900	1,100	1,130	1,170	1,200	1,250	
g	0,070	0,160	0,250	0,270	0,360	0,470	0,620	0,830	0,900	0,950	1,100	1,200	1,280	1,330	1,400	1,470	1,520	
h	0,090	0,200	0,270	0,300	0,400	0,520	0,750	1,000	1,100	1,200	1,300	1,350	1,430	1,500	1,650	1,700	1,800	

CLASSIFICAZIONE DEI MATERIALI GROUPS OF MATERIALS

ESEMPI DI MATERIALI - MATERIAL EXAMPLE

		W. - Nr.	DIN	EN	B.S.	AISI/SAE	SS
- Acciai sino a 500 N/mm2	- Steels up to 500 N/mm2	1.0037	ST 37-2	EN 10025	FE 360 B	M 1010	1311
- Acciai da costruzione	- Construction steels	1.0044	ST 44-2	EN 10025	FE 430 B FN	M 1015	1412
- Acciai alta velocità	- Steels for automatic lathes	1.0711	9 S 20	1651	220 M 07		
		1.0715	9 SMn 28	1651	230 M 07	1213	1912
		1.0718	9 MnPb 28	1651		12 L 13	1914

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- Acciai sopra 500 - 800 N/mm2	- Steels more than 500 - 800 N/mm2	1.0060	St 60-2	EN 10025	4360-55E; 55C	A572 GR.65	1650
- Acciai da costruzione	- Construction steels	1.0503	C 45	EN 10083-2	080 M 46	1045	1672
- Acciai alta velocità	- Steels for automatic lathes	1.0570	St 52-3	EN 10025	4360-50 D		2134
- Acciai da cementazione	- Case hardening steels	1.0727	45 S 20	1651		1146	
- Acciai da bonifica	- Tempering steels	1.1141	Ck 15	1652T.3	080 M15	1015	1370
- Acciai da utensili nonlegati	- Non-alloyed tools steels	1.1191	Ck 45		080 M 46	1045	1672
- Titanio non legato	- Non-alloyed titanium						
- Ghisa grigia < 180 HB	- Cast iron < 180 HB						

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- Acciai sopra 800 - 1000 N/mm2	- Steels more than 800 - 1000 N/mm2	0.6020	GG 20		GRADE 220	A48-30B	0120-00
		0.7040	GGG 40		420/12	60-40-18	0717-02
- Acciai da cementazione	- Case hardening steels	0.8035	GTW-35				
- Acciai da bonifica	- Tempering steels	0.8135	GTS-35		B 340/12	32510	
- Acciai da nitrurazione	- Nitriding steels	1.1167	36 Mn 5	17204	150 M 36	1335	2120
- Acciai da costruzione resistenti al calore	- Heat resistant construction steels	1.1221	Ck 60	EN 10083-1	060 A 62	1060	1665
- Ghisa grigia > 180 HB	- Cast iron > 180 HB	1.2312	40 CrMnMoS 8 6	17350			
		1.5732	14 NiCr 10				3415
		1.5775	31 NiCr 14		653 M 31		
		1.7131	16 MnCr 5		572 M 17	5115	2173
		1.7225	42 CrMo 4	EN 10083-1	708 M 40	4140	2244
		1.8504	34 CrAl 6				
		1.8507	34 CrAlMo 5	17211		A355 Cl.D	
		1.8509	41 CrAlMo 7		905 M 39	A355 Cl.A	2940
		1.8515	31 CrMo 12	17211	722 M 24		2240

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- Acciai sopra 1000 - 1300 N/mm2	- Steels more than 1000 - 1300 N/mm2	0.6030	GG 30		GRADE 300	A48-45B	0130-00
		0.7050	GGG 50		500/7	65-45-12	0727-02
- Acciai da cementazione	- Case hardening steels	0.7060	GGG 60		600/3	80-55-06	0732-03
- Acciai da bonifica	- Tempering steels	0.8065	GTW-65				
- Acciai da nitrurazione	- Nitriding steels	0.8170	GTS-70		P 690		
- Acciai da utensili per lavorazioni a caldo	- Hot working steels	1.2067	102 Cr 6	17350	BL 3	L 3	
- Acciai inossidabili ferritici	- Ferritic Stainless steel	1.2311	40 CrMnMo 7				
- Leghe di titanio	- Titanium alloys	1.2312	40 CrMnMoS 8 6	17350			
		1.2343	X 38 CrMoV 5-1	17350	BH 11	H 11	
		1.2344	X40CrMoV 5-1	17350	BH13	H13	HARDOX600
		1.2510	100 MnCrW 4		BO 1	O 1	HARDOX400 500
		1.2710	45 NiCr 6				
		1.2711	54 NiCrMo V 6				
		1.2714	56 NiCrMoV 7	17350			
		1.2833	100 V 1		BW 2	W 210	
		1.2842	90 MnCrV 8	17350	BO 2	O 2	
		1.3565	48 CrMo 4	17230	817 M40		
		1.4002	X 6 CrAl 13	E EN 10088	405 S 17	405	2302
		1.4006	X 10 Cr 13	E EN 10088	410 S21	410	
		1.4028	X 30 Cr 13	E EN 10088	420 S 45	420F	2304
		1.6587	17 CrNiMo 6	1672 T.3	820 A 16		
		1.8519	31 CrMoV 9	17211			
		1.8550	34 CrAlNi 7	17211			
		1.8550	34 CrAlNi 7	17211.4301	X 5 CrNi 18 10	E EN 10088	304 S 15

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CLASSIFICAZIONE DEI MATERIALI GROUPS OF MATERIALS

ESEMPI DI MATERIALI - MATERIAL EXAMPLE

		W. - Nr.	DIN	EN	B.S.	AISI/SAE	SS
- Acciai da utensili per lavorazioni a freddo 12% Cr	- Tool steels for cold machining 12% Cr	1.2080	X 210 Cr 12	17350	BD 3	D 3	
- Acciai resistenti al calore = 17% Ni e 17% Cr	- High temperature steels = 17% Ni and 17% Cr	1.2379	X 155 CrVMo 12-1	17350	BD 2	D 2	2310
- Acciai inossidabili austenitici	- Austenitic stainless steel	1.2436	X 210 CrW 12	17350			2312
- Leghe di titanio indurite	- Titanium alloys hardened	1.2601	X 165 CrMoV 12	17350			
- Leghe a base di nichel non indurenti	- Nickel-based alloys	1.4301	X 5 CrNi 18 10	E EN 10088	304 S 15	304	2332
		1.4305	X 12 CrNi S 18 9	E EN 10088	303 S 22	303	2346
		1.4571	X 6CrNiMoTi 17-12-2	E EN 10088	320 S 18	316 Ti	2350
		1.4876	Incoloy 800	SEW 470	NA 15	B 163	
		1.4923	X 22 CrMoV 12-1	17240			
		1.4945	X 6 CrNiWNb 16 16				
		1.4962	X 12 CrNiWTi 16-13				
		1.5920	18 CrNi 8				
		1.6582	34 CrNiMo 6	EN 10083-1			
		2.4632	Nimonic 90	LW			
		2.4654	Waspalloy	LW			
		2.4665	Hastelloy X	LW			
		2.4670	Inconel 713	LW			
		2.4816	Inconel 600	17742			
		2.4856	Inconel 625	17744			

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- Leghe resistenti al calore	- Higt temperature alloys	2.4636	Udimet 700
- Leghe a base di nichel indurenti	- Nickel-based alloys	2.4668	Inconel 718
		2.4973	René 41
		Astroloy	
		René 95	
		Stellite 6	

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- Alluminio puro	- Pure aluminium	3.0255	Al 99,5
- Leghe d'alluminio non bonificato	- Non-hardened aluminium	3.2315	AlMgSi 1
- Materiali malleabili	- Forging materials	3.3211	AlMg 1 SiCu
		3.3535	AlMg 3
		3.4365	AlZnMgCu 1,5

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- Leghe d'alluminio bonificato	- Hardened aluminium	3.2151	G-Al Si6 Cu 4
- Materiali malleabili	- Forging materials	3.2341	G-AlSi 5 Mg
- Getti in lega leggera Si ≤ 10%	- Aluminium cast material Si ≤ 10%	3.2373	G-AlSi 9 Mg

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- Getti in lega leggera Si > 10%	- Aluminium cast material Si > 10%	3.2381	G-AlSi 10 Mg
- Leghe rame - zinco (ottone)	- Copper - zinc alloys (brass)	3.2581	G-AlSi 12
- Leghe rame - stagno (bronzo)	- Copper - zinc alloys (bronze)	AlSi 17 Cu 4	
- Duroplastica laminata	- Duroplast laminated	Al Si 21 CuNiMg	
		AlSi 25 CuNiMg	

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