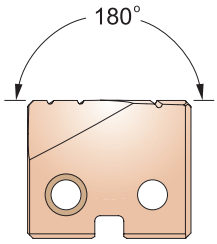
SPADE DRILLS

SERIES Y,Z,0

SPADE DRILL INSERTS - SUPER COBALT T15 FLAT BOTTOM
SPADE DRILL BOHRER-EINSÄTZE - SUPER COBALT T15(FLACH-NUT)

POINT ANGLE : 180 degree



cutting conditions : P.327

Series Min. to Max. (mm/inch)	Diameter			Thick	EDP No.		
					SUPER HSS (T15)		
	Inch (inch)	Metric (mm)	Decimal (inch)	Metric (mm/inch)	TiN	Hardslick	TiAlN
Y 9.50 (.374″) to 11.07 (.436″)		9.50	.3740"	2.4 (3/32″)	S2155095	S2170095	S2165095
	3/8″	9.53	.3750"		S2105024	S2120024	S2115024
		9.80	.3858"		S2155098	S2170098	S2165098
	25/64″	9.92	.3906"		S2105025	S2120025	S2115025
		10.00	.3937"		S2155100	S2170100	S2165100
		10.20	.4016"		S2155102	S2170102	S2165102
	13/32″	10.32	.4062"		S2105026	S2120026	S2115026
		10.50	.4134"		S2155105	S2170105	S2165105
	27/64″	10.72	.4219"		S2105027	S2120027	S2115027
		10.80	.4252"		S2155108	S2170108	S2165108
		11.00	.4331"		S2155110	S2170110	S2165110
Z 11.11(.437″) to 12.95(.510″)	7/16″	11.11	.4375"	2.4 (3/32″)	S2105028	S2120028	S2115028
		11.50	.4528"		S2155115	S2170115	S2165115
	29/64″	11.51	.4531"		S2105029	S2120029	S2115029
	15/32″	11.91	.4688"		S2105030	S2120030	S2115030
		12.00	.4724"		S2155120	S2170120	S2165120
	31/64″	12.30	.4844"		S2105031	S2120031	S2115031
		12.50	.4921"		S2155125	S2170125	S2165125
	1/2″	12.70	.5000"		S2105032	S2120032	S2115032
0 12.98 (.511″) to 17.65 (.695″)		13.00	.5118"	3.2 (1/8″)	S2155130	S2170130	S2165130
	33/64″	13.10	.5156"		S2105033	S2120033	S2115033
	17/32″	13.49	.5312"		S2105034	S2120034	S2115034
		13.50	.5315"		S2155135	S2170135	S2165135
	35/64″	13.89	.5469"		S2105035	S2120035	S2115035
		14.00	.5512"		S2155140	S2170140	S2165140
	9/16″	14.29	.5625"		S2105036	S2120036	S2115036
		14.50	.5709"		S2155145	S2170145	S2165145
	37/64″	14.68	.5781"		S2105037	S2120037	S2115037
		15.00	.5906"		S2155150	S2170150	S2165150
	19/32″	15.08	.5938"		S2105038	S2120038	S2115038
	39/64″	15.48	.6094"		S2105039	S2120039	S2115039
		15.50	.6102"		S2155155	S2170155	S2165155
	5/8″	15.88	.6250"		S2105040	S2120040	S2115040
		16.00	.6299"		S2155160	S2170160	S2165160

◎ : Excellent ○ : Good

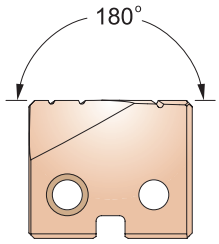
Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

SPADE DRILLS

SERIES 0,1

SPADE DRILL INSERTS - SUPER COBALT T15 FLAT BOTTOM
SPADE DRILL BOHRER-EINSÄTZE - SUPER COBALT T15(FLACH-NUT)

POINT ANGLE : 180 degree



cutting conditions : P.327

Series Min. to Max. (mm/inch)	Diameter Inch (inch)	Diameter Metric (mm)	Diameter Decimal (inch)	Thick Metric (mm/inch)	EDP No. SUPER HSS (T15) TiN	Hardslick	TiAlN
0 12.98(.511″) to 17.65(.695″)	41/64″	16.27	.6406"	3.2 (1/8″)	S2105041	S2120041	S2115041
		16.50	.6496"		S2155165	S2170165	S2165165
	21/32″	16.67	.6562"		S2105042	S2120042	S2115042
		17.00	.6693"		S2155170	S2170170	S2165170
	43/64″	17.07	.6719"		S2105043	S2120043	S2115043
	11/16″	17.46	.6875"		S2105044	S2120044	S2115044
		17.50	.6890"		S2155175	S2170175	S2165175
1 17.53 (.690″) to 24.38 (.960″)	45/64″	17.86	.7031"	4.0 (5/32″)	S2105045	S2120045	S2115045
		18.00	.7087"		S2155180	S2170180	S2165180
	23/32″	18.26	.7188"		S2105046	S2120046	S2115046
		18.50	.7283"		S2155185	S2170185	S2165185
	47/64″	18.65	.7344"		S2105047	S2120047	S2115047
		19.00	.7480"		S2155190	S2170190	S2165190
	3/4″	19.05	.7500"		S2105048	S2120048	S2115048
	49/64″	19.45	.7656"		S2105049	S2120049	S2115049
		19.50	.7677"		S2155195	S2170195	S2165195
	25/32″	19.84	.7812"		S2105050	S2120050	S2115050
		20.00	.7874"		S2155200	S2170200	S2165200
	51/64″	20.24	.7969"		S2105051	S2120051	S2115051
		20.50	.8071"		S2155205	S2170205	S2165205
	13/16″	20.64	.8125"		S2105052	S2120052	S2115052
		21.00	.8268"		S2155210	S2170210	S2165210
	27/32″	21.43	.8438"		S2105054	S2120054	S2115054
	55/64″	21.83	.8594"		S2105055	S2120055	S2115055
		22.00	.8661"		S2155220	S2170220	S2165220
	7/8″	22.23	.8750"		S2105056	S2120056	S2115056
	57/64″	22.62	.8906"		S2105057	S2120057	S2115057
		23.00	.9055"		S2155230	S2170230	S2165230
	29/32″	23.02	.9062"		S2105058	S2120058	S2115058
	59/64″	23.42	.9219"		S2105059	S2120059	S2115059
	15/16″	23.81	.9375"		S2105060	S2120060	S2115060
		24.00	.9449"		S2155240	S2170240	S2165240

◎ : Excellent ○ : Good

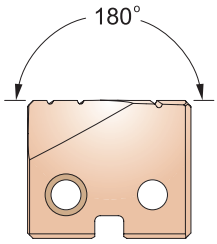
Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

SPADE DRILLS

SERIES 2

SPADE DRILL INSERTS - SUPER COBALT T15 FLAT BOTTOM
SPADE DRILL BOHRER-EINSÄTZE - SUPER COBALT T15(FLACH-NUT)

POINT ANGLE : 180 degree



cutting conditions : P.327

Series Min. to Max. (mm/inch)	Diameter			Thick	EDP No.		
					SUPER HSS (T15)		
	Inch (inch)	Metric (mm)	Decimal (inch)	Metric (mm/inch)	TiN	Hardslick	TiAlN
2 24.41 (.961″) to 35.05 (1.380″)	31/32″	24.61	.9688"	4.8 (3/16″)	S2105062	S2120062	S2115062
	63/64″	25.00	.9843"		S2105063	S2120063	S2115063
	1″	25.40	1.0000"		S2105100	S2120100	S2115100
	1-1/64″	25.80	1.0156"		S2105101	S2120101	S2115101
		26.00	1.0236"		S2155260	S2170260	S2165260
	1-1/32″	26.19	1.0312"		S2105102	S2120102	S2115102
	1-3/64″	26.59	1.0469"		S2105103	S2120103	S2115103
	1-1/16″	26.99	1.0625"		S2105104	S2120104	S2115104
		27.00	1.0630"		S2155270	S2170270	S2165270
	1-3/32″	27.78	1.0938"		S2105106	S2120106	S2115106
		28.00	1.1024"		S2155280	S2170280	S2165280
	1-7/64″	28.18	1.1094"		S2105107	S2120107	S2115107
	1-1/8″	28.58	1.1250"		S2105108	S2120108	S2115108
		29.00	1.1417"		S2155290	S2170290	S2165290
	1-5/32″	29.37	1.1562"		S2105110	S2120110	S2115110
		30.00	1.1811"		S2155300	S2170300	S2165300
	1-3/16″	30.16	1.1875"		S2105112	S2120112	S2115112
	1-7/32″	30.96	1.2188"		S2105114	S2120114	S2115114
		31.00	1.2205"		S2155310	S2170310	S2165310
	1-1/4″	31.75	1.2500"		S2105116	S2120116	S2115116
		32.00	1.2598"		S2155320	S2170320	S2165320
	1-9/32″	32.54	1.2812"		S2105118	S2120118	S2115118
		33.00	1.2992"		S2155330	S2170330	S2165330
	1-5/16″	33.34	1.3125"		S2105120	S2120120	S2115120
		34.00	1.3386"		S2155340	S2170340	S2165340
	1-11/32″	34.13	1.3438"		S2105122	S2120122	S2115122
	1-3/8″	34.93	1.3750"		S2105124	S2120124	S2115124
		35.00	1.3780"		S2155350	S2170350	S2165350

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

SUPER HSS T-15 FLAT BOTTOM
SPADE DRILL BOHRER-EINSÄTZE - SUPER COBALT T15(FLACH-NUT)

Material	Material Hardness		Speed		Feed			
	(Bhn)	(HRc)	TiN	TiAlN (Hardslick)	Ø 9.5 ~12.5	Ø 13 ~17.5	Ø 18 ~24	Ø 25 ~35
Free machining Steels 9SMn36, 9SMnPb28 10SPb20 etc	100 - 150		63	67	0.13	0.18	0.25	0.32
	150 - 200	- 13	56	65	0.13	0.18	0.25	0.32
	200 - 250	13 - 24	53	58	0.11	0.18	0.25	0.30
Low Carbon Steels C10, C15, C22, C25 etc	85 - 125		54	60	0.12	0.18	0.22	0.30
	125 - 175	- 7	50	58	0.12	0.18	0.22	0.30
	175 - 225	7 - 20	46	55	0.10	0.15	0.19	0.27
	225 - 275	20 - 28	45	53	0.10	0.15	0.19	0.27
Medium Carbon Steels C35, C40, C45 etc	125 - 175	- 7	50	60	0.11	0.18	0.22	0.28
	175 - 225	7 - 20	47	55	0.10	0.15	0.18	0.27
	225 - 275	20 - 28	45	50	0.10	0.15	0.18	0.27
	275 - 325	28 - 34	42	46	0.08	0.14	0.17	0.22
Structural Steels St33, St37-2, St44-2 St52, St60 etc	100 - 150		45	50	0.11	0.18	0.23	0.28
	150 - 250	- 24	38	44	0.10	0.18	0.19	0.22
	250 - 350	24 - 37	33	36	0.08	0.16	0.18	0.19
Cast Iron / S,G Iron GG10, 20 ,25, 35, 40 GGG50, 70 GTW35, GTS70 etc	120 - 150		56	66	0.13	0.25	0.35	0.41
	150 - 200	- 13	51	60	0.12	0.21	0.29	0.40
	200 - 220	13 - 19	47	51	0.12	0.20	0.25	0.36
	220 - 260	19 - 26	38	48	0.10	0.14	0.20	0.25
	260 - 320	26 - 34	30	37	0.10	0.13	0.13	0.20
Alloy Steels 45CrMo4, 42CrMo4 16MnCr5, Ck75 35CrMo4, 16MnCr5 etc	125 - 175	- 7	46	50	0.12	0.16	0.19	0.29
	175 - 225	7 - 20	45	46	0.10	0.16	0.19	0.29
	225 - 275	20 - 28	40	45	0.10	0.13	0.18	0.28
	275 - 325	28 - 34	38	42	0.07	0.12	0.18	0.22
	325 - 375	34 - 40	34	37	0.06	0.12	0.17	0.22
Tool Steels 102Cr6, 105WCr6, C75W etc	150 - 200	- 13	27	29	0.07	0.12	0.15	0.20
	200 - 250	13 - 24	22	23	0.07	0.12	0.15	0.20
High Temp. Alloy Hastelloy B,Inconel etc	140 - 220	- 19	9	10	0.06	0.14	0.16	0.19
	220 - 310	19 - 33	7	9	0.06	0.11	0.14	0.15
High Strength Alloy 36CrNiMo4, 34CrNiMo8 40NiCrMo73 etc	225 - 300	- 32	27	28	0.10	0.14	0.18	0.19
	300 - 350	32 - 37	21	22	0.08	0.14	0.18	0.19
	350 - 400	37 - 43	17	18	0.06	0.12	0.16	0.18
Aluminum AlCuSiMn, AlMgSi0.5, AlZnMgCu1.5 etc	30		208	213	0.17	0.28	0.36	0.43
	180	- 8	112	121	0.17	0.28	0.36	0.41
Stainless Steels X7Cr13, X10CrA118, X5CrNi189, X5CrNiMo18 10 etc	135 - 185	- 9	26	29	0.12	0.18	0.20	0.23
	185 - 275	9 - 28	20	25	0.09	0.15	0.18	0.22

RPM= revolution per minute (rev/min)
M/min= surface meter per minute(M/min)
DIA= diameter of drill (mm)
mm/rev = feed rate(mm/rev)

*** Formulas :**

$$M/min = \frac{(RPM) \cdot (\pi) \cdot (DIA.)}{1000}$$

$$mm/min = (RPM) \cdot (mm/rev)$$

$$RPM = \frac{(M/min) \cdot (1000)}{(\pi) \cdot (DIA.)}$$

The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.
Speed and feed reductions (20% reduction in speed and 10% reduction in feed) are recommended.