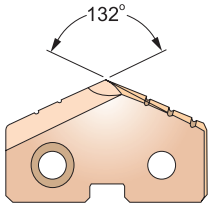
SPADE DRILLS

SERIES Y,Z,0

SPADE DRILL INSERTS - PREMIUM HSS M48
EINWEG BOHREINSATZ - PREMIUM HSS M48

- For use in high temperature alloys and materials with 350~500 Brinell.
- Set up time can be reduced due to changing inserts easily on the machine.
- Any non-standard size available.

- Zur Anwendung bei hitzebeständigen Legierungen und Werkstoffen mit 350 - 500 Brinell
- Reduzierte Rüstzeiten, einfacher Einsatzwechsel auf der Maschine
- Jede Abmessung außerhalb des Kataloges lieferbar



cutting conditions : P.325

Series Min. to Max. (mm/inch)	Diameter			Thick	EDP No.		
					PREMIUM HSS (M48)		
	Inch (inch)	Metric (mm)	Decimal (inch)	Metric (mm/inch)	TiN	TiCN	TiAIN
Y 9.50 (.374″) to 11.07 (.436″)		9.50	.3740″	2.4 (3/32″)	S1555095	S1560095	S1565095
	3/8″	9.53	.3750″		S1505024	S1510024	S1515024
		9.80	.3860″		S1555098	S1560098	S1565098
	25/64″	9.92	.3906″		S1505025	S1510025	S1515025
		10.00	.3937″		S1555100	S1560100	S1565100
		10.20	.4016″		S1555102	S1560102	S1565102
	13/32″	10.32	.4063″		S1505026	S1510026	S1515026
		10.50	.4134″		S1555105	S1560105	S1565105
	27/64″	10.72	.4219″		S1505027	S1510027	S1515027
		10.80	.4252″		S1555108	S1560108	S1565108
		11.00	.4331″		S1555110	S1560110	S1565110
Z 11.11(.437″) to 12.95(.510″)	7/16″	11.11	.4375″	2.4 (3/32″)	S1505028	S1510028	S1515028
		11.50	.4528″		S1555115	S1560115	S1565115
	29/64″	11.51	.4531″		S1505029	S1510029	S1515029
	15/32″	11.91	.4688″		S1505030	S1510030	S1515030
		12.00	.4724″		S1555120	S1560120	S1565120
	31/64″	12.30	.4844″		S1505031	S1510031	S1515031
		12.50	.4921″		S1555125	S1560125	S1565125
	1/2″	12.70	.5000″		S1505032	S1510032	S1515032
0 12.98 (.511″) to 17.65 (.695″)		13.00	.5118″	3.2 (1/8″)	S1555130	S1560130	S1565130
	33/64″	13.10	.5156″		S1505033	S1510033	S1515033
	17/32″	13.49	.5313″		S1505034	S1510034	S1515034
		13.50	.5315″		S1555135	S1560135	S1565135
	35/64″	13.89	.5469″		S1505035	S1510035	S1515035
		14.00	.5512″		S1555140	S1560140	S1565140
	9/16″	14.29	.5625″		S1505036	S1510036	S1515036
		14.50	.5709″		S1555145	S1560145	S1565145
	37/64″	14.68	.5781″		S1505037	S1510037	S1515037
		15.00	.5906″		S1555150	S1560150	S1565150
	19/32″	15.08	.5938″		S1505038	S1510038	S1515038
	39/64″	15.48	.6094″		S1505039	S1510039	S1515039
		15.50	.6102″		S1555155	S1560155	S1565155
	5/8″	15.88	.6250″		S1505040	S1510040	S1515040
		16.00	.6299″		S1555160	S1560160	S1565160

◎ : 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
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○

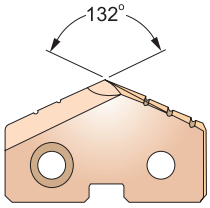
SPADE DRILLS

SERIES 0,1

SPADE DRILL INSERTS - PREMIUM HSS M48
EINWEG BOHREINSATZ - PREMIUM HSS M48

- For use in high temperature alloys and materials with 350~500 Brinell.
- Set up time can be reduced due to changing inserts easily on the machine.
- Any non-standard size available.

- Zur Anwendung bei hitzebeständigen Legierungen und Werkstoffen mit 350 - 500 Brinell
- Reduzierte Rüstzeiten, einfacher Einsatzwechsel auf der Maschine
- Jede Abmessung außerhalb des Kataloges lieferbar



cutting conditions : P.325

Series Min. to Max. (mm/inch)	Diameter Inch (inch)	Diameter Metric (mm)	Diameter Decimal (inch)	Thick Metric (mm/inch)	EDP No. PREMIUM HSS (M48) TiN	TiCN	TiAlN
0 12.98(.511″) to 17.65(.695″)	41/64″	16.27	.6406″	3.2 (1/8″)	S1505041	S1510041	S1515041
		16.50	.6496″		S1555165	S1560165	S1565165
	21/32″	16.67	.6563″		S1505042	S1510042	S1515042
		17.00	.6693″		S1555170	S1560170	S1565170
	43/64″	17.07	.6719″		S1505043	S1510043	S1515043
	11/16″	17.46	.6875″		S1505044	S1510044	S1515044
		17.50	.6890″		S1555175	S1560175	S1565175
1 17.53 (.690″) to 24.38 (.960″)	45/64″	17.86	.7031″	4.0 (5/32″)	S1505045	S1510045	S1515045
		18.00	.7087″		S1555180	S1560180	S1565180
	23/32″	18.26	.7188″		S1505046	S1510046	S1515046
		18.50	.7283″		S1555185	S1560185	S1565185
	47/64″	18.65	.7344″		S1505047	S1510047	S1515047
		19.00	.7480″		S1555190	S1560190	S1565190
	3/4″	19.05	.7500″		S1505048	S1510048	S1515048
	49/64″	19.45	.7656″		S1505049	S1510049	S1515049
		19.50	.7677″		S1555195	S1560195	S1565195
	25/32″	19.84	.7813″		S1505050	S1510050	S1515050
		20.00	.7874″		S1555200	S1560200	S1565200
	51/64″	20.24	.7969″		S1505051	S1510051	S1515051
		20.50	.8071″		S1555205	S1560205	S1565205
	13/16″	20.64	.8125″		S1505052	S1510052	S1515052
		21.00	.8268″		S1555210	S1560210	S1565210
	27/32″	21.43	.8438″		S1505054	S1510054	S1515054
	55/64″	21.83	.8594″		S1505055	S1510055	S1515055
		22.00	.8661″		S1555220	S1560220	S1565220
	7/8″	22.23	.8750″		S1505056	S1510056	S1515056
	57/64″	22.62	.8906″		S1505057	S1510057	S1515057
		23.00	.9055″		S1555230	S1560230	S1565230
	29/32″	23.02	.9063″		S1505058	S1510058	S1515058
	59/64″	23.42	.9219″		S1505059	S1510059	S1515059
	15/16″	23.81	.9375″		S1505060	S1510060	S1515060
		24.00	.9449″		S1555240	S1560240	S1565240

◎ : 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
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○

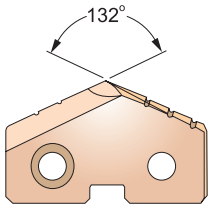
SPADE DRILLS

SERIES 2

SPADE DRILL INSERTS - PREMIUM HSS M48
EINWEG BOHREINSATZ - PREMIUM HSS M48

- For use in high temperature alloys and materials with 350~500 Brinell.
- Set up time can be reduced due to changing inserts easily on the machine.
- Any non-standard size available.

- Zur Anwendung bei hitzebeständigen Legierungen und Werkstoffen mit 350 - 500 Brinell
- Reduzierte Rüstzeiten, einfacher Einsatzwechsel auf der Maschine
- Jede Abmessung außerhalb des Kataloges lieferbar



cutting conditions : P.325

Series Min. to Max. (mm/inch)	Diameter			Thick	EDP No.		
	Inch (inch)	Metric (mm)	Decimal (inch)	Metric (mm/inch)	PREMIUM HSS (M48) TiN	PREMIUM HSS (M48) TiCN	PREMIUM HSS (M48) TiAlN
2 24.41 (.961″) to 35.05 (1.380″)	31/32″	24.61	.9688″	4.8 (3/16″)	S1505062	S1510062	S1515062
	63/64″	25.00	.9843″		S1555250	S1560250	S1565250
	1″	25.40	1.0000″		S1505100	S1510100	S1515100
	1-1/64″	25.80	1.0156″		S1505101	S1510101	S1515101
		26.00	1.0236″		S1555260	S1560260	S1565260
	1-1/32″	26.19	1.0313″		S1505102	S1510102	S1515102
	1-3/64″	26.59	1.0469″		S1505103	S1510103	S1515103
	1-1/16”	26.99	1.0625″		S1505104	S1510104	S1515104
		27.00	1.0630″		S1555270	S1560270	S1565270
	1-3/32″	27.78	1.0938″		S1505106	S1510106	S1515106
		28.00	1.1024″		S1555280	S1560280	S1565280
	1-7/64″	28.18	1.1094″		S1505107	S1510107	S1515107
	1-1/8″	28.58	1.1250″		S1505108	S1510108	S1515108
		29.00	1.1417″		S1555290	S1560290	S1565290
	1-5/32″	29.37	1.1563″		S1505110	S1510110	S1515110
		30.00	1.1811″		S1555300	S1560300	S1565300
	1-3/16″	30.16	1.1875″		S1505112	S1510112	S1515112
	1-7/32″	30.96	1.2188″		S1505114	S1510114	S1515114
		31.00	1.2205″		S1555310	S1560310	S1565310
	1-1/4″	31.75	1.2500″		S1505116	S1510116	S1515116
		32.00	1.2598″		S1555320	S1560320	S1565320
	1-9/32″	32.54	1.2813″		S1505118	S1510118	S1515118
		33.00	1.2992″		S1555330	S1560330	S1565330
	1-5/16″	33.34	1.3125″		S1505120	S1510120	S1515120
		34.00	1.3386″		S1555340	S1560340	S1565340
	1-11/32″	34.13	1.3438″		S1505122	S1510122	S1515122
	1-3/8″	34.93	1.3750″		S1505124	S1510124	S1515124
		35.00	1.3780″		S1555350	S1560350	S1565350

◎ : 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

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN

DRILL INSERT (METRIC) - HSS
BOHREINSATZ (METRISCH) - HSS

Material	Material Hardness (Bhn)	Material Hardness (HRc)	* HSS Grade	Speed (M/min) TiN	Speed (M/min) TiCN	Speed (M/min) TiAlN	Feed (mm/rev) Ø9.5 ~12.5	Ø13 ~17.5	Ø18 ~24	Ø25 ~35	Ø36 ~47	Ø48 ~65	Ø66 ~114
Free machining Steels 9SMn36, 9SMnPb28 10SPb20 etc	100 - 150		HSS	63	79	84	0.16	0.23	0.31	0.40	0.48	0.55	0.67
	150 - 200	- 13	HSS	58	70	81	0.16	0.23	0.31	0.40	0.48	0.55	0.67
	200 - 250	13 - 24	HSS	51	66	72	0.14	0.23	0.31	0.38	0.48	0.57	0.69
Low Carbon Steels C10, C15, C22, C25 etc	85 - 125		HSS	54	67	75	0.15	0.22	0.28	0.37	0.46	0.56	0.67
	125 - 175	- 7	HSS	51	63	72	0.15	0.22	0.28	0.37	0.46	0.56	0.67
	175 - 225	7 - 20	HSS	49	58	69	0.13	0.19	0.24	0.34	0.43	0.50	0.57
	225 - 275	20 - 28	HSS	45	56	66	0.13	0.19	0.24	0.34	0.43	0.50	0.57
Medium Carbon Steels C35, C40, C45 etc	125 - 175	- 7	HSS	52	63	75	0.14	0.22	0.28	0.35	0.45	0.55	0.65
	175 - 225	7 - 20	HSS	48	59	69	0.13	0.19	0.23	0.34	0.43	0.50	0.58
	225 - 275	20 - 28	HSS	45	56	63	0.13	0.19	0.23	0.34	0.43	0.50	0.58
	275 - 325	28 - 34	SH, PH	42	52	58	0.10	0.17	0.21	0.28	0.38	0.45	0.55
Structural Steels St33, St37-2, St44-2 St52, St60 etc	100 - 150		HSS	44	56	63	0.14	0.23	0.29	0.35	0.44	0.50	0.63
	150 - 250	- 24	HSS	39	47	55	0.13	0.22	0.24	0.28	0.38	0.46	0.59
	250 - 350	24 - 37	SH, PH	32	41	45	0.10	0.20	0.22	0.24	0.34	0.40	0.48
Cast Iron / S,G Iron GG10, 20 ,25, 35, 40 GGG50, 70 GTW35, GTS70 etc	120 - 150		HSS	52	64	75	0.16	0.30	0.40	0.49	0.59	0.69	0.75
	150 - 200	- 13	HSS	48	58	70	0.14	0.26	0.35	0.45	0.56	0.64	0.68
	200 - 220	13 - 19	HSS	42	53	58	0.14	0.23	0.30	0.41	0.46	0.52	0.60
	220 - 260	19 - 26	SH, PH	35	44	52	0.13	0.17	0.23	0.30	0.35	0.43	0.50
	260 - 320	26 - 34	SH, PH	29	35	41	0.10	0.15	0.16	0.23	0.28	0.35	0.40
Alloy Steels 45CrMo4, 42CrMo4 16MnCr5, Ck75 35CrMo4, 16MnCr5 etc	125 - 175	- 7	HSS	48	58	63	0.15	0.20	0.24	0.36	0.43	0.47	0.53
	175 - 225	7 - 20	HSS	45	56	58	0.13	0.20	0.24	0.36	0.42	0.46	0.55
	225 - 275	20 - 28	HSS	41	50	56	0.13	0.16	0.23	0.35	0.41	0.44	0.55
	275 - 325	28 - 34	SH, PH	39	47	53	0.09	0.15	0.22	0.28	0.38	0.41	0.50
	325 - 375	34 - 40	SH, PH	36	43	46	0.08	0.15	0.21	0.27	0.38	0.40	0.51
Tool Steels 102Cr6, 105WCr6, C75W etc	150 - 200	- 13	SH	25	34	36	0.09	0.15	0.19	0.25	0.28	0.36	0.41
	200 - 250	13 - 24	SH, PH	19	27	29	0.09	0.15	0.19	0.25	0.28	0.36	0.41
High Temp. Alloy Hastelloy B,Inconel etc	140 - 220	- 19	SH, PH	9	11	12	0.08	0.17	0.20	0.24	0.30	0.37	0.39
	220 - 310	19 - 33	PH	8	9	11	0.08	0.14	0.18	0.19	0.25	0.29	0.34
High Strength Alloy 36CrNiMo4, 34CrNiMo8 40NiCrMo73 etc	225 - 300	- 32	SH, PH	25	34	35	0.13	0.18	0.23	0.24	0.36	0.43	0.50
	300 - 350	32 - 37	SH, PH	19	26	27	0.10	0.18	0.23	0.24	0.36	0.43	0.50
	350 - 400	37 - 43	PH	16	21	22	0.08	0.15	0.20	0.22	0.30	0.48	0.46
Aluminum AlCuSiMn, AlMgSi0.5, AlZnMgCu1.5 etc	30		HSS	187	229	244	0.19	0.33	0.41	0.50	0.54	0.64	0.62
	180	- 8	HSS	92	137	137	0.19	0.33	0.41	0.46	0.54	0.64	0.62
Stainless Steels X7Cr13, X10CrA118, X5CrNi189, X5CrNiMo18 10 etc	135 - 185	- 9	HSS	24	29	34	0.14	0.20	0.23	0.26	0.36	0.41	0.50
	185 - 275	9 - 28	HSS	20	23	29	0.12	0.18	0.20	0.24	0.30	0.36	0.46

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 :**

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

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

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

* **HSS Grade : HSS** = HSS M4, **SH** = Super HSS T15, **PH** = Premium HSS M48
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.