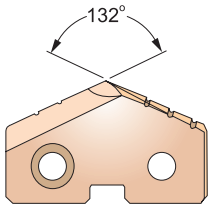
SPADE DRILLS

SERIES 2

SPADE DRILL INSERTS - CARBIDE(K20)
EINWEG BOHREINSATZ - VOLLHARTMETALL(K20)

- For use in Gray cast iron up to 220 Brinell, nonferrous metals, copper, brass and aluminum.
- Set up time can be reduced due to changing inserts easily on the machine.
- Any non-standard size available.

- Zur Anwendung in Grauguss bis 220 Brinell, Nichteisen - Metallen, Kupfer, Messing und Aluminium
- Reduzierte Rüstzeiten, einfacher Einsatzwechsel auf der Maschine
- Jede Abmessung außerhalb des Kataloges lieferbar



cutting conditions : P.326

Series Min. to Max. (mm/inch)	Diameter			Thick	EDP No.		
					CARBIDE (K20)		
	Inch (inch)	Metric (mm)	Decimal (inch)	Metric (mm/inch)	TiN	TiCN	TiAlN
2 24.41 (.961″) to 35.05 (1.380″)	31/32″	24.61	.9688″	4.8 (3/16″)	S1705062	S1710062	S1715062
	63/64″	25.00	.9843″		S1755250	S1760250	S1765250
	1″	25.40	1.0000″		S1705100	S1710100	S1715100
	1-1/64″	25.80	1.0156″		S1705101	S1710101	S1715101
		26.00	1.0236″		S1755260	S1760260	S1765260
	1-1/32″	26.19	1.0313″		S1705102	S1710102	S1715102
	1-3/64″	26.59	1.0469″		S1705103	S1710103	S1715103
	1-1/16″	26.99	1.0625″		S1705104	S1710104	S1715104
		27.00	1.0630″		S1755270	S1760270	S1765270
	1-3/32″	27.78	1.0938″		S1705106	S1710106	S1715106
		28.00	1.1024″		S1755280	S1760280	S1765280
	1-7/64″	28.18	1.1094″		S1705107	S1710107	S1715107
	1-1/8″	28.58	1.1250″		S1705108	S1710108	S1715108
		29.00	1.1417″		S1755290	S1760290	S1765290
	1-5/32″	29.37	1.1563″		S1705110	S1710110	S1715110
		30.00	1.1811″		S1755300	S1760300	S1765300
	1-3/16″	30.16	1.1875″		S1705112	S1710112	S1715112
	1-7/32″	30.96	1.2188″		S1705114	S1710114	S1715114
		31.00	1.2205″		S1755310	S1760310	S1765310
	1-1/4″	31.75	1.2500″		S1705116	S1710116	S1715116
		32.00	1.2598″		S1755320	S1760320	S1765320
	1-9/32″	32.54	1.2813″		S1705118	S1710118	S1715118
		33.00	1.2992″		S1755330	S1760330	S1765330
	1-5/16″	33.34	1.3125″		S1705120	S1710120	S1715120
		34.00	1.3386″		S1755340	S1760340	S1765340
	1-11/32″	34.13	1.3438″		S1705122	S1710122	S1715122
	1-3/8″	34.93	1.3750″		S1705124	S1710124	S1715124
		35.00	1.3780″		S1755350	S1760350	S1765350

◎ : 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) - CARBIDE
BOHREINSATZ (METRISCH) - VOLLHARTMETALL

Material	Material Hardness (Bhn)	Material Hardness (HRc)	CARBIDE Grade	Speed (M/min) TiN	Speed (M/min) TiCN	Speed (M/min) TiAlN	Feed (mm/rev) Ø 9.5 ~12.5	Feed (mm/rev) Ø 13 ~17.5	Feed (mm/rev) Ø 18 ~24	Feed (mm/rev) Ø 25 ~35	Feed (mm/rev) Ø 36 ~47
Free machining Steels 9SMn36, 9SMnPb28 10SPb20 etc	100 - 150		P40	101	113	125	0.18	0.28	0.36	0.44	0.50
	150 - 200	- 13	P40	88	99	110	0.16	0.26	0.33	0.39	0.45
	200 - 250	13 - 24	P40	82	88	101	0.14	0.23	0.31	0.41	0.42
Low Carbon Steels C10, C15, C22, C25 etc	85 - 125		P40	94	110	119	0.20	0.24	0.31	0.42	0.46
	125 - 175	- 7	P40	82	88	107	0.18	0.24	0.31	0.39	0.43
	175 - 225	7 - 20	P40	76	82	96	0.15	0.22	0.29	0.36	0.40
	225 - 275	20 - 28	P40	62	73	84	0.13	0.22	0.29	0.36	0.40
Medium Carbon Steels C35, C40, C45 etc	125 - 175	- 7	P40	82	88	102	0.17	0.24	0.31	0.37	0.42
	175 - 225	7 - 20	P40	75	84	93	0.15	0.22	0.28	0.36	0.40
	225 - 275	20 - 28	P40	66	70	84	0.15	0.22	0.28	0.36	0.40
	275 - 325	28 - 34	P40	56	64	67	0.13	0.19	0.26	0.33	0.37
Structural Steels St33, St37-2, St44-2 St52, St60 etc	100 - 150		P40	75	82	91	0.19	0.26	0.34	0.39	0.43
	150 - 250	- 24	P40	62	70	75	0.15	0.24	0.29	0.33	0.37
	250 - 350	24 - 37	P40	55	64	73	0.13	0.23	0.27	0.29	0.33
Cast Iron / S,G Iron GG10, 20 ,25, 35, 40 GGG50, 70 GTW35, GTS70 etc	120 - 150		K20,K10	98	125	137	0.18	0.30	0.37	0.46	0.56
	150 - 200	- 13	K20,K10	95	101	125	0.17	0.26	0.32	0.42	0.53
	200 - 220	13 - 19	K20,K10	75	91	111	0.14	0.23	0.30	0.38	0.45
	220 - 260	19 - 26	K20,K10	66	81	93	0.13	0.15	0.28	0.33	0.37
	260 - 320	26 - 34	K20,K10	56	70	79	0.13	0.18	0.23	0.28	0.33
Alloy Steels 45CrMo4, 42CrMo4 16MnCr5, Ck75 35CrMo4, 16MnCr5 etc	125 - 175	- 7	P40	79	85	98	0.18	0.25	0.32	0.40	0.45
	175 - 225	7 - 20	P40	73	81	88	0.15	0.23	0.29	0.38	0.42
	225 - 275	20 - 28	P40	66	73	81	0.15	0.21	0.28	0.37	0.41
	275 - 325	28 - 34	P40	62	70	78	0.12	0.20	0.27	0.33	0.40
	325 - 375	34 - 40	P40	53	58	64	0.10	0.18	0.23	0.30	0.38
Tool Steels 102Cr6, 105WCr6, C75W etc	150 - 200	- 13	P40	50	56	67	0.09	0.18	0.22	0.28	0.31
	200 - 250	13 - 24	P40	37	46	50	0.09	0.18	0.22	0.28	0.31
High Temp. Alloy Hastelloy B,Inconel etc	140 - 220	- 19	K20	26	27	30	0.10	0.17	0.23	0.27	0.33
	220 - 310	19 - 33	K20	20	23	24	0.10	0.14	0.20	0.24	0.30
High Strength Alloy 36CrNiMo4, 34CrNiMo8 40NiCrMo73 etc	225 - 300	- 32	P40	49	55	62	0.15	0.23	0.25	0.29	0.38
	300 - 350	32 - 37	P40	43	49	55	0.12	0.20	0.23	0.27	0.35
	350 - 400	37 - 43	P40	38	43	47	0.10	0.18	0.20	0.24	0.30
Aluminum AlCuSiMn, AlMgSi0.5, AlZnMgCu1.5 etc	30		K20	366	396	427	0.24	0.38	0.45	0.50	0.53
	180	- 8	K20	244	290	291	0.22	0.33	0.40	0.45	0.48
Stainless Steels X7Cr13, X10CrA118, X5CrNi189, X5CrNiMo18 10 etc	135 - 185	- 9	K20	50	55	62	0.19	0.19	0.21	0.24	0.30
	185 - 275	9 - 28	K20	38	44	46	0.15	0.17	0.20	0.21	0.25

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.