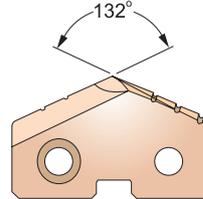


SPADE DRILL INSERTS - CARBIDE(K20) EINWEG BOHREINSATZ - VOLLHARTMETALL(K20)

- ▶ 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 Metric (mm/inch)	EDP No.		
	Inch (inch)	Metric (mm)	Decimal (inch)		CARBIDE (K20)		
					TiN	TiCN	TiAlN
Y 9.50 (.374") to 11.07 (.436")	3/8"	9.50	.3740"	2.4 (3/32")	S1755095	S1760095	S1765095
		9.53	.3750"		S1705024	S1710024	S1715024
	25/64"	9.80	.3860"		S1755098	S1760098	S1765098
		9.92	.3906"		S1705025	S1710025	S1715025
	13/32"	10.00	.3937"		S1755100	S1760100	S1765100
		10.20	.4016"		S1755102	S1760102	S1765102
	27/64"	10.32	.4063"		S1705026	S1710026	S1715026
		10.50	.4134"		S1755105	S1760105	S1765105
	11.00	10.72	.4219"		S1705027	S1710027	S1715027
		10.80	.4252"		S1755108	S1760108	S1765108
Z 11.11(.437") to 12.95(.510")	7/16"	11.11	.4375"	2.4 (3/32")	S1755110	S1760110	S1765110
		11.50	.4528"		S1705028	S1710028	S1715028
	29/64"	11.51	.4531"		S1755115	S1760115	S1765115
		11.91	.4688"		S1705029	S1710029	S1715029
	31/64"	12.00	.4724"		S1705030	S1710030	S1715030
		12.30	.4844"		S1755120	S1760120	S1765120
	1/2"	12.50	.4921"		S1705031	S1710031	S1715031
12.70	.5000"	S1755125	S1760125	S1765125			
0 12.98 (.511") to 17.65 (.695")	33/64"	13.00	.5118"	3.2 (1/8")	S1705032	S1710032	S1715032
		13.10	.5156"		S1755130	S1760130	S1765130
	17/32"	13.49	.5313"		S1705033	S1710033	S1715033
		13.50	.5315"		S1705034	S1710034	S1715034
	35/64"	13.89	.5469"		S1755135	S1760135	S1765135
		14.00	.5512"		S1705035	S1710035	S1715035
	9/16"	14.29	.5625"		S1755140	S1760140	S1765140
		14.50	.5709"		S1705036	S1710036	S1715036
	37/64"	14.68	.5781"		S1755145	S1760145	S1765145
		15.00	.5906"		S1705037	S1710037	S1715037
	19/32"	15.08	.5938"		S1755150	S1760150	S1765150
		15.48	.6094"		S1705038	S1710038	S1715038
	39/64"	15.50	.6102"		S1705039	S1710039	S1715039
15.88		.6250"	S1755155	S1760155	S1765155		
5/8"	16.00	.6299"	S1705040	S1710040	S1715040		
			S1755160	S1760160	S1765160		

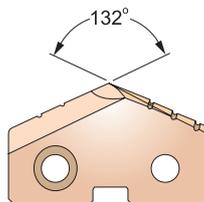
◎ : Excellent ○ : Good

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)
○	○	○	○	○	◎	◎	○	○	○	○	◎	○	○	◎	◎

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 Metric (mm/inch)	EDP No. CARBIDE (K20)				
	Inch (inch)	Metric (mm)	Decimal (inch)		TiN	TiCN	TiAlN		
0 12.98(.511") to 17.65(.695")	41/64"	16.27	.6406"	3.2 (1/8")	S1705041	S1710041	S1715041		
		16.50	.6496"		S1755165	S1760165	S1765165		
	21/32"	16.67	.6563"		S1705042	S1710042	S1715042		
		17.00	.6693"		S1755170	S1760170	S1765170		
	43/64"	17.07	.6719"		S1705043	S1710043	S1715043		
		17.46	.6875"		S1705044	S1710044	S1715044		
	11/16"	17.50	.6890"		S1755175	S1760175	S1765175		
		17.86	.7031"		S1705045	S1710045	S1715045		
	1 17.53 (.690") to 24.38 (.960")	45/64"	18.00		.7087"	4.0 (5/32")	S1755180	S1760180	S1765180
			18.26		.7188"		S1705046	S1710046	S1715046
23/32"		18.50	.7283"	S1755185	S1760185		S1765185		
		18.65	.7344"	S1705047	S1710047		S1715047		
47/64"		19.00	.7480"	S1755190	S1760190		S1765190		
		19.05	.7500"	S1705048	S1710048		S1715048		
3/4"		19.45	.7656"	S1705049	S1710049		S1715049		
		19.50	.7677"	S1755195	S1760195		S1765195		
49/64"		19.84	.7813"	S1705050	S1710050		S1715050		
		20.00	.7874"	S1755200	S1760200		S1765200		
25/32"		20.24	.7969"	S1705051	S1710051		S1715051		
		20.50	.8071"	S1755205	S1760205		S1765205		
51/64"		20.64	.8125"	S1705052	S1710052		S1715052		
		21.00	.8268"	S1755210	S1760210		S1765210		
13/16"		21.43	.8438"	S1705054	S1710054		S1715054		
		21.83	.8594"	S1705055	S1710055		S1715055		
55/64"		22.00	.8661"	S1755220	S1760220		S1765220		
		22.23	.8750"	S1705056	S1710056		S1715056		
7/8"		22.62	.8906"	S1705057	S1710057		S1715057		
		23.00	.9055"	S1755230	S1760230		S1765230		
57/64"	23.02	.9063"	S1705058	S1710058	S1715058				
	23.42	.9219"	S1705059	S1710059	S1715059				
29/32"	23.42	.9219"	S1705060	S1710060	S1715060				
	23.81	.9375"	S1755240	S1760240	S1765240				
59/64"	24.00	.9449"							
	24.00	.9449"							

◎ : 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)
	○	○	○	○	○	◎	◎	○	○	○	○	○	○	○	◎	◎

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 Metric (mm/inch)	EDP No.		
	Inch (inch)	Metric (mm)	Decimal (inch)		CARBIDE (K20)		
					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)
○	○	○	○	○	◎	◎	○	○	○	○	◎	○	○	◎	◎

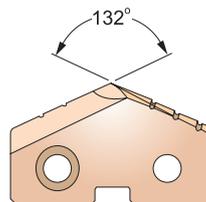
- HSS
- I-DREAM DRILLS
- DREAM DRILLS -GENERAL
- DREAM DRILLS -INOX
- DREAM DRILLS -ALU
- DREAM DRILLS -CFRP
- DREAM DRILLS -MQL TYPE
- DREAM DRILLS for HARDENED STEELS
- GENERAL CARBIDE DRILLS
- NC-SPOTTING DRILLS
- CENTER DRILLS
- MULTI-1 DRILLS
- HPD DRILLS
- GOLD-P DRILLS
- STRAIGHT SHANK DRILLS
- TAPER SHANK DRILLS
- NC-SPOTTING DRILLS
- CENTER DRILLS
- SPADE DRILLS
- TECHNICAL DATA

YG SPADE DRILLS

SERIES 3

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 Metric (mm/inch)	EDP No.		
	Inch (inch)	Metric (mm)	Decimal (inch)		CARBIDE (K20)		
					TiN	TiCN	TiAlN
3 34.37 (1.353") to 47.80 (1.882")	1-13/32"	35.72	1.4063"	6.4 (1/4")	S1705126	S1710126	S1715126
		36.00	1.4173"		S1755360	S1760360	S1765360
	1-7/16"	36.51	1.4375"		S1705128	S1710128	S1715128
		37.00	1.4567"		S1755370	S1760370	S1765370
	1-15/32"	37.31	1.4688"		S1705130	S1710130	S1715130
		38.00	1.4961"		S1755380	S1760380	S1765380
	1-1/2"	38.10	1.5000"		S1705132	S1710132	S1715132
		38.89	1.5313"		S1705134	S1710134	S1715134
	1-17/32"	39.00	1.5354"		S1755390	S1760390	S1765390
		39.69	1.5625"		S1705136	S1710136	S1715136
	1-9/16"	40.00	1.5748"		S1755400	S1760400	S1765400
		40.48	1.5938"		S1705138	S1710138	S1715138
	1-19/32"	41.00	1.6142"		S1755410	S1760410	S1765410
		41.28	1.6250"		S1705140	S1710140	S1715140
	1-5/8"	42.00	1.6535"		S1755420	S1760420	S1765420
		42.07	1.6563"		S1705142	S1710142	S1715142
	1-21/32"	42.86	1.6875"		S1705144	S1710144	S1715144
		43.00	1.6929"		S1755430	S1760430	S1765430
	1-11/16"	43.66	1.7188"		S1705146	S1710146	S1715146
		44.00	1.7323"		S1755440	S1760440	S1765440
1-23/32"	44.45	1.7500"	S1705148	S1710148	S1715148		
	45.00	1.7717"	S1755450	S1760450	S1765450		
1-3/4"	45.24	1.7813"	S1705150	S1710150	S1715150		
	46.00	1.8110"	S1755460	S1760460	S1765460		
1-25/32"	46.04	1.8125"	S1705152	S1710152	S1715152		
	46.83	1.8438"	S1705154	S1710154	S1715154		
1-13/16"	47.00	1.8504"	S1755470	S1760470	S1765470		
	47.63	1.8750"	S1705156	S1710156	S1715156		

◎ : Excellent ○ : Good

Non-alloy 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)		
○	○	○	○	○	◎	◎	○	○	○	○	◎	○	○	◎	◎



SPADE DRILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN

DRILL INSERT (METRIC) - CARBIDE
BOHREINSATZ (METRISCH) - VOLLHARTMETALL

Material	Material Hardness		CARBIDE Grade	Speed (M/min)			Feed (mm/rev)				
	(Bhn)	(HRc)		TiN	TiCN	TiAlN	Ø 9.5 ~12.5	Ø 13 ~17.5	Ø 18 ~24	Ø 25 ~35	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
Medium Carbon Steels C35, C40, C45 etc	225 - 275	20 - 28	P40	62	73	84	0.13	0.22	0.29	0.36	0.40
	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
Structural Steels St33, St37-2, St44-2 St52, St60 etc	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
	100 - 150		P40	75	82	91	0.19	0.26	0.34	0.39	0.43
Cast Iron / S,G Iron GG10, 20, 25, 35, 40 GGG50, 70 GTW35, GTS70 etc	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
	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
Alloy Steels 45CrNiO4, 42CrMo4 16MnCr5, Ck75 35CrMo4, 16MnCr5 etc	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
	125 - 175	- 7	P40	79	85	98	0.18	0.25	0.32	0.40	0.45
Tool Steels 102Cr6, 105WCr6, C75W etc	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
High Temp. Alloy Hastelloy B, Inconel 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 Strength Alloy 36CrNiMo4, 34CrNiMo8 40NiCrMo73 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
Aluminum AlCuSiMn, AlMgSiO.5, AlZnMgCu1.5 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
Stainless Steels X7Cr13, X10CrAl18, X5CrNi189, X5CrNiMo18 10 etc	350 - 400	37 - 43	P40	38	43	47	0.10	0.18	0.20	0.24	0.30
	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
	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.