

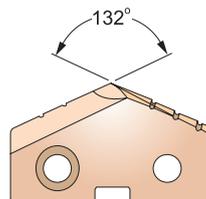
YG SPADE DRILLS

SERIES Y,Z,0

SPADE DRILL INSERTS FOR CAST IRON - CARBIDE(K10)
EINWEG BOHREINSATZ - VOLLHARTMETALL(K10)

- ▶ High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys.
- ▶ Set up time can be reduced due to changing inserts easily on the machine.
- ▶ Any non-standard size available.

- ▶ Beste Leistung in Grauguss über 220 Brinell, kurzspanendem Kugelgraphitguss, Si-Aluminium und Kupferlegierungen
- ▶ Reduzierte Rüstzeiten, einfacher Einsatzwechsel auf der Maschine
- ▶ Jede Abmessung außerhalb des Kataloges lieferbar



cutting conditions : P.326

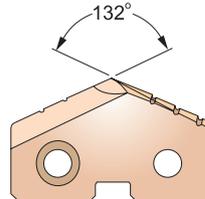
Series Min. to Max. (mm/inch)	Diameter			Thick Metric (mm/inch)	EDP No. CARBIDE (K10)		
	Inch (inch)	Metric (mm)	Decimal (inch)		TiN	TiCN	TiAlN
Y 9.50 (.374") to 11.07 (.436")	3/8"	9.50	.3740"	2.4 (3/32")	S1655095	S1660095	S1665095
		9.53	.3750"		S1605024	S1610024	S1615024
	25/64"	9.80	.3860"		S1655098	S1660098	S1665098
		9.92	.3906"		S1605025	S1610025	S1615025
	13/32"	10.00	.3937"		S1655100	S1660100	S1665100
		10.20	.4016"		S1655102	S1660102	S1665102
	27/64"	10.32	.4063"		S1605026	S1610026	S1615026
		10.50	.4134"		S1655105	S1660105	S1665105
	11.00	10.72	.4219"		S1605027	S1610027	S1615027
		10.80	.4252"		S1655108	S1660108	S1665108
Z 11.11(.437") to 12.95(.510")	7/16"	11.00	.4331"	2.4 (3/32")	S1655110	S1660110	S1665110
		11.11	.4375"		S1605028	S1610028	S1615028
	29/64"	11.50	.4528"		S1655115	S1660115	S1665115
		11.51	.4531"		S1605029	S1610029	S1615029
	15/32"	11.91	.4688"		S1605030	S1610030	S1615030
		12.00	.4724"		S1655120	S1660120	S1665120
	31/64"	12.30	.4844"		S1605031	S1610031	S1615031
		12.50	.4921"		S1655125	S1660125	S1665125
	1/2"	12.70	.5000"		S1605032	S1610032	S1615032
		13.00	.5118"		S1655130	S1660130	S1665130
0 12.98 (.511") to 17.65 (.695")	33/64"	13.10	.5156"	3.2 (1/8")	S1605033	S1610033	S1615033
		17/32"	.5313"		S1605034	S1610034	S1615034
	35/64"	13.49	.5313"		S1655135	S1660135	S1665135
		13.50	.5315"		S1605035	S1610035	S1615035
	9/16"	13.89	.5469"		S1655140	S1660140	S1665140
		14.00	.5512"		S1605036	S1610036	S1615036
	37/64"	14.29	.5625"		S1655145	S1660145	S1665145
		14.50	.5709"		S1605037	S1610037	S1615037
	19/32"	14.68	.5781"		S1655150	S1660150	S1665150
		15.00	.5906"		S1605038	S1610038	S1615038
39/64"	15.08	.5938"	S1605039	S1610039	S1615039		
	15.48	.6094"	S1655155	S1660155	S1665155		
5/8"	15.50	.6102"	S1605040	S1610040	S1615040		
	15.88	.6250"	S1655160	S1660160	S1665160		
16.00	.6299"						

◎ : 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)		
												◎	◎		

SPADE DRILL INSERTS FOR CAST IRON - CARBIDE(K10)
EINWEG BOHREINSATZ - VOLLHARTMETALL(K10)

- ▶ High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys.
- ▶ Set up time can be reduced due to changing inserts easily on the machine.
- ▶ Any non-standard size available.
- ▶ Beste Leistung in Grauguss über 220 Brinell, kurzspanendem Kugelgraphitguss, Si-Aluminium und Kupferlegierungen
- ▶ 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 (K10)		
	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")	S1605041	S1610041	S1615041
		16.50	.6496"		S1655165	S1660165	S1665165
	21/32"	16.67	.6563"		S1605042	S1610042	S1615042
		17.00	.6693"		S1655170	S1660170	S1665170
	43/64"	17.07	.6719"		S1605043	S1610043	S1615043
	11/16"	17.46	.6875"		S1605044	S1610044	S1615044
1 17.53 (.690") to 24.38 (.960")		17.50	.6890"	4.0 (5/32")	S1655175	S1660175	S1665175
	45/64"	17.86	.7031"		S1605045	S1610045	S1615045
		18.00	.7087"		S1655180	S1660180	S1665180
	23/32"	18.26	.7188"		S1605046	S1610046	S1615046
		18.50	.7283"		S1655185	S1660185	S1665185
	47/64"	18.65	.7344"		S1605047	S1610047	S1615047
		19.00	.7480"		S1655190	S1660190	S1665190
	3/4"	19.05	.7500"		S1605048	S1610048	S1615048
	49/64"	19.45	.7656"		S1605049	S1610049	S1615049
		19.50	.7677"		S1655195	S1660195	S1665195
	25/32"	19.84	.7813"		S1605050	S1610050	S1615050
		20.00	.7874"		S1655200	S1660200	S1665200
	51/64"	20.24	.7969"		S1605051	S1610051	S1615051
		20.50	.8071"		S1655205	S1660205	S1665205
	13/16"	20.64	.8125"		S1605052	S1610052	S1615052
		21.00	.8268"		S1655210	S1660210	S1665210
	27/32"	21.43	.8438"		S1605054	S1610054	S1615054
	55/64"	21.83	.8594"		S1605055	S1610055	S1615055
		22.00	.8661"		S1655220	S1660220	S1665220
	7/8"	22.23	.8750"		S1605056	S1610056	S1615056
57/64"	22.62	.8906"	S1605057	S1610057	S1615057		
	23.00	.9055"	S1655230	S1660230	S1665230		
29/32"	23.02	.9063"	S1605058	S1610058	S1615058		
59/64"	23.42	.9219"	S1605059	S1610059	S1615059		
15/16"	23.81	.9375"	S1605060	S1610060	S1615060		
	24.00	.9449"	S1655240	S1660240	S1665240		

◎ : 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)
												◎	◎		

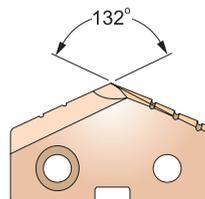
YG SPADE DRILLS

SERIES 2

SPADE DRILL INSERTS FOR CAST IRON - CARBIDE(K10)
EINWEG BOHREINSATZ - VOLLHARTMETALL(K10)

- ▶ High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys.
- ▶ Set up time can be reduced due to changing inserts easily on the machine.
- ▶ Any non-standard size available.

- ▶ Beste Leistung in Grauguss über 220 Brinell, kurzspanendem Kugelgraphitguss, Si-Aluminium und Kupferlegierungen
- ▶ 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 (K10)		
					TiN	TiCN	TiAlN
2 24.41 (.961") to 35.05 (1.380")	31/32"	24.61	.9688"	4.8 (3/16")	S1605062	S1610062	S1615062
	63/64"	25.00	.9843"		S1655250	S1660250	S1665250
	1"	25.40	1.0000"		S1605100	S1610100	S1615100
	1-1/64"	25.80	1.0156"		S1605101	S1610101	S1615101
		26.00	1.0236"		S1655260	S1660260	S1665260
	1-1/32"	26.19	1.0313"		S1605102	S1610102	S1615102
	1-3/64"	26.59	1.0469"		S1605103	S1610103	S1615103
	1-1/16"	26.99	1.0625"		S1605104	S1610104	S1615104
		27.00	1.0630"		S1655270	S1660270	S1665270
	1-3/32"	27.78	1.0938"		S1605106	S1610106	S1615106
		28.00	1.1024"		S1655280	S1660280	S1665280
	1-7/64"	28.18	1.1094"		S1605107	S1610107	S1615107
	1-1/8"	28.58	1.1250"		S1605108	S1610108	S1615108
		29.00	1.1417"		S1655290	S1660290	S1665290
	1-5/32"	29.37	1.1563"		S1605110	S1610110	S1615110
		30.00	1.1811"		S1655300	S1660300	S1665300
	1-3/16"	30.16	1.1875"		S1605112	S1610112	S1615112
	1-7/32"	30.96	1.2188"		S1605114	S1610114	S1615114
		31.00	1.2205"		S1655310	S1660310	S1665310
	1-1/4"	31.75	1.2500"		S1605116	S1610116	S1615116
		32.00	1.2598"		S1655320	S1660320	S1665320
	1-9/32"	32.54	1.2813"		S1605118	S1610118	S1615118
		33.00	1.2992"		S1655330	S1660330	S1665330
	1-5/16"	33.34	1.3125"		S1605120	S1610120	S1615120
	34.00	1.3386"	S1655340	S1660340	S1665340		
1-11/32"	34.13	1.3438"	S1605122	S1610122	S1615122		
1-3/8"	34.93	1.3750"	S1605124	S1610124	S1615124		
	35.00	1.3780"	S1655350	S1660350	S1665350		

◎ : 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)		
												◎	◎		



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 45CrNiMo4, 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
High Temp. Alloy Hastelloy B, Inconel etc	325 - 375	34 - 40	P40	53	58	64	0.10	0.18	0.23	0.30	0.38
	150 - 200	- 13	P40	50	56	67	0.09	0.18	0.22	0.28	0.31
High Strength Alloy 36CrNiMo4, 34CrNiMo8 40NiCrMo73 etc	200 - 250	13 - 24	P40	37	46	50	0.09	0.18	0.22	0.28	0.31
	140 - 220	- 19	K20	26	27	30	0.10	0.17	0.23	0.27	0.33
Aluminum AlCuSiMn, AlMgSi0.5, AlZnMgCu1.5 etc	220 - 310	19 - 33	K20	20	23	24	0.10	0.14	0.20	0.24	0.30
	225 - 300	- 32	P40	49	55	62	0.15	0.23	0.25	0.29	0.38
Stainless Steels X7Cr13, X10CrA118, X5CrNi189, X5CrNiMo18 10 etc	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.