

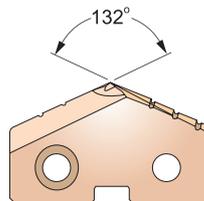
YG SPADE DRILLS

SERIES Y,Z,0

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

- ▶ High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys.
- ▶ Improved stability and hole straightness by newly developed thinning design.
- ▶ Less thrust force and excellent self-centering.
- ▶ Any non-standard size available.

- ▶ Beste Leistung in Grauguss über 220 Brinell, kurzspanendem Kugelgraphitguss, Si-Aluminium und Kupferlegierungen
- ▶ Erhöhte Stabilität und Fluchtgenauigkeit durch neu entwickelte Querschnittsgeometrie
- ▶ Verminderte Bohrkraft und ausgezeichnete Selbstzentrierung
- ▶ 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")	SM655095	SM660095	SM665095
		9.53	.3750"		SM605024	SM610024	SM615024
		9.80	.3858"		SM655098	SM660098	SM665098
		9.92	.3906"		SM605025	SM610025	SM615025
		10.00	.3937"		SM655100	SM660100	SM665100
		10.20	.4016"		SM655102	SM660102	SM665102
		10.32	.4062"		SM605026	SM610026	SM615026
		10.50	.4134"		SM655105	SM660105	SM665105
		10.72	.4219"		SM605027	SM610027	SM615027
		10.80	.4252"		SM655108	SM660108	SM665108
Z 11.11(.437") to 12.95(.510")	7/16"	11.00	.4331"	2.4 (3/32")	SM655110	SM660110	SM665110
		11.11	.4375"		SM605028	SM610028	SM615028
		11.50	.4528"		SM655115	SM660115	SM665115
		11.51	.4531"		SM605029	SM610029	SM615029
		11.91	.4688"		SM605030	SM610030	SM615030
		12.00	.4724"		SM655120	SM660120	SM665120
		12.30	.4844"		SM605031	SM610031	SM615031
		12.50	.4921"		SM655125	SM660125	SM665125
		12.70	.5000"		SM605032	SM610032	SM615032
		0 12.98 (.511") to 17.65 (.695")	1/2"		13.00	.5118"	3.2 (1/8")
13.10	.5156"			SM605033	SM610033	SM615033	
13.49	.5312"			SM605034	SM610034	SM615034	
13.50	.5315"			SM655135	SM660135	SM665135	
13.89	.5469"			SM605035	SM610035	SM615035	
14.00	.5512"			SM655140	SM660140	SM665140	
14.29	.5625"			SM605036	SM610036	SM615036	
14.50	.5709"			SM655145	SM660145	SM665145	
14.68	.5781"			SM605037	SM610037	SM615037	
15.00	.5906"			SM655150	SM660150	SM665150	
0 17.65 (.695")	19/32"	15.08	.5938"	3.2 (1/8")	SM605038	SM610038	SM615038
		15.48	.6094"		SM605039	SM610039	SM615039
		15.50	.6102"		SM655155	SM660155	SM665155
		15.88	.6250"		SM605040	SM610040	SM615040
		16.00	.6299"		SM655160	SM660160	SM665160
		16.00	.6299"		SM655160	SM660160	SM665160

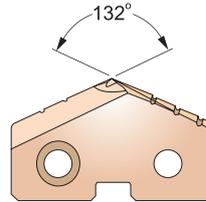
◎ : Excellent ○ : Good

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)		
												◎	◎		

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

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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")	SM605041	SM610041	SM615041
		16.50	.6496"		SM655165	SM660165	SM665165
	21/32"	16.67	.6562"		SM605042	SM610042	SM615042
		17.00	.6693"		SM655170	SM660170	SM665170
	43/64"	17.07	.6719"		SM605043	SM610043	SM615043
	11/16"	17.46	.6875"		SM605044	SM610044	SM615044
		17.50	.6890"		SM655175	SM660175	SM665175
	45/64"	17.86	.7031"		SM605045	SM610045	SM615045
		18.00	.7087"		SM655180	SM660180	SM665180
	23/32"	18.26	.7188"		SM605046	SM610046	SM615046
	18.50	.7283"	SM655185	SM660185	SM665185		
47/64"	18.65	.7344"	SM605047	SM610047	SM615047		
	19.00	.7480"	SM655190	SM660190	SM665190		
3/4"	19.05	.7500"	SM605048	SM610048	SM615048		
49/64"	19.45	.7656"	SM605049	SM610049	SM615049		
	19.50	.7677"	SM655195	SM660195	SM665195		
1 17.53 (.690") to 24.38 (.960")	25/32"	19.84	.7812"	4.0 (5/32")	SM605050	SM610050	SM615050
		20.00	.7874"		SM655200	SM660200	SM665200
	51/64"	20.24	.7969"		SM605051	SM610051	SM615051
		20.50	.8071"		SM655205	SM660205	SM665205
	13/16"	20.64	.8125"		SM605052	SM610052	SM615052
		21.00	.8268"		SM655210	SM660210	SM665210
	27/32"	21.43	.8438"		SM605054	SM610054	SM615054
	55/64"	21.83	.8594"		SM605055	SM610055	SM615055
		22.00	.8661"		SM655220	SM660220	SM665220
	7/8"	22.23	.8750"		SM605056	SM610056	SM615056
	57/64"	22.62	.8906"		SM605057	SM610057	SM615057
		23.00	.9055"		SM655230	SM660230	SM665230
	29/32"	23.02	.9062"		SM605058	SM610058	SM615058
	59/64"	23.42	.9219"		SM605059	SM610059	SM615059
	15/16"	23.81	.9375"		SM605060	SM610060	SM615060
		24.00	.9449"		SM655240	SM660240	SM665240

◎ : 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)
												◎	◎		

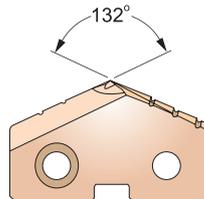
YG SPADE DRILLS

SERIES 2

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

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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")	SM605062	SM610062	SM615062
	63/64"	25.00	.9843"		SM655250	SM660250	SM665250
	1"	25.40	1.0000"		SM605100	SM610100	SM615100
	1-1/64"	25.80	1.0156"		SM605101	SM610101	SM615101
		26.00	1.0236"		SM655260	SM660260	SM665260
	1-1/32"	26.19	1.0312"		SM605102	SM610102	SM615102
	1-3/64"	26.59	1.0469"		SM605103	SM610103	SM615103
	1-1/16"	26.99	1.0625"		SM605104	SM610104	SM615104
		27.00	1.0630"		SM655270	SM660270	SM665270
	1-3/32"	27.78	1.0938"		SM605106	SM610106	SM615106
		28.00	1.1024"		SM655280	SM660280	SM665280
	1-7/64"	28.18	1.1094"		SM605107	SM610107	SM615107
	1-1/8"	28.58	1.1250"		SM605108	SM610108	SM615108
		29.00	1.1417"		SM655290	SM660290	SM665290
	1-5/32"	29.37	1.1562"		SM605110	SM610110	SM615110
		30.00	1.1811"		SM655300	SM660300	SM665300
	1-3/16"	30.16	1.1875"		SM605112	SM610112	SM615112
	1-7/32"	30.96	1.2188"		SM605114	SM610114	SM615114
		31.00	1.2205"		SM655310	SM660310	SM665310
	1-1/4"	31.75	1.2500"		SM605116	SM610116	SM615116
	32.00	1.2598"	SM655320	SM660320	SM665320		
1-9/32"	32.54	1.2812"	SM605118	SM610118	SM615118		
	33.00	1.2992"	SM655330	SM660330	SM665330		
1-5/16"	33.34	1.3125"	SM605120	SM610120	SM615120		
	34.00	1.3386"	SM655340	SM660340	SM665340		
1-11/32"	34.13	1.3438"	SM605122	SM610122	SM615122		
1-3/8"	34.93	1.3750"	SM605124	SM610124	SM615124		
	35.00	1.3780"	SM655350	SM660350	SM665350		

◎ : 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, X10CrAl18, 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
	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.