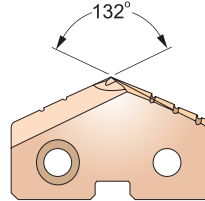


SM-POINT SPADE DRILL INSERTS - CARBIDE(K20) SM-POINT EINWEG BOHREINSATZ - VOLLHARTMETALL(K20)

- ▶ For use in Gray cast iron up to 220 Brinell, nonferrous metals, copper, brass and aluminum.
- ▶ Improved stability and hole straightness by newly developed thinning design.
- ▶ Less thrust force and excellent self-centering.
- ▶ Any non-standard size available.

- ▶ Zur Anwendung in Grauguss bis 220 Brinell, Nichteisen - Metallen, Kupfer, Messing und Aluminium
- ▶ Erhöhte Stabilität und Fluchtgenauigkeit durch neu entwickelte Querschnitengeometrie
- ▶ 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 (K20)		
	Inch (inch)	Metric (mm)	Decimal (inch)		TiN	TiCN	TiAlN
Y 9.50 (.374") to 11.07 (.436")		9.50	.3740"	2.4 (3/32")	SM755095	SM760095	SM765095
	3/8"	9.53	.3750"		SM705024	SM710024	SM715024
		9.80	.3858"		SM755098	SM760098	SM765098
	25/64"	9.92	.3906"		SM705025	SM710025	SM715025
		10.00	.3937"		SM755100	SM760100	SM765100
		10.20	.4016"		SM755102	SM760102	SM765102
	13/32"	10.32	.4062"		SM705026	SM710026	SM715026
		10.50	.4134"		SM755105	SM760105	SM765105
	27/64"	10.72	.4219"		SM705027	SM710027	SM715027
		10.80	.4252"		SM755108	SM760108	SM765108
Z 11.11(.437") to 12.95(.510")		11.00	.4331"	2.4 (3/32")	SM755110	SM760110	SM765110
	7/16"	11.11	.4375"		SM705028	SM710028	SM715028
		11.50	.4528"		SM755115	SM760115	SM765115
	29/64"	11.51	.4531"		SM705029	SM710029	SM715029
	15/32"	11.91	.4688"		SM755030	SM710030	SM715030
		12.00	.4724"		SM705031	SM710031	SM715031
	31/64"	12.30	.4844"		SM755120	SM760120	SM765120
	12.50	.4921"	SM705032	SM710032	SM715032		
0 12.98 (.511") to 17.65 (.695")	1/2"	12.70	.5000"	3.2 (1/8")	SM705033	SM710033	SM715033
		13.00	.5118"		SM755130	SM760130	SM765130
	33/64"	13.10	.5156"		SM705034	SM710034	SM715034
	17/32"	13.49	.5312"		SM755135	SM760135	SM765135
		13.50	.5315"		SM705035	SM710035	SM715035
	35/64"	13.89	.5469"		SM755140	SM760140	SM765140
		14.00	.5512"		SM705036	SM710036	SM715036
	9/16"	14.29	.5625"		SM755145	SM760145	SM765145
		14.50	.5709"		SM705037	SM710037	SM715037
	37/64"	14.68	.5781"		SM755150	SM760150	SM765150
		15.00	.5906"		SM705038	SM710038	SM715038
	19/32"	15.08	.5938"		SM755039	SM710039	SM715039
	39/64"	15.48	.6094"		SM705040	SM710040	SM715040
		15.50	.6102"		SM755155	SM760155	SM765155
5/8"	15.88	.6250"	SM705040	SM710040	SM715040		
	16.00	.6299"	SM755160	SM760160	SM765160		

◎ : 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)
○	○	○	○	○	◎	◎	○	○	○	○	◎	○	○	◎	◎

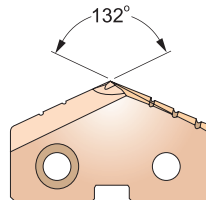
YG SPADE DRILLS

SERIES 0,1

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

- ▶ For use in Gray cast iron up to 220 Brinell, nonferrous metals, copper, brass and aluminum.
- ▶ Improved stability and hole straightness by newly developed thinning design.
- ▶ Less thrust force and excellent self-centering.
- ▶ Any non-standard size available.

- ▶ Zur Anwendung in Grauguss bis 220 Brinell, Nichteisen - Metallen, Kupfer, Messing und Aluminium
- ▶ Erhöhte Stabilität und Fluchtgenauigkeit durch neu entwickelte Querschnidengeometrie
- ▶ 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.				
	Inch (inch)	Metric (mm)	Decimal (inch)		CARBIDE (K20)				
					TiN	TiCN	TiAlN		
0 12.98(.511") to 17.65(.695")	41/64"	16.27	.6406"	3.2 (1/8")	SM705041	SM710041	SM715041		
		16.50	.6496"		SM755165	SM760165	SM765165		
	21/32"	16.67	.6562"		SM705042	SM710042	SM715042		
		17.00	.6693"		SM755170	SM760170	SM765170		
	43/64"	17.07	.6719"		SM705043	SM710043	SM715043		
		17.46	.6875"		SM705044	SM710044	SM715044		
	11/16"	17.50	.6890"		SM755175	SM760175	SM765175		
		17.86	.7031"		SM705045	SM710045	SM715045		
	1 17.53 (.690") to 24.38 (.960")	45/64"	18.00		.7087"	4.0 (5/32")	SM755180	SM760180	SM765180
			18.26		.7188"		SM705046	SM710046	SM715046
23/32"		18.50	.7283"	SM755185	SM760185		SM765185		
		18.65	.7344"	SM705047	SM710047		SM715047		
47/64"		19.00	.7480"	SM755190	SM760190		SM765190		
		19.05	.7500"	SM705048	SM710048		SM715048		
3/4"		19.45	.7656"	SM705049	SM710049		SM715049		
		19.50	.7677"	SM755195	SM760195		SM765195		
49/64"		19.84	.7812"	SM705050	SM710050		SM715050		
		20.00	.7874"	SM755200	SM760200		SM765200		
25/32"		20.24	.7969"	SM705051	SM710051		SM715051		
		20.50	.8071"	SM755205	SM760205		SM765205		
51/64"		20.64	.8125"	SM705052	SM710052		SM715052		
		21.00	.8268"	SM755210	SM760210		SM765210		
13/16"		21.43	.8438"	SM705054	SM710054		SM715054		
		21.83	.8594"	SM705055	SM710055		SM715055		
55/64"		22.00	.8661"	SM755220	SM760220		SM765220		
		22.23	.8750"	SM705056	SM710056		SM715056		
7/8"	22.62	.8906"	SM705057	SM710057	SM715057				
	23.00	.9055"	SM755230	SM760230	SM765230				
57/64"	23.02	.9062"	SM705058	SM710058	SM715058				
	23.42	.9219"	SM705059	SM710059	SM715059				
29/32"	23.81	.9375"	SM705060	SM710060	SM715060				
	24.00	.9449"	SM755240	SM760240	SM765240				

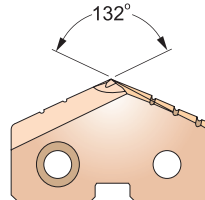
◎ : Excellent ○ : Good

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

- ▶ For use in Gray cast iron up to 220 Brinell, nonferrous metals, copper, brass and aluminum.
- ▶ Improved stability and hole straightness by newly developed thinning design.
- ▶ Less thrust force and excellent self-centering.
- ▶ Any non-standard size available.

- ▶ Zur Anwendung in Grauguss bis 220 Brinell, Nichteisen - Metallen, Kupfer, Messing und Aluminium
- ▶ Erhöhte Stabilität und Fluchtgenauigkeit durch neu entwickelte Querschnitengeometrie
- ▶ 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.		
	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")	SM705062	SM710062	SM715062
	63/64"	25.00	.9843"		SM755250	SM760250	SM765250
	1"	25.40	1.0000"		SM705100	SM710100	SM715100
	1-1/64"	25.80	1.0156"		SM705101	SM710101	SM715101
		26.00	1.0236"		SM755260	SM760260	SM765260
	1-1/32"	26.19	1.0312"		SM705102	SM710102	SM715102
	1-3/64"	26.59	1.0469"		SM705103	SM710103	SM715103
	1-1/16"	26.99	1.0625"		SM705104	SM710104	SM715104
		27.00	1.0630"		SM755270	SM760270	SM765270
	1-3/32"	27.78	1.0938"		SM705106	SM710106	SM715106
		28.00	1.1024"		SM755280	SM760280	SM765280
	1-7/64"	28.18	1.1094"		SM705107	SM710107	SM715107
	1-1/8"	28.58	1.1250"		SM705108	SM710108	SM715108
		29.00	1.1417"		SM755290	SM760290	SM765290
	1-5/32"	29.37	1.1562"		SM705110	SM710110	SM715110
		30.00	1.1811"		SM755300	SM760300	SM765300
	1-3/16"	30.16	1.1875"		SM705112	SM710112	SM715112
	1-7/32"	30.96	1.2188"		SM705114	SM710114	SM715114
		31.00	1.2205"		SM755310	SM760310	SM765310
	1-1/4"	31.75	1.2500"		SM705116	SM710116	SM715116
		32.00	1.2598"		SM755320	SM760320	SM765320
	1-9/32"	32.54	1.2812"		SM705118	SM710118	SM715118
		33.00	1.2992"		SM755330	SM760330	SM765330
	1-5/16"	33.34	1.3125"		SM705120	SM710120	SM715120
	34.00	1.3386"	SM755340	SM760340	SM765340		
1-11/32"	34.13	1.3438"	SM705122	SM710122	SM715122		
1-3/8"	34.93	1.3750"	SM705124	SM710124	SM715124		
	35.00	1.3780"	SM755350	SM760350	SM765350		

◎ : 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)
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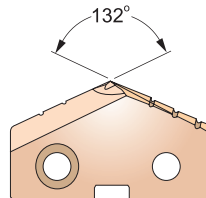
YG SPADE DRILLS

SERIES 3

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

- ▶ For use in Gray cast iron up to 220 Brinell, nonferrous metals, copper, brass and aluminum.
- ▶ Improved stability and hole straightness by newly developed thinning design.
- ▶ Less thrust force and excellent self-centering.
- ▶ Any non-standard size available.

- ▶ Zur Anwendung in Grauguss bis 220 Brinell, Nichteisen - Metallen, Kupfer, Messing und Aluminium
- ▶ Erhöhte Stabilität und Fluchtgenauigkeit durch neu entwickelte Querschnidengeometrie
- ▶ 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.		
	Inch (inch)	Metric (mm)	Decimal (inch)		CARBIDE (K20)		
3 34.37 (1.353") to 47.80 (1.882")				6.4 (1/4")	TiN	TiCN	TiAlN
	1-13/32"	35.72	1.4062"		SM705126	SM710126	SM715126
		36.00	1.4173"		SM755360	SM760360	SM765360
	1-7/16"	36.51	1.4375"		SM705128	SM710128	SM715128
		37.00	1.4567"		SM755370	SM760370	SM765370
	1-15/32"	37.31	1.4688"		SM705130	SM710130	SM715130
		38.00	1.4961"		SM755380	SM760380	SM765380
	1-1/2"	38.10	1.5000"		SM705132	SM710132	SM715132
	1-17/32"	38.89	1.5312"		SM705134	SM710134	SM715134
		39.00	1.5354"		SM755390	SM760390	SM765390
	1-9/16"	39.69	1.5625"		SM705136	SM710136	SM715136
		40.00	1.5748"		SM755400	SM760400	SM765400
	1-19/32"	40.48	1.5938"		SM705138	SM710138	SM715138
		41.00	1.6142"		SM755410	SM760410	SM765410
	1-5/8"	41.28	1.6250"		SM705140	SM710140	SM715140
		42.00	1.6535"		SM755420	SM760420	SM765420
	1-21/32"	42.07	1.6562"		SM705142	SM710142	SM715142
	1-11/16"	42.86	1.6875"		SM705144	SM710144	SM715144
		43.00	1.6929"		SM755430	SM760430	SM765430
	1-23/32"	43.66	1.7188"		SM705146	SM710146	SM715146
	44.00	1.7323"	SM755440	SM760440	SM765440		
1-3/4"	44.45	1.7500"	SM705148	SM710148	SM715148		
	45.00	1.7717"	SM755450	SM760450	SM765450		
1-25/32"	45.24	1.7812"	SM705150	SM710150	SM715150		
	46.00	1.8110"	SM755460	SM760460	SM765460		
1-13/16"	46.04	1.8125"	SM705152	SM710152	SM715152		
1-27/32"	46.83	1.8438"	SM705154	SM710154	SM715154		
	47.00	1.8504"	SM755470	SM760470	SM765470		
1-7/8"	47.63	1.8750"	SM705156	SM710156	SM715156		

◎ : 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)	~HRc19 (~HB220)	HRc19~ (~HB220~)	~HRc8 (~HB180)
○	○	○	○	○	◎	◎	○	○	○	○	◎	○	○	◎	◎



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
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, X10CrAl18, 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.