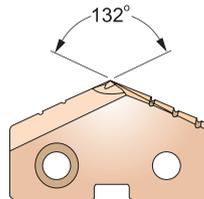


SM-POINT SPADE DRILL INSERTS - HSS M4
SM-POINT EINWEG BOHREINSATZ - HSS M4

- ▶ For general use in steels and cast irons.
- ▶ Improved stability and hole straightness by newly developed thinning design.
- ▶ Less thrust force and excellent self-centering.
- ▶ Any non-standard size available.

- ▶ Für allgemeine Anwendung in Stahl und Gusseisen
- ▶ Erhöhte Stabilität und Fluchtgenauigkeit durch neu entwickelte Querschnittsgeometrie
- ▶ Verminderte Bohrkraft und ausgezeichnete Selbstzentrierung
- ▶ Jede Abmessung außerhalb des Kataloges lieferbar



cutting conditions : P.325

Series Min. to Max. (mm/inch)	Diameter			Thick Metric (mm/inch)	EDP No. HSS (M4)		
	Inch (inch)	Metric (mm)	Decimal (inch)		TiN	TiCN	TiAlN
1 17.53 (.690") to 24.38 (.960")	45/64"	17.86	.7031"	4.0 (5/32")	SM405045	SM410045	SM415045
		18.00	.7087"		SM455180	SM460180	SM465180
	23/32"	18.26	.7188"		SM405046	SM410046	SM415046
		18.50	.7283"		SM455185	SM460185	SM465185
	47/64"	18.65	.7344"		SM405047	SM410047	SM415047
		19.00	.7480"		SM455190	SM460190	SM465190
	3/4"	19.05	.7500"		SM405048	SM410048	SM415048
	49/64"	19.45	.7656"		SM405049	SM410049	SM415049
		19.50	.7677"		SM455195	SM460195	SM465195
	25/32"	19.84	.7812"		SM405050	SM410050	SM415050
		20.00	.7874"		SM455200	SM460200	SM465200
	51/64"	20.24	.7969"		SM405051	SM410051	SM415051
		20.50	.8071"		SM455205	SM460205	SM465205
	13/16"	20.64	.8125"		SM405052	SM410052	SM415052
		21.00	.8268"		SM455210	SM460210	SM465210
	27/32"	21.43	.8438"		SM405054	SM410054	SM415054
	55/64"	21.83	.8594"		SM405055	SM410055	SM415055
		22.00	.8661"		SM455220	SM460220	SM465220
	7/8"	22.23	.8750"		SM405056	SM410056	SM415056
	57/64"	22.62	.8906"		SM405057	SM410057	SM415057
	23.00	.9055"	SM455230	SM460230	SM465230		
29/32"	23.02	.9062"	SM405058	SM410058	SM415058		
59/64"	23.42	.9219"	SM405059	SM410059	SM415059		
15/16"	23.81	.9375"	SM405060	SM410060	SM415060		
	24.00	.9449"	SM455240	SM460240	SM465240		

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

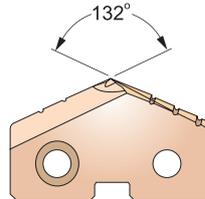
◎ : Excellent ○ : Good

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)
○	○	○	○	○	○	○	○	○	○	○	◎	◎	○	◎	◎

SM-POINT SPADE DRILL INSERTS - HSS M4 SM-POINT EINWEG BOHREINSATZ - HSS M4

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- ▶ Jede Abmessung außerhalb des Kataloges lieferbar



cutting conditions : P.325

Series Min. to Max. (mm/inch)	Diameter			Thick Metric (mm/inch)	EDP No.		
	Inch (inch)	Metric (mm)	Decimal (inch)		HSS (M4)		
					TiN	TiCN	TiAlN
2 24.41 (.961") to 35.05 (1.380")	31/32"	24.61	.9688"	4.8 (3/16")	SM405062	SM410062	SM415062
	63/64"	25.00	.9843"		SM455250	SM460250	SM465250
	1"	25.40	1.0000"		SM405100	SM410100	SM415100
	1-1/64"	25.80	1.0156"		SM405101	SM410101	SM415101
		26.00	1.0236"		SM455260	SM460260	SM465260
	1-1/32"	26.19	1.0312"		SM405102	SM410102	SM415102
	1-3/64"	26.59	1.0469"		SM405103	SM410103	SM415103
	1-1/16"	26.99	1.0625"		SM405104	SM410104	SM415104
		27.00	1.0630"		SM455270	SM460270	SM465270
	1-3/32"	27.78	1.0938"		SM405106	SM410106	SM415106
		28.00	1.1024"		SM455280	SM460280	SM465280
	1-7/64"	28.18	1.1094"		SM405107	SM410107	SM415107
	1-1/8"	28.58	1.1250"		SM405108	SM410108	SM415108
		29.00	1.1417"		SM455290	SM460290	SM465290
	1-5/32"	29.37	1.1562"		SM405110	SM410110	SM415110
		30.00	1.1811"		SM455300	SM460300	SM465300
	1-3/16"	30.16	1.1875"		SM405112	SM410112	SM415112
	1-7/32"	30.96	1.2188"		SM405114	SM410114	SM415114
		31.00	1.2205"		SM455310	SM460310	SM465310
	1-1/4"	31.75	1.2500"		SM405116	SM410116	SM415116
		32.00	1.2598"		SM455320	SM460320	SM465320
	1-9/32"	32.54	1.2812"		SM405118	SM410118	SM415118
		33.00	1.2992"		SM455330	SM460330	SM465330
	1-5/16"	33.34	1.3125"		SM405120	SM410120	SM415120
	34.00	1.3386"	SM455340	SM460340	SM465340		
1-11/32"	34.13	1.3438"	SM405122	SM410122	SM415122		
1-3/8"	34.93	1.3750"	SM405124	SM410124	SM415124		
	35.00	1.3780"	SM455350	SM460350	SM465350		

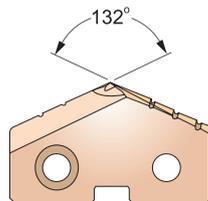
◎ : Excellent ○ : Good

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)
○	○	○	○		○		○	○			◎	◎	○	◎	◎

SM-POINT SPADE DRILL INSERTS - HSS M4
SM-POINT EINWEG BOHREINSATZ - HSS M4

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cutting conditions : P.325

Series Min. to Max. (mm/inch)	Diameter			Thick Metric (mm/inch)	EDP No. HSS (M4)		
	Inch (inch)	Metric (mm)	Decimal (inch)		TiN	TiCN	TiAlN
3 34.37 (1.353") to 47.80 (1.882")	1-13/32"	35.72	1.4062"	6.4 (1/4")	SM405126	SM410126	SM415126
		36.00	1.4173"		SM455360	SM460360	SM465360
	1-7/16"	36.51	1.4375"		SM405128	SM410128	SM415128
		37.00	1.4567"		SM455370	SM460370	SM465370
	1-15/32"	37.31	1.4688"		SM405130	SM410130	SM415130
		38.00	1.4961"		SM455380	SM460380	SM465380
	1-1/2"	38.10	1.5000"		SM405132	SM410132	SM415132
	1-17/32"	38.89	1.5312"		SM405134	SM410134	SM415134
		39.00	1.5354"		SM455390	SM460390	SM465390
	1-9/16"	39.69	1.5625"		SM405136	SM410136	SM415136
		40.00	1.5748"		SM455400	SM460400	SM465400
	1-19/32"	40.48	1.5938"		SM405138	SM410138	SM415138
		41.00	1.6142"		SM455410	SM460410	SM465410
	1-5/8"	41.28	1.6250"		SM405140	SM410140	SM415140
		42.00	1.6535"		SM455420	SM460420	SM465420
	1-21/32"	42.07	1.6562"		SM405142	SM410142	SM415142
	1-11/16"	42.86	1.6875"		SM405144	SM410144	SM415144
		43.00	1.6929"		SM455430	SM460430	SM465430
	1-23/32"	43.66	1.7188"		SM405146	SM410146	SM415146
		44.00	1.7323"		SM455440	SM460440	SM465440
1-3/4"	44.45	1.7500"	SM405148	SM410148	SM415148		
	45.00	1.7717"	SM455450	SM460450	SM465450		
1-25/32"	45.24	1.7812"	SM405150	SM410150	SM415150		
	46.00	1.8110"	SM455460	SM460460	SM465460		
1-13/16"	46.04	1.8125"	SM405152	SM410152	SM415152		
1-27/32"	46.83	1.8438"	SM405154	SM410154	SM415154		
	47.00	1.8504"	SM455470	SM460470	SM465470		
1-7/8"	47.63	1.8750"	SM405156	SM410156	SM415156		

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- GENERAL CARBIDE DRILLS
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- 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

◎ : 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)
○	○	○	○		○		○	○			◎	◎	○	◎	◎



DRILL INSERT (METRIC) - HSS BOHREINSATZ (METRISCH) - HSS

Material	Material Hardness		* HSS Grade	Speed (M/min)			Feed (mm/rev)						
	(Bhn)	(HRc)		TiN	TiCN	TiAlN	Ø9.5 ~12.5	Ø13 ~17.5	Ø18 ~24	Ø25 ~35	Ø36 ~47	Ø48 ~65	Ø66 ~114
Free machining Steels 9SMn36, 9SMnPb28 10SPb20 etc	100 - 150		HSS	63	79	84	0.16	0.23	0.31	0.40	0.48	0.55	0.67
	150 - 200	- 13	HSS	58	70	81	0.16	0.23	0.31	0.40	0.48	0.55	0.67
	200 - 250	13 - 24	HSS	51	66	72	0.14	0.23	0.31	0.38	0.48	0.57	0.69
Low Carbon Steels C10, C15, C22, C25 etc	85 - 125		HSS	54	67	75	0.15	0.22	0.28	0.37	0.46	0.56	0.67
	125 - 175	- 7	HSS	51	63	72	0.15	0.22	0.28	0.37	0.46	0.56	0.67
	175 - 225	7 - 20	HSS	49	58	69	0.13	0.19	0.24	0.34	0.43	0.50	0.57
Medium Carbon Steels C35, C40, C45 etc	225 - 275	20 - 28	HSS	45	56	66	0.13	0.19	0.24	0.34	0.43	0.50	0.57
	125 - 175	- 7	HSS	52	63	75	0.14	0.22	0.28	0.35	0.45	0.55	0.65
	175 - 225	7 - 20	HSS	48	59	69	0.13	0.19	0.23	0.34	0.43	0.50	0.58
Structural Steels St33, St37-2, St44-2 St52, St60 etc	225 - 275	20 - 28	HSS	45	56	63	0.13	0.19	0.23	0.34	0.43	0.50	0.58
	275 - 325	28 - 34	SH, PH	42	52	58	0.10	0.17	0.21	0.28	0.38	0.45	0.55
	100 - 150		HSS	44	56	63	0.14	0.23	0.29	0.35	0.44	0.50	0.63
Cast Iron / S,G Iron GG10, 20, 25, 35, 40 GGG50, 70 GTW35, GTS70 etc	150 - 250	- 24	HSS	39	47	55	0.13	0.22	0.24	0.28	0.38	0.46	0.59
	250 - 350	24 - 37	SH, PH	32	41	45	0.10	0.20	0.22	0.24	0.34	0.40	0.48
	120 - 150		HSS	52	64	75	0.16	0.30	0.40	0.49	0.59	0.69	0.75
Alloy Steels 45CrNiMo4, 42CrMo4 16MnCr5, Ck75 35CrMo4, 16MnCr5 etc	150 - 200	- 13	HSS	48	58	70	0.14	0.26	0.35	0.45	0.56	0.64	0.68
	200 - 220	13 - 19	HSS	42	53	58	0.14	0.23	0.30	0.41	0.46	0.52	0.60
	220 - 260	19 - 26	SH, PH	35	44	52	0.13	0.17	0.23	0.30	0.35	0.43	0.50
Tool Steels 102Cr6, 105WCr6, C75W etc	260 - 320	26 - 34	SH, PH	29	35	41	0.10	0.15	0.16	0.23	0.28	0.35	0.40
	125 - 175	- 7	HSS	48	58	63	0.15	0.20	0.24	0.36	0.43	0.47	0.53
	175 - 225	7 - 20	HSS	45	56	58	0.13	0.20	0.24	0.36	0.42	0.46	0.55
High Temp. Alloy Hastelloy B, Inconel etc	225 - 275	20 - 28	HSS	41	50	56	0.13	0.16	0.23	0.35	0.41	0.44	0.55
	275 - 325	28 - 34	SH, PH	39	47	53	0.09	0.15	0.22	0.28	0.38	0.41	0.50
	325 - 375	34 - 40	SH, PH	36	43	46	0.08	0.15	0.21	0.27	0.38	0.40	0.51
High Strength Alloy 36CrNiMo4, 34CrNiMo8 40NiCrMo73 etc	150 - 200	- 13	SH	25	34	36	0.09	0.15	0.19	0.25	0.28	0.36	0.41
	200 - 250	13 - 24	SH, PH	19	27	29	0.09	0.15	0.19	0.25	0.28	0.36	0.41
Aluminum AlCuSiMn, AlMgSi0.5, AlZnMgCu1.5 etc	140 - 220	- 19	SH, PH	9	11	12	0.08	0.17	0.20	0.24	0.30	0.37	0.39
	220 - 310	19 - 33	PH	8	9	11	0.08	0.14	0.18	0.19	0.25	0.29	0.34
	225 - 300	- 32	SH, PH	25	34	35	0.13	0.18	0.23	0.24	0.36	0.43	0.50
Stainless Steels X7Cr13, X10CrA118, X5CrNi189, X5CrNiMo18 10 etc	300 - 350	32 - 37	SH, PH	19	26	27	0.10	0.18	0.23	0.24	0.36	0.43	0.50
	350 - 400	37 - 43	PH	16	21	22	0.08	0.15	0.20	0.22	0.30	0.48	0.46
Aluminum AlCuSiMn, AlMgSi0.5, AlZnMgCu1.5 etc	30		HSS	187	229	244	0.19	0.33	0.41	0.50	0.54	0.64	0.62
	180	- 8	HSS	92	137	137	0.19	0.33	0.41	0.46	0.54	0.64	0.62
Stainless Steels X7Cr13, X10CrA118, X5CrNi189, X5CrNiMo18 10 etc	135 - 185	- 9	HSS	24	29	34	0.14	0.20	0.23	0.26	0.36	0.41	0.50
	185 - 275	9 - 28	HSS	20	23	29	0.12	0.18	0.20	0.24	0.30	0.36	0.46

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 :

$$M/min = \frac{(RPM) \cdot (\pi) \cdot (DIA.)}{1000}$$

$$mm/min = (RPM) \cdot (mm/rev)$$

$$RPM = \frac{(M/min) \cdot (1000)}{(\pi) \cdot (DIA.)}$$

* HSS Grade : HSS = HSS M4, SH = Super HSS T15, PH = Premium HSS M48

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.

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