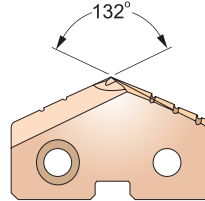


SM-POINT SPADE DRILL INSERTS - CARBIDE(P40) SM-POINT EINWEG BOHREINSATZ - VOLLHARTMETALL(P40)

- ▶ For general use in carbon steels and alloys steels.
- ▶ 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 Kohlenstoffstählen und legierten Stählen
- ▶ 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. CARBIDE (P40)			
	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")	SM855095	SM860095	SM865095	
		9.53	.3750"		SM805024	SM810024	SM815024	
	25/64"	9.80	.3858"		SM855098	SM860098	SM865098	
		9.92	.3906"		SM805025	SM810025	SM815025	
	13/32"	10.00	.3937"		SM855100	SM860100	SM865100	
		10.20	.4016"		SM855102	SM860102	SM865102	
		10.32	.4062"		SM805026	SM810026	SM815026	
		10.50	.4134"		SM855105	SM860105	SM865105	
		27/64"	10.72		.4219"	SM805027	SM810027	SM815027
		10.80	.4252"		SM855108	SM860108	SM865108	
Z 11.11(.437") to 12.95(.510")	7/16"	11.00	.4331"	SM855110	SM860110	SM865110		
	29/64"	11.11	.4375"	SM805028	SM810028	SM815028		
		11.50	.4528"	SM855115	SM860115	SM865115		
	15/32"	11.51	.4531"	SM805029	SM810029	SM815029		
	31/64"	11.91	.4688"	SM805030	SM810030	SM815030		
		12.00	.4724"	SM855120	SM860120	SM865120		
	1/2"	12.30	.4844"	SM805031	SM810031	SM815031		
0 12.98 (.511") to 17.65 (.695")	33/64"	12.50	.4921"	SM805032	SM810032	SM815032		
		12.70	.5000"	SM855130	SM860130	SM865130		
	17/32"	13.00	.5118"	SM805033	SM810033	SM815033		
		13.10	.5156"	SM855135	SM860135	SM865135		
	35/64"	13.49	.5312"	SM805034	SM810034	SM815034		
		13.50	.5315"	SM855140	SM860140	SM865140		
	9/16"	13.89	.5469"	SM805035	SM810035	SM815035		
		14.00	.5512"	SM855145	SM860145	SM865145		
	37/64"	14.29	.5625"	SM805036	SM810036	SM815036		
		14.50	.5709"	SM855150	SM860150	SM865150		
	19/32"	14.68	.5781"	SM805037	SM810037	SM815037		
		15.00	.5906"	SM855155	SM860155	SM865155		
	39/64"	15.08	.5938"	SM805038	SM810038	SM815038		
15.48		.6094"	SM805039	SM810039	SM815039			
5/8"	15.50	.6102"	SM855160	SM860160	SM865160			
	15.88	.6250"						
	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)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○

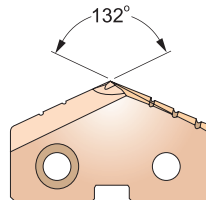
YG SPADE DRILLS

SERIES 0,1

SM-POINT SPADE DRILL INSERTS - CARBIDE(P40)
SM-POINT EINWEG BOHREINSATZ - VOLLHARTMETALL(P40)

- ▶ For general use in carbon steels and alloys steels.
- ▶ 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 Kohlenstoffstählen und legierten Stählen
- ▶ Erhöhte Stabilität und Fluchtgenauigkeit durch neu entwickelte Querschnidegeometrie
- ▶ 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 (P40)		
	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")	SM805041	SM810041	SM815041
		16.50	.6496"		SM855165	SM860165	SM865165
	21/32"	16.67	.6562"		SM805042	SM810042	SM815042
		17.00	.6693"		SM855170	SM860170	SM865170
	43/64"	17.07	.6719"		SM805043	SM810043	SM815043
		17.46	.6875"		SM805044	SM810044	SM815044
	11/16"	17.50	.6890"		SM855175	SM860175	SM865175
		17.86	.7031"		SM805045	SM810045	SM815045
	23/32"	18.00	.7087"		SM855180	SM860180	SM865180
		18.26	.7188"		SM805046	SM810046	SM815046
1 17.53 (.690") to 24.38 (.960")	47/64"	18.50	.7283"	4.0 (5/32")	SM855185	SM860185	SM865185
		18.65	.7344"		SM805047	SM810047	SM815047
	3/4"	19.00	.7480"		SM855190	SM860190	SM865190
		19.05	.7500"		SM805048	SM810048	SM815048
	49/64"	19.45	.7656"		SM805049	SM810049	SM815049
		19.50	.7677"		SM855195	SM860195	SM865195
	25/32"	19.84	.7812"		SM805050	SM810050	SM815050
		20.00	.7874"		SM855200	SM860200	SM865200
	51/64"	20.24	.7969"		SM805051	SM810051	SM815051
		20.50	.8071"		SM855205	SM860205	SM865205
13/16"	20.64	.8125"	SM805052	SM810052	SM815052		
	21.00	.8268"	SM855210	SM860210	SM865210		
27/32"	21.43	.8438"	SM805054	SM810054	SM815054		
	21.83	.8594"	SM805055	SM810055	SM815055		
55/64"	22.00	.8661"	SM855220	SM860220	SM865220		
	22.23	.8750"	SM805056	SM810056	SM815056		
7/8"	22.62	.8906"	SM805057	SM810057	SM815057		
	23.00	.9055"	SM855230	SM860230	SM865230		
29/32"	23.02	.9062"	SM805058	SM810058	SM815058		
	23.42	.9219"	SM805059	SM810059	SM815059		
59/64"	23.81	.9375"	SM805060	SM810060	SM815060		
	24.00	.9449"	SM855240	SM860240	SM865240		

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



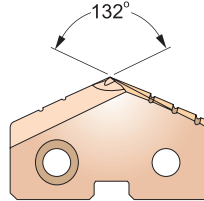
SPADE DRILLS

SERIES 2

SM-POINT SPADE DRILL INSERTS - CARBIDE(P40) SM-POINT EINWEG BOHREINSATZ - VOLLHARTMETALL(P40)

- ▶ For general use in carbon steels and alloys steels.
- ▶ 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 Kohlenstoffstählen und legierten Stählen
- ▶ 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 (P40)		
					TiN	TiCN	TiAlN
2 24.41 (.961") to 35.05 (1.380")	31/32"	24.61	.9688"	4.8 (3/16")	SM805062	SM810062	SM815062
	63/64"	25.00	.9843"		SM855250	SM860250	SM865250
	1"	25.40	1.0000"		SM805100	SM810100	SM815100
	1-1/64"	25.80	1.0156"		SM805101	SM810101	SM815101
		26.00	1.0236"		SM855260	SM860260	SM865260
	1-1/32"	26.19	1.0312"		SM805102	SM810102	SM815102
	1-3/64"	26.59	1.0469"		SM805103	SM810103	SM815103
	1-1/16"	26.99	1.0625"		SM805104	SM810104	SM815104
		27.00	1.0630"		SM855270	SM860270	SM865270
	1-3/32"	27.78	1.0938"		SM805106	SM810106	SM815106
		28.00	1.1024"		SM855280	SM860280	SM865280
	1-7/64"	28.18	1.1094"		SM805107	SM810107	SM815107
	1-1/8"	28.58	1.1250"		SM805108	SM810108	SM815108
		29.00	1.1417"		SM855290	SM860290	SM865290
	1-5/32"	29.37	1.1562"		SM805110	SM810110	SM815110
		30.00	1.1811"		SM855300	SM860300	SM865300
	1-3/16"	30.16	1.1875"		SM805112	SM810112	SM815112
	1-7/32"	30.96	1.2188"		SM805114	SM810114	SM815114
		31.00	1.2205"		SM855310	SM860310	SM865310
	1-1/4"	31.75	1.2500"		SM805116	SM810116	SM815116
	32.00	1.2598"	SM855320	SM860320	SM865320		
1-9/32"	32.54	1.2812"	SM805118	SM810118	SM815118		
	33.00	1.2992"	SM855330	SM860330	SM865330		
1-5/16"	33.34	1.3125"	SM805120	SM810120	SM815120		
	34.00	1.3386"	SM855340	SM860340	SM865340		
1-11/32"	34.13	1.3438"	SM805122	SM810122	SM815122		
1-3/8"	34.93	1.3750"	SM805124	SM810124	SM815124		
	35.00	1.3780"	SM855350	SM860350	SM865350		

◎ : 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)
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○

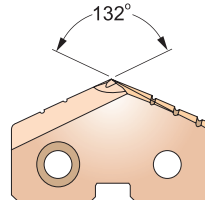
YG SPADE DRILLS

SERIES 3

SM-POINT SPADE DRILL INSERTS - CARBIDE(P40)
SM-POINT EINWEG BOHREINSATZ - VOLLHARTMETALL(P40)

- ▶ For general use in carbon steels and alloys steels.
- ▶ 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 Kohlenstoffstählen und legierten Stählen
- ▶ 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 (P40)		
					TiN	TiCN	TiAlN
3 34.37 (1.353") to 47.80 (1.882")	1-13/32"	35.72	1.4062"	6.4 (1/4")	SM805126	SM810126	SM815126
		36.00	1.4173"		SM855360	SM860360	SM865360
	1-7/16"	36.51	1.4375"		SM805128	SM810128	SM815128
		37.00	1.4567"		SM855370	SM860370	SM865370
	1-15/32"	37.31	1.4688"		SM805130	SM810130	SM815130
		38.00	1.4961"		SM855380	SM860380	SM865380
	1-1/2"	38.10	1.5000"		SM805132	SM810132	SM815132
	1-17/32"	38.89	1.5312"		SM805134	SM810134	SM815134
		39.00	1.5354"		SM855390	SM860390	SM865390
	1-9/16"	39.69	1.5625"		SM805136	SM810136	SM815136
		40.00	1.5748"		SM855400	SM860400	SM865400
		1-19/32"	40.48		1.5938"	SM805138	SM810138
		41.00	1.6142"		SM855410	SM860410	SM865410
		1-5/8"	41.28		1.6250"	SM805140	SM810140
		42.00	1.6535"		SM855420	SM860420	SM865420
		1-21/32"	42.07		1.6562"	SM805142	SM810142
	1-11/16"	42.86	1.6875"		SM805144	SM810144	SM815144
		43.00	1.6929"		SM855430	SM860430	SM865430
	1-23/32"	43.66	1.7188"		SM805146	SM810146	SM815146
		44.00	1.7323"		SM855440	SM860440	SM865440
1-3/4"	44.45	1.7500"	SM805148	SM810148	SM815148		
	45.00	1.7717"	SM855450	SM860450	SM865450		
1-25/32"	45.24	1.7812"	SM805150	SM810150	SM815150		
	46.00	1.8110"	SM855460	SM860460	SM865460		
1-13/16"	46.04	1.8125"	SM805152	SM810152	SM815152		
1-27/32"	46.83	1.8438"	SM805154	SM810154	SM815154		
	47.00	1.8504"	SM855470	SM860470	SM865470		
1-7/8"	47.63	1.8750"	SM805156	SM810156	SM815156		

◎ : 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.