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Tool specifications are subject to change without prior notice.

YG1YUSD190809002

SPADE DRILLS

2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

Various Grades of Cutting Tool Materials for Diverse Applications
For High Productivity and Longer Tools Life
For Drilling Larger Diameters

NEW SERIES

- SV-POINT SPADE DRILL INSERTS - SUPER COBALT (T15)
- SV-POINT SPADE DRILL INSERTS - PREMIUM COBALT (M48)
- SV-POINT SPADE DRILL INSERTS - CARBIDE C5 (P40)

SPADE DRILLS

2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SELECTION GUIDE

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SERIES Y,Z,0,1,2		SPADE DRILL INSERTS - PREMIUM COBALT (M48)	.3740 (#Y)	1.3780 (#2)	15
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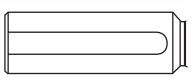
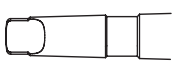
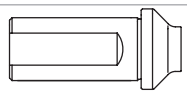
STRAIGHT SHANK		STRAIGHT SHANK HOLDER, STRAIGHT FLUTE			59
TAPER SHANK		TAPER SHANK HOLDER, STRAIGHT FLUTE / HELICAL FLUTE			63
FLANGED SHANK		FLANGED STRAIGHT SHANK HOLDER, STRAIGHT FLUTE			65
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◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
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2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SPADE DRILL INSERTS - HSS (M4)

SERIES 1, 2

- General purpose insert for most materials
- Not recommended for tool steels and high temperature alloys
- High toughness for loose or manual machines

POINT ANGLE - 132 degree
(Series 5-8 : 144 degree)

cutting conditions : p.68

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	HSS (M4)		
					TiN	TiAlN	Hardslick
1 .690 (17.53) to .960 (24.38)	45/64	17.86	.7031	5/32 (4.0)	S01101	S03101	S04101
		18.00	.7087		S01102	S03102	S04102
	23/32	18.26	.7188		S01103	S03103	S04103
		18.50	.7283		S01104	S03104	S04104
	47/64	18.65	.7344		S01105	S03105	S04105
		19.00	.7480		S01106	S03106	S04106
	3/4	19.05	.7500		S01107	S03107	S04107
	49/64	19.45	.7656		S01108	S03108	S04108
		19.50	.7677		S01109	S03109	S04109
	25/32	19.84	.7813		S01110	S03110	S04110
		20.00	.7874		S01111	S03111	S04111
	51/64	20.24	.7969		S01160	S03160	S04160
		20.50	.8071		S01112	S03112	S04112
	13/16	20.64	.8125		S01113	S03113	S04113
		21.00	.8268		S01114	S03114	S04114
	27/32	21.43	.8438		S01115	S03115	S04115
	55/64	21.83	.8594		S01161	S03161	S04161
		22.00	.8661		S01116	S03116	S04116
	7/8	22.23	.8750		S01117	S03117	S04117
	57/64	22.62	.8906		S01162	S03162	S04162
		23.00	.9055		S01118	S03118	S04118
	29/32	23.02	.9063		S01119	S03119	S04119
	59/64	23.42	.9219		S01120	S03120	S04120
	15/16	23.81	.9375		S01121	S03121	S04121
		24.00	.9449		S01122	S03122	S04122
2 .961 (24.41) to 1.380 (35.05)	31/32	24.61	.9688	3/16 (4.8)	S01201	S03201	S04201
	63/64	25.00	.9843		S01202	S03202	S04202
	1	25.40	1.0000		S01203	S03203	S04203
	1-1/64	25.80	1.0156		S01204	S03204	S04204
		26.00	1.0236		S01205	S03205	S04205
	1-1/32	26.19	1.0313		S01206	S03206	S04206
	1-3/64	26.59	1.0469		S01260	S03260	S04260
	1-1/16	26.99	1.0625		S01207	S03207	S04207
		27.00	1.0630		S01208	S03208	S04208

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
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2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SPADE DRILL INSERTS - HSS (M4)

SERIES 2, 3

- General purpose insert for most materials
- Not recommended for tool steels and high temperature alloys
- High toughness for loose or manual machines

POINT ANGLE **- 132 degree**
(Series 5-8 : 144 degree)

cutting conditions : p.68

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	HSS (M4)		
					TiN	TiAlN	Hardslick
2 .961 (24.41) to 1.380 (35.05)	1-3/32	27.78	1.0938	3/16 [4.8]	S01209	S03209	S04209
		28.00	1.1024		S01210	S03210	S04210
	1-7/64	28.18	1.1094		S01261	S03261	S04261
	1-1/8	28.58	1.1250		S01211	S03211	S04211
		29.00	1.1417		S01212	S03212	S04212
	1-5/32	29.37	1.1563		S01213	S03213	S04213
		30.00	1.1811		S01214	S03214	S04214
	1-3/16	30.16	1.1875		S01215	S03215	S04215
	1-7/32	30.96	1.2188		S01216	S03216	S04216
		31.00	1.2205		S01217	S03217	S04217
	1-1/4	31.75	1.2500		S01218	S03218	S04218
		32.00	1.2598		S01219	S03219	S04219
	1-9/32	32.54	1.2813		S01220	S03220	S04220
		33.00	1.2992		S01221	S03221	S04221
	1-5/16	33.34	1.3125		S01222	S03222	S04222
		34.00	1.3386		S01223	S03223	S04223
	1-11/32	34.13	1.3438		S01224	S03224	S04224
	1-3/8	34.93	1.3750		S01225	S03225	S04225
		35.00	1.3780		S01226	S03226	S04226
3 1.353 (34.37) to 1.882 (47.80)	1-13/32	35.72	1.4063	1/4 [6.4]	S01301	S03301	S04301
		36.00	1.4173		S01302	S03302	S04302
	1-7/16	36.51	1.4375		S01303	S03303	S04303
		37.00	1.4567		S01304	S03304	S04304
	1-15/32	37.31	1.4688		S01305	S03305	S04305
		38.00	1.4961		S01306	S03306	S04306
	1-1/2	38.10	1.5000		S01307	S03307	S04307
	1-17/32	38.89	1.5313		S01308	S03308	S04308
		39.00	1.5354		S01309	S03309	S04309
	1-9/16	39.69	1.5625		S01310	S03310	S04310
		40.00	1.5748		S01311	S03311	S04311
	1-19/32	40.48	1.5938		S01312	S03312	S04312
		41.00	1.6142		S01313	S03313	S04313
	1-5/8	41.28	1.6250		S01314	S03314	S04314
		42.00	1.6535		S01315	S03315	S04315

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
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2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SPADE DRILL INSERTS - HSS (M4)

SERIES 3, 4

- General purpose insert for most materials
- Not recommended for tool steels and high temperature alloys
- High toughness for loose or manual machines

POINT ANGLE - 132 degree
(Series 5-8 : 144 degree)

cutting conditions : p.68

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	HSS (M4)		
					TiN	TiAlN	Hardslick
3 1.353 (34.37) to 1.882 (47.80)	1-21/32	42.07	1.6563	1/4 (6.4)	S01316	S03316	S04316
	1-11/16	42.86	1.6875		S01317	S03317	S04317
		43.00	1.6929		S01318	S03318	S04318
	1-23/32	43.66	1.7188		S01319	S03319	S04319
		44.00	1.7323		S01320	S03320	S04320
	1-3/4	44.45	1.7500		S01321	S03321	S04321
		45.00	1.7717		S01322	S03322	S04322
	1-25/32	45.24	1.7813		S01323	S03323	S04323
		46.00	1.8110		S01324	S03324	S04324
	1-13/16	46.04	1.8125		S01325	S03325	S04325
	1-27/32	46.83	1.8438		S01326	S03326	S04326
		47.00	1.8504		S01327	S03327	S04327
	1-7/8	47.63	1.8750		S01328	S03328	S04328
4 1.850 (46.99) to 2.570 (65.28)	1-29/32	48.42	1.9063	5/16 (7.9)	S01402	S03402	S04402
	1-15/16	49.21	1.9375		S01404	S03404	S04404
	1-31/32	50.01	1.9688		S01406	S03406	S04406
	2	50.80	2.0000		S01407	S03407	S04407
	2-1/32	51.59	2.0313		S01409	S03409	S04409
	2-3/64	52.00	2.0472		S01410	S03410	S04410
	2-1/16	52.39	2.0625		S01411	S03411	S04411
	2-3/32	53.18	2.0938		S01413	S03413	S04413
	2-1/8	53.98	2.1250		S01414	S03414	S04414
	2-5/32	54.77	2.1563		S01416	S03416	S04416
	2-3/16	55.56	2.1875		S01418	S03418	S04418
	2-7/32	56.36	2.2188		S01420	S03420	S04420
	2-1/4	57.15	2.2500		S01422	S03422	S04422
	2-9/32	57.94	2.2813		S01423	S03423	S04423
	2-5/16	58.74	2.3125		S01425	S03425	S04425
	2-11/32	59.53	2.3438		S01427	S03427	S04427
	2-3/8	60.33	2.3750		S01429	S03429	S04429
	2-13/32	61.12	2.4063		S01431	S03431	S04431
	2-7/16	61.91	2.4375		S01432	S03432	S04432
	2-15/32	62.71	2.4688		S01434	S03434	S04434
	2-1/2	63.50	2.5000		S01436	S03436	S04436

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
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2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SPADE DRILL INSERTS - HSS (M4)

SERIES 4, 5, 6, 7, 8

- General purpose insert for most materials
- Not recommended for tool steels and high temperature alloys
- High toughness for loose or manual machines

POINT ANGLE **- 132 degree**
(Series 5-8 : 144 degree)

cutting conditions : p.68

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	HSS (M4)		
					TiN	TiAlN	Hardslick
4	2-17/32	64.29	2.5313	5/16 [7.9]	S01438	S03438	S04438
	2-9/16	65.09	2.5625		S01440	S03440	S04440
5 2.456 (62.38) to 3.000 (76.20)	2-1/2	63.50	2.5000	7/16 [11.1]	S01501	S03501	S04501
	2-5/8	66.68	2.6250		S01507	S03507	S04507
	2-3/4	69.85	2.7500		S01512	S03512	S04512
	2-25/32	70.64	2.7813		S01514	S03514	S04514
	2-13/16	71.44	2.8125		S01515	S03515	S04515
	2-27/32	72.23	2.8438		S01517	S03517	S04517
	2-7/8	73.03	2.8750		S01518	S03518	S04518
	2-29/32	73.82	2.9063		S01519	S03519	S04519
	2-15/16	74.61	2.9375		S01521	S03521	S04521
	2-31/32	75.41	2.9688		S01522	S03522	S04522
	3	76.20	3.0000		S01524	S03524	S04524
6 3.001(76.23) to 3.507(89.08	3-1/16	77.79	3.0625	7/16 [11.1]	S01602	S03602	S04602
	3-1/8	79.38	3.1250		S01605	S03605	S04605
	3-1/4	82.55	3.2500		S01611	S03611	S04611
	3-3/8	85.73	3.3750		S01616	S03616	S04616
	3-7/16	87.31	3.4375		S01619	S03619	S04619
	3-1/2	88.90	3.5000		S01622	S03622	S04622
7 3.455(87.76) to 4.000(101.60)	3-9/16	90.49	3.5625	7/16 [11.1]	S01703	S03703	S04703
	3-5/8	92.08	3.6250		S01706	S03706	S04706
	3-3/4	95.25	3.7500		S01711	S03711	S04711
	3-7/8	98.43	3.8750		S01717	S03717	S04717
	4	101.60	4.0000		S01722	S03722	S04722
8 4.001(101.63) to 4.507(114.48)	4-1/8	104.78	4.1250	7/16 [11.1]	S01804	S03804	S04804
	4-1/4	107.95	4.2500		S01807	S03807	S04807
	4-3/8	111.13	4.3750		S01811	S03811	S04811
	4-1/2	114.30	4.5000		S01815	S03815	S04815

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
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2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES Y, Z, 0

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys
- Performs best in rigid setups

POINT ANGLE - 132 degree
(Series 5-8 : 144 degree)

cutting conditions : p.68

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	SUPER COBALT (T15)		
					TiN	TiAlN	Hardslick
Y .374 (9.50) to .436 (11.07)		9.50	.3740	3/32 (2.4)	* S06Y01	* S08Y01	* S09Y01
	3/8	9.53	.3750		* S06Y02	* S08Y02	* S09Y02
		9.80	.3860		* S06Y03	* S08Y03	* S09Y03
	25/64	9.92	.3906		* S06Y04	* S08Y04	* S09Y04
		10.00	.3937		* S06Y05	* S08Y05	* S09Y05
		10.20	.4016		* S06Y06	* S08Y06	* S09Y06
	13/32	10.32	.4063		* S06Y07	* S08Y07	* S09Y07
		10.50	.4134		* S06Y08	* S08Y08	* S09Y08
	27/64	10.72	.4219		* S06Y09	* S08Y09	* S09Y09
		10.80	.4252		* S06Y10	* S08Y10	* S09Y10
		11.00	.4331		* S06Y11	* S08Y11	* S09Y11
Z .437 (11.11) to .510 (12.95)	7/16	11.11	.4375	3/32 (2.4)	* S06Z01	* S08Z01	* S09Z01
		11.50	.4528		* S06Z02	* S08Z02	* S09Z02
	29/64	11.51	.4531		* S06Z03	* S08Z03	* S09Z03
	15/32	11.91	.4688		* S06Z04	* S08Z04	* S09Z04
		12.00	.4724		* S06Z05	* S08Z05	* S09Z05
	31/64	12.30	.4844		* S06Z06	* S08Z06	* S09Z06
		12.50	.4921		* S06Z07	* S08Z07	* S09Z07
	1/2	12.70	.5000		* S06Z08	* S08Z08	* S09Z08
0 .511 (12.98) to .695 (17.65)		13.00	.5118	1/8 (3.2)	* S06001	* S08001	* S09001
	33/64	13.10	.5156		* S06002	* S08002	* S09002
	17/32	13.49	.5313		* S06003	* S08003	* S09003
		13.50	.5315		* S06004	* S08004	* S09004
	35/64	13.89	.5469		* S06060	* S08060	* S09060
		14.00	.5512		* S06005	* S08005	* S09005
	9/16	14.29	.5625		* S06006	* S08006	* S09006
		14.50	.5709		* S06007	* S08007	* S09007
	37/64	14.68	.5781		* S06008	* S08008	* S09008
		15.00	.5906		* S06009	* S08009	* S09009
	19/32	15.08	.5938		* S06010	* S08010	* S09010
	39/64	15.48	.6094		* S06061	* S08061	* S09061
		15.50	.6102		* S06011	* S08011	* S09011
	5/8	15.88	.6250		* S06012	* S08012	* S09012

* 2pcs per package

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

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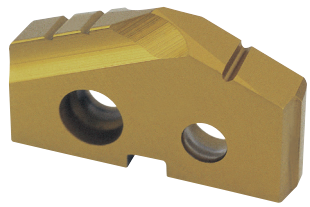
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT
SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES 0, 1

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys
- Performs best in rigid setups

POINT ANGLE **- 132 degree**
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	SUPER COBALT (T15)		
					TiN	TiAlN	Hardslick
0 .511 (12.98) to .695 (17.65)		16.00	.6299	1/8 [3.2]	* S06013	* S08013	* S09013
	41/64	16.27	.6406		* S06062	* S08062	* S09062
		16.50	.6496		* S06014	* S08014	* S09014
	21/32	16.67	.6563		* S06015	* S08015	* S09015
		17.00	.6693		* S06016	* S08016	* S09016
	43/64	17.07	.6719		* S06063	* S08063	* S09063
	11/16	17.46	.6875		* S06017	* S08017	* S09017
		17.50	.6890		* S06018	* S08018	* S09018
1 .690 (17.53) to .960 (24.38)	45/64	17.86	.7031	5/32 [4.0]	S06101	S08101	S09101
		18.00	.7087		S06102	S08102	S09102
	23/32	18.26	.7188		S06103	S08103	S09103
		18.50	.7283		S06104	S08104	S09104
	47/64	18.65	.7344		S06105	S08105	S09105
		19.00	.7480		S06106	S08106	S09106
	3/4	19.05	.7500		S06107	S08107	S09107
	49/64	19.45	.7656		S06108	S08108	S09108
		19.50	.7677		S06109	S08109	S09109
	25/32	19.84	.7813		S06110	S08110	S09110
		20.00	.7874		S06111	S08111	S09111
	51/64	20.24	.7969		S06160	S08160	S09160
		20.50	.8071		S06112	S08112	S09112
	13/16	20.64	.8125		S06113	S08113	S09113
		21.00	.8268		S06114	S08114	S09114
	27/32	21.43	.8438		S06115	S08115	S09115
	55/64	21.83	.8594		S06161	S08161	S09161
		22.00	.8661		S06116	S08116	S09116
	7/8	22.23	.8750		S06117	S08117	S09117
	57/64	22.62	.8906		S06162	S08162	S09162
		23.00	.9055		S06118	S08118	S09118
	29/32	23.02	.9063		S06119	S08119	S09119
	59/64	23.42	.9219		S06120	S08120	S09120
	15/16	23.81	.9375		S06121	S08121	S09121
		24.00	.9449		S06122	S08122	S09122

* 2pcs per package

◎ : Excellent ○ : Good

P											M	K			N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎		○	○

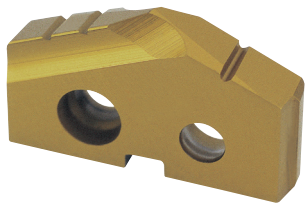
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES 2, 3

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys
- Performs best in rigid setups

POINT ANGLE - 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	SUPER COBALT (T15)		
					TiN	TiAlN	Hardslick
2 .961 (24.41) to 1.380 (35.05)	31/32	24.61	.9688	3/16 [4.8]	S06201	S08201	S09201
	63/64	25.00	.9843		S06202	S08202	S09202
	1	25.40	1.0000		S06203	S08203	S09203
	1-1/64	25.80	1.0156		S06204	S08204	S09204
		26.00	1.0236		S06205	S08205	S09205
	1-1/32	26.19	1.0313		S06206	S08206	S09206
	1-3/64	26.59	1.0469		S06260	S08260	S09260
	1-1/16	26.99	1.0625		S06207	S08207	S09207
		27.00	1.0630		S06208	S08208	S09208
	1-3/32	27.78	1.0938		S06209	S08209	S09209
		28.00	1.1024		S06210	S08210	S09210
	1-7/64	28.18	1.1094		S06261	S08261	S09261
	1-1/8	28.58	1.1250		S06211	S08211	S09211
		29.00	1.1417		S06212	S08212	S09212
	1-5/32	29.37	1.1563		S06213	S08213	S09213
		30.00	1.1811		S06214	S08214	S09214
	1-3/16	30.16	1.1875		S06215	S08215	S09215
	1-7/32	30.96	1.2188		S06216	S08216	S09216
		31.00	1.2205		S06217	S08217	S09217
	1-1/4	31.75	1.2500		S06218	S08218	S09218
		32.00	1.2598		S06219	S08219	S09219
	1-9/32	32.54	1.2813		S06220	S08220	S09220
		33.00	1.2992		S06221	S08221	S09221
	1-5/16	33.34	1.3125		S06222	S08222	S09222
		34.00	1.3386		S06223	S08223	S09223
	1-11/32	34.13	1.3438		S06224	S08224	S09224
	1-3/8	34.93	1.3750		S06225	S08225	S09225
		35.00	1.3780		S06226	S08226	S09226
3	1-13/32	35.72	1.4063	1/4 [6.4]	S06301	S08301	S09301
		36.00	1.4173		S06302	S08302	S09302
	1-7/16	36.51	1.4375		S06303	S08303	S09303
		37.00	1.4567		S06304	S08304	S09304
	1-15/32	37.31	1.4688		S06305	S08305	S09305

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

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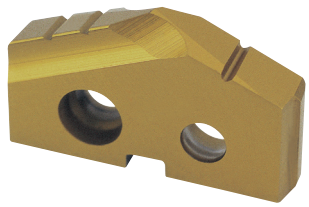
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES 3, 4

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys
- Performs best in rigid setups

POINT ANGLE - 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	SUPER COBALT (T15)		
					TiN	TiAlN	Hardslick
3 **1.353 (34.37) to 1.882 (47.80)**		38.00	1.4961	1/4 (6.4)	S06306	S08306	S09306
	1-1/2	38.10	1.5000		S06307	S08307	S09307
	1-17/32	38.89	1.5313		S06308	S08308	S09308
		39.00	1.5354		S06309	S08309	S09309
	1-9/16	39.69	1.5625		S06310	S08310	S09310
		40.00	1.5748		S06311	S08311	S09311
	1-19/32	40.48	1.5938		S06312	S08312	S09312
		41.00	1.6142		S06313	S08313	S09313
	1-5/8	41.28	1.6250		S06314	S08314	S09314
		42.00	1.6535		S06315	S08315	S09315
	1-21/32	42.07	1.6563		S06316	S08316	S09316
	1-11/16	42.86	1.6875		S06317	S08317	S09317
		43.00	1.6929		S06318	S08318	S09318
	1-23/32	43.66	1.7188		S06319	S08319	S09319
		44.00	1.7323		S06320	S08320	S09320
	1-3/4	44.45	1.7500		S06321	S08321	S09321
		45.00	1.7717		S06322	S08322	S09322
	1-25/32	45.24	1.7813		S06323	S08323	S09323
		46.00	1.8110		S06324	S08324	S09324
	1-13/16	46.04	1.8125		S06325	S08325	S09325
	1-27/32	46.83	1.8438		S06326	S08326	S09326
		47.00	1.8504		S06327	S08327	S09327
	1-7/8	47.63	1.8750		S06328	S08328	S09328
4 **1.850 (46.99) to 2.570 (65.28)**	1-29/32	48.42	1.9062	5/16 (7.9)	S06402	S08402	S09402
	1-15/16	49.21	1.9375		S06404	S08404	S09404
	1-31/32	50.01	1.9688		S06406	S08406	S09406
	2	50.80	2.0000		S06407	S08407	S09407
	2-1/32	51.59	2.0312		S06409	S08409	S09409
	2-3/64	52.00	2.0472		S06410	S08410	S09410
	2-1/16	52.39	2.0625		S06411	S08411	S09411
	2-3/32	53.18	2.0938		S06413	S08413	S09413
	2-1/8	53.98	2.1250		S06414	S08414	S09414
	2-5/32	54.77	2.1562		S06416	S08416	S09416

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

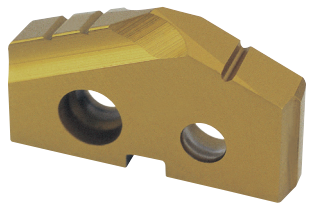
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES 4, 5

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys
- Performs best in rigid setups

POINT ANGLE - 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	SUPER COBALT (T15)		
					TiN	TiAlN	Hardslick
4 1.850 (46.99) to 2.570 (65.28)	2-3/16	55.56	2.1875	5/16 (7.9)	S06418	S08418	S09418
	2-7/32	56.36	2.2188		S06420	S08420	S09420
	2-1/4	57.15	2.2500		S06422	S08422	S09422
	2-9/32	57.94	2.2812		S06423	S08423	S09423
	2-5/16	58.74	2.3125		S06425	S08425	S09425
	2-11/32	59.53	2.3438		S06427	S08427	S09427
	2-3/8	60.33	2.3750		S06429	S08429	S09429
	2-13/32	61.12	2.4062		S06431	S08431	S09431
	2-7/16	61.91	2.4375		S06432	S08432	S09432
	2-15/32	62.71	2.4688		S06434	S08434	S09434
	2-1/2	63.50	2.5000		S06436	S08436	S09436
	2-17/32	64.29	2.5312		S06438	S08438	S09438
	2-9/16	65.09	2.5625		S06440	S08440	S09440
5 2.456 (62.38) to 3.000 (76.20)	2-1/2	63.50	2.5000	7/16 (11.1)	—	—	S09501
		64.00	2.5197		—	—	S09502
	2-17/32	64.29	2.5312		—	—	S09503
	2-9/16	65.09	2.5625		—	—	S09504
	2-19/32	65.88	2.5938		—	—	S09505
		66.00	2.5984		—	—	S09506
	2-5/8	66.68	2.6250		—	—	S09507
	2-21/32	67.47	2.6562		—	—	S09508
		68.00	2.6772		—	—	S09509
	2-11/16	68.26	2.6875		—	—	S09510
	2-23/32	69.09	2.7188		—	—	S09511
	2-3/4	69.85	2.7500		—	—	S09512
		70.00	2.7559		—	—	S09513
	2-25/32	70.64	2.7812		—	—	S09514
	2-13/16	71.44	2.8125		—	—	S09515
		72.00	2.8346		—	—	S09516
	2-27/32	72.23	2.8438		—	—	S09517
	2-7/8	73.03	2.8750		—	—	S09518
	2-29/32	73.82	2.9062		—	—	S09519
		74.00	2.9134		—	—	S09520

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

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2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES 5, 6, 7

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys
- Performs best in rigid setups

POINT ANGLE - 132 degree
(Series 5-8 : 144 degree)

cutting conditions : p.68

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	SUPER COBALT (T15)		
					TiN	TiAlN	Hardslick
5	2-15/16	74.61	2.9375	7/16 [11.1]	—	—	S09521
	2-31/32	75.41	2.8688		—	—	S09522
		76.00	2.9921		—	—	S09523
	3	76.20	3.0000		—	—	S09524
6 3.001 (76.23) to 3.507 (89.08)	3-1/32	76.99	3.0312	7/16 [11.1]	—	—	S09601
	3-1/16	77.79	3.0625		—	—	S09602
		78.00	3.0709		—	—	S09603
	3-3/32	78.58	3.0938		—	—	S09604
	3-1/8	79.38	3.1250		—	—	S09605
		80.00	3.1496		—	—	S09606
	3-5/32	80.17	3.1562		—	—	S09607
	3-3/16	80.96	3.1875		—	—	S09608
	3-7/32	81.76	3.2188		—	—	S09609
		82.00	3.2283		—	—	S09610
	3-1/4	82.55	3.2500		—	—	S09611
	3-9/32	83.34	3.2812		—	—	S09612
		84.00	3.3071		—	—	S09613
	3-5/16	84.14	3.3125		—	—	S09614
	3-11/32	84.93	3.3438		—	—	S09615
	3-3/8	85.73	3.3750		—	—	S09616
		86.00	3.3858		—	—	S09617
	3-13/32	86.52	3.3062		—	—	S09618
	3-7/16	87.31	3.4375		—	—	S09619
		88.00	3.4646		—	—	S09620
	3-15/32	88.11	3.4688		—	—	S09621
	3-1/2	88.90	3.5000		—	—	S09622
7 3.455(87.76) to 4.000(101.60)	3-17/32	89.69	3.5312	7/16 [11.1]	—	—	S09701
		90.00	3.5433		—	—	S09702
	3-9/16	90.49	3.5625		—	—	S09703
	3-19/32	91.28	3.5938		—	—	S09704
		92.00	3.6221		—	—	S09705
	3-5/8	92.08	3.6250		—	—	S09706
	3-21/32	92.87	3.6563		—	—	S09707

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES 7, 8

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys
- Performs best in rigid setups

POINT ANGLE - 132 degree
(Series 5-8 : 144 degree)

cutting conditions : p.68

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	SUPER COBALT (T15)		
					TiN	TiAlN	Hardslick
7 3.455 (87.76) to 4.000 (101.60)	3-11/16	93.66	3.6875	7/16 (11.1)	—	—	S09708
		94.00	3.7008		—	—	S09709
	3-23/32	94.46	3.7188		—	—	S09710
	3-3/4	95.25	3.7500		—	—	S09711
		96.00	3.7795		—	—	S09712
	3-25/32	96.04	3.7812		—	—	S09713
	3-13/16	96.84	3.8125		—	—	S09714
	3-27/32	97.63	3.8438		—	—	S09715
		98.00	3.8583		—	—	S09716
	3-7/8	98.43	3.8750		—	—	S09717
	3-29/32	99.22	3.9062		—	—	S09718
		100.00	3.9370		—	—	S09719
	3-15/16	100.01	3.9375		—	—	S09720
	3-31/32	100.81	3.9688		—	—	S09721
	4	101.60	4.0000		—	—	S09722
8 4.001 (101.63) to 4.507 (114.48)	4-1/64	102.00	4.0156	7/16 (11.1)	—	—	S09801
	4-1/16	103.19	4.0625		—	—	S09802
	4-3/32	104.00	4.0945		—	—	S09803
	4-1/8	104.78	4.1250		—	—	S09804
		106.00	4.1732		—	—	S09805
	4-3/16	106.36	4.1875		—	—	S09806
	4-1/4	107.95	4.2500		—	—	S09807
		108.00	4.2520		—	—	S09808
	4-5/16	109.54	4.3125		—	—	S09809
		110.00	4.3307		—	—	S09810
	4-3/8	111.13	4.3750		—	—	S09811
		112.00	4.4094		—	—	S09812
	4-7/16	112.71	4.4375		—	—	S09813
		114.00	4.4882		—	—	S09814
	4-1/2	114.30	4.5000		—	—	S09815

◎ : Excellent ○ : Good

P											M	K			N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎		○	○

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2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SPADE DRILL INSERTS - PREMIUM COBALT (M48)

SERIES **Y, Z, 0**

- Increased tool life over T15
- For use in high temperature alloys and materials including medium carbon, Alloy and tool steels
- Rigid set up needed

POINT ANGLE : 132 degree

cutting conditions : p.68

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
					PREMIUM COBALT (M48)		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	TiN	TiAlN	Hardslick
Y .374 (9.50) to .436 (11.07)		9.50	.3740	3/32 (2.4)	* S11Y01	* S13Y01	* S14Y01
	3/8	9.53	.3750		* S11Y02	* S13Y02	* S14Y02
		9.80	.3860		* S11Y03	* S13Y03	* S14Y03
	25/64	9.92	.3906		* S11Y04	* S13Y04	* S14Y04
		10.00	.3937		* S11Y05	* S13Y05	* S14Y05
		10.20	.4016		* S11Y06	* S13Y06	* S14Y06
	13/32	10.32	.4063		* S11Y07	* S13Y07	* S14Y07
		10.50	.4134		* S11Y08	* S13Y08	* S14Y08
	27/64	10.72	.4219		* S11Y09	* S13Y09	* S14Y09
		10.80	.4252		* S11Y10	* S13Y10	* S14Y10
		11.00	.4331		* S11Y11	* S13Y11	* S14Y11
Z .437 (11.11) to .510 (12.95)	7/16	11.11	.4375	3/32 (2.4)	* S11Z01	* S13Z01	* S14Z01
		11.50	.4528		* S11Z02	* S13Z02	* S14Z02
	29/64	11.51	.4531		* S11Z03	* S13Z03	* S14Z03
	15/32	11.91	.4688		* S11Z04	* S13Z04	* S14Z04
		12.00	.4724		* S11Z05	* S13Z05	* S14Z05
	31/64	12.30	.4844		* S11Z06	* S13Z06	* S14Z06
		12.50	.4921		* S11Z07	* S13Z07	* S14Z07
	1/2	12.70	.5000		* S11Z08	* S13Z08	* S14Z08
0 .511 (12.98) to .695 (17.65)		13.00	.5118	1/8 (3.2)	* S11001	* S13001	* S14001
	33/64		.5156		* S11002	* S13002	* S14002
	17/32		.5313		* S11003	* S13003	* S14003
		13.50	.5315		* S11004	* S13004	* S14004
	35/64		.5469		* S11060	* S13060	* S14060
		14.00	.5512		* S11005	* S13005	* S14005
	9/16		.5625		* S11006	* S13006	* S14006
		14.50	.5709		* S11007	* S13007	* S14007
	37/64		.5781		* S11008	* S13008	* S14008
		15.00	.5906		* S11009	* S13009	* S14009
	19/32		.5938		* S11010	* S13010	* S14010
	39/64		.6094		* S11061	* S13061	* S14061
		15.50	.6102		* S11011	* S13011	* S14011
	5/8		.6250		* S11012	* S13012	* S14012

* 2pcs per package

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○

2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SPADE DRILL INSERTS - PREMIUM COBALT (M48)

SERIES 0, 1

- Increased tool life over T15
- For use in high temperature alloys and materials including medium carbon, Alloy and tool steels
- Rigid set up needed

POINT ANGLE : 132 degree

cutting conditions : p.68

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
					PREMIUM COBALT (M48)		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	TiN	TiAlN	Hardslick
0 .511 (12.98) to .695 (17.65)		16.00	.6299	1/8 (3.2)	* S11013	* S13013	* S14013
	41/64		.6406		* S11062	* S13062	* S14062
		16.50	.6496		* S11014	* S13014	* S14014
	21/32		.6563		* S11015	* S13015	* S14015
		17.00	.6693		* S11016	* S13016	* S14016
	43/64		.6719		* S11063	* S13063	* S14063
	11/16		.6875		* S11017	* S13017	* S14017
		17.50	.6890		* S11018	* S13018	* S14018
1 .690 (17.53) to .960 (24.38)	45/64	17.86	.7031	5/32 (4.0)	S11101	S13101	S14101
		18.00	.7087		S11102	S13102	S14102
	23/32	18.26	.7188		S11103	S13103	S14103
		18.50	.7283		S11104	S13104	S14104
	47/64	18.65	.7344		S11105	S13105	S14105
		19.00	.7480		S11106	S13106	S14106
	3/4	19.05	.7500		S11107	S13107	S14107
	49/64	19.45	.7656		S11108	S13108	S14108
		19.50	.7677		S11109	S13109	S14109
	25/32	19.84	.7812		S11110	S13110	S14110
		20.00	.7874		S11111	S13111	S14111
	51/64	20.24	.7969		S11160	S13160	S14160
		20.50	.8071		S11112	S13112	S14112
	13/16	20.64	.8125		S11113	S13113	S14113
		21.00	.8268		S11114	S13114	S14114
	27/32	21.43	.8438		S11115	S13115	S14115
	55/64	21.83	.8594		S11161	S13161	S14161
		22.00	.8661		S11116	S13116	S14116
	7/8	22.23	.8750		S11117	S13117	S14117
	57/64	22.62	.8906		S11162	S13162	S14162
		23.00	.9055		S11118	S13118	S14118
	29/32	23.02	.9062		S11119	S13119	S14119
	59/64	23.42	.9219		S11120	S13120	S14120
	15/16	23.81	.9375		S11121	S13121	S14121
		24.00	.9449		S11122	S13122	S14122

* 2pcs per package

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○

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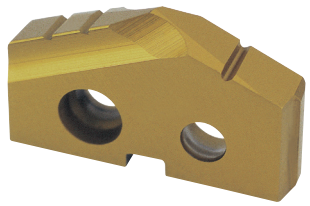
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SPADE DRILL INSERTS - PREMIUM COBALT (M48)

SERIES 2

- Increased tool life over T15
- For use in high temperature alloys and materials including medium carbon, Alloy and tool steels
- Rigid set up needed

POINT ANGLE : 132 degree



cutting conditions : p.68

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
					PREMIUM COBALT (M48)		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	TiN	TiAlN	Hardslick
2 .961 (24.41) to 1.380 (35.05)	31/32	24.61	.9688	3/16 [4.8]	S11201	S13201	S14201
	63/64	25.00	.9843		S11202	S13202	S14202
	1	25.40	1.0000		S11203	S13203	S14203
	1-1/64	25.80	1.0156		S11204	S13204	S14204
		26.00	1.0236		S11205	S13205	S14205
	1-1/32	26.19	1.0312		S11206	S13206	S14206
	1-3/64	26.59	1.0469		S11260	S13260	S14260
	1-1/16	26.99	1.0625		S11207	S13207	S14207
		27.00	1.0630		S11208	S13208	S14208
	1-3/32	27.78	1.0938		S11209	S13209	S14209
		28.00	1.1024		S11210	S13210	S14210
	1-7/64	28.18	1.1094		S11261	S13261	S14261
	1-1/8	28.58	1.1250		S11211	S13211	S14211
		29.00	1.1417		S11212	S13212	S14212
	1-5/32	29.37	1.1562		S11213	S13213	S14213
		30.00	1.1811		S11214	S13214	S14214
	1-3/16	30.16	1.1875		S11215	S13215	S14215
	1-7/32	30.96	1.2188		S11216	S13216	S14216
		31.00	1.2205		S11217	S13217	S14217
	1-1/4	31.75	1.2500		S11218	S13218	S14218
		32.00	1.2598		S11219	S13219	S14219
	1-9/32	32.54	1.2812		S11220	S13220	S14220
		33.00	1.2992		S11221	S13221	S14221
	1-5/16	33.34	1.3125		S11222	S13222	S14222
		34.00	1.3386		S11223	S13223	S14223
	1-11/32	34.13	1.3438		S11224	S13224	S14224
	1-3/8	34.93	1.3750		S11225	S13225	S14225
		35.00	1.3780		S11226	S13226	S14226

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○

2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

CARBIDE BLADE INSERTS C2 (K20), C5 (P40), C3 (K10)

SERIES Y, Z

- ▶ High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys. (C3)
- ▶ For general use in carbon steels and alloys steels. (C5)
- ▶ For use in Gray cast iron, nonferrous metals,copper, brass and aluminum. (C2)

POINT ANGLE : 132 degree

cutting conditions : p.69

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.					
					Multi purpose Geometry				Cast Iron Geometry	
					C2 (K20)		C5 (P40)		C3 (K10)	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	TiN	TiAlN	TiN	TiAlN	TiN	TiAlN
Y .374 (9.50) to .436 (11.07)		9.50	.3740	3/32 (2.4)	* S21Y01	* S23Y01	* S26Y01	* S28Y01	* S16Y01	* S18Y01
	3/8	9.53	.3750		* S21Y02	* S23Y02	* S26Y02	* S28Y02	* S16Y02	* S18Y02
		9.80	.3860		* S21Y03	* S23Y03	* S26Y03	* S28Y03	* S16Y03	* S18Y03
	25/64	9.92	.3906		* S21Y04	* S23Y04	* S26Y04	* S28Y04	* S16Y04	* S18Y04
		10.00	.3937		* S21Y05	* S23Y05	* S26Y05	* S28Y05	* S16Y05	* S18Y05
		10.20	.4016		* S21Y06	* S23Y06	* S26Y06	* S28Y06	* S16Y06	* S18Y06
	13/32	10.32	.4063		* S21Y07	* S23Y07	* S26Y07	* S28Y07	* S16Y07	* S18Y07
		10.50	.4134		* S21Y08	* S23Y08	* S26Y08	* S28Y08	* S16Y08	* S18Y08
	27/64	10.72	.4219		* S21Y09	* S23Y09	* S26Y09	* S28Y09	* S16Y09	* S18Y09
		10.80	.4252		* S21Y10	* S23Y10	* S26Y10	* S28Y10	* S16Y10	* S18Y10
		11.00	.4331		* S21Y11	* S23Y11	* S26Y11	* S28Y11	* S16Y11	* S18Y11
Z .437 (11.11) to .510 (12.95)	7/16	11.11	.4375	3/32 (2.4)	* S21Z01	* S23Z01	* S26Z01	* S28Z01	* S16Z01	* S18Z01
		11.50	.4528		* S21Z02	* S23Z02	* S26Z02	* S28Z02	* S16Z02	* S18Z02
	29/64	11.51	.4531		* S21Z03	* S23Z03	* S26Z03	* S28Z03	* S16Z03	* S18Z03
	15/32	11.91	.4688		* S21Z04	* S23Z04	* S26Z04	* S28Z04	* S16Z04	* S18Z04
		12.00	.4724		* S21Z05	* S23Z05	* S26Z05	* S28Z05	* S16Z05	* S18Z05
	31/64	12.30	.4844		* S21Z06	* S23Z06	* S26Z06	* S28Z06	* S16Z06	* S18Z06
		12.50	.4921		* S21Z07	* S23Z07	* S26Z07	* S28Z07	* S16Z07	* S18Z07
	1/2	12.70	.5000		* S21Z08	* S23Z08	* S26Z08	* S28Z08	* S16Z08	* S18Z08

* 2pcs per package

◎ : Excellent ○ : Good

	P											M	K		N	
	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)	~HB110
C2(K20)	○	○	○	○	○	◎	◎	○	○	○	○	◎	○	○	◎	◎
C5(P40)	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○
C3(K10)													◎	◎		

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2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

CARBIDE BLADE INSERTS C2 (K20), C5 (P40), C3 (K10)

SERIES 0

- High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys. (C3)
- For general use in carbon steels and alloys steels. (C5)
- For use in Gray cast iron, nonferrous metals,copper, brass and aluminum. (C2)

POINT ANGLE : 132 degree

cutting conditions : p.69

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.					
					Multi purpose Geometry				Cast Iron Geometry	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	C2 (K20)		C5 (P40)		C3 (K10)	
					TiN	TiAlN	TiN	TiAlN	TiN	TiAlN
0 .511 (12.98) to .695 (17.65)		13.00	.5118	1/8 (3.2)	* S21001	* S23001	* S26001	* S28001	* S16001	* S18001
	33/64	13.10	.5156		* S21002	* S23002	* S26002	* S28002	* S16002	* S18002
	17/32	13.49	.5313		* S21003	* S23003	* S26003	* S28003	* S16003	* S18003
		13.50	.5315		* S21004	* S23004	* S26004	* S28004	* S16004	* S18004
	35/64	13.89	.5469		* S21060	* S23060	* S26060	* S28060	* S16060	* S18060
		14.00	.5512		* S21005	* S23005	* S26005	* S28005	* S16005	* S18005
	9/16	14.29	.5625		* S21006	* S23006	* S26006	* S28006	* S16006	* S18006
		14.50	.5709		* S21007	* S23007	* S26007	* S28007	* S16007	* S18007
	37/64	14.68	.5781		* S21008	* S23008	* S26008	* S28008	* S16008	* S18008
		15.00	.5906		* S21009	* S23009	* S26009	* S28009	* S16009	* S18009
	19/32	15.08	.5938		* S21010	* S23010	* S26010	* S28010	* S16010	* S18010
	39/64	15.48	.6094		* S21061	* S23061	* S26061	* S28061	* S16061	* S18061
		15.50	.6102		* S21011	* S23011	* S26011	* S28011	* S16011	* S18011
		15.70	.6181		* S21064	* S23064	* S26064	* S28064	* S16064	* S18064
	5/8	15.88	.6250		* S21012	* S23012	* S26012	* S28012	* S16012	* S18012
		16.00	.6299		* S21013	* S23013	* S26013	* S28013	* S16013	* S18013
	41/64	16.27	.6406		* S21062	* S23062	* S26062	* S28062	* S16062	* S18062
		16.50	.6496		* S21014	* S23014	* S26014	* S28014	* S16014	* S18014
	21/32	16.67	.6563		* S21015	* S23015	* S26015	* S28015	* S16015	* S18015
		17.00	.6693		* S21016	* S23016	* S26016	* S28016	* S16016	* S18016
	43/64	17.07	.6719		* S21063	* S23063	* S26063	* S28063	* S16063	* S18063
	11/16	17.46	.6875		* S21017	* S23017	* S26017	* S28017	* S16017	* S18017
		17.50	.6890		* S21018	* S23018	* S26018	* S28018	* S16018	* S18018

* 2pcs per package

◎ : Excellent ○ : Good

	P											M	K		N	
	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)	~HB110
C2(K20)	○	○	○	○	○	◎	◎	○	○	○	○	◎	○	○	◎	◎
C5(P40)	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○
C3(K10)													◎	◎		

2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

CARBIDE BLADE INSERTS C2 (K20), C5 (P40), C3 (K10)

SERIES 1

- ▶ High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys. (C3)
- ▶ For general use in carbon steels and alloys steels. (C5)
- ▶ For use in Gray cast iron, nonferrous metals,copper, brass and aluminum. (C2)

POINT ANGLE : 132 degree

cutting conditions : p.69

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.					
					Multi purpose Geometry				Cast Iron Geometry	
					C2 (K20)		C5 (P40)		C3 (K10)	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	TiN	TiAlN	TiN	TiAlN	TiN	TiAlN
1 **.690 (17.53) to .960 (24.38)**	45/64	17.86	.7031	5/32 [4.0]	S21101	S23101	S26101	S28101	S16101	S18101
		18.00	.7087		S21102	S23102	S26102	S28102	S16102	S18102
	23/32	18.26	.7188		S21103	S23103	S26103	S28103	S16103	S18103
		18.50	.7283		S21104	S23104	S26104	S28104	S16104	S18104
	47/64	18.65	.7344		S21105	S23105	S26105	S28105	S16105	S18105
		19.00	.7480		S21106	S23106	S26106	S28106	S16106	S18106
	3/4	19.05	.7500		S21107	S23107	S26107	S28107	S16107	S18107
	49/64	19.45	.7656		S21108	S23108	S26108	S28108	S16108	S18108
		19.50	.7677		S21109	S23109	S26109	S28109	S16109	S18109
	25/32	19.84	.7813		S21110	S23110	S26110	S28110	S16110	S18110
		20.00	.7874		S21111	S23111	S26111	S28111	S16111	S18111
	51/64	20.24	.7969		S21160	S23160	S26160	S28160	S16160	S18160
		20.50	.8071		S21112	S23112	S26112	S28112	S16112	S18112
	13/16	20.64	.8125		S21113	S23113	S26113	S28113	S16113	S18113
		21.00	.8268		S21114	S23114	S26114	S28114	S16114	S18114
	27/32	21.43	.8438		S21115	S23115	S26115	S28115	S16115	S18115
	55/64	21.83	.8594		S21161	S23161	S26161	S28161	S16161	S18161
		22.00	.8661		S21116	S23116	S26116	S28116	S16116	S18116
	7/8	22.23	.8750		S21117	S23117	S26117	S28117	S16117	S18117
	57/64	22.62	.8906		S21162	S23162	S26162	S28162	S16162	S18162
		23.00	.9055		S21118	S23118	S26118	S28118	S16118	S18118
	29/32	23.02	.9063		S21119	S23119	S26119	S28119	S16119	S18119
	59/64	23.42	.9219		S21120	S23120	S26120	S28120	S16120	S18120
	15/16	23.81	.9375		S21121	S23121	S26121	S28121	S16121	S18121
		24.00	.9449		S21122	S23122	S26122	S28122	S16122	S18122

◎ : Excellent ○ : Good

	P											M	K		N	
	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)	~HB110
C2(K20)	○	○	○	○	○	◎	◎	○	○	○	○	◎	○	○	◎	◎
C5(P40)	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○
C3(K10)													◎	◎		

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2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

CARBIDE BLADE INSERTS C2 (K20), C5 (P40), C3 (K10)

SERIES 2

- ▶ High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys. (C3)
- ▶ For general use in carbon steels and alloys steels. (C5)
- ▶ For use in Gray cast iron, nonferrous metals,copper, brass and aluminum. (C2)

POINT ANGLE : 132 degree

cutting conditions : p.69

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.					
					Multi purpose Geometry				Cast Iron Geometry	
					C2 (K20)		C5 (P40)		C3 (K10)	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	TiN	TiAlN	TiN	TiAlN	TiN	TiAlN
2 .961 (24.41) to 1.380 (35.05)	31/32	24.61	.9688	3/16 [4.8]	S21201	S23201	S26201	S28201	S16201	S18201
	63/64	25.00	.9843		S21202	S23202	S26202	S28202	S16202	S18202
	1	25.40	1.0000		S21203	S23203	S26203	S28203	S16203	S18203
	1-1/64	25.80	1.0156		S21204	S23204	S26204	S28204	S16204	S18204
		26.00	1.0236		S21205	S23205	S26205	S28205	S16205	S18205
	1-1/32	26.19	1.0313		S21206	S23206	S26206	S28206	S16206	S18206
	1-3/64	26.59	1.0469		S21260	S23260	S26260	S28260	S16260	S18260
	1-1/16	26.99	1.0625		S21207	S23207	S26207	S28207	S16207	S18207
		27.00	1.0630		S21208	S23208	S26208	S28208	S16208	S18208
	1-3/32	27.78	1.0938		S21209	S23209	S26209	S28209	S16209	S18209
		28.00	1.1024		S21210	S23210	S26210	S28210	S16210	S18210
	1-7/64	28.18	1.1094		S21261	S23261	S26261	S28261	S16261	S18261
	1-1/8	28.58	1.1250		S21211	S23211	S26211	S28211	S16211	S18211
		29.00	1.1417		S21212	S23212	S26212	S28212	S16212	S18212
	1-5/32	29.37	1.1563		S21213	S23213	S26213	S28213	S16213	S18213
		30.00	1.1811		S21214	S23214	S26214	S28214	S16214	S18214
	1-3/16	30.16	1.1875		S21215	S23215	S26215	S28215	S16215	S18215
	1-7/32	30.96	1.2188		S21216	S23216	S26216	S28216	S16216	S18216
		31.00	1.2205		S21217	S23217	S26217	S28217	S16217	S18217
	1-1/4	31.75	1.2500		S21218	S23218	S26218	S28218	S16218	S18218
		32.00	1.2598		S21219	S23219	S26219	S28219	S16219	S18219
	1-9/32	32.54	1.2813		S21220	S23220	S26220	S28220	S16220	S18220
		33.00	1.2992		S21221	S23221	S26221	S28221	S16221	S18221
	1-5/16	33.34	1.3125		S21222	S23222	S26222	S28222	S16222	S18222
		34.00	1.3386		S21223	S23223	S26223	S28223	S16223	S18223
	1-11/32	34.13	1.3438		S21224	S23224	S26224	S28224	S16224	S18224
	1-3/8	34.93	1.3750		S21225	S23225	S26225	S28225	S16225	S18225
		35.00	1.3780		S21226	S23226	S26226	S28226	S16226	S18226

◎ : Excellent ○ : Good

	P											M	K		N	
	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)	~HB110
C2(K20)	○	○	○	○	○	◎	◎	○	○	○	○	◎	○	○	◎	◎
C5(P40)	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○
C3(K10)													◎	◎		

2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

CARBIDE BLADE INSERTS C2 (K20), C5 (P40), C3 (K10)

SERIES 3

- High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys. (C3)
- For general use in carbon steels and alloys steels. (C5)
- For use in Gray cast iron, nonferrous metals,copper, brass and aluminum. (C2)

POINT ANGLE : 132 degree

cutting conditions : p.69

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.					
					Multi purpose Geometry				Cast Iron Geometry	
					C2 (K20)		C5 (P40)		C3 (K10)	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	TiN	TiAlN	TiN	TiAlN	TiN	TiAlN
3 1.353 (34.37) to 1.882 (47.80)	1-13/32	35.72	1.4063	1/4 [6.4]	S21301	S23301	S26301	S28301	Special or non-standard inserts available on request	
		36.00	1.4173		S21302	S23302	S26302	S28302		
	1-7/16	36.51	1.4375		S21303	S23303	S26303	S28303		
		37.00	1.4567		S21304	S23304	S26304	S28304		
	1-15/32	37.31	1.4688		S21305	S23305	S26305	S28305		
		38.00	1.4961		S21306	S23306	S26306	S28306		
	1-1/2	38.10	1.5000		S21307	S23307	S26307	S28307		
	1-17/32	38.89	1.5313		S21308	S23308	S26308	S28308		
		39.00	1.5354		S21309	S23309	S26309	S28309		
	1-9/16	39.69	1.5625		S21310	S23310	S26310	S28310		
		40.00	1.5748		S21311	S23311	S26311	S28311		
	1-19/32	40.48	1.5938		S21312	S23312	S26312	S28312		
		41.00	1.6142		S21313	S23313	S26313	S28313		
	1-5/8	41.28	1.6250		S21314	S23314	S26314	S28314		
		42.00	1.6535		S21315	S23315	S26315	S28315		
	1-21/32	42.07	1.6563		S21316	S23316	S26316	S28316		
	1-11/16	42.86	1.6875		S21317	S23317	S26317	S28317		
		43.00	1.6929		S21318	S23318	S26318	S28318		
	1-23/32	43.66	1.7188		S21319	S23319	S26319	S28319		
		44.00	1.7323		S21320	S23320	S26320	S28320		
	1-3/4	44.45	1.7500		S21321	S23321	S26321	S28321		
		45.00	1.7717		S21322	S23322	S26322	S28322		
	1-25/32	45.24	1.7813		S21323	S23323	S26323	S28323		
		46.00	1.8110		S21324	S23324	S26324	S28324		
	1-13/16	46.04	1.8125		S21325	S23325	S26325	S28325		
	1-27/32	46.83	1.8438		S21326	S23326	S26326	S28326		
		47.00	1.8504		S21327	S23327	S26327	S28327		
	1-7/8	47.63	1.8750		S21328	S23328	S26328	S28328		

◎ : Excellent ○ : Good

	P											M	K		N	
	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)	~HB110
C2(K20)	○	○	○	○	○	◎	◎	○	○	○	○	◎	○	○	◎	◎
C5(P40)	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○
C3(K10)													◎	◎		

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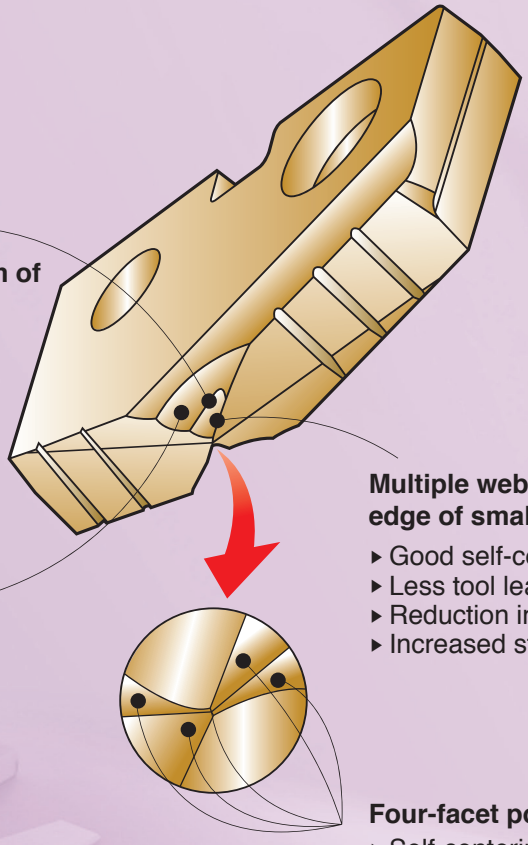
Special features of SM-Point Spade Drill

This “Hybrid Point” combines the strength of the standard point with additional “Web Thinning”.

This point increases stability, reduces thrust, improves centering and allows increased speeds and feeds.



Multiple thinning form at the bottom of the large thinning.

- The optimum thinning for the difference from the cutting speed, the cutting quantity and the cutting load according to the distance from the drill point to the cutting edge.

Radius back face

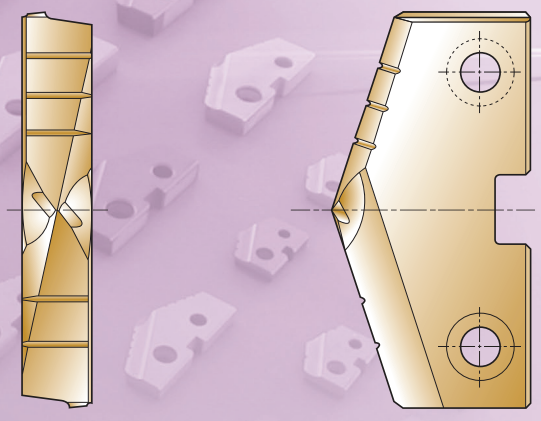
- Wide chip space

Multiple web thinning with the cutting edge of small web thinning.

- Good self-centering
- Less tool lead off
- Reduction in bell mouthing, thrust
- Increased stability

Four-facet point

- Self-centering
- Less thrust force



2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SM-POINT SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES **Y, Z, 0, 1**

- Improved stability and hole straightness by newly developed thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.

POINT ANGLE **- 132 degree**
(Series 5-8 : 144 degree)

cutting conditions : p.68

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	TiAIN
Y .374 (9.50) to .436 (11.07)		9.50	.3740	3/32 (2.4)	* SM08Y01
	3/8	9.53	.3750		* SM08Y02
		9.80	.3858		* SM08Y03
	25/64	9.92	.3906		* SM08Y04
		10.00	.3937		* SM08Y05
		10.20	.4016		* SM08Y06
	13/32	10.32	.4062		* SM08Y07
		10.50	.4134		* SM08Y08
	27/64	10.72	.4219		* SM08Y09
		10.80	.4252		* SM08Y10
		11.00	.4331		* SM08Y11
Z .437 (11.11) to .510 (12.95)	7/16	11.11	.4375	3/32 (2.4)	* SM08Z01
		11.50	.4528		* SM08Z02
	29/64	11.51	.4531		* SM08Z03
	15/32	11.91	.4688		* SM08Z04
		12.00	.4724		* SM08Z05
	31/64	12.30	.4844		* SM08Z06
		12.50	.4921		* SM08Z07
	1/2	12.70	.5000		* SM08Z08
0 .511 (12.98) to .695 (17.65)		13.00	.5118	1/8 (3.2)	* SM08001
	33/64	13.10	.5156		* SM08002
	17/32	13.49	.5312		* SM08003
		13.50	.5315		* SM08004
	35/64	13.89	.5469		* SM08060
		14.00	.5512		* SM08005
	9/16	14.29	.5625		* SM08006
		14.50	.5709		* SM08007
	37/64	14.68	.5781		* SM08008
		15.00	.5906		* SM08009
	19/32	15.08	.5938		* SM08010
	39/64	15.48	.6094		* SM08061
		15.50	.6102		* SM08011
	5/8	15.88	.6250		* SM08012

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	TiAIN
0 .511 (12.98) to .695 (17.65)		16.00	.6299	1/8 (3.2)	* SM08013
	41/64	16.27	.6406		* SM08062
		16.50	.6496		* SM08014
	21/32	16.67	.6562		* SM08015
		17.00	.6693		* SM08016
	43/64	17.07	.6719		* SM08063
	11/16	17.46	.6875		* SM08017
		17.50	.6890		* SM08018
1 .690 (17.53) to .960 (24.38)	45/64	17.86	.7031	5/32 (4.0)	SM08101
		18.00	.7087		SM08102
	23/32	18.26	.7188		SM08103
		18.50	.7283		SM08104
	47/64	18.65	.7344		SM08105
		19.00	.7480		SM08106
	3/4	19.05	.7500		SM08107
	49/64	19.45	.7656		SM08108
		19.50	.7677		SM08109
	25/32	19.84	.7812		SM08110
		20.00	.7874		SM08111
	51/64	20.24	.7969		SM08160
		20.50	.8071		SM08112
	13/16	20.64	.8125		SM08113
		21.00	.8268		SM08114
	27/32	21.43	.8438		SM08115
	55/64	21.83	.8594		SM08161
		22.00	.8661		SM08116
	7/8	22.23	.8750		SM08117
	57/64	22.62	.8906		SM08162
		23.00	.9055		SM08118
	29/32	23.02	.9062		SM08119
	59/64	23.42	.9219		SM08120
	15/16	23.81	.9375		SM08121
		24.00	.9449		SM08122

* 2pcs per package

◎ : Excellent ○ : Good

P											M	K			N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎		○	○

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2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SM-POINT SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES 2, 3

- Improved stability and hole straightness by newly developed thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.

POINT ANGLE - 132 degree
(Series 5-8 : 144 degree)

cutting conditions : p.68

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	TiAIN
2 **.961 (24.41) to 1.380 (35.05)**	31/32	24.61	.9688	3/16 [4.8]	SM08201
	63/64	25.00	.9843		SM08202
	1	25.40	1.0000		SM08203
	1-1/64	25.80	1.0156		SM08204
		26.00	1.0236		SM08205
	1-1/32	26.19	1.0312		SM08206
	1-3/64	26.59	1.0469		SM08260
	1-1/16	26.99	1.0625		SM08207
		27.00	1.0630		SM08208
	1-3/32	27.78	1.0938		SM08209
		28.00	1.1024		SM08210
	1-7/64	28.18	1.1094		SM08261
	1-1/8	28.58	1.1250		SM08211
		29.00	1.1417		SM08212
	1-5/32	29.37	1.1562		SM08213
		30.00	1.1811		SM08214
	1-3/16	30.16	1.1875		SM08215
	1-7/32	30.96	1.2188		SM08216
		31.00	1.2205		SM08217
	1-1/4	31.75	1.2500		SM08218
		32.00	1.2598		SM08219
	1-9/32	32.54	1.2812		SM08220
		33.00	1.2992		SM08221
	1-5/16	33.34	1.3125		SM08222
		34.00	1.3386		SM08223
	1-11/32	34.13	1.3438		SM08224
	1-3/8	34.93	1.3750		SM08225
		35.00	1.3780		SM08226

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	TiAIN
3 **1.353 (34.37) to 1.882 (47.80)**	1-13/32	35.72	1.4062	1/4 [6.4]	SM08301
		36.00	1.4173		SM08302
	1-7/16	36.51	1.4375		SM08303
		37.00	1.4567		SM08304
	1-15/32	37.31	1.4688		SM08305
		38.00	1.4961		SM08306
	1-1/2	38.10	1.5000		SM08307
	1-17/32	38.89	1.5312		SM08308
		39.00	1.5354		SM08309
	1-9/16	39.69	1.5625		SM08310
		40.00	1.5748		SM08311
	1-19/32	40.48	1.5938		SM08312
		41.00	1.6142		SM08313
	1-5/8	41.28	1.6250		SM08314
		42.00	1.6535		SM08315
	1-21/32	42.07	1.6562		SM08316
	1-11/16	42.86	1.6875		SM08317
		43.00	1.6929		SM08318
	1-23/32	43.66	1.7188		SM08319
		44.00	1.7323		SM08320
	1-3/4	44.45	1.7500		SM08321
		45.00	1.7717		SM08322
	1-25/32	45.24	1.7812		SM08323
		46.00	1.8110		SM08324
	1-13/16	46.04	1.8125		SM08325
	1-27/32	46.83	1.8438		SM08326
		47.00	1.8504		SM08327
	1-7/8	47.63	1.8750		SM08328

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
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2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SM-POINT SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES 4, 5

- Improved stability and hole straightness by newly developed thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.

POINT ANGLE **- 132 degree**
(Series 5-8 : 144 degree)

cutting conditions : p.68

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	TiAIN
4 **1.850 (46.99) to 2.570 (65.28)**		48.00	1.8898	5/16 (7.9)	SM08401
	1-29/32	48.42	1.9062		SM08402
		49.00	1.9291		SM08403
	1-15/16	49.21	1.9375		SM08404
		50.00	1.9685		SM08405
	1-31/32	50.01	1.9688		SM08406
	2	50.80	2.0000		SM08407
		51.00	2.0079		SM08408
	2-1/32	51.59	2.0312		SM08409
	2-3/64	52.00	2.0472		SM08410
	2-1/16	52.39	2.0625		SM08411
		53.00	2.0866		SM08412
	2-3/32	53.18	2.0938		SM08413
	2-1/8	53.98	2.1250		SM08414
		54.00	2.1260		SM08415
	2-5/32	54.77	2.1562		SM08416
		55.00	2.1654		SM08417
	2-3/16	55.56	2.1875		SM08418
		56.00	2.2047		SM08419
	2-7/32	56.36	2.2188		SM08420
		57.00	2.2441		SM08421
	2-1/4	57.15	2.2500		SM08422
	2-9/32	57.94	2.2812		SM08423
		58.00	2.2835		SM08424
	2-5/16	58.74	2.3125		SM08425
		59.00	2.3228		SM08426
	2-11/32	59.53	2.3438		SM08427
		60.00	2.3622		SM08428
	2-3/8	60.33	2.3750		SM08429
		61.00	2.4016		SM08430
	2-13/32	61.12	2.4062		SM08431
	2-7/16	61.91	2.4375		SM08432

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	TiAIN
4 **1.850 (46.99) to 2.570 (65.28)**		62.00	2.4409	5/16 (7.9)	SM08433
	2-15/32	62.71	2.4688		SM08434
		63.00	2.4803		SM08435
	2-1/2	63.50	2.5000		SM08436
		64.00	2.5197		SM08437
	2-17/32	64.29	2.5312		SM08438
		65.00	2.5591		SM08439
	2-9/16	65.09	2.5625		SM08440
5 **2.456 (62.38) to 3.000 (76.20)**	2-1/2	63.50	2.5000	7/16 (11.1)	SM08501
		64.00	2.5197		SM08502
	2-17/32	64.29	2.5312		SM08503
	2-9/16	65.09	2.5625		SM08504
	2-19/32	65.88	2.5938		SM08505
		66.00	2.5984		SM08506
	2-5/8	66.68	2.6250		SM08507
	2-21/32	67.47	2.6562		SM08508
		68.00	2.6772		SM08509
	2-11/16	68.26	2.6875		SM08510
	2-23/32	69.05	2.7188		SM08511
	2-3/4	69.85	2.7500		SM08512
		70.00	2.7559		SM08513
	2-25/32	70.64	2.7812		SM08514
	2-13/16	71.44	2.8125		SM08515
		72.00	2.8346		SM08516
	2-27/32	72.23	2.8438		SM08517
	2-7/8	73.03	2.8750		SM08518
	2-29/32	73.82	2.9062		SM08519
		74.00	2.9134		SM08520
	2-15/16	74.61	2.9375		SM08521
	2-31/32	75.41	2.9688		SM08522
		76.00	2.9921		SM08523
	3	76.20	3.0000		SM08524

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

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2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SM-POINT SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES 6, 7, 8

- Improved stability and hole straightness by newly developed thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.

POINT ANGLE - 132 degree
(Series 5-8 : 144 degree)

cutting conditions : p.68

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	TiAIN
6 3.001 (76.23) to 3.507 (89.08)	3-1/32	76.99	3.0312	7/16 (11.1)	SM08601
	3-1/16	77.79	3.0625		SM08602
		78.00	3.0709		SM08603
	3-3/32	78.58	3.0938		SM08604
	3-1/8	79.38	3.1250		SM08605
		80.00	3.1496		SM08606
	3-5/32	80.17	3.1562		SM08607
	3-3/16	80.96	3.1875		SM08608
	3-7/32	81.76	3.2188		SM08609
		82.00	3.2283		SM08610
	3-1/4	82.55	3.2500		SM08611
	3-9/32	83.34	3.2812		SM08612
		84.00	3.3071		SM08613
	3-5/16	84.14	3.3125		SM08614
	3-11/32	84.93	3.3438		SM08615
	3-3/8	85.73	3.3750		SM08616
		86.00	3.3858		SM08617
	3-13/32	86.52	3.4063		SM08618
	3-7/16	87.31	3.4375		SM08619
		88.00	3.4646		SM08620
	3-15/32	88.11	3.4688		SM08621
7 3.455 (87.76) to 4.000 (101.60)	3-1/2	88.90	3.5000	7/16 (11.1)	SM08622
	3-17/32	89.69	3.5312		SM08701
		90.00	3.5433		SM08702
	3-9/16	90.49	3.5625		SM08703
	3-19/32	91.28	3.5938		SM08704
		92.00	3.6221		SM08705
	3-5/8	92.08	3.6250		SM08706
	3-21/32	92.87	3.6562		SM08707
	3-11/16	93.66	3.6875		SM08708

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	TiAIN
7 3.455 (87.76) to 4.000 (101.60		94.00	3.7008	7/16 (11.1)	SM08709
	3-23/32	94.46	3.7188		SM08710
	3-3/4	95.25	3.7500		SM08711
		96.00	3.7795		SM08712
	3-25/32	96.04	3.7812		SM08713
	3-13/16	96.84	3.8125		SM08714
	3-27/32	97.63	3.8438		SM08715
		98.00	3.8583		SM08716
	3-7/8	98.43	3.8750		SM08717
	3-29/32	99.22	3.9062		SM08718
		100.00	3.9370		SM08719
	3-15/16	100.01	3.9375		SM08720
	3-31/32	100.81	3.9688		SM08721
	4	101.60	4.0000		SM08722
8 4.001 (101.63) to 4.507 (114.48	4-1/64	102.00	4.0156	7/16 (11.1)	SM08801
	4-1/16	103.19	4.0625		SM08802
	4-3/32	104.00	4.0945		SM08803
	4-1/8	104.78	4.1250		SM08804
		106.00	4.1732		SM08805
	4-3/16	106.36	4.1875		SM08806
	4-1/4	107.95	4.2500		SM08807
		108.00	4.2520		SM08808
	4-5/16	109.54	4.3125		SM08809
		110.00	4.3307		SM08810
	4-3/8	111.13	4.3750		SM08811
		112.00	4.4094		SM08812
	4-7/16	112.71	4.4375		SM08813
		114.00	4.4882		SM08814
	4-1/2	114.30	4.5000		SM08815

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SM-POINT SPADE DRILL INSERTS - CARBIDE C5 (P40)

SERIES **Y, Z, 0, 1**

- Improved stability and hole straightness by newly developed chip thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.
- Increased speeds & feeds

POINT ANGLE : 132 degree

cutting conditions : p.69

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	TiAIN
Y .374 (9.50) to .436 (11.07)		9.50	.3740	3/32 (2.4)	*SM28Y01
	3/8	9.53	.3750		*SM28Y02
		9.80	.3858		*SM28Y03
	25/64	9.92	.3906		*SM28Y04
		10.00	.3937		*SM28Y05
		10.20	.4016		*SM28Y06
	13/32	10.32	.4062		*SM28Y07
		10.50	.4134		*SM28Y08
	27/64	10.72	.4219		*SM28Y09
		10.80	.4252		*SM28Y10
		11.00	.4331		*SM28Y11
Z .437 (11.11) to .510 (12.95)	7/16	11.11	.4375	3/32 (2.4)	*SM28Z01
		11.50	.4528		*SM28Z02
	29/64	11.51	.4531		*SM28Z03
	15/32	11.91	.4688		*SM28Z04
		12.00	.4724		*SM28Z05
	31/64	12.30	.4844		*SM28Z06
		12.50	.4921		*SM28Z07
	1/2	12.70	.5000		*SM28Z08
0 .511 (12.98) to .695 (17.65)		13.00	.5118	1/8 (3.2)	*SM28001
	33/64	13.10	.5156		*SM28002
	17/32	13.49	.5312		*SM28003
		13.50	.5315		*SM28004
	35/64	13.89	.5469		*SM28060
		14.00	.5512		*SM28005
	9/16	14.29	.5625		*SM28006
		14.50	.5709		*SM28007
	37/64	14.68	.5781		*SM28008
		15.00	.5906		*SM28009
	19/32	15.08	.5938		*SM28010
	39/64	15.48	.6094		*SM28061
		15.50	.6102		*SM28011
	5/8	15.88	.6250		*SM28012

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	TiAIN
0 .511 (12.98) to .695 (17.65)		16.00	.6299	1/8 (3.2)	*SM28013
	41/64	16.27	.6406		*SM28062
		16.50	.6496		*SM28014
	21/32	16.67	.6562		*SM28015
		17.00	.6693		*SM28016
	43/64	17.07	.6719		*SM28063
	11/16	17.46	.6875		*SM28017
		17.50	.6890		*SM28018
1 .690 (17.53) to .960 (24.38)	45/64	17.86	.7031	5/32 (4.0)	SM28101
		18.00	.7087		SM28102
	23/32	18.26	.7188		SM28103
		18.50	.7283		SM28104
	47/64	18.65	.7344		SM28105
		19.00	.7480		SM28106
	3/4	19.05	.7500		SM28107
	49/64	19.45	.7656		SM28108
		19.50	.7677		SM28109
	25/32	19.84	.7812		SM28110
		20.00	.7874		SM28111
	51/64	20.24	.7969		SM28160
		20.50	.8071		SM28112
	13/16	20.64	.8125		SM28113
		21.00	.8268		SM28114
	27/32	21.43	.8438		SM28115
	55/64	21.83	.8594		SM28161
		22.00	.8661		SM28116
	7/8	22.23	.8750		SM28117
	57/64	22.62	.8906		SM28162
		23.00	.9055		SM28118
	29/32	23.02	.9062		SM28119
	59/64	23.42	.9219		SM28120
	15/16	23.81	.9375		SM28121
		24.00	.9449		SM28122

* 2pcs per package

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

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2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SM-POINT SPADE DRILL INSERTS - CARBIDE C5 (P40)

SERIES 2, 3

- Improved stability and hole straightness by newly developed chip thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.
- Increased speeds & feeds

POINT ANGLE : 132 degree

cutting conditions : p.69

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	TiAIN
2 **.961 (24.41) to 1.380 (35.05)**	31/32	24.61	.9688	3/16 (4.8)	**SM28201**
	63/64	25.00	.9843		**SM28202**
	1	25.40	1.0000		**SM28203**
	1-1/64	25.80	1.0156		**SM28204**
		26.00	1.0236		**SM28205**
	1-1/32	26.19	1.0312		**SM28206**
	1-3/64	26.59	1.0469		**SM28260**
	1-1/16	26.99	1.0625		**SM28207**
		27.00	1.0630		**SM28208**
	1-3/32	27.78	1.0938		**SM28209**
		28.00	1.1024		**SM28210**
	1-7/64	28.18	1.1094		**SM28261**
	1-1/8	28.58	1.1250		**SM28211**
		29.00	1.1417		**SM28212**
	1-5/32	29.37	1.1562		**SM28213**
		30.00	1.1811		**SM28214**
	1-3/16	30.16	1.1875		**SM28215**
	1-7/32	30.96	1.2188		**SM28216**
		31.00	1.2205		**SM28217**
	1-1/4	31.75	1.2500		**SM28218**
		32.00	1.2598		**SM28219**
	1-9/32	32.54	1.2812		**SM28220**
		33.00	1.2992		**SM28221**
	1-5/16	33.34	1.3125		**SM28222**
		34.00	1.3386		**SM28223**
	1-11/32	34.13	1.3438		**SM28224**
	1-3/8	34.93	1.3750		**SM28225**
		35.00	1.3780		**SM28226**

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	TiAIN
3 **1.353 (34.37) to 1.882 (47.80)**	1-13/32	35.72	1.4062	1/4 (6.4)	**SM28301**
		36.00	1.4173		**SM28302**
	1-7/16	36.51	1.4375		**SM28303**
		37.00	1.4567		**SM28304**
	1-15/32	37.31	1.4688		**SM28305**
		38.00	1.4961		**SM28306**
	1-1/2	38.10	1.5000		**SM28307**
	1-17/32	38.89	1.5312		**SM28308**
		39.00	1.5354		**SM28309**
	1-9/16	39.69	1.5625		**SM28310**
		40.00	1.5748		**SM28311**
	1-19/32	40.48	1.5938		**SM28312**
		41.00	1.6142		**SM28313**
	1-5/8	41.28	1.6250		**SM28314**
		42.00	1.6535		**SM28315**
	1-21/32	42.07	1.6562		**SM28316**
	1-11/16	42.86	1.6875		**SM28317**
		43.00	1.6929		**SM28318**
	1-23/32	43.66	1.7188		**SM28319**
		44.00	1.7323		**SM28320**
	1-3/4	44.45	1.7500		**SM28321**
		45.00	1.7717		**SM28322**
	1-25/32	45.24	1.7812		**SM28323**
		46.00	1.8110		**SM28324**
	1-13/16	46.04	1.8125		**SM28325**
	1-27/32	46.83	1.8438		**SM28326**
		47.00	1.8504		**SM28327**
	1-7/8	47.63	1.8750		**SM28328**

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SPADE DRILL FLAT BOTTOM INSERTS - SUPER COBALT (T15)

SERIES **Y, Z, 0, 1, 2**

POINT ANGLE : 180 degree

cutting conditions : p.70

Series Min. to Max. (inch/mm)	Diameter		Thick	EDP No.	
	Fractional (inch)	Decimal (inch)	Fractional [Metric]	TiN	TiAlN
Y	3/8	.3750	3/32 [2.4]	**SF05024**	**SF15024**
	13/32	.4063		**SF05026**	**SF15026**
Z	7/16	.4375	3/32 [2.4]	**SF05028**	**SF15028**
	15/32	.4688		**SF05030**	**SF15030**
	1/2	.5000		**SF05032**	**SF15032**
	17/32	.5313		**SF05034**	**SF15034**
0	9/16	.5625	1/8 [3.2]	**SF05036**	**SF15036**
	19/32	.5938		**SF05038**	**SF15038**
	5/8	.6250		**SF05040**	**SF15040**
	21/32	.6563		**SF05042**	**SF15042**
	11/16	.6875		**SF05044**	**SF15044**
	23/32	.7188		**SF05046**	**SF15046**
1	3/4	.7500	5/32 [4.0]	**SF05048**	**SF15048**
	25/32	.7813		**SF05050**	**SF15050**
	13/16	.8125		**SF05052**	**SF15052**
	27/32	.8438		**SF05054**	**SF15054**
	7/8	.8750		**SF05056**	**SF15056**
	29/32	.9063		**SF05058**	**SF15058**
	15/16	.9375		**SF05060**	**SF15060**

Series Min. to Max. (inch/mm)	Diameter		Thick	EDP No.	
	Fractional (inch)	Decimal (inch)	Fractional [Metric]	TiN	TiAlN
2	31/32	.9688	3/16 [4.8]	**SF05062**	**SF15062**
	1	1.0000		**SF05100**	**SF15100**
	1-1/32	1.0313		**SF05102**	**SF15102**
	1-1/16	1.0625		**SF05104**	**SF15104**
	1-3/32	1.0938		**SF05106**	**SF15106**
	1-1/8	1.1250		**SF05108**	**SF15108**
	1-5/32	1.1563		**SF05110**	**SF15110**
	1-3/16	1.1875		**SF05112**	**SF15112**
	1-7/32	1.2188		**SF05114**	**SF15114**
	1-1/4	1.2500		**SF05116**	**SF15116**
	1-9/32	1.2813		**SF05118**	**SF15118**
	1-5/16	1.3125		**SF05120**	**SF15120**
	1-11/32	1.3438		**SF05122**	**SF15122**
	1-3/8	1.3750		**SF05124**	**SF15124**

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

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SPADE DRILLS SV-POINT

Improved stability and hole straightness

H-Coating (Upgraded AlCrN-Based Multi-Layer coating)

- Higher wear resistance and reduced material adhesion
- Higher cutting speeds and feeds
- Improved hole quality over conventional spade drills

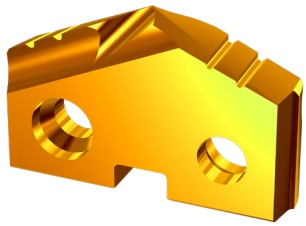
- Smooth cutting
- Breaks chips
- Low thrust
- Stable torque
- Self centering
- Long tool life

2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES Y, Z

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation



POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)

cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	SUPER COBALT (T15) Hardslick	SUPER COBALT (T15) H-Coating
Y .374 (9.50) to .436 (11.07)		9.5	.3740	3/32 [2.4]	SV170095	SV175095
	3/8	9.53	.3750		SV120024	SV125024
		9.8	.3860		SV170098	SV175098
	25/64	9.92	.3906		SV120025	SV125025
		10	.3937		SV170100	SV175100
		10.2	.4016		SV170102	SV175102
	13/32	10.32	.4063		SV120026	SV125026
		10.5	.4134		SV170105	SV175105
	27/64	10.72	.4219		SV120027	SV125027
		10.8	.4252		SV170108	SV175108
		11	.4331		SV170110	SV175110
Z .437 (11.11) to .510 (12.95)	7/16	11.11	.4375	3/32 [2.4]	SV120028	SV125028
		11.5	.4528		SV170115	SV175115
	29/64	11.51	.4531		SV120029	SV125029
	15/32	11.91	.4688		SV120030	SV125030
		12	.4724		SV170120	SV175120
	31/64	12.3	.4844		SV120031	SV125031
		12.5	.4921		SV170125	SV175125
	1/2	12.7	.5000		SV120032	SV125032

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

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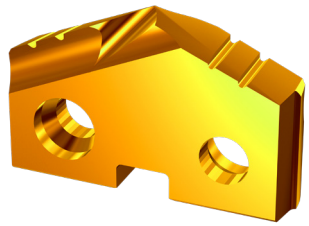
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES 0

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	SUPER COBALT (T15) Hardslick	SUPER COBALT (T15) H-Coating
0 .511 (12.98) to .695 (17.65)		13	.5118	1/8 [3.2]	SV170130	SV175130
	33/64	13.1	.5156		SV120033	SV125033
	17/32	13.49	.5313		SV120034	SV125034
		13.5	.5315		SV170135	SV175135
	35/64	13.89	.5469		SV120035	SV125035
		14	.5512		SV170140	SV175140
	9/16	14.29	.5625		SV120036	SV125036
		14.5	.5709		SV170145	SV175145
	37/64	14.68	.5781		SV120037	SV125037
		15	.5906		SV170150	SV175150
	19/32	15.08	.5938		SV120038	SV125038
	39/64	15.48	.6094		SV120039	SV125039
		15.5	.6102		SV170155	SV175155
	5/8	15.88	.6250		SV120040	SV125040
		16	.6299		SV170160	SV175160
	41/64	16.27	.6406		SV120041	SV125041
		16.5	.6496		SV170165	SV175165
	21/32	16.67	.6563		SV120042	SV125042
		17	.6693		SV170170	SV175170
	43/64	17.07	.6719		SV120043	SV125043
	11/16	17.46	.6875		SV120044	SV125044

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

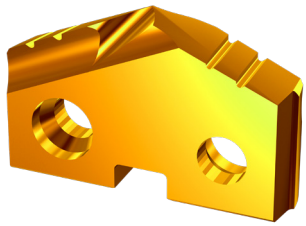
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES 1

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	SUPER COBALT (T15) Hardslick	SUPER COBALT (T15) H-Coating
1 **.690 (17.53) to .960 (24.38)**	45/64	17.86	.7031	5/32 [4.0]	SV120045	SV125045
		18	.7087		SV170180	SV175180
	23/32	18.26	.7188		SV120046	SV125046
		18.5	.7283		SV170185	SV175185
	47/64	18.65	.7344		SV120047	SV125047
		19	.7480		SV170190	SV175190
	3/4	19.05	.7500		SV120048	SV125048
		19.5	.7677		SV170195	SV175195
	25/32	19.84	.7812		SV120050	SV125050
		20	.7874		SV170200	SV175200
	51/64	20.24	.7969		SV120051	SV125051
		20.5	.8071		SV170205	SV175205
	13/16	20.64	.8125		SV120052	SV125052
		21	.8268		SV170210	SV175210
	27/32	21.43	.8438		SV120054	SV125054
	55/64	21.83	.8594		SV120055	SV125055
		22	.8661		SV170220	SV175220
	7/8	22.23	.8750		SV120056	SV125056
	57/64	22.62	.8906		SV120057	SV125057
		23	.9055		SV170230	SV175230
	29/32	23.02	.9062		SV120058	SV125058
	59/64	23.42	.9219		SV120059	SV125059
	15/16	23.81	.9375		SV120060	SV125060
		24	.9449		SV170240	SV175240

◎ : Excellent ○ : Good

P											M	K			N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎		○	○

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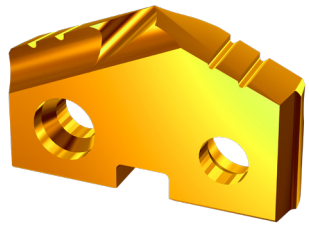
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT
SV-POINT SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES 2

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	SUPER COBALT (T15) Hardslick	SUPER COBALT (T15) H-Coating
2 .961 (24.41) to 1.380 (35.05)	31/32	24.61	.9688	3/16 [4.8]	SV120062	SV125062
	63/64	25	.9843		SV120063	SV125063
	1	25.4	1.0000		SV120100	SV125100
	1 1/64	25.8	1.0156		SV120101	SV125101
		26	1.0236		SV170260	SV175260
	1 1/32	26.19	1.0312		SV120102	SV125102
	1 3/64	26.59	1.0469		SV120103	SV125103
	1 1/16	26.99	1.0625		SV120104	SV125104
		27	1.0630		SV170270	SV175270
	1 3/32	27.78	1.0938		SV120106	SV125106
		28	1.1024		SV170280	SV175280
	1 7/64	28.18	1.1094		SV120107	SV125107
	1 1/8	28.58	1.1250		SV120108	SV125108
		29	1.1417		SV170290	SV175290
	1 5/32	29.37	1.1562		SV120110	SV125110
		30	1.1811		SV170300	SV175300
	1 3/16	30.16	1.1875		SV120112	SV125112
	1 7/32	30.96	1.2188		SV120114	SV125114
		31	1.2205		SV170310	SV175310
	1 1/4	31.75	1.2500		SV120116	SV125116
		32	1.2598		SV170320	SV175320
	1 9/32	32.54	1.2812		SV120118	SV125118
		33	1.2992		SV170330	SV175330
	1 5/16	33.34	1.3125		SV120120	SV125120
		34	1.3386		SV170340	SV175340
	1 11/32	34.13	1.3438		SV120122	SV125122
	1 3/8	34.93	1.3750		SV120124	SV125124
		35	1.3780		SV170350	SV175350

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

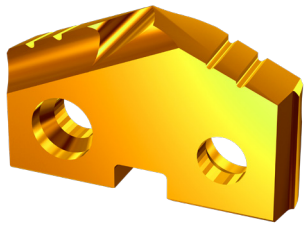
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES 3

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	SUPER COBALT (T15) Hardslick	SUPER COBALT (T15) H-Coating
3 **1.353 (34.37) to 1.882 (47.80)**	1 13/32	35.72	1.4063	1/4 [6.4]	SV120126	SV125126
		36	1.4173		SV170360	SV175360
	1 7/16	36.51	1.4375		SV120128	SV125128
		37	1.4567		SV170370	SV175370
	1 15/32	37.31	1.4688		SV120130	SV125130
		38	1.4961		SV170380	SV175380
	1 1/2	38.1	1.5000		SV120132	SV125132
	1 17/32	38.89	1.5313		SV120134	SV125134
		39	1.5354		SV170390	SV175390
	1 9/16	39.69	1.5625		SV120136	SV125136
		40	1.5748		SV170400	SV175400
	1 19/32	40.48	1.5938		SV120138	SV125138
		41	1.6142		SV170410	SV175410
	1 5/8	41.28	1.6250		SV120140	SV125140
		42	1.6535		SV170420	SV175420
	1 21/32	42.07	1.6563		SV120142	SV125142
	1 11/16	42.86	1.6875		SV120144	SV125144
		43	1.6929		SV170430	SV175430
	1 23/32	43.66	1.7188		SV120146	SV125146
		44	1.7323		SV170440	SV175440
	1 3/4	44.45	1.7500		SV120148	SV125148
		45	1.7717		SV170450	SV175450
	1 25/32	45.24	1.7813		SV120150	SV125150
		46	1.8110		SV170460	SV175460
	1 13/16	46.04	1.8125		SV120152	SV125152
	1 27/32	46.83	1.8438		SV120154	SV125154
		47	1.8504		SV170470	SV175470
	1 7/8	47.63	1.8750		SV120156	SV125156

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

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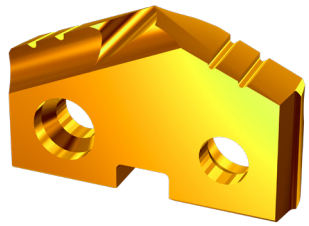
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT
SV-POINT SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES 4

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	SUPER COBALT (T15) Hardslick	SUPER COBALT (T15) H-Coating
4 **1.850 (46.99) to 2.570 (65.28)**		48	1.8898	5/16 [7.9]	SV170480	SV175480
	1 29/32	48.42	1.9062		SV120158	SV125158
		49	1.9291		SV170490	SV175490
	1 15/16	49.21	1.9375		SV120160	SV125160
		50	1.9685		SV170500	SV175500
	1 31/32	50.01	1.9688		SV120162	SV125162
	2	50.8	2.0000		SV120200	SV125200
		51	2.0079		SV170510	SV175510
	2 1/32	51.59	2.0312		SV120202	SV125202
	2 3/64	51.99	2.0472		SV120203	SV125203
	2 1/16	52.39	2.0625		SV120204	SV125204
		53	2.0866		SV170530	SV175530
	2 3/32	53.18	2.0938		SV120206	SV125206
	2 1/8	53.98	2.1250		SV120208	SV125208
		54	2.1260		SV170540	SV175540
	2 5/32	54.77	2.1562		SV120210	SV125210
		55	2.1654		SV170550	SV175550
	2 3/16	55.56	2.1875		SV120212	SV125212
		56	2.2047		SV170560	SV175560
	2 7/32	56.36	2.2188		SV120214	SV125214
		57	2.2441		SV170570	SV175570
	2 1/4	57.15	2.2500		SV120216	SV125216
	2 9/32	57.94	2.2812		SV120218	SV125218
		58	2.2835		SV170580	SV175580
	2 5/16	58.74	2.3125		SV120220	SV125220
		59	2.3228		SV170590	SV175590
	2 11/32	59.53	2.3438		SV120222	SV125222
		60	2.3622		SV170600	SV175600
	2 3/8	60.33	2.3750		SV120224	SV125224

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

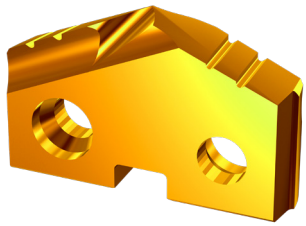
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES 4

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	SUPER COBALT (T15)	
					Hardslick	H-Coating
4 1.850 (46.99) to 2.570 (65.28)		61	2.4016	5/16 [7.9]	SV170610	SV175610
	2 13/32	61.12	2.4062		SV120226	SV125226
	2 7/16	61.91	2.4375		SV120228	SV125228
		62	2.4409		SV170620	SV175620
	2 15/32	62.71	2.4688		SV120230	SV125230
		63	2.4803		SV170630	SV175630
	2 1/2	63.5	2.5000		SV120232	SV125232
		64	2.5197		SV170640	SV175640
	2 17/32	64.29	2.5312		SV120234	SV125234
		65	2.5591		SV170650	SV175650
	2 9/16	65.09	2.5625		SV120236	SV125236

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

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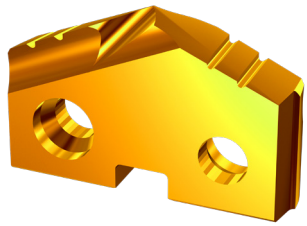
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES 5

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	SUPER COBALT (T15) Hardslick	SUPER COBALT (T15) H-Coating
5 2.456 (62.38) to 3.000 (76.20)	2 1/2	63.5	2.5000	7/16 [11.1]	SV1202D2	SV1252D2
		64	2.5197		SV170640	SV17564A
	2 17/32	64.29	2.5312		SV1202D4	SV1252D4
	2 9/16	65.09	2.5625		SV1202D6	SV1252D6
	2 19/32	65.88	2.5938		SV120238	SV125238
		66	2.5984		SV170660	SV175660
	2 5/8	66.68	2.6250		SV120240	SV125240
	2 21/32	67.47	2.6562		SV120242	SV125242
		68	2.6772		SV170680	SV175680
	2 11/16	68.26	2.6875		SV120244	SV125244
	2 23/32	69.06	2.7188		SV120246	SV125246
	2 3/4	69.85	2.7500		SV120248	SV125248
		70	2.7559		SV170700	SV175700
	2 25/32	70.64	2.7812		SV120250	SV125250
	2 13/16	71.44	2.8125		SV120252	SV125252
		72	2.8346		SV170720	SV175720
	2 27/32	72.23	2.8438		SV120254	SV125254
	2 7/8	73.03	2.8750		SV120256	SV125256
	2 29/32	73.82	2.9062		SV120258	SV125258
		74	2.9134		SV170740	SV175740
	2 15/16	74.61	2.9375		SV120260	SV125260
	2 31/32	75.41	2.9688		SV120262	SV125262
		76	2.9921		SV170760	SV175760
	3	76.2	3.0000		SV120300	SV125300

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

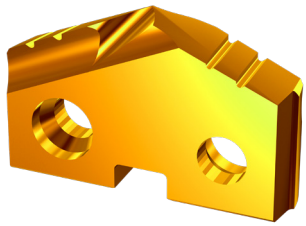
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES 6

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	SUPER COBALT (T15) Hardslick	SUPER COBALT (T15) H-Coating
6 **3.001 (76.23) to 3.507 (89.08)**	3 1/32	76.99	3.0312	7/16 [11.1]	SV120302	SV125302
	3 1/16	77.79	3.0625		SV120304	SV125304
		78	3.0709		SV170780	SV175780
	3 3/32	78.58	3.0938		SV120306	SV125306
	3 1/8	79.38	3.1250		SV120308	SV125308
		80	3.1496		SV170800	SV175800
	3 5/32	80.17	3.1562		SV120310	SV125310
	3 3/16	80.96	3.1875		SV120312	SV125312
	3 7/32	81.76	3.2188		SV120314	SV125314
		82	3.2283		SV170820	SV175820
	3 1/4	82.55	3.2500		SV120316	SV125316
	3 9/32	83.34	3.2812		SV120318	SV125318
		84	3.3071		SV170840	SV175840
	3 5/16	84.14	3.3125		SV120320	SV125320
	3 11/32	84.93	3.3438		SV120322	SV125322
	3 3/8	85.73	3.3750		SV120324	SV125324
		86	3.3858		SV170860	SV175860
	3 13/32	86.52	3.4063		SV120326	SV125326
	3 7/16	87.31	3.4375		SV120328	SV125328
		88	3.4646		SV170880	SV175880
	3 15/32	88.11	3.4688		SV120330	SV125330
	3 1/2	88.9	3.5000		SV120332	SV125332

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
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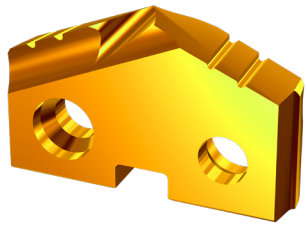
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT
SV-POINT SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES 7

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	SUPER COBALT (T15)	
					Hardslick	H-Coating
7 3.455 (87.76) to 4.000 (101.60)	3 17/32	89.69	3.5312	7/16 [11.1]	SV120334	SV125334
		90	3.5433		SV170900	SV175900
	3 9/16	90.49	3.5625		SV120336	SV125336
	3 19/32	91.28	3.5938		SV120338	SV125338
		92	3.6221		SV170920	SV175920
	3 5/8	92.08	3.6250		SV120340	SV125340
	3 21/32	92.87	3.6562		SV120342	SV125342
	3 11/16	93.66	3.6875		SV120344	SV125344
		94	3.7008		SV170940	SV175940
	3 23/32	94.46	3.7188		SV120346	SV125346
	3 3/4	95.25	3.7500		SV120348	SV125348
		96	3.7795		SV170960	SV175960
	3 25/32	96.04	3.7812		SV120350	SV125350
	3 13/16	96.84	3.8125		SV120352	SV125352
	3 27/32	97.63	3.8438		SV120354	SV125354
		98	3.8583		SV170980	SV175980
	3 7/8	98.43	3.8750		SV120356	SV125356
	3 29/32	99.22	3.9062		SV120358	SV125358
		100	3.9370		SV170A00	SV175A00
	3 15/16	100.01	3.9375		SV120360	SV125360
	3 31/32	100.81	3.9688		SV120362	SV125362
	4	101.6	4.0000		SV120400	SV125400

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

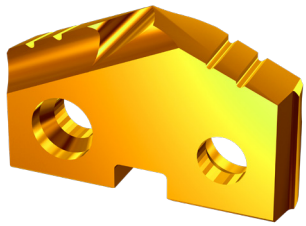
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - SUPER COBALT (T15)

SERIES 8

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	SUPER COBALT (T15)	
					Hardslick	H-Coating
8 **4.001 (101.63) to 4.507 (114.48)**	4 1/64	102	4.0156	7/16 [11.1]	SV120401	SV125401
	4 1/16	103.19	4.0625		SV120404	SV125404
	4 3/32	103.98	4.0945		SV120406	SV125406
	4 1/8	104.78	4.1250		SV120408	SV125408
		106	4.1732		SV170A60	SV175A60
	4 3/16	106.36	4.1875		SV120412	SV125412
	4 1/4	107.95	4.2500		SV120416	SV125416
		108	4.2520		SV170A80	SV175A80
	4 5/16	109.54	4.3125		SV120420	SV125420
		110	4.3307		SV170B00	SV175B00
	4 3/8	111.13	4.3750		SV120424	SV125424
		112	4.4094		SV170B20	SV175B20
	4 7/16	112.71	4.4375		SV120428	SV125428
		114	4.4882		SV170B40	SV175B40
	4 1/2	114.3	4.5000		SV120432	SV125432

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

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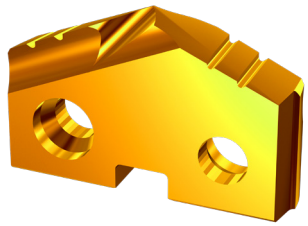
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - PREMIUM COBALT (M48)

SERIES Y, Z

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	PREMIUM COBALT (M48)	
					Hardslick	H-Coating
Y .374 (9.50) to .436 (11.07)		9.5	.3740	3/32 [2.4]	SV570095	SV575095
	3/8	9.53	.3750		SV520024	SV525024
		9.8	.3860		SV570098	SV575098
	25/64	9.92	.3906		SV520025	SV525025
		10	.3937		SV570100	SV575100
		10.2	.4016		SV570102	SV575102
	13/32	10.32	.4063		SV520026	SV525026
		10.5	.4134		SV570105	SV575105
	27/64	10.72	.4219		SV520027	SV525027
		10.8	.4252		SV570108	SV575108
		11	.4331		SV570110	SV575110
Z .437 (11.11) to .510 (12.95)	7/16	11.11	.4375	3/32 [2.4]	SV520028	SV525028
		11.5	.4528		SV570115	SV575115
	29/64	11.51	.4531		SV520029	SV525029
	15/32	11.91	.4688		SV520030	SV525030
		12	.4724		SV570120	SV575120
	31/64	12.3	.4844		SV520031	SV525031
		12.5	.4921		SV570125	SV575125
	1/2	12.7	.5000		SV520032	SV525032

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○

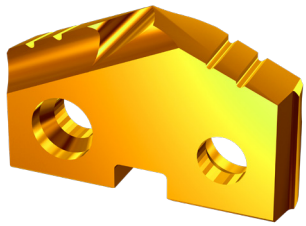
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - PREMIUM COBALT (M48)

SERIES 0

- ▶ Sinusoidal thinning edge for smooth cutting
- ▶ Positive rake angle
- ▶ Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	PREMIUM COBALT (M48) Hardslick	PREMIUM COBALT (M48) H-Coating
0 .511 (12.98) to .695 (17.65)		13	.5118	1/8 [3.2]	SV570130	SV575130
	33/64	13.1	.5156		SV520033	SV525033
	17/32	13.49	.5313		SV520034	SV525034
		13.5	.5315		SV570135	SV575135
	35/64	13.89	.5469		SV520035	SV525035
		14	.5512		SV570140	SV575140
	9/16	14.29	.5625		SV520036	SV525036
		14.5	.5709		SV570145	SV575145
	37/64	14.68	.5781		SV520037	SV525037
		15	.5906		SV570150	SV575150
	19/32	15.08	.5938		SV520038	SV525038
	39/64	15.48	.6094		SV520039	SV525039
		15.5	.6102		SV570155	SV575155
	5/8	15.88	.6250		SV520040	SV525040
		16	.6299		SV570160	SV575160
	41/64	16.27	.6406		SV520041	SV525041
		16.5	.6496		SV570165	SV575165
	21/32	16.67	.6563		SV520042	SV525042
		17	.6693		SV570170	SV575170
	43/64	17.07	.6719		SV520043	SV525043
	11/16	17.46	.6875		SV520044	SV525044
		17.5	.6890		SV570175	SV575175

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○

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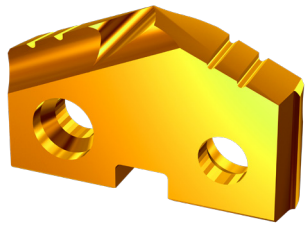
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - PREMIUM COBALT (M48)

SERIES 1

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	PREMIUM COBALT (M48) Hardslick	PREMIUM COBALT (M48) H-Coating
1 .690 (17.53) to .960 (24.38)	45/64	17.86	.7031	5/32 [4.0]	SV520045	SV525045
		18	.7087		SV570180	SV575180
	23/32	18.26	.7188		SV520046	SV525046
		18.5	.7283		SV570185	SV575185
	47/64	18.65	.7344		SV520047	SV525047
		19	.7480		SV570190	SV575190
	3/4	19.05	.7500		SV520048	SV525048
	49/64	19.45	.7656		SV520049	SV525049
		19.5	.7677		SV570195	SV575195
	25/32	19.84	.7812		SV520050	SV525050
		20	.7874		SV570200	SV575200
	51/64	20.24	.7969		SV520051	SV525051
		20.5	.8071		SV570205	SV575205
	13/16	20.64	.8125		SV520052	SV525052
		21	.8268		SV570210	SV575210
	27/32	21.43	.8438		SV520054	SV525054
	55/64	21.83	.8594		SV520055	SV525055
		22	.8661		SV570220	SV575220
	7/8	22.23	.8750		SV520056	SV525056
	57/64	22.62	.8906		SV520057	SV525057
		23	.9055		SV570230	SV575230
	29/32	23.02	.9062		SV520058	SV525058
	59/64	23.42	.9219		SV520059	SV525059
	15/16	23.81	.9375		SV520060	SV525060
		24	.9449		SV570240	SV575240

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○

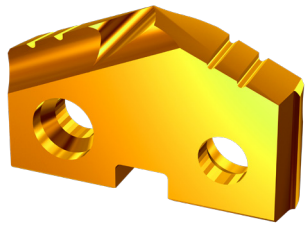
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - PREMIUM COBALT (M48)

SERIES 2

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	PREMIUM COBALT (M48)	
					Hardslick	H-Coating
2 **.961 (24.41) to 1.380 (35.05)**	31/32	24.61	.9688	3/16 [4.8]	SV520062	SV525062
	63/64	25	.9843		SV520063	SV525063
	1	25.4	1.0000		SV520100	SV525100
	1 1/64	25.8	1.0156		SV520101	SV525101
		26	1.0236		SV570260	SV575260
	1 1/32	26.19	1.0312		SV520102	SV525102
	1 3/64	26.59	1.0469		SV520103	SV525103
	1 1/16	26.99	1.0625		SV520104	SV525104
		27	1.0630		SV570270	SV575270
	1 3/32	27.78	1.0938		SV520106	SV525106
		28	1.1024		SV570280	SV575280
	1 7/64	28.18	1.1094		SV520107	SV525107
	1 1/8	28.58	1.1250		SV520108	SV525108
		29	1.1417		SV570290	SV575290
	1 5/32	29.37	1.1562		SV520110	SV525110
		30	1.1811		SV570300	SV575300
	1 3/16	30.16	1.1875		SV520112	SV525112
	1 7/32	30.96	1.2188		SV520114	SV525114
		31	1.2205		SV570310	SV575310
	1 1/4	31.75	1.2500		SV520116	SV525116
		32	1.2598		SV570320	SV575320
	1 9/32	32.54	1.2812		SV520118	SV525118
		33	1.2992		SV570330	SV575330
	1 5/16	33.34	1.3125		SV520120	SV525120
		34	1.3386		SV570340	SV575340
	1 11/32	34.13	1.3438		SV520122	SV525122
	1 3/8	34.93	1.3750		SV520124	SV525124
		35	1.3780		SV570350	SV575350

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
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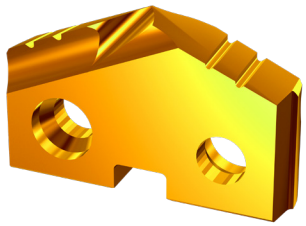
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - PREMIUM COBALT (M48)

SERIES 3

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	PREMIUM COBALT (M48) Hardslick	PREMIUM COBALT (M48) H-Coating
3 1.353 (34.37) to 1.882 (47.80)	1 13/32	35.72	1.4063	1/4 [6.4]	SV520126	SV525126
		36	1.4173		SV570360	SV575360
	1 7/16	36.51	1.4375		SV520128	SV525128
		37	1.4567		SV570370	SV575370
	1 15/32	37.31	1.4688		SV520130	SV525130
		38	1.4961		SV570380	SV575380
	1 1/2	38.1	1.5000		SV520132	SV525132
	1 17/32	38.89	1.5313		SV520134	SV525134
		39	1.5354		SV570390	SV575390
	1 9/16	39.69	1.5625		SV520136	SV525136
		40	1.5748		SV570400	SV575400
	1 19/32	40.48	1.5938		SV520138	SV525138
		41	1.6142		SV570410	SV575410
	1 5/8	41.28	1.6250		SV520140	SV525140
		42	1.6535		SV570420	SV575420
	1 21/32	42.07	1.6563		SV520142	SV525142
	1 11/16	42.86	1.6875		SV520144	SV525144
		43	1.6929		SV570430	SV575430
	1 23/32	43.66	1.7188		SV520146	SV525146
		44	1.7323		SV570440	SV575440
	1 3/4	44.45	1.7500		SV520148	SV525148
		45	1.7717		SV570450	SV575450
	1 25/32	45.24	1.7813		SV520150	SV525150
		46	1.8110		SV570460	SV575460
	1 13/16	46.04	1.8125		SV520152	SV525152
	1 27/32	46.83	1.8438		SV520154	SV525154
		47	1.8504		SV570470	SV575470
	1 7/8	47.63	1.8750		SV520156	SV525156

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○

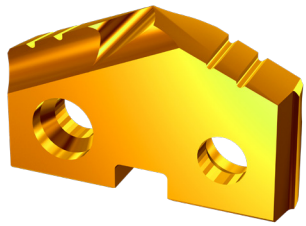
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - PREMIUM COBALT (M48)

SERIES 4

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	PREMIUM COBALT (M48)	
					Hardslick	H-Coating
4 1.850 (46.99) to 2.570 (65.28)		48	1.8898	5/16 [7.9]	SV570480	SV575480
	1 29/32	48.42	1.9062		SV520158	SV525158
		49	1.9291		SV570490	SV575490
	1 15/16	49.21	1.9375		SV520160	SV525160
		50	1.9685		SV570500	SV575500
	1 31/32	50.01	1.9688		SV520162	SV525162
	2	50.8	2.0000		SV520200	SV525200
		51	2.0079		SV570510	SV575510
	2 1/32	51.59	2.0312		SV520202	SV525202
	2 3/64	51.99	2.0472		SV520203	SV525203
	2 1/16	52.39	2.0625		SV520204	SV525204
		53	2.0866		SV570530	SV575530
	2 3/32	53.18	2.0938		SV520206	SV525206
	2 1/8	53.98	2.1250		SV520208	SV525208
		54	2.1260		SV570540	SV575540
	2 5/32	54.77	2.1562		SV520210	SV525210
		55	2.1654		SV570550	SV575550
	2 3/16	55.56	2.1875		SV520212	SV525212
		56	2.2047		SV570560	SV575560
	2 7/32	56.36	2.2188		SV520214	SV525214
		57	2.2441		SV570570	SV575570
	2 1/4	57.15	2.2500		SV520216	SV525216
	2 9/32	57.94	2.2812		SV520218	SV525218
		58	2.2835		SV570580	SV575580
	2 5/16	58.74	2.3125		SV520220	SV525220
		59	2.3228		SV570590	SV575590

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○

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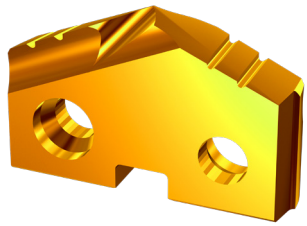
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - PREMIUM COBALT (M48)

SERIES 4

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	PREMIUM COBALT (M48) Hardslick	PREMIUM COBALT (M48) H-Coating
4 1.850 (46.99) to 2.570 (65.28)	2 11/32	59.53	2.3438	5/16 [7.9]	SV520222	SV525222
		60	2.3622		SV570600	SV575600
	2 3/8	60.33	2.3750		SV520224	SV525224
		61	2.4016		SV570610	SV575610
	2 13/32	61.12	2.4062		SV520226	SV525226
	2 7/16	61.91	2.4375		SV520228	SV525228
		62	2.4409		SV570620	SV575620
	2 15/32	62.71	2.4688		SV520230	SV525230
		63	2.4803		SV570630	SV575630
	2 1/2	63.5	2.5000		SV520232	SV525232
		64	2.5197		SV570640	SV575640
	2 17/32	64.29	2.5312		SV520234	SV525234
		65	2.5591		SV570650	SV575650
	2 9/16	65.09	2.5625		SV520236	SV525236
	2 1/2	63.5	2.5000		SV520232	SV525232
		64	2.5197		SV570640	SV575640
	2 17/32	64.29	2.5312		SV520234	SV525234
	2 9/16	65.09	2.5625		SV520236	SV525236

◎ : Excellent ○ : Good

P											M	K			N	
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)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎		○	○

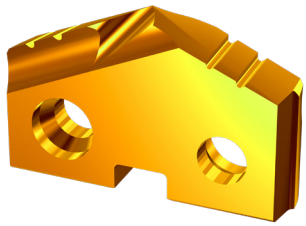
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - PREMIUM COBALT (M48)

SERIES 5

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	PREMIUM COBALT (M48) Hardslick	PREMIUM COBALT (M48) H-Coating
5 2.456 (62.38) to 3.000 (76.20)	2 19/32	65.88	2.5938	7/16 [11.1]	SV520238	SV525238
		66	2.5984		SV570660	SV575660
	2 5/8	66.68	2.6250		SV520240	SV525240
	2 21/32	67.47	2.6562		SV520242	SV525242
		68	2.6772		SV570680	SV575680
	2 11/16	68.26	2.6875		SV520244	SV525244
	2 23/32	69.06	2.7188		SV520246	SV525246
	2 3/4	69.85	2.7500		SV520248	SV525248
		70	2.7559		SV570700	SV575700
	2 25/32	70.64	2.7812		SV520250	SV525250
	2 13/16	71.44	2.8125		SV520252	SV525252
		72	2.8346		SV570720	SV575720
	2 27/32	72.23	2.8438		SV520254	SV525254
	2 7/8	73.03	2.8750		SV520256	SV525256
	2 29/32	73.82	2.9062		SV520258	SV525258
		74	2.9134		SV570740	SV575740
	2 15/16	74.61	2.9375		SV520260	SV525260
	2 31/32	75.41	2.9688		SV520262	SV525262
		76	2.9921		SV570760	SV575760
	3	76.2	3.0000		SV520300	SV525300

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○

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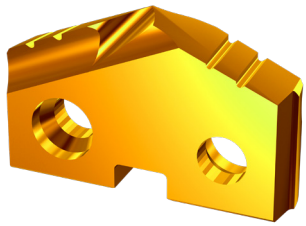
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - PREMIUM COBALT (M48)

SERIES 6

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	PREMIUM COBALT (M48)	
					Hardslick	H-Coating
6 3.001 (76.23) to 3.507 (89.08)	3 1/32	76.99	3.0312	7/16 [11.1]	SV520302	SV525302
	3 1/16	77.79	3.0625		SV520304	SV525304
		78	3.0709		SV570780	SV575780
	3 3/32	78.58	3.0938		SV520306	SV525306
	3 1/8	79.38	3.1250		SV520308	SV525308
		80	3.1496		SV570800	SV575800
	3 5/32	80.17	3.1562		SV520310	SV525310
	3 3/16	80.96	3.1875		SV520312	SV525312
	3 7/32	81.76	3.2188		SV520314	SV525314
		82	3.2283		SV570820	SV575820
	3 1/4	82.55	3.2500		SV520316	SV525316
	3 9/32	83.34	3.2812		SV520318	SV525318
		84	3.3071		SV570840	SV575840
	3 5/16	84.14	3.3125		SV520320	SV525320
	3 11/32	84.93	3.3438		SV520322	SV525322
	3 3/8	85.73	3.3750		SV520324	SV525324
		86	3.3858		SV570860	SV575860
	3 13/32	86.52	3.4063		SV520326	SV525326
	3 7/16	87.31	3.4375		SV520328	SV525328
		88	3.4646		SV570880	SV575880
	3 15/32	88.11	3.4688		SV520330	SV525330
	3 1/2	88.9	3.5000		SV520332	SV525332

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○

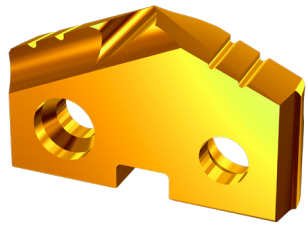
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - PREMIUM COBALT (M48)

SERIES 7

- ▶ Sinusoidal thinning edge for smooth cutting
- ▶ Positive rake angle
- ▶ Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	PREMIUM COBALT (M48) Hardslick	PREMIUM COBALT (M48) H-Coating
7 **3.455 (87.76) to 4.000 (101.60)**	3 17/32	89.69	3.5312	7/16 [11.1]	SV520334	SV525334
		90	3.5433		SV570900	SV575900
	3 9/16	90.49	3.5625		SV520336	SV525336
	3 19/32	91.28	3.5938		SV520338	SV525338
		92	3.6221		SV570920	SV575920
	3 5/8	92.08	3.6250		SV520340	SV525340
	3 21/32	92.87	3.6562		SV520342	SV525342
	3 11/16	93.66	3.6875		SV520344	SV525344
		94	3.7008		SV570940	SV575940
	3 23/32	94.46	3.7188		SV520346	SV525346
	3 3/4	95.25	3.7500		SV520348	SV525348
		96	3.7795		SV570960	SV575960
	3 25/32	96.04	3.7812		SV520350	SV525350
	3 13/16	96.84	3.8125		SV520352	SV525352
	3 27/32	97.63	3.8438		SV520354	SV525354
		98	3.8583		SV570980	SV575980
	3 7/8	98.43	3.8750		SV520356	SV525356
	3 29/32	99.22	3.9062		SV520358	SV525358
		100	3.9370		SV570A00	SV575A00
	3 15/16	100.01	3.9375		SV520360	SV525360
	3 31/32	100.81	3.9688		SV520362	SV525362
	4	101.6	4.0000		SV520400	SV525400

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○

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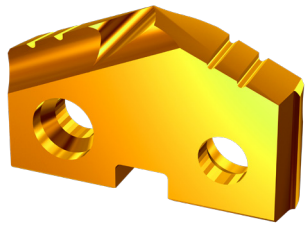
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT
SV-POINT SPADE DRILL INSERTS - PREMIUM COBALT (M48)

SERIES 8

- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree
(Series 5-8 : 144 degree)



cutting conditions : p.68

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	PREMIUM COBALT (M48)	
					Hardslick	H-Coating
8 4.001 (101.63) to 4.507 (114.48)	4 1/64	102	4.0156	7/16 [11.1]	SV520401	SV525401
	4 1/16	103.19	4.0625		SV520404	SV525404
	4 3/32	103.98	4.0945		SV520406	SV525406
	4 1/8	104.78	4.1250		SV520408	SV525408
		106	4.1732		SV570A60	SV575A60
	4 3/16	106.36	4.1875		SV520412	SV525412
	4 1/4	107.95	4.2500		SV520416	SV525416
		108	4.2520		SV570A80	SV575A80
	4 5/16	109.54	4.3125		SV520420	SV525420
		110	4.3307		SV570B00	SV575B00
	4 3/8	111.13	4.3750		SV520424	SV525424
		112	4.4094		SV570B20	SV575B20
	4 7/16	112.71	4.4375		SV520428	SV525428
		114	4.4882		SV570B40	SV575B40
	4 1/2	114.3	4.5000		SV520432	SV525432

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
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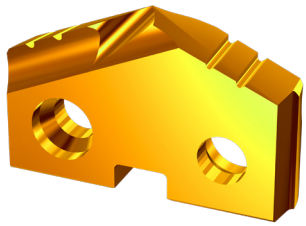
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - CARBIDE C5 (P40)

SERIES Y, Z

- For general use in carbon steels and alloys steels
- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree



cutting conditions : p.69

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	C5 (P40) Hardslick	C5 (P40) H-Coating
Y .374 (9.50) to .436 (11.07)		9.5	.3740	3/32 [2.4]	SV870095	SV875095
	3/8	9.53	.3750		SV820024	SV825024
		9.8	.3860		SV870098	SV875098
	25/64	9.92	.3906		SV820025	SV825025
		10	.3937		SV870100	SV875100
		10.2	.4016		SV870102	SV875102
	13/32	10.32	.4063		SV820026	SV825026
		10.5	.4134		SV870105	SV875105
	27/64	10.72	.4219		SV820027	SV825027
		10.8	.4252		SV870108	SV875108
		11	.4331		SV870110	SV875110
Z .437 (11.11) to .510 (12.95)	7/16	11.11	.4375	3/32 [2.4]	SV820028	SV825028
		11.5	.4528		SV870115	SV875115
	29/64	11.51	.4531		SV820029	SV825029
	15/32	11.91	.4688		SV820030	SV825030
		12	.4724		SV870120	SV875120
	31/64	12.3	.4844		SV820031	SV825031
		12.5	.4921		SV870125	SV875125
	1/2	12.7	.5000		SV820032	SV825032

◎ : Excellent ○ : Good

P											M	K		N	
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)	~HB110
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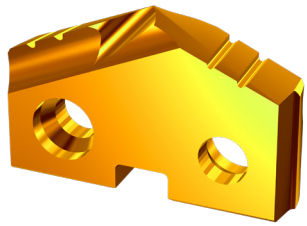
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - CARBIDE C5 (P40)

SERIES 0

- For general use in carbon steels and alloys steels
- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree



cutting conditions : p.69

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	C5 (P40) Hardslick	C5 (P40) H-Coating
0 .511 (12.98) to .695 (17.65)		13	.5118	1/8 [3.2]	SV870130	SV875130
	33/64	13.1	.5156		SV820033	SV825033
	17/32	13.49	.5313		SV820034	SV825034
		13.5	.5315		SV870135	SV875135
	35/64	13.89	.5469		SV820035	SV825035
		14	.5512		SV870140	SV875140
	9/16	14.29	.5625		SV820036	SV825036
		14.5	.5709		SV870145	SV875145
	37/64	14.68	.5781		SV820037	SV825037
		15	.5906		SV870150	SV875150
	19/32	15.08	.5938		SV820038	SV825038
	39/64	15.48	.6094		SV820039	SV825039
		15.5	.6102		SV870155	SV875155
	5/8	15.88	.6250		SV820040	SV825040
		16	.6299		SV870160	SV875160
	41/64	16.27	.6406		SV820041	SV825041
		16.5	.6496		SV870165	SV875165
	21/32	16.67	.6563		SV820042	SV825042
		17	.6693		SV870170	SV875170
	43/64	17.07	.6719		SV820043	SV825043
	11/16	17.46	.6875		SV820044	SV825044
		17.5	.6890		SV870175	SV875175

◎ : Excellent ○ : Good

P											M	K			N	
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)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○		○	○

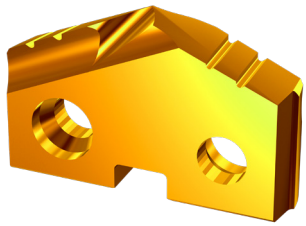
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - CARBIDE C5 (P40)

SERIES 1

- For general use in carbon steels and alloys steels
- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree



cutting conditions : p.69

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	C5 (P40) Hardslick	C5 (P40) H-Coating
1 .690 (17.53) to .960 (24.38)	45/64	17.86	.7031	5/32 [4.0]	SV820045	SV825045
		18	.7087		SV870180	SV875180
	23/32	18.26	.7188		SV820046	SV825046
		18.5	.7283		SV870185	SV875185
	47/64	18.65	.7344		SV820047	SV825047
		19	.7480		SV870190	SV875190
	3/4	19.05	.7500		SV820048	SV825048
	49/64	19.45	.7656		SV820049	SV825049
		19.5	.7677		SV870195	SV875195
	25/32	19.84	.7812		SV820050	SV825050
		20	.7874		SV870200	SV875200
	51/64	20.24	.7969		SV820051	SV825051
		20.5	.8071		SV870205	SV875205
	13/16	20.64	.8125		SV820052	SV825052
		21	.8268		SV870210	SV875210
	27/32	21.43	.8438		SV820054	SV825054
	55/64	21.83	.8594		SV820055	SV825055
		22	.8661		SV870220	SV875220
	7/8	22.23	.8750		SV820056	SV825056
	57/64	22.62	.8906		SV820057	SV825057
		23	.9055		SV870230	SV875230
	29/32	23.02	.9062		SV820058	SV825058
	59/64	23.42	.9219		SV820059	SV825059
	15/16	23.81	.9375		SV820060	SV825060
		24	.9449		SV870240	SV875240

◎ : Excellent ○ : Good

P											M	K			N	
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)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○		○	○

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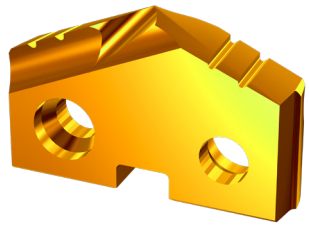
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - CARBIDE C5 (P40)

SERIES 2

- For general use in carbon steels and alloys steels
- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree



cutting conditions : p.69

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	C5 (P40) Hardslick	C5 (P40) H-Coating
2 .961 (24.41) to 1.380 (35.05)	31/32	24.61	.9688	3/16 [4.8]	SV820062	SV825062
	63/64	25	.9843		SV820063	SV825063
	1	25.4	1.0000		SV820100	SV825100
	1 1/64	25.8	1.0156		SV820101	SV825101
		26	1.0236		SV870260	SV875260
	1 1/32	26.19	1.0312		SV820102	SV825102
	1 3/64	26.59	1.0469		SV820103	SV825103
	1 1/16	26.99	1.0625		SV820104	SV825104
		27	1.0630		SV870270	SV875270
	1 3/32	27.78	1.0938		SV820106	SV825106
		28	1.1024		SV870280	SV875280
	1 7/64	28.18	1.1094		SV820107	SV825107
	1 1/8	28.58	1.1250		SV820108	SV825108
		29	1.1417		SV870290	SV875290
	1 5/32	29.37	1.1562		SV820110	SV825110
		30	1.1811		SV870300	SV875300
	1 3/16	30.16	1.1875		SV820112	SV825112
	1 7/32	30.96	1.2188		SV820114	SV825114
		31	1.2205		SV870310	SV875310
	1 1/4	31.75	1.2500		SV820116	SV825116
		32	1.2598		SV870320	SV875320
	1 9/32	32.54	1.2812		SV820118	SV825118
		33	1.2992		SV870330	SV875330
	1 5/16	33.34	1.3125		SV820120	SV825120
		34	1.3386		SV870340	SV875340
	1 11/32	34.13	1.3438		SV820122	SV825122
	1 3/8	34.93	1.3750		SV820124	SV825124
		35	1.3780		SV870350	SV875350

◎ : Excellent ○ : Good

P											M	K			N	
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)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○		○	○

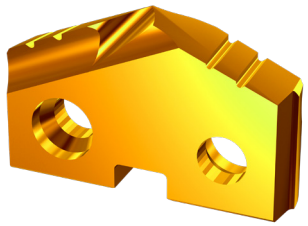
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SV-POINT SPADE DRILL INSERTS - CARBIDE C5 (P40)

SERIES 3

- For general use in carbon steels and alloys steels
- Sinusoidal thinning edge for smooth cutting
- Positive rake angle
- Less thrust force and heat generation

POINT ANGLE : 132 degree



cutting conditions : p.69

Series Min. to Max. inch (mm)	Diameter			Thick	EDP. No.	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Fractional [Metric]	C5 (P40) Hardslick	C5 (P40) H-Coating
3 **1.353 (34.37) to 1.882 (47.80)**	1 13/32	35.72	1.4063	1/4 [6.4]	SV820126	SV825126
		36	1.4173		SV870360	SV875360
	1 7/16	36.51	1.4375		SV820128	SV825128
		37	1.4567		SV870370	SV875370
	1 15/32	37.31	1.4688		SV820130	SV825130
		38	1.4961		SV870380	SV875380
	1 1/2	38.1	1.5000		SV820132	SV825132
	1 17/32	38.89	1.5313		SV820134	SV825134
		39	1.5354		SV870390	SV875390
	1 9/16	39.69	1.5625		SV820136	SV825136
		40	1.5748		SV870400	SV875400
	1 19/32	40.48	1.5938		SV820138	SV825138
		41	1.6142		SV870410	SV875410
	1 5/8	41.28	1.6250		SV820140	SV825140
		42	1.6535		SV870420	SV875420
	1 21/32	42.07	1.6563		SV820142	SV825142
	1 11/16	42.86	1.6875		SV820144	SV825144
		43	1.6929		SV870430	SV875430
	1 23/32	43.66	1.7188		SV820146	SV825146
		44	1.7323		SV870440	SV875440
	1 3/4	44.45	1.7500		SV820148	SV825148
		45	1.7717		SV870450	SV875450
	1 25/32	45.24	1.7813		SV820150	SV825150
		46	1.8110		SV870460	SV875460
	1 13/16	46.04	1.8125		SV820152	SV825152
	1 27/32	46.83	1.8438		SV820154	SV825154
		47	1.8504		SV870470	SV875470
	1 7/8	47.63	1.8750		SV820156	SV825156

◎ : Excellent ○ : Good

P											M	K			N	
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)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○

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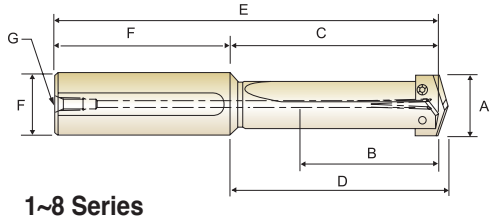
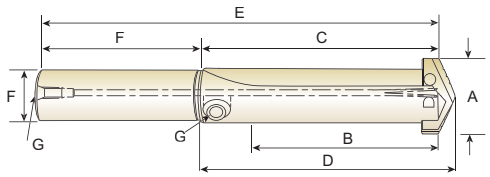
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT
STRAIGHT SHANK HOLDER, STRAIGHT FLUTE

P13 SERIES
P14 SERIES

Y~0.5 Series



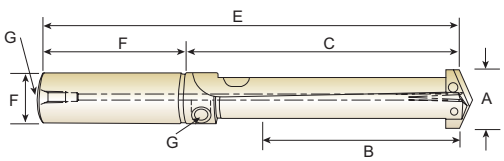
1~8 Series



SHORT LENGTH

Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
Y	P13Y01	3/8 – 27/64	1-1/4	2-1/32	2-1/8	4-13/32	3/4	2-3/8	1/8
Z	P13Z01	7/16 – 1/2	1-1/4	2-1/32	2-1/8	4-13/32	3/4	2-3/8	1/8
0	P13001	33/64 – 11/16	1-3/8	2-3/16	2-19/64	4-9/16	3/4	2-3/8	1/8
0.5	P13051	39/64 – 11/16	1-3/8	2-3/16	2-19/64	4-9/16	3/4	2-3/8	1/8
1	P13101	45/64 – 15/16	2-5/8	3-7/8	4-1/64	6-7/8	3/4	3	1/8
	P13102	45/64 – 15/16	2-5/8	3-7/8	4-1/64	6-7/8	1	3	1/8
1.5	P13151	55/64 – 15/16	2-5/8	3-7/8	4-1/64	6-7/8	3/4	3	1/8
	P13152	55/64 – 15/16	2-5/8	3-7/8	4-1/64	6-7/8	1	3	1/8
2	P13202	31/32 – 1-3/8	3-3/8	4-1/2	4-41/64	8	1	3-1/2	1/8
	P13203	31/32 – 1-3/8	3-3/8	4-1/2	4-41/64	8	1-1/4	3-1/2	1/8
2.5	P13252	1-3/16 – 1-3/8	3-3/8	4-1/2	4-41/64	8	1	3-1/2	1/8
	P13253	1-3/16 – 1-3/8	3-3/8	4-1/2	4-41/64	8	1-1/4	3-1/2	1/8
3	P13303	1-13/32 – 1-7/8	4-3/4	6	6-3/16	10	1-1/4	4	1/4
	P13304	1-13/32 – 1-7/8	4-3/4	6	6-3/16	10	1-1/2	4	1/4
4	P13404	1-29/32 – 2-9/16	5-1/8	6-1/2	6-11/16	10-1/2	1-1/2	4	1/4
	P13405	1-29/32 – 2-9/16	5-1/8	6-1/2	6-11/16	10-1/2	1-3/4	4	1/4
5-6	P13506	2-1/2 – 3-1/2	6-3/4	8-1/2	8-3/4	12-1/2	2	4	1/2
7-8	P13708	3-17/32 – 4-1/2	6-3/4	8-7/8	9-1/8	13-7/8	3	5	1/2



INTERMEDIATE LENGTH

Unit : Inch

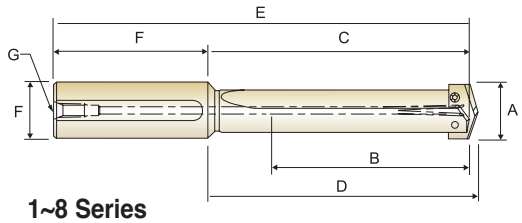
Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
1	P14102	45/64 – 15/16	4-5/8	5-7/8	6-1/64	8-7/8	1	3	1/8
1.5	P14152	55/64 – 15/16	4-5/8	5-7/8	6-1/64	8-7/8	1	3	1/8
2	P14203	31/32 – 1-3/8	5-3/8	6-1/2	6-41/64	10	1-1/4	3-1/2	1/8
2.5	P14253	1-3/16 – 1-3/8	5-3/8	6-1/2	6-41/64	10	1-1/4	3-1/2	1/8
3	P14304	1-13/32 – 1-7/8	6-1/2	7-3/4	7-15/16	11-3/4	1-1/2	4	1/4

2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

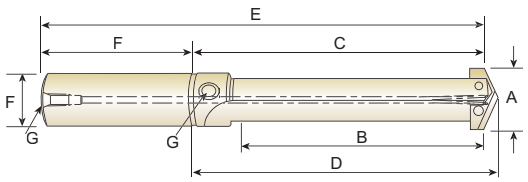
STRAIGHT SHANK HOLDER, STRAIGHT FLUTE

P15 SERIES

Y~0.5 Series



1~8 Series



STANDARD LENGTH

Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
Y	P15Y01	3/8 – 27/64	2-3/8	3-5/32	3-1/4	5-17/32	3/4	2-3/8	1/8
Z	P15Z01	7/16 – 1/2	2-3/8	3-5/32	3-1/4	5-17/32	3/4	2-3/8	1/8
0	P15001	33/64 – 11/16	2-1/2	3-5/16	3-27/64	5-11/16	3/4	2-3/8	1/8
0.5	P15051	39/64 – 11/16	2-1/2	3-5/16	3-27/64	5-11/16	3/4	2-3/8	1/8
1	P15101	45/64 – 15/16	6-5/8	7-7/8	8-1/64	10-7/8	3/4	3	1/8
	P15102	45/64 – 15/16	6-5/8	7-7/8	8-1/64	10-7/8	1	3	1/8
1.5	P15151	55/64 – 15/16	6-5/8	7-7/8	8-1/64	10-7/8	3/4	3	1/8
	P15152	55/64 – 15/16	6-5/8	7-7/8	8-1/64	10-7/8	1	3	1/8
2	P15202	31/32 – 1-3/8	7-3/8	8-1/2	8-41/64	12	1	3-1/2	1/8
	P15203	31/32 – 1-3/8	7-3/8	8-1/2	8-41/64	12	1-1/4	3-1/2	1/8
2.5	P15252	1-3/16 – 1-3/8	7-3/8	8-1/2	8-41/64	12	1	3-1/2	1/8
	P15253	1-3/16 – 1-3/8	7-3/8	8-1/2	8-41/64	12	1-1/4	3-1/2	1/8
3	P15303	1-13/32 – 1-7/8	8-1/4	9-1/2	9-11/16	13-1/2	1-1/4	4	1/4
	P15304	1-13/32 – 1-7/8	8-1/4	9-1/2	9-11/16	13-1/2	1-1/2	4	1/4
4	P15404	1-29/32 – 2-9/16	9-1/8	10-1/2	10-11/16	14-1/2	1-1/2	4	1/4
	P15405	1-29/32 – 2-9/16	9-1/8	10-1/2	10-11/16	14-1/2	1-3/4	4	1/4
5-6	P15506	2-1/2 – 3-1/2	10-3/4	12-1/2	12-3/4	16-1/2	2	4	1/2
7-8	P15708	3-17/32 – 4-1/2	10-3/4	12-7/8	13-1/8	17-7/8	3	5	1/2

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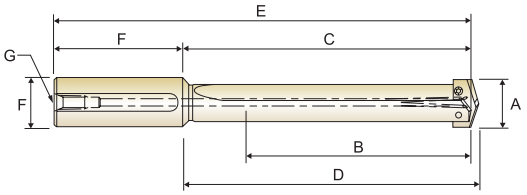
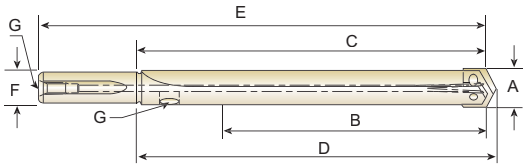
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT
STRAIGHT SHANK HOLDER, STRAIGHT FLUTE

P16 SERIES

Y~0.5 Series



1~8 Series



EXTENDED LENGTH

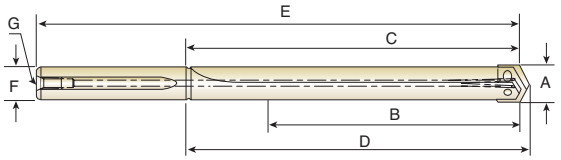
Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
Y	P16Y01	3/8 – 27/64	4-3/8	5-5/32	5-1/4	7-17/32	3/4	2-3/8	1/8
Z	P16Z01	7/16 – 1/2	4-3/8	5-5/32	5-1/4	7-17/32	3/4	2-3/8	1/8
0	P16001	33/64 – 11/16	4-1/2	5-5/16	5-27/64	7-11/16	3/4	2-3/8	1/8
0.5	P16051	39/64 – 11/16	4-1/2	5-5/16	5-27/64	7-11/16	3/4	2-3/8	1/8
1	P16102	45/64 – 15/16	10-5/8	11-7/8	12-1/64	14-7/8	1	3	1/8
1.5	P16152	55/64 – 15/16	10-5/8	11-7/8	12-1/64	14-7/8	1	3	1/8
2	P16203	31/32 – 1-3/8	11-3/8	12-1/2	12-41/64	16	1-1/4	3-1/2	1/8
2.5	P16253	1-3/16 – 1-3/8	11-3/8	12-1/2	12-41/64	16	1-1/4	3-1/2	1/8
3	P16303	1-13/32 – 1-7/8	13-3/4	15	15-3/16	19	1-1/4	4	1/4
4	P16404	1-29/32 – 2-9/16	16-5/8	18	18-3/16	22	1-1/2	4	1/4
5-6	P16506	2-1/2 – 3-1/2	18-1/4	20	20-1/4	24	2	4	1/2
7-8	P16708	3-17/32 – 4-1/2	21-7/8	24	24-1/4	29	3	5	1/2

2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

STRAIGHT SHANK HOLDER, STRAIGHT FLUTE

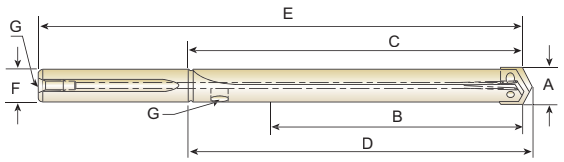
P17 SERIES



LONG LENGTH

Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
0	P17001	33/64 – 11/16	7	7-13/16	7-59/64	10-3/16	3/4	2-3/8	1/8
0.5	P17051	39/64 – 11/16	7	7-13/16	7-59/64	10-3/16	3/4	2-3/8	1/8



EXTRA LONG LENGTH

Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
1	P17101	45/64 – 15/16	18	19-1/4	19-25/64	22-1/4	1	3	1/8
2	P17202	31/32 – 1-3/8	20-1/8	21-1/4	21-25/64	24-3/4	1-1/4	3-1/2	1/8
3	P17303	1-13/32 – 1-7/8	22	23-1/4	23-7/16	27-1/4	1-1/2	4	1/4
4	P17404	1-29/32 – 2-9/16	24-5/8	26	26-3/16	30	1-1/2	4	1/4
5	P17506	2-1/2 – 3-1/2	26	27-3/4	28	31-3/4	2	4	1/2
7	P17708	3-17/32 – 4-1/2	27	29-1/8	29-3/8	34-1/8	3	5	1/2

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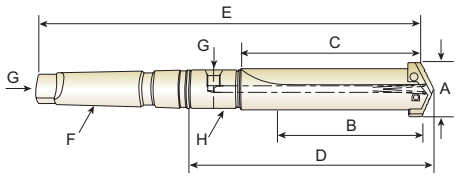
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT
TAPER SHANK HOLDER, STRAIGHT FLUTE / HELICAL FLUTE

P01 SERIES
P08 SERIES

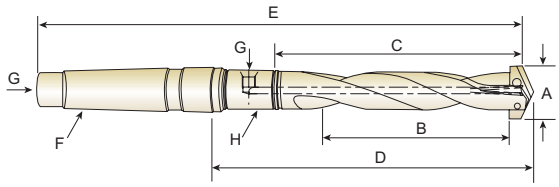


SHORT LENGTH

Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	MT	Pipe Tap	RCI
		A	B	C	D	E	F	G	H
Y	P01Y02	3/8 – 27/64	1-1/4	2-1/32	3-15/32	6-5/16	#2	1/16	PR1030
Z	P01Z02	7/16 – 1/2	1-1/4	2-1/32	3-15/32	6-5/16	#2	1/16	PR1030
0	P01002	33/64 – 11/16	1-3/8	2-3/16	3-41/64	6-15/32	#2	1/16	PR1030
0.5	P01052	39/64 – 11/16	1-3/8	2-3/16	3-41/64	6-15/32	#2	1/16	PR1030
1	P01103	45/64 – 15/16	2-3/4	3-7/8	5-39/64	9-5/32	#3	1/8	PR1031
	P01104	45/64 – 15/16	2-3/4	3-7/8	5-43/64	10-5/32	#4	1/8	PR1031
1.5	P01153	55/64 – 15/16	2-3/4	3-7/8	5-39/64	9-5/32	#3	1/8	PR1031
	P01154	55/64 – 15/16	2-3/4	3-7/8	5-43/64	10-5/32	#4	1/8	PR1031
2	P01203	31/32 – 1-3/8	3-3/8	4-1/2	6-15/64	9-25/32	#3	1/8	PR1031
	P01204	31/32 – 1-3/8	3-3/8	4-1/2	6-19/64	10-25/32	#4	1/8	PR1031
2.5	P01253	1-3/16 – 1-3/8	3-3/8	4-1/2	6-15/64	9-25/32	#3	1/8	PR1031
	P01254	1-3/16 – 1-3/8	3-3/8	4-1/2	6-37/64	11-1/16	#4	1/4	PR1042
3	P01304	1-13/32 – 1-7/8	4-3/4	6	8-1/8	12-9/16	#4	1/4	PR1042
	P01305	1-13/32 – 1-7/8	4-3/4	6	8-1/8	13-13/16	#5	1/4	PR1043
4	P01404	1-29/32 – 2-9/16	5-1/8	6-1/2	8-5/8	13-1/16	#4	1/4	PR1042
	P01405	1-29/32 – 2-9/16	5-1/8	6-1/2	8-5/8	14-5/16	#5	1/4	PR1043
5-6	P01505	2-1/2 – 3-1/2	6-3/4	8-1/2	11-5/16	16-15/16	#5	1/2	PR1054
7-8	P01705	3-17/32 – 4-1/2	6-3/4	8-7/8	11-11/16	17-5/16	#5	1/2	PR1054

▶ You can also apply **RCI**(**R**otary **C**oolant **I**nducer) for internal cooling. (See page 277)



INTERMEDIATE LENGTH

Unit : Inch

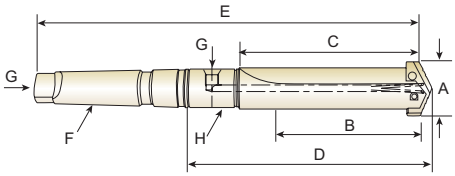
Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	MT	Pipe Tap	RCI
		A	B	C	D	E	F	G	H
1	P08103	45/64 – 15/16	4-3/4	5-7/8	7-39/64	11-5/32	#3	1/8	PR1031
1.5	P08153	55/64 – 15/16	4-3/4	5-7/8	7-39/64	11-5/32	#3	1/8	PR1031
2	P08204	31/32 – 1-3/8	5-3/8	6-1/2	8-19/64	12-25/32	#4	1/8	PR1031
2.5	P08254	1-3/16 – 1-3/8	5-3/8	6-1/2	8-37/64	13-1/16	#4	1/4	PR1042

▶ You can also apply **RCI**(**R**otary **C**oolant **I**nducer) for internal cooling. (See page 277)

2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

STRAIGHT SHANK HOLDER, STRAIGHT FLUTE

P03 SERIES



STANDARD LENGTH

Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	MT	Pipe Tap	RCI
		A	B	C	D	E	F	G	H
Y	P03Y02	3/8 – 27/64	2-3/8	3-5/32	4-19/32	7-7/16	#2	1/16	PR1030
Z	P03Z02	7/16 – 1/2	2-3/8	3-5/32	4-19/32	7-7/16	#2	1/16	PR1030
0	P03002	33/64 – 11/16	2-1/2	3-5/16	4-49/64	7-19/32	#2	1/16	PR1030
0.5	P03052	39/64 – 11/16	2-1/2	3-5/16	4-49/64	7-19/32	#2	1/16	PR1030
1	P03103	45/64 – 15/16	6-3/4	7-7/8	9-39/64	13-5/32	#3	1/8	PR1031
	P03104	45/64 – 15/16	6-3/4	7-7/8	9-43/64	14-5/32	#4	1/8	PR1031
1.5	P03153	55/64 – 15/16	6-3/4	7-7/8	9-39/64	13-5/32	#3	1/8	PR1031
	P03154	55/64 – 15/16	6-3/4	7-7/8	9-43/64	14-5/32	#4	1/8	PR1031
2	P03203	31/32 – 1-3/8	7-3/8	8-1/2	10-15/64	13-25/32	#3	1/8	PR1031
	P03204	31/32 – 1-3/8	7-3/8	8-1/2	10-19/64	14-25/32	#4	1/8	PR1031
2.5	P03253	1-3/16 – 1-3/8	7-3/8	8-1/2	10-15/64	13-25/32	#3	1/8	PR1031
	P03254	1-3/16 – 1-3/8	7-3/8	8-1/2	10-37/64	15-1/16	#4	1/4	PR1042
3	P03304	1-13/32 – 1-7/8	8-1/4	9-1/2	11-5/8	16-1/16	#4	1/4	PR1042
	P03305	1-13/32 – 1-7/8	8-1/4	9-1/2	11-5/8	17-5/16	#5	1/4	PR1043
4	P03404	1-29/32 – 2-9/16	9-1/8	10-1/2	12-5/8	17-1/16	#4	1/4	PR1042
	P03405	1-29/32 – 2-9/16	9-1/8	10-1/2	12-5/8	18-5/16	#5	1/4	PR1043
5-6	P03505	2-1/2 – 3-1/2	10-3/4	12-1/2	15-5/16	20-15/16	#5	1/2	PR1054
7-8	P03705	3-17/32 – 4-1/2	10-3/4	12-7/8	15-11/16	21-5/16	#5	1/2	PR1054

▶ You can also apply **RCI**(**R**otary **C**oolant **I**nducer) for internal cooling. (See page 277)

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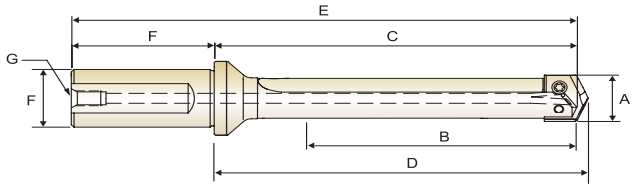
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT
FLANGED STRAIGHT SHANK HOLDER, STRAIGHT FLUTE

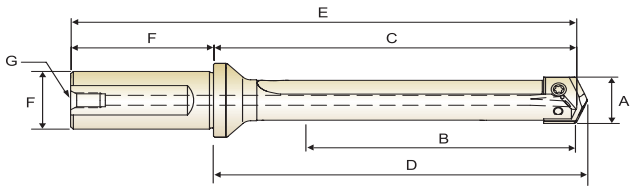
P25 SERIES
P26 SERIES



SHORT LENGTH

Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
Y	P25Y01	3/8 – 27/64	1-1/4	2-13/32	2-1/2	4-7/16	3/4	2-1/32	1/8
Z	P25Y01	7/16 – 1/2	1-1/4	2-13/32	2-1/2	4-7/16	3/4	2-1/32	1/8
0	P25001	33/64 – 11/16	1-3/8	2-1/2	2-39/64	4-17/32	3/4	2-1/32	1/8
0.5	P25051	39/64 – 11/16	1-3/8	2-1/2	2-39/64	4-17/32	3/4	2-1/32	1/8
1	P25102	45/64 – 15/16	2-5/8	4-7/32	4-23/64	6-1/2	1	2-9/32	1/8
1.5	P25152	55/64 – 15/16	2-5/8	4-7/32	4-23/64	6-1/2	1	2-9/32	1/8
2	P25203	31/32 – 1-3/8	3-3/8	5-1/16	5-13/64	7-11/32	1-1/4	2-9/32	1/4
2.5	P25253	1-3/16 – 1-3/8	3-3/8	5-1/16	5-13/64	7-11/32	1-1/4	2-9/32	1/4
3	P25303	1-13/32 – 1-7/8	4-3/4	6-13/16	7	9-1/2	1-1/2	2-11/16	1/4
4	P25404	1-29/32 – 2-9/16	5-1/8	7-1/16	7-1/4	9-3/4	1-1/2	2-11/16	1/4



INTERMEDIATED LENGTH

Unit : Inch

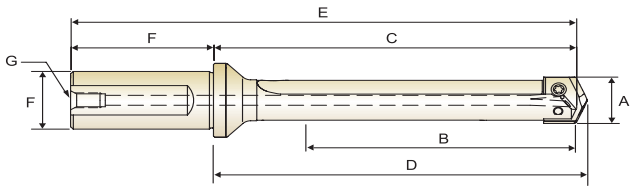
Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
1	P26102	45/64 ~ 15/16	4-5/8	6-3/32	6-15/64	8-3/8	1	2-9/32	1/8
1.5	P26152	55/64 ~ 15/16	4-5/8	6-3/32	6-15/64	8-3/8	1	2-9/32	1/8
2	P26203	31/32 ~ 1-3/8	5-3/8	7-1/16	7-13/64	9-11/32	1-1/4	2-9/32	1/4
2.5	P26253	1-3/16 ~ 1-3/8	5-3/8	7-1/16	7-13/64	9-11/32	1-1/4	2-9/32	1/4
3	P26304	1-13/32 ~ 1-7/8	6-1/2	8-9/16	8-3/4	11-1/4	1-1/2	2-11/32	1/4

2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

FLANGED STRAIGHT SHANK HOLDER, STRAIGHT FLUTE

P27 SERIES

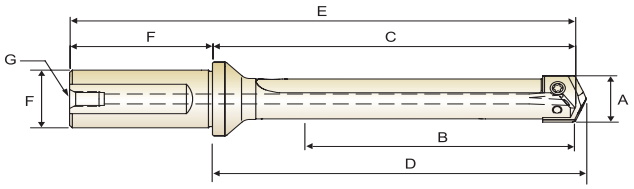
P28 SERIES



STANDARD LENGTH

Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
Y	P27Y01	3/8 ~ 27/64	2-3/8	3-17/32	3-5/8	5-9/16	3/4	2-1/32	1/8
Z	P27Z01	7/16 ~ 1/2	2-3/8	3-17/32	3-5/8	5-9/16	3/4	2-1/32	1/8
0	P27001	33/64 ~ 11/16	2-1/2	3-5/8	3-47/64	5-21/32	3/4	2-1/32	1/8
0.5	P27051	39/64 ~ 11/16	2-1/2	3-5/8	3-47/64	5-21/32	3/4	2-1/32	1/8
1	P27102	45/64 ~ 15/16	6-5/8	8-3/32	8-15/64	10-3/8	1	2-9/32	1/8
1.5	P27152	55/64 ~ 15/16	6-5/8	8-3/32	8-15/64	10-3/8	1	2-9/32	1/8
2	P27203	31/32 ~ 1-3/8	7-3/8	9-1/16	9-13/64	11-11/32	1-1/4	2-9/32	1/4
2.5	P27253	1-3/16 ~ 1-3/8	7-3/8	9-1/16	9-13/64	11-11/32	1-1/4	2-9/32	1/4
3	P27303	1-13/32 ~ 1-7/8	8-1/4	10-5/16	10-1/2	13	1-1/2	2-11/16	1/4
4	P27404	1-29/32 ~ 2-9/16	9-1/8	11-1/16	11-1/4	13-3/4	1-1/2	2-11/16	1/4



EXTENDED LENGTH

Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
Y	P28Y01	3/8 ~ 27/64	4-3/8	5-17/32	5-5/8	7-9/16	3/4	2-1/32	1/8
Z	P28Y01	7/16 ~ 1/2	4-3/8	5-17/32	5-5/8	7-9/16	3/4	2-1/32	1/8
0	P28001	33/64 ~ 11/16	4-1/2	5-5/8	5-47/64	7-21/32	3/4	2-1/32	1/8
0.5	P28051	39/64 ~ 11/16	4-1/2	5-5/8	5-47/64	7-21/32	3/4	2-1/32	1/8
1	P28102	45/64 ~ 15/16	10-5/8	12-3/32	12-15/64	14-3/8	1	2-9/32	1/8
1.5	P28152	55/64 ~ 15/16	10-5/8	12-3/32	12-15/64	14-3/8	1	2-9/32	1/8
2	P28203	31/32 ~ 1-3/8	11-3/8	13-1/16	13-13/64	15-11/32	1-1/4	2-9/32	1/4
2.5	P28253	1-3/32 ~ 1-3/8	11-3/8	13-1/16	13-13/64	15-11/32	1-1/4	2-9/32	1/4

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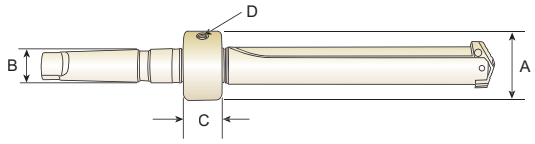
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT
HOLDER ACCESSORIES

TORX SCREWS AND PREMIUM TORX HAND DRIVERS

Series	Torx Screws		Torx Screws (Nylon Locking)		Premium Torx Drivers	Drill Range		Torque in Lbs. 5.5
	Item	PKG EDP No. (10 Screws)	Item	PKG EDP No. (10 Screws)	EDP No.	Inch	Metric	
						inch	mm	
Y	2XT7	J7Y001	2XT7N	J7Y006	J5Y007	3/8 – 27/64	9.5 – 11.0	5.5
Z	2LXT7	J7Z011	2LXT7N	J7Z016	J5Y007	7/16 – 1/2	11.5 – 12.5	5.5
0	2.5XT8	J80021	2.5XT8N	J80026	J50008	33/64 – 11/16	13.0 – 17.5	11.0
0.5	2.5LXT8	J80531	2.5LXT8N	J80536	J50008	39/64 – 11/16	15.5 – 17.5	11.0
1	3XT9	J91041	3XT9N	J91046	J51009	45/64 – 15/16	18.0 – 24.0	20.0
1.5	3LXT9	J91551	3LXT9N	J91556	J51009	55/64 – 15/16	22.0 – 24.0	20.0
2	4XT15	JB2061	4XT15N	JB2066	J52015	31/32 – 1-3/8	25.0 – 35.0	45.0
2.5	4XT15	JB2061	4XT15N	JB2066	J52015	31/32 – 1-3/8	30.0 – 35.0	45.0
3-4	5XT20	JC3081	5XT20N	JC3086	J53020	1-13/32 – 2-9/16	36.0 – 65.0	90.0
5-8	6XT25	JD5091	6XT25N	JD5096	J55025	2-1/2 – 4-1/2	64.0 – 114.0	155.0

NOTE : Replacement screws sold in packages (10 screws per package)



ROTARY COOLANT INDUCER (RCI) AND ACCESSORIES

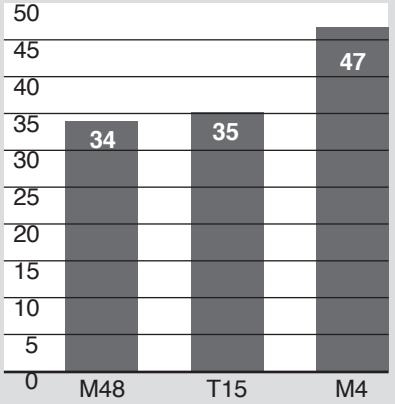
Complete with O'Rings, Flat Washers and Locking Clips.

EDP No.	I.D.	Pipe O.D.	Length	Tap	Thread for Driving Rod
	A	B	C	D	
PR1030	1-3/4	3/4	7/8	1/8	5/16 – NC
PR1031	2-1/8	1	1-1/8	1/8	5/16 – NC
PR1042	2-1/2	1-1/4	1-3/8	1/4	3/8 – NC
PR1043	3	1-3/4	1-3/8	1/4	3/8 – NC
PR1054	3-3/4	2-1/4	1-3/4	1/2	1/2 – NC

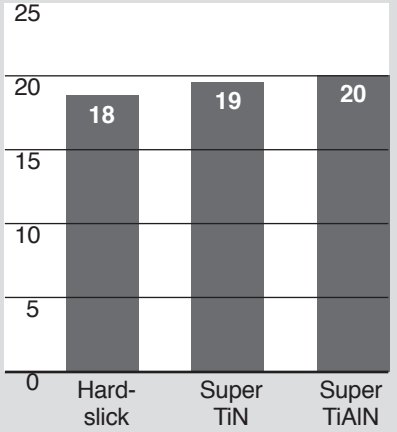
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SPADE BLADE INSERTS SELECTION & APPLICATIONS HSS

Toughness Values



Wear Values



- **WHEN TO USE M4**
  - Loose or Manual Machines
  - If T15 Breaks
- **WHEN TO USE T15**
  - When M4 Life needs to be Extended
  - If M48 Breaks
- **WHEN TO USE M48**
  - Extend Life T15
- **WHEN TO USE SM POINT**
  - Reduce Thrust
  - Smoother Entry
  - Improve Hole Quality
  - Higher Speeds and Feeds

SPEEDS – FEED RECOMMENDATIONS (STD POINT-SM POINT, SV POINT)

STANDARD GEOMETRY
SM POINT, SV POINT

Material	Material Hardness (BHN)	SFM Surface Footage		Feed (IPR)													
				3/8 ~ 1/2		33/64 ~ 11/16		45/64 ~ 15/16		31/32~ 1-3/8		1-13/32 ~ 1-7/8		1-29/32 ~ 2-9/16		2-19/32 ~ 4-1/2	
Free Machining Steel 1118, 1215, 12L14	100 - 150 150 - 200 200 - 250	280 260 240	330 305 285	.007 .007 .007	.008 .007 .006	.010 .010 .010	.012 .011 .010	.013 .013 .013	.016 .015 .014	.016 .016 .016	.019 .017 .016	.020 .020 .020	.020 .020 .020	.023 .023 .023	.023 .023 .023	.028 .028 .028	.028 .028 .028
Low & Medium Carbon Steel 1018, 1040, 1140		240 225 210 195	280 265 245 230	.006 .005 .005 .004	.007 .006 .006 .005	.009 .008 .008 .007	.010 .009 .009 .008	.012 .010 .010 .009	.014 .013 .013 .012	.015 .014 .014 .012	.017 .016 .016 .015	.019 .018 .018 .016	.019 .018 .018 .016	.023 .021 .021 .019	.023 .021 .021 .019	.027 .024 .024 .022	.027 .024 .024 .022
Alloy Steel 4140, 5140, 8640	125 - 175 175 - 225 225 - 275 275 - 325 325 - 375	210 195 180 170 155	245 230 215 200 185	.006 .005 .005 .004 .003	.007 .006 .006 .005 .004	.008 .008 .007 .006 .006	.010 .009 .009 .008 .007	.010 .010 .010 .009 .009	.014 .013 .013 .012 .011	.014 .014 .014 .012 .012	.017 .016 .016 .015 .014	.017 .017 .017 .015 .015	.017 .017 .017 .015 .015	.019 .019 .019 .017 .017	.019 .019 .019 .017 .017	.022 .022 .022 .020 .020	.022 .022 .022 .020 .020
High Strength Alloy Stee 4340, 4330V, 300M		110 85 70	130 105 85	.005 .004 .003	.006 .005 .004	.007 .007 .006	.009 .008 .007	.009 .009 .008	.011 .010 .009	.010 .010 .009	.013 .012 .011	.014 .014 .012	.014 .014 .012	.017 .017 .015	.017 .017 .015	.020 .020 .018	.020 .020 .018
Structural Steel A36, A285, A516	100 - 150 150 - 250 250 - 350	200 170 140	240 195 165	.006 .005 .004	.008 .006 .005	.010 .009 .008	.011 .010 .009	.012 .010 .009	.015 .013 .012	.014 .012 .010	.017 .015 .013	.018 .016 .014	.018 .016 .014	.021 .019 .017	.021 .019 .017	.026 .024 .020	.026 .024 .020
High Temp, Alloy Hastelloy B, Inconel 600		40 35	50 45	.003 .003	.004 .004	.006 .006	.007 .006	.007 .007	.009 .008	.008 .008	.011 .010	.010 .010	.012 .010	.012 .012	.015 .012	.015 .015	.017 .014
Stainless Steel 303, 416, 420, 17-4 PH	135 - 185 185 - 275	105 90	125 110	.006 .005	.007 .006	.008 .007	.009 .008	.009 .008	.012 .011	.011 .010	.014 .012	.014 .012	.014 .012	.016 .014	.016 .014	.020 .018	.020 .018
Tool Steel H-13, H021, A04, O-2, S-3		110 90	130 110	.004 .004	.004 .004	.006 .006	.007 .007	.008 .008	.010 .010	.010 .010	.012 .012	.012 .012	.012 .012	.015 .015	.015 .015	.017 .017	.017 .017
Aluminum	30 180	850 450	- -	.008 .008	- -	.013 .013	- -	.016 .016	- -	.020 .018	- -	.022 .022	.022 .022	.025 .025	.025 .025	.025 .025	.025 .025
Cast Iron Gray, Ductile, Nodular		250 225 195 165 135	295 265 230 195 160	.007 .006 .006 .005 .004	.008 .007 .006 .005 .005	.012 .011 .009 .007 .006	.012 .011 .009 .008 .007	.016 .014 .012 .009 .007	.016 .015 .013 .011 .010	.020 .018 .016 .012 .009	.020 .019 .017 .014 .011	.024 .022 .018 .014 .012	.024 .022 .018 .014 .012	.027 .025 .021 .017 .014	.027 .025 .021 .017 .014	.030 .028 .024 .020 .016	.030 .028 .024 .020 .016

The recommendations for speed, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points. Speed and feed reduction (20% reduction in speed and 10% reduction in feed) are recommended.

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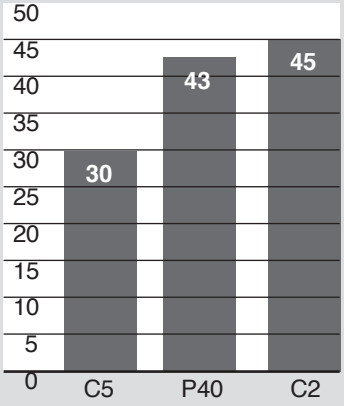
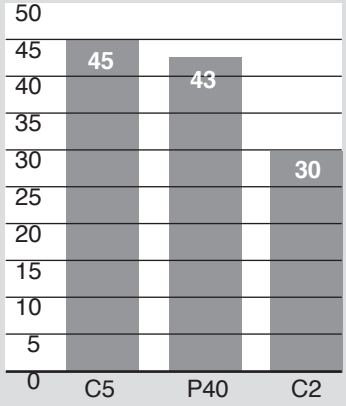
2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SPADE BLADE INSERTS SELECTION & APPLICATIONS CARBIDE

Toughness Values



Wear Values



If C5 chips try C2 at 10% – 20% lower S.F.M. than C5 rating

Grade	Geometry and Application	Stocked Coatings
P40 & C5	Steel Cutting	Super TiN TiAlN
C3	Cast Iron	Super TiN TiAlN
P40 & C2	Ductile Iron Stainless Steel Aluminum Exotic Alloys	Super TiN TiAlNE

Note : Carbide has a lower transverse rupture strength than HSS and is prone to chipping and breakage.

Recutting of chips or lack of rigidity can cause breakage.

Check Coolant Recommendations Chart on Page 461 for flow rates.

SPEEDS – FEED RECOMMENDATIONS (STD POINT-SM POINT, SV POINT)

STANDARD GEOMETRY

SM POINT, SV POINT

Material	Material Hardness (BHN)	SFM Surface Footage		Feed (IPR) 3/8 ~ 1/2		33/64 ~ 11/16		45/64 ~ 15/16		31/32 ~ 1-3/8		1-13/32 ~ 1-7/8	
Free Machining Steel 1118, 1215, 12L14	100 - 150	420	485	.006	.008	.009	.012	.012	.016	.015	.019	.019	-
	150 - 200	360	420	.006	.007	.008	.011	.011	.015	.013	.017	.017	-
	200 - 250	340	395	.005	.006	.008	.010	.010	.014	.012	.016	.015	-
Low & Medium Carbon Steel 1018, 1040, 1140	125 - 175	340	395	.005	.007	.008	.010	.010	.014	.014	.017	.017	-
	175 - 225	310	360	.005	.006	.007	.009	.008	.013	.012	.016	.016	-
	225 - 275	270	315	.004	.006	.007	.009	.008	.013	.012	.016	.015	-
	275 - 325	230	270	.004	.005	.006	.008	.006	.012	.010	.015	.014	-
Alloy Steel 4140, 5140, 8640	125 - 175	325	380	.005	.007	.008	.010	.010	.014	.013	.017	.016	-
	175 - 225	300	350	.005	.006	.007	.009	.009	.013	.012	.016	.015	-
	225 - 275	270	315	.004	.006	.007	.009	.009	.013	.012	.016	.015	-
	275 - 325	250	290	.004	.005	.006	.008	.008	.012	.011	.015	.014	-
	325 - 375	220	260	.003	.004	.005	.007	.008	.011	.010	.014	.013	-
High Strength Alloy Stee 4340, 4330V, 300M	225 - 300	200	235	.005	.006	.007	.009	.008	.011	.010	.013	.014	-
	300 - 350	180	210	.004	.005	.006	.008	.007	.010	.009	.012	.012	-
	350 - 400	160	190	.003	.004	.005	.007	.006	.009	.008	.011	.010	-
Structural Steel A36, A285, A516	100 - 150	310	360	.006	.008	.010	.011	.011	.015	.012	.017	.016	-
	150 - 250	250	290	.005	.006	.008	.010	.009	.013	.011	.015	.015	-
	250 - 350	230	270	.004	.005	.007	.009	.008	.012	.009	.013	.013	-
High Temp, Alloy Hastelloy B, Inconel 600	140 - 220	80	125	.003	.004	.006	.007	.007	.009	.009	.011	.011	-
	220 - 310	60	100	.003	.004	.005	.006	.006	.008	.008	.010	.010	-
Stainless Steel 303, 416, 420, 17-4 PH	135 - 185	210	245	.006	.007	.008	.009	.009	.012	.011	.014	.013	-
	185 - 275	160	190	.005	.006	.007	.008	.008	.011	.010	.012	.011	-
Tool Steel H-13, H021, A04, 0-2, S-3	150 - 200	220	260	.003	.004	.005	.007	.007	.010	.009	.012	.011	-
	200 - 250	170	200	.003	.004	.005	.007	.007	.010	.009	.012	.011	-
Aluminum	30	1500	-	.008	-	.013	-	.016	-	.020	-	.022	-
	180	1000	-	.007	-	.011	-	.014	-	.018	-	.020	-
Cast Iron Gray, Ductile, Nodular	120 - 150	460	505	.006	.008	.009	.012	.011	.015	.015	.019	.020	-
	150 - 200	400	485	.005	.007	.008	.011	.010	.013	.014	.017	.018	-
	200 - 220	360	435	.005	.006	.007	.009	.008	.012	.012	.015	.015	-
	220 - 260	310	375	.004	.005	.006	.008	.007	.011	.010	.013	.013	-
	260 - 320	270	340	.004	.005	.005	.007	.006	.010	.008	.011	.011	-

The recommendations for speed, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points. Speed and feed reduction (20% reduction in speed and 10% reduction in feed) are recommended.

2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

SUPER COBALT (T15) FLAT BOTTOM

Material	Material Hardness (BHN)	Speed (SFM)		Feed			
		TiN	TiAlN	3/8 ~ 1/2	33/64 ~ 11/16	45/64 ~ 15/16	31/32 ~ 1-3/8
Free machining Steel 1213, 12L13, 1215 12L14, 1118	100 - 150 150 - 200 200 - 250	165 150 135	220 215 190	0.005 0.005 0.004	0.007 0.007 0.007	0.010 0.010 0.010	0.013 0.013 0.012
Low Carbon Steel 1015, 1020, 1140, 1025	85 - 125 125 - 175 175 - 225 225 - 275	140 135 125 115	195 190 180 175	0.005 0.005 0.004 0.004	0.007 0.007 0.006 0.006	0.009 0.009 0.008 0.008	0.012 0.012 0.011 0.011
Medium Carbon Steel 1035, 1050, 1045 1055, 1140	125 - 175 175 - 225 225 - 275 275 - 325	135 125 115 105	195 180 165 150	0.004 0.004 0.004 0.003	0.007 0.006 0.006 0.005	0.009 0.007 0.007 0.007	0.011 0.011 0.011 0.009
Structural Steel A36, A516, A182	100 - 150 150 - 250 250 - 350	115 100 80	165 140 115	0.004 0.004 0.003	0.007 0.007 0.006	0.009 0.008 0.007	0.011 0.009 0.008
Cast Iron / S,G Iron A48-76 GR30/GR45 A536-72 60-40-18 A220-76 GR40010	120 - 150 150 - 200 200 - 220 220 - 260 260 - 320	145 130 110 95 80	215 190 165 150 120	0.005 0.005 0.005 0.004 0.004	0.010 0.008 0.008 0.006 0.005	0.014 0.011 0.010 0.008 0.006	0.016 0.016 0.014 0.010 0.008
Alloy Steel 8620, 4130, 4137 4140, 6150	125 - 175 175 - 225 225 - 275 275 - 325 325 - 375	125 115 105 100 90	165 150 145 140 120	0.005 0.004 0.004 0.003 0.003	0.006 0.006 0.005 0.005 0.005	0.008 0.008 0.007 0.007 0.007	0.011 0.011 0.011 0.009 0.009
Tool Steel H13, H21, A2, S1	150 - 200 200 - 250	65 45	90 75	0.003 0.003	0.005 0.005	0.006 0.006	0.008 0.008
High Temp. Alloy Hastelloy B,Inconel	140 - 220 220 - 310 225 - 300	20 15 65	30 25 90	0.003 0.003 0.004	0.005 0.004 0.006	0.006 0.006 0.007	0.008 0.006 0.008
High Strength Alloy 9840, 4340, 4330V	300 - 350 350 - 400	45 40	70 60	0.003 0.003	0.006 0.005	0.007 0.006	0.008 0.007
Aluminium 2014, 6061, 7075	30 180	520 255	700 390	0.007 0.007	0.011 0.011	0.014 0.014	0.017 0.016
Stainless Steel 310, 316, 410, 330	135 - 185 185 - 275	60 50	90 80	0.005 0.004	0.007 0.006	0.008 0.007	0.009 0.009

RPM = revolution per minute (rev/min)
SFM = surface feet per minute (ft/min)
DIA = diameter of drill (inch)
IPR = feed rate (in/rev)
IPM = inch per minute penetration rate

*** Formulas :**

$$SFM = (RPM) \cdot (.262) \cdot (DIA.)$$

$$IPM = (RPM) \cdot (IPR)$$

$$RPM = \frac{(SFM) \cdot (3.82)}{(DIA.)}$$

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.

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2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

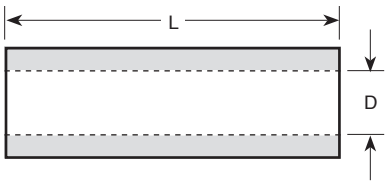
SPADE BLADE INSERTS HORSEPOWER CONSUMPTION RATE

Metal Removal Rates (MRR)

Example : 1.50 Dia. Drill @ 6.412 I.P.M.

Volume of Cylinder Method : D^2x.785xL

D = Hole Diameter
L = Length in I.P.M.
.785 is Constant



Material Drilled 4140 250 BHN :
Cutting Data : 180 S.F.M. (458 R.P.M.) x .014 Feed per Rev.

458 R.P.M. x .014 = 6.412 I.P.M. (L)

D^2 $(1.5)^2$ x .785 x L (6.412) = 11.3 C.U.In./ Min (MRR)

MRR of 11.3 x 1.4 Energy Value = 15.8HP.

metal removal rates (mrR)

- Cubic inches of metal removal per unit of horsepower.
- Unit horsepower (HP_u) is the amount of power to remove a volume of metal in a period of time.
  - HP_u = power to cut 1 cubic inch per minute – found in tables

Average Unit Horsepower Values of Energy Per Unit Volume		
Material	BHN	HP_u (HP/(in^3/min.))
Carbon Steels	150-200	1.0
	200-250	1.4
	250-350	1.6
Leaded Steels	150-175	0.7
Cast Irons	125-190	0.5
	190-250	1.6
Stainless Steels	135-275	1.5
Aluminum Alloys	50-100	0.3
Magnesium Alloys	40-90	0.2
Copper	125-140	0.7
Copper Alloys	100-150	0.7

2-FLUTE EXCHANGEABLE DRILLS WITH INTERNAL COOLANT

COOLANT RECOMMENDATIONS (SPADE BLADE)

Material	Material Hardness (BHN)	Coolant Pressure (PSi) / Coolant Volumetric Flowrate (GPM)						
		3/8 ~ 1/2	33/64 ~ 11/16	23/32 ~ 1	1 ~ 1-1/4	1-1/4 ~ 2	2 ~ 3	3 ~ 4
Free Machining Steel 1118, 1215, 12L14, etc.	100 – 250	175-185 2.5-2.6	100-120 2.8-3.0	105-140 4.4-5.2	80-115 7-8	75-100 12-14	40-50 30-33	65-90 38-44
Low Carbon Steel 1010, 1020, 1025, 1522, etc.	85 – 275	165-170 2.4-2.5	75-90 2.4-2.6	75-95 3.7-4.2	60-80 6-7	55-75 11-12	30-40 26-30	50-65 33-38
Medium Carbon Steel 1030,1040,1050,1527,1140,1151,etc.	125 – 325	160-165 2.3-2.4	70-85 2.3-2.6	70-90 3.6-4.1	55-75 5-6	50-70 10-12	30-40 26-30	50-65 33-38
Alloy Steel 4140, 5140, 8640, etc.	125 – 375	160-165 2.3-2.4	66-75 2.2-2.4	65-80 3.5-3.9	50-70 5-6	45-60 10-11	30-35 26-28	40-50 30-33
High Strength Alloy 4340, 4330V, 300M, etc.	225 – 400	150-155 2.3-2.4	55-60 2.1-2.2	45-50 2.9-3.1	25-30 4-5	25-30 7-8	20-25 21-23	25-30 23-26
Structural Steel A36, A285, A516, etc.	100 – 350	160-165 2.3-2.4	75-85 2.4-2.6	65-80 3.5-3.9	40-55 5-6	40-50 9-10	25-30 23-26	40-50 30-33
High Temp. Alloy Hastelloy B, Inconel 600, etc.	140 – 310	150-155 2.3-2.4	60-65 2.2-2.3	50-55 3.1-3.2	30-35 4-5	25-30 7-8	25-30 23-26	- -
Stainless Steel 301, 316, 330, 17-4PH, etc.	135 – 275	165-170 2.4-2.5	70-85 2.3-2.6	65-75 3.5-3.7	40-55 5-6	40-50 9-10	25-30 23-26	35-45 28-31
Tool Steel H-13, H-21, A-4, O-2, S-3, etc.	150 – 250	150-155 2.3-2.4	55-60 2.1-2.2	45-50 2.9-3.1	25-30 4-5	25-30 7-8	20-25 21-23	25-30 23-26
Aluminum	30 – 180	190-210 2.6-2.7	140-180 3.3-3.7	150-200 5.3-6.1	115-160 8-9	90-125 14-16	40-50 30-33	60-80 36-42
Cast Iron	120 – 320	155-160 2.3-2.4	60-65 2.2-2.3	50-60 3.1-3.3	30-40 4-5	30-35 8-9	25-30 23-26	30-35 26-28

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