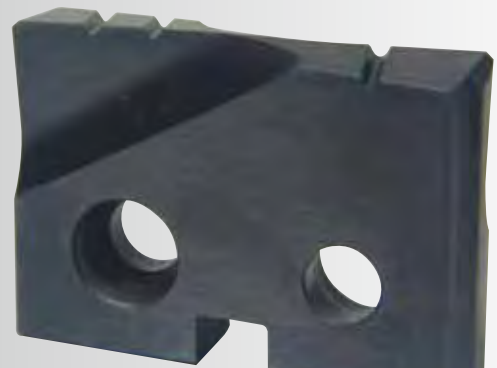
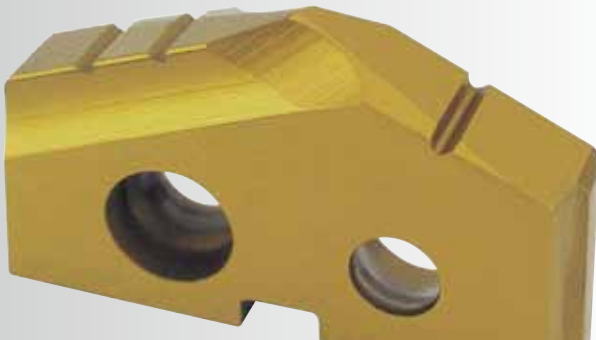




Being the best through innovation

INSERTS & HOLDERS

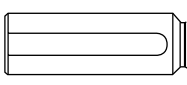
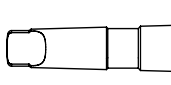
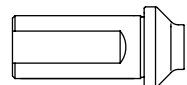


SPADE DRILLS

- Carbide for Long Tool Life, and HSS-PM for General Machines and Large Diameters
Higher Productivity than Other Drilling Tools

SELECTION GUIDE

SPADE DRILL INSERTS & HOLDER

ITEM	MODEL	DESCRIPTION	SIZE		PAGE
			MIN	MAX	
SERIES 1~8		SPADE DRILL INSERTS - HSS M4	.7031 (#1)	4.5000 (#8)	242
SERIES Y,Z,0,1~8		SPADE DRILL INSERTS - SUPER HSS T15	.3740 (#Y)	4.5000 (#8)	246
SERIES Y,Z,0,1,2		SPADE DRILL INSERTS - PREMIUM HSS M48	.3740 (#Y)	1.3780 (#2)	253
SERIES Y,Z,0,1~3		CARBIDE BLADE INSERTS-C2(K20)	.3740 (#Y)	1.8750 (#3)	256
SERIES Y,Z,0,1~3		CARBIDE BLADE INSERTS-C5(P40)	.3740 (#Y)	1.8750 (#3)	256
SERIES Y,Z,0,1~2		CARBIDE BLADE INSERTS-C3(K10)	.3740 (#Y)	1.3780 (#2)	256
SERIES Y,Z,0,1~8		SM-POINT SPADE DRILL INSERTS - SUPER COBALT(T15)	.3740 (#Y)	4.5000 (#8)	262
SERIES Y,Z,0,1~3		SM-POINT SPADE DRILL INSERTS - CARBIDE(C5)	.3740 (#Y)	1.8750 (#3)	266
SERIES Y,Z,0,1,2		SPADE DRILL FLAT BOTTOM INSERTS - SUPER COBALT T15	.3750 (#Y)	1.3750 (#2)	268
STRAIGHT SHANK		SPADE DRILL HOLDER - STRAIGHT SHANK			269
TAPER SHANK		SPADE DRILL HOLDER - TAPER SHANK			273
FLANGED SHANK		SPADE DRILL HOLDER - FLANGED SHANK			275
		HOLDER ACCESSORIES			277
		RECOMMENDED CUTTING CONDITIONS			278

◎ : 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
○	○	○	○		○		○	○			◎	◎	○	◎	◎
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○
○	○	○	○	○	◎	◎	○	○	○	○	◎	○	○	◎	◎
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○
												◎	◎		
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○



SPADE DRILL INSERTS - HSS M4

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

POINT ANGLE - under 2-1/2 : 132 degree
 - over 2-1/2 : 144 degree



cutting conditions : p.278

Series Min. to Max. (inch/mm)	Diameter			Thick Metric (inch/mm)	EDP No. HSS (M4)		
	Fractional (inch)	Metric (mm)	Decimal (inch)		TiN	TiAIN	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
2 .961 (24.41) to 1.380 (35.05)	29/32	23.02	.9063	3/16 (4.8)	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
	31/32	24.61	.9688		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
○	○	○	○	○	○	○	○	○			◎	◎	○	◎	◎

SPADE DRILL INSERTS - HSS M4

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

POINT ANGLE - under 2-1/2 : 132 degree
 - over 2-1/2 : 144 degree



cutting conditions : p.278

Series Min. to Max. (inch/mm)	Diameter			Thick Metric (inch/mm)	EDP No. HSS (M4)		
	Fractional (inch)	Metric (mm)	Decimal (inch)		TiN	TiAIN	Hardslick
2 .961 (24.41) to 1.380 (35.05)	1-3/32	27.78	1.0938	3/16 (4.8)	SO1209	SO3209	SO4209
		28.00	1.1024		SO1210	SO3210	SO4210
	1-7/64	28.18	1.1094		SO1261	SO3261	SO4261
	1-1/8	28.58	1.1250		SO1211	SO3211	SO4211
		29.00	1.1417		SO1212	SO3212	SO4212
	1-5/32	29.37	1.1563		SO1213	SO3213	SO4213
		30.00	1.1811		SO1214	SO3214	SO4214
	1-3/16	30.16	1.1875		SO1215	SO3215	SO4215
	1-7/32	30.96	1.2188		SO1216	SO3216	SO4216
		31.00	1.2205		SO1217	SO3217	SO4217
	1-1/4	31.75	1.2500		SO1218	SO3218	SO4218
		32.00	1.2598		SO1219	SO3219	SO4219
	1-9/32	32.54	1.2813		SO1220	SO3220	SO4220
		33.00	1.2992		SO1221	SO3221	SO4221
	1-5/16	33.34	1.3125		SO1222	SO3222	SO4222
		34.00	1.3386		SO1223	SO3223	SO4223
3 1.353 (34.37) to 1.882 (47.80)	1-13/32	35.72	1.4063	1/4 (6.4)	SO1224	SO3224	SO4224
		36.00	1.4173		SO1225	SO3225	SO4225
	1-7/16	36.51	1.4375		SO1226	SO3226	SO4226
		37.00	1.4567		SO1301	SO3301	SO4301
	1-15/32	37.31	1.4688		SO1302	SO3302	SO4302
		38.00	1.4961		SO1303	SO3303	SO4303
	1-1/2	38.10	1.5000		SO1304	SO3304	SO4304
	1-17/32	38.89	1.5313		SO1305	SO3305	SO4305
		39.00	1.5354		SO1306	SO3306	SO4306
	1-9/16	39.69	1.5625		SO1307	SO3307	SO4307
		40.00	1.5748		SO1308	SO3308	SO4308
	1-19/32	40.48	1.5938		SO1309	SO3309	SO4309
		41.00	1.6142		SO1310	SO3310	SO4310
	1-5/8	41.28	1.6250		SO1311	SO3311	SO4311
		42.00	1.6535		SO1312	SO3312	SO4312
					SO1313	SO3313	SO4313
					SO1314	SO3314	SO4314
					SO1315	SO3315	SO4315

◎ : Excellent ○ : Good

P										M	K			N	
Non-alloy Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels	Stainless Steels	Cast Iron			Aluminum	Copper Alloys
~HRC24 (~HB250)	~HRC28 (~HB275)	HRC28~ (HB275~)	~HRC28 (~HB275)	HRC28~ (HB275~)	~HRC37 (~HB350)	HRC37~ (HB350~)	~HRC24 (~HB250)	HRC24~ (HB250~)	~HRC13 (~HB200)	HRC13~ (HB200~)	~HRC28 (~HB275)	~HRC19 (~HB220)	HRC19~ (HB220~)	~HRC8 (~HB180)	~HB110
○	○	○	○		○		○	○			◎	◎	○	◎	◎



SPADE DRILL INSERTS - HSS M4

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

POINT ANGLE - under 2-1/2 : 132 degree
 - over 2-1/2 : 144 degree



cutting conditions : p.278

Series Min. to Max. (inch/mm)	Diameter			Thick Metric (inch/mm)	EDP No. HSS (M4)		
	Fractional (inch)	Metric (mm)	Decimal (inch)		TiN	TiAIN	Hardslick
3 1.353 (34.37) to 1.882 (47.80)	1-21/32	42.07	1.6563	1/4 (6.4)	SO1316	SO3316	SO4316
	1-11/16	42.86	1.6875		SO1317	SO3317	SO4317
		43.00	1.6929		SO1318	SO3318	SO4318
	1-23/32	43.66	1.7188		SO1319	SO3319	SO4319
		44.00	1.7323		SO1320	SO3320	SO4320
	1-3/4	44.45	1.7500		SO1321	SO3321	SO4321
		45.00	1.7717		SO1322	SO3322	SO4322
	1-25/32	45.24	1.7813		SO1323	SO3323	SO4323
		46.00	1.8110		SO1324	SO3324	SO4324
	1-13/16	46.04	1.8125		SO1325	SO3325	SO4325
	1-27/32	46.83	1.8438		SO1326	SO3326	SO4326
		47.00	1.8504		SO1327	SO3327	SO4327
4 1.850 (46.99) to 2.570 (65.28)	1-7/8	47.63	1.8750	5/16 (7.9)	SO1328	SO3328	SO4328
	1-29/32	48.42	1.9063		SO1402	SO3402	SO4402
	1-15/16	49.21	1.9375		SO1404	SO3404	SO4404
	1-31/32	50.01	1.9688		SO1406	SO3406	SO4406
	2	50.80	2.0000		SO1407	SO3407	SO4407
	2-1/32	51.59	2.0313		SO1409	SO3409	SO4409
	2-3/64	52.00	2.0472		SO1410	SO3410	SO4410
	2-1/16	52.39	2.0625		SO1411	SO3411	SO4411
	2-3/32	53.18	2.0938		SO1413	SO3413	SO4413
	2-1/8	53.98	2.1250		SO1414	SO3414	SO4414
	2-5/32	54.77	2.1563		SO1416	SO3416	SO4416
	2-3/16	55.56	2.1875		SO1418	SO3418	SO4418
	2-7/32	56.36	2.2188		SO1420	SO3420	SO4420
	2-1/4	57.15	2.2500		SO1422	SO3422	SO4422
	2-9/32	57.94	2.2813		SO1423	SO3423	SO4423
	2-5/16	58.74	2.3125		SO1425	SO3425	SO4425
	2-11/32	59.53	2.3438		SO1427	SO3427	SO4427
	2-3/8	60.33	2.3750		SO1429	SO3429	SO4429
	2-13/32	61.12	2.4063		SO1431	SO3431	SO4431
	2-7/16	61.91	2.4375		SO1432	SO3432	SO4432
	2-15/32	62.71	2.4688		SO1434	SO3434	SO4434
	2-1/2	63.50	2.5000		SO1436	SO3436	SO4436

◎ : 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
○	○	○	○		○		○	○				◎	◎	○	◎	◎

SPADE DRILL INSERTS - HSS M4

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

POINT ANGLE - under 2-1/2 : 132 degree
 - over 2-1/2 : 144 degree



cutting conditions : p.278

Series Min. to Max. (inch/mm)	Diameter			Thick Metric (inch/mm)	EDP No. HSS (M4)		
	Fractional (inch)	Metric (mm)	Decimal (inch)		TiN	TiAlN	Hardslick
4	2-17/32	64.29	2.5313	5/16 [7.9]	SO1438	SO3438	SO4438
	2-9/16	65.09	2.5625		SO1440	SO3440	SO4440
5 2.456 (62.38) to 3.000 (76.20)	2-1/2	63.50	2.5000	7/16 [11.1]	SO1501	SO3501	SO4501
	2-5/8	66.68	2.6250		SO1507	SO3507	SO4507
	2-3/4	69.85	2.7500		SO1512	SO3512	SO4512
	2-25/32	70.64	2.7813		SO1514	SO3514	SO4514
	2-13/16	71.44	2.8125		SO1515	SO3515	SO4515
	2-27/32	72.23	2.8438		SO1517	SO3517	SO4517
	2-7/8	73.03	2.8750		SO1518	SO3518	SO4518
	2-29/32	73.82	2.9063		SO1519	SO3519	SO4519
	2-15/16	74.61	2.9375		SO1521	SO3521	SO4521
	2-31/32	75.41	2.9688		SO1522	SO3522	SO4522
	3	76.20	3.0000		SO1524	SO3524	SO4524
6 3.001(76.23) to 3.507(89.08)	3-1/16	77.79	3.0625	7/16 [11.1]	SO1602	SO3602	SO4602
	3-1/8	79.38	3.1250		SO1605	SO3605	SO4605
	3-1/4	82.55	3.2500		SO1611	SO3611	SO4611
	3-3/8	85.73	3.3750		SO1616	SO3616	SO4616
	3-7/16	87.31	3.4375		SO1619	SO3619	SO4619
	3-1/2	88.90	3.5000		SO1622	SO3622	SO4622
7 3.455 (87.76) to 4.000 (101.60)	3-9/16	90.49	3.5625	7/16 [11.1]	SO1703	SO3703	SO4703
	3-5/8	92.08	3.6250		SO1706	SO3706	SO4706
	3-3/4	95.25	3.7500		SO1711	SO3711	SO4711
	3-7/8	98.43	3.8750		SO1717	SO3717	SO4717
	4	101.60	4.0000		SO1722	SO3722	SO4722
8 4.001 (101.63) to 4.507 (114.48)	4-1/8	104.78	4.1250	7/16 [11.1]	SO1804	SO3804	SO4804
	4-1/4	107.95	4.2500		SO1807	SO3807	SO4807
	4-3/8	111.13	4.3750		SO1811	SO3811	SO4811
	4-1/2	114.30	4.5000		SO1815	SO3815	SO4815

◎ : Excellent ○ : Good

P										M	K	N			
Non-alloy Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRC24 (~HB250)	~HRC28 (~HB275)	HRC28~ (HB275~)	~HRC28 (~HB275)	HRC28~ (HB275~)	~HRC37 (~HB350)	HRC37~ (HB350~)	~HRC24 (~HB250)	HRC24~ (HB250~)	~HRC13 (~HB200)	HRC13~ (HB200~)	~HRC28 (~HB275)	~HRC19 (~HB220)	HRC19~ (HB220~)	~HRC8 (~HB180)	~HB110
○	○	○	○		○		○	○			◎	◎	○	◎	◎



SPADE DRILL INSERTS - SUPER COBALT(T15)

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys over 280 Brinell
- Performs best in rigid setups

POINT ANGLE - under 2-1/2 : 132 degree
 - over 2-1/2 : 144 degree



cutting conditions : p.278

Series Min. to Max. (inch/mm)	Diameter			Thick Metric (inch/mm)	EDP No. SUPER COBALT(T15)		
	Fractional (inch)	Metric (mm)	Decimal (inch)		TiN	TiAIN	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
0 .511 (12.98) to .695 (17.65)	1/2	12.70	.5000	1/8 (3.2)	* S06Z08	* S08Z08	* S09Z08
		13.00	.5118		* 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
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

SPADE DRILL INSERTS - SUPER COBALT(T15)

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys over 280 Brinell
- Performs best in rigid setups

POINT ANGLE - under 2-1/2 : 132 degree
 - over 2-1/2 : 144 degree



cutting conditions : p.278

Series Min. to Max. (inch/mm)	Diameter			Thick Metric (inch/mm)	EDP No. SUPER COBALT(T15)		
	Fractional (inch)	Metric (mm)	Decimal (inch)		TiN	TiAIN	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
1 .690 (17.53) to .960 (24.38)		17.50	.6890	5/32 (4.0)	* S06018	* S08018	* S09018
	45/64	17.86	.7031		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-alloy Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRC24 (~HB250)	~HRC28 (~HB275)	HRC28~ (HB275~)	~HRC28 (~HB275)	HRC28~ (HB275~)	~HRC37 (~HB350)	HRC37~ (HB350~)	~HRC24 (~HB250)	HRC24~ (HB250~)	~HRC13 (~HB200)	HRC13~ (HB200~)	~HRC28 (~HB275)	~HRC19 (~HB220)	HRC19~ (HB220~)	~HRC8 (~HB180)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○



SPADE DRILL INSERTS - SUPER COBALT(T15)

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys over 280 Brinell
- Performs best in rigid setups

POINT ANGLE - under 2-1/2 : 132 degree
 - over 2-1/2 : 144 degree

cutting conditions : p.278



Series Min. to Max. (inch/mm)	Diameter			Thick Metric (inch/mm)	EDP No. SUPER COBALT(T15)		
	Fractional (inch)	Metric (mm)	Decimal (inch)		TiN	TiAIN	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
3	1-11/32	34.13	1.3438	1/4 (6.4)	S06224	S08224	S09224
	1-3/8	34.93	1.3750		S06225	S08225	S09225
		35.00	1.3780		S06226	S08226	S09226
	1-13/32	35.72	1.4063		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
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

SPADE DRILL INSERTS - SUPER COBALT(T15)

- ▶ Increase wear resistance over M4
- ▶ For use in medium carbon steel to high temperature alloys over 280 Brinell
- ▶ Performs best in rigid setups

POINT ANGLE - under 2-1/2 : 132 degree
 - over 2-1/2 : 144 degree



cutting conditions : p.278

Series Min. to Max. (inch/mm)	Diameter			Thick Metric (inch/mm)	EDP No. SUPER COBALT(T15)		
	Fractional (inch)	Metric (mm)	Decimal (inch)		TiN	TiAIN	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	
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○	



SPADE DRILL INSERTS - SUPER COBALT(T15)

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys over 280 Brinell
- Performs best in rigid setups

POINT ANGLE - under 2-1/2 : 132 degree
 - over 2-1/2 : 144 degree

cutting conditions : p.278



Series Min. to Max. (inch/mm)	Diameter			Thick Metric (inch/mm)	EDP No. SUPER COBALT(T15)		
	Fractional (inch)	Metric (mm)	Decimal (inch)		TiN	TiAIN	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
	2-1/2	63.50	2.5000	7/16 (11.1)	—	—	S09501
5 2.456 (62.38) to 3.000 (76.20)		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
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

SPADE DRILL INSERTS - SUPER COBALT(T15)

- ▶ Increase wear resistance over M4
- ▶ For use in medium carbon steel to high temperature alloys over 280 Brinell
- ▶ Performs best in rigid setups

POINT ANGLE

- under 2-1/2 : 132 degree
- over 2-1/2 : 144 degree



cutting conditions : p.278

Series Min. to Max. (inch/mm)	Diameter			Thick Metric (inch/mm)	EDP No. SUPER COBALT(T15)		
	Fractional (inch)	Metric (mm)	Decimal (inch)		TiN	TiAIN	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-alloy Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRC24 (~HB250)	~HRC28 (~HB275)	HRC28~ (HB275~)	~HRC28 (~HB275)	HRC28~ (HB275~)	~HRC37 (~HB350)	HRC37~ (HB350~)	~HRC24 (~HB250)	HRC24~ (HB250~)	~HRC13 (~HB200)	HRC13~ (HB200~)	~HRC28 (~HB275)	~HRC19 (~HB220)	HRC19~ (HB220~)	~HRC8 (~HB180)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○



SPADE DRILL INSERTS - SUPER COBALT(T15)

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys over 280 Brinell
- Performs best in rigid setups

POINT ANGLE - under 2-1/2 : 132 degree
 - over 2-1/2 : 144 degree



cutting conditions : p.278

Series Min. to Max. (inch/mm)	Diameter			Thick Metric (inch/mm)	EDP No. SUPER COBALT(T15)		
	Fractional (inch)	Metric (mm)	Decimal (inch)		TiN	TiAIN	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
8 4.001 (101.63) to 4.507 (114.48)	4	101.60	4.0000	7/16 (11.1)	—	—	S09722
	4-1/64	102.00	4.0156		—	—	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
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

SPADE DRILL INSERTS - PREMIUM COBALT(M48)

- ▶ Increased tool life over T15
- ▶ For use in high temperature alloys and materials including medium carbon, Alloy and tool steels with 350~500 Brinell
- ▶ Rigid set up needed

POINT ANGLE : 132 degree



cutting conditions : p.278

Series Min. to Max. (inch/mm)	Diameter			Thick Metric (inch/mm)	EDP No. PREMIUM COBALT(M48)		
	Fractional (inch)	Metric (mm)	Decimal (inch)		TiN	TiAlN	Hardslick
Y .374 (9.50) to .436 (11.07)	3/8	9.50	.3740	3/32 (2.4)	* S11Y01	* S13Y01	* S14Y01
		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
		10.72	.4219		* S11Y09	* S13Y09	* S14Y09
	27/64	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
O .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
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○



SPADE DRILL INSERTS - PREMIUM COBALT(M48)

- ▶ Increased tool life over T15
- ▶ For use in high temperature alloys and materials including medium carbon, Alloy and tool steels with 350~500 Brinell
- ▶ Rigid set up needed

POINT ANGLE : 132 degree



cutting conditions : p.278

Series Min. to Max. (inch/mm)	Diameter			Thick Metric (inch/mm)	EDP No. PREMIUM COBALT(M48)		
	Fractional (inch)	Metric (mm)	Decimal (inch)		TiN	TiAIN	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
1 .690 (17.53) to .960 (24.38)		17.50	.6890	5/32 (4.0)	* S11018	* S13018	* S14018
	45/64	17.86	.7031		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
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○

SPADE DRILL INSERTS - PREMIUM COBALT(M48)

- ▶ Increased tool life over T15
- ▶ For use in high temperature alloys and materials including medium carbon, Alloy and tool steels with 350~500 Brinell
- ▶ Rigid set up needed

POINT ANGLE : 132 degree



cutting conditions : p.278

Series Min. to Max. (inch/mm)	Diameter			Thick Metric (inch/mm)	EDP No. PREMIUM COBALT(M48)		
	Fractional (inch)	Metric (mm)	Decimal (inch)		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
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○



CARBIDE BLADE INSERTS(C2,C5,C3)

- ▶ 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 up to 220 Brinell, nonferrous metals, copper, brass and aluminum. (C2)

POINT ANGLE : 132 degree



cutting conditions : p.279

Series Min. to Max. (inch/mm)	Diameter			Thick Metric (inch/mm)	EDP No.					
	Fractional (inch)	Metric (mm)	Decimal (inch)		Multi purpose Geometry				Cast Iron Geometry	
					C2(K20)		C5(P40)		C3(K10)	
					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-alloy Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
		~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)
C2	○	○	○	○	○	⊗	⊗	○	○	○	○	⊗	○	○	⊗	⊗
C5	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	○	○	○	○	○
C3													⊗	⊗		

CARBIDE BLADE INSERTS(C2,C5,C3)

- ▶ 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 up to 220 Brinell, nonferrous metals, copper, brass and aluminum. (C2)

POINT ANGLE : 132 degree



cutting conditions : p.279

Series Min. to Max. (inch/mm)	Diameter			Thick Metric (inch/mm)	EDP No.					
	Fractional (inch)	Metric (mm)	Decimal (inch)		Multi purpose Geometry				Cast Iron Geometry	
					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-alloy Steels, Free Machining Steels	Carbon Steels			Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
		~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
C2	○	○	○	○	○	◎	◎	○	○	○	○	◎	○	○	◎	◎	
C5	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	
C3													◎	◎			



CARBIDE BLADE INSERTS(C2,C5,C3)

- ▶ 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 up to 220 Brinell, nonferrous metals, copper, brass and aluminum. (C2)

POINT ANGLE : 132 degree



cutting conditions : p.279

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.					
	Fractional (inch)	Metric (mm)	Decimal (inch)		Metric (inch/mm)	Multi purpose Geometry				Cast Iron Geometry
				C2(K20)		C5(P40)		C3(K10)		
				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		S21112	S23112	S26112	S28112	S16112	S18112
		20.50	.8071		S21113	S23113	S26113	S28113	S16113	S18113
	13/16	20.64	.8125		S21114	S23114	S26114	S28114	S16114	S18114
		21.00	.8268		S21115	S23115	S26115	S28115	S16115	S18115
	27/32	21.43	.8438		S21116	S23116	S26116	S28116	S16116	S18116
	55/64	21.83	.8594		S21117	S23117	S26117	S28117	S16117	S18117
		22.00	.8661		S21118	S23118	S26118	S28118	S16118	S18118
	7/8	22.23	.8750		S21119	S23119	S26119	S28119	S16119	S18119
	57/64	22.62	.8906		S21120	S23120	S26120	S28120	S16120	S18120
		23.00	.9055		S21121	S23121	S26121	S28121	S16121	S18121
	29/32	23.02	.9063		S21122	S23122	S26122	S28122	S16122	S18122
	59/64	23.42	.9219							
	15/16	23.81	.9375							
		24.00	.9449							

● : 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	○	○	○	○	○	◎	◎	○	○	○	○	◎	○	○	◎	◎
C5	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○
C3													◎	◎		

CARBIDE BLADE INSERTS(C2,C5,C3)

- ▶ 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 up to 220 Brinell, nonferrous metals, copper, brass and aluminum. (C2)

POINT ANGLE : 132 degree



cutting conditions : p.279

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.					
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	Multi purpose Geometry				Cast Iron Geometry	
					C2(K20)		C5(P40)		C3(K10)	
					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		
	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	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
C5	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
C3												○	○			



CARBIDE BLADE INSERTS(C2,C5,C3)

- ▶ 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 up to 220 Brinell, nonferrous metals, copper, brass and aluminum. (C2)

POINT ANGLE : 132 degree



cutting conditions : p.279

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.					
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	Multi purpose Geometry				Cast Iron Geometry	
					C2(K20)		C5(P40)		C3(K10)	
					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	○	○	○	○	○	◎	◎	○	○	○	○	◎	○	○	◎	◎
C5	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○
C3													◎	◎		



Special features of SM-Point Spade Drill

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

This new 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

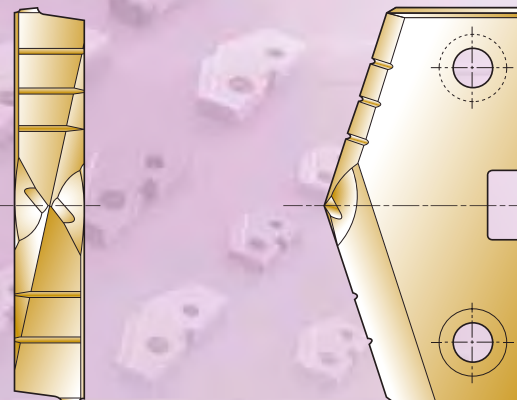
- ▶ Wide chip space

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





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

- ▶ 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



cutting conditions : p.278

Series Min. to Max. (inch/mm)	Diameter			EDP No.	Series Min. to Max. (inch/mm)	Diameter			EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	TiAlN		Fractional (inch)	Metric (mm)	Decimal (inch)	TiAlN
Y .374 (9.50) to .436 (11.07) Thick 3/32 (2.4)		9.50	.3740	* SM08Y01	0 .511 (12.98) to .695 (17.65)		16.00	.6299	* SM08013
	3/8	9.53	.3750	* SM08Y02		41/64	16.27	.6406	* SM08062
		9.80	.3858	* SM08Y03			16.50	.6496	* SM08014
	25/64	9.92	.3906	* SM08Y04		21/32	16.67	.6562	* SM08015
		10.00	.3937	* SM08Y05			17.00	.6693	* SM08016
		10.20	.4016	* SM08Y06		43/64	17.07	.6719	* SM08063
	13/32	10.32	.4062	* SM08Y07		11/16	17.46	.6875	* SM08017
		10.50	.4134	* SM08Y08			17.50	.6890	* SM08018
	27/64	10.72	.4219	* SM08Y09		45/64	17.86	.7031	SM08101
		10.80	.4252	* SM08Y10			18.00	.7087	SM08102
		11.00	.4331	* SM08Y11		23/32	18.26	.7188	SM08103
Z .437 (11.11) to .510 (12.95) 3/32(2.4)	7/16	11.11	.4375	* SM08Z01		18.50	.7283	SM08104	
		11.50	.4528	* SM08Z02	47/64	18.65	.7344	SM08105	
	29/64	11.51	.4531	* SM08Z03		19.00	.7480	SM08106	
	15/32	11.91	.4688	* SM08Z04	3/4	19.05	.7500	SM08107	
		12.00	.4724	* SM08Z05	49/64	19.45	.7656	SM08108	
	31/64	12.30	.4844	* SM08Z06		19.50	.7677	SM08109	
		12.50	.4921	* SM08Z07	25/32	19.84	.7812	SM08110	
	1/2	12.70	.5000	* SM08Z08		20.00	.7874	SM08111	
		13.00	.5118	* SM08001	51/64	20.24	.7969	SM08160	
	33/64	13.10	.5156	* SM08002		20.50	.8071	SM08112	
	17/32	13.49	.5312	* SM08003	13/16	20.64	.8125	SM08113	
0 .511 (12.98) to .695 (17.65) Thick 1/8 (3.2)		13.50	.5315	* SM08004		21.00	.8268	SM08114	
	35/64	13.89	.5469	* SM08060	27/32	21.43	.8438	SM08115	
		14.00	.5512	* SM08005	55/64	21.83	.8594	SM08161	
	9/16	14.29	.5625	* SM08006		22.00	.8661	SM08116	
		14.50	.5709	* SM08007	7/8	22.23	.8750	SM08117	
	37/64	14.68	.5781	* SM08008	57/64	22.62	.8906	SM08162	
		15.00	.5906	* SM08009		23.00	.9055	SM08118	
	19/32	15.08	.5938	* SM08010	29/32	23.02	.9062	SM08119	
	39/64	15.48	.6094	* SM08061	59/64	23.42	.9219	SM08120	
		15.50	.6102	* SM08011	15/16	23.81	.9375	SM08121	
	5/8	15.88	.6250	* SM08012		24.00	.9449	SM08122	

* 2pcs per package

◎ : Excellent ○ : Good

P										M	K	N			
Non-alloy Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

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

- ▶ 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



cutting conditions : p.278

Series Min. to Max. (inch/mm)	Diameter			EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	TiAIN
2 .961 (24.41) to 1.380 (35.05) Thick 3/16 (4.8)	31/32	24.61	.9688	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			EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	TiAIN
3 1.353 (34.37) to 1.882 (47.80) Thick 1/4 (6.4)	1-13/32	35.72	1.4062	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
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○



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

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

POINT ANGLE - under 2-1/2 : 132 degree
 - over 2-1/2 : 144 degree



cutting conditions : p.278

Series Min. to Max. (inch/mm)	Diameter			EDP No. TiAlN
	Fractional (inch)	Metric (mm)	Decimal (inch)	
4 1.850 (46.99) to 2.570 (65.28) Thick 5/16 (7.9)		48.00	1.8898	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			EDP No. TiAlN
	Fractional (inch)	Metric (mm)	Decimal (inch)	
4 1.850 (46.99) to 2.570 (65.28)	2-15/32	62.00	2.4409	SM08433
		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
	2-1/2	63.50	2.5000	SM08501
		64.00	2.5197	SM08502
5 2.456 (62.38) to 3.000 (76.20) Thick 7/16 (11.1)	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
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

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

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

POINT ANGLE : 144 degree



cutting conditions : p.278

Series Min. to Max. (inch/mm)	Diameter			EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	TiAIN
6 3.001 (76.23) to 3.507 (89.08) Thick 7/16 (11.1)	3-1/32	76.99	3.0312	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
7 3.455 (87.76) to 4.000 (101.60) Thick 7/16 (11.1)	3-7/16	87.31	3.4375	SM08619
		88.00	3.4646	SM08620
	3-15/32	88.11	3.4688	SM08621
	3-1/2	88.90	3.5000	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			EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	TiAIN
7 3.455 (87.76) to 4.000 (101.60) Thick 7/16 (11.1)		94.00	3.7008	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
8 4.001 (101.63) to 4.507 (114.48) Thick 7/16 (11.1)	3-31/32	100.81	3.9688	SM08721
	4	101.60	4.0000	SM08722
	4-1/64	102.00	4.0156	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
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○



SM-POINT SPADE DRILL INSERTS - CARBIDE(C5)

- ▶ 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.279

Series Min. to Max. (inch/mm)	Diameter			EDP No.	Series Min. to Max. (inch/mm)	Diameter			EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	TiAlN		Fractional (inch)	Metric (mm)	Decimal (inch)	TiAlN
Y .374 (9.50) to .436 (11.07) Thick 3/32 (2.4)		9.50	.3740	* SM28Y01	0 .511 (12.98) to .695 (17.65)		16.00	.6299	* SM28013
	3/8	9.53	.3750	* SM28Y02		41/64	16.27	.6406	* SM28062
		9.80	.3858	* SM28Y03			16.50	.6496	* SM28014
	25/64	9.92	.3906	* SM28Y04		21/32	16.67	.6562	* SM28015
		10.00	.3937	* SM28Y05			17.00	.6693	* SM28016
		10.20	.4016	* SM28Y06		43/64	17.07	.6719	* SM28063
	13/32	10.32	.4062	* SM28Y07		11/16	17.46	.6875	* SM28017
		10.50	.4134	* SM28Y08			17.50	.6890	* SM28018
	27/64	10.72	.4219	* SM28Y09		45/64	17.86	.7031	SM28101
		10.80	.4252	* SM28Y10			18.00	.7087	SM28102
		11.00	.4331	* SM28Y11		23/32	18.26	.7188	SM28103
Z .437 (11.11) to .510 (12.95) 3/32(2.4)	7/16	11.11	.4375	* SM28Z01		18.50	.7283	SM28104	
		11.50	.4528	* SM28Z02	47/64	18.65	.7344	SM28105	
	29/64	11.51	.4531	* SM28Z03		19.00	.7480	SM28106	
	15/32	11.91	.4688	* SM28Z04	3/4	19.05	.7500	SM28107	
		12.00	.4724	* SM28Z05	49/64	19.45	.7656	SM28108	
	31/64	12.30	.4844	* SM28Z06		19.50	.7677	SM28109	
		12.50	.4921	* SM28Z07	25/32	19.84	.7812	SM28110	
	1/2	12.70	.5000	* SM28Z08		20.00	.7874	SM28111	
		13.00	.5118	* SM28001	51/64	20.24	.7969	SM28160	
	33/64	13.10	.5156	* SM28002		20.50	.8071	SM28112	
	17/32	13.49	.5312	* SM28003	13/16	20.64	.8125	SM28113	
0 .511 (12.98) to .695 (17.65) Thick 1/8 (3.2)		13.50	.5315	* SM28004		21.00	.8268	SM28114	
	35/64	13.89	.5469	* SM28060	27/32	21.43	.8438	SM28115	
		14.00	.5512	* SM28005	55/64	21.83	.8594	SM28161	
	9/16	14.29	.5625	* SM28006		22.00	.8661	SM28116	
		14.50	.5709	* SM28007	7/8	22.23	.8750	SM28117	
	37/64	14.68	.5781	* SM28008	57/64	22.62	.8906	SM28162	
		15.00	.5906	* SM28009		23.00	.9055	SM28118	
	19/32	15.08	.5938	* SM28010	29/32	23.02	.9062	SM28119	
	39/64	15.48	.6094	* SM28061	59/64	23.42	.9219	SM28120	
		15.50	.6102	* SM28011	15/16	23.81	.9375	SM28121	
	5/8	15.88	.6250	* SM28012		24.00	.9449	SM28122	

* 2pcs per package

◎ : Excellent ○ : Good

P											M	K	N		
Non-alloy Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○

SM-POINT SPADE DRILL INSERTS - CARBIDE(C5)

- ▶ 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.279

Series Min. to Max. (inch/mm)	Diameter			EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	TiAIN
2 .961 (24.41) to 1.380 (35.05) Thick 3/16 (4.8)	31/32	24.61	.9688	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			EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	TiAIN
3 1.353 (34.37) to 1.882 (47.80) Thick 1/4 (6.4)	1-13/32	35.72	1.4062	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
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○



SPADE DRILL FLAT BOTTOM INSERTS - SUPER COBALT T15

POINT ANGLE : 180 degree



cutting conditions : p.280

Series	Diameter		EDP No.	
	Fractional (inch)	Decimal (inch)	TiN	TiAIN
Y	3/8	.3750	* SF05024	* SF15024
	13/32	.4063	* SF05026	* SF15026
Z	7/16	.4375	* SF05028	* SF15028
	15/32	.4688	* SF05030	* SF15030
0	1/2	.5000	* SF05032	* SF15032
	17/32	.5313	* SF05034	* SF15034
1	9/16	.5625	* SF05036	* SF15036
	19/32	.5938	* SF05038	* SF15038
2	5/8	.6250	* SF05040	* SF15040
	21/32	.6563	* SF05042	* SF15042
3	11/16	.6875	* SF05044	* SF15044
	23/32	.7188	SF05046	SF15046
4	3/4	.7500	SF05048	SF15048
	25/32	.7813	SF05050	SF15050
5	13/16	.8125	SF05052	SF15052
	27/32	.8438	SF05054	SF15054
6	7/8	.8750	SF05056	SF15056
	29/32	.9063	SF05058	SF15058
7	15/16	.9375	SF05060	SF15060

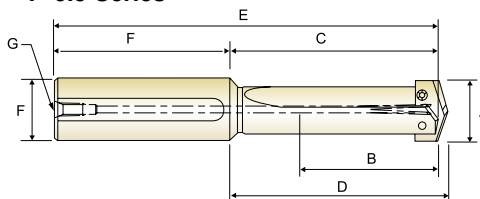
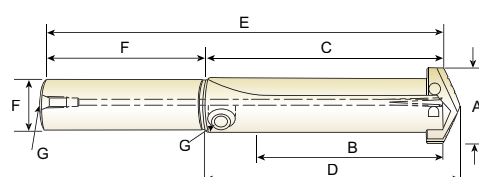
* 2pcs per package

Series	Diameter		EDP No.	
	Fractional (inch)	Decimal (inch)	TiN	TiAIN
2	31/32	.9688	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-alloy Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

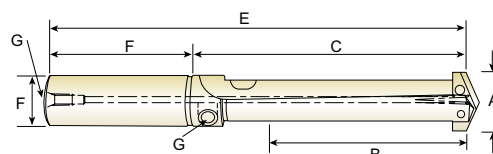
STRAIGHT SHANK HOLDER, STRAIGHT FLUTE


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
O	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

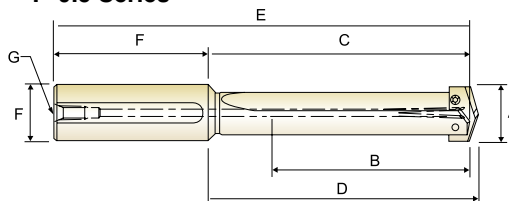
Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
1	P14102	45/64 – 15/16	4-5/8	5-7/8	6-1/64	8-7/8	1	3	1/8
1.5	P14152	55/64 – 15/16	4-5/8	5-7/8	6-1/64	8-7/8	1	3	1/8
2	P14203	31/32 – 1-3/8	5-3/8	6-1/2	6-41/64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



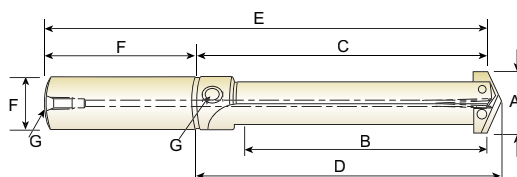
STRAIGHT SHANK HOLDER, STRAIGHT FLUTE



Y~0.5 Series



1~8 Series

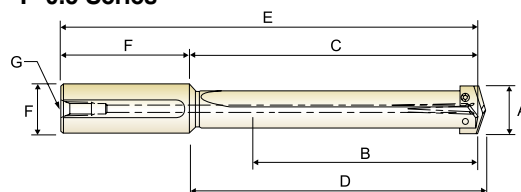
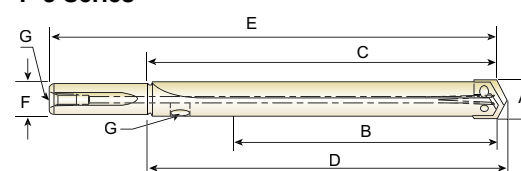


STANDARD LENGTH

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
O	P15O01	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

STRAIGHT SHANK HOLDER, STRAIGHT FLUTE

Y~0.5 Series

1~8 Series


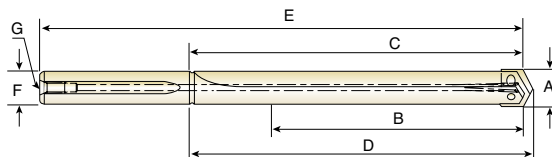
Unit : Inch

EXTENDED LENGTH

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
O	P16O01	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	P16O51	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



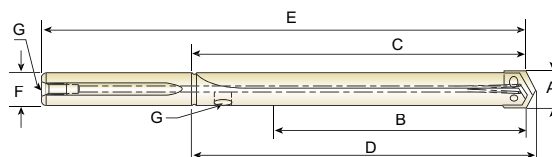
STRAIGHT SHANK HOLDER, STRAIGHT FLUTE



LONG LENGTH

Unit : Inch

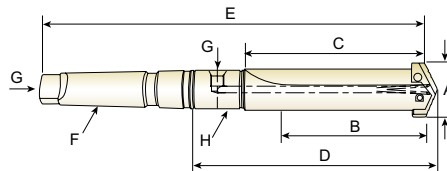
Series	EDP No.	Drill Insert Range A	Max. Drill Depth B	Flute Length C	Ref. Length D	Overall Length E	Shank		Pipe Tap G
							Dia. F	Length	
0	P17001	33/64 – 11/16	7	7-13/16	7-59/64	10-3/16	3/4	2-3/8	1/8
0.5	P17051	39/64 – 11/16	7	7-13/16	7-59/64	10-3/16	3/4	2-3/8	1/8



EXTRA LONG LENGTH

Unit : Inch

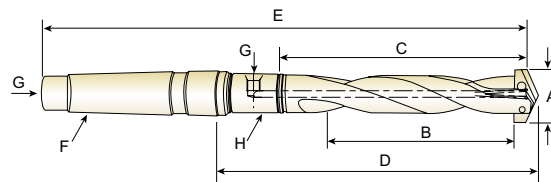
Series	EDP No.	Drill Insert Range A	Max. Drill Depth B	Flute Length C	Ref. Length D	Overall Length E	Shank		Pipe Tap G
							Dia. F	Length	
1	P17101	45/64 – 15/16	18	19-1/4	19-25/64	22-1/4	1	3	1/8
2	P17202	31/32 – 1-3/8	20-1/8	21-1/4	21-25/64	24-3/4	1-1/4	3-1/2	1/8
3	P17303	1-13/32 – 1-7/8	22	23-1/4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

TAPER SHANK HOLDER, STRAIGHT FLUTE / HELICAL FLUTE

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
O	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**(Rotary Coolant Inducer) for internal cooling. (See page 277)


INTERMEDIATE LENGTH

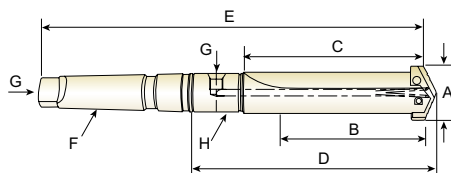
Unit : Inch

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**(Rotary Coolant Inducer) for internal cooling. (See page 277)



TAPER SHANK HOLDER, STRAIGHT FLUTE

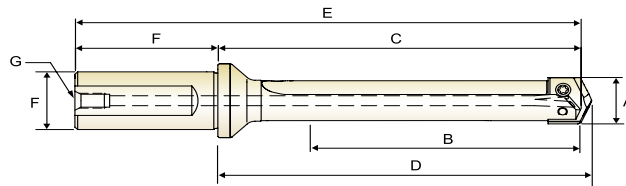


STANDARD LENGTH

Unit : Inch

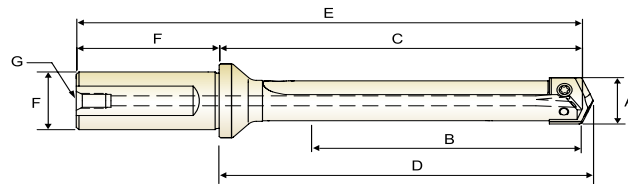
Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	MT	Pipe Tap	RCI
		A	B	C	D	E	F	G	H
Y	P03Y02	3/8 - 27/64	2-3/8	3-5/32	4-19/32	7-7/16	#2	1/16	PR1030
Z	P03Z02	7/16 - 1/2	2-3/8	3-5/32	4-19/32	7-7/16	#2	1/16	PR1030
O	P03002	33/64 - 11/16	2-1/2	3-5/16	4-49/64	7-19/32	#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(Rotary Coolant Inducer) for internal cooling. (See page 277)

FLANGED STRAIGHT SHANK HOLDER, STRAIGHT FLUTE

SHORT LENGTH SPADE DRILL HOLDER

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

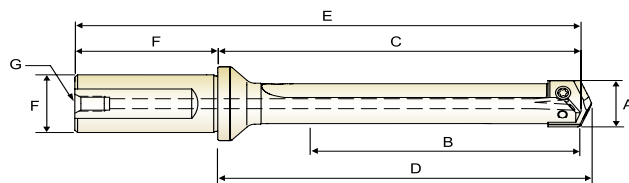

INTERMEDIATED LENGTH

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



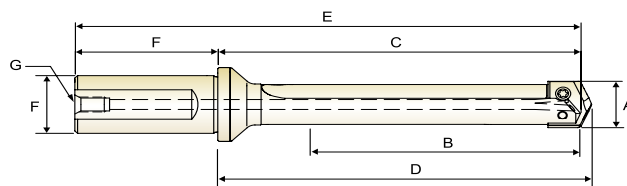
FLANGED STRAIGHT SHANK HOLDER, STRAIGHT FLUTE



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
O	P27O01	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	P27O51	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

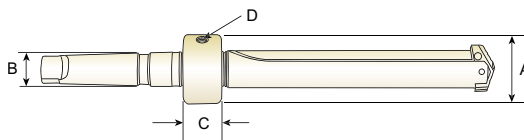
Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
Y	P28Y01	3/8 ~ 27/64	4-3/8	5-17/32	5-5/8	7-9/16	3/4	2-1/32	1/8
Z	P28Y01	7/16 ~ 1/2	4-3/8	5-17/32	5-5/8	7-9/16	3/4	2-1/32	1/8
O	P28O01	33/64 ~ 11/16	4-1/2	5-5/8	5-47/64	7-21/32	3/4	2-1/32	1/8
0.5	P28O51	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

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.	Fractional	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
O	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

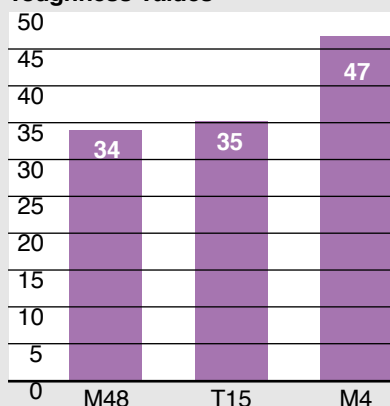


Complete with O'Rings, Flat Washers and Locking Clips.

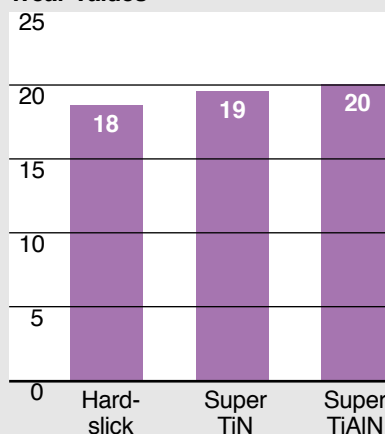
EDP No.	I.D.	Pipe O.D.	Length	Tap	Thread for Driving Rod
	A	B	C	D	
PR1030	1-3/4	3/4	7/8	1/8	5/16 – NC
PR1031	2-1/8	1	1-1/8	1/8	5/16 – NC
PR1042	2-1/2	1-1/4	1-3/8	1/4	3/8 – NC
PR1043	3	1-3/4	1-3/8	1/4	3/8 – NC
PR1054	3-3/4	2-1/4	1-3/4	1/2	1/2 – NC

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

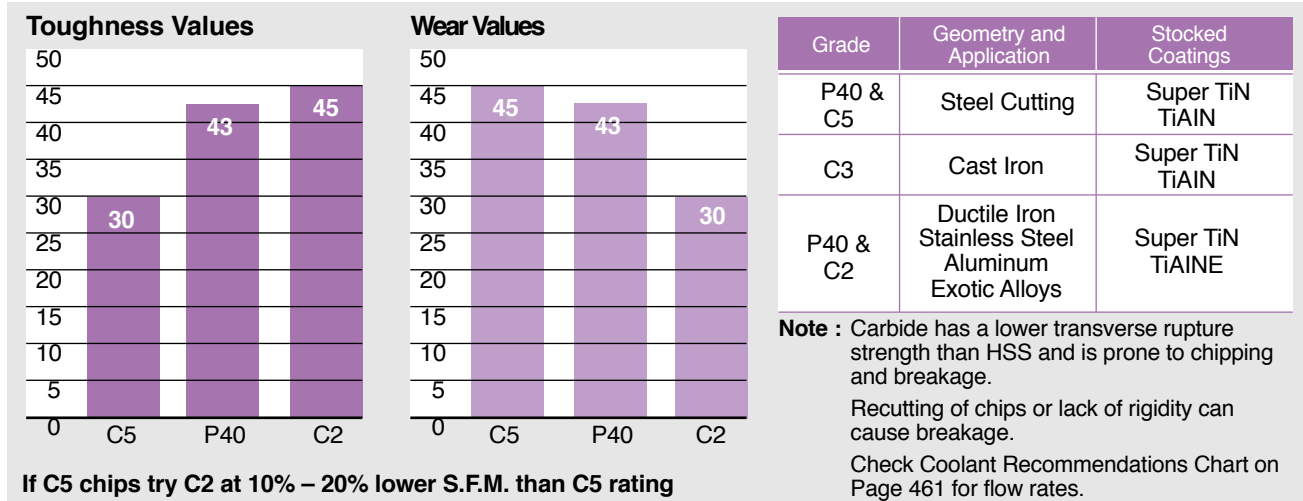
- Reduce Thrust
- Smoother Entry
- Improve Hole Quality
- Higher Speeds and Feeds

SPEEDS – FEED RECOMMENDATIONS
(STD POINT-SM POINT)

STANDARD GEOMETRY
SM 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	280	330	.007	.008	.010	.012	.013	.016	.016	.019	.020	.020	.023	.023	.028
	150 - 200	260	305	.007	.007	.010	.011	.013	.015	.016	.017	.020	.020	.023	.023	.028
	200 - 250	240	285	.007	.006	.010	.010	.013	.014	.016	.016	.020	.020	.023	.023	.028
Low & Medium Carbon Steel 1018, 1040, 1140		240	280	.006	.007	.009	.010	.012	.014	.015	.017	.019	.019	.023	.023	.027
		225	265	.005	.006	.008	.009	.010	.013	.014	.016	.018	.018	.021	.021	.024
		210	245	.005	.006	.008	.009	.010	.013	.014	.016	.018	.018	.021	.021	.024
		195	230	.004	.005	.007	.008	.009	.012	.012	.015	.016	.016	.019	.019	.022
Alloy Steel 4140, 5140, 8640	125 - 175	210	245	.006	.007	.008	.010	.010	.014	.014	.017	.017	.017	.019	.019	.022
	175 - 225	195	230	.005	.006	.008	.009	.010	.013	.014	.016	.017	.017	.019	.019	.022
	225 - 275	180	215	.005	.006	.007	.009	.010	.013	.014	.016	.017	.017	.019	.019	.022
	275 - 325	170	200	.004	.005	.006	.008	.009	.012	.012	.015	.015	.015	.017	.017	.020
	325 - 375	155	185	.003	.004	.006	.007	.009	.011	.012	.014	.015	.015	.017	.017	.020
High Strength Alloy Steel 4340, 4330V, 300M		110	130	.005	.006	.007	.009	.009	.011	.010	.013	.014	.014	.017	.017	.020
		85	105	.004	.005	.007	.008	.009	.010	.010	.012	.014	.014	.017	.017	.020
		70	85	.003	.004	.006	.007	.008	.009	.009	.011	.012	.012	.015	.015	.018
Structural Steel A36, A285, A516	100 - 150	200	240	.006	.008	.010	.011	.012	.015	.014	.017	.018	.018	.021	.021	.026
	150 - 250	170	195	.005	.006	.009	.010	.010	.013	.012	.015	.016	.016	.019	.019	.024
	250 - 350	140	165	.004	.005	.008	.009	.009	.012	.010	.013	.014	.014	.017	.017	.020
High Temp, Alloy Hastelloy B, Inconel 600		40	50	.003	.004	.006	.007	.007	.009	.008	.011	.010	.012	.012	.015	.015
		35	45	.003	.004	.006	.006	.007	.008	.008	.010	.010	.010	.012	.012	.015
Stainless Steel 303, 416, 420, 17-4 PH	135 - 185	105	125	.006	.007	.008	.009	.009	.012	.011	.014	.014	.014	.016	.016	.020
	185 - 275	90	110	.005	.006	.007	.008	.008	.011	.010	.012	.012	.012	.014	.014	.018
Tool Steel H-13, H021, A04, O-2, S-3		110	130	.004	.004	.006	.007	.008	.010	.010	.012	.012	.012	.015	.015	.017
		90	110	.004	.004	.006	.007	.008	.010	.010	.012	.012	.012	.015	.015	.017
Aluminum	30	850	-	.008	-	.013	-	.016	-	.020	-	.022	.022	.025	.025	.025
	180	450	-	.008	-	.013	-	.016	-	.018	-	.022	.022	.025	.025	.025
Cast Iron Gray, Ductile, Nodular		250	295	.007	.008	.012	.012	.016	.016	.020	.020	.024	.024	.027	.027	.030
		225	265	.006	.007	.011	.011	.014	.015	.018	.019	.022	.022	.025	.025	.028
		195	230	.006	.006	.009	.009	.012	.013	.016	.017	.018	.018	.021	.021	.024
		165	195	.005	.005	.007	.008	.009	.011	.012	.014	.014	.014	.017	.017	.020
		135	160	.004	.005	.006	.007	.007	.010	.009	.011	.012	.012	.014	.014	.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.

SPADE BLADE INSERTS SELECTION & APPLICATIONS **CARBIDE**

SPEEDS – FEED RECOMMENDATIONS (STD POINT-SM POINT)

STANDARD GEOMETRY
 SM 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	-
High Strength Alloy Steel 4340, 4330V, 300M	325 - 375	220	260	.003	.004	.005	.007	.008	.011	.010	.014	.013	-
	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	-
Structural Steel A36, A285, A516	350 - 400	160	190	.003	.004	.005	.007	.006	.009	.008	.011	.010	-
	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	-
High Temp, Alloy Hastelloy B, Inconel 600	250 - 350	230	270	.004	.005	.007	.009	.008	.012	.009	.013	.013	-
	140 - 220	80	125	.003	.004	.006	.007	.007	.009	.009	.011	.011	-
Stainless Steel 303, 416, 420, 17-4 PH	220 - 310	60	100	.003	.004	.005	.006	.006	.008	.008	.010	.010	-
	135 - 185	210	245	.006	.007	.008	.009	.009	.012	.011	.014	.013	-
Tool Steel H-13, H021, A04, O-2, S-3	185 - 275	160	190	.005	.006	.007	.008	.008	.011	.010	.012	.011	-
	150 - 200	220	260	.003	.004	.005	.007	.007	.010	.009	.012	.011	-
Aluminum	200 - 250	170	200	.003	.004	.005	.007	.007	.010	.009	.012	.011	-
	30	1500	-	.008	-	.013	-	.016	-	.020	-	.022	-
Cast Iron Gray, Ductile, Nodular	180	1000	-	.007	-	.011	-	.014	-	.018	-	.020	-
	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.



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

$$\text{SFM} = (\text{RPM}) \cdot (.262) \cdot (\text{DIA.})$$

$$\text{IPM} = (\text{RPM}) \cdot (\text{IPR})$$

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

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.

SPADE BLADE INSERTS HORSEPOWER CONSUMPTION RATE

Metal Removal Rates (MRR)

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

Volume of Cylinder Method : $D^2 \times .785 \times L$

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)

$D^2 (1.5)^2 \times .785 \times L (6.412) = 11.3 \text{ C.U.In./Min (MRR)}$

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



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