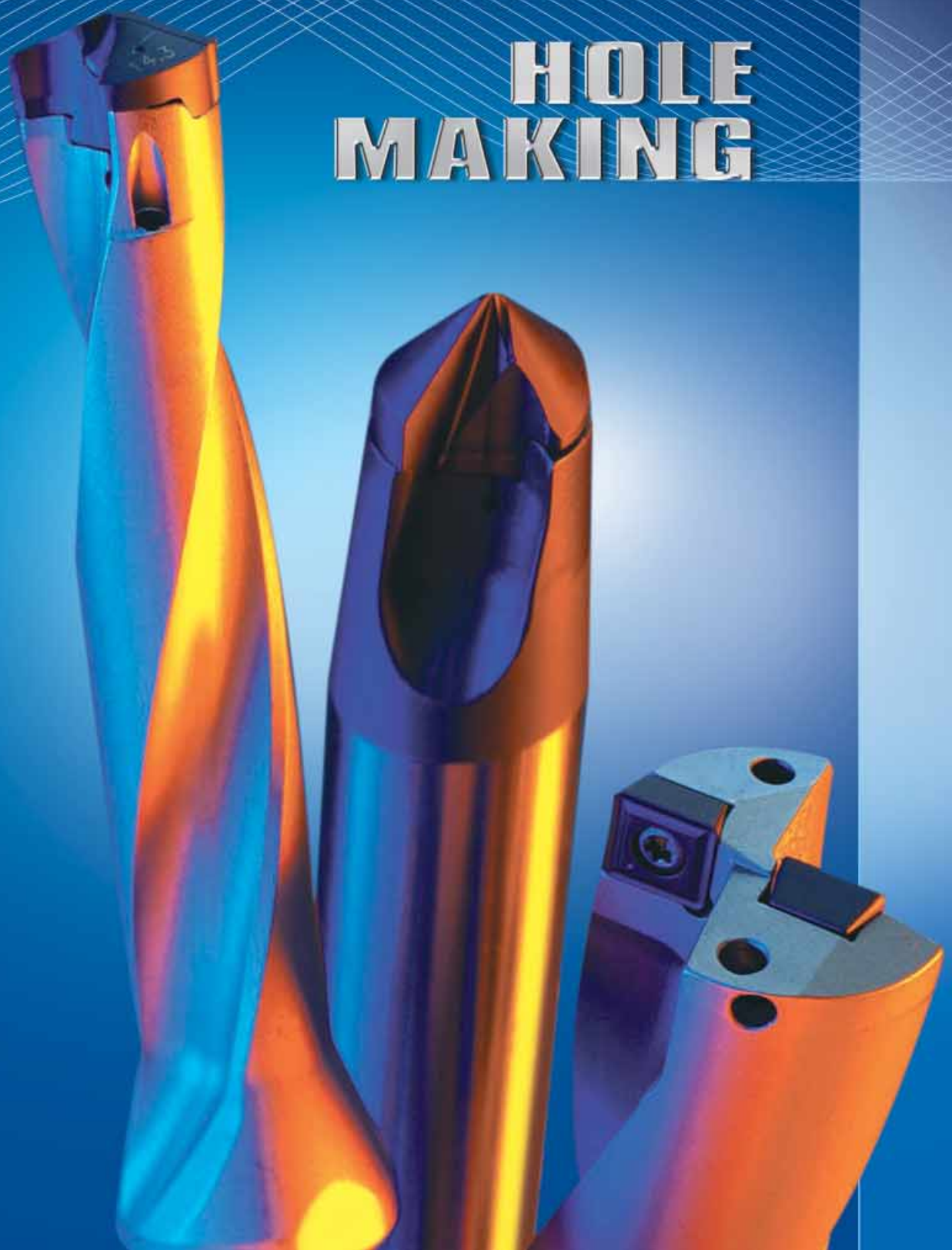
Member IMC Group

Ingersoll Cutting Tools

HOLE MAKING



Ingersoll

CUTTINGTOOLS

Cutting Tools

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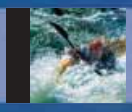

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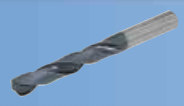
HOLE MAKING

Cutting Tools

Ingersoll Cutting Tools

HOLE MAKING

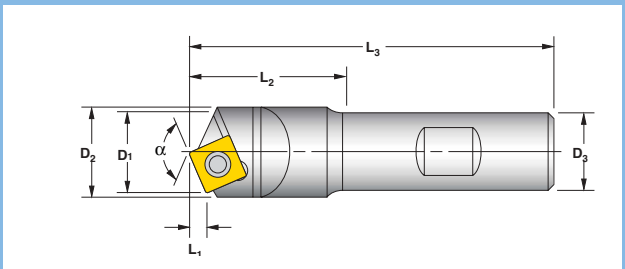
	Diameter Range	Cutting Depth	Description	Series	Page
	.685-.842	.12-.42	SPOT-IN™ Indexable Spotting Drill	FAK	H8
	.685-.842	.12-.42	DRILL-PAK™ Indexable Spotting Drill Pak	FAK	H8
	.472 and .630	.08-.31	SPOT-IN™ Replaceable Point Drills	Y	H10
	.1181-.4724	.87-2.08	DRILL-IN™ Solid Carbide Drills	DR	H12
	.2953-1.0197	.87-2.95	QWIK-TWIST™ Replaceable Point Drills 3:1	Y	H14
	.2953-1.0197	1.46-4.92	QWIK-TWIST™ Replaceable Point Drills 5:1	Y	H15
	.3937-1.0197	3.15-7.87	QWIK-TWIST™ Replaceable Point Drills 8:1	Y	H16
	.2953-.8228	1.02-2.60	QWIK-TWIST™ Slip Fit Drills	Y	H17
	.2953-.8228	.43-2.50	QWIK-TWIST™ Chamfer Shanks	MHK	H19
	.2677-.8622	.97-1.98	QWIK-TWIST™ Tap Drill/Chamfer Combo	Y	H20

	Diameter Range	Cutting Depth	Description	Series	Page
	.394-.787	.06-.08	QWIK TWIST Chamfer Rings	CB	H22
	.500-2.000	.100-.400	QUAD DRILL+ Square Insert Indexable Drills 2:1	Q	H28
	.500-2.000	1.50-6.00	QUAD DRILL+ Square Insert Indexable Drills 3:1	Q	H29
	.500-2.000	2.00-8.00	QUAD DRILL+ Square Insert Indexable Drills 4:1	Q	H30
	2.125-3.250	.87-.295 4.25-9.75	QUAD DRILL Square Insert Solid Carbide Drills 2:1, 3:1	Q	H31
	–	–	QUAD DRILL+ Eccentric Adjustment Bushing	BU	H33
	.500-2.000	.50-2.00	QUAD BORE Center Cut Counter Bore Tools	15S	H34
	.438-2.000	.44-2.00	QUAD BORE Indexable Counter Bore Tools	15C	H35
	–	–	Gun Drills	–	H38
	–	–	BTA Drills	–	H49

Member IMC Group
Ingersoll Cutting Tools

SPOTOIN™ INDEXABLE SPOTTING DRILL - SERIES "FAK"

Diameters	Nominal Included Angles	Insert Corner
.685"to .842"	82°, 90°, 118°, 135°, 144°	118°, 135°, 144° : .010"R 82°, 90° : .031", .010"R



α Included Angle	D_1 Max Dia. of Spot inch	mm	Drill Number	L_1 Maximum Depth of Cut	D_2 Overall Diameter	L_2 Extension from Holder	L_3 Overall Length	D_3 Shank Size/Style	Number of Inserts
82°	.782	19,86	**FAK-0708284R01**	.42	.810	1.50	3.50	.750 Weldon	1
90°	.842	21,39	**FAK-0809084R01**	.39	.810	1.50	3.50	.750 Weldon	1
118°	.685	17,40	**FAK-0611884R01**	.20	.875	1.50	3.50	.750 Weldon	1
135°	.738	18,75	**FAK-0713584R01**	.15	.875	1.50	3.50	.750 Weldon	1
144°	.737	18,72	**FAK-0714484R01**	.12	.875	1.50	3.50	.750 Weldon	1

DRILLOPAK™ INDEXABLE SPOTTING DRILL PACKAGES- SERIES "FAK"

Included Angle	Package Number
82°	**FAK-0708284K01**
90°	**FAK-0809084K01**
118°	**FAK-0611884K01**
135°	**FAK-0713584K01**
144°	**FAK-0714484K01**

Save up to 15% when purchasing tooling packages

Spotting drills with indexable strength and convenience

Tooling Package Includes:

- One indexable spotting drill
- Ten inserts
- One Torx® screw driver
- Three additional insert screws
- Durable polypropylene case

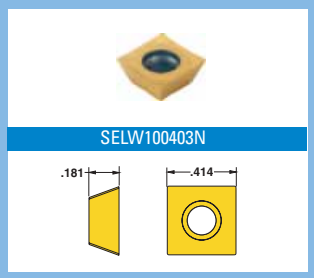
SPOTIN™ FAK ENGRAVING CAPABILITY

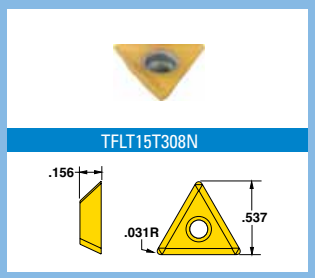
- Engrave part numbers, serial numbers, lot numbers, company logos, etc. all in the same machine set-up.
- Utilize the CNC control capability to program the engraving.
- High speed engraving capability up to 100 inches/minute.

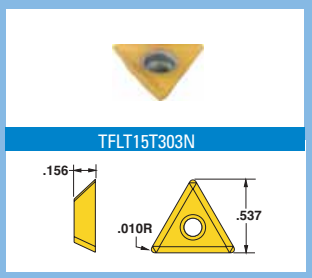
Item No.- 5110040
Insert Part No.- TFLT15T303N
Grade- IN1530 (Tough wear resistant grade,well suited for engraving)

.010 R for fine engraving line width

INSERTS







α Included Angle	Insert Number	Application	Corner	Grade* IN 1530
82°**	**TFLT15T303N**	Multi-Purpose	.010R	■
82°	**TFLT15T308N**	Multi-Purpose	.031R	■
90°**	**TFLT15T303N**	Multi-Purpose	.010R	■
90°	**TFLT15T308N**	Multi-Purpose	.031R	■
118°	**SELW100403N**	Multi-Purpose	.010R	■
135°	**SELW100403N**	Multi-Purpose	.010R	■
144°	**SELW100403N**	Multi-Purpose	.010R	

*For insert grade descriptions, see page 132. **.010 insert radii for engraving

HARDWARE

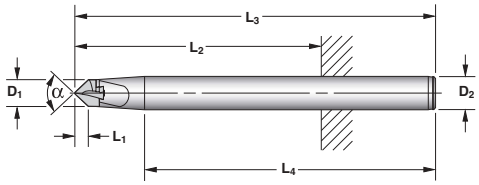
Insert Series	Insert Screw Part No.	Insert Screw Torque	Driver Part No.
TFLT15	SM30-065-00	13-18 in. lbs.	DS-T09W (Tx-09)
SELW10	SM40-093-20	30-35 in. lbs.	DS-T15T (Tx-15)

For technical information, see pages 137 and 138.

BOREline

SPOTIN™ REPLACEABLE POINT SPOTTING DRILLS - SERIES "Y"

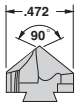
Diameters	Nominal Included Angles	Max. Dia. of Spot:
.472" and .630"	90° and 140°	1/2" Drill Body: .472" 3/4" Drill Body: .630"



α Included Angle	D_1 Dia. of Spot inch	D_1 Dia. of Spot mm	L_1 Max DOC	Drill Body Part Number	L_2 Maximum Extension	L_3 Overall Length	L_4 Shank Length	D_2 Shank Diameter
90°	.472	12,0	.23	**YB1200006S5R01**	4.70	6.00	4.58	.500
140°	.472	12,0	.08	**YB1200006S5R01**	4.54	5.84	4.58	.500
90°	.630	16,0	.31	**YB1600008S7R01**	6.40	8.00	6.50	.750
140°	.630	16,0	.11	**YB1600008S7R01**	6.20	7.80	6.50	.750

INSERTS

YCB1200R01



YAB1200R01

YCB1600R01

YAB1600R01

Drill Points		Drill Point Number	Application	Grade*		
Included Angle	Diameter			IN	2005	2030
90°	.472	**YCB1200R01**	Multi-Purpose			■
140°	.472	**YAB1200R01**	Multi-Purpose	■		■
90°	.630	**YCB1600R01**	Multi-Purpose			■
140°	.630	**YAB1600R01**	Multi-Purpose	■		■

*For insert grade descriptions, see page 132.

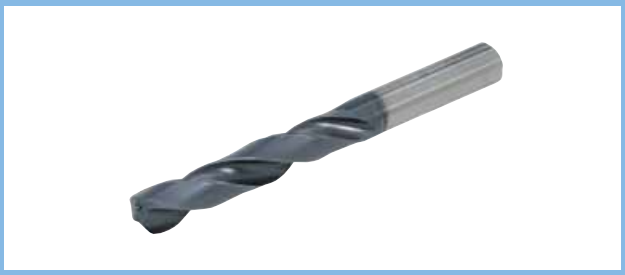
HARDWARE

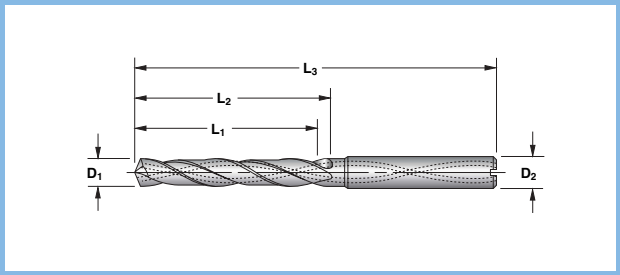
90° and 140° Angle	
Drill Point Series	Clamping Key
YCB1200 & YAB1200	KDCM-12-A
YCB1600 & YAB1600	KDCM-16-A

For technical information, see pages 137, 138 and 139.

DRILLOIN™ SOLID CARBIDE DRILLS - SERIES "DR"

Diameters	L:D Ratio	Geometry
3,00mm to 12,00mm	5:1	140° included point angle 30° axial rake angle





Metric Standard-(dimensions in mm unless noted)

D_1 Diameter mm	D_1 Diameter inches	Drill Number	D_2 Shank Diameter	L_1 Maximum Depth of Cut	L_2 Flute Length	L_3 Overall Length
3,00	.1181	DR0300024T7R01	6,00	24	28	66
3,10	.1220	DR0310023T7R01	6,00	23	28	66
3,20	.1260	DR0320023T7R01	6,00	23	28	66
3,30	.1299	DR0330023T7R01	6,00	23	28	66
3,40	.1339	DR0340023T7R01	6,00	23	28	66
3,50	.1378	DR0350023T7R01	6,00	23	28	66
3,60	.1417	DR0360023T7R01	6,00	23	28	66
3,70	.1457	DR0370022T7R01	6,00	22	28	66
3,80	.1496	DR0380030T7R01	6,00	30	36	74
3,90	.1535	DR0390030T7R01	6,00	30	36	74
4,00	.1575	DR0400030T7R01	6,00	30	36	74
4,10	.1614	DR0410030T7R01	6,00	30	36	74
4,20	.1654	DR0420030T7R01	6,00	30	36	74
4,30	.1693	DR0430030T7R01	6,00	30	36	74
4,40	.1732	DR0440029T7R01	6,00	29	36	74
4,50	.1772	DR0450029T7R01	6,00	29	36	74
4,60	.1811	DR0460029T7R01	6,00	29	36	74
4,70	.1850	DR0470029T7R01	6,00	29	36	74
4,80	.1890	DR0480037T7R01	6,00	37	44	82
4,90	.1929	DR0490037T7R01	6,00	37	44	82
5,00	.1969	DR0500037T7R01	6,00	39	46	84
5,10	.2008	DR0510036T7R01	6,00	38	46	84
5,20	.2047	DR0520036T7R01	6,00	38	46	84
5,30	.2087	DR0530036T7R01	6,00	38	46	84
5,40	.2126	DR0540036T7R01	6,00	38	46	84
5,50	.2165	DR0550036T7R01	6,00	38	46	84
5,60	.2205	DR0560036T7R01	6,00	38	46	84
5,70	.2244	DR0570035T7R01	6,00	37	46	84
5,80	.2283	DR0580035T7R01	6,00	37	46	84
5,90	.2323	DR0590035T7R01	6,00	37	46	84
6,00	.2362	DR0600035T7R01	6,00	37	46	84
6,10	.2402	DR0610044T0R01	8,00	47	56	94
6,20	.2441	DR0620044T0R01	8,00	47	56	94
6,30	.2480	DR0630044T0R01	8,00	47	56	94
6,40	.2520	DR0640043T0R01	8,00	46	56	94

(CONTINUED)

Metric Standard-(dimensions in mm unless noted)

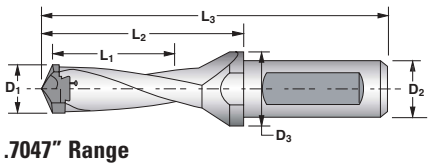
D_1 Diameter mm	D_1 Diameter inches	Drill Number	D_2 Shank Diameter	L_1 Maximum Depth of Cut	L_2 Flute Length	L_3 Overall Length
6,50	.2559	DR0650043T0R01	8,00	46	56	94
6,60	.2598	DR0660043T0R01	8,00	46	56	94
6,70	.2638	DR0670043T0R01	8,00	46	56	94
6,80	.2677	DR0680043T0R01	8,00	46	56	94
6,90	.2717	DR0690043T0R01	8,00	46	56	94
7,00	.2756	DR0700043T0R01	8,00	46	56	94
7,10	.2795	DR0710042T0R01	8,00	45	56	94
7,20	.2835	DR0720042T0R01	8,00	45	56	94
7,30	.2874	DR0730042T0R01	8,00	45	56	94
7,40	.2913	DR0740042T0R01	8,00	45	56	94
7,50	.2953	DR0750042T0R01	8,00	45	56	94
7,60	.2992	DR0760042T0R01	8,00	45	56	94
7,70	.3031	DR0770041T0R01	8,00	44	56	94
7,80	.3071	DR0780041T0R01	8,00	44	56	94
7,90	.3110	DR0790041T0R01	8,00	44	56	94
8,00	.3150	DR0800041T0R01	8,00	44	56	94
8,10	.3189	DR0810049T1R01	10,00	53	65	107
8,20	.3228	DR0820049T1R01	10,00	53	65	107
8,30	.3268	DR0830049T1R01	10,00	53	65	107
8,40	.3307	DR0840048T1R01	10,00	52	65	107
8,50	.3346	DR0850048T1R01	10,00	52	65	107
8,60	.3386	DR0860048T1R01	10,00	52	65	107
8,70	.3425	DR0870048T1R01	10,00	52	65	107
8,80	.3465	DR0880048T1R01	10,00	52	65	107
8,90	.3504	DR0890048T1R01	10,00	52	65	107
9,00	.3543	DR0900048T1R01	10,00	52	65	107
9,10	.3583	DR0910047T1R01	10,00	51	65	107
9,20	.3622	DR0920047T1R01	10,00	51	65	107
9,30	.3661	DR0930047T1R01	10,00	51	65	107
9,40	.3701	DR0940047T1R01	10,00	51	65	107
9,50	.3740	DR0950047T1R01	10,00	51	65	107
9,60	.3780	DR0960047T1R01	10,00	51	65	107
9,70	.3819	DR0970046T1R01	10,00	50	65	107
9,80	.3858	DR0980046T1R01	10,00	50	65	107
9,90	.3898	DR0990046T1R01	10,00	50	65	107
10,00	.3937	DR1000046T1R01	10,00	50	65	107
10,10	.3976	DR1010056T2R01	12,00	63	78	125
10,20	.4016	DR1020056T2R01	12,00	63	78	125
10,30	.4055	DR1030056T2R01	12,00	63	78	125
10,40	.4094	DR1040055T2R01	12,00	62	78	125
10,50	.4134	DR1050055T2R01	12,00	62	78	125
10,60	.4173	DR1060055T2R01	12,00	62	78	125
10,70	.4213	DR1070055T2R01	12,00	62	78	125
10,80	.4252	DR1080055T2R01	12,00	62	78	125
10,90	.4291	DR1090055T2R01	12,00	62	78	125
11,00	.4331	DR1100055T2R01	12,00	62	78	125
11,10	.4370	DR1110054T2R01	12,00	61	78	125
11,20	.4409	DR1120054T2R01	12,00	61	78	125
11,30	.4449	DR1130054T2R01	12,00	61	78	125
11,40	.4488	DR1140054T3R01	12,00	61	78	125
11,50	.4528	DR1150054T2R01	12,00	61	78	125
11,60	.4567	DR1160054T2R01	12,00	61	78	125
11,70	.4606	DR1170053T2R01	12,00	60	78	125
11,80	.4646	DR1180053T2R01	12,00	60	78	125
11,90	.4685	DR1190053T2R01	12,00	60	78	125
12,00	.4724	DR1200053T2R01	12,00	60	78	125

For technical information, see page 140.

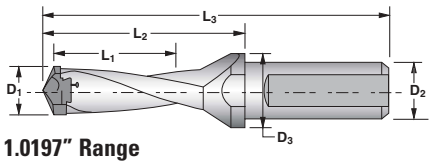
QWIKTWIST™ REPLACEABLE POINT DRILLS - SERIES "Y"

Diameters	Length to Diameter Ratio
.2953" to 1.0197"	3:1

Drilling Coolant



.2953" to .7047" Range



.7087" to 1.0197" Range

D_1 Nom. Dia. inch	mm	Body Number 3:1	L_1 DOC	L_2 Ext.	L_3 Overall	D_2 Shank Dia.	D_3 Flange Dia.	Pocket Size	Clamping Key	Optional Torque Clamping Key	Chamfer Ring
.2953-.3110	7,5-7,9	**YD0750022B9R01**	.87	1.30	3.07	.500	.63	8	KDCM-8	TKDCM-8	-
.3150-.3307	8,0-8,4	**YD0800024B9R01**	.94	1.38	3.15	.500	.63	8	KDCM-8	TKDCM-8	-
.3346-.3504	8,5-8,9	**YD0850025B9R01**	.98	1.46	3.23	.500	.63	8	KDCM-8	TKDCM-8	-
.3543-.3701	9,0-9,4	**YD0900027B9R01**	1.06	1.54	3.31	.500	.63	9	KDCM-9	TKDCM-9	-
.3740-.3898	9,5-9,9	**YD0950028B9R01**	1.10	1.68	3.45	.500	.63	9	KDCM-9	TKDCM-9	-
.3937-.4094	10,0-10,4	**YD1000030C0R01**	1.18	1.73	3.62	.625	.79	10	KDCM-10	TKDCM-10	CB100-01
.4134-.4291	10,5-10,9	**YD1050031C0R01**	1.24	1.81	3.70	.625	.79	10	KDCM-10	TKDCM-10	CB105-01
.4331-.4488	11,0-11,4	**YD1100033C0R01**	1.30	1.89	3.78	.625	.79	11	KDCM-11	TKDCM-11	CB110-01
.4528-.4685	11,5-11,9	**YD1150034C0R01**	1.35	1.97	3.86	.625	.79	11	KDCM-11	TKDCM-11	CB115-01
.4724-.4882	12,0-12,4	**YD1200036C0R01**	1.41	2.06	3.95	.625	.79	12	KDCM-12	TKDCM-12	CB120-01
.4912-.5079	12,5-12,9	**YD1250037C0R01**	1.47	2.12	4.01	.625	.79	12	KDCM-12	TKDCM-12	CB125-01
.5118-.5276	13,0-13,4	**YD1300039C0R01**	1.53	2.22	4.11	.625	.79	13	KDCM-13	TKDCM-13	CB130-01
.5315-.5472	13,5-13,9	**YD1350040C0R01**	1.59	2.30	4.19	.625	.79	13	KDCM-13	TKDCM-13	CB135-01
.5512-.5669	14,0-14,4	**YD1400042C0R01**	1.65	2.41	4.30	.625	.79	14	KDCM-14	TKDCM-14	CB140-01
.5709-.5866	14,5-14,9	**YD1450043C0R01**	1.71	2.49	4.38	.625	.79	14	KDCM-14	TKDCM-14	CB145-01
.5906-.6260	15,0-15,9	**YD150004518R01**	1.77	2.58	4.55	.750	.98	15	KDCM-15	TKDCM-15	CB150-01
.6299-.6654	16,0-16,9	**YD160004818R01**	1.89	2.75	4.72	.750	.98	16	KDCM-16	TKDCM-16	CB160-01
.6693-.7047	17,0-17,9	**YD170005118R01**	2.01	2.89	4.86	.750	.98	17	KDCM-17	TKDCM-17	CB170-01
.7087-.7441	18,0-18,9	**YD1800054C8R01**	2.13	3.08	5.28	1.000	1.26	18	KDCM-18	TKDCM-18	CB180-01
.7480-.7835	19,0-19,9	**YD1900057C8R01**	2.24	3.24	5.44	1.000	1.26	19	KDCM-19	TKDCM-19	CB190-01
.7874-.8228	20,0-20,9	**YD2000060C8R01**	2.36	3.42	5.62	1.000	1.26	20	KDCM-20	TKDCM-20	CB200-01
.8268-.8622	21,0-21,9	**YD2100063C8R01**	2.48	3.57	5.77	1.000	1.26	21	KDCM-21	TKDCM-21	-
.8661-.9016	22,0-22,9	**YD2200066C8R01***	2.60	3.74	5.94	1.000	1.26	22	KDCM-22	TKDCM-22	-
.9055-.9409	23,0-23,9	**YD2300069C8R01***	2.71	3.92	6.12	1.000	1.26	23	KDCM-23	TKDCM-23	-
.9449-.9803	24,0-24,9	**YD2400072C8R01***	2.83	4.08	6.28	1.000	1.26	24	KDCM-24	TKDCM-24	-
.9843-1.0197	25,0-25,9	**YD2500075C8R01***	2.95	4.29	6.49	1.000	1.26	25	KDCM-25	TKDCM-25	-

Do not mount a smaller drill point than the D1 range listed for each drill body.

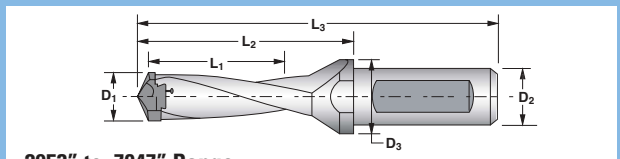
* Drill bodies for coolant through the point.

Metric shanks available as non-stock standards.
See pages 23-27 for replaceable drill points.
For technical information, see pages 141-148.

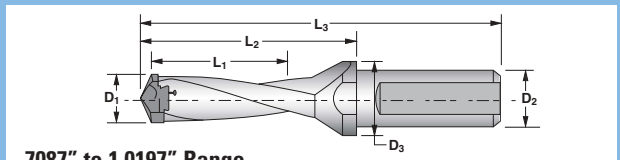
BOREline

Diameters	Length to Diameter Ratio
.2953" to 1.0197"	5:1

Drilling Coolant



.2953" to .7047" Range



.7087" to 1.0197" Range

D_1 Nom. Dia. inch	mm	Body Number 5:1	L_1 DOC	L_2 Ext.	L_3 Overall	D_2 Shank Dia.	D_3 Flange Dia.	Pocket Size	Clamping Key	Optional Torque Clamping Key	Chamfer Ring
.2953-.3110	7,5-7,9	**YD0750037B9R01**	1.46	2.01	3.78	.500	.63	8	KDCM-8	TKDCM-8	-
.3150-.3307	8,0-8,4	**YD0800040B9R01**	1.57	2.01	3.78	.500	.63	8	KDCM-8	TKDCM-8	-
.3346-.3504	8,5-8,9	**YD0850042B9R01**	1.65	2.13	3.90	.500	.63	8	KDCM-8	TKDCM-8	-
.3543-.3701	9,0-9,4	**YD0900045B9R01**	1.77	2.25	4.02	.500	.63	9	KDCM-9	TKDCM-9	-
.3740-.3898	9,5-9,9	**YD0950047B9R01**	1.85	2.37	4.14	.500	.63	9	KDCM-9	TKDCM-9	-
.3937-.4094	10,0-10,4	**YD1000050C0R01**	1.96	2.52	4.41	.625	.79	10	KDCM-10	TKDCM-10	CB100-01
.4134-.4291	10,5-10,9	**YD1050052C0R01**	2.06	2.64	4.53	.625	.79	10	KDCM-10	TKDCM-10	CB105-01
.4331-.4488	11,0-11,4	**YD1100055C0R01**	2.16	2.76	4.65	.625	.79	11	KDCM-11	TKDCM-11	CB110-01
.4528-.4685	11,5-11,9	**YD1150057C0R01**	2.26	2.87	4.76	.625	.79	11	KDCM-11	TKDCM-11	CB115-01
.4724-.4882	12,0-12,4	**YD1200060C0R01**	2.36	3.00	4.89	.625	.79	12	KDCM-12	TKDCM-12	CB120-01
.4912-.5079	12,5-12,9	**YD1250062C0R01**	2.46	3.12	5.01	.625	.79	12	KDCM-12	TKDCM-12	CB125-01
.5118-.5276	13,0-13,4	**YD1300065C0R01**	2.56	3.24	5.13	.625	.79	13	KDCM-13	TKDCM-13	CB130-01
.5315-.5472	13,5-13,9	**YD1350067C0R01**	2.65	3.36	5.25	.625	.79	13	KDCM-13	TKDCM-13	CB135-01
.5512-.5669	14,0-14,4	**YD1400070C0R01**	2.75	3.51	5.40	.625	.79	14	KDCM-14	TKDCM-14	CB140-01
.5709-.5866	14,5-14,9	**YD1450072C0R01**	2.85	3.63	5.52	.625	.79	14	KDCM-14	TKDCM-14	CB145-01
.5906-.6260	15,0-15,9	**YD150007518R01**	2.95	3.76	5.73	.750	.98	15	KDCM-15	TKDCM-15	CB150-01
.6299-.6654	16,0-16,9	**YD160008018R01**	3.15	4.01	5.98	.750	.98	16	KDCM-16	TKDCM-16	CB160-01
.6693-.7047	17,0-17,9	**YD170008518R01**	3.35	4.23	6.20	.750	.98	17	KDCM-17	TKDCM-17	CB170-01
.7087-.7441	18,0-18,9	**YD1800090C8R01**	3.54	4.50	6.70	1.000	1.26	18	KDCM-18	TKDCM-18	CB180-01
.7480-.7835	19,0-19,9	**YD1900095C8R01**	3.74	4.73	6.93	1.000	1.26	19	KDCM-19	TKDCM-19	CB190-01
.7874-.8228	20,0-20,9	**YD2000100C8R01**	3.94	5.00	7.20	1.000	1.26	20	KDCM-20	TKDCM-20	CB200-01
.8268-.8622	21,0-21,9	**YD2100105C8R01**	4.13	5.23	7.43	1.000	1.26	21	KDCM-21	TKDCM-21	-
.8661-.9016	22,0-22,9	**YD2200110C8R01***	4.33	5.47	7.67	1.000	1.26	22	KDCM-22	TKDCM-22	-
.9055-.9409	23,0-23,9	**YD2300115C8R01***	4.53	5.72	7.92	1.000	1.26	23	KDCM-23	TKDCM-23	-
.9449-.9803	24,0-24,9	**YD2400120C8R01***	4.72	5.97	8.17	1.000	1.26	24	KDCM-24	TKDCM-24	-
.9843-1.0197	25,0-25,9	**YD2500125C8R01***	4.92	6.26	8.46	1.000	1.26	25	KDCM-25	TKDCM-25	-

Do not mount a smaller drill point than the D1 range listed for each drill body.

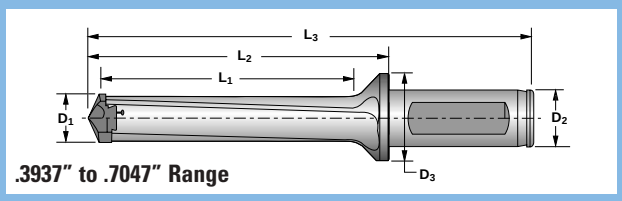
* Drill bodies for coolant through the point.

Metric shanks available as non-stock standards.
See pages 23-27 for replaceable drill points.
For technical information, see pages 141-148.

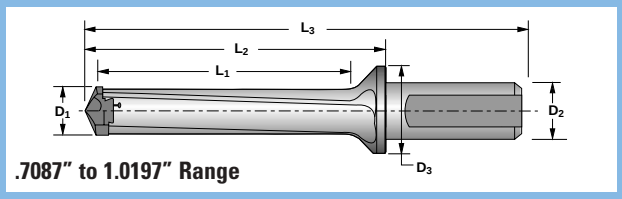
QWIKTWIST™ REPLACEABLE POINT DRILLS - SERIES "Y"

Diameters	Length to Diameter Ratio
.3937" to 1.0197"	8:1

Drilling Coolant



.3937" to .7047" Range



.7087" to 1.0197" Range

D_1 Nom. Dia. inch	mm	Body Number 8:1	L_1 DOC	L_2 Ext.	L_3 Overall	D_2 Shank Dia.	D_3 Flange Dia.	Pocket Size	Clamping Key	Optional Torque Clamping Key
.3937-.4291	10,0-10,9	**YD1000080C0R01**	3.15	3.70	5.59	.625	.79	10	KDCM-10	TKDCM-10
.4331-.4685	11,0-11,9	**YD1100088C0R01**	3.46	4.06	5.95	.625	.79	11	KDCM-11	TKDCM-11
.4724-.5079	12,0-12,9	**YD1200096C0R01**	3.78	4.42	6.31	.625	.79	12	KDCM-12	TKDCM-12
.5118-.5472	13,0-13,9	**YD1300104C0R01**	4.09	4.78	6.67	.625	.79	13	KDCM-13	TKDCM-13
.5512-.5866	14,0-14,9	**YD1400112C0R01**	4.41	5.17	7.06	.625	.79	14	KDCM-14	TKDCM-14
.5906-.6260	15,0-15,9	**YD150012018R01**	4.72	5.54	7.51	.750	.98	15	KDCM-15	TKDCM-15
.6299-.6654	16,0-16,9	**YD160012818R01**	5.04	5.90	7.87	.750	.98	16	KDCM-16	TKDCM-16
.6693-.7047	17,0-17,9	**YD170013618R01**	5.35	6.24	8.21	.750	.98	17	KDCM-17	TKDCM-17
.7087-.7441	18,0-18,9	**YD1800144C8R01**	5.67	6.62	8.82	1.000	1.26	18	KDCM-18	TKDCM-18
.7480-.7835	19,0-19,9	**YD1900152C8R01**	5.98	6.98	9.18	1.000	1.26	19	KDCM-19	TKDCM-19
.7874-.8228	20,0-20,9	**YD2000160C8R01**	6.30	7.37	9.57	1.000	1.26	20	KDCM-20	TKDCM-20
.8268-.8622	21,0-21,9	**YD2100168C8R01**	6.61	7.72	9.93	1.000	1.26	21	KDCM-21	TKDCM-21
.8661-.9016	22,0-22,9	**YD2200176C8R01***	6.93	8.07	10.28	1.000	1.26	22	KDCM-22	TKDCM-22
.9055-.9409	23,0-23,9	**YD2300184C8R01***	7.24	8.46	10.67	1.000	1.26	23	KDCM-23	TKDCM-23
.9449-.9803	24,0-24,9	**YD2400192C8R01***	7.56	8.83	11.04	1.000	1.26	24	KDCM-24	TKDCM-24
.9843-1.0197	25,0-25, 9	**YD2500200C8R01***	7.87	9.20	11.41	1.000	1.26	25	KDCM-25	TKDCM-25

Do not mount a smaller drill point than the D1 range listed for each drill body.

* Drill bodies for coolant through the point.

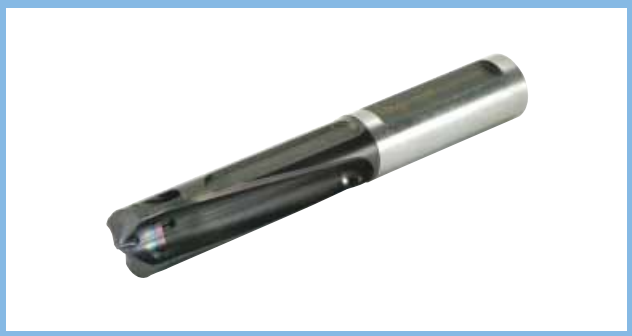
Metric shanks available as non-stock standards.
See pages 23-27 for replaceable drill points.
For technical information, see pages 141-148.

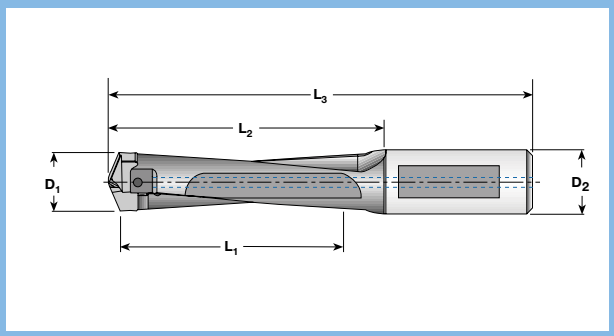
BOREline

QWIKTWIST™ SLIP FIT DRILLS - SERIES "Y"

Diameters	Length to Diameter Ratio
.2953-.8228"	3.5:1

Drilling Coolant





D1 Nom. Dia inch	D1 Nom. Dia mm	Part Number	L_1 DOC	L_2 Ext	L_3 Overall	D_2 Shank Dia inch	D_2 Shank Dia mm	Pocket Size	Clamping Key
.2953-.3110	7,5-7,9	YD0750026SDR00	1.02	1.33	3.02	.315	8	8	KDCM-8
.3150-.3307	8,0-8,4	YD0800028SDR00	1.10	1.41	3.11	.315	8	8	KDCM-8
.3346-.3504	8,5-8,9	YD0850029SER00	1.14	1.45	3.15	.354	9	8	KDCM-8
.3543-.3701	9,0-9,4	YD0900031SER00	1.22	1.54	3.23	.354	9	9	KDCM-9
.3740-.3898	9,5-9,9	YD0950033SFR00	1.30	1.59	3.28	.394	10	9	KDCM-9
.3937-.4094	10,0-10,4	YD1000033SFR00	1.30	1.69	3.39	.394	10	10	KDCM-10
.4134-.4291	10,5-10,9	YD1050034SGR00	1.34	1.76	3.46	.433	11	10	KDCM-10
.4331-.4488	11,0-11,4	YD1100036SGR00	1.42	1.85	3.54	.433	11	11	KDCM-11
.4528-.4685	11,5-11,9	YD1150038SHR00	1.50	1.91	3.61	.472	12	11	KDCM-11
.4724-.4882	12,0-12,4	YD1200042SHR00	1.65	2.00	3.69	.472	12	12	KDCM-12
.4921-.5079	12,5-12,9	YD1250042SJR00	1.65	2.07	3.76	.512	13	12	KDCM-12
.5118-.5276	13,0-13,4	YD1300042SJR00	1.65	2.15	3.92	.512	13	13	KDCM-13
.5315-.5472	13,5-13,9	YD1350044SKR00	1.73	2.21	3.98	.551	14	13	KDCM-14
.5512-.5669	14,0-14,4	YD1400048SKR00	1.89	2.33	4.10	.551	14	14	KDCM-14
.5709-.5866	14,5-14,9	YD1450050SLR00	1.97	2.40	4.17	.591	15	14	KDCM-15
.5906-.6260	15,0-15,9	YD1500052SLR00	2.05	2.49	4.26	.591	15	15	KDCM-15
.6299-.6654	16,0-16,9	YD1600052SMR00	2.05	2.64	4.53	.630	16	16	KCDM-16
.6693-.7047	17,0-17,9	YD1700055SNR00	2.17	2.90	4.79	.669	17	17	KDCM-17
.7087-.7441	18,0-18,9	YD1800060SPR00	2.36	3.08	4.97	.709	18	18	KDCM-18
.7480-.7835	19,0-19,9	YD1900062SQR00	2.44	3.22	5.35	.748	19	19	KDCM-19
.7874-.8228	20,0-20,9	YD2000066SRR00	2.60	3.33	5.46	.787	20	20	KDCM-20

Do not mount a smaller drill point than the D1 range listed for each drill body.

See pages 23-27 for replaceable drill points.
For technical information, see page 148.

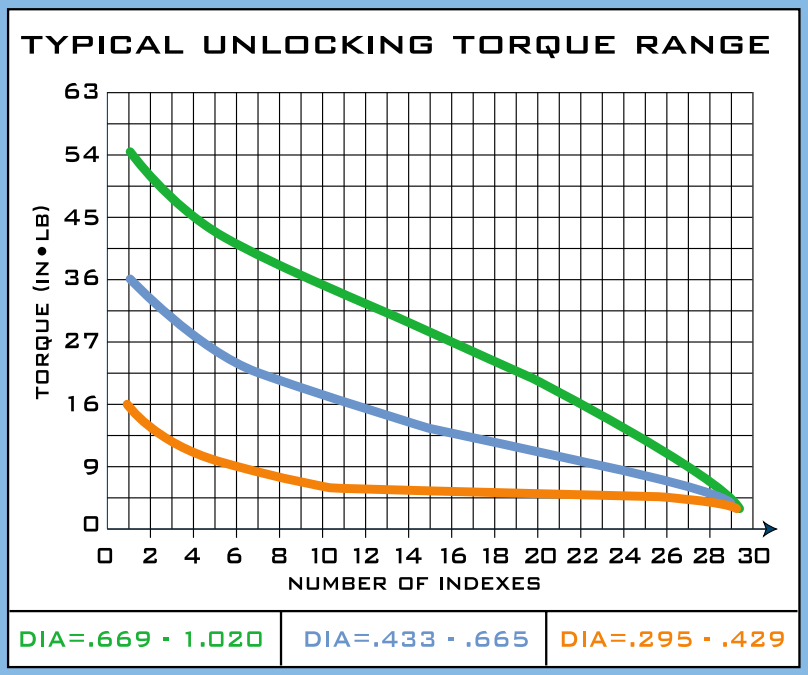
QWIK TWIST™ TORQUE KEY

The number of drill point indexes is dependent on machine rigidity, workpiece stability and clamping, machining parameters, workpiece configuration, material coolant, coolant pressure and proper drill application.

It is recommended to use the torque key for inspection purposes only, not as a substitute for the standard key provided with each drill body.

Torque keys are available for checking minimal clamping torque. If a "click" is not heard or felt while slowly unclamping with the torque key, the drill must be replaced

Key Part Number	Drill Pocket Size	Minimal Clamping Torque (in-lb)
TKDCM-8	8	1.3 - 1.8
TKDCM-9	9	1.3 - 1.8
TKDCM-10	10	1.9 - 2.1
TKDCM-11	11	1.9 - 2.1
TKDCM-12	12	1.9 - 2.1
TKDCM-13	13	1.9 - 2.1
TKDCM-14	14	1.9 - 2.1
TKDCM-15	15	1.9 - 2.1
TKDCM-16	16	1.9 - 2.1
TKDCM-17	17	2.3 - 2.6
TKDCM-18	18	2.3 - 2.6
TKDCM-19	19	2.3 - 2.6
TKDCM-20	20	2.3 - 2.6
TKDCM-21	21	2.7 - 3.1
TKDCM-22	22	2.7 - 3.1
TKDCM-23	23	2.7 - 3.1
TKDCM-24	24	2.7 - 3.1
TKDCM-25	25	2.7 - 3.1

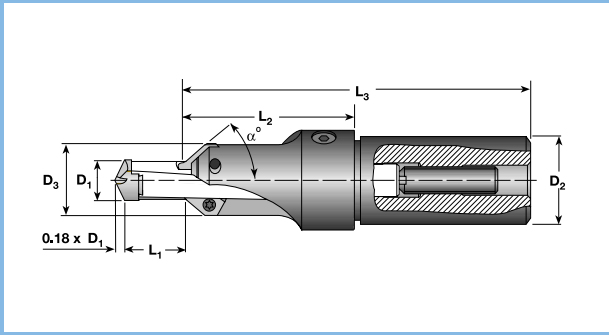


QWIKTWIST™ SLIP FIT CHAMFER SHANKS - SERIES "MHK"

Hole Diameters
.2953" - .8228"

Shanks
Adjustable depth drilling and chamfering combination tools

Chamfering | Drilling | Coolant



D1 Nom. Dia. Inch	D1 Nom. Dia. mm	Slip Fit Drills Part No.	L1 Adjustment Min[1]	L1 Adjustment Max[2]	Chamfer Part Number	*D2 Shank Dia	D3 Insert Dia	L2 Ext.	L3 OAL	Chamfer Inse Series
.2953-.3110	7,5-7,9	YD0750026SDR00	.43	.81	**MHK018047DBR01**	1.000	.74	1.87	4.07	GOMT06…
.3150-.3307	8,0-8,4	YD0800028SDR00	.49	.85						
.3346-.3504	8,5-8,9	YD0850029SER00	.53	.98	**MHK019047DBR01**	1.000	.78	1.87	4.07	GOMT06…
.3543-.3701	9,0-9,4	YD0900031SER00	.55	1.00						
.3740-3898	9,5-9,9	YD0950033SFR00	.61	1.08	**MHK024067DBR01**	1.000	.98	2.65	4.85	GOMT08…
.3937-.4094	10,0-10,4	YD1000033SFR00	.49	1.04						
.4134-.4291	10,5-10,9	YD1050034SGR00	.49	1.08	**MHK025067DBR01**	1.000	1.02	2.65	4.85	GOMT08…
.4331-.4488	11,0-11,4	YD1100036SGR00	.63	1.14						
.4528-.4685	11,5-11,9	YD1150038SHR00	.53	1.22	**MHK026067DBR01**	1.000	1.06	2.65	4.85	GOMT08…
.4724-.4882	12,0-12,4	YD1200042SHR00	.67	1.30						
.4921-.5079	12,5-12,9	YD1250042SJR00	.67	1.38	**MHK027067DBR01**	1.000	1.10	2.65	4.85	GOMT08…
.5118-.5276	13,0-13,4	YD1300042SJR00	.75	1.42						
.5315-.5472	13,5-13,9	YD1350044SKR00	.67	1.46	**MHK028067DCR01**	1.250	1.12	2.65	5.01	GOMT08…
.5512-.5669	14,0-14,4	YD1400048SKR00	.75	1.54						
.5709-.5866	14,5-14,9	YD1450050SLR00	.69	1.56	**MHK029067DCR01**	1.250	1.16	2.65	5.01	GOMT08…
.5906-.6260	15,0-15,9	YD1500052SLR00	.89	1.61						
.6299-.6654	16,0-16,9	YD1600052SMR00	.93	1.83	**MHK030067DCRO1**	1.250	1.20	2.65	5.01	GOMT08…
.6693-.7047	17,0-17,9	YD1700055SNR00	1.00	1.95	**MHK031067DCR01**	1.250	1.24	2.65	5.01	GOMT08…
.7087-.7441	18,0-18,9	YD1800060SPR00	1.10	2.13	**MHK032067DCR01**	1.250	1.28	2.65	5.01	GOMT08…
.7480-.7835	19,0-19,9	YD1900062SQR00	1.30	2.36	**MHK033075DCR01**	1.250	1.31	2.95	5.31	GOMT08…
.7874-.8228	20,0-20,9	YD2000066SRR00	1.42	2.50	**MHK034075DCR01**	1.250	1.35	2.95	5.31	GOMT08…

1- Minimum adjustment is with the smallest drill point diameter in the range
2- Maximum adjustment is with the largest drill point diameter in the range
*Straight shank with whistle notch flat

For chamfer inserts see page 21.
For replaceable points see page 23-27.
For technical information, see page148.

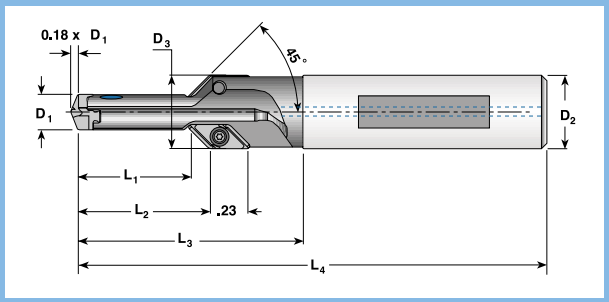
HARDWARE

Drill Range	Side Lock Screw	Rear Adjusting Screw	Lock Screw Key	Insert Screw	Torque (in-lbs)	Insert Screw Torx Blade	Insert Screw T-Handle
Chamfer Shank .2953"-.3701"	SA060-02	SC060-02	WS-0060	SM25-064-00	9-13	DS-T08W	–
Chamfer Shank .3740"-.8228"	SA100-02	SC100-02	DS-H05HB	SM40-093-20	30-35	DS-T15HB	DSHH06T

QWIK TWIST™ TAP DRILL/CHAMFER COMBO - SERIES "Y"

Tap Drills
M8-M24
UNC/UNF 3/8"-7/8"

Combine tap drilling and chamfering in one operation.



Metric

Thread Size	D1 Nom Point Size Inch	D1 Nom Point Size mm	Body Number	General Purpose Drill Point	D1 Point Range	L1 Full Dia to Chamfer	L2 Full Dia to Top of Chamfer	L3 Ext	L4 OAL	D2 Shank Dia mm	D2 Shank Dia	D3 Chamfer Dia	Pocket Size	Clamping Key
M8	.2677	6,8	**YC0680021SKR00**	YAB0680R01	.2677 .2913	.827	.972	1.650	3.42	14	.551	.547	6,8	KDCM-8
M10	.3346	8,5	**YC0830026SKR00**	YAB0850R01	.3268 .3504	1.024	1.138	1.831	3.60	14	.551	.551	8	KDCM-8
M12	.4016	10,2	**YC1000030SKR00**	YAB1020R01	.3937 .4291	1.181	1.264	2.047	3.82	14	.551	.551	10	KDCM-10
M14	.4724	12,0	**YC1200035SMR00**	YAB1200R01	.4724 .5079	1.378	1.465	2.283	4.17	16	.630	.630	12	KDCM-12
M16	.5512	14,0	**YC1400039SPR00**	YAB1400R01	.5512 .5866	1.535	1.622	2.362	4.25	18	.709	.709	14	KDCM-14
M20	.6890	17,5	**YC1730042SRR00**	YAB1750R01	.6811 .7047	1.654	1.728	2.480	4.45	20	.787	.827	17	KDCM-17
M24	.8268	21,0	**YC2100048SSR00**	YAB2100R01	.8268 .8622	1.890	1.984	2.677	4.88	25	.984	1.004	21	KDCM-21

Reduce recommended feed for M8 drill by 10%.

Inch

Thread Size	D1 Nom Point Size Inch	D1 Nom Point Size mm	Body Number	General Purpose Drill Point	D1 Point Range	L1 Full Dia to Chamfer	L2 Full Dia to Top of Chamfer	L3 Ext	L4 OAL	D2 Shank Dia mm	D2 Shank Dia Inch	D3 Chamfer Dia	Pocket Size	Clamping Key
3/8 UNC	.3110	7,9	**YC0770025RHR01**	YAB0790R01	.3031 .3110	1.00	1.15	1.80	3.69	15.88	.625	.59	8	KDCM-8
3/8 UNF	.3346	8,5	**YC0820025RHR01**	YAB0850R01	.3228 .3504	1.00	1.15	1.80	3.69	15.88	.625	.61	8	KDCM-8
7/16 UNC	.3701	9,4	**YC0910026RHR01**	YAB0940R01	.3583 .3898	1.06	1.20	1.83	3.72	15.88	.625	.63	9	KDCM-9
7/16 UNF	.3898	9,9	**YC0910026RHR01**	YAB0990R01	.3819 .3898	1.06	1.18	1.82	3.71	15.88	.625	.63	9	KDCM-9
1/2 UNC	.4252	10,8	**YC1050026RHR01**	YAB1080R01	.4134 .4291	1.06	1.17	1.89	3.78	15.88	.625	.63	10	KDCM-10
1/2 UNF	.4528	11,5	**YC1130026RHR01**	YAB1150R01	.4449 .4685	1.06	1.15	1.89	3.78	15.88	.625	.63	11	KDCM-11
9/16 UNC	.4843	12,3	**YC1210026RHR01**	YAB1230R01	.4764 .5079	1.06	1.14	1.89	3.78	15.88	.625	.63	12	KDCM-12
9/16 UNF	.5118	13,0	**YC1300026RHR01**	YAB1300R01	.5118 .5472	1.06	1.12	1.89	3.78	15.88	.625	.63	13	KDCM-13
5/8 UNC	.5394	13,7	**YC1330030RJR01**	YAB1370R01	.5236 .5472	1.20	1.32	2.01	3.98	19.05	.750	.75	13	KDCM-13
5/8 UNF	.5748	14,6	**YC1450030RJR01**	YAB1460R01	.5709 .5866	1.20	1.29	2.03	4.00	19.05	.750	.75	14	KDCM-14
3/4 UNC	.6575	16,7	**YC1650035RJR01**	YAB1670R01	.6496 .6654	1.40	1.47	2.20	4.17	19.05	.750	.78	16	KDCM-16
3/4 UNF	.6890	17,5	**YC1730035RLR01**	YAB1750R01	.6811 .7047	1.40	1.50	2.20	4.40	25.40	1.000	.88	17	KDCM-17
7/8 UNC	.7677	19,5	**YC1920041RLR01**	YAB1950R01	.7559 .7835	1.65	1.78	2.48	4.68	25.40	1.000	1.00	19	KDCM-19
7/8 UNF	.8071	20,5	**YC2040041RLR01**	YAB2050R01	.8031 .8228	1.65	1.75	2.48	4.68	25.40	1.000	1.00	20	KDCM-20

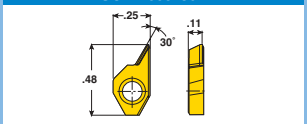
For chamfer inserts see page 21. For replaceable points see page 23-27. For technical information, see page 148.

HARDWARE

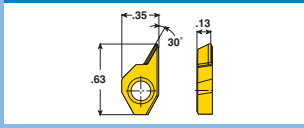
Chamfering Insert Screw	Chamfering Insert Screw Key	Torque (in-lbs)
SM22-046-00	DS-T07F	7-11

CHAMFER SHANK INSERTS

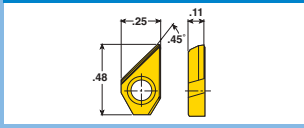
GOMT060230R



GOMT080330R



GOMT060245R



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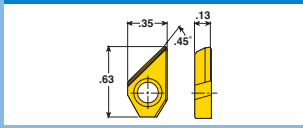
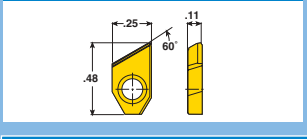
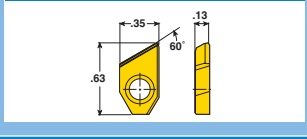


GOMT060260R



GOMT080360R

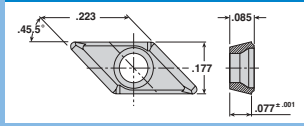


Insert Number	Application	Grade* IN	Grade* 1505
GOMT060230R	Multi-Purpose		■
GOMT080330R	Multi-Purpose		■
GOMT060245R	Multi-Purpose		■
GOMT080345R	Multi-Purpose		■
GOMT060260R	Multi-Purpose		■
GOMT080360R	Multi-Purpose		■

* For insert grade descriptions, see page 132.

TAP DRILL/CHAMFER COMBO DRILL INSERTS

KOMT050104R



Insert Number	Application	Grade* IN	Grade* 2005
KOMT050104R	Multi-Purpose		■

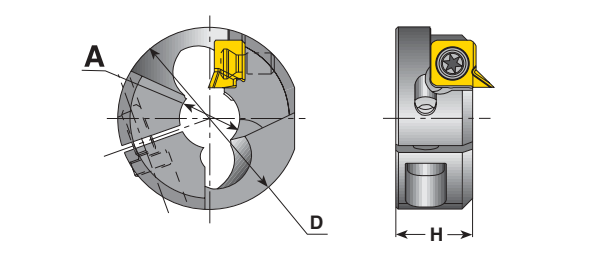
* For insert grade descriptions, see page 132.

QWIK•TWIST™ CHAMFER RINGS - SERIES "CB"

Chamfer Hole Diameters
.394" to .787"

Chamfer Rings
Combine drilling and chamfering in one operation.

Chamfering

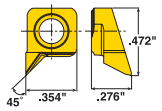


Ring Number	A Fits Quik•Twist Drill Series	Maximum Chamfer Size	D	H
CB100-01	YD1000 _ _ _ _ _ _ _ _	.06" X 45°	1.26	.56
CB105-01	YD1050 _ _ _ _ _ _ _ _	.06" X 45°	1.26	.56
CB110-01	YD1100 _ _ _ _ _ _ _ _	.06" X 45°	1.38	.57
CB115-01	YD1150 _ _ _ _ _ _ _ _	.06" X 45°	1.38	.57
CB120-01	YD1200 _ _ _ _ _ _ _ _	.06" X 45°	1.48	.57
CB125-01	YD1250 _ _ _ _ _ _ _ _	.06" X 45°	1.48	.57
CB130-01	YD1300 _ _ _ _ _ _ _ _	.06" X 45°	1.54	.57
CB135-01	YD1350 _ _ _ _ _ _ _ _	.06" X 45°	1.54	.57
CB140-01	YD1400 _ _ _ _ _ _ _ _	.06" X 45°	1.61	.60
CB145-01	YD1450 _ _ _ _ _ _ _ _	.06" X 45°	1.61	.60
CB150-01	YD1500 _ _ _ _ _ _ _ _	.06" X 45°	1.69	.65
CB160-01	YD1600 _ _ _ _ _ _ _ _	.08" X 45°	1.77	.67
CB170-01	YD1700 _ _ _ _ _ _ _ _	.08" X 45°	1.85	.69
CB180-01	YD1800 _ _ _ _ _ _ _ _	.08" X 45°	1.89	.71
CB190-01	YD1900 _ _ _ _ _ _ _ _	.08" X 45°	1.97	.71
CB200-01	YD2000 _ _ _ _ _ _ _ _	.08" X 45°	2.05	.71

Chamfer rings for use only with 3:1 and 5:1 Qwik Twist drills.

INSERTS & HARDWARE

ZOMW090700R



Insert Number	Application	Grade* IN	Grade* 1530
ZOMW090700R	Multi-Purpose		■

* For insert grade descriptions, see page 132.

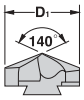
Ring Number	Insert Screw Part No.	Insert Screw Torque	Ring Clamp Screw Part No.	Driver: Insert Driver Blade	Driver: Clamp Screw Driver Blade	Driver: Driver Blade Handle
CB 100 to CB150	SM40-093-20	30-35 in. lbs.	SD050-A5	DS-T15HB	DS-T25HB	DSHH06T
CB 160 to CB200	SM40-093-20	30-35 in. lbs.	SD060-20	DS-T15HB	DS-H05HB	DSHH06T

For technical information, see pages 146-147.

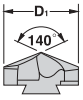
QWIK TWIST™ REPLACEABLE DRILL POINTS - SERIES "Y"

DRILL POINTS- .2677" TO .4291"

General Purpose



Cast Iron



D_1 Drill Diameter inch	mm	General Purpose Part Number	Cast Iron** Part Number	Pocket Size	Grade* IN	Grade* 2005
.2677	6.8	YAB0680R01	YBB0680R01	6, 8		■
.2953	7,5	YAB0750R01	YBB0750R01	8		■
.2992	7,6	YAB0760R01	YBB0760R01	8		■
.3031	7,7	YAB0770R01	YBB0770R01	8		■
.3071	7,8	YAB0780R01	YBB0780R01	8		■
.3110	7,9	YAB0790R01	YBB0790R01	8		■
.3150	8,0	YAB0800R01	YBB0800R01	8		■
.3189	8,1	YAB0810R01	YBB0810R01	8		■
.3228	8,2	YAB0820R01	YBB0820R01	8		■
.3268	8,3	YAB0830R01	YBB0830R01	8		■
.3307	8,4	YAB0840R01	YBB0840R01	8		■
.3346	8,5	YAB0850R01	YBB0850R01	8		■
.3386	8,6	YAB0860R01	YBB0860R01	8		■
.3425	8,7	YAB0870R01	YBB0870R01	8		■
.3465	8,8	YAB0880R01	YBB0880R01	8		■
.3504	8,9	YAB0890R01	YBB0890R01	8		■
.3543	9,0	YAB0900R01	YBB0900R01	9		■
.3583	9,1	YAB0910R01	YBB0910R01	9		■
.3622	9,2	YAB0920R01	YBB0920R01	9		■
.3661	9,3	YAB0930R01	YBB0930R01	9		■
.3701	9,4	YAB0940R01	YBB0940R01	9		■
.3740	9,5	YAB0950R01	YBB0950R01	9		■
.3780	9,6	YAB0960R01	YBB0960R01	9		■
.3819	9,7	YAB0970R01	YBB0970R01	9		■
.3858	9,8	YAB0980R01	YBB0980R01	9		■
.3898	9,9	YAB0990R01	YBB0990R01	9		■
.3937	10,0	YAB1000R01	YBB1000R01	10		■
.3976	10,1	YAB1010R01	YBB1010R01	10		■
.4016	10,2	YAB1020R01	YBB1020R01	10		■
.4055	10,3	YAB1030R01	YBB1030R01	10		■
.4094	10,4	YAB1040R01	YBB1040R01	10		■
.4134	10,5	YAB1050R01	YBB1050R01	10		■
.4173	10,6	YAB1060R01	YBB1060R01	10		■
.4213	10,7	YAB1070R01	YBB1070R01	10		■
.4252	10,8	YAB1080R01	YBB1080R01	10		■
.4291	10,9	YAB1090R01	YBB1090R01	10		■

* For insert grade descriptions, see page 132. ** Cast iron point also effective in reducing burrs and breakout in steel applications.

DRILL POINTS- .4331" TO .5866"

D_1 Drill Diameter inch	mm	General Purpose Part Number	Cast Iron** Part Number	Pocket Size	Grade* IN	Grade* 2005
.4331	11,0	YAB1100R01	YBB1100R01	11		■
.4370	11,1	YAB1110R01	YBB1110R01	11		■
.4409	11,2	YAB1120R01	YBB1120R01	11		■
.4449	11,3	YAB1130R01	YBB1130R01	11		■
.4488	11,4	YAB1140R01	YBB1140R01	11		■
.4528	11,5	YAB1150R01	YBB1150R01	11		■
.4567	11,6	YAB1160R01	YBB1160R01	11		■
.4606	11,7	YAB1170R01	YBB1170R01	11		■
.4646	11,8	YAB1180R01	YBB1180R01	11		■
.4685	11,9	YAB1190R01	YBB1190R01	11		■
.4724	12,0	YAB1200R01	YBB1200R01	12		■
.4764	12,1	YAB1210R01	YBB1210R01	12		■
.4803	12,2	YAB1220R01	YBB1220R01	12		■
.4843	12,3	YAB1230R01	YBB1230R01	12		■
.4882	12,4	YAB1240R01	YBB1240R01	12		■
.4921	12,5	YAB1250R01	YBB1250R01	12		■
.4961	12,6	YAB1260R01	YBB1260R01	12		■
.5000	12,7	YAB1270R01	YBB1270R01	12		■
.5039	12,8	YAB1280R01	YBB1280R01	12		■
.5079	12,9	YAB1290R01	YBB1290R01	12		■
.5118	13,0	YAB1300R01	YBB1300R01	13		■
.5157	13,1	YAB1310R01	YBB1310R01	13		■
.5197	13,2	YAB1320R01	YBB1320R01	13		■
.5236	13,3	YAB1330R01	YBB1330R01	13		■
.5276	13,4	YAB1340R01	YBB1340R01	13		■
.5315	13,5	YAB1350R01	YBB1350R01	13		■
.5354	13,6	YAB1360R01	YBB1360R01	13		■
.5394	13,7	YAB1370R01	YBB1370R01	13		■
.5433	13,8	YAB1380R01	YBB1380R01	13		■
.5472	13,9	YAB1390R01	YBB1390R01	13		■
.5512	14,0	YAB1400R01	YBB1400R01	14		■
.5551	14,1	YAB1410R01	YBB1410R01	14		■
.5591	14,2	YAB1420R01	YBB1420R01	14		■
.5630	14,3	YAB1430R01	YBB1430R01	14		■
.5669	14,4	YAB1440R01	YBB1440R01	14		■
.5709	14,5	YAB1450R01	YBB1450R01	14		■
.5748	14,6	YAB1460R01	YBB1460R01	14		■
.5787	14,7	YAB1470R01	YBB1470R01	14		■
.5827	14,8	YAB1480R01	YBB1480R01	14		■
.5866	14,9	YAB1490R01	YBB1490R01	14		■

* For insert grade descriptions, see page 132.
** Cast iron point also effective in reducing burrs and breakout in steel applications.

DRILL POINTS- .5906" TO .7441"

D_1 Drill Diameter inch	mm	General Purpose Part Number	Cast Iron** Part Number	Pocket Size	Grade* IN	Grade* 2005
.5906	15,0	YAB1500R01	YBB1500R01	15		■
.5945	15,1	YAB1510R01	YBB1510R01	15		■
.5984	15,2	YAB1520R01	YBB1520R01	15		■
.6024	15,3	YAB1530R01	YBB1530R01	15		■
.6063	15,4	YAB1540R01	YBB1540R01	15		■
.6102	15,5	YAB1550R01	YBB1550R01	15		■
.6142	15,6	YAB1560R01	YBB1560R01	15		■
.6181	15,7	YAB1570R01	YBB1570R01	15		■
.6220	15,8	YAB1580R01	YBB1580R01	15		■
.6260	15,9	YAB1590R01	YBB1590R01	15		■
.6299	16,0	YAB1600R01	YBB1600R01	16		■
.6339	16,1	YAB1610R01	YBB1610R01	16		■
.6378	16,2	YAB1620R01	YBB1620R01	16		■
.6417	16,3	YAB1630R01	YBB1630R01	16		■
.6457	16,4	YAB1640R01	YBB1640R01	16		■
.6496	16,5	YAB1650R01	YBB1650R01	16		■
.6535	16,6	YAB1660R01	YBB1660R01	16		■
.6575	16,7	YAB1670R01	YBB1670R01	16		■
.6614	16,8	YAB1680R01	YBB1680R01	16		■
.6654	16,9	YAB1690R01	YBB1690R01	16		■
.6693	17,0	YAB1700R01	YBB1700R01	17		■
.6732	17,1	YAB1710R01	YBB1710R01	17		■
.6772	17,2	YAB1720R01	YBB1720R01	17		■
.6811	17,3	YAB1730R01	YBB1730R01	17		■
.6850	17,4	YAB1740R01	YBB1740R01	17		■
.6890	17,5	YAB1750R01	YBB1750R01	17		■
.6929	17,6	YAB1760R01	YBB1760R01	17		■
.6968	17,7	YAB1770R01	YBB1770R01	17		■
.7008	17,8	YAB1780R01	YBB1780R01	17		■
.7047	17,9	YAB1790R01	YBB1790R01	17		■
.7087	18,0	YAB1800R01	YBB1800R01	18		■
.7126	18,1	YAB1810R01	YBB1810R01	18		■
.7165	18,2	YAB1820R01	YBB1820R01	18		■
.7205	18,3	YAB1830R01	YBB1830R01	18		■
.7244	18,4	YAB1840R01	YBB1840R01	18		■
.7283	18,5	YAB1850R01	YBB1850R01	18		■
.7323	18,6	YAB1860R01	YBB1860R01	18		■
.7362	18,7	YAB1870R01	YBB1870R01	18		■
.7402	18,8	YAB1880R01	YBB1880R01	18		■
.7441	18,9	YAB1890R01	YBB1890R01	18		■

* For insert grade descriptions, see page 132.
** Cast iron point also effective in reducing burrs and breakout in steel applications.

QWIKTWIST™ REPLACEABLE DRILL POINTS - SERIES "Y"

DRILL POINTS- .7480" TO .9016"

D_1 Drill Diameter inch	mm	General Purpose Part Number	Cast Iron** Part Number	Pocket Size	Grade* IN	Grade* 2005
.7480	19,0	YAB1900R01	YBB1900R01	19	■	
.7500	19,05	YAB1905R01	YBB1905R01	19	■	
.7520	19,1	YAB1910R01	YBB1910R01	19	■	
.7559	19,2	YAB1920R01	YBB1920R01	19	■	
.7598	19,3	YAB1930R01	YBB1930R01	19	■	
.7638	19,4	YAB1940R01	YBB1940R01	19	■	
.7677	19,5	YAB1950R01	YBB1950R01	19	■	
.7717	19,6	YAB1960R01	YBB1960R01	19	■	
.7756	19,7	YAB1970R01	YBB1970R01	19	■	
.7795	19,8	YAB1980R01	YBB1980R01	19	■	
.7835	19,9	YAB1990R01	YBB1990R01	19	■	
.7874	20,0	YAB2000R01	YBB2000R01	20	■	
.7913	20,1	YAB2010R01	YBB2010R01	20	■	
.7953	20,2	YAB2020R01	YBB2020R01	20	■	
.7992	20,3	YAB2030R01	YBB2030R01	20	■	
.8031	20,4	YAB2040R01	YBB2040R01	20	■	
.8071	20,5	YAB2050R01	YBB2050R01	20	■	
.8110	20,6	YAB2060R01	YBB2060R01	20	■	
.8150	20,7	YAB2070R01	YBB2070R01	20	■	
.8189	20,8	YAB2080R01	YBB2080R01	20	■	
.8228	20,9	YAB2090R01	YBB2090R01	20	■	
.8268	21,0	YAB2100R01	YBB2100R01	21	■	
.8307	21,1	YAB2110R01	YBB2110R01	21	■	
.8346	21,2	YAB2120R01	YBB2120R01	21	■	
.8386	21,3	YAB2130R01	YBB2130R01	21	■	
.8425	21,4	YAB2140R01	YBB2140R01	21	■	
.8465	21,5	YAB2150R01	YBB2150R01	21	■	
.8504	21,6	YAB2160R01	YBB2160R01	21	■	
.8543	21,7	YAB2170R01	YBB2170R01	21	■	
.8583	21,8	YAB2180R01	YBB2180R01	21	■	
.8622	21,9	YAB2190R01	YBB2190R01	21	■	
.8661	22,0	YAB2200R01	YBB2200R01	22	■	
.8701	22,1	YAB2210R01	YBB2210R01	22	■	
.8740	22,2	YAB2220R01	YBB2220R01	22	■	
.8750	22,22	YAB2222R01	YBB2222R01	22	■	
.8780	22,3	YAB2230R01	YBB2230R01	22	■	
.8819	22,4	YAB2240R01	YBB2240R01	22	■	
.8858	22,5	YAB2250R01	YBB2250R01	22	■	
.8898	22,6	YAB2260R01	YBB2260R01	22	■	
.8937	22,7	YAB2270R01	YBB2270R01	22	■	
.8976	22,8	YAB2280R01	YBB2280R01	22	■	
.9016	22,9	YAB2290R01	YBB2290R01	22	■	

** Cast iron point also effective in reducing burrs and breakout in steel applications.

DRILL POINTS- .9055" TO 1.0197"

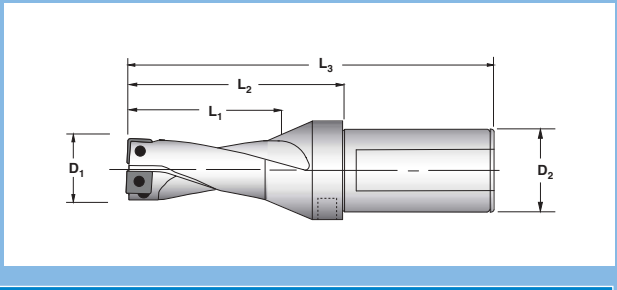
D_1 Drill Diameter inch	mm	General Purpose Part Number	Cast Iron** Part Number	Pocket Size	Grade* IN	Grade* 2005
.9055	23,0	YAB2300R01	YBB2300R01	23		■
.9094	23,1	YAB2310R01	YBB2310R01	23		■
.9134	23,2	YAB2320R01	YBB2320R01	23		■
.9173	23,3	YAB2330R01	YBB2330R01	23		■
.9213	23,4	YAB2340R01	YBB2340R01	23		■
.9252	23,5	YAB2350R01	YBB2350R01	23		■
.9291	23,6	YAB2360R01	YBB2360R01	23		■
.9331	23,7	YAB2370R01	YBB2370R01	23		■
.9370	23,8	YAB2380R01	YBB2380R01	23		■
.9409	23,9	YAB2390R01	YBB2390R01	23		■
.9449	24,0	YAB2400R01	YBB2400R01	24		■
.9488	24,1	YAB2410R01	YBB2410R01	24		■
.9528	24,2	YAB2420R01	YBB2420R01	24		■
.9567	24,3	YAB2430R01	YBB2430R01	24		■
.9606	24,4	YAB2440R01	YBB2440R01	24		■
.9646	24,5	YAB2450R01	YBB2450R01	24		■
.9685	24,6	YAB2460R01	YBB2460R01	24		■
.9724	24,7	YAB2470R01	YBB2470R01	24		■
.9764	24,8	YAB2480R01	YBB2480R01	24		■
.9803	24,9	YAB2490R01	YBB2490R01	24		■
.9843	25,0	YAB2500R01	YBB2500R01	25		■
.9882	25,1	YAB2510R01	YBB2510R01	25		■
.9921	25,2	YAB2520R01	YBB2520R01	25		■
.9961	25,3	YAB2530R01	YBB2530R01	25		■
1.0000	25,4	YAB2540R01	YBB2540R01	25		■
1.0039	25,5	YAB2550R01	YBB2550R01	25		■
1.0079	25,6	YAB2560R01	YBB2560R01	25		■
1.0118	25,7	YAB2570R01	YBB2570R01	25		■
1.0157	25,8	YAB2580R01	YBB2580R01	25		■
1.0197	25,9	YAB2590R01	YBB2590R01	25		■

* For insert grade descriptions, see page 132.
** Cast iron point also effective in reducing burrs and breakout in steel applications.

QUADDRILL+™ SQUARE INSERT INDEXABLE DRILLS-2:1

Diameters	L:D Ratio	Geometry
.500" to 2.000"	2:1	Positive

Drilling Coolant



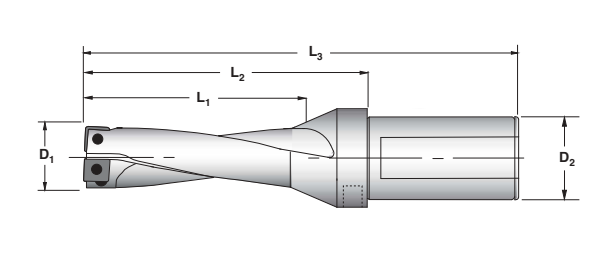
D_1 Nom. Dia. inch	mm	New Drill Number	L_1 Drilling Length	L_2 Ext. frm Holder	L_3 Overall Length	D_2 Shank Style/Size	Num. of Inserts
.500	12,7	Q0127025N5R01	1.00	2.05	4.25	1.000 Universal	2
.531	13,5	Q0135027N5R01	1.06	2.13	4.33	1.000 Universal	2
.563	14,3	Q0143029N5R01	1.13	2.13	4.33	1.000 Universal	2
.594	15,0	Q0150030N5R01	1.19	2.24	4.44	1.000 Universal	2
.625	15,9	Q0159032N5R01	1.25	2.36	4.57	1.000 Universal	2
.657	16,7	Q0167033N5R01	1.31	2.44	4.65	1.000 Universal	2
.688	17,5	Q0175035N5R01	1.38	2.56	4.76	1.000 Universal	2
.719	18,3	Q0183037N5R01	1.44	2.56	4.76	1.000 Universal	2
.750	19,0	Q0191038N5R01	1.50	2.64	4.84	1.000 Universal	2
.781	19,8	Q0198040N5R01	1.56	2.80	5.00	1.000 Universal	2
.813	20,6	Q0206041N5R01	1.63	2.87	5.08	1.000 Universal	2
.843	21,4	Q0214042N5R02	1.69	2.95	5.16	1.000 Universal	2
.875	22,2	Q0222044N5R02	1.75	2.95	5.16	1.000 Universal	2
.906	23,0	Q0230046N6R01	1.81	3.19	5.55	1.250 Universal	2
.938	23,8	Q0238048N6R01	1.88	3.31	5.67	1.250 Universal	2
.969	24,6	Q0246049N6R01	1.94	3.43	5.79	1.250 Universal	2
1.000	25,4	Q0254051N6R01	2.00	3.50	5.87	1.250 Universal	2
1.031	26,2	Q0262052N6R01	2.06	3.50	5.87	1.250 Universal	2
1.063	27,0	Q0270054N6R01	2.13	3.58	5.94	1.250 Universal	2
1.094	27,8	Q0278056N6R02	2.19	3.70	6.06	1.250 Universal	2
1.125	28,6	Q0286057N6R02	2.25	3.78	6.14	1.250 Universal	2
1.156	29,4	Q0294059N6R01	2.31	3.98	6.34	1.250 Universal	2
1.187	30,2	Q0302060N6R01	2.37	3.98	6.34	1.250 Universal	2
1.219	31,0	Q0310062N6R01	2.44	4.09	6.45	1.250 Universal	2
1.250	31,7	Q0318063N6R01	2.50	4.17	6.53	1.250 Universal	2
1.281	32,5	Q0325065N6R01	2.56	4.29	6.65	1.250 Universal	2
1.312	33,3	Q0333067N6R01	2.62	4.29	6.65	1.250 Universal	2
1.343	34,1	Q0341068N6R02	2.69	4.37	6.73	1.250 Universal	2
1.375	34,9	Q0349070N6R02	2.75	4.49	6.85	1.250 Universal	2
1.406	35,7	Q0357071N6R02	2.81	4.61	6.97	1.250 Universal	2
1.437	36,5	Q0365073N6R01	2.87	4.72	7.08	1.250 Universal	2
1.468	37,3	Q0373075N6R01	2.94	4.72	7.08	1.250 Universal	2
1.500	38,1	Q0381076N6R01	3.00	4.84	7.20	1.250 Universal	2
1.531	38,9	Q0389078N6R01	3.06	4.92	7.28	1.250 Universal	2
1.562	39,7	Q0397079N6R01	3.12	5.04	7.40	1.250 Universal	2
1.594	40,5	Q0405081N6R01	3.19	5.16	7.52	1.250 Universal	2
1.625	41,3	Q0413083N6R01	3.25	5.16	7.52	1.250 Universal	2
1.687	42,8	Q0428086N6R02	3.37	5.35	7.71	1.250 Universal	2
1.719	43,7	Q0437087N6R01	3.44	5.43	7.79	1.250 Universal	2
1.750	44,5	Q0445089N6R01	3.50	5.59	7.95	1.250 Universal	2
1.781	45,2	Q0452090N7R01	3.56	5.59	8.35	1.500 Universal	2
1.813	46,0	Q0460092N7R01	3.63	5.71	8.46	1.500 Universal	2
1.875	47,6	Q0476095N7R01	3.75	5.91	8.66	1.500 Universal	2
1.937	49,2	Q0492098N7R01	3.87	5.98	8.74	1.500 Universal	2
1.969	50,0	Q0500100N7R01	3.94	6.10	8.86	1.500 Universal	2
2.000	50,8	Q0508102N7R01	4.00	6.22	8.98	1.500 Universal	2

For insert information, see page 32.

QUADDRILL+™ SQUARE INSERT INDEXABLE DRILLS-3:1

Diameters	L:D Ratio	Geometry
.500" to 2.000"	3:1	Positive

Drilling Coolant

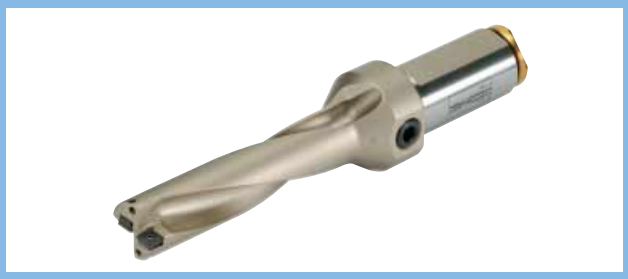


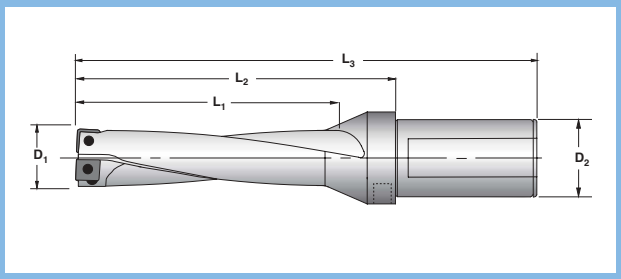
D_1 Nom. Dia. inch	mm	New Drill Number	L_1 Drilling Length	L_2 Ext. frm Holder	L_3 Overall Length	D_2 Shank Style/Size	Num. of Inserts
.500	12,7	Q0127038N5R01	1.50	2.56	4.76	1.000 Universal	2
.531	13,5	Q0135041N5R01	1.59	2.68	4.88	1.000 Universal	2
.563	14,3	Q0143043N5R01	1.69	2.68	4.88	1.000 Universal	2
.594	15,0	Q0150045N5R01	1.78	2.83	5.03	1.000 Universal	2
.626	15,9	Q0159048N5R01	1.88	2.99	5.20	1.000 Universal	2
.657	16,7	Q0167050N5R01	1.97	3.11	5.31	1.000 Universal	2
.688	17,5	Q0175053N5R01	2.06	3.27	5.47	1.000 Universal	2
.719	18,3	Q0183055N5R01	2.16	3.27	5.47	1.000 Universal	2
.750	19,0	Q0191057N5R01	2.25	3.39	5.59	1.000 Universal	2
.781	19,8	Q0198059N5R01	2.34	3.58	5.79	1.000 Universal	2
.813	20,6	Q0206062N5R01	2.44	3.70	5.91	1.000 Universal	2
.843	21,4	Q0214064N5R02	2.53	3.82	6.02	1.000 Universal	2
.875	22,2	Q0222067N5R02	2.63	3.82	6.02	1.000 Universal	2
.906	23,0	Q0230069N6R01	2.72	4.09	6.46	1.250 Universal	2
.938	23,8	Q0238071N6R01	2.81	4.25	6.61	1.250 Universal	2
.969	24,6	Q0246074N6R01	2.91	4.41	6.77	1.250 Universal	2
1.000	25,4	Q0254076N6R01	3.00	4.53	6.89	1.250 Universal	2
1.031	26,2	Q0262079N6R01	3.09	4.53	6.89	1.250 Universal	2
1.063	27,0	Q0270081N6R01	3.19	4.65	7.01	1.250 Universal	2
1.094	27,8	Q0278083N6R02	3.28	4.80	7.17	1.250 Universal	2
1.125	28,6	Q0286086N6R02	3.38	4.92	7.28	1.250 Universal	2
1.156	29,4	Q0294088N6R01	3.47	5.16	7.52	1.250 Universal	2
1.187	30,2	Q0302090N6R01	3.56	5.16	7.52	1.250 Universal	2
1.219	31,0	Q0310093N6R01	3.66	5.31	7.67	1.250 Universal	2
1.250	31,7	Q0318095N6R01	3.75	5.43	7.79	1.250 Universal	2
1.281	32,5	Q0325098N6R01	3.84	5.59	7.95	1.250 Universal	2
1.312	33,3	Q0333100N6R01	3.94	5.59	7.95	1.250 Universal	2
1.343	34,1	Q0341102N6R02	4.03	5.71	8.07	1.250 Universal	2
1.375	34,9	Q0349105N6R02	4.13	5.87	8.23	1.250 Universal	2
1.406	35,7	Q0357107N6R02	4.22	6.02	8.38	1.250 Universal	2
1.437	36,5	Q0365110N6R01	4.31	6.18	8.54	1.250 Universal	2
1.468	37,3	Q0373112N6R01	4.40	6.18	8.54	1.250 Universal	2
1.500	38,1	Q0381114N6R01	4.50	6.34	8.70	1.250 Universal	2
1.531	38,9	Q0389117N6R01	4.59	6.46	8.82	1.250 Universal	2
1.562	39,7	Q0397119N6R01	4.69	6.61	8.97	1.250 Universal	2
1.594	40,5	Q0405122N6R01	4.78	6.77	9.13	1.250 Universal	2
1.625	41,3	Q0413124N6R01	4.88	6.77	9.13	1.250 Universal	2
1.687	42,8	Q0428128N6R02	5.06	7.05	9.41	1.250 Universal	2
1.719	43,7	Q0437131N6R01	5.16	7.17	9.53	1.250 Universal	2
1.750	44,5	Q0445134N6R01	5.25	7.36	9.72	1.250 Universal	2
1.781	45,2	Q0452136N7R01	5.34	7.36	10.12	1.500 Universal	2
1.813	46,0	Q0460138N7R01	5.44	7.52	10.28	1.500 Universal	2
1.875	47,6	Q0476143N7R01	5.63	7.80	10.55	1.500 Universal	2
1.937	49,2	Q0492148N7R01	5.81	7.91	10.67	1.500 Universal	2
1.969	50,0	Q0500150N7R01	5.91	8.07	10.83	1.500 Universal	2
2.000	50,8	Q0508152N7R01	6.00	8.23	10.98	1.500 Universal	2

For insert information, see page 32.

QUADODRILL+™ SQUARE INSERT INDEXABLE DRILLS-4:1

Diameters	L:D Ratio	Geometry
.500" to 2.000"	4:1	Positive





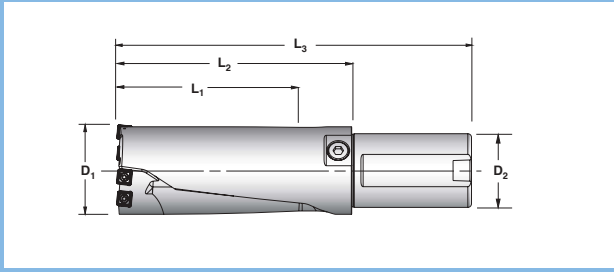
D_1 Nom. Dia. inch	mm	Drill Number	L_1 Drilling Length	L_2 Ext. frm Holder	L_3 Overall Length	D_2 Shank Style/Size	Num. of Inserts
.500	12,7	Q0127051N5R01	2.00	3.07	5.27	1.000 Universal	2
.531	13,5	Q0135054N5R01	2.12	3.23	5.43	1.000 Universal	2
.563	14,3	Q0143057N5R01	2.25	3.23	5.43	1.000 Universal	2
.594	15,0	Q0150060N5R01	2.38	3.43	5.63	1.000 Universal	2
.626	15,9	Q0159064N5R01	2.50	3.62	5.83	1.000 Universal	2
.657	16,7	Q0167067N5R01	2.63	3.78	5.98	1.000 Universal	2
.688	17,5	Q0175070N5R01	2.75	3.98	6.18	1.000 Universal	2
.719	18,3	Q0183073N5R01	2.88	3.98	6.18	1.000 Universal	2
.750	19,0	Q0191076N5R01	3.00	4.13	6.34	1.000 Universal	2
.781	19,8	Q0198079N5R01	3.12	4.37	6.57	1.000 Universal	2
.813	20,6	Q0206082N5R01	3.25	4.53	6.73	1.000 Universal	2
.843	21,4	Q0214086N5R02	3.37	4.69	6.89	1.000 Universal	2
.875	22,2	Q0222089N5R02	3.50	4.69	6.89	1.000 Universal	2
.906	23,0	Q0230092N6R01	3.62	5.00	7.36	1.250 Universal	2
.938	23,8	Q0238095N6R01	3.75	5.20	7.56	1.250 Universal	2
.969	24,6	Q0246098N6R01	3.88	5.39	7.76	1.250 Universal	2
1.000	25,4	Q0254102N6R01	4.00	5.55	7.91	1.250 Universal	2
1.031	26,2	Q0262105N6R01	4.12	5.55	7.91	1.250 Universal	2
1.063	27,0	Q0270108N6R01	4.25	5.71	8.27	1.250 Universal	2
1.094	27,8	Q0278111N6R02	4.38	5.91	7.79	1.250 Universal	2
1.125	28,6	Q0286114N6R02	4.50	6.06	8.43	1.250 Universal	2
1.156	29,4	Q0294118N6R01	4.62	6.34	8.70	1.250 Universal	2
1.187	30,2	Q0302120N6R01	4.75	6.34	8.90	1.250 Universal	2
1.219	31,0	Q0310124N6R01	4.88	6.54	8.82	1.250 Universal	2
1.250	31,8	Q0318127N6R01	5.00	6.69	9.05	1.250 Universal	2
1.281	32,5	Q0325130N6R01	5.12	6.89	9.25	1.250 Universal	2
1.312	33,3	Q0333133N6R01	5.25	6.89	9.25	1.250 Universal	2
1.343	34,1	Q0341136N6R02	5.37	6.65	9.33	1.250 Universal	2
1.375	34,9	Q0349140N6R02	5.50	7.24	9.60	1.250 Universal	2
1.406	35,7	Q0357143N6R02	5.62	7.44	9.80	1.250 Universal	2
1.437	36,5	Q0365146N6R01	5.75	7.64	10.00	1.250 Universal	2
1.468	37,3	Q0373149N6R01	5.87	7.64	10.00	1.250 Universal	2
1.500	38,1	Q0381152N6R01	6.00	7.83	10.19	1.250 Universal	2
1.531	38,9	Q0389156N6R01	6.12	7.99	10.35	1.250 Universal	2
1.562	39,7	Q0397159N6R01	6.25	8.19	10.55	1.250 Universal	2
1.594	40,5	Q0405162N6R01	6.38	8.39	10.75	1.250 Universal	2
1.625	41,3	Q0413165N6R01	6.50	8.39	10.75	1.250 Universal	2
1.687	42,8	Q0428171N6R02	6.75	8.74	11.26	1.250 Universal	2
1.719	43,7	Q0437175N6R01	6.88	8.90	11.18	1.250 Universal	2
1.750	44,5	Q0445178N6R01	7.00	9.13	11.89	1.250 Universal	2
1.781	45,2	Q0452181N7R01	7.12	9.13	11.89	1.500 Universal	2
1.813	46,0	Q0460184N7R01	7.25	9.33	12.09	1.500 Universal	2
1.875	47,6	Q0476190N7R01	7.50	9.69	12.44	1.500 Universal	2
1.937	49,2	Q0492197N7R01	7.75	9.84	12.60	1.500 Universal	2
1.969	50,0	Q0500200N7R01	7.88	10.04	12.80	1.500 Universal	2
2.000	50,8	Q0508203N7R01	8.00	10.24	12.99	1.500 Universal	2

For insert information, see page 32.

QUADDRILL™ LARGE INDEXABLE DRILLS-2:1, 3:1

Diameters	L:D Ratio	Geometry
2.125" to 3.250"	2:1, 3:1	Neutral

Drilling Coolant



2:1

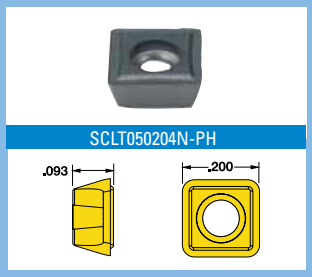
D_1 Nom. Dia. inch	mm	Drill Number	L_1 Drilling Length	L_2 Ext. frm Holder	L_3 Overall Length	D_2 Shank Style/Size	Num. of Inserts
2.125	53,9	**Q0539108N8R01**	4.25	6.00	9.25	2.000 Universal	4
2.250	57,1	**Q0571114N8R01**	4.50	6.00	9.25	2.000 Universal	4
2.375	60,3	**Q0603121N8R01**	4.75	6.50	9.75	2.000 Universal	4
2.500	63,5	**Q0635127N8R01**	5.00	6.38	9.63	2.000 Universal	4
2.625	66,6	**Q0666133N8R01**	5.25	6.75	10.00	2.000 Universal	4
2.750	69,8	**Q0698140N8R01**	5.50	7.00	10.25	2.000 Universal	4
2.875	73,0	**Q0730146N8R01**	5.75	7.25	10.50	2.000 Universal	4
3.000	76,2	**Q0762152N8R01**	6.00	7.50	10.75	2.000 Universal	4
3.250	82,5	**Q0825165N8R01**	6.50	8.00	11.25	2.000 Universal	4

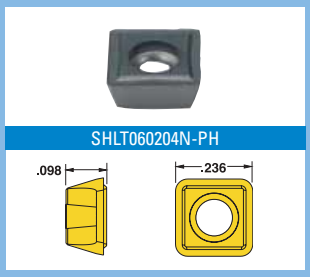
3:1

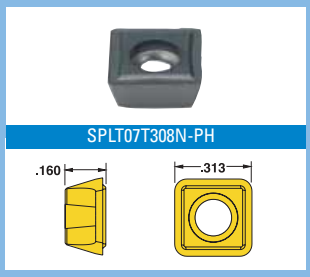
D Nom. Dia. inch	mm	Drill Number	L_1 Drilling Length	L_2 Ext. frm Holder	L_3 Overall Length	D_2 Shank Style/Size	Num. of Inserts
2.125	53,9	**Q0539162N8R01**	6.38	7.88	11.13	2.000 Universal	4
2.250	57,1	**Q0571172N8R01**	6.75	8.25	11.50	2.000 Universal	4
2.375	60,3	**Q0603181N8R01**	7.13	8.88	12.13	2.000 Universal	4
2.500	63,5	**Q0635191N8R01**	7.50	8.88	12.13	2.000 Universal	4
2.625	66,6	**Q0666200N8R01**	7.88	8.38	12.63	2.000 Universal	4
2.750	69,8	**Q0698210N8R01**	8.25	9.75	13.00	2.000 Universal	4
2.875	73,0	**Q0730219N8R01**	8.63	10.13	13.38	2.000 Universal	4
3.000	76,2	**Q0762229N8R01**	9.00	10.50	13.75	2.000 Universal	4
3.250	82,5	**Q0825248N8R01**	9.75	11.25	14.50	2.000 Universal	4

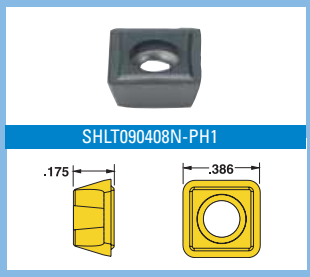
For insert information, see page 32.

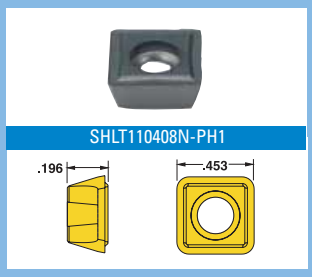
INSERTS

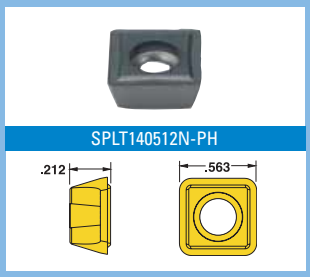










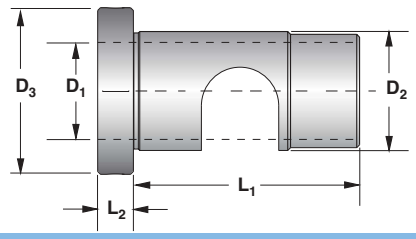


Drill Diameter	Insert Number	Corner	Grades* IN	1030	2005
.500-.594	**SCLT050204N-PH**	.015R		■	■
.625-.813	**SHLT060204N-PH**	.016R		■	■
.843-1.063 + 2.125	**SPLT07T308N-PH**	.030R		■	■
1.094-1.312, 2.250-2.750	**SHLT090408N-PH1**	.030R		■	■
1.343-1.625, 2.875-3.000	**SHLT110408N-PH1**	.030R		■	■
1.687 - 2.000 + 3.250	**SPLT140512N-PH**	.047R		■	■

* For insert grade descriptions, see page 132.

HARDWARE

Insert Screw			Driver	
Drill Diameter	Part No.	Torque	Part No.	Coolant Fitting
.500-.594	SM20-043-00	5-9 in. lbs.	DS-TP06S	PF-0012
.625-.813	SM22-052-00	7-11 in. lbs.	DS-T07F (Tx-07)	PF-0012
.843-1.063 + 2.125	SM25-064-00	10-15 in. lbs.	DS-T08W (Tx-08)	PF-0013
1.094-1.312, 2.250-2.750	SM35-088-60	25-30 in. lbs.	DS-T10T (Tx-10)	–
1.343-1.625, 2.875-3.000	SM40-093-20	30-35 in. lbs.	DS-T15T (Tx-15)	–
1.687 - 2.000 + 3.250	SM50-122-50	40-45 in. lbs.	DS-T20T (Tx-20)	–

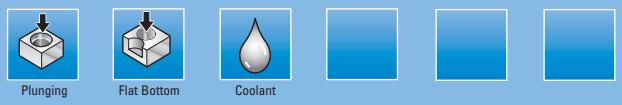


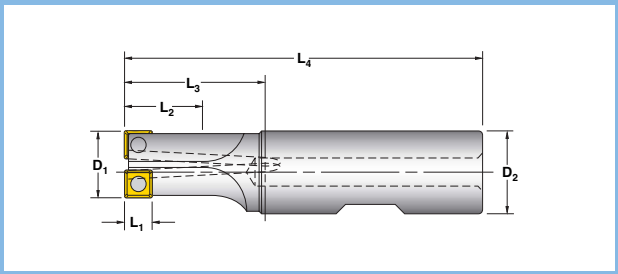
Bushing Number	D_1	D_2	D_3	L_1	L_2
BU16-16	1.00	1.25	1.75	2.00	0.38
BU24-44	1.25	1.50	2.00	2.10	0.38
BU32-02	1.50	2.00	2.50	2.44	0.38

For technical information, see page 154.

QUADBORE™ CENTER-CUTTING COUNTER BORE TOOLS- SERIES "15S"

Diameters	L:D Ratio	Geometry
.500" to 2.000"	1:1	Positive





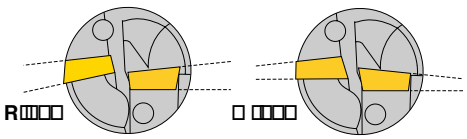
D_1 Nom. Dia. inch	mm	Drill Number	L_1 Cutting Edge	L_2 Max C'bore Depth	L_3 Ext. from Holder	L_4 Overall Length	D_2 Shank Size/Style	Num. of Inserts
.500	12,7	**15S1D-0500884R01**	.22	.50	.88	2.85	.750 Weldon	1
.625	15,8	**15S1D-0601084R01**	.22	.62	1.00	2.97	.750 Weldon	2
.719	18,2	**15S1D-0701084R01**	.22	.72	1.00	2.97	.750 Weldon	2
.750	19,0	**15S1D-0701284R01**	.22	.75	1.25	3.22	.750 Weldon	2
.813	20,6	**15S1G-0801284R01**	.40	.75	1.25	3.25	.750 Weldon	1
.844	21,4	**15S1G-0801284R02**	.40	.75	1.25	3.25	.750 Weldon	1
1.000	25,4	**15S1F-1001580R01**	.33	1.00	1.50	3.69	1.000 Weldon	2
1.187	30,1	**15S1G-1102080R01**	.40	1.18	2.00	4.25	1.000 Weldon	2
1.250	31,7	**15S1G-1202080R01**	.40	1.25	2.00	4.25	1.000 Weldon	2
1.375	34,9	**15S1G-1302281R01**	.40	1.38	2.25	4.50	1.250 Weldon	2
1.500	38,1	**15S1G-1502281R01**	.40	1.50	2.25	4.50	1.250 Weldon	2
1.625	41,2	**15S1J-1602381R01**	.53	1.63	2.38	4.63	1.250 Weldon	2
1.750	44,4	**15S1J-1702681R01**	.53	1.75	2.62	4.82	1.250 Weldon	2
2.000	50,8	**15S1J-2003081R01**	.53	2.00	3.00	5.61	1.250 Weldon	2

HARDWARE

Insert Screw			Driver
Drill Diameter	Part No.	Torque	New Part No.
.500-.750	SM22-052-00	7-11 in. lbs.	DS-T07F (Tx-07)
.813-1.000	SM40-080-30	30-35 in. lbs.	DS-T15T (Tx-15)
1.187-1.500	SM40-093-20	30-35 in. lbs.	DS-T15T (Tx-15)
1.625	SM50-096-20	40-45 in. lbs.	DS-T20T (Tx-20)
1.750-2.000	SM50-127-10	40-45 in. lbs.	DS-T20T (Tx-20)

For technical information, see pages 155 and 156.

Insert Loading–15S: Insert Series R.



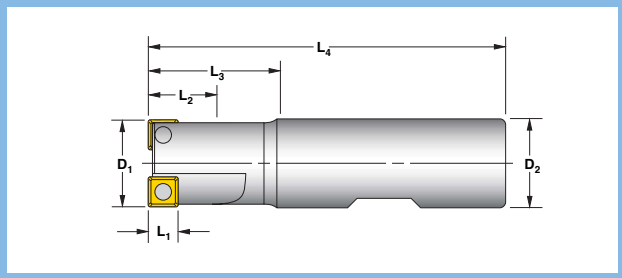
Series R inserts have only two cutting edges and must be loaded into the pockets properly or damage to the tool may result.

For insert informaton see page 36.

For technical information, see pages 155 and 156.

QUAD BORE™ INDEXABLE COUNTER BORING TOOLS- SERIES "15C"

Diameters	L:D Ratio	Geometry
.438" to 2.000"	1:1	Positive



D_1 Nom. Dia. inch	mm	Drill Number	L_1 Cutting Edge	L_2 Max C'bore Depth	L_3 Ext. from Holder	L_4 Overall Length	D_2 Shank Size/Style	Number of Inserts	Min. Cored Hole Dia. Socket Head Cap Screw	Min. Cored Hole Dia.
.438	11,1	**15C1D-0400884R01**	.22	.44	.88	2.85	.750 Weldon	1	1/4	.150
.531	13,4	**15C1D-0500884R01**	.22	.53	.88	2.85	.750 Weldon	1	5/16	.230
.625	15,8	**15C1D-0601084R01**	.22	.62	1.00	2.97	.750 Weldon	2	3/8	.320
.719	18,2	**15C1D-0701084R01**	.22	.72	1.00	2.97	.750 Weldon	2	7/16	.420
.812	20,6	**15C1E-0801284R01**	.28	.81	1.25	3.25	.750 Weldon	2	1/2	.250
1.000	25,4	**15C1G-1001580R01**	.40	1.00	1.50	3.75	1.000 Weldon	2	5/8	.250
1.187	30,1	**15C1G-1102080R01**	.40	1.18	2.00	4.25	1.000 Weldon	2	3/4	.437
1.250	31,7	**15C1G-1202080R01**	.40	1.25	2.00	4.25	1.000 Weldon	2	-	.500
1.375	34,9	**15C1G-1302281R01**	.40	1.38	2.25	4.50	1.250 Weldon	3	-	.625
1.500	38,1	**15C1G-1502281R01**	.40	1.50	2.25	4.50	1.250 Weldon	3	-	.750
1.500	38,1	**15C1G-1503781R01**	.40	1.00	3.75	6.00	1.250 Weldon*	3	-	.750
1.750	44,4	**15C1J-1702681R01**	.53	1.75	2.62	4.82	1.250 Weldon	2	-	.880
2.000	50,8	**15C1J-2003081R01**	.53	2.00	3.00	5.25	1.250 Weldon	4	-	1.120

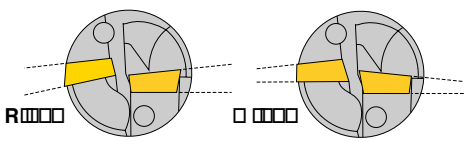
*Modified Weldon shank for more extension.

HARDWARE

Insert Screw			Driver
Drill Diameter	Part No.	Torque	New Part No.
0.438	SM22-037-00	7-11 in. lbs.	DS-T07F (Tx-07)
.531-.719	SM22-052-30	7-11 in. lbs.	DS-T07F (Tx-07)
0.812	SM30-065-20	13-18 in. lbs.	DS-T09W (Tx-09)
1.000-1.500	SM40-093-20	30-35 in. lbs.	DS-T15T (Tx-15)
1.750	SM50-127-10	40-45 in. lbs.	DS-T20T (Tx-20)
2.000	SM50-096-20	40-45 in. lbs.	DS-T20T (Tx-20)

For technical information, see pages 155 and 156.

Insert Loading–15C: Insert Series R.



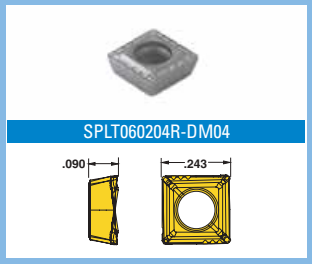
Series R inserts have only two cutting edges and must be loaded into the pockets properly or damage to the tool may result.

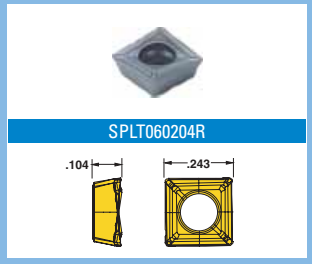
For insert informaton see page 36.

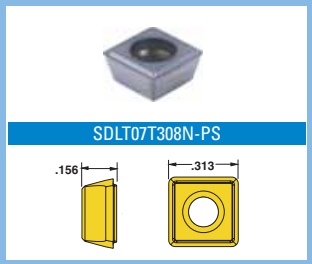
For technical information, see pages 155 and 156.

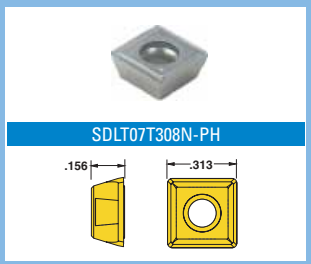
QUADBORE™ INDEXABLE COUNTER BORING INSERTS

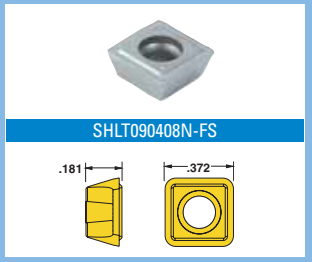
INSERTS

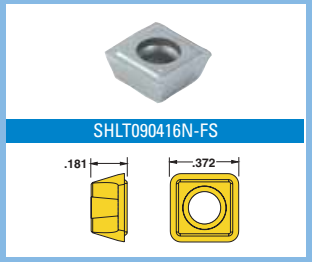


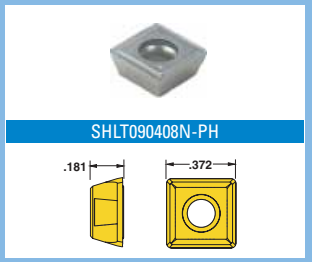


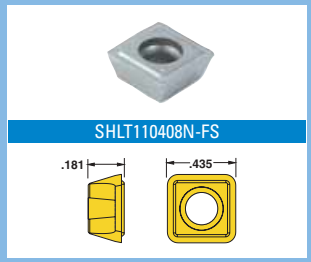


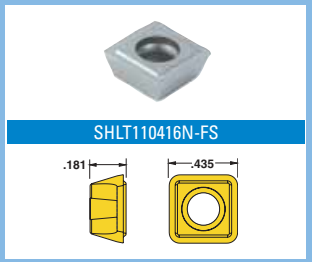


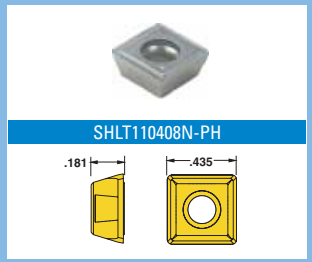


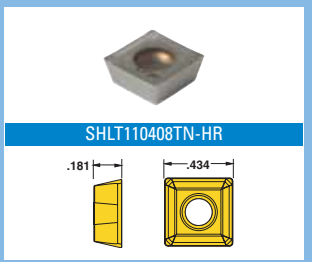


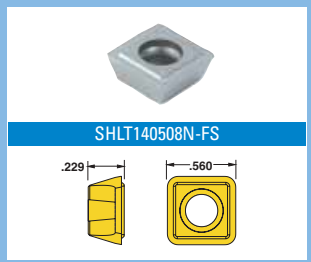


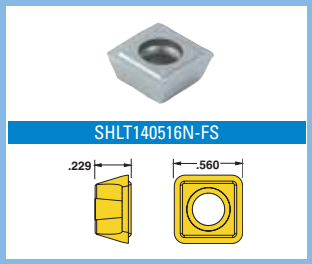


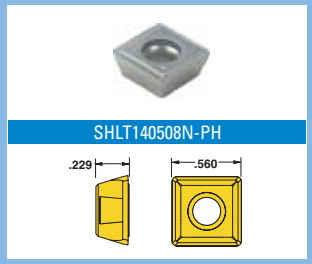


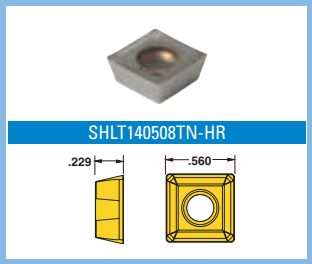












*For Insert Descriptions, see page 132.

*DM04 Series: Designed with 4 cutting edges and is suitable for use in all materials.
*R Series: Designed with 2 cutting edges for use in materials such as steels, cast irons, stainless, carbon and alloyed steels.
*PS Series: Designed with 4 cutting edges for use in materials that tend to drill easily but are too malleable to break.
*FS Series: Designed with 4 cutting edges for use in materials such as steels, cast irons, stainless, carbon and alloyed steels.
*PH Series: Designed with 4 cutting edges for use in materials such as steels, cast irons, stainless, carbon, alloyed steels, aluminum and high temp alloys.
*HR Series: Designed with 4 cutting edges for use in materials such as steels, cast irons, stainless, carbon, alloyed steels, aluminum and high temp alloys.

15C Counterbore Diameter inch	mm	Insert Number	Corner	Grade* IN	30M	40P	1030	1040	2005	6515	6530
.438 to .719	11,1 to 18,2	**SPLT060204R-DM04**	.016R				■				
.438 to .719	11,1 to 18,2	**SPLT060204R**	.016R		■		■	■			
.812	20,6	**SDLT07T308N-PS**	.030R				■				
.812	20,6	**SDLT07T308N-PH**	.030R						■		
1.000 to 1.500	25,4 to 38,1	**SHLT110408N-FS**	.030R				■		■	■	
1.000 to 1.500	25,4 to 38,1	**SHLT110416N-FS**	.060R				■				
1.000 to 1.500	25,4 to 38,1	**SHLT110408N-PH**	.030R						■		
1.000 to 1.500	25,4 to 38,1	**SHLT110408TN-HR**	.030R		■	■	■		■		■
1.750 to 2.000	44,4 to 50,8	**SHLT140508N-FS**	.030R				■		■	■	
1.750 to 2.000	44,4 to 50,8	**SHLT140516N-FS**	.060R				■			■	
1.750 to 2.000	44,4 to 50,8	**SHLT140508N-PH**	.030R						■		
1.750 to 2.000	44,4 to 50,8	**SHLT140508TN-HR**	.030R		■	■	■		■		■

* For insert grade descriptions, see page 132.

15S Center Cutting Counterbore Diameter inch	mm	Insert Number	Corner	Grade* IN	30M	40P	1030	1040	2005	6515	6530
.500 to .750	11,1 to 19,0	**SPLT060204R-DM04**	.016R				■				
.500 to .750	11,1 to 19,0	**SPLT060204R**	.016R		■		■	■			
.500 to .750	11,1 to 19,0	**SPLT060204-DM**	.016R								
.813 to 1.500	20,7 to 38,1	**SHLT110408N-FS**	.030R				■		■	■	
.813 to 1.500	20,7 to 38,1	**SHLT110416N-FS**	.060R				■			■	
.813 to 1.500	20,7 to 38,1	**SHLT110408N-PH**	.030R				■				
.813 to 1.500	20,7 to 38,1	**SHLT110408TN-HR**	.030R		■		■		■		
1.000	25,4	**SHLT090408N-FS**	.030R				■		■	■	
1.000	25,4	**SHLT090416N-FS**	.060R				■			■	
1.000	25,4	**SHLT090408N-PH**	.030R						■		
1.625 to 2.000	41,2 to 50,8	**SHLT140508N-FS**	.030R				■		■	■	
1.625 to 2.000	41,2 to 50,8	**SHLT140516N-FS**	.060R				■			■	
1.625 to 2.000	41,2 to 50,8	**SHLT140508N-PH**	.030R				■				
1.625 to 2.000	41,2 to 50,8	**SHLT140508TN-HR**	.030R		■	■	■		■		■

* For insert grade descriptions, see page 132.

Optional Inserts

Insert Series SHLT110408TN-HR & SHLT140508TN-HR for End Milling.

Series 15C1G, 15C1J, 15S1G and 15S1TJ can use optional insert Series SHLT110408TN-HR & SHLT140508TN-HR. These inserts include a chipbreaker designed to enhance chip formation when end milling. Do not use Series SHLT110408TN-HR or SHLT140508TN-HR inserts for counterboring applications.

SINGLE FLUTE BRAZED GUN DRILLS

Diameter Range (inch): Ø0.100" to Ø1.575"

Length Range (inch): 5.9" to 118.0"

Advantages:

- Hole tolerance of IT7 to IT9 attainable
- Excellent straigtness and concentricity
- Reduced true position deviation
- Surface finish Ra 0.4 to 1.6 easily achieved
- Often eleiminates secondary reaming operation

The Carbide Cutting Tip

Available with 4 different standard cutting geometries, 8 different standard pad forms and 4 coating options for a multitude of possibilities.

The Extension Tube

Designed with a crimped "V" flute and large coolant ports. The hardened steel extension tube provides the optimal conditions for twist resistance, coolant flow and ship evacuation.

The Driver

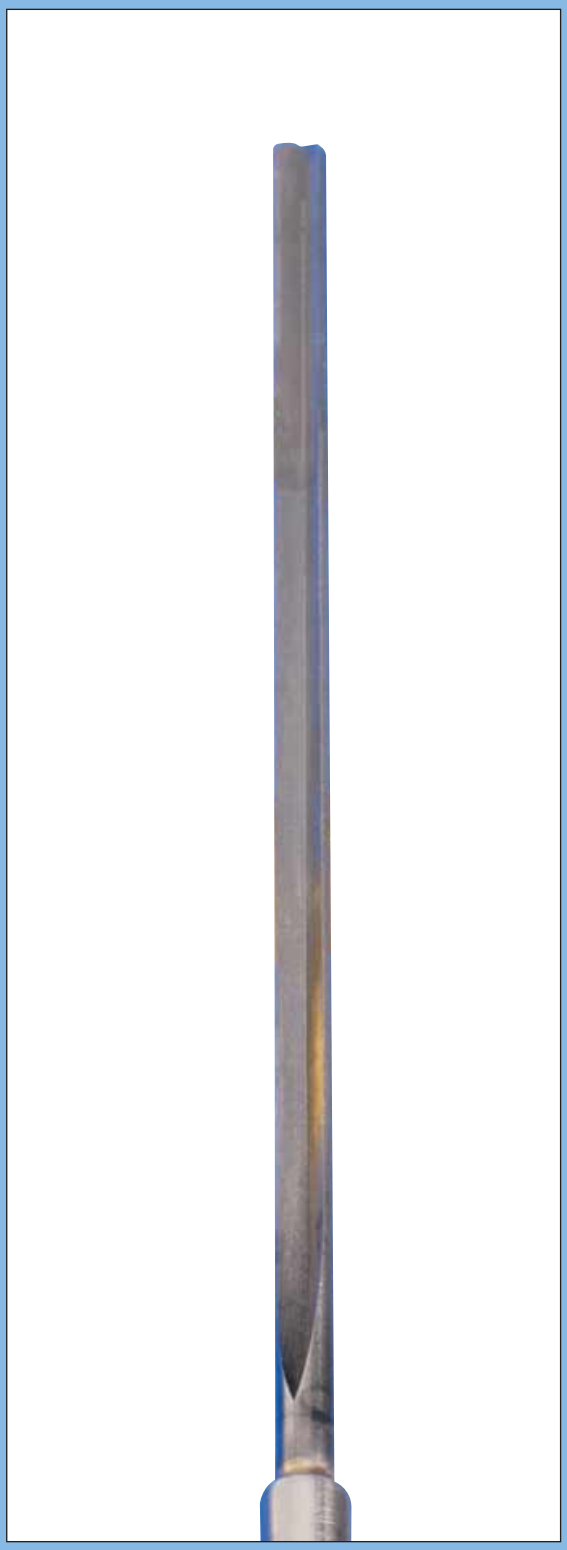
The steel driver provides the means to clamp the gundrill into the machine tool.

SOLID CARBIDE GUNDRILLS

Diameter Range (inch): Ø.055" to Ø.630"

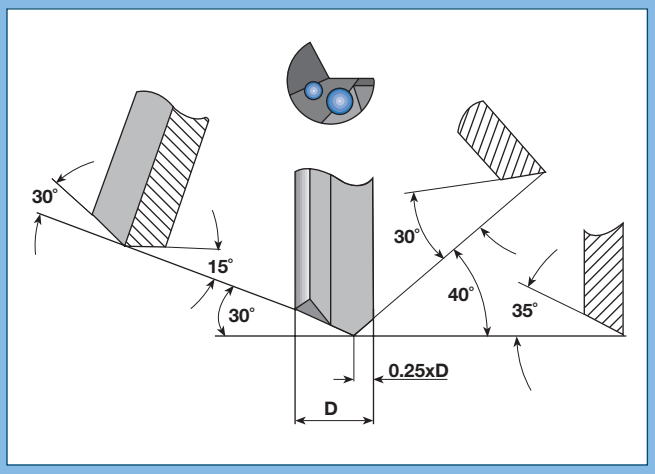
Length Range (inch): 40 x Drill Diameter up to 7.874" flute length

Made with an integral cutting tip and extension tube with either a steel or carbide driver. The solid carbide gun drill is designed for use in conventional machining centers and lathes. These drills provide superior rigidity with optimum coolant flow. As a result, speeds and feeds up to 100% faster may be obtained.

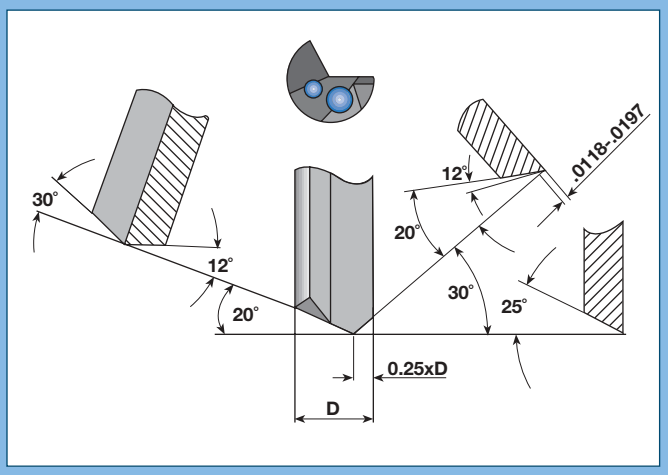


STANDARD GUN DRILL SHARPENING ANGLES

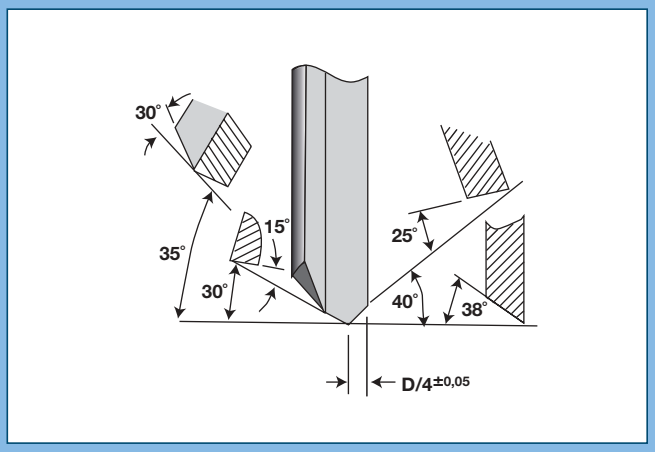
Depending on the required tolerance, cutting performance and desired chip shape, the following standard sharpening angles are recommended



Standard sharpening for diameters less than .157"

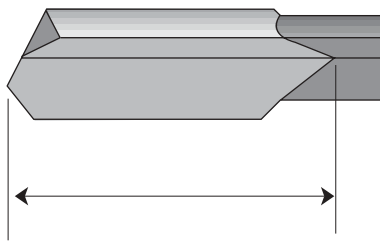


Standard sharpening for diameters greater than .157"



Optional sharpening for materials where it is difficult to break a chip.

Standard Gundrill Carbide Length



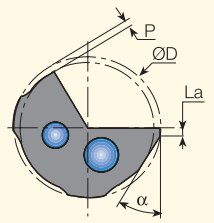
Diameter Range	Head Length
.098" - .149"	.787"
.150" - .159"	.906"
.160" - .199"	.094"
.200" - .258"	1.181"
.259" - .435"	1.378"
.436" - .722"	1.575"
.723" - .841"	1.772"
.842" - .919"	1.970"
.920" - .1.037"	2.165"
.1.038" - 1.260"	2.560"

Regrindable Length = Length-Dia.

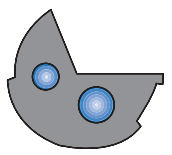
STANDARD GUN DRILL PAD FORMS

Drilling capacity and hole finish are dependent on the geometrical shape of the drill head. Both the pad form and the sharpening must be matched to the workpiece material. The pad form is determined when the tool is manufactured. Regrinding may change the cutting geometry, but the pad form will remain the same.

All cross section profile parameters such as: P, La and a must be precisely matched to the workpiece material properties.



Universal G Form



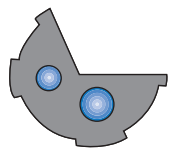
Applications:

For all material groups

Works well in materials that tend to shrink

Maintains precision bore tolerance and straightness

Standard A Form



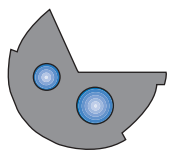
Applications:

For cast iron & aluminum alloys (coated)

Drilling through cross holes and angled entry and exits

Large gap between pads ensures good lubrication

Standard B Form



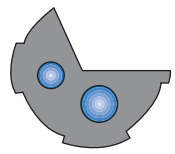
Applications:

For cast iron & aluminum alloys

Maintains high precision hole tolerances

Excellent surface finish

Standard C Form



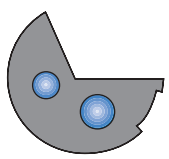
Applications:

With larger back taper for use in materials that tend to shrink. (Some alloys and stainless)

Drilling through cross holes and angled entry and exit

Not recommended for precise straightness control

Standard D Form

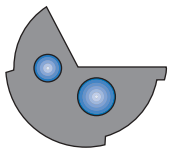


Applications:

For cast iron only (with coating)

Works very well in grey cast iron

Standard E Form



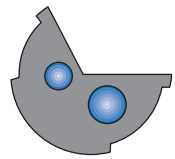
Applications:

General purpose for all materials

Commonly used in crankshaft and other forged materials

Precise straightness control

Standard H Form



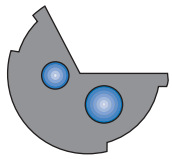
Applications:

For all non-ferrous materials

For cast iron greater than .200" hole diameter

Can be used in wood & plastic with a larger back taper

Standard I Form

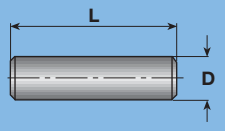
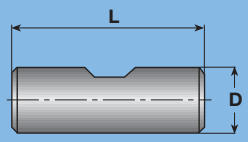
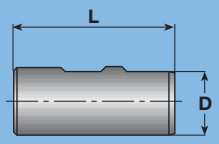
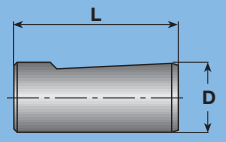
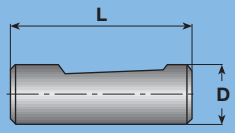
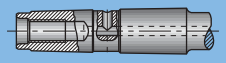
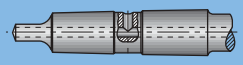


Applications:

For aluminum and brass when best surface finish is required

Can be used in cross hole and interrupted cut applications

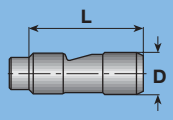
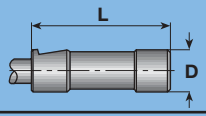
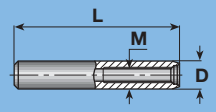
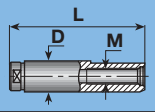
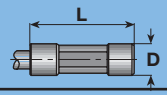
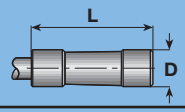
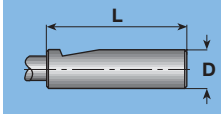
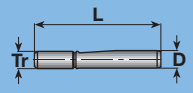
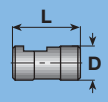
STANDARD GUN DRILL DRIVERS FOR MACHINING CENTERS, LATHES, ETC.

Driver Type	Drawing	ßD x L	Driver Code	Carbide Tipped Gun Drills	Solid Carbide Gun Drills
Cylindrical DIN1835A DIN6535HA		.157x1.102	01	●	●
		.197x1.102	02		●
		.236x1.417	03	●	●
		.315x1.417	04	●	●
		.394x1.575	05	●	●
		.472x1.772	06	●	●
		.551x1.772	07		●
		.630x1.890	08	●	●
		.709x1.890	09		
		.787x1.968	10	●	
		.984x2.205	11	●	
		1.260x2.362	12	●	
		1.575x2.756	13		
		1.969x3.150	14		
		2.480x3.543	15		
Weldon DIN1835B		.236x1.417	16	●	
		.315x1.417	17	●	
		.394x1.575	18	●	●
		.472x1.772	19	●	●
		.630x1.890	20	●	●
		.709x1.890	21		
DIN6535HB		.787x1.968	22	●	●
		.984x2.205	23	●	
		1.260x2.362	24	●	
		1.575x2.756	25		
		1.968x3.150	26		
		2.48x3.543	27		
Whistle Notch DIN1835E		.236x1.417	28	●	
		.315x1.417	29	●	
		.394x1.575	30	●	●
		.472x1.772	31	●	●
		.630x1.890	32	●	●
		.709x1.890	33		
		.787x1.968	34	●	●
		.984x2.205	35	●	
		1.26x2.362	36	●	
		1.575x2.756	37		
Whistle Notch DIN6535HE		.236x1.417	38	●	
		.315x1.417	39	●	
		.394x1.575	40	●	●
		.472x1.772	41	●	●
		.630x1.890	42	●	●
		.709x1.890	43		
		.787x1.968	44	●	●
DIN228AK		CM1	45		
		CM2	46	●	
		CM3	47		
		CM4	48		
DIN228BK		CM1	49		
		CM2	50	●	
		CM3	51		
		CM4	52		

● Recommended style

BOREline

STANDARD GUN DRILL DRIVERS FOR GUN DRILL MACHINES

Driver Type	Drawing	D x L	Driver Code	Carbide Tipped Gun Drills	Solid Carbide Gun Drills
Central Clamping Surface 15°		.236x1.181	53		●
		.394x1.575	54	●	●
		.630x1.772	55	●	
		.750x2.748	56	●	
		.984x2.756	57	●	
		1.00x2.748	58	●	
		1.25x2.748	59	●	
		1.50x2.748	60		
Frontal Clamping Surface 15°		.630x1.968	61	●	
Cylindrical with Thread		.394x1.968 M6X0.5	62		●
		.394x2.362 M6X0.5	63	●	
		.500x1.968 M6x0.5	64		●
		.630x3.150 M10X1	65	●	●
		.984x3.937 M16x1.5	66	●	
		1.417x4.724 M24x1.5	67		
VDI Design		.394x2.677 M6x0.5	68	●	
		.630x3.543 M10x1	69	●	●
		.984x4.409 M16x1.5	70	●	
		1.417x5.315 M24x1.5	71		
Central Clamping Hexagonal		.984x2.756	72	●	
		1.26x2.756	73	●	
Central Clamping Tapered		.500x1.500	74	●	●
		.630x2.756	75		
		.750x2.748	76	●	
		.787x2.756	77		
Frontal Clamping Surface 2°		.500x1.500	78	●	
		.750x2.748	79	●	
		1.00x2.748	80	●	
		1.00x3.937	81	●	
		1.25x2.748	82	●	
		1.25x3.937	83	●	
		1.50x2.748	84		
		1.50x3.937	85		
Trapezoidal Thread		.630x4.409 Tr 16x1.5	86	●	
		.787x4.960 Tr 20x2	87	●	
		1.102x4.960 Tr 28x2	88	●	
		1.417x6.378 Tr 36x2	89		
Spraymist Driver		.630x1.575	90	●	
		.984x1.968	91	●	
		1.378x2.362	92	●	

● Recommended style

BOREline

BRAZED GUN DRILLS

All Ingersoll brazed gun drills are made to order. Standard gun drill components, carbide tips, extension tubes and drivers are kept in stock.

STANDARD DESIGN

- Standard diameters:
  Ø.098" to .787" available in .004" increments
  Ø.788" to 1.260" available in .039" (1mm) increments
  Standard sub-micron carbide Grade (K15)
- Standard inch sizes in stock:
  1/4, 7/16, 3/8, 1/2, 9/16. 5/8, 3/4
- Standard pad form = G form
  (Standard inch sizes = E form)
- Standard back taper (0.07%)
- Standard sharpening
- Uncoated
- Standard driver

SEMI-STANDARD DESIGN

- Out of standard diameter range
- Any other pad form from the catalog other than G or E
- Special surface finish
- Any coating

SPECIAL DESIGN

- Any non-catalog specification

SOLID CARBIDE GUN DRILLS

All Ingersoll solid carbide gun drills are made to order. Standard solid carbide gun drills and drivers are kept in stock.

STANDARD DESIGN

- Standard sub-micron carbide Grade (K15)
- Standard pad form (G)
- Standard back taper (0.07%)
- Standard sharpening
- Uncoated
- Standard driver

SEMI-STANDARD DESIGN

- Any other pad form from the catalog
- Special surface finish
- Coating

SPECIAL DESIGN

- Any non-catalog specification

GUN DRILL REQUEST FOR QUOTATION FORM

CUSTOMER

Customer Number	
Company Name	
Address	
Contact Person	

Inquiry Number	
Inquiry Date	
Quantities Requested	

THE PIECE PART

Name	
Part Number	

Hole Diameter	
Tolerance	
Surface Finish (Ra, Rz,...)	
Concentricity (.001”/1.0”)	
Straightness (.001”/1.0’)	

Hole Depth	

Hole Type (Check all that apply)

Blind Hole	☐	**Through Hole**	☐
Angled entry	☐	Angled exit	☐
Drilling from solid	☐	Core drill	☐
Cross holes	☐	Other (text)	

Material (Din material, spec etc.)

Steel ☐	Iron ☐	Aluminum ☐
Stainless steel ☐	Nickel ☐	Other ☐
Hardness		
Long chips ☐		Short chips ☐

Application		
Workpiece	Stationary ☐	Rotating ☐
Tool	Stationary ☐	Rotating ☐

THE MACHINE

Machine Type/Model		
Power		[hp/Kw]
Rigidity: Good ☐	Average ☐	Poor ☐

Cutting Data	Max Possible	Current
Cutting speed “Vc” (SFM)		
Revolutions per minute		
Feed “f” (in/rev)		
Feed “F” (in/min)		

Drill Guide Method	Internal Dia.	Tolerance
Pre-Drilled pilot hole		
Bushing		

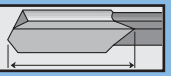
Coolant		
Pressure “P” (psi)		
Flow Rate (gal/min)		
Neat Oil ☐	Soluable ☐	%

THE TOOL

Tool Type		Carbide Tipped	☐
Unknown	☐	Solid Carbide	☐
Single Lipped	☐	**Double Lipped**	☐
Customer Drawing No.			

Tool Diameter			[in/mm]
Tolerance h5	☐	Other	☐

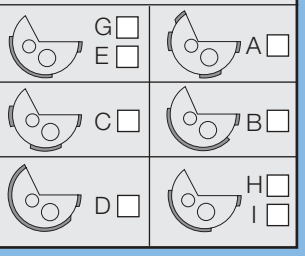
Coating of the Carbide Tip			
Uncoated	☐	TiAlN	☐
TiN	☐	AlTiN	☐
TiCN	☐	Unknown	☐
TiN + TiCN	☐	Other	

Carbide Tip Length	Other	
Standard	☐	

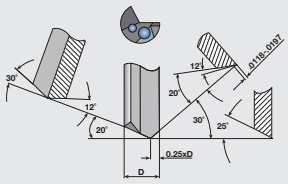
Overall Length	[in/mm]
Flute Length	[in/mm]

Driver	
List Std catalog number	
Other Length x Diameter	
Driver Extension L x Dia	

Pad Forms



Grind Geometry



Std grind for diameters from .055” thru .157”

—1=40 —2=30 d=D/4

—1=30 —2=15 —3=35 —1=0 —2=30 b=0

Std grind for diameters from .158” thru 1.260”

—1=30 —2=20 d=D/4

—1=12 —2=12 —3=25 —1=25 —2=30 b=0,3/0,5

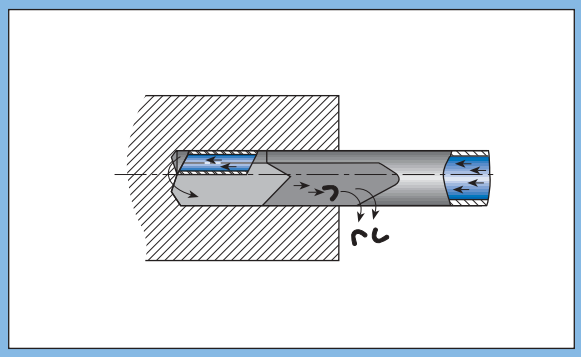
Other —1= —2= d=

—1= —2= —3= —1= —2= b=

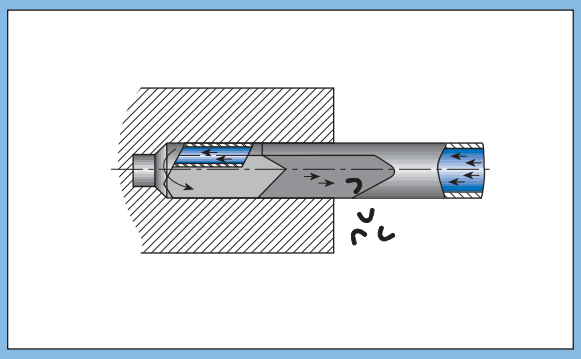
Additional Information

BOREline

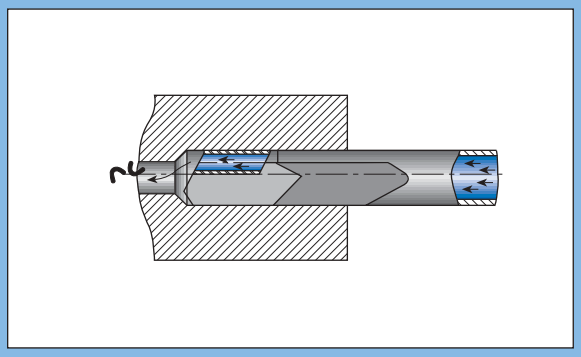
DEEP DRILLING APPLICATIONS



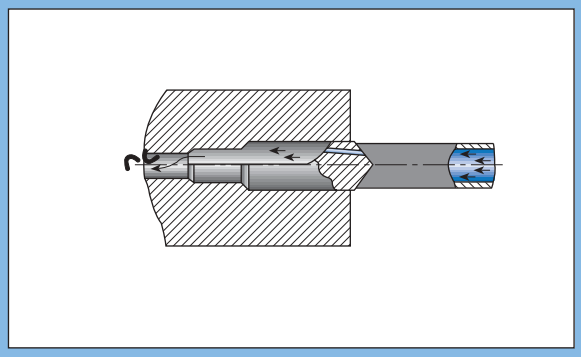
Gun drilling operation in blind hole when chips and coolant are evacuated back through the flute.



Gun drill boring operation in blind hole when chips and coolant are evacuated back through the flute.



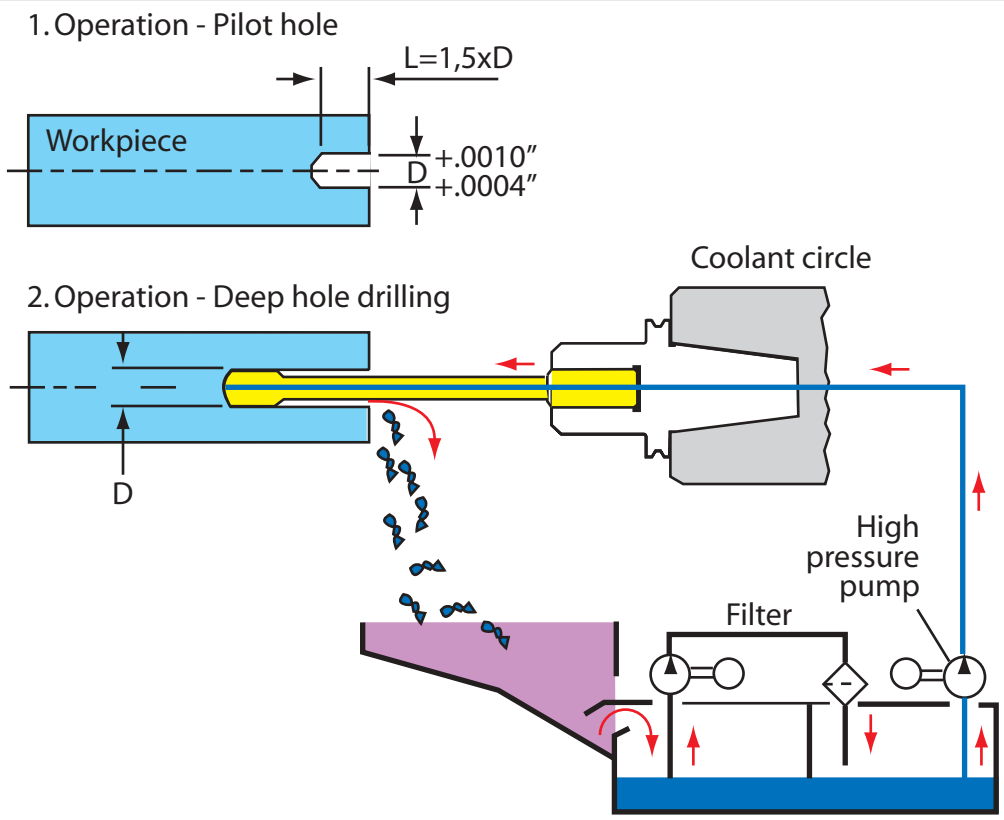
Gundrill boring operation in through hole when chips and coolant are evacuated ahead of the drill tip.



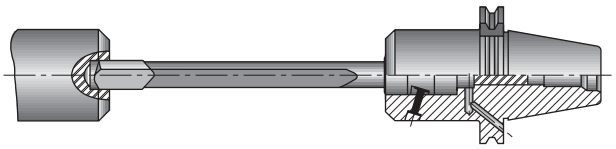
Stepped gundrill boring operation in through hole when chips and coolant are evacuated ahead of the drill tip.

GUN DRILL MACHINING CENTER APPLICATION

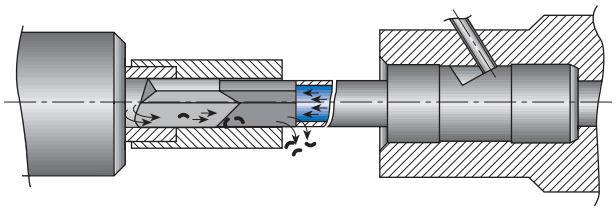
Deep Hole Drilling on Conventional Machine Tools



Gun Drills in Machining Centers



Centering/Guiding hole for gundrill operation in machining center



Bushing guide barrel for Gun drill stabilizing in machining center

BOREline

GUN DRILL TROUBLESHOOTING GUIDE

Possible Cause	Drill Problems											Hole Problems					
	Cratering	Built-up edge	Damaged wear pad	Flute bending	Drill heat	Excessive flank wear	Excessive corner wear	Excessive margin wear	Poor drill life	Chipping	Breakage	Corved hole axis	Conical entrance	Runout	Rough surface finish	Undersized	Oversized
Poor clamping								+			+	+		+			+
Insufficient coolant flow					+	+			+		+				+		+
Low coolant pressure									+		+				+	+	
Incorrect coolant type	+	+	+			+	+	+	+						+		
Feed fluctuations		+		+					+	+	+	+		+	+		
Too high feed	+	+		+	+	+			+		+	+	+	+	+		+
Too low feed		+							+	+		+					
Spindle speed too high			+	+	+	+	+	+	+		+						
Spindle speed too low	+	+													+		
Material structure	+	+	+				+		+	+	+	+		+			
Material shrinking due to heat			+		+		+		+		+			+	+	+	
Workpiece thin wall section									+		+	+		+			
Misalignment			+	+		+		+	+		+	+		+			+
Undersized hole			+		+	+		+	+		+				+		
Rough cutting edge finish	+	+					+		+	+	+	+		+			
Built up edge							+		+		+				+		+
Worn out edge	+	+					+	+	+	+	+	+		+	+		
Interrupted chip flow			+	+		+		+	+		+	+		+	+		+
Too small flute clearance			+		+	+		+	+	+		+		+			
Incoorrect drill profile	+	+	+	+			+	+	+		+	+		+	+	+	+
Incorrect head angles	+	+		+		+	+		+	+	+	+	+		+	+	+
Vibrations	+	+	+	+			+		+	+	+	+	+	+	+		+
Oversized bushing									+		+	+	+	+			+
A gap between bushing and workpiece						+			+		+	+	+	+	+	+	+
Bushing undersized			+	+		+		+	+		+			+		+	
Loss of coolant pressure		+	+	+	+				+		+		+		+	+	
High coolant pressure												+					+
Overheating coolant	+		+		+	+	+	+	+						+		
Insufficent coolant	+	+	+	+	+				+		+	+		+	+		+
Head inside angle excessive wear			+	+					+					+	+		+
Head outside angle excessive wear		+		+			+		+					+	+	+	
Too short carbide head	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+
Tool heel drag			+	+	+	+		+	+		+	+		+	+		+
Worn supporting pads	+		+	+	+		+		+		+			+			+
Tool whip - Reverse tool rotation	+	+	+	+			+		+	+	+			+	+		+

Ingersoll

BTA DRILLS

Cutting Tools

■ **DEEP HOLE BTA-STYLE DRILLS**

- Exceptional Hole Tolerances
- Excellent Surface Finish
- Superior Hole Straightness
- Precision Concentricity

BTA Cartridge-Style Indexable Drills	50
TBTA-A & TBTA-B for Small Diameters	69
TBTA-C for Economy on Standard Tolerance	77
TBTA-D for High Productivity	81
TBTA-L for Large Diameters	85
BTA Brazed	90
BTA Reamers	98
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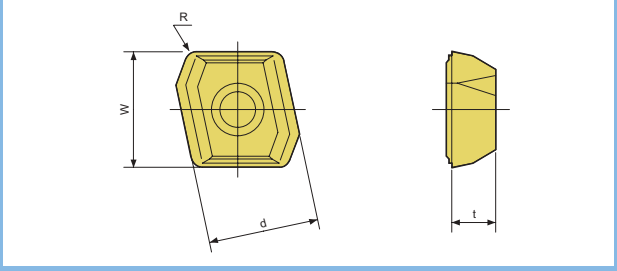
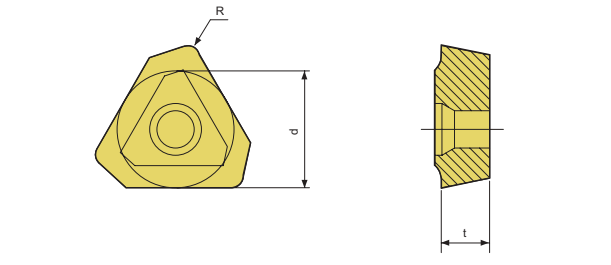
User Guide	119

Member IMC Group
Ingersoll
Cutting Tools

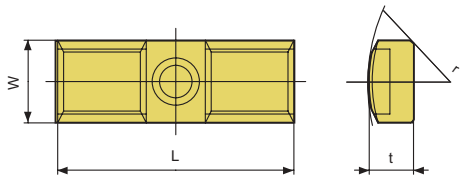


Designation	Dimension				Pocket			Grade	Screw
	d	t	R	W	Center	Inner	Outer	IN2005	
NPMX 0803RB	0.315	0.125	0.031	0.329	○	○	○		**CSTB2.2**
NPMX 0803RG	0.315	0.125	0.031	0.329	○	○	○		**CSTB2.2**

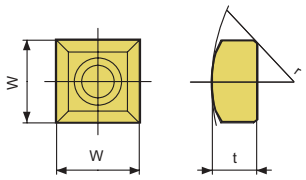


Designation	Dimension			Pocket			Grade	Screw
	d	t	R	Center	Inner	Outer	IN2005	
TPMX 1403RB	0.013	0.138	0.016	○	○	○		**CSTB2.5**
TPMX 1403RG	0.013	0.138	0.031	○	○	○		**CSTB2.5**
TPMX 1704RB	0.016	0.157	0.016	○	○	○		**CSTB3.5D**
TPMX 1704RG	0.016	0.157	0.031	○	○	○		**CSTB3.5D**
TPMX 2405RB	0.022	0.217	0.016	○	○	○		**CSTB4M**
TPMX 2405RG	0.022	0.217	0.047	○	○	○		**CSTB4M**
TPMX 2807RB	0.026	0.295	0.031	○	○	○		**CSTB5**
TPMX 2807RG	0.026	0.295	0.063	○	○	○		**CSTB5**

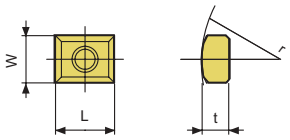
BTA INDEXABLE PAD FOR TBTA 3.../5.../7...



Guide Pad



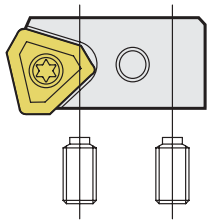
Guide Pad Protector



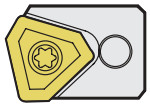
Sub Pad

Type	Designation	Dimension				Screw
		W	t	L	r	
Guide Pad	PAD-GC08	0.315	0.177	0.984	0.689	CSTB3S
	PAD-GC10	0.394	0.236	1.378	0.787	CSTB4S
	PAD-GC14	0.551	0.295	1.575	0.984	CSTA5S
	PAD-GC18	0.709	0.354	1.575	1.181	LS1206S
Guide Pad Protector	PAD-P08	0.315	0.177	0.315	0.689	CSTB3S
	PAD-P10	0.394	0.236	0.394	0.787	CSTB4S
	PAD-P14	0.551	0.295	0.551	0.984	CSTA5S
	PAD-P18	0.709	0.354	0.709	1.181	LS1206S
Sub Pad	PAD-S08	0.315	0.177	0.394	0.689	CSTB3S
	PAD-S10	0.394	0.197	0.394	1.142	CSTB3S
	PAD-S14	0.551	0.276	0.787	1.772	CCSTA5S

Outer



Inner & Center



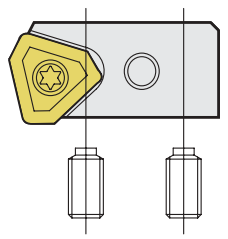
Designation		Adjust Screw	Wrench	Lock Screw	Wrench	Insert
Outer	PERC05R	AS0003-5	H1.5	LS1803RH	H2	NPMX0803..
	PERC402-04	AS0004-8	H2	LS1803.5RH	H2.5	NPMX1403..
	PERC402-32	AS0005-10	H2.5	LS1805RH	H3	NPMX1704..
	PERC402-43	AS0005-15	H2.5	L1806RH	H4	NPMX2405..
	PERC402-63	AS0006-15	H3	L1806RH	H4	NPMX2807..
Inner & Center	CENC05R	-	-	CSTB3	T9	NPMX0803..
	CENC402-04	-	-	CSTB3.5	T15	NPMX1403..
	CENC402-32	-	-	CSTA5	T15	NPMX1704..
	CENC402-43	-	-	LS1206	H3	NPMX2405..
	CENC402-63	-	-	LS1206	H3	NPMX2807..

BTA INDEXABLE DIA PLUS KITS FOR TBTA 3.../ 5.../ 7...

With Dia Plus kits, BTA indexable drill can increase hole size by up to 0.197 beyond target drill diameter.

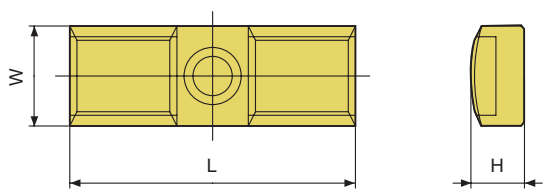
Dia plus kits are composed of +cartridge and +guide pad.

+Cartridge



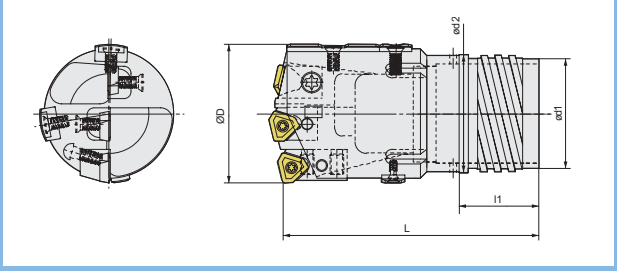
Cartridge	Dimension				
	D+0.039	D+0.079	D+0.118	D+0.157	D+0.197
PERC05	PERC05R+0.039	PERC05R+0.079			
PERC402-04	PERC402-04+0.039	PERC402-04+0.079	PERC402-04+0.118		
PERC402-32	PERC402-32+0.039	PERC402-32+0.079	PERC402-32+0.118	PERC402-32+0.157	
PERC402-43	PERC402-43+0.039	PERC402-43+0.079	PERC402-43+0.118	PERC402-43+0.157	PERC402-43+0.197
PERC402-63	PERC402-63+0.039	PERC402-63+0.079	PERC402-63+0.118	PERC402-63+0.157	PERC402-63+0.197

+Guide Pad



Guide Pad	Dimension									
	D+0.039	H	D+0.079	H	D+0.118	H	D+0.157	H	D+0.197	H
PAD-GC08	PAD-GC08+0.039	0.197	PAD-GC08+0.079	0.217	PAD-GC08+0.118	0.236				
PAD-GC10	PAD-GC10+0.039	0.256	PAD-GC10+0.079	0.276	PAD-GC10+0.118	0.295	PAD-GC10+0.157	0.315		
PAD-GC14	PAD-GC14+0.039	0.315	PAD-GC14+0.079	0.335	PAD-GC14+0.118	0.354	PAD-GC14+0.157	0.374	PAD-GC14+0.197	0.394
PAD-GC18	PAD-GC18+0.039	0.374	PAD-GC18+0.079	0.394	PAD-GC18+0.118	0.413	PAD-GC18+0.157	0.433	PAD-GC18+0.197	0.453

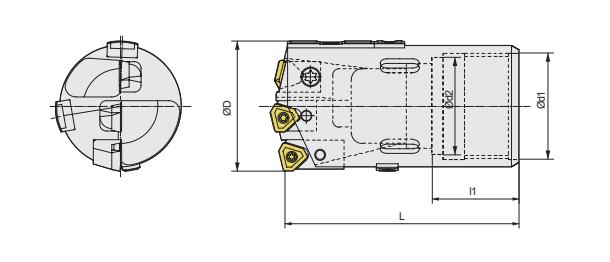
Diameters
1.496 - 4.212



Designation	Diameter	Dimension				Tube	
		L	l1	d1	d2	Part	Diameter
TBTA3-xx.xxxSE4-33	1.496 - 1.559	3.35	1.20	1.063	1.181	BTSI 033	1.299
TBTA3-xx.xxxSE4-36	1.559 - 1.693	3.35	1.20	1.181	1.299	BTSI 036	1.417
TBTA3-xx.xxxSE4-39	1.693 - 1.850	3.74	1.20	1.299	1.417	BTSI 039	1.535
TBTA3-xx.xxxSE4-43	1.851 - 2.035	3.74	1.20	1.417	1.535	BTSI 043	1.693
TBTA3-xx.xxxSE4-47	2.036 - 2.213	3.94	1.36	1.555	1.693	BTSI 047	1.850
TBTA3-xx.xxxSE4-51	2.213 - 2.386	4.33	1.36	1.713	1.850	BTSI 051	2.008
TBTA3-xx.xxxSE4-56	2.386 - 2.559	4.33	1.36	1.870	2.008	BTSI 056A	2.205
TBTA3-xx.xxxSE4-56	2.559 - 2.637	5.91	2.44	1.850	2.047	BTSI 056B	2.205
TBTA3-xx.xxxSE4-62	2.638 - 2.874	5.91	2.44	2.087	2.283	BTSI 062	2.441
TBTA3-xx.xxxSE4-68	2.874 - 3.149	5.91	2.44	2.283	2.480	BTSI 068	2.677
TBTA3-xx.xxxSE4-75	3.150 - 3.425	7.09	3.23	2.520	2.756	BTSI 075	2.953
TBTA3-xx.xxxSE4-82	3.425 - 3.937	7.09	3.23	2.795	3.031	BTSI 082	3.228
TBTA3-xx.xxxSE4-94	3.937 - 4.212	7.09	3.23	3.268	3.504	BTSI 094	3.701

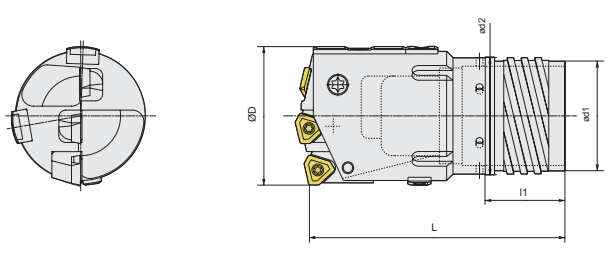
BTA INDEXABLE - 3 CARTRIDGE SYSTEM SINGLE TUBE SYSTEM - INNER SINGLE START THREAD

Diameters
1.496 - 4.212



Designation	Diameter	Dimension				Tube	
		L	l1	d1	d2	Part	Diameter
TBTA3-xx.xxxSI1-33	**1.496 - 1.574**	3.15	1.57	1.181	1.063	BTSE 033	1.299
TBTA3-xx.xxxSI1-36	**1.575 - 1.732**	3.15	1.57	1.299	1.181	BTSE 036	1.417
TBTA3-xx.xxxSI1-39	**1.732 - 1.850**	3.54	1.57	1.457	1.339	BTSE 039	1.535
TBTA3-xx.xxxSI1-43	**1.850 - 2.047**	3.54	1.57	1.614	1.457	BTSE 043	1.693
TBTA3-xx.xxxSI1-47	**2.047 - 2.244**	3.94	1.57	1.732	1.575	BTSE 047	1.850
TBTA3-xx.xxxSI1-51	**2.244 - 2.401**	4.33	1.57	1.929	1.772	BTSE 051	2.008
TBTA3-xx.xxxSI1-56	**2.402 - 2.677**	4.33	1.57	2.087	1.929	BTSE 056	2.205
TBTA3-xx.xxxSI1-62	**2.677 - 2.952**	4.72	1.57	2.323	2.126	BTSE 062	2.441
TBTA3-xx.xxxSI1-68	**2.953 - 3.189**	5.91	2.76	2.559	2.362	BTSE 068	2.677
TBTA3-xx.xxxSv1-75	**3.189 - 3.582**	5.91	2.76	2.795	2.598	BTSE 075	2.953
TBTA3-xx.xxxSI1-82	**3.583 - 3.897**	5.91	2.76	3.110	2.913	BTSE 082	3.228
TBTA3-xx.xxxSI1-94	**3.898 - 4.212**	5.91	2.76	3.543	3.346	BTSE 094	3.701

Diameters
1.496 - 4.212

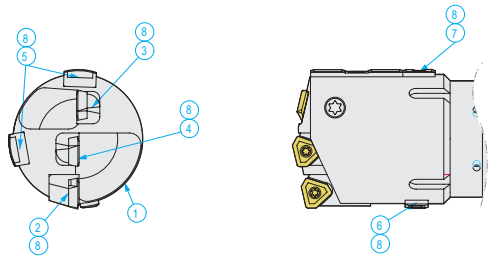


Designation	Diameter	Dimension				Tube		
		L	l1	d1	d2	Outer Tube	Inner Tube	Dia
TBTA3-xx.xxxDE4-35.5	**1.496 - 1.559**	3.35	1.20	1.181	1.299	BTDO 035.5	BTDI 026	1.398
TBTA3-xx.xxxDE4-39	**1.559 - 1.693**	3.35	1.20	1.299	1.417	BTDO 039	BTDI 029	1.535
TBTA3-xx.xxxDE4-42.5	**1.693 - 1.850**	3.74	1.20	1.417	1.535	BTDO 042.5	BTDI 032	1.673
TBTA3-xx.xxxDE4-46.5	**1.851 - 2.035**	3.74	1.36	1.555	1.693	BTDO 046.5	BTDI 035	1.831
TBTA3-xx.xxxDE4-51	**2.036 - 2.213**	3.94	1.36	1.713	1.850	BTDO 051	BTDI 039	2.008
TBTA3-xx.xxxDE4-55.5	**2.213 - 2.559**	4.33	1.36	1.870	2.008	BTDO 055.5	BTDI 043A	2.185
TBTA3-xx.xxxDE4-56	**2.559 - 2.637**	5.91	2.44	1.850	2.047	BTDO 056	BTDI 043B	2.205
TBTA3-xx.xxxDE4-62	**2.638 - 2.874**	5.91	2.44	2.087	2.283	BTDO 062	BTDI 048	2.441
TBTA3-xx.xxxDE4-68	**2.874 - 3.149**	5.91	2.44	2.283	2.480	BTDO 068	BTDI 053	2.677
TBTA3-xx.xxxDE4-75	**3.150 - 3.425**	7.09	3.23	2.520	2.756	BTDO 075	BTDI 059	2.953
TBTA3-xx.xxxDE4-82	**3.425 - 3.937**	7.09	3.23	2.795	3.031	BTDO 082	BTDI 066	3.228
TBTA3-xx.xxxDE4-94	**3.937 - 4.212**	7.09	3.23	3.268	3.504	BTDO 094	BTDI 078	3.701

Ingersoll

BTA INDEXABLE - 3 CARTRIDGE SYSTEM ASSEMBLY OF TBTA3 SERIES

Diameters
1.496 - 2.165



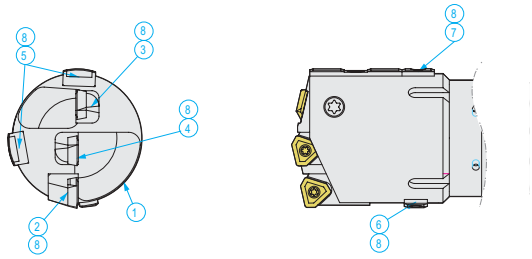
1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw

Parts		Diameter				
		1.496 - 1.574	1.575 - 1.771	1.772 - 1.889	1.890 - 2.047	2.047 - 2.165
Cartridge	Outer	PERC 05R	PERC 4002-04	PERC 402-04	PERC 402-04	PERC 402-32
	Adjust Screw	AS0003-5	AS0004-8	AS0004-8	AS0004-8	AS0005-10
	Wrench	H1.5	H2	H2	H2	H2.5
	Screw	LS1803RH	LS1803.5RH	LS1803.5RH	LS1803.5RH	LS1805RH
	Wrench	H2	H2.5	H2.5	H2.5	H3
	Inner	CENC 05R	CENC 05R	CENC 05R	CENC 402-04	CENC 402-04
	Screw	CSTB3	CSTB3	CSTB3	CSTB3.5	CSTB3.5
	Wrench	T9	T9	T9	T15	T15
	Center	CENC 05R	CENC 05R	CENC 402-04	CENC 402-04	CENC 402-04
	Screw	CSTB3	CSTB3	CSTB3.5	CSTB3.5	CSTB3.5
	Wrench	T9	T9	T15	T15	T15
Insert	Outer	NPMX 0803RG	TPMX 1403RG	TPMX 1403RG	TPMX 1403RG	TPMX 1704RG
	Screw	CSTB2.2	CSTB2.5	CSTB2.5	CSTB2.5	CSTB3.5D
	Wrench	T7	T8	T8	T8	T9
	Inner	NPMX 0803RG	NPMX 0803RG	NPMX 0803RG	TPMX 1403RG	TPMX 1403RG
	Screw	CSTB2.2	CSTB2.2	CSTB2.2	CSTB2.5	CSTB2.5
	Wrench	T7	T7	T7	T8	T8
	Center	NPMX 0803RG	NPMX 0803RG	TPMX 1403RG	TPMX 1403RG	TPMX 1403RG
	Screw	CSTB2.2	CSTB2.2	CSTB2.5	CSTB2.5	CSTB2.5
	Wrench	T7	T7	T8	T8	T8
Pad	Guide Pad	PAD-GC08	PAD-GC08	PAD-GC10	PAD-GC10	PAD-GC10
	Screw	CSTB3S	CSTB3S	CSTB4S	CSTB4S	CSTB4S
	Wrench	T9	T9	T15	T15	T15
	Guide Pad Protector	PAD-P08	PAD-P08	PAD-P10	PAD-P10	PAD-P10
	Screw	CSTB3S	CSTB3S	CSTB4S	CSTB4S	CSTB4S
	Wrench	T9	T9	T15	T15	T15
	Sub Guide Pad	PAD-S08	PAD-S08	PAD-S08	PAD-S08	PAD-S08
	Screw	CSTB3S	CSTB3S	CSTB3S	CSTB3S	CSTB3S
	Wrench	T9	T9	T9	T9	T9

BOREline

BTA INDEXABLE - 3 CARTRIDGE SYSTEM ASSEMBLY OF TBTA3 SERIES

Diameters
2.165 - 3.070

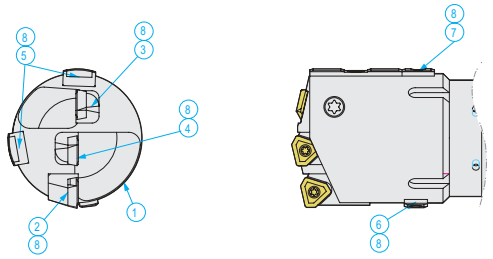


1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw

Parts		Diameter				
		2.165 - 2.283	2.283 - 2.362	2.362 - 2.519	2.520 - 2.677	2.677 - 3.070
Cartridge	Outer	PERC 402-32	PERC 402-32	PERC 402-32	PERC 402-43	PERC 402-32
	Adjust Screw	AS0005-10	AS0005-10	AS0005-10	AS0005-15	AS0005-10
	Wrench	H2.5	H2.5	H2.5	H2.5	H2.5
	Screw	LS1805RH	LS1805RH	LS1805RH	LS1806RH	LS1806RH
	Wrench	H3	H3	H3	H4	H4
	Inner	CENC 402-04	CENC 402-32	CENC 402-32	CENC 402-32	CENC 402-43
	Screw	CSTB3.5	CSTA5	CSTA5	CSTA5	LS1206
	Wrench	T15	T15	T15	T15	H3
	Center	CENC 402-32	CENC 402-32	CENC 402-32	CENC 402-32	CENC 402-43
	Screw	CSTA5	CSTA5	CSTA5	CSTA5	LS1206
	Wrench	T15	T15	T15	T15	H3
Insert	Outer	TPMX 1704RG	TPMX 1704RG	TPMX 1704RG	TPMX 2405RG	TPMX 1704RG
	Screw	CSTB3.5D	CSTB3.5D	CSTB3.5D	CSTB4M	CSTB3.5D
	Wrench	T9	T9	T9	T15	T9
	Inner	TPMX 1403RG	TPMX 1704RG	TPMX 1704RG	TPMX 1704RG	TPMX 2405RG
	Screw	CSTB2.5	CSTB3.5D	CSTB3.5D	CSTB3.5D	CSTB4M
	Wrench	T8	T9	T9	T9	T15
	Center	TPMX 1704RG	TPMX 1704RG	TPMX 1704RG	TPMX 1704RG	TPMX 2405RG
	Screw	CSTB3.5D	CSTB3.5D	CSTB3.5D	CSTB3.5D	CSTB4M
	Wrench	T9	T9	T9	T9	T15
Pad	Guide Pad	PAD-GC10	PAD-GC10	PAD-GC14	PAD-GC14	PAD-GC14
	Screw	CSTB4S	CSTB4S	CSTA5S	CSTA5S	CSTA5S
	Wrench	T15	T15	T15	T15	T15
	Guide Pad Protector	PAD-P10	PAD-P10	PAD-P14	PAD-P14	PAD-P14
	Screw	CSTB4S	CSTB4S	CSTA5S	CSTA5S	CSTA5S
	Wrench	T15	T15	T15	T15	T15
	Sub Guide Pad	PAD-S08	PAD-S08	PAD-S08	PAD-S10	PAD-S10
	Screw	CSTB3S	CSTB3S	CSTB3S	CSTB3S	CSTB3S
	Wrench	T9	T9	T9	T9	T9

BTA INDEXABLE - 3 CARTRIDGE SYSTEM ASSEMBLY OF TBTA3 SERIES

Diameters
3.071 - 4.212



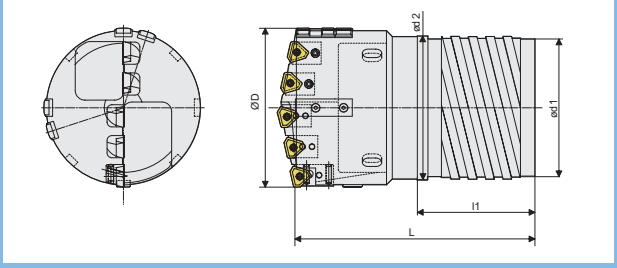
1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw

Parts		Diameter			
		3.071 - 3.346	3.346 - 3.622	3.622 - 3.897	3.898 - 4.212
Cartridge	Outer	PERC 402-43	PERC 402-63	PERC 402-43	PERC 402-63
	Adjust Screw	AS0005-15	AS0006-15	AS0005-15	AS0006-15
	Wrench	H2.5	H3	H2.5	H3
	Screw	LS1806RH	LS1806RH	LS1806RH	LS1806RH
	Wrench	H4	H4	H4	H4
	Inner	CENC 402-43	CENC 402-43	CENC 402-63	CENC 402-63
	Screw	LS1206	LS1206	LS1206	LS1206
	Wrench	H3	H3	H3	H3
	Center	CENC 402-43	CENC 402-43	CENC 402-63	CENC 402-63
	Screw	LS1206	LS1206	LS1206	LS1206
	Wrench	H3	H3	H3	H3
Insert	Outer	TPMX 2405RG	TPMX 2807RG	TPMX 2405RG	TPMX 2807RG
	Screw	CSTB4M	CSTB5	CSTB4M	CSTB5
	Wrench	T15	T20	T15	T20
	Inner	TPMX 2405RG	TPMX 2405RG	TPMX 2807RG	TPMX 2807RG
	Screw	CSTB4M	CSTB4M	CSTB5	CSTB5
	Wrench	T15	T15	T20	T20
	Center	TPMX 2405RG	TPMX 2405RG	TPMX 2807RG	TPMX 2807RG
	Screw	CSTB4M	CSTB4M	CSTB5	CSTB5
	Wrench	T15	T15	T20	T20
Pad	Guide Pad	PAD-GC14	PAD-GC14	PAD-GC14	PAD-GC18
	Screw	CSTA5S	CSTA5S	CSTA5S	LS1206S
	Wrench	T15	T15	T15	H3
	Guide Pad Protector	PAD-P14	PAD-P14	PAD-P14	PAD-P18
	Screw	CSTB5S	CSTB5S	CSTA5S	LS1206S
	Wrench	T15	T15	T15	H3
	Sub Guide Pad	PAD-S10	PAD-S10	PAD-S10	PAD-S14
	Screw	CSTB3S	CSTB3S	CSTB3S	CSTA5S
	Wrench	T9	T9	T9	T15

BTA INDEXABLE - 5 CARTRIDGE SYSTEM

SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

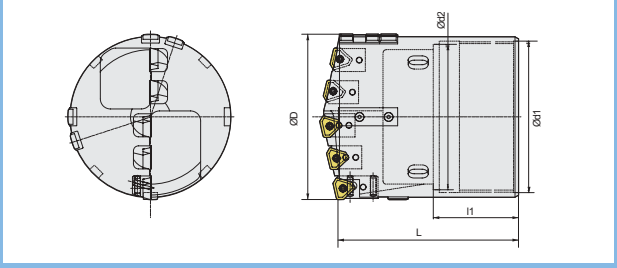
Diameters
4.213 - 6.653



Designation	Diameter	Dimension				Tube	
		L	l1	d1	d2	Part	Diameter
TBTA5-xx.xxxSE4-094	**4.213 - 4.409**	7.09	3.23	3.268	3.504	BTSI 094	3.701
TBTA5-xx.xxxSE4-106	**4.409 - 4.881**	8.07	4.02	3.740	3.976	BTSI 106	4.173
TBTA5-xx.xxxSE4-118	**4.882 - 5.354**	8.07	4.02	4.213	4.449	BTSI 118	4.646
TBTA5-xx.xxxSE4-130	**5.354 - 5.826**	8.07	4.02	4.685	4.921	BTSI 130	5.118
TBTA5-xx.xxxSE4-142	**5.827 - 6.299**	8.86	4.80	5.157	5.394	BTSI 142	5.591
TBTA5-xx.xxxSE4-154	**6.299 - 6.653**	8.86	4.80	5.630	5.866	BTSI 154	6.063

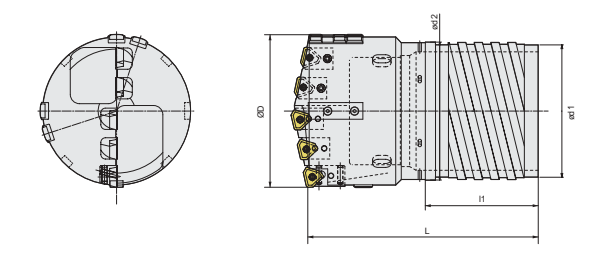
BTA INDEXABLE - 5 CARTRIDGE SYSTEM SINGLE TUBE SYSTEM - INNER SINGLE START THREAD

Diameters
4.213 - 6.653



Designation	Diameter	Dimension				Tube	
		L	l1	d1	d2	Part	Diameter
TBTA5-xx.xxxSI1-094	**4.213 - 4.370**	5.91	2.76	3.543	3.346	BTSE 094	3.701
TBTA5-xx.xxxSI1-106	**4.370 - 4.842**	5.91	2.76	4.016	3.819	BTSE 106	4.173
TBTA5-xx.xxxSI1-118	**4.843 - 5.315**	5.91	2.76	4.488	4.291	BTSE 118	4.646
TBTA5-xx.xxxSI1-130	**5.315 - 5.866**	5.91	2.76	4.961	4.764	BTSE 130	5.118
TBTA5-xx.xxxSI1-142	**5.866 - 6.378**	5.91	2.76	5.472	5.276	BTSE 142	5.591
TBTA5-xx.xxxSI1-154	**6.378 - 6.653**	7.48	3.35	5.945	5.709	BTSE 154	6.063

Diameters
4.213 - 6.653



Designation	Diameter	Dimension				Tube		
		L	l1	d1	d2	Outer Tube	Inner Tube	Diameter
TBTA5-xx.xxxDE4-094	**4.213 - 4.409**	7.09	3.23	3.268	3.504	BTDO 094	BTDI 078	3.701
TBTA5-xx.xxxDE4-106	**4.409 - 4.881**	8.07	4.02	3.740	3.976	BTDO 106	BTDI 090	4.173
TBTA5-xx.xxxDE4-118	**4.882 - 5.354**	8.07	4.02	4.213	4.449	BTDO 118	BTDI 092	4.646
TBTA5-xx.xxxDE4-130	**5.354 - 5.826**	8.07	4.02	4.685	4.921	BTDO 130	BTDI 093	5.118
TBTA5-xx.xxxDE4-142	**5.827 - 6.299**	8.86	4.80	5.157	5.394	BTDO 142	BTDI 094	5.591
TBTA5-xx.xxxDE4-154	**6.299 - 6.653**	8.86	4.80	5.630	5.866	BTDO 154	BTDI 095	6.063

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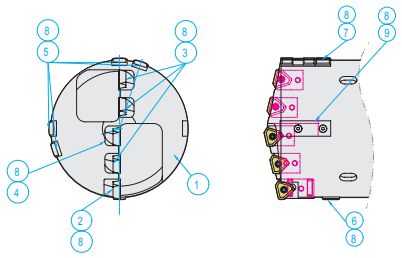
BTA INDEXABLE - 5 CARTRIDGE SYSTEM ASSEMBLY OF TBTA5 SERIES

Diameters
4.213 - 5.944



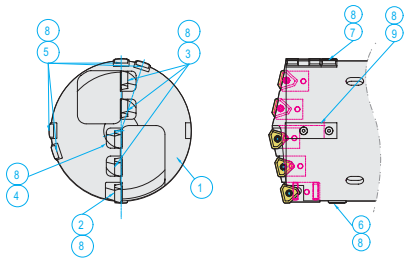
1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw
9. Filler

Parts		Diameter			
		4.213 - 4.645	4.646 - 5.354	5.354 - 5.708	5.709 - 5.944
Cartridge	Outer	PERC 402-43	PERC 402-43	PERC 402-43	PERC 402-43
	Adjust Screw	AS0005-15	AS0005-15	AS0005-15	AS0005-15
	Wrench	H2.5	H2.5	H2.5	H2.5
	Screw	LS1806RH	LS1806RH	LS1806RH	LS1806RH
	Wrench	H4	H4	H4	H4
	Inner	CENC 402-32	CENC 402-43	CENC 402-43	CENC 402-43
	Screw	CSTA5	LS1206	LS1206	LS1206
	Wrench	T15	H3	H3	H3
	Center	CENC 402-43	CENC 402-43	CENC 402-63	CENC 402-63
	Screw	LS1206	LS1206	LS1206	LS1206
	Wrench	H3	H3	H3	H3
Insert	Outer	TPMX 2405RG	TPMX 2405RG	TPMX 2405RG	TPMX 2405RG
	Screw	CSTB4M	CSTB4M	CSTB4M	CSTB4M
	Wrench	T15	T15	T15	T15
	Inner	TPMX 1704RG	TPMX 2405RG	TPMX 2405RG	TPMX 2405RG
	Screw	CSTB3.5D	CSTB4M	CSTB4M	CSTB4M
	Wrench	T9	T15	T15	T15
	Center	TPMX 2405RG	TPMX 2405RG	TPMX 2807RG	TPMX 2807RG
	Screw	CSTB4M	CSTB4M	CSTB5	CSTB5
	Wrench	T15	T15	T20	T20
Pad	Guide Pad	PAD-GC18	PAD-GC18	PAD-GC18	PAD-GC18
	Screw	LS1206S	LS1206S	LS1206S	LS1206S
	Wrench	H3	H3	H3	H3
	Guide Pad Protector	PAD-P18	PAD-P18	PAD-P18	PAD-P18
	Screw	LS1206S	LS1206S	LS1206S	LS1206S
	Wrench	H3	H3	H3	H3
	Sub Guide Pad	PAD-S14	PAD-S14	PAD-S14	PAD-S14
	Screw	CSTA5S	CSTA5S	CSTA5S	CSTA5S
	Wrench	T15	T15	T15	T15

BOREline

BTA INDEXABLE - 5 CARTRIDGE SYSTEM ASSEMBLY OF TBTA5 SERIES

Diameters
5.945 - 6.653

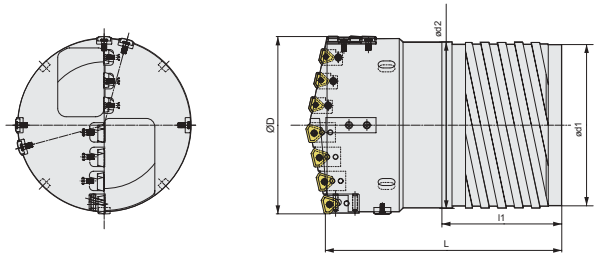


1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw
9. Filler

Parts		Diameter		
		5.945 - 6.181	6.181 - 6.417	6.417 - 6.653
Cartridge	Outer	PERC 402-63	PERC 402-63	PERC 402-63
	Adjust Screw	AS0006-15	AS0006-15	AS0006-15
	Wrench	H3	H3	H3
	Screw	LS1806RH	LS1806RH	LS1806RH
	Wrench	H4	H4	H4
	Inner	CENC 402-43	CENC 402-43	CENC 402-63
	Screw	LS1206	LS1206	LS1206
	Wrench	H3	H3	H3
	Center	CENC 402-63	CENC 402-63	CENC 402-63
	Screw	LS1206	LS1206	LS1206
	Wrench	H3	H3	H3
Insert	Outer	TPMX 2807RG	TPMX 2807RG	TPMX 2807RG
	Screw	CSTB5	CSTB5	CSTB5
	Wrench	T20	T20	T20
	Inner	TPMX 2405RG	TPMX 2405RG	TPMX 2807RG
	Screw	CSTB4M	CSTB4M	CSTB5
	Wrench	T15	T15	T20
	Center	TPMX 2807RG	TPMX 2807RG	TPMX 2807RG
	Screw	CSTB5	CSTB5	CSTB5
	Wrench	T20	T20	T20
Pad	Guide Pad	PAD-GC18	PAD-GC18	PAD-GC18
	Screw	LS1206S	LS1206S	LS1206S
	Wrench	H3	H3	H3
	Guide Pad Protector	PAD-P18	PAD-P18	PAD-P18
	Screw	LS1206S	LS1206S	LS1206S
	Wrench	H3	H3	H3
	Sub Guide Pad	PAD-S14	PAD-S14	PAD-S14
	Screw	CSTA5S	CSTA5S	CSTA5S
	Wrench	T15	T15	T15

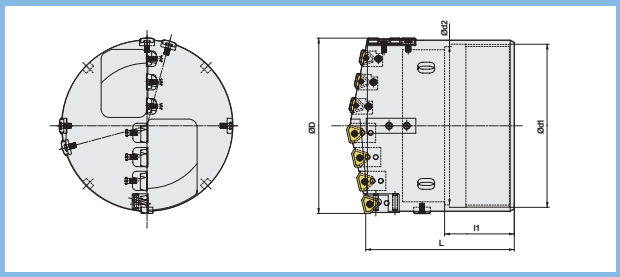
BTA INDEXABLE - 7 CARTRIDGE SYSTEM SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

Diameters
6.654 - 9.173



Designation	Diameter	Dimension				Tube	
		L	l1	d1	d2	Part	Diameter
TBTA7-xx.xxxSE4-154	**6.654 - 6.771**	9.06	4.80	5.630	5.866	BTSI 154	6.063
TBTA7-xx.xxxSE4-166	**6.772 - 7.244**	9.06	4.80	6.102	6.339	BTSI 166	6.535
TBTA7-xx.xxxSE4-178	**7.244 - 7.716**	9.84	5.59	6.575	6.811	BTSI 178	7.008
TBTA7-xx.xxxSE4-190	**7.717 - 8.189**	9.84	5.59	7.047	7.283	BTSI 190	7.480
TBTA7-xx.xxxSE4-202	**8.189 - 8.661**	9.84	5.59	7.520	7.756	BTSI 202	7.953
TBTA7-xx.xxxSE4-214	**8.661 - 9.133**	10.63	6.38	7.913	8.189	BTSI 214	8.425
TBTA7-xx.xxxSE4-226	**9.134 - 9.173**	10.63	6.38	8.386	8.661	BTSI 226	8.898

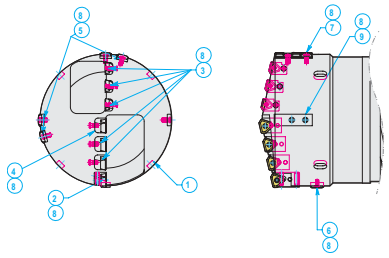
Diameters
6.654 - 9.685



Designation	Diameter	Dimension				Tube	
		L	l1	d1	d2	Part	Diameter
TBTA7-xx.xxxSI1-154	**6.654 - 6.850**	7.48	3.35	5.709	5.945	BTSE 154	6.063
TBTA7-xx.xxxSI1-166	**6.850 - 7.322**	7.48	3.35	6.181	6.417	BTSE 166	6.535
TBTA7-xx.xxxSI1-178	**7.323 - 7.795**	7.48	3.35	6.654	6.890	BTSE 178	7.008
TBTA7-xx.xxxSI1-190	**7.795 - 8.267**	7.48	3.35	7.126	7.362	BTSE 190	7.480
TBTA7-xx.xxxSI1-202	**8.268 - 8.740**	7.48	3.35	7.598	7.835	BTSE 202	7.953
TBTA7-xx.xxxSI1-214	**8.740 - 9.212**	7.48	3.35	8.071	8.307	BTSE 214	8.425
TBTA7-xx.xxxSI1-226	**9.213 - 9.685**	7.48	3.35	8.543	8.780	BTSE 226	8.898

BTA INDEXABLE - 7 CARTRIDGE SYSTEM ASSEMBLY OF TBTA7 SERIES

Diameters
6.654 - 8.228

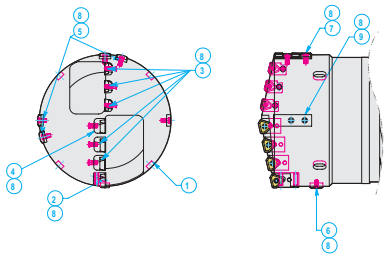


1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw
9. Filler

Parts		Diameter			
		6.654 - 7.441	7.441 - 7.756	7.756 - 7.992	7.992 - 8.228
Cartridge	Outer	PERC 402-43	PERC 402-43	PERC 402-43	PERC 402-43
	Adjust Screw	AS0005-15	AS0005-15	AS0005-15	AS0005-15
	Wrench	H2.5	H2.5	H2.5	H2.5
	Screw	LS1806RH	LS1806RH	LS1806RH	LS1806RH
	Wrench	H4	H4	H4	H4
	Inner	CENC 402-43	CENC 402-43	CENC 402-43	CENC 402-43
	Screw	LS1206	LS1206	LS1206	LS1206
	Wrench	H3	H3	H3	H3
	Center	CENC 402-43	CENC 402-63	CENC 402-63	CENC 402-63
	Screw	LS1206	LS1206	LS1206	LS1206
	Wrench	H3	H3	H3	H3
Insert	Outer	TPMX 2405RG	TPMX 2405RG	TPMX 2405RG	TPMX 2405RG
	Screw	CSTB4M	CSTB4M	CSTB4M	CSTB4M
	Wrench	T15	T15	T15	T15
	Inner	TPMX 2405RG	TPMX 2405RG	TPMX 2405RG	TPMX 2405RG
	Screw	CSTB4M	CSTB4M	CSTB4M	CSTB4M
	Wrench	T15	T15	T15	T15
	Center	TPMX 2405RG	TPMX 2807RG	TPMX 2807RG	TPMX 2807RG
	Screw	CSTB4M	CSTB5	CSTB5	CSTB5
	Wrench	T15	T20	T20	T20
Pad	Guide Pad	PAD-GC18	PAD-GC18	PAD-GC18	PAD-GC18
	Screw	LS1206S	LS1206S	LS1206S	LS1206S
	Wrench	H3	H3	H3	H3
	Guide Pad Protector	PAD-P18	PAD-P18	PAD-P18	PAD-P18
	Screw	LS1206S	LS1206S	LS1206S	LS1206S
	Wrench	H3	H3	H3	H3
	Sub Guide Pad	PAD-S14	PAD-S14	PAD-S14	PAD-S14
	Screw	CSTA5S	CSTA5S	CSTA5S	CSTA5S
	Wrench	T15	T15	T15	T15

BTA INDEXABLE - 7 CARTRIDGE SYSTEM ASSEMBLY OF TBTA7 SERIES

Diameters
8.228 - 8.937



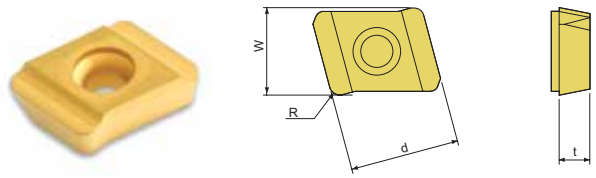
1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw
9. Filler

Parts		Diameter		
		8.228 - 8.464	8.465 - 8.700	8.701 - 8.937
Cartridge	Outer	PERC 402-63	PERC 402-63	PERC 402-63
	Adjust Screw	AS0006-15	AS0006-15	AS0006-15
	Wrench	H3	H3	H3
	Screw	L1806RH	L1806RH	L1806RH
	Wrench	H4	H4	H4
	Inner	CENC 402-43	CENC 402-43	CENC 402-43
	Screw	LS1206	LS1206	LS1206
	Wrench	H3	H3	H3
	Center	CENC 402-63	CENC 402-63	CENC 402-63
	Screw	LS1206	LS1206	LS1206
	Wrench	H3	H3	H3
Insert	Outer	TPMX 2807RG	TPMX 2807RG	TPMX 2807RG
	Screw	CSTB5	CSTB5	CSTB5
	Wrench	T20	T20	T20
	Inner	TPMX 2405RG	TPMX 2405RG	TPMX 2405RG
	Screw	CSTB4M	CSTB4M	CSTB4M
	Wrench	T15	T15	T15
	Center	TPMX 2807RG	TPMX 2807RG	TPMX 2807RG
	Screw	CSTB5	CSTB5	CSTB5
	Wrench	T20	T20	T20
Pad	Guide Pad	PAD-GC18	PAD-GC18	PAD-GC18
	Screw	LS1206S	LS1206S	LS1206S
	Wrench	H3	H3	H3
	Guide Pad Protector	PAD-P18	PAD-P18	PAD-P18
	Screw	LS1206S	LS1206S	LS1206S
	Wrench	H3	H3	H3
	Sub Guide Pad	PAD-S14	PAD-S14	PAD-S14
	Screw	CSTA5S	CSTA5S	CSTA5S
	Wrench	T15	T15	T15

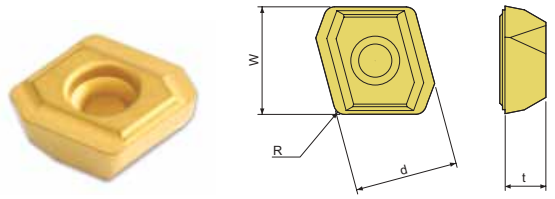
BTA INDEXABLE FOR SMALL DIAMETER SERIES "Y"

Insert for TBTA-A

Inner, Center & Outer Insert

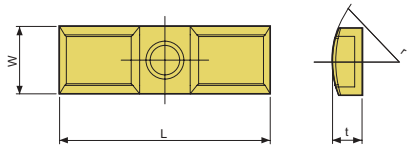


Inner & Outer Insert

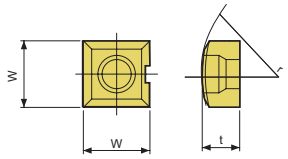


Designation	Dimension				Pocket			Grade	Screw
	d	t	R	W	Center	Inner	Outer	IN2005	
NPMX 0802RG	0.335	0.094	0.031	0.256	○	○	○		**CSTB 2.2**
NPMX 0803RG	0.315	0.125	0.031	0.329		○	○		**CSTB 2.2**

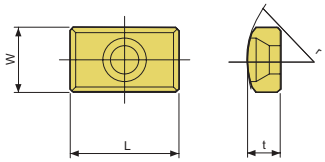
Pad



Guide Pad



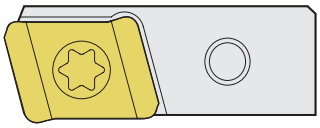
Guide Pad Protector



Sub Pad

Type	Designation	Dimension				Screw
		W	t	L	r	
Guide Pad	**PAD-GC08-140**	0.315	0.138	0.984	0.551	**CSTB 3S**
Guide Pad Protector	**PAD-P08-140**	0.315	0.138	0.315	0.551	**CSTB 3S**
Sub Pad	**PAD-S06**	0.236	0.118	0.394	0.315	**CSTB 2.2S**

Cartridge for TBTA-A

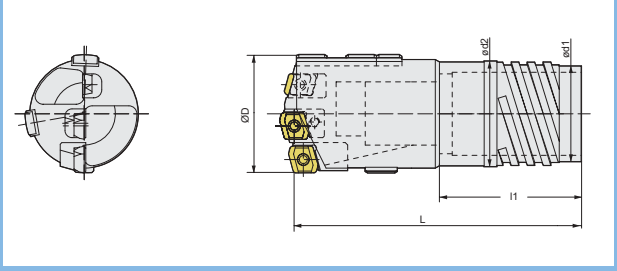


Designation		Adjust Screw	Wrench	Lock Screw	Wrench	Insert
Outer	**PERC05R**	AS0003-5	H1.5	LS1803RH	H2	NPMX0803..
	PERC06R	AS0002.5-5	H1.27	CSTB2.5	H8	NPMX0802..
Inner & Center	**CENC05R**	-	-	CSTB3	T9	NPMX0803..
	CENC06R	-	-	CSTB2.5	T8	NPMX0802..

BTA INDEXABLE FOR SMALL DIAMETER

SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

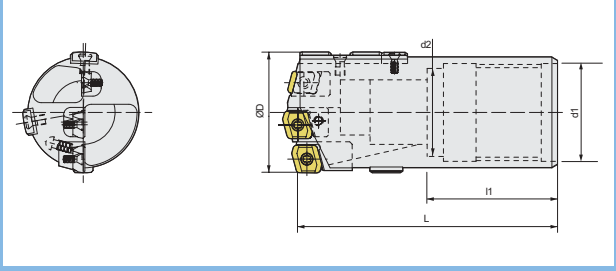
Diameters
1.142 - 1.496



Designation	Diameter	Dimension				Tube	
		L	l1	d1	d2	Part	Diameter
TBTA-Axx.xxxSE4-26	**1.142 - 1.220**	2.72	0.96	0.827	0.925	BTSI 026	1.024
TBTA-Axx.xxxSE4-28	**1.221 - 1.311**	2.72	0.96	0.906	1.004	BTSI 028	1.102
TBTA-Axx.xxxSE4-30	**1.311 - 1.425**	2.72	0.96	1.004	1.102	BTSI 030	1.181
TBTA-Axx.xxxSE4-33	**1.426 - 1.496**	2.95	1.20	1.063	1.181	BTSI 033	1.299

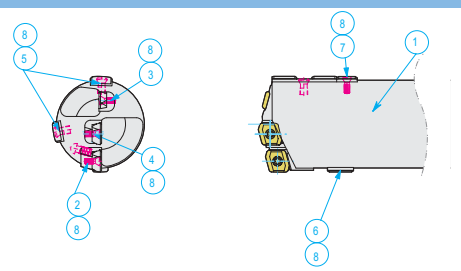
BTA INDEXABLE FOR SMALL DIAMETER SINGLE TUBE SYSTEM - INNER SINGLE START THREAD

Diameters
1.142 - 1.496



Designation	Diameter	Dimension				Tube	
		L	l1	d1	d2	Part	Diameter
TBTA-Axx.xxxSI1-24	**1.142 - 1.181**	2.95	0.98	0.866	0.748	BTSE 024	0.945
TBTA-Axx.xxxSI1-26	**1.181 - 1.259**	2.95	0.98	0.945	0.827	BTSE 026	1.024
TBTA-Axx.xxxSI1-28	**1.260 - 1.338**	2.95	0.98	1.024	0.906	BTSE 028	1.102
TBTA-Axx.xxxSI1-30	**1.339 - 1.456**	3.54	1.57	1.063	0.945	BTSE 030	1.181
TBTA-Axx.xxxSI1-33	**1.457 - 1.496**	3.54	1.57	1.181	1.063	BTSE 033	1.299

Diameters
1.142 - 1.496

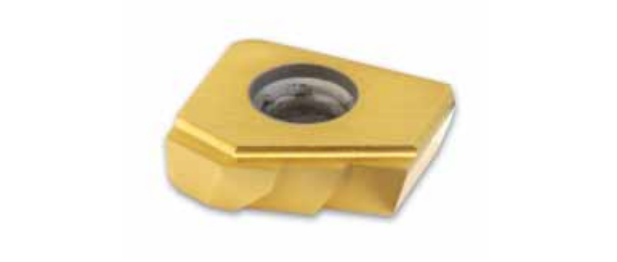


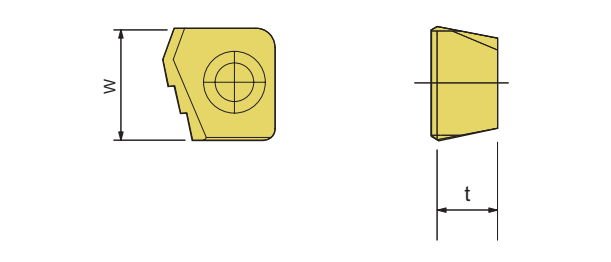
1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw

Parts		Diameter		
		1.142 - 1.338	1.339 - 1.378	1.378 - 1.496
Cartridge	Outer	PERC 06R	PERC 06R	PERC 05R
	Adjust Screw	AS0002.5-5	AS0002.5-5	AS0003-5
	Wrench	H1.27	H1.27	H1.5
	Screw	CSTB2.5	CSTB2.5	LS1803RH
	Wrench	T8	T8	H2
	Inner	CENC 06R	CENC 06R	CENC 06R
	Screw	CSTB2.5	CSTB2.5	CSTB2.5
	Wrench	T8	T8	T8
	Center	CENC 06R	CENC 05R	CENC 05R
	Screw	CSTB2.5	CSTB3	CSTB3
	Wrench	T8	T9	T9
Insert	Outer	NPMX 0802RG	NPMX 0802RG	NPMX 0803RG
	Screw	CSTB2.2	CSTB2.2	CSTB2.2
	Wrench	T7	T7	T7
	Inner	NPMX 0802RG	NPMX 0803RG	NPMX 0803RG
	Screw	CSTB2.2	CSTB2.2	CSTB2.2
	Wrench	T7	T7	T7
	Center	NPMX 0802RG	NPMX 0802RG	NPMX 0802RG
	Screw	CSTB2.2	CSTB2.2	CSTB2.2
	Wrench	T7	T7	T7
Pad	Guide Pad	PAD-GC08-140	PAD-GC08-140	PAD-GC08-140
	Screw	CSTB3S	CSTB3S	CSTB3S
	Wrench	T9	T9	T9
	Guide Pad Protector	PAD-P08-140	PAD-P08-140	PAD-P08-140
	Screw	CSTB3S	CSTB3S	CSTB3S
	Wrench	T9	T9	T9
	Sub Guide Pad	PAD-S06	PAD-S06	PAD-S06
	Screw	CSTB2.2S	CSTB2.2S	CSTB2.2S
	Wrench	T7	T7	T7

BTA INDEXABLE FOR SMALL DIAMETER

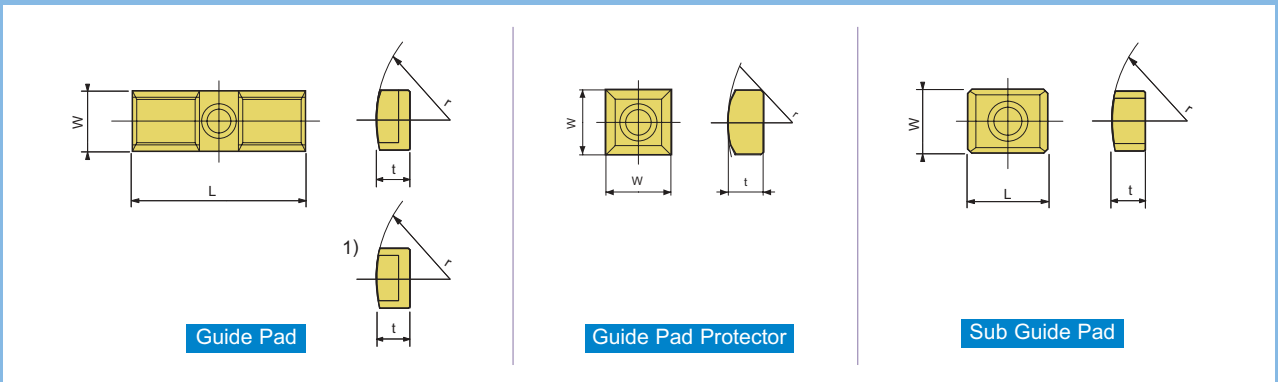
Insert for TBTA-B





Designation	Dimension		Pocket			Grade	Screw
	t	W	Center	Inner	Outer	IN2005	
XPMT 16002UB	0.110	0.374			○		CSTANO3-4.5
XPMT 18003UB	0.120	0.433			○		CSTANO5-5.5
XPMT 21003UB	0.140	0.512			○		CSTANO5-6.5
XPMT 25003UB	0.134	0.571			○		CSTA4-7.5

Pad

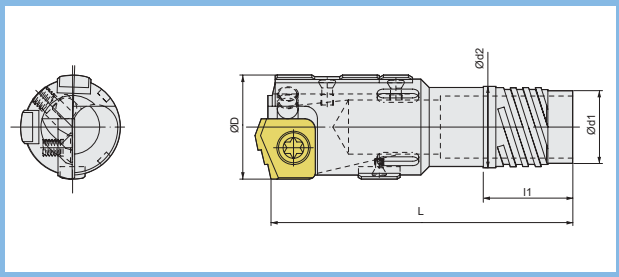


Type	Designation	Dimension				Screw
		W	t	L	r	
Guide Pad	PAD-GC06-075	0.236	0.128	0.787	0.295	CSTB2.2S
	PAD-GC06-085	0.236	0.150	0.787	0.335	CSTB2.2S
	PAD-GC06-100	0.236	0.154	0.787	0.394	CSTB2.2S
	PAD-GC08-120 1)	0.315	0.173	0.984	0.472	CSTB3S
Guide Pad Protector	PAD-P06-075	0.236	0.128	0.236	0.295	CSTB2.2S
	PAD-P06-085	0.236	0.150	0.236	0.335	CSTB2.2S
	PAD-P06-100	0.236	0.154	0.236	0.394	CSTB2.2S
	PAD-P08-120	0.236	0.173	0.236	0.472	CSTB3S
Sub Guide Pad	PAD-S06	0.236	0.118	0.394	0.315	CSTB2.2S

BTA INDEXABLE FOR SMALL DIAMETER

SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

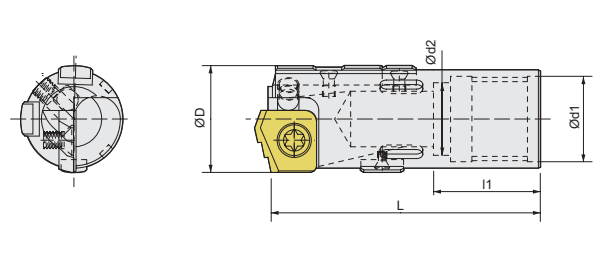
Diameters
0.630 - 1.122



Designation	Diameter	Dimension				Tube	
		L	l1	d1	d2	Part	Diameter
TBTA-Bxx.xxxSE4-14	**0.630 - 0.657**	2.44	0.79	0.425	0.496	BTSI 014	0.551
TBTA-Bxx.xxxSE4-15	**0.658 - 0.697**	2.44	0.79	0.465	0.535	BTSI 015	0.591
TBTA-Bxx.xxxSE4-16	**0.697 - 0.744**	2.44	0.85	0.492	0.571	BTSI 016	0.630
TBTA-Bxx.xxxSE4-17	**0.744 - 0.787**	2.44	0.85	0.531	0.610	BTSI 017	0.669
TBTA-Bxx.xxxSE4-18	**0.788 - 0.858**	2.66	0.85	0.551	0.630	BTSI 018	0.709
TBTA-Bxx.xxxSE4-20	**0.859 - 0.949**	2.66	0.85	0.630	0.709	BTSI 020	0.787
TBTA-Bxx.xxxSE4-22	**0.949 - 1.039**	2.85	0.85	0.689	0.768	BTSI 022	0.866
TBTA-Bxx.xxxSE4-24	**1.040 - 1.122**	2.85	0.85	0.748	0.827	BTSI 024	0.945

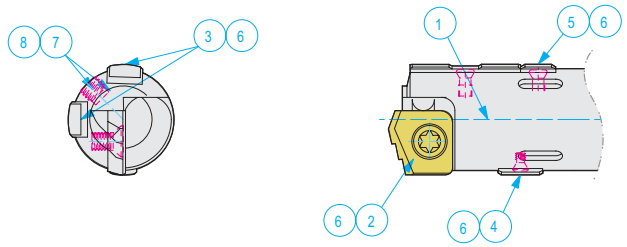
BTA INDEXABLE FOR SMALL DIAMETER SINGLE TUBE SYSTEM - INNER SINGLE START THREAD

Diameters
0.630 - 1.122



Designation	Diameter	Dimension				Tube	
		L	l1	d1	d2	Part	Diameter
TBTA-Bxx.xxxSI1-13	**0.630 - 0.650**	1.97	0.91	0.500	0.437	BTSE 013B	0.512
TBTA-Bxx.xxxSI1-14	**0.650 - 0.679**	1.97	0.91	0.528	0.465	BTSE 014A	0.551
TBTA-Bxx.xxxSI1-14	**0.680 - 0.709**	1.97	0.91	0.539	0.476	BTSE 014B	0.551
TBTA-Bxx.xxxSI1-15	**0.709 - 0.748**	1.97	0.91	0.567	0.504	BTSE 015	0.591
TBTA-Bxx.xxxSI1-16.5	**0.748 - 0.787**	1.97	0.91	0.606	0.543	BTSE 016.5	0.650
TBTA-Bxx.xxxSI1-18	**0.787 - 0.866**	2.17	0.98	0.650	0.571	BTSE 018	0.709
TBTA-Bxx.xxxSI1-20	**0.866 - 0.984**	2.17	0.98	0.748	0.630	BTSE 020	0.787
TBTA-Bxx.xxxSI1-22	**0.984 - 1.063**	2.36	0.98	0.787	0.669	BTSE 022	0.866
TBTA-Bxx.xxxSI1-24	**1.063 - 1.122**	2.36	0.98	0.866	0.748	BTSE 024	0.945

Diameters
0.630 - 1.122

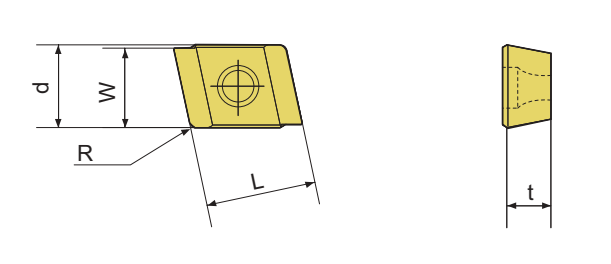


1. Head Shank
2. Indexable Insert
3. Guide Pad
4. Sub Guide
5. Guide Pad Protector
6. Lock Screw
7. Adjust Ball
8. Adjust Screw

Parts		Diameter			
		0.630 - 0.709	0.709 - 0.827	0.827 - 0.984	0.984 - 1.122
Insert	Insert	XPMT 16002UB	XPMT 18003UB	XPMT 21003UB	XPMT 25003UB
	Screw	CSTANO5-5.5	CSTANO5-5.5	CSTANO5-5.5	CSTANO5-5.5
	Wrench	T9	T9	T9	T9
	Adjust Screw	B2.5	B3	B4	B5
	Wrench	AS0003-3.5	AS0003-3.5	AS0003-3.5	AS0003-3.5
	Adjust Ball	H1.5	H1.5	H1.5	H1.5
Pad	Guide Pad	PAD-GC06-075	PAD-GC06-085	PAD-GC06-100	PAD-GC08-120
	Screw	CSTB2.2S	CSTB2.2S	CSTB2.2S	CSTB2.2S
	Wrench	T7	T7	T7	T7
	Guide Pad Protector	PAD-P06-075	PAD-P06-085	PAD-P06-100	PAD-P08-120
	Screw	CSTB2.2S	CSTB2.2S	CSTB2.2S	CSTB2.2S
	Wrench	T7	T7	T7	T7
	Sub Guide Pad	PAD-S06	PAD-S06	PAD-S06	PAD-S06
	Screw	CSTB2.2S	CSTB2.2S	CSTB2.2S	CSTB2.2S
	Wrench	T7	T7	T7	T7

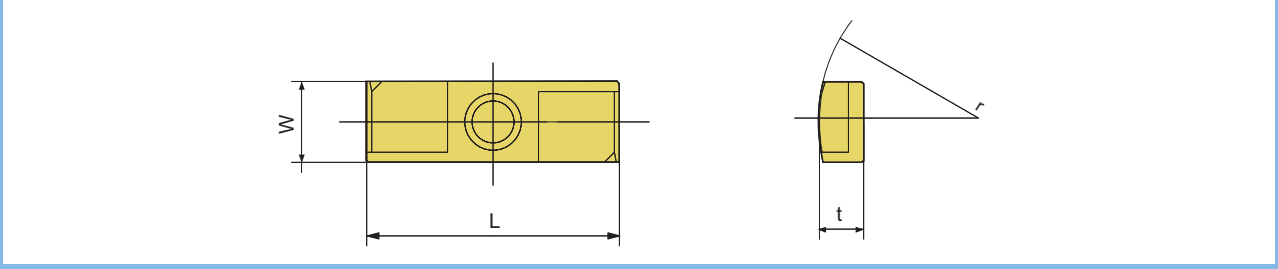
BTA INDEXABLE - COST EFFECTIVE STANDARD TOLERANCE SOLUTIONS

Insert for TBTA-C



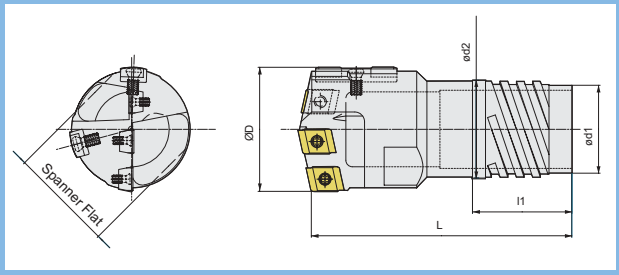
Designation	Dimension					Pocket			Grade	Screw
	d	t	L	W	R	Center	Inner	Outer	IN2005	
NPMT 05504R1	0.217	0.157	0.394	0.205	0.024	○	○	○		**CSTB 2.5**
NPMT 06504R1	0.256	0.157	0.394	0.244	0.024	○	○	○		
NPMT 07504R1	0.295	0.157	0.394	0.283	0.024	○	○	○		
NPMT 09504R1	0.374	0.157	0.394	0.362	0.024	○	○	○		

Pad



Type	Designation	Dimension				Screw
		W	t	L	r	
Guide Pad	**PAD-GO-07**	0.276	0.138	0.787	0.472	**CSTB 3S**
	PAD-GO-08	0.315	0.177	0.984	0.610	**CSTB 3.5S**
	PAD-GO-10	0.394	0.177	1.181	0.787	**CSTB 3.5S**

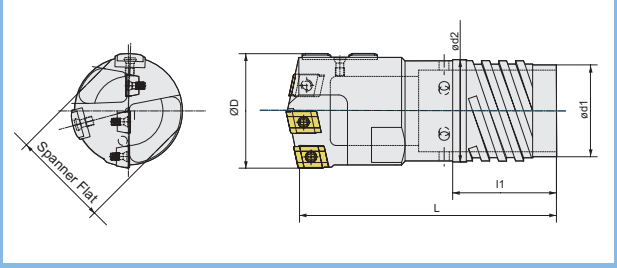
Diameters
0.984 - 2.094



Designation	Diameter	Dimension				Spanner Flat	Tube	
		L	l1	d1	d2		Part	Diameter
TBTA-Cxx.xxxSE4-22	**0.984 - 1.039**	2.56	0.85	0.689	0.768	0.75	BTSI 022	0.866
TBTA-Cxx.xxxSE4-24	**1.040 - 1.130**	2.56	0.85	0.748	0.827	0.83	BTSI 024	0.945
TBTA-Cxx.xxxSE4-26	**1.130 - 1.220**	2.76	0.96	0.827	0.925	0.94	BTSI 026	1.024
TBTA-Cxx.xxxSE4-28	**1.221 - 1.311**	2.76	0.96	0.906	1.004	1.02	BTSI 028	1.102
TBTA-Cxx.xxxSE4-30	**1.311 - 1.425**	2.76	0.96	1.004	1.102	1.10	BTSI 030	1.181
TBTA-Cxx.xxxSE4-33	**1.426 - 1.559**	2.95	1.20	1.063	1.181	1.18	BTSI 033	1.299
TBTA-Cxx.xxxSE4-36	**1.559 - 1.693**	3.15	1.20	1.181	1.299	1.26	BTSI 036	1.417
TBTA-Cxx.xxxSE4-39	**1.693 - 1.850**	3.54	1.20	1.299	1.417	1.42	BTSI 039	1.535
TBTA-Cxx.xxxSE4-43	**1.851 - 2.035**	3.54	1.20	1.417	1.535	1.50	BTSI 043	1.693
TBTA-Cxx.xxxSE4-47	**2.036 - 2.094**	3.54	1.36	1.555	1.693	1.81	BTSI 047	1.850

BTA INDEXABLE DOUBLE TUBE SYSTEM - OUTER FOUR START THREAD

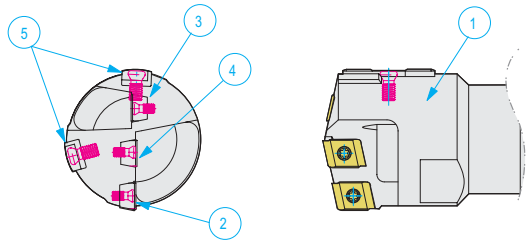
Diameters
0.984 - 2.094



Designation	Diameter	Dimension				Spanner Flat	Tube		
		L	l1	d1	d2		Outer Tube	Inner Tube	Diameter
TBTA-Cxx.xxxDE4-23.5	**0.984 - 1.039**	2.56	0.85	0.748	0.827	0.75	BTDO 023.5	BTDI 016	0.925
TBTA-Cxx.xxxDE4-26	**1.040 - 1.130**	2.76	0.96	0.827	0.925	0.83	BTDO 026	BTDI 018	1.024
TBTA-Cxx.xxxDE4-28	**1.130 - 1.220**	2.76	0.96	0.906	1.004	0.94	BTDO 028	BTDI 020	1.102
TBTA-Cxx.xxxDE4-30.5	**1.221 - 1.311**	2.76	0.96	1.004	1.122	1.02	BTDO 030.5	BTDI 022	1.201
TBTA-Cxx.xxxDE4-33	**1.311 - 1.425**	2.95	1.20	1.063	1.181	1.10	BTDO 033	BTDI 024	1.299
TBTA-Cxx.xxxDE4-35.5	**1.426 - 1.512**	2.95	1.20	1.181	1.299	1.18	BTDO 035.5	BTDI 026	1.398
TBTA-Cxx.xxxDE4-35.5	**1.512 - 1.559**	2.95	1.20	1.181	1.299	1.18	BTDO 035.5	BTDI 026	1.398
TBTA-Cxx.xxxDE4-39	**1.559 - 1.646**	3.15	1.20	1.299	1.417	1.26	BTDO 039	BTDI 029	1.535
TBTA-Cxx.xxxDE4-39	**1.646 - 1.693**	3.15	1.20	1.299	1.417	1.26	BTDO 039	BTDI 029	1.535
TBTA-Cxx.xxxDE4-42.5	**1.693 - 1.795**	3.54	1.20	1.417	1.535	1.42	BTDO 042.5	BTDI 032	1.673
TBTA-Cxx.xxxDE4-42.5	**1.796 - 1.850**	3.54	1.20	1.417	1.535	1.42	BTDO 042.5	BTDI 032	1.673
TBTA-Cxx.xxxDE4-46.5	**1.851 - 2.035**	3.54	1.36	1.555	1.693	1.50	BTDO 046.5	BTDI 035	1.831
TBTA-Cxx.xxxDE4-51	**2.036 - 2.094**	3.54	1.36	1.713	1.850	1.50	BTDO 051	BTDI 039	2.008

BTA INDEXABLE ASSEMBLY OF TBTA-C SERIES

Diameters
0.984 - 2.094



1. Head Shank
2. Outer Insert
3. Inner Insert
4. Center Insert
5. Guide Pad

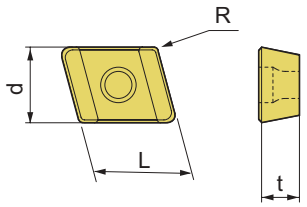
Parts		Diameter						
		0.984 - 1.039	1.040 - 1.130	1.130 - 1.220	1.221 - 1.311	1.311 - 1.425	1.426 - 1.512	1.512 - 1.559
Insert	Outer	NPMT 05504R1	NPMT 05504R1	NPMT 06504R1	NPMT 06504R1	NPMT 06504R1	NPMT 07504R1	NPMT 07504R1
	Screw	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5
	Wrench	T8	T8	T8	T8	T8	T8	T8
	Inner	NPMT 05504R1	NPMT 05504R1	NPMT 05504R1	NPMT 05504R1	NPMT 06504R1	NPMT 06504R1	NPMT 06504R1
	Screw	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5
	Wrench	T8	T8	T8	T8	T8	T8	T8
	Center	NPMT 05504R1	NPMT 05504R1	NPMT 05504R1	NPMT 06504R1	NPMT 06504R1	NPMT 06504R1	NPMT 07504R1
	Screw	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5
	Wrench	T8	T8	T8	T8	T8	T8	T8
Pad	Guide Pad	PAD-GO07	PAD-GO07	PAD-GO07	PAD-GO07	PAD-GO07	PAD-GO07	PAD-GO08
	Screw	CSTB3S	CSTB3S	CSTB3S	CSTB3S	CSTB3S	CSTB3S	CSTB3.5
	Wrench	T9	T9	T9	T9	T9	T9	T9

Parts		Diameter					
		1.559 - 1.646	1.646 - 1.693	1.693 - 1.795	1.796 - 1.850	1.851 - 2.035	2.036 - 2.094
Insert	Outer	NPMT 07504R1	NPMT 09504R1	NPMT 09504R1	NPMT 09504R1	NPMT 09504R1	NPMT 09504R1
	Screw	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5
	Wrench	T8	T8	T8	T8	T8	T8
	Inner	NPMT 07504R1	NPMT 07504R1	NPMT 07504R1	NPMT 07504R1	NPMT 09504R1	NPMT 09504R1
	Screw	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5
	Wrench	T8	T8	T8	T8	T8	T8
	Center	NPMT 07504R1	NPMT 07504R1	NPMT 09504R1	NPMT 09504R1	NPMT 09504R1	NPMT 09504R1
	Screw	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5
	Wrench	T8	T8	T8	T8	T8	T8
Pad	Guide Pad	PAD-GO08	PAD-GO08	PAD-GO08	PAD-GO10	PAD-GO10	PAD-GO10
	Screw	CSTB3.5	CSTB3.5	CSTB3.5	CSTB3.5	CSTB3.5	CSTB3.5
	Wrench	T9	T9	T9	T9	T9	T9

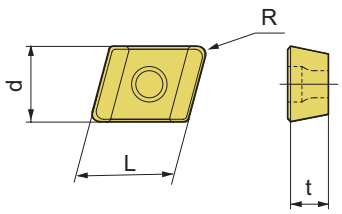
BTA INDEXABLE FOR HIGH PRODUCTIVITY

Insert for TBTA-D

Inner & Outer Insert

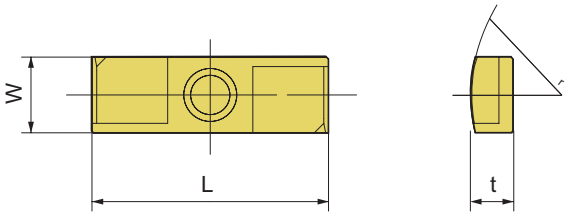


Center Insert



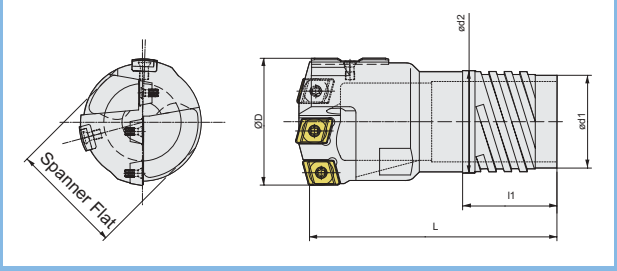
Designation	Dimension				Pocket			Grade	Screw
	d	t	L	R	Center	Inner	Outer	IN2005	
NPMT 06504L2	0.256	0.157	0.394	0.031	○				CSTB 2.5
NPMT 0804L2	0.315	0.157	0.394	0.031	○				
NPMT 09504L2	0.374	0.157	0.394	0.031	○				
NPMT 12504L2	0.492	0.157	0.394	0.031	○				
NPMT 06504R2	0.256	0.157	0.394	0.016		○	○		CSTB 2.5
NPMT 0804R2	0.315	0.157	0.394	0.016		○	○		
NPMT 09504R2	0.374	0.157	0.394	0.016		○	○		
NPMT 12504R2	0.492	0.157	0.394	0.016		○	○		

Pad



Type	Designation	Dimension				Screw
		W	t	L	r	
Guide Pad	PAD-GO-07	0.276	0.138	0.787	0.472	CSTB3S
	PAD-GO-08	0.315	0.177	0.984	0.610	CSTB3.5S
	PAD-GO-10	0.394	0.177	1.181	0.787	CSTB3.5S
	PAD-GO-12	0.472	0.217	1.378	0.984	CSTB3.5S

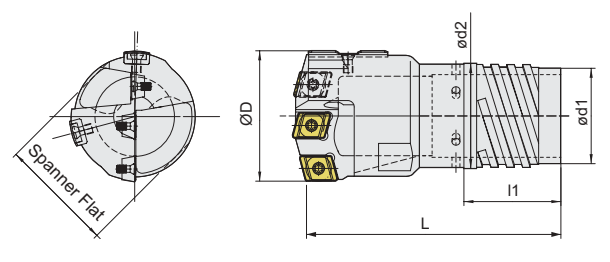
Diameters
1.181 - 2.559



Designation	Diameter	Dimension				Spanner Flat	Tube	
		L	l1	d1	d2		Part	Diameter
TBTA-Dxx.xxxSE4-26	**1.181 - 1.220**	2.76	0.96	0.827	0.925	0.75	BTSI 026	1.024
TBTA-Dxx.xxxSE4-28	**1.221 - 1.311**	2.76	0.96	0.906	1.004	0.83	BTSI 028	1.102
TBTA-Dxx.xxxSE4-30	**1.311 - 1.425**	2.76	0.96	1.004	1.102	0.94	BTSI 030	1.181
TBTA-Dxx.xxxSE4-33	**1.426 - 1.559**	2.95	1.20	1.063	1.181	1.02	BTSI 033	1.299
TBTA-Dxx.xxxSE4-36	**1.559 - 1.693**	3.15	1.20	1.181	1.299	1.10	BTSI 036	1.417
TBTA-Dxx.xxxSE4-39	**1.693 - 1.850**	3.54	1.20	1.299	1.417	1.18	BTSI 039	1.535
TBTA-Dxx.xxxSE4-43	**1.851 - 2.035**	3.54	1.20	1.417	1.535	1.26	BTSI 043	1.693
TBTA-Dxx.xxxSE4-47	**2.036 - 2.213**	3.54	1.36	1.555	1.693	1.42	BTSI 047	1.850
TBTA-Dxx.xxxSE4-51	**2.213 - 2.386**	3.54	1.36	1.713	1.870	1.50	BTSI 051	2.008
TBTA-Dxx.xxxSE4-56	**2.386 - 2.559**	3.54	1.36	1.870	2.008	1.81	BTSI 056	2.205

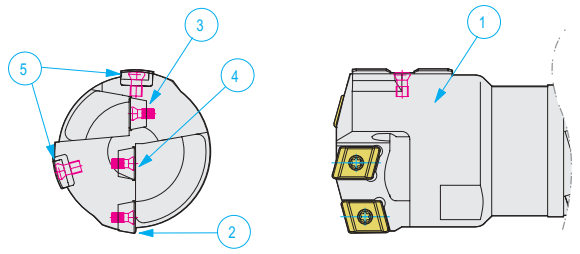
BTA INDEXABLE FOR HIGH PRODUCTIVITY DOUBLE TUBE SYSTEM - OUTER FOUR START THREAD

Diameters
1.181 - 2.559



Designation	Diameter	Dimension				Spanner Flat	Tube		
		L	l1	d1	d2		Outer Tube	Inner Tube	Diameter
TBTA-Dxx.xxxDE4-28	**1.181 - 1.220**	2.76	0.96	0.906	1.004	1.02	BTDO 028	BTDI 020	1.102
TBTA-Dxx.xxxDE4-30.5	**1.221 - 1.311**	2.76	0.96	1.004	1.102	1.10	BTDO 030.5	BTDI 022	1.201
TBTA-Dxx.xxxDE4-33	**1.311 - 1.425**	2.95	1.20	1.063	1.181	1.18	BTDO 033	BTDI 024	1.299
TBTA-Dxx.xxxDE4-35.5	**1.426 - 1.559**	3.15	1.20	1.181	1.299	1.26	BTDO 035.5	BTDI 026	1.398
TBTA-Dxx.xxxDE4-39	**1.559 - 1.693**	3.15	1.20	1.299	1.417	1.42	BTDO 039	BTDI 029	1.535
TBTA-Dxx.xxxDE4-42.5	**1.693 - 1.850**	3.54	1.20	1.417	1.535	1.50	BTDO 042.5	BTDI 032	1.673
TBTA-Dxx.xxxDE4-46.5	**1.851 - 2.035**	3.54	1.36	1.555	1.693	1.57	BTDO 046.5	BTDI 035	1.831
TBTA-Dxx.xxxDE4-51	**2.036 - 2.213**	3.54	1.36	1.713	1.870	1.97	BTDO 051	BTDI 039	2.008
TBTA-Dxx.xxxDE4-55.5	**2.213 - 2.559**	3.54	1.36	1.870	2.008	1.97	BTDO 055.5	BTDI 043	2.185

Diameters
1.181 - 2.559



1. Head Shank
2. Outer Insert
3. Inner Insert
4. Center Insert
5. Guide Pad

Parts		Diameter				
		1.181 - 1.299	1.300 - 1.417	1.418 - 1.535	1.536 - 1.654	1.654 - 1.772
Insert	Outer	NPMT 06504R2	NPMT 06504R2	NPMT 0804R2	NPMT 0804R2	NPMT 0804R2
	Screw	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5
	Wrench	T8	T8	T8	T8	T8
	Inner	NPMT 06504R2	NPMT 06504R2	NPMT 06504R2	NPMT 0804R2	NPMT 0804R2
	Screw	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5
	Wrench	T8	T8	T8	T8	T8
	Center	NPMT 06504LH2	NPMT 0804LH2	NPMT 0804LH2	NPMT 0804LH2	NPMT 09504LH2
	Screw	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5
	Wrench	T8	T8	T8	T8	T8
Pad	Guide Pad	PAD-GO07	PAD-GO07	PAD-GO08	PAD-GO08	PAD-GO08
	Screw	CSTB3S	CSTB3S	CSTB3.5	CSTB3.5	CSTB3.5
	Wrench	T9	T9	T9	T9	T9

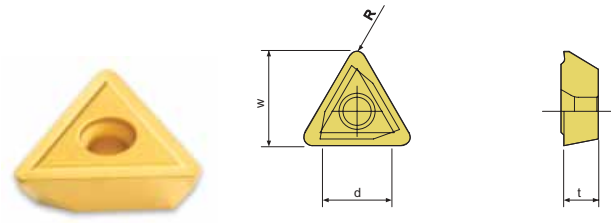
Parts		Diameter				
		1.772 - 1.890	1.890 - 2.008	2.008 - 2.244	2.244 - 2.480	2.481 - 2.559
Insert	Outer	NPMT 09504R2	NPMT 09504R2	NPMT 09504R2	NPMT 12504R2	NPMT 12504R2
	Screw	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5
	Wrench	T8	T8	T8	T8	T8
	Inner	NPMT 0804R2	NPMT 09504R2	NPMT 09504R2	NPMT 09504R2	NPMT 12504R2
	Screw	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5
	Wrench	T8	T8	T8	T8	T8
	Center	NPMT 09504LH2	NPMT 09504LH2	NPMT 12504LH2	NPMT 12504LH2	NPMT 12504LH2
	Screw	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5
	Wrench	T8	T8	T8	T8	T8
Pad	Guide Pad	PAD-GO10	PAD-GO10	PAD-GO10	PAD-GO12	PAD-GO12
	Screw	CSTB3.5	CSTB3.5	CSTB3.5	CSTB3.5	CSTB3.5
	Wrench	T9	T9	T9	T9	T9

* Wrench for all Inserts: T8
* Wrench for all guide pads: T9

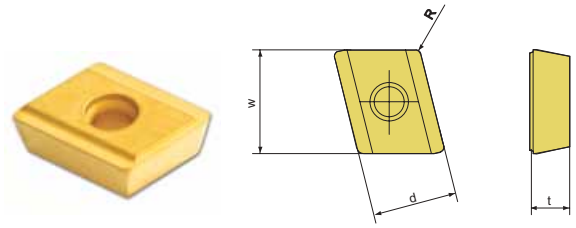
BTA INDEXABLE FOR LARGE DIAMETER

Insert for TBTA-L

Center & Inner & Outer Insert



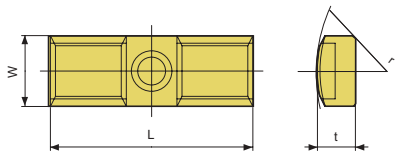
Outer Insert



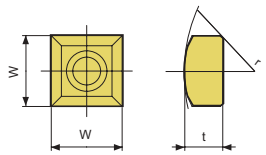
Designation	Dimension				Pocket			Grade	Screw
	d	W	R	t	Center	Inner	Outer	IN2005	
TPMX 16-TDM	0.375	0.515	0.047	0.187	○	○	○		CSTB3.5D
TPMX 22-TDM	0.500	0.703	0.047	0.250	○	○	○		CSTB4M
NPMT 13-TDMR	0.433	0.531	0.031	0.187			○*		CSTB3.5D
NPMT 19-TDMR	0.472	0.768	0.024	0.250			○*		CSTB4M

* NPMX type insert is available for outer pocket on request.

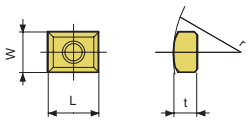
Pad



Guide Pad



Guide Pad Protector

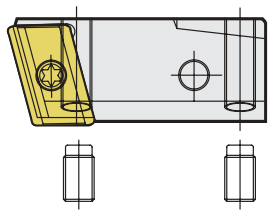


Sub Pad

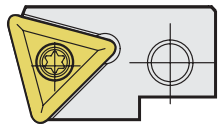
Type	Designation	Dimension				Screw
		W	T	L	R	
Guide Pad	PAD-GC14	0.551	0.295	1.575	0.984	CSTA5S
	PAD-GC18	0.709	0.354	1.575	1.181	LS1206S
	PAD-GC22	0.866	0.591	1.969	2.953	LS1206
Guide Pad Protector	PAD-P14	0.551	0.295	0.551	0.984	CSTA5S
	PAD-P18	0.709	0.354	0.709	1.181	LS1206S
	PAD-P22	0.866	0.591	0.866	2.953	LS1206
Sub Pad	PAD-S10	0.394	0.197	0.394	1.142	CSTB3S
	PAD-S14	0.551	0.276	0.787	1.772	CSTB5S

Cartridge for TBTA-L

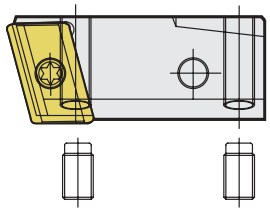
Outer



Inner



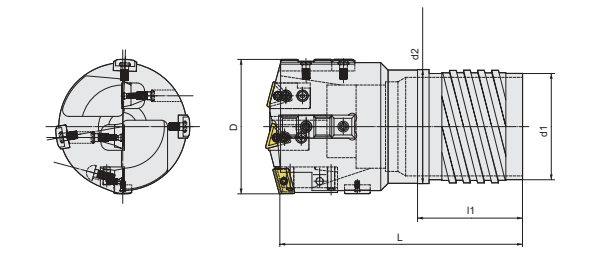
Center



Designation		Adjust Screw	Wrench	Lock Screw	Wrench	Insert
Outer	PERC310-13QRA	AS0006-10	H3	LS1805RH	H4	NPMX13-TDMR
	PERC310-19QRA	AS0006-15	H3	LS1806RH	H4	NPMX19-TDMR
Inner	CENC310-16TRB	-	-	LS1206	H3	TPMX16-TDM
	CENC310-22TRB	-	-	LS1206	H3	TPMX22-TDM
Center	CENC310-16TLB	-	-	LS1206	H3	TPMX16-TDM
	CENC310-12TLB	-	-	LS1206	H3	TPMX22-TDM

BTA INDEXABLE FOR LARGE DIAMETER SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

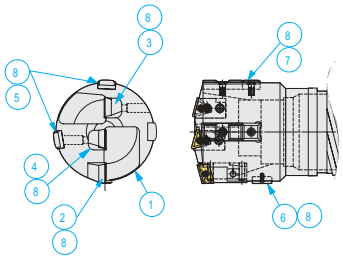
Diameters
2.441 - 7.244



Designation	Diameter	Dimension				Tube	
		L	l1	d1	d2	Part	Diameter
TBTA-Lxx.xxxSE4-56A	2.441 - 2.559	4.72	1.36	1.870	2.008	BTSI 056A	2.205
TBTA-Lxx.xxxSE4-56B	2.559 - 2.637	6.30	2.44	1.850	2.047	BTSI 056B	2.205
TBTA-Lxx.xxxSE4-62	2.638 - 2.874	6.30	2.44	2.087	2.283	BTSI 062	2.441
TBTA-Lxx.xxxSE4-68	2.874 - 3.149	6.30	2.44	2.283	2.480	BTSI 068	2.677
TBTA-Lxx.xxxSE4-75	3.150 - 3.425	7.48	3.23	2.520	2.756	BTSI 075	2.953
TBTA-Lxx.xxxSE4-82	3.425 - 3.937	7.48	3.23	2.795	3.031	BTSI 082	3.228
TBTA-Lxx.xxxSE4-94	3.937 - 4.409	7.48	3.23	3.268	3.504	BTSI 094	3.701
TBTA-Lxx.xxxSE4-106	4.409 - 4.881	8.27	4.02	3.740	3.976	BTSI 106	4.173
TBTA-Lxx.xxxSE4-118	4.882 - 5.354	8.27	4.02	4.213	4.449	BTSI 118	4.646
TBTA-Lxx.xxxSE4-130	5.354 - 5.826	8.66	4.02	4.685	4.921	BTSI 130	5.118
TBTA-Lxx.xxxSE4-142	5.827 - 6.299	8.66	4.80	5.157	5.394	BTSI 142	5.591
TBTA-Lxx.xxxSE4-154	6.299 - 6.771	8.66	4.80	5.630	5.630	BTSI 154	6.063
TBTA-Lxx.xxxSE4-166	6.772 - 7.244	8.66	4.80	6.102	6.339	BTSI 166	6.535

BTA INDEXABLE FOR LARGE DIAMETER ASSEMBLY OF TBTA-L SERIES

Diameters
2.441 - 5.118

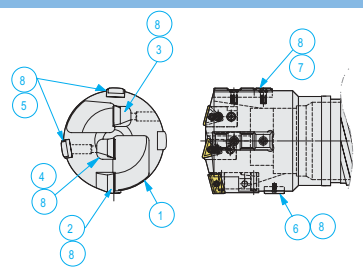


1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw

Parts		Diameter						
		2.441 - 2.913	2.913 - 3.267	3.268 - 3.700	3.701 - 3.937	3.937 - 4.173	4.173 - 4.724	4.724 - 5.118
Cartridge	Outer	PERC310-13QRA	PERC310-19QRA	PERC310-19QRA	PERC310-19QRA	PERC310-19QRA	PERC310-13QRA	PERC310-19QRA
	Adjust Screw	AS0006-10	AS0006-15	AS0006-15	AS0006-15	AS0006-15	AS0006-10	AS0006-15
	Wrench	H3	H3	H3	H3	H3	H3	H3
	Screw	LS1805RH	LS1806RH	LS1806RH	LS1806RH	LS1806RH	LS1805RH	LS1806RH
	Wrench	H4	H4	H4	H4	H4	H4	H4
	Inner	CENC310-16TRB	CENC310-16TRB	CENC310-16TRB	CENC310-22TRB	CENC310-22TRB	CT310-16TRB	CT310-16TRB
	Screw	LS1206	LS1206	LS1206	LS1206	LS1206	LS1206	LS1206
	Wrench	H3	H3	H3	H3	H3	H3	H3
	Center	CENC310-16TLB	CENC310-16TLB	CENC310-22TLB	CENC310-22TLB	CENC310-22TLB	CT310-16TLB	CT310-16TLB
	Screw	LS1206	LS1206	LS1206	LS1206	LS1206	LS1206	LS1206
	Wrench	H3	H3	H3	H3	H3	H3	H3
Insert	Outer	NPMT 13-TDMR	NPMT 19-TDMR	NPMT 19-TDMR	NPMT 19-TDMR	NPMT 19-TDMR	NPMT 13-TDMR	NPMT 19-TDMR
	Screw	CSTB3.5D	CSTB4M	CSTB4M	CSTB4M	CSTB4M	CSTB3.5D	CSTB4M
	Wrench	T9	T15	T15	T15	T15	T9	T15
	Inner	TPMX 16-TDM	TPMX 16-TDM	TPMX 16-TDM	TPMX 22-TDM	TPMX 22-TDM	TPMX 16-TDM	TPMX 16-TDM
	Screw	CSTB3.5D	CSTB3.5D	CSTB3.5D	CSTB4M	CSTB4M	CSTB3.5D	CSTB3.5D
	Wrench	T9	T9	T9	T15	T15	T9	T9
	Center	TPMX 16-TDM	TPMX 16-TDM	TPMX 22-TDM	TPMX 22-TDM	TPMX 22-TDM	TPMX 16-TDM	TPMX 16-TDM
	Screw	CSTB3.5D	CSTB3.5D	CSTB4M	CSTB4M	CSTB4M	CSTB3.5D	CSTB3.5D
	Wrench	T9	T9	T15	T15	T15	T9	T9
Pad	Guide Pad	PAD-GC14	PAD-GC14	PAD-GC14	PAD-GC18	PAD-GC18	PAD-GC18	PAD-GC18
	Screw	CSTA5S	CSTA5S	CSTA5S	LS1206S	LS1206S	LS1206S	LS1206S
	Wrench	T15	T15	T15	H3	H3	H3	H3
	Guide Pad Protector	PAD-P14	PAD-P14	PAD-P14	PAD-P18	PAD-P18	PAD-P18	PAD-P18
	Screw	CSTA5S	CSTA5S	CSTA5S	LS1206S	LS1206S	LS1206S	LS1206S
	Wrench	T15	T15	T15	H3	H3	H3	H3
	Sub Guide Pad	PAD-S10	PAD-S10	PAD-S10	PAD-S14	PAD-S14	PAD-S14	PAD-S14
	Screw	CSTB3S	CSTB3S	CSTB3S	CSTA5S	CSTA5S	CSTA5S	CSTA5S
	Wrench	T9	T9	T9	T15	T15	T15	T15

BTA INDEXABLE FOR LARGE DIAMETER ASSEMBLY OF TBTA-L SERIES

Diameters
5.118 - 7.401

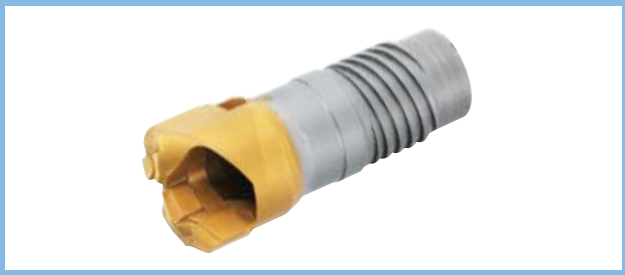


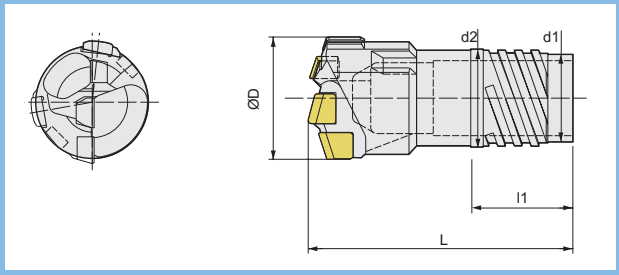
1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw

Parts		Diameter					
		5.118 - 5.551	5.551 - 5.944	5.945 - 6.378	6.378 - 6.811	6.811 - 7.007	7.008 - 7.401
Cartridge	Outer	PERC310-19QRA	PERC310-19QRA	PERC310-19QRA	PERC310-190QRA	PERC310-13QRA	PERC310-13QRA
	Adjust Screw	AS0006-15	AS0006-15	AS0006-15	AS0006-15	AS0006-10	AS0006-10
	Wrench	H3	H3	H3	H3	H3	H3
	Screw	LS1806RH	LS1806RH	LS1806RH	LS1806RH	LS1805RH	LS1805RH
	Wrench	H4	H4	H4	H4	H4	H4
	Inner	CENC310-16TRB	CENC310-16TRB	CENC310-16TRB	CENC310-22TRB	CENC310-16TRB	CENC310-16TRB
	Screw	LS1206	LS1206	LS1206	LS1206	LS1206	LS1206
	Wrench	H3	H3	H3	H3	H3	H3
	Center	CENC310-22TLB	CENC310-22TLB	CENC310-22TLB	CENC310-22TLB	CENC310-22TLB	CENC310-22TLB
	Screw	LS1206	LS1206	LS1206	LS1206	LS1206	LS1206
	Wrench	H3	H3	H3	H3	H3	H3
Insert	Outer	NPMT 19-TDMR	NPMT 19-TDMR	NPMT 19-TDMR	NPMT 19-TDMR	NPMT 13-TDMR	NPMT 13-TDMR
	Screw	CSTB4M	CSTB4M	CSTB4M	CSTB4M	CSTB3.5D	CSTB3.5D
	Wrench	T15	T15	T15	T15	T9	T9
	Inner	TPMX 16-TDM	TPMX 16-TDM	TPMX 16-TDM	TPMX 22-TDM	TPMX 16-TDM	TPMX 16-TDM
	Screw	CSTB3.5D	CSTB3.5D	CSTB3.5D	CSTB4M	CSTB3.5D	CSTB3.5D
	Wrench	T9	T9	T9	T15	T9	T9
	Center	TPMX 22-TDM	TPMX 22-TDM	TPMX 22-TDM	TPMX 22-TDM	TPMX 22-TDM	TPMX 22-TDM
	Screw	CSTB4M	CSTB4M	CSTB4M	CSTB4M	CSTB4M	CSTB4M
	Wrench	T15	T15	T15	T15	T15	T15
Pad	Guide Pad	PAD-GC18	PAD-GC18	PAD-GC18	PAD-GC18	PAD-GC22	PAD-GC22
	Screw	LS1206S	LS1206S	LS1206S	LS1206S	LS1206	LS1206
	Wrench	H3	H3	H3	H3	H3	H3
	Guide Pad Protector	PAD-P18	PAD-P18	PAD-P18	PAD-P18	PAD-P22	PAD-P22
	Screw	LS1206S	LS1206S	LS1206S	LS1206S	LS1206	LS1206
	Wrench	H3	H3	H3	H3	H3	H3
	Sub Guide Pad	PAD-S14	PAD-S14	PAD-S14	PAD-S14	PAD-S14	PAD-S14
	Screw	CSTA5S	CSTA5S	CSTA5S	CSTA5S	CSTA5S	CSTA5S
	Wrench	T15	T15	T15	T15	T15	T15

BTA BRAZED SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

Diameters
0.496 - 1.559



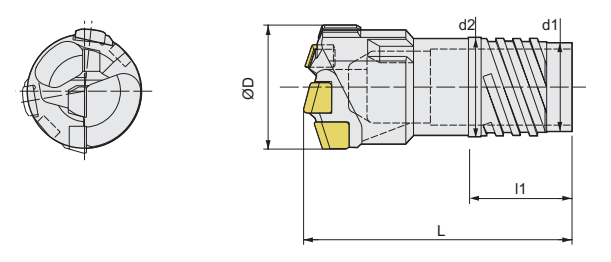


Designation	Diameter	Dimension				Tube		Grade					
		L	l1	d1	d2	Part No.	Diameter	TB103	TB203	TB253	TB293	TB200	TB290
BTA xx.xxx SE4-11	0.496 - 0.516	1.69	0.93	0.323	0.378	BTSI011	0.433	●	●	●	●	●	●
BTA xx.xxx SE4-11	0.516 - 0.535	1.69	0.93	0.323	0.378	BTSI011	0.433	●	●	●	●	●	●
BTA xx.xxx SE4-12	0.536 - 0.555	1.69	0.93	0.362	0.417	BTSI012	0.472	●	●	●	●	●	●
BTA xx.xxx SE4-12	0.556 - 0.575	1.69	0.93	0.362	0.417	BTSI012	0.472	●	●	●	●	●	●
BTA xx.xxx SE4-13	0.575 - 0.594	1.69	0.93	0.402	0.457	BTSI013	0.512	●	●	●	●	●	●
BTA xx.xxx SE4-13	0.595 - 0.614	1.69	0.93	0.402	0.457	BTSI013	0.512	●	●	●	●	●	●
BTA xx.xxx SE4-14	0.614 - 0.638	1.69	0.79	0.425	0.496	BTSI014	0.551	●	●	●	●	●	●
BTA xx.xxx SE4-14	0.638 - 0.657	1.69	0.79	0.425	0.496	BTSI014	0.551	●	●	●	●	●	●
BTA xx.xxx SE4-15	0.658 - 0.677	1.69	0.79	0.465	0.535	BTSI015	0.591	●	●	●	●	●	●
BTA xx.xxx SE4-15	0.678 - 0.697	1.69	0.79	0.465	0.535	BTSI015	0.591	●	●	●	●	●	●
BTA xx.xxx SE4-16	0.697 - 0.724	1.85	0.85	0.492	0.571	BTSI016	0.630	●	●	●	●	●	●
BTA xx.xxx SE4-16	0.725 - 0.744	1.85	0.85	0.492	0.571	BTSI016	0.630	●	●	●	●	●	●
BTA xx.xxx SE4-17	0.744 - 0.756	1.85	0.85	0.531	0.610	BTSI017	0.669	●	●	●	●	●	●
BTA xx.xxx SE4-17	0.756 - 0.787	1.85	0.85	0.531	0.610	BTSI017	0.669	●	●	●	●	●	●
BTA xx.xxx SE4-18	0.788 - 0.823	2.07	0.85	0.551	0.630	BTSI018	0.709	●	●	●	●	●	●
BTA xx.xxx SE4-18	0.823 - 0.858	2.07	0.85	0.551	0.630	BTSI018	0.709	●	●	●	●	●	●
BTA xx.xxx SE4-20	0.859 - 0.902	2.20	0.85	0.630	0.709	BTSI020	0.787	●	●	●	●	●	●
BTA xx.xxx SE4-20	0.902 - 0.949	2.20	0.85	0.630	0.709	BTSI020	0.787	●	●	●	●	●	●
BTA xx.xxx SE4-22	0.949 - 0.992	2.26	0.85	0.689	0.768	BTSI022	0.866	●	●	●	●	●	●
BTA xx.xxx SE4-22	0.993 - 1.039	2.26	0.85	0.689	0.768	BTSI022	0.866	●	●	●	●	●	●
BTA xx.xxx SE4-24	1.040 - 1.083	2.26	0.85	0.748	0.827	BTSI024	0.945	○	○	○	○	○	○
BTA xx.xxx SE4-24	1.083 - 1.130	2.26	0.85	0.748	0.827	BTSI024	0.945	○	○	○	○	○	○
BTA xx.xxx SE4-26	1.130 - 1.173	2.50	0.96	0.827	0.925	BTSI026	1.024	○	○	○	○	○	○
BTA xx.xxx SE4-26	1.174 - 1.220	2.50	0.96	0.827	0.925	BTSI026	1.024	○	○	○	○	○	○
BTA xx.xxx SE4-28	1.221 - 1.264	2.50	0.96	0.906	1.004	BTSI028	1.102	○	○	○	○	○	○
BTA xx.xxx SE4-28	1.264 - 1.311	2.50	0.96	0.906	1.004	BTSI028	1.102	○	○	○	○	○	○
BTA xx.xxx SE4-30	1.311 - 1.370	2.50	0.96	1.004	1.102	BTSI030	1.181	○	○	○	○	○	○
BTA xx.xxx SE4-30	1.370 - 1.425	2.50	0.96	1.004	1.102	BTSI030	1.181	○	○	○	○	○	○
BTA xx.xxx SE4-33	1.426 - 1.469	2.89	1.20	1.063	1.181	BTSI033	1.299	○	○	○	○	○	○
BTA xx.xxx SE4-33	1.469 - 1.512	2.89	1.20	1.063	1.181	BTSI033	1.299	○	○	○	○	○	○
BTA xx.xxx SE4-33	1.512 - 1.559	2.89	1.20	1.063	1.181	BTSI033	1.299	○	○	○	○	○	○

●Standard
○Semi-Standard

BTA BRAZED SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

Diameters
1.559 - 2.559

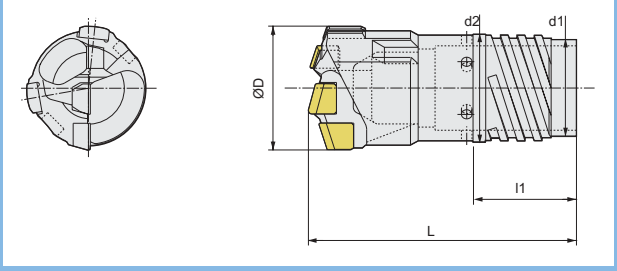


Designation	Diameter	Dimension				Tube		Grade					
		L	l1	d1	d2	Part No.	Diameter	TB103	TB203	TB253	TB293	TB200	TB290
BTA xx.xxx SE4-36	1.559 - 1.598	2.89	1.20	1.181	1.299	BTSI036	1.417	○	○	○	○	●	●
BTA xx.xxx SE4-36	1.599 - 1.646	2.89	1.20	1.181	1.299	BTSI036	1.417	○	○	○	○	●	●
BTA xx.xxx SE4-36	1.646 - 1.693	2.89	1.20	1.181	1.299	BTSI036	1.417	○	○	○	○	●	●
BTA xx.xxx SE4-39	1.693 - 1.744	2.95	1.20	1.299	1.417	BTSI039	1.535	○	○	○	○	●	●
BTA xx.xxx SE4-39	1.744 - 1.795	2.95	1.20	1.299	1.417	BTSI039	1.535	○	○	○	○	●	●
BTA xx.xxx SE4-39	1.796 - 1.850	2.95	1.20	1.299	1.417	BTSI039	1.535	○	○	○	○	●	●
BTA xx.xxx SE4-43	1.851 - 1.909	2.95	1.20	1.417	1.535	BTSI043	1.693	○	○	○	○	●	●
BTA xx.xxx SE4-43	1.910 - 1.972	2.95	1.20	1.417	1.535	BTSI043	1.693	○	○	○	○	●	●
BTA xx.xxx SE4-43	1.973 - 2.035	2.95	1.20	1.417	1.535	BTSI043	1.693	○	○	○	○	●	●
BTA xx.xxx SE4-47	2.036 - 2.094	3.23	1.36	1.555	1.693	BTSI047	1.850	○	○	○	○	●	●
BTA xx.xxx SE4-47	2.095 - 2.154	3.23	1.36	1.555	1.693	BTSI047	1.850	○	○	○	○	●	●
BTA xx.xxx SE4-47	2.154 - 2.213	3.23	1.36	1.555	1.693	BTSI047	1.850	○	○	○	○	●	●
BTA xx.xxx SE4-51	2.213 - 2.299	3.31	1.36	1.713	1.850	BTSI051	2.008	○	○	○	○	●	●
BTA xx.xxx SE4-51	2.300 - 2.386	3.31	1.36	1.713	1.850	BTSI051	2.008	○	○	○	○	●	●
BTA xx.xxx SE4-51	2.386 - 2.472	3.31	1.36	1.713	1.850	BTSI051	2.008	○	○	○	○	●	●
BTA xx.xxx SE4-51	2.473 - 2.559	3.31	1.36	1.713	1.850	BTSI051	2.008	○	○	○	○	●	●
BTA xx.xxx SE4-56	2.386 - 2.472	3.31	1.36	1.870	2.008	BTSI056	2.205	○	○	○	○	●	●
BTA xx.xxx SE4-56	2.473 - 2.559	3.31	1.36	1.870	2.008	BTSI056	2.205	○	○	○	○	●	●

●Standard
○Semi-Standard

BTA BRAZED DOUBLE TUBE SYSTEM - OUTER FOUR START THREAD

Diameters
0.725 - 1.559

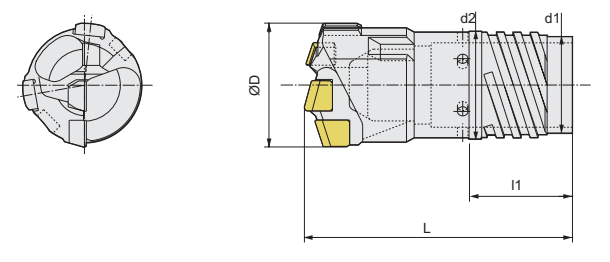


Designation	Diameter	Dimension				Tube			Grade					
		L	l1	d1	d2	Outer Tube	Inner Tube	Diameter	TB103	TB203	TB253	TB293	TB200	TB290
BTA xx.xxx DE4-18	**0.725 - 0.756**	1.97	0.85	0.551	0.630	BTDO018	BTDI012	0.709	●	●	●	●	●	●
BTA xx.xxx DE4-18	**0.756 - 0.787**	1.97	0.85	0.551	0.630	BTDO018	BTDI012	0.709	●	●	●	●	●	●
BTA xx.xxx DE4-19.5	**0.788 - 0.823**	2.20	0.85	0.630	0.709	BTDO019.5	BTDI014	0.768	●	●	●	●	●	●
BTA xx.xxx DE4-19.5	**0.823 - 0.858**	2.20	0.85	0.630	0.709	BTDO019.5	BTDI014	0.768	●	●	●	●	●	●
BTA xx.xxx DE4-21.5	**0.859 - 0.902**	2.20	0.85	0.689	0.768	BTDO021.5	BTDI015	0.846	●	●	●	●	●	●
BTA xx.xxx DE4-21.5	**0.902 - 0.949**	2.20	0.85	0.689	0.768	BTDO021.5	BTDI015	0.846	●	●	●	●	●	●
BTA xx.xxx DE4-23.5	**0.949 - 0.992**	2.26	0.85	0.748	0.827	BTDO023.5	BTDI016	0.925	●	●	●	●	●	●
BTA xx.xxx DE4-23.5	**0.993 - 1.039**	2.26	0.85	0.748	0.827	BTDO023.5	BTDI016	0.925	●	●	●	●	●	●
BTA xx.xxx DE4-26	**1.040 - 1.083**	2.38	0.96	0.827	0.925	BTDO026	BTDI018	1.024	○	○	○	○	○	○
BTA xx.xxx DE4-26	**1.083 - 1.130**	2.38	0.96	0.827	0.925	BTDO026	BTDI018	1.024	○	○	○	○	○	○
BTA xx.xxx DE4-28	**1.130 - 1.173**	2.50	0.96	0.906	1.004	BTDO028	BTDI020	1.102	○	○	○	○	○	○
BTA xx.xxx DE4-28	**1.174 - 1.220**	2.50	0.96	0.906	1.004	BTDO028	BTDI020	1.102	○	○	○	○	○	○
BTA xx.xxx DE4-30.5	**1.221 - 1.264**	2.50	0.96	1.004	1.102	BTDO030.5	BTDI022	1.201	○	○	○	○	○	○
BTA xx.xxx DE4-30.5	**1.264 - 1.311**	2.50	0.96	1.004	1.102	BTDO030.5	BTDI022	1.201	○	○	○	○	○	○
BTA xx.xxx DE4-33	**1.311 - 1.370**	2.78	1.20	1.063	1.181	BTDO033.0	BTDI024	1.299	○	○	○	○	○	○
BTA xx.xxx DE4-33	**1.370 - 1.425**	2.78	1.20	1.063	1.181	BTDO033.0	BTDI024	1.299	○	○	○	○	○	○
BTA xx.xxx DE4-35.5	**1.426 - 1.469**	2.89	1.20	1.181	1.299	BTDO035.5	BTDI026	1.398	○	○	○	○	○	○
BTA xx.xxx DE4-35.5	**1.469 - 1.512**	2.89	1.20	1.181	1.299	BTDO035.5	BTDI026	1.398	○	○	○	○	○	○
BTA xx.xxx DE4-35.5	**1.512 - 1.559**	2.89	1.20	1.181	1.299	BTDO035.5	BTDI026	1.398	○	○	○	○	○	○

●Standard
○Semi-Standard

BTA BRAZED DOUBLE TUBE SYSTEM - OUTER FOUR START THREAD

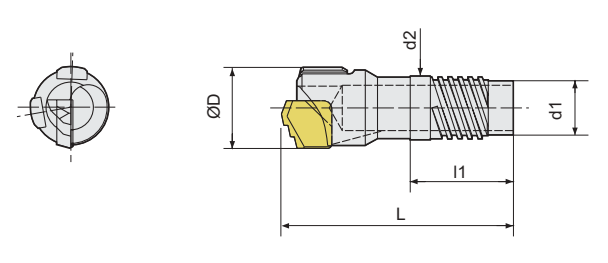
Diameters
1.559 - 2.559



Designation	Diameter	Dimension				Tube			Grade					
		L	l1	d1	d2	Outer Tube	Inner Tube	Diameter	TB103	TB203	TB253	TB293	TB200	TB290
BTA xx.xxx DE4-39	**1.559 - 1.598**	2.89	1.20	1.299	1.417	BTDO039	BTDI029	1.535	○	○	○	○	●	●
BTA xx.xxx DE4-39	**1.599 - 1.646**	2.89	1.20	1.299	1.417	BTDO039	BTDI029	1.535	○	○	○	○	●	●
BTA xx.xxx DE4-39	**1.646 - 1.693**	2.89	1.20	1.299	1.417	BTDO039	BTDI029	1.535	○	○	○	○	●	●
BTA xx.xxx DE4-42.5	**1.693 - 1.744**	2.95	1.20	1.417	1.535	BTDO042.5	BTDI032	1.673	○	○	○	○	●	●
BTA xx.xxx DE4-42.5	**1.744 - 1.795**	2.95	1.20	1.417	1.535	BTDO042.5	BTDI032	1.673	○	○	○	○	●	●
BTA xx.xxx DE4-42.5	**1.796 - 1.850**	2.95	1.20	1.417	1.535	BTDO042.5	BTDI032	1.673	○	○	○	○	●	●
BTA xx.xxx DE4-46.5	**1.851 - 1.909**	3.11	1.36	1.555	1.693	BTDO046.5	BTDI035	1.831	○	○	○	○	●	●
BTA xx.xxx DE4-46.5	**1.910 - 1.972**	3.11	1.36	1.555	1.693	BTDO046.5	BTDI035	1.831	○	○	○	○	●	●
BTA xx.xxx DE4-46.5	**1.973 - 2.035**	3.11	1.36	1.555	1.693	BTDO046.5	BTDI035	1.831	○	○	○	○	●	●
BTA xx.xxx DE4-51	**2.036 - 2.094**	3.23	1.36	1.713	1.850	BTDO051	BTDI039	2.008	○	○	○	○	●	●
BTA xx.xxx DE4-51	**2.095 - 2.154**	3.23	1.36	1.713	1.850	BTDO051	BTDI039	2.008	○	○	○	○	●	●
BTA xx.xxx DE4-51	**2.154 - 2.213**	3.23	1.36	1.713	1.850	BTDO051	BTDI039	2.008	○	○	○	○	●	●
BTA xx.xxx DE4-55.5	**2.213 - 2.299**	3.31	1.36	1.870	2.008	BTDO055.5	BTDI043A	2.185	○	○	○	○	●	●
BTA xx.xxx DE4-55.5	**2.300 - 2.386**	3.31	1.36	1.870	2.008	BTDO055.5	BTDI043A	2.185	○	○	○	○	●	●
BTA xx.xxx DE4-55.5	**2.386 - 2.472**	3.31	1.36	1.870	2.008	BTDO055.5	BTDI043A	2.185	○	○	○	○	●	●
BTA xx.xxx DE4-55.5	**2.473 - 2.559**	3.31	1.36	1.870	2.008	BTDO055.5	BTDI043A	2.185	○	○	○	○	●	●

●Standard
○Semi-Standard

Diameters
0.496 - 0.787

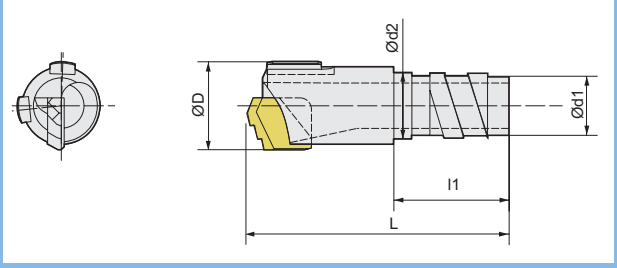


Designation	Diameter	Dimension				Tube		Grade
		L	l1	d1	d2	Part No.	Diameter	TB203
BTS xx.xxx SE4-11 □	**0.496 - 0.535**	1.68	0.81	0.323	0.378	BTSI011	0.433	
BTS xx.xxx SE4-12 □	**0.536 - 0.575**	1.68	0.89	0.362	0.417	BTSI012	0.472	
BTS xx.xxx SE4-13 □	**0.575 - 0.614**	1.68	0.89	0.402	0.457	BTSI013	0.512	
BTS xx.xxx SE4-14	**0.615 - 0.657**	1.70	0.89	0.425	0.496	BTSI014	0.551	
BTS xx.xxx SE4-15	**0.658 - 0.697**	1.70	0.89	0.465	0.535	BTSI015	0.591	
BTS xx.xxx SE4-16	**0.697 - 0.744**	1.72	0.89	0.492	0.571	BTSI016	0.630	
BTS xx.xxx SE4-17	**0.744 - 0.787**	1.72	0.89	0.531	0.610	BTSI017	0.669	

□Marks are outer two start thread

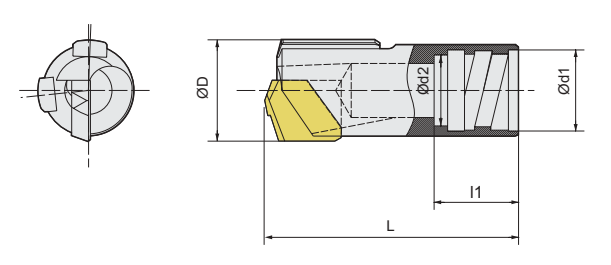
BTA BRAZED SINGLE TUBE SYSTEM - OUTER ONE START THREAD

Diameters
0.315 - 0.570



Designation	Diameter	Dimension				Drill Tube		Grade
		L	l1	d1	d2	Part No.	Diameter	TB203
BTS xx.xxx SE1-7.1	**0.315 - 0.354**	1.40	0.63	0.213	0.236	BTSO071	0.280	
BTS xx.xxx SE1-8.3	**0.354 - 0.393**	1.40	0.63	0.248	0.283	BTSO083	0.327	
BTS xx.xxx SE1-9	**0.394 - 0.433**	1.41	0.63	0.264	0.299	BTSO090	0.354	
BTS xx.xxx SE1-10	**0.433 - 0.472**	1.41	0.63	0.303	0.339	BTSO100	0.394	
BTS xx.xxx SE1-11	**0.472 - 0.531**	1.41	0.63	0.323	0.358	BTSO110	0.433	
BTS xx.xxx SE1-12	**0.531 - 0.570**	1.42	0.63	0.370	0.425	BTSO120	0.472	

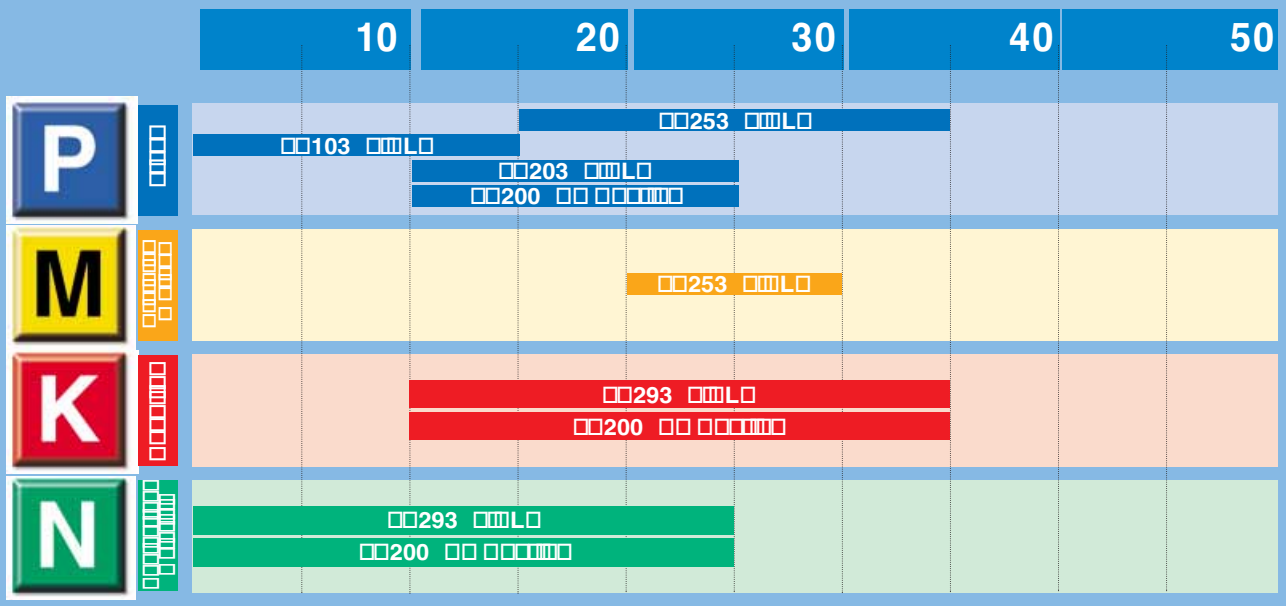
Diameters
0.571 - 2.559



Designation	Diameter	Dimension				Drill Tube		Grade
		L	l1	d1	d2	Part No.	Diameter	TB203
BTS xx.xxx SI1-12	0.571 - 0.591	2.06	0.91	0.453	0.390	BTSE012A	0.472	
BTS xx.xxx SI1-12	0.591 - 0.610	2.06	0.91	0.465	0.402	BTSE012B	0.472	
BTS xx.xxx SI1-13	0.611 - 0.630	2.06	0.91	0.488	0.425	BTSE013A	0.512	
BTS xx.xxx SI1-13	0.630 - 0.650	2.06	0.91	0.500	0.437	BTSE013B	0.512	
BTS xx.xxx SI1-14	0.650 - 0.679	2.07	0.91	0.528	0.465	BTSE014A	0.551	
BTS xx.xxx SI1-14	0.680 - 0.709	2.07	0.91	0.539	0.476	BTSE014B	0.551	
BTS xx.xxx SI1-15	0.709 - 0.748	2.08	0.91	0.567	0.504	BTSE015	0.591	
BTS xx.xxx SI1-16.5	0.748 - 0.787	2.08	0.91	0.606	0.543	BTSE016.5	0.650	
BTS xx.xxx SI1-18	0.787 - 0.866	2.44	0.98	0.650	0.571	BTSE018	0.709	
BTS xx.xxx SI1-20	0.866 - 0.984	2.46	0.98	0.748	0.630	BTSE020	0.787	
BTS xx.xxx SI1-22	0.984 - 1.063	2.74	0.98	0.787	0.669	BTSE022	0.866	
BTS xx.xxx SI1-24	1.063 - 1.181	2.76	0.98	0.866	0.748	BTSE024	0.945	
BTS xx.xxx SI1-26	1.181 - 1.259	2.97	0.98	0.945	0.827	BTSE026	1.024	
BTS xx.xxx SI1-28	1.260 - 1.338	3.37	0.98	1.024	0.906	BTSE028	1.102	
BTS xx.xxx SI1-30	1.339 - 1.456	3.39	1.57	1.063	0.945	BTSE030	1.181	
BTS xx.xxx SI1-32	1.457 - 1.574	3.39	1.57	1.181	1.063	BTSE032	1.260	
BTS xx.xxx SI1-36	1.575 - 1.732	3.41	1.57	1.299	1.181	BTSE036	1.417	
BTS xx.xxx SI1-39	1.732 - 1.850	3.82	1.57	1.457	1.339	BTSE039	1.535	
BTS xx.xxx SI1-43	1.850 - 2.047	3.83	1.57	1.614	1.457	BTSE043	1.693	
BTS xx.xxx SI1-47	2.047 - 2.244	3.85	1.57	1.732	1.575	BTSE047	1.850	
BTS xx.xxx SI1-51	2.244 - 2.401	3.87	1.57	1.929	1.772	BTSE051	2.008	
BTS xx.xxx SI1-56	2.402 - 2.559	3.89	1.57	2.087	1.929	BTSE056	2.205	

BTA BRAZED

Grade Combination per ISO application



1) TiN coating can be supplied upon request.

Application of grade combinations

Machine & working condition	Poor	Medium	Good
Recommended Grade Combination	TB253	TB203	TB103

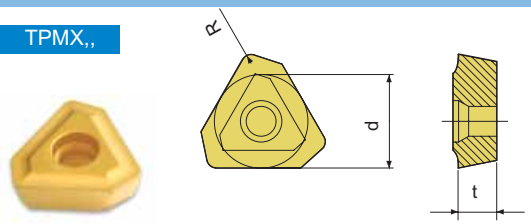
Itemised grade combinations

Item	Standard Grade	Semi-Standard Grades	Special Grades
□□□	TB253	TB103 TB203	TB293
□□□	TB203		

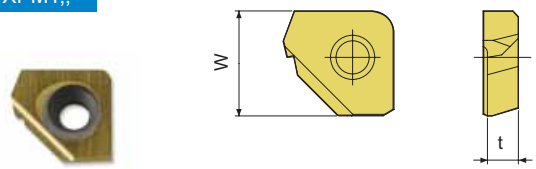
BTA INDEXABLE REAMER

Insert

TPMX,,



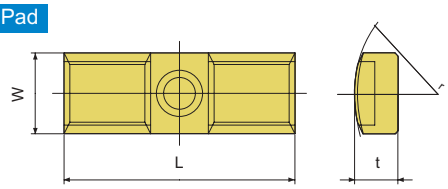
XPMT,,



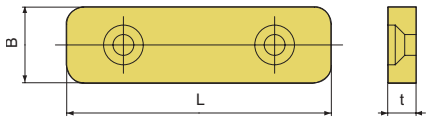
Designation	Dimension				Pocket			Grade	Screw
	d	t	R	W	Center	Inner	Outer	IN2005	
TPMX 1403LG	0.333	0.138	0.031	-			○		**CSTB2.5**
TPMX 1704LG	0.406	0.157	0.031	-			○		**CSTB3.5D**
TPMX 2405LG	0.559	0.217	0.047	-			○		**CSTB4M**
XPMT 16002-45	-	0.106	-	0.374			○		**CSTA3**

Pad

Guide Pad



Resin Guide Pad

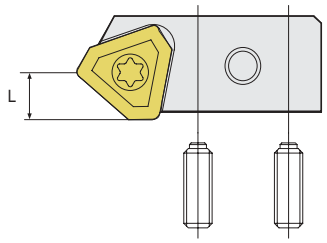


Type	Designation	Dimension				Screw
		W	t	L	r	
Guide Pad	**PAD-GC08-120**	0.315	0.173	0.984	0.689	**CSTB3S**
	PAD-GC08	0.315	0.177	0.984	0.689	**CSTB3S**
	PAD-GC10	0.394	0.236	1.378	0.787	**CSTB4S**
	PAD-GC14	0.551	0.295	1.575	0.984	**CSTA5S**
	PAD-GC18	0.709	0.354	1.575	1.181	**LS1206S**
Resin Guide Pad	**PAD-R10**	0.394	0.157	1.575	-	**LS0902.5-6**
	PAD-R12	0.472	0.197	1.772	-	**LS0903-8**
	PAD-R15	0.591	0.228	1.969	-	**LS0904-10**
	PAD-R20	0.787	0.295	2.756	-	**LS0905-12**
	PAD-R30	1.181	0.492	3.150	-	**LS0906-15**
	PAD-R35	1.378	0.610	3.937	-	**LS0906-15**

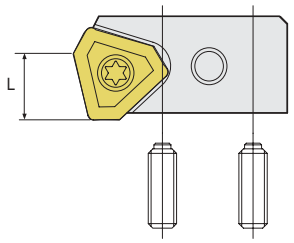
BTA INDEXABLE REAMER

Cartridge

Accurate Applications



Open Tolerance Applications

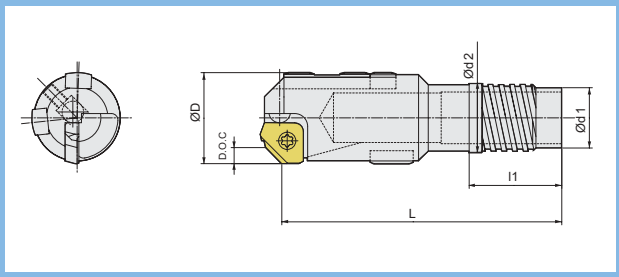


Designation		L	Adjust Screw	Wrench	Lock Screw	Wrench	Insert
Accurate Tolerance Applications	PERC-P04R	0.197	AS0004-8	H2	LS1803.5RH	H2.5	TPMX1403
	PERC-P32R	0.236	AS0005-10	H2.5	LS1805RH	H3	TPMX1704
	PERC-P43R	0.315	AS0005-15	H2.5	LS1806RH	H4	TPMX2405
Open Tolerance Applications	PERC-N04	0.315	AS0004-8	H2	LS1803.5RH	H2.5	TPMX1403
	PERC-N32	0.354	AS0005-10	H2.5	LS1805RH	H3	TPMX1704
	PERC-N43	0.512	AS0005-15	H2.5	LS1806RH	H4	TPMX2405

* PERC-P and PERC-N cartridges are interchangable in the same pocket.

BTA INDEXABLE REAMER SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

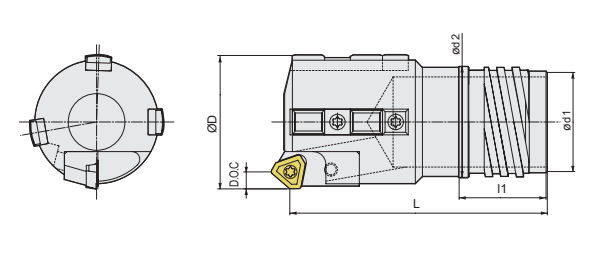
Diameters
0.984 - 1.574



Designation	Diameter	D.O.C	Dimension				Tube	
			L	l1	d1	d2	Type	Diameter
TBTA-R-xx.xxxSE4-22	**0.984 - 1.039**	0.14	2.76	0.85	0.689	0.768	BTSI 022	0.866
TBTA-R-xx.xxxSE4-24	**1.040 - 1.130**	0.14	2.76	0.85	0.748	0.827	BTSI 024	0.945
TBTA-R-xx.xxxSE4-26	**1.130 - 1.220**	0.14	2.95	0.96	0.827	0.925	BTSI 026	1.024
TBTA-R-xx.xxxSE4-28	**1.221 - 1.311**	0.14	2.95	0.96	0.906	1.004	BTSI 028	1.102
TBTA-R-xx.xxxSE4-30	**1.311 - 1.425**	0.14	2.95	0.96	1.004	1.102	BTSI 030	1.181
TBTA-R-xx.xxxSE4-33	**1.426 - 1.559**	0.14	3.54	1.20	1.063	1.181	BTSI 033	1.299
TBTA-R-xx.xxxSE4-36	**1.559 - 1.574**	0.14	3.54	1.20	1.181	1.299	BTSI 036	1.417

BTA INDEXABLE REAMER SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

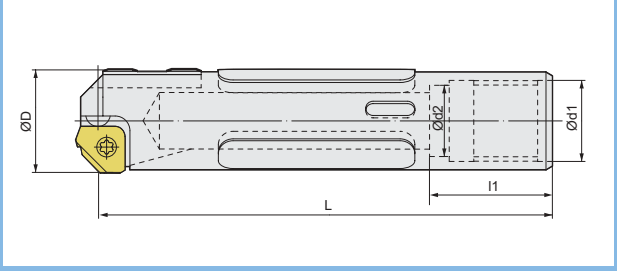
Diameters
1.575 - 3.898



Designation	Diameter	D.O.C	Dimension				Tube	
			L	l1	d1	d2	Type	Diameter
TBTA-R-xx.xxxSE4-36	1.575 - 1.693	0.20	3.54	1.20	1.181	1.299	BTSI 036	1.417
TBTA-R-xx.xxxSE4-39	1.693 - 1.850	0.20	3.74	1.20	1.299	1.417	BTSI 039	1.535
TBTA-R-xx.xxxSE4-43	1.851 - 2.035	0.20	3.94	1.20	1.417	1.535	BTSI 043	1.693
TBTA-R-xx.xxxSE4-47	2.036 - 2.213	0.20	3.94	1.36	1.555	1.693	BTSI 047	1.850
TBTA-R-xx.xxxSE4-51	2.213 - 2.386	0.24	4.13	1.36	1.713	1.850	BTSI 051	2.008
TBTA-R-xx.xxxSE4-56	2.386 - 2.559	0.24	4.33	1.36	1.870	2.008	BTSI 056A	2.205
TBTA-R-xx.xxxSE4-56	2.559 - 2.637	0.24	5.91	2.44	1.850	2.047	BTSI 056B	2.205
TBTA-R-xx.xxxSE4-62	2.638 - 2.874	0.31	5.91	2.44	2.087	2.283	BTSI 062	2.441
TBTA-R-xx.xxxSE4-68	2.874 - 3.149	0.31	5.91	2.44	2.283	2.480	BTSI 068	2.677
TBTA-R-xx.xxxSE4-75	3.150 - 3.425	0.31	7.09	3.23	2.520	2.756	BTSI 075	2.953
TBTA-R-xx.xxxSE4-82	3.425 - 3.937	0.31	7.09	3.23	2.795	3.031	BTSI 082	3.228

BTA INDEXABLE REAMER SINGLE TUBE SYSTEM - INNER SINGLE START THREAD

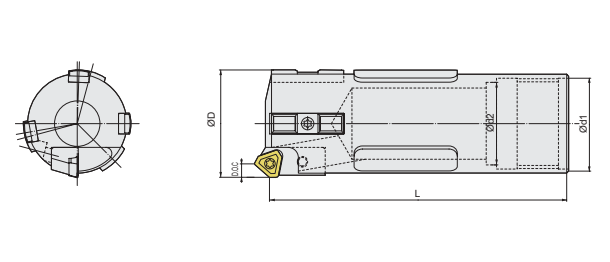
Diameters
0.984 - 1.574



Designation	Diameter	D.O.C	Dimension				Tube	
			L	l1	d1	d2	Type	Diameter
TBTA-R-xx.xxxSI1-22	**0.984 - 1.063**	0.14	4.33	0.98	0.787	0.669	BTSE 022	0.866
TBTA-R-xx.xxxSI1-24	**1.063 - 1.181**	0.14	4.33	0.98	0.866	0.748	BTSE 024	0.945
TBTA-R-xx.xxxSI1-26	**1.181 - 1.259**	0.14	4.33	0.98	0.945	0.827	BTSE 026	1.024
TBTA-R-xx.xxxSI1-28	**1.260 - 1.338**	0.14	4.33	0.98	1.024	0.906	BTSE 028	1.102
TBTA-R-xx.xxxSI1-30	**1.339 - 1.456**	0.14	5.31	1.57	1.063	0.945	BTSE 030	1.181
TBTA-R-xx.xxxSI1-33	**1.457 - 1.574**	0.14	5.31	1.57	1.181	1.063	BTSE 033	1.299

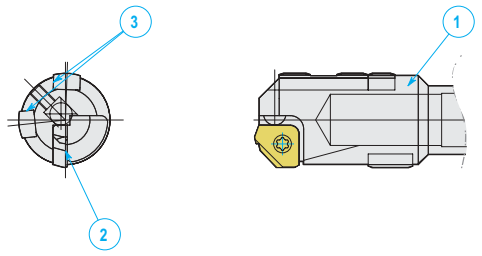
BTA INDEXABLE REAMER SINGLE TUBE SYSTEM - INNER SINGLE START THREAD

Diameters
1.575 - 4.370



Designation	Diameter	D.O.C	Dimension				Tube	
			L	l1	d1	d2	Type	Diameter
TBTA-R-xx.xxxSI1-36	**1.575 - 1.732**	0.10	5.31	1.57	1.299	1.181	BTSE 036	1.417
TBTA-R-xx.xxxSI1-39	**1.732 - 1.850**	0.10	5.31	1.57	1.457	1.339	BTSE 039	1.535
TBTA-R-xx.xxxSI1-43	**1.850 - 2.047**	0.10	5.71	1.57	1.614	1.457	BTSE 043	1.693
TBTA-R-xx.xxxSI1-47	**2.047 - 2.244**	0.16	5.71	1.57	1.732	1.575	BTSE 047	1.850
TBTA-R-xx.xxxSI1-51	**2.244 - 2.401**	0.16	6.69	1.57	1.929	1.772	BTSE 051	2.008
TBTA-R-xx.xxxSI1-56	**2.402 - 2.677**	0.16	6.69	1.57	2.087	1.929	BTSE 056	2.205
TBTA-R-xx.xxxSI1-62	**2.677 - 2.952**	0.20	6.69	1.57	2.323	2.126	BTSE 062	2.441
TBTA-R-xx.xxxSI1-68	**2.953 - 3.189**	0.20	8.07	2.76	2.559	2.362	BTSE 068	2.677
TBTA-R-xx.xxxSI1-75	**3.189 - 3.582**	0.20	8.07	2.76	2.795	2.598	BTSE 075	2.953
TBTA-R-xx.xxxSI1-82	**3.583 - 3.897**	0.20	8.46	2.76	3.110	2.913	BTSE 082	3.228
TBTA-R-xx.xxxSI1-94	**3.898 - 4.370**	0.20	8.46	2.76	3.543	3.346	BTSE 094	3.701

Diameters
0.984 - 1.574



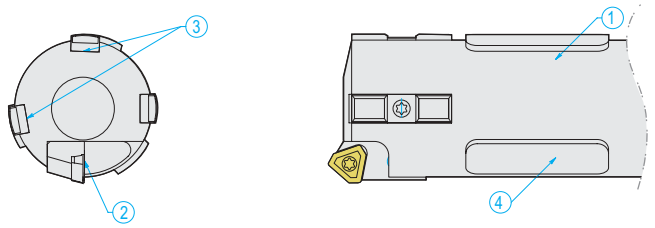
1. Head Shank
2. Cartridge & Lock Screw
3. Guide Pad

Parts			Diameter			
			0.984 - 1.102	1.102 - 1.181	1.181 - 1.496	1.496 - 1.574
Close Tolerance	Cartridge	Cartridge	-	-	-	-
		Adjust Screw	-	-	-	-
		Wrench	-	-	-	-
		Screw	-	-	-	-
		Wrench	-	-	-	-
	Insert	Insert	XPMT 16002-45	XPMT 16002-45	XPMT 16002-45	XPMT 16002-45
		Screw	CSTANO3	CSTANO3	CSTANO3	CSTANO3
		Wrench	T9	T9	T9	T9
Normal Tolerance	Cartridge	Outer	-	-	-	-
		Adjust Screw	-	-	-	-
		Wrench	-	-	-	-
		Screw	-	-	-	-
		Wrench	-	-	-	-
	Insert	Inner	XPMT 16002-45	XPMT 16002-45	XPMT 16002-45	XPMT 16002-45
		Screw	CSTANO3	CSTANO3	CSTANO3	CSTANO3
		Wrench	T9	T9	T9	T9
Pad		Guide Pad (A)	PAD-GC08-120	PAD-GC08-120	PAD-GC08-140	PAD-GC08
		Screw	CSTB3S	CSTB3S	CSTB3S	CSTB3S
		Wrench	T9	T9	T9	T9
		Guide Pad Protector (B)	PAD-P08-120	PAD-P08-120	PAD-P08-140	PAD-P08
		Screw	CSTB3S	CSTB3S	CSTB3S	CSTB3S
		Wrench	T9	T9	T9	T9
		Resin Guide Pad (C)	PAD-R10	PAD-R10	PAD-R12	PAD-R15
		Screw	LS0902	LS0902	LS0903	LS0904
		Wrench	+	+	+	+

A + B is for outer four start thread connection type.
A + C is for inner single start thread connection type.

BTA INDEXABLE REAMER ASSEMBLY OF TBTA-R SERIES

Diameters
1.575 - 2.637



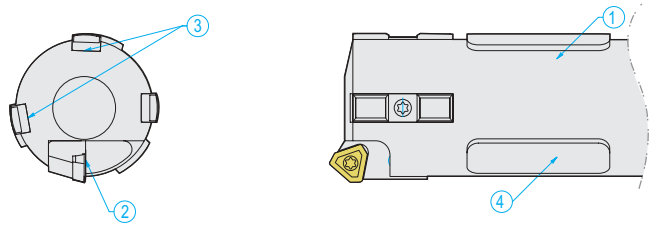
1. Head Shank
2. Cartridge & Lock Screw
3. Guide Pad
4. Resin Guide Pad & Lock Screw

Parts			Diameter			
			1.575 - 1.811	1.811 - 2.047	2.047 - 2.362	2.362 - 2.637
Close Tolerance	Cartridge	Cartridge	PERC-P 04R	PERC-P 04R	PERC-P 32R	PERC-P 32R
		Adjust Screw	AS0004-8	AS0004-8	AS0005-10	AS0005-10
		Wrench	H2	H2	H2.5	H2.5
		Screw	LS1803.5RH	LS1803.5RH	LS1805RH	LS1805RH
		Wrench	H2.5	H2.5	H3	H3
	Insert	Insert	TPMX 1403LG	TPMX 1403LG	TPMX 1704LG	TPMX 1704LG
		Screw	CSTB2.5	CSTB2.5	CSTB3.5D	CSTB3.5D
		Wrench	T8	T8	T9	T9
Normal Tolerance	Cartridge	Outer	PERC 402-04	PERC 402-04	PERC 402-32	PERC 402-32
		Adjust Screw	AS0004-8	AS0004-8	AS0005-10	AS0005-10
		Wrench	H2	H2	H2.5	H2.5
		Screw	LS1803.5RH	LS1803.5RH	LS1805RH	LS1805RH
		Wrench	H2.5	H2.5	H3	H3
	Insert	Inner	TPMX 1403RG	TPMX 1403RG	TPMX 1704RG	TPMX 1704RG
		Screw	CSTB2.5	CSTB2.5	CSTB3.5D	CSTB3.5D
		Wrench	T8	T8	T9	T9
Pad		Guide Pad (A)	PAD-GC08	PAD-GC10	PAD-GC10	PAD-GC14
		Screw	CSTB3S	CSTB3S	CSTB3S	CSTA5S
		Wrench	T9	T9	T9	T15
		Guide Pad Protector (B)	PAD-P08	PAD-P10	PAD-P10	PAD-P14
		Screw	CSTB3S	CSTB4S	CSTB4S	CSTA5S
		Wrench	T9	T15	T15	T15
		Resin Guide Pad (C)	PAD-R15	PAD-R15	PAD-R15	PAD-R20
		Screw	LS0904	LS0904	LS0904	LS0905
		Wrench	+	+	+	+

A + B is for outer four start thread connection type.
A + C is for inner single start thread connection type.

BTA INDEXABLE REAMER ASSEMBLY OF TBTA-R SERIES

Diameters
2.638 - 4.842



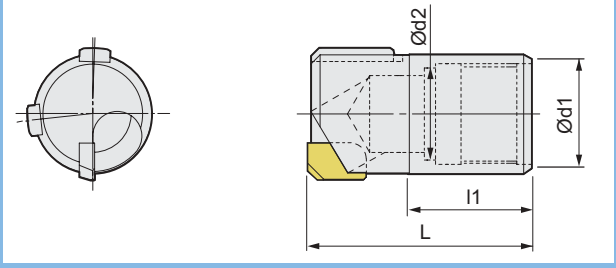
1. Head Shank
2. Cartridge & Lock Screw
3. Guide Pad
4. Resin Guide Pad & Lock Screw

Parts			Diameter			
			2.638 - 3.189	3.189 - 3.582	3.583 - 3.937	3.937 - 4.842
Close Tolerance	Cartridge	Cartridge	PERC-P 43R	PERC-P 43R	PERC-P 43R	PERC-P 43R
		Adjust Screw	AS0005-15	AS0005-15	AS0005-15	AS0005-15
		Wrench	H2.5	H2.5	H2.5	H2.5
		Screw	LS1806RH	LS1806RH	LS1806RH	LS1806RH
		Wrench	H4	H4	H4	H4
	Insert	Insert	TPMX 2405LG	TPMX 2405LG	TPMX 2405LG	TPMX 2405LG
		Screw	CSTB4M	CSTB4M	CSTB4M	CSTB4M
		Wrench	T15	T15	T15	T15
Normal Tolerance	Cartridge	Outer	PERC 402-43	PERC 402-43	PERC 402-43	PERC 402-43
		Adjust Screw	AS0005-15	AS0005-15	AS0005-15	AS0005-15
		Wrench	H2.5	H2.5	H2.5	H2.5
		Screw	LS1806RH	LS1806RH	LS1806RH	LS1806RH
		Wrench	H4	H4	H4	H4
	Insert	Inner	TPMX 2405RG	TPMX 2405RG	TPMX 2405RG	TPMX 2405RG
		Screw	CSTB4M	CSTB4M	CSTB4M	CSTB4M
		Wrench	T15	T15	T15	T15
Pad		Guide Pad (A)	PAD-GC14	PAD-GC14	PAD-GC14	PAD-GC18
		Screw	CSTA5S	CSTA5S	CSTA5S	CSTA5S
		Wrench	T15	T15	T15	T15
		Guide Pad Protector (B)	PAD-P14	PAD-P14	PAD-P14	PAD-P18
		Screw	CSTA5S	CSTA5S	CSTA5S	LS1206S
		Wrench	T15	T15	T15	H3
		Resin Guide Pad (C)	PAD-R20	PAD-R30	PAD-R35	PAD-R35
		Screw	LS0905	LS0906	LS0906	LS0906
		Wrench	+	+	+	+

A + B is for outer four start thread connection type.
A + C is for inner single start thread connection type.

HEAD CHANGE REAMER SINGLE TUBE SYSTEM - INNER SINGLE START THREAD

Diameters
0.571- 2.559

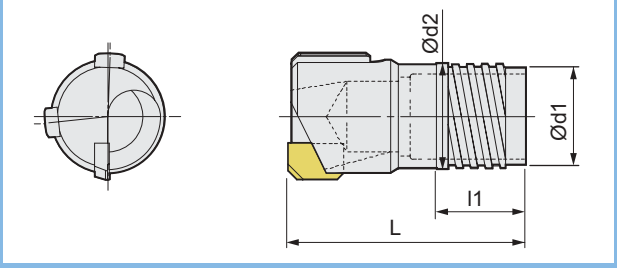


Designation	Diameter	Dimension				Tube		Grade
		L	l1	d1	d2	Part No.	Diameter	TB103
BTA-Rxx.xxxSI1-12-□□□	0.571 - 0.591	2.05	0.91	0.453	0.390	BTSE012A	0.472	
BTA-Rxx.xxxSI1-12-□□□	0.591 - 0.610	2.05	0.91	0.465	0.402	BTSE012B	0.472	
BTA-Rxx.xxxSI1-13-□□□	0.611 - 0.630	2.05	0.91	0.488	0.425	BTSE013A	0.512	
BTA-Rxx.xxxSI1-13-□□□	0.630 - 0.650	2.05	0.91	0.500	0.437	BTSE013B	0.512	
BTA-Rxx.xxxSI1-14-□□□	0.650 - 67.913	2.05	0.91	0.528	0.465	BTSE014A	0.551	
BTA-Rxx.xxxSI1-14-□□□	0.680 - 0.709	2.05	0.91	0.539	0.476	BTSE014B	0.551	
BTA-Rxx.xxxSI1-15-□□□	0.709 - 0.748	2.05	0.91	0.567	0.504	BTSE015	0.591	
BTA-Rxx.xxxSI1-16.5-□□□	0.748 - 0.787	2.24	0.91	0.606	0.543	BTSE016.5	0.650	
BTA-Rxx.xxxSI1-18-□□□	0.787 - 0.866	2.24	0.98	0.650	0.571	BTSE018	0.709	
BTA-Rxx.xxxSI1-20-□□□	0.866 - 0.984	2.24	0.98	0.748	0.630	BTSE020	0.787	
BTA-Rxx.xxxSI1-22-□□□	0.984 - 1.063	2.64	0.98	0.787	0.669	BTSE022	0.866	
BTA-Rxx.xxxSI1-24-□□□	1.063 - 1.181	2.64	0.98	0.866	0.748	BTSE024	0.945	
BTA-Rxx.xxxSI1-26-□□□	1.181 - 1.259	2.64	0.98	0.945	0.827	BTSE026	1.024	
BTA-Rxx.xxxSI1-28-□□□	1.260 - 1.338	3.15	0.98	1.024	0.906	BTSE028	1.102	
BTA-Rxx.xxxSI1-30-□□□	1.339 - 1.456	3.15	1.57	1.063	0.945	BTSE030	1.181	
BTA-Rxx.xxxSI1-32-□□□	1.457 - 1.574	3.15	1.57	1.181	1.063	BTSE032	1.260	
BTA-Rxx.xxxSI1-36-□□□	1.575 - 1.732	3.54	1.57	1.299	1.181	BTSE036	1.417	
BTA-Rxx.xxxSI1-39-□□□	1.732 - 1.850	3.54	1.57	1.457	1.339	BTSE039	1.535	
BTA-Rxx.xxxSI1-43-□□□	1.850 - 2.047	3.54	1.57	1.614	1.457	BTSE043	1.693	
BTA-Rxx.xxxSI1-47-□□□	2.047 - 2.244	3.54	1.57	1.732	1.575	BTSE047	1.850	
BTA-Rxx.xxxSI1-51-□□□	2.244 - 2.401	3.54	1.57	1.929	1.772	BTSE051	2.008	
BTA-Rxx.xxxSI1-56-□□□	2.402 - 2.559	3.54	1.57	2.087	1.929	BTSE056	2.205	

Ordering example: BTA-R00.571SI1-12-B45
•Reamer diameter: 0.571
•Chip backward style (Chip forward style is available for through hole)
•Entering angle: 45degree

HEAD CHANGE REAMER SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

Diameters
0.744 - 2.559

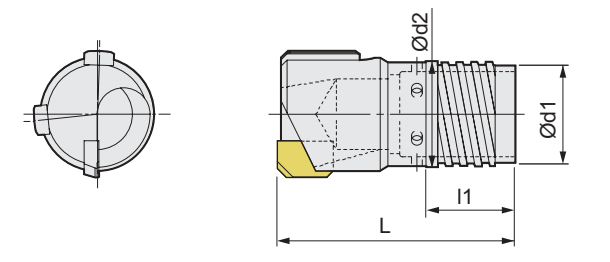


Designation	Diameter	Dimension				Tube		Grade
		L	l1	d1	d2	Part No.	Diameter	TB103
BTA-Rxx.xxxSE4-17-□□□	0.744 - 0.756	2.24	1.74	0.531	0.610	BTSI017	0.669	
BTA-Rxx.xxxSE4-17-□□□	0.756 - 0.787	2.24	1.73	0.531	0.610	BTSI017	0.669	
BTA-Rxx.xxxSE4-18-□□□	0.788 - 0.823	2.56	1.94	0.551	0.630	BTSI018	0.709	
BTA-Rxx.xxxSE4-18-□□□	0.823 - 0.858	2.56	1.94	0.551	0.630	BTSI018	0.709	
BTA-Rxx.xxxSE4-20-□□□	0.859 - 0.902	2.56	2.08	0.630	0.709	BTSI020	0.787	
BTA-Rxx.xxxSE4-20-□□□	0.902 - 0.949	2.56	2.07	0.630	0.709	BTSI020	0.787	
BTA-Rxx.xxxSE4-22-□□□	0.949 - 0.992	2.56	2.13	0.689	0.768	BTSI022	0.866	
BTA-Rxx.xxxSE4-22-□□□	0.993 - 1.039	2.56	2.13	0.689	0.768	BTSI022	0.866	
BTA-Rxx.xxxSE4-24-□□□	1.040 - 1.083	2.56	2.12	0.748	0.827	BTSI024	0.945	
BTA-Rxx.xxxSE4-24-□□□	1.083 - 1.130	2.56	2.12	0.748	0.827	BTSI024	0.945	
BTA-Rxx.xxxSE4-26-□□□	1.130 - 1.173	2.76	2.34	0.827	0.925	BTSI026	1.024	
BTA-Rxx.xxxSE4-26-□□□	1.174 - 1.220	2.76	2.33	0.827	0.925	BTSI026	1.024	
BTA-Rxx.xxxSE4-28-□□□	1.221 - 1.264	2.76	2.34	0.906	1.004	BTSI028	1.102	
BTA-Rxx.xxxSE4-28-□□□	1.264 - 1.311	2.76	2.33	0.906	1.004	BTSI028	1.102	
BTA-Rxx.xxxSE4-30-□□□	1.311 - 1.370	2.76	2.32	1.004	1.102	BTSI030	1.181	
BTA-Rxx.xxxSE4-30-□□□	1.370 - 1.425	2.76	2.32	1.004	1.102	BTSI030	1.181	
BTA-Rxx.xxxSE4-33-□□□	1.426 - 1.469	3.23	2.70	1.063	1.181	BTSI033	1.299	
BTA-Rxx.xxxSE4-33-□□□	1.469 - 1.512	3.23	2.70	1.063	1.181	BTSI033	1.299	
BTA-Rxx.xxxSE4-33-□□□	1.512 - 1.559	3.23	2.69	1.063	1.181	BTSI033	1.299	
BTA-Rxx.xxxSE4-36-□□□	1.559 - 1.598	3.23	2.69	1.181	1.299	BTSI036	1.417	
BTA-Rxx.xxxSE4-36-□□□	1.599 - 1.646	3.23	2.68	1.181	1.299	BTSI036	1.417	
BTA-Rxx.xxxSE4-36-□□□	1.646 - 1.693	3.23	2.67	1.181	1.299	BTSI036	1.417	
BTA-Rxx.xxxSE4-39-□□□	1.693 - 1.744	3.23	2.74	1.299	1.417	BTSI039	1.535	
BTA-Rxx.xxxSE4-39-□□□	1.744 - 1.795	3.23	2.73	1.299	1.417	BTSI039	1.535	
BTA-Rxx.xxxSE4-39-□□□	1.796 - 1.850	3.23	2.72	1.299	1.417	BTSI039	1.535	
BTA-Rxx.xxxSE4-43-□□□	1.851 - 1.909	3.23	2.71	1.417	1.535	BTSI043	1.693	
BTA-Rxx.xxxSE4-43-□□□	1.910 - 1.972	3.23	2.70	1.417	1.535	BTSI043	1.693	
BTA-Rxx.xxxSE4-43-□□□	1.973 - 2.035	3.23	2.70	1.417	1.535	BTSI043	1.693	
BTA-Rxx.xxxSE4-47-□□□	2.036 - 2.094	3.66	2.96	1.555	1.693	BTSI047	1.850	
BTA-Rxx.xxxSE4-47-□□□	2.095 - 2.154	3.66	2.96	1.555	1.693	BTSI047	1.850	
BTA-Rxx.xxxSE4-47-□□□	2.154 - 2.213	3.66	2.96	1.555	1.693	BTSI047	1.850	
BTA-Rxx.xxxSE4-51-□□□	2.213 - 2.299	3.66	3.05	1.713	1.850	BTSI051	2.008	
BTA-Rxx.xxxSE4-51-□□□	2.300 - 2.386	3.66	3.03	1.713	1.850	BTSI051	2.008	
BTA-Rxx.xxxSE4-56-□□□	2.386 - 2.472	3.66	3.02	1.870	2.008	BTSI056	2.205	
BTA-Rxx.xxxSE4-56-□□□	2.473 - 2.559	3.66	3.01	1.870	2.008	BTSI056	2.205	

Ordering example: BTA-R00.571SE4-12-B45
•Reamer diameter: 0.571
•Chip backward style (Chip forward style is available for through hole)
•Entering angle: 45degree

HEAD CHANGE REAMER DOUBLE TUBE SYSTEM - OUTER FOUR START THREAD

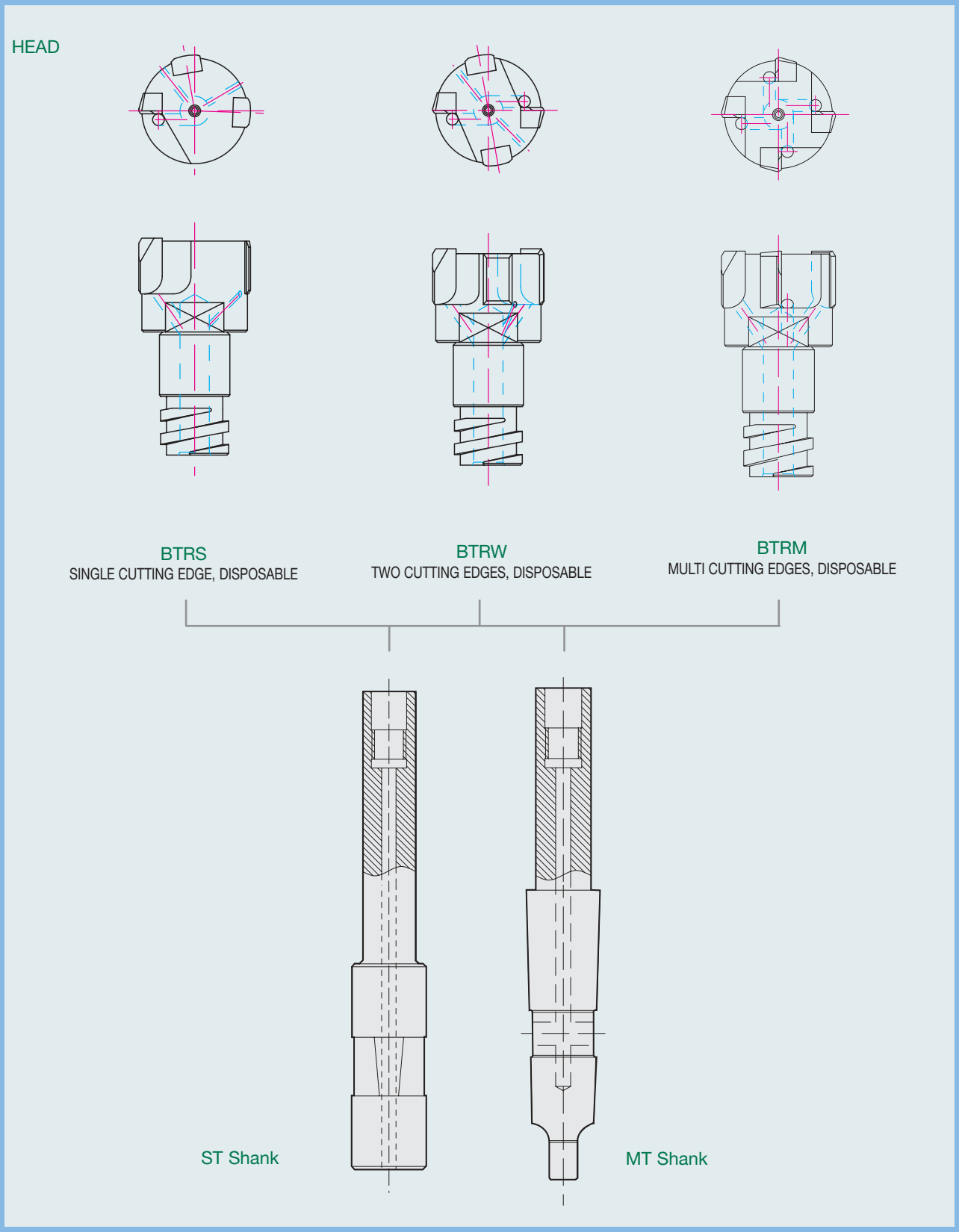
Diameters
0.725 - 2.559



Designation	Diameter	Dimension				Tube			Grade
		L	l1	d1	d2	Outer Tube	Inner Tube	Diameter	TB103
BTA-Rxx.xxxDE4-18-□□□	0.725 - 0.756	2.24	0.85	0.551	0.630	BTDO018	BTDI012	0.709	
BTA-Rxx.xxxDE4-18-□□□	0.756 - 0.787	2.24	0.85	0.551	0.630	BTDO018	BTDI012	0.709	
BTA-Rxx.xxxDE4-19.5-□□□	0.796 - 0.823	2.56	0.85	0.630	0.709	BTDO019.5	BTDI014	0.768	
BTA-Rxx.xxxDE4-19.5-□□□	0.823 - 0.858	2.56	0.85	0.630	0.709	BTDO019.5	BTDI014	0.768	
BTA-Rxx.xxxDE4-21.5-□□□	0.859 - 0.902	2.56	0.85	0.689	0.768	BTDO021.5	BTDI015	0.846	
BTA-Rxx.xxxDE4-21.5-□□□	0.902 - 0.949	2.56	0.85	0.689	0.768	BTDO021.5	BTDI015	0.846	
BTA-Rxx.xxxDE4-23.5-□□□	0.949 - 0.992	2.56	0.85	0.748	0.827	BTDO023.5	BTDI016	0.925	
BTA-Rxx.xxxDE4-23.5-□□□	0.993 - 1.039	2.56	0.85	0.748	0.827	BTDO023.5	BTDI016	0.925	
BTA-Rxx.xxxDE4-26-□□□	1.040 - 1.083	2.56	0.96	0.827	0.925	BTDO026	BTDI018	1.024	
BTA-Rxx.xxxDE4-26-□□□	1.083 - 1.130	2.56	0.96	0.827	0.925	BTDO026	BTDI018	1.024	
BTA-Rxx.xxxDE4-28-□□□	1.130 - 1.173	2.76	0.96	0.906	1.004	BTDO028	BTDI020	1.102	
BTA-Rxx.xxxDE4-28-□□□	1.174 - 1.220	2.76	0.96	0.906	1.004	BTDO028	BTDI020	1.102	
BTA-Rxx.xxxDE4-30.5-□□□	1.221 - 1.264	2.76	0.96	1.004	1.102	BTDO030.5	BTDI022	1.201	
BTA-Rxx.xxxDE4-30.5-□□□	1.264 - 1.311	2.76	0.96	1.004	1.102	BTDO030.5	BTDI022	1.201	
BTA-Rxx.xxxDE4-33-□□□	1.311 - 1.370	2.76	1.20	1.063	1.181	BTDO033.0	BTDI024	1.299	
BTA-Rxx.xxxDE4-33-□□□	1.370 - 1.425	2.76	1.20	1.063	1.181	BTDO033.0	BTDI024	1.299	
BTA-Rxx.xxxDE4-35.5-□□□	1.426 - 1.469	3.23	1.20	1.181	1.299	BTDO035.5	BTDI026	1.398	
BTA-Rxx.xxxDE4-35.5-□□□	1.469 - 1.512	3.23	1.20	1.181	1.299	BTDO035.5	BTDI026	1.398	
BTA-Rxx.xxxDE4-35.5-□□□	1.512 - 1.559	3.23	1.20	1.181	1.299	BTDO035.5	BTDI026	1.398	
BTA-Rxx.xxxDE4-39-□□□	1.559 - 1.598	3.23	1.20	1.299	1.417	BTDO039	BTDI029	1.535	
BTA-Rxx.xxxDE4-39-□□□	1.599 - 1.646	3.23	1.20	1.299	1.417	BTDO039	BTDI029	1.535	
BTA-Rxx.xxxDE4-39-□□□	1.646 - 1.693	3.23	1.20	1.299	1.417	BTDO039	BTDI029	1.535	
BTA-Rxx.xxxDE4-42.5-□□□	1.693 - 1.744	3.23	1.20	1.417	1.535	BTDO042.5	BTDI032	1.673	
BTA-Rxx.xxxDE4-42.5-□□□	1.744 - 1.795	3.23	1.20	1.417	1.535	BTDO042.5	BTDI032	1.673	
BTA-Rxx.xxxDE4-42.5-□□□	1.796 - 1.850	3.23	1.20	1.417	1.535	BTDO042.5	BTDI032	1.673	
BTA-Rxx.xxxDE4-46.5-□□□	1.851 - 1.909	3.23	1.36	1.555	1.693	BTDO046.5	BTDI035	1.831	
BTA-Rxx.xxxDE4-46.5-□□□	1.910 - 1.972	3.23	1.36	1.555	1.693	BTDO046.5	BTDI035	1.831	
BTA-Rxx.xxxDE4-46.5-□□□	1.973 - 2.035	3.23	1.36	1.555	1.693	BTDO046.5	BTDI035	1.831	
BTA-Rxx.xxxDE4-51-□□□	2.036 - 2.094	3.66	1.36	1.713	1.850	BTDO051	BTDI039	2.008	
BTA-Rxx.xxxDE4-51-□□□	2.095 - 2.154	3.66	1.36	1.713	1.850	BTDO051	BTDI039	2.008	
BTA-Rxx.xxxDE4-51-□□□	2.154 - 2.213	3.66	1.36	1.713	1.850	BTDO051	BTDI039	2.008	
BTA-Rxx.xxxDE4-55.5-□□□	2.213 - 2.299	3.66	1.36	1.870	2.008	BTDO055.5	BTDI043A	2.185	
BTA-Rxx.xxxDE4-55.5-□□□	2.300 - 2.386	3.66	1.36	1.870	2.008	BTDO055.5	BTDI043A	2.185	
BTA-Rxx.xxxDE4-55.5-□□□	2.386 - 2.472	3.66	1.36	1.870	2.008	BTDO055.5	BTDI043A	2.185	
BTA-Rxx.xxxDE4-55.5-□□□	2.473 - 2.559	3.66	1.36	1.870	2.008	BTDO055.5	BTDI043A	2.185	

Ordering example: BTA-R00.726DE4-18-B30
•Reamer diameter: 0.726
•Chip backward style (Chip forward style is available for through hole)
•Entering angle: 30degree

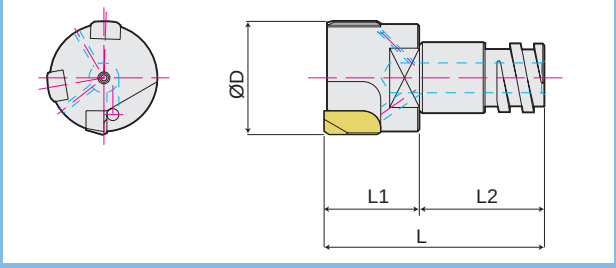
HEAD CHANGE REAMER BT REAMER



BOREline

BTA REAMER HEAD - SHANK SYSTEM BTRS

Diameters
0.236 - 0.984

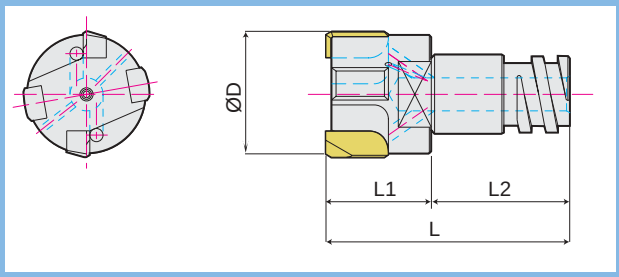


Designation	Diameter	L	L1	L2	Bar
BTRS xx.xxx 041	**0.236 - 0.305**	0.94	0.51	0.43	BTR04-...
BTRS xx.xxx 051	**0.305 - 0.344**	0.98	0.51	0.47	BTR05-...
BTRS xx.xxx 061	**0.344 - 0.383**	1.06	0.55	0.51	BTR06-...
BTRS xx.xxx 071	**0.384 - 0.433**	1.14	0.59	0.55	BTR07-...
BTRS xx.xxx 081	**0.433 - 0.472**	1.14	0.59	0.55	BTR08-...
BTRS xx.xxx 091	**0.472 - 0.511**	1.18	0.59	0.59	BTR09-...
BTRS xx.xxx 092	**0.512 - 0.590**	1.18	0.59	0.59	BTR09-...
BTRS xx.xxx 101	**0.591 - 0.630**	1.26	0.63	0.63	BTR10-...
BTRS xx.xxx 102	**0.630 - 0.669**	1.26	0.63	0.63	BTR10-...
BTRS xx.xxx 103	**0.669 - 0.708**	1.26	0.63	0.63	BTR10-...
BTRS xx.xxx 104	**0.709 - 0.748**	1.26	0.63	0.63	BTR10-...
BTRS xx.xxx 121	**0.748 - 0.787**	1.46	0.63	0.83	BTR12-...
BTRS xx.xxx 122	**0.787 - 0.866**	1.46	0.63	0.83	BTR12-...
BTRS xx.xxx 123	**0.866 - 0.944**	1.46	0.63	0.83	BTR12-...
BTRS xx.xxx 124	**0.945 - 0.984**	1.46	0.63	0.83	BTR12-...

* For high speed machinining, ceramic guide is available on request.

BTA REAMER HEAD - SHANK SYSTEM BTRW

Diameters
0.236 - 0.984



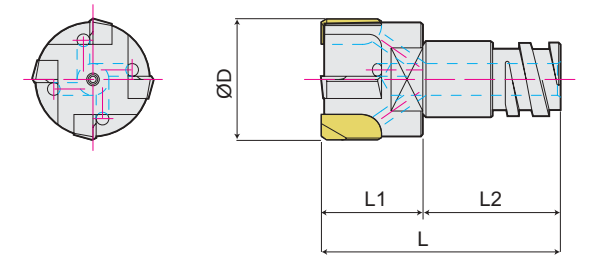
Designation	Diameter	L	L1	L2	Bar
BTRW xx.xxx 041	**0.236 - 0.305**	0.94	0.51	0.43	BTR04-...
BTRW xx.xxx 051	**0.305 - 0.344**	0.98	0.51	0.47	BTR05-...
BTRW xx.xxx 061	**0.344 - 0.383**	1.06	0.55	0.51	BTR06-...
BTRW xx.xxx 071	**0.384 - 0.433**	1.14	0.59	0.55	BTR07-...
BTRW xx.xxx 081	**0.433 - 0.472**	1.14	0.59	0.55	BTR08-...
BTRW xx.xxx 091	**0.472 - 0.511**	1.18	0.59	0.59	BTR09-...
BTRW xx.xxx 092	**0.512 - 0.590**	1.18	0.59	0.59	BTR09-...
BTRW xx.xxx 101	**0.591 - 0.630**	1.26	0.63	0.63	BTR10-...
BTRW xx.xxx 102	**0.630 - 0.669**	1.26	0.63	0.63	BTR10-...
BTRW xx.xxx 103	**0.669 - 0.708**	1.26	0.63	0.63	BTR10-...
BTRW xx.xxx 104	**0.709 - 0.748**	1.26	0.63	0.63	BTR10-...
BTRW xx.xxx 121	**0.748 - 0.787**	1.46	0.63	0.83	BTR12-...
BTRW xx.xxx 122	**0.787 - 0.866**	1.46	0.63	0.83	BTR12-...
BTRW xx.xxx 123	**0.866 - 0.944**	1.46	0.63	0.83	BTR12-...
BTRW xx.xxx 124	**0.945 - 0.984**	1.46	0.63	0.83	BTR12-...

* For high speed machinining, ceramic guide is available on request.

Ingersoll

BTA REAMER HEAD - SHANK SYSTEM BTRM

Diameters
0.236 - 0.984

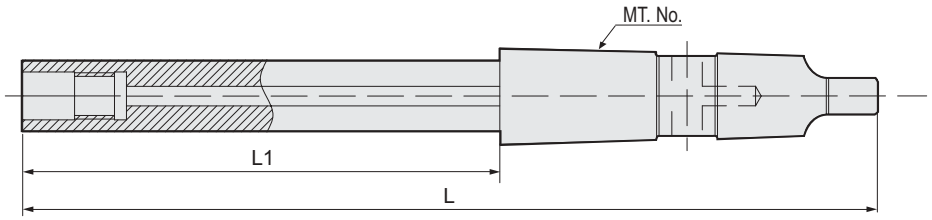


Designation	Diameter	L	L1	L2	Bar
BTRM xx.xxx 041	**0.236 - 0.305**	0.94	0.51	0.43	BTR04-...
BTRM xx.xxx 051	**0.305 - 0.344**	0.98	0.51	0.47	BTR05-...
BTRM xx.xxx 061	**0.344 - 0.383**	1.06	0.55	0.51	BTR06-...
BTRM xx.xxx 071	**0.384 - 0.433**	1.14	0.59	0.55	BTR07-...
BTRM xx.xxx 081	**0.433 - 0.472**	1.14	0.59	0.55	BTR08-...
BTRM xx.xxx 091	**0.472 - 0.511**	1.18	0.59	0.59	BTR09-...
BTRM xx.xxx 092	**0.512 - 0.590**	1.18	0.59	0.59	BTR09-...
BTRM xx.xxx 101	**0.591 - 0.630**	1.26	0.63	0.63	BTR10-...
BTRM xx.xxx 102	**0.630 - 0.669**	1.26	0.63	0.63	BTR10-...
BTRM xx.xxx 103	**0.669 - 0.708**	1.26	0.63	0.63	BTR10-...
BTRM xx.xxx 104	**0.709 - 0.748**	1.26	0.63	0.63	BTR10-...
BTRM xx.xxx 121	**0.748 - 0.787**	1.46	0.63	0.83	BTR12-...
BTRM xx.xxx 122	**0.787 - 0.866**	1.46	0.63	0.83	BTR12-...
BTRM xx.xxx 123	**0.866 - 0.944**	1.46	0.63	0.83	BTR12-...
BTRM xx.xxx 124	**0.945 - 0.984**	1.46	0.63	0.83	BTR12-...

* For high speed machinining, ceramic guide is available on request.

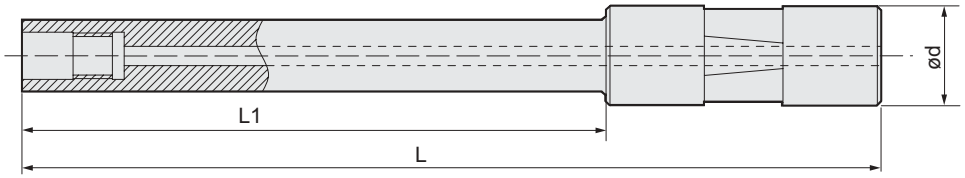
Diameters
0.260 - 0.984

MT Shank



Part No.	Diameter	L	L1	MT. No.	Corresponding Reaming Head
BTR04-090-MT1	**0.236 - 0.305**	6.12	3.54	1	BTRW/S/M XX.XxX 041
BTR05-100-MT1	**0.305 - 0.344**	6.52	3.94	1	BTRW/S/M XX.XxX 051
BTR06-100-MT1	**0.344 - 0.383**	6.52	3.94	1	BTRW/S/M XX.XxX 061
BTR07-120-MT2	**0.384 - 0.433**	7.87	4.72	2	BTRW/S/M XX.XxX 071
BTR08-120-MT2	**0.433 - 0.472**	7.87	4.72	2	BTRW/S/M XX.XxX 081
BTR09-120-MT2	**0.472 - 0.590**	7.87	4.72	2	BTRW/S/M XX.XxX 091,092
BTR10-150-MT3	**0.591 - 0.748**	9.06	5.91	2	BTRW/S/M XX.XxX 101,102,103,104
BTR12-150-MT3	**0.748 - 0.984**	9.80	5.91	3	BTRW/S/M XX.XxX 121,122,123,124

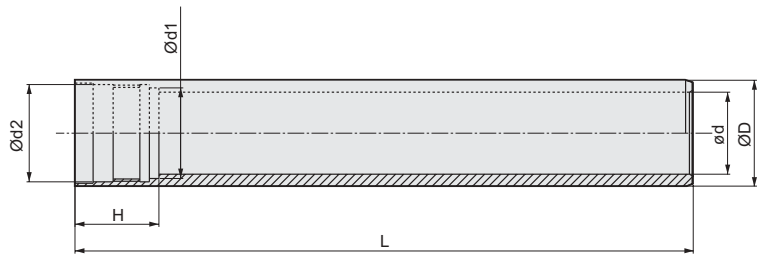
ST Shank



Part No.	Diameter	L	L1	d	Corresponding Reaming Head
BTR04-040-ST20	**0.236 - 0.305**	4.33	1.57	0.787	BTRW/S/M XX.XxX 041
BTR05-050-ST20	**0.305 - 0.344**	4.72	1.97	0.787	BTRW/S/M XX.XxX 051
BTR06-050-ST20	**0.344 - 0.383**	4.72	1.97	0.787	BTRW/S/M XX.XxX 061
BTR07-060-ST20	**0.384 - 0.433**	5.12	2.36	0.787	BTRW/S/M XX.XxX 071
BTR08-060-ST20	**0.433 - 0.472**	5.12	2.36	0.787	BTRW/S/M XX.XxX 081
BTR09-060-ST20	**0.472 - 0.590**	5.12	2.36	0.787	BTRW/S/M XX.XxX 091,092
BTR10-080-ST25	**0.591 - 0.748**	5.91	3.15	0.984	BTRW/S/M XX.XxX 101,102,103,104
BTR12-100-ST25	**0.748 - 0.984**	6.69	3.94	0.984	BTRW/S/M XX.XxX 121,122,123,124

TUBE SINGLE TUBE SYSTEM - INNER FOUR START THREAD

Drill Range
0.496 - 9.606

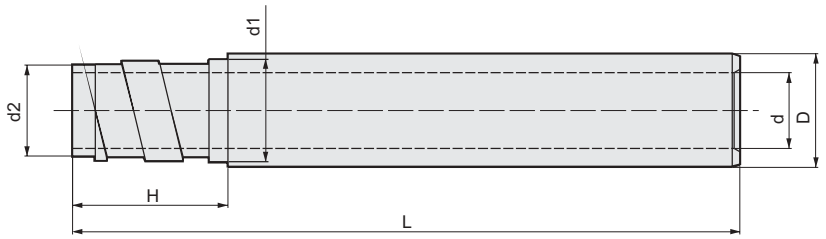


Drill Range	Designation	Dimension					
		D	d	d1	d2	H	S
0.496 - 0.535	BTSI 011 □	0.433	0.276	0.323	0.378	0.87	0.24
0.536 - 0.575	BTSI 012 □	0.472	0.315	0.362	0.417	0.87	0.24
0.575 - 0.614	BTSI 013 □	0.512	0.335	0.402	0.457	0.87	0.24
0.614 - 0.657	BTSI 014	0.551	0.354	0.425	0.496	0.83	0.31
0.658 - 0.697	BTSI 015	0.591	0.394	0.465	0.535	0.83	0.31
0.697 - 0.744	BTSI 016	0.630	0.413	0.492	0.571	0.87	0.31
0.744 - 0.787	BTSI 017	0.669	0.453	0.531	0.610	0.87	0.31
0.788 - 0.858	BTSI 018	0.709	0.472	0.551	0.630	1.08	0.39
0.859 - 0.949	BTSI 020	0.787	0.512	0.630	0.709	1.18	0.47
0.949 - 1.039	BTSI 022	0.866	0.551	0.689	0.768	1.18	0.47
1.040 - 1.130	BTSI 024	0.945	0.610	0.748	0.827	1.18	0.47
1.130 - 1.220	BTSI 026	1.024	0.669	0.827	0.925	1.30	0.63
1.221 - 1.311	BTSI 028	1.102	0.728	0.906	1.004	1.30	0.63
1.311 - 1.425	BTSI 030	1.181	0.787	1.004	1.102	1.30	0.63
1.426 - 1.559	BTSI 033	1.299	0.906	1.063	1.181	1.57	0.79
1.559 - 1.693	BTSI 036	1.417	1.004	1.181	1.299	1.57	0.79
1.693 - 1.850	BTSI 039	1.535	1.102	1.299	1.417	1.57	0.79
1.851 - 2.035	BTSI 043	1.693	1.220	1.417	1.535	1.57	0.79
2.036 - 2.213	BTSI 047	1.850	1.378	1.555	1.693	1.73	0.94
2.213 - 2.386	BTSI 051	2.008	1.535	1.713	1.850	1.73	0.94
2.386 - 2.559	BTSI 056A	2.205	1.693	1.870	2.008	1.73	0.94
2.559 - 2.637	BTSI 056B	2.205	1.693	1.850	2.047	2.95	1.26
2.638 - 2.874	BTSI 062	2.441	1.890	2.087	2.283	2.95	1.26
2.874 - 3.149	BTSI 068	2.677	2.087	2.283	2.480	2.95	1.26
3.150 - 3.425	BTSI 075	2.953	2.323	2.520	2.756	3.82	1.73
3.425 - 3.937	BTSI 082	3.228	2.598	2.795	3.031	3.82	1.73
3.937 - 4.409	BTSI 094	3.701	3.071	3.268	3.504	3.82	1.73
4.409 - 4.881	BTSI 106	4.173	3.543	3.740	3.976	4.65	2.36
4.882 - 5.354	BTSI 118	4.646	3.622	4.213	4.449	4.65	2.36
5.354 - 5.826	BTSI 130	5.118	4.094	4.685	4.921	4.65	2.36
5.827 - 6.299	BTSI 142	5.591	4.567	5.157	5.394	5.47	2.83
6.299 - 6.771	BTSI 154	6.063	5.039	5.630	5.866	5.47	2.83
6.772 - 7.244	BTSI 166	6.535	5.512	6.102	6.339	5.47	2.83
7.244 - 7.716	BTSI 178	7.008	5.984	6.575	6.811	5.67	3.15
7.717 - 8.189	BTSI 190	7.480	6.063	7.047	7.283	5.67	3.15
8.189 - 8.661	BTSI 202	7.953	6.535	7.520	7.756	5.67	3.15
8.661 - 9.133	BTSI 214	8.425	7.008	7.913	8.189	6.46	3.62
9.134 - 9.606	BTSI 226	8.898	7.480	8.386	8.661	6.46	3.62

1) Please indicate overall length (L) when ordering.

□Indicates parts are outer two start thread

Drill Range
0.571 - 9.685

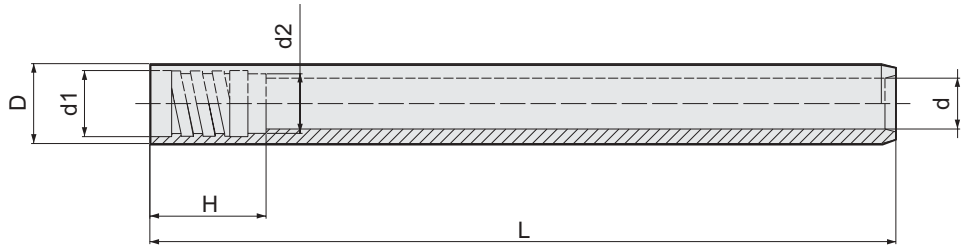


Drill Range	Designation	Dimension					
		D	d	H	d1	d2	S
0.571 - 0.591	BTSE 012A	0.472	0.315	0.91	0.453	0.390	0.24
0.591 - 0.610	BTSE 012B	0.472	0.315	0.91	0.465	0.402	0.24
0.611 - 0.630	BTSE 013A	0.512	0.335	0.91	0.488	0.425	0.24
0.630 - 0.650	BTSE 013B	0.512	0.335	0.91	0.500	0.437	0.24
0.650 - 0.679	BTSE 014A	0.551	0.354	0.91	0.528	0.465	0.24
0.680 - 0.709	BTSE 014B	0.551	0.354	0.91	0.539	0.476	0.24
0.709 - 0.748	BTSE 015	0.591	0.394	0.91	0.567	0.504	0.24
0.748 - 0.787	BTSE 016.5	0.650	0.433	0.91	0.606	0.543	0.24
0.787 - 0.866	BTSE 018	0.709	0.472	1.02	0.650	0.571	0.39
0.866 - 0.984	BTSE 020	0.787	0.512	1.02	0.748	0.630	0.39
0.984 - 1.063	BTSE 022	0.866	0.551	1.02	0.787	0.669	0.39
1.063 - 1.181	BTSE 024	0.945	0.610	1.02	0.866	0.748	0.39
1.181 - 1.259	BTSE 026	1.024	0.669	1.02	0.945	0.827	0.39
1.260 - 1.338	BTSE 028	1.102	0.728	1.02	1.024	0.906	0.39
1.339 - 1.456	BTSE 030	1.181	0.787	1.61	1.063	0.945	0.79
1.457 - 1.574	BTSE 033	1.299	0.906	1.61	1.181	1.063	0.79
1.575 - 1.732	BTSE 036	1.417	1.004	1.61	1.299	1.181	0.79
1.732 - 1.850	BTSE 039	1.535	1.102	1.61	1.457	1.339	0.79
1.850 - 2.047	BTSE 043	1.693	1.220	1.61	1.614	1.457	0.79
2.047 - 2.244	BTSE 047	1.850	1.378	1.61	1.732	1.575	0.79
2.244 - 2.401	BTSE 051	2.008	1.535	1.61	1.929	1.772	0.79
2.402 - 2.677	BTSE 056	2.205	1.693	1.61	2.087	1.929	0.79
2.677 - 2.952	BTSE 062	2.441	1.890	1.61	2.323	2.126	0.79
2.953 - 3.189	BTSE 068	2.677	2.087	2.80	2.559	2.362	1.57
3.189 - 3.582	BTSE 075	2.953	2.323	2.80	2.795	2.598	1.57
3.583 - 3.897	BTSE 082	3.228	2.598	2.80	3.110	2.913	1.57
3.898 - 4.370	BTSE 094	3.701	3.071	2.80	3.543	3.346	1.57
4.370 - 4.842	BTSE 106	4.173	3.543	2.80	4.016	3.819	1.57
4.843 - 5.315	BTSE 118	4.646	4.016	2.80	4.488	4.291	1.57
5.315 - 5.866	BTSE 130	5.118	4.488	2.80	4.961	4.764	1.57
5.866 - 6.378	BTSE 142	5.591	4.961	2.80	5.472	5.276	1.57
6.378 - 6.850	BTSE 154	6.063	5.433	3.39	5.945	5.709	2.20
6.850 - 7.322	BTSE 166	6.535	5.906	3.39	6.417	6.181	2.20
7.323 - 7.795	BTSE 178	7.008	6.378	3.39	6.890	6.654	2.20
7.795 - 8.267	BTSE 190	7.480	6.850	3.39	7.362	7.126	2.20
8.268 - 8.740	BTSE 202	7.953	7.323	3.39	7.835	7.598	2.20
8.740 - 9.212	BTSE 214	8.425	7.795	3.39	8.307	8.071	2.20
9.213 - 9.685	BTSE 226	8.898	8.268	3.39	8.780	8.543	2.20

1) Please indicate overall length (L) when ordering.

TUBE SINGLE TUBE SYSTEM - INNER SINGLE START THREAD

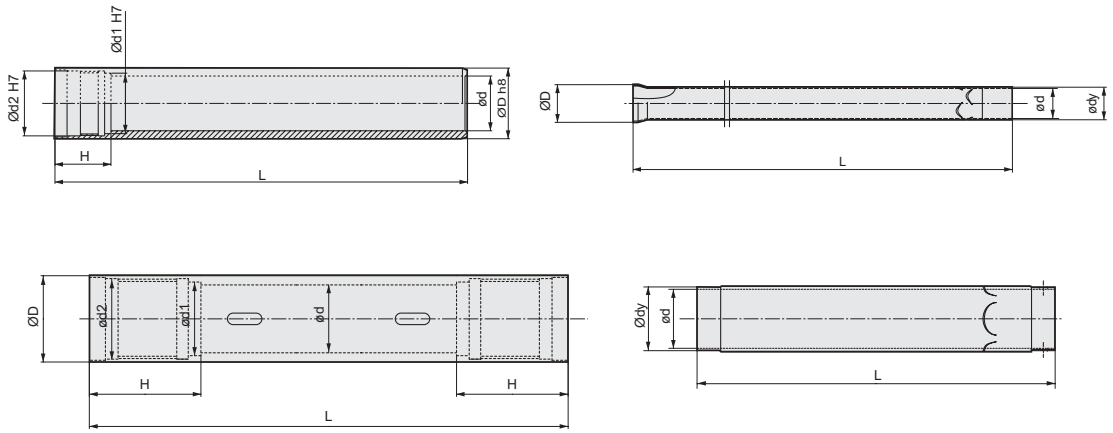
Drill Range
0.315 - 0.570



Drill Range	Designation	Dimension					
		D	d	d1	d2	H	S
0.315 - 0.350	**BTSO 071**	0.280	0.177	0.236	0.213	0.63	0.16
0.354 - 0.393	**BTSO 083**	0.327	0.197	0.283	0.248	0.63	0.16
0.394 - 0.433	**BTSO 090**	0.354	0.217	0.299	0.264	0.63	0.16
0.433 - 0.472	**BTSO 100**	0.394	0.256	0.339	0.303	0.63	0.16
0.472 - 0.531	**BTSO 110**	0.433	0.276	0.358	0.323	0.63	0.24
0.531 - 0.570	**BTSO 120**	0.472	0.315	0.425	0.370	0.63	0.24

1) Please indicate overall length (L) when ordering.

Drill Range
0.725 - 6.771



Outer Tube

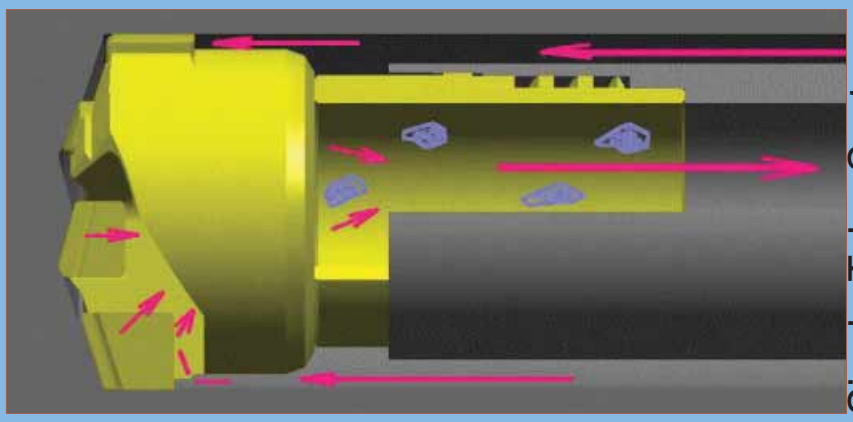
Inner Tube

Drill Range	Outer Tube	Dimension						Inner Tube	Dimension		
		D	d	d1	d2	H	S		D	dy	d
0.725 - 0.787	BTDO 018	0.709	0.472	0.551	0.630	1.08	0.39	BTDI 012	0.472	0.394	0.354
0.788 - 0.858	BTDO 019.5	0.768	0.551	0.630	0.709	1.18	0.47	BTDI 014	0.551	0.472	0.433
0.859 - 0.949	BTDO 021.5	0.846	0.591	0.689	0.768	1.18	0.47	BTDI 015	0.591	0.512	0.472
0.949 - 1.039	BTDO 023.5	0.925	0.630	0.748	0.827	1.18	0.47	BTDI 016	0.630	0.551	0.512
1.040 - 1.130	BTDO 026	1.024	0.709	0.827	0.925	1.30	0.63	BTDI 018	0.709	0.630	0.551
1.130 - 1.220	BTDO 028	1.102	0.787	0.906	1.004	1.30	0.63	BTDI 020	0.787	0.709	0.630
1.221 - 1.311	BTDO 030.5	1.201	0.866	1.004	1.102	1.30	0.63	BTDI 022	0.866	0.787	0.709
1.311 - 1.425	BTDO 033	1.299	0.945	1.063	1.181	1.57	0.79	BTDI 024	0.945	0.866	0.787
1.426 - 1.559	BTDO 035.5	1.398	1.024	1.181	1.299	1.57	0.79	BTDI 026	1.024	0.945	0.866
1.559 - 1.693	BTDO 039	1.535	1.142	1.299	1.417	1.57	0.79	BTDI 029	1.142	1.063	0.984
1.693 - 1.850	BTDO 042.5	1.673	1.260	1.417	1.535	1.57	0.79	BTDI 032	1.260	1.181	1.102
1.851 - 2.035	BTDO 046.5	1.831	1.378	1.555	1.693	1.73	0.94	BTDI 035	1.378	1.260	1.181
2.036 - 2.213	BTDO 051	2.008	1.535	1.713	1.850	1.73	0.94	BTDI 039	1.535	1.417	1.339
2.213 - 2.559	BTDO 055.5	2.185	1.693	1.870	2.008	1.73	0.94	BTDI 043A	1.693	1.575	1.496
2.559 - 2.756	BTDO 056	2.205	1.693	1.850	2.047	2.95	1.26	BTDI 043B	-	1.575	1.496
2.756 - 2.874	BTDO 062	2.441	1.890	2.087	2.283	2.95	1.26	BTDI 048	-	1.732	1.614
2.874 - 3.149	BTDO 068	2.677	2.087	2.283	2.480	2.95	1.26	BTDI 053	-	1.890	1.772
3.150 - 3.425	BTDO 075	2.953	2.323	2.520	2.756	3.82	1.73	BTDI 059	-	2.126	1.969
3.425 - 3.937	BTDO 082	3.228	2.598	2.795	3.031	3.82	1.73	BTDI 066	-	2.362	2.205
3.937 - 4.409	BTDO 094	3.701	3.071	3.228	3.504	3.82	1.73	BTDI 078	-	2.756	2.598
4.409 - 4.881	BTDO 106	4.173	3.543	3.740	3.976	4.65	2.36	BTDI 090	-	3.150	2.992
4.882 - 5.354	BTDO 118	4.646	3.622	4.213	4.449	4.65	2.36	BTDI 092	-	3.150	2.992
5.354 - 5.826	BTDO 130	5.118	4.094	4.685	4.921	4.65	2.36	BTDI104	-	3.740	3.583
5.827 - 6.299	BTDO 142	5.591	4.567	5.157	5.394	5.47	2.83	BTDI 116	-	3.937	3.780
6.299 - 6.771	BTDO 154	6.063	6.220	5.630	5.866	5.47	2.83	BTDI 128	-	4.724	4.567

1) Please indicate overall length(L) when ordering.
*For diameter range 0.725- 2.559 (OT13) the inner tube should be ordered 1.181 longer than the outer tube.
*For diameter range 2.559- 4.881 (OT14 - OT20) the inner tube should be ordered 7.480 longer than outer tube.
*For diameter range 4.882- 7.244 (OT21 - OT25) the inner tube should be ordered 8.661 longer than the outer tube.

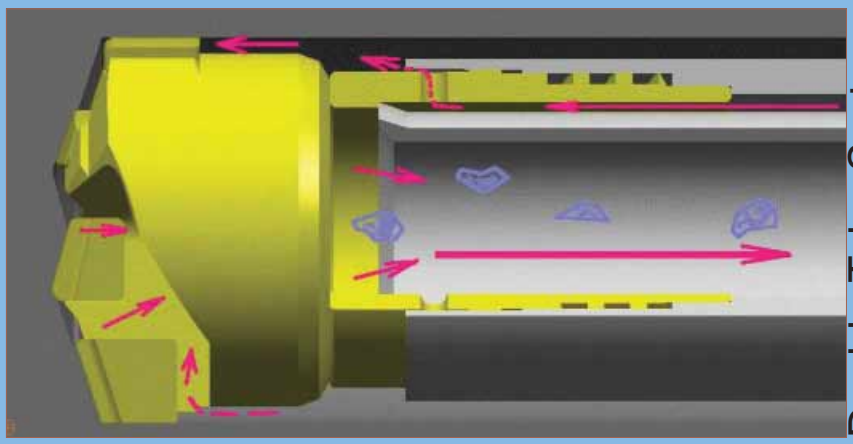
BOREline

Single Tube System



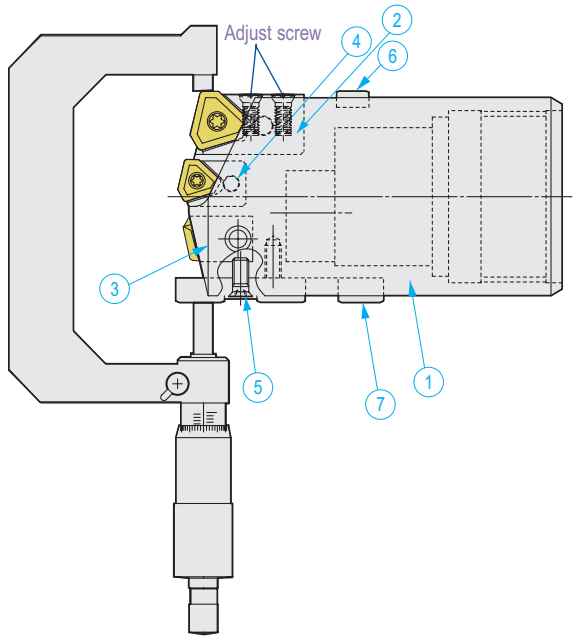
Single Tube System

Double Tube System



Double Tube System

Setting the diameter when indexing and replacing inserts



1. Head Shank
2. Outer Cartridge & Lock Screw
3. Inner Cartridge & Lock Screw
4. Center Cartridge & Lock Screw
5. Guide pad & Lock Screw
6. Sub Guide Pad & Lock Screw
7. Guide Pad Protector & Lock Screw

STEP 1: Slide the Guide Pad (5) forward as shown in the diagram
- locate the lock screw (5) as shown and tighten

STEP 2: Loosen the adjust screws and the lock screw of the outer cartridge (2)
STEP 3: Firmly push the outer cartridge toward the center of the head.
STEP 4: Slightly tighten the lock screw (2) and adjust the diameter with the two adjust screws.
STEP 5: When adjustment is completed, firmly tighten the lock screw (2).

Replacing Inserts:

Clean insert pockets carefully and remove even the smallest foreign particles from insert pocket.
Fasten insert securely in the cartridge and ensure it is completely seated.

Replacing Guide Pad:

Guide pad pockets are precisely produced and are back tapered, therefore the guide pads may be reversed and used again when excessive wear occurs on the corner.

Guide pads are ground to size for immediate use.

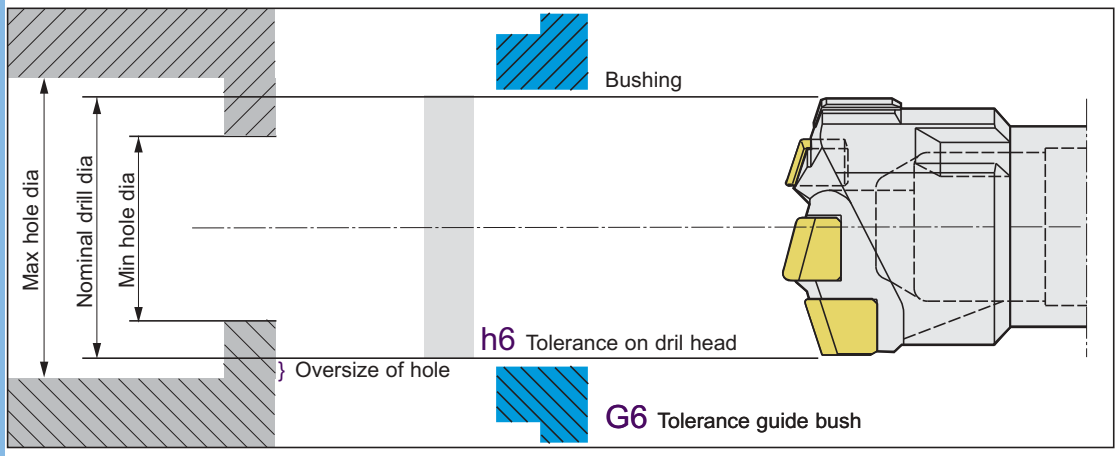
Special precaution:

Use the correct spanner when attaching or detaching the drill head from boring bar.
Use of a pipe wrench or other improper equipment will permanently damage the drill head shank, threading and boring bar threads.

Note:

Although lock screws have been treated with an anti-friction lubricant, please re-apply a suitable anti-friction lubricant regularly to avoid "lock-up".

Applicaton: BTA & BTS Type
Drill dia: 0.496 - 2.559
Hole Tolerance: IT9
Surface finish: Ra 2µm
Coolant: Neat or soluble oil



Nominal drill dia = Min hole dia + 2/3 X (Max hole dia - Min hole dia)
Max hole dia - Tool dia>0.002
Finish ground to the desired diameter to tolerance ISO h6.

*Nomally the drill diameter set at the lower limit plus(+) two third(2/3) of tolerance.
It is important to set the drill diameter -0.002 below the upper limit of the hole diameter

G6 Tolerance (for Guide bush)

Guide bush dia (ø in)	Tolerance (in)
0.394 - 0.709	+0.00024 - +0.00067
0.709 - 1.181	+0.00028 - +0.00079
1.181 - 1.969	+0.00035 - +0.00098
1.969 - 2.559	+0.00039 - +0.00114

h6 Tolerance (for Drill dia)

Drill dia (ø in)	Tolerance (in)
0.394 - 0.709	-0.00024 - 0
0.709 - 1.181	-0.00051 - 0
1.181 - 1.969	-0.00063 - 0
1.969 - 2.559	-0.00075 - 0

USER GUIDE RECOMMENDED CUTTING CONDITION - FOR BTA BRAZED & TBTA INDEXABLE

ISO	Material		Condition	Tensile Strength Rm(N/mm2)	Hardness HB	Ground Brazed Solid Drill Heads BTA(ø0.496 - ø2.559) , BTS(ø0.315 - ø0.787) Cutting Speed	Feed Rate f (in/rev)					Ajustable Solid Drill Heads TBTA-B(ø0.630 - ø1.122) No Cartridge Cutting Speed	Feed Rate f (in/rev)	
						SFM	0.31 - 0.79 *1	0.22 - 0.79	0.79 - 1.22	1.22 - 1.69	1.69 - 2.56	SFM	0.63 - 0.87	0.87 - 1.12
P	Non-alloy steel, cast steel, free cutting steel	0.1 - 0.25 %C	Annealed	420	125	230-394	0.002 - 0.005	0.003 - 0.006	0.004 - 0.007	0.005 - 0.008	0.006 - 0.012	197-394	0.003 - 0.005	0.004- 0.006
		0.25 - 0.25 %C	Annealed	650	190	230-394	0.002 - 0.005	0.003 - 0.006	0.004 - 0.007	0.005 - 0.008	0.006 - 0.012	197-394	0.003 - 0.005	0.004- 0.006
		0.25 - 0.25 %C	Quenched and tempered	850	250	131-230	0.002 - 0.005	0.003 - 0.006	0.004 - 0.007	0.005 - 0.008	0.006 - 0.012	197-394	0.003 - 0.005	0.004- 0.006
		0.55 - 0.80 %C	Annealed	750	220	230-394	0.002 - 0.005	0.003 - 0.006	0.004 - 0.007	0.005 - 0.008	0.006 - 0.012	197-394	0.003 - 0.005	0.004- 0.006
		0.55 - 0.80 %C	Quenched and tempered	1000	300	180-328	0.002 - 0.004	0.003 - 0.005	0.004 - 0.006	0.005 - 0.007	0.006 - 0.011	164-328	0.003 - 0.004	0.004- 0.005
	Low alloy steel and cast steel (less than 5% alloying elements)		Annealed	600	200	230-328	0.002 - 0.005	0.003 - 0.006	0.004 - 0.007	0.005 - 0.008	0.006 - 0.012	164-328	0.003 - 0.004	0.004- 0.006
				930	275	180-328	0.002 - 0.004	0.003 - 0.005	0.004 - 0.006	0.005 - 0.007	0.006 - 0.011	164-328	0.003 - 0.004	0.004- 0.005
			Quenched and tempered	1000	300	180-328	0.002 - 0.004	0.003 - 0.005	0.004 - 0.006	0.005 - 0.007	0.006 - 0.011	164-328	0.003 - 0.004	0.004- 0.005
				1200	350	180-328	0.002 - 0.004	0.003 - 0.005	0.004 - 0.006	0.005 - 0.007	0.006 - 0.011	164-328	0.003 - 0.004	0.004- 0.005
	High alloy steel, cast steel and tool steel.		Annealed	680	200	164-279	0.002 - 0.005	0.003 - 0.006	0.004 - 0.007	0.005 - 0.008	0.006 - 0.012	197-394	0.003 - 0.005	0.004- 0.006
			Quenched and tempered	1100	325	180-328	0.002 - 0.004	0.003 - 0.005	0.004 - 0.006	0.005 - 0.007	0.006 - 0.011	164-328	0.003 - 0.004	0.004- 0.005
M	Stainless steel and cast steel		Ferritic/martensitic	680	200	197-328	0.002 - 0.005	0.003 - 0.006	0.004 - 0.011	0.005 - 0.012	0.006 - 0.014	131-262	0.003 - 0.005	0.004- 0.006
			Martensitic	820	240	197-328	0.002 - 0.005	0.003 - 0.006	0.004 - 0.011	0.005 - 0.012	0.006 - 0.014	131-262	0.003 - 0.005	0.004- 0.006
			Austenitic	600	180	197-328	0.002 - 0.005	0.002 - 0.005	0.003 - 0.010	0.004 - 0.011	0.006 - 0.013	98-197	0.002 - 0.004	0.003- 0.006
K	Cast iron nodular (GGG)		Ferritic/pearlitic		180	262-328	0.002 - 0.005	0.003 - 0.006	0.004 - 0.007	0.005 - 0.008	0.006 - 0.012	230-328	0.003 - 0.005	0.004- 0.006
			Pearlitic		260	262-328	0.002 - 0.005	0.003 - 0.006	0.004 - 0.007	0.005 - 0.008	0.006 - 0.012	230-328	0.003 - 0.005	0.004- 0.006
	Gray cast iron (GG)		Ferritic		160	197-328	0.002 - 0.005	0.002 - 0.005	0.003 - 0.007	0.004 - 0.008	0.006 - 0.010	164-295	0.002 - 0.005	0.003- 0.006
			Pearlitic		250	197-328	0.002 - 0.005	0.002 - 0.005	0.003 - 0.007	0.004 - 0.008	0.006 - 0.010	164-262	0.002 - 0.005	0.003- 0.006
	Malleable cast iron		Ferritic		130	164-328	0.002 - 0.005	0.002 - 0.005	0.003 - 0.007	0.004 - 0.008	0.006 - 0.010	164-295	0.002 - 0.005	0.003- 0.006
			Pearlitic		230	164-328	0.002 - 0.005	0.002 - 0.005	0.003 - 0.007	0.004 - 0.008	0.006 - 0.010	164-295	0.002 - 0.005	0.003- 0.006
N	Aluminum-wrought alloy		Not cureable		60	213-426	0.002 - 0.005	0.003 - 0.006	0.004 - 0.008	0.006 - 0.010	0.006 - 0.012	197-394	0.003 - 0.005	0.004- 0.007
			Cured		100	213-328	0.002 - 0.005	0.003 - 0.006	0.004 - 0.008	0.006 - 0.010	0.006 - 0.012	197-295	0.003 - 0.005	0.004- 0.007
	Aluminum-cast, alloyed	<=12% Si	Not cureable		75	213-426	0.002 - 0.005	0.003 - 0.006	0.004 - 0.008	0.006 - 0.010	0.006 - 0.012	197-394	0.003 - 0.005	0.004- 0.007
			Cured		90	213-426	0.002 - 0.005	0.003 - 0.006	0.004 - 0.008	0.006 - 0.010	0.006 - 0.012	197-394	0.003 - 0.005	0.004- 0.007
		>12% Si	High temp.		130	213-426	0.002 - 0.005	0.003 - 0.006	0.004 - 0.008	0.006 - 0.010	0.006 - 0.012	197-394	0.003 - 0.005	0.004- 0.007
		>1% Pb	Free cutting		110	213-426	0.002 - 0.005	0.003 - 0.006	0.004 - 0.008	0.006 - 0.010	0.006 - 0.012	197-394	0.003 - 0.005	0.004- 0.007
	Copper alloys		Brass		90	213-426	0.002 - 0.005	0.003 - 0.006	0.004 - 0.008	0.006 - 0.010	0.006 - 0.012	197-394	0.003 - 0.005	0.004- 0.007
			Electrolitic copper		100	213-426	0.002 - 0.005	0.003 - 0.006	0.004 - 0.008	0.006 - 0.010	0.006 - 0.012	197-394	0.003 - 0.005	0.004- 0.007
S	High temp. alloys	Fe based	Annealed		200	33-164	0.002 - 0.005	0.002 - 0.005	0.003 - 0.006	0.005 - 0.007	0.006 - 0.010	66-164	0.002 - 0.004	0.003- 0.006
			Cured		280	33-164	0.002 - 0.005	0.002 - 0.005	0.003 - 0.006	0.005 - 0.007	0.006 - 0.010	66-164	0.002 - 0.004	0.003- 0.006
	Super alloys	Ni or	Annealed		250	33-164	0.002 - 0.005	0.002 - 0.005	0.003 - 0.006	0.005 - 0.007	0.006 - 0.010	66-164	0.002 - 0.004	0.003- 0.006
		Co based	Cured		350	33-164	0.002 - 0.005	0.002 - 0.005	0.003 - 0.006	0.005 - 0.007	0.006 - 0.010	66-164	0.002 - 0.004	0.003- 0.006
			Cast		320	33-164	0.002 - 0.005	0.002 - 0.005	0.003 - 0.006	0.005 - 0.007	0.006 - 0.010	66-164	0.002 - 0.004	0.003- 0.006
	Titanium,			Rm 400		98-164	0.002 - 0.004	0.002 - 0.004	0.003 - 0.005	0.004 - 0.006	0.005 - 0.079	66-164	0.002 - 0.004	0.003- 0.004
	Ti alloys	Alpha+beta alloys cured		Rm 1050		98-164	0.002 - 0.004	0.002 - 0.004	0.003 - 0.005	0.004 - 0.006	0.005 - 0.008	66-164	0.002 - 0.004	0.003- 0.004
H	Hardened steel		Hardened		55 HRc									
			Hardened		60 HRc									
	Chilled cast iron		Cast		400									
	Cast iron		Hardened		55 HRc									

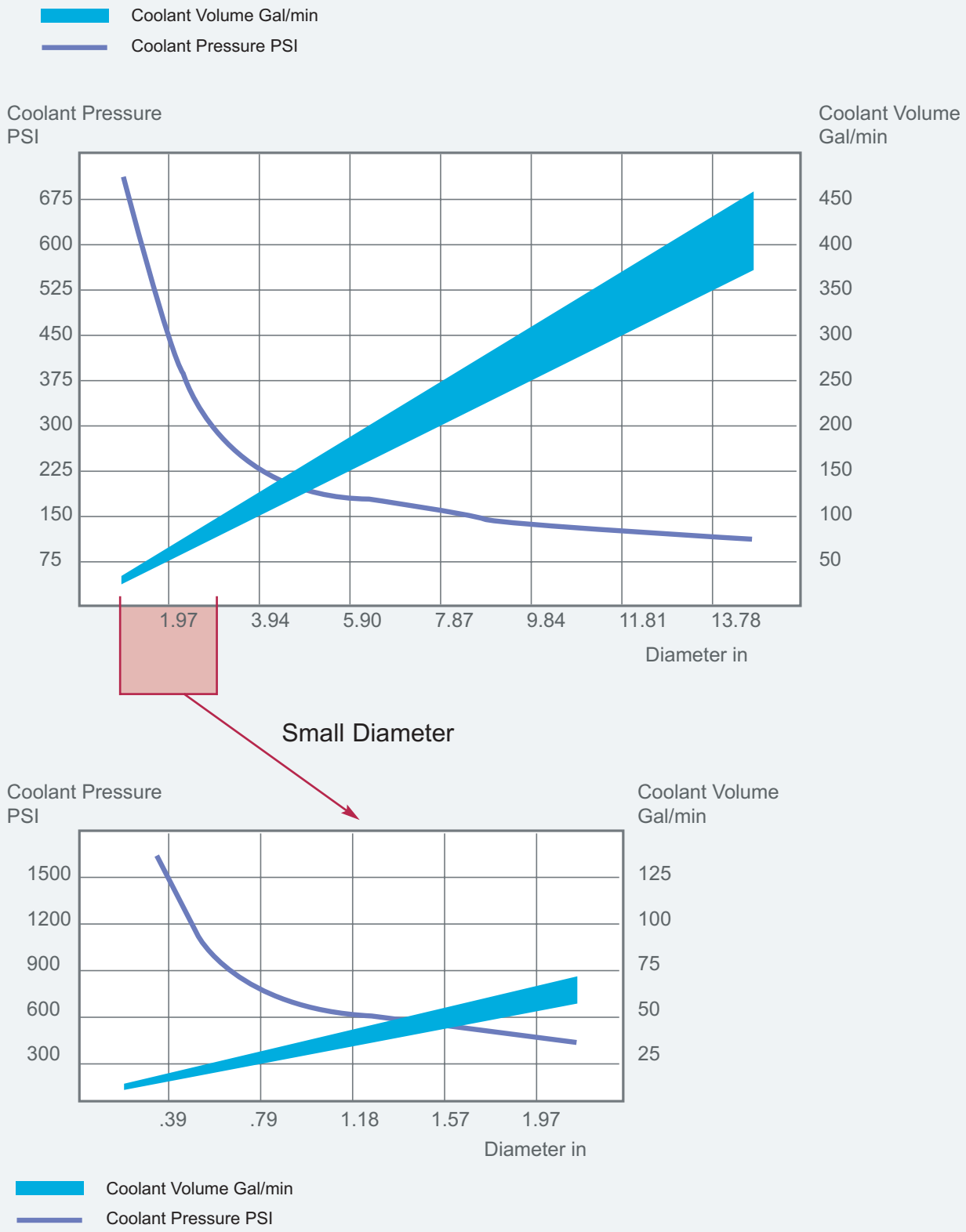
USER GUIDE RECOMMENDED CUTTING CONDITION – FOR BTA BRAZED & TBTA INDEXABLE

ISO	Material		Condition	Tensile Strength Rm(N/mm2)	Hardness HB	No Cartridge Solid Drill Heads TBTA-C(ø0.984- ø2.094) TBTA-D(ø1.181- ø2.559)					Ajustable Solid Drill Heads TBTA3/5/7(ø1.496 - ø9.685)					
						Cutting Speed	Feed Rate f (in/rev)		Feed Rate f (in/rev)		Cutting Speed	Feed Rate f (in/rev)				
						SFM	0.98 - 1.56	1.56 - 2.09	1.18 - 1.69	1.69 - 2.56	SFM	1.50 - 1.57	1.57 - 2.05	2.05 - 2.52	2.52 - 3.35	3.35-
P		0.1 - 0.25 %C	Annealed	420	125	230-426	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	197-394	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
	Non-alloy steel,	0.25 - 0.25 %C	Annealed	650	190	230-426	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	197-394	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
	cast steel, free	0.25 - 0.25 %C	Quenched and tempered	850	250	230-426	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	197-394	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
	cutting steel	0.55 - 0.80 %C	Annealed	750	220	230-426	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	197-394	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
		0.55 - 0.80 %C	Quenched and tempered	1000	300	230-426	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	197-394	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
	Low alloy steel		Annealed	600	200	230-361	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	197-328	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
	and cast steel			930	275	197-361	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	197-328	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
	(less than 5%		Quenched and tempered	1000	300	197-361	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	164-328	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
	alloying elements)			1200	350	197-361	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	168-328	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
	High alloy steel, cast steel and		Annealed	680	200	230-426	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	197-394	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
	tool steel.		Quenched and tempered	1100	325	230-426	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	197-394	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
M	Stainless steel		Ferritic/martensitic	680	200	131-361	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	197-361	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
	and cast steel		Martensitic	820	240	131-361	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	197-361	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
			Austenitic	600	180	131-361	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	197-361	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
K	Cast iron nodular		Ferritic/pearlitic		180	164-361	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	197-328	0.003 - 0.005	0.004 - 0.006	0.005 - 0.007	0.006 - 0.008	0.007 - 0.009
	(GGG)		Pearlitic		260	164-361	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	197-328	0.003 - 0.005	0.004 - 0.006	0.005 - 0.007	0.006 - 0.008	0.007 - 0.009
	Gray cast iron		Ferritic		160	197-361	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	197-328	0.003 - 0.005	0.004 - 0.006	0.005 - 0.007	0.006 - 0.008	0.007 - 0.009
	(GG)		Pearlitic		250	197-361	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	197-328	0.003 - 0.005	0.004 - 0.006	0.005 - 0.007	0.006 - 0.008	0.007 - 0.009
	Malleable cast iron		Ferritic		130	230-361	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	197-328	0.003 - 0.005	0.004 - 0.006	0.005 - 0.007	0.006 - 0.008	0.007 - 0.009
			Pearlitic		230	230-361	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	197-328	0.003 - 0.005	0.004 - 0.006	0.005 - 0.007	0.006 - 0.008	0.007 - 0.009
N	Aluminum-		Not cureable		60	213-426	0.004 - 0.008	0.005 - 0.012	0.004 - 0.010	0.005 - 0.014	197-426	0.003 - 0.008	0.004 - 0.010	0.005 - 0.011	0.006 - 0.012	0.007 - 0.013
	wrought alloy		Cured		100	213-426	0.003 - 0.007	0.005 - 0.009	0.003 - 0.009	0.005 - 0.011	197-426	0.003 - 0.008	0.004 - 0.010	0.005 - 0.011	0.006 - 0.012	0.007 - 0.013
	Aluminum-	<=12% Si	Not cureable		75	213-426	0.003 - 0.007	0.005 - 0.009	0.003 - 0.009	0.005 - 0.011	197-426	0.003 - 0.008	0.004 - 0.010	0.005 - 0.011	0.006 - 0.012	0.007 - 0.013
	cast, alloyed		Cured		90	213-426	0.003 - 0.007	0.005 - 0.009	0.003 - 0.009	0.005 - 0.011	197-426	0.003 - 0.008	0.004 - 0.010	0.005 - 0.011	0.006 - 0.012	0.007 - 0.013
		>12% Si	High temp.		130	213-426	0.003 - 0.007	0.005 - 0.009	0.003 - 0.009	0.005 - 0.011	197-426	0.003 - 0.008	0.004 - 0.010	0.005 - 0.011	0.006 - 0.012	0.007 - 0.013
		>1% Pb	Free cutting		110	213-426	0.003 - 0.007	0.005 - 0.009	0.003 - 0.009	0.005 - 0.011	197-426	0.003 - 0.008	0.004 - 0.010	0.005 - 0.011	0.006 - 0.012	0.007 - 0.013
	Copper alloys		Brass		90	213-426	0.003 - 0.007	0.005 - 0.009	0.003 - 0.009	0.005 - 0.011	197-426	0.003 - 0.008	0.004 - 0.010	0.005 - 0.011	0.006 - 0.012	0.007 - 0.013
			Electrolitic copper		100	213-426	0.003 - 0.007	0.005 - 0.009	0.003 - 0.009	0.005 - 0.011	197-426	0.003 - 0.008	0.004 - 0.010	0.005 - 0.011	0.006 - 0.012	0.007 - 0.013
S	High temp. alloys	Fe based	Annealed		200	66-164	0.003 - 0.007	0.005 - 0.009	0.003 - 0.009	0.005 - 0.011	66-213	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
			Cured		280	66-164	0.003 - 0.007	0.005 - 0.009	0.003 - 0.009	0.005 - 0.011	66-213	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
	Super alloys	Ni or	Annealed		250	66-164	0.003 - 0.007	0.005 - 0.009	0.003 - 0.009	0.005 - 0.011	66-213	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
		Co based	Cured		350	66-164	0.003 - 0.007	0.005 - 0.009	0.003 - 0.009	0.005 - 0.011	66-213	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
			Cast		320	66-164	0.003 - 0.007	0.005 - 0.009	0.003 - 0.009	0.005 - 0.011	66-213	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
	Titanium,			Rm 400		98-197	0.003 - 0.007	0.005 - 0.009	0.003 - 0.009	0.005 - 0.011	98-328	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
	Ti alloys	Alpha+beta alloys cured		Rm 1050		98-197	0.003 - 0.007	0.005 - 0.009	0.003 - 0.009	0.005 - 0.011	98-328	0.003 - 0.006	0.004 - 0.008	0.005 - 0.009	0.006 - 0.010	0.007 - 0.012
H	Hardened steel		Hardened		55 HRc											
			Hardened		60 HRc											
	Chilled cast iron		Cast		400											
	Cast iron		Hardened		55 HRc											

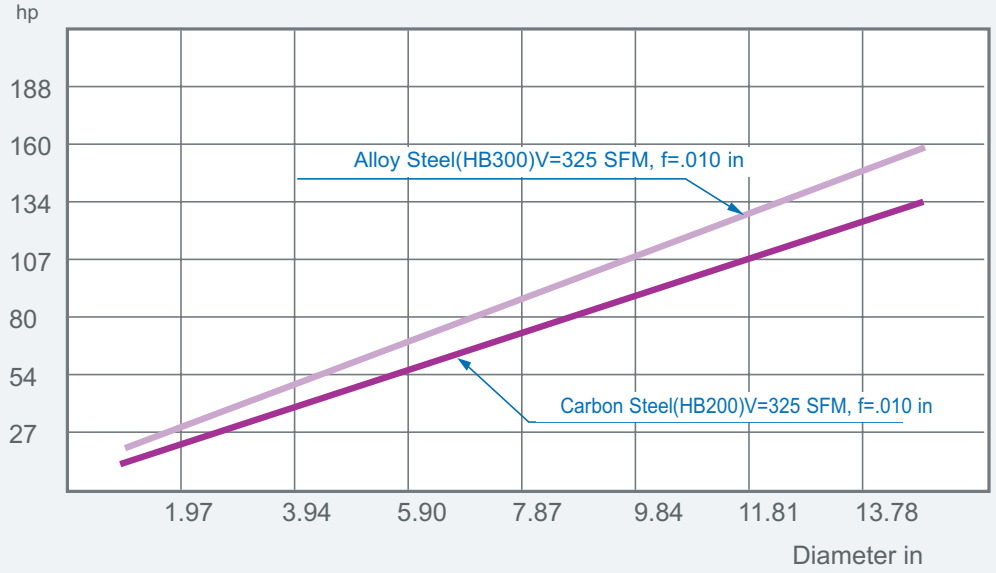
No.	Problem	Causes	Solutions
1	Chips too small	improper cutting conditions	adjust speed and feed
		chipbreaker or CB radius too small and deep	amend chip breaker
		faulty tool geometry	use correct geometry
		misalignment of shank and spindle	correct misalignment
		material variation	try to adjust by altering speeds and feeds
		loose or oversize guide bushes	change bushing
		poor starting conditions (workpiece not centered)	center workpiece
2	Chips too large	improper cutting conditions	adjust speed and feed
		chipbreaker or CB radius too large and shallow	amend chip breaker
		oversized guide bush or guide bush misalignment	correct misalignment or change bush
3	Erratic chip pattern	lack of uniformity in workpiece material	adjust speeds & feeds or amend CB
		faulty feed mechanism (likely to occur with hydraulic feed system)	consult machine builder or sales engineer
		inncorrect carbide grade	check grade charts for guidelines
		chips jamming because of inadequate coolant supply	increase coolant supply
		pressure or incorrect tool geometry	correct tool geometry
		misalignment of shank and spindle	correct misalignment
		excessive vibration due to insufficient workpiece/tool rigidity	contact machine builder or tool manufacturer
		wrong choice of coolant	consult with tool manufacturer
		under or oversized guide bushing	change bushing
4	Stringy chips	incorrect tip geometry	amend chip breaker
		lack of uniformity in workpiece material	adjust with speed & feed or amend CB
		faulty feed mechanism (likely to occur with hydraulic feed system)	consult with machine builder or sales engineer
		cooling contaminated with fines	clean coolant
		chemical affinity between workpiece and carbide	check possibility of changing grade
		chipped cutting edge	replace drill
		feedrate too low	increase feed

USER GUIDE TROUBLE SHOOTING GUIDE

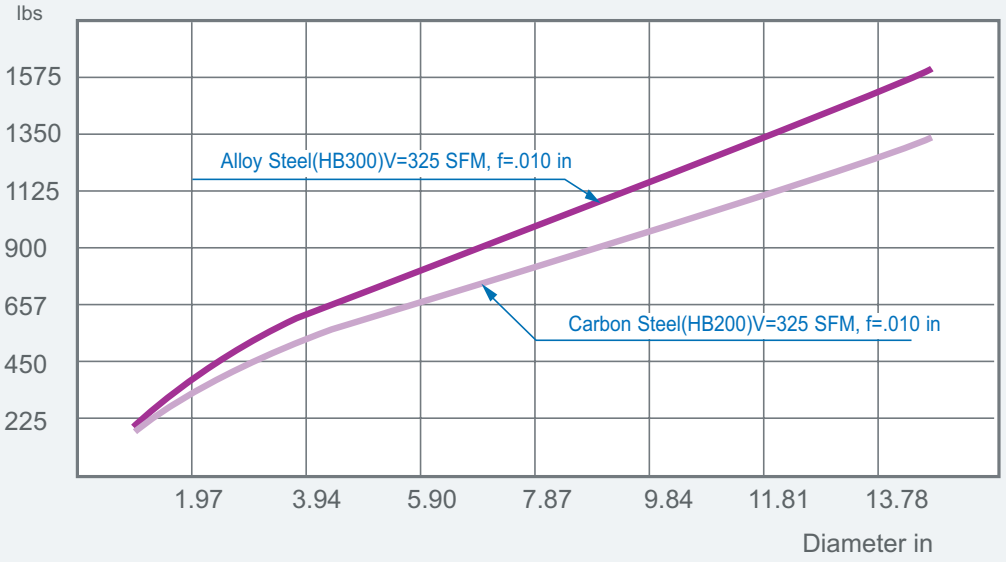
No.	Problem	Causes	Solutions
5	Carbide tip breakage	dull tool	hone cutting edges if required
		inadequate coolant	check volume and pressure
		contaminated coolant	check coolant
		guide bush tolerance too tight	replace if necessary or undersize drill
		misalignment of shank and spindle	correct misalignment
		tool geometry error	correct geometry
		material variation	try to adjust by altering speeds and feeds
6	Short tool life	improper speed or feed	adjust accordingly
		incorrect carbide grade	choose proper grade for material
		worn guide bushes	replace guide bush
		excessively warm coolant	check coolant temperature & system
		incorrect cutting fluid	replace if possible
		misalignment of shank and spindle	correct misalignment
		tool geometry error	correct geometry
		material variation	try to adjust by altering speeds and feeds
7	Poor surface finish	misalignment	check and adjust
		inadequate dampening of shank causing vibration	provide vibration dampers
		CB too far above or below center line	correct chip breaker
		faulty cutter or guide pad geometry	correct geometry
		misalignment between workpiece and drill	correct misalignment
		workpiece deflection	improve clampiing and rigidity
		excessive vibration	contact tool or machine manufacturer
		tool geometry error	correct geometry
		cutting speed too low	increase cutting speed
		feed too light especially in hardened material	increase feed
		uneven feed	correct feed mechanism
		none of above or unsolved problems	contact tool manufacturer


Coolant Volume Gal/min
Coolant Pressure PSI
Coolant Pressure PSI
Coolant Volume Gal/min
675
600
525
450
375
300
225
150
75
450
400
350
300
250
200
150
100
50
1.97
3.94
5.90
7.87
9.84
11.81
13.78
Diameter in
Small Diameter
Coolant Pressure PSI
Coolant Volume Gal/min
1500
1200
900
600
300
125
100
75
50
25
.39
.79
1.18
1.57
1.97
Diameter in
Coolant Volume Gal/min
Coolant Pressure PSI

Power



Thrust Force



DEEP HOLE DRILLING QUESTIONNAIRE

Campany Name	Inquiry Number
Address	Inquiry Date
Contact person	Customer No

WORKPIECE
(If possible,please attach a drawing)

Product Name	
Hole diameter(ø)	(in)
Hole depth(drilling length)	(in)
No. of holes	
Tolerance(of hole)	
Surface finish(Rz,Ra...)	
Deviation(mm/100)	
Straightness(mm/100)	

MATERIAL

Material(DIN,AISI,JIS...)	
Hardness(HB,HS,HRC...)	
Condition	☐Annealed ☐Quenched ☐Tempered
	☐Cast ☐
	☐Other ☐

MACHINE

Machine supplier name	
Machine type/model	
Rigidity	☐Good ☐Normal ☐Bad
Date of manufacture	
Retrofitted	☐NC lathe ☐M/C ☐Other
Double rotation(TR/WR)	☐Tool and Workpiece
Rotating workpiece(WR)	☐
Rotating tool(TR)	☐
Safety devices	
Motors power	

COOLANT

Coolant supplier name	
Water based	☐Soluble ☐Emulsion %
Oil based	☐
Coolant Pressure	
Coolant Volume	

TOOL
DRILL

Drill diameter(ø)		(in)	
Thread	☐Inner	☐Outer	
Brazed	☐		
Indexable	☐Adjustable	☐Direct mount	☐
Coating	☐Coated	☐Uncoated	
Coating type	☐TiN	☐TiAlN	☐Other
• Solid drilling	☐		
• Counterboring	☐		
Cutting angle brazed	☐ 20°	☐ 45°	☐
Cutting angle indexable	☐nomal angle	☐ close angle	
Pre-bored size(per side)		(in)	
Bottom finishing	☐Fullball R	☐Flatbottom R	☐Corner R
	☐Compound R		
• Trepanning	☐		
Core size(ø)		(in)	☐
Tube inner dia(ø)		(in)	
Tube outer dia(ø)		(in)	

BODY

Outside Dia(ø)		(in)	
Total Length(L)		(in)	
Internal Thread		☐	
External Thread	☐ 4 Starts	☐ 2 Starts	☐ 1 Start
Tube thread	☐ 1 end	☐ Both ends	
Inner Tube Length		(in)	
Inner Tube Slit	☐ 1 End	☐ Both ends	

DRILL SYSTEM

Single tube system	☐	STS
Double tube system	☐	DTS

HOLE DRILLING

Through hole drilling	☐
Blind hole drilling	☐
Cross hole drilling	☐

CURRENT PROCESS

Quantity per year:				
Present Performance Status:				
grade,tool life,etc:				
Cutting Data:	Vc=	SFM,	N=	rpm
	f=	in/re,	F=	in/min

BOREline

Ingersoll

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Member IMC Group
Ingersoll
Cutting Tools

STANDARD GRADE DESCRIPTIONS

	Grade Number	Industry Class	ISO Rating	Coating	Workpiece Materials
UNC (Uncoated)	**IN30M**	C-1/C-2	K20-K50 M20-M40	None	Cast iron, aluminum, non-ferrous materials, high-temp alloys
UNC (Uncoated)	**IN40P**	C-5/C-6	P20-P35	None	Steels
CVD (Chemical Vapor Deposition)	**IN6515**	C-1/C-3 C-5/C-7	K15-K35 P20-P30	MT-CVD Al_2O_3	Cast iron, steels
CVD (Chemical Vapor Deposition)	**IN6530**	C-2/C-1 C-5/C-6	K20-K50 M25-M40 P25-P45	MT-CVD Al_2O_3	Cast iron, steels, stainless, high-temp alloys
PVD (Physical Vapor Deposition)	**IN1030**	C-1/C-2	K20-K30 M20-M40	PVD TiCN	Cast iron, aluminum, stainless, titanium
PVD (Physical Vapor Deposition)	**IN1040**	C-5/C-7	P20-P40	PVD TiCN	Steels, stainless
PVD (Physical Vapor Deposition)	**IN1505**	C-1/C-7	P10-P30 M10-M30	TiCN-TiN	Cast iron, steels, stainless, high-temp alloys
PVD (Physical Vapor Deposition)	**IN1530**	C-1/C-5	K25-K40 M30-M40	PVD TiCN-TiN	Steels, stainless, titanium, high-temp alloys
PVD (Physical Vapor Deposition)	**IN2005**	C-1/C-8	K50-P01	PVD TiAlN	Cast iron, steels, stainless, high-temp alloys
PVD (Physical Vapor Deposition)	**IN2030**	C-1/C-5	K25-K40 M30-M40	TiAlN	Cast iron, steels, stainless, high-temp alloys

CARBIDE SELECTION GUIDE

Direction of Use	Wear Resistance →	Wear Resistance →	Wear Resistance →
	← Toughness	← Toughness	← Toughness
	← Increase Feed	← Increase Feed	← Increase Feed
	Increase Speed →	Increase Speed →	Increase Speed →
Material	Short Chipping Malleable Iron, Non-Ferrous Metal, Hardened Iron, Chilled Iron, Cast Iron	High-Temp Alloys, Alloy Iron, Steel Casting, Manganese	Free Cutting Steels, Malleable Iron, Steel Casting, Steel
Grade (Coating)	C1	C2	C3	C4		C5	C6	C7	C8
	K50 K45 K40 K35 K30 K25 K20 K15 K10 K05 K01	M50 M40 M30 M20 M10	P50 P45 P40 P35 P30 P25 P20 P15 P10 P05 P01

IN30M	Uncoated	IN30M												IN30M													
IN40P	Uncoated																				IN40P						
IN6515	CVD				IN6515																	IN6515					
IN6530	CVD	IN6530												IN6530			IN6530										
IN1030	PVD					IN1030																					
IN1040	PVD													IN1030				IN1040									
IN1505	PVD												IN1505					IN1505									
IN1530	PVD			IN1530											IN 1530												
IN2005	PVD			IN2005									IN2005								IN2005						
IN2030	PVD		IN2030											IN2030			IN2030										

INGERSOLL ISO MATERIAL GROUPS

ISO	Material		Condition	Tensile Strength (Kpsi)	Hardness HB	Material Number
P	Non - Alloy Steels	<0.25% C	Annealed	61	125	1
	Steel Castings	=>0.25% C	Annealed	94	190	2
	Free Machining Steel	<0.55% C	Quenched & Tempered	123	250	3
		=>0.55% C	Annealed	109	220	4
		=>0.55% C	Quenched & Tempered	145	300	5
	Low - Alloy Steels and Steel Castings (less than 5% of alloying elements)		Annealed	87	200	6
			Quenched & Tempered	135	275	7
				145	300	8
				174	350	9
	High - Alloy Steels, Steel Castings & Tool Steels		Annealed	99	200	10
			Quenched & Tempered	160	325	11
M	Stainless Steels and Stainless Steel Castings		Ferritic/Martensitic	99	200	12
			Martensitic	119	240	13
			Austenitic & P.H.	87	180	14
K	Nodular Cast Iron (GGG)		Ferritic / Pearlitic		180	15
			Pearlitic		260	16
	Grey Cast Iron (GG)		Ferritic		160	17
			Pearlitic		250	18
	Malleable Cast Iron		Ferritic		130	19
			Pearlitic		230	20
N	Aluminum wrought alloy		As cast		60	21
			Forged		100	22
	Cast Aluminum alloyed	<=12% Si	As cast		75	23
			Forged		90	24
		> 12% Si	High Temperature		130	25
	Copper Alloys		Free Cutting		110	26
			Brass		90	27
			Electrolitic Copper		100	28
	Non Metallic		Duroplastics & Fiberplastics			29
			Hard Rubber			30
S	High Temp Alloys	Fe Based	Annealed		200	31
			Cured		280	32
		Ni or Co Based	Annealed		250	33
			Cured		350	34
			Cast		320	35
	Titanium and Ti Alloys			58		36
			Alpha+Beta alloys cured	152		37
H	Hardened Steel				55 HRc	38
					60 HRc	39
	Chilled Cast Iron		Cast		400	40
	Cast Iron		Hardened		55 HRc	41

=P =M =K =N =S =H

INGERSOLL MATERIAL GROUPS

Material Group	AISI/SAE Material Spec	DIN Material Spec
1	1010	Ck10
1	1025	C25E, Ck25
1	1213	9SMn28
1	1215	9SMn36
1	1015, 1017	CK15
1	1016	C15
1	1020, 1023	C22
1	1022, 1518	20Mn5
1	11 L 08	10SPb20
1	12 L 13	9SMnPb28
1	12 L 14	9SMnPb36
1	A27 65-35	GS-45
2	1035	C35, Cf35
2	1039	40Mn4
2	1040	C40
2	1042	Ck45
2	1043, 1045	C45
2	1050	Cf53
2	1140	35S20
2	1146	45S20
2	A148 80 40	GS-60
2	A27 70-36	GS-52
2	A537 1	19Mn6
2	A662 C	Ast45
2	A738	Ast52
2	1335	36Mn5
2	1330	28Mn6
4	1055	C55, Ck55
4	1060	C60
4	1064	Ck60
4	1070	Ck67
4	1080	Ck75
4	1095	Ck101
4	W110	C105W1
4	9255	55Si7
6	1006	St36
6	A515 65	H1
6	A573 81	St44-3
6	A573 81 65	St37-3
6	8620, 8617	21NiCrMo2
6	8740, 8640, 8742	40NiCrMo22
6	4317	17CrNiMo6
6	5015	15Cr3
6	5132	34Cr4
6	5140	41Cr4
6	5155	55Cr3
6	5120	St52-3
6	9262	1.0961

Material Group	AISI/SAE Material Spec	DIN Material Spec
6	4520	16Mo5
6	ASTM A350LF5	14Ni6
6	L1	34MoCrS4G
6	5140	42Cr4
6	5115	16MnCr5
6		14MoV6 3
6		31CeMo12
6		39CrMoV13 9
6-7	4130	25CrMo4
6-7	4135, 4137	34CrMo4
6-7	4142	41CrMo4
6-7	4140	42CrMo4
6-9	L3	100Cr6
6-9		105WCr6
6-9	L6	55NiCrMoV6
6-9	L6	50NiCr13
6-9	9840	36CrNiMo4
6-9	6150	50CrV4
6-9	ASTM A290	41CrAlMo7
7		15CrMo5
7	A570-36	RSt37-2
7	4340	35CrNiMo6
9	52100	100Cr6
9	ASTM A204 Gr. A	15Mo3
9	3135	36NiCr6
9	3415	14NilCr10
9	3310	14NilCr14
9	ASTM A182 F-12	13CrMo44
9	ASTM A387 12-2	16CrMo44
9		32CrMo12
10	ASM A353	X8Ni9
10	2515, 2517	12Ni19
10	9310	14NiCrMo13-4
10	D3	X210Cr12
10		X42Cr13
10	H13	X40CrMoV51
10	A2	X100CrMoV51
10	S1	45WCrV7
10	H21	X30WCrV93
10		X165CrMoV12
10	M35	S6/5/2/5
10	M2	S6/5/2
10	M7	S2/9/2
10	HW3	X45CrSi93
11	D2	X155CrVMo121
11	D4, D6	X210CrW12
11	630	1.4542/1.4548
12	430F	X12CrMoS17

INGERSOLL MATERIAL GROUPS

Material Group	AISI/SAE Material Spec	DIN Material Spec
12		X5CrNi134
12	430	X10CrA118
12	405	X10CrA113
12	434	X6CrMo17
12	HNV6	X80CrNiSi20
12	446	X10CrA124
12	EV8	X53CrMnNiN219
12	S32900	X8CrNiMo
12	440B	X90CrMoV18
12		X46Cr13
12	403	X7Cr13
12	410	X10Cr13
12	420	1.4021
12	431	X22CrNi17
13	ASTM A128 75	G-X120Mn12
14	303	X12CrNiS188
14	304L	X2CrNiN189
14	304	X5CrNi189
14	301	X12CrNi177
14	304LN	X4CrNiN1810
14	316	X5CrNiMo1810
14	316LN	X2CrNiMoN1813
14	316L	X2CrNiMo1812
14	317L	X2CrNiMo1816
14	S32304	X2CrNiN234
14	S31803	X2CrNiMoN2253
14	321	X10CrNiTi189
14	347	X10CrNiNb
14	316Ti	X10CrNiMoTi18
14	318	X10CrNiMoNb18
14	309	X15CrNiSi2012
14	310S	X12CrNi2521
14	S31254	
14	17-7PH	1.4568/1.4504
15		GGG 35.3
15	60-40-18	GGG 40
15		GGG 40.3
15	80-55-06	GGG 50
16		GGG 60
16	100-70-03	GGG 70
17	A48 20B	GG 10
17	A48 25B	GG15
17	A48 30B	GG 20
18	A48 40B	
18	A48 35B	GG 25
18	A48 45B	GG 30
18	A48 50B	GG 35
18	A48 60B	GG 40

Material Group	AISI/SAE Material Spec	DIN Material Spec
19	32510	GTS-35
20	40010	GTS-45
20	50005	GTS-55
20	70003	GTS-65
23-24	A356-72	
23-24	356.1	
23-24	A360.2	G-AlSi10Mg
23-24	A413.2	G-AlSi12
23-24	A413.1	G-AlSi12(Cu)
23-24	A413.0	GD-AlSi12
23-24	A380.1	GD-AlSi8Cu3
31	330	X12NiCrSi
31		G-X40NiCrSi
33	5390A	2.4603
33		NiCr20Ti
33	5666	NiCr22Mo9N
34	5537C	CoCr20W15
34	4676	NiCu30Al
34		NiCr20TiAk
34	AMS 5399	NiCr19Co11
34	5391	S-NiCr13A16
34	5660	NiFe35Cr14
34	5383	NiCr19Fe19
34	AMS 5544	NiCr19Fe19
34	AMS 5772	CoCr22W14
35	AMS 5397	NiCo15Cr10
37		TiAl4Mo4Sn4Si0.5
37	AMS R54520	TiAl5Sn2.5
37	AMS R56400	TiAl6V4
37	AMS R56401	TiAl6V4ELI

SPOTIN™ OPERATING GUIDELINES- SERIES FAK AND SERIES Y

SERIES "FAK" DRILL

ISO	Material Number	Cutting Speed (SFM)	Feed (in./rev.) ø.189-ø.292
P	1	450 - 550	.001" - .003"
	2	450 - 550	.001" - .003"
	3	450 - 550	.001" - .003"
	4	450 - 550	.001" - .003"
	5	450 - 550	.001" - .003"
	6	450 - 550	.001" - .003"
	7	450 - 550	.001" - .003"
	8	450 - 550	.001" - .003"
	9	450 - 550	.001" - .003"
	10	450 - 550	.001" - .003"
	11	450 - 550	.001" - .003"
M	12	400 - 500	.001" - .003"
	13	300 - 400	.001" - .003"
	14	400 - 500	.001" - .003"
K	15	300 - 400	.002" - .004"
	16	300 - 400	.002" - .004"
	17	450 - 550	.002" - .004"
	18	450 - 550	.002" - .004"
	19	450 - 550	.002" - .004"
	20	450 - 550	.002" - .004"
N	21	1500 - 3000	.002" - .004"
	22	1500 - 3000	.002" - .004"
	23	1500 - 3000	.002" - .004"
	24	1500 - 3000	.002" - .004"
	25	1500 - 3000	.002" - .004"
	26	1500 - 3000	.002" - .004"
	27	1500 - 3000	.002" - .004"
	28	1500 - 3000	.002" - .004"
	29		
	30		
S	31	100 - 200	.001" - .003"
	32	100 - 200	.001" - .003"
	33	100 - 200	.001" - .003"
	34	100 - 200	.001" - .003"
	35	100 - 200	.001" - .003"
	36	130 - 230	.001" - .003"
	37	130 - 230	.001" - .003"
H	38	50 - 100	.001" - .003"
	39	50 - 100	.001" - .003"
	40	50 - 100	.001" - .003"
	41	50 - 100	.001" - .003"

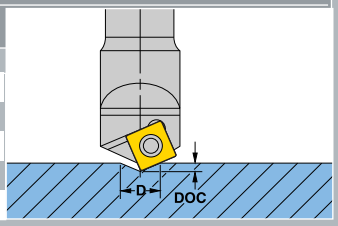
SERIES "Y" (SPOT IN) DRILL

ISO	Material Number	Cutting Speed (SFM)	Feed (in./rev.) ø.189-ø.292
P	1	260 - 430	.006" - .010"
	2	260 - 430	.006" - .010"
	3	230 - 390	.006" - .010"
	4	230 - 390	.006" - .010"
	5	230 - 390	.006" - .010"
	6	130 - 430	.006" - .010"
	7	130 - 430	.006" - .010"
	8	130 - 430	.006" - .010"
	9	130 - 430	.006" - .010"
	10	130 - 260	.005" - .008"
	11	130 - 260	.005" - .008"
M	12	70 - 160	.004" - .006"
	13	70 - 160	.004" - .006"
	14	70 - 160	.004" - .006"
K	15	260 - 460	.010" - .014"
	16	260 - 460	.010" - .014"
	17	300 - 590	.010" - .014"
	18	300 - 590	.010" - .014"
	19	300 - 590	.010" - .014"
	20	300 - 590	.010" - .014"
N	21	260 - 520	.010" - .014"
	22	260 - 520	.010" - .014"
	23	260 - 520	.010" - .014"
	24	260 - 520	.010" - .014"
	25	260 - 520	.010" - .014"
	26	260 - 520	.010" - .014"
	27	260 - 520	.010" - .014"
	28	260 - 520	.010" - .014"
	29		
	30		
S	31	70 - 160	.003" - .005"
	32	70 - 160	.003" - .005"
	33	70 - 160	.003" - .005"
	34	70 - 160	.003" - .005"
	35	70 - 160	.003" - .005"
	36	70 - 160	.004" - .006"
	37	70 - 160	.004" - .006"
H	38	70 - 160	.004" - .006"
	39	70 - 160	.004" - .006"
	40	70 - 160	.004" - .006"
	41	70 - 160	.004" - .006"

○=P ○=M ●=K ○=N ○=S ○=H

Z-Axis DOC to Spot Diameter Chart (FAK)

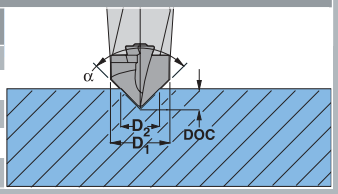
a Included Angle	D Spot Diameter .060	.090	.120	.150	.210	.270	.330	.390	.480	.570	.660	.750	.840
82°	.035	.052	.069	.086	.121	.155	.190	.224	.276	.328	.380	.431	-
90°	.030	.045	.060	.075	.105	.135	.165	.195	.240	.285	.330	.375	.420
118°	.018	.027	.036	.045	.063	.081	.099	.117	.144	.171	.198	-	-
135°	.012	.019	.025	.031	.043	.056	.068	.081	.099	.118	.137	-	-
144°	.010	.015	.019	.024	.034	.044	.054	.063	.078	.093	.107	-	-



*Z-axis DOC is measured to theoretical sharp corner.

Z-Axis DOC to Spot Diameter Chart (SPOT IN)

D_1 Cutter Dia. inch	mm	a Included Angle	D_2 Spot Diameter .060	.090	.120	.150	.200	.250	.310	.380	.470	.500	.560	.630
.630	16,0	90°	.030	.045	.060	.075	.100	.125	.155	.190	.235	.250	.280	.315
.630	16,0	140°	.011	.016	.022	.027	.036	.045	.056	.069	.086	.091	.102	.115
.472	12,0	90°	.030	.045	.060	.075	.100	.125	.155	.190	.235	-	-	-
.472	12,0	140°	.011	.016	.022	.027	.036	.045	.056	.069	.086	-	-	-



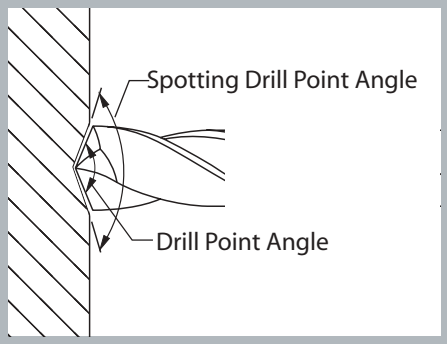
*Z-axis DOC is measured to theoretical sharp corner.

Insert Loading:

Insert loading is easy and fast. Simply insert the drill point into the special dovetail bayonet pocket. Then turn it to the locked position using the proper clamping wrench provided with each drill body.

SPOTTING DRILL RECOMMENDATIONS

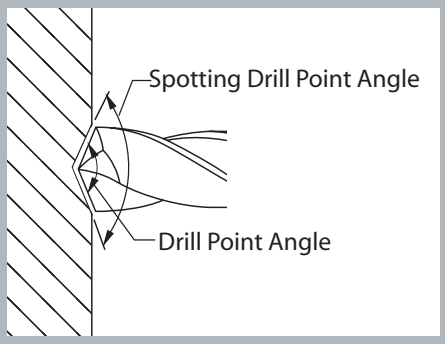
SPOTTING DRILL RECOMMENDATIONS FOR SOLID CARBIDE AND QWIK TWIST DRILLS



BEST

Spotting drill angle is greater than the drill point angle.

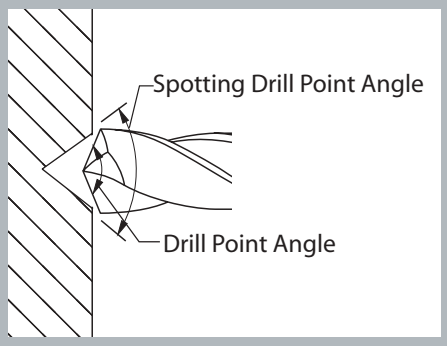
- First contact is at the drill point.
- Best drill centering possibility.
- Drill loading increases with penetration.



ACCEPTABLE

Spotting drill angle is the same as the drill point angle.

- Tool loading problems can occur due to immediate full engagement.
- Chatter may be a problem.
- Reduced feed at entry recommended.
- Good drill centering.



NOT RECOMMENDED WITH CARBIDE

Spotting drill angle is less than the drill point angle.

- Point contact along cutting lips or corner - drill point should contact spotted hole first..
- Chipping likely in these areas.

DR SOLID CARBIDE DRILLS OPERATING GUIDELINES

ISO	Material Number	Cutting Speed (SFM)	Feed (in/rev) ø.118 - ø.185	Feed (in/rev) ø.189 - ø.292	Feed (in/rev) ø.295 - ø.396	Feed (in/rev) ø.397 - ø.500
P	1	250 - 450	.002" - .006"	.003" - .007"	.005" - .010"	.006" - .012"
	2	250 - 450	.002" - .006"	.003" - .007"	.005" - .010"	.006" - .012"
	3	150 - 400	.002" - .004"	.003" - .005"	.005" - .008"	.006" - .010"
	4	150 - 400	.002" - .004"	.003" - .005"	.005" - .008"	.006" - .010"
	5	150 - 400	.002" - .004"	.003" - .005"	.005" - .008"	.006" - .010"
	6	120 - 250	.002" - .004"	.002" - .005"	.004" - .007"	.005" - .009"
	7	120 - 250	.002" - .004"	.002" - .005"	.004" - .007"	.005" - .009"
	8	120 - 250	.002" - .004"	.002" - .005"	.004" - .007"	.005" - .009"
	9	120 - 250	.002" - .004"	.002" - .005"	.004" - .007"	.005" - .009"
	10	100 - 240	.002" - .004"	.002" - .004"	.004" - .006"	.005" - .009"
	11	100 - 240	.002" - .004"	.002" - .004"	.004" - .006"	.005" - .009"
M	12	190 - 230	.002" - .004"	.002" - .004"	.003" - .006"	.005" - .008"
	13	160 - 200	.002" - .004"	.002" - .005"	.004" - .007"	.006" - .009"
	14	110 - 200	.002" - .004"	.002" - .004"	.003" - .006"	.005" - .008"
K	15	230 - 300	.005" - .008"	.007" - .011"	.009" - .015"	.012" - .020"
	16	230 - 300	.005" - .008"	.007" - .011"	.009" - .015"	.012" - .020"
	17	260 - 330	.006" - .010"	.008" - .013"	.011" - .017"	.013" - .024"
	18	260 - 330	.006" - .010"	.008" - .013"	.011" - .017"	.013" - .024"
	19	260 - 330	.006" - .010"	.008" - .013"	.011" - .017"	.013" - .024"
	20	260 - 330	.006" - .010	.008" - .013"	.011" - .017"	.013" - .024"
N	21	300 - 400	.004" - .010"	.007" - .014"	.009" - .017"	.012" - .020"
	22	300 - 400	.004" - .010"	.007" - .014"	.009" - .017"	.012" - .020"
	23	300 - 400	.004" - .010"	.007" - .014"	.009" - .017"	.012" - .020"
	24	300 - 400	.004" - .010	.007" - .014"	.009" - .017"	.012" - .020"
	25	300 - 400	.004" - .010"	.007" - .014"	.009" - .017"	.012" - .020"
	26	300 - 400	.003" - .007"	.007" - .014"	.009" - .017"	.012" - .020"
	27	300 - 400	.003" - .007"	.007" - .014"	.009" - .017"	.012" - .020"
	28	300 - 400	.003" - .007"	.007" - .014"	.009" - .017"	.012" - .020"
	29					
	30					
S	31	30 - 80	.001" - .003"	.002" - .003"	.003" - .004"	.004" - .005"
	32	30 - 80	.001" - .003"	.002" - .003"	.003" - .004"	.004" - .005"
	33	30 - 80	.001" - .003"	.002" - .003"	.003" - .004"	.004" - .005"
	34	30 - 80	.001" - .003"	.002" - .003"	.003" - .004"	.004" - .005"
	35	30 - 80	.001" - .003"	.002" - .003"	.003" - .004"	.004" - .005"
	36	70 - 140	.001" - .003"	.002" - .004"	.003" - .006"	.004" - .008"
	37	70 - 140	.001" - .003"	.002" - .004"	.003" - .006"	.004" - .008"
H	38	50 - 100	.001" - .002"	.001" - .003"	.001" - .003"	.002" - .004"
	39	50 - 100	.001" - .002"	.001" - .003"	.001" - .003"	.002" - .004"
	40	50 - 100	.001" - .002"	.001" - .003"	.001" - .003"	.002" - .004"
	41	50 - 100	.001" - .002"	.001" - .003"	.001" - .003"	.002" - .004"

=P =M =K =N =S =H

QWIK TWIST™ REPLACEABLE POINT DRILLS OPERATING GUIDELINES

ISO	Material Number	Cutting Speed Vc sfm	Feed vs. Drill Diameter ipr					
			D=.268-.429	D=.433-.508	D=.512-.587	D=.591-.665	D=.669-.823	D=.827-1.020
P	1	160-430	.005-.008	.006-.010	.008-.012	.010-.014	.010-.018	.010-.018
	2	330-390						
	3	300-360						
	4	300-390						
	5	230-300						
	6	160-360	.005-.008	.006-.010	.008-.012	.010-.014	.012-.016	.012-.018
	7	230-360						
	8	200-300						
	9	130-230						
	10	160-260	.005-.008	.005-.009	.006-.010	.008-.011	.010-.013	.010-.014
	11	130-230						
M	12	70-160	.003-.006	.005-.009	.005-.006	.006-.008	.006-.009	.006-.011
	13							
	14							
K	15	300-460	.008-.012	.010-.014	.012-.016	.014-.018	.016-.020	.016-.024
	16	260-430						
	17	330-590						
	18	300-520						
	19							
	20							
N	21	300-520	.008-.014	.010-.016	.012-.018	.014-.018	.016-.024	.016-.026
	22							
	23							
	24							
	25	260-390						
	26	300-520						
	27							
	28							
	29							
	30							
S	31	100-160	.002-.004	.003-.005	.004-.006	.005-.007	.005-.008	.005-.009
	32	70-130						
	33							
	34							
	35							
	36	70-160	.002-.005	.004-.006	.005-.007	.006-.008	.006-.009	.006-.010
	37							
H	38	70-160	.002-.005	.004-.006	.005-.007	.006-.008	.006-.009	.006-.010
	39							
	40							
	41							

DRILL POINT REPLACEMENT INDICATIONS

1. Limit cutting edge wear to .008" to .012". (see Fig. 1)
2. Power consumption exceeds 125% of normal. (see Fig. 2)
3. Drilled hole diameter variation. (see Fig. 3)
4. Deterioration of surface finish of the drilled hole. (see Fig. 4)
5. Significant increase in noise or vibration. (see Fig. 5)

Fig. 1: Wear Limit

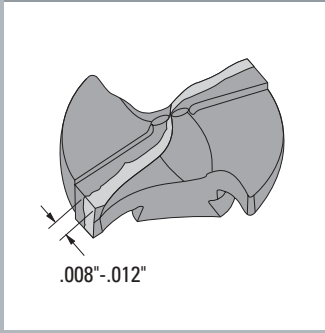


Fig. 2: Power Restriction

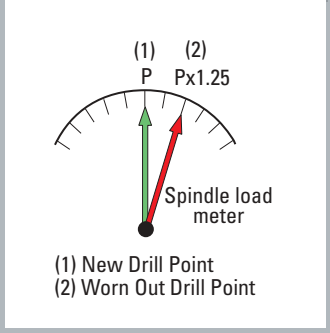


Fig. 3: Diameter Change

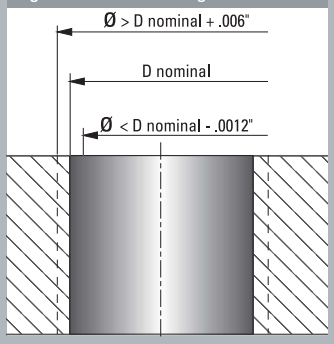


Fig. 4: Surface Finish Decline

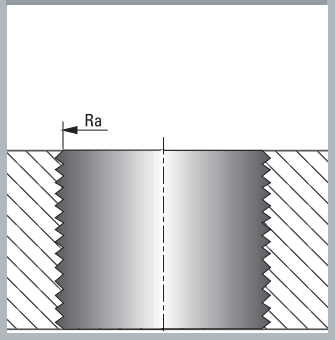
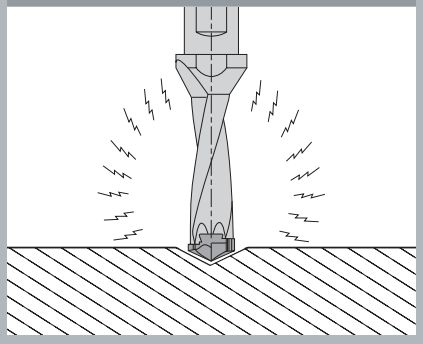
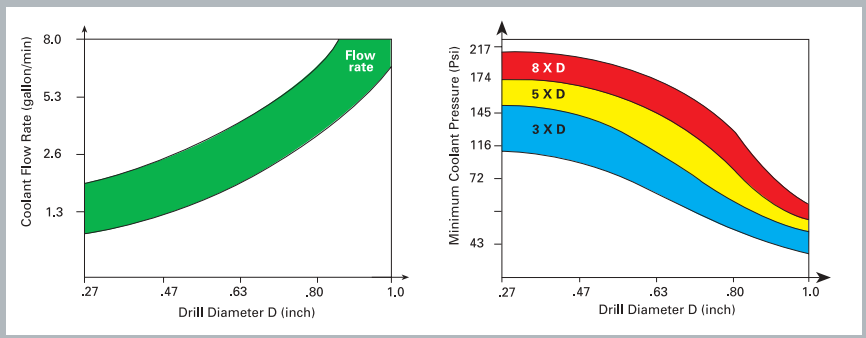


Fig. 5: Noise or vibration drastically increases



RECOMMENDED COOLANT PRESSURE AND FLOW RATE



For proper chip evacuation, the coolant must flow through the tool. If the machine is not equipped with coolant through the spindle, we recommend using a coolant inducer. External coolant supply can be used if the hole depth is less than 1xD and reduced cutting parameters are applied.

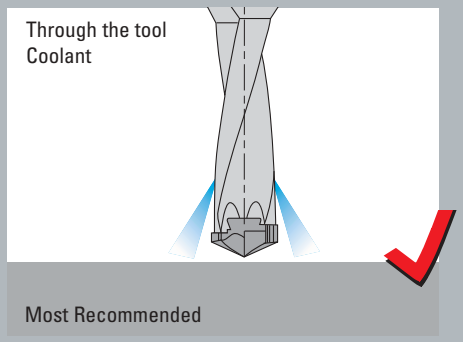
Coolant Mix

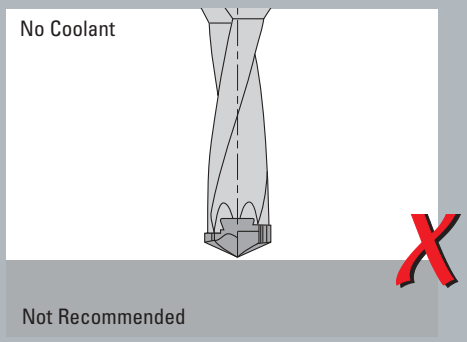
Recommended coolant concentration is 6% to 8%. When drilling stainless and high strength steels, a 10% concentration is recommended.

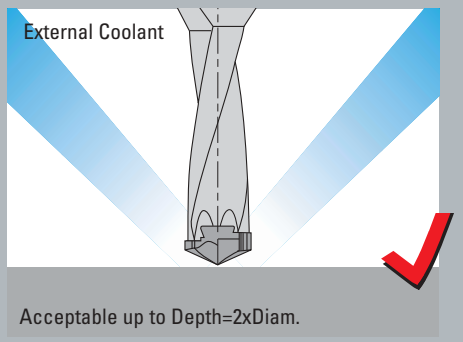
Dry Drilling

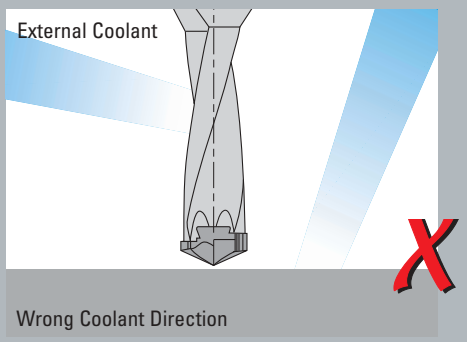
It is possible to drill without coolant in cast iron. oil mist through the drill is required (2xD max hole depth).

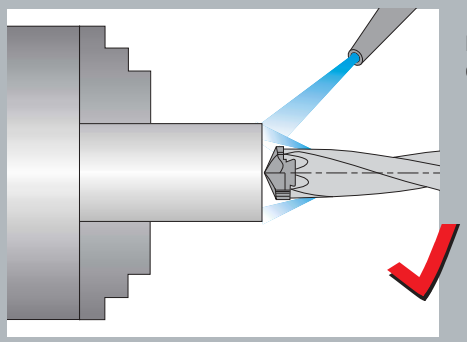
COOLANT





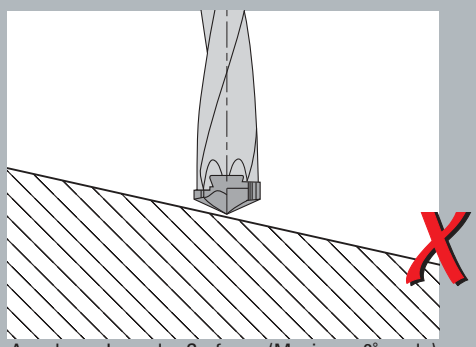




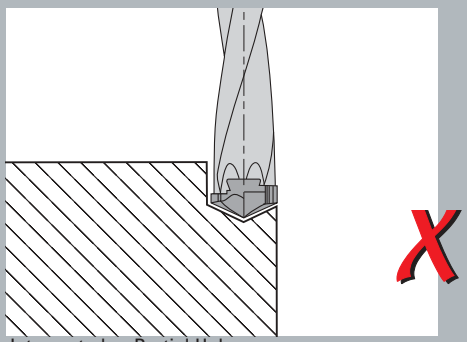


In stationary drill applications both through the tool and external coolant is recommended.

DRILLING LIMITATIONS



Angular or Irregular Surfaces (Maximum 6° angle)



Interrupted or Partial Holes

MOUNTING A DRILL POINT

Fig. 1

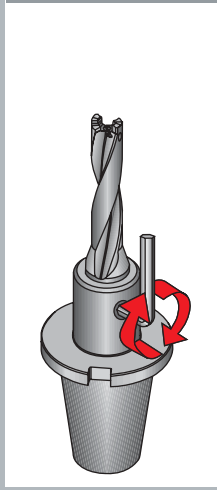


Fig. 2

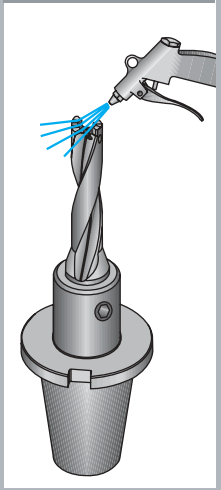


Fig. 3

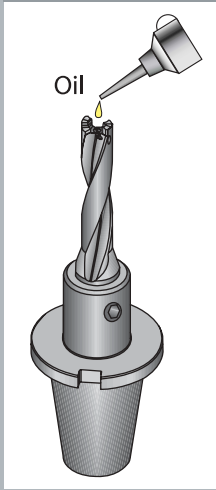


Fig. 4

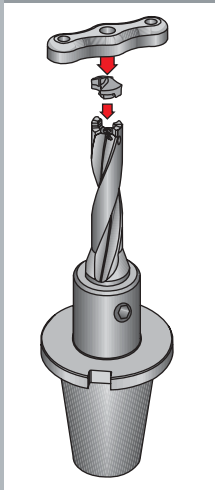
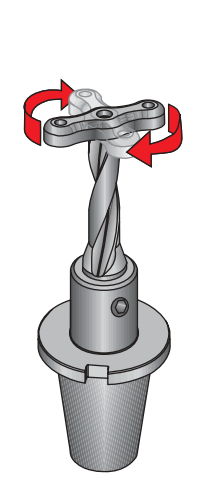
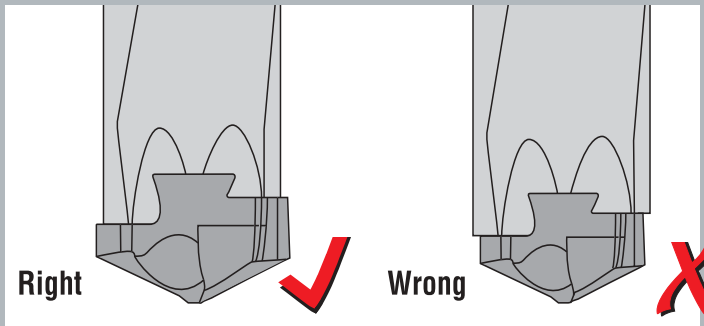


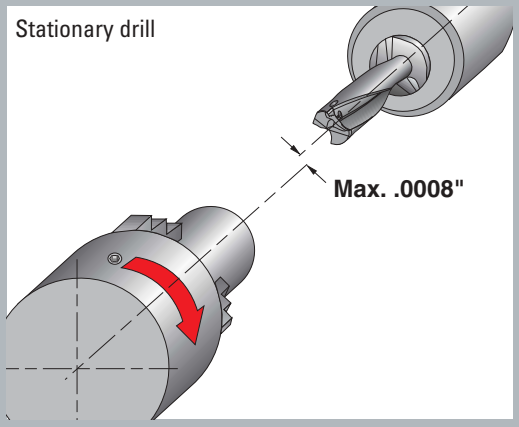
Fig. 5

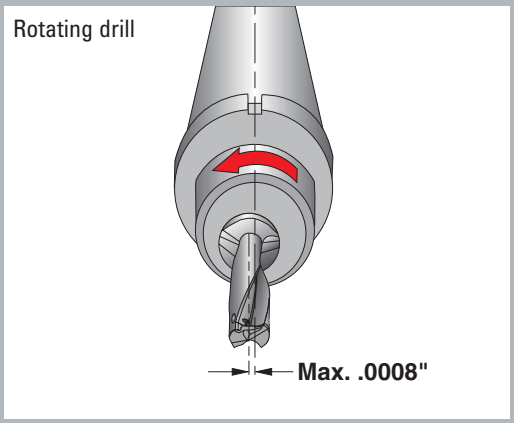




Check Drill Point Compatibility!
Drill points should always be larger than drill body.

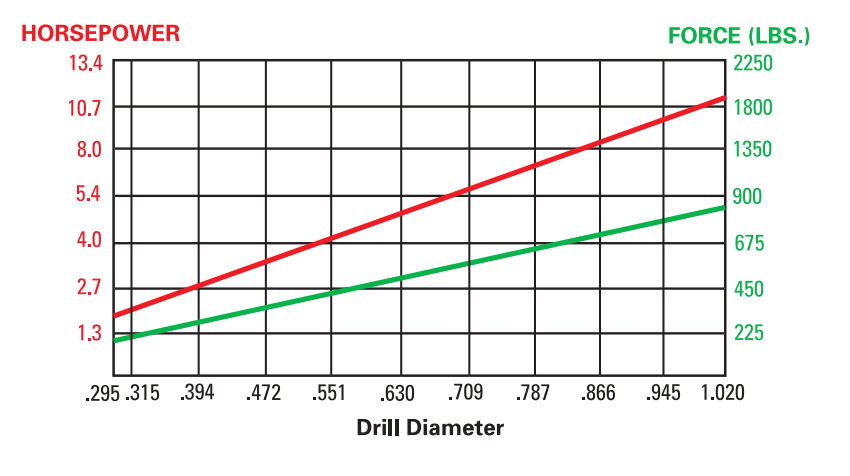
SET-UP: RUN-OUT TOLERANCE





QWIK•TWIST™ REPLACEABLE POINT DRILLS

POWER/FORCE REQUIREMENTS

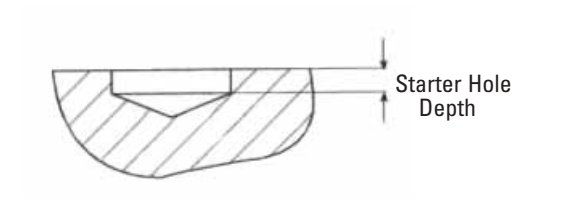


Material: SAE 4340
Speed: 330 SFM
Feed: .008 ipr

Values change according to different materials and drilling conditions.

QWIK•TWIST 8:1 DRILLS

- In case of stationary applications- on lathes- a high degree of radial and angular alignment between the chuck and the turret is required.
- The recommended cutting parameters for 8:1 drills is 20% lower than the cutting speeds used for the 3:1 and 5:1 drills.



Starter Hole Guide

Hole Diameter Range		Drill Body Number 8:1	Starter Hole Depth	Starter Hole Body Number 3:1
.3937	.4291	YD1000080C0R01	.20	YD1000030C0R01
.4331	.4685	YD1100088C0R01	.20	YD1100033C0R01
.4724	.5079	YD1200096C0R01	.20	YD1200036C0R01
.5118	.5472	YD1300104C0R01	.20	YD1300039C0R01
.5512	.5866	YD1400112C0R01	.20	YD1400042C0R01
.5906	.6260	YD150012018R01	.20	YD150004518R01
.6299	.6654	YD160012818R01	.20	YD160004818R01
.6693	.7047	YD170013618R01	.20	YD170005118R01
.7087	.7441	YD1800144C8R01	.20	YD1800054C8R01
.7480	.7835	YD1900152C8R01	.20	YD1900057C8R01
.7874	.8228	YD2000160C8R01	.20	YD2000060C8R01
.8268	.8622	YD2100168C8R01	.20	YD2100063C8R01
.8661	.9016	YD2200176C8R01	.20	YD2200066C8R01
.9055	.9409	YD2300184C8R01	.20	YD2300069C8R01
.9449	.9803	YD2400192C8R01	.20	YD2400072C8R01
.9843	1.0197	YD2500200C8R01	.20	YD2500075C8R01

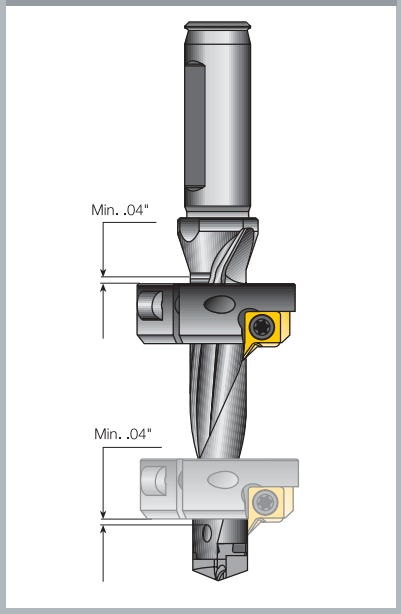
We strongly recommend the use of a 3:1 Qwik•Twist drill of the same diameter to drill a centering starter hole. The use of a centering starter hole improves hole location, accuracy, roundness, straightness and surface finish.

DRILLING AND CHAMFERING IN ONE OPERATION

Mounting Instructions:

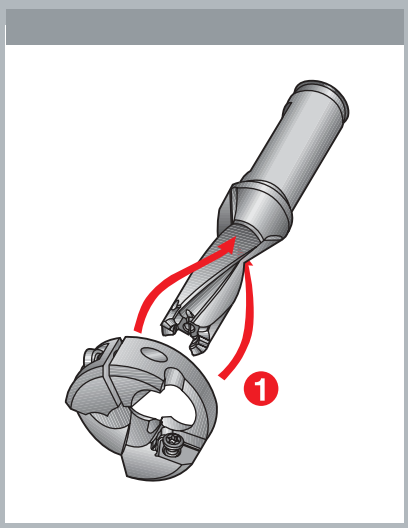
1. Insert the Chamfer Ring on the drill body and slide to the desired position [1].
2. Rotate the ring clockwise until the stopper engages the flute edge.
3. Tighten the ring clamp screw according to the maximum tightening torque indicated in the table below.
4. Mount the chamfer insert. (Torque 35 in. lbs.).
5. Mount the Qwik•Twist Drill Point..

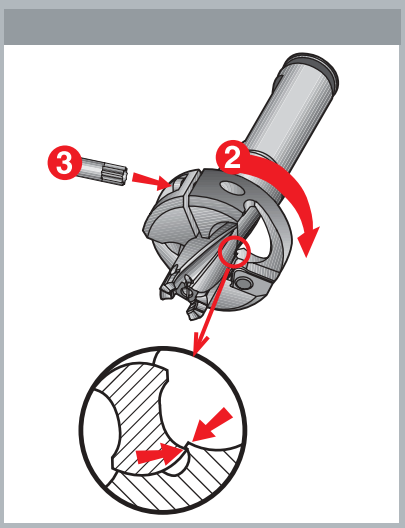
[1] Mount the ring on the drill body subject to the limitations shown in the drawing to the right and the position possibilities in the table "Chamfer Ring Position Range" on the next page.

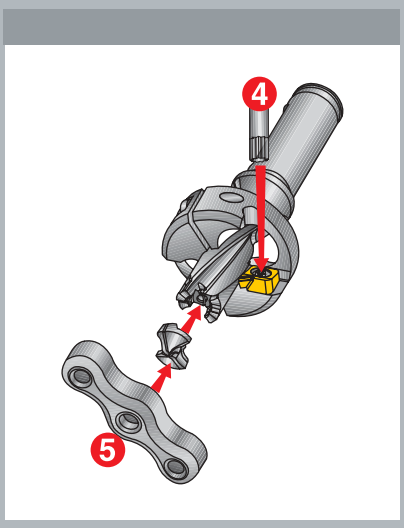


Maximum Tightening Torque- Ring Clamp Screw

Ring Number	Ring Clamp Screw	Torque
CB100-01 thru CB150-01	SD050-A5	62 in. lbs.
CB160-01 thru CB200-01	SD060-20	88 in. lbs.





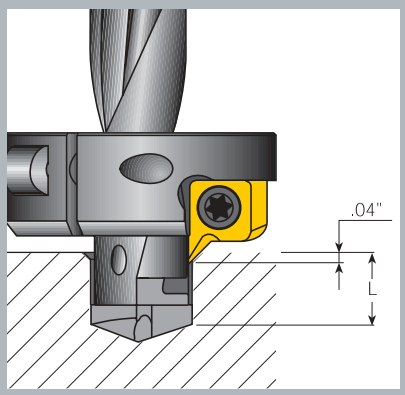


Before drilling insure that:

- There exists a very small gap beween the chamfer insert and the drill body, but without contact (i.e., chamfer insert should not be in contact with the drill body).
- The cutting edge point (45˚) is aligned with the flute edge.

QWIKTWIST™ CHAMFER RINGS

Chamfer Ring Position Range			
Drill Diameter	Drill Body 3xD L (min-max)	Drill Body 5xD L (min-max)	Maximum Chamfer Size
.394	.31-.63	.59-1.42	
.413	.31-.71	.67-1.54	
.433	.31-.75	.71-1.61	
.453	.31-.83	.79-1.73	
.472	.31-.87	.83-1.81	
.492	.31-.94	.91-1.93	.06
.512	.31-.98	.94-2.01	
.531	.31-1.06	1.02-2.13	
.551	.35-1.14	1.10-2.24	
.571	.35-1.22	1.18-2.36	
.591	.35-1.18	1.14-2.36	
.630	.35-1.30	1.26-2.56	
.699	.43-1.38	1.34-2.72	
.709	.43-1.50	1.46-2.91	.08
.748	.43-1.65	1.61-3.15	
.787	.43-1.77	1.73-3.35	

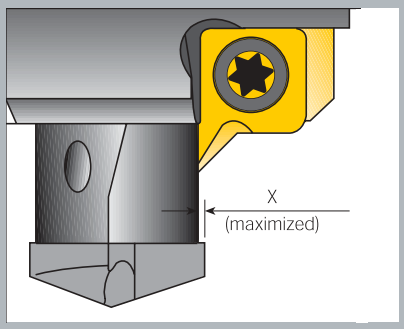


The "L" dimension shown is for a .04" chamfer.
For other sizes, adjust "L" accordingly.

User Guide

Recommendation for better stability:

- Use 3xD drill instead of 5xD, if possible.
- Mount the ring as close as possible to the drill shank.
- In order to get better chamfer insert life, it is suggested to apply coolant to the chamfer insert in addition to the through the drill coolant and/or external coolant..
- A wider difference "X" between the drill body and the replaceable point size is preferred (i.e., for .575" replaceable point select .551" drill body rather than .571"). A slightly larger "X" dimension can dramatically increase the chamfer insert life.



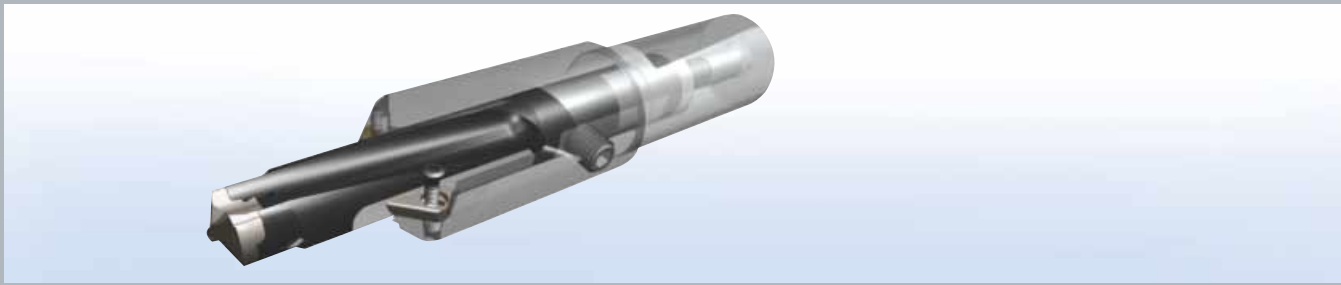
Trouble Shooting

- Bad chamfer surface finish (vibrations)

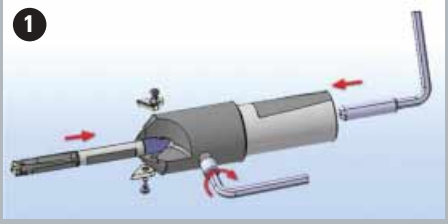
  Solutions:
  - Use a shorter drill.
  - Move the ring closer to the drill shank.
  - Reduce the cutting speed while cutting th chamfer.

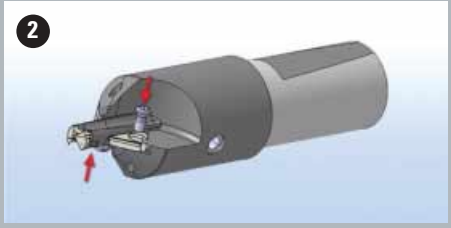
- Chips packed on the ring flutes:
  - Ensure that the ring is positioned as shown in the mounting instructions.
  - Adjust the cutting speed.
  - Use a pecking cycle.

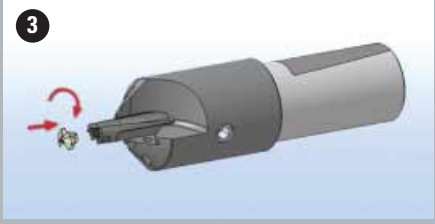
CONSTRUCTION



CHAMFER SHANK / SLIP FIT DRILL INITIAL SET-UP

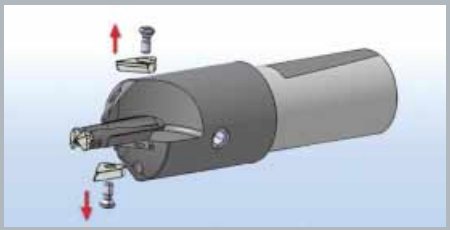


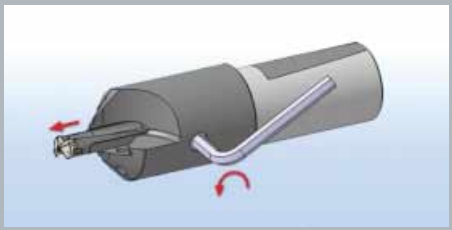


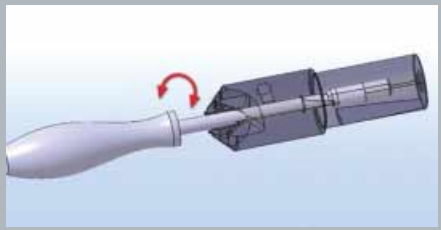


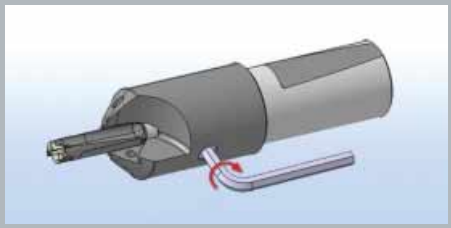
1. Unscrew the Chamfer Shank side lock screw, the chamfer insert screws, and remove inserts. Insert the proper Slip Fit Drill into the Chamfer Shank and position it against the rear adjusting screw. Slightly tighten the side lock screw for initial tension with the Slip Fit Drill.
2. In order to achieve symmetrical positioning of the chamfering inserts and to avoid edge damage, tighten the insert screws gradually and alternately from side to side insuring the inserts are tightly clamped against the side walls of the peripheral guiding surfaces. Tighten the side lock screw.
3. Install the proper size Qwik Twist Drill point on the Slip Fit Drill.

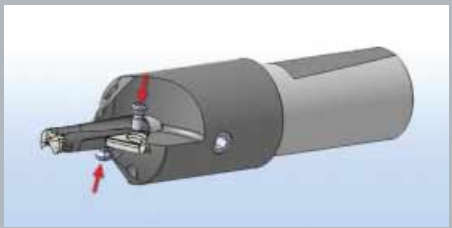
DRILL DEPTH ADJUSTMENT ADJUSTMENT











1. Remove Chamfer inserts.
2. Loosen the side lock screw and remove the Slip Fit Drill.
3. Adjust the rear adjusting screw with a flat point screw driver.
4. Insert Slip Fit Drill and slightly tighten the side lock screw.
5. Re-install Chamfer Inserts as per Initial Set-up Instructions #2. Tighten side lock screw.

GENERAL APPLICATION INFORMATION

QuadDrills are One-Effective. Indexable drills are one-effective cutting geometry regardless of the number of inserts in the tool. This is extremely important when establishing feeds and speeds for a given operation.

Rigidity. A high degree of rigidity of the machine and fixturing is critical for indexable drilling.

Spindle Rigidity. If the spindle is not tight or properly adjusted, the drill will cut off-center, producing oversize holes. Insert chipping or low tool life may also result and hole finish will be affected.

Fixture Rigidity. Workpiece strength is essential. Flimsy or inadequately supported workpieces will render indexable drills virtually ineffective.

Chip Control. Chip control is essential for indexable drilling. Proper chip control directly enhances chip evacuation, which extends tool life and improves hole tolerance and finish (see Fig. 2).

Large, long chips will restrict the flutes' capacity to evacuate chips, and cause insert chipping and possible drill failure.

Operating parameters should be adjusted to fall within recommended guidelines to achieve optimum form or figure"9" chips that can successfully evacuate along the drill flutes.

Coolant. In drilling, heat and chips are generated in a confined area at the bottom of the hole. Coolant must be used as a carrier to extract heat and chips from the bottom of the hole, along the drill flutes and out of the hole.

Through the tool water base or synthetic coolant is strongly recommended.

Do not operate indexable drills over 1:1 diameter to length ratios with air, air mist or dry. Running drills under those conditions can result in drill failure.

Fig. 2: Chip Formation

Optimum form

Too tight: Increase speed within recommended limit. If unsatisfactory, decrease feed.

Too long: May clog drill flutes. Reduce speed or increase feed within recommended limits.

QUAD DRILL™ / QUAD DRILL+™ OPERATING GUIDELINES

Recommendations are starting parameters only and can be effected by cutting conditions such as spindal and fixture rigidity. Minimum 150 psi coolant through the tool is required for proper drill performance. If not possible, then cutting parameters may have to be reduced. Start at the midpoint of the range and adjust the cutting parameters according to your cutting conditions.

For drills that are 4:1 length to diameter ratio, it may be necessary to reduce your feed by 40% for the first .06" of drilling depth. Then increase to full feed rate for the remainder of the cut.

ISO	Material Number	Cutting Speed (SFM)	Feed (in/rev) ø.500 - ø.594	Feed (in/rev) ø.625 - ø.813	Feed (in/rev) ø.843 - ø1.063	Feed (in/rev) ø1.094 - ø1.312	Feed (in/rev) ø1.343 - ø1.625
P	1	800 - 1000	.002" - .004"	.0025" - .004"	.0025" - .005"	.003" - .005"	.003" - .006"
	2	800 - 1000	.002" - .004"	.0025" - .004"	.0025" - .005"	.003" - .005"	.003" - .006"
	3	500 - 800	.002" - .004"	.003" - .006"	.004" - .007"	.005" - .0085"	.005" - .0095"
	4	800 - 1000	.002" - .004"	.003" - .006"	.004" - .007"	.005" - .0085"	.005" - .0095"
	5	600 - 800	.002" - .004"	.003" - .006"	.004" - .007"	.005" - .0085"	.005" - .0095"
	6	500 - 800	.002" - .004"	.003" - .0055"	.004" - .007"	.005" - .0085"	.005" - .009"
	7	400 - 700	.002" - .005"	.003" - .006"	.004" - .007"	.005" - .008"	.006" - .009"
	8	400 - 600	.002" - .005"	.003" - .006"	.004" - .007"	.005" - .008"	.006" - .009"
	9	300 - 550	.002" - .005"	.003" - .006"	.004" - .007"	.005" - .008"	.006" - .009"
	10	400 - 600	.002" - .005"	.003" - .006"	.004" - .007"	.005" - .008"	.006" - .009"
	11	400 - 550	.002" - .005"	.003" - .006"	.004" - .008"	.005" - .009"	.006" - .0095"
M	12	550 - 800	.002" - .004"	.003" - .006"	.003" - .006"	.0035" - .0065"	.004" - .007"
	13	500 - 700	.002" - .004"	.003" - .006"	.003" - .006"	.0035" - .0065"	.004" - .007"
	14	500 - 700	.002" - .004"	.003" - .006"	.003" - .006"	.0035" - .0065"	.004" - .007"
K	15	500 - 800	.002" - .004"	.003" - .0065"	.005" - .008"	.006" - .010"	.006" - .011"
	16	500 - 800	.002" - .004"	.003" - .0065"	.005" - .008"	.006" - .010"	.006" - .011"
	17	600 - 800	.002" - .004"	.003" - .0065"	.005" - .008"	.006" - .010"	.006" - .011"
	18	600 - 800	.002" - .004"	.003" - .0065"	.005" - .008"	.006" - .010"	.006" - .011"
	19	600 - 800	.002" - .004"	.003" - .0065"	.005" - .008"	.006" - .010"	.006" - .011"
	20	500 - 700	.002" - .004"	.003" - .0065"	.005" - .008"	.006" - .010"	.006" - .011"
N	21	1300 - 2000	.002" - .005"	.003" - .006"	.004" - .008"	.005" - .009"	.0055" - .009"
	22	1000 - 1300	.002" - .005"	.003" - .006"	.004" - .008"	.005" - .009"	.0055" - .009"
	23	1300 - 2000	.002" - .005"	.003" - .006"	.004" - .008"	.005" - .009"	.0055" - .009"
	24	1000 - 1300	.002" - .005"	.003" - .006"	.004" - .008"	.005" - .009"	.0055" - .009"
	25	1000 - 1300	.002" - .005"	.003" - .006"	.004" - .008"	.005" - .009"	.0055" - .009"
	26	800 - 1000	.002" - .005"	.003" - .006"	.004" - .008"	.005" - .009"	.0055" - .009"
	27	750 - 900	.002" - .005"	.003" - .006"	.004" - .008"	.005" - .009"	.0055" - .009"
	28	800 - 1000	.002" - .005"	.003" - .006"	.004" - .008"	.005" - .009"	.0055" - .009"
	29						
	30						
S	31	100 - 250	.002" - .004"	.0025" - .0055"	.003" - .007"	.004" - .0085"	.0055" - .009"
	32	100 - 250	.002" - .004"	.0025" - .0055"	.003" - .007"	.004" - .0085"	.0055" - .009"
	33	100 - 250	.002" - .004"	.0025" - .0055"	.003" - .007"	.004" - .0085"	.0055" - .009"
	34	100 - 250	.002" - .004"	.0025" - .0055"	.003" - .007"	.004" - .0085"	.0055" - .009"
	35	100 - 250	.002" - .004"	.0025" - .0055"	.003" - .007"	.004" - .0085"	.0055" - .009"
	36	100 - 250	.002" - .004"	.0025" - .0055"	.003" - .007"	.004" - .0085"	.0055" - .009"
	37	100 - 200	.002" - .004"	.0025" - .0055"	.003" - .007"	.004" - .0085"	.0055" - .009"
H	38	50 - 150	.001" - .002"	.001" - .002"	.001" - .003"	.002" - .003"	.002" - .003"
	39	50 - 150	.001" - .002"	.001" - .002"	.001" - .003"	.002" - .003"	.002" - .003"
	40	50 - 150	.001" - .002"	.001" - .002"	.001" - .003"	.002" - .003"	.002" - .003"
	41	50 - 150	.001" - .002"	.001" - .002"	.001" - .003"	.002" - .003"	.002" - .003"

●=P ●=M ●=K ●=N ●=S ○=H

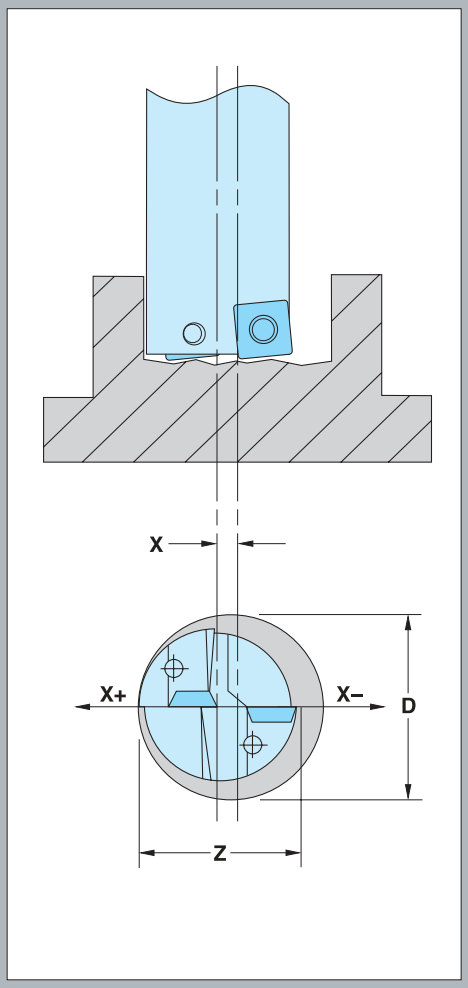
Feed (in/rev) ø1.687 - ø2.000	Feed (in/rev) ø2.125	Feed (in/rev) ø2.250 - ø2.750	Feed (in/rev) ø2.875 - ø3.000	Feed (in/rev) ø3.250
.0035" - .0065"	.003" - .006"	.0035" - .006"	.0035" - .007"	.004" - .008"
.0035" - .0065"	.003" - .006"	.0035" - .006"	.0035" - .007"	.004" - .008"
.005" - .010"	.005" - .0085"	.006" - .010"	.006" - .0115"	.006" - .012"
.005" - .010"	.005" - .0085"	.006" - .010"	.006" - .0115"	.006" - .012"
.005" - .010"	.005" - .0085"	.006" - .010"	.006" - .0115"	.006" - .012"
.005" - .0095"	.005" - .0085"	.006" - .010"	.006" - .011"	.006" - .0115"
.0065" - .010"	.005" - .0085"	.006" - .0095"	.007" - .011"	.008" - .012"
.0065" - .010"	.005" - .0085"	.006" - .0095"	.007" - .011"	.008" - .012"
.0065" - .010"	.005" - .0085"	.006" - .0095"	.007" - .011"	.008" - .012"
.0065" - .010"	.005" - .0085"	.006" - .0095"	.007" - .011"	.008" - .012"
.0065" - .010"	.005" - .0095"	.006" - .011"	.007" - .0115"	.008" - .012"
.0045" - .0075"	.0035" - .007"	.004" - .008"	.005" - .0085"	.0055" - .009"
.0045" - .0075"	.0035" - .007"	.004" - .008"	.005" - .0085"	.0055" - .009"
.0045" - .0075"	.0035" - .007"	.004" - .008"	.005" - .0085"	.0055" - .009"
.007" - .012"	.006" - .0095"	.007" - .012"	.007" - .013"	.0085" - .014"
.007" - .012"	.006" - .0095"	.007" - .012"	.007" - .013"	.0085" - .014"
.007" - .012"	.006" - .0095"	.007" - .012"	.007" - .013"	.0085" - .014"
.007" - .012"	.006" - .0095"	.007" - .012"	.007" - .013"	.0085" - .014"
.007" - .012"	.006" - .0095"	.007" - .012"	.007" - .013"	.0085" - .014"
.007" - .012"	.006" - .0095"	.007" - .012"	.007" - .013"	.0085" - .014"
.006" - .010"	.005" - .0095"	.006" - .011"	.0065" - .011"	.007" - .012"
.006" - .010"	.005" - .0095"	.006" - .011"	.0065" - .011"	.007" - .012"
.006" - .010"	.005" - .0095"	.006" - .011"	.0065" - .011"	.007" - .012"
.006" - .010"	.005" - .0095"	.006" - .011"	.0065" - .011"	.007" - .012"
.006" - .010"	.005" - .0095"	.006" - .011"	.0065" - .011"	.007" - .012"
.006" - .010"	.005" - .0095"	.006" - .011"	.0065" - .011"	.007" - .012"
.006" - .010"	.005" - .0095"	.006" - .011"	.0065" - .011"	.007" - .012"
.006" - .010"	.005" - .0095"	.006" - .011"	.0065" - .011"	.007" - .012"
.006" - .0095"	.0035" - .0085"	.005" - .010"	.006" - .011"	.007" - .0115"
.006" - .0095"	.0035" - .0085"	.005" - .010"	.006" - .011"	.007" - .0115"
.006" - .0095"	.0035" - .0085"	.005" - .010"	.006" - .011"	.007" - .0115"
.006" - .0095"	.0035" - .0085"	.005" - .010"	.006" - .011"	.007" - .0115"
.006" - .0095"	.0035" - .0085"	.005" - .010"	.006" - .011"	.007" - .0115"
.006" - .0095"	.0035" - .0085"	.005" - .010"	.006" - .011"	.007" - .0115"
.006" - .0095"	.0035" - .0085"	.005" - .010"	.006" - .011"	.007" - .0115"
.002" - .004"	.001" - .0035"	.0025" - .0035"	.0025" - .0035"	.0025" - .0045"
.002" - .004"	.001" - .0035"	.0025" - .0035"	.0025" - .0035"	.0025" - .0045"
.002" - .004"	.001" - .0035"	.0025" - .0035"	.0025" - .0035"	.0025" - .0045"
.002" - .004"	.001" - .0035	.0025" - .0035"	.0025" - .0035"	.0025" - .0045"

OFFSETTING ROTATING INDEXABLE DRILLS

Offsetting indexable drills in a positive direction has proven to be beneficial in several ways. Reports indicate that it improves chip evacuation when applied to machines with inadequate coolant.

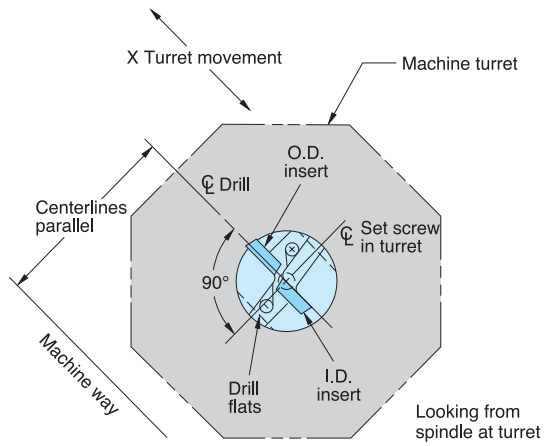
Offsetting can reduce chatter and noticeably improve surface finish when cutting materials like 316 stainless steel. It also allows drilling a full range of hole diameters with a minimum of drill sizes.

A complete list of "Maximum Offset" dimensions for each standard drill size is shown here. Remember, only 2:1 and 3:1 L/D ratio drills are recommended for this type of work because of their rigidity.

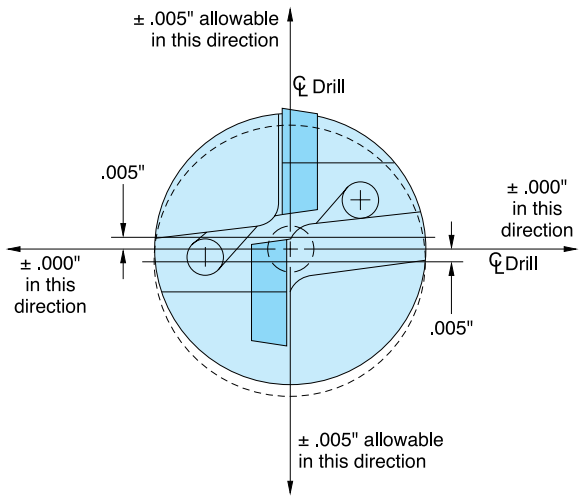


Z Drill Diameter	X Max. Radial Offset	Max. offset Dia.
.500	.010	.520
.531	.010	.551
.563	.010	.583
.594	.010	.614
.625	.020	.665
.657	.020	.697
.688	.020	.728
.719	.020	.759
.750	.020	.790
.781	.020	.821
.813	.010	.833
.844	.020	.884
.875	.020	.915
.906	.020	.946
.938	.020	.978
.969	.020	1.009
1.000	.010	1.020
1.031	.010	1.051
1.063	.010	1.083
1.094	.020	1.134
1.125	.020	1.165
1.156	.020	1.196
1.187	.020	1.227
1.219	.010	1.239
1.250	.010	1.270
1.281	.010	1.301
1.312	.010	1.332
1.343	.020	1.383
1.375	.020	1.415
1.406	.020	1.446
1.437	.020	1.477
1.468	.020	1.508
1.500	.020	1.540
1.531	.020	1.571
1.562	.010	1.582
1.594	.010	1.614
1.625	.010	1.645
1.687	.020	1.727
1.719	.020	1.759
1.750	.020	1.790
1.781	.020	1.821
1.813	.020	1.853
1.875	.010	1.895
1.937	.010	1.957
1.969	0.00 - no offset possible	
2.000	0.00 - no offset possible	
2.125	.010	2.145
2.250	.040	2.330
2.375	.015	2.405
2.500	.015	2.530
2.625	.015	2.655
2.750	0.00 - no offset possible	
2.875	.020	2.915
3.000	.015	3.030
3.250	.060	3.370

STATIONARY DRILLING



When setting up an indexable drill, it is always a good idea to locate the drill in the turret in an attitude that puts the inserts parallel to the machine ways. Most lathes have more than one set of screws in the turret that allows this.



When using drills on the lathe, the drills must be properly aligned prior to taking the first cut. Plus, periodic alignment checks must be made to insure the continued accuracy of the setup.

DRILLING CONDITIONS

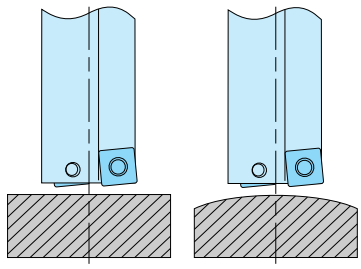
Common drilling applications with flat or convex surfaces generally require no speed or feed adjustment during the drilling cycle.

Special situations however, may necessitate temporary adjustments. In the examples below, reductions to feed and/or speed may be required to minimize deflection or tool wear.

Material surface conditions such as case hardening or scale may require slowing penetration to some degree. Interior conditions such as porosity, sandy castings, etc., also have some effect on tool life. Operating parameters may have to be adjusted accordingly.

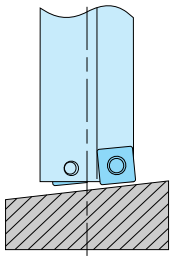
Feedrates on 4:1 drills may need to be reduced even more than the recommendations below indicate. Generally, this reduced feedrate is required until the first .200" DOC after full engagement is reached.

Most Common Conditions

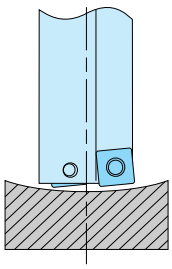


Flat **Convex**

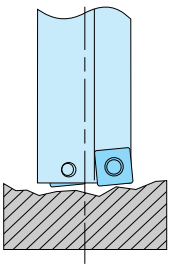
Less Common Conditions



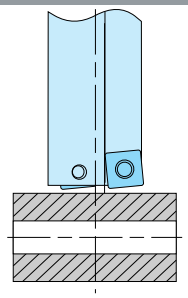
Sloped: If slope exceeds 5°, reduce feed by 50% during penetration.



Concave: Reduce feed by 60% during penetration.



Irregular: Reduce speed during penetration.



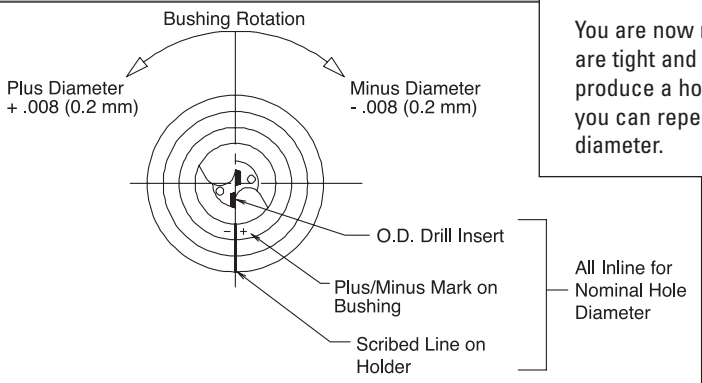
Interrupted: Reduce feed when crossing and before penetration.

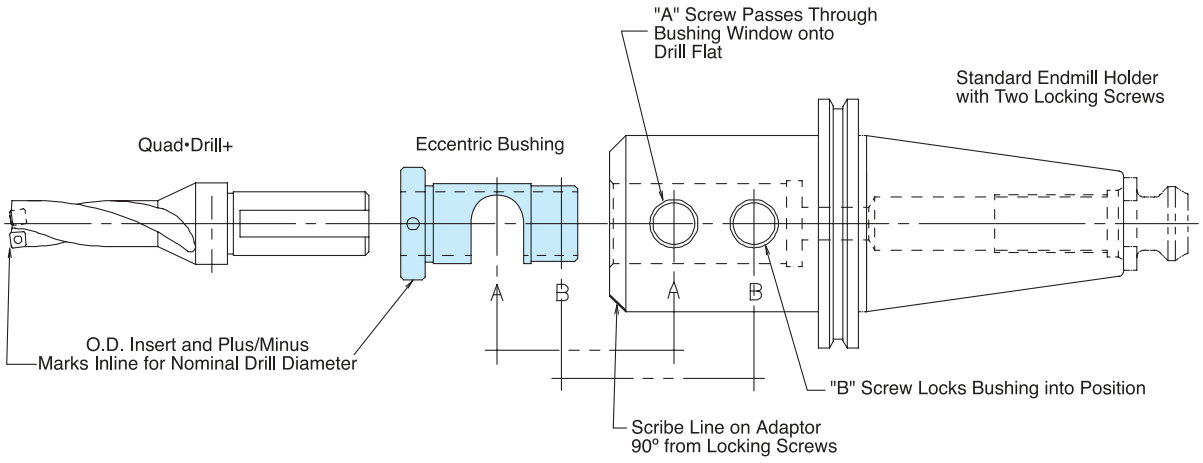
ASSEMBLY. SET-UP AND ADJUCTMENT PROCEDURES

Recommend using Weldon style end mill adapter that uses two side locking screws.

1. Scribe line on front face of adapter exactly 90 degrees from locking screws.
2. Load eccentric bushing over drill shank and into adapter lining up the scribed line on adapter and bushing.
3. Before locking the set screws in adapter, line up OD insert in drill with both scribed lines on the bushing and adapter. The drill in this position will drill a nominal (drill size) hole diameter.
4. With the drill and bushing loaded into the adapter and the OD insert in line with the scribed lines, apply the rear set screw (B) in adapter locking the bushing in place. Use only hand pressure to tighten the screw. Applying the set screw to the bushing provides positive axial retention of the bushing and hand tightening allows radial adjustment.
5. Rotate the bushing either plus or minus to desired position then lock the (B) set screw using a wrench. This will lock the radial position setting in preparation for drilling.
6. Lock the front (A) set screw in the adapter using a wrench to lock the drill into the holder.

You are now ready to drill. Please check to make sure all screws are tight and assembly is rigid before drilling. Once you produce a hole with the current setting and inspect the diameter, you can repeat procedures #5 & 6 if required to achieve desired diameter.





QUADOBORE™ 15S OPERATING GUIDELINES

ISO	Material Number	Cutting Speed (SFM)	Feed (in/rev) E.500 - E.750	Feed (in/rev) E1.000	Feed (in/rev) E.813 - E1.500	Feed (in/rev) E1.625 - E2.000	Insert Grade*
P	1	500 - 1000	.002" - .006"	.004" - .007"	.005" - .008"	.006" - .010"	
	2	500 - 1000	.002" - .006"	.004" - .007"	.005" - .008"	.006" - .010"	
	3	400 - 900	.002" - .006"	.003" - .006"	.004" - .007"	.005" - .0085"	IN 2005
	4	700 - 900	.002" - .006"	.003" - .006"	.004" - .007"	.005" - .0085"	
	5	700 - 900	.002" - .006"	.003" - .006"	.004" - .007"	.005" - .0085"	
	6	500 - 800	.002" - .006"	.003" - .0055"	.004" - .007"	.005" - .0085"	IN 1030
	7	500 - 800	.002" - .005"	.003" - .006"	.004" - .007"	.005" - .008"	
	8	500 - 800	.002" - .005"	.003" - .006"	.004" - .007"	.005" - .008"	
	9	500 - 800	.002" - .005"	.003" - .006"	.004" - .007"	.005" - .008"	IN 6515
	10	350 - 550	.002" - .005"	.003" - .006"	.004" - .007"	.005" - .008"	
	11	350 - 550	.002" - .005"	.003" - .006"	.004" - .008"	.005" - .009"	
M	12	450 - 750	.002" - .005"	.004" - .006"	.007" - .009"	.008" - .010"	IN 2005
	13	375 - 600	.002" - .005"	.004" - .006"	.007" - .009"	.008" - .010"	
	14	375 - 600	.002" - .005"	.004" - .006"	.007" - .009"	.008" - .010"	IN 1030
K	15	500 - 800	.002" - .005"	.003" - .0065"	.004" - .007"	.005" - .008"	
	16	500 - 800	.002" - .005"	.003" - .0065"	.004" - .007"	.005" - .008"	IN 6515
	17	600 - 800	.002" - .005"	.003" - .0065"	.004" - .007"	.005" - .008"	
	18	600 - 800	.002" - .005"	.003" - .0065"	.004" - .007"	.005" - .008"	IN 2005
	19	600 - 800	.002" - .005"	.003" - .0065"	.004" - .007"	.005" - .008"	
	20	500 - 700	.002" - .005"	.003" - .0065"	.004" - .007"	.005" - .008"	IN 1030
N	21	1100 - 1800	.003" - .006"	.004" - .006"	.006" - .008"	.007" - .010"	
	22	800 - 1100	.003" - .006"	.004" - .006"	.006" - .008"	.007" - .010"	IN 30M
	23	1100 - 1800	.003" - .006"	.004" - .006"	.006" - .008"	.007" - .010"	
	24	800 - 1100	.003" - .006"	.004" - .006"	.006" - .008"	.007" - .010"	IN 1030
	25	800 - 1100	.003" - .006"	.004" - .006"	.006" - .008"	.007" - .010"	
	26	600 - 800	.003" - .006"	.004" - .006"	.006" - .008"	.007" - .010"	IN 2005
	27	550 - 700	.003" - .006"	.004" - .006"	.006" - .008"	.007" - .010"	
	28	600 - 800	.003" - .006"	.004" - .006"	.006" - .008"	.007" - .010"	IN 1030
	29						
	30						
S	31	100 - 250	.002" - .004"	.003" - .005"	.004" - .006"	.005" - .007"	
	32	100 - 250	.002" - .004"	.003" - .005"	.004" - .006"	.005" - .007"	IN 2005
	33	100 - 250	.002" - .004"	.003" - .005"	.004" - .006"	.005" - .007"	
	34	100 - 250	.002" - .004"	.003" - .005"	.004" - .006"	.005" - .007"	
	35	100 - 250	.002" - .004"	.003" - .005"	.004" - .006"	.005" - .007"	
	36	100 - 250	.002" - .004"	.003" - .005"	.004" - .006"	.005" - .007"	IN 1030
	37	100 - 200	.002" - .004"	.003" - .005"	.004" - .006"	.005" - .007"	
H	38	50 - 150	.001" - .002"	.001" - .002"	.001" - .003"	.002" - .003"	IN 6515
	39	50 - 150	.001" - .002"	.001" - .002"	.001" - .003"	.002" - .003"	
	40	50 - 150	.001" - .002"	.001" - .002"	.001" - .003"	.002" - .003"	IN 2005
	41	50 - 150	.001" - .002"	.001" - .002"	.001" - .003"	.002" - .003"	

○=P ○=M ●=K ○=N ○=S ○=H

QUADOBORE™ 15C OPERATING GUIDELINES

ISO	Material Number	Cutting Speed (SFM)	Feed (in/rev) E.438 - ø.719	Feed (in/rev) E.812	Feed (in/rev) E1.000 - ø1.500	Feed (in/rev) E1.750 - ø2.000	Insert Grade*
P	1	500 - 1000	.004" - .010"	.006" - .011"	.008" - .014"	.010" - .016"	
	2	500 - 1000	.004" - .010"	.006" - .011"	.008" - .014"	.010" - .016"	
	3	400 - 900	.004" - .010"	.004" - .011"	.007" - .012"	.010" - .017"	IN 2005
	4	700 - 900	.004" - .010"	.004" - .011"	.007" - .012"	.010" - .017"	
	5	700 - 900	.004" - .010"	.004" - .011"	.007" - .012"	.010" - .017"	
	6	500 - 800	.004" - .010"	.004" - .011"	.007" - .012"	.010" - .017"	IN 1030
	7	500 - 800	.004" - .009"	.004" - .011"	.007" - .012"	.009" - .015"	
	8	500 - 800	.004" - .009"	.004" - .011"	.007" - .012"	.009" - .015"	
	9	500 - 800	.004" - .009"	.004" - .011"	.007" - .012"	.009" - .015"	IN 6515
	10	350 - 550	.004" - .009"	.004" - .011"	.007" - .012"	.009" - .015"	
	11	350 - 550	.004" - .009"	.004" - .011"	.008" - .014"	.010" - .016"	
M	12	450 - 750	.004" - .009"	.006" - .010"	.012" - .016"	.014" - .018"	IN 2005
	13	375 - 600	.004" - .009"	.006" - .010"	.012" - .016"	.014" - .018"	
	14	375 - 600	.004" - .009"	.006" - .010"	.012" - .016"	.014" - .018"	IN 1030
K	15	500 - 800	.004" - .009"	.004" - .010"	.007" - .013"	.010" - .015"	
	16	500 - 800	.004" - .009"	.004" - .010"	.007" - .013"	.010" - .015"	IN 6515
	17	600 - 800	.004" - .009"	.004" - .010"	.007" - .013"	.010" - .015"	
	18	600 - 800	.004" - .009"	.004" - .010"	.007" - .013"	.010" - .015"	IN 2005
	19	600 - 800	.004" - .009"	.004" - .010"	.007" - .013"	.010" - .015"	
	20	500 - 700	.004" - .009"	.004" - .010"	.007" - .013"	.010" - .015"	IN 1030
N	21	1100 - 1800	.006" - .011"	.006" - .010"	.012" - .015"	.013" - .018"	
	22	800 - 1100	.006" - .011"	.006" - .010"	.012" - .015"	.013" - .018"	IN 30M
	23	1100 - 1800	.006" - .011"	.006" - .010"	.012" - .015"	.013" - .018"	
	24	800 - 1100	.006" - .011"	.006" - .010"	.012" - .015"	.013" - .018"	
	25	800 - 1100	.006" - .011"	.006" - .010"	.012" - .015"	.013" - .018"	IN 1030
	26	600 - 800	.006" - .011"	.006" - .010"	.012" - .015"	.013" - .018"	
	27	550 - 700	.006" - .011"	.006" - .010"	.012" - .015"	.013" - .018"	
	28	600 - 800	.006" - .011"	.006" - .010"	.012" - .015"	.013" - .018"	IN 1030
	29						
	30						
S	31	100 - 250	.004" - .007"	.004" - .008"	.007" - .011"	.009" - .013"	
	32	100 - 250	.004" - .007"	.004" - .008"	.007" - .011"	.009" - .013"	IN 2005
	33	100 - 250	.004" - .007"	.004" - .008"	.007" - .011"	.009" - .013"	
	34	100 - 250	.004" - .007"	.004" - .008"	.007" - .011"	.009" - .013"	
	35	100 - 250	.004" - .007"	.004" - .008"	.007" - .011"	.009" - .013"	
	36	100 - 250	.004" - .007"	.004" - .008"	.007" - .011"	.009" - .013"	IN 1030
	37	100 - 200	.004" - .007"	.004" - .008"	.007" - .011"	.009" - .013"	
H	38	50 - 150	.002" - .003"	.002" - .003"	.002" - .005"	.004" - .006"	IN 6515
	39	50 - 150	.002" - .003"	.002" - .003"	.002" - .005"	.004" - .006"	
	40	50 - 150	.002" - .003"	.002" - .003"	.002" - .005"	.004" - .006"	IN 2005
	41	50 - 150	.002" - .003"	.002" - .003"	.002" - .005"	.004" - .006"	

○=P ○=M ●=K ○=N ●=S ○=H

Ingersoll

GUN DRILL OPERATING GUIDELINES

ISO	Material Number	Cutting Speed (SFM) ø.078 - ø.197	Cutting Speed (SFM) ø.198 - ø.512	Cutting Speed (SFM) ø.513 - ø1.575
P	1	230 - 300	260 - 360	230 - 330
	2	230 - 300	260 - 360	230 - 330
	3	165 - 230	200 - 260	165 - 230
	4	230 - 300	260 - 360	230 - 330
	5	165 - 230	200 - 260	165 - 230
	6	200 - 260	230 - 300	200 - 260
	7	165 - 230	200 - 260	165 - 230
	8	165 - 230	200 - 260	165 - 230
	9	165 - 230	200 - 260	165 - 230
	10	165 - 230	200 - 260	165 - 230
	11	165 - 230	200 - 260	165 - 230
M	12	165 - 230	165 - 230	165 - 230
	13	165 - 230	165 - 230	165 - 230
	14	165 - 230	165 - 230	165 - 230
K	15	200 - 260	230 - 300	230 - 300
	16	200 - 260	230 - 300	230 - 300
	17	200 - 260	230 - 300	230 - 300
	18	200 - 260	230 - 300	230 - 300
	19	200 - 260	230 - 300	230 - 300
	20	200 - 260	230 - 300	230 - 300
N	21	230 - 590	330 - 1000	330 - 1000
	22	230 - 590	330 - 1000	330 - 1000
	23	230 - 590	330 - 1000	330 - 1000
	24	230 - 590	330 - 1000	330 - 1000
	25	230 - 590	330 - 1000	330 - 1000
	26	230 - 390	330 - 520	260 - 530
	27	230 - 390	330 - 520	260 - 530
	28	230 - 390	330 - 520	260 - 530
	29			
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GUN DRILL COOLANT AND OPERATING GUIDELINES

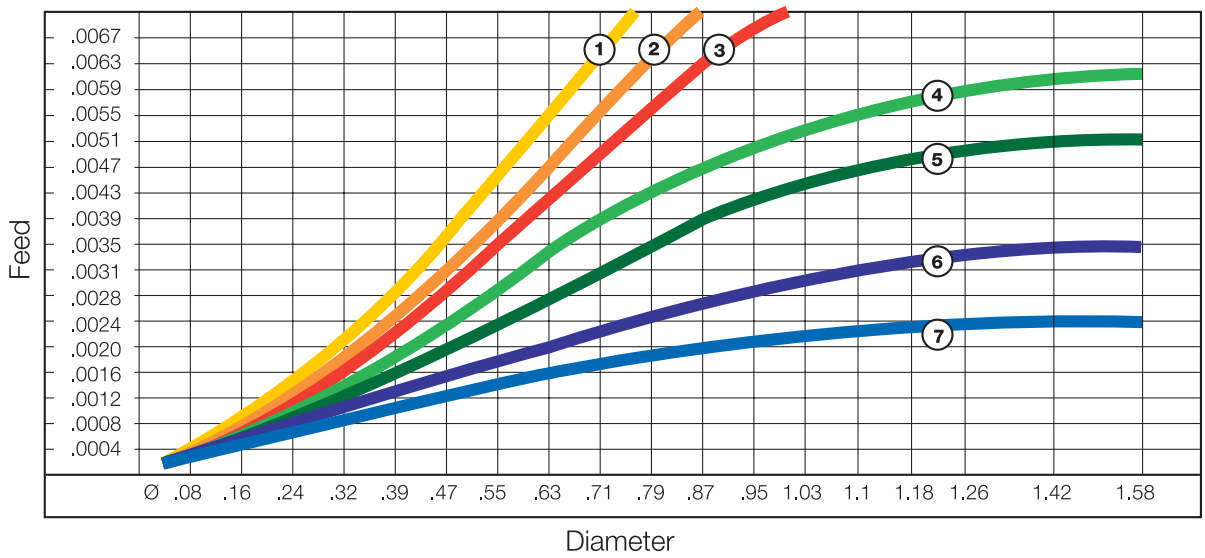
THE RIGHT COOLANT

Neat Oil
- Oil is preferred over water soluable coolant
- Most conventional gundrilling machines use oil
- Provides superior lubricity, better tool life and surface finish
- No worry about concentration levels
- Does not evaporate

Water Soluable
- Used on most CNC machines

<8% = unacceptable
10-12% = acceptable
12-15% = preferred

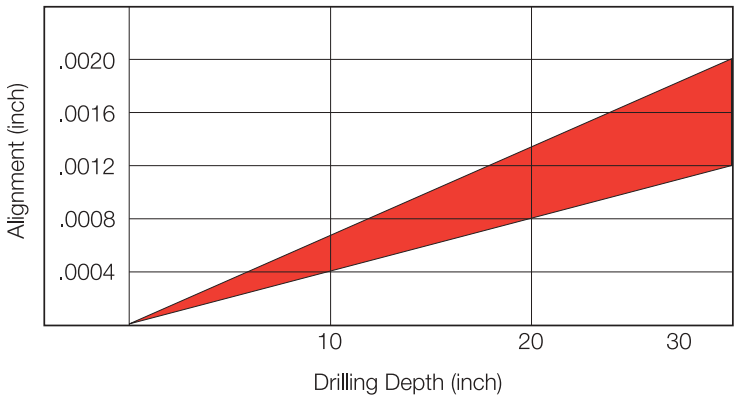
CUTTING CONDITIONS

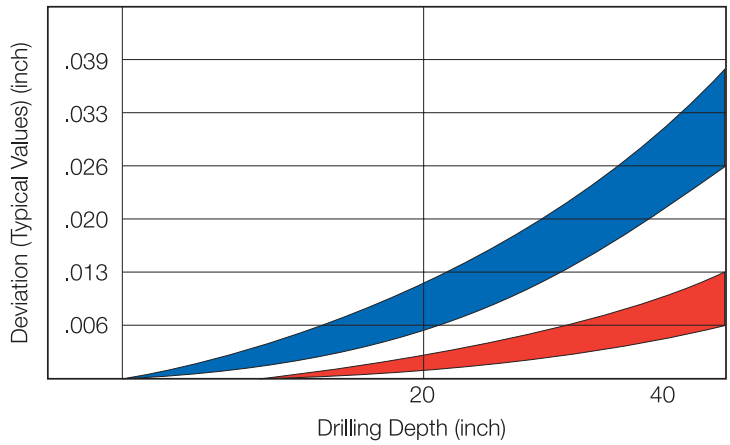


1. Aluminum Alloy
2. Grey Cast Iron
3. Nodular Cast Iron
4. Structural and Free Cutting Steel
5. High Temper Alloys
6. Super Alloys
7. Ferritic and Austenitic Stainless Steel

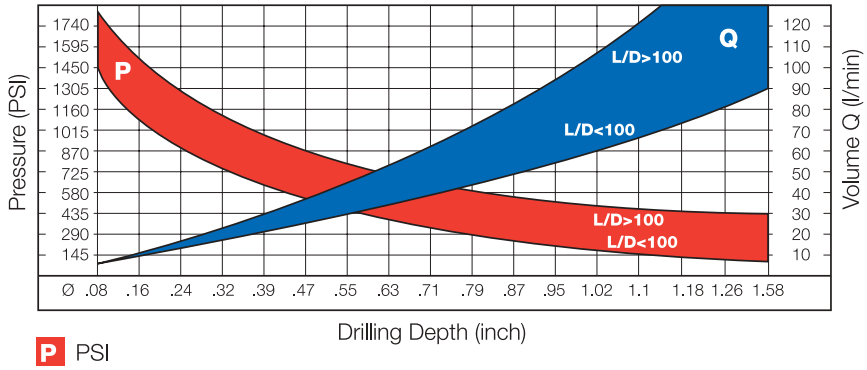
GUN DRILL OPERATING GUIDELINES

CUTTING CONDITIONS





Stationary workpiece - rotating tool
Anti clockwise revolving workpiece - rotating tool



P PSI
Q l/min

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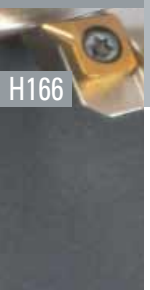

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