

**SOLID
CARBIDE
HIGH
PERFORMANCE**

VOL. 705

DESIGN-RITE XL
PREMIUM CARBIDE CUTTING TOOLS

MADE IN THE U.S.A.

**NEW ITEMS
INSIDE**

TECHNICAL INFORMATION

MATERIAL	SPEED (S.M.F.)	END MILL DIAMETER		
		UP TO 1/4"	UP TO 1/2"	UP TO 1"
FEED PER TOOTH (INCHES)				
Aluminum/Aluminum Alloys	600-1200	.0002-.0020	.0020-.0040	.0060-.0100
Brass/Bronze	200-350	.0005-.0020	.0020-.0030	.0040-.0080
Copper/Copper Alloys	350-900	.0005-.0020	.0020	.0020-.0060
Iron-Cast (soft)	200-500	.0005-.0020	.0020-.0030	.0030-.0080
Iron-Cast (hard)	80-350	.0003-.0008	.0008-.0020	.0020-.0040
Iron-Ductile	80-400	.0002-.0010	.0010-.0020	.0020-.0060
Iron-Malleable	200-600	.0002-.0010	.0010-.0030	.0030-.0070
Magnesium/Magnesium Alloys	800-1400	.0005-.0020	.0020-.0060	.0040-.0100
Monel/High Nickel Steel	150-300	.0002-.0010	.0010-.0020	.0020-.0040
Plastics	600-1200	.0006-.0030	.0030-.0060	.0060-.0150
Plastic-Glass Filled	300-800	.0006-.0030	.0030-.0040	.0040-.0120
Refractory Alloys	80-400	.0002-.0010	.0010	.0010-.0020
Steel-Low Carbon	200-500	.0002-.0010	.0010-.0030	.0030-.0070
Steel-Medium Carbon	100-250	.0004-.0015	.0015-.0020	.0020-.0050
Steel-Hardened	25-120	.0002-.0005	.0005-.0010	.0010-.0030
Steel-Mold	200-350	.0002-.0010	.0010-.0020	.0020-.0060
Steel-Tool	100-300	.0002-.0010	.0010-.0020	.0020-.0060

ALL DESIGN-RITE END MILLS ARE CENTER CUTTING

- ↑ Lower Radial Width of Cut – Higher range of recommended surface speeds should be used
- ↑ Greater Radial Width of Cut – Lower range of recommended surface speeds should be used
- ↑ For Slotting Applications – Speeds should be reduced by approximately 20% of lowest range value
- ↑ For Peripheral Applications – Axial depth of cut not to exceed 1-1/2 times the cutter diameter
 - ↑ Long & X-Long End Mills – Reduce feed per tooth by 50%
 - ↑ TiCN & AlTiN Coating – Increase S.F.M. by 25% to 40%

S.F.M./R.P.M. CONVERSION CHART

DIAMETER

S.F.M.	1/16	3/32	1/8	5/32	3/16	7/32	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1
50	3,050	2,040	1,530	1,220	1,020	875	765	610	510	440	380	310	250	220	190
75	4,580	3,060	2,290	1,830	1,530	1,310	1,150	920	760	660	570	460	380	330	285
100	6,100	4,080	3,050	2,450	2,040	1,750	1,530	1,220	1,020	870	760	610	510	440	385
125	7,630	5,100	3,820	3,050	2,550	2,180	1,920	1,530	1,270	1,100	950	770	630	550	475
150	9,150	6,120	4,570	3,670	3,060	2,620	2,290	1,830	1,530	1,310	1,140	920	760	660	575
175	10,680	7,140	5,350	4,270	3,570	3,060	2,680	2,140	1,780	1,540	1,330	1,080	880	770	665
200	12,200	8,150	6,100	4,900	4,070	3,500	3,100	2,450	2,000	1,750	1,500	1,200	1,000	875	750
300	18,500	12,200	9,200	7,300	6,100	5,250	4,600	3,700	3,100	2,600	2,300	1,800	1,500	1,300	1,100
400	24,500	16,300	12,200	9,800	8,150	7,000	6,100	4,900	4,100	3,500	3,050	2,450	2,050	1,750	1,525
500	30,500	20,400	15,300	12,200	10,200	8,700	7,600	6,100	5,100	4,400	3,800	3,100	2,500	2,200	1,900
750	45,800	36,700	22,900	18,300	15,300	13,100	11,500	9,200	7,600	6,550	5,700	4,600	3,800	3,770	2,850
1,000	–	40,800	30,600	24,500	20,400	17,500	15,300	12,200	10,200	8,750	7,650	6,100	5,100	4,400	3,800
1,500	–	–	45,900	36,700	30,600	26,200	22,900	18,300	15,300	13,150	11,300	9,200	7,600	6,500	5,700
2,000	–	–	–	49,000	40,800	35,000	30,600	24,400	20,400	17,500	15,300	12,200	10,200	8,700	7,600
3,000	–	–	–	–	–	52,500	45,900	36,600	30,600	26,250	22,900	18,300	15,300	13,100	11,400
4,000	–	–	–	–	–	–	–	48,800	40,800	35,000	30,600	24,400	20,400	17,500	15,200
5,000	–	–	–	–	–	–	–	–	–	43,700	38,200	30,600	25,500	21,800	19,000

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TECHNICAL INFORMATION

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SERIES D142

2 FLUTE DUAL-PURPOSE for ALUMINUM

Aluminum
Workhorse!



DIAMETER TOLERANCE:
1/8" Thru 1" = +.000/-.002

SHANK TOLERANCE:
1/8" Thru 1" = -.0001/-.0004

Designed as a dual-purpose Roughing and Finishing tool, this End Mill is intended to be a workhorse in **aluminum** and other non-ferrous applications. Available in a multitude of sizes and lengths for all your application needs. It also comes standard with a highly effective Zirconium Nitride (ZrN) coating which does NOT allow aluminum to build up during machining.

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER ZrN
1/8	Stub	1/8	1/4	1-1/2	D1422120	DI422126
1/8	Standard	1/8	3/8	1-1/2	D1421120	DI421126
5/32	Stub	3/16	5/16	2	D1422150	DI422156
5/32	Standard	3/16	9/16	2	D1421150	DI421156
3/16	Stub	3/16	5/16	2	D1422180	DI422186
3/16	Standard	3/16	9/16	2	D1421180	DI421186
7/32	Stub	1/4	3/8	2-1/2	D1422210	DI422216
7/32	Standard	1/4	3/4	2-1/2	D1421210	DI421216
1/4	Stub	1/4	3/8	2-1/2	D1422250	DI422256
1/4	Standard	1/4	3/4	2-1/2	D1421250	DI421256
1/4	Long	1/4	1-1/4	3-1/2	D1423250	DI423256
9/32	Stub	5/16	7/16	2-1/2	D1422280	DI422286
9/32	Standard	5/16	13/16	2-1/2	D1421280	DI421286
5/16	Stub	5/16	7/16	2-1/2	D1422310	DI422316
5/16	Standard	5/16	13/16	2-1/2	D1421310	DI421316
5/16	Long	5/16	1-1/4	3-1/2	D1423310	DI423316
5/16	X-Long	5/16	2-1/8	4	D1424310	DI424316
11/32	Stub	3/8	1/2	2-1/2	D1422340	DI422346
11/32	Standard	3/8	1	2-1/2	D1421340	DI421346
3/8	Stub	3/8	1/2	2-1/2	D1422370	DI422376
3/8	Standard	3/8	1	2-1/2	D1421370	DI421376
3/8	Long	3/8	1-1/2	4	D1423370	DI423376
3/8	X-Long	3/8	2-1/2	6	D1424370	DI424376
13/32	Stub	7/16	9/16	2-3/4	D1422400	DI422406
13/32	Standard	7/16	1	2-3/4	D1421400	DI421406
7/16	Stub	7/16	9/16	2-3/4	D1422430	DI422436
7/16	Standard	7/16	1	2-3/4	D1421430	DI421436
7/16	Long	7/16	2	4	D1423430	DI423436
15/32	Stub	1/2	5/8	2-3/4	D1422460	DI422466
15/32	Standard	1/2	1-1/4	3	D1421460	DI421466
1/2	Stub	1/2	5/8	3	D1422500	DI422506
1/2	Standard	1/2	1-1/4	3	D1421500	DI421506
1/2	Long	1/2	2	4	D1423500	DI423506
1/2	X-Long	1/2	3	6	D1424500	DI424506
5/8	Stub	5/8	3/4	3-1/2	D1422620	DI422626
5/8	Standard	5/8	1-5/8	3-1/2	D1421620	DI421626
5/8	Long	5/8	2-1/2	5	D1423620	DI423626
5/8	X-Long	5/8	3-3/4	6	D1424620	DI424626
3/4	Stub	3/4	1	4	D1422750	DI422756
3/4	Standard	3/4	1-5/8	4	D1421750	DI421756
3/4	Long	3/4	3	6	D1423750	DI423756
3/4	X-Long	3/4	4	7	D1424750	DI424756
1	Stub	1	1-1/4	5	D1422100	DI422106
1	Standard	1	2	5	D1421100	DI421106
1	Long	1	3	6	D1423100	DI423106
1	X-Long	1	4-1/8	7	D1424100	DI424106

SERIES D162

2 FLUTE DUAL-PURPOSE BALL for ALUMINUM

DIAMETER TOLERANCE:
1/4" Thru 1" = +.000/-0.002

SHANK TOLERANCE:
1/4" Thru 1" = -.0001/-0.0004

BALL RADIUS TOLERANCE: +/-0.001



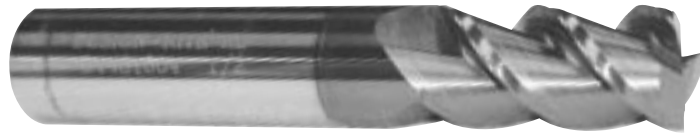
DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER ZrN
1/4	Stub	1/4	3/8	2-1/2	D1622250	D1622256
1/4	Standard	1/4	3/4	2-1/2	D1621250	D1621256
1/4	Long	1/4	1-1/4	3-1/2	D1623250	D1623256
5/16	Stub	5/16	7/16	2-1/2	D1622310	D1622316
5/16	Standard	5/16	13/16	2-1/2	D1621310	D1621316
5/16	Long	5/16	1-1/4	3-1/2	D1623310	D1623316
3/8	Stub	3/8	1/2	2-1/2	D1622370	D1622376
3/8	Standard	3/8	1	2-1/2	D1621370	D1621376
3/8	Long	3/8	1-1/2	4	D1623370	D1623376
7/16	Stub	7/16	9/16	2-3/4	D1622430	D1622436
7/16	Standard	7/16	1	2-3/4	D1621430	D1621436
7/16	Long	7/16	2	4	D1623430	D1623436
1/2	Stub	1/2	5/8	3	D1622500	D1622506
1/2	Standard	1/2	1-1/4	3	D1621500	D1621506
1/2	Long	1/2	2	4	D1623500	D1623506
5/8	Stub	5/8	3/4	3-1/2	D1622620	D1622626
5/8	Standard	5/8	1-5/8	3-1/2	D1621620	D1621626
5/8	Long	5/8	2-1/2	5	D1623620	D1623626
3/4	Stub	3/4	1	4	D1622750	D1622756
3/4	Standard	3/4	1-5/8	4	D1621750	D1621756
3/4	Long	3/4	3	6	D1623750	D1623756
1	Stub	1	1-1/4	5	D1622100	D1622106
1	Standard	1	2	5	D1621100	D1621106
1	Long	1	3	6	D1623100	D1623106

This Ball Nose version of our dual-purpose End Mill is intended to be a workhorse in **aluminum** and other non-ferrous applications. Available in a multitude of sizes and lengths for all your application needs. It also comes standard with a highly effective Zirconium Nitride (ZrN) coating which does NOT allow aluminum to build up during machining.

SERIES D143

3 Flute 50° Helix

New
*Sizes



DIAMETER TOLERANCE:
3/16" Thru 3/4" = +.000/-0.002

SHANK TOLERANCE:
3/16" Thru 3/4" = -.0001/-0.0004

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER AlTiN	PART NUMBER ZrN
3/16	Stub	3/16	3/8	2	D1432180	D1432184	D1432186
3/16	Standard	3/16	5/8	2	D1431180	D1431184	D1431186
3/16	*Long	3/16	1	3	D1433180	D1433184	D1433186
1/4	Stub	1/4	1/2	2	D1432250	D1432254	D1432256
1/4	Standard	1/4	3/4	2-1/2	D1431250	D1431254	D1431256
1/4	Long	1/4	1-1/4	3	D1433250	D1433254	D1433256
5/16	*Stub	5/16	1/2	2	D1432310	D1432314	D1432316
5/16	*Standard	5/16	3/4	2-1/2	D1431310	D1431314	D1431316
5/16	*Long	5/16	1-1/4	4	D1433310	D1433314	D1433316
3/8	Stub	3/8	1/2	2	D1432370	D1432374	D1432376
3/8	Standard	3/8	1	2-1/2	D1431370	D1431374	D1431376
3/8	Long	3/8	1-1/2	3-1/2	D1433370	D1433374	D1433376
7/16	*Stub	7/16	9/16	2-1/2	D1432430	D1432434	D1432436
7/16	*Standard	7/16	1	2-3/4	D1431430	D1431434	D1431436
7/16	*Long	7/16	2	4	D1433430	D1433434	D1433436
1/2	Stub	1/2	5/8	2-1/2	D1432500	D1432504	D1432506
1/2	Standard	1/2	1	3	D1431500	D1431504	D1431506
1/2	Long	1/2	2	4	D1433500	D1433504	D1433506
9/16	*Stub	9/16	7/8	3	D1432560	D1432564	D1432566
9/16	*Standard	9/16	1-1/4	3-1/2	D1431560	D1431564	D1431566
9/16	*Long	9/16	2-1/2	6	D1433560	D1433564	D1433566
5/8	Stub	5/8	7/8	3	D1432620	D1432624	D1432626
5/8	Standard	5/8	1-1/4	3-1/2	D1431620	D1431624	D1431626
5/8	X-Long	5/8	2-1/2	6	D1434620	D1434624	D1434626
3/4	Stub	3/4	1	3	D1432750	D1432754	D1432756
3/4	Standard	3/4	1-1/2	4	D1431750	D1431754	D1431756
3/4	X-Long	3/4	3	6	D1434750	D1434754	D1434756
1	*Stub	1	1	3	D1432100	D1432104	D1432106
1	*Standard	1	2	4	D1431100	D1431104	D1431106
1	*Long	1	3-1/4	6	D1433100	D1433104	D1433106

- High Performance
- Available Uncoated and in Aluminum Titanium Nitride (AlTiN) and Zirconium Nitride (ZrN) Coatings
- Excellent for use in ALL Materials including Stainless Steel and High Temperature Alloys.

SERIES D143R

3 Flute 50° Helix with CORNER RADIUS

DIAMETER TOLERANCE:
3/16" Thru 3/4" = +.000/-0.002

SHANK TOLERANCE:
3/16" Thru 3/4" = -.0001/-0.0004

RADIUS TOLERANCE: +/-0.001



.030 Radius
Shown



DIA	LENGTH	SHANK	LOC	CORNER RADIUS	OAL	PART NUMBER Uncoated	PART NUMBER AlTiN
3/16	Stub	3/16	3/8	0.010	2	DI432180/10	DI432184/10
3/16	Standard	3/16	5/8	0.010	2	DI431180/10	DI431184/10
3/16	*Long	3/16	1	0.010	3	DI433180/10	DI433184/10
1/4	Stub	1/4	1/2	0.010	2	DI432250/10	DI432254/10
1/4	Standard	1/4	3/4	0.010	2-1/2	DI431250/10	DI431254/10
1/4	Long	1/4	1-1/4	0.010	3	DI433250/10	DI433254/10
5/16	*Stub	5/16	1/2	0.015	2	DI432310/15	DI432314/15
5/16	*Standard	5/16	3/4	0.015	2-1/2	DI431310/15	DI431314/15
5/16	*Long	5/16	1-1/4	0.015	4	DI433310/15	DI433314/15
3/8	Stub	3/8	1/2	0.015	2	DI432370/15	DI432374/15
3/8	Standard	3/8	1	0.015	2-1/2	DI431370/15	DI431374/15
3/8	Long	3/8	1-1/2	0.015	3-1/2	DI433370/15	DI433374/15
7/16	*Stub	7/16	9/16	0.020	2-1/2	DI432430/20	DI432434/20
7/16	*Standard	7/16	1	0.020	2-3/4	DI431430/20	DI431434/20
7/16	*Long	7/16	2	0.020	4	DI433430/20	DI433434/20
1/2	Stub	1/2	5/8	0.020	2-1/2	DI432500/20	DI432504/20
1/2	Standard	1/2	1	0.020	3	DI431500/20	DI431504/20
1/2	Long	1/2	2	0.020	4	DI433500/20	DI433504/20
9/16	*Stub	9/16	7/8	0.025	3	DI432560/25	DI432564/25
9/16	*Standard	9/16	1-1/4	0.025	3-1/2	DI431560/25	DI431564/25
9/16	*Long	9/16	2-1/2	0.025	6	DI433560/25	DI433564/25
5/8	Stub	5/8	7/8	0.025	3	DI432620/25	DI432624/25
5/8	Standard	5/8	1-1/4	0.025	3-1/2	DI431620/25	DI431624/25
5/8	X-Long	5/8	2-1/2	0.025	6	DI434620/25	DI434624/25
3/4	Stub	3/4	1	0.030	3	DI432750/30	DI432754/30
3/4	Standard	3/4	1-1/2	0.030	4	DI431750/30	DI431754/30
3/4	X-Long	3/4	3	0.030	6	DI434750/30	DI434754/30
1	*Stub	1	1-1/8	0.030	3	DI432100/30	DI432104/30
1	*Standard	1	2	0.030	4	DI431100/30	DI431104/30
1	*Long	1	3-1/4	0.030	6	DI433100/30	DI433104/30

- Standard with Corner Radius for Added Corner Protection
- High Performance
- Available Uncoated and in Aluminum Titanium Nitride (AlTiN)
- Excellent for use in ALL Materials including Stainless Steel and High Temperature Alloys.

*****Other Radius Sizes Available Upon Request*****

SERIES D243

3 FLUTE 35° with RADIUS for STAINLESS



DIAMETER TOLERANCE:
1/8" Thru 1" = +.000/-0.002

SHANK TOLERANCE:
1/8" Thru 1" = -.0001/-0.0004

RADIUS TOLERANCE: +/-0.001

DIA	LENGTH	SHANK	LOC	CORNER RADIUS	OAL	PART NUMBER AITiN
1/8 1/8	Stub Standard	1/8 1/8	1/4 1/2	.010 .010	1-1/2 1-1/2	D2432124 D2431124
5/32 5/32	Stub Standard	3/16 3/16	5/16 9/16	.010 .010	2 2	D2432154 D2431154
3/16 3/16	Stub Standard	3/16 3/16	5/16 9/16	.010 .010	2 2	D2432184 D2431184
7/32 7/32	Stub Standard	1/4 1/4	3/8 3/4	.020 .020	2 2-1/2	D2432214 D2431214
1/4 1/4	Stub Standard	1/4 1/4	3/8 3/4	.020 .020	2 2-1/2	D2432254 D2431254
9/32 9/32	Stub Standard	5/16 5/16	7/16 13/16	.020 .020	2 2-1/2	D2432284 D2431284
5/16 5/16	Stub Standard	5/16 5/16	7/16 13/16	.020 .020	2 2-1/2	D2432314 D2431314
11/32 11/32	Stub Standard	3/8 3/8	1/2 1	.020 .020	2 2-1/2	D2432344 D2431344
3/8 3/8	Stub Standard	3/8 3/8	1/2 1	.020 .020	2 2-1/2	D2432374 D2431374
7/16 7/16	Stub Standard	7/16 7/16	9/16 1	.020 .020	2-1/2 2-3/4	D2432434 D2431434
1/2 1/2	Stub Standard	1/2 1/2	5/8 1-1/4	.020 .020	2-1/2 3	D2432504 D2431504
5/8 5/8	Stub Standard	5/8 5/8	3/4 1-5/8	.030 .030	3 3-1/2	D2432624 D2431624
3/4 3/4	Stub Standard	3/4 3/4	1 1-5/8	.030 .030	3 4	D2432754 D2431754
1 1	Stub Standard	1 1	1-1/4 2	.030 .030	3 4	D2432104 D2431104

- Standard with a Corner Radius
- Dramatically increases chip loads
- Remarkable results in Alloys and other Materials
- Standard with the extremely heat resistant Aluminum Titanium Nitride (AlTiN) coating.

*****Other Radius Sizes Available Upon Request*****

SERIES D263

3 FLUTE 35° BALL NOSE for STAINLESS

DIAMETER TOLERANCE:
1/8" Thru 1" = +.000/-0.002

SHANK TOLERANCE:
1/8" Thru 1" = -.0001/-0.0004

BALL RADIUS TOLERANCE: +/-0.001

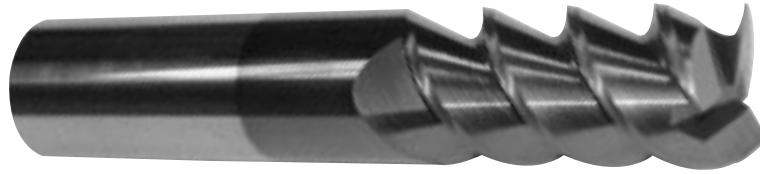


- Dramatically increases chip loads
- Remarkable results in Alloys and other Materials
- Standard with the extremely heat resistant Aluminum Titanium Nitride (AlTiN) coating.

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER AITiN
1/8 1/8	Stub Standard	1/8 1/8	1/4 1/2	1-1/2 1-1/2	D2632124 D2631124
5/32 5/32	Stub Standard	3/16 3/16	5/16 9/16	2 2	D2632154 D2631154
3/16 3/16	Stub Standard	3/16 3/16	5/16 9/16	2 2	D2632184 D2631184
7/32 7/32	Stub Standard	1/4 1/4	3/8 3/4	2 2-1/2	D2632214 D2631214
1/4 1/4	Stub Standard	1/4 1/4	3/8 3/4	2 2-1/2	D2632254 D2631254
9/32 9/32	Stub Standard	5/16 5/16	7/16 13/16	2 2-1/2	D2632284 D2631284
5/16 5/16	Stub Standard	5/16 5/16	7/16 13/16	2 2-1/2	D2632314 D2631314
1 1/32 1 1/32	Stub Standard	3/8 3/8	1/2 1	2 2-1/2	D2632344 D2631344
3/8 3/8	Stub Standard	3/8 3/8	1/2 1	2 2-1/2	D2632374 D2631374
7/16 7/16	Stub Standard	7/16 7/16	9/16 1	2-1/2 2-3/4	D2632434 D2631434
1/2 1/2	Stub Standard	1/2 1/2	5/8 1-1/4	2-1/2 3	D2632504 D2631504
5/8 5/8	Stub Standard	5/8 5/8	3/4 1-5/8	3 3-1/2	D2632624 D2631624
3/4 3/4	Stub Standard	3/4 3/4	1 1-5/8	3 4	D2632754 D2631754
1 1	Stub Standard	1 1	1-1/4 2	3 4	D2632104 D2631104

SERIES D343

3 FLUTE 60° HELIX for HIGH TEMP ALLOYS



DIAMETER TOLERANCE:
1/8" Thru 1" = +.000/-.002

SHANK TOLERANCE:
1/8" Thru 1" = -.0001/-.0004

The geometry of this 3 flute high helix end mill was designed specifically for high performance milling on periphery cuts. Coupled with a modified end gash for stronger corners, this tool is exceptional in **Stainless Steel, Titanium, and High Temperature Alloys such as Inconel, Waspalloys, etc.** Standard with the high heat resistance of Aluminum Titanium Nitride (AlTiN) coating, this tool will leave an outstanding finish on these high temperature alloys as well as other materials. Available in a wide variety of sizes and lengths.

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER AlTiN
1/8	Stub	1/8	1/4	1-1/2	D3432124
1/8	Standard	1/8	3/8	1-1/2	D3431124
5/32	Stub	3/16	5/16	2	D3432154
5/32	Standard	3/16	9/16	2	D3431154
3/16	Stub	3/16	5/16	2	D3432184
3/16	Standard	3/16	9/16	2	D3431184
7/32	Stub	1/4	3/8	2	D3432214
7/32	Standard	1/4	3/4	2-1/2	D3431214
1/4	Stub	1/4	3/8	2	D3432254
1/4	Standard	1/4	3/4	2-1/2	D3431254
1/4	Long	1/4	1-1/4	3-1/2	D3433254
9/32	Stub	5/16	7/16	2	D3432284
9/32	Standard	5/16	13/16	2-1/2	D3431284
5/16	Stub	5/16	7/16	2	D3432314
5/16	Standard	5/16	13/16	2-1/2	D3431314
5/16	Long	5/16	1-3/8	3-1/2	D3433314
11/32	Stub	3/8	1/2	2	D3432344
11/32	Standard	3/8	1	2-1/2	D3431344
3/8	Stub	3/8	1/2	2	D3432374
3/8	Standard	3/8	1	2-1/2	D3431374
3/8	Long	3/8	1-1/2	3-1/2	D3433374
13/32	Stub	7/16	9/16	2-1/2	D3432404
13/32	Standard	7/16	1	2-3/4	D3431404
7/16	Stub	7/16	9/16	2-1/2	D3432434
7/16	Standard	7/16	1	2-3/4	D3431434
7/16	Long	7/16	2	4	D3433434
15/32	Stub	1/2	5/8	2-1/2	D3432464
15/32	Standard	1/2	1	3	D3431464
1/2	Stub	1/2	5/8	2-1/2	D3432504
1/2	Standard	1/2	1	3	D3431504
1/2	Long	1/2	2	4	D3433504
5/8	Stub	5/8	3/4	3	D3432624
5/8	Standard	5/8	1-1/4	3-1/2	D3431624
5/8	Long	5/8	2-1/2	5	D3433624
3/4	Stub	3/4	1	3	D3432754
3/4	Standard	3/4	1-1/2	4	D3431754
3/4	X-Long	3/4	3-1/4	6	D3434754
1	Stub	1	1-1/4	3	D3432104
1	Standard	1	1-5/8	4	D3431104
1	Long	1	2	4	D3433104
1	X-Long	1	3-1/4	6	D3434104

SERIES D645

5 FLUTE 45° HELIX

DIAMETER TOLERANCE:
1/8" Thru 1" = +.000/-0.002

SHANK TOLERANCE:
1/8" Thru 1" = -.0001/-0.0004

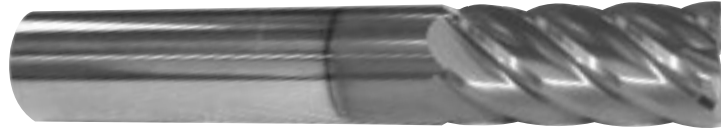


DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER AlTiN
1/8	Stub	1/8	1/4	1-1/2	D6452120	D6452124
1/8	Standard	1/8	1/2	1-1/2	D6451120	D6451124
5/32	Stub	3/16	5/16	2	D6452150	D6452154
5/32	Standard	3/16	9/16	2	D6451150	D6451154
3/16	Stub	3/16	5/16	2	D6452180	D6452184
3/16	Standard	3/16	9/16	2	D6451180	D6451184
7/32	Stub	1/4	3/8	2	D6452210	D6452214
7/32	Standard	1/4	3/4	2-1/2	D6451210	D6451214
1/4	Stub	1/4	3/8	2	D6452250	D6452254
1/4	Standard	1/4	3/4	2-1/2	D6451250	D6451254
1/4	X-Long	1/4	1-1/4	4	D6454250	D6454254
9/32	Stub	5/16	7/16	2	D6452280	D6452284
9/32	Standard	5/16	13/16	2-1/2	D6451280	D6451284
5/16	Stub	5/16	7/16	2	D6452310	D6452314
5/16	Standard	5/16	13/16	2-1/2	D6451310	D6451314
5/16	X-Long	5/16	1-1/4	4	D6454310	D6454314
11/32	Stub	3/8	1/2	2	D6452340	D6452344
11/32	Standard	3/8	1	2-1/2	D6451340	D6451344
3/8	Stub	3/8	1/2	2	D6452370	D6452374
3/8	Standard	3/8	1	2-1/2	D6451370	D6451374
3/8	X-Long	3/8	1-1/2	4	D6454370	D6454374
13/32	Stub	7/16	9/16	2-1/2	D6452400	D6452404
13/32	Standard	7/16	1	2-3/4	D6451400	D6451404
7/16	Stub	7/16	9/16	2-1/2	D6452430	D6452434
7/16	Standard	7/16	1	2-3/4	D6451430	D6451434
7/16	Long	7/16	2	4	D6453430	D6453434
15/32	Stub	1/2	5/8	2-1/2	D6452460	D6452464
15/32	Standard	1/2	1-1/4	3	D6451460	D6451464
1/2	Stub	1/2	5/8	2-1/2	D6452500	D6452504
1/2	Standard	1/2	1-1/4	3	D6451500	D6451504
1/2	Long	1/2	2	4	D6453500	D6453504
9/16	Standard	9/16	1-1/2	3-1/2	D6451560	D6451564
5/8	Stub	5/8	3/4	3	D6452620	D6452624
5/8	Standard	5/8	1-5/8	3-1/2	D6451620	D6451624
5/8	Long	5/8	2-1/2	5	D6453620	D6453624
3/4	Stub	3/4	1	3	D6452750	D6452754
3/4	Standard	3/4	1-5/8	4	D6451750	D6451754
3/4	X-Long	3/4	3-1/4	6	D6454750	D6454754
7/8	Standard	7/8	2	4	D6451870	D6451874
1	Stub	1	1-1/4	3	D6452100	D6452104
1	Standard	1	2	4	D6451100	D6451104
1	X-Long	1	3-1/4	6	D6454100	D6454104

The calculated geometry of our 5 Flute, 45° helix end mill has a stronger core for heavier cuts that run incredibly smooth. Designed to run specifically in **exotic materials, stainless steel, carbon steel, titanium, inconel, etc.** where you will achieve **Improved Finishes at Higher Speeds.** Standard with high heat resistance Aluminum Titanium Nitride (AlTiN) coating.

SERIES D646

6 FLUTE 40° HELIX



DIAMETER TOLERANCE:
3/16" Thru 1-1/4" = +.000/-0.002

SHANK TOLERANCE:
3/16" Thru 1-1/4" = -.0001/-0.0004

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
3/16	Standard	3/16	5/8	2	D6461180	D6461182	D6461184
1/4 1/4	Standard Long	1/4 1/4	3/4 1-1/8	2-1/2 3	D6461250 D6463250	D6461252 D6463252	D6461254 D6463254
5/16	Standard	5/16	7/8	2-1/2	D6461310	D6461312	D6461314
3/8 3/8	Standard Long	3/8 3/8	7/8 1-1/8	2-1/2 3	D6461370 D6463370	D6461372 D6463372	D6461374 D6463374
7/16	Standard	7/16	1	2-3/4	D6461430	D6461432	D6461434
1/2 1/2	Standard Long	1/2 1/2	1 2	3 4	D6461500 D6463500	D6461502 D6463502	D6461504 D6463504
5/8 5/8	Standard Long	5/8 5/8	1-1/4 2-1/8	3-1/2 4-5/8	D6461620 D6463620	D6461622 D6463622	D6461624 D6463624
3/4 3/4	Standard Long	3/4 3/4	1-1/2 2-1/4	4 5	D6461750 D6463750	D6461752 D6463752	D6461754 D6463754
1 1	Standard Long	1 1	1-3/4 2-1/4	4 5	D6461100 D6463100	D6461102 D6463102	D6461104 D6463104
1-1/4 1-1/4	Standard Long	1-1/4 1-1/4	2 3-1/4	4-1/2 6	D6461990 D6463990	D6461992 D6463992	D6461994 D6463994

See our Medium Helix End Mills on The Following Pages:

3 Flute Square	Pg. 25-26
3 Flute Added Reach Square	Pg. 14
3 Flute Ball	Pg. 27-28
3 Flute Added Reach Ball	Pg. 14
4 Flute Square	Pg. 29-30
4 Flute Added Reach Square	Pg. 15
4 Flute Corner Radius	Pg. 19-20
4 Flute Added Reach Corner Radius	Pg. 16-17
4 Flute Ball	Pg. 31-32
4 Flute Added Reach Ball	Pg. 15

SERIES D442

2 FLUTE 30° EXTENDED REACH

DIAMETER TOLERANCE:
1/8" Thru 1" = +.000/-0.002

SHANK TOLERANCE:
1/8" Thru 1" = -.0001/-0.0004



DIA	LENGTH	SHANK	LOC	L.B.S. Length Below Shank	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1/8	Extended Reach	1/8	2	1/2	3	D4424120	D4424122	D4424124
3/16	Extended Reach	3/16	2	1/2	3	D4424180	D4424182	D4424184
1/4	Extended Reach	1/4	2-1/2	3/4	4	D4424250	D4424252	D4424254
5/16	Extended Reach	5/16	2-1/2	3/4	4	D4424310	D4424312	D4424314
3/8	Extended Reach	3/8	2-1/2	3/4	4	D4424370	D4424372	D4424374
1/2	Extended Reach	1/2	2-1/2	1	4	D4423500	D4423502	D4423504
1/2	Extended Reach	1/2	4-1/8	1-1/8	6	D4424500	D4424502	D4424504
5/8	Extended Reach	5/8	4-1/8	1-1/4	6	D4424620	D4424622	D4424624
3/4	Extended Reach	3/4	4-1/8	1-1/2	6	D4424750	D4424752	D4424754
1	Extended Reach	1	4-1/4	1-1/2	6	D4424100	D4424102	D4424104

Complete with a powerful 2 flute design, relieved shank and stub flute length, this tool has more rigidity, resulting in minimal tool deflection while allowing for faster chip evacuation at aggressive feeds and speeds. Available Uncoated and with Titanium Carbonitride (TiCN) or Aluminum Titanium Nitride (AlTiN).

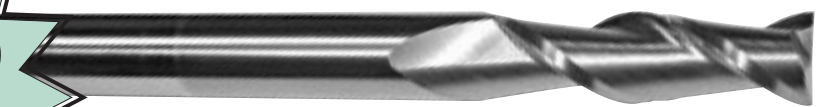
See our 2 Flute Medium Helix End Mills on The Following Pages:

2 Flute Square	Pg. 21-22
2 Flute Added Reach Square	Pg. 13
2 Flute Corner Radius	Pg. 18
2 Flute Ball	Pg. 23-24
2 Flute Added Reach Ball	Pg. 13

SERIES D642AR

2 FLUTE MEDIUM HELIX ADDED REACH

***New**



DIAMETER TOLERANCE:
1/8" Thru 1" = +.000/-.002

SHANK TOLERANCE:
1/8" Thru 1" = -.0001/-.0004

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1/8	*Long Reach	1/8	3/4	3	D6426120	D6426122	D6426124
3/16	*Long Reach	3/16	1	4	D6426180	D6426182	D6426184
1/4	*Long Reach	1/4	1	4	D6426250	D6426252	D6426254
1/4	*X-Long Reach	1/4	1-1/2	6	D6427250	D6427252	D6427254
5/16	*Long Reach	5/16	1	4	D6426310	D6426312	D6426314
5/16	*X-Long Reach	5/16	1-1/2	6	D6427310	D6427312	D6427314
3/8	*Long Reach	3/8	1	4	D6426370	D6426372	D6426374
3/8	*X-Long Reach	3/8	1-1/2	6	D6427370	D6427372	D6427374
7/16	*Long Reach	7/16	1	4	D6426430	D6426432	D6426434
7/16	*X-Long Reach	7/16	1-1/2	6	D6427430	D6427432	D6427434
1/2	*Long Reach	1/2	1	4	D6426500	D6426502	D6426504
1/2	*X-Long Reach	1/2	1-1/2	6	D6427500	D6427502	D6427504
9/16	*Long Reach	9/16	2	6	D6426560	D6426562	D6426564
5/8	*Long Reach	5/8	2	6	D6426620	D6426622	D6426624
3/4	*Long Reach	3/4	2	6	D6426750	D6426752	D6426754
1	*Long Reach	1	2	6	D6426100	D6426102	D6426104

SERIES D662AR

2 FLUTE MEDIUM HELIX BALL ADDED REACH

***New**



DIAMETER TOLERANCE:
1/8" Thru 1" = +.000/-.002

SHANK TOLERANCE:
1/8" Thru 1" = -.0001/-.0004

BALL RADIUS TOLERANCE: +/--.001

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1/8	*Long Reach	1/8	3/4	3	D6626120	D6626122	D6626124
3/16	*Long Reach	3/16	1	4	D6626180	D6626182	D6626184
1/4	*Long Reach	1/4	1	4	D6626250	D6626252	D6626254
1/4	*X-Long Reach	1/4	1-1/2	6	D6627250	D6627252	D6627254
5/16	*Long Reach	5/16	1	4	D6626310	D6626312	D6626314
5/16	*X-Long Reach	5/16	1-1/2	6	D6627310	D6627312	D6627314
3/8	*Long Reach	3/8	1	4	D6626370	D6626372	D6626374
3/8	*X-Long Reach	3/8	1-1/2	6	D6627370	D6627372	D6627374
7/16	*Long Reach	7/16	1	4	D6626430	D6626432	D6626434
7/16	*X-Long Reach	7/16	1-1/2	6	D6627430	D6627432	D6627434
1/2	*Long Reach	1/2	1	4	D6626500	D6626502	D6626504
1/2	*X-Long Reach	1/2	1-1/2	6	D6627500	D6627502	D6627504
9/16	*Long Reach	9/16	2	6	D6626560	D6626562	D6626564
5/8	*Long Reach	5/8	2	6	D6626620	D6626622	D6626624
3/4	*Long Reach	3/4	2	6	D6626750	D6626752	D6626754
1	*Long Reach	1	2	6	D6626100	D6626102	D6626104

SERIES D643AR

3 FLUTE MEDIUM HELIX ADDED REACH

DIAMETER TOLERANCE:
1/8" Thru 1" = +.000/-0.002

SHANK TOLERANCE:
1/8" Thru 1" = -.0001/-0.0004



DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1/8	*Long Reach	1/8	3/4	3	D6436120	D6436122	D6436124
3/16	*Long Reach	3/16	1	4	D6436180	D6436182	D6436184
1/4	*Long Reach	1/4	1	4	D6436250	D6436252	D6436254
1/4	*X-Long Reach	1/4	1-1/2	6	D6437250	D6437252	D6437254
5/16	*Long Reach	5/16	1	4	D6436310	D6436312	D6436314
5/16	*X-Long Reach	5/16	1-1/2	6	D6437310	D6437312	D6437314
3/8	*Long Reach	3/8	1	4	D6436370	D6436372	D6436374
3/8	*X-Long Reach	3/8	1-1/2	6	D6437370	D6437372	D6437374
7/16	*Long Reach	7/16	1	4	D6436430	D6436432	D6436434
7/16	*X-Long Reach	7/16	1-1/2	6	D6437430	D6437432	D6437434
1/2	*Long Reach	1/2	1	4	D6436500	D6436502	D6436504
1/2	*X-Long Reach	1/2	1-1/2	6	D6437500	D6437502	D6437504
9/16	*Long Reach	9/16	2	6	D6436560	D6436562	D6436564
5/8	*Long Reach	5/8	2	6	D6436620	D6436622	D6436624
3/4	*Long Reach	3/4	2	6	D6436750	D6436752	D6436754
1	*Long Reach	1	2	6	D6436100	D6436102	D6436104

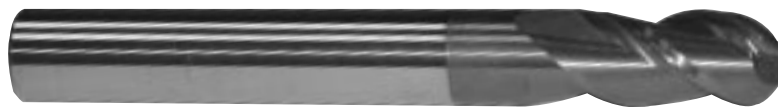
SERIES D663AR

3 FLUTE MEDIUM HELIX ADDED REACH

DIAMETER TOLERANCE:
1/8" Thru 1" = +.000/-0.002

SHANK TOLERANCE:
1/8" Thru 1" = -.0001/-0.0004

BALL RADIUS TOLERANCE: +/-0.001



DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1/8	*Long Reach	1/8	3/4	3	D6636120	D6636122	D6636124
3/16	*Long Reach	3/16	1	4	D6636180	D6636182	D6636184
1/4	*Long Reach	1/4	1	4	D6636250	D6636252	D6636254
1/4	*X-Long Reach	1/4	1-1/2	6	D6637250	D6637252	D6637254
5/16	*Long Reach	5/16	1	4	D6636310	D6636312	D6636314
5/16	*X-Long Reach	5/16	1-1/2	6	D6637310	D6637312	D6637314
3/8	*Long Reach	3/8	1	4	D6636370	D6636372	D6636374
3/8	*X-Long Reach	3/8	1-1/2	6	D6637370	D6637372	D6637374
7/16	*Long Reach	7/16	1	4	D6636430	D6636432	D6636434
7/16	*X-Long Reach	7/16	1-1/2	6	D6637430	D6637432	D6637434
1/2	*Long Reach	1/2	1	4	D6636500	D6636502	D6636504
1/2	*X-Long Reach	1/2	1-1/2	6	D6637500	D6637502	D6637504
9/16	*Long Reach	9/16	2	6	D6636560	D6636562	D6636564
5/8	*Long Reach	5/8	2	6	D6636620	D6636622	D6636624
3/4	*Long Reach	3/4	2	6	D6636750	D6636752	D6636754
1	*Long Reach	1	2	6	D6636100	D6636102	D6636104

Relieved Shanks are Available On All Added Reach Tools.

SERIES D644AR

4 FLUTE MEDIUM HELIX ADDED REACH

***New**



DIAMETER TOLERANCE:
1/8" Thru 1" = +.000/-.002

SHANK TOLERANCE:
1/8" Thru 1" = -.0001/-.0004

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1/8	*Long Reach	1/8	3/4	3	D6446120	D6446122	D6446124
3/16	*Long Reach	3/16	1	4	D6446180	D6446182	D6446184
1/4	*Long Reach	1/4	1	4	D6446250	D6446252	D6446254
1/4	*X-Long Reach	1/4	1-1/2	6	D6447250	D6447252	D6447254
5/16	*Long Reach	5/16	1	4	D6446310	D6446312	D6446314
5/16	*X-Long Reach	5/16	1-1/2	6	D6447310	D6447312	D6447314
3/8	*Long Reach	3/8	1	4	D6446370	D6446372	D6446374
3/8	*X-Long Reach	3/8	1-1/2	6	D6447370	D6447372	D6447374
7/16	*Long Reach	7/16	1	4	D6446430	D6446432	D6446434
7/16	*X-Long Reach	7/16	1-1/2	6	D6447430	D6447432	D6447434
1/2	*Long Reach	1/2	1	4	D6446500	D6446502	D6446504
1/2	*X-Long Reach	1/2	1-1/2	6	D6447500	D6447502	D6447504
9/16	*Long Reach	9/16	2	6	D6446560	D6446562	D6446564
5/8	*Long Reach	5/8	2	6	D6446620	D6446622	D6446624
3/4	*Long Reach	3/4	2	6	D6446750	D6446752	D6446754
1	*Long Reach	1	2	6	D6446100	D6446102	D6446104

SERIES D664AR

4 FLUTE MEDIUM HELIX BALL ADDED REACH

***New**



DIAMETER TOLERANCE:
1/8" Thru 1" = +.000/-.002

SHANK TOLERANCE:
1/8" Thru 1" = -.0001/-.0004

BALL RADIUS TOLERANCE: +/- .001

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1/8	*Long Reach	1/8	3/4	3	D6646120	D6646122	D6646124
3/16	*Long Reach	3/16	1	4	D6646180	D6646182	D6646184
1/4	*Long Reach	1/4	1	4	D6646250	D6646252	D6646254
1/4	*X-Long Reach	1/4	1-1/2	6	D6647250	D6647252	D6647254
5/16	*Long Reach	5/16	1	4	D6646310	D6646312	D6646314
5/16	*X-Long Reach	5/16	1-1/2	6	D6647310	D6647312	D6647314
3/8	*Long Reach	3/8	1	4	D6646370	D6646372	D6646374
3/8	*X-Long Reach	3/8	1-1/2	6	D6647370	D6647372	D6647374
7/16	*Long Reach	7/16	1	4	D6646430	D6646432	D6646434
7/16	*X-Long Reach	7/16	1-1/2	6	D6647430	D6647432	D6647434
1/2	*Long Reach	1/2	1	4	D6646500	D6646502	D6646504
1/2	*X-Long Reach	1/2	1-1/2	6	D6647500	D6647502	D6647504
9/16	*Long Reach	9/16	2	6	D6646560	D6646562	D6646564
5/8	*Long Reach	5/8	2	6	D6646620	D6646622	D6646624
3/4	*Long Reach	3/4	2	6	D6646750	D6646752	D6646754
1	*Long Reach	1	2	6	D6646100	D6646102	D6646104

D644AC

4 FL MED HELIX ADDED REACH CORNER RADIUS

DIAMETER TOLERANCE:
3/16" Thru 1" = +.000/-0.002

SHANK TOLERANCE:
3/16" Thru 1" = -.0001/-0.0004

RADIUS TOLERANCE: +/-0.001

.030 Radius
Shown



***New**

DIA	LENGTH	SHANK	LOC	CORNER RADIUS	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
3/16	*Long Reach	3/16	I	*0.010	4	D6446180/10	D6446182/10	D6446184/10
3/16	*Long Reach	3/16	I	*0.015	4	D6446180/15	D6446182/15	D6446184/15
3/16	*Long Reach	3/16	I	*0.020	4	D6446180/20	D6446182/20	D6446184/20
3/16	*Long Reach	3/16	I	*0.030	4	D6446180/30	D6446182/30	D6446184/30
3/16	*Long Reach	3/16	I	*0.045	4	D6446180/45	D6446182/45	D6446184/45
3/16	*Long Reach	3/16	I	*0.060	4	D6446180/60	D6446182/60	D6446184/60
1/4	*Long Reach	1/4	I	*0.010	4	D6446250/10	D6446252/10	D6446254/10
1/4	*Long Reach	1/4	I	*0.020	4	D6446250/20	D6446252/20	D6446254/20
1/4	*Long Reach	1/4	I	*0.030	4	D6446250/30	D6446252/30	D6446254/30
1/4	*Long Reach	1/4	I	*0.045	4	D6446250/45	D6446252/45	D6446254/45
1/4	*Long Reach	1/4	I	*0.060	4	D6446250/60	D6446252/60	D6446254/60
1/4	*X-Long Reach	1/4	I-1/2	*0.010	6	D6447250/10	D6447252/10	D6447254/10
1/4	*X-Long Reach	1/4	I-1/2	*0.020	6	D6447250/20	D6447252/20	D6447254/20
1/4	*X-Long Reach	1/4	I-1/2	*0.030	6	D6447250/30	D6447252/30	D6447254/30
1/4	*X-Long Reach	1/4	I-1/2	*0.045	6	D6447250/45	D6447252/45	D6447254/45
1/4	*X-Long Reach	1/4	I-1/2	*0.060	6	D6447250/60	D6447252/60	D6447254/60
3/8	*Long Reach	3/8	I	*0.010	4	D6446370/10	D6446372/10	D6446374/10
3/8	*Long Reach	3/8	I	*0.020	4	D6446370/20	D6446372/20	D6446374/20
3/8	*Long Reach	3/8	I	*0.030	4	D6446370/30	D6446372/30	D6446374/30
3/8	*Long Reach	3/8	I	*0.045	4	D6446370/45	D6446372/45	D6446374/45
3/8	*Long Reach	3/8	I	*0.060	4	D6446370/60	D6446372/60	D6446374/60
3/8	*Long Reach	3/8	I	*0.090	4	D6446370/90	D6446372/90	D6446374/90
3/8	*Long Reach	3/8	I	*0.125	4	D6446370/12	D6446372/12	D6446374/12
3/8	*X-Long Reach	3/8	I-1/2	*0.010	6	D6447370/10	D6447372/10	D6447374/10
3/8	*X-Long Reach	3/8	I-1/2	*0.020	6	D6447370/20	D6447372/20	D6447374/20
3/8	*X-Long Reach	3/8	I-1/2	*0.030	6	D6447370/30	D6447372/30	D6447374/30
3/8	*X-Long Reach	3/8	I-1/2	*0.045	6	D6447370/45	D6447372/45	D6447374/45
3/8	*X-Long Reach	3/8	I-1/2	*0.060	6	D6447370/60	D6447372/60	D6447374/60
3/8	*X-Long Reach	3/8	I-1/2	*0.090	6	D6447370/90	D6447372/90	D6447374/90
3/8	*X-Long Reach	3/8	I-1/2	*0.125	6	D6447370/12	D6447372/12	D6447374/12
1/2	*Long Reach	1/2	I	*0.015	4	D6446500/15	D6446502/15	D6446504/15
1/2	*Long Reach	1/2	I	*0.020	4	D6446500/20	D6446502/20	D6446504/20
1/2	*Long Reach	1/2	I	*0.030	4	D6446500/30	D6446502/30	D6446504/30
1/2	*Long Reach	1/2	I	*0.045	4	D6446500/45	D6446502/45	D6446504/45
1/2	*Long Reach	1/2	I	*0.060	4	D6446500/60	D6446502/60	D6446504/60
1/2	*Long Reach	1/2	I	*0.090	4	D6446500/90	D6446502/90	D6446504/90
1/2	*Long Reach	1/2	I	*0.125	4	D6446500/12	D6446502/12	D6446504/12
1/2	*X-Long Reach	1/2	I-1/2	*0.015	6	D6447500/15	D6447502/15	D6447504/15
1/2	*X-Long Reach	1/2	I-1/2	*0.020	6	D6447500/20	D6447502/20	D6447504/20
1/2	*X-Long Reach	1/2	I-1/2	*0.030	6	D6447500/30	D6447502/30	D6447504/30
1/2	*X-Long Reach	1/2	I-1/2	*0.045	6	D6447500/45	D6447502/45	D6447504/45
1/2	*X-Long Reach	1/2	I-1/2	*0.060	6	D6447500/60	D6447502/60	D6447504/60
1/2	*X-Long Reach	1/2	I-1/2	*0.090	6	D6447500/90	D6447502/90	D6447504/90
1/2	*X-Long Reach	1/2	I-1/2	*0.125	6	D6447500/12	D6447502/12	D6447504/12

*****Relieved Shanks are Available On All Added Reach Tools.*****

DIA	LENGTH	SHANK	LOC	CORNER RADIUS	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AITiN
5/8	*Long Reach	5/8	2	*0.015	6	D6446620/15	D6446622/15	D6446624/15
5/8	*Long Reach	5/8	2	*0.020	6	D6446620/20	D6446622/20	D6446624/20
5/8	*Long Reach	5/8	2	*0.030	6	D6446620/30	D6446622/30	D6446624/30
5/8	*Long Reach	5/8	2	*0.045	6	D6446620/45	D6446622/45	D6446624/45
5/8	*Long Reach	5/8	2	*0.060	6	D6446620/60	D6446622/60	D6446624/60
5/8	*Long Reach	5/8	2	*0.090	6	D6446620/90	D6446622/90	D6446624/90
5/8	*Long Reach	5/8	2	*0.125	6	D6446620/12	D6446622/12	D6446624/12
3/4	*Long Reach	3/4	2	*0.015	6	D6446750/15	D6446752/15	D6446754/15
3/4	*Long Reach	3/4	2	*0.020	6	D6446750/20	D6446752/20	D6446754/20
3/4	*Long Reach	3/4	2	*0.030	6	D6446750/30	D6446752/30	D6446754/30
3/4	*Long Reach	3/4	2	*0.045	6	D6446750/45	D6446752/45	D6446754/45
3/4	*Long Reach	3/4	2	*0.060	6	D6446750/60	D6446752/60	D6446754/60
3/4	*Long Reach	3/4	2	*0.090	6	D6446750/90	D6446752/90	D6446754/90
3/4	*Long Reach	3/4	2	*0.125	6	D6446750/12	D6446752/12	D6446754/12
1	*Long Reach	1	2	*0.015	6	D6446100/15	D6446102/15	D6446104/15
1	*Long Reach	1	2	*0.020	6	D6446100/20	D6446102/20	D6446104/20
1	*Long Reach	1	2	*0.030	6	D6446100/30	D6446102/30	D6446104/30
1	*Long Reach	1	2	*0.045	6	D6446100/45	D6446102/45	D6446104/45
1	*Long Reach	1	2	*0.060	6	D6446100/60	D6446102/60	D6446104/60
1	*Long Reach	1	2	*0.090	6	D6446100/90	D6446102/90	D6446104/90
1	*Long Reach	1	2	*0.125	6	D6446100/12	D6446102/12	D6446104/12

See pages 19-20 for additional 4 Flute Corner Radius End Mills Lengths.

See page 15 for our 4 Flute Medium Helix Added Reach Square End End Mills.

See pages 29-30 for our 4 Flute Medium Helix Square End End Mills.

See pages 31-32 for our 4 Flute Medium Helix Ball Nose End Mills.

D642CR

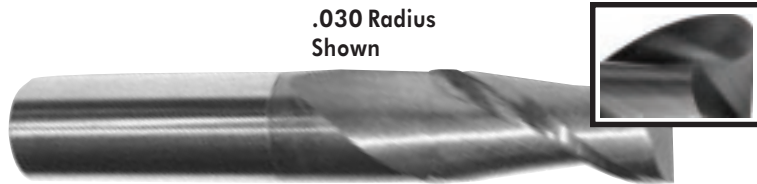
2 FLUTE MEDIUM HELIX CORNER RADIUS

DIAMETER TOLERANCE:
1/8" Thru 1" = +.000/-0.002

SHANK TOLERANCE:
1/8" Thru 1" = -.0001/-0.0004

RADIUS TOLERANCE: +/-0.001

**.030 Radius
Shown**



DIA	LENGTH	SHANK	LOC	CORNER RADIUS	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1/8	Standard	1/8	1/2	0.015	1-1/2	D6421120/15	D6421122/15	D6421124/15
1/8	Standard	1/8	1/2	0.020	1-1/2	D6421120/20	D6421122/20	D6421124/20
1/8	Standard	1/8	1/2	0.030	1-1/2	D6421120/30	D6421122/30	D6421124/30
3/16	Standard	3/16	5/8	0.010	2	D6421180/10	D6421182/10	D6421184/10
3/16	Standard	3/16	5/8	0.015	2	D6421180/15	D6421182/15	D6421184/15
3/16	Standard	3/16	5/8	0.020	2	D6421180/20	D6421182/20	D6421184/20
3/16	Standard	3/16	5/8	0.030	2	D6421180/30	D6421182/30	D6421184/30
1/4	Standard	1/4	3/4	0.015	2-1/2	D6421250/15	D6421252/15	D6421254/15
1/4	Standard	1/4	3/4	0.020	2-1/2	D6421250/20	D6421252/20	D6421254/20
1/4	Standard	1/4	3/4	0.030	2-1/2	D6421250/30	D6421252/30	D6421254/30
1/4	Standard	1/4	3/4	0.045	2-1/2	D6421250/45	D6421252/45	D6421254/45
1/4	Standard	1/4	3/4	0.060	2-1/2	D6421250/60	D6421252/60	D6421254/60
5/16	Standard	5/16	3/4	0.015	2-1/2	D6421310/15	D6421312/15	D6421314/15
5/16	Standard	5/16	3/4	0.020	2-1/2	D6421310/20	D6421312/20	D6421314/20
5/16	Standard	5/16	3/4	0.030	2-1/2	D6421310/30	D6421312/30	D6421314/30
5/16	Standard	5/16	3/4	0.045	2-1/2	D6421310/45	D6421312/45	D6421314/45
5/16	Standard	5/16	3/4	0.060	2-1/2	D6421310/60	D6421312/60	D6421314/60
3/8	Standard	3/8	7/8	0.015	2-1/2	D6421370/15	D6421372/15	D6421374/15
3/8	Standard	3/8	7/8	0.020	2-1/2	D6421370/20	D6421372/20	D6421374/20
3/8	Standard	3/8	7/8	0.030	2-1/2	D6421370/30	D6421372/30	D6421374/30
3/8	Standard	3/8	7/8	0.045	2-1/2	D6421370/45	D6421372/45	D6421374/45
3/8	Standard	3/8	7/8	0.060	2-1/2	D6421370/60	D6421372/60	D6421374/60
1/2	Standard	1/2	1	0.015	3	D6421500/15	D6421502/15	D6421504/15
1/2	Standard	1/2	1	0.020	3	D6421500/20	D6421502/20	D6421504/20
1/2	Standard	1/2	1	0.030	3	D6421500/30	D6421502/30	D6421504/30
1/2	Standard	1/2	1	0.045	3	D6421500/45	D6421502/45	D6421504/45
1/2	Standard	1/2	1	0.060	3	D6421500/60	D6421502/60	D6421504/60
5/8	Standard	5/8	1-1/4	0.015	3-1/2	D6421620/15	D6421622/15	D6421624/15
5/8	Standard	5/8	1-1/4	0.020	3-1/2	D6421620/20	D6421622/20	D6421624/20
5/8	Standard	5/8	1-1/4	0.030	3-1/2	D6421620/30	D6421622/30	D6421624/30
5/8	Standard	5/8	1-1/4	0.045	3-1/2	D6421620/45	D6421622/45	D6421624/45
5/8	Standard	5/8	1-1/4	0.060	3-1/2	D6421620/60	D6421622/60	D6421624/60
5/8	Standard	5/8	1-1/4	0.090	3-1/2	D6421620/90	D6421622/90	D6421624/90
3/4	Standard	3/4	1-1/2	0.015	4	D6421750/15	D6421752/15	D6421754/15
3/4	Standard	3/4	1-1/2	0.020	4	D6421750/20	D6421752/20	D6421754/20
3/4	Standard	3/4	1-1/2	0.030	4	D6421750/30	D6421752/30	D6421754/30
3/4	Standard	3/4	1-1/2	0.045	4	D6421750/45	D6421752/45	D6421754/45
3/4	Standard	3/4	1-1/2	0.060	4	D6421750/60	D6421752/60	D6421754/60
3/4	Standard	3/4	1-1/2	0.090	4	D6421750/90	D6421752/90	D6421754/90
3/4	Standard	3/4	1-1/2	0.125	4	D6421750/12	D6421752/12	D6421754/12
1	Standard	1	1-3/4	0.015	4	D6421100/15	D6421102/15	D6421104/15
1	Standard	1	1-3/4	0.020	4	D6421100/20	D6421102/20	D6421104/20
1	Standard	1	1-3/4	0.030	4	D6421100/30	D6421102/30	D6421104/30
1	Standard	1	1-3/4	0.045	4	D6421100/45	D6421102/45	D6421104/45
1	Standard	1	1-3/4	0.060	4	D6421100/60	D6421102/60	D6421104/60
1	Standard	1	1-3/4	0.090	4	D6421100/90	D6421102/90	D6421104/90
1	Standard	1	1-3/4	0.125	4	D6421100/12	D6421102/12	D6421104/12

D644CR

4 FLUTE MEDIUM HELIX CORNER RADIUS

New
*Sizes

.030 Radius
Shown



DIAMETER TOLERANCE:
1/8" Thru 1" = +.000/-0.002

SHANK TOLERANCE:
1/8" Thru 1" = -.0001/-0.004

RADIUS TOLERANCE: +/-0.001

DIA	LENGTH	SHANK	LOC	CORNER RADIUS	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AITIN
1/8	Stub	1/8	1/4	0.015	1-1/2	D6442120/15	D6442122/15	D6442124/15
1/8	Stub	1/8	1/4	0.020	1-1/2	D6442120/20	D6442122/20	D6442124/20
1/8	Stub	1/8	1/4	0.030	1-1/2	D6442120/30	D6442122/30	D6442124/30
1/8	Standard	1/8	1/2	0.015	1-1/2	D6441120/15	D6441122/15	D6441124/15
1/8	Standard	1/8	1/2	0.020	1-1/2	D6441120/20	D6441122/20	D6441124/20
1/8	Standard	1/8	1/2	0.030	1-1/2	D6441120/30	D6441122/30	D6441124/30
1/8	*Standard	1/8	1/2	*0.045	1-1/2	D6441120/45	D6441122/45	D6441124/45
1/8	*X-Long	1/8	1	*0.010	3	D6444120/10	D6444122/10	D6444124/10
1/8	*X-Long	1/8	1	*0.015	3	D6444120/15	D6444122/15	D6444124/15
1/8	*X-Long	1/8	1	*0.020	3	D6444120/20	D6444122/20	D6444124/20
1/8	*X-Long	1/8	1	*0.030	3	D6444120/30	D6444122/30	D6444124/30
1/8	*X-Long	1/8	1	*0.045	3	D6444120/45	D6444122/45	D6444124/45
3/16	Stub	3/16	3/8	0.010	2	D6442180/10	D6442182/10	D6442184/10
3/16	Stub	3/16	3/8	0.015	2	D6442180/15	D6442182/15	D6442184/15
3/16	Stub	3/16	3/8	0.020	2	D6442180/20	D6442182/20	D6442184/20
3/16	Stub	3/16	3/8	0.030	2	D6442180/30	D6442182/30	D6442184/30
3/16	Standard	3/16	5/8	0.010	2	D6441180/10	D6441182/10	D6441184/10
3/16	Standard	3/16	5/8	0.015	2	D6441180/15	D6441182/15	D6441184/15
3/16	Standard	3/16	5/8	0.020	2	D6441180/20	D6441182/20	D6441184/20
3/16	Standard	3/16	5/8	0.030	2	D6441180/30	D6441182/30	D6441184/30
3/16	*Standard	3/16	5/8	*0.045	2	D6441180/45	D6441182/45	D6441184/45
3/16	*Standard	3/16	5/8	*0.060	2	D6441180/60	D6441182/60	D6441184/60
3/16	*X-Long	3/16	1-1/8	*0.010	3	D6444180/10	D6444182/10	D6444184/10
3/16	*X-Long	3/16	1-1/8	*0.015	3	D6444180/15	D6444182/15	D6444184/15
3/16	*X-Long	3/16	1-1/8	*0.020	3	D6444180/20	D6444182/20	D6444184/20
3/16	*X-Long	3/16	1-1/8	*0.030	3	D6444180/30	D6444182/30	D6444184/30
3/16	*X-Long	3/16	1-1/8	*0.045	3	D6444180/45	D6444182/45	D6444184/45
3/16	*X-Long	3/16	1-1/8	*0.060	3	D6444180/60	D6444182/60	D6444184/60
1/4	Stub	1/4	3/8	0.015	2	D6442250/15	D6442252/15	D6442254/15
1/4	Stub	1/4	3/8	0.020	2	D6442250/20	D6442252/20	D6442254/20
1/4	Stub	1/4	3/8	0.030	2	D6442250/30	D6442252/30	D6442254/30
1/4	Stub	1/4	3/8	0.045	2	D6442250/45	D6442252/45	D6442254/45
1/4	Stub	1/4	3/8	0.060	2	D6442250/60	D6442252/60	D6442254/60
1/4	Standard	1/4	3/4	0.015	2-1/2	D6441250/15	D6441252/15	D6441254/15
1/4	Standard	1/4	3/4	0.020	2-1/2	D6441250/20	D6441252/20	D6441254/20
1/4	Standard	1/4	3/4	0.030	2-1/2	D6441250/30	D6441252/30	D6441254/30
1/4	Standard	1/4	3/4	0.045	2-1/2	D6441250/45	D6441252/45	D6441254/45
1/4	Standard	1/4	3/4	0.060	2-1/2	D6441250/60	D6441252/60	D6441254/60
1/4	*Standard	1/4	3/4	*0.090	2-1/2	D6441250/90	D6441252/90	D6441254/90
1/4	*Long	1/4	1-1/8	*0.010	3	D6443250/10	D6443252/10	D6443254/10
1/4	*Long	1/4	1-1/8	*0.020	3	D6443250/20	D6443252/20	D6443254/20
1/4	*Long	1/4	1-1/8	*0.030	3	D6443250/30	D6443252/30	D6443254/30
1/4	*Long	1/4	1-1/8	*0.045	3	D6443250/45	D6443252/45	D6443254/45
1/4	*Long	1/4	1-1/8	*0.060	3	D6443250/60	D6443252/60	D6443254/60
5/16	Stub	5/16	1/2	0.015	2	D6442310/15	D6442312/15	D6442314/15
5/16	Stub	5/16	1/2	0.020	2	D6442310/20	D6442312/20	D6442314/20
5/16	Stub	5/16	1/2	0.030	2	D6442310/30	D6442312/30	D6442314/30
5/16	Stub	5/16	1/2	0.045	2	D6442310/45	D6442312/45	D6442314/45
5/16	Stub	5/16	1/2	0.060	2	D6442310/60	D6442312/60	D6442314/60
5/16	Standard	5/16	3/4	0.015	2-1/2	D6441310/15	D6441312/15	D6441314/15
5/16	Standard	5/16	3/4	0.020	2-1/2	D6441310/20	D6441312/20	D6441314/20
5/16	Standard	5/16	3/4	0.030	2-1/2	D6441310/30	D6441312/30	D6441314/30
5/16	Standard	5/16	3/4	0.045	2-1/2	D6441310/45	D6441312/45	D6441314/45
5/16	Standard	5/16	3/4	0.060	2-1/2	D6441310/60	D6441312/60	D6441314/60
5/16	*Standard	5/16	3/4	*0.090	2-1/2	D6441310/90	D6441312/90	D6441314/90
5/16	*Standard	5/16	3/4	*0.125	2-1/2	D6441310/12	D6441312/12	D6441314/12

DIA	LENGTH	SHANK	LOC	CORNER RADIUS	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
5/16	*X-Long	5/16	1-5/8	*0.010	4	D6444310/10	D6444312/10	D6444314/10
5/16	*X-Long	5/16	1-5/8	*0.020	4	D6444310/20	D6444312/20	D6444314/20
5/16	*X-Long	5/16	1-5/8	*0.030	4	D6444310/30	D6444312/30	D6444314/30
5/16	*X-Long	5/16	1-5/8	*0.045	4	D6444310/45	D6444312/45	D6444314/45
5/16	*X-Long	5/16	1-5/8	*0.060	4	D6444310/60	D6444312/60	D6444314/60
5/16	*X-Long	5/16	1-5/8	*0.090	4	D6444310/90	D6444312/90	D6444314/90
5/16	*X-Long	5/16	1-5/8	*0.125	4	D6444310/12	D6444312/12	D6444314/12
3/8	Stub	3/8	5/8	0.015	2	D6442370/15	D6442372/15	D6442374/15
3/8	Stub	3/8	5/8	0.020	2	D6442370/20	D6442372/20	D6442374/20
3/8	Stub	3/8	5/8	0.030	2	D6442370/30	D6442372/30	D6442374/30
3/8	Stub	3/8	5/8	0.045	2	D6442370/45	D6442372/45	D6442374/45
3/8	Stub	3/8	5/8	0.060	2	D6442370/60	D6442372/60	D6442374/60
3/8	Standard	3/8	7/8	0.015	2-1/2	D6441370/15	D6441372/15	D6441374/15
3/8	Standard	3/8	7/8	0.020	2-1/2	D6441370/20	D6441372/20	D6441374/20
3/8	Standard	3/8	7/8	0.030	2-1/2	D6441370/30	D6441372/30	D6441374/30
3/8	Standard	3/8	7/8	0.045	2-1/2	D6441370/45	D6441372/45	D6441374/45
3/8	Standard	3/8	7/8	0.060	2-1/2	D6441370/60	D6441372/60	D6441374/60
3/8	*Standard	3/8	7/8	*0.090	2-1/2	D6441370/90	D6441372/90	D6441374/90
3/8	*Standard	3/8	7/8	*0.125	2-1/2	D6441370/12	D6441372/12	D6441374/12
3/8	*X-Long	3/8	1-3/4	*0.010	4	D6444370/10	D6444372/10	D6444374/10
3/8	*X-Long	3/8	1-3/4	*0.020	4	D6444370/20	D6444372/20	D6444374/20
3/8	*X-Long	3/8	1-3/4	*0.030	4	D6444370/30	D6444372/30	D6444374/30
3/8	*X-Long	3/8	1-3/4	*0.045	4	D6444370/45	D6444372/45	D6444374/45
3/8	*X-Long	3/8	1-3/4	*0.060	4	D6444370/60	D6444372/60	D6444374/60
3/8	*X-Long	3/8	1-3/4	*0.090	4	D6444370/90	D6444372/90	D6444374/90
3/8	*X-Long	3/8	1-3/4	*0.125	4	D6444370/12	D6444372/12	D6444374/12
1/2	Stub	1/2	5/8	0.015	2-1/2	D6442500/15	D6442502/15	D6442504/15
1/2	Stub	1/2	5/8	0.020	2-1/2	D6442500/20	D6442502/20	D6442504/20
1/2	Stub	1/2	5/8	0.030	2-1/2	D6442500/30	D6442502/30	D6442504/30
1/2	Stub	1/2	5/8	0.045	2-1/2	D6442500/45	D6442502/45	D6442504/45
1/2	Stub	1/2	5/8	0.060	2-1/2	D6442500/60	D6442502/60	D6442504/60
1/2	Standard	1/2	1	0.015	3	D6441500/15	D6441502/15	D6441504/15
1/2	Standard	1/2	1	0.020	3	D6441500/20	D6441502/20	D6441504/20
1/2	Standard	1/2	1	0.030	3	D6441500/30	D6441502/30	D6441504/30
1/2	Standard	1/2	1	0.045	3	D6441500/45	D6441502/45	D6441504/45
1/2	Standard	1/2	1	0.060	3	D6441500/60	D6441502/60	D6441504/60
1/2	*Standard	1/2	1	*0.090	3	D6441500/90	D6441502/90	D6441504/90
1/2	*Standard	1/2	1	*0.125	3	D6441500/12	D6441502/12	D6441504/12
1/2	*Long	1/2	2	*0.015	4	D6443500/15	D6443502/15	D6443504/15
1/2	*Long	1/2	2	*0.020	4	D6443500/20	D6443502/20	D6443504/20
1/2	*Long	1/2	2	*0.030	4	D6443500/30	D6443502/30	D6443504/30
1/2	*Long	1/2	2	*0.045	4	D6443500/45	D6443502/45	D6443504/45
1/2	*Long	1/2	2	*0.060	4	D6443500/60	D6443502/60	D6443504/60
1/2	*Long	1/2	2	*0.090	4	D6443500/90	D6443502/90	D6443504/90
1/2	*Long	1/2	2	*0.125	4	D6443500/12	D6443502/12	D6443504/12
5/8	Standard	5/8	1-1/4	0.015	3-1/2	D6441620/15	D6441622/15	D6441624/15
5/8	Standard	5/8	1-1/4	0.020	3-1/2	D6441620/20	D6441622/20	D6441624/20
5/8	Standard	5/8	1-1/4	0.030	3-1/2	D6441620/30	D6441622/30	D6441624/30
5/8	Standard	5/8	1-1/4	0.045	3-1/2	D6441620/45	D6441622/45	D6441624/45
5/8	Standard	5/8	1-1/4	0.060	3-1/2	D6441620/60	D6441622/60	D6441624/60
5/8	Standard	5/8	1-1/4	0.090	3-1/2	D6441620/90	D6441622/90	D6441624/90
5/8	*Standard	5/8	1-1/4	*0.125	3-1/2	D6441620/12	D6441622/12	D6441624/12
3/4	Standard	3/4	1-1/2	0.015	4	D6441750/15	D6441752/15	D6441754/15
3/4	Standard	3/4	1-1/2	0.020	4	D6441750/20	D6441752/20	D6441754/20
3/4	Standard	3/4	1-1/2	0.030	4	D6441750/30	D6441752/30	D6441754/30
3/4	Standard	3/4	1-1/2	0.045	4	D6441750/45	D6441752/45	D6441754/45
3/4	Standard	3/4	1-1/2	0.060	4	D6441750/60	D6441752/60	D6441754/60
3/4	Standard	3/4	1-1/2	0.090	4	D6441750/90	D6441752/90	D6441754/90
3/4	Standard	3/4	1-1/2	0.125	4	D6441750/12	D6441752/12	D6441754/12
3/4	*X-Long	3/4	3	*0.015	6	D6444750/15	D6444752/15	D6444754/15
3/4	*X-Long	3/4	3	*0.020	6	D6444750/20	D6444752/20	D6444754/20
3/4	*X-Long	3/4	3	*0.030	6	D6444750/30	D6444752/30	D6444754/30
3/4	*X-Long	3/4	3	*0.045	6	D6444750/45	D6444752/45	D6444754/45
3/4	*X-Long	3/4	3	*0.060	6	D6444750/60	D6444752/60	D6444754/60
3/4	*X-Long	3/4	3	*0.090	6	D6444750/90	D6444752/90	D6444754/90
3/4	*X-Long	3/4	3	*0.125	6	D6444750/12	D6444752/12	D6444754/12
1	Standard	1	1-3/4	0.015	4	D6441100/15	D6441102/15	D6441104/15
1	Standard	1	1-3/4	0.020	4	D6441100/20	D6441102/20	D6441104/20
1	Standard	1	1-3/4	0.030	4	D6441100/30	D6441102/30	D6441104/30
1	Standard	1	1-3/4	0.045	4	D6441100/45	D6441102/45	D6441104/45
1	Standard	1	1-3/4	0.060	4	D6441100/60	D6441102/60	D6441104/60
1	Standard	1	1-3/4	0.090	4	D6441100/90	D6441102/90	D6441104/90
1	Standard	1	1-3/4	0.125	4	D6441100/12	D6441102/12	D6441104/12
1	*X-Long	1	3	*0.015	6	D6444100/15	D6444102/15	D6444104/15
1	*X-Long	1	3	*0.020	6	D6444100/20	D6444102/20	D6444104/20
1	*X-Long	1	3	*0.030	6	D6444100/30	D6444102/30	D6444104/30
1	*X-Long	1	3	*0.045	6	D6444100/45	D6444102/45	D6444104/45
1	*X-Long	1	3	*0.060	6	D6444100/60	D6444102/60	D6444104/60
1	*X-Long	1	3	*0.090	6	D6444100/90	D6444102/90	D6444104/90
1	*X-Long	1	3	*0.125	6	D6444100/12	D6444102/12	D6444104/12

SERIES D642

2 FLUTE MEDIUM HELIX



DIAMETER TOLERANCE:
1/32" Thru 1" = +.000/- .002

SHANK TOLERANCE:
1/32" Thru 1" = -.0001/- .0004

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1/32	Standard	1/8	3/32	1-1/2	D6421030	D6421032	D6421034
3/64	Standard	1/8	9/64	1-1/2	D6421040	D6421042	D6421044
1/16 1/16	Stub Standard	1/8 1/8	1/8 3/16	1-1/2 1-1/2	D6422060 D6421060	D6422062 D6421062	D6422064 D6421064
5/64	Standard	1/8	1/4	1-1/2	D6421070	D6421072	D6421074
3/32 3/32	Stub Standard	1/8 1/8	3/16 9/32	1-1/2 1-1/2	D6422090 D6421090	D6422092 D6421092	D6422094 D6421094
7/64 7/64	Stub Standard	1/8 1/8	3/16 3/8	1-1/2 1-1/2	D6422190 D6421190	D6422192 D6421192	D6422194 D6421194
1/8 1/8 1/8 1/8	Stub Standard Long X-Long	1/8 1/8 1/8 1/8	1/4 1/2 3/4 1	1-1/2 1-1/2 2-1/4 3	D6422120 D6421120 D6423120 D6424120	D6422122 D6421122 D6423122 D6424122	D6422124 D6421124 D6423124 D6424124
9/64 9/64	Stub Standard	3/16 3/16	3/8 1/2	2 2	D6422140 D6421140	D6422142 D6421142	D6422144 D6421144
5/32 5/32 5/32	Stub Standard Extended LOC	3/16 3/16 3/16	3/8 1/2 3/4	2 2 2	D6422150 D6421150 D6425150	D6422152 D6421152 D6425152	D6422154 D6421154 D6425154
11/64 11/64	Stub Standard	3/16 3/16	3/8 5/8	2 2	D6422170 D6421170	D6422172 D6421172	D6422174 D6421174
3/16 3/16 3/16 3/16 3/16	Stub Standard Long Extended LOC X-Long	3/16 3/16 3/16 3/16 3/16	3/8 5/8 3/4 1 1-1/8	2 2 2-1/2 2 3	D6422180 D6421180 D6423180 D6425180 D6424180	D6422182 D6421182 D6423182 D6425182 D6424182	D6422184 D6421184 D6423184 D6425184 D6424184
13/64 13/64	Stub Standard	1/4 1/4	3/8 5/8	2 2-1/2	D6422200 D6421200	D6422202 D6421202	D6422204 D6421204
7/32 7/32 7/32	Stub Standard Extended LOC	1/4 1/4 1/4	3/8 5/8 1	2 2-1/2 2-1/2	D6422210 D6421210 D6425210	D6422212 D6421212 D6425212	D6422214 D6421214 D6425214
15/64 15/64	Stub Standard	1/4 1/4	3/8 3/4	2 2-1/2	D6422230 D6421230	D6422232 D6421232	D6422234 D6421234
1/4 1/4 1/4 1/4 1/4	Stub Standard Long Extended LOC X-Long	1/4 1/4 1/4 1/4 1/4	3/8 3/4 1-1/8 1-1/4 1-1/2	2 2-1/2 3 2-1/2 4	D6422250 D6421250 D6423250 D6425250 D6424250	D6422252 D6421252 D6423252 D6425252 D6424252	D6422254 D6421254 D6423254 D6425254 D6424254
17/64 17/64	Stub Standard	5/16 5/16	1/2 3/4	2 2-1/2	D6422260 D6421260	D6422262 D6421262	D6422264 D6421264
9/32 9/32 9/32	Stub Standard Extended LOC	5/16 5/16 5/16	1/2 3/4 1-1/4	2 2-1/2 2-1/2	D6422280 D6421280 D6425280	D6422282 D6421282 D6425282	D6422284 D6421284 D6425284
19/64 19/64	Stub Standard	5/16 5/16	1/2 3/4	2 2-1/2	D6422290 D6421290	D6422292 D6421292	D6422294 D6421294

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
5/16	Stub	5/16	1/2	2	D6422310	D6422312	D6422314
5/16	Standard	5/16	3/4	2-1/2	D6421310	D6421312	D6421314
5/16	Long	5/16	1-1/8	3	D6423310	D6423312	D6423314
5/16	Extended LOC	5/16	1-3/8	2-1/2	D6425310	D6425312	D6425314
5/16	X-Long	5/16	1-5/8	4	D6424310	D6424312	D6424314
21/64	Stub	3/8	5/8	2	D6422320	D6422322	D6422324
21/64	Standard	3/8	7/8	2-1/2	D6421320	D6421322	D6421324
11/32	Stub	3/8	5/8	2	D6422340	D6422342	D6422344
11/32	Standard	3/8	7/8	2-1/2	D6421340	D6421342	D6421344
23/64	Stub	3/8	5/8	2	D6422350	D6422352	D6422354
23/64	Standard	3/8	7/8	2-1/2	D6421350	D6421352	D6421354
3/8	Stub	3/8	5/8	2	D6422370	D6422372	D6422374
3/8	Standard	3/8	7/8	2-1/2	D6421370	D6421372	D6421374
3/8	Long	3/8	1-1/8	3	D6423370	D6423372	D6423374
3/8	Extended LOC	3/8	1-3/8	2-1/2	D6425370	D6425372	D6425374
3/8	X-Long	3/8	1-3/4	4	D6424370	D6424372	D6424374
3/8	XX-Long	3/8	3	6	D6428370	D6428372	D6428374
25/64	Stub	7/16	5/8	2	D6422390	D6422392	D6422394
25/64	Standard	7/16	1	2-3/4	D6421390	D6421392	D6421394
13/32	Stub	7/16	5/8	2	D6422400	D6422402	D6422404
13/32	Standard	7/16	1	2-3/4	D6421400	D6421402	D6421404
27/64	Stub	7/16	5/8	2	D6422420	D6422422	D6422424
27/64	Standard	7/16	1	2-3/4	D6421420	D6421422	D6421424
7/16	Stub	7/16	5/8	2	D6422430	D6422432	D6422434
7/16	Standard	7/16	1	2-3/4	D6421430	D6421432	D6421434
7/16	Extended LOC	7/16	1-3/8	2-3/4	D6425430	D6425432	D6425434
7/16	Long	7/16	2	4	D6423430	D6423432	D6423434
7/16	X-Long	7/16	3	6	D6424430	D6424432	D6424434
29/64	Stub	1/2	5/8	2-1/2	D6422450	D6422452	D6422454
29/64	Standard	1/2	1	3	D6421450	D6421452	D6421454
15/32	Stub	1/2	5/8	2-1/2	D6422460	D6422462	D6422464
15/32	Standard	1/2	1	3	D6421460	D6421462	D6421464
31/64	Stub	1/2	5/8	2-1/2	D6422480	D6422482	D6422484
31/64	Standard	1/2	1	3	D6421480	D6421482	D6421484
1/2	Stub	1/2	5/8	2-1/2	D6422500	D6422502	D6422504
1/2	Standard	1/2	1	3	D6421500	D6421502	D6421504
1/2	Extended LOC	1/2	1-1/2	3-1/4	D6425500	D6425502	D6425504
1/2	Long	1/2	2	4	D6423500	D6423502	D6423504
1/2	X-Long	1/2	3	6	D6424500	D6424502	D6424504
9/16	Stub	9/16	7/8	3	D6422560	D6422562	D6422564
9/16	Standard	9/16	1-1/4	3 1/2	D6421560	D6421562	D6421564
9/16	X-Long	9/16	3	6	D6424560	D6424562	D6424564
5/8	Stub	5/8	7/8	3	D6422620	D6422622	D6422624
5/8	Standard	5/8	1-1/4	3-1/2	D6421620	D6421622	D6421624
5/8	Long	5/8	2-1/8	4-5/8	D6423620	D6423622	D6423624
5/8	X-Long	5/8	3	6	D6424620	D6424622	D6424624
11/16	Stub	3/4	1	3	D6422680	D6422682	D6422684
11/16	Standard	3/4	1-1/2	4	D6421680	D6421682	D6421684
3/4	Stub	3/4	1	3	D6422750	D6422752	D6422754
3/4	Standard	3/4	1-1/2	4	D6421750	D6421752	D6421754
3/4	Long	3/4	2-1/4	5	D6423750	D6423752	D6423754
3/4	X-Long	3/4	3	6	D6424750	D6424752	D6424754
7/8	Standard	7/8	1-3/4	4	D6421870	D6421872	D6421874
1	Standard	1	1-3/4	4	D6421100	D6421102	D6421104
1	Long	1	2-1/4	5	D6423100	D6423102	D6423104
1	X-Long	1	3	6	D6424100	D6424102	D6424104

SERIES D662

2 FLUTE BALL NOSE MEDIUM HELIX



DIAMETER TOLERANCE:
1/32" Thru 1" = +.000/-.002

SHANK TOLERANCE:
1/32" Thru 1" = -.0001/-.0004

BALL RADIUS TOLERANCE: +/- .001

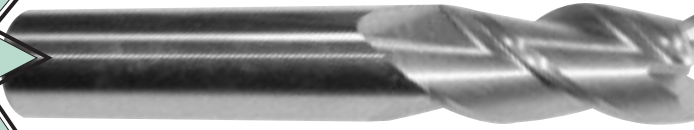
DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1/32	Standard	1/8	3/32	1-1/2	D6621030	D6621032	D6621034
3/64	Standard	1/8	9/64	1-1/2	D6621040	D6621042	D6621044
1/16 1/16	Stub Standard	1/8 1/8	1/8 3/16	1-1/2 1-1/2	D6622060 D6621060	D6622062 D6621062	D6622064 D6621064
5/64	Standard	1/8	1/4	1-1/2	D6621070	D6621072	D6621074
3/32 3/32	Stub Standard	1/8 1/8	3/16 9/32	1-1/2 1-1/2	D6622090 D6621090	D6622092 D6621092	D6622094 D6621094
7/64 7/64	Stub Standard	1/8 1/8	3/16 3/8	1-1/2 1-1/2	D6622190 D6621190	D6622192 D6621192	D6622194 D6621194
1/8 1/8 1/8 1/8	Stub Standard Long X-Long	1/8 1/8 1/8 1/8	1/4 1/2 3/4 1	1-1/2 1-1/2 2-1/4 3	D6622120 D6621120 D6623120 D6624120	D6622122 D6621122 D6623122 D6624122	D6622124 D6621124 D6623124 D6624124
9/64 9/64	Stub Standard	3/16 3/16	3/8 1/2	2 2	D6622140 D6621140	D6622142 D6621142	D6622144 D6621144
5/32 5/32	Stub Standard	3/16 3/16	3/8 1/2	2 2	D6622150 D6621150	D6622152 D6621152	D6622154 D6621154
11/64 11/64	Stub Standard	3/16 3/16	3/8 5/8	2 2	D6622170 D6621170	D6622172 D6621172	D6622174 D6621174
3/16 3/16 3/16 3/16	Stub Standard Long X-Long	3/16 3/16 3/16 3/16	3/8 5/8 3/4 1-1/8	2 2 2-1/2 3	D6622180 D6621180 D6623180 D6624180	D6622182 D6621182 D6623182 D6624182	D6622184 D6621184 D6623184 D6624184
13/64 13/64	Stub Standard	1/4 1/4	3/8 5/8	2 2-1/2	D6622200 D6621200	D6622202 D6621202	D6622204 D6621204
7/32 7/32	Stub Standard	1/4 1/4	3/8 5/8	2 2-1/2	D6622210 D6621210	D6622212 D6621212	D6622214 D6621214
15/64 15/64	Stub Standard	1/4 1/4	3/8 3/4	2 2-1/2	D6622230 D6621230	D6622232 D6621232	D6622234 D6621234
1/4 1/4 1/4 1/4	Stub Standard Long X-Long	1/4 1/4 1/4 1/4	3/8 3/4 1-1/8 1-1/2	2 2-1/2 3 4	D6622250 D6621250 D6623250 D6624250	D6622252 D6621252 D6623252 D6624252	D6622254 D6621254 D6623254 D6624254
17/64 17/64	Stub Standard	5/16 5/16	1/2 3/4	2 2-1/2	D6622260 D6621260	D6622262 D6621262	D6622264 D6621264
9/32 9/32	Stub Standard	5/16 5/16	1/2 3/4	2 2-1/2	D6622280 D6621280	D6622282 D6621282	D6622284 D6621284
19/64 19/64	Stub Standard	5/16 5/16	1/2 3/4	2 2-1/2	D6622290 D6621290	D6622292 D6621292	D6622294 D6621294

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
5/16 5/16 5/16 5/16	Stub Standard Long X-Long	5/16 5/16 5/16 5/16	1/2 3/4 1-1/8 1-5/8	2 2-1/2 3 4	D6622310 D6621310 D6623310 D6624310	D6622312 D6621312 D6623312 D6624312	D6622314 D6621314 D6623314 D6624314
21/64 21/64	Stub Standard	3/8 3/8	5/8 7/8	2 2-1/2	D6622320 D6621320	D6622322 D6621322	D6622324 D6621324
11/32 11/32	Stub Standard	3/8 3/8	5/8 7/8	2 2-1/2	D6622340 D6621340	D6622342 D6621342	D6622344 D6621344
23/64 23/64	Stub Standard	3/8 3/8	5/8 7/8	2 2-1/2	D6622350 D6621350	D6622352 D6621352	D6622354 D6621354
3/8 3/8 3/8 3/8 3/8	Stub Standard Long X-Long XX-Long	3/8 3/8 3/8 3/8 3/8	5/8 7/8 1-1/8 1-3/4 3	2 2-1/2 3 4 6	D6622370 D6621370 D6623370 D6624370 D6628370	D6622372 D6621372 D6623372 D6624372 D6628372	D6622374 D6621374 D6623374 D6624374 D6628374
25/64 25/64	Stub Standard	7/16 7/16	5/8 1	2 2-3/4	D6622390 D6621390	D6622392 D6621392	D6622394 D6621394
13/32 13/32	Stub Standard	7/16 7/16	5/8 1	2 2-3/4	D6622400 D6621400	D6622402 D6621402	D6622404 D6621404
27/64 27/64	Stub Standard	7/16 7/16	5/8 1	2 2-3/4	D6622420 D6621420	D6622422 D6621422	D6622424 D6621424
7/16 7/16 7/16 7/16	Stub Standard Long X-Long	7/16 7/16 7/16 7/16	5/8 1 2 3	2 2-3/4 4 6	D6622430 D6621430 D6623430 D6624430	D6622432 D6621432 D6623432 D6624432	D6622434 D6621434 D6623434 D6624434
29/64 29/64	Stub Standard	1/2 1/2	5/8 1	2-1/2 3	D6622450 D6621450	D6622452 D6621452	D6622454 D6621454
15/32 15/32	Stub Standard	1/2 1/2	5/8 1	2-1/2 3	D6622460 D6621460	D6622462 D6621462	D6622464 D6621464
31/64 31/64	Stub Standard	1/2 1/2	5/8 1	2-1/2 3	D6622480 D6621480	D6622482 D6621482	D6622484 D6621484
1/2 1/2 1/2 1/2	Stub Standard Long X-Long	1/2 1/2 1/2 1/2	5/8 1 2 3	2-1/2 3 4 6	D6622500 D6621500 D6623500 D6624500	D6622502 D6621502 D6623502 D6624502	D6622504 D6621504 D6623504 D6624504
9/16 9/16 9/16	Stub Standard X-Long	9/16 9/16 9/16	7/8 1-1/4 3	3 3-1/2 6	D6622560 D6621560 D6624560	D6622562 D6621562 D6624562	D6622564 D6621564 D6624564
5/8 5/8 5/8 5/8	Stub Standard Long X-Long	5/8 5/8 5/8 5/8	7/8 1-1/4 2-1/8 3	3 3-1/2 4-5/8 6	D6622620 D6621620 D6623620 D6624620	D6622622 D6621622 D6623622 D6624622	D6622624 D6621624 D6623624 D6624624
11/16 11/16	Stub Standard	3/4 3/4	1 1-1/2	3 4	D6622680 D6621680	D6622682 D6621682	D6622684 D6621684
3/4 3/4 3/4 3/4	Stub Standard Long X-Long	3/4 3/4 3/4 3/4	1 1-1/2 2-1/4 3	3 4 5 6	D6622750 D6621750 D6623750 D6624750	D6622752 D6621752 D6623752 D6624752	D6622754 D6621754 D6623754 D6624754
7/8	Standard	7/8	1 3/4	4	D6621870	D6621872	D6621874
1 1 1	Standard Long X-Long	1 1 1	1-3/4 2-1/4 3	4 5 6	D6621100 D6623100 D6624100	D6621102 D6623102 D6624102	D6621104 D6623104 D6624104

SERIES D643

3 FLUTE MEDIUM HELIX

New
*Sizes



DIAMETER TOLERANCE:
1/16" Thru 1" = +.000/-0.002

SHANK TOLERANCE:
1/16" Thru 1" = -.0001/-0.0004

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1/16	Stub	1/8	1/8	1-1/2	D6432060	D6432062	D6432064
1/16	Standard	1/8	3/16	1-1/2	D6431060	D6431062	D6431064
5/64	Standard	1/8	1/4	1 1/2	D6431070	D6431072	D6431074
3/32	Stub	1/8	3/16	1-1/2	D6432090	D6432092	D6432094
3/32	Standard	1/8	9/32	1-1/2	D6431090	D6431092	D6431094
7/64	Standard	1/8	3/8	1-1/2	D6431190	D6431192	D6431194
1/8	Stub	1/8	1/4	1-1/2	D6432120	D6432122	D6432124
1/8	Standard	1/8	1/2	1-1/2	D6431120	D6431122	D6431124
1/8	Long	1/8	3/4	2-1/4	D6433120	D6433122	D6433124
1/8	X-Long	1/8	1	3	D6434120	D6434122	D6434124
9/64	*Standard	3/16	1/2	2	D6431140	D6431142	D6431144
5/32	Stub	3/16	3/8	2	D6432150	D6432152	D6432154
5/32	Standard	3/16	1/2	2	D6431150	D6431152	D6431154
11/64	*Standard	3/16	5/8	2	D6431170	D6431172	D6431174
3/16	Stub	3/16	3/8	2	D6432180	D6432182	D6432184
3/16	Standard	3/16	5/8	2	D6431180	D6431182	D6431184
3/16	Long	3/16	3/4	2-1/2	D6433180	D6433182	D6433184
3/16	*Extended LOC	3/16	1	2	D6435180	D6435182	D6435184
3/16	X-Long	3/16	1-1/8	3	D6434180	D6434182	D6434184
13/64	*Standard	1/4	5/8	2-1/2	D6431200	D6431202	D6431204
7/32	Stub	1/4	3/8	2	D6432210	D6432212	D6432214
7/32	Standard	1/4	5/8	2-1/2	D6431210	D6431212	D6431214
15/64	*Standard	1/4	3/4	2-1/2	D6431230	D6431232	D6431234
1/4	Stub	1/4	3/8	2	D6432250	D6432252	D6432254
1/4	Standard	1/4	3/4	2-1/2	D6431250	D6431252	D6431254
1/4	Long	1/4	1-1/8	3	D6433250	D6433252	D6433254
1/4	X-Long	1/4	1-1/2	4	D6434250	D6434252	D6434254
17/64	*Standard	5/16	3/4	2-1/2	D6431260	D6431262	D6431264
9/32	Stub	5/16	1/2	2	D6432280	D6432282	D6432284
9/32	Standard	5/16	3/4	2-1/2	D6431280	D6431282	D6431284
19/64	*Standard	5/16	3/4	2-1/2	D6431290	D6431292	D6431294
5/16	Stub	5/16	1/2	2	D6432310	D6432312	D6432314
5/16	Standard	5/16	3/4	2-1/2	D6431310	D6431312	D6431314
5/16	Long	5/16	1-1/8	3	D6433310	D6433312	D6433314
5/16	X-Long	5/16	1-5/8	4	D6434310	D6434312	D6434314

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
21/64	*Standard	3/8	7/8	2-1/2	D6431320	D6431322	D6431324
11/32 11/32	Stub Standard	3/8 3/8	5/8 7/8	2 2-1/2	D6432340 D6431340	D6432342 D6431342	D6432344 D6431344
23/64	*Standard	3/8	7/8	2-1/2	D6431350	D6431352	D6431354
3/8 3/8 3/8 3/8	Stub Standard Long X-Long	3/8 3/8 3/8 3/8	5/8 7/8 1-1/8 1-3/4	2 2-1/2 3 4	D6432370 D6431370 D6433370 D6434370	D6432372 D6431372 D6433372 D6434372	D6432374 D6431374 D6433374 D6434374
25/64	*Standard	7/16	1	2-3/4	D6431390	D6431392	D6431394
13/32	Standard	7/16	1	2-3/4	D6431400	D6431402	D6431404
27/64	*Standard	7/16	1	2-3/4	D6431420	D6431422	D6431424
7/16 7/16 7/16 7/16	Stub Standard *Long *X-Long	7/16 7/16 7/16 7/16	1 5/8 1 3	2 2-3/4 3 6	D6432430 D6431430 D6433430 D6434430	D6432432 D6431432 D6433432 D6434432	D6432434 D6431434 D6433434 D6434434
29/64	*Standard	1/2	1	3	D6431450	D6431452	D6431454
15/32	Standard	1/2	1	3	D6431460	D6431462	D6431464
31/64	*Standard	1/2	1	3	D6431480	D6431482	D6431484
1/2 1/2 1/2 1/2	Stub Standard Long X-Long	1/2 1/2 1/2 1/2	5/8 1 2 3	2-1/2 3 4 6	D6432500 D6431500 D6433500 D6434500	D6432502 D6431502 D6433502 D6434502	D6432504 D6431504 D6433504 D6434504
9/16 9/16 9/16	Stub Standard *X-Long	9/16 9/16 9/16	7/8 1-1/4 3	3 3-1/2 6	D6432560 D6431560 D6434560	D6432562 D6431562 D6434562	D6432564 D6431564 D6434564
5/8 5/8 5/8 5/8	Stub Standard Long X-Long	5/8 5/8 5/8 5/8	7/8 1-1/4 2-1/8 3	3 3-1/2 4-5/8 6	D6432620 D6431620 D6433620 D6434620	D6432622 D6431622 D6433622 D6434622	D6432624 D6431624 D6433624 D6434624
11/16 11/16	Stub Standard	3/4 3/4	1 1-1/2	3 4	D6432680 D6431680	D6432682 D6431682	D6432684 D6431684
3/4 3/4 3/4 3/4	Stub Standard Long X-Long	3/4 3/4 3/4 3/4	1 1-1/2 2-1/4 3	3 4 5 6	D6432750 D6431750 D6433750 D6434750	D6432752 D6431752 D6433752 D6434752	D6432754 D6431754 D6433754 D6434754
7/8	Standard	7/8	1-3/4	4	D6431870	D6431872	D6431874
1 1 1	Standard Long X-Long	1 1 1	1-3/4 2-1/4 3	4 5 6	D6431100 D6433100 D6434100	D6431102 D6433102 D6434102	D6431104 D6433104 D6434104

See Page 14 for our 3 Flute Added Reach End Mills.

SERIES D663

3 FLUTE BALL NOSE MEDIUM HELIX

**New
*Sizes**



DIAMETER TOLERANCE:
1/8" Thru 1" = +.000/-0.002

SHANK TOLERANCE:
1/8" Thru 1" = -.0001/-0.0004

BALL RADIUS TOLERANCE: +/-0.001

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1/8	Stub	1/8	1/4	1-1/2	D6632120	D6632122	D6632124
1/8	Standard	1/8	1/2	1-1/2	D6631120	D6631122	D6631124
1/8	Long	1/8	3/4	2-1/4	D6633120	D6633122	D6633124
1/8	X-Long	1/8	1	3	D6634120	D6634122	D6634124
9/64	*Standard	3/16	1/2	2	D6631140	D6631142	D6631144
5/32	Standard	3/16	1/2	2	D6631150	D6631152	D6631154
11/64	*Standard	3/16	5/8	2	D6631170	D6631172	D6631174
3/16	Stub	3/16	3/8	2	D6632180	D6632182	D6632184
3/16	Standard	3/16	5/8	2	D6631180	D6631182	D6631184
3/16	Long	3/16	3/4	2-1/2	D6633180	D6633182	D6633184
3/16	*Extended LOC	3/16	1	2	D6635180	D6635182	D6635184
3/16	X-Long	3/16	1-1/8	3	D6634180	D6634182	D6634184
13/64	*Standard	1/4	5/8	2-1/2	D6631200	D6631202	D6631204
7/32	Standard	1/4	5/8	2-1/2	D6631210	D6631212	D6631214
15/64	*Standard	1/4	3/4	2-1/2	D6631230	D6631232	D6631234
1/4	Stub	1/4	3/8	2	D6632250	D6632252	D6632254
1/4	Standard	1/4	3/4	2-1/2	D6631250	D6631252	D6631254
1/4	Long	1/4	1-1/8	3	D6633250	D6633252	D6633254
1/4	X-Long	1/4	1-1/2	4	D6634250	D6634252	D6634254
17/64	*Standard	5/16	3/4	2-1/2	D6631260	D6631262	D6631264
9/32	Standard	5/16	3/4	2-1/2	D6631280	D6631282	D6631284
19/64	*Standard	5/16	3/4	2-1/2	D6631290	D6631292	D6631294
5/16	Standard	5/16	3/4	2-1/2	D6631310	D6631312	D6631314
21/64	*Standard	3/8	7/8	2-1/2	D6631320	D6631322	D6631324
11/32	Standard	3/8	7/8	2-1/2	D6631340	D6631342	D6631344
23/64	*Standard	3/8	7/8	2-1/2	D6631350	D6631352	D6631354
3/8	Stub	3/8	5/8	2	D6632370	D6632372	D6632374
3/8	Standard	3/8	7/8	2-1/2	D6631370	D6631372	D6631374
3/8	Long	3/8	1-1/8	3	D6633370	D6633372	D6633374
3/8	X-Long	3/8	1-3/4	4	D6634370	D6634372	D6634374
3/8	*XX-Long	3/8	3	6	D6638370	D6638372	D6638374

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
25/64	*Standard	7/16	1	2-3/4	D6631390	D6631392	D6631394
13/32	Standard	7/16	1	2-3/4	D6631400	D6631402	D6631404
27/64	*Standard	7/16	1	2-3/4	D6631420	D6631422	D6631424
7/16	Standard	7/16	1	2-3/4	D6631430	D6631432	D6631434
7/16	*Long	7/16	2	4	D6633430	D6633432	D6633434
7/16	*X-Long	7/16	3	6	D6634430	D6634432	D6634434
29/64	*Standard	1/2	1	3	D6631450	D6631452	D6631454
15/32	Standard	1/2	1	3	D6631460	D6631462	D6631464
31/64	*Standard	1/2	1	3	D6631480	D6631482	D6631484
1/2	Stub	1/2	5/8	2-1/2	D6632500	D6632502	D6632504
1/2	Standard	1/2	1	3	D6631500	D6631502	D6631504
1/2	Long	1/2	2	4	D6633500	D6633502	D6633504
1/2	X-Long	1/2	3	6	D6634500	D6634502	D6634504
9/16	Standard	9/16	1	3-1/2	D6631560	D6631562	D6631564
9/16	*X-Long	9/16	3	6	D6634560	D6634562	D6634564
5/8	Standard	5/8	1-1/4	3-1/2	D6631620	D6631622	D6631624
5/8	Long	5/8	2-1/8	4-5/8	D6633620	D6633622	D6633624
5/8	X-Long	5/8	3	6	D6634620	D6634622	D6634624
1 1/16	Standard	3/4	1-1/2	4	D6631680	D6631682	D6631684
3/4	Standard	3/4	1-1/2	4	D6631750	D6631752	D6631754
3/4	Long	3/4	2-1/4	5	D6633750	D6633752	D6633754
3/4	X-Long	3/4	3	6	D6634750	D6634752	D6634754
7/8	Standard	7/8	1-3/4	4	D6631870	D6631872	D6631874
1	Standard	1	1-3/4	4	D6631100	D6631102	D6631104
1	Long	1	2-1/4	5	D6633100	D6633102	D6633104
1	X-Long	1	3	6	D6634100	D6634102	D6634104

See page 14 for our 3 Flute Added Reach Medium Helix End Mills.

See page 5 for our 3 Flute 50° Helix End Mills.

See page 6 for our 3 Flute 50° Helix End Mills with Corner Radius.

See page 9 for our 3 Flute 60° Helix End Mills.

See pages 7-8 for our 3 Flute End Mills for Stainless Steel.

SERIES D644

4 FLUTE MEDIUM HELIX



DIAMETER TOLERANCE:
1/32" Thru 1" = +.000/- .002

SHANK TOLERANCE:
1/32" Thru 1" = -.0001/- .0004

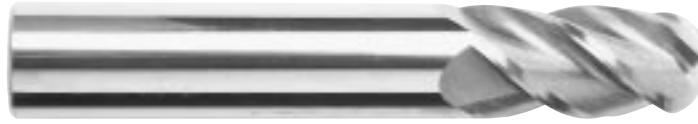
DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1/32	Standard	1/8	3/32	1-1/2	D6441030	D6441032	D6441034
3/64	Standard	1/8	9/64	1-1/2	D6441040	D6441042	D6441044
1/16 1/16	Stub Standard	1/8 1/8	1/8 3/16	1-1/2 1-1/2	D6442060 D6441060	D6442062 D6441062	D6442064 D6441064
5/64	Standard	1/8	1/4	1-1/2	D6441070	D6441072	D6441074
3/32 3/32	Stub Standard	1/8 1/8	3/16 9/32	1-1/2 1-1/2	D6442090 D6441090	D6442092 D6441092	D6442094 D6441094
7/64 7/64	Stub Standard	1/8 1/8	3/16 3/8	1-1/2 1-1/2	D6442190 D6441190	D6442192 D6441192	D6442194 D6441194
1/8 1/8 1/8 1/8	Stub Standard Extended LOC X-Long	1/8 1/8 1/8 1/8	1/4 1/2 3/4 1	1-1/2 1-1/2 2-1/4 3	D6442120 D6441120 D6445120 D6444120	D6442122 D6441122 D6445122 D6444122	D6442124 D6441124 D6445124 D6444124
9/64 9/64	Stub Standard	3/16 3/16	3/8 1/2	2 2	D6442140 D6441140	D6442142 D6441142	D6442144 D6441144
5/32 5/32 5/32	Stub Standard Extended LOC	3/16 3/16 3/16	3/8 1/2 3/4	2 2 2	D6442150 D6441150 D6445150	D6442152 D6441152 D6445152	D6442154 D6441154 D6445154
11/64 11/64	Stub Standard	3/16 3/16	3/8 5/8	2 2	D6442170 D6441170	D6442172 D6441172	D6442174 D6441174
3/16 3/16 3/16 3/16 3/16	Stub Standard Long Extended LOC X-Long	3/16 3/16 3/16 3/16 3/16	3/8 5/8 3/4 1 1-1/8	2 2 2-1/2 2 3	D6442180 D6441180 D6443180 D6445180 D6444180	D6442182 D6441182 D6443182 D6445182 D6444182	D6442184 D6441184 D6443184 D6445184 D6444184
13/64 13/64	Stub Standard	1/4 1/4	3/8 5/8	2 2-1/2	D6442200 D6441200	D6442202 D6441202	D6442204 D6441204
7/32 7/32 7/32	Stub Standard Extended LOC	1/4 1/4 1/4	3/8 5/8 1	2 2-1/2 2-1/2	D6442210 D6441210 D6445210	D6442212 D6441212 D6445212	D6442214 D6441214 D6445214
15/64 15/64	Stub Standard	1/4 1/4	3/8 3/4	2 2-1/2	D6442230 D6441230	D6442232 D6441232	D6442234 D6441234
1/4 1/4 1/4 1/4 1/4	Stub Standard Long Extended LOC X-Long	1/4 1/4 1/4 1/4 1/4	3/8 3/4 1-1/8 1-1/4 1-1/2	2 2-1/2 3 2-1/2 4	D6442250 D6441250 D6443250 D6445250 D6444250	D6442252 D6441252 D6443252 D6445252 D6444252	D6442254 D6441254 D6443254 D6445254 D6444254
17/64 17/64	Stub Standard	5/16 5/16	1/2 3/4	2 2-1/2	D6442260 D6441260	D6442262 D6441262	D6442264 D6441264
9/32 9/32 9/32	Stub Standard Extended LOC	5/16 5/16 5/16	1/2 3/4 1-1/4	2 2-1/2 2-1/2	D6442280 D6441280 D6445280	D6442282 D6441282 D6445282	D6442284 D6441284 D6445284
19/64 19/64	Stub Standard	5/16 5/16	1/2 3/4	2 2-1/2	D6442290 D6441290	D6442292 D6441292	D6442294 D6441294

See Page 15 for our 4 Flute Added Reach End Mills.

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
5/16	Stub	5/16	1/2	2	D6442310	D6442312	D6442314
5/16	Standard	5/16	3/4	2-1/2	D6441310	D6441312	D6441314
5/16	Long	5/16	1-1/8	3	D6443310	D6443312	D6443314
5/16	Extended LOC	5/16	1-3/8	2-1/2	D6445310	D6445312	D6445314
5/16	X-Long	5/16	1-5/8	4	D6444310	D6444312	D6444314
21/64	Stub	3/8	5/8	2	D6442320	D6442322	D6442324
21/64	Standard	3/8	7/8	2-1/2	D6441320	D6441322	D6441324
11/32	Stub	3/8	5/8	2	D6442340	D6442342	D6442344
11/32	Standard	3/8	7/8	2-1/2	D6441340	D6441342	D6441344
23/64	Stub	3/8	5/8	2	D6442350	D6442352	D6442354
23/64	Standard	3/8	7/8	2-1/2	D6441350	D6441352	D6441354
3/8	Stub	3/8	5/8	2	D6442370	D6442372	D6442374
3/8	Standard	3/8	7/8	2-1/2	D6441370	D6441372	D6441374
3/8	Long	3/8	1-1/8	3	D6443370	D6443372	D6443374
3/8	Extended LOC	3/8	1-3/8	2-1/2	D6445370	D6445372	D6445374
3/8	X-Long	3/8	1-3/4	4	D6444370	D6444372	D6444374
3/8	XX-Long	3/8	3	6	D6448370	D6448372	D6448374
25/64	Stub	7/16	5/8	2	D6442390	D6442392	D6442394
25/64	Standard	7/16	1	2-3/4	D6441390	D6441392	D6441394
13/32	Stub	7/16	5/8	2	D6442400	D6442402	D6442404
13/32	Standard	7/16	1	2-3/4	D6441400	D6441402	D6441404
27/64	Stub	7/16	5/8	2	D6442420	D6442422	D6442424
27/64	Standard	7/16	1	2-3/4	D6441420	D6441422	D6441424
7/16	Stub	7/16	5/8	2	D6442430	D6442432	D6442434
7/16	Standard	7/16	1	2-3/4	D6441430	D6441432	D6441434
7/16	Extended LOC	7/16	1-3/8	2-3/4	D6445430	D6445432	D6445434
7/16	Long	7/16	2	4	D6443430	D6443432	D6443434
7/16	X-Long	7/16	3	6	D6444430	D6444432	D6444434
29/64	Stub	1/2	5/8	2-1/2	D6442450	D6442452	D6442454
29/64	Standard	1/2	1	3	D6441450	D6441452	D6441454
15/32	Stub	1/2	5/8	2-1/2	D6442460	D6442462	D6442464
15/32	Standard	1/2	1	3	D6441460	D6441462	D6441464
31/64	Stub	1/2	5/8	2-1/2	D6442480	D6442482	D6442484
31/64	Standard	1/2	1	3	D6441480	D6441482	D6441484
1/2	Stub	1/2	5/8	2-1/2	D6442500	D6442502	D6442504
1/2	Standard	1/2	1	3	D6441500	D6441502	D6441504
1/2	Extended LOC	1/2	1-1/2	3-1/4	D6445500	D6445502	D6445504
1/2	Long	1/2	2	4	D6443500	D6443502	D6443504
1/2	X-Long	1/2	3	6	D6444500	D6444502	D6444504
9/16	Stub	9/16	7/8	3	D6442560	D6442562	D6442564
9/16	Standard	9/16	1-1/4	3 1/2	D6441560	D6441562	D6441564
9/16	X-Long	9/16	3	6	D6444560	D6444562	D6444564
5/8	Stub	5/8	7/8	3	D6442620	D6442622	D6442624
5/8	Standard	5/8	1-1/4	3-1/2	D6441620	D6441622	D6441624
5/8	Long	5/8	2-1/8	4-5/8	D6443620	D6443622	D6443624
5/8	X-Long	5/8	3	6	D6444620	D6444622	D6444624
11/16	Stub	3/4	1	3	D6442680	D6442682	D6442684
11/16	Standard	3/4	1-1/2	4	D6441680	D6441682	D6441684
3/4	Stub	3/4	1	3	D6442750	D6442752	D6442754
3/4	Standard	3/4	1-1/2	4	D6441750	D6441752	D6441754
3/4	Long	3/4	2-1/4	5	D6443750	D6443752	D6443754
3/4	X-Long	3/4	3	6	D6444750	D6444752	D6444754
7/8	Standard	7/8	1-3/4	4	D6441870	D6441872	D6441874
1	Standard	1	1-3/4	4	D6441100	D6441102	D6441104
1	Long	1	2-1/4	5	D6443100	D6443102	D6443104
1	X-Long	1	3	6	D6444100	D6444102	D6444104

SERIES D664

4 FLUTE BALL NOSE MEDIUM HELIX



DIAMETER TOLERANCE:
1/32" Thru 1" = +.000/-.002

SHANK TOLERANCE:
1/32" Thru 1" = -.0001/-.0004

BALL RADIUS TOLERANCE: +/- .001

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1/32	Standard	1/8	3/32	1-1/2	D6641030	D6641032	D6641034
3/64	Standard	1/8	9/64	1-1/2	D6641040	D6641042	D6641044
1/16 1/16	Stub Standard	1/8 1/8	1/8 3/16	1-1/2 1-1/2	D6642060 D6641060	D6642062 D6641062	D6642064 D6641064
5/64	Standard	1/8	1/4	1-1/2	D6641070	D6641072	D6641074
3/32 3/32	Stub Standard	1/8 1/8	3/16 9/32	1-1/2 1-1/2	D6642090 D6641090	D6642092 D6641092	D6642094 D6641094
7/64 7/64	Stub Standard	1/8 1/8	3/16 3/8	1-1/2 1-1/2	D6642190 D6641190	D6642192 D6641192	D6642194 D6641194
1/8 1/8 1/8 1/8	Stub Standard Long X-Long	1/8 1/8 1/8 1/8	1/4 1/2 3/4 1	1-1/2 1-1/2 2-1/4 3	D6642120 D6641120 D6643120 D6644120	D6642122 D6641122 D6643122 D6644122	D6642124 D6641124 D6643124 D6644124
9/64 9/64	Stub Standard	3/16 3/16	3/8 1/2	2 2	D6642140 D6641140	D6642142 D6641142	D6642144 D6641144
5/32 5/32	Stub Standard	3/16 3/16	3/8 1/2	2 2	D6642150 D6641150	D6642152 D6641152	D6642154 D6641154
11/64 11/64	Stub Standard	3/16 3/16	3/8 5/8	2 2	D6642170 D6641170	D6642172 D6641172	D6642174 D6641174
3/16 3/16 3/16 3/16	Stub Standard Long X-Long	3/16 3/16 3/16 3/16	3/8 5/8 3/4 1-1/8	2 2 2-1/2 3	D6642180 D6641180 D6643180 D6644180	D6642182 D6641182 D6643182 D6644182	D6642184 D6641184 D6643184 D6644184
13/64 13/64	Stub Standard	1/4 1/4	3/8 5/8	2 2-1/2	D6642200 D6641200	D6642202 D6641202	D6642204 D6641204
7/32 7/32	Stub Standard	1/4 1/4	3/8 5/8	2 2-1/2	D6642210 D6641210	D6642212 D6641212	D6642214 D6641214
15/64 15/64	Stub Standard	1/4 1/4	3/8 3/4	2 2-1/2	D6642230 D6641230	D6642232 D6641232	D6642234 D6641234
1/4 1/4 1/4 1/4	Stub Standard Long X-Long	1/4 1/4 1/4 1/4	3/8 3/4 1-1/8 1-1/2	2 2-1/2 3 4	D6642250 D6641250 D6643250 D6644250	D6642252 D6641252 D6643252 D6644252	D6642254 D6641254 D6643254 D6644254
17/64 17/64	Stub Standard	5/16 5/16	1/2 3/4	2 2-1/2	D6642260 D6641260	D6642262 D6641262	D6642264 D6641264
9/32 9/32	Stub Standard	5/16 5/16	1/2 3/4	2 2-1/2	D6642280 D6641280	D6642282 D6641282	D6642284 D6641284
19/64 19/64	Stub Standard	5/16 5/16	1/2 3/4	2 2-1/2	D6642290 D6641290	D6642292 D6641292	D6642294 D6641294

See Page 15 for our 4 Flute Ball Nose Added Reach End Mills.

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
5/16	Stub	5/16	1/2	2	D6642310	D6642312	D6642314
5/16	Standard	5/16	3/4	2-1/2	D6641310	D6641312	D6641314
5/16	Long	5/16	1-1/8	3	D6643310	D6643312	D6643314
5/16	X-Long	5/16	1-5/8	4	D6644310	D6644312	D6644314
21/64	Stub	3/8	5/8	2	D6642320	D6642322	D6642324
21/64	Standard	3/8	7/8	2-1/2	D6641320	D6641322	D6641324
11/32	Stub	3/8	5/8	2	D6642340	D6642342	D6642344
11/32	Standard	3/8	7/8	2-1/2	D6641340	D6641342	D6641344
23/64	Stub	3/8	5/8	2	D6642350	D6642352	D6642354
23/64	Standard	3/8	7/8	2-1/2	D6641350	D6641352	D6641354
3/8	Stub	3/8	5/8	2	D6642370	D6642372	D6642374
3/8	Standard	3/8	7/8	2-1/2	D6641370	D6641372	D6641374
3/8	Long	3/8	1-1/8	3	D6643370	D6643372	D6643374
3/8	X-Long	3/8	1-3/4	4	D6644370	D6644372	D6644374
3/8	XX-Long	3/8	3	6	D6648370	D6648372	D6648374
25/64	Stub	7/16	5/8	2	D6642390	D6642392	D6642394
25/64	Standard	7/16	1	2-3/4	D6641390	D6641392	D6641394
13/32	Stub	7/16	5/8	2	D6642400	D6642402	D6642404
13/32	Standard	7/16	1	2-3/4	D6641400	D6641402	D6641404
27/64	Stub	7/16	5/8	2	D6642420	D6642422	D6642424
27/64	Standard	7/16	1	2-3/4	D6641420	D6641422	D6641424
7/16	Stub	7/16	5/8	2	D6642430	D6642432	D6642434
7/16	Standard	7/16	1	2-3/4	D6641430	D6641432	D6641434
7/16	Long	7/16	2	4	D6643430	D6643432	D6643434
7/16	X-Long	7/16	3	6	D6644430	D6644432	D6644434
29/64	Stub	1/2	5/8	2-1/2	D6642450	D6642452	D6642454
29/64	Standard	1/2	1	3	D6641450	D6641452	D6641454
15/32	Stub	1/2	5/8	2-1/2	D6642460	D6642462	D6642464
15/32	Standard	1/2	1	3	D6641460	D6641462	D6641464
31/64	Stub	1/2	5/8	2-1/2	D6642480	D6642482	D6642484
31/64	Standard	1/2	1	3	D6641480	D6641482	D6641484
1/2	Stub	1/2	5/8	2-1/2	D6642500	D6642502	D6642504
1/2	Standard	1/2	1	3	D6641500	D6641502	D6641504
1/2	Long	1/2	2	4	D6643500	D6643502	D6643504
1/2	X-Long	1/2	3	6	D6644500	D6644502	D6644504
9/16	Stub	9/16	7/8	3	D6642560	D6642562	D6642564
9/16	Standard	9/16	1-1/4	3-1/2	D6641560	D6641562	D6641564
9/16	X-Long	9/16	3	6	D6644560	D6644562	D6644564
5/8	Stub	5/8	7/8	3	D6642620	D6642622	D6642624
5/8	Standard	5/8	1-1/4	3-1/2	D6641620	D6641622	D6641624
5/8	Long	5/8	2-1/8	4-5/8	D6643620	D6643622	D6643624
5/8	X-Long	5/8	3	6	D6644620	D6644622	D6644624
11/16	Stub	3/4	1	3	D6642680	D6642682	D6642684
11/16	Standard	3/4	1-1/2	4	D6641680	D6641682	D6641684
3/4	Stub	3/4	1	3	D6642750	D6642752	D6642754
3/4	Standard	3/4	1-1/2	4	D6641750	D6641752	D6641754
3/4	Long	3/4	2-1/4	5	D6643750	D6643752	D6643754
3/4	X-Long	3/4	3	6	D6644750	D6644752	D6644754
7/8	Standard	7/8	1 3/4	4	D6641870	D6641872	D6641874
1	Standard	1	1-3/4	4	D6641100	D6641102	D6641104
1	Long	1	2-1/4	5	D6643100	D6643102	D6643104
1	X-Long	1	3	6	D6644100	D6644102	D6644104

SERIES D842

2 FLUTE DOUBLE END MEDIUM HELIX



DIAMETER TOLERANCE:
1/32" Thru 1/2" = +.000/-0.002

SHANK TOLERANCE:
1/32" Thru 1/2" = -.0001/-0.0004

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AiTiN
1/32	Stub	1/8	1/16	1-1/2	D8422030	D8422032	D8422034
3/64	Stub	1/8	3/32	1-1/2	D8422040	D8422042	D8422044
1/16	Stub	1/8	1/8	1-1/2	D8422060	D8422062	D8422064
5/64	Stub	1/8	5/32	1-1/2	D8422070	D8422072	D8422074
3/32	Stub	1/8	3/16	1-1/2	D8422090	D8422092	D8422094
7/64	Stub	1/8	3/16	1-1/2	D8422190	D8422192	D8422194
1/8 1/8	Stub Standard	1/8 3/8	1/4 3/8	1-1/2 3	D8422120 D8421120	D8422122 D8421122	D8422124 D8421124
9/64	Stub	3/16	5/16	2	D8422140	D8422142	D8422144
5/32 5/32	Stub Standard	3/16 3/8	5/16 7/16	2 3	D8422150 D8421150	D8422152 D8421152	D8422154 D8421154
11/64	Stub	3/16	5/16	2	D8422170	D8422172	D8422174
3/16 3/16	Stub Standard	3/16 3/8	3/8 1/2	2 3	D8422180 D8421180	D8422182 D8421182	D8422184 D8421184
13/64	Stub	1/4	1/2	2-1/2	D8422200	D8422202	D8422204
7/32 7/32	Stub Standard	1/4 3/8	7/16 9/16	2-1/2 3	D8422210 D8421210	D8422212 D8421212	D8422214 D8421214
15/64	Stub	1/4	1/2	2-1/2	D8422230	D8422232	D8422234
1/4 1/4	Stub Standard	1/4 3/8	1/2 5/8	2-1/2 3	D8422250 D8421250	D8422252 D8421252	D8422254 D8421254
9/32 9/32	Stub Standard	5/16 3/8	1/2 11/16	2-1/2 3-1/2	D8422280 D8421280	D8422282 D8421282	D8422284 D8421284
5/16 5/16	Stub Standard	5/16 3/8	1/2 3/4	2-1/2 3-1/2	D8422310 D8421310	D8422312 D8421312	D8422314 D8421314
11/32	Standard	3/8	3/4	3-1/2	D8421340	D8421342	D8421344
3/8 3/8	Stub Standard	3/8 3/8	1/2 3/4	2-1/2 3-1/2	D8422370 D8421370	D8422372 D8421372	D8422374 D8421374
7/16 7/16	Stub Standard	7/16 1/2	9/16 7/8	2-3/4 4	D8422430 D8421430	D8422432 D8421432	D8422434 D8421434
1/2 1/2	Stub Standard	1/2 1/2	5/8 1	3 4	D8422500 D8421500	D8422502 D8421502	D8422504 D8421504

SERIES D862

2 FLUTE BALL DOUBLE END MEDIUM HELIX

DIAMETER TOLERANCE:
1/32" Thru 1/2" = +.000/-0.002

SHANK TOLERANCE:
1/32" Thru 1/2" = -.0001/-0.0004

BALL RADIUS TOLERANCE: +/-0.001



DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1/32	Stub	1/8	1/16	1-1/2	D8622030	D8622032	D8622034
3/64	Stub	1/8	3/32	1-1/2	D8622040	D8622042	D8622044
1/16	Stub	1/8	1/8	1-1/2	D8622060	D8622062	D8622064
5/64	Stub	1/8	5/32	1-1/2	D8622070	D8622072	D8622074
3/32	Stub	1/8	3/16	1-1/2	D8622090	D8622092	D8622094
7/64	Stub	1/8	3/16	1-1/2	D8622190	D8622192	D8622194
1/8 1/8	Stub Standard	1/8 3/8	1/4 3/8	1-1/2 3	D8622120 D8621120	D8622122 D8621122	D8622124 D8621124
9/64	Stub	3/16	5/16	2	D8622140	D8622142	D8622144
5/32 5/32	Stub Standard	3/16 3/8	5/16 7/16	2 3	D8622150 D8621150	D8622152 D8621152	D8622154 D8621154
11/64	Stub	3/16	5/16	2	D8622170	D8622172	D8622174
3/16 3/16	Stub Standard	3/16 3/8	3/8 1/2	2 3	D8622180 D8621180	D8622182 D8621182	D8622184 D8621184
13/64	Stub	1/4	1/2	2-1/2	D8622200	D8622202	D8622204
7/32 7/32	Stub Standard	1/4 3/8	7/16 9/16	2-1/2 3	D8622210 D8621210	D8622212 D8621212	D8622214 D8621214
15/64	Stub	1/4	1/2	2-1/2	D8622230	D8622232	D8622234
1/4 1/4	Stub Standard	1/4 3/8	1/2 5/8	2-1/2 3	D8622250 D8621250	D8622252 D8621252	D8622254 D8621254
9/32 9/32	Stub Standard	5/16 3/8	1/2 11/16	2-1/2 3-1/2	D8622280 D8621280	D8622282 D8621282	D8622284 D8621284
5/16 5/16	Stub Standard	5/16 3/8	1/2 3/4	2-1/2 3-1/2	D8622310 D8621310	D8622312 D8621312	D8622314 D8621314
11/32	Standard	3/8	3/4	3-1/2	D8621340	D8621342	D8621344
3/8 3/8	Stub Standard	3/8 3/8	1/2 3/4	2-1/2 3-1/2	D8622370 D8621370	D8622372 D8621372	D8622374 D8621374
7/16 7/16	Stub Standard	7/16 1/2	9/16 7/8	2-3/4 4	D8622430 D8621430	D8622432 D8621432	D8622434 D8621434
1/2 1/2	Stub Standard	1/2 1/2	5/8 1	3 4	D8622500 D8621500	D8622502 D8621502	D8622504 D8621504

SERIES D844

4 FLUTE DOUBLE END MEDIUM HELIX



DIAMETER TOLERANCE:
1/32" Thru 1/2" = +.000/-0.002

SHANK TOLERANCE:
1/32" Thru 1/2" = -.0001/-0.0004

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1/32	Stub	1/8	1/16	1-1/2	D8442030	D8442032	D8442034
3/64	Stub	1/8	3/32	1-1/2	D8442040	D8442042	D8442044
1/16	Stub	1/8	1/8	1-1/2	D8442060	D8442062	D8442064
5/64	Stub	1/8	5/32	1-1/2	D8442070	D8442072	D8442074
3/32	Stub	1/8	3/16	1-1/2	D8442090	D8442092	D8442094
7/64	Stub	1/8	3/16	1-1/2	D8442190	D8442192	D8442194
1/8 1/8	Stub Standard	1/8 3/8	1/4 3/8	1-1/2 3	D8442120 D8441120	D8442122 D8441122	D8442124 D8441124
9/64	Stub	3/16	5/16	2	D8442140	D8442142	D8442144
5/32 5/32	Stub Standard	3/16 3/8	5/16 7/16	2 3	D8442150 D8441150	D8442152 D8441152	D8442154 D8441154
11/64	Stub	3/16	5/16	2	D8442170	D8442172	D8442174
3/16 3/16	Stub Standard	3/16 3/8	3/8 1/2	2 3	D8442180 D8441180	D8442182 D8441182	D8442184 D8441184
13/64	Stub	1/4	1/2	2-1/2	D8442200	D8442202	D8442204
7/32 7/32	Stub Standard	1/4 3/8	7/16 9/16	2-1/2 3	D8442210 D8441210	D8442212 D8441212	D8442214 D8441214
15/64	Stub	1/4	1/2	2-1/2	D8442230	D8442232	D8442234
1/4 1/4	Stub Standard	1/4 3/8	1/2 5/8	2-1/2 3	D8442250 D8441250	D8442252 D8441252	D8442254 D8441254
9/32 9/32	Stub Standard	5/16 3/8	1/2 11/16	2-1/2 3 1/2	D8442280 D8441280	D8442282 D8441282	D8442284 D8441284
5/16 5/16	Stub Standard	5/16 3/8	1/2 3/4	2-1/2 3-1/2	D8442310 D8441310	D8442312 D8441312	D8442314 D8441314
11/32	Standard	3/8	3/4	3-1/2	D8441340	D8441342	D8441344
3/8 3/8	Stub Standard	3/8 3/8	1/2 3/4	2-1/2 3-1/2	D8442370 D8441370	D8442372 D8441372	D8442374 D8441374
7/16 7/16	Stub Standard	7/16 1/2	9/16 7/8	2-3/4 4	D8442430 D8441430	D8442432 D8441432	D8442434 D8441434
1/2 1/2	Stub Standard	1/2 1/2	5/8 1	3 4	D8442500 D8441500	D8442502 D8441502	D8442504 D8441504

SERIES D864

4 FLUTE DOUBLE END BALL MEDIUM HELIX

DIAMETER TOLERANCE:
1/32" Thru 1/2" = +.000/-0.002

SHANK TOLERANCE:
1/32" Thru 1/2" = -.0001/-0.0004

BALL RADIUS TOLERANCE: +/-0.001



DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1/32	Stub	1/8	1/16	1-1/2	D8642030	D8642032	D8642034
3/64	Stub	1/8	3/32	1-1/2	D8642040	D8642042	D8642044
1/16	Stub	1/8	1/8	1-1/2	D8642060	D8642062	D8642064
5/64	Stub	1/8	5/32	1-1/2	D8642070	D8642072	D8642074
3/32	Stub	1/8	3/16	1-1/2	D8642090	D8642092	D8642094
7/64	Stub	1/8	3/16	1-1/2	D8642190	D8642192	D8642194
1/8 1/8	Stub Standard	1/8 3/8	1/4 3/8	1-1/2 3	D8642120 D8641120	D8642122 D8641122	D8642124 D8641124
9/64	Stub	3/16	5/16	2	D8642140	D8642142	D8642144
5/32 5/32	Stub Standard	3/16 3/8	5/16 7/16	2 3	D8642150 D8641150	D8642152 D8641152	D8642154 D8641154
11/64	Stub	3/16	5/16	2	D8642170	D8642172	D8642174
3/16 3/16	Stub Standard	3/16 3/8	3/8 1/2	2 3	D8642180 D8641180	D8642182 D8641182	D8642184 D8641184
13/64	Stub	1/4	1/2	2-1/2	D8642200	D8642202	D8642204
7/32 7/32	Stub Standard	1/4 3/8	7/16 9/16	2-1/2 3	D8642210 D8641210	D8642212 D8641212	D8642214 D8641214
15/64	Stub	1/4	1/2	2-1/2	D8642230	D8642232	D8642234
1/4 1/4	Stub Standard	1/4 3/8	1/2 5/8	2-1/2 3	D8642250 D8641250	D8642252 D8641252	D8642254 D8641254
9/32 9/32	Stub Standard	5/16 3/8	1/2 11/16	2-1/2 3-1/2	D8642280 D8641280	D8642282 D8641282	D8642284 D8641284
5/16 5/16	Stub Standard	5/16 3/8	1/2 3/4	2-1/2 3-1/2	D8642310 D8641310	D8642312 D8641312	D8642314 D8641314
11/32	Standard	3/8	3/4	3-1/2	D8641340	D8641342	D8641344
3/8 3/8	Stub Standard	3/8 3/8	1/2 3/4	2-1/2 3-1/2	D8642370 D8641370	D8642372 D8641372	D8642374 D8641374
7/16 7/16	Stub Standard	7/16 1/2	9/16 7/8	2-3/4 4	D8642430 D8641430	D8642432 D8641432	D8642434 D8641434
1/2 1/2	Stub Standard	1/2 1/2	5/8 1	3 4	D8642500 D8641500	D8642502 D8641502	D8642504 D8641504

SERIES D845

5 FLUTE DOUBLE END 45° HELIX

***New**



DIAMETER TOLERANCE:
1/8" Thru 1/2" = +.000/-0.002

SHANK TOLERANCE:
1/8" Thru 1/2" = -.0001/-0.0004

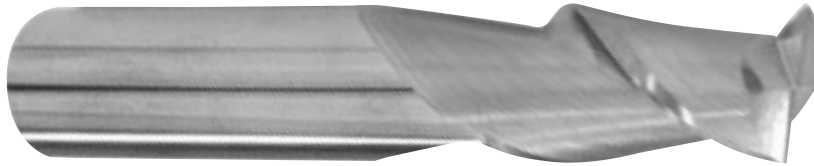
DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER AlTiN
1/8	*Stub	1/8	1/4	1-1/2	D8452120	D8452124
3/16	*Stub	3/16	3/8	2	D8452180	D8452184
1/4	*Stub	1/4	1/2	2-1/2	D8452250	D8452254
5/16	*Stub	5/16	1/2	2-1/2	D8452310	D8452314
3/8	*Stub	3/8	1/2	2-1/2	D8452370	D8452374
7/16	*Stub	7/16	9/16	2-3/4	D8452430	D8452434
1/2	*Stub	1/2	5/8	3	D8452500	D8452504

SERIES D642M

2 FLUTE METRIC MEDIUM HELIX

DIAMETER TOLERANCE:
1mm Thru 25mm = +.000/-0.002

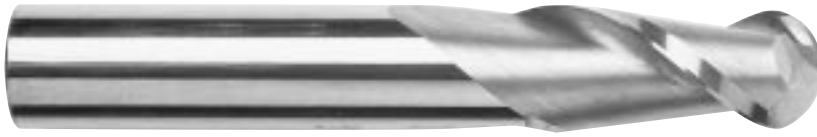
SHANK TOLERANCE:
1mm Thru 25mm = -.0001/-0.0004



DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1 mm 1 mm	Stub Standard	3 mm 3 mm	2 mm 4 mm	38 mm 38 mm	D64220390 D64210390	D64220392 D64210392	D64220394 D64210394
1.5 mm 1.5 mm	Stub Standard	3 mm 3 mm	3 mm 6 mm	38 mm 38 mm	D64220590 D64210590	D64220592 D64210592	D64220594 D64210594
2 mm 2 mm	Stub Standard	3 mm 3 mm	4 mm 8 mm	38 mm 38 mm	D64220780 D64210780	D64220782 D64210782	D64220784 D64210784
2.5 mm 2.5 mm	Stub Standard	3 mm 3 mm	5 mm 10 mm	38 mm 38 mm	D64220980 D64210980	D64220982 D64210982	D64220984 D64210984
3 mm 3 mm	Stub Standard	3 mm 3 mm	6 mm 12 mm	38 mm 38 mm	D64221180 D64211180	D64221182 D64211182	D64221184 D64211184
3.5 mm 3.5 mm	Stub Standard	4 mm 4 mm	7 mm 12 mm	50 mm 50 mm	D64221370 D64211370	D64221372 D64211372	D64221374 D64211374
4 mm 4 mm	Stub Standard	4 mm 4 mm	8 mm 14 mm	50 mm 50 mm	D64221570 D64211570	D64221572 D64211572	D64221574 D64211574
4.5 mm 4.5 mm	Stub Standard	6 mm 6 mm	9.5 mm 16 mm	63 mm 63 mm	D64221770 D64211770	D64221772 D64211772	D64221774 D64211774
5 mm 5 mm	Stub Standard	6 mm 6 mm	10 mm 16 mm	63 mm 63 mm	D64221960 D64211960	D64221962 D64211962	D64221964 D64211964
6 mm 6 mm	Stub Standard	6 mm 6 mm	12 mm 19 mm	63 mm 63 mm	D64222360 D64212360	D64222362 D64212362	D64222364 D64212364
7 mm 7 mm	Stub Standard	8 mm 8 mm	12 mm 19 mm	63 mm 63 mm	D64222750 D64212750	D64222752 D64212752	D64222754 D64212754
8 mm 8 mm	Stub Standard	8 mm 8 mm	12 mm 20 mm	63 mm 63 mm	D64223150 D64213150	D64223152 D64213152	D64223154 D64213154
9 mm 9 mm	Stub Standard	10 mm 10 mm	14 mm 25 mm	70 mm 70 mm	D64223540 D64213540	D64223542 D64213542	D64223544 D64213544
10 mm 10 mm	Stub Standard	10 mm 10 mm	14 mm 25 mm	70 mm 70 mm	D64223930 D64213930	D64223932 D64213932	D64223934 D64213934
11 mm 11 mm	Stub Standard	12 mm 12 mm	14 mm 25 mm	76 mm 76 mm	D64224330 D64214330	D64224332 D64214332	D64224334 D64214334
12 mm 12 mm	Stub Standard	12 mm 12 mm	16 mm 25 mm	76 mm 76 mm	D64224720 D64214720	D64224722 D64214722	D64224724 D64214724
14 mm	Standard	14 mm	32 mm	89 mm	D64215510	D64215512	D64215514
16 mm	Standard	16 mm	32 mm	89 mm	D64216290	D64216292	D64216294
18 mm	Standard	18 mm	38 mm	101 mm	D64217080	D64217082	D64217084
20 mm	Standard	20 mm	38 mm	101 mm	D64217870	D64217872	D64217874
25 mm	Standard	25 mm	38 mm	101 mm	D64219840	D64219842	D64219844

SERIES D662M

2 FLUTE METRIC BALL NOSE MEDIUM HELIX



DIAMETER TOLERANCE:
1mm Thru 25mm = $+0.000/-0.002$

SHANK TOLERANCE:
1mm Thru 25mm = $-0.0001/-0.0004$

BALL RADIUS TOLERANCE: $+/-0.001$

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1 mm 1 mm	Stub Standard	3 mm 3 mm	2 mm 4 mm	38 mm 38 mm	D66220390 D66210390	D66220392 D66210392	D66220394 D66210394
1.5 mm 1.5 mm	Stub Standard	3 mm 3 mm	3 mm 6 mm	38 mm 38 mm	D66220590 D66210590	D66220592 D66210592	D66220594 D66210594
2 mm 2 mm	Stub Standard	3 mm 3 mm	4 mm 8 mm	38 mm 38 mm	D66220780 D66210780	D66220782 D66210782	D66220784 D66210784
2.5 mm 2.5 mm	Stub Standard	3 mm 3 mm	5 mm 10 mm	38 mm 38 mm	D66220980 D66210980	D66220982 D66210982	D66220984 D66210984
3 mm 3 mm	Stub Standard	3 mm 3 mm	6 mm 12 mm	38 mm 38 mm	D66221180 D66211180	D66221182 D66211182	D66221184 D66211184
3.5 mm 3.5 mm	Stub Standard	4 mm 4 mm	7 mm 12 mm	50 mm 50 mm	D66221370 D66211370	D66221372 D66211372	D66221374 D66211374
4 mm 4 mm	Stub Standard	4 mm 4 mm	8 mm 14 mm	50 mm 50 mm	D66221570 D66211570	D66221572 D66211572	D66221574 D66211574
4.5 mm 4.5 mm	Stub Standard	6 mm 6 mm	9.5 mm 16 mm	63 mm 63 mm	D66221770 D66211770	D66221772 D66211772	D66221774 D66211774
5 mm 5 mm	Stub Standard	6 mm 6 mm	10 mm 16 mm	63 mm 63 mm	D66221960 D66211960	D66221962 D66211962	D66221964 D66211964
6 mm 6 mm	Stub Standard	6 mm 6 mm	12 mm 19 mm	63 mm 63 mm	D66222360 D66212360	D66222362 D66212362	D66222364 D66212364
7 mm 7 mm	Stub Standard	8 mm 8 mm	12 mm 19 mm	63 mm 63 mm	D66222750 D66212750	D66222752 D66212752	D66222754 D66212754
8 mm 8 mm	Stub Standard	8 mm 8 mm	12 mm 20 mm	63 mm 63 mm	D66223150 D66213150	D66223152 D66213152	D66223154 D66213154
9 mm 9 mm	Stub Standard	10 mm 10 mm	14 mm 25 mm	70 mm 70 mm	D66223540 D66213540	D66223542 D66213542	D66223544 D66213544
10 mm 10 mm	Stub Standard	10 mm 10 mm	14 mm 25 mm	70 mm 70 mm	D66223930 D66213930	D66223932 D66213932	D66223934 D66213934
11 mm 11 mm	Stub Standard	12 mm 12 mm	14 mm 25 mm	76 mm 76 mm	D66224330 D66214330	D66224332 D66214332	D66224334 D66214334
12 mm 12 mm	Stub Standard	12 mm 12 mm	16 mm 25 mm	76 mm 76 mm	D66224720 D66214720	D66224722 D66214722	D66224724 D66214724
14 mm	Standard	14 mm	32 mm	89 mm	D66215510	D66215512	D66215514
16 mm	Standard	16 mm	32 mm	89 mm	D66216290	D66216292	D66216294
18 mm	Standard	18 mm	38 mm	101 mm	D66217080	D66217082	D66217084
20 mm	Standard	20 mm	38 mm	101 mm	D66217870	D66217872	D66217874
25 mm	Standard	25 mm	38 mm	101 mm	D66219840	D66219842	D66219844

SERIES D644M

4 FLUTE METRIC MEDIUM HELIX

DIAMETER TOLERANCE:
1mm Thru 25mm= +.000/-0.002

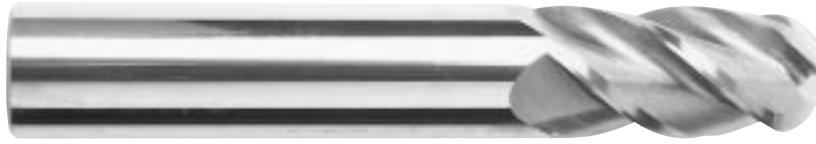
SHANK TOLERANCE:
1mm Thru 25mm= -.0001/-0.0004



DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1 mm 1 mm	Stub Standard	3 mm 3 mm	2 mm 4 mm	38 mm 38 mm	D64420390 D64410390	D64420392 D64410392	D64420394 D64410394
1.5 mm 1.5 mm	Stub Standard	3 mm 3 mm	3 mm 6 mm	38 mm 38 mm	D64420590 D64410590	D64420592 D64410592	D64420594 D64410594
2 mm 2 mm	Stub Standard	3 mm 3 mm	4 mm 8 mm	38 mm 38 mm	D64420780 D64410780	D64420782 D64410782	D64420784 D64410784
2.5 mm 2.5 mm	Stub Standard	3 mm 3 mm	5 mm 10 mm	38 mm 38 mm	D64420980 D64410980	D64420982 D64410982	D64420984 D64410984
3 mm 3 mm	Stub Standard	3 mm 3 mm	6 mm 12 mm	38 mm 38 mm	D64421180 D64411180	D64421182 D64411182	D64421184 D64411184
3.5 mm 3.5 mm	Stub Standard	4 mm 4 mm	7 mm 12 mm	50 mm 50 mm	D64421370 D64411370	D64421372 D64411372	D64421374 D64411374
4 mm 4 mm	Stub Standard	4 mm 4 mm	8 mm 14 mm	50 mm 50 mm	D64421570 D64411570	D64421572 D64411572	D64421574 D64411574
4.5 mm 4.5 mm	Stub Standard	6 mm 6 mm	9.5 mm 16 mm	63 mm 63 mm	D64421770 D64411770	D64421772 D64411772	D64421774 D64411774
5 mm 5 mm	Stub Standard	6 mm 6 mm	10 mm 16 mm	63 mm 63 mm	D64421960 D64411960	D64421962 D64411962	D64421964 D64411964
6 mm 6 mm	Stub Standard	6 mm 6 mm	12 mm 19 mm	63 mm 63 mm	D64422360 D64412360	D64422362 D64412362	D64422364 D64412364
7 mm 7 mm	Stub Standard	8 mm 8 mm	12 mm 19 mm	63 mm 63 mm	D64422750 D64412750	D64422752 D64412752	D64422754 D64412754
8 mm 8 mm	Stub Standard	8 mm 8 mm	12 mm 20 mm	63 mm 63 mm	D64423150 D64413150	D64423152 D64413152	D64423154 D64413154
9 mm 9 mm	Stub Standard	10 mm 10 mm	14 mm 25 mm	70 mm 70 mm	D64423540 D64413540	D64423542 D64413542	D64423544 D64413544
10 mm 10 mm	Stub Standard	10 mm 10 mm	14 mm 25 mm	70 mm 70 mm	D64423930 D64413930	D64423932 D64413932	D64423934 D64413934
11 mm 11 mm	Stub Standard	12 mm 12 mm	14 mm 25 mm	76 mm 76 mm	D64424330 D64414330	D64424332 D64414332	D64424334 D64414334
12 mm 12 mm	Stub Standard	12 mm 12 mm	16 mm 25 mm	76 mm 76 mm	D64424720 D64414720	D64424722 D64414722	D64424724 D64414724
14 mm	Standard	14 mm	32 mm	89 mm	D64415510	D64415512	D64415514
16 mm	Standard	16 mm	32 mm	89 mm	D64416290	D64416292	D64416294
18 mm	Standard	18 mm	38 mm	101 mm	D64417080	D64417082	D64417084
20 mm	Standard	20 mm	38 mm	101 mm	D64417870	D64417872	D64417874
25 mm	Standard	25 mm	38 mm	101 mm	D64419840	D64419842	D64419844

SERIES D664M

4 FLUTE METRIC BALL NOSE MEDIUM HELIX



DIAMETER TOLERANCE:
1mm Thru 25mm= +.000/-.002

SHANK TOLERANCE:
1mm Thru 25mm= -.0001/-.0004

BALL RADIUS TOLERANCE: +/- .001

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1 mm 1 mm	Stub Standard	3 mm 3 mm	2 mm 4 mm	38 mm 38 mm	D66420390 D66410390	D66420392 D66410392	D66420394 D66410394
1.5 mm 1.5 mm	Stub Standard	3 mm 3 mm	3 mm 6 mm	38 mm 38 mm	D66420590 D66410590	D66420592 D66410592	D66420594 D66410594
2 mm 2 mm	Stub Standard	3 mm 3 mm	4 mm 8 mm	38 mm 38 mm	D66420780 D66410780	D66420782 D66410782	D66420784 D66410784
2.5 mm 2.5 mm	Stub Standard	3 mm 3 mm	5 mm 10 mm	38 mm 38 mm	D66420980 D66410980	D66420982 D66410982	D66420984 D66410984
3 mm 3 mm	Stub Standard	3 mm 3 mm	6 mm 12 mm	38 mm 38 mm	D66421180 D66411180	D66421182 D66411182	D66421184 D66411184
3.5 mm 3.5 mm	Stub Standard	4 mm 4 mm	7 mm 12 mm	50 mm 50 mm	D66421370 D66411370	D66421372 D66411372	D66421374 D66411374
4 mm 4 mm	Stub Standard	4 mm 4 mm	8 mm 14 mm	50 mm 50 mm	D66421570 D66411570	D66421572 D66411572	D66421574 D66411574
4.5 mm 4.5 mm	Stub Standard	6 mm 6 mm	9.5 mm 16 mm	63 mm 63 mm	D66421770 D66411770	D66421772 D66411772	D66421774 D66411774
5 mm 5 mm	Stub Standard	6 mm 6 mm	10 mm 16 mm	63 mm 63 mm	D66421960 D66411960	D66421962 D66411962	D66421964 D66411964
6 mm 6 mm	Stub Standard	6 mm 6 mm	12 mm 19 mm	63 mm 63 mm	D66422360 D66412360	D66422362 D66412362	D66422364 D66412364
7 mm 7 mm	Stub Standard	8 mm 8 mm	12 mm 19 mm	63 mm 63 mm	D66422750 D66412750	D66422752 D66412752	D66422754 D66412754
8 mm 8 mm	Stub Standard	8 mm 8 mm	12 mm 20 mm	63 mm 63 mm	D66423150 D66413150	D66423152 D66413152	D66423154 D66413154
9 mm 9 mm	Stub Standard	10 mm 10 mm	14 mm 25 mm	70 mm 70 mm	D66423540 D66413540	D66423542 D66413542	D66423544 D66413544
10 mm 10 mm	Stub Standard	10 mm 10 mm	14 mm 25 mm	70 mm 70 mm	D66423930 D66413930	D66423932 D66413932	D66423934 D66413934
11 mm 11 mm	Stub Standard	12 mm 12 mm	14 mm 25 mm	76 mm 76 mm	D66424330 D66414330	D66424332 D66414332	D66424334 D66414334
12 mm 12 mm	Stub Standard	12 mm 12 mm	16 mm 25 mm	76 mm 76 mm	D66424720 D66414720	D66424722 D66414722	D66424724 D66414724
14 mm	Standard	14 mm	32 mm	89 mm	D66415510	D66415512	D66415514
16 mm	Standard	16 mm	32 mm	89 mm	D66416290	D66416292	D66416294
18 mm	Standard	18 mm	38 mm	101 mm	D66417080	D66417082	D66417084
20 mm	Standard	20 mm	38 mm	101 mm	D66417870	D66417872	D66417874
25 mm	Standard	25 mm	38 mm	101 mm	D66419840	D66419842	D66419844

SERIES D842M

2 FLUTE METRIC DOUBLE END MEDIUM HELIX

DIAMETER TOLERANCE:
1mm Thru12mm= +.000/-0.002

SHANK TOLERANCE:
1mm Thru12mm= -.0001/-0.0004



DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1 mm	Stub	3 mm	2 mm	38 mm	D84220390	D84220392	D84220394
1.5 mm	Stub	3 mm	3 mm	38 mm	D84220590	D84220592	D84220594
2 mm	Stub	3 mm	4 mm	38 mm	D84220780	D84220782	D84220784
2.5 mm	Stub	3 mm	5 mm	38 mm	D84220980	D84220982	D84220984
3 mm	Stub	3 mm	6 mm	38 mm	D84221180	D84221182	D84221184
3.5 mm	Stub	4 mm	7 mm	50 mm	D84221370	D84221372	D84221374
4 mm	Stub	4 mm	8 mm	50 mm	D84221570	D84221572	D84221574
4.5 mm	Stub	6 mm	10 mm	63 mm	D84221770	D84221772	D84221774
5 mm	Stub	6 mm	10 mm	63 mm	D84221960	D84221962	D84221964
6 mm	Stub	6 mm	11 mm	63 mm	D84222360	D84222362	D84222364
7 mm	Stub	8 mm	12 mm	63 mm	D84222750	D84222752	D84222754
8 mm	Stub	8 mm	12 mm	63 mm	D84223150	D84223152	D84223154
9 mm	Stub	10 mm	14 mm	70 mm	D84223540	D84223542	D84223544
10 mm	Stub	10 mm	14 mm	70 mm	D84223930	D84223932	D84223934
11 mm	Stub	12 mm	14 mm	76 mm	D84224330	D84224332	D84224334
12 mm	Stub	12 mm	16 mm	76 mm	D84224720	D84224722	D84224724

SERIES D844M

4FL METRIC DOUBLE END MEDIUM HELIX



DIAMETER TOLERANCE:
1mm Thru12mm= +.000/-0.002

SHANK TOLERANCE:
1mm Thru12mm= -.0001/-0.0004

DIA	LENGTH	SHANK	LOC	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1 mm	Stub	3 mm	2 mm	38 mm	D84420390	D84420392	D84420394
1.5 mm	Stub	3 mm	3 mm	38 mm	D84420590	D84420592	D84420594
2 mm	Stub	3 mm	4 mm	38 mm	D84420780	D84420782	D84420784
2.5 mm	Stub	3 mm	5 mm	38 mm	D84420980	D84420982	D84420984
3 mm	Stub	3 mm	6 mm	38 mm	D84421180	D84421182	D84421184
3.5 mm	Stub	4 mm	7 mm	50 mm	D84421370	D84421372	D84421374
4 mm	Stub	4 mm	8 mm	50 mm	D84421570	D84421572	D84421574
4.5 mm	Stub	6 mm	10 mm	63 mm	D84421770	D84421772	D84421774
5 mm	Stub	6 mm	10 mm	63 mm	D84421960	D84421962	D84421964
6 mm	Stub	6 mm	11 mm	63 mm	D84422360	D84422362	D84422364
7 mm	Stub	8 mm	12 mm	63 mm	D84422750	D84422752	D84422754
8 mm	Stub	8 mm	12 mm	63 mm	D84423150	D84423152	D84423154
9 mm	Stub	10 mm	14 mm	70 mm	D84423540	D84423542	D84423544
10 mm	Stub	10 mm	14 mm	70 mm	D84423930	D84423932	D84423934
11 mm	Stub	12 mm	14 mm	76 mm	D84424330	D84424332	D84424334
12 mm	Stub	12 mm	16 mm	76 mm	D84424720	D84424722	D84424724

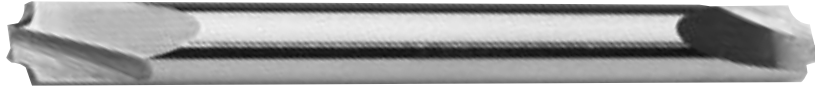
SERIES D871

2FL CORNER ROUNDERS

SHANK TOLERANCE:
1/8" Thru 3/8" = +.000/-0.0005

RADIUS TOLERANCE:
1/8" Thru 3/8" = +/- .001

MINOR DIAMETER TOLERANCE:
1/8" Thru 3/8" = + .000/-0.004



SHANK	RADIUS	MINOR DIAMETER	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1/8	0.010	.105	1-1/2	D8712010	D87120102	D87120104
1/8	0.015	.095	1-1/2	D8712015	D87120152	D87120154
1/8	0.020	.085	1-1/2	D8712020	D87120202	D87120204
1/8	0.025	.075	1-1/2	D8712025	D87120252	D87120254
1/8	0.031	.063	1-1/2	D8712031	D87120312	D87120314
1/8	0.035	.055	1-1/2	D8712035	D87120352	D87120354
1/8	0.040	.045	1-1/2	D8712040	D87120402	D87120404
3/16	0.046	.095	2	D8712046	D87120462	D87120464
3/16	0.050	.087	2	D8712050	D87120502	D87120504
3/16	0.055	.077	2	D8712055	D87120552	D87120554
3/16	0.062	.063	2	D8712062	D87120622	D87120624
1/4	0.072	.106	2-1/2	D8712072	D87120722	D87120724
1/4	0.078	.094	2-1/2	D8712078	D87120782	D87120784
1/4	0.085	.080	2-1/2	D8712085	D87120852	D87120854
1/4	0.094	.062	2-1/2	D8712094	D87120942	D87120944
1/4	0.100	.050	2-1/2	D8712100	D87121002	D87121004
5/16	0.109	.094	2-1/2	D8712109	D87121092	D87121094
5/16	0.118	.076	2-1/2	D8712118	D87121182	D87121184
5/16	0.125	.063	2-1/2	D8712125	D87121252	D87121254
3/8	0.140	.095	2-1/2	D8712140	D87121402	D87121404
3/8	0.156	.063	2-1/2	D8712156	D87121562	D87121564

SERIES D601

4FL CORNER ROUNDERS



SHANK TOLERANCE:
3/16" Thru 1/2" = +.000/-0.005

RADIUS TOLERANCE:
3/16" Thru 1/2" = +/- .001

MINOR DIAMETER TOLERANCE:
3/16" Thru 1/2" = +.000/-0.004

SHANK	RADIUS	MINOR DIAMETER	OAL	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
3/16	.010	.162	2	D60101200	D60101202	D60101204
3/16	.015	.152	2	D60101210	D60101212	D60101214
3/16	.020	.142	2	D60101220	D60101222	D60101224
3/16	.031	.120	2	D60101240	D60101242	D60101244
3/16	.035	.112	2	D60101250	D60101252	D60101254
1/4	.040	.165	2-1/2	D60101600	D60101602	D60101604
1/4	.046	.153	2-1/2	D60101610	D60101612	D60101614
1/4	.050	.145	2-1/2	D60101620	D60101622	D60101624
1/4	.062	.121	2-1/2	D60101630	D60101632	D60101634
3/8	.078	.214	2-1/2	D60102400	D60102402	D60102404
3/8	.094	.182	2-1/2	D60102410	D60102412	D60102414
3/8	.100	.170	2-1/2	D60102420	D60102422	D60102424
3/8	.118	.134	2-1/2	D60102430	D60102432	D60102434
3/8	.125	.120	2-1/2	D60102440	D60102442	D60102444
1/2	.156	.183	3	D60103200	D60103202	D60103204

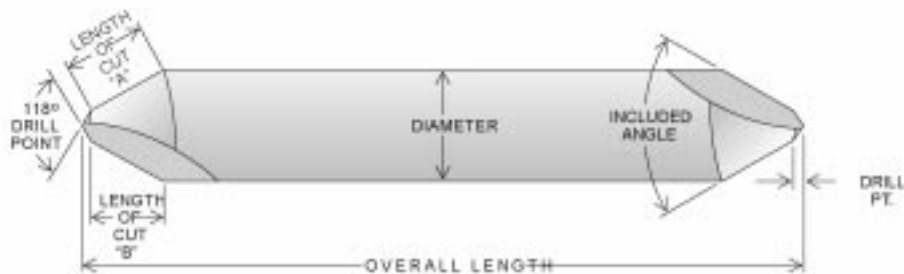
CHAMFER-SPOTTING TOOLS

2FL & 4FL

SHANK TOLERANCE:
-.0001/- .0004



DIA	ANGLE	OAL	CUT "A"	CUT "B"	FLUTES	PART NUMBER Uncoated	PART NUMBER TiCN	PART NUMBER AlTiN
1/8	60	1-1/2	.098	.085	2	D8726120	D8726122	D8726124
1/8	90	1-1/2	.071	.050	2	D8729120	D8729122	D8729124
3/16	60	2	.147	.127	2	D8726180	D8726182	D8726184
3/16	90	2	.107	.076	2	D8729180	D8729182	D8729184
1/4	60	2-1/2	.200	.173	2	D8726250	D8726252	D8726254
1/4	60	2-1/2	.200	.173	4	D8746250	D8746252	D8746254
1/4	90	2-1/2	.144	.100	2	D8729250	D8729252	D8729254
1/4	90	2-1/2	.141	.100	4	D8749250	D8749252	D8749254
1/4	120	2-1/2	.124	.062	2	D8721250	D8721252	D8721254
1/4	120	2-1/2	.144	.072	4	D8741250	D8741252	D8741254
3/8	60	2-1/2	.313	.271	2	D8726370	D8726372	D8726374
3/8	60	2-1/2	.313	.271	4	D8746370	D8746372	D8746374
3/8	90	2-1/2	.221	.157	2	D8729370	D8729372	D8729374
3/8	90	2-1/2	.221	.157	4	D8749370	D8749372	D8749374
3/8	120	2-1/2	.199	.100	2	D8721370	D8721372	D8721374
3/8	120	2-1/2	.217	.108	4	D8741370	D8741372	D8741374
1/2	60	3	.430	.372	2	D8726500	D8726502	D8726504
1/2	60	3	.430	.372	4	D8746500	D8746502	D8746504
1/2	90	3	.304	.215	2	D8729500	D8729502	D8729504
1/2	90	3	.304	.215	4	D8749500	D8749502	D8749504
1/2	120	3	.266	.133	2	D8721500	D8721502	D8721504
1/2	120	3	.289	.144	4	D8741500	D8741502	D8741504
3/4	60	4	.670	.580	4	D8746750	D8746752	D8746754
3/4	90	4	.474	.335	4	D8749750	D8749752	D8749754



CARBIDE TWIST DRILLS FRACTIONAL & LETTER SIZES



Drill Point 118°

AlTiN Coating
Available Upon Request.

FRACTIONAL SIZES

DIA	LOC	OAL	PART NUMBER
3/64	3/4	1-1/2	D42059
1/16	3/4	1-1/2	D42060
5/64	7/8	1-3/4	D42061
3/32	1	2	D42062
7/64	1-1/4	2-1/4	D42063
1/8	1-1/4	2-1/4	D42064
9/64	1-3/8	2-1/2	D42065
5/32	1-3/8	2-1/2	D42066
11/64	1-5/8	2-3/4	D42067
3/16	1-5/8	2-3/4	D42068
13/64	1-3/4	3	D42069
7/32	1-3/4	3	D42070
15/64	2	3-1/4	D42071
1/4	2	3-1/4	D42072
17/64	2-1/8	3-1/2	D42073
9/32	2-1/8	3-1/2	D42074
19/64	2-3/8	3-3/4	D42075
5/16	2-3/8	3-3/4	D42076
21/64	2-1/2	4	D42077
11/32	2-1/2	4	D42078
23/64	2-3/4	4-1/4	D42079
3/8	2-3/4	4-1/4	D42080
25/64	2-7/8	4-1/2	D42081
13/32	2-7/8	4-1/2	D42082
27/64	2-7/8	4-1/2	D42083
7/16	2-7/8	4-1/2	D42084
29/64	3	4-3/4	D42085
15/32	3	4-3/4	D42086
31/64	3	4-3/4	D42087
1/2	3	4-3/4	D42088

LETTER SIZES

DIA	DEC.	LOC	OAL	PART NUMBER
A	.2340	2	3-1/4	D4200A
B	.2380	2	3-1/4	D4200B
C	.2420	2	3-1/4	D4200C
D	.2460	2	3-1/4	D4200D
E	.2500	2	3-1/4	D4200E
F	.2570	2	3-1/4	D4200F
G	.2610	2-1/8	3-1/2	D4200G
H	.2660	2-1/8	3-1/2	D4200H
I	.2720	2-1/8	3-1/2	D4200I
J	.2770	2-1/8	3-1/2	D4200J
K	.2810	2-1/8	3-1/2	D4200K
L	.2900	2-1/8	3-1/2	D4200L
M	.2950	2-3/8	3-3/4	D4200M
N	.3020	2-3/8	3-3/4	D4200N
O	.3160	2-3/8	3-3/4	D4200O
P	.3230	2-3/8	3-3/4	D4200P
Q	.3320	2-1/2	4	D4200Q
R	.3390	2-1/2	4	D4200R
S	.3480	2-1/2	4	D4200S
T	.3580	2-3/4	4-1/4	D4200T
U	.3680	2-3/4	4-1/4	D4200U
V	.3770	2-3/4	4-1/4	D4200V
W	.3860	2-7/8	4-1/2	D4200W
X	.3970	2-7/8	4-1/2	D4200X
Y	.4040	2-7/8	4-1/2	D4200Y
Z	.4130	2-7/8	4-1/2	D4200Z

CARBIDE TWIST DRILLS

WIRE SIZES

Drill Point 118°

AlTiN Coating
Available Upon Request.



WIRE SIZES 1-28

DIA	DEC.	LOC	OAL	PART NUMBER
1	.2280	1-3/4	3	D42001
2	.2210	1-3/4	3	D42002
3	.2130	1-3/4	3	D42003
4	.2090	1-3/4	3	D42004
5	.2053	1-3/4	3	D42005
6	.2040	1-3/4	3	D42006
7	.2010	1-3/4	3	D42007
8	.1990	1-3/4	3	D42008
9	.1960	1-3/4	3	D42009
10	.1935	1-5/8	2-3/4	D42010
11	.1910	1-5/8	2-3/4	D42011
12	.1890	1-5/8	2-3/4	D42012
13	.1850	1-5/8	2-3/4	D42013
14	.1820	1-5/8	2-3/4	D42014
15	.1800	1-5/8	2-3/4	D42015
16	.1770	1-5/8	2-3/4	D42016
17	.1730	1-5/8	2-3/4	D42017
18	.1695	1-5/8	2-3/4	D42018
19	.1669	1-5/8	2-3/4	D42019
20	.1610	1-3/8	2-1/2	D42020
21	.1590	1-3/8	2-1/2	D42021
22	.1570	1-3/8	2-1/2	D42022
23	.1540	1-3/8	2-1/2	D42023
24	.1520	1-3/8	2-1/2	D42024
25	.1495	1-3/8	2-1/2	D42025
26	.1470	1-3/8	2-1/2	D42026
27	.1440	1-3/8	2-1/2	D42027
28	.1405	1-3/8	2-1/2	D42028

WIRE SIZES 29-56

DIA	DEC.	LOC	OAL	PART NUMBER
29	.1360	1-3/8	2-1/2	D42029
30	.1285	1-1/4	2-1/4	D42030
31	.1200	1-1/4	2-1/4	D42031
32	.1160	1-1/4	2-1/4	D42032
33	.1130	1-1/4	2-1/4	D42033
34	.1110	1-1/4	2-1/4	D42034
35	.1100	1-1/4	2-1/4	D42035
36	.1065	1-1/4	2-1/4	D42036
37	.1040	1-1/4	2-1/4	D42037
38	.1015	1-1/4	2-1/4	D42038
39	.0995	1-1/4	2-1/4	D42039
40	.0980	1	2	D42040
41	.0960	1	2	D42041
42	.0935	1	2	D42042
43	.0890	1	2	D42043
44	.0860	1	2	D42044
45	.0820	7/8	1-3/4	D42045
46	.0810	7/8	1-3/4	D42046
47	.0785	7/8	1-3/4	D42047
48	.0760	7/8	1-3/4	D42048
49	.0730	7/8	1-3/4	D42049
50	.0700	7/8	1-3/4	D42050
51	.0670	3/4	1-1/2	D42051
52	.0635	3/4	1-1/2	D42052
53	.0595	3/4	1-1/2	D42053
54	.0550	3/4	1-1/2	D42054
55	.0520	3/4	1-1/2	D42055
56	.0465	3/4	1-1/2	D42056

CARBIDE STUB DRILLS

FRACTIONAL & LETTER SIZES



Drill Point 135°

Split Point

AlTiN Coating

Available Upon Request.

FRACTIONAL SIZES

DIA	LOC	OAL	PART NUMBER
3/64	1/2	1-1/2	D43061
1/16	5/8	1-5/8	D43062
5/64	11/16	1-11/16	D43063
3/32	3/4	1-3/4	D43064
7/64	13/16	1-13/16	D43263
1/8	7/8	1-7/8	D43065
9/64	15/16	1-15/16	D43112
5/32	1	2-1/16	D43067
11/64	1-1/16	2-1/8	D43113
3/16	1-1/8	2-3/16	D43068
13/64	1-3/16	2-1/4	D43114
7/32	1-1/4	2-3/8	D43066
15/64	1-5/16	2-7/16	D44071
1/4	1-3/8	2-1/2	D43069
17/64	1-7/16	2-5/8	D43116
9/32	1-1/2	2-11/16	D43117
19/64	1-9/16	2-3/4	D43118
5/16	1-5/8	2-13/16	D43070
21/64	1-11/16	2-15/16	D43119
11/32	1-11/16	3	D43120
23/64	1-3/4	3-1/16	D43121
3/8	1-13/16	3-1/8	D43071
25/64	1-7/8	3-1/4	D43122
13/32	1-15/16	3-5/16	D43072
27/64	2	3-3/8	D43124
7/16	2-1/16	3-7/16	D43125
29/64	2-1/8	3-9/16	D43126
15/32	2-1/8	3-5/8	D43127
31/64	2-3/16	3-11/16	D43128
1/2	2-1/4	3-3/4	D43129

LETTER SIZES

DIA	DEC.	LOC	OAL	PART NUMBER
A	.2340	1-5/16	2-7/16	D4443A
B	.2380	1-3/8	2-1/2	D4443B
C	.2420	1-3/8	2-1/2	D4443C
D	.2460	1-3/8	2-1/2	D4443D
E	.2500	1-3/8	2-1/2	D4443E
F	.2570	1-7/16	2-5/8	D4443F
G	.2610	1-7/16	2-5/8	D4443G
H	.2660	1-1/2	2-11/16	D4443H
I	.2720	1-1/2	2-11/16	D4443I
J	.2770	1-1/2	2-11/16	D4443J
K	.2810	1-1/2	2-11/16	D4443K
L	.2900	1-9/16	2-3/4	D4443L
M	.2950	1-9/16	2-3/4	D4443M
N	.3020	1-5/8	2-13/16	D4443N
O	.3160	1-11/16	2-15/16	D4443O
P	.3230	1-11/16	2-15/16	D4443P
Q	.3320	1-11/16	3	D4443Q
R	.3390	1-11/16	3	D4443R
S	.3480	1-3/4	3-1/16	D4443S
T	.3580	1-3/4	3-1/16	D4443T
U	.3680	1-13/16	3-1/8	D4443U
V	.3770	1-7/8	3-1/4	D4443V
W	.3860	1-7/8	3-1/4	D4443W
X	.3970	1-15/16	3-5/16	D4443X
Y	.4040	1-15/16	3-5/16	D4443Y
Z	.4130	2	3-3/8	D4443Z

CARBIDE STUB DRILLS

WIRE SIZES

Drill Point 135°

Split Point

AlTiN Coating

Available Upon Request.



WIRE SIZES 1-28

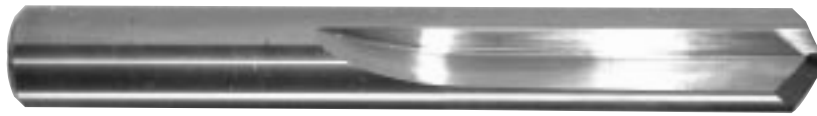
DIA	DEC.	LOC	OAL	PART NUMBER
1	.2280	1-5/16	2-7/16	D43201
2	.2210	1-5/16	2-7/16	D43202
3	.2130	1-1/4	2-3/8	D43203
4	.2090	1-1/4	2-3/8	D43204
5	.2053	1-1/4	2-3/8	D43205
6	.2040	1-1/4	2-3/8	D43206
7	.2010	1-3/16	2-1/4	D43207
8	.1990	1-3/16	2-1/4	D43208
9	.1960	1-3/16	2-1/4	D43209
10	.1935	1-3/16	2-1/4	D43210
11	.1910	1-3/16	2-1/4	D43211
12	.1890	1-3/16	2-1/4	D43212
13	.1850	1-1/8	2-3/16	D43213
14	.1820	1-1/8	2-3/16	D43214
15	.1800	1-1/8	2-3/16	D43215
16	.1770	1-1/8	2-3/16	D43216
17	.1730	1-1/8	2-3/16	D43217
18	.1695	1-1/16	2-1/8	D43218
19	.1669	1-1/16	2-1/8	D43219
20	.1610	1-1/16	2-1/8	D43220
21	.1590	1-1/16	2-1/8	D43221
22	.1570	1-1/16	2-1/8	D43222
23	.1540	1	2-1/16	D43223
24	.1520	1	2-1/16	D43224
25	.1495	1	2-1/16	D43225
26	.1470	1	2-1/16	D43226
27	.1440	1	2-1/16	D43227
28	.1405	15/16	1-15/16	D43228

WIRE SIZES 29-56

DIA	DEC.	LOC	OAL	PART NUMBER
29	.1360	15/16	1-15/16	D43229
30	.1285	15/16	1-15/16	D43230
31	.1200	7/8	1-7/8	D43231
32	.1160	7/8	1-7/8	D43232
33	.1130	7/8	1-7/8	D43233
34	.1110	7/8	1-7/8	D43234
35	.1100	7/8	1-7/8	D43235
36	.1065	13/16	1-13/16	D43236
37	.1040	13/16	1-13/16	D43237
38	.1015	13/16	1-13/16	D43238
39	.0995	13/16	1-13/16	D43239
40	.0980	13/16	1-13/16	D43240
41	.0960	13/16	1-13/16	D43241
42	.0935	3/4	1-3/4	D43242
43	.0890	3/4	1-3/4	D43243
44	.0860	3/4	1-3/4	D43244
45	.0820	3/4	1-3/4	D43245
46	.0810	3/4	1-3/4	D43246
47	.0785	3/4	1-3/4	D43247
48	.0760	11/16	1-11/16	D43248
49	.0730	11/16	1-11/16	D43249
50	.0700	11/16	1-11/16	D43250
51	.0670	11/16	1-11/16	D43251
52	.0635	11/16	1-11/16	D43252
53	.0595	1/2	1-1/2	D43253
54	.0550	1/2	1-1/2	D43254
55	.0520	1/2	1-1/2	D43255
56	.0465	1/2	1-1/2	D43256

CARBIDE STRAIGHT FLUTE DRILLS

FRACTIONAL & LETTER SIZES



Drill Point 140°

AlTiN Coating
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FRACTIONAL SIZES

DIA	LOC	OAL	PART NUMBER
3/64	1/2	1-1/2	D42259
1/16	5/8	1-5/8	D42260
5/64	11/16	1-11/16	D42261
3/32	3/4	1-3/4	D42262
7/64	13/16	1-13/16	D42263
1/8	7/8	1-7/8	D42264
9/64	15/16	1-15/16	D42265
5/32	1	2-1/16	D42266
11/64	1-1/16	2-1/8	D42267
3/16	1-1/8	2-3/16	D42268
13/64	1-3/16	2-1/4	D42269
7/32	1-1/4	2-3/8	D42270
15/64	1-5/16	2-7/16	D42271
1/4	1-3/8	2-1/2	D42272
17/64	1-7/16	2-5/8	D42273
9/32	1-1/2	2-11/16	D42274
19/64	1-9/16	2-3/4	D42275
5/16	1-5/8	2-13/16	D42276
21/64	1-11/16	2-15/16	D42277
11/32	1-11/16	3	D42278
23/64	1-3/4	3-1/16	D42279
3/8	1-13/16	3-1/8	D42280
25/64	1-7/8	3-1/4	D42281
13/32	1-15/16	3-5/16	D42282
27/64	2	3-3/8	D42283
7/16	2-1/16	3-7/16	D42284
29/64	2-1/8	3-9/16	D42285
15/32	2-1/8	3-5/8	D42286
31/64	2-3/16	3-11/16	D42287
1/2	2-1/4	3-3/4	D42288

LETTER SIZES

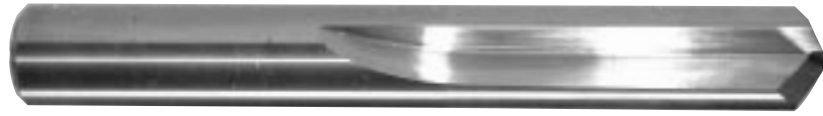
DIA	DEC.	LOC	OAL	PART NUMBER
A	.2340	1-5/16	2-7/16	D4400A
B	.2380	1-3/8	2-1/2	D4400B
C	.2420	1-3/8	2-1/2	D4400C
D	.2460	1-3/8	2-1/2	D4400D
E	.2500	1-3/8	2-1/2	D4400E
F	.2570	1-7/16	2-5/8	D4400F
G	.2610	1-7/16	2-5/8	D4400G
H	.2660	1-1/2	2-11/16	D4400H
I	.2720	1-1/2	2-11/16	D4400I
J	.2770	1-1/2	2-11/16	D4400J
K	.2810	1-1/2	2-11/16	D4400K
L	.2900	1-9/16	2-3/4	D4400L
M	.2950	1-9/16	2-3/4	D4400M
N	.3020	1-5/8	2-13/16	D4400N
O	.3160	1-11/16	2-15/16	D4400O
P	.3230	1-11/16	2-15/16	D4400P
Q	.3320	1-11/16	3	D4400Q
R	.3390	1-11/16	3	D4400R
S	.3480	1-3/4	3-1/16	D4400S
T	.3580	1-3/4	3-1/16	D4400T
U	.3680	1-13/16	3-1/8	D4400U
V	.3770	1-7/8	3-1/4	D4400V
W	.3860	1-7/8	3-1/4	D4400W
X	.3970	1-15/16	3-5/16	D4400X
Y	.4040	1-15/16	3-5/16	D4400Y
Z	.4130	.4130	3-3/8	D4400Z

CARBIDE STRAIGHT FLUTE DRILLS

WIRE SIZES

Drill Point 140°

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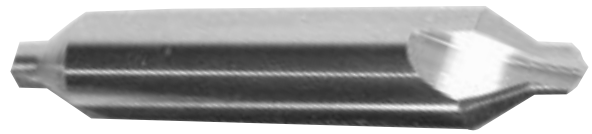
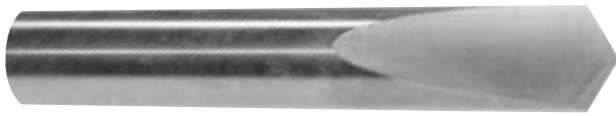
WIRE SIZES 1-28

DIA	DEC.	LOC	OAL	PART NUMBER
1	.2280	1-5/16	2-7/16	D43001
2	.2210	1-5/16	2-7/16	D43002
3	.2130	1-1/4	2-3/8	D43003
4	.2090	1-1/4	2-3/8	D43004
5	.2053	1-1/4	2-3/8	D43005
6	.2040	1-1/4	2-3/8	D43006
7	.2010	1-3/16	2-1/4	D43007
8	.1990	1-3/16	2-1/4	D43008
9	.1960	1-3/16	2-1/4	D43009
10	.1935	1-3/16	2-1/4	D43010
11	.1910	1-3/16	2-1/4	D43011
12	.1890	1-3/16	2-1/4	D43012
13	.1850	1-1/8	2-3/16	D43013
14	.1820	1-1/8	2-3/16	D43014
15	.1800	1-1/8	2-3/16	D43015
16	.1770	1-1/8	2-3/16	D43016
17	.1730	1-1/8	2-3/16	D43017
18	.1695	1-1/16	2-1/8	D43018
19	.1669	1-1/16	2-1/8	D43019
20	.1610	1-1/16	2-1/8	D43020
21	.1590	1-1/16	2-1/8	D43021
22	.1570	1-1/16	2-1/8	D43022
23	.1540	1	2-1/16	D43023
24	.1520	1	2-1/16	D43024
25	.1495	1	2-1/16	D43025
26	.1470	1	2-1/16	D43026
27	.1440	1	2-1/16	D43027
28	.1405	15/16	1-15/16	D43028

WIRE SIZES 29-56

DIA	DEC.	LOC	OAL	PART NUMBER
29	.1360	15/16	1-15/16	D43029
30	.1285	15/16	1-5/16	D43030
31	.1200	7/8	1-7/8	D43031
32	.1160	7/8	1-7/8	D43032
33	.1130	7/8	1-7/8	D43033
34	.1110	7/8	1-7/8	D43034
35	.1100	7/8	1-7/8	D43035
36	.1065	13/16	1-13/16	D43036
37	.1040	13/16	1-13/16	D43037
38	.1015	13/16	1-13/16	D43038
39	.0995	13/16	1-13/16	D43039
40	.0980	13/16	1-13/16	D43040
41	.0960	13/16	1-13/16	D43041
42	.0935	3/4	1-3/4	D43042
43	.0890	3/4	1-3/4	D43043
44	.0860	3/4	1-3/4	D43044
45	.0820	3/4	1-3/4	D43045
46	.0810	3/4	1-3/4	D43046
47	.0785	3/4	1-3/4	D43047
48	.0760	11/16	1-11/16	D43048
49	.0730	11/16	1-11/16	D43049
50	.0700	11/16	1-11/16	D43050
51	.0670	11/16	1-11/16	D43051
52	.0635	11/16	1-11/16	D43052
53	.0595	1/2	1-1/2	D43053
54	.0550	1/2	1-1/2	D43054
55	.0520	1/2	1-1/2	D43055
56	.0465	1/2	1-1/2	D43056

CARBIDE SPADE DRILLS & CARBIDE CENTER DRILLS



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CARBIDE SPADE DRILLS

DIA	LOC	OAL	PART NUMBER
1/32	3/16	1-1/2	D41002
3/64	7/32	1-1/2	D41005
1/16	5/16	1-1/2	D41007
3/32	7/16	1-1/2	D41010
7/64	7/16	1-1/2	D41011
1/8	1/2	1-1/2	D41020
9/64	1/2	2	D41021
5/32	9/16	2	D41030
11/64	9/16	2	D41031
3/16	11/16	2	D41040
7/32	19/32	2	D41050
1/4	11/16	2	D41060
9/32	7/8	2-1/2	D41070
5/16	7/8	2-1/2	D41080
11/32	15/16	2-1/2	D41090
3/8	1-1/8	2-1/2	D41100
13/32	1-1/8	2-3/4	D41110
7/16	1-3/16	2-3/4	D41120
15/32	1-3/16	3	D41130
1/2	1-3/16	3	D41140

CARBIDE 60° CENTER DRILLS

DIA	DEC.	SHANK	OAL	PART NUMBER
00	.025	1/8	1-1/2	D31001
0	1/32	1/8	1-1/2	D31002
1	3/64	1/8	1-1/2	D31003
2	5/64	3/16	1-7/8	D31004
3	7/64	1/4	2	D31005
4	1/8	5/16	2-1/8	D31006
5	3/16	7/16	2-3/4	D31007
6	7/32	1/2	3	D31008

DRILL

SPEED & FEED RECOMMENDATIONS

MATERIAL	SPEED [SMF]
Aluminum/Aluminum Alloys Aluminum, high Silicon	250-450 100-250
Brass Bronze Copper/Copper Alloys	250-450 150-250 150-350
Cast Iron, Soft Cast iron, Medium Castiron, Hard	130-200 100-150 50-130
Magnesium Monel Steel, Cast & Forged Steel, Heat Treated [35-40 Rc] Steel, Heat Treated [40-45 Rc] Steel, Heat Treated [45 Rc+]	300-600 60-120 60-120 60-80 40-60 20-40

MATERIAL	SPEED [SMF]
Steel, medium carbon Mild Steel Tool Steel Stainless Steel, 300 Series Stainless Steel, 400 Series	100-180 60-130 40-110 30-90 40-130
Inconel Rene Titanium Waspaloy	30-70 30-60 40-100 30-60
Epoxy Fiber Plastic Resin, Fiberglass	200-350 200-600 200-400
Masonite Phenolic	80-200 70-120

Diameter Range [inches]	Feed [inches per revolution]
Under 1/16"	.0005-.001
Over 1/16" through 1/8"	.001-.002
Over 1/8" through 1/4"	.002-.003
Over 1/4" through 3/8"	.003-.004
Over 3/8" through 1/2"	.004-.005

Reduce speed and feed when hole depth exceeds three times the drill diameter.

Properly used, **DESIGN-RITE DRILLS** will produce clean holes to close tolerances and assure longer tool life. Drills should not be allowed to dwell or edges will become dull, requiring excessive re-sharpening.

DESIGN-RITE DRILLS can eliminate a centering operation while leaving superior hole finishers.

DESIGN-RITE XL
PREMIUM CARBIDE CUTTING TOOLS
MADE IN THE U.S.A.

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Rancho Cordova, CA 95742
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