Member IMC Group

Ingersoll Cutting Tools

CHIPSURFER™

Precision Solid Carbide Modular Tooling System

Part of the Ingersoll CHASE line

CHIP SURFER™

Precision Solid Carbide Modular Tooling

- ***Interchangeable carbide tips for extreme versatility:***
  - Change tips right on the machine
  - Various tip styles fit the same shank
- ***Precision ground tolerance for accurate finishing:***
  - Each new tip repeats like a master insert
  - No more machine resetting or entering offsets
  - Symmetrically designed for high RPM
  - Advanced grade and geometry for high speed and hardened steel
- ***Streamlines high production operations:***
  - Tip changes in seconds
  - Standardize tips to reduce inventory
- ***Radical advantages in long reach applications:***
  - Tips are more economically replaced when compared to long round tools
  - Short flute length means body core strength

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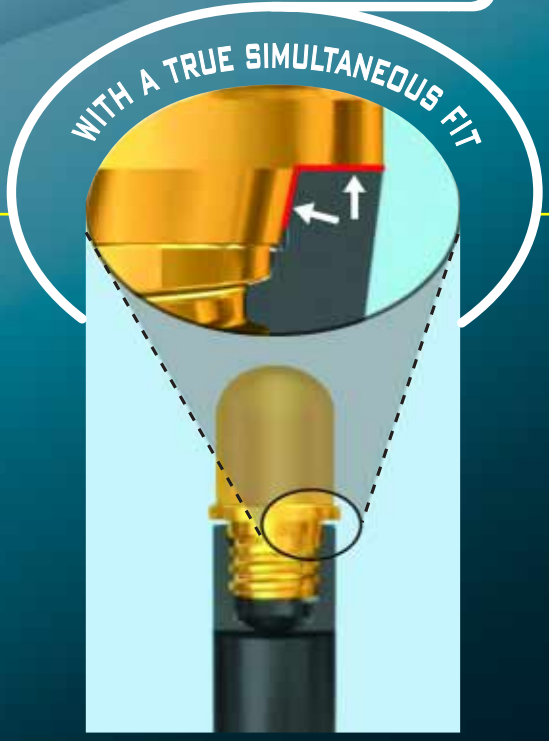
Accuracy



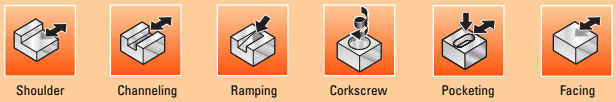
To view some of these products in action, please visit us at :

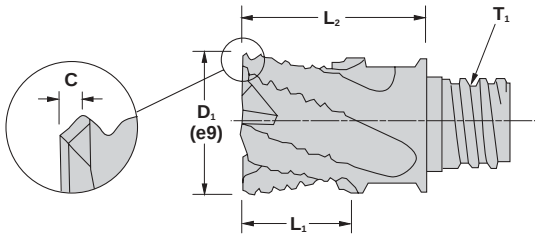
VIRTUAL CHIPSURFER™ SEMINAR
www.ingersoll-imc.com

CONTENTS

CHIP•SURFER™ SOLID CARBIDE SERRATED ROUGHING TIP SERIES 47C, 48C
(0° LEAD, 45° HELIX, CENTER CUTTING)

Diameters	Grade	Corner
.312" to .750"	IN2005	Chamfer & Radius

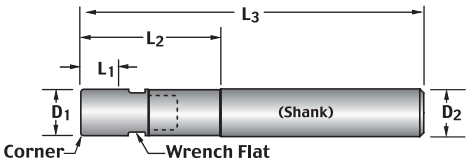




Cutter Number	Eff.	D_1 Nominal Diameter	L_1 Cutting Edge Length	T_1 Thread Size	L_2 Extension Length	C Corner
47C-3120TQRN01	4	.312	.20	T05	.39	.010 x 45
47C-3727T6RN01	4	.375	.27	T06	.50	.013 x 45
47D-3727T6RN03	4	.375	.27	T06	.50	.031
47C-5037T8RN01	4	.500	.37	T08	.65	.012 x 45
47D-5037T8RN03	4	.500	.37	T08	.65	.031
47D-5037T8RN06	4	.500	.37	T08	.65	.062
47C-6247TRRN01	5	.625	.47	T10	.80	.014 x 45
48C-7562TSRN01	6	.750	.62	T12	1.00	.016 x 45
48D-7562TSRN06	6	.750	.62	T12	1.00	.062

Chip•Surfer Paks

Tip and Shank



Order This Pak Number	End Mill Tip	Straight Shank	D_1 End Mill Diameter	End Mill Corner	D_2 Shank Adaption	L_1 Length of Cut	L_2 Projection Length	L_3 Assm Length	Wrench
S050T08KA-06-02	47C-5037T8RN01	S050T08SA-06 (Steel)	.500	.015 x 45	.500 Cyl	.37	1.18	4.15	WS-0030
S050T08KA-25-02	47C-5037T8RN01	S050T08CA-25 (Carbide)	.500	.015 x 45	.500 Cyl	.37	3.10	6.15	WS-0030

Wrench (Not included with carbide tip or shank purchase).

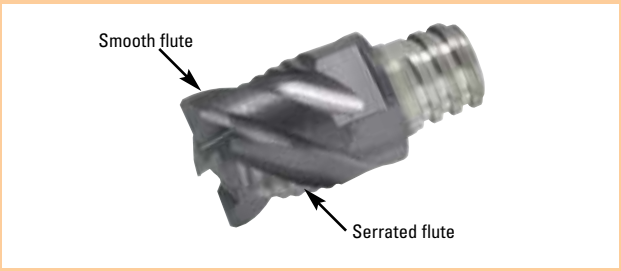
Thread Size	Wrench Part No.	Optional Torque Wrench	Torque Value (in. lbs.)
T05	WS-0043	DT-60-06	60
T06	WS-0029	DT-90-08	90
T08	WS-0030	DT-130-10	130
T10	WS-0044	DT-250-13	250
T12	WS-0059	DT-250-16	250

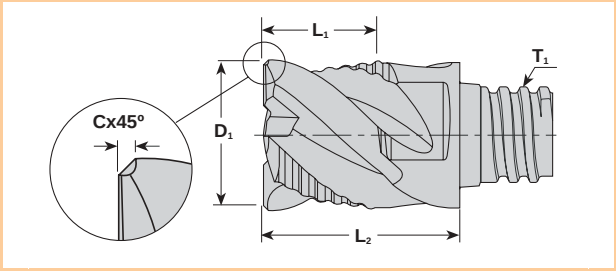
When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

CHIPSURFER™ ROUGH-FIN SOLID CARBIDE END MILL TIP SERIES 47C, 47D

(0° LEAD, 45° HELIX, CENTER CUTTING FOR ROUGHING & FINISHING)

Diameters	Grade	Corner
.312" to .750"	IN2005	Chamfer & Radius





Cutter Number	D_1 Nominal Diameter	Eff.	L_1 Cutting Edge Length	T_1 Thread Size	L_2 Extension Length	C Corner Radius
47C-3120TQRU01	.312	4	.20	T05	.39	.012 x 45
47C-3727T6RU01	.375	4	.27	T06	.51	.012 x 45
47D-3727T6RU03	.375	4	.27	T06	.51	.031
47C-5037T8RU01	.500	4	.37	T08	.65	.015 x 45
47D-5037T8RU03	.500	4	.37	T08	.65	.031
47C-6247TRRU02	.625	4	.47	T10	.80	.024 x 45
47D-6247TRRU06	.625	4	.47	T10	.80	.062
47C-7562TSRU02	.750	4	.62	T12	1.00	.024 x 45
47D-7562TSRU06	.750	4	.62	T12	1.00	.062

Wrench (Not included with carbide tip or shank purchase).

Thread Size	Wrench Part No.	Optional Torque Wrench	Torque Value (in. lbs.)
T05	WS-0043	DT-60-06	60
T06	WS-0029	DT-90-08	90
T08	WS-0030	DT-130-10	130
T10	WS-0044	DT-250-13	250
T12	WS-0059	DT-250-16	250

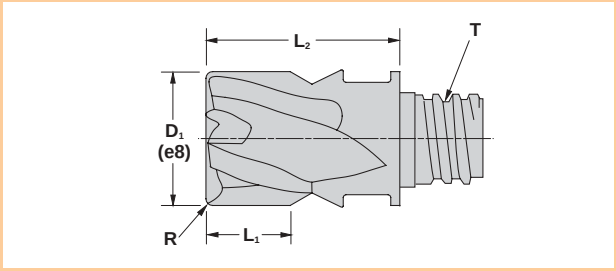
When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

CHASEline

CHIPoSURFER™ SOLID CARBIDE CENTER CUTTING END MILL TIP SERIES 46J, 46D

(0° LEAD, 45° HELIX, HIGH PRECISION)

Diameters	**Grade**	**Corner**
.312" to .500"	IN2005	Sharp, .015", .031" and .062"R



Cutter Number	Eff.	D_1 Nominal Diameter	L_1 Cutting Edge Length	T_1 Thread Size	L_2 Extension Length	R Corner Radius
3-FLUTE END MILL HEADS						
46J-3120TQRD04	3	.312	.20	T05	.39	SHARP
46D-3120TQRD03	3	.312	.20	T05	.39	.031
46J-3727T6RD05	3	.375	.27	T06	.50	SHARP
46D-3727T6RD01	3	.375	.27	T06	.50	.015
46D-3727T6RD03	3	.375	.27	T06	.50	.031
46D-3727T6RD06	3	.375	.27	T06	.50	.062
46J-5037T8RD06	3	.500	.37	T08	.65	SHARP
46D-5037T8RD01	3	.500	.37	T08	.65	.015
46D-5037T8RD03	3	.500	.37	T08	.65	.031
46D-5037T8RD06	3	.500	.37	T08	.65	.062

Wrench (Not included with carbide tip or shank purchase).

Thread Size	Wrench Part No.	Optional Torque Wrench	Torque Value (in. lbs.)
T05	WS-0043	DT-60-06	60
T06	WS-0029	DT-90-08	90
T08	WS-0030	DT-130-10	130

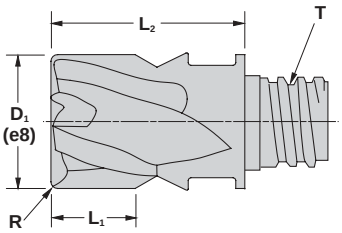
When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

CHASEline

CHIPSURFER™ SOLID CARBIDE CENTER CUTTING END MILL TIP SERIES 47J, 47D

(0° LEAD, 45° HELIX, HIGH PRECISION)

Diameters	**Grade**	**Corner**
.312" to .750"	IN2005, IN3005	Sharp, .015", .031" and .062"R



Cutter Number	Eff.	D_1 Nominal Diameter	L_1 Cutting Edge Length	T_1 Thread Size	L_2 Extension Length	R Corner Radius
4-FLUTE END MILL HEADS						
47J-3120TQRD04	4	.312	.20	T05	.39	SHARP
47D-3120TQRD01	4	.312	.20	T05	.39	.015
47D-3120TQRD03	4	.312	.20	T05	.39	.031
47D-3120TQRD06	4	.312	.20	T05	.39	.062
47J-3727T6RD05	4	.375	.27	T06	.50	SHARP
47D-3727T6RD01	4	.375	.27	T06	.50	.015
***47D-3727T6RD03**	4	.375	.27	T06	.50	.031
47D-3727T6RD06	4	.375	.27	T06	.50	.062
47J-5037T8RD06	4	.500	.37	T08	.65	SHARP
47D-5037T8RD01	4	.500	.37	T08	.65	.015
47D-5037T8RD03	4	.500	.37	T08	.65	.031
47D-5037T8RD06	4	.500	.37	T08	.65	.062
47J-6247TRRD08	4	.625	.47	T10	.80	SHARP
47D-6247TRRD03	4	.625	.47	T10	.80	.031
47D-7562TSRD03	4	.750	.62	T12	1.00	.031

* Also offered in Grade IN3005 - diamond coated for milling graphite.

Order This Pak Number	End Mill Tip	Straight Shank	D_1 End Mill Diameter	R End Mill Corner	D_2 Shank Adaption	L_1 Length of Cut	L_2 Projection Length	L_3 Assm Length	Wrench
S037T06KA-06-11	47D-3727T6RD03	S037T06SA-06 (Steel)	.375	.031	.375 Cyl	.27	1.00	3.50	WS-0029
S050T08KA-06-11	47D-5037T8RD03	S050T08SA-06 (Steel)	.500	.031	.500 Cyl	.37	1.18	4.15	WS-0030

Wrench (Not included with carbide tip or shank purchase).

Thread Size	Wrench Part No.	Optional Torque Wrench	Torque Value (in. lbs.)
T05	WS-0043	DT-60-06	60
T06	WS-0029	DT-90-08	90
T08	WS-0030	DT-130-10	130
T10	WS-0044	DT-250-13	250
T12	WS-0059	DT-250-16	250

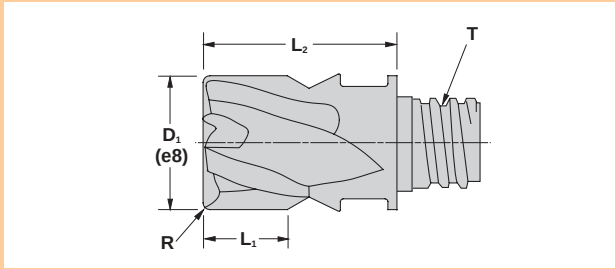
When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

CHASEline

CHIPSURFER™ SOLID CARBIDE FINISHING END MILL TIP SERIES 48D, 48J, 49D, 49J

(0° LEAD, 45° HELIX, NOT CENTER CUTTING)

Diameters	Grade	Corner
.312" to .625"	IN2005	Sharp, .015", .031" and .062"R



Cutter Number	Eff.	D_1 Nominal Diameter	L_1 Cutting Edge Length	T_1 Thread Size	L_2 Extension Length	R Corner Radius
48J-3120TQRD04	6	.312	.20	T05	.39	SHARP
48D-3120TQRD03	6	.312	.20	T05	.39	.031
48J-3727T6RD05	6	.375	.27	T06	.50	SHARP
48D-3727T6RD01	6	.375	.27	T06	.50	.015
48D-3727T6RD03	6	.375	.27	T06	.50	.031
48D-3727T6RD06	6	.375	.27	T06	.50	.062
48J-5037T8RD06	6	.500	.37	T08	.65	SHARP
48D-5037T8RD01	6	.500	.37	T08	.65	.015
48D-5037T8RD03	6	.500	.37	T08	.65	.031
48D-5037T8RD06	6	.500	.37	T08	.65	.062
49J-6247TRRD08	8	.625	.47	T10	.80	SHARP
49D-6247TRRD03	8	.625	.47	T10	.80	.031
49D-6247TRRD06	8	.625	.47	T10	.80	.062
49D-7562TSRD03	10	.750	.62	T12	1.00	.031
49D-7562TSRD06	10	.750	.62	T12	1.00	.062

Wrench (Not included with carbide tip or shank purchase).

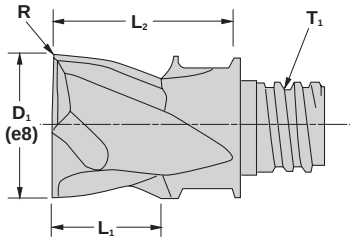
Size	Part No.	Optional Torque Wrench	Torque Value (in. lbs.)
T05	WS-0043	DT-60-06	60
T06	WS-0029	DT-90-08	90
T08	WS-0030	DT-130-10	130
T10	WS-0044	DT-250-13	250
T12	WS-0059	DT-250-16	250

When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

CHIP•SURFER™ 0° LEAD, 45° HELIX, POLISHED, SHARP, FOR ALUMINUM

SERIES 45D, 45J, 46D, 46J
(CENTER CUTTING)

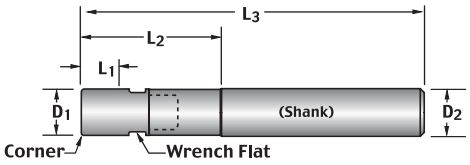
Diameters	Grade	Corner
.312" to .750"	IN2005	Sharp and .020"R



Cutter Number	Eff.	D_1 Nominal Diameter	L_1 Cutting Edge Length	T_1 Thread Size	L_2 Extension Length	R Corner Radius
46D-3120TQRD02-P	3	.312	.20	T05	.39	.020
45J-3727T6RD05-P	2	.375	.27	T06	.50	SHARP
45D-3727T6RD02-P	2	.375	.27	T06	.50	.020
46D-3727T6RD03-P	3	.375	.27	T06	.50	.020
45J-5037T8RD06-P	2	.500	.37	T08	.65	SHARP
45D-5037T8RD02-P	2	.500	.37	T08	.65	.020
46D-5037T8RD03-P	3	.500	.37	T08	.65	.020
46J-6239TRRD08-P	3	.625	.39	T10	.80	SHARP
46D-7550TSRD02-P	3	.750	.50	T12	1.00	.020

Chip•Surfer Paks

Tip and Shank



ORDER THIS Pak Number	(QTY) End Mill Tip	Straight Shank	D1 End Mill Dia.	End Mill Corner	D2 Shank Adaption	L1 Length of Cut	L2 Projection Length	L3 Assem. Length	Wrench
S037T06KA-06-04	(2) 45J-3725T6RB05-P	S037T06SA-06 (Steel)	.375	Sharp	.375 Cylindrical	.25	.98	3.48	WS-0029
S050T08KA-06-04	(2) 45J-5035T8RB06-P	S050T08SA-06 (Steel)	.500	Sharp	.500 Cylindrical	.35	1.16	4.13	WS-0030

Wrench (Not included with carbide tip or shank purchase).

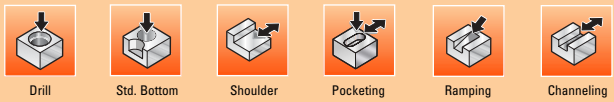
Thread Size	Wrench Part No.	Optional Torque Wrench	Torque Value (in. lbs.)
T05	WS-0043	DT-60-06	60
T06	WS-0029	DT-90-08	90
T08	WS-0030	DT-130-10	130
T10	WS-0044	DT-250-13	250
T12	WS-0059	DT-250-14	250

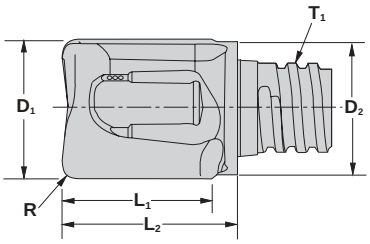
When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

CHASEline

CHIP•SURFER™ DRILL-MILL TIP SERIES 45D

Diameters	Grade	Corner
.375" to .625"	IN2005	.015"R



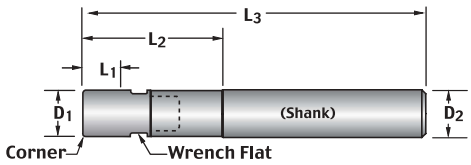


Cutter Number	Eff.	D_1 Nominal Diameter	D_2 Flange Diameter	T_1 Thread Size	L_1 Edge Length	L_2 Extension Length	R Corner Radius
45D-3738T6RA01	2	.375	.35	T06	.38	.48	.015
45D-5045T8RA01	2	.500	.48	T08	.45	.60	.015
45D-6263TRRA01	2	.625	.60	T10	.60	.75	.015

*Drill depth not to exceed 2/3 edge length.

Chip•Surfer Paks

Tip and Shank



ORDER THIS Pak Number	(QTY) End Mill Tip	Straight Shank	D1 End Mill Dia.	End Mill Corner	D2 Shank Adaption	L1 Length of Cut	L2 Projection Length	L3 Assem. Length	Wrench
S037T06KA-06-D1	(2) 45D-3738T6RA01	S037T06SA-06 (Steel)	.375	.015	.375 Cylindrical	.38	.98	3.48	WS-0029
S050T08KA-06-D1	(2) 45D-5045T8RA01	S050T08SA-06 (Steel)	.500	.015	.500 Cylindrical	.45	1.13	4.10	WS-0030

Wrench (Not included with carbide tip or shank purchase).

Thread Size	Wrench Part No.	Optional Torque Wrench	Torque Value (in. lbs.)
T06	WS-0029	DT-90-05	90
T08	WS-0030	DT-130-07	130
T10	WS-0044	DT-250-08	250

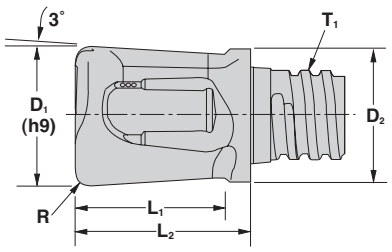
When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

CHASEline

CHIP•SURFER™ FLAT BOTTOM PLUNGE CUTTER SERIES 45V

Diameters	Grade	Corner
.375" - .625"	IN2005	.031"

Drill | Flat Bottom | Plunge

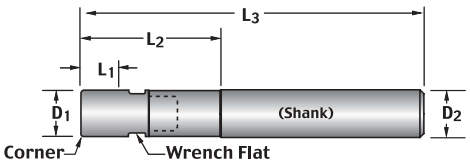


Cutter Number	Eff.	D_1 Nominal Diameter	D_2 Flange Diameter	T_1 Thread Size	L_3 Edge Length	L_2 Extension Length	R Corner Radius
45V-3738T6RA03	2	.375	.35	T06	.38	.48	.031
45V-5045T8RA03	2	.500	.48	T08	.45	.60	.031
45V-6260TRRA03	2	.625	.60	T10	.60	.75	.031

*Drill depth not to exceed 2/3 edge length.

Chip•Surfer Paks

Tip and Shank



ORDER THIS Pak Number	(QTY) End Mill Tip	Straight Shank	D1 End Mill Dia.	End Mill Corner	D2 Shank Adaption	L1 Length of Cut	L2 Projection Length	L3 Assem. Length	Wrench
S037T06KA-06-P1	(2) 45V-3738T6RA03	S037T06SA-06 (Steel)	.375	.030	.375 Cylindrical	.38	.98	3.48	WS-0029
S050T08KA-06-P1	(2) 45V-5045T8RA03	S050T08SA-06 (Steel)	.500	.030	.500 Cylindrical	.45	1.13	4.10	WS-0030

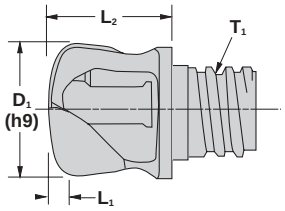
Wrench (Not included with carbide tip or shank purchase).

Thread Size	Wrench Part No.	Optional Torque Wrench	Torque Value (in. lbs.)
T06	WS-0029	DT-90-05	90
T08	WS-0030	DT-130-07	130
T10	WS-0044	DT-250-08	250

When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

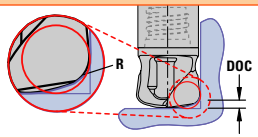
CHIPoSURFER™ SOLID CARBIDE ULTRA HIGH FEED TIP SERIES 45A

Diameters	Grade	Corner
.375" to .629"	IN2005	.080", .100" and .120""R



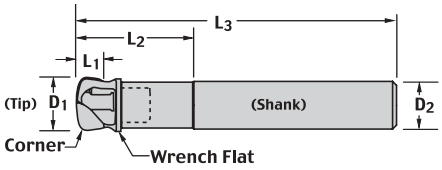
Cutter Number	D_1 Nominal Diameter	Eff.	L_1 Depth of Cut	T Thread Size	L_2 Extension Length	R Corner Radius	Ramp Angle
45A-3703T6RA06	.375	2	.02	T06	.47	.080	10°
45A-10001T6RA20	.394 (10mm)	2	.02	T06	.49	.080	10°
45A-12001T8RA25	.472 (12mm)	2	.04	T08	.44	.100	10°
45A-5004T8RA08	.500	2	.04	T08	.49	.100	10°
45A-16001TRRA30	.629 (16mm)	2	.04	T10	.80	.120	10°

Program as though they are a square bottom end mill with noted corner radius.
This method will ensure and minimize remaining stock for secondary passes.



Chip•Surfer Paks

Tip and Shank



ORDER THIS Pak Number	(QTY) End Mill Tip	Straight Shank	D_1 End Mill Dia.	D_2 End Mill Corner	L_1 Shank Adaption	L_2 Length of Cut	L_3 Projection Length	Assem. Length	Wrench
S037T06KA-06-F2	(2) 45A-3703T6RA06	S037T06SA-06 (stl)	.375	.08	.375 Cyl	.02	.98	3.48	WS-0029
S037T06KA-20-F2	(2) 45A-3703T6RA06	S037T06CA-20 (carb)	.375	.08	.375 Cyl	.02	2.43	5.23	WS-0029
S050T08KA-06-F1	(2) 45A12001T8RA25	S050T08SA-061(stl	.472 (12mm)	.10	.500 Cyl	.04	1.07	3.94	WS-0030
S050T08KA-25-F1	(2) 45A12001T8RA25	S050T08CA-251(carb)	.472 (12mm)	.10	.500 Cyl	.04	2.90	5.94	WS-0030
S050T08KA-06-F2	(2) 45A-5004T8RA08	S050T08SA-06 (stl)	.500	.10	.500 Cyl	.04	1.33	4.30	WS-0030
S050T08KA-20-F2	(2) 45A-5004T8RA08	S050T08CA-25 (carb)	.500	.10	.500 Cyl	.04	3.25	6.30	WS-0030

Wrench (Not included with carbide tip or shank purchase).

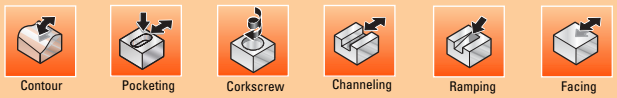
Size	Wrench Part No.	Optional Torque Wrench	Torque Value (in. lbs.)
T06	WS-0029	DT-90-05	90
T08	WS-0030	DT-130-07	130
T10	WS-0044	DT-250-08	250

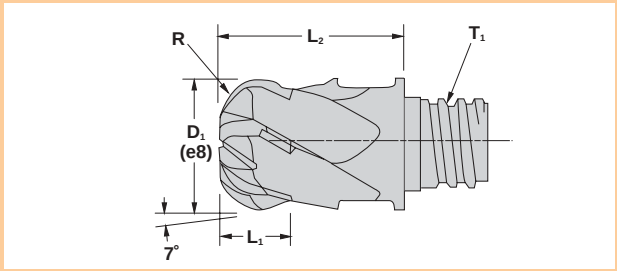
When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

CHASEline

CHIP•SURFER™ SOLID CARBIDE BACKDRAFT TOROIDAL TIP SERIES 48U

Diameters	Grades	Corner
.375" to .500"	IN2005, IN3005	.031", .062" and .125"R



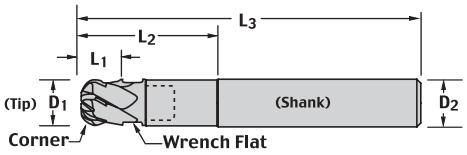


Cutter Number	Eff.	D_1 Nominal Diameter	L_1 Cutting Edge Length	T_1 Thread Size	L_2 Extension Length	R Corner Radius	Ramp Angle
***48U-3719T6RB03**	6	.375	.19	T06	.50	.031	9°
48U-3719T6RB06	6	.375	.19	T06	.50	.062	9°
48U-5027T8RB03	6	.500	.27	T08	.65	.031	9°
48U-5027T8RB06	6	.500	.27	T08	.65	.062	9°
48U-5027T8RB12	6	.500	.27	T08	.65	.125	9°

*Also offered in grade IN3005- diamond coated for milling graphite.

Chip•Surfer Paks

Tip and Shank



ORDER THIS Pak Number	(QTY) Chamfer/Spotter Tip	Straight Shank	D_1 Dia.	Corner	D_2 Shank Adaption	L_1 Length of Cut	L_2 Projection Length	L_3 Assem. Length	Wrench
S037T06KA-06-B1	(2) 48U-3719T6RB06	S037T06SA-06 (stl)	.375	.06	.375 Cyl	.19	1.00	3.50	WS-0043
S037T06KA-20-B1	(2) 48U-3719T6RB06	S037T06CA-20 (car)	.375	.06	.375 Cyl	.19	2.95	5.25	WS-0043
S050T08KA-06-B1	(2) 48U-5027T8RB06	S050T08SA-06 (stl)	.500	.06	.500 Cyl	.27	1.18	4.15	WS-0029
S050T08KA-25-B1	(2) 48U-5027T8RB06	S050T08CA-25 (car)	.500	.06	.500 Cyl	.27	3.10	6.15	WS-0029

Wrench (Not included with carbide tip or shank purchase).

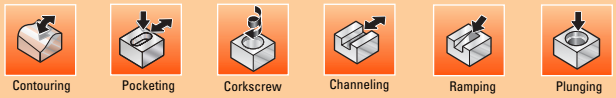
Thread Size	Wrench Part No.	Optional Torque Wrench	Torque Value (in. lbs.)
T06	WS-0043	DT-90-08	90
T08	WS-0029	DT-130-10	130

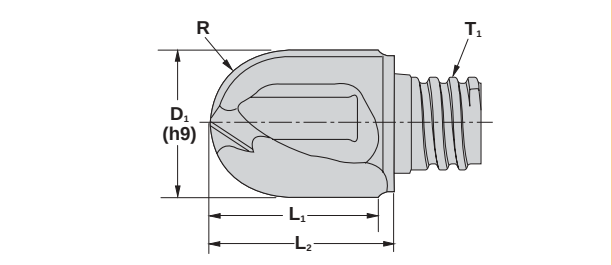
When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

CHASEline

CHIPSURFER™ BALL NOSE TIP SERIES 45B

Diameters	Grade	Corner
.312" to .625"	IN2005	.156", .187", .250" and .312"R





Cutter Number	Eff.	D_1 Nominal Diameter	L_1 Cutting Edge Length	T_1 Thread Size	L_2 Extension Length	R Corner Radius
45B-3131TQRA04	2	.312	.31	T05	.39	.156
45B-3738T6RA04	2	.375	.38	T06	.48	.187
45B-5050T8RA06	2	.500	.50	T08	.64	.250
45B-6263TRRA07	2	.625	.63	T10	.75	.312

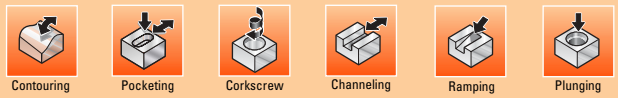
Wrench (Not included with carbide tip or shank purchase).

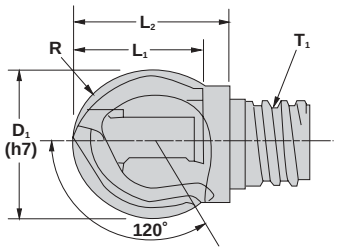
Thread Size	Wrench Part No.	Optional Torque Wrench	Torque Value (in. lbs.)
T05	WS-0043	DT-60-04	60
T06	WS-0029	DT-90-05	90
T08	WS-0030	DT-130-07	130
T10	WS-0044	DT-250-08	250

When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

CHIPSURFER™ SPHERICAL BALL NOSE TIP SERIES 45X

Diameter	Grade	Corner
.312" to .625"	IN2005	.187", .250", .312" and .375"R





Cutter Number	Eff.	D_1 Nominal Diameter	T_1 Thread Size	L_1 Cutting Length	L_2 Extension Length	Corner Radius
45X-3727TQRA03	2	.375	T05	.33	.38	.187
45X-5037T6RA04	2	.500	T06	.40	.45	.250
45X-6248T8RA06	2	.625	T08	.55	.60	.312
45X-7560TRRA07	2	.750	T10	.66	.71	.375

Wrench (Not included with carbide tip or shank purchase).

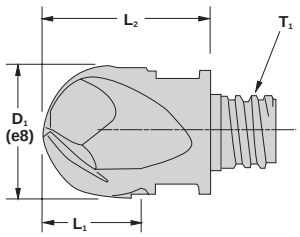
Thread Size	Wrench Part No.	Optional Torque Wrench	Torque Value (in. lbs.)
T05	WS-0043	DT-60-04	60
T06	WS-0030	DT-90-07	90
T08	WS-0044	DT-130-08	130
T10	WS-0044	DT-250-08	250

When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

CHASEline

CHIP•SURFER™ HIGH PRECISION HELICAL BALL NOSE TIP SERIES 45B, 47B

Diameters	Grade	Corner
.312" to .625"	IN2005, IN3005	.156", .187", .250", .312" and .374"R

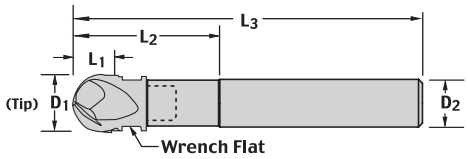


Cutter Number	Eff.	D_1 Nominal Diameter	L_1 Cutting Edge Length	T_1 Thread Size	L_2 Extension Length	R Corner Radius	Tolerance
45B-3120TQRB03	2	.312	.20	T05	.39	.156	.0004
47B-3120TQRB03	4	.312	.20	T05	.39	.156	.0004
45B-3727T6RB05	2	.375	.27	T06	.51	.187	.0004
***47B-3727T6RB05**	4	.375	.27	T06	.51	.187	.0004
45B-5037T8RB06	2	.500	.37	T08	.65	.250	.0004
47B-5037T8RB06	4	.500	.37	T08	.65	.250	.0004
45B-6235TRRB08	2	.625	.35	T10	.80	.312	.0004
47B-6247TRRB08	4	.625	.47	T10	.80	.312	.0004
47B-7550TSRB10	2	.750	.50	T12	1.00	.374	.0004
47B-7562TSRB10	4	.750	.62	T12	1.00	.374	.0004

*Also offered in grade IN3005- diamond coated for milling graphite.

Chip•Surfer Paks

Tip and Shank



ORDER THIS Pak Number	(QTY) Ball Nose Tip	Straight Shank	D_1 Ball Nose Dia.	Ball Nose Corner	D_2 Shank Adaption	L_1 Length of Cut	L_2 Projection Length	L_3 Assem. Length	Wrench
S037T06KA-06-05	(4) 47B-3727T6RB05	S037T06SA-06 (Steel)	.375	.187	.375 Cyl	.27	1.00	3.50	WS-0029
S037T06KA-20-05	(4) 47B-3727T6RB05	S037T06CA-20 (Carbide)	.375	.187	.375 Cyl	.27	2.45	5.25	WS-0029
S050T08KA-06-05	(4) 47B-5037T8RB06	S050T08SA-06 (Steel)	.500	.250	.500 Cyl	.37	1.18	4.15	WS-0030
S050T08KA-25-05	(4) 47B-5037T8RB06	S050T08CA-25 (Carbide)	.500	.250	.500 Cyl	.37	3.10	6.15	WS-0030

Wrench (Not included with carbide tip or shank purchase).

Thread Size	Wrench Part No.	Optional Torque Wrench	Torque Value (in. lbs.)
T05	WS-0043	DT-60-06	60
T06	WS-0029	DT-90-08	90
T08	WS-0030	DT-130-10	130
T10	WS-0044	DT-250-13	250
T12	WS-0059	DT-250-16	250

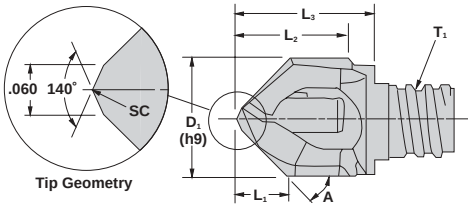
When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

CHASEline

CHIP•SURFER™ CHAMFER AND SPOTTING TIP SERIES 45N, 45M, 45P

Diameter	Grades	Nominal Chamfer Angle
.390" and .625"	IN2005	30˚, 45˚, 60˚ and 72˚

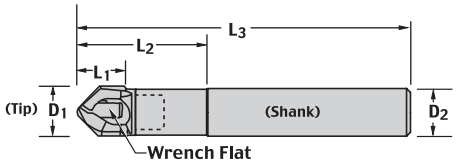
Spot Drilling | Chamfering



Cutter Number	A Nominal Chamfer Angle	Eff.	D_1 Nominal Diameter	L_1 Cutting Edge Length	T_1 Thread Size	L_2 Depth	L_3 Extension Length
45N10009T6RA45	45˚	2	.390	.18	T06	.35	.50
45N10009T6RA72	72˚	2	.390	.06	T06	.35	.50
45N16015TRRA45	45˚	2	.625	.29	T10	.59	.75
45M10009T6RA30	30˚	2	.390	.26	T06	.37	.50
45P10009T6RA60	60˚	2	.390	.10	T06	.39	.50

Chip•Surfer Paks

Tip and Shank



ORDER THIS Pak Number	(QTY) Chamfer/Spotter Tip	Straight Shank	D_1 Dia.	Included Angle	D_2 Shank Adaption	L_1 Length of Cut	L_2 Projection Length	L_3 Assem. Length	Wrench
S037T06KA-06-07	(2) 45N-10009T6RA45	S037T06SA-06 (Steel)	.400	90˚	.375 Cylindrical	.46	.96	3.50	WS-0029

Wrench (Not included with carbide tip or shank purchase).

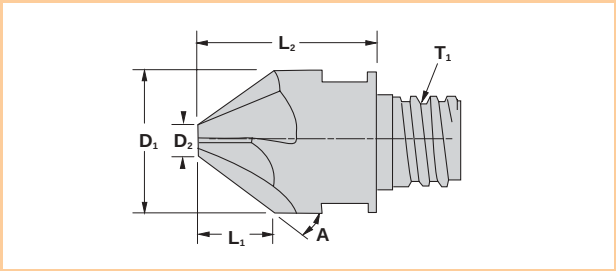
Thread Size	Wrench Part No.	Optional Torque Wrench	Torque Value (in. lbs.)
T06	WS-0029	DT-90-05	90
T10	WS-0044	DT-250-08	250

When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

CHASEline

CHIPSURFER™ SOLID CARBIDE CHAMFER AND COUNTERSINK SERIES 47N, 48N
(NON-CENTER CUTTING)

Diameters	Grade	Nominal Chamfer Angle
.500" to .787"	IN2005	45°



Cutter Number	A Nominal Chamfer Angle	Eff.	D_1 Nominal Diameter	D_2 Inner Diameter	T_1 Thread Size	L_1 Length of Cut	L_2 Extension Length
47N-5006T8RA45	45°	4	.500	.078	T08	0.20	.65
48N20025TSRA45	45°	6	.787	.197	T12	0.29	1.00

Wrench (Not included with carbide tip or shank purchase).

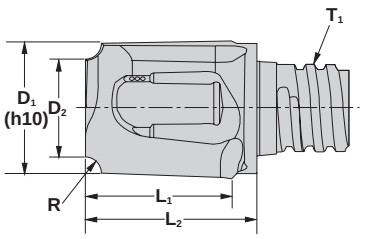
Thread Size	Wrench Part No.	Optional Torque Wrench	Torque Value (in. lbs.)
T08	WS-0044	DT-130-10	130
T12	WS-0059	DT-250-16	250

When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

CHIPSURFER™ SOLID CARBIDE CORNER ROUNDING SERIES 45R

Diameters	Grade	Corner
.394" to .630"	IN2005	.062", .094", .125", .156" and .187"R (O.D. Radius)

Corner Rounding | Plunging



Cutter Number	R Corner Radius	Eff.	D_1 Nominal Diameter	D_2 Inner Diameter	L_1 Length	T_1 Thread Size	L_2 Extension Length
45R10009T6RA16	.062	2	0.394 (10mm)	.244	.425	T06	.49 (12.4mm)
45R10009T6RA25	.094	2	0.394 (10mm)	.200	.395	T06	.49 (12.4 mm)
45R12012T8RA30	.125	2	0.500 (12mm)	.256	.485	T08	.61 (15.5mm)
45R12012T8RA40	.156	2	0.500 (12mm)	.470	.455	T08	.61 (15.5mm)
45R16015TRRA50	.187	2	0.630 (16mm)	.244	.560	T10	.75 (19mm)

Wrench (Not included with carbide tip or shank purchase).

Thread Size	Wrench Part No.	Optional Torque Wrench	Torque Value (in. lbs.)
T06	WS-0029	DT-90-05	90
T08	WS-0030	DT-130-07	130
T10	WS-0044	DT-250-08	250

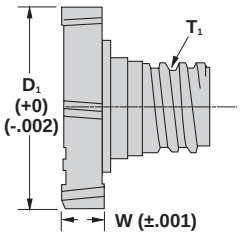
When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

CHASEline

CHIPSURFER™ PRECISION T-SLOT MILLING TIP SERIES 18T

Diameters	Grade	Corner
.056" to .375"	IN1030	.015"R and .006 x 45° chamfer

Slotting T-Slotting



Cutter Number	Eff.	D_1 Nominal Diameter	W Width	Max. Radial Depth of Cut	T_1 Thread Size	Corner Radius	Driver Size/ Torque Value (in. lbs.)
18T-5006TQRN00	6	.500	.062	.12	T05	.006 x 45°	1 / 60
18T-5012TQRN00	6	.500	.125	.12	T05	.006 x 45°	1 / 60
18T-6205T6RN02	6	.625	.056	.13	T06	.015	1 / 90
18T-6206T6RN01	6	.625	.062	.13	T06	.015	1 / 90
18T-6206T6RN02	6	.625	.068	.13	T06	.015	1 / 90
18T-6208T6RN01	6	.625	.078	.13	T06	.015	1 / 90
18T-6208T6RN02	6	.625	.086	.13	T06	.015	1 / 90
18T-6210T6RN01	6	.625	.105	.13	T06	.015	1 / 90
18T-6212T6RN01	6	.625	.125	.13	T06	.015	2 / 90
18T-6216T6RN01	6	.625	.156	.13	T06	.015	2 / 90
18T-7516T8RN01	6	.750	.156	.13	T08	.015	3 / 130
18T-7519T8RN01	6	.750	.187	.13	T08	.015	3 / 130
18T-7525T8RN01	6	.750	.250	.13	T08	.015	3 / 130
18T-8718T8RN01	6	.875	.187	.19	T08	.015	4 / 130
18T-8725T8RN01	6	.875	.250	.19	T08	.015	4 / 130
18T-8731T8RN01	6	.875	.312	.19	T08	.015	4 / 130
18T-10037TRRN02	6	1.00	.375	.19	T10	.015	5 / 250

Wrench (Not included with carbide tip or shank purchase).

Torx Driver	Torx Driver Part No.	Optional Torque Bit / Hex Drive
1	DS-T20T	DS-T20B /.250"
2	DS-T25T	DS-T25B /.250"
3	DS-T30T	DS-T30B /.250"
4	DS-T40T	DS-T40B /.250"
5	DS-T50L	DS-T50B /.312"

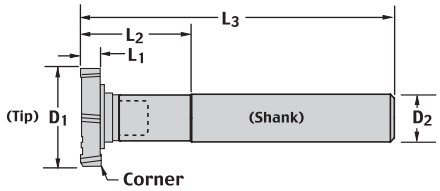
When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

CHASEline

CHIP•SURFER™ PAKS FOR PRECISION T-SLOT MILLING TIP SERIES 18T

Chip•Surfer Paks

Tip and Shank



ORDER THIS Pak Number	(QTY) T-Slot Tip	Straight Shank	D_1 T-Slot Dia.	T-Slot Corner	D_2 Shank Adaption	L_1 Length of Cut	L_2 Projection Length	L_3 Assem. Length	Wrench
S037T06KA-06-08	(2) 18T-6208T6RN01	S037T06SA-06 (Steel)	.625	.15	.375 Cylindrical	.078	.70	3.10	DS-T20T
S037T06KA-06-18	(2) 18T-6212T6RN01	S037T06SA-06 (Steel)	.625	.15	.375 Cylindrical	.125	.75	3.15	DS-T20T
S037T06KA-06-28	(2) 18T-6216T6RN01	S037T06SA-06 (Steel)	.625	.15	.375 Cylindrical	.156	.80	3.19	DS-T20T
S050T08KA-06-38	(2) 18T-7519T8RN01	S050T08SA-06 (Steel)	.750	.15	.500 Cylindrical	.187	.85	3.72	DS-T30T
S050T08KA-06-48	(2) 18T-7525T8RN01	S050T08SA-06 (Steel)	.750	.15	.500 Cylindrical	.250	.91	3.78	DS-T30T

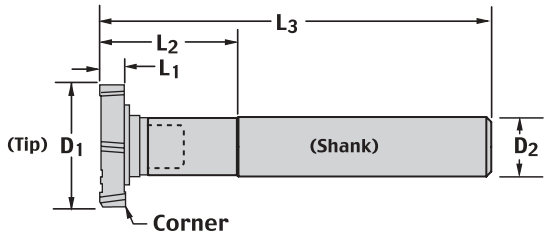
CHIP•SURFER™ PAKS FOR SNAP RING GROOVES SERIES 18T

Contents
4 Different Tips, 1 Shank, 1 Wrench

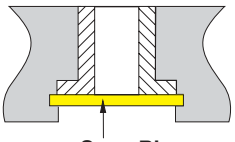

Slotting


T-Slotting

T-Slot Pak
(6 Flutes) Multi-Purpose, PVD - TiAlN-Coated IN1030



Order This Pak Number	Shank	(Qty) T-Slot Tips	L_1 Width of Cut	D_1 Nominal Diameter	L_2 Projection Length	L_3 Assm Length	Corner	D_2 Shank Adaption	Wrench
S037T06KA-12-98	S037T06CA-12(Carbide)	(1) 18T-6205T6RN02	.056	.625	1.45	4.190	.015R	.375 Cyl	DS-T20T
		(1) 18T-6206T6RN02	.068						
		(1) 18T-6208T6RN02	.086						
		(1) 18T-6212T6RN01	.125						


Snap Ring Groove

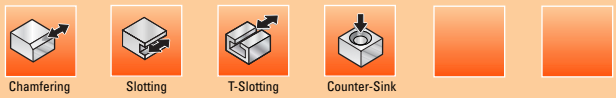

Internal Snap Ring

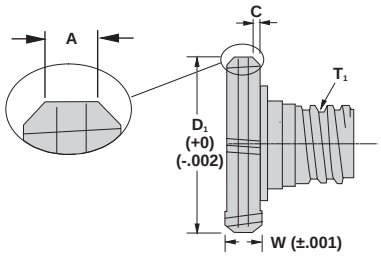
When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

CHASEline

CHIPSURFER™ FRONT/BACK CHAMFER, V-FORM TIP SERIES 18T

Diameter	Grade	Corner
.625"	IN2005	.062" x 45°





Cutter Number	Eff.	D_1 Nominal Diameter	Max. Radial Depth of Cut	T_1 Thread Size	A Width	W Width	C Corner Chamfer
18T-6216T6RN06	6	.625	.13	T06	.030	.156	.062 x 45°

Wrench (Not included with carbide tip or shank purchase).

Thread Size	Wrench Part No.	Optional Torque Wrench	Torque Value (in. lbs.)
T06	DS-T20T	DS-T20B	90

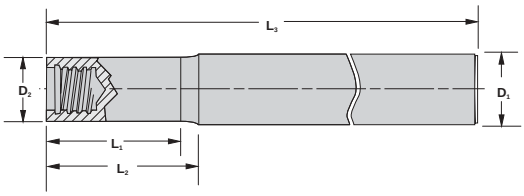
When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

CHASEline

CHIPSURFER™ NECKED DOWN STRAIGHT SHANKS

Thread Connections
T05, T06, T08, R10 and T12

Shank Materials
Steel or Carbide



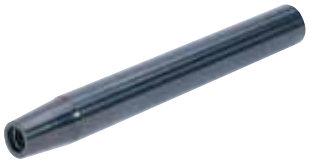
T_1 Thread Size	Part Number	L_1 Projection Length	L_2 Extension Length	L_3 Overall Length	D_1 Shank Diameter	D_2 Mating Diameter
STEEL SHANKS						
T05	**S031T05SA-05**	.51	.59	2.50	.312	.300
T06	**S037T06SA-06**	.50	.60	3.00	.375	.364
T08	**S050T08SA-06**	.53	.63	3.50	.500	.480
T08	***S050T08SA-061**	.53	.63	3.50	.500	**.455**
T10	**S075T10SA-00**	-	.13	2.75	.750	.750
T10	**S062T10SA-06**	.68	.78	4.00	.625	.600
T12	**S075T12SA-08**	.88	1.00	5.00	.750	.720
T12	**WB100T12SA-00**	-	.24	3.00	1.000	.720
CARBIDE SHANKS						
T05	**S031T05CA-09**	.95	1.00	3.00	.312	.300
T05	**S031T05CA-19**	1.95	2.00	4.00	.312	.300
T06	**S037T06CA-12**	1.20	1.25	4.00	.375	.364
T06	**S037T06CA-20**	1.95	2.00	4.75	.375	.364
T08	**S050T08CA-15**	1.45	1.50	4.00	.500	.480
T08	***S050T08CA-151**	1.45	1.50	4.00	.500	**.455**
T08	**S050T08CA-25**	2.45	2.50	5.50	.500	.480
T08	***S050T08CA-251**	2.45	2.50	5.50	.500	**.455**
T10	**S062T10CA-34**	3.43	3.50	5.50	.625	.600
T10	**S062T10CA-49**	4.93	5.00	7.00	.625	.600
T12	**S075T12CA-14**	1.43	1.50	4.00	.750	.720
T12	**S075T12CA-29**	2.93	3.00	5.50	.750	.720
T12	**S075T12CA-44**	4.43	4.50	8.00	.750	.720

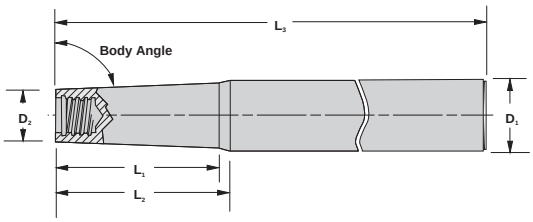
*Necked down shanks for 12mm tips. For technical information, see page 30-34.

CHIPSURFER™ CONICAL SHANKS

Thread Connections
T05, T06, T08, T10 and T12

Shank Materials
Steel or Carbide





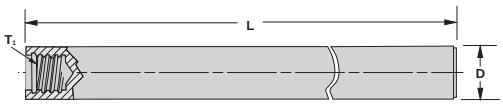
T_1 Thread Size	α Body Angle	Part Number	L_1 Projection Length	L_2 Extension Length	L_3 Overall Length	D_1 Shank Diameter	D_2 Mating Diameter
STEEL SHANKS							
T06	85°	**S062T06SK-13**	1.25	1.37	5.00	.625	.364
T06	89°	**S062T06SK-21**	1.75	2.15	6.30	.625	.364
T08	85°	**S062T08SK-08**	.75	.85	5.50	.625	.480
T08	89°	**S075T08SK-31**	2.75	3.15	6.50	.750	.480
T12	85°	**S100T12SK-16**	-	1.60	6.30	1.000	.720
T12	89°	**S100T12SK-34**	3.40	3.75	8.00	1.000	.720
T12	85°	**S125T12SK-31**	-	3.15	7.50	1.250	.720
CARBIDE SHANKS							
T05	89°	**S037T05CK-15**	-	1.50	3.50	.375	.300
T05	89°	**S062T05CK-39**	3.90	4.00	6.00	.625	.300
T06	88.5°	**S050T06CK-25**	2.50	2.50	5.50	.500	.364
T06	88.5°	**S062T06CK-35**	3.37	3.50	6.50	.625	.364
T08	89°	**S062T08CK-35**	3.45	3.50	6.50	.625	.480
T08	88.5°	**S075T08CK-40**	3.90	4.00	7.00	.750	.480
T10	89°	**S075T10CK-40**	-	4.00	6.50	.750	.600
T10	89°	**S075T10CK-62**	6.24	6.30	8.80	.750	.600
T12	89°	**S100T12CK-55**	-	5.50	10.00	1.000	.720

When assembling, be sure carbide tip is seated firmly on shank with no gap. For technical information, see page 30-34.

CHASEline

Thread Connections
T05, T06, T08, T10 and T12

Shank Materials
Carbide, Steel



Due to tolerance, Shank Diameter will be slightly larger than tip diameter.

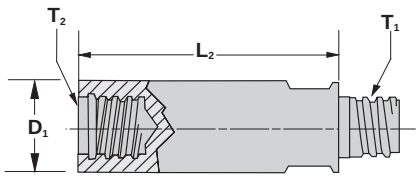
T_1 Thread Size	Part Number	L Length	D Shank Diameter
CARBIDE SHANKS			
T05	**S031T05CA-65**	6.50	.312
T06	**S037T06CA-70**	7.00	.375
T08	**S050T08CA-75**	7.50	.500
T10	**S062T10CA-80**	8.00	.625
T12	**S075T12CA-80**	8.00	.750
STEEL SHANKS			
T05	**S031T05SA-27**	2.75	.312
T06	**S037T06SA-32**	3.25	.375
T08	**S050T08SA-37**	3.75	.500
T10	**S062T10SA-40**	4.00	.625

For technical information, see page 30-34.

CHIPoSURFER™ EXTENSIONS

Extension Length
1.000" to 1.500"

Thread Size
T05, T06, T08, T10 and T12



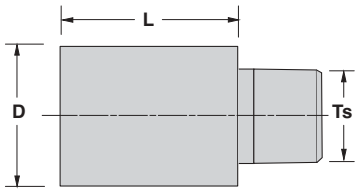
Part Number	D_1 Nominal Diameter	T_1 Thread Size	T_2 Female Thread	L Extension Length
T05T05SA-10	.300	T05	T05	1.000
T06T06SA-10	.366	T06	T06	1.000
T08T08SA-10	.480	T08	T08	1.000
T10T10SA-15	.600	T10	T10	1.500
T12T12SA-15	.720	T12	T12	1.500

Wrench (Not included with carbide tip or shank purchase).

Thread Size	Wrench Part No.	Optional Torque Wrench	Torque Value (in. lbs.)
T05	WS-0043	DT-60-06	60
T06	WS-0029	DT-90-08	90
T08	WS-0030	DT-130-10	130
T10	WS-0044	DT-250-13	250
T12	WS-0059	DT-250-16	250

CHIPSURFER™ BLANKS

Diameters	Thread Size
.315" to .787"	T05, T06, T08, T10 and T12



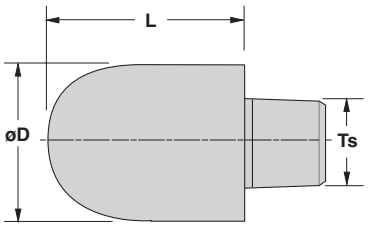
D Diameter	Part Number	L Length	Ts Thread Size
.315	**4RJ08000TQ-S100**	.407	T05
.394	**4RJ10000T6-S140**	.525	T06
.501	**4RJ-5000T8-S060**	.670	T08
.630	**4RJ16000TR-S210**	.820	T10
.787	**4RJ20000TS-S260**	1.025	T12

For technical information, see page 30-34.

CHIPoSURFER™ BALL NOSE BLANKS

Diameters
.315" to .787"

Thread Size
T05, T06, T08, T10 and T12



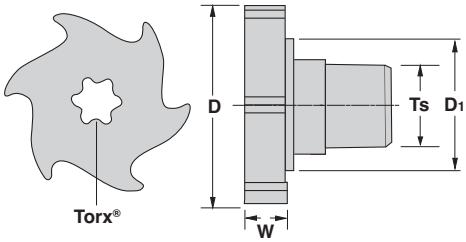
D Diameter	Part Number	L Length	Ts Thread Size
.315	4RB08000TQ-S100	.407	T05
.394	4RB10000T6-S140	.525	T06
.501	4RB-5000T8-S060	.670	T08
.630	4RB16000TR-S210	.820	T10
.787	4RB20000TS-S260	1.025	T12

For technical information, see page 30-34.

CHIPSURFER™ T-SLOT PREFORM BLANKS

Diameters
.551" to 1.125"

Thread Size
T05, T06, T08 and T10



D Nominal Diameter	Part Number	W Width	Ts Thread Size	D_1 Hub Diameter	Torx	Number of Teeth
.551	**18T14019TQRS000**	.075	T05	.320	T20	6
.551	**18T14028TQRS000**	.110	T05	.320	T20	6
.551	**18T14033TQRS000**	.130	T05	.320	T20	6
.551	**18T14043TQRS000**	.169	T05	.320	T20	6
.641	**18T16323T6RS000**	.090	T06	.364	T20	6
.641	**18T16333T6RS000**	.130	T06	.364	T25	6
.641	**18T16343T6RS000**	.169	T06	.364	T25	6
.762	**18T19439T8RS000**	.149	T08	.480	T30	6
.762	**18T19444T8RS000**	.173	T08	.480	T30	6
.762	**18T19451T8RS000**	.200	T08	.480	T30	6
.762	**18T19467T8RS000**	.263	T08	.480	T30	6
.779	**18T19844T8RS000**	.173	T08	.480	T30	6
.779	**18T19854T8RS000**	.212	T08	.480	T30	6
.779	**18T19863T8RS000**	.251	T08	.480	T30	6
.919	**18T23453T8RS000**	.208	T08	.480	T40	6
.919	**18T23463T8RS000**	.248	T08	.480	T40	6
.919	**18T23483T8RS000**	.327	T08	.480	T40	6
.919	**18T23499T8RS000**	.387	T08	.480	T40	6
1.015	**18T25826TRRS000**	.102	T10	.630	T50	6
1.015	**18T25840TRRS000**	.157	T10	.630	T50	6
1.015	**18T25850TRRS000**	.197	T10	.630	T50	6
1.015	**18T25866TRRS000**	.260	T10	.630	T50	6
1.015	**18T25883TRRS000**	.327	T10	.630	T50	6
1.015	**18T25899TRRS000**	.390	T10	.630	T50	6
1.125	**18T28628TRRS000**	.110	T10	.630	T40	6
1.125	**18T28636TRRS000**	.141	T10	.630	T40	6
1.125	**18T28656TRRS000**	.220	T10	.630	T40	6
1.125	**18T28610TRRS000**	.405	T10	.630	T40	6

For technical information, see page 30-34.

MILLING TIP OPERATING GUIDELINES

INDEXING CHIPSURFER TIP GUIDELINES

Step 1: Screw tip into shank until finger tight (Figure 1a). Note a .010" gap (Figure 1b).
Step 2: Use wrench to torque approximately 1/4 turn, creating a simultaneous fit (Figure 2).
Step 3: Use .001" shim stock to check the simultaneous fit at the intersection of the tip and the shank.
The shim should not be able to enter the intersection (Figure 3a).
If it does, tighten further with the wrench until there is no gap (Figure 3b).

Note: Pre-set torque wrenches (series DT-. . .) can be purchased.

Figure 1a. Finger tight

Figure 1b. .010" gap

Figure 2. 1/4 turn

Figure 3a. Shim should NOT enter intersection

Figure 3b. Proper fit

Series DT-. . . Optional Torque Wrench

Material	Specifications	Hardness Brinnel	Coolant?	SFM	Diameter	IPT Based on Diameter
Aluminum Alloys	**7075 - T6 6061 - T6 2024**	-	Yes	1000-5000	0.312 0.375 0.500 0.625 0.750	.003 .004 005 .006 .008
Magnesium	**Die Cast, Extruded**	-	?	800-1500	0.312 0.375 0.500 0.625 0.750	.002 .003 .004 .006 .008
Copper	**Yellow Brass, High Lead Brass, Red Brass**	-	?	800-1000	0.312 0.375 0.500 0.625 0.750	.002 0025 .003 .004 .004
Copper Alloys	**Aluminum/Bronze, Low Silicon Bronze**	-	?	750-1000	0.312 0.375 0.500 0.625 0.750	.002 .0025 .003 .004 .004
Plastics,Acrylics, Phenolics	**Polysulfone, G10, G11**	-	?	200-500	0.312 0.375 0.500 0.625 0.750	003 .004 .006 .008 .010
Cast Iron	**Ductile Cast Iron**	150-250	No	600-650	0.312 0.375 0.500 0.625 0.750	.0015 .002 .0022 .003 004
Cast Iron	**Gray Cast Iron**	150-250	No	600-650	0.312 0.375 0.500 0.625 0.750	.002 .003 .004 .005 .006
Steel	**Low Alloy Steels 10xx, 11xx, 13xx**	100-250	No	600-800	0.312 0.375 0.500 0.625 0.750	.0012 .002 .003 004 .005
Steel	**High Strength Steels 4140, 4340, 6150, H13**	150-300	No	600-800	0.312 0.375 0.500 0.625 0.750	.001 .0015 .002 .0025 .003
Steel	**High Alloy Steels A2, A6, P20**	Up to 300	No	500-650	0.312 0.375 0.500 0.625 0.750	.001 .0015 0015 .0025 .003

MILLING TIP OPERATING GUIDELINES

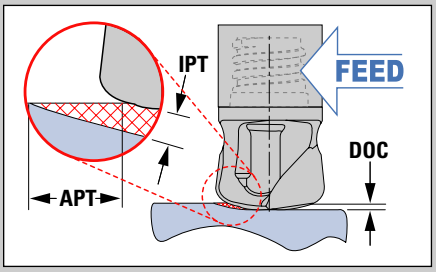
Material	Specifications	Hardness Brinnel	Coolant?	SFM	Diameter	IPT Based on Diameter
Steel	**Medium Alloy Steels 200, 250, 300**	250-400	No	500-750	0.312 0.375 0.500 0.625 0.750	.001 .002 .0025 .0035 .004
Stainless Steel	**13/8, 15/5, AM-350/355**	-	Yes*	200-275	0.312 0.375 0.500 0.625 0.750	.001 0015 .002 .003 .004
Stainless Steel	**200 Series, 302, 303, 304L, 316L**	-	Yes*	225-300	0.312 0.375 0.500 0.625 0.750	.002 .0025 .003 .0035 .0035
Stainless Steel	**403, 410, 416**	-	Yes*	250-325	0.312 0.375 0.500 0.625 0.750	0005 .001 .0015 .0025 .003
High Temperature Alloys	**Nickel Base: Inconel,Hastelloy,Waspalloy**	-	Yes	100-200	0.312 0.375 0.500 0.625 0.750	.0008 .001 .002 .0025 003
High Temperature Alloys	**Cobalt Base: Stelite, Haynes, X-40, L-605**	-	Yes	100-200	0.312 0.375 0.500 0.625 0.750	.001 .001 .0012 .0015 .002
High Temperature Alloys	**Iron Base: Incoloy, Multimet, Timken**	-	Yes	125-225	0.312 0.375 0.500 0.625 0.750	.001 .0015 .002 0025 .003
Titanium	**Titanium Alloys: 6AL-4V, etc.**	-	Yes	100-250	0.312 0.375 0.500 0.625 0.750	.0005 .001 .0015 .0025 .003
Carbon, Graphites	**Carbon, Graphites** -	?	200-500		0.312 0.375 0.500 0.625 0.750	.006 .008 010 .010 .015

ULTRA HIGH FEED MILLING TIPS

Material	Spec	Hardness Brinnel	SFM	IPT	Coolant
Steel	**Hi Strength Steel 4140, 4340, 6150, H13**	150-300	600-800	.008-.018	No
	High Alloy Tool Steel	Up to 300	500-650	.008-.018	
	Medium Alloy 200, 250, 300	250-400	500-750	.008-.018	
	Low Alloy 1018, 1045	100-250	600-800	.010-.020	
	Hardened Steel	Rc 42-52	300-450	.002-.004	
	Hardened Steel	Rc 52-58	200-350	.001-.003	
	Hardened Steel	Rc 58-62	100-200	.001-.003	
Stainless Steel	**Precipitation 13/8, 15/5, AM350/355**	-	200-275	.003-.013	Yes
	Austenitic 200 series, 302, 303, 304L, 316L	-	225-300	.008-.018	
	Martensitic 403, 410, 416	Up to 320	250-325	.008-.018	
Cast Iron	**Ductile Iron**	150-250	600-650	.005-.015	No
	Gray Cast Iron	150-250	600-650	.006-.016	
Hi Temp Alloys	**Cobalt Based - Stelite, HS-21, X-40, L-605**	-	100-200	.002-.004	Yes
	Nickel Base - Inconel, Monel, Incoly 600-800	-	100-200	.003-.005	
	Iron Base - Incoloy 800-802, Multimet N-155, Timken 16-26-6	-	125-225	.003-.005	
Titanium	**Titanium Alloys - 6AL4V**	-	100-250	.003-.005	Yes

FEDE RATE CALCULATION

Hardened Steel Applications	Extended Cutter Applications (Length/Dia > 8:1)	Typical Applications (Length/Dia < 8:1)
.005 < DOC < .010 APT = 3 X IPT	.005 < DOC < .015 APT = 3 X IPT	.015 < DOC < .030 APT = 4 X IPT

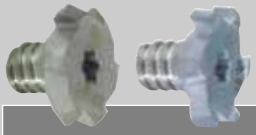


EXAMPLE CALCULATION

Given	Step 1	Step 2	Step 3	Step 4	Operating Parameters
▪ Tip = 45A12001T8RA25 ▪ Number of Flutes = 2 ▪ Material = H13 Pre Hard ▪ Hardness = 38-42 ▪ Extension = 2.0	Convert 38-42 HRC to Brinell & then select SFM. Calculate RPM for .472" diameter tip	Select DOC and FeedRate Multiplier from the application table for a ratio of < 8:1	Select appropriate Chip Thickness	Calculate FeedRate (full width)	▪ RPM = 4855 ▪ DOC = .025 ▪ Fede Rate = 388 IPM ▪ WOC = .472
	*RPM = 4855	DOC = .025	CT = .010"	**FeedRate = 388 IPM	

*RPM = SFM x 3.82 / Diameter ** FeedRate = RPM x Number of Flutes x CT x Multiplier

INDEXING CHIPSURFER TIPS



T-SLOTTER

Material	Spec	Hardness Brinnel	SFM	IPT	Coolant
Aluminum	**7075 - T6, 6061 - T6, 2024**	-	1650-2500	.0025-.0035	Yes
Cast Iron	**Gray**	150-250	350-550	.0025-.0035	No
	Nodular	150-250	425-650	.0030-.0040	
Steel	**Low Carbon 1018, 8620**	150-250	450-750	.0025-.0035	No
	High Carbon F-6180	250-400	250-450	.0030-.0040	
	Alloyed Steel 4140, 4340	150-300	350-550		
	Tool Steel A-6, D-1, D-2	Up to 300	350-450		
Stainless Steel	**300 Series, 304, 316**	-	300-500 at high speeds	.0025-.0035	may not be required
	400 Series 15-5 PH	Up to 320	250-400	.0030-.0040	may not be required at high speeds
	13-8 PH	-	200-350		Yes
Nickel Alloys	**Inconel, Hastelloy, Waspalloy**	-	100-200	.0025-.0035	Yes
Titanium	**6AL-4V**	-	150-200	.0025-.0035	Yes

Please see Ingersoll's Milling Products Catalog (CAT-001) for chip thinning factor application at various depths of cut

CHIP SURFER™

Indexable Solid Carbide SPECIALS

SPECIAL RADIUS

• Crankshaft Oil Grooves

SPECIAL CORNER

• Engine Blocks
• Con Rod Bearing Locks
• Lock Notch Groove

SPECIAL ANGLE FOR SNAP RING GROOVE

• Differential Case
• O-Ring Groove
• Axle Tubes
• Bushing Retention

Carbide Blanks For Your Next Project

CHASEline

CHIP SURFER™

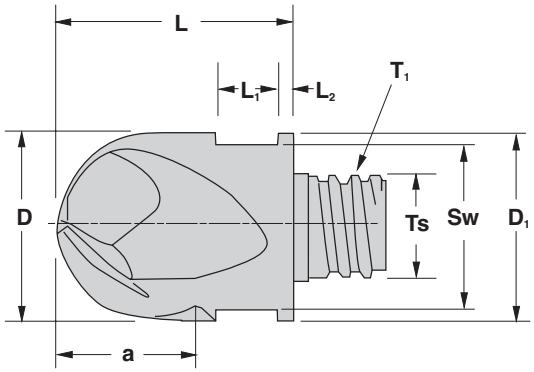
COPY PAGE AND FILL IN INFORMATION TO COMMUNICATE BASIC DESIGN REQUIREMENTS

product worksheet quote request

SPECIFICATIONS NEW

Diameter (D)	
Diameter Tolerance	(e8)
Extension Length (L)	
Cutting Length (a)	
Number of Flutes	
Neck Diameter (D1)	(D-.02)
Helix Angle	(30)
Radial Rake Angle	(11)
Grade	IN05S(uncoated), IN2005(TiAln)
Adaption (Ts)	

Center Cut



ADDITIONAL INFORMATION

Reference Catalog Part #	
Quantity (min. of 6)	6,
Material to Machine	
Application	(Milling)

( ) INDICATES DEFAULT

Part Number	D	L	Ts	Sw	L1	L2
4RB08000TQ-S100	0.315	0.407	5	0.212	0.14	0.02
4RB10000T6-S140	0.394	0.525	6	0.311	0.17	0.02
4RB-5000T8-S060	0.501	0.670	8	0.390	0.21	0.02
4RB16000TR-S210	0.630	0.820	10	0.508	0.24	0.03
4RJ20000TS-S260	0.787	1.025	12	0.626	0.24	0.05

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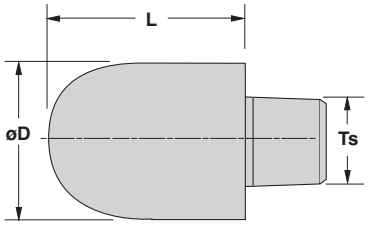

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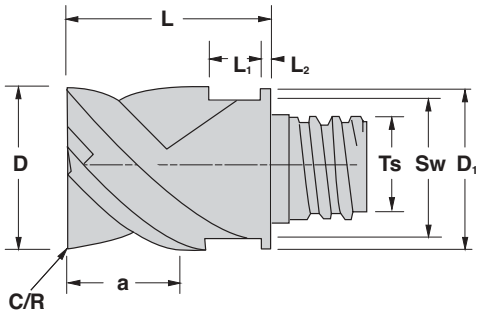
SPECIFICATIONS	NEW
Diameter (D)	
Diameter Tolerance	(e8)
Extension Length (L)	
Cutting Length (a)	
Number of Flutes	
Neck Diameter (D_1)	(D-.02)
Helix Angle	(45)
Radial Rake Angle	(10)
Chamfer (C)	
Radius (R)	
Grade	IN05S(uncoated), IN2005(TiAln)
Adaption (Ts)	

ADDITIONAL INFORMATION

Reference Catalog Part #	
Quantity (min. 0f 6)	6,
Material to Machine	
Application	Circle one: (Milling) (Boring)

( ) INDICATES DEFAULT

Circle one of these:



Part Number	D	L	Ts	Sw	L1	L2
4RJ08000TQ-S100	0.315	0.407	5	0.212	0.14	0.02
4RJ10000T6-S140	0.394	0.525	6	0.311	0.17	0.02
4RJ-5000T8-S060	0.501	0.670	8	0.390	0.21	0.02
4RJ16000TR-S210	0.630	0.820	10	0.508	0.24	0.03
4RJ20000TS-S260	0.787	1.025	12	0.626	0.24	0.05

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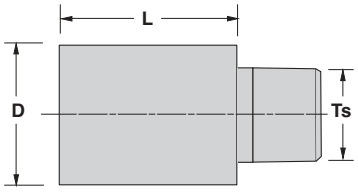

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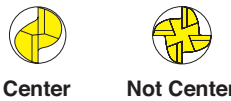
SPECIFICATIONS	NEW
Diameter (D)	
Diameter Tolerance	(e8)
Extension Length (L)	
Cutting Length (a)	
Number of Flutes	
Neck Diameter (D_1)	(D-.02)
Inner Diameter (D_2)	
Angle (K)	
Helix Angle	(0)
Radial Rake Angle	(0)
Grade	IN05S(uncoated), IN2005(TiAlN)
Adaption (Ts)	

ADDITIONAL INFORMATION

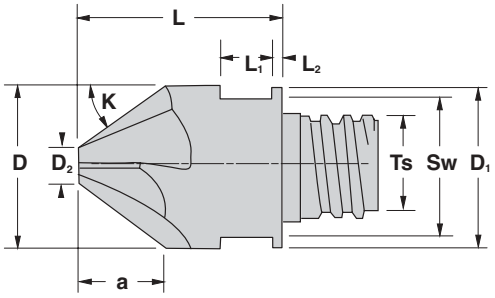
Reference Catalog Part #	
Quantity (min. of 6)	6,
Material to Machine	
Application	Circle one: (Milling) (Boring)

( ) INDICATES DEFAULT

Circle one of these:



Center Cut | Not Center Cutting



Part Number	D	L	Ts	Sw	L1	L2
4RJ08000TQ-S100	0.315	0.407	5	0.212	0.14	0.02
4RJ10000T6-S140	0.394	0.525	6	0.311	0.17	0.02
4RJ-5000T8-S060	0.501	0.670	8	0.390	0.21	0.02
4RJ16000TR-S210	0.630	0.820	10	0.508	0.24	0.03
4RJ20000TS-S260	0.787	1.025	12	0.626	0.24	0.05

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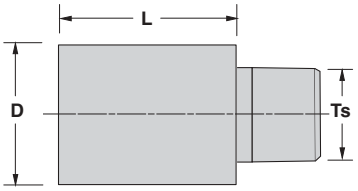

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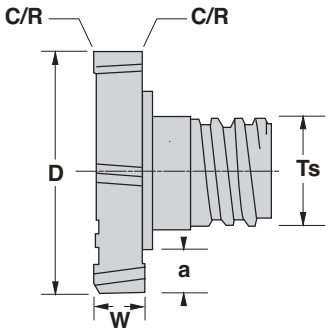
SPECIFICATIONS	NEW
Diameter (D)	
Width of Cut (W)	
Number of Flutes	(6)
Depth of Cut (a)	[(D-D1)/2]
Axial Rake	(3)
Chamfer (C)	
Radius (R)	
Grade	IN30M(uncoated), IN2030(TiAln)
Tolerance	(D-.002 / W±.002)
Adaption (Ts)	



ADDITIONAL INFORMATION

Reference Catalog Part #	
Quantity (min. of 6)	6,
Material to Machine	
Application	Circle one: (Milling) (Boring)

( ) INDICATES DEFAULT

Part Number	D	W	Ts	D1	Torx®	# Teeth
18T14019TQRS000	0.552	0.074	T5	0.320	T20	6
18T14028TQRS000	0.552	0.110	T5	0.320	T20	6
18T14033TQRS000	0.552	0.130	T5	0.320	T20	6
18T14043TQRS000	0.552	0.169	T5	0.320	T20	6
18T16323T6RS000	0.641	0.091	T6	0.364	T20	6
18T16333T6RS000	0.641	0.130	T6	0.364	T25	6
18T16343T6RS000	0.641	0.169	T6	0.364	T25	6
18T19439T8RS000	0.762	0.149	T8	0.480	T30	6
18T19444T8RS000	0.762	0.173	T8	0.480	T30	6
18T19451T8RS000	0.762	0.200	T8	0.480	T30	6
18T19467T8RS000	0.762	0.263	T8	0.480	T30	6
18T19844T8RS000	0.781	0.173	T8	0.480	T30	6
18T19854T8RS000	0.781	0.213	T8	0.480	T30	6
18T19863T8RS000	0.781	0.252	T8	0.480	T30	6
18T23453T8RS000	0.919	0.209	T8	0.480	T40	6
18T23463T8RS000	0.919	0.248	T8	0.480	T40	6
18T23483T8RS000	0.919	0.327	T8	0.480	T40	6
18T23499T8RS000	0.919	0.390	T8	0.480	T40	6
18T25826TRRS000	1.014	0.102	T10	0.630	T50	6
18T25840TRRS000	1.014	0.157	T10	0.630	T50	6
18T25850TRRS000	1.014	0.197	T10	0.630	T50	6
18T25866TRRS000	1.014	0.260	T10	0.630	T50	6
18T25883TRRS000	1.014	0.327	T10	0.630	T50	6
18T25899TRRS000	1.014	0.390	T10	0.630	T50	6
18T28628TRRS000	1.125	0.110	T10	0.630	T40	6
18T28636TRRS000	1.125	0.141	T10	0.630	T40	6
18T28656TRRS000	1.125	0.220	T10	0.630	T40	6
18T28610TRRS000	1.125	0.405	T10	0.630	T40	6

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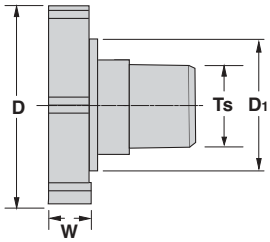

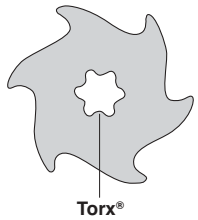

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