CHIP SURFER™

Small Diameter Hi-Feed End Mill Tips Tailored for any Application

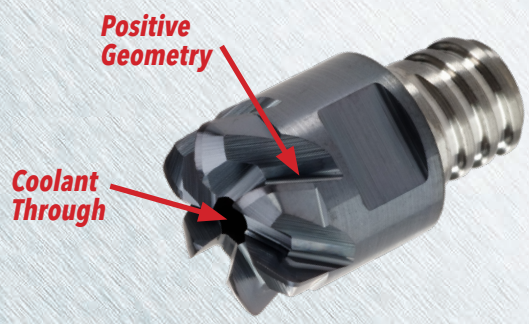
Tip Style:
Hi-Feed End Mills

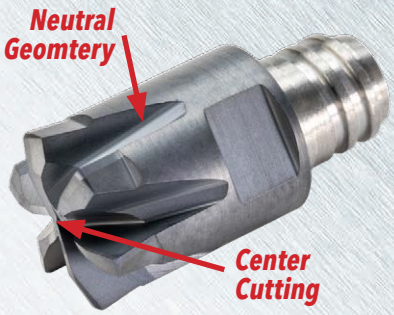
Diameters:
.375"-1.000", 8mm-25mm

Geometry:
Positive & Neutral

Adaptions:
T05, T06, T08, T10, T12, T15

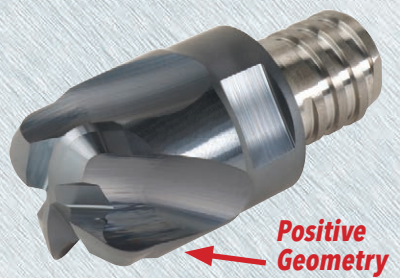
Materials:
Steel, Stainless Steel, Iron, Hi-Temp Alloys, Titanium, Hard Steel





6 Flute:

- Fine Pitch Density for utmost feed rate capability
- Ideal for Steel, Iron and Hardened Steel
- Programmer tip: Must "drive" corners when pocketing due to tooth engagement (90° turns not recommended)
- Neutral geometry for durability and maximum ramping angle
- Positive geometry for higher efficiency



4 Flute:

- Medium Pitch Density for elevated feed rate capability
- Positive Rake Geometry and Keen Edge
- Ideal for Hard Steel (external airblast); SS, Hi-Temps and Ti (external coolant)
- Programmer tip: Must "drive" corners when pocketing due to tooth engagement (90° turns not recommended)

2 Flute:

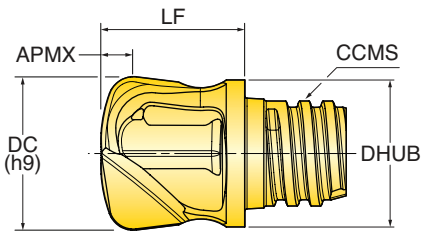
- Coarse Pitch Density ideal for tight pocket corners and low face pressure
- Neutral geometry and Strong Edge to survive mechanical shock and interruptions
- Ideal for long reach, chatter prone & abusive applications; Weld
- Programmer tip: 30-40% diameter radial step-overs recommended for best tool life

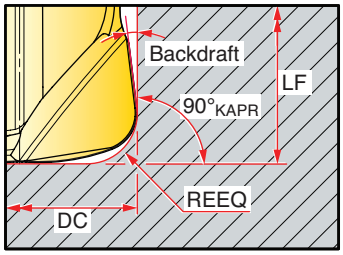
INDUSTRY 4.0 PRODUCT ANNOUNCEMENT •UPDATE• 2025

Member IMC Group
Ingersoll Cutting Tools

CHIPoSURFER™ SERIES 45A

SOLID CARBIDE 2 FLUTE HIGH-FEED ROUGHING TIP (NEUTRAL GEOMETRY)



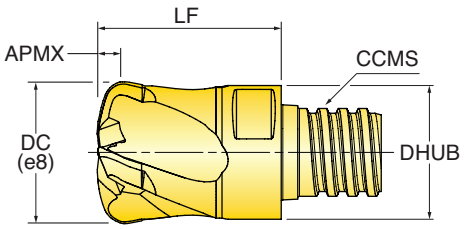


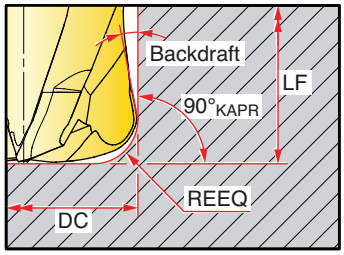
Part Number	DC Cutting Diameter	REEQ Program Radius Equivalent	APMX Depth of Cut Max.	ZEFF Effective Flutes	LF Functional Length	CCMS Connection Code	DHUB Hub Diameter
INCH	(inch)	(inch)	(inch)		(inch)		(inch)
45A-3703T6RA06	0.375	0.059	0.020	2	0.490	Chip Surfer T06	0.360
45A-5004T8RA08	0.500	0.098	0.027	2	0.591	Chip Surfer T08	0.453
45A-7506TSRA12	0.750	0.079	0.056	2	0.685	Chip Surfer T12	0.726
METRIC	(mm)	(mm)	(mm)		(mm)		(mm)
45A10001T6RA20	10.00	2.00	0.60	2	12.50	Chip Surfer T06	9.60
45A12001T8RA25	12.00	2.50	0.68	2	11.10	Chip Surfer T08	11.50
45A16001TRRA30	16.00	3.00	1.10	2	13.50	Chip Surfer T10	15.20
45A20001TSRA30	20.00	3.00	1.50	2	17.50	Chip Surfer T12	18.30

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

CHIPoSURFER™ SERIES 47A

SOLID CARBIDE 4 FLUTE HIGH-FEED ROUGHING TIP (POSITIVE GEOMETRY)



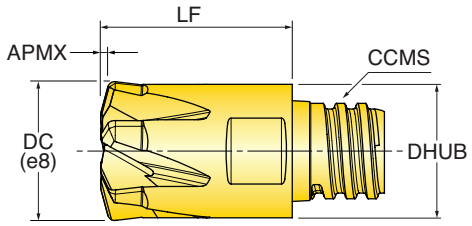


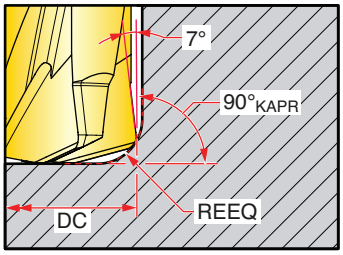
Part Number	DC Cutting Diameter	REEQ Program Radius Equivalent	APMX Depth of Cut Max.	ZEFF Effective Flutes	LF Functional Length	CCMS Connection Code	DHUB Hub Diameter	RMPX Ramp Angle Max.
INCH	(inch)	(inch)	(inch)		(inch)		(inch)	
47A-5004T8RA09	0.500	0.100	0.023	4	0.649	Chip Surfer T08	0.480	5.00
47A-7504TSRA16	0.750	0.160	0.039	4	1.000	Chip Surfer T12	0.726	5.00
METRIC	(mm)	(mm)	(mm)		(mm)		(mm)	
47A08001TQRA16	8.00 mm	1.62 mm	0.40 mm	4	10.00 mm	Chip Surfer T05	7.50 mm	5.00
47A10001T6RA20	10.00 mm	2.01 mm	0.50 mm	4	13.00 mm	Chip Surfer T06	9.50 mm	5.00
47A12001T8RA24	12.00 mm	2.47 mm	0.60 mm	4	16.50 mm	Chip Surfer T08	11.50 mm	5.00
47A16001TRRA32	16.00 mm	3.25 mm	0.80 mm	4	20.50 mm	Chip Surfer T10	15.40 mm	5.00
47A20001TSRA40	20.00 mm	4.02 mm	1.00 mm	4	25.50 mm	Chip Surfer T12	18.45 mm	5.00

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

CHIPoSURFER™ SERIES 48A_T_RX

SOLID CARBIDE 6 FLUTE HIGH-FEED ROUGHING TIP (NEUTRAL GEOMETRY)



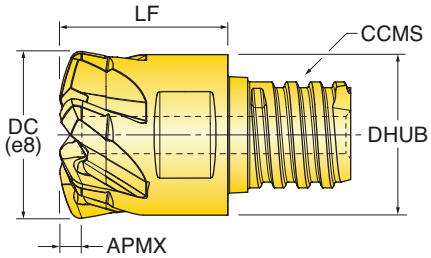


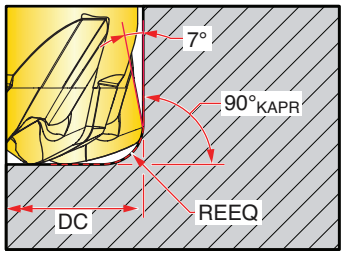
Part Number	DC Cutting Diameter	REEQ Program Radius Equivalent	APMX Depth of Cut Max.	ZEFF Effective Flutes	LF Functional Length	CCMS Connection Code	DHUB Hub Diameter	RMPX Ramp Angle Max.
INCH	(inch)	(inch)	(inch)		(inch)		(inch)	
48A-5004T8RX05	0.500	0.051	0.028	6	0.650	Chip Surfer T08	0.488	5.00
METRIC	(mm)	(mm)	(mm)		(mm)		(mm)	
48A08001T5RX09	8.00	0.86	0.40	6	10.00	Chip Surfer T05	7.50	5.00
48A10001T6RX10	10.00	1.00	0.45	6	13.00	Chip Surfer T06	9.50	5.00
48A12001T8RX12	12.00	1.20	0.65	6	16.50	Chip Surfer T08	11.50	5.00
48A16001TRRX20	16.00	2.00	1.05	6	20.50	Chip Surfer T10	15.40	5.00
48A20001TSRX22	20.00	2.20	1.25	6	25.50	Chip Surfer T12	18.45	5.00
48A25001TURX25	25.00	2.50	1.55	6	25.00	Chip Surfer T15	23.90	5.00

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

CHIPoSURFER™ SERIES 48A_T_RA

SOLID CARBIDE 6 FLUTE HIGH-FEED ROUGHING TIP (POSITIVE GEOMETRY)





Part Number	DC Cutting Diameter	REEQ Program Radius Equivalent	APMX Depth of Cut Max.	ZEFF Effective Flutes	LF Functional Length	CCMS Connection Code	DHUB Hub Diameter	CSP Coolant	RMPX Ramp Angle Max.
INCH	(inch)	(inch)	(inch)		(inch)		(inch)		
48A-5004T8RA051	0.500	0.051	0.039	6	0.500	Chip Surfer T08	0.480	Yes	3.00
48A-1004TURA20	1.000	0.145	0.047	6	0.984	Chip Surfer T15	0.940	Yes	5.00
METRIC	(mm)	(mm)	(mm)		(mm)		(mm)		
48A10001T6RA101	10.00 mm	1.00 mm	0.45 mm	6	10.00 mm	Chip Surfer T06	9.50 mm	Yes	3.00
48A12001T8RA121	12.00 mm	1.20 mm	0.65 mm	6	12.50 mm	Chip Surfer T08	11.50 mm	Yes	3.00
48A16001TRRA201	16.00 mm	2.00 mm	1.08 mm	6	16.00 mm	Chip Surfer T10	15.40 mm	Yes	3.00
48A20001TSRA221	20.00 mm	2.20 mm	1.28 mm	6	20.00 mm	Chip Surfer T12	18.45 mm	Yes	3.00
48A25001TURA36	25.00 mm	3.10 mm	1.20 mm	6	25.00 mm	Chip Surfer T15	23.80 mm	No	5.00

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

CHIPoSURFER™ HARDWARE

CCMS Connection Code	 Wrench	 Optional Torque Driver	Torque Value
T05	WS-0043	DT-60-06	60in/lbs
T06	WS-0029	DT-90-08	90in/lbs
T08	WS-0030	DT-130-10	130in/lbs
T10	WS-0044	DT-250-13	250in/lbs
T12	WS-0059	DT-250-16	250in/lbs
T15	WS-0059	DT-250-16	250in/lbs

When assembling, be sure carbide tip is seated firmly on shank with no gap.
Note: DO NOT apply lubricant to the thread connection. Wrench not included with carbide tip or shank purchase.

Materials				Vc Cutting Speed SFM *	DC Cutting Dia. (inch)	fz Feed per Tooth (inch)	Coolant
ISO	Mat'l Group #VDI 3323	Type	Examples				
P	1-5	Non-alloy Steel	1018, A36, 1045, A572, 1070	600-1000	0.375	.015-.030	No
					0.500	.020-.040	
					0.625	.025-.040	
					0.750	.025-.040	
	6-9	Low-alloy Steel	4140, 4340, P20, 8620, 300M	500-800	0.375	.012-.027	
					0.500	.015-.030	
					0.625	.015-.030	
					0.750	.020-.030	
	10-11	High-alloy Steel	H13, A2, D2, M2, T1	450-700	0.375	.012-.027	
					0.500	.015-.030	
					0.625	.015-.030	
					0.750	.020-.030	
M	12-13	Stainless Steel (Ferritic & Martens-itic)	410, 416, 440	350-600	0.375	.012-.025	Yes
					0.500	.012-.030	
					0.625	.020-.030	
					0.750	.020-.030	
	14	Stainless Steel (Austenitic)	303, 304, 316, 15-5, 17-4	300-550	0.375	.012-.025	May not be required at high speeds
					0.500	.012-.030	
					0.625	.020-.030	
					0.750	.020-.030	
K	15-16	Gray Cast Iron	CLS. 20, 30, 45	600-1000	0.375	.015-.030	No
					0.500	.020-.040	
					0.625	.025-.040	
					0.750	.025-.040	
	17-20	Nodular Cast Iron	60-40-18, 100-70-03	450-700	0.375	.012-.027	
					0.500	.015-.030	
					0.625	.015-.030	
					0.750	.020-.030	
S	31-35	High-Temp Alloys	Inconel, Hastelloy, Nimonic, Monel	65-200	0.375	.010-.020	Yes
					0.500	.010-.020	
					0.625	.012-.025	
					0.750	.012-.025	
	36-37	Titanium Alloys	6Al-4V, 5Al-5Mo-5V-3Cr	85-200	0.375	.010-.020	
					0.500	.010-.020	
					0.625	.012-.025	
					0.750	.012-.025	
H	38-39	Hardened 45-60 HRC	A2, O1, D2	150-300	0.375	.010-.015	No
					0.500	.010-.015	
					0.625	.012-.020	
					0.750	.012-.020	

Materials				Vc Cutting Speed SFM *	DC Cutting Dia. (inch)	fz Feed per Tooth (inch)	Coolant
ISO	Mat'l Group #VDI 3323	Type	Examples				
P	1-5	Non-alloy Steel	1018, A36, 1045, A572, 1070	600-1000	0.312	.015-.025	No
					0.375	.018-.028	
					0.500	.018-.028	
					0.625	.020-.030	
					0.750	.020-.030	
	6-9	Low-alloy Steel	4140, 4340, P20, 8620, 300M	500-800	0.312	.015-.025	
					0.375	.018-.028	
					0.500	.018-.028	
					0.625	.020-.030	
					0.750	.020-.030	
	10-11	High-alloy Steel	H13, A2, D2, M2, T1	450-700	0.312	.015-.025	
					0.375	.018-.028	
					0.500	.018-.028	
					0.625	.020-.030	
					0.750	.020-.030	
M	12-13	Stainless Steel (Ferritic & Martens-itic)	410, 416, 440	350-600	0.312	.015-.025	Yes
					0.375	.018-.028	
					0.500	.018-.028	
					0.625	.020-.030	
					0.750	.020-.030	
	14	Stainless Steel (Austenitic)	303, 304, 316, 15-5, 17-4	300-550	0.312	.015-.025	May not be required at high speeds
					0.375	.018-.028	
					0.500	.018-.028	
					0.625	.020-.030	
					0.750	.020-.030	
K	15-16	Gray Cast Iron	CLS. 20, 30, 45	600-1000	0.312	.015-.025	No
					0.375	.018-.028	
					0.500	.018-.028	
					0.625	.020-.030	
					0.750	.020-.030	
	17-20	Nodular Cast Iron	60-40-18, 100-70-03	450-700	0.312	.015-.025	
					0.375	.018-.028	
					0.500	.018-.028	
					0.625	.020-.030	
					0.750	.020-.030	
S	31-35	High-Temp Alloys	Inconel, Hastelloy, Nimonic, Monel	65-200	0.312	.008-.018	Yes
					0.375	.012-.022	
					0.500	.012-.022	
					0.625	.015-.025	
					0.750	.015-.025	
	36-37	Titanium Alloys	6Al-4V, 5Al-5Mo-5V-3Cr	85-200	0.312	.008-.018	
					0.375	.012-.022	
					0.500	.012-.022	
					0.625	.015-.025	
					0.750	.015-.025	
H	38-39	Hardened 45-60 HRC	A2, O1, D2	150-300	0.312	.008-.018	No
					0.375	.012-.022	
					0.500	.012-.022	
					0.625	.015-.025	
					0.750	.015-.025	

Materials				Vc Cutting Speed SFM *	DC Cutting Dia. (inch)	fz Feed per Tooth (inch)	Coolant
ISO	Mat'l Group #VDI 3323	Type	Examples				
P	1-5	Non-alloy Steel	1018, A36, 1045, A572, 1070	600-1000	0.312	.015-.025	No
					0.375	.018-.028	
					0.500	.018-.028	
					0.625	.020-.030	
					0.750	.020-.030	
					1.000	.025-.035	
	6-9	Low-alloy Steel	4140, 4340, P20, 8620, 300M	500-800	0.312	.015-.025	
					0.375	.018-.028	
					0.500	.018-.028	
					0.625	.020-.030	
					0.750	.020-.030	
					1.000	.025-.035	
	10-11	High-alloy Steel	H13, A2, D2, M2, T1	450-700	0.312	.015-.025	
					0.375	.018-.028	
					0.500	.018-.028	
					0.625	.020-.030	
					0.750	.020-.030	
					1.000	.025-.035	
M	12-13	Stainless Steel (Ferritic & Martens-itic)	410, 416, 440	350-600	0.312	.015-.025	Yes
					0.375	.018-.028	
					0.500	.018-.028	
					0.625	.020-.030	
					0.750	.020-.030	
					1.000	.025-.035	
	14	Stainless Steel (Austenitic)	303, 304, 316, 15-5, 17-4	300-550	0.312	.015-.025	May not be required at high speeds
					0.375	.018-.028	
					0.500	.018-.028	
					0.625	.020-.030	
					0.750	.020-.030	
					1.000	.025-.035	
K	15-16	Gray Cast Iron	CLS. 20, 30, 45	600-1000	0.312	.015-.025	No
					0.375	.018-.028	
					0.500	.018-.028	
					0.625	.020-.030	
					0.750	.020-.030	
					1.000	.025-.035	
	17-20	Nodular Cast Iron	60-40-18, 100-70-03	450-700	0.312	.015-.025	
					0.375	.018-.028	
					0.500	.018-.028	
					0.625	.020-.030	
					0.750	.020-.030	
					1.000	.025-.035	
S	31-35	High-Temp Alloys	Inconel, Hastelloy, Nimonic, Monel	65-200	0.312	.008-.018	Yes
					0.375	.012-.022	
					0.500	.012-.022	
					0.625	.015-.025	
					0.750	.015-.025	
					1.000	.018-.028	
	36-37	Titanium Alloys	6Al-4V, 5Al-5Mo-5V-3Cr	85-200	0.312	.008-.018	
					0.375	.012-.022	
					0.500	.012-.022	
					0.625	.015-.025	
					0.750	.015-.025	
					1.000	.018-.028	
H	38-39	Hardened 45-60 HRC	A2, O1, D2	150-300	0.312	.008-.018	No
					0.375	.012-.022	
					0.500	.012-.022	
					0.625	.015-.025	
					0.750	.015-.025	
					1.000	.018-.028	

CHIPoSURFER™ INDEXING CHIP SURFER TIPS

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