

## BALL NOSE CUTTING SYSTEM

for 3-D Countour Milling

# BALL NOSE TECHNOLOGY REDEFINED



### Insert Styles:

NOHG  
GOHG

### Holders:

- 12A5, 12A8, & 12A9
- End mill
- Top-on (modular)
- Solid Carbide (brazed shanks)

### Grades:

IN2005, IN2006, IN055,  
IN2504 (NEW)

### Applications:

- Aero Space
- Die & Mold
- General Purpose

The 12A5, 12A8 and 12A9 series Ball Nose are the newest edition to the Ingersoll Die & Mold contour milling offering. This exciting new technology is packed with features to deliver performance and productivity.

- Ultra Stable clamping system and excellent repeatability
- Through-the-tool coolant, delivered to the cutting edge
- Premium ground cutter bodies

### COOLANT-THROUGH INSERTS



Ball Nose



Back Draft Blade



# FINISH BALL+™

## SERIES 12A9

BALL NOSE, STEEL CUTTER BODIES



Ramping



Corkscrew



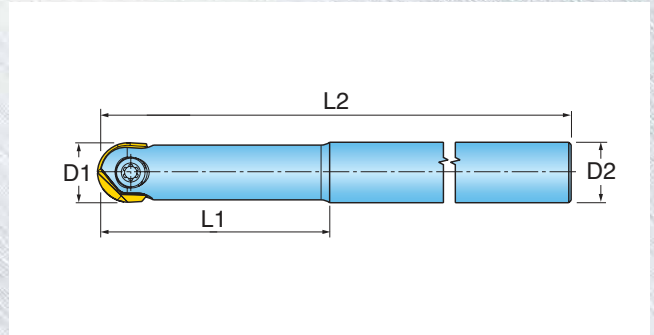
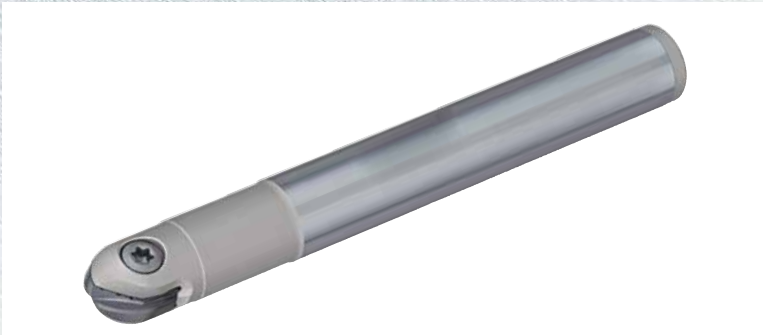
Pocket



Contour



Coolant



Cutter Number	D1 Effective Diameter	D2 Shank Size/Style	L1 Extension Length	L2 Overall Length	Effective Cutting Edges	Insert Series
12A9F-03017S4R01	0.375	.500" Cylindrical	1.85	6.00	2	09
12A9H-05019S4R01	0.500	.500" Cylindrical	1.92	7.00	2	12
12A9K-06015S6R01	0.625	.625" Cylindrical	1.58	8.00	2	15
12A9M-07018S7R01	0.750	.750" Cylindrical	1.85	8.00	2	19
12A9R-10018S1R01	1.000	1.000" Cylindrical	1.81	8.00	2	25
12A9S-12030S9R01	1.250	1.250" Cylindrical	3.03	11.81	2	31

### HARDWARE



Insert Screw



Driver



Torx Driver

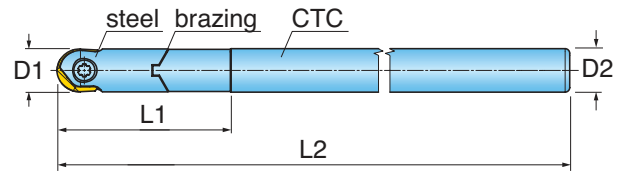
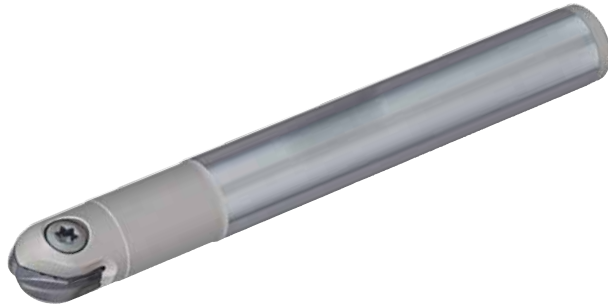
12A9F-03017S4R01	SM30-083-B1	DS-TP10S	-
12A9H-05019S4R01	SM40-106-B1	DS-TP15S	-
12A9K-06015S6R01	SM50-139-B1	-	DS-T20T
12A9M-07018S7R01	SM60-167-B1	-	DS-T25T
12A9R-10018S1R01	SM70-210-B1	-	DS-T25T
12A9S-12030S9R01	SM80-250-B1	-	DS-T30T



# FINISH BALL+™

## SERIES 12A5

BALL NOSE, SOLID CARBIDE CUTTER BODIES



Note: No Through Coolant

Cutter Number	D1 Effective Diameter	D2 Shank Size/Style	L1 Extension Length	L2 Overall Length	Effective Cutting Edge	Insert Series
12A5F-03015S8R01	0.375	.375" Cylindrical	1.50	6.00	2	09
12A5H-05015S4R02	0.500	.500" Cylindrical	1.50	4.00	2	12
12A5H-05015S4R01	0.500	.500" Cylindrical	1.50	7.00	2	12
12A5K-06018S6R02	0.625	.625" Cylindrical	1.88	4.00	2	15
12A5K-06018S6R01	0.625	.625" Cylindrical	1.88	7.00	2	15
12A5M-07022S7R02	0.750	.750" Cylindrical	2.25	4.00	2	19
12A5M-07022S7R01	0.750	.750" Cylindrical	2.25	7.50	2	19

### HARDWARE



Insert Screw



Driver



Torx Driver

12A5F-03015S8R01	SM30-083-B1	DS-TP10S	-
12A5H-05015S4R02	SM40-106-B1	DS-TP15S	-
12A5H-05015S4R01	SM40-106-B1	DS-TP15S	-
12A5K-06018S6R02	SM50-139-B1	-	DS-T20T
12A5K-06018S6R01	SM50-139-B1	-	DS-T20T
12A5M-07022S7R02	SM60-167-B1	-	DS-T25T
12A5M-07022S7R01	SM60-167-B1	-	DS-T25T



# FINISH BALL+™

## SERIES 12A8

BALL NOSE, TAPER STEEL CUTTER BODIES



Ramping



Corkscrew



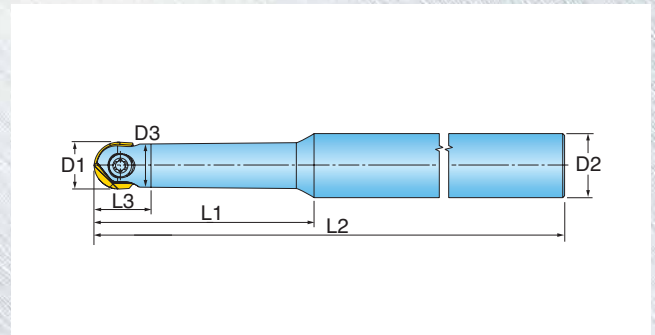
Pocket



Contour



Coolant



Cutter Number	D1 Effective Diameter	D2 Shank Size/Style	D3 Neck Diameter	L1 Extension Length	L2 Overall Length	L3 Extension	Effective Cutting Edge	Insert Series
12A8F-03013S4R01	0.375	0.500	.34	1.35	3.50	.63	2	09
12A8F-03018S4R01	0.375	0.500	.34	1.88	6.00	.63	2	09
12A8H-05025S4R01	0.500	0.625	.41	2.50	6.00	.75	2	12
12A8M-07035S7R01	0.750	1.000	.67	3.50	7.50	1.00	2	19

### HARDWARE



Insert Screw



Driver



Torx Driver

12A8F-03013S4R01	SM30-083-B1	DS-TP10S	-
12A8F-03018S4R01	SM30-083-B1	DS-TP10S	-
12A8H-05025S4R01	SM40-106-B1	DS-TP15S	-
12A8M-07035S7R01	SM60-167-B1	-	DS-T25T



# FINISH BALL+™

## SERIES 12A9

BALL NOSE, STEEL CUTTER BODIES (TOP•ON STYLE)



Ramping



Corkscrew



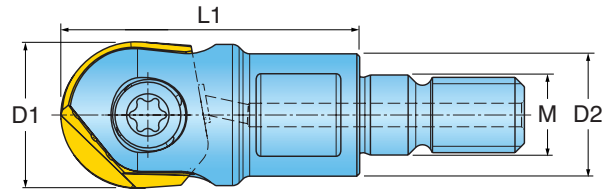
Pocket



Contour



Coolant

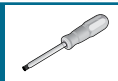


Cutter Number	D1 Effective Diameter	D2 Flange Diameter	M Thread Size	L1 Extension Length	Effective Cutting Edges
12A9F-03011X5R01	.375	.510	M8	1.00	2
12A9H-05011X5R01	.500	.510	M8	1.00	2
12A9K-06015X5R01	.625	.510	M8	1.25	2
12A9M-07016X6R01	.750	.710	M10	1.25	2
12A9M-07021X7R01	.750	.830	M12	1.50	2
12A9R-10023X7R01	1.000	.975	M12	1.50	2
12A9R-10023X7R02	1.000	.820	M12	1.50	2
12A9S-12063X8R01	1.250	1.140	M16	2.50	2

### HARDWARE



Insert Screw



Driver



Torx Driver

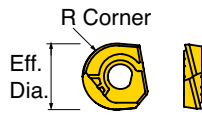
Cutter Number	Insert Screw	Driver	Torx Driver
12A9F-03011X5R01	SM30-083-B1	DS-TP10S	-
12A9H-05011X5R01	SM40-106-B1	DS-TP15S	-
12A9K-06015X5R01	SM50-139-B1	-	DS-T20T
12A9M-07016X6R01	SM60-167-B1	-	DS-T25T
12A9R-07021X7R01	SM60-167-B1	-	DS-T25T
12A9S-10023X7R01	SM70-210-B1	-	DS-T25T
12A9R-10023X7R02	SM70-210-B1	-	DS-T25T



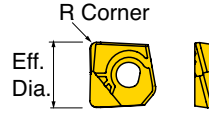
# FINISH BALL+™

## INSERTS

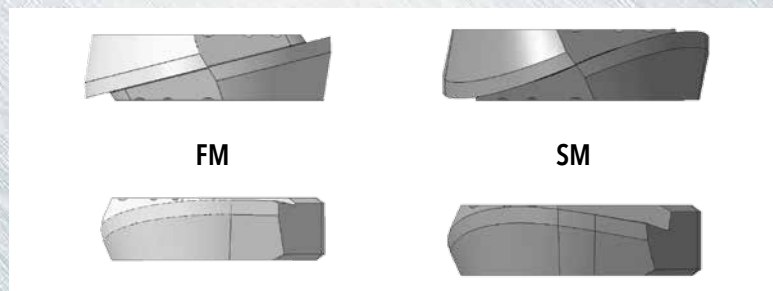
NOHG



GQHG



Eff. Dia.	Part Number	Applications	R Corner	Grade	IN2005	IN2006	IN05S	(NEW) IN2504
0.375	NQHG090200R-FM	Ball Nose, coolant through	0.188		X	X		
0.500	NQHG120300R-FM	Ball Nose, coolant through	0.250		X	X		
0.625	NQHG150400R-FM	Ball Nose, coolant through	0.312		X	X		
0.750	NQHG190500R-FM	Ball Nose, coolant through	0.375		X	X		
1.000	NQHG250600R-FM	Ball Nose, coolant through	0.500		X	X		
1.250	NQHG310700R-FM	Ball Nose, coolant through	0.625		X	X		
0.375	NQHG090200R-SM	Ball Nose, coolant through	0.188		X	X	X	X
0.500	NQHG120300R-SM	Ball Nose, coolant through	0.250		X	X	X	X
0.625	NQHG150400R-SM	Ball Nose, coolant through	0.312		X	X		X
0.750	NQHG190500R-SM	Ball Nose, coolant through	0.375		X	X	X	X
1.000	NQHG250600R-SM	Ball Nose, coolant through	0.500		X	X	X	X
1.250	NQHG310700R-SM	Ball Nose, coolant through	0.625		X	X		X
0.375	GQHG090208R01	Backdraft Blade, coolant through	0.031		X	X		X
0.500	GQHG120308R01	Backdraft Blade, coolant through	0.031		X	X		X
0.500	GQHG120316R01	Backdraft Blade, coolant through	0.062		X	X		X
0.625	GQHG150408R01	Backdraft Blade, coolant through	0.031		X	X		X
0.625	GQHG150416R01	Backdraft Blade, coolant through	0.062		X	X		X
0.750	GQHG190508R01	Backdraft Blade, coolant through	0.031		X	X		X
0.750	GQHG190516R01	Backdraft Blade, coolant through	0.062		X	X		X
0.750	GQHG190532R01	Backdraft Blade, coolant through	0.125		X	X		X
1.000	GQHG250608R01	Backdraft Blade, coolant through	0.031		X	X		X
1.000	GQHG250616R01	Backdraft Blade, coolant through	0.062		X	X		X
1.000	GQHG250632R01	Backdraft Blade, coolant through	0.125		X	X		X





## TECHNICAL INFORMATION

FinishBall - Series 12A9, 12A5, 12A8					IN2005	IN2006	IN055	IN2504 (NEW)	Coolant
Material		Brinnell Hardness	SFM	Feed per Insert					
Aluminum	6061-T6, 7075-T6	-	1000 - 8000	.003 - .006	2		1		Yes
Cast Iron	Gray	150 - 250	500 - 1200	.002 - .006	1				No
	Nodular		400 - 800						
Steel	Low Carbon 1018, 8620	150 - 250	600 - 1200	.002 - .006	1				No
	High Carbon F-6180	250 - 400*	400 - 600	.002 - .005	3	2	1		
	Alloyed Steel 4140	150 - 300	400 - 800		1	2			
	Tool Steel P20 - H13	Up to 460*		3	2	1			
Stainless Steel	300 Series, 304, 316	-	400 - 800	.002 - .005	1	2			No
	400 Series 15-5 PH, 17-4 PH	Up to 320	500-1000						Yes
	13-8 PH	-	200 - 400						
Nickel Alloys	Inconel 600, 706, 718, 903, Hastelloy	75-120	75-120	.002 - .004	1	2			Yes
Titanium	6AL-4V	-	80 - 150	.002 - .005	1	2			Yes

\*58 Rc & Above use IN2504

Note: Feed and speed recommendations are starting operating parameters. They are only guidelines from which further optimization should take place. Operating parameters are influenced by many machining variables. These variables may cause for reductions in feeds and speed or dramatic increases. Additionally, DOC and WOC may need to be revised to optimize the tools performance.

