



Member IMC Group

**Ingersoll**  
Cutting Tools

• **UPDATED** •

**FINISH BALL™**

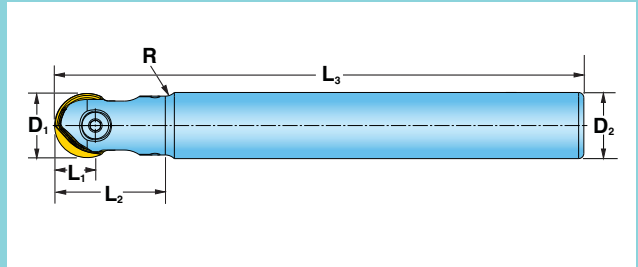
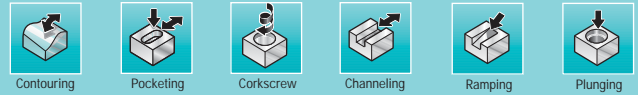
**Precision Ball Nose  
End Mill**



Part of the  
**Ingersoll**  
**D&M** line

## FINISHBALL™ END MILL SERIES 12W9

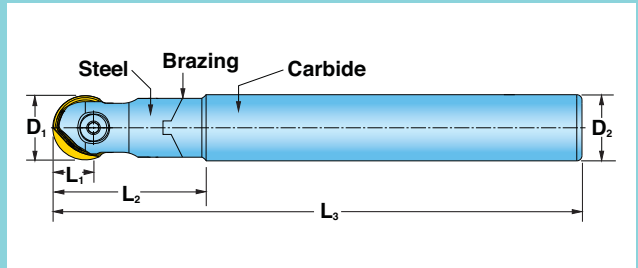
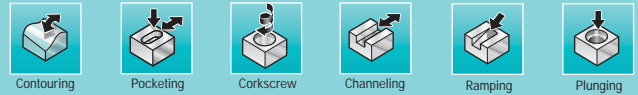
Diameters  
.375" to 1.250"



D <sub>1</sub> Effective Diameter	Cutter Number	D <sub>2</sub> Shank Size/Style	L <sub>1</sub> Max DOC	L <sub>2</sub> Extension	L <sub>3</sub> Overall Length	Effective Cutting Edges	R Radius
.375	12W9F-03017S4R01	.500 Straight	.187	1.850	6.000	2	.393
.500	12W9H-05019S4R01	.500 Straight	.250	1.920	7.000	2	.196
.625	12W9K-06015S6R01	.625 Straight	.312	1.580	8.000	2	.118
.750	12W9M-07018S7R01	.750 Straight	.375	1.850	8.000	2	.196
1.000	12W9R-10018S1R01	1.000 Straight	.500	1.810	8.000	2	.196
1.250	12W9S-12030S9R01	1.250 Straight	.625	3.030	11.810	2	.393

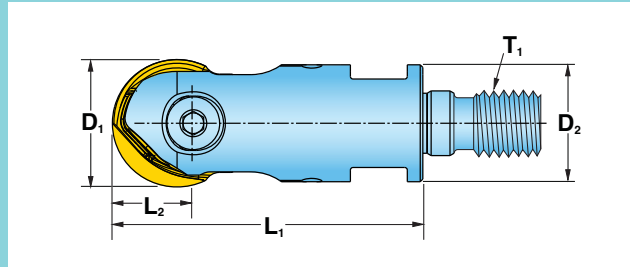
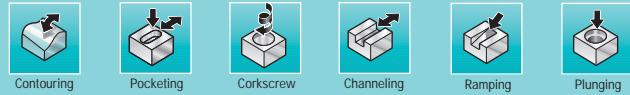
## FINISHBALL™ SOLID CARBIDE END MILL SERIES 12W5

Diameters  
.375" to .750"



D <sub>1</sub> Effective Diameter	Cutter Number	D <sub>2</sub> Shank Size/Style	L <sub>1</sub> Max DOC	L <sub>2</sub> Extension	L <sub>3</sub> Overall Length	Effective Cutting Edges
.375	12W5F-03015R8R01	.375 Straight	.187	1.500	6.000	2
.375	12W5F-03015R8R02	.375 Straight	.187	1.500	4.000	2
.500	12W5H-05015S4R01	.500 Straight	.250	1.500	7.000	2
.500	12W5H-05015S4R02	.500 Straight	.250	1.500	4.000	2
.625	12W5K-06018S6R01	.625 Straight	.312	1.875	7.000	2
.625	12W5K-06018S6R02	.625 Straight	.312	1.875	4.000	2
.750	12W5M-07022S7R01	.750 Straight	.375	2.250	7.500	2
.750	12W5M-07022S7R02	.750 Straight	.375	2.250	4.500	2

Diameters  
.375" to 1.000"



D <sub>1</sub> Effective Diameter	T <sub>1</sub> Adaption	Cutter Number	D <sub>2</sub> Flange Diameter	L <sub>1</sub> Ext. From Holder	L <sub>2</sub> Max DOC	Effective Cutting Edges
.375	M8	12W9F-03011X5R01	.51	1.18	.187	2
.500	M8	12W9H-05011X5R01	.51	1.18	.250	2
.625	M8	12W9K-06015X5R01	.51	1.50	.312	2
.625	M10	12W9K-06017X6R01	.71	1.77	.312	2
.750	M10	12W9M-07016X6R01	.71	1.69	.375	2
.750	M12	12W9M-07021X7R01	.83	2.17	.375	2
1.000	M12*	12W9R-10023X7R01	.89	2.36	.500	2
1.000	M16	12W9R-10023X8R01	1.14	2.36	.500	2

Note: Steel and Solid Carbide TopOn Shanks Available for All Diameters.

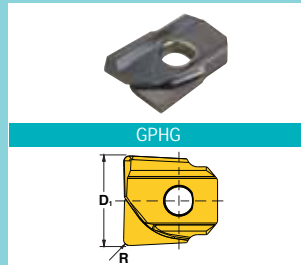
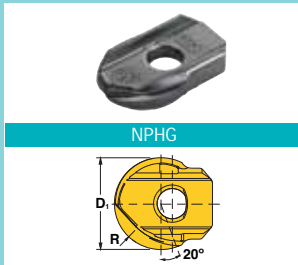
\*SPECIAL, No Relief Shank Available (S100MOD12CA-65, S100MOD12CA-85)

## OPERATING GUIDELINES

Series 12W9, 12W5		Material	Brinell Hardness	SFM	Feed per Insert	Grades			Coolant
						IN2005	IN2006	IN05S	
Aluminum	6061 T-6, 7075 T-6	-	1000-3000	.003-.006	2	1		Yes	
Cast Iron	Gray	150-250	500-1200	.002-.006	1			No	
	Nodular	150-250	400-800	.002-.006	1			No	
Steel	Low Carbon 1018-8620	150-250	600-1200	.002-.006	1			No	
	High Carbon F-6180	250-400*	400-600	.002-.005	2	1		No	
	Alloyed Steel 4140	150-300	400-800	.002-.005	1	2		No	
	Tool Steel P-20-H13	Up to 460*	400-800	.002-.005	2	1		No	
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	.002-.005	1	2		No	
	13-8 PH	-	200-400	.002-.005	1	2		Yes	
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	

\*58Rc & Above use IN2006.

## INSERTS



Cutter Diameter	Insert Number	Cutter Series	R Corner	Indexes per Insert	Grades			
					IN	2005	2006	05S
.375	NPHG090300R	12W9 & 12W5	.187	1	■	■		
.375	GPHG091208R01	12V Back Draft	.031	1	■			
.500	NPHG120400R	12W9 & 12W5	.250	1	■	■	■	
.500	GPHG121708R01	12V Back Draft	.031	1	■			
.500	GPHG121716R01	12V Back Draft	.062	1	■			
.500	GPHG121732R01	12V Back Draft	.125	1	■			
.625	NPHG150400R	12W9 & 12W5	.312	1	■	■		
.625	GPHG152208R01	12V Back Draft	.031	1	■			
.625	GPHG152216R01	12V Back Draft	.062	1	■			
.625	GPHG152232R01	12V Back Draft	.125	1	■			
.750	NPHG190400R	12W9 & 12W5	.375	1	■	■	■	
.750	GPHG192508R01	12V Back Draft	.031	1	■			
.750	GPHG192516R01	12V Back Draft	.062	1	■			
.750	GPHG192532R01	12V Back Draft	.125	1	■			
1.000	NPHG250600R	12W9 & 12W5	.500	1	■	■	■	
1.000	GPHG252608R01	12V Back Draft	.031	1	■			
1.000	GPHG252616R01	12V Back Draft	.062	1	■			
1.000	GPHG252632R01	12V Back Draft	.125	1	■			
1.250	NPHG310700R	12W9 & 12W5	.625	1	■			

## FINISH-BALL™ HARDWARE

### HARDWARE

Cutter Diameter	Insert Screw		Driver Part No.
	Part No.	Torque	
.375	SM30-082-B0	17.4 in. lbs.	TD-10P
.500	SM40-106-B0	26.0 in. lbs.	TD15-P
.625	SM50-138-B0	39.1 in. lbs.	L-W 3
.750	SM60-165-B0	52.1 in. lbs.	L-W 4
1.000	SM70-210-B0	82.5 in. lbs.	L-W 4
1.250	SM80-250-B0	95.5 in. lbs.	L-W 4

# FINISH BALL™

## ■ FEATURES AND BENEFITS

- *Stable*- Unique prismatic clamping system ensures an extremely strong and uniform clamping condition.
- *Free Cutting*- Smooth and efficient chip removal is made possible by two positive free flowing cutting edges.
- *Accurate*- Unparalleled repeatability (+/- .0004 runout, +/- .0002 insert radius).





## Ingersoll Cutting Tools for the Americas

### **Marketing & Technology Center**

845 S. Lyford Road  
Rockford, IL 61108-2749 U.S.A.  
Tel: 815.387.6600  
Fax: 815.387.6968  
Email: [info@ingersoll-imc.com](mailto:info@ingersoll-imc.com)  
Internet: [www.ingersoll-imc.com](http://www.ingersoll-imc.com)

### **Ingersoll Cutting Tool Ltd.**

4510 Rhodes Drive, Unit #100  
Windsor, Ontario N8W 5K5, Canada  
Tel: 519.974.1019  
Fax: 519.974.2260

### **Ingersoll Cutting Tools de México S.A. de C.V.**

Carr. Saltillo Monterrey Km. 5.5, Local 2 y 3  
Saltillo, Coahuila C.P. 25200, México  
Tel: (844) 432.2546, (844) 432.2547  
Fax: (844) 432.2544

## Ingersoll Cutting Tools for Europe

### **Marketing & Technology Center**

Ingersoll Werkzeuge GmbH  
Kalteiche-Ring 21-25  
35708 Haiger, Germany  
Tel: 02773.742 0  
Fax: 02773.742 812/814  
Email: [info@ingersoll-imc.de](mailto:info@ingersoll-imc.de)  
Internet: [www.ingersoll-imc.de](http://www.ingersoll-imc.de)