

Member IMC Group
Ingersoll
Cutting Tools

• **UPDATED** •

FINISH BALL™

**Precision Ball Nose
End Mill**



Part of the
Ingersoll
D&M line

FINISH-BALL™ END MILL SERIES 12W9

Diameters
.375" to 1.250"



Contouring



Pocketing



Corkscrew



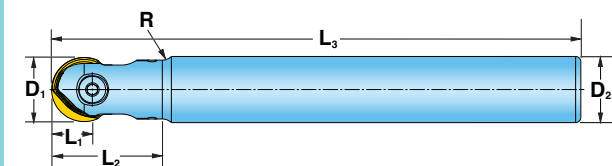
Channelling



Ramping



Plunging



D ₁ Effective Diameter	Cutter Number	D ₂ Shank Size/Style	L ₁ Max DOC	L ₂ Extension	L ₃ 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

FINISH-BALL™ SOLID CARBIDE END MILL SERIES 12W5

Diameters
.375" to .750"



Contouring



Pocketing



Corkscrew



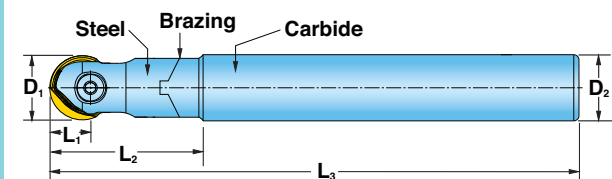
Channelling



Ramping

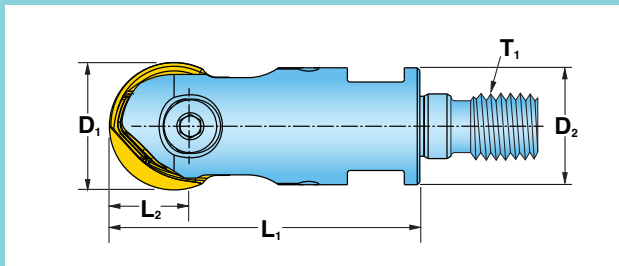


Plunging



D ₁ Effective Diameter	Cutter Number	D ₂ Shank Size/Style	L ₁ Max DOC	L ₂ Extension	L ₃ 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 ₁ Effective Diameter	T ₁ Adaption	Cutter Number	D ₂ Flange Diameter	L ₁ Ext. From Holder	L ₂ 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.

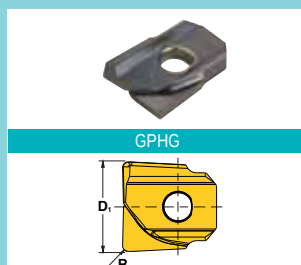
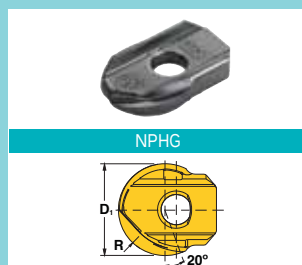
*SPECIAL, No Relief Shank Available (S100MOD12CA-65, S100MOD12CA-85)

OPERATING GUIDELINES

Series 12W9, 12W5						Grades		
Material		Brinell Hardness	SFM	Feed per Insert	IN2005	IN2006	IN05S	Coolant
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			
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		
	Alloyed Steel 4140	150-300	400-800	.002-.005	1	2		
	Tool Steel P-20-H13	Up to 460*	400-800	.002-.005	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	.002-.005	1	2		
	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



■ 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
Internet: 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
Internet: www.ingersoll-imc.de