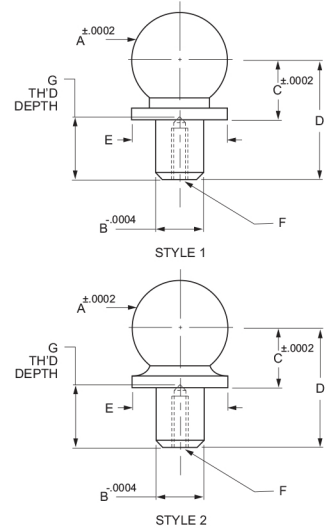
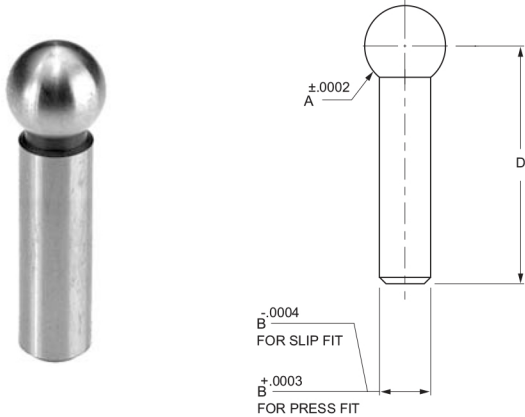


# TOOLING BALLS

Tooling balls may be used as reference points in the construction and checking of jigs and fixtures. They are hardened and ground. Standard and shoulder types are available with slip fit or light press fit shank diameters.

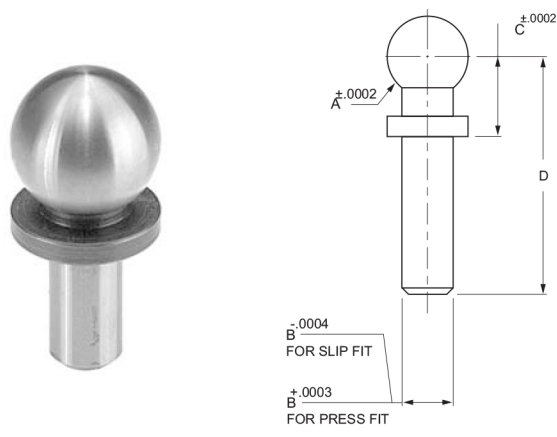
- Slip fit shank tolerance is  $+.0000 - .0004$
- Press Fit shank tolerance is  $+.0003 - .0000$
- The ball and shank are concentric within  $.0002$  T.I.R.

With the construction ball, one size will fit the majority of the applications that might be needed. They are available with a tapped hole for screw mounting. The shoulder provides a precise  $\pm .0002$  tolerance shoulder base to centerline dimension to facilitate locating the ball in three dimensions. The ball and shank are concentric within  $.0002$  T.I.R.



STANDARD TOOLING BALL				
Case Hardened and Ground				
P/N		DIMENSIONS		
SLIP FIT	PRESS FIT	A	B	D
173-00	174-00	.2500	.1250	.563
173-05	174-05	.3750	.1875	.750
173-10	174-10	.5000	.2500	.940
173-15	174-15	.5000	.2500	1.500
173-20	174-20	.5000	.3750	1.500

TOOLMAKER'S CONSTRUCTION BALL							
Style 1 - Case Hardened and Ground							
P/N	DIMENSIONS						
	A	B	C	D	E	F	G
177-00	.5000	.2500	.3125	.625	.49	6-32	1/4
177-05	.5000	.2500	.3125	.625	.49	-	-
177-10	.2500	.1250	.2000	.560	.25	-	-
177-15	.3752	.1875	.3000	.750	.37	-	-
177-20	.5000	.2500	.4000	.940	.46	-	-
177-25	.7500	.3750	.5000	1.250	.75	-	-



TOOLMAKER'S CONSTRUCTION BALL							
Style 2 - Case Hardened and Ground							
P/N	DIMENSIONS						
	A	B	C	D	E	F	G
177-30	.5000	.2500	.3125	.63	.25	6-32	1/4
177-35	.5000	.2500	.5000	.94	.25	6-32	5/16
177-40	.5000	.2500	.5000	1.50	.25	-	-
177-45	.5000	.3125	.5000	.94	.46	6-32	5/16
177-50	.5000	.3125	.5000	1.50	.46	-	-
177-55	.5000	.3750	.5000	1.50	.56	-	-

SHOULDER TOOLING BALL					
Case Hardened and Ground					
P/N		DIMENSIONS			
SLIP FIT	PRESS FIT	A	B	C	D
175-00	176-00	.2500	.1250	.200	.563
175-05	176-05	.3750	.1875	.300	.750
175-10	176-10	.5000	.2500	.400	.940
175-15	176-15	.5000	.2500	.500	1.500
175-20	176-20	.5000	.3750	.500	1.500

METRIC TOOLMAKER'S CONSTRUCTION BALL							
Style 1 - Case Hardened and Ground							
P/N	DIMENSIONS						
	A	B	C	D	E	F	G
177-70	.2364	.1181	.2362	.47	.24	-	-
177-80	.4726	.2362	.4724	.87	.47	-	-
177-90	.4726	.2392	.4724	.98	.47	M3.5	.24