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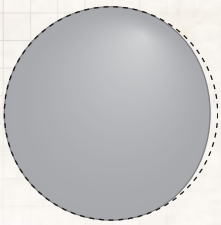
PRECISION BALL FEATURES

Precision balls are used mainly in ball bearing designs and other demanding industrial applications. They are manufactured to the American Bearing Manufacturers Association (ABMA) Standard 10, which characterizes their geometric tolerances. Grades range from 2000 to 3. The smaller the number the higher the precision and lack of flats, pits, cuts, or other geometric anomalies. The surface roughness of precision balls may be as smooth as .000008" Arithmetic Average depending on grade. Hardness varies depending on material grade selected.

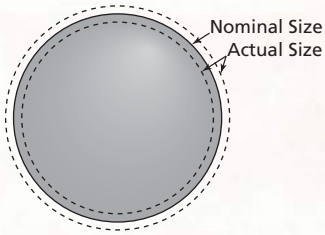
DESIGN CONSIDERATIONS

SPHERICITY



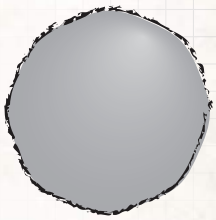
A MEASURE OF HOW MUCH THE BALL DEVIATES FROM A TRUE SPHERE

SIZE



ACTUAL SIZE MAY BE SLIGHTLY LARGER OR SMALLER THAN NOMINAL SIZE

SMOOTHNESS

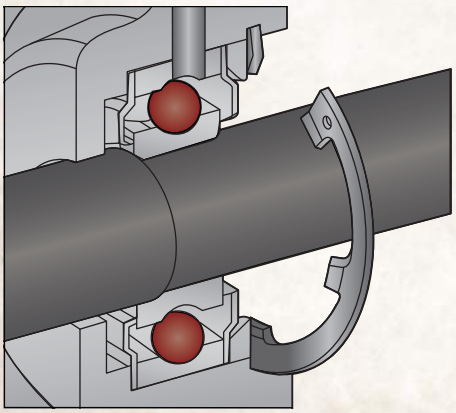


A MEASURE OF THE TEXTURE AND WAVINESS OF THE SURFACE

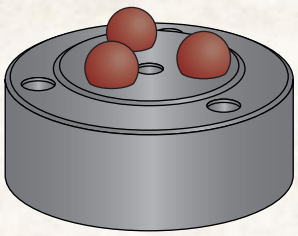
QUICK REFERENCE GUIDE

	COMMON NAMES	APPLICABLE STANDARDS	FABRICATION	HOW TO IDENTIFY	COMMON USES	COMMENTS
PRECISION BALLS	Bearing Balls; Steel Balls	ABMA STD-10	Wire is cut into pellets, which are then spherized using specialized machinery. Steel balls may be heat treated and ground.	Diameter × grade.	Ball bearings, precision valves, free wheel mechanisms, kinematic mounts.	Imperfections are generally not visible to the naked eye.

APPLICATION



PRECISION BALLS ARE USED IN BALL BEARING ASSEMBLIES AND IN KINEMATIC MOUNTING APPLICATIONS



MEASURING

Depending on their grade, variances from nominal sizes for precision balls may be so slight (±0.000001") that they can not be measured using calipers or micrometers.

Accurately measuring precision balls requires highly specialized equipment like the **HEIDENHAIN-CERTO Length Gauge** or a **Talyrond Machine** capable of measuring the size, roundness, and cylindricity of the ball between two parallel flats.