



Bal-tec manufactures [standard commercial balls](#) and [custom balls](#) of all materials, sizes and tolerances. We make steel balls and stainless steel balls. With over 30,000 square feet of manufacturing facilities housing "state of the art" equipment, we have the ability to meet all your spherical needs from prototype to millions in quantity.

At **Bal-tec**, quality is of the utmost concern. We use the [Talyrond System](#) to measure sphericity of balls. The overall accuracy of this system is one-millionth of an inch and is calibrated using standards traceable to [NIST](#). The size of balls is determined using a [Heidenhain Certo 60](#) to an accuracy of 10-millionths of an inch. Most balls are produced to the Anti-Friction Bearing Manufacturers Association, (A.F.B.M.A.) or military specifications.

Bal-tec stocks over 40,000 different sizes, grades and materials of balls.

Bal-tec manufactures [Ball Bars](#), [Probe Characterization Spheres](#), C.M.M. Pallet Systems, and a full line of [measuring related products](#). Bal-tec, a division of Micro Surface Engineering Inc., is a privately held, family owned, corporation.



A.F.B.M.A. BALL GRADES

| Grade | Allowable Ball Diameter Variation | Deviation From Spherical Form | Surface Roughness Arithmetical Average | Basic Diameter Tolerance | Allowable Lot Diameter Variation |
|-------|-----------------------------------|-------------------------------|--|--------------------------|----------------------------------|
| 3 | 3 μ" .000003" | 3 μ" .000003" | .5 μ" .0000005" | 30 μ" ±.00003" | 5 μ" .000005" |
| 5 | 5 μ" .000005" | 5 μ" .000005" | 8 μ" .0000008" | 50 μ" ±.00005" | 10 μ" .00001" |
| 10 | 10 μ" .00001" | 10 μ" .00001" | 1.0 μ" .000001" | 100 μ" ±.0001" | 20 μ" .00002" |
| 15 | 15 μ" .000015" | 15 μ" .000015" | 1.0 μ" .000001" | 100 μ" ±.0001" | 30 μ" .00003" |
| 16 | 16 μ" .000016" | 16 μ" .000016" | 1.0 μ" .000001" | 100 μ" ±.0001" | 32 μ" .000032" |
| 24 | 24 μ" .000024" | 24 μ" .000024" | 2.0 μ" .000002" | 100 μ" ±.0001" | 48 μ" .000048" |
| 25 | 25 μ" .000025" | 25 μ" .000025" | 2.0 μ" .000002" | 100 μ" ±.0001" | 50 μ" .00005" |
| 48 | 48 μ" .000048" | 48 μ" .000048" | 3.0 μ" .000003" | 200 μ" ±.0002" | 96 μ" .000096" |
| 50 | 50 μ" .00005" | 50 μ" .00005" | 3.0 μ" .000003" | 300 μ" ±.0003" | 100 μ" .0001" |
| 100 | 100 μ" .0001" | 100 μ" .0001" | 5.0 μ" .000005" | 500 μ" ±.0005" | 200 μ" .0002" |
| 200 | 200 μ" .0002" | 200 μ" .0002" | 8.0 μ" .000008" | 1000 μ" ±.001" | 400 μ" .0004" |
| 300 | 300 μ" .0003" | 300 μ" .0003" | | 1000 μ" ±.001" | 600 μ" .0006" |
| 500 | 500 μ" .0005" | 500 μ" .0005" | | 2000 μ" ±.002" | 1000 μ" .001" |
| 1000 | 1000 μ" .001" | 1000 μ" .001" | | 5000 μ" ±.005" | 2000 μ" .002" |
| 2000 | 2000 μ" .002" | 2000 μ" .002" | | 5000 μ" ±.005" | 4000 μ" .004" |
| 3000 | 3000 μ" .003" | 3000 μ" .003" | | 5000 μ" ±.005" | 6000 μ" .006" |

ALLOWABLE BALL DIAMETER VARIATION is the largest variation in diameter found in any one ball from the sample lot inspection.

ALLOWABLE DEVIATION FROM SPHERICAL FORM is the greatest radial distance in any radial plane between a sphere circumscribed around the ball surface and any point on the ball surface.

SURFACE ROUGHNESS is all those irregularities which form the surface relief but are not deviations of form or waviness. The measurement of this characteristic is to be made with equipment meeting the requirements of and in accordance with Standard ANSI B 46.1.

BASIC DIAMETER TOLERANCE is the maximum allowable deviation in any ball mean diameter from the basic diameter ordered.

ALLOWABLE LOT DIAMETER VARIATION is the difference between the mean diameter of the largest ball and that of the smallest ball in the lot.

