

## Ball Lenses, A.F.B.M.A. grade terminology and tolerances.

A.F.B.M.A. grade	Dia. Tol. (µm) (Ball sphericity)	Dia. Tol. (inch) (Ball sphericity)	Basic dia. Tol. (µm) (Ball dia)	Basic dia. Tol. (inch) (Ball dia)	Surface roughness (µm) (RA)	Surface roughness (inch) (RMS)
3	0.0762	0.000003	± 0.0762	± 0.00003	0.0762	0.000003
5	0.1270	0.000005	± 1.270	± 0.00005	0.1270	0.000005
10	0.2540	0.000010	± 2.540	± 0.00010	0.2540	0.000010
15	0.3810	0.000015	± 2.540	± 0.00010	0.3810	0.000015
25	0.6350	0.000025	± 2.540	± 0.00010	0.6350	0.000025
50	1.2700	0.000050	± 5.080	± 0.00020	1.2700	0.000050
100	2.5400	0.000100	± 12.70	± 0.00050	2.5400	0.000100
200	5.0800	0.000200	± 25.40	± 0.00100	5.0800	0.000200

Ball lens diameter tolerances are expressed around the size of lens ordered to which the basis of the “basic lens diameter” tolerance applies to.

### Grade:

This is the numerical value of the diameter tolerance per ball lens as a millionth of a inch/mm.

### Diameter tolerance per ball (Sphericity):

The amount of permissible deviation of any one ball per shipment from the basic diameter.

### Basic diameter tolerance:

The maximum amount of tolerance deviation of any ball lens in any one shipment of an order for the basic diameter.

### Surface roughness (RA):

Is the measured texture of the surface. Roughness is normally quantified by the deviations of the surface in comparison to its ideal shape and form. Roughness is normally measured in microinches.