

Ball Size, Grade and Tolerance Definitions

ABMA Std-10

Grade	Sphericity		Dia. Tolerance per Container/Lot		Diameter Tolerance per Shipment		Surface Finish
	Inches	MM	Inches	MM	Inches	MM	Arithmetic Average
10	0.00001	0.0002	0.00002	0.0005	±0.0001	±0.00254	1
15	0.00001	0.0004	0.00003	0.0007	±0.0001	±0.00254	1
25	0.000025	0.0006	0.00005	0.0013	±0.0001	±0.00254	2
50	0.00005	0.0013	0.0001	0.0025	±0.0002	±0.0050	3
100	0.0001	0.0025	0.0002	0.0050	±0.0005	±0.0127	5
200	0.0002	0.0051	0.0004	0.0102	±0.0010	±0.0254	8
300	0.0003	0.0076	0.0006	0.0152	±0.0015	±0.0381	n/a
500	0.0005	0.0127	0.001	0.025	±0.002	±0.050	n/a
1000	0.0010	0.0254	0.002	0.051	±0.005	±0.127	n/a
2000	n/a	n/a	0.005	0.127	±0.005	±0.127	n/a
Burnishing	n/a	n/a	n/a	n/a	±0.005	±0.127	n/a

ISO 3290

Grade	Sphericity	Variation of Ball Diameter	Variation of Ball lot Diameter	Surface Finish
	μ meters	μ meters	μ meters	Ra
3	.08	.08	.13	.010
5	.13	.13	.25	.014
10	.25	.25	.5	.020
16	.4	.4	.8	.025
20	.5	.5	1	.032
24	.6	.6	1.2	.040
28	.7	.7	1.4	.050
40	1	1	2	.060
60	1.5	1.5	3	.080
100	2.5	2.5	5	.100
200	5	5	10	.150

DIN 5401

Grade	Sphericity	Variation of Ball Diameter	Variation of Ball lot Diameter	Surface roughness
	μ meters	μ meters	μ meters	Ra
3	.08	.08	.13	.010
5	.13	.13	.25	.014
10	.25	.25	.5	.020
16	.4	.4	.8	.025
20	.5	.5	1	.032
28	.7	.7	1.4	.050
40	1	1	2	.060
100	2.5	2.5	5	.125
200	5	5	10	.200
500	25	25	N/A	N/A