

ALUMINA BALL



MARUWA alumina balls are used at glass, porcelain enamel, abrasives, cement, pigment, and other ceramic factories, as well as paint factories, chemical factories, and weak electric appliance makers, as powder grinding media for pot mills, tube mills, and vibration mills.

■ Features

- High grinding efficiency: The high hardness and large specific gravity of the material itself enhance the grinding efficiency and shorten the grinding time.
- Long life of balls: The wear resistance is as large as approx. five times that of ordinary porcelain balls.
- The purity of ground substances can be kept high.: The grinding loss of balls is small, and the quantity of abraded ball material mixed with the ground substances is small; therefore, the purity of ground substances can be kept high.

■ Material

The material is dense corundum crystalline made by high-temperature sintering of A-192, A-189, or A-185 material, which contains high-purity Alumina (α -Al₂O₃). The material has high hardness, stickiness, and impact strength, excelling in the wear resistance, heat resistance, and chemical stability at high temperatures. The comparison of properties with ordinary porcelain and agate balls is shown below.

Description	MARUWA materials			General materials	
Material	A-192	A-189	A-185	Ordinary porcelain	Agate ball
Alumina content (%)	92	89	85	-	-
Apparent specific gravity	3.5	3.5	3.5	2.4	2.6
Color	white	white	white	white	Gray, dark brown, etc.
Hardness (Rockwell 15 N)	93	93	93	70	70 ~ 80
Compressive strength (GPa)	> 1.5	> 1.5	> 1.5	0.2	-
Porosity (%)	0	0	0	0	0
Features	Great wear resistance	Great wear resistance	Great wear resistance	-	-
Adaptive part No.	MHQ-20 (20mm) MHQ-30E(30mm)	MHQ-30 (30mm)	MHQ-30C(30mm)	-	-

■ Ball materials and their features

- A-192 is recommended for ordinary wet grinding with small-diameter balls (20 or less). The wear resistance is far greater than that of A-189.
- Be sure to use A-185 for white cement clinker grinding, ceramic material grinding, and other dry grinding purposes. The impact resistance and chipping resistance during dry grinding are excellent.

■ Performance comparison test of various ball materials

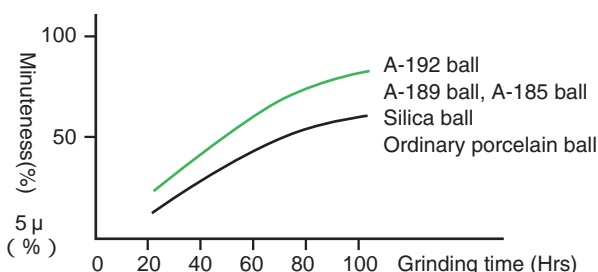
Material	Ball shape	Apparent specific gravity	Volume in pot mill *1	Pot mill speed	Dosage of balls	Ground object *2	Water
A-192	Ball 20	3.5	7 ℓ	88rpm	3kg	3kg	2kg
	Ball 30	3.5	7 ℓ	88rpm	3kg	3kg	2kg
A-189	Ball 30	3.5	7 ℓ	88rpm	3kg	3kg	2kg
A-185	Ball 30	3.5	7 ℓ	88rpm	3kg	3kg	2kg
Ordinary porcelain	Ball 30	2.4	7 ℓ	88rpm	3kg	3kg	2kg
Silica	Flat egg shape 30~40	2.6	7 ℓ	88rpm	3kg	3kg	2kg

*1 Ordinary porcelain pot mill of 220 in inner diameter

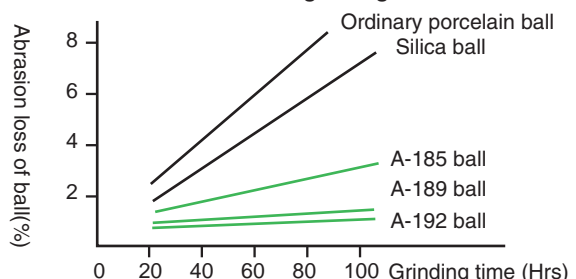
*2 Quartz rock 10-250 mesh

■ Wear resistance test

① Minuteness and grinding time



② Abrasion loss of ball and grinding time



$$\text{Abrasion loss of ball (\%)} = \frac{(\text{Weight before grinding} - \text{Weight after grinding})}{\text{Weight before grinding}} \times 100$$