

# **BALL MILLING TECHNICAL SPECIFICATIONS**

*SMALL SIZE BALLS*

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## TECHNICAL SPECIFICATIONS

Nominal Ball Diameter in (inch) & Mass in (g)			Nominal Ball Diameter in (mm) & Mass in (g)		
Ball Diameter (inch)	Minimum Mass (g)	Maximum Mass (g)	Ball Diameter (mm)	Minimum Mass (g)	Maximum Mass (g)
1.0	67	80	25	64	77
1.25	131	157	32	134	161
1.5	226	271	40	261	314

Chemistry (weight %)											
Ball Diameter		C		Mn		Si		Cr		Mo	
(in)	(mm)	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1.0	25	0.90	1.10	0.50	1.00	0.10	0.50	0.00	0.50	0.00	0.10
1.25	32	0.90	1.10	0.50	1.00	0.10	0.50	0.00	0.50	0.00	0.10
1.5	40	0.90	1.10	0.50	1.00	0.10	0.50	0.00	0.50	0.00	0.10
S Max (0.040)						P Max (0.035)					

Hardness (Rockwell C)					
Ball Diameter (inch)		Average Surface Hardness		Average Volumetric Hardness	
(in)	(mm)	Min	Max	Min	Max
1.0	25	59	65	59	65
1.25	32	59	65	59	65
1.5	40	59	65	59	65

The above is intended as a guide only. Individual ball hardness readings may fall outside the range listed above.

## BALL MILLING - SMALL BALLS

Molycop manufactures balls for grinding operations (using high carbon alloy steel bars as the raw material) through special bar heating, forging and heat treatment processes, the objective of which is to obtain optimum wear and impact resistance. The small ball series is used primarily for regrind or tertiary grinding operations in which high wear resistance is the main ball attribute required.

## PRODUCT SPECIFICATIONS

### SIZES

Molycop manufactures small balls, less than 2 inch or 50mm. Common nominal sizes are 1.0, 1.25, and 1.5 inch or 25, 32, and 40mm. The tolerance for the mass of the balls is - 0; +20% overweight.

### CHEMISTRY

The chemistry ranges for each diameter ball are designed to optimise the microstructure and hardness after appropriate heat treatment. The hardenability parameter  $D_i$ , which depends on the chemistry, is equal to or larger than the diameter of the ball to be made with alloy. Careful selection of steel bar suppliers through agreed process assessment, process qualification and continuous monitoring of supplier capability, ensures ball chemistry is optimized within the specification. The mean composition may vary with the ball diameter.

### SURFACE AND VOLUMETRIC HARDNESS

The wear resistance of the balls depends on the microstructure developed in the steel by carefully selected heat treatment variables, specifically designed for each alloy. The control variable of the finished product, although not totally determining the final performance in their application, is the hardness range achieved.

## SUPPLY AND QUALITY GUARANTEE

Long established strategic relationships with local and foreign raw material suppliers allow us to ensure all balls supplied to our customers are made from the highest quality products and meet strict Molycop specifications. This combined with our global manufacturing network gives our customers the confidence in the quality of the product that only Molycop is able to assure.

## PACKAGING OPTIONS

### BULK

Balls can be transported in bulk by open top trucks.

### BAGS

Balls can be supplied in polypropylene bags which have secure bag straps to reduce time and effort in loading and unloading. While bags are treated to resist UV rays, bags should be protected from direct sunlight to maximize shelf life.

### DRUMS

Recycled drums can also be supplied. Drums are more efficient for some modes of transportation and can also be delivered on wooden pallets.

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*If you require grinding media for your operations, or just want more information, we're here to answer any of your questions.*

**Contact us today for more information**  
**[www.molycop.com](http://www.molycop.com)**

