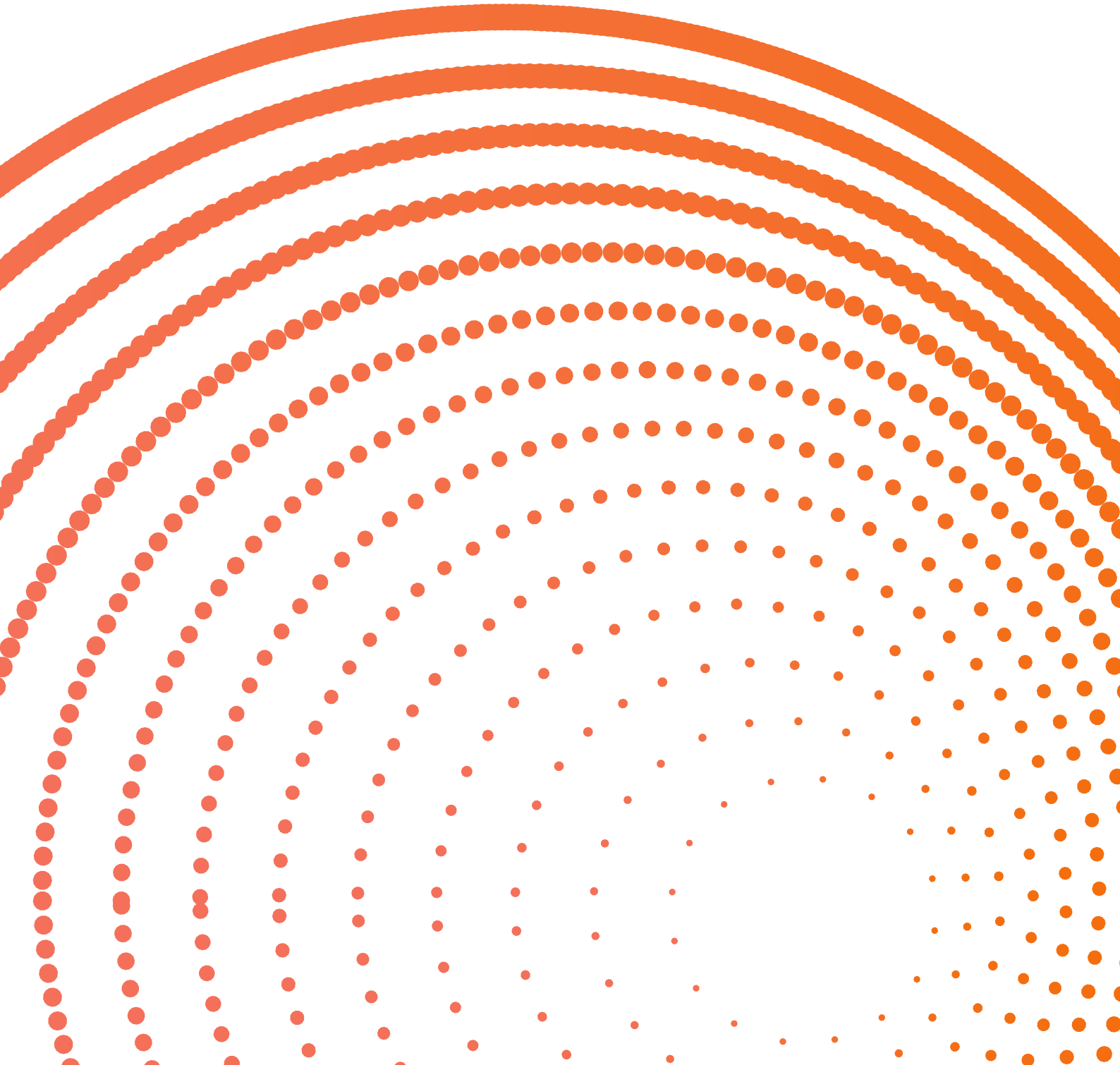
Ball Milling Technical Specifications

MOLYCOP

Mid Size Balls

Milling



Nominal Ball Diameter in (inch) & Mass in (g)			Nominal Ball Diameter in (mm) & Mass in (g)		
Ball Diameter (in)	Minimum Mass (g)	Maximum Mass (g)	Ball Diameter (mm)	Minimum Mass (g)	Maximum Mass (g)
2.0	535	642	50	511	613
2.5	1046	1255	65	1122	1346
3.0	1807	2168	80	2091	2509
3.5	2869	3443	94	3392	4070
4.0	4283	5140	105	4728	5674

Chemistry (Weight %)

Ball Diameter		C		Mn		Si		Cr		Mo	
in.	mm.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
2.0	50	0.90	1.10	0.75	1.25	0.10	0.50	0.10	0.60	0.00	0.10
2.5	65	0.90	1.10	0.75	1.25	0.10	0.50	0.25	0.75	0.00	0.10
3.0	80	0.90	1.10	0.75	1.25	0.10	0.50	0.30	0.80	0.00	0.10
3.5	94	0.85	1.05	0.75	1.25	0.10	0.50	0.40	0.90	0.00	0.10
4.0	105	0.85	1.05	0.75	1.25	0.10	0.50	0.50	1.00	0.00	0.10
S Max (0.040)						P Max (0.035)					

Hardness (Rockwell C)

Ball Diameter		Average Surface Hardness		Average Volumetric Hardness	
in.	mm.	Min.	Max.	Min.	Max.
2.0	50	59	65	59	65
2.5	65	59	65	59	65
3.0	80	59	65	59	65
3.5	94	59	65	59	65
4.0	105	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 Mid Size 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 mid-size ball series is used primarily for secondary ore grinding operations in which high wear resistance and impact breakage resistance are the main ball attributes required.

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.

Product Specifications

Sizes
Molycop manufactures mid-size balls, equal or larger than 2 inch or 50mm and smaller than 4 inch or 105mm. Common nominal sizes are 2.0, 2.5, 3.0, 3.5 and 4.0 inch or 50, 65, 80, 94 and 105 mm. The tolerance for the mass of the balls is – 0; +20% overweight.

Chemistry
The chemistry ranges for each diameter ball designed to optimise the microstructure and hardness after appropriate heat treatment. The hardenability parameter Di, which depends on the chemistry, is equal to or larger than the diameter of the ball to be made with alloy.

Surface and volumetric hardness
The wear resistance and the impact breakage resistance of the balls depend 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.

Packaging Options

Bulk
Balls can be transported in bulk open top trucks, open top rail cars, or in standard 20ft containers.

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.

If you're interested in exploring Molycop's products and services, we're here to help.

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