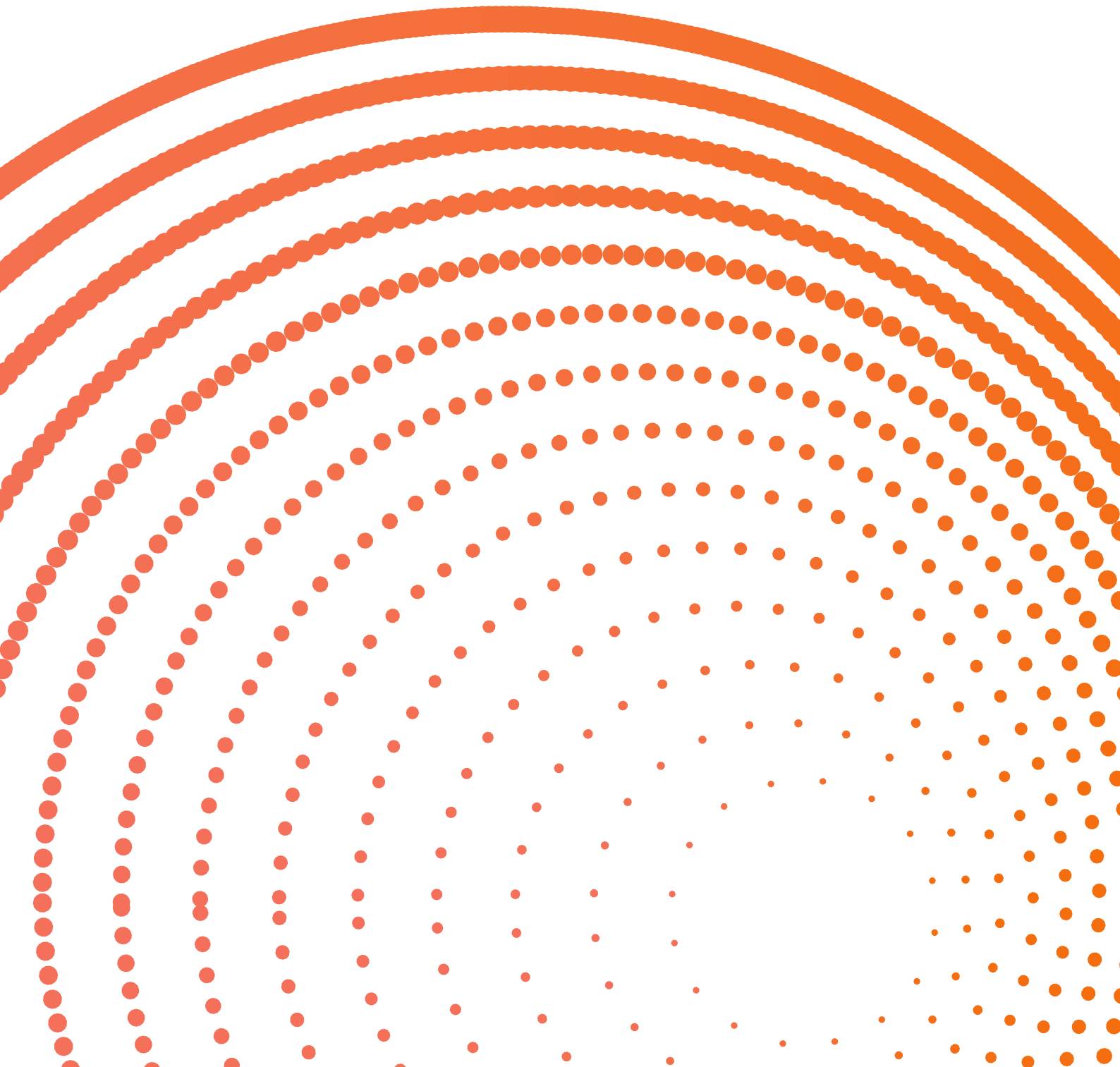


Ball Milling Technical Specifications



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.

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 D_1 , 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.

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 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.



molycop.com

All Rights Reserved 2024

This publication has been prepared by Moly-Cop Global Holdings Inc. on its behalf and as agent for each of its related companies. All information contained in this publication is subject to change, replacement and/or modification at any time, without notice. Moly-Cop Global Holdings Inc. expressly disclaims all warranties, whether expressed or implied, oral or written, including any implied warranty of merchantability, fitness for a particular purpose, non-infringement, or other warranties arising from course of dealing, course of performance, usage of trade, or otherwise. The information is provided on an "as is" and "as available" basis. The information is provided for informational purposes only and Moly-Cop Global Holdings Inc. does not warrant the accuracy of any information or that the information will be error-free. Users of this publication are responsible to verify the accuracy and completeness of all information. Moly-Cop Global Holdings Inc. shall have no liability for any losses or damages of any kind arising out of or resulting from this publication, its contents and any use thereof.

Photographs shown are representative only of typical applications and are current as of August, 2023. This publication is not an offer to trade and shall not form any part of the trading terms in any transaction.

Reproduction in whole or in part, in any form or medium without the express written permission of Moly-Cop Global Holdings Inc. is prohibited. All images and content, trademarks or registered trademarks are the property of Moly-Cop Global Holdings Inc.

