

SGS Minerals Services

Standard Bond Ball Mill Grindability Test

Project No.: 50269-001 Date: 19-Oct-12
Sample: Master Comp

Purpose: To determine the ball mill grindability of the sample in terms of a Bond work index number.

Procedure: The equipment and procedure duplicate the Bond method for determining ball mill work indices.

Test Conditions: Feed 100% Passing 6 mesh
Mesh of grind: 150 mesh
Test feed weight (700 mL): 1,335 grams
Equivalent to : 1,907 kg/m³ at Minus 6 mesh
Weight % of the undersize material in the ball mill feed: 27.3%
Weight of undersize product for 250% circulating load: 381 grams

Results: Gram per Rev Average for the Last Three Stages = **2.46 g**
Circulation load = **250%**

CALCULATION OF A BOND WORK INDEX

$$BWI = \frac{44.5}{P_1^{0.23} \times Grp^{0.82} \times \left\{ \frac{10}{\sqrt{P}} - \frac{10}{\sqrt{F}} \right\}}$$

P₁ = 100% passing size of the product 106 microns
Grp = Grams per revolution 2.46 grams
P₈₀ = 80% passing size of product 75 microns
F₈₀ = 80% passing size of the feed 2,254 microns

BWI = 7.7 kWh/t (imperial)

BWI = 8.5 kWh/t (metric)

Comments:

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Stage No.	# of Revs	New Feed (grams)	Product in Feed (grams)	Material to Be Ground (grams)	Material Passing 150 mesh in Product (grams)	Material Ground Per Mill Rev (grams)
1	150	1,335	364	17	669	305
2	98	669	183	199	430	247
3	105	430	117	264	380	263
4	111	380	104	278	378	274
5	113	378	103	278	382	279
6	112	382	104	277	379	274
7	113	379	103	278	383	280
Average for Last Three Stages =					381 g	2.46 g

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Feed Particle Size Analysis

Size Mesh	μm	Weight grams	% Retained		% Passing Cumulative
			Individual	Cumulative	
6	3,360	0.00	0.00	0.00	100.0
7	2,800	22.4	7.80	7.80	92.2
8	2,360	29.6	10.3	18.1	81.9
10	1,700	36.2	12.6	30.7	69.3
14	1,180	28.6	9.95	40.7	59.3
20	850	17.5	6.09	46.7	53.3
28	600	14.8	5.15	51.9	48.1
35	425	13.2	4.59	56.5	43.5
48	300	13.0	4.52	61.0	39.0
65	212	11.8	4.11	65.1	34.9
100	150	10.8	3.76	68.9	31.1
150	106	11.0	3.83	72.7	27.3
170	90				
200	75				
270	53				
400	38				
Pan	-	78.4	27.3	100.0	-
Total	-	287.3	100.0	F₈₀: 2,254	P₈₀: 75

Product Particle Size Analysis

Weight grams	% Retained		% Passing Cumulative
	Individual	Cumulative	
0.00	0.00	0.00	100.0
0.00	0.00	0.00	100.0
0.00	0.00	0.00	100.0
16.0	9.58	9.58	90.4
17.1	10.2	19.8	80.2
21.2	12.7	32.5	67.5
12.8	7.66	40.2	59.8
99.9	59.8	100.0	-
167.0	100.0	P₈₀: 75	

