

F.C. BOND BICO BALL MILL

The F.C. Bond Ball Mill is a small universal laboratory mill used in calculating the grindability of all ores.

GRINDABILITY IS THE NUMBER OF NET GRAMS OF SCREEN UNDERSIZE PRODUCED PER REVOLUTION.

This Ball Mill can be used continuously or it can be used for any number of revolutions, according to the type of grind desired. For instance, the Fred C. Bond Grindability Tests were made in the Bico Mill running at 70 revolutions per minute, with a charge of 285 iron balls ranging in size from 3/4 inch to 1-1/2 inch in diameter, and weighing approximately 20,125 grams. 700 CC of minus 6 mesh, stage crushed, dry feed was used and the circulation load maintained constant at 250% by adjusting the number of revolutions for each grinding period.

BALL CHARGE DETERMINATION

Because of variations in ball size, no exact number of balls of each size can be specified. The ball charge is prepared by starting with 285 balls, consisting of approximately equal weights of various size balls. These sizes include: 3/4 inch, 7/8 inch, 1 inch, 1-1/4 inch and 1-1/2 inch..... about 400 grams of each size. With 285 balls always present, some balls of one size are removed and replaced with the next size of larger or smaller balls.

This is continued until the total weight is as close to 20,125 grams as possible, making the last adjustment with the smallest size of balls. Do not remove all the balls of any one size. Once a suitable grinding charge is prepared from one grade of balls, count and note the number of balls of each size.

Other batches of the same grade can be started using this count, and further adjusted if necessary. It is **IMPORTANT** to retain the "one for one" ratio while adjusting the final weight to maintain the proper ball count.

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F. C. BOND BALL MILL CHARGE

We find that the question of correct ball charge arises often and is still very debatable. Back in 1960, Mr. Bond himself recommended the charge described:

43 balls - 1-1/2 inch	(1.45)
67 balls - 1-1/4 inch	(1.17)
10 balls - 1 inch	(1.00)
71 balls - 3/4 inch	(.75)
94 balls - 5/8 inch	(.61)
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285 BALLS	Total wt. = apx. 44.5 lbs.

Mr. Bond himself admitted that it is very difficult to specify a given number of balls of each weight, and in our most recent correspondence with Mr. Bond, he recommended a charge *excluding the 5/8 inch (.61) balls*. Because of this, Bico Inc. experimentally came up with the following figure for a charge:

25 balls - 1-1/2 inch	(1.50)
39 balls - 1-1/4 inch	(1.25)
60 balls - 1 inch	(1.00)
68 balls - 7/8 inch	(.875)
93 balls - 3/4 inch	(.75)
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285 balls	Total wt. = apx. 44.5 lbs.

We include several extra balls of each size so that the charge can be manipulated to result in the 20,125 gm total with 285 balls.

OPERATING INSTRUCTIONS

Connect the power supply to the control box. Wires are protruding for easy connection. Make sure all circuit breakers are off to avoid severe electrical shock.

This machine is equipped with an automatic counter. To set the counter, press the button to the desired number of revolutions. The switch has two positions, "RUN" for normal use, and "JOG" to move the drum to a desired position (for emptying).

To load the drum, "JOG" the drum opening until it faces upward. Remove the cover and gasket. Insert the sample and ball charge into the drum. Replace the gasket and cover. Set the number of revolutions you desire on the counter and start the motor by pushing the start control.

The machine will stop automatically when the number of revolutions is reached. Again, use the "JOG" button to position the opening of the drum upward towards the ceiling. Now, remove the cover and gasket. Again, "JOG" the opening of the drum towards the receiving pan so the sample and balls can discharge into the receiving pan.

BICO INC. F. C. BOND BALL MILL SPARE PARTS
PLEASE SPECIFY SERIAL NUMBER WHEN ORDERING

CATALOG #	DESCRIPTION	LBS/KG
BM-1	Drum, with Shafts (Please specify S/N)	113/52
BM-2	Cover	11/5
BM-3	Hanger	13/6
BM-6/7	Table with Legs	109/50
BM-9	Pillow Block	1/4
BM-12	Asbestos Gasket	.3/1
BM-13A	50 HZ Digital Counter/Jogging Switch	
BM-13B	60 HZ Digital Counter/Jogging Switch	
BM-13C	Counter Bracket	
BM-13D	Counter Sensor	
BM-14/20	Pan with Screen and Receiving Pan	9/4
BM-15	Charge of Balls	50/22
BM-23	Chain Guard	3/1.5
BM-26	Chain, one length = 29 inches	1/4
BM-29A	Connecting link for 60 HZ operation	1/4
BM-29B	Offset link for 50 HZ operation	1/4
BM-32	Shaft Key	

*** Sprockets are available and quoted upon request. (S/N and HZ required).