

BOND INDEX TESTER BT 100



A detailed overview and knowledge of the characteristics of a raw material is of utmost importance, especially when planning the layout of a crushing plant. In order to minimize all possible risks extensive trials are necessary to obtain information on the properties of the raw materials. A clear definition of the required crushing capacities and the desired product quality can be precisely determined by using the Bond Index test methods. Using the Bond Index test procedures it is possible to calculate crushing / abrasion behavior of mineral samples. This knowledge is essential to define the required ball mill layout and production capacity.

In order to perform the Bond Index Test successfully it is necessary to use pre-crushed sample material as defined below:

Module Ball Mill

- | Minerals pre-crushed to < 3.35 mm and sieved
- | Drillcore pre-crushed to < 3.35 mm and sieved
- | Half Drillcore pre-crushed to < 3.35 mm and sieved

The Bond Index conforming ball charge consists of:

- | 43 x 1.45" balls
- | 67 x 1.17" balls
- | 10 x 1" balls
- | 71 x 0.75" balls
- | 94 x 0.61" balls

The optimum number of grinding balls is 285. However, the ball diameters vary due to wear. Therefore, the total ball number should be adjusted from time to time to ensure a total mass of 20.125 grams.

The grinding jar of the Bond Index Ball Mill measures 12" x 12" and has well-rounded corners.

Module Rod Mill

- | Minerals pre-crushed to < 12.50 mm and sieved
- | Drillcore pre-crushed to < 12.50 mm and sieved
- | Half a drillcore pre-crushed to < 12.50 mm and sieved

The Bond Index conforming rod charge consists of:

- | 6 rods of 1.25" diameter and 21" length
- | 2 rods of 1.75" diameter and 21" length

The grinding jar for the Bond Index Rod Mill is 12" x 24" in size and has a wave-shaped design.

At least 15 to 20 kg sample material is required to simulate a closed grinding circuit in a ball or rod mill. The Rod Mill Work Index (RWI) is used for particle size determination in a size range from 25 mm down to 2.1 mm whereas Ball Mill Work Index (BWI) is used for the range from 2.1 mm down to 100 µm.

Adjustment of grinding parameters:

The operation display permits convenient selection and storage of parameters such as rotation counter, rotation speed, grinding time, start and stop.

PRODUCT ADVANTAGES

- | suitable for the determination of Work Index according to Bond
- | available modules include Ball Mill and Rod Mill
- | easy tilt function to empty the drum
- | solid steel frame
- | removable sample collector
- | convenient parameter setting via display
- | funnel with handles
- | guide rail allows for ergonomic removal of jar
- | separation grid to separate sample from grinding balls (only for Ball Mill)
- | grinding jar with gasket for loss-free operation
- | solid noise-protection hood with safety switch
- | emergency switch

FEATURES

Applications

quantification of grindability of ores and minerals

Field of application	construction materials, environment / recycling, geology / metallurgy
Feed material	hard, brittle
Size reduction principle	friction
Material feed size*	< 3.35 mm with ball module / 12.50 mm with rod module
Final fineness*	< 100 µm with ball module / 2,100 µm with rod module
Batch size / feed quantity*	min. 15 kg with ball module / min. 20 kg with rod module
Rotation speed	70 min ⁻¹ with ball module / 46 min ⁻¹ with rod module
No. of grinding stations	1
Material of grinding tools	hardened steel
Grinding jar sizes	21.7 l with ball module / 43.3 l with rod module
Setting of grinding time	digital
Drive power	0.75 kW
Electrical supply data	different voltages
Power connection	1-phase
Protection code	IP 50
W x H x D closed	1500 x 1200 x 700 mm
Net weight	~ 295 kg
Standards	CE

*depending on feed material and instrument configuration/settings

FUNCTIONAL PRINCIPLE

The ball and the rod mill basically have the same concept comprising either a 12x12" jar with grinding balls or a 12x24" jar with grinding rods.

The jar is attached to a rotating yoke which is driven by a motor and can be placed in three different positions: Upwards for loading, horizontal for grinding, downwards for discharging.

To carry out the Bond Index test the pre-defined number of grinding balls or grinding rods is required. The electronic control integrated in the drive is equipped with an overload protection and permits and controls different speeds.

During the grinding process the difference in speeds between the balls / rods and grinding jar produces an interaction between frictional and impact forces, which releases the required comminution energy. The interplay between these forces produces a very effective degree of size reduction.

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