

ANHUI CEMINE MACHINERY CO.,LTD

Add: ADDRESS:,BLOCK 1, DELIJIA TECH PARK,NO.767 YULAN AVENUE,HEFEI,ANHUI,CHINA WHATSAPP: 0086-15955116426

# Φ2.2\*7m BALL MILL

## Operationg Instruction

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# Catalogue

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## 1.Overview

This machine is mainly used for ore dressing, ceramics, chemical and cement industries with dry grinding and wet grinding types, energy-saving ball mill has been invented in recent years and it can save 25% to 30% energy, compared with others. The main parts of ball mill is a slowly rotating cylinder with grinding medium inside, due to features of simple and firm structure, easy operation and maintenance, and continuously working, so the ratio of reduction is big and high capacity to meet needs of modern construction.

## 2. 性能 Parameter

Model	Φ2200×7000	
Feeding size	0-25mm	
Discharging size	0.074-0.4mm	
Capacity	10-20t/ h	
Model of motor	JR148-8	380KW
Frequency	50Hz	
Voltage	415V	
Rotary speed	21.5r/min	
Filling ratio	27%	
Model and velocity ratio of reducer	ZD70-9- II	i=5
Velocity ratio of gear wheel and pinion	i=6.86	

## 3. Main parts and operating principle

### 1) Main parts

It is a open circuit ball mill of edge transmission and center discharging, which contains cylindrical barrel, feeding and discharging device, hollow shaft, main bearing, pinion, gear rim, reduction gear, motor, etc.

**a. Rotary shell**

Rotating barrel of which the two ends is connected with feeding and discharging device is formed by welding curved steel plate and supported on two self-aligning bearing flatly. There are some spiral in the feeding and discharging device. Rotating is achieved by motor, reduction gear, pinion and the fixed gear rim at one end of the barrel. There are lining plate inside to protect the barrel and get the medium-steel ball to appropriate height to improve crushing efficiency. There is an access hole in the barrel for maintenance and unloading grinding medium.

**b. Feeding and discharging device**

Feeding device is used to feed material and add steel ball. discharging device is used to discharge processed material and wearing steel ball.

**c. Supporting device**

Rotating barrel, steel ball and material are all supported by the supporting device which plays an essential role. The main bearing is self-adjusting to adapt tiny operating and installation mistakes.

**d. Transmission device**

Transmission device is made up of elastic coupling, reduction gear, pinion and gear rim.

please note that the transmission device could not be moved as will. if the position is changed ,then we have to make the acting force from pinion to gear rim is vertical and up. Generally the position of transmission device is unallowed to change.

**2) Operating principle**

When the rotating barrel is rotating by the action of transmission device, steel ball inside and the feeding material will rise highly under the centrifugal force and frictional force, then steel ball hit the material fiercely. during the grinding process, material is feeding constantly while grinded material is discharging with water flow simultaneously. Ball mill has sinistrogyration and dextrorotation kinds. Customers could decide which one to choose, but it should be noted in purchasing contract.

## 4.Installation requirements

Beside the requirements written in the drawing, other requirements below should be paid attention.

1)

Beside the requirements written in the drawing, other requirements below should be paid attention. The barrel, gear, hollow shaft, bearing block, drive bearing and reduction gear should be checked before installation.

2)

All parts should be tidy, especially the junction surface and sliding surface. and parts like grinding plate should be installed in the right direction. before test run, make sure ball mill is tidy.

3) Adjust the distance of two main bearings center according to actual measurement data on which the ground sill design is based.(this step could be omitted when there is a support device.

4) Requirements of ground sill design are as follows (not overall support equipment):

a) two piers on the basis, the error of vertical and horizontal distance to the center line  $\leq \pm$

3mm

b)Elevation error of  $\pm 5$ mm (mean pouring the concrete surface one time)

5) Secondary grouting

Secondary grouting should be conducted after calibration. Bolts hole should be cleared concrete polluted by oil should be eliminated. The grouting surface should receive treatment. Base and bottom of ball mill should be clean.

Crushed stone concrete, a grade higher than general concrete, should be used to grout. Keep equipment, mat iron, anchor bolts stationary to insure installation accuracy when tamping. Secondary calibration is proceeded after compression strength has been up to 75% of designed compression strength.

6) Installation of main bearing

Check the main bearing before installation. heat the bearing by oil till the inner hole become bigger enough to be installed.

7) Installation of rotating barrel

- Junction surface should be clean and applied lead oil when barrel and hollow shaft is connected. During the process, nothing is allowed to added in the faying place.

## 5. Test run, operating instruction and maintenance

1) Test run could be started after all installation requirements are met. Below are steps for test run:

- a. Add lubrication oil to reduction motor and gear oil to gear cover.
- b. Ball mill runs 24 hours without anything inside.
- c. Add one third medium and run for 8 hours with feeding raw material inside.
- d. Add two third medium and run for 72 hours with feeding raw material inside.

Check oil sites once at least per hour to insure the temperature of the main bearing, drive bearing and reduction motor not more than 70 °C and 55 °C respectively, check whether the gear rim and pinion working sound is normal. And Check any leakage phenomenon around sealed places.

2) If the test run is qualified, then the ball mill could be put into use.

a. Operating guidelines

There are two ways to judge whether ball mill runs normally. The first way is check whether discharging size meets required standard, if the answer is positive then we judge ball mill is normal. The second way is listening to the ball mill, if it sounds like "hua hua" and lightly impact sound, then we could judge ball mill is normal. If the sound becomes heavy or no more impact sound then generally we can judge material inside is too much, which suggest us stop feeding. What is worse, if we can't hear normal sound and discharging material is less than normal, it may suggest material inside is stuck together if it is dry grinding type. Generally the problem could be solved by declining moisture of raw material to 2% or lower, else adding dry material is another choice. Wet grinding ball mill won't occur such problems. If the impact sound is too strong, it means material inside is too less that we should add more material individually.

b. Operating procedures of ball mill:

b-1 Preparation before starting ball mill

- (1) Remove other unconcerned things
- (2) Check whether there is anybody inside of ball mill

(3) Check whether the distance between ball mill surface and lining plate and the filling ratio is as required

(4) Close and seal the access hole

(5) Whether lubrication oil and oil sites is enough

(6) Operator should add oil lubrication on the hollow shaft neck when first test run or ball mill hasn't run for a long time. and start the electrical motor when there is no collision and stagnation phenomenon

(7)Start the ball mill after getting permission.

#### b-2Start sequences:

(1)Turn on conveying device

(2) Turn on electrical motor

(3)Turn on feeding equipment

#### b-3Turn off sequences

(1) Turn off feeding equipment

(2) Turn off electrical motor

(3) Turn off conveying equipment

#### b-4Matter needing attention

(1)When the ball mill wouldn't run for a long time, take out grinding medium inside in case of barrel deformation.

(2)Check lubrication condition of main bearing frequently.

(3)Make barrel take a turn every 10 to 20 minutes after ball mill stops running till it cools off.

### 3) Maintenance of ball mill

a. Regularly check the anchor bolts, lining plate bolts, grinding door bolts and other important bolts to know whether bolts become loose.

b. check oil sites once at least per hour to insure the temperature of the main bearing, drive bearing and reduction motor not more than 70°C and 55°C respectively.

c. Check any leakage phenomenon around sealed places.

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- d. Record the changes of motor current value. if abnormal changes occurs, stop running and check
- e. Whether the gear rim and pinion working sound is normal.
- f. In addition to normal maintenance, operators should examine joint places and fraying degree of main parts periodically in case of breakdown.

4.Refer to the following table when choose lubricating oil of which the application is based on different climate and oil sites.

NO.	Oil Site	Brand of Oil	Climate	Note
1	Bearing	Automobile oil NT40 or 2# lithium lubricating grease	winter	
2	Gear	Gear oil with 13 <sup>0</sup> E Engler viscosity	winter	
3	Reduction gear	Automobile oil NL20	winter	
4	Bearing	Automobile oil NT50 or 2# lithium lubricating grease	Summer	
5	Gear	Gear oil with 25 <sup>0</sup> E Engler viscosity	Summer	
6	Reducer	Automobile oil NL30	Summer	