

# GTEK Laboratory Continuous Rod Mill

LAB OVERFLOW ROD MILL OPERATION MANUAL

420×600



## I Application

For use in wet grinding circuit or determining grindability index of ore in mineral, chemical or industrial feasibility testing or pilot plant applications.

## II Technical Specification

### 1. Rod Mill

Item		Unit	Specification
Mill Shell Size		mm	Φ420×600
Mill Speed		RPM	57
Mill Volume		L	80
Rod Charge	Φ35-Φ40	kg	45
	Φ30	kg	60
	Φ25	kg	50
Feed Size		mm	≤6
Discharge Size		mm	≤0.074
Feed Volume		cm <sup>3</sup>	700
Capacity		Kg/h	150
Motor	Model		100L-6
	Power	kw	2.2
	Speed	RPM	920
Dimensions		mm	
Weight		kg	800

Note: Capacity can be reach up to 200Kg/h in a cut grinding circuit

### 2. Spiral Classifier

Item		Unit	Specification
Spiral Diameter		mm	Φ150
Spiral Length		mm	1400
Overflow end width		mm	240
Tilt adjustment range		°	15° 30', 22°
Maximum Return Sand Ratio		%	300
Spiral Speed			18, 23, 30
Motor	Model		YS7124-4
	Power	kw	0.55
	Speed	RPM	1400
Feed Size		mm	≤6
Discharge Size		mm	≤0.074

Feed Volume	cm <sup>3</sup>	700
Capacity	Kg/h	150
Motor	Model	100L-6
	Power	kw
	Speed	RPM
Dimensions	mm	
Weight	kg	800

### 3.Ore Bin Vibratory Feeder

Item	Unit	Specification
Bin volume	L	35
Vibratory Frequency	RPM	19
Feed Capacity	Kg/h	6-200
Motor		Share with spiral conveyor

### 4.Spiral Conveyor

Item	Unit	Specification
Spiral Size	mm	Φ90×600
Spiral Speed	RPM	38
Motor	Model	AO2-6314
	Power	kw
	Speed	RPM

## III Structure

Φ420×600 continuous overflow rod mill is mainly consists of the feeding part, grinding part, discharging part, classification part and conveying part.

### 1.Feeding Part

Consist of vibrating feeder with feed bin and volute feeder. After opening the gate of feed bin, the material is fed to the volute feeder evenly and continuously, and is fed to the drum with water by volute feeder. The feed quantity is regulated by opening size of the gate and rotation speed of the drum.

The volute feeder of the feeding system is a spiral shape spoon, by which the feed ore and return sand can be lifted and fed to the inside of drum. The feed volute is connected to the feed end of the drum and is covered in the volute feeder housing. The volute feeder housing can be disassembled and is easy for cleaning and inspection.

**Due to the gap between the volute feeder and volute feeder housing is very small, materials larger than 8mm shall be prevented into feeder when using, or it will result in collision between the volute feeder and volute feeder housing and cause damage.**

## 2.Grinding Part

The grinding part is a  $\Phi 420 \times 600$  lined with 6 corrugated manganese steel liner,the drum is supported by two pairs of rollers by two rims welded outside the drum.There is gear ring close to the feed part,and the drum is driven to rotate by means of bridge drive gear engagement.

## 3.Discharging Part

The ground product is discharged overflow from the discharging end,and flow into the spiral separator automatically by means of the gradient of discharging chute.There is hose connector welded on the upper end of discharge chute,which is connected with the water supply pipe by rubber hose.The water supply pipe is coupled with stopcock so as to adjust the quantity of water.There is a shield plugged outside the chute to avoid splash of discharge ore slurry.

## 4.Classification Part

The classification part is a  $\Phi 150 \times 1400$ mm spiral classifier.Make use of the inlet hole of discharging chute as one of the support point of one end,the whole spiral classifier can be turned to a certain degree of angle to achieve different inclination requirements.The other end is supported by screw rod,turn the hand wheel with sleeve nut to adjust the degree of slope,so as to control quantity of return sand and overflow fineness.

## 5.Conveying Part

The conveying part is a  $\Phi 90 \times 600$ mm spiral conveyor which connect the spiral classifier and volute feed housing,the sand from spiral classifier is evenly and continuously fed to the volute feeder housing.The classifier sand and raw ore are fed to the drum of rod mill by volute feeder.So the spiral classifier and rod mill constitute a closed grinding system,and continuous grinding is realized.The whole component is simple in structure,reasonable in sealing,reliable in driving and easy in installation and maintenance.

# IV Water Supply and Electricity System

## 1.Water Supply System

There is a inlet water nozzle,after the water is supplied through this inlet water nozzle,the inlet water is divided into two parts,supplying water for both feeding part and discharging part,so as to satisfy the water requirements for working of the two parts.

During operation,on one hand,pay attention to check the water check the sealing conditions of water pipe joints,on the other hand,due to the vertical structure of the two water inlet,so violet impact should be avoided which will result in damage to the pipelines.To ensure the effect of grinding and classification,constant pressure water tank can be used for water source.

## 2.Electricity System

The different parts of the mill are driven by independent motors and can be individually controlled.

## V Installation, Operation & Maintenance

The above parts together with the driving system, water supply system and electric cabinet are all mounted on structural base. No additional foundation is required. Place the equipment in the right position and slightly adjust the horizontal level. The equipment can also be fixed with expansion bolt, and put rubber sheets between ground and the equipment for shock absorbing. Clean up the grease of package and check lubrication conditions, and then connect the water pipe, electricity power, and start test run for to determine the rotation direction of the mill.

### 1. Preparations before use.

1.1 Check if the oil cup, gear box, bearing and other moving part have sufficient lubrication oil or not.

1.2 Clean up the abandoned ore or other dirt remained in the feeder, mill, classifier and conveyor.

1.3 Check if the electric control cabinet is in good condition, run the moving part for one round by hand to check weather there is block, and check if they are flexible or not.

1.4 Connect to the general power supply and water supply.

1.5 Open the gate of the feeder, start in turn the classifier, mill, and spiral classifier, check if the equipment is running normally, and then open the water supply valve of volute feeder, stop after washing and cleaning up the slags, dirties and rust remained in the mill, classifier and spiral conveyor. (If necessary, feed the waste material that needs to be ground to the mill and running for a certain time to make it more clean and less debris)

1.6 After washing, closed the gate valve of the feeder, pour the ore that needs to be ground into the feed bin, and then measure the amount of ore fed, when determining, slide witch the position of feed chute, so that it can take the ore with container to make measurement. Start test run (start spiral conveyor), and adjust gate valve of the feeder, when the desired amount of feed is reached, stop running, and return the feed chute to the original position. (to the position to feed the ore to the volute feeder housing)

1.7 Adjust and measure the amount of water used in the volute feeder housing and ore discharging chute to achieve the desired grinding concentration and classification concentration.

### 2. Start Operation Procedure

After the above preparation is completed, power on in turn the classifier, mill, spiral conveyor (include the feeder), and start grinding. For first starting of the motor, please be noted that the direction of motor rotation must be same as the marked rotation.

### 3. Precautions when using

3.1 Feed the ore to the bin at any time, so as to maintain a certain amount of the material.

3.2 Observe the ground product and overflow fineness at regular time, if any changes, adjust in time.

3.3 Observe the running conditions of all mechanical parts and motors, and check whether the temperature rise is normal in all lubrication sections.

### 4. Stop Operation Procedure

4.1 After ore feeding is completed, let the mill, classifier and spiral conveyor running for a certain time, when the ore is ground to the fineness for overflow, stop the spiral conveyor, mill and classifier in turn.

4.2 After grinding, first open the ore discharging port at the lower part of the classifier, drain away the remain slurry and sands, and wash it with water.

4.3 Wash the sands remained in the spiral conveyor into volute feeder housing, meanwhile, open the ore discharging port in the volute feeder housing, and then close the ore discharging port.

4.4 Remove the ore discharging port, and start the mill, meanwhile, feed volute feeder with water until clean water is discharged, stop washing and stop running the mill.

4.5 Take out all the steel rods from the discharge port of the mill, suck the residual water in the drum with rubber pipe, wipe the drum with clean cloth, and then put the steel rod into the drum, fix the ore discharging chute.

### 5. Precautions after use

5.1 Disconnect the general power supply and water supply.

5.2 Clean up all the parts of equipment and surrounding environment.

5.3 Add lubrication oil to all lubrication section.

5.4 If necessary, do rust protection work.