



FOSHAN METECH ALUMINUM TECHNOLOGY CO., LTD

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Pure Aluminum Rod LLZ-15-1600 Electric Aluminum Rod Continuous Casting and Rolling line

Technical Specification

Foshan Metech Aluminum Technology CO., LTD

Office address: 2nd Floor, E1 building , Jiulong hardware&stainless steel trade centre, Dali town, Nanhai districtng, Foshan, Guangdong,China

Factory address: Matang magnetic industry park, Yueyang, Hunan,China

Main products: Aluminum Melting Furnaces, Aluminum Holding Furnaces, industrial furnaces, continuous casting and rolling machines, permanent magnetic stirrer, coal gas generator, aluminum dross processing machines etc. aluminum industry equipments

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i .Equipment description

1. Function of the equipment

This equipment adopts new type four-wheel continuous casting machine and continuous casting and rolling technics to manufacture the $\varnothing 9.5\text{mm}$, $\varnothing 12\text{mm}$, $\varnothing 14\text{mm}$ aluminum rod. $\varnothing 14\text{mm}$ aluminum rod with 11 rolling stands, $\varnothing 12\text{mm}$ aluminum rod with 13 rolling stands, $\varnothing 9.5\text{mm}$ aluminum rod with 15 rolling stands. The continuous rolling machine can feed and rod-pack initiatively; There equip with a set of water-blowing device at the outlet of the rod collecting tube, which is used to dry-up the water on the aluminum alloy rod surface. At the same time, there installed drawing device to ensure the alloy rod leading-out smoothly. The arc deflection tube adopts wheel-oriented structure, which can stop the aluminum rod surface from bruising. Rod-winding adopts centrifugal shaking mode, which can guarantee the take-up system operate continuously.

2. Brief manufacturing process flow

Aluminum Melting Furnace→ Holding Furnace→ Four wheels continuous casting machine→ Pulling capstan→ Rolling Shearer→ Drawing-in → Continuous rolling Machine→ Twin-coiler→ Aluminum Rod

3. Detail technical parameter:

3.1 Four rings continuous casting machine

Diameter of the casting ring:	$\varnothing 1600\text{mm}$
Casting bar section:	2400mm^2
Casting bar speed:	7.6-15m/min
Rotating speed of the casting ring:	1.66—3.3r/min
Casting machine motor power:	4Kw Frequency control
Cooling water pressure of the casting ring:	0.2-0.5Mpa
Cooling water consumption:	100t/h (inner: 40t/h, outside: 30 t/h, side: 30t/h)
Cooling water temperature	$15\sim 45^{\circ}\text{C}$
Water demand:	PH7-8, CaO content: 20-50 PPM Impurity grain size: below 0.8mm, content mg/e Meet the demand of GB1576

NOTED: The buyer should offer the above cooling water

3.2 Front Pulling Capstan 5.5kw

Motor	5.5Kw Frequency control
Reducer gear box	1 pc
Wheel box	1 pc
Air cylinder	1 pc
Pedestal	1 pc

3.3 Rolling Shearer

Motor	11Kw
Reducer gear box	1 pc
Wheel box	1 pc



Air cylinder	1 pc
Pedestal	1 pc
Hydraulic baking rod pusher	1 pc

3.4 Carrier roller 2 sets

3.5 Continuous Rolling Machine

Rolling rod diameter:	∅9.5mm; ∅12mm
Quantity of rolling stand:	15
Diameter of the roller :	∅255mm
Drive ration of the adjacent stand:	1:1.25
Max finished rolling speed:	V=6.2m/s
Center height	1635mm
Main motor	280Kw (DC)
Capacity of the gear lubrication oil box:	4m ³

3.6 Twin-coiler

Rod diameter:	∅9.5
Moving motor:	3Kw
Coil's size:	∅2000×∅1400mm
Swivel motor	1.1KW (2 pcs)
Laying head motor:	2.2Kw Frequency control
Collecting basket:	∅2000×1400mm
Coils' weight	1.5-2.5 T

4. Structure features

4.1 Four rings casting machine

The four-rings casting machine is made up of up and down casting ladle, gravity flow-adjusting device, casting ring and driving device, pressing ring device, steel strip oiling device, bridge approaching device, tight device, ingot-picking device, cooling device and steel strip etc.

The aluminum liquid would flow into the up ladle via the launder, the floating plug that controlled by the gravity control the aluminum liquid flow of flowing into the down ladle. Then the aluminum liquid would horizontally cast into the mold chamber that combined by the casting ring and closed steel strip. The casting ring section is "H" type, cooling form all sides, which can guarantee the cast ingots compacted and uniform. Inside, outside and side cooling device can be conveniently pulled out from the casting mold, which is very convenient to adjust and maintain. All the spray heads are stainless steel. The cooling water pressure and flow can be displayed, the steel strip take-up is pneumatic (can be adjusted). There equipped cooling device on the supporting shaft of the casting ring, after flow through the 0.2-0.5 MPa cooling water. The cooling water will spray on the casting ring's surface via spray head. There are three cooling areas, which can make the aluminum liquid cool gradually and c into the aluminum billets.

The aluminum congeal on the casting ring would be picked out by the picking

and then be sent out along the approach bridge. The compressing device press the steel strip tightly on the casting ring, to avoid the aluminum liquid leaking out which may change the direction of the steel strip. The tension of the steel strip can be adjusted by the take-up device. In order to de-mold easily, there equipped with steel strip oiling device. The whole process is continuous, which can get big long casting billets.



4.2 Front Pulling Capstan

The motor of the front pulling capstan is frequency control, which can be operated in stand-alone or linkage modes.

The front pulling capstan is made up of motor, reducer box, wheel box and roller wheels (up and down). It is used to lead the rod materials to the rolling shear. So the rolling shear can cut the unqualified materials. It can be linked with the rolling machine, once there is something wrong with the rolling machine, the up roller wheel of the pulling capstan would press down, clipping the rod materials , and then lead it to the rolling shear for shearing, and then transferring away by the trolley.

4.3 Rolling shear

The motor will drive the reducer to drive the up and down cutter head which has two pieces of cutting knife. The cutting speed is approx to the casting billets moving speed. When the quality of the casting billets is not good, the rolling shear would cut them into short materials; if the casting billets meet the rolling requirement, the shear would stop working, the casting billets would be sent to the rolling machine to roll. During the process of rolling , if there is something wrong with the rolling mac rod-collector, the rolling shear would be power-on automatically, cutting the into short materials and send them to the billets car.



4.4 Carrier Roller

The carrier roller is used to lead the rod sent by the Pulling capstan to the Drawing-in device, then to the rolling machine.



4.5 Continuous Rolling machine

It consists of 15 pieces of rolling stands, is 3-high mould rolling stand. The diameter of the roller is 255mm.

The system:

Oil pump (2 pcs):

KCB300—18m³/0.36 (one for reserve)

Max flow

18m³ /h

Operating pressure:

0.35 Mpa

Motor model

Y132M2-6 5.5Kw

Oil temperature:	$\leq 45^{\circ}\text{C}$
Oil storage tank:	$V=4\text{m}^3$
The stand is lubricated and cooled by emulsion. The emulsion system:	
Emulsion pump (2 pcs):	ISW100-250B (one for reserve)
Max flow:	$87\text{m}^3/\text{h}$
Operating pressure	0.3-0.5 Mpa
Motor model:	Y180M-2 22Kw
Emulsion temperature	$15-45^{\circ}\text{C}$

The Seller would equip with a TDL filter to ensure there in no impurity in the emulsion. To our advice, better using WD-6 aluminum continuous casting and rolling emulsion. The flow of the emulsion can be adjusted by the switch on the valves.



4.6 Continuous water cooling device

The continuous water cooling device would cool the high temperature aluminum rod that comes from the continuous rolling machine to a certain technics temperature of the user (Adjusting the water flow of the cooling water spraying drum)



4.7 Basket down coiler

It consists of coil down frame and wire basket truckle:

The coil down frame would lead the rod wire through the guiding pipe with pulley to the arc pulley frame, then fall into the collecting basket via the rod laying device. Adjusting the rotate speed of the laying head motor could get the different diameters coils in the collecting basket. The pulley could reduce the resistance that between the rod wire and guiding pipe, stop the rod wire from damage.

The wire basket truckle has two same size wire basket (the wire basket can be rotated via frequency control). There equipped with moving motor under the truckle, when one of the wire baskets is filled with rod wire, then driving the empty wire basket to the place.



4.8 Electric control device 1 set

Power of the electric system Three phase four wire system ,400v,50Hz
 Total power of the equipment ~380 Kw

4.8.1 Electric drive control

The electric drive control consists of DC box of the rolling machine, operation platform of the continuous casting and rolling, rod-collecting operating board etc.

4.8.2 Main electric device of the system:

Frequency control device (SIEMENS) of the continuous casting machine:	1 pc
Frequency control device (SIEMENS) of the pulling capstan:	1 pc
Frequency control device (SIEMENS) of the rolling shear:	1 pc
Frequency control device (SIEMENS) of the coiler:	1 pc
Frequency control device (SIEMENS) of the continuous rolling machine:	1 pc
SIEMENS PLC controller:	1 pc
SIMENS touch screen:	1 pc



Other electric device all adopts SIEMENS brand products

4.8.3 Explanation of the electric drive control:

The PLC would exchange the data in two-way, to inspect and control the system via programme control of the PLC

The motor speed of the rolling machine can be adjusted by the " speed lift and down" button . The casting and coiling speed are both controlled by the potential device.

The system can control and inspect the below operations:

Power on/off of the all the equipment; Speed of all the equipment; working conditions and alarm of all the speed-adjusting devices; operating conditions and alarm of all the auxiliary machinery, operation of the system etc.

Electric current and rotary speed display of the rolling machine;

The good electric control system can make the aluminum rod much more tidy and dense.

4.8.4 Dimension of the electric control devices:

DC control cabinet: 1000*800*1800 mm

Continuous casting operating platform: 1000*620*1000 mm

Continuous rolling operating platform: 1000*620*1000 mm

Coiling operating board: 500*400*1000 mm

4.8.5 Electric technical documents:

Circuit diagram: 1 set

Electric connect graph 1 set

Operating instruction manual of the equipment: 1 copy

Operating instruction manual of the DC speed regulating device: 1 copy

Operating instruction manual of the frequency control device: 1 copy



Goods supplying scope:

The aluminum rod continuous casting and rolling line is mainly made up of four-wheel continuous casting machine, rolling shear, front pulling machine, continuous rolling machine, twin-coiler, lubrication and emulsion oil supplying device, electric control device etc.

Below is the detail:

Item	Quantity	Remark
I. Four rings continuous casting machine		
1. pedestal	1 pc	
2. tight ring	1 pc	
3. casting ring	1 pc	
4. air cylinder	1 pc	
5. Pressing ring device	1 set	
6. casting ladle	1 pc	
7. bridge bracket	1 set	
8. flow-adjusting device	1 set	
II. Front pulling machine		
1. reduction gearbox	1 pc	
2. wheel box	1 pc	
3. air cylinder	1 pc	
4. pedestal	1 pc	
III. Rolling shear		
1. pedestal	1 pc	
2. reduction gear box	1 pc	
3. wheel box	1 pc	
4. Hydraulic rod pusher	1 pc	
5. blade	4 pcs	
6. Convey guide track	2 sets	
iv. Continuous rolling machine		
1. gear box	1 pc	
2. safety coupling	15 sets	
3. Y255 rolling stand	15 pcs	
4. Rolling stand base plate	15 pcs	
5. Gear box base plate	1 pc	
6. Drawing-in/feeding device	1 pc	
7. Motor coupling	1 set	
8. Emulsion shunt valve	1 pc	
v. Twin-coiler		
1. Arc pulley bracket	1 set	
2. Rolling pipe	1 set	



3. Coiling device	1 set	
4. Collecting basket	2 pcs	
5. Take-up car	1 pc	
vi. Electric control system		
1. DC speed regulating cabinet	1 set	
2. Operating box	3 pcs	
3. DC speed regulating motor of the continuous rolling machine: 280 kw	1 pc	
4. Continuous casting motor: 4 kw	1 pc	
5. Pulling machine motor: 5.5kw	1 pc	
6. Rolling shear motor: 11 kw	1 pc	
7. Emulsion pump motor: 22 kw	2 pcs	
8. Oil pump motor: 5.5 Kw	2 pcs	
9. Coiling motor: 1.1 kw	2 pcs	
10. Trolley moving motor: 3 Kw	1 pc	
11. Rod laying motor: 2.2 Kw	1 pc	
vii. Cooling and lubrication		
1. Emulsion pump (ISW100-250B)	2 pcs	One for reserve
2. Oil pump (KCB300)	2 pcs	One for reserve
3. Water pipe joint	80 pcs	
4. Valve(1/2")	80 pcs	
5. Flange 5"	1 set	
6. Plastic pipe 6"	30 meters	
7. Plastic pipe 4"	40 meters	
viii. Others		
1. Pass plug gauge	1 set	
2. snap- gauge	1 pc	
3. Oil tank 4 cub meter	1 pc	
4. Tail screw M27	17 pcs	
ix Component		
1. Outlet pipe (Bakelite)	1 set	
2. Gasket ring 85*120*12	2 pcs	
3. Gasket ring 140*170*16	5 pcs	
4. Gasket ring 180*220*18	5 pcs	
5. Gasket ring 180*150*16	2 pcs	
6. Safe shear pin	10 pcs	

Responsibility of the Buyer:

1. Public accommodation of the water, electricity, air supplying
2. Foundation of the equipment, including all the embedded parts
3. Sizing block for installation and installation materials covering board



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4. Tools for installing and commissioning, maintaining and manufacturing
5. Lubrication and emulsion oil
6. Electric cable, water pump, air pump connecting