

## 20 Tons Homogenizing Furnace

Configuration List just for one line

No.	Production	Quantity	Amount(USD)
1.	20 Tons Homogenizing Furnace	1 set	US\$230,000
2.	Cooling furnace	1 set	
3.	3D Charging Skip	1 set	
4.	Terms		
<b>Total:</b>		<b>SAY TOTAL IN USD TWO HUNDRED THIRTY THOUSAND ONLY.</b>	
		<b>USD\$230,000.00</b>	

Note:Price terms:FOB Shanghai Port,if CIF is required,sea freight need to be added.



## 20 吨均质炉组

### 20 tons homogenizing furnace

附件 Appendix

#### ► 20t 均质炉组 20ton Homogenizing Furnace

##### 1. 20 吨均质炉供货范围（卖方）

##### 1. 20t Homogenizing furnace supply range (the sellers)

燃烧系统 数量 一套

6 支整套的燃气烧嘴、6 个风/气比例阀。

点火气枪、自动空气流量控制阀、高压点火器、

燃烧风机、电磁阀、压力开关、风管、液化气管、压力表、U V 火焰探头。

Combustion system quantity 1 set

Four complete set of gas burner, four air/gas ratio valve, ignition air gun, automatic air flow control valve, high voltage ignition lighter, combustion air fan, solenoid valve, wind pipe, liquefied gas pipe, V-meter, UV flame detector .

安全切断阀、过滤器、减压阀 数量 一套

Safety cut-off valve, filter, reducing valve Quantity 1 set

测温热电偶 数量 六支

Temperature thermocouple Quantity 6 pcs

循环不锈钢风机（26 / 32 K W 双速电机、V 型皮带及皮带轮） 数量 3 台

Circular stainless steel blower (26 / 32 K W double speed electric machine

V-type leather belt and belt roller) Quantity 3 pcs

炉门及密封、提升系统钢炉门、提升电机、提升机构、耐火内衬、炉门导向装置、气缸、气流量阀、气换向阀、密封耐火材料。

Door, airproof, and lift system Steel furnace door, up and down electrical motor, lift structure, fire-resistant liner, door guiding device, cylinder, and airproof fire-resistant material.

炉体钢结构、内层不锈钢、夹层及底层耐火材料。

Body use the steel structure, inside layer is stainless steel; the interlayer and bottom layer is fire-resistant material.

炉内钢轨、炉底耐火材料。

furnace inside is steel rail, fire-resistant material of bottom.

排烟烟囱及烟囱至炉体废气排出口接管。

Air exhaust chimney and the pipe from the furnace air exhaust pot to the chimney.

控制电柜至炉子间电缆及控制线

Cable and control wire between the control electrical ark and furnace.

炉子土建基础条件图

Furnace foundation condition drawings

铝棒支承架 数量 一套（8# 承料架 50 支，16#承料架 10 支）

料台护钢，方钢管支承架顶衬不锈钢，方钢管横间上下衬不锈钢。

Aluminum billet loading frame 1set（8#: 50pcs, 16#: 10pcs）

Material table is square steel tube loading frame and roof is stainless steel, square steel tube sidelong out liner is stainless .

电路控制系统

380V 电路电机控制部份：3 台 26/32 千瓦循环风机起动器、1 台 18.5 千瓦燃烧风机起动器、1 台 2 千瓦炉提升电机控制器、1 台供控制用的 380V/220V 变压器。

220V 电路控制部份：6 支烧嘴火焰控制电路、1 套 PLC 温控程序、1 套彩色触摸屏(内存温度记录)。

以上所有电器中安装于电柜内形成一个控制系统，包括按钮、指示灯、开关、报警、回复等。

Circuit control system

380V voltage electrical motor control part: 3 set of 26/32kw circular air fans jump-start machine, one set of 18.5kw combustion-supporting air fan jump-start machine, one set 2kw furnace lift electrical motor control machine, one set 380V/220V transformer for the controlling.

220V voltage control part: 6 burner flame control circuit; 1 set PLC temperature control procedure, 1 set color touch screen (including temperature record machine).

The components mentioned above are installed in a electrical cabinet as a control system, including button, indicator light, switch ,alarm and reset.

买方负责：The buyer supply range:

买方电源至控制电柜的电缆、压缩空气源至炉子间压缩空气管。

Cable from the electrical supply to the control electrical motor, and air pipe from the air compress supply to the furnace.

炉子土建、地脚螺栓。

Furnace foundation and foundation bolt

铝棒承料架 2套

Aluminum billet loading frame 2sets

2. 20吨冷却室的供货范围

20t cooling room supply range

3kw 轴流风机。

3kw cooling blower.

温度传感器。

temperature transmitter

炉体钢结构、排气风管、水雾喷头。

Furnace body steel structure, air exhaust tube, water fog spray-head

炉门及提升装置

furnace door and lift device

基础条件图

foundation condition drawing

控制电柜

control electric cabinet

3. 加料车 一台

material loading car 1set

钢架、车轮、轴及轴承、液压系统（包括油泵、油管、接头、油阀、油缸、液压马达）减速机、电缆及电缆收放装置、控制电柜及操作台。

Steel frame, wheel, axis and axletree, hydraulic system ( including oil pump, oil pipe, tie-in , oil valve , oil cylinder ,and hydraulic motor ), speed reducer cable and cable picking and laying device, control electrical cabinet and operator table

#### 4. 20 吨均质炉

##### 20t Homogenizing furnace

##### 4.1. 技术参数

吨位	20 吨
产量	约 40-60 吨/天
炉子内侧长度	≥6500mm
炉膛高度	2200mm
地面至料台高度	1155mm
开门时炉口宽度	1990mm
最大加料宽度	1620mm
最大加料高度	1500mm
最大加料长度	6000mm
极限操作温度	610°C
控制区数	3
循环风机数	3
风机风量	≥20 立方米/秒
电机功率	26/32 千瓦（双速）
每区烧嘴数	2
总烧嘴数	6
炉子总功率	2.5×10 <sup>6</sup> 千卡/小时
炉温温控精度	±5°C
从加料至铝棒表面到均质温度	4 至 6 小时
能耗	≤28 m <sup>3</sup> /吨·铝
炉子控制方式	全自动
电源	380V 3 相 50hz 220V 单相 50hz
燃料	天然气
热值	8400 大卡/ m <sup>3</sup>

Technology parameter:

Capacity tonnage:	20t
Output:	about 40-60t/day
Length of furnace inner side	≥6500mm
Height of furnace chamber	2200mm
Height (From ground to material)	1155mm

Width of Door mouth ( when open )	1990mm
Maximum width of loading material	1620mm
Maximum height of loading material	1500mm
Maximum length of loading material	6000mm
Limiting temperature for operation	610°C
Number of control zone	3
Number of Circular air fan	3
Air fan wind rate	≥20 cubic meter /second
Electric machine power	32/42kw ( double speed )
Number of burner in each zone	2
Total number of burner	6
Furnace overall power	2.5×10 <sup>6</sup> kw /H
Furnace Temperature control precision	±5°C
From loading material to Homogenizing temperature	4to 6hours
Energy consumption	≤28 m <sup>3</sup> /ton aluminum
Furnace control mode	full automaticity
Power	380V 3phase 50hz
Control power	220Vsingle phase 50hz
Fuel	gas
Heating capacity	8400 kilocalorie / m <sup>3</sup>

4.2 装载资料

loading information

铝棒直径(mm) aluminum billet diameter	每支棒重 (kg) weight of each billet	装载数量 (宽×高) loading number (W*H)	总支数 Total number	装载宽度 (mm) loading width(mm)	装载高度 (mm) loading heigh(mm)	总重 (kg) total weight(kg)

装料棒长 6000mm 为基准、横间用 100mm 方钢管、底架用 150mm 方钢管

loading billet take 6000mm as standard, use 100mm square tube, bottom frame use 150mm square tube.

#### 4.3 加热方式

铝棒装载好后，通过加料车送入均质炉内，循环风机启动循环炉内空气使温度均匀，炉顶侧 6 支高速烧嘴通过点火枪点燃后，加热炉内空气，通过空气的循环而使铝棒升温。PLC 通过测温热电偶的信号，自动控制烧嘴的开关及火力大小来控制温度及温升模式。触摸屏有十种以上升温模式可储存。

##### Heating mode

Finish loading, the aluminum billets are fed into homogenizing furnace by material car. Circular air fan start to circulate. And the furnace air makes the temperature homogeneous. six high speed burners that on the furnace top side ignite to heat the furnace air in order to up the billet temperature via air circulating. PLC through automatically control burner on/off, firepower strong or weak to control temperature and temperature-up mode depend on the temperature thermocouple's signal. Touch screen can store about ten temperature-up mode.

#### 4.4 循环风机

循环风机安装于炉体侧,由双速电机通过 V 型皮带带动，低温时低速，高温时自动转成高速，确保炉内温度均匀。风机由耐热的不锈钢制造。当打开炉门时，烧嘴及循环风机会自动停止。

##### Circular air fan

Circular air fan is installed near by furnace body and drove by double electric motor via V-shape leather belt. Low temperature with low speed, in the condition of high temperature, it turns into high speed automatically to ensure uniform temperature. Air fan is made of heat-resistant stainless steel. When open the door, burner and circular air fan will stop automatically.

#### 4.5 导流板

导流板由不锈钢制造、导流板的作用是使热气均匀流经铝棒、使温度均匀。

##### Fair water fin

Fair water fin is made of stainless steel. It's function is making hot air flow through aluminum billet fairly to make temperature homogeneous.

#### 4.6 炉子结构

炉子外壳由型钢及钢板焊接，内层不锈钢板，不锈钢板通过不锈钢螺栓及螺母固定，炉侧及炉顶夹层由 300mm 厚的耐火纤维填充，炉子的底部由厚度为 300mm 的耐火砖及保温砖筑成，确保炉子的保温性能。炉子内有钢轨及承料台，确保加料车进出自如及承料稳固。

钢结构用材如下：（所有钢材由于生产厂家关系允许出现负公差）

4.6.1 炉顶 200×75 槽钢及 5mm 钢板。

4.6.2 炉后墙 320×90 槽钢、80×80×5 角钢及 5mm 钢板。

4.6.3 侧墙 120×53 槽钢及 5mm 钢板。

4.6.4 风机侧墙 160×65 槽钢及 5mm 钢板。

4.6.5 炉底 160×65 槽钢、160×88 工字钢及 5mm 钢板。

4.6.6 前墙及提升架 320×90 槽钢、160×160×10 角钢、80×43 槽钢、80×80×5 角钢及 8mm 钢板。

4.6.7 炉门 160×65 槽钢及 5mm 钢板。

4.6.8 炉内钢轨 24 公斤/米。

4.6.9 炉内支承台Φ168×14 钢管及 20mm 钢板。

4.6.10 内衬不锈钢板厚度 1.5mm。

Furnace construction:

The crust of the furnace is made of profiled bar and steel sheet. The inside layer use stainless steel sheet that has been fixed by the stainless steel slot and nut. The interlayer between the furnace side and the roof is filled by the 300mm fire fiber ,the bottom of the furnace is made of fire-brick with the thickness of 300mm and temperature keeping brick to assure the temperature keeping performance of the furnace.

There are steel rail and material holding table inside the furnace so as to make the material car come and out freely.

Steel configuration: (all the steel could allow the minus tolerance )

Furnace roof : 200×75 channel steel and 5mm steel sheet

Furnace backer wall: 320×90 channel steel, 80 ×80×5 angle steel and 5mm steel sheet.

Furnace Side wall : 120×53 channel steel and 5mm steel sheet

Furnace air fan side wall : 160×65 channel steel and 5mm steel sheet

Furnace bottom : 160×65 channel steel , 160×88 flange steel ,and 5mm steel sheet

Front wall and take-up frame: 320×90 channel steel, 160 ×160×10 angle steel , 80×43 channel steel, 80 ×80×5 angle steel and 8mm steel sheet.

Furnace door: 160×65 channel steel and 5mm steel sheet .

Steel rail inside the furnace: 24kg/meter.

Side furnace holding table: Φ168×14 steel tube and 20mm steel sheet .

Liner stainless steel sheet: thickness 1.5mm

#### 4.7 炉门装置

炉门外层由型钢及钢板焊接，内层不锈钢，夹层为 250mm 耐火纤维。炉门提升为电动机构，电机带刹车，为了确保不漏气，炉门设有夹紧机构，通过气缸的作用来实现。打开气缸，炉门可以提升，炉门升降有导轨限位，上下到位自动停止。密封材料为耐火纤维。

Furnace door and open door configuration:

Out side layer of the furnace door is made of profiled bar and steel sheet, inside layer is stainless steel, interlayer filled by 250mm fire fiber. Furnace door take-up is electro motion framework, electrical machine with brake. To avoid the leak of the air, there is a clamp setup, and make it work through the cylinder. Open the cylinder, the door could take up, and the up and down of the door is limited by the guide rail. So, it can stop automatically when it up and down in right location. The airproof material is



fire fiber.

#### 4.8 燃烧系统

均质炉采用高速烧嘴分 3 区加热及控温，加料后以一定的负荷升温一段时间，以减少炉子膨胀速度。然后转入全负荷加热，达到限制温度各区关一支烧嘴，转到控温阶段后再关一烧嘴，最后余下两支烧嘴控温，由于火焰无级可调，故控温很准。整套燃烧系统由风机、风管、高压点火系统、压力表、电磁阀、风/气比例阀等组成。整套燃烧系统由 PLC 自动操作，改变程序可改变升温模式。

Burning system:

The homogenizing furnace is use high speed burner to separate two zone to heating and temperature controlling ,when the material added ,the temperature going up under a certain burthen for a period reducing the inflation speed of the furnace. Then turn to a whole burthen for heating ,when arrived the limited temperature ,close one burner for each zone, when turn to another temperature controlling step close another burner again. Finally only two burners left. For there is no adjusting stage for fire, it can control the temperature exactly. A complete burning system consist of air fan, air fan tube and high pressure ignition system ,pressure meter, solenoid valve, and air/gas rate valve, and this system can be automatically controlled by PLC. It can through change the temperature-up mode to change program.

#### 4.9 电控系统

为了准确控制燃烧并确保安全，卖方提供的电控系统将全部安

装于电柜内。电柜内 PLC 将控制燃烧系统，控制失灵时超温自动停止,并带触摸屏内存温度记录。整套电控系统由指示灯、按钮、报警器、开关、断电器、保险等组成。整个电控系统在卖方的工厂内已全部安装好。

Electricity control system:

To control the burning and ensure safety, all the electrical control system are fixed into the electrical cabinet. Inside the electrical cabinet, PLC could control the burning system. The over temperature could stop automatically when the control failed, and long with a touch screen EMS memory temperature record. This complete electrical control system includes indicator light, button, alarm equipment, switch, break electrical machine, and insurance. This complete electrical system has been installed in the seller’s factory.

### 5. 20 吨冷却室

20t cooling room

#### 5.1. 技术参数

吨位	20 吨
炉内长度	≥6500mm
开门时炉内宽度	1990mm
地面至料台高度	1155mm
风机数	10 台

电机功率	3kw
冷却时间	约 2 小时
冷却速率	≥300°C/小时
动力电源	380V 3 相 50hz
控制电源	220V 单相 50hz

Technology parameter

Capacity tonnage:	20t
Length of inside furnace	≥6500mm
Width of inside furnace (when open)	1990mm
Height (From ground to material)	1155mm
Number of air fan	10pcs
Electric motor power	3kw
Cooling time	about 2hours
Cooling rate	≥300°C/hour
Power supply	380V 3phase 50hz
Control power	220Vsingle phase 50hz

5.2 冷却室结构

型钢与钢板焊成炉体，炉体通过预埋螺栓与基础相连、冷却室内料台为钢混凝土结构。钢结构用材如下：（所有钢材由于生产厂家关系允许出现负公差）

The furnace body made of profile and steel sheet. The body is jointed by the embedded bolt and basement. The inside material table of the cooling room is made of reinforced concrete.(all the steel allow the minus tolerance)

5.2.1 炉顶 160×65 槽钢及 5mm 钢板。

5.2.2 炉后墙、前墙及提升架 200×75 槽钢、80 ×80×5 角钢及 5mm 钢板。

5.2.3 侧墙 160×65 槽钢、70 ×70×4 角钢及 5mm 钢板。

5.2.4 风机侧墙 160×65 槽钢、100×63×8 角钢及 5mm 钢板。

5.2.5 炉门 50×37 槽钢及 3mm 钢板。

5.2.6 炉内钢轨 24 公斤/米。

Roof: 160x65 channel steel and 5mm steel sheet.

Back wall, front wall and lift framework: 200x75 channel steel, 80x80x5 angle steel and 5mm steel sheet.

Side wall: 160x65 channel steel, 70x70x4 angle steel and 5mm steel sheet.

Air fan side wall: 160x65 channel steel 100x63x8 angle and 5mm steel sheet.

Furnace door: 50x37 channel steel and 3mm steel sheet.

Steel rail inside the furnace is 24kg /meter.

### 5.3 冷却系统

3 台冷却风机安装于冷却室旁，风机开动时，空气从冷却室的一侧进入冷却室，再通过冷却室另一侧排出炉体，同时开启水雾喷淋系统喷淋铝棒，达到快速冷却铝棒的目的。

There are two set of cooling air fans are installed near by the cooling room, the air will come into the cooling room by one side and drained out by another side when the air fan is run, to achieve the purpose of cooling the billet.

### 5.4 电控系统

电控系统由起动机、按钮、指示灯等组成，温度感应器自动控制风机的起停。

#### Electrical control system

The electrical control system consists of jump-start machine, indicator light and button. The temperature sensor could control the start and stop of the air fans automatically

### 5.5 冷却工艺

本系统的设计原则是使最大直径的Φ178mm 棒重 20000kg，从均质工艺 580°C冷却至 100°C只需 2 小时，6063 合金要保持固溶状态高温阶段必须以最小 300°C/小时的速率冷却。

#### Cooling technology

The design principle of this system is that the maximum diameter Φ178mm billet weigh 20000kg, from homogenization technology 580°C cooling to 100°C only need 2hours. 6063 alloy must be cool at the rate of 300°C/hour at the high temperature stage of keeping solution condition.

## 6. 加料车的技术条款

### 6.1.技术参数

最大装载能力	20 吨
铝棒最大长度	6000mm
小车行走距离	≥6500mm
小车顶水平	1120mm
小车上升高度	70mm
车总长	9500mm
大车动力	液压
大车行车速度	约 7.5 米/分钟
小车动力	液压
小车上升	液压
小车行走速度	约 7.5 米/分钟
动力电源	380V 3 相 50hz
控制电源	220V 单相 50hz



Technology parameter	
Maximum loading capacity	20ton
Maximum length of aluminum billet	6000mm
Small car drive distance	≥6500mm
Small car top level	1120mm
Small car rise height	70mm
Overall length of car	9500mm
Big car power	hydraulic
Big car drive speed	about7.5m /minute
Small car power	hydraulic
Small car rise	hydraulic
Small car drive speed	about 7.5m /minute
Power supply	380V 3phase 50hz
Control power	220V single phase 50hz

### 6.2. 小车结构及工作方式

小车由钢材焊接通过精密加工而成，小车为两层结构，上层可上升或下降，两层合在一起通过液压驱动前进或后退。当加料时，小车上层下降，前进进入料台，然后上升，将堆放好的铝棒抬离料台，小车后退至正常位置，大车开动至炉口，小车前进，到位后小车下降，将铝棒放于炉内料台，小车后退，完成运输。

#### Small car's construction and working mode

Small car is precision machined by welding steel sheet. It contains two layers; upper layer can up or down; this two layers can together go forward or draw backward drove by hydraulic. When load material, upper layer goes down to go forward into material table, then rise to carry stacked billet from material table. Finally, small car draw backward to normal position, and the big car move to the furnace mouth. Small car goes forwards until in position. Next, small car goes down so as to put billet into furnace material table. Small car draw backward last. All transition finish.

### 6.3. 大车工作方式

大车由钢材焊接，四个大轮行走于地面钢轨，由液压动力驱动，整台车通过收放电缆，由电缆输送动力，大车通过行程开关定位。

加料车用钢材（所有钢材由于生产厂家关系允许出现负公差）

6.3.1 大车车架 450×150×11.5 工字钢、钢轨 38 公斤/米。

6.3.2 大车轮支座 20mm 钢板。

6.3.3 小车侧板 20mm 钢板、连接梁 220×110×7.5 工字钢。

6.3.4 小车面板 10mm 钢板。

#### Big car working mode

Big car is made of steel sheet. Four big wheels travel along on ground rail drove by hydraulic. The whole car transport power by picking and laying cable. Big car locate by travel switch.

Material loading is made of steel (it is allow minus tolerance)

Big car frame 450 ×150×11.5 flange beam, steel rail 38kg /m

Big car wheel support saddle 20mm steel sheet

Small car lateral plate 20mm steel sheet、 tie-beam 220×110×7.5 flange.

Small car front panel 10mm steel sheet.

#### 6.4 电控系统

电控系统将安装于电箱内，放置于料车上方便操作，电控系统控制整台车的动作。

Electric control system

Electric control system is installed inside electric cabinet which is put on the material car for the purpose of operating simply.

## 7. Terms

### 7.1 Payment terms:

Prepayment 40% of total contract should be prepaid.;55% of total contract should be paid before the seller arrange the shipment;The rest 5% of total contract should be paid after the installation of equipment.

### 7.2 Quotation terms:

7.2.1 Quotation valid:Two month;

7.2.2 Delivery time:60 days after received buyer's prepayment;

7.2.3 Trade terms:FOB Chinese Port

### 7.3 Installation&Maintance:

7.3.1 The seller will dispatch Iran local engineers to the site to install supervision and test the equipments after the cargo arrive at the buyer's site.

7.3.2 The buyer should ready workers to assistant the engineer during the installation.

7.3.3 The installation cost shall be paid by buyer directly to the installation team;



