www.billetcasting.com

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billetcasting®

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About Us

Established in 1968, ORMAK TIC. and SAN. continued its journey as ORAY MACHINERY ***(also as Billet Casting)*** *from 1997 onward, expanding its operations in Istanbul/Tuzla until April 2007. Since then, we have been dedicated to serving our clients from our state-of-the-art facility in Gebze-Şekerpınar, boasting a spacious 1250m2 closed area. Specializing in manufacturing and production across various industries, including cement, paper, rubber, steel, copper, aluminum, and the drying sector, we bring decades of sector experience and a skilled team to cater to diverse customer demands.*

Our cutting-edge machining benches, featuring heavy capacity in our machine park, enable us to provide a wide array of equipment tailored to your specific needs. From melting and holding casting furnaces, loading robots, and filtration systems to processing both pure and recycled aluminum, our offerings are comprehensive.

We take pride in manufacturing Hot-top vertical billet casting systems, Automatic billet cutting machines, automatic billet stacking systems, scrap packing presses, Anti-rotative Casting Cylinders, and Homogenization Facilities. Additionally, we offer support and modernization services, and upon request, provide a turnkey Billet Casthouse service.

With 58 years of machining expertise, we consistently uphold the highest standards of workmanship in every project we undertake. At ORAY MACHINERY, we continue to embody a legacy of excellence in the engineering and manufacturing industry.

ORAY
MAKİNA SAN. İNŞ. ve MÜH. TİC. LTD. ŞTİ.

Products and Services

Aluminum Billet Casthouse

Welcome to Billet Casting, your comprehensive solution provider for aluminum billet casthouse equipment. We specialize in manufacturing all the necessary machinery and components required for efficient billet production. From casting tables to cooling systems, our products are meticulously designed and crafted to meet the highest industry standards, ensuring optimal performance and durability.

But our commitment doesn't stop there. In addition to top-quality equipment, Billet Casting offers extensive support services for foundry construction and settlement projects. Our team of experts will guide you through every step of the process, from initial planning to final implementation, to ensure the success of your project.

And with our turnkey solutions, you can trust Billet Casting to deliver a fully operational aluminum billet foundry tailored to your specific needs. From equipment installation to staff training, we take care of everything, allowing you to focus on your core business with confidence.

Choose Billet Casting for all your aluminum billet foundry needs, and experience the difference of working with a trusted partner dedicated to your success.

Short Gallery

Regenerative Melting Furnace

SPECIFICATION

Fuel: Natural Gas, 300 Nm3/h
Pressure at entry: 300 mbar
Calorific value assumed: 3.000 kcal/NM3
Electricity:
380V, 3 phase, 50 Hz
220V, single phase, 50Hz
24V DC for controls
Compressed Air: 8 Bar

COMBUSTION SYSTEM

Total Burner Capacity: 5.000.000 kcal x 2 regenerative burner
Melting Capacity: 2 times charge per day with %50 scrap
3 times charge per day with %5 scrap
Burner Ignition: By spark ignited pilot burners
Flame Supervision: Automatic supervision by ignition
rod and flame relay
Temperature Control: Automatic over bath and roof thermocouples

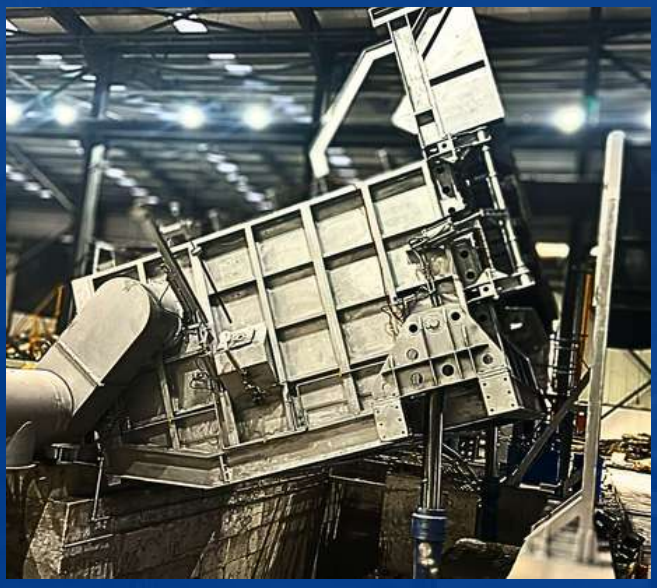
FURNACE DATA

Furnace Type: Tilting Furnace with Regenerative Burner
Liquid Metal Max Capacity: 35 tons
Max Metal Temperature: 780 oC
Average Bath Depth: 650 mm
Door Sill Line Over Bath Level: 100 mm
Number of Doors: 1
Door Operation: Hydraulic
Door Size: 1500mm x 4750mm

AUTOMATION AND ELECTRICAL EQUIPMENTS

Brand: ABB (PLC,AC driver,circuit breaker,contactor)

- All equipment brand will be ABB
- Electrical Panel have air condition system



REGENERATIVE BURNER DESCRIPTION

The furnace will be heated using a pair of regenerative hot air burners, situated in a side wall at an angle to ensure efficient heat transfer to the charge and effective circulation of hot combustion gases within the furnace. A regenerative burner is a combustion heating system that allows for highly efficient recovery of exhaust heat in industrial furnaces.

The regenerative burner system ignites a pair of burners integrated with heat reservoirs alternately at intervals of several tens of seconds. While one burner is active, exhaust gas passes through and heats the heat reservoir of the other burner, recovering the energy of the exhaust gas. Then, when the other burner ignites, the preheated heat reservoir aids combustion air, recovering the energy conventionally wasted in exhaust gas, ensuring high efficiency combustion.

Each burner will have individual air/fuel ratio regulation controlled by valves in the fuel and air lines, as well as control over the burner firing rate. Burners will be ignited by spark-ignited pilot burners, with an ultraviolet scanner mounted on the burners to control the flame, along with a programmed relay unit in a control panel. Combustion air for the main burners and pilot burners will be provided by separate high-pressure blowers, while exhaust gases will be extracted by an exhaust blower. Safety controls, including fuel and air pressure switches, solenoid-operated fuel shut-off valves, purge sequencing, governors, and fuel isolating valves, will be incorporated into the combustion system.

CONTROL PANEL

All necessary equipment for controlling and operating the furnace will be housed in a dust-tight control panel, positioned conveniently adjacent to the furnace. During furnace operation, various conditions, functions, and alarms will be indicated on an annunciator panel integrated into the front of the control panel. An automatic ignition programmer ensures correct ignition sequencing, while furnace temperature control is automatic. In case of furnace roof over-temperature, the safety controller will shut down the burners and sound an alarm.

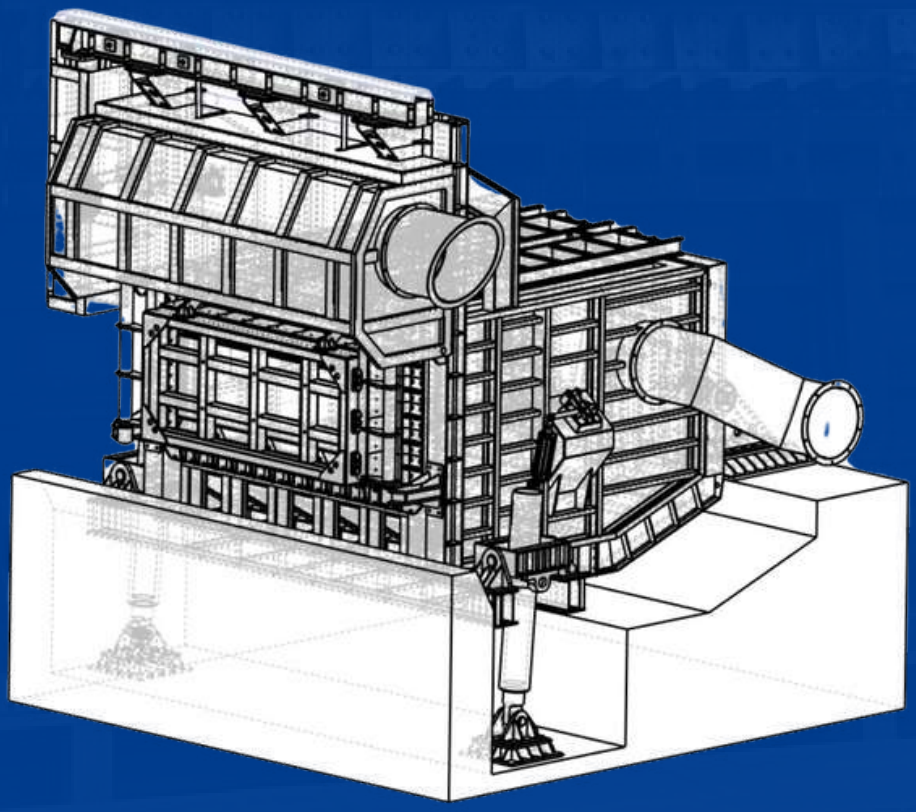
The control panel will feature indicating readouts and control instrumentation for essential operations:

- Bath temperature
- Roof temperature
- Furnace pressure
- Flame failure programming units

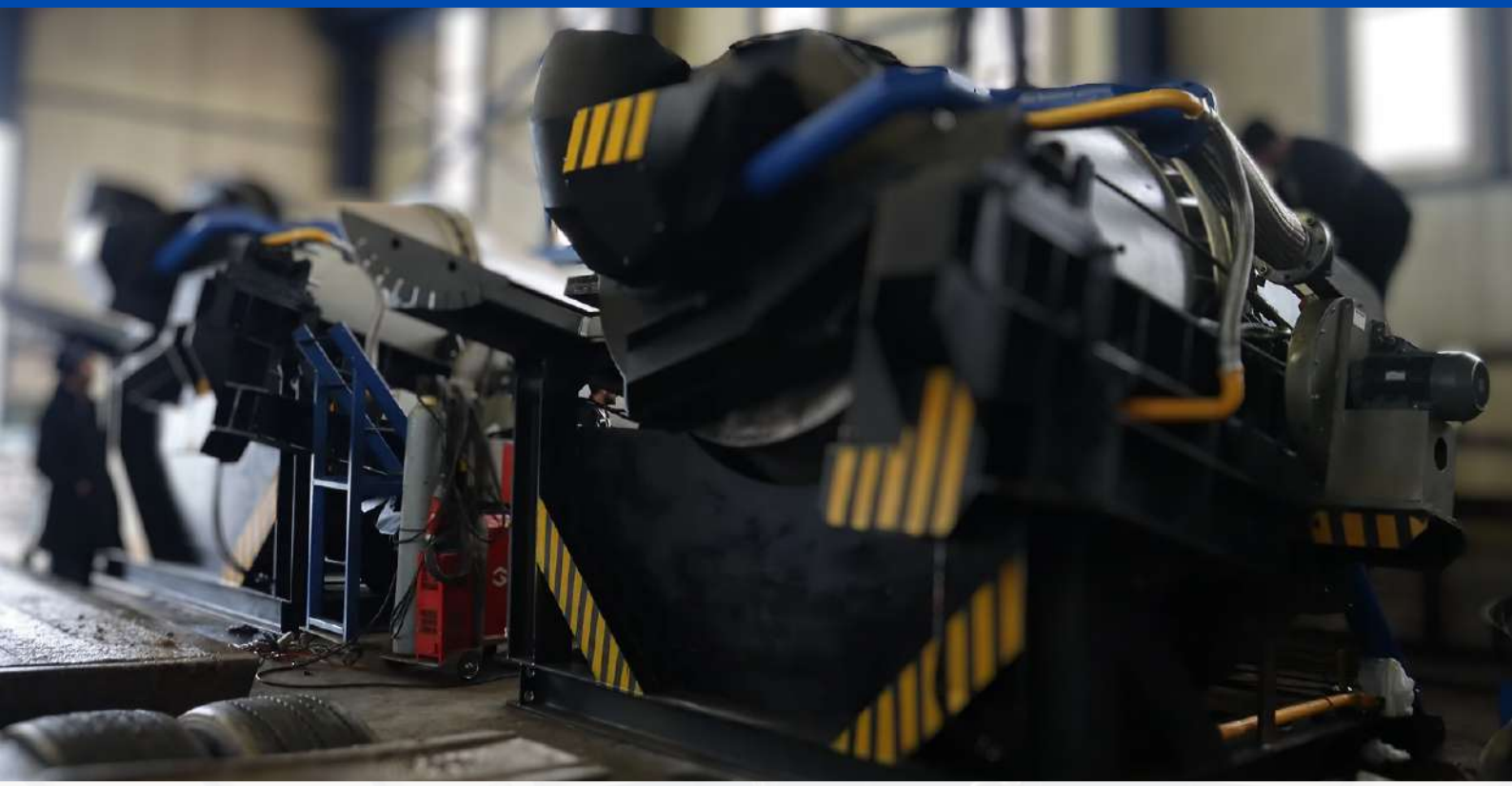
All mains voltage functions, such as transformers and motor starters, will be housed in a separate compartment within the panel. The panel will be fully internally wired with trunking, terminal blocks, and incorporate all necessary lights, buttons, and labels on the front face. The panel will undergo shop testing before delivery.

SCOPE OF SUPPLY

- Combustion system including burners, regenerative beds, heat storage media, combustion air fan, exhaust fan, pilot burners fan, changeover valves, solenoid valves, control valves, flexes, trimming valves, isolating cocks, pressure switches, flame relays, and ignition system.
- Geared motor unit, ceramic seals, limit switches, clamping cylinders, bearings, chains, and chainwheels for the main door.
- Pneumatic actuator bearings and pressure transducer for the damper.
- Pneumatic control, regulation, and conditioning units for the door and exhaust damper.
- Pivot type pouring spout and knuckle assembly.
- Launder metal level float control system.
- Thermocouples for molten metal and roof temperature monitoring.
- Composite suite of panels housing the electrical control safety system.
- Refractory materials.
- Steel fabrication and machined steel components including furnace casing and structural steel, packs and shims, motor brackets, door, door structure, brackets, door frame, balance weight, exhaust duct, and fume hood.



Rotary Melting Furnace



TECHNICAL DETAILS

Electricity: 380 V, 3 phase
220 V, 1 phase
24 V, DC
Fuel: Natural gas, 300 mbar
Furnace Type: Rotatable and Tiltable
Metal Temperature: 700-760 oC max
Liquid Metal Capacity: 15 tons aluminum
Tilt to front degree: 150
Tilt to behind degree: 270
Inner diameter of furnace: Ø2000
Inner diameter of furnace door: Ø1200

Melting Capacity: 3750kg (15 ton) - 2000 kg/hour
Melting Time: 4 hour
Cycle time: 5 hour
Number of casting per day : 4 times
Furnace RPM: 1-4 revulation /min. (with AC driver.)
Tilting System: Hydraulic
Rotating System: Planet reducer Turkish brand (AC driver)
Buner: 2.600.000 FIREOX Proportional Control
Brand of electronic equipments: ABB
Gas Consumption: 100m3/ tons

CONTROL PANEL

Scrap Charging Car

BilletCasting builds scrap charging cars for aluminum melting furnaces in order to optimize the recycling and production processes for aluminum. These charging cars with an innovative camera system, use machine learning and Iot solutions to provide safe and efficient operations in cast houses.
Due to its heavy construction structure, the car can charge 2 to 20 tons of scrap, ingot bundles, or T-bars and is available with diesel or electric motor-driven options. It can be divided into two types based on the following purposes:

1. Charging scrap to the melting furnace ramp (charging table retracted – commonly used in multi-chamber melting furnaces),
2. Feeding scrap into the metal bath of the melting furnace via the pusher plate.

Degassing

BilletCasting runner degassing unit, the amount of hydrogen, which is 0.25-0.30 cc / 100 g, is reduced to 0.15-0.20 cc / 100 g after receiving the gas.
3-5% Cl gas mixture is offered as an option to clean alkaline impurities such as Na, K, Li.

Capacity: 35 ton/hour
Process gas: Ar, N2 (Optional Cl)
Gas injection: with 1 graphite rotor

The degassing unit consists of the following parts :

- 650 kg Liquid Aluminum capacity Crucible
- 1 Graphite Rotor (mounted on the cover)
- Pnomatic Rotor lifting system
- Gas mixing board (N2 / Ar + Optional Cl)

Ladle entrance and exit runners

- Control Board, ABB

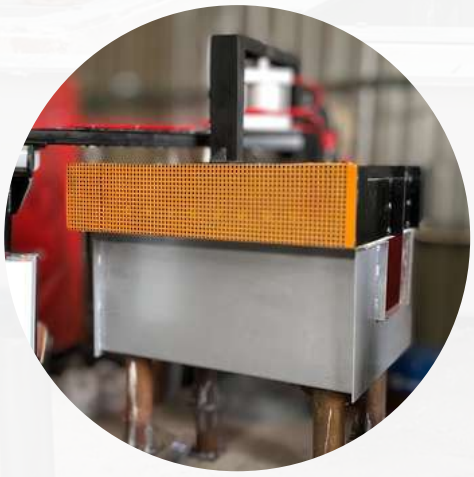
Ceramic Filter Box

BilletCasting designs and manufactures a ceramic filter unit with heater in the desired capacity for molten aluminum filtration.

Ceramic filter chamber: Suitable for Standard 20 " ceramic filter
Capacity: 3-30 Ton / hour molten aluminum.

The unit consists of the following equipment;

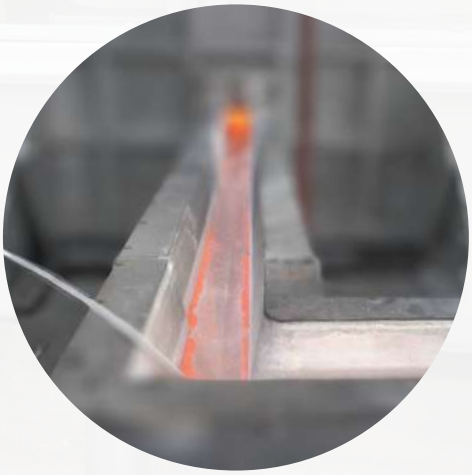
- Refractory lined boat with a capacity of 250 kg,
- Pneumatic driven heater cover,
- Bottom drain hole,
- Electric resistance heater for heating,
- Control panel for Electric Heater,



Ceramic Runners

Ceramic runners enable the molten liquid aluminum material to be transported from the furnace to the casting table. The lower part of the ceramic runner is placed on a steel construction. Between the ceramic runner and the steel construction, the ceramic blanket acts as a pillow. From the top of the construction, the ceramic runner is locked with a bolted steel sheet.

Billet Casting provides the necessary technical data about how the liquid transfer runners should be according to the foundry layout project.

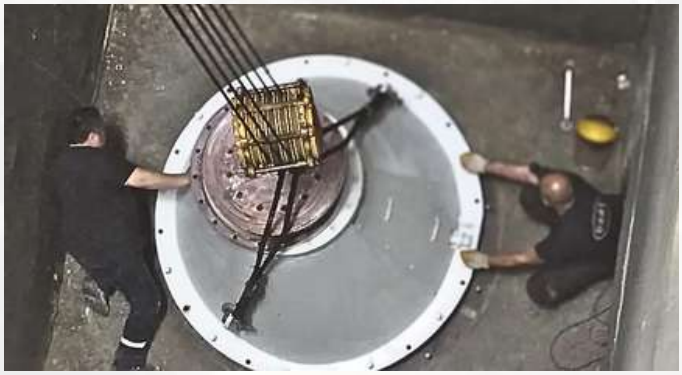


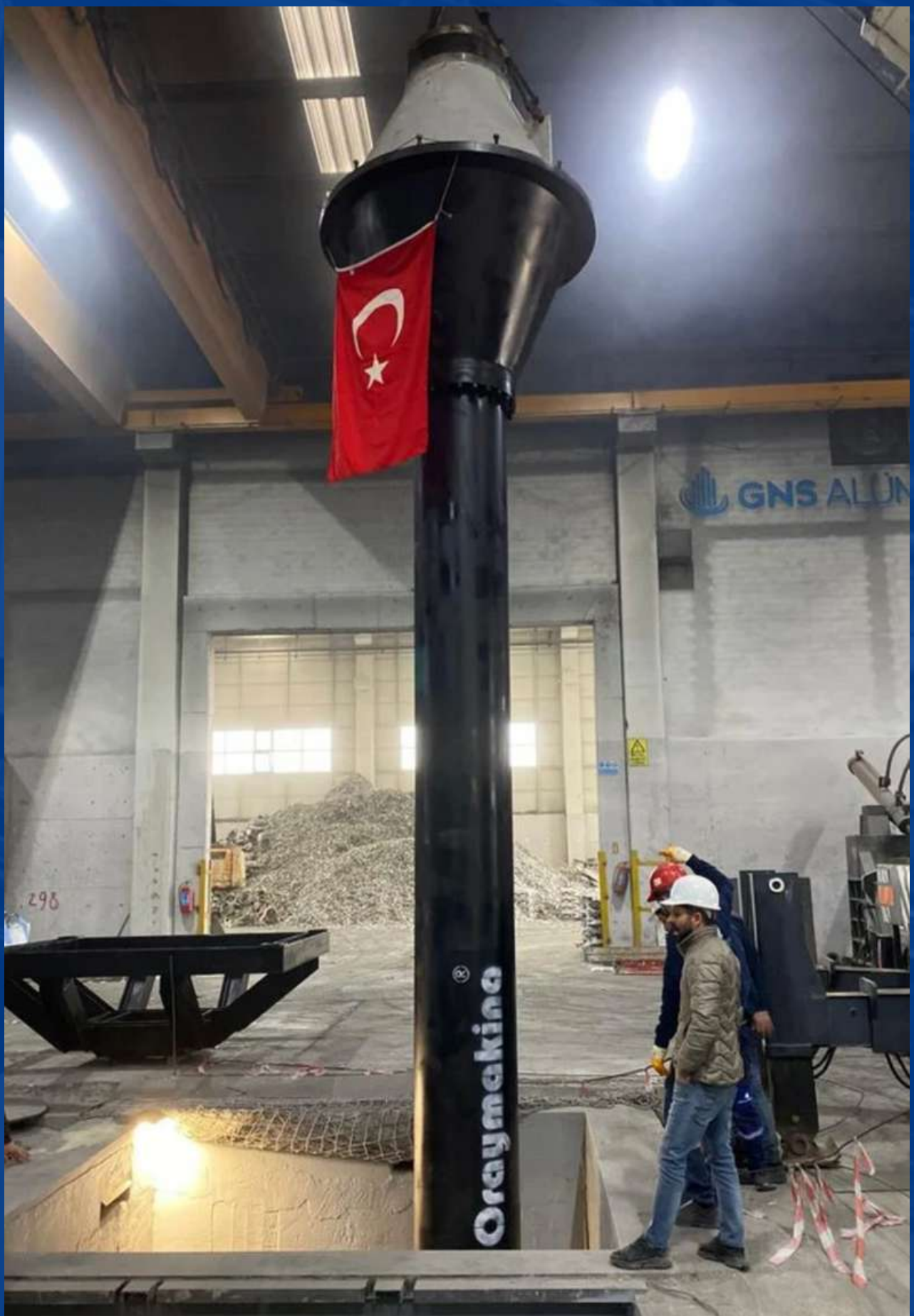
DETAILS

OrCast hydraulic casting piston has been designed by our Turkish Engineers to perform high quality aluminum billet casting by working at a constant speed with a precise speed control, which does not require maintenance for many years.
Our hydraulic piston is designed to be able to cast 6 and 7 meters of billets.
It is a single-acting piston with a rod shaft bearing from itself without the need for rail and bearing elements in the well.
The Orcast casting piston measures the speed and position information of the piston directly over the rod shaft every 3 mm throughout the casting.

DEVELOPMENT PROCESS

The development processes of OrCast began in 2010 in collaboration with TÜBİTAK, led by Mehmet Engin Oray. It was completed in approximately 5 years, with an additional 1.5 years for R&D and manufacturing. The development of our piston was accomplished through intensive work in both software and mechanical aspects.
Our first casting piston was delivered to a customer in 2016, demonstrating high performance and reliability.
Thanks to the OrCast casting piston, which is entirely domestically produced, high-quality casting can be achieved, and real-time information on billet casting length and speed can be obtained. Ready-made records for various diameters with desired casting parameters can be created easily, and special alarms can be set up for operators to receive warnings about the approaching end of casting, facilitating the production of regular and standard billet sizes.
Optionally, water line, water flow, and temperature information can be integrated into our casting panel system. By adapting it, casting parameters can be consolidated into a single control system.

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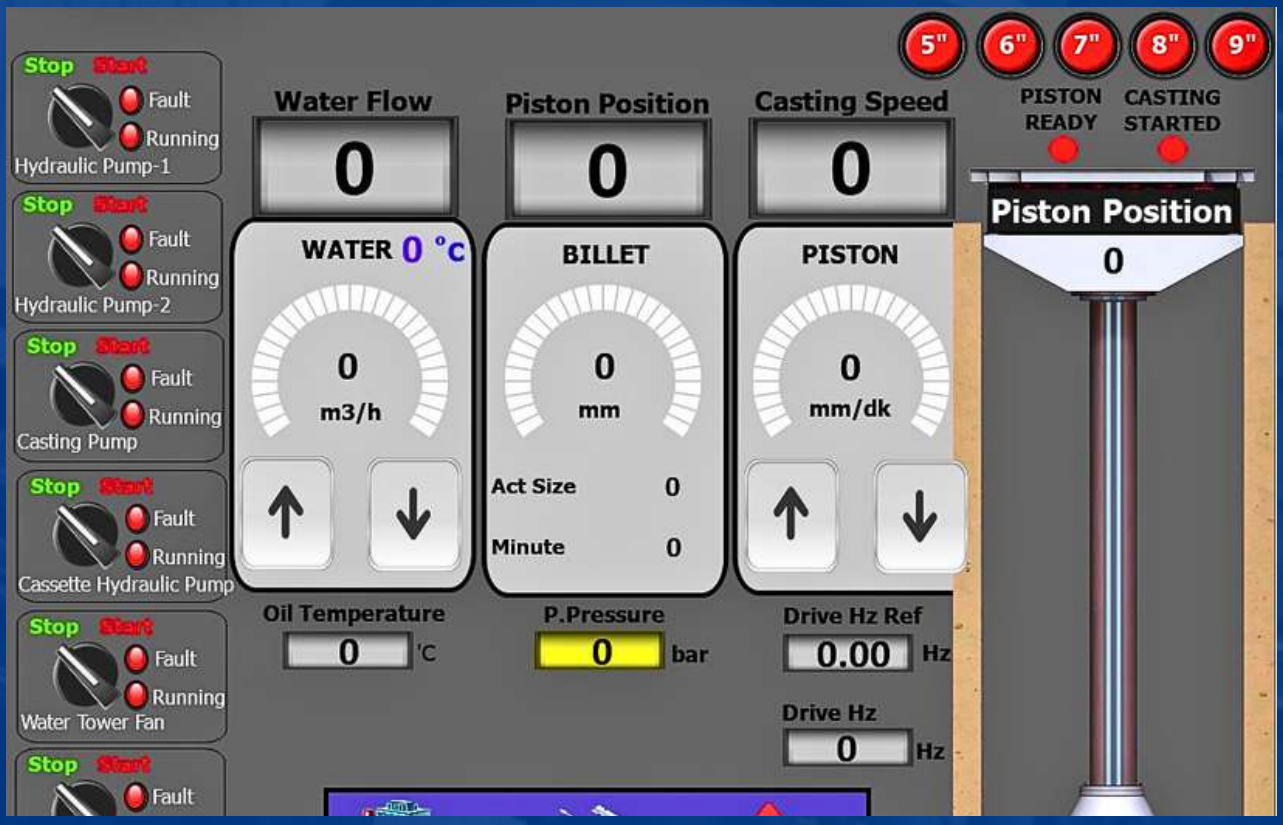
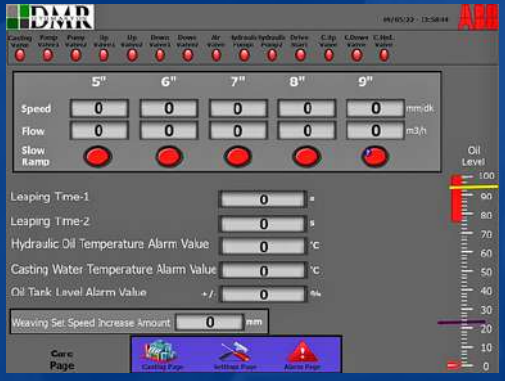
TECHNICAL DATA	
Cylinder Weight	18 ton
Maximum Casting Capacity	30 ton
Stroke	6800mm
Rod Diameter	Ø450mm
Antirotation Tolerance	±2mm for Ø450mm (±0.05°)
Casting Speed Fixing Tolerance	±2 mm/min
Speed Range	30 mm/min – 180 mm/min
Cylinder Upside Movement Speed	800 mm/min

PLC CONTROL PANEL

With the PLC electrical control panel, you can monitor all the necessary information for billet casting live and control it manually when needed. Our control panel features automatic casting software in different inches for each billet diameter. Additionally, there are emergency alarms available for multiple scenarios.

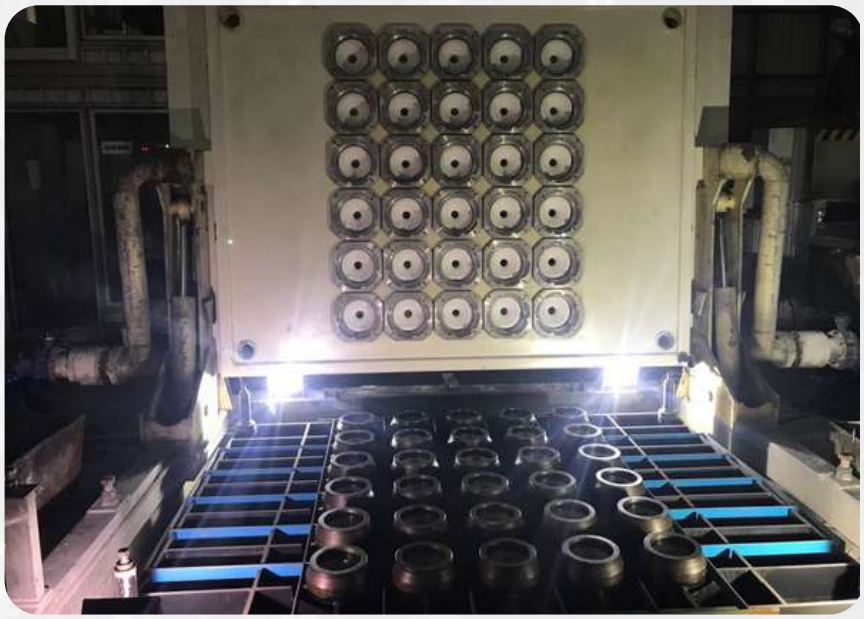




HOT TOP CASTING TABLES

Our Aluminum Billet Casting Tables are designed for excellent results in the aluminum billet casting industry. With designs suitable for all diameters, integrated into furnace volume, and tonnage options, we optimize your production process.

Featuring a water-cooled aluminum mold system, our tables provide stable and rapid cooling for enhanced production efficiency. Superior quality graphite rings and highly insulated, non-metallic ceramics ensure safe and efficient casting operations.
With easily replaceable body design, we enhance production flexibility and ease of maintenance. Our product is meticulously crafted to deliver top performance and durability in the industry.



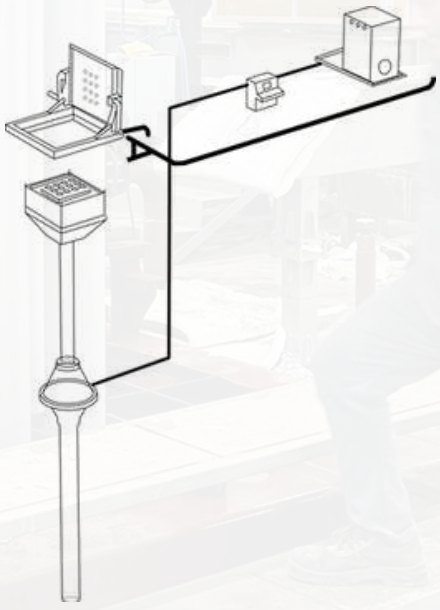
SLAB CASTING TABLES

Explore comprehensive solutions for direct chill (DC) casting of aluminum slabs or rolling ingots. Our range includes consumable products for casting tables, meticulously designed to match OEM specifications. With materials tailored to operational needs, components ensure optimal performance.

We supply leading casting equipment manufacturers and offer in-plant consultations for DC slab casting projects. Trust us for efficient and reliable slab casting solutions.

DC Complete Casting Machine

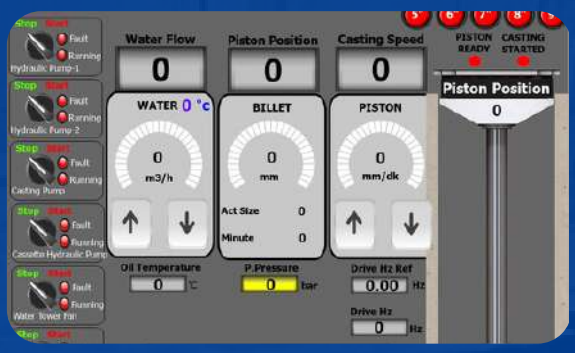
The DC Billet Casting Machine will be used for the semi continuous casting of billets from molten aluminum and aluminum alloys in a vertical casting process. The DC Machine will be designed for heavy duty operation 24 hours per day and 365 days of the year and will incorporate latest state of the art internally guided hydraulic cylinder.



Includes ORCAST Hydraulic Casting Cylinder, Hydraulic Unit, Control Panel, Casting Table, Starter Table, Hydraulic Table Tilter, Steel Prisma, Water Pipes

The hydraulic tilter facilitates the vertical movement of casting tables, operating through two hydraulic pistons. These pistons are connected to two cantilevered arms, universally compatible with all casting tables. Additionally, the water line passes through this assembly, with sealing ensured by rotary seal elements.

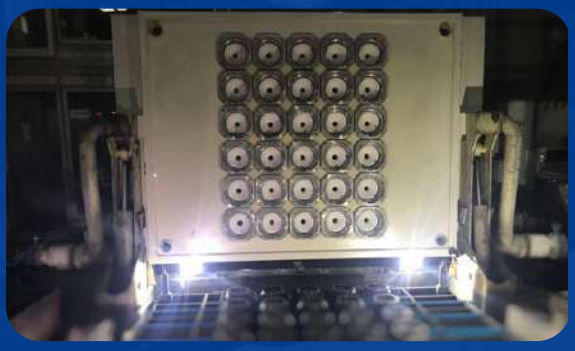
Steel Prisma and Starter Table



Control Screen

Water Cooling Tower and Pipes

Control Panel



Casting Tables

Hydraulic Unit

Homogenisation Furnace

SPECIFICATION

Fuel: Natural gas, 300 Nm3/h
Pressure at entry: 300 mbar
Calorific value assumed: 8,250 kcal/Nm3
Electricity: 380V, 3 phase, 50 Hz
Compressed air: 7 bar

FURNACE DATA

Internal length: 7800 mm
Maximum load length: 7300 mm diameter
Number of circulating fan: 3 x 30,000m3/h @ 125 mm WC
Burner control zones: 3
Burner capacity in each zone: 500,000 kcal/h x 3
Operating temperature range: 550-650°C

FURNACE BODY

The furnace body is made of rolled steel sheet of minimum 5 mm thickness, with St37 quality, and the joints are welded to ensure gas tightness.

To enhance strength and achieve a robust structure, the body is reinforced with profiles in necessary areas. Extra reinforcements are made around openings such as doors and fan mounts.

Around the furnace body, there are platforms, stairs, and guardrails for maintenance and repair purposes.

The load to be annealed will be placed longitudinally inside the furnace on high-strength profiles. These profiles and the rails of the loading cart are securely fixed to the ground.

ISOLATION

- The furnace ceiling, floor, and walls covered with insulation material to minimize heat loss.
- The warm face of the walls covered with a 50mm thick ceramic fiber blanket with a density of 128 kg/m3, while the back covered with a 200mm thick rock wool with a density of 100 kg/m3.
- Insulation panels stacked on top of each other without leaving any gaps at the joints and fixed to the outer shell with 304-grade stainless steel plates, with thicknesses of 2mm and 3mm. Additionally, a 15mm x 150mm x 150mm stainless steel 304-grade material used for the door frame.

CIRCULATION FANS

- Each zone of the furnace equipped with one circulation fan. These circulation fans mounted on steel chassis on the side walls in a manner that ensures a robust structure and allows for easy removal when needed.
- Automatic speed-controlled fans will select the speed according to the furnace temperature.
- Fan rotors and shafts will be manufactured from 310-grade stainless steel. Fan shafts supported at two points outside the furnace body.
- The function of circulation fans is to ensure rapid circulation of hot combustion gases within the furnace. This circulation not only homogenises the temperature distribution inside the furnace but also contributes to increasing the rate of heat transfer, thereby reducing the heating time.
- The selection of circulation fan capacity is proportional not to the amount of load inside the furnace, but to the dimensions of the area through which the gases will circulate inside the furnace. The focus here is on the velocity of hot gases passing over the load.

DOOR MECHANISM

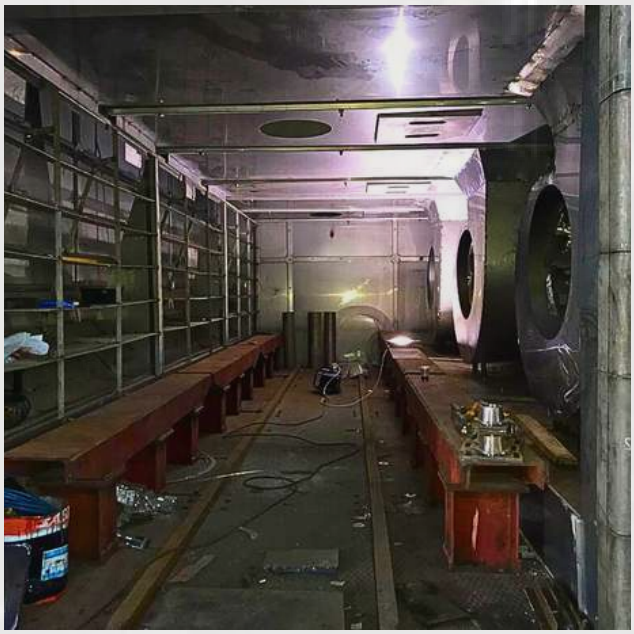
- The guillotine-type door, made of steel sheet, is placed at the front of the furnace. It's reinforced with rolled steel profiles, insulated similarly to the body, and covered with stainless steel sheet.
- The vertical movement of the door is achieved through an internally-braked gearbox motor.
- The door is hanging by two chains passing over sprockets on a steel chassis attached to the furnace.

NATURAL GAS EQUIPMENT

- Major equipment in the natural gas installation is sourced from DUNGS (German) brand.

CONTROL PANEL

- The control panel consists of a floor-mounted type, protected against dust and moisture, housing all control and monitoring devices, motor starters, necessary lamps, warning lights, fuses, relays, buttons, and similar equipment for the furnace.
- System controls are performed through the touchscreen interface of the Touch Panel. Users can record different processes for various materials and recall these processes without needing to readjust them whenever necessary.
- All drivers and other major electronic equipment are from the ABB brand.



Cooling Chamber

SPECIFICATION

Nominal Capacity: 17 Tons
Width of Door Opening: 2200 mm
Overall Length: 7000 mm
Motor Size: 30 KW
Initial Cooling Rate: 300°C/h
Inside Length: 7800 mm
Overall Width: 4500 mm
Cooling Fans: (3x 60,000 m3/h)
Time To Cool Charge: 3.5 hours
Electric Supply: 380 V 3 ph 50 Hz

DESCRIPTIONS

The cooling chamber will be fabricated from 4 mm thick steel plate, reinforced with steel sections, to form a rigid floor mounted unit.
The load would be supported on heavy duty rolled stell beams, arranged longitudinally on vertically mounted tubular stools, in a similar configuration to the furnace hearth. Access would be via a roller shutter door.

Charging Car for Homogenisation Furnace

SPECIFICATION

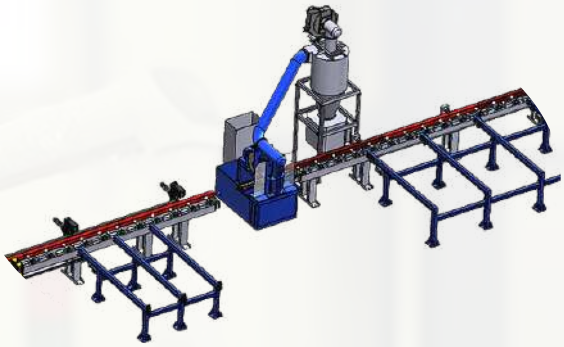
Maximum Load: 15-30 Tons
Maximum Width of Charge: 1800 mm
Width of Load Carriage Platform: 1400 mm
Number of Road Wheels: 6
Diameter of Road Wheels: 500 mm
Traverse Drive Motor: Hydraulic
Load Carriage Lift: Hydraulic
Load Carriage Lift Speed: 10 seconds
Maximum Length of Charge: 7400 mm
Fork Extension: 7600 mm
Load Carriage Lift: 70 mm
Centres of Road Wheels: 2500 mm
Overall Length: 9000 mm
Traverse Drive Speed: 10 m/min
Load Carriage Drive Motor: Hydraulic
Load Carriage Drive Speed: 6 m/min

GENERAL DESCRIPTIONS AND WORKING PARAMETERS

The loading cart designed with overhead transfer capability and made from strong rolled steel profiles for durability.
There's an operator platform in a distant corner of the furnace. It has a control panel and is shielded by a heat-resistant curtain.
Horizontal movement is powered by wheels driven by hydraulic gearboxes, supported by shafts and bearings on the main frame.
The carrier platform is supported by wheel units and driven by a hydraulic motor connected to the driving gearbox.

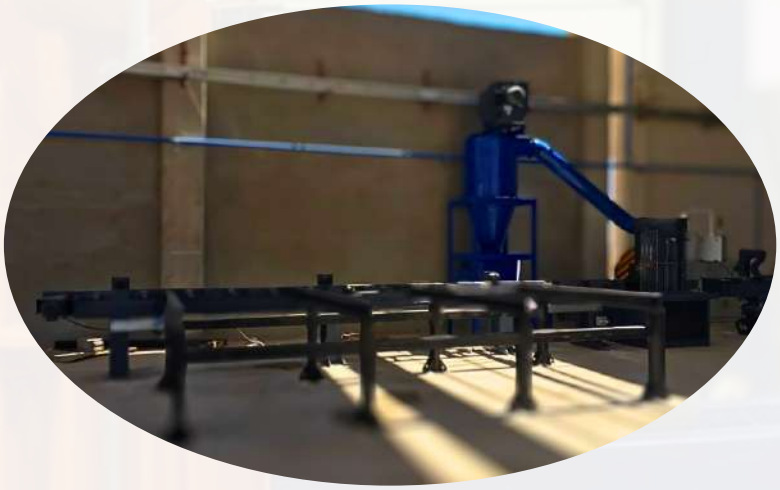
Automatic Billet Cutting Saw

Billet Casting produces fully automatic billet saw machine with double conveyors, which can cut up to 10'' billets, supported by PLC system. After installing billet, all processes run fully automatically. And you can also control these processes from the electrical panel. It also automatically collects the chips in the chip collection body for recycling.
We produce according to your request in the size we specify and according to the design you want.



SPECIFICATIONS

Diameter of Saw : Max 700 mm
Thickness of Saw : 4mm
Drive Motor of Saw : 11 kW@2800 rpm
Cutting force : 2 tons by hydraulic cylinder
Clamping force : 2 tons by hydraulic cylinder
Cutting speed : 25 mm/sec max adjastable
Entry conveyor : 7000 mm drived
Exit conveyor : 7000 mm drived
Billet Sizes : 4-5-6-7-8-9-10''
Chips Collector System : with air fan



Ingot Casting Conveyor

TECHNICAL DETAILS

Model: KONV7-250-5

Sizes: 2.100 x 2.100 x 12.000 mm. (G x Y x U)

Mold numbers: 250

Max. Capacity: 5-10 ton/h

Weight aluminium of each molds: 7 kg.

Cooling System: Air

Mold Materials: GGG40

CONSTRUCTION

Conveyor steel construction is durable.

INGOT MOLDS

Ingot Molds GGG 40 ductile iron will be produced.

DRIVE UNIT

The torque and speed units of the drive unit will be selected to match the machine. Conveyor speed is inverter controlled. This inverter can be programmed so that the acceleration and deceleration work can be adjusted according to the requirements.

CONVEYOR CHAIN

Chain rollers and pins are nduction hardened to strengthen their strength.




CYCLONE UNIT

Capacity: 70.000 m3/h
Cyclone Diameter: ∅ 1400mm x 4 pcs
Body: 3mm thickness ST 37,2 sheet material
Powder discharge: Powder discharging by 2 pcs rotary valve

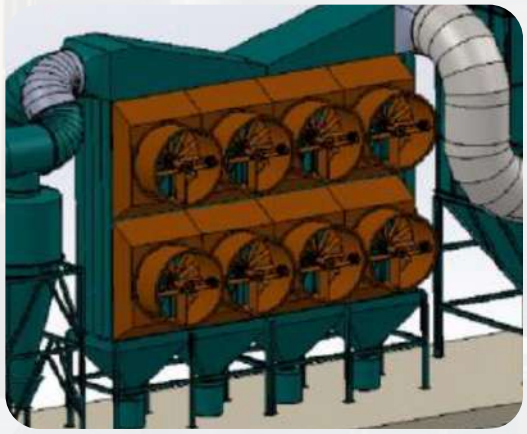
BAG FILTER SYSTEM

Model: BFS-80 Jet pulse bag types
Capacity: 70.000m^3/h
Body: 3mm thickenss ST 37,2 steel sheet metarial
Filter working condititons: -10°C , +150°C continous
Filter surface area: Ø160mm x 3600mm x 432pcs
Filter Types: Ø160x3600mm 432 bags
Filter Cage: Ø160x3600mm size electro galvinized wired
Explosion Valve: 1 ½ " size 24V DC 36pcs SMS Tork - Duravis
Powder discharge: Powder discharging by 1 pcs spiral conveyor and 1 pcs rotary valve
Cleaning shape: Jet pulse cleaning system with air pressure.

FAN UNIT

Capacity : 70.000m^3/h
Pressure : 480mmSS
Motor : 132 kw
Drive Shape : Direct contact
Rpm : 1470d/min
Electricity : 400V / 3P / 50Hz
Noise Level : 89dBA
132kw Delta brand AC softstart driver

FAN COOLER



3 pieces of 12,000m3/h cooling fans used. A total air flow rate of 36,000m3/h used. 40 cooler pipes with a diameter of 200 mm and a height of 4 meters used.
Fans will operate in 3 stages.
Stage 1 will operate when the temperature reaches 80°C.
Stage 2 will operate when the temperature reaches 100°C.
When the 3rd stage temperature reaches 120°C, the emergency flap will open.

Control Panel

Fan Control Driver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