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Turnkey Projects



TOTAL SOLUTION FOR
INTEGRATED STEEL PLANT
Worldwide



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ET **ELECTROTHERM**
Engineering & Projects Division



THE GENESIS

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A young Electrical Engineer Mr. Mukesh Bhandari wanted to change the world of secondary steelmaking through Induction route in early '80s. The world opposed, but he had a purpose, a clear vision and strong determination. He established Electrotherm (India) for manufacturing Induction Melting Furnaces, which were used only in foundry industry till then. He customized it for steelmaking application, a move that was even denounced by all other contemporary induction furnace manufacturers. Today, around 70 million tons of steel is produced through Induction route around the world, thanks to the initiatives of Electrotherm. And no wonder all those who were opposed to steelmaking through Induction route had no alternative but to follow the suit, or vanished eventually.

The journey of Electrotherm that began in 1983 was based on openness for ideas, eagerness to innovate, supplemented by in-house research & development and focus on customer-centric product and process development. Electrotherm kept designing and manufacturing larger capacities furnaces, suitable refining equipment like ladle furnaces and metal refining converters, high speed continuous casting machine and various gadgets for improving productivity and quality of steel produced. It incorporated mechanized charging system and high-end plant automation with SCADA and DCS for reducing dependency on manpower, introduced proper fume capturing and de-dusting system for making steel plant through Induction Furnace route a cleaner affair.

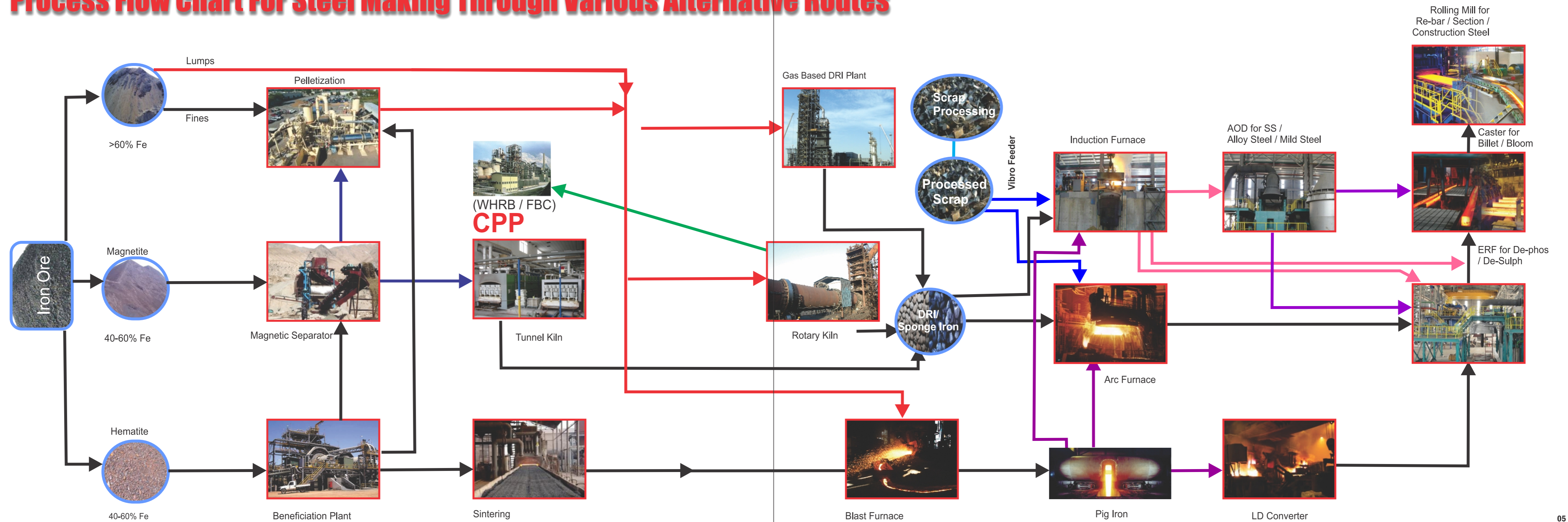
'Always innovate for a better tomorrow' has not only been the mission of the company, it has been the way of life all through its journey. After developing larger capacity melting furnaces, refining and casting equipment, Electrotherm once again raised the bar on technological front by launching DIFOC® based DTi series of Induction Furnaces in March 2017. This significantly superior product, the most energy efficient induction furnace in the world, has positively impacted steelmaking segment (through induction furnace route) in the country and around the world lowering the cost of steelmaking substantially and enhancing productivity as well.

Turnkey projects through Induction Furnace route was another giant leap Electrotherm took as early as in year 2000 when it executed a mini steel plant project in Zimbabwe. Since then it has made several turnkey projects for steelmaking in Turkey, Iran, Iraq, Saudi Arabia, Pakistan, Bangladesh, Nigeria, Uganda, Algeria and several other countries around the world. Other manufacturers have again no alternative but to follow the path, sooner or later!

Today, Electrotherm is an ISO 9001:2015 certified, public limited business conglomerate with interest in Engineering, Steel, Ductile Iron Pipe, Electric Vehicle, Renewable Energy, Transformer, Transmission Line Tower, Education, etc. It is the first company in India to make battery operated two-wheelers in line with company's commitment towards environment. 'No Engine No Pollution' is the philosophy behind it, and in order to promote green energy initiative of the nation, it established Renewable Energy division as well.

The Engineering & Projects (E&P) division of Electrotherm, which caters to the needs of steelmaking, foundry and heat treatment industry, is particularly renowned for providing end-to-end total solutions for steelmaking plants up to 1 MTPA capacity through various alternative routes, supplying sturdy and highly efficient plant and machinery supplemented by best in the industry after-sales-services to its customers around the world. It has installed its equipment in 56 countries spread over four continents with major focus on Middle East Asia, African Continent and Indian Sub-continent. Moreover, Electrotherm (E&P) is the only Indian company having CE marking for its Induction Furnaces, LRF and MRK, certified by UL Laboratories, USA for export to European countries.

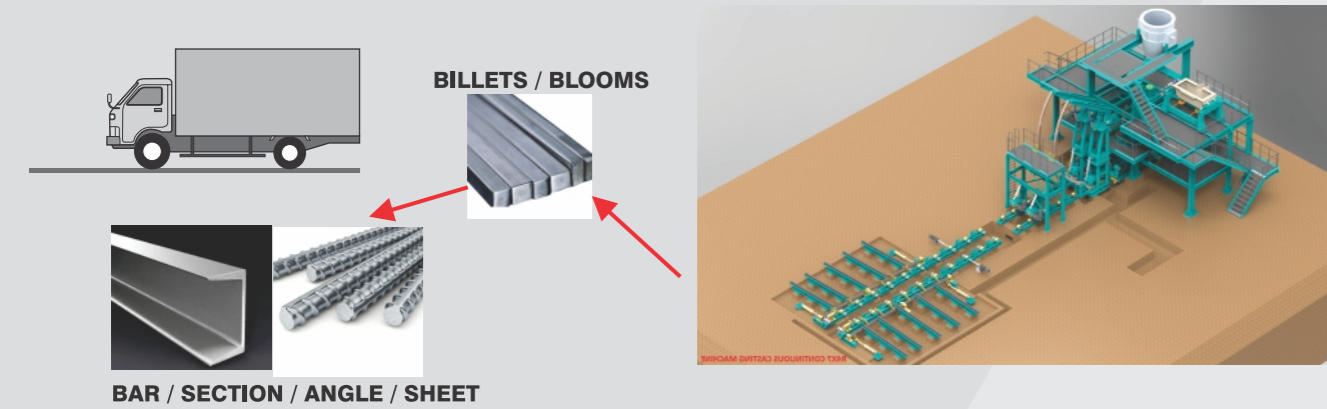
Process Flow Chart For Steel Making Through Various Alternative Routes



PROCESS FLOW CHART FOR STEEL MAKING THROUGH INDUCTION FURNACE ROUTE

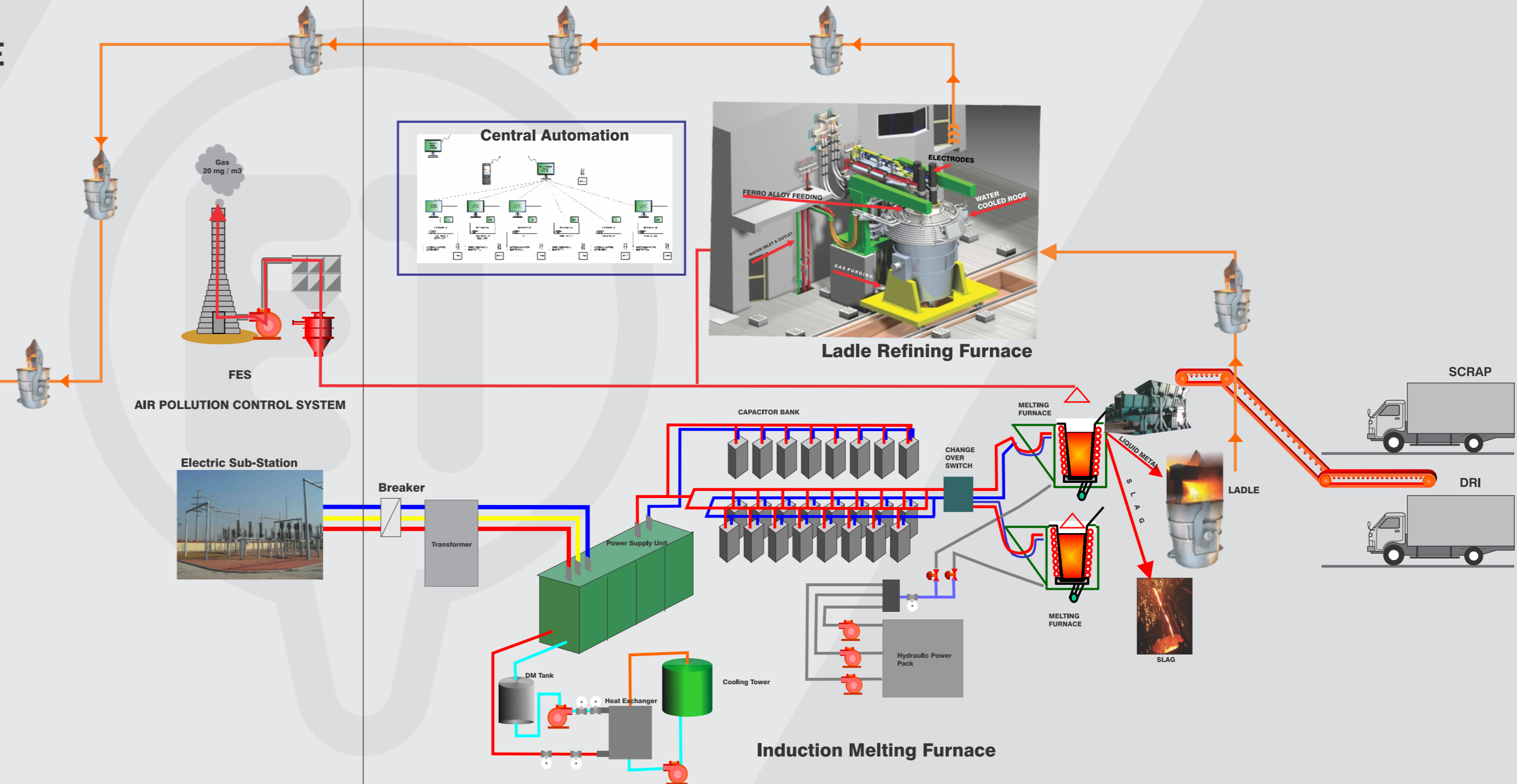
Electric Induction Melting Furnace, Metal Refining Konverter, Ladle Refining Furnace and Continuous Casting Machine combined together with host of other supporting machinery viz. Electrical and Cooling System, Material Handling System, Pollution Control System, Laboratory etc. make the most economically viable route for producing plain carbon steel / alloy steel / stainless steel billet / bloom, which can be further rolled in a Rolling Mill to produce long steel products. Electrotherm (India) Limited has executed various projects on turnkey basis through this route across the globe.

CONTINUOUS CASTING MACHINE



OUR PRODUCTS

- ▶ INDUCTION MELTING & HOLDING FURNACE
- ▶ METAL REFINING KONVERTER
- ▶ ELECTROTHERM REFINING FURNACE
- ▶ CONTINUOUS CASTING MACHINE
- ▶ TRANSFORMER
- ▶ COAL BASED DRI PLANT
- ▶ AIR POLLUTION CONTROL SYSTEM
- ▶ TURNKEY PROJECTS



Induction Melting & Holding Furnace

The core of any steel melt shop is melting furnace and we are pioneer in making Medium Frequency Induction Melting Furnaces. We have maintained leadership in designing, developing and manufacturing the largest and most efficient Induction Melting Furnaces right since our inception in 1983.

Ratings: 15 KW to 40000 KW

Capacity: 1 Kg to 50 ton



Metal Refining Konverter (MRK)[®]

Metal Refining Konverter (MRK[®]) is metallurgical equipment used for decarburizing high carbon steel to produce stainless steel, low carbon alloy steel and even plain carbon steel. MRK is an improvised version of conventional Argon Oxygen Decarburization (AOD) process for economical steelmaking.

Capacity: 10 ton to 150 ton



Electrotherm Refining Furnace[®]

Electrotherm Refining Furnace (ERF[®]) with ELdFOS[®] technology is a specially designed equipment for de-phosphorization, de-sulphurization, degassing, removal of solid inclusions and homogenization of temperature of liquid steel for producing high quality steel using even poor grades of raw materials.



Continuous Casting Machine

Electrotherm developed High Speed Modular Caster for existing ingot making plants with smaller shed height and / or smaller capacity furnaces. This caster is suitable for heat size as small as 5 ton and modules are available for casting sections from 80 mm x 80 mm to 160 mm x 160 mm. Large radius and multi-point straightening Bullet Caster are specially designed for casting larger sections at very high throughput and lowest possible operating cost. Electrotherm casters are most suitable for direct rolling of hot billets without any intermediate re-heating.



Air Pollution Control System

Electrotherm developed state-of-the art Air Pollution Control System specially designed for induction furnaces based steelmaking plants. The APC system is highly effective and efficient without interfering continuous feeding to the furnace and meets stringent exhaust gas norms of the country of installation. For sophisticated foundries and steelmaking plants with high quality scrap, double acting fume hood integrated with modern scrap feeding system is also available which captures fumes even during scrap charging and tapping of the liquid steel.



Coal Based DRI Plant & Captive Power Plant

Electrotherm's Coal-based Direct Reduced Iron (DRI) making plant through Rotary Kiln (SL/RN Process) with versatile design adaptable to use wide range of raw materials' grades enables integrated plants to produce alternative raw material for steelmaking. The flue gas is utilized to generate power through Waste Heat Recovery Boiler and plant is made pollution-free with highly effective dust suppression, collection and filtering system.





**ESC Erbil Çelik Sanayi
Insaat İç ve Dis. Tic. Ltd. Sti.
(Erstwhile Erbil Steel Co.),
Iraq**

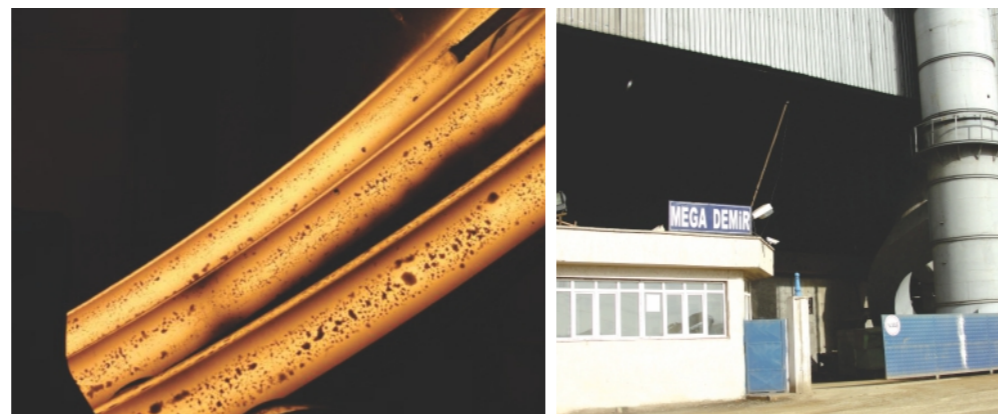
Erbil steel company is one of the most prominent heavy industry investment in Kurdish region of Iraq and produces steel bars for use in construction industries. Electrotherm built this 220,000 TPA capacity steelmaking plant in a very difficult terrain through two sets of 10 MW / 25 ton Induction Furnaces, 30 ton Ladle Refining Furnace, 3-strand 6/11 meter radius Caster with complete electrical and cooling system, material handling system, laboratory and other technological equipment in the year 2007.



**Egemen Metalurji San. ve Tic. A.Ş.
(Erstwhile Mega Demir
Mamulleri San. ve Tic. Ltd. Sti.),
Turkey**



Electrotherm commissioned 200,000–220,000 TPA capacity steel melt shop through two sets of 10 MW / 25 ton Induction Furnaces and 30 ton Ladle Refining Furnace with electrical and cooling system in 2008. Capacity of this plant was extended to 300,000 TPA in 2014 and further expansion is currently underway to make it a 400,000 TPA by adding 4th set of Induction Furnace.





**Platinum Demir Çelik San. Tic. A.Ş.
(Erstwhile Ilhan Metalurji
Endustrisi A.Ş.), Turkey**

Electrotherm commissioned 200,000 – 220,000 TPA capacity steel melt shop through two sets of 10 MW / 25 ton Induction Furnaces and 30 ton Ladle Refining Furnace with electrical and cooling system in 2008.



**Bilecik Demir Çelik
San. ve Tic. A.Ş.
Turkey**



Electrotherm executed 200,000 – 240,000 TPA capacity steelmaking plant through two sets of 10 MW / 25 ton Induction Furnaces, 30 ton Metal Refining Konverter (AOD), 7 MVA / 30 ton Ladle Refining Furnace, 3-strand 6/11 meter radius Caster with complete electrical and cooling system, material handling system, laboratory and other technological equipment. This plant was commissioned in 2009.

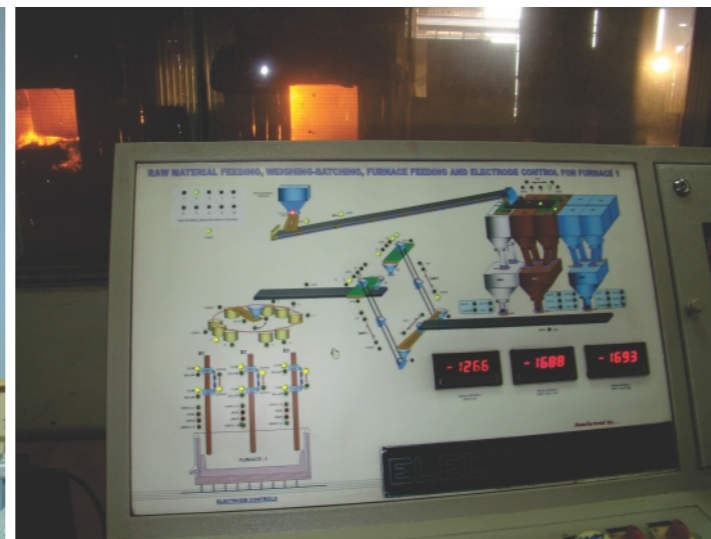




Bahrain Ferro Alloys Bahrain

SUBMERGED ARC FURNACE FOR FERRO ALLOY MAKING

Electrotherm commissioned this world class ferroalloy making plant through a 16.5 MVA Submerged Arc Furnace in Gulf Region for producing ferrochrome, ferromanganese and ferrosilicon in 2007, and since then its capacity has been further enhanced.



**Surendra Mining
Industries Pvt. Ltd.
India**



From concept to commissioning, this plant was built by Electrotherm with two sets of 6 MW / 15 ton Induction Furnaces and 2-strand High Speed Modular Caster, complete electrical and cooling system, material handling system, air pollution control system, laboratory and all technological equipment in 2014.



Kabkan Steel Company Iran



Electrotherm built this 75,000 – 80,000 TPA capacity steelmaking plant around an existing rolling through one set of 7.5 MW / 20 ton Induction Furnace, 25 ton Ladle Refining Furnace, 2-strand 6/11 meter radius Caster with all electrical and cooling systems. This plant came into operation in 2009.





Kavir Damghan Steel Company (KADASCO) Iran



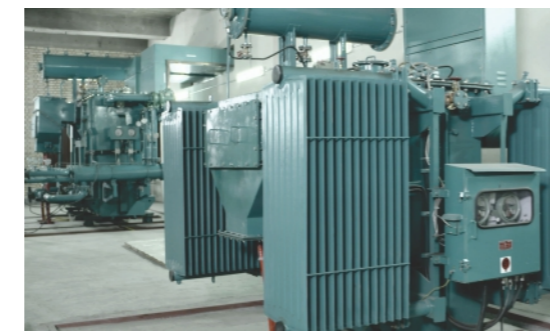
The first phase of KADASCO, consisting one set of 10 MW – 1250 KW / 25 ton Induction Furnace, 2-strand 6/11 meter radius Caster (with provision for 3rd strand) with complete electrical and cooling system, material handling system, air pollution control system, laboratory and all technological equipment, was commissioned in 2016. This plant is designed to produce 100,000 – 120,000 TPA billets / blooms. Besides melt shop, a 350 TPD coal based DRI (sponge iron) plant is under execution for producing raw material for steelmaking.



Shahroud Steel Company Iran



First phase of this plant, consisting of one set of 12 MW – 1250 KW / 25 ton Induction Furnace, 2-strand multi-radius Bullet Caster (with provision for 2 more strands) with complete electrical and cooling system, material handling system, air pollution control system, laboratory and all technological equipment, was commissioned in 2017. The plant is capable of producing 120,000 – 140,000 TPA of billets / bloom.



**Bisotoun Steel Company
Iran**



Steelmaking plant of 200,000 – 280,000 TPA capacity consisting of two sets of 12 MW – 1.5 MW / 30 ton Induction Furnaces, 7.5 MVA / 35 ton ERF, 2-strand multi-radius Bullet Caster (with provision for 2 more strands) with complete electrical and cooling system, material handling system, air pollution control system, laboratory and all technological equipment, has been commissioned in 2018. Electrotherm is also executing a 500 TPD coal based DRI plant with 12 MW captive power plant through waste heat recovery boiler (WHRB) to make it a fully integrated plant



**Alvand Foolad Arya
Iran**



Electrotherm executed 60,000 TPA capacity steelmaking plant based on 5 MW / 12 ton Induction Furnace, High Speed Modular Caster complete with electrical and cooling system and some material handling equipment in 2016.





**Watani Iron Steel Company
Kingdom of Saudi Arabia**

Electrotherm commissioned one of the largest Induction Furnace based steel melt shop in GCC region for producing 360,000 TPA of steel with three sets of 12 MW – 1.5 MW / 30 ton Induction Furnaces in year 2015.





Darfala for Iron Melting & Steel Manufacturing Kingdom of Saudi Arabia

Electrotherm commissioned 40,000 – 50,000 TPA capacity plant based on one set of 4 MW/ 10 ton Induction Furnace, High Speed Modular Caster with complete electrical and cooling system, material handling system, air pollution control system, laboratory and all technological equipment in 2015.



**Othman A. Al-Usaimi & Partner
Factory for Iron & Steel
Kingdom of Saudi Arabia**



Electrotherm executed 50,000 – 60,000 TPA capacity steel melt shop consisting of 5 MW/ 12 ton Induction Furnace, High Speed Modular Caster with complete electrical and cooling system, material handling system, air pollution control system, laboratory and all technological equipment from concept to commissioning. The first phase of the plant was commissioned in 2015 and second phase is under execution for doubling the production capacity of the plant.





Electrotherm executed 100,000 – 120,000 TPA capacity plant based on set of 10 MW / 20 ton Induction Furnace, 2-strand High Speed Modular Caster with complete electrical and cooling system, material handling system, air pollution control system, laboratory and all technological equipment. The plant has been commissioned in 2018.

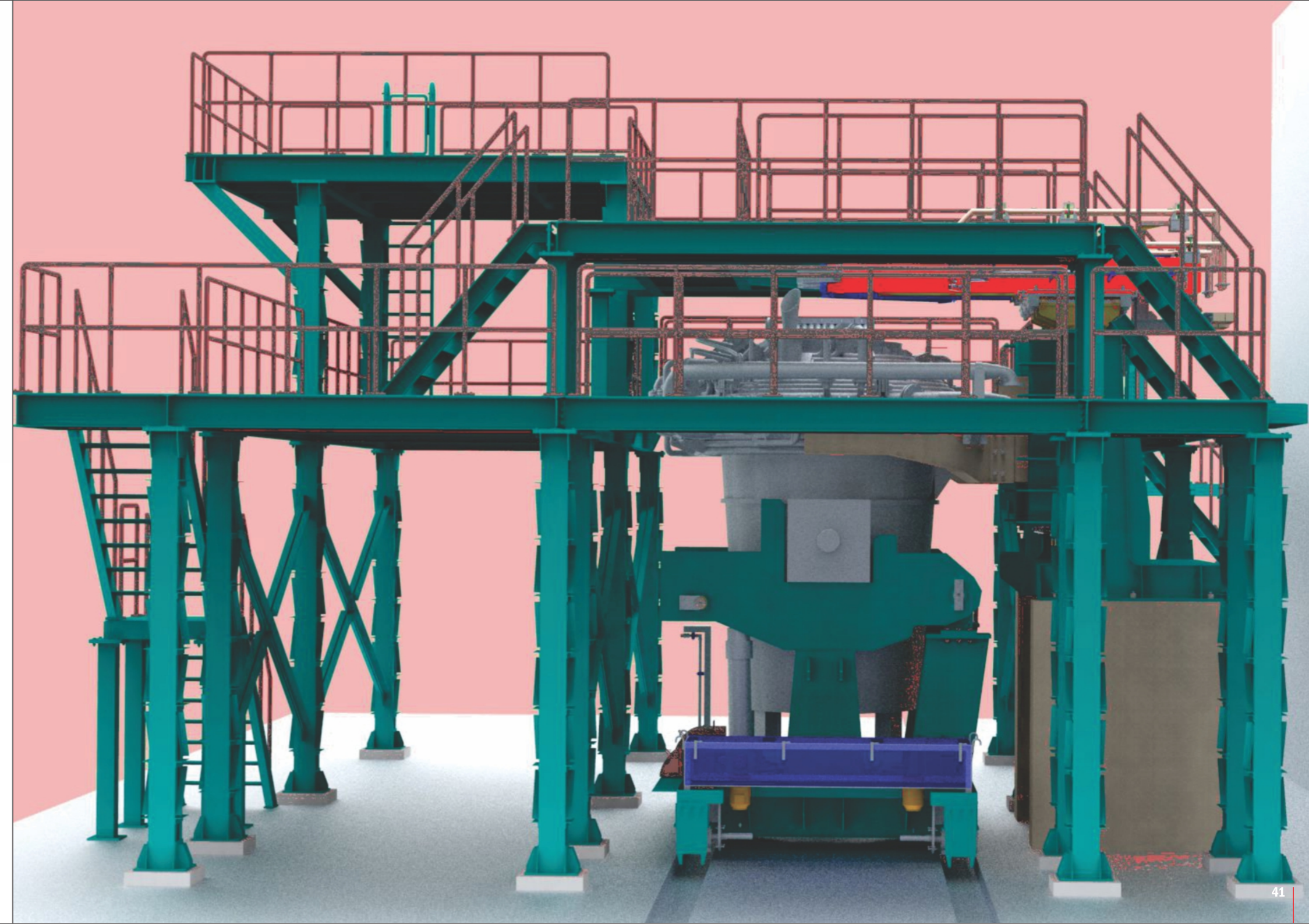




First of its kind re-bar plant of 250,000 TPA capacity in North Africa through two sets of 12 MW / 30 ton Induction Furnaces, 35 ton ERF, 2-strand multi-radius Bullet Caster complete electrical and cooling system, material handling system, air pollution control system, laboratory and all technological equipment, together with Rolling Mill is under execution and is expected to come into operation in 2019.



Photos given are from existing working plants

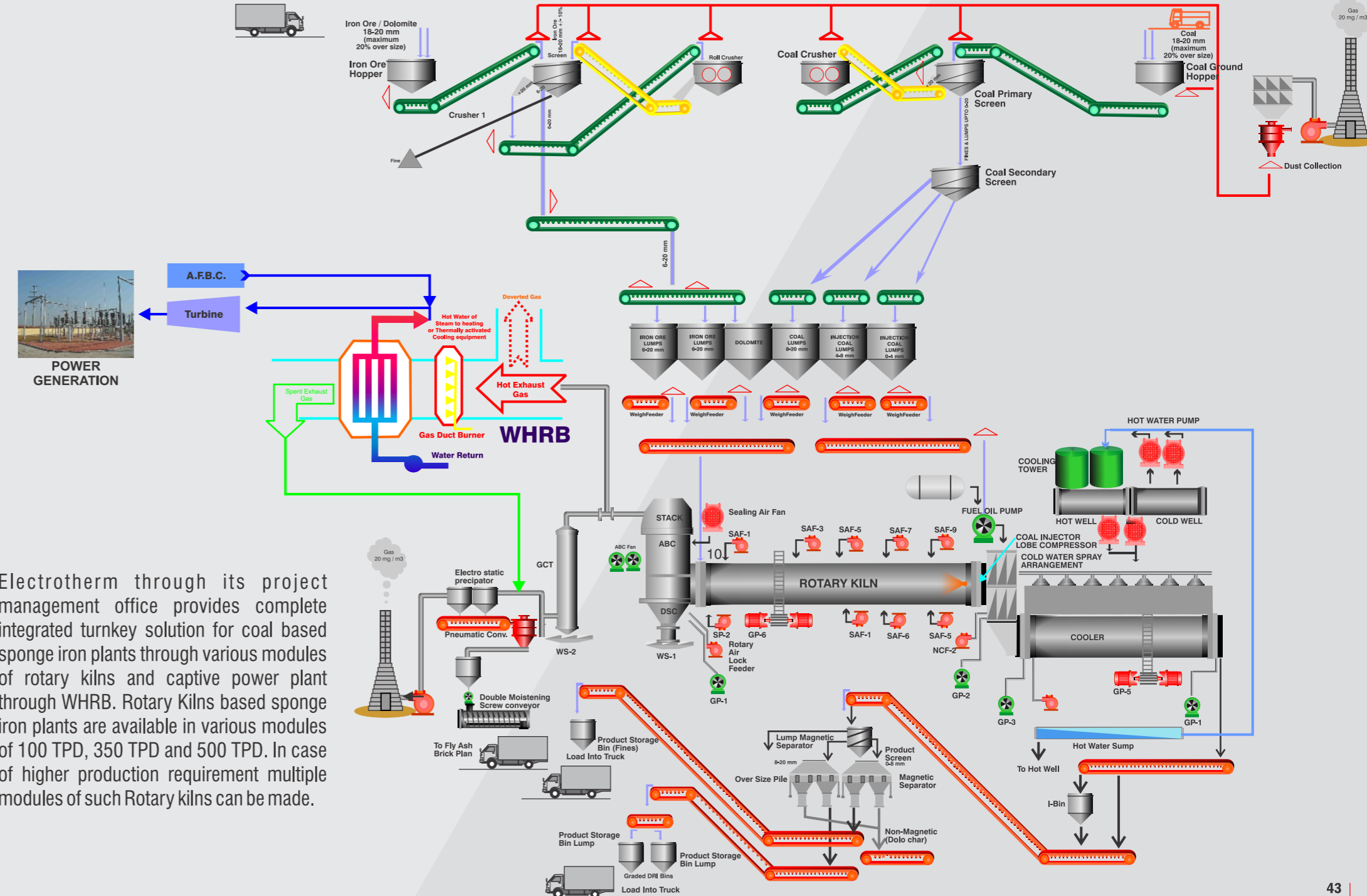




Coal Based DRI Plant



PROCESS FLOW CHART - COAL BASED DRI PLANT



Electrotherm through its project management office provides complete integrated turnkey solution for coal based sponge iron plants through various modules of rotary kilns and captive power plant through WHRB. Rotary Kilns based sponge iron plants are available in various modules of 100 TPD, 350 TPD and 500 TPD. In case of higher production requirement multiple modules of such Rotary kilns can be made.



Inception of Steel Producing Terrain



Ground Work in Progress



Strong Foundations



Shed Building



Cable laying



Crane Mounting



Furnace Platform



Pump House



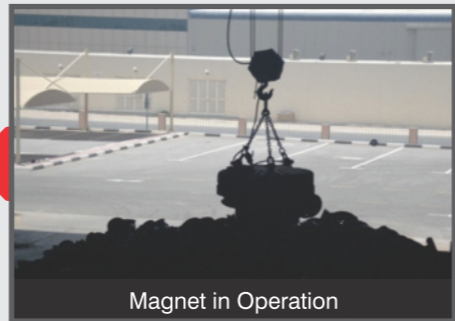
Canopy and Water-cooled Duct for MRK



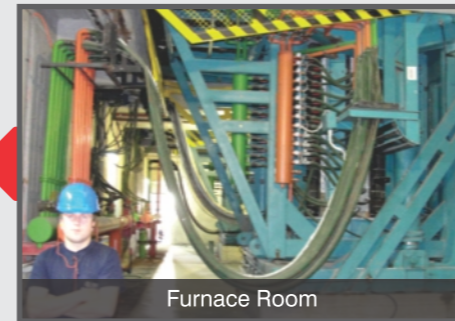
Slag Removal



Vibro Feeder



Magnet in Operation



Furnace Room



Front View Post Furnace Installation



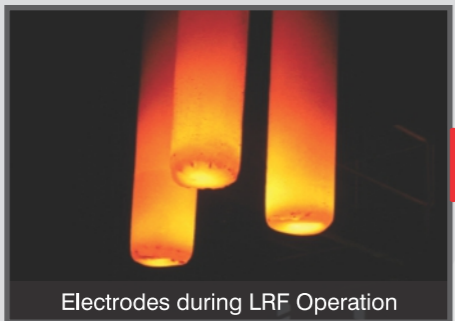
Tilting Structure Positioning



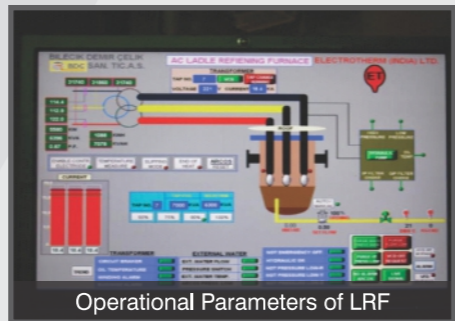
Cooling Tower



Ladle Refining Station



Electrodes during LRF Operation



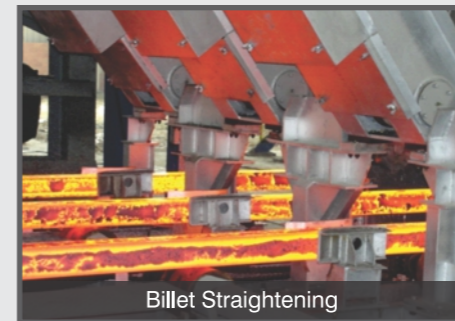
Operational Parameters of LRF



Continuous Casting Machine



Billet Casting



Billet Straightening



Billet Cutting



Turn-over Cooling Bed



Secondary Pollution Control



Oxygen Evaporator & Tanks



Air Pollution Control System



Plant Overview

GLOBAL NETWORK - ENGINEERING & PROJECTS



● Sales & Service
● Installations



NATIONAL NETWORK



● Head Office & Works
● Regional Office
● Sales & Service Centres