Doshi Technologies (P) Ltd.

INTRODUCTION

ELECTRIC ARC & LADLE REFINING FURNACE
ELECTRIC ARC FURNACE AND LADLE REFINING FURNACE
SALIENT FEATURES

- Compact design with minimum space requirements
- User friendly for ease of operation and maintenance.
- Low refractory wear due to small pitch circle diameter
- Tubular Roof Design
- Exact guidance of electrode mast with self-centering guide rollers
- Positive Clamping For Electrode to ensure Zero Slippage
- User-friendly digital electrode regulation system
- Designed for metal movement by transfer trolley or with gantry swiveling arrangements.
- Furnace operations and control are automated with PLC and computer based Human Interface which are very friendly to operate and maintain.
- From conceptualization to commissioning, under one roof.
- In house manufacturing facilities.
DESIGN CONCEPT FOR LRF

Estimated Cycle Time – LRF:
Ladle positioning on the ladle car: 1.5min
Ladle car travel & Roof lowering on the ladle: 1.5min
Temperature measurement & sampling: 2.0min
Ferro-alloys and flux addition: 6.0min
Temperature raising: 20.0min
Wire feeding (if required): 2.0min
Final temperature raising and sampling: 2.0min
Final adjustment for homogenization: 2.0min
Roof lifting after treatment and ladle car travel: 1.5min
Ladle lifting from the ladle car (Approx.): 1.5min
Total Cycle Time: 40.0min
**LIST OF INSTALLATIONS**

<table>
<thead>
<tr>
<th>CUSTOMER</th>
<th>FURNACE TYPE</th>
<th>CAPACITY</th>
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</thead>
<tbody>
<tr>
<td>MAHINDRA UGINE STEEL CO. LTD, KHOPOLI</td>
<td>LADLE REFINING FURNACE</td>
<td>50 MT / 10 MVA</td>
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<td>USHA MARTIN LIMITED, JAMSHEDPUR</td>
<td>LADLE REFINING FURNACE</td>
<td>40MT / 6 MVA</td>
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<td>SHAIFALI ROLLS LIMITED, GANDHIDHAM</td>
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<td>30 MT / 6 MVA</td>
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<td>SUNFLAG IRON &amp; STEEL CO. LTD, NAGPUR</td>
<td>LADLE REFINING FURNACE</td>
<td>60MT / 11 MVA</td>
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<td>AMRELI STEELS LIMITED, KARACHI PAKISTAN</td>
<td>LADLE REFINING FURNACE</td>
<td>30 MT / 6 MVA</td>
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<td></td>
<td>LADLE REFINING FURNACE (UNDER COMMISSIONING)</td>
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<tr>
<td>BSRM IRON &amp; STEEL MILLS, CHITTAGONG, BANGLADESH</td>
<td>LADLE REFINING FURNACE</td>
<td>30 MT / 6 MVA</td>
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<td>CEW, LUCKNOW</td>
<td>ELECTRIC ARC FURNACE</td>
<td>5 MT / 2.4 MVA</td>
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<td>FRONTIER ALLOYS &amp; STEELS LTD, PAONTA SAHIB</td>
<td>ELECTRIC ARC FURNACE</td>
<td>3MT / 1.5 MVA</td>
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<td>CUSTOMER</td>
<td>FURNACE TYPE</td>
<td>CAPACITY</td>
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<td>R L ENERGY &amp; STEELS LTD. AURANGABAD</td>
<td>ELECTRIC ARC FURNACE</td>
<td>25 MT / 15 MVA</td>
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<td>ADHUNIK METALIKS ROURKELA</td>
<td>LADLE REFINNING FURNACE</td>
<td>30 MT / 5 MVA</td>
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<tr>
<td>INDSUR USA, SAUDI FOUNDRY PROJECT</td>
<td>ELECTRIC ARC FURNACE</td>
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<tr>
<td>KSRM IRON &amp; STEEL ROLLING MILLS CHITTAGONG BANGLADESH</td>
<td>LADLE REFINNING FURNACE</td>
<td>35 MT / 7 MVA</td>
</tr>
<tr>
<td>ABHIJEET GROUP – CORPORATE ISPAT, JAMSHEDPUR</td>
<td>2 NOS. X LADLE REFINNING FURNACE</td>
<td>35 MT / 7 MVA</td>
</tr>
<tr>
<td>KAMALJEET SINGH AHLUWALIA KEONJHAR, ORISSA</td>
<td>LADLE REFINNING FURNACE</td>
<td>18 MT / 3.6 MVA</td>
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<td>MITTAL CORP LIMITED, INDORE</td>
<td>LADLE REFINNING FURNACE</td>
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<tr>
<td>CALCUTTA SPRINGS LIMITED</td>
<td>ELECTRIC ARC FURNACE</td>
<td>5 MT / 2.4 MVA</td>
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ELECTRIC ARC FURNACE
SHOP ASSEMBLED

- Compact design with minimum space requirements
- User friendly for ease of operation and maintenance.
- Low refractory wear due to small pitch circle diameter
ELECTRODE HOLDING ARMS
With Working Platform & Bus Tubes

- Smallest Possible PCD for a given Electrode size.
- Electrode Holders are Water Cooled.
- Positive Clamping type Electrode Gripping cylinder – Spring Loaded.
- Copper Bus Tubes on Arms
- Insulated & Rigid Arm Holding & Adjusting Bolts.
- Integrated Working platform
LADLE FURNACE
SALIENT FEATURES

- POSITIVE SLIP FREE ELECTRODE CLAMPING BY SPRING LOADED HYDRAULIC CYLINDER

- PRISMATICALLY GUIDED MAST ASSEMBLY FOR MINIMUM JERK AVOIDING ELECTRODE BREAKAGE
LADLE FURNACE
SALIENT FEATURES

➢ IN HOUSE MANUFACTURING AND PREDESPATCH ASSEMBLY
LADLE FURNACE
SALIENT FEATURES

- IN HOUSE MANUFACTURING AND PRE-DESPATCH ASSEMBLY
LADLE FURNACE
SALIENT FEATURES

- MINERAL OIL BASED HYDRAULIC SYSTEM
LADLE FURNACE
SALIENT FEATURES

- Hydraulic Pumps are specifically chosen for mill duty application and reduced power consumption.

- Accumulator design is proven for smooth hydraulic operation as against conventional pressure vessel design.
LADLE FURNACE
SALIENT FEATURES

- The proportional control valve are with feedback control for better electrode regulation.

- Accumulator design is proven for smooth hydraulic operation as against conventional pressure vessel design.
HYDRAULIC POWER PACK WITH PROPORTIONAL CONTROL VALVES & ACCUMALOTORS

- High Pressure Hydraulic system with Proportional control valve.
- Valves with On Board amplification & signal control cards.
- Piston Accumulators for Normal & Emergency operation.
- 100% Standy Pumps with motors.
- Complete with Interconnecting piping & accessories.
LADLE FURNACE
SALIENT FEATURES

- PLC BASED FURNACE CONTROL SYSTEM.

- FURNACE IS OPERATED FROM COMPUTER BASED HMI

- SCADA ON HMI DISPLAYS ALL OPERATION AND CONTROL FEATURES
PLC BASED CONTROL PANEL FOR EASE OF OPERATION, DIAGNOSIS AND MIS
ELECTRODE REGULATION

- Current
- Arc Stability
- Active Power Input
- Electrode Consumption
- Refractory Consumption
- Energy Consumption

- Electrode Movements
- Setpoint keeping
- Safety Functions
Functions of a classical electrode control system

- Measurement of Voltages and Currents
- Impedance Regulation
- Set-Point Memory
- Overcurrent Limitation
- Touch Down Stop
OPERATOR CONSOLE WITH HMI

- PLC based Furnace Control System.
- Computer Based HMI with screen to operate and control the furnace from control pulpit.
- User friendly, proven electrode regulation system interfaced with furnace controls & protection system.
- Can be connected to existing Management Information System.

DOSHI TECHNOLOGIES (P) LTD.
www.doshiaassociates.net
6 MVA - 30 MT LRF ERECTED AT SITE
6 MVA - 30 MT LRF ERECTED AT SITE
LADLE FURNACE
SALIENT FEATURES

- Depending on shop layout, roof swing or fixed roof type LRF offered.

- Fixed roof type LRF comes with roof lifting & lowering and ladle transfer car for ladle movement.
LADLE REFINING FURNACE
LAYOUT FOR LRF 3D MODEL
LADLE TRANSFER CAR
Ladle Transfer Car with Tilt Ng Arrangement for De-Slagging
LADLE TRANSFER CAR WITH TILTING ARRANGEMENT FOR DE-SLAGGING
ARGON OR NITROGEN PURGING SYSTEM FOR LRF

DOSHI TECHNOLOGIES PRIVATE LIMITED,
INDIA
SECONDARY LOW VOLTAGE DELTA – FURNACE TRANSFORMER
SUB ASSEMBLIES FOR EAF AND LRF
ELECTRODE HOLDING ARMS WITH COPPER BUS TUBES & HYDRAULIC CLAMPING CYLINDER
FUME EXTRACTION DUCT FOR 110 MT EAF
WATER COOLED ROOF FOR 60 MT EAF
WATER COOLED ROOF - EAF – SHELL INNER DIA. 3600MM
WATER COOLED ROOF EAF
WATER COOLED ROOF 30 MT LRF
MAST ASSEMBLY WITH GUIDE ROLLERS & HYDRAULIC CYLINDERS FOR LRF
MAST ASSEMBLY WITH GUIDE ROLLERS & HYDRAULIC CYLINDERS FOR LRF
INDUCTION FURNACE SPARES AND ACCESSORIES
INDUCTION FURNACE
TILTING SHELL
INDUCTION FURNACE SHELL ASSEMBLED WITH COIL, YOKE & TILTING CYLINDER
ACCESSORIES FOR STEEL PLANT & FOUNDRIES
SCRAP CHARGING BUCKETS

- Environment Friendly
- Detachable Bail Arm
- Suitable for Induction Furnace Charging
- Increases productivity
- Reduces the use of Shop Crane and hence increases its availability
- Can be used with all kinds of scrap
- Reduces no. of charges