



## **3. Main features**

***FOLADSAZI.IR***

## Main features

### Ladle Furnace [LF] Construction:

- **Gantry:**
  - frame work holding the three electrode masts and the roof support mast.
  - Three Current Conducting Electrode Arms [CCEA], fabricated from copper plated steel.
- **Roof:**
  - Roof water-cooled, fabricated from steel pipe, with side draft hood (box type construction) on top
  - The ladle reaching working position, the roof can be lowered.
  - As soon as the roof hits the ladle rim (skull), the roof movement is stopped to keep it horizontal.
  - Electrode savers on the roof around the electrodes, fabricated from refractory.

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### Ladle Furnace [LF] Main Layout Parameters

Type of Furnace.....		with Ladle Car
Furnace capacity (tapping weight).....	130 – 170	t
Heating rate.....	4	°C/min (165 t)
Transformer size.....	26	MVA
Active power.....	max. 19	MW
Ladle diameter (ID)/Roof diameter.....	3900	mm
Roof height.....	1040	mm
Freeboard (180 t) .....	2100	mm
Roof lifting stroke.....	550	mm
Distance transformer house – centre line columns...	3750	mm
Distance centre columns – ladle centre...	1400	mm
Distance Arms.....	600	mm
Electrode stroke.....	3600	mm
Electrode regulation speed.....	100 – 120	mm/sec
Electrode diameter.....	456	mm
Electrode pitch circle.....	875	mm

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### High Current

Transformer Capacity.....	26MVA
Active Power.....	19 MW
Primary Voltage.....	35 kV
Cycles.....	50 Hz
Secondary Voltage Taps.....	5
Maximum Voltage Tap.....	~ 350 V
Minimum Voltage Tap.....	~ 285 V
Maximum Current.....	~ 40 kA

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### Cooling Water

Roof including Side Draft Hood (closed circuit).....	170 m <sup>3</sup> /h
Electrode Arms including HC System.....	140 m <sup>3</sup> /h
Transformer (open circuit).....	35 m <sup>3</sup> /h
Hydraulic Cooling (open circuit).....	10 m <sup>3</sup> /h
Inlet Temperature max (Transformer).....	40 (35) °C
Mean temperature Increase.....	10 -12 °C
Supply Pressure.....	6.0 bars
Pressure drop.....	3.5 bars
Emergency Water.....	- 0 - m <sup>3</sup> for 1 h

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## Cooling Water - Quality

	Dimension	IW	MW
INLET TEMPERATURE	°C	max.35	max.35
OUTLET TEMPERATURE	°C	max.55	max.55
SUSPENDED SOLIDS	[mg/l]	max.10	max.10
TOTAL DISSOLVED SOLIDS (TDS)	[mg/l]	max.500	
TOTAL DISSOLVED SOLIDS (TDS)	[mg/l]		max.300
PARTICLE SIZE	[mm]	max.0,1	max.0,1
PH-VALUE	[-]	8-9	7,5-8,5
Ks4,3 (Bikarbonate Alkalinity) as CaCO <sub>3</sub>	[mmol/l]	max. 3,2	max. 1
TOTAL HARDNESS	[mg/l]	max.100	max.50
CONDUCTIVITY STEEL PARTS	[mS/cm]	1000	
CONDUCTIVITY AC PARTS	[mS/cm]		500
IRON Fe + MANGANESE Mn	[mg/l]	max.0,5	max.0,5
CLORIDES Cl <sup>-</sup>	[mg/l]	max.150	max.60
SILICATE SiO <sub>2</sub>	[mg/l]	max.40	max.40
CARBONIC ACID	[mg/l]	50 - 75	50 - 75
OXYGEN CONTENT	[mg/l]	max.6	max.6
OIL	[mg/l]	1	0
SULPHATES SO <sub>4</sub>	[mg/l]	max.250	max.200

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### Hydraulics

Hydraulic Fluid.....	Water Glycol
Operating Pressure (T.O.P).....	140 bars
Design Pressure.....	250 bars
Tank capacity.....	1 500 l
Piston type accumulator.....	1 * 250 l
Main pumps.....	1 + 1 stand-by
• capacity.....	~ 140 l/min
• power rating.....	~ 2 * 45 kW
Circulation pump.....	1
• capacity.....	~ 90 l/min
• power rating.....	~ 2.2 kW
Emergency accumulator for tilting/electrode raise/roof swivel	
Quality	
Filtration.....	10 µm
Dew point (atmosphere).....	- 20 °C
Oil content.....	1 mg/Nm <sup>3</sup>
Temperature.....	20 °C

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### Inert Gas Ar/N

Quality Argon.....	> 99.9 %
Nitrogen.....	> 99.5 %
Supply Pressure (T.O.P).....	20 bars
Pressure delivered at Valve stand.....	9 – 10 bars
Number of porous Plugs in the Ladle.....	2
Flow Rates per Plug	
• Soft Stirring including Heating.....	100 – 200 l/min
• Intensive Stirring.....	400 – 800 l/min
Lay-out of Control Line.....	1 500 l/min
Consumption	
• per Heat.....	100 Nm <sup>3</sup> /h
• per ton Steel.....	~ 0.5 Nm <sup>3</sup> /t

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### Lubrication Grease

Quality.....	NLG II
Storage tank capacity.....	? m <sup>3</sup>
Consumption.....	~ 10 l/month

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# End Main Features

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