

# INDUSTRY 4.0

**It matters for Electric Arc  
Furnaces- Why ?**



The better the question. The better the answer.  
The better the world works.

- Four Distinct Examples
  - Heat Treatment Furnaces
  - Electroplating Industry
  - **Electric Arc Furnaces**
  - Vegetable Oil Refining



- Started with 1988 with the first plant to be automated
- Until 2011, we had automated 14 plants in India.
- The capacity of the furnace varied from 5 tons to 50 tons and the monthly production from 9,000 tons to 300,000 tons
- Initially only the EAF was automated but with requests from clients, the Ladle Refining Furnaces and Billet Casters were also included.
- Energy optimization and improved productivity is the main focus of our system

- Control algorithms have been developed to control Primary and Secondary Currents, Energy Input, Power Factor, DRI feeding and many such Electrical, Metallurgical and other factors.
- Changes included modification of Control Hardware, upgrading/ installing Control Software etc.
- Data Analytics helped design new algorithms for control.



- ✓ PLCs : Siemens, ABB or Omron
- ✓ Various Models of Controllers from Delta, Eurotherm,
- ✓ Various models of oxygen lancing equipment, thermocouples, DRI feeders etc.
- ✓ Design of PCBs for Electrode Regulation

- Starting in 1985 with a 20 ton EAF in RASL, we have automated 14 facilities.
- We have reduced energy consumption in all cases by at least 20 kWh/ton.
- The quality of the finished products leaves nothing to be desired and is of top most **export** quality.
- The range of synchronised control spans multiple units of EAF, LRF, Caster in the same facility.



- Optimized Plant Design
- Over 15 types of Reports
- End Customer involved in design of reports
- Graphical information : present and past
- Continuous Support

- Data collected for more than 25 years
- New algorithms developed for control.
- Publication in the process



- Reduction in Energy Consumption
- Increase in Productivity
- Improvement of Quality

- See attached document
- [Savings thru Automation EAF.pdf](#)



<b>Parameter</b>	<b>Unit</b>	<b>Benefit</b>	<b>Production / year</b>	<b>Cost, Rs</b>	<b>Total Benefit, Rs Crores</b>
Energy Saving	Kwh/ton	20	1,50,000	5	1.5
Increased Production	tons		7,500	10,000	7.5
Quality Assurance	tons		7,500	10,000	7.5
Customer Satisfaction	Export Quality 100%				Please Add
Total Annual Benefit					16.5 Crores

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