ENCON THERMAL ENGINEERS

…Answer to the Continued Need for Energy Conservation

AN INTRODUCTION

ENCON

- Established in 1978 during energy crisis in India.
- Oriented towards energy Conservation
- Well known for Designing, Manufacturing, Supplying and Commissioning of **FUEL EFFICIENT HEATING SYSTEMS** on *Turn Key Basis*

WE SERVE…

- Steel Plants
- Transformers & Distribution [T&D] Industries
- Automotive Industries
- Foundries
- Aluminum Industries
- Pharmaceutical Industries
- Cement Industries
- Glass Industries
- Ceramics & Refractory Industries

LANDMARKS IN R&D

- YEAR 1978 :
- Development of indigenous Recuperator
- Condensate Recovery System.
- YEAR 1979:
- Fuel Conversion – from Oil fired to Wood firing.

LANDMARKS CONTD.

- YEAR 1979:
- Designing of efficient Billet Reheating Furnace.
- YEAR 1985:
- Introduction of IIP-ENCON Film Burner.
- YEAR 1989:
- Recuperative Ladle Preheating System for Mukand Ltd, Mumbai resulted in 75% Energy savings.

- YEAR 1991:
- Introduce the concept of Ceramic Fibre in Billet Reheating Furnaces.
- YEAR 1992:
- Introduction of Mono Block Burners resulting in 30% in fuel saving and 95% Electrical saving.
- YEAR 1993:
- Development of 90 ton LPH with Hydraulic lifting & lowering Mechanism.

- YEAR 1996:
- Revamping with Energy Efficient Design of 45TPH/BRHF at TATA SSL at Tarapore. The total investment $150,000.00 recovered in 45 days.
- YEAR 2000:
- Development of Industrial Gas Burner
- (Project Sponsored by Ministry of Science & Technology and GAIL)

- YEAR 2001:
- Development of Rad Heat Gas Heating Elements.
- YEAR 2005:
- Development of Raycon System for patch up lining of Induction Furnaces.
- Development of Sand Dryer for Foundries.

- YEAR 2007:
- Development of 160ft long conveyorised HYBRID Oven (Solar-Gas-Electric) for Divya Pharmacy.
- YEAR 2008:
- Development of Coke Oven Gas Burner
- YEAR 2009:
- Development of High Velocity Burner which resulted into 15-20% increased production capacity – saving of 15% in SFC carriedout at ISWPL (subsidy of TATA Steel)

- YEAR 2010:
- Development of Core Baking Oven energized by Gas heating elements for TATA Motors Jamshedpur.
- YEAR 2016:
- Conversion of THERMIC FLUID HEATERS to ENCON RADHEAT systems.

LDO to NG for Pretreatment

Source of Idea	1st Time
Replication Potential	In all Industries

1) *"First Time Implemented on National Level Project"* - Elimination of polluting Light Diesel Oil (LDO) fuel with clean Natural Gas based heating system for Long Member pre-treatment process

Process : Phosphating and degreasing

Component : Long Member

Location : E Block /E2 Bay

Situation Before Kaizen

- In long member for pretreatment degreasing & phosphating ,LDO thermic fluid was used for heating purpose.
- It is inefficient heating system as Thermic fluid was being heated at 200 °C to achieve to 80°C at tank level to over come transmission and system losses on account of auxiliary circulation pumps and heat exchangers, hence cost of process was appr.114 Lakhs /year.
- process cost of Long member per component was Rs 153 /-
- Age old system (30 years old) . Hence high breakdown time and cost of maintenance .
- It was very dirty system and was occupying 350 sq. mtrs for LDO Tank and boilers etc.

Innovation

4. Innovative Projects implemented

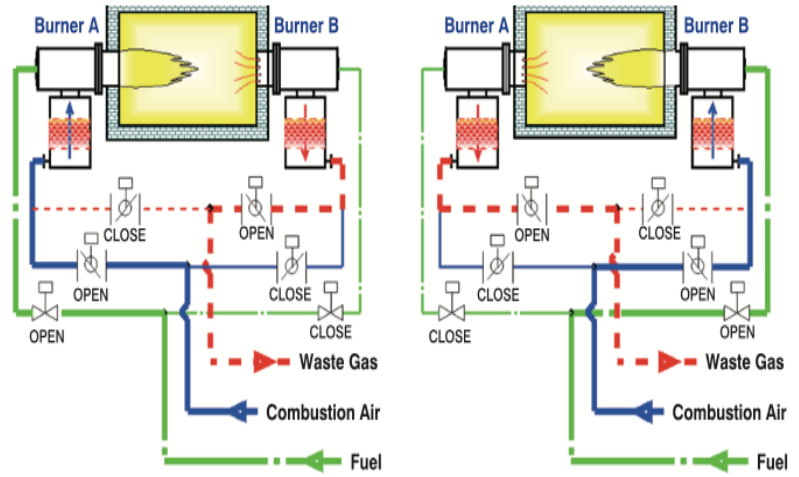
KAIZEN Result

No.	Parameter	Before Kaizen	After Kaizen	Saving	% Improvement
1	Process Cost per component in (Rs. Per Component)	153	72	81	*53 % cost reduction*
2	Cost of fuel for process (Rs. in Lakhs)	114	60	54	*47 % cost reduction*
3	Space required – (Sq. meter)	350	25	325	*93 % space reduction*
4	Electric energy required (KWH)	250 KWH	1.76 KWH	248.24 KWH	*99 % Electrical energy Reduction*

Equivalent CO_2 reduction: **570 tons of CO_2** reduced per annum

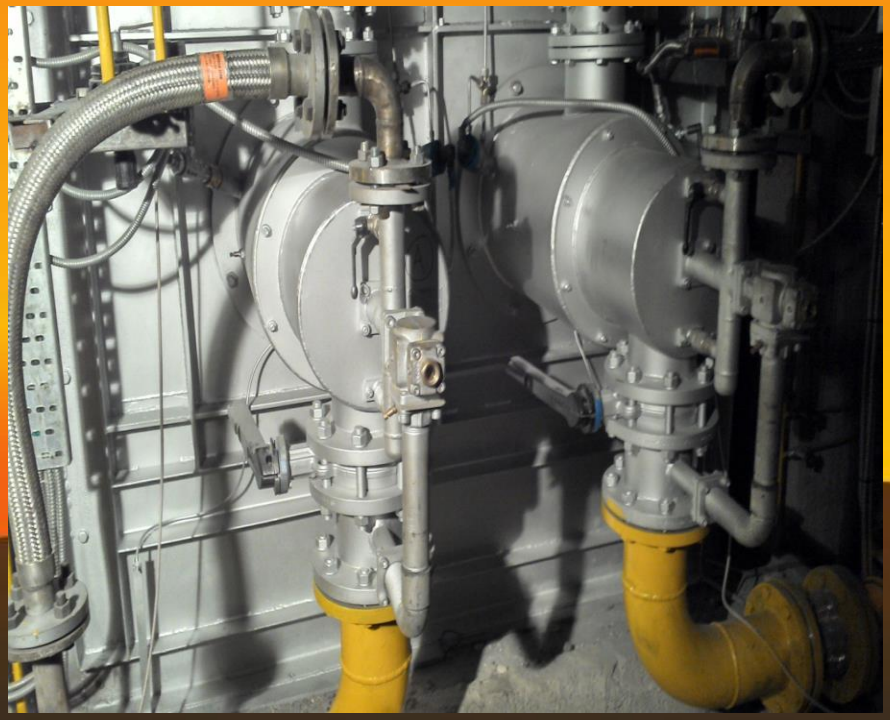
2019:DEVELOPMENT OF REGENERATIVE BURNER

The aim of this development was to develop Regenerative burners to be used for regular fuels and for non-conventional fuels such as Blast Furnace Gas , Coke Oven Gas, Syn Gas etc , which are other wised flared , which results in production of polluting gasses and loss of useful energy.



Mode A	
Burner A	Combustion
Burner B	Regeneration

Mode B	
Burner A	Regeneration
Burner B	Combustion



SAVINGS onNG:-

Useful heat	1000000	kcal/ h				
LHV fuel NG	8200	kcal/ Nm3				
Furnace T °C	**Gas Consumption (Nm3/h)**			**Saving NG and CO2 metallic vs. cold %**	**Saving NG and CO2 regener vs. cold %**	**Saving NG and CO2 regener vs. metallic rec.%**
	Cold Air	**Metallic rec. 450°C**	**Regen 800°C**			
1000	230	164	135	28	**41.5**	**18.1**
1050	241	170	138	29	**42.6**	**18.6**
1100	252	176	142	30	**43.7**	**19.1**
1150	265	182	146	31	**44.9**	**19.7**
1200	279	188	150	33	**46.2**	**20.2**

SAVINGS onMIXED GAS

Useful heat	1000000	kcal/h				
LHV fuel MIX GAS	1200	kcal/Nm3				
Furnace T °C	**Gas Consumption (Nm3/h)**			**Saving GAS and CO2 metallic vs. cold %**	**Saving GAS and CO2 regener vs. cold %**	**Saving GAS and CO2 regener vs. metallic rec.%**
	Cold Air	**Metallic rec. 450°C**	**Regen 800°C**			
1000	2,000	1,227	943	39	**52.8**	**23.1**
1050	2,151	1,282	976	40	**54.6**	**23.9**
1100	2,326	1,342	1,010	42	**56.6**	**24.7**
1150	2,532	1,408	1,047	44	**58.6**	**25.7**
1200	2,778	1,481	1,087	47	**60.9**	**26.6**

Replacing NG with RECOVERED GAS means that the operating costs is strongly reduced, but also the CO2 released. In fact the “released CO2” is only connected to the limited amount of NG burnt, while the BFG or COG would have been burnt anyway in a torch, therefore releasing CO2 in any case.

THANK YOU!

ENCON

“Adopt eco-friendly technologies that your children can be proud of ”

Vishve Bandhu Mahendra