About Thermax Ltd.

Thermax offers products, systems and solutions in energy and environmental engineering to industrial and commercial establishments around the world. Its business expertise covers heating, cooling, waste heat recovery, captive power, water treatment and recycling, air pollution control and waste management and performance chemicals.

Thermax – Waste Heat Experience

Thermax provides energy solutions to utilize waste heat from various processes and applications to improve overall energy balance in oil & gas, minerals, ferrous metals, non-ferrous metals, cement, glass and other sectors. The offerings include a variety of customised, turnkey solutions to generate heat, steam and power.

Over the years we have acquired the ability to offer comprehensive solutions and a reputation for accomplishing innovative projects through our wide application knowledge.

Today, based on technology developed and continuously refined by Thermax, waste heat recovery boilers are integrated into nearly 50 applications in various industries, with a global installation base of over 800 boilers.

Introduction

Cement manufacturing is a highly energy-intensive process. Given the fragile and dynamic nature of the fuel and power situation faced by cement plants today, it makes sense for them to adopt waste heat recovery based solution for the following reasons:

- **Greater energy security** (helps meet upto 35% of power requirement)
- **Improved competitive positioning**
- **Regulatory push** (Policies mandating use of minimum 5–10% renewable/WHR energy are already in place in several states)

Waste Heat Recovery solution based on **Steam Rankine Cycle** and envisaging recovery at two points viz. **Preheater/Calciner** and **Clinker Cooler** (tapping at exhaust or mid-Cooler) is field tested and proven at many cement plants all over the world for the past two decades.

Based on Technical assistance from **Taiheiyo Engineering Corp. Japan** for cement process back up, Thermax offers world class waste heat recovery systems through the following routes:
CEMENT WASTE HEAT RECOVERY: A Boon to Cement Plant

- Boiler Island
- Boiler Turbine Generator Package (BTG)
- Complete turnkey on EPC route basis
- Build-Own-Operate-Transfer (BOOT) basis

Objectives & Benefits

Energy conservation in cement plants through efficient waste heat recovery system to

- Save energy
- Protect environment
- Reduce cost of cement production
- Improve profitability and competitive positioning
- Higher energy security
- Comply with Government pollution control norms
- CDM Benefits

Sources of Waste Heat

- Heat from suspension pre-heater gas stream (PH)
- Heat from calciner gas stream
- Heat from clinker cooler gas stream (both outlet and/or mid tap off)
- Heat from DG sets running at base load

Technology Options

- Steam based Rankine cycle for power generation*
- Generation of LP steam for use in thermal deaerators
- Generation of LP steam for injection into steam turbine
- Pre-heating of feed water
- Generation of LP steam for partial usage in absorption cooling machine

* Note - Can also offer WHR solution based on organic Rankine cycle on case to case basis

Pre-Heater & Calciner Boiler

- Horizontal boiler with tubes located vertically for uniform dust disposal and gas distribution
- Cross flow gas direction offering efficient heat transfer
CEMENT WASTE HEAT RECOVERY: A Boon to Cement Plant

- Forced circulation design
- Proven technology to handle high dust laden gases of pre-heater/calciner (120 gms/nm³)
- Fully field proven de-dusting hammering mechanism
- Higher water hold up to cater to steam fluctuations if any
- Better accessibility

Clinker Cooler Boiler

- Vertical boiler with tubes located horizontally
- Special Fin design for better heat transfer area
- Cross flow gas direction offering efficient heat transfer
- Less floor space offering flexibility in layout
- Proven design for highly abrasive clinker cooler dust
- Available in Forced/ Natural circulation design to offer design flexibility unlike other designs.

CONCLUSION

- Waste heat recovery power generation system of Thermax guarantees Energy efficient cement plant with reduced cost of cement production improving profitability
- Environment friendly technology
- No interference in the existing cement manufacturing process
- Quick return on your Investment
- Thermax the one stop solution provider with expertise on cement Industry from Taiheiyo Engg. Corporation (Japan)
- Proven system design with world class project execution capabilities
- Thermax as a Indian Multinational in the field of energy and environment solution