

Roof-Fired Dual-Headed Regenerative Burners for a Forge Furnace



BC0888, B010371, B010821

Application: Forge Furnace

Due to space constraints in the plant, Bloom designed special **downward firing regenerative burners** mounted on the roof of a forging furnace using a **low calorific value fuel (<500 Btu/SCF)**.

Purpose/Drivers

 Limited space on the furnace

 Low Calorific Value Fuel

 Thermal Efficiency

Scope

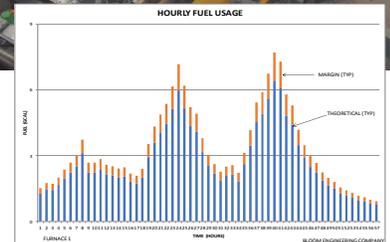
- Thermal modeling to determine required input
- Special downward-fired, dual-headed regenerative design
- Cycle Valves for:
 - Air
 - Fuel
 - Exhaust
- Burner Pilot equipment

Achievements

- Unique design for all physical constraints
- Met guarantees on scale, fuel consumption and uniformity
- >70% [LHV] combustion efficiency

Key Points:

- 1) The **thermal analysis** (by Bloom) **determined the proper heat input** for the furnace.
- 2) Bloom **engineered a new burner design** specifically for this furnace arrangement with roof mounting of the cases, and **dual heads**.
- 3) The roof was fiber-lined and did not provide sufficient support, thus requiring an innovative **burner port design**.



Bloom completed a thermal analysis for a Chinese steel manufacturer’s proposed forging process and determined the thermal inputs required. Limited physical space around a forge furnace required an special downward-firing regenerative burner with cases mounted on the roof. Furthermore, the furnace roof provided no physical support because it was fiber, and thus necessitated a careful design of the burner support structure. Bloom designed a dual-headed system, meaning two burner heads shared one media case so that there were fewer valves, fewer cases and reduced maintenance.

Keywords: Forge Furnace, Regenerative, dual-head, low calorific value fuel

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