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).

**Application:** Forge Furnace

**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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