






B022442

Cold air System for Melting Furnace with Shorter Flame Profile for Smaller Chamber

Application: Aluminum Melting Furnace

Through use of a specially designed port block, Bloom was able to meet a **stringent NO_x requirement** while fitting the flame into a **smaller furnace chamber**. Use of pilots on the burners allowed for quicker relighting, and thus **better productivity**.

Purpose/Drivers

-  Emissions
-  Limited Space
-  Reliability

Scope

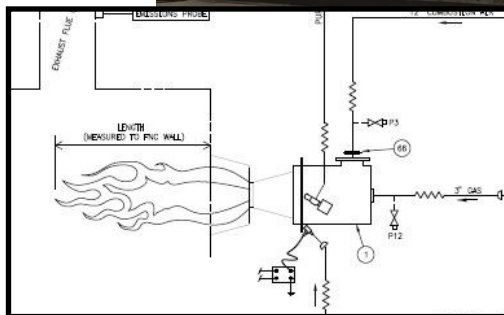
- Complete Combustion System (1600-120 burners)
- UL stamped control panel
- Start-up & Commissioning
- Pre-piped/pre-wired gas train

Achievements

- Lower capital expense due to smaller furnace chamber
- Low Emissions (<65 ppm@3% O₂)
- No purge requirement/shorter cycle times

Key Points:

- 1) Special **port block design** maintains emissions levels, while decreasing flame dimensions.
- 2) Because the **pilots stay lit** even when the burners turn off during the stirring cycle, **no purge** is necessary.
- 3) Pre-assembling the fuel train and control panels **decreased field installation time**.



In order to accommodate a smaller combustion chamber for a tilting aluminum melting furnace, Bloom engineered an innovative port design on a medium velocity burner, proven with extensive lab testing, in order to shorten the flame, and thus avoid impingement. Although it seems that using pilots instead of direct spark ignition would add unnecessary complication, by lighting the pilots when the main burners shut off during the stirring cycle, there is constant flame. Therefore, no purge is necessary, and cycle time decreases while fuel efficiency increases. Furthermore, the pre-piped and pre-wired gas train, as well as the shop fabricated UL approved control panel drastically reduced field installation time.

Keywords: Aluminum, NO_x, melting furnace, flame shape

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