

High-Capacity Melt Furnace



New Furnace Reduces Energy Consumption and Enhances Performance

Micropyretics Heaters International has developed a technology with the potential to improve the performance of aluminum melting furnaces. The production of primary and secondary aluminum ingots typically uses melt furnaces that rely on resistor elements, induction heating, or gas/oil burners for the heat sources. Such furnaces are either energy-inefficient or environmentally unfriendly because they generate combustion emissions or use electricity resources poorly.

The improved melt furnace design uses convective heat transfer instead of radiant heat transfer for an energy- and cost-saving design. The design eliminates combustion emissions, reduces noise, overcomes melt oxidation, and allows gas selection for the melting process. The advanced furnaces are available as ingot-loading furnaces for small casters and rotary furnaces for medium- and large-scale casters. The rotary furnaces also melt both ingots and aluminum scrap.

Benefits

Energy Savings

The new furnace design uses very low power, about 0.15 kWh/lb of aluminum for the small ingot-loading furnaces. An estimated 70% improvement in energy efficiency is also possible.

Environmental

No combustion is involved in the improved process, so typical combustion-related pollution is not present. The technology replaces a traditional natural gas process with an electric system, removing all the on-site emissions. The technology also produces very low levels of noise pollution compared with a typical application.

Profitability

The new furnace has significantly lower costs than a typical melter furnace. The technology may reduce dross and prevent the evaporation of low-vapor-pressure alloying additions.

Overview

- ◆ Invented by Micropyretics Heaters International
- ◆ Commercialized in 2001
- ◆ 1 unit operating in 2003

Applications

Ingot-loading furnaces for small casters and rotary furnace applications for medium and large-scale casters

Capabilities

- ◆ Can be used in rotary furnaces to melt both ingots and aluminum scrap.
- ◆ Results in a low dross content of 0.3% to 1%.
- ◆ Reduces the typical furnace footprint by 80%.

