

Freedom[®] Furnace

Maintain Clean Molten Metal Without Special Treatment

Freedom[®] Furnace low oxidation design assures months of operation without requiring holding bath cleaning ... even after 7 months production.

Patented by Nippon Crucible Corp in 10 countries in 2015 there are now over 120 of these furnaces working worldwide. The Freedom Furnace is now made and serviced in the US by SINC Thermal.

Oxides thrive in environments with residual oxygen and high temperatures but with the Freedom[®] furnace the concentration of the residual oxygen in the holding chamber is controlled within 2% or less. (Target 1%) and the molten metal can be held at a consistently low temperature and lower chamber temperatures.

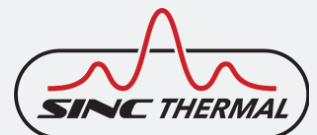
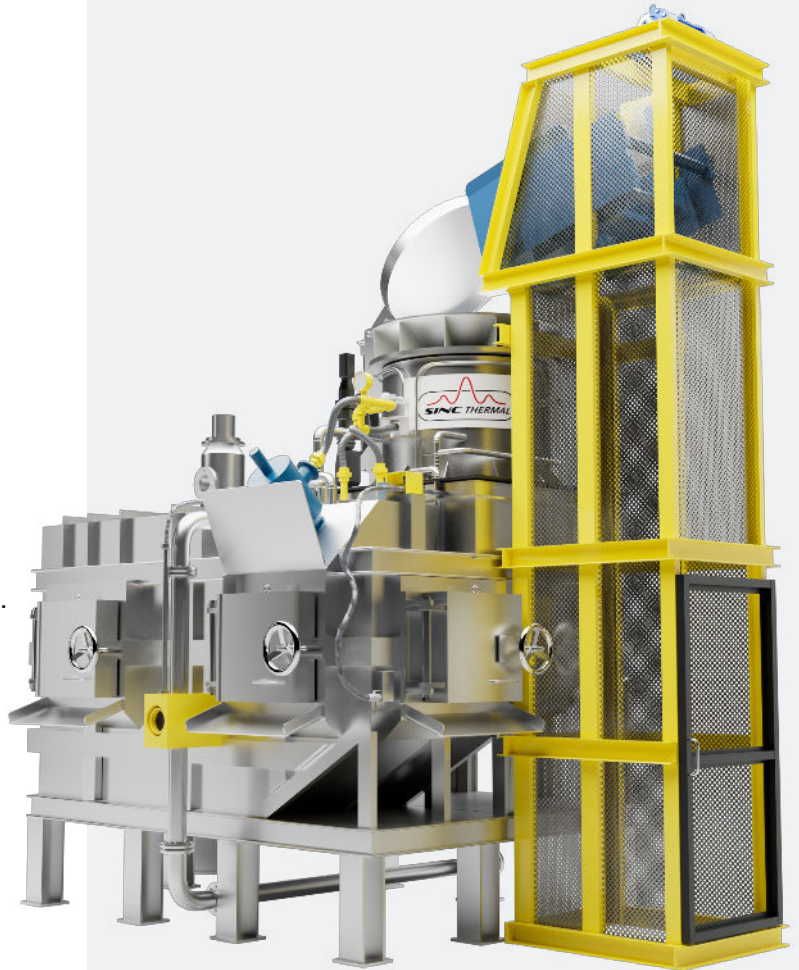
Lower energy consumption, low metal loss from oxidation, cleaner metal and less scrap from inclusions and longer cleaning periods of 6 months or more, for the holding bath, mean less metal rich drag out from daily bath cleaning.

Holding Capacity

Holding capacity (standard) – 1,600 – 9,600 kg
(~3,525 – 21,170 lbs)

Note: holding volume can be increased to accommodate superheat for higher hold temperatures and/or high tapping rates.

Holding temperatures (standard) – 690 – 720°C
(1,275 - 1,325°F)



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Furnace Characteristics

- Shaft melting principles for continuous operation
- Flat flame holding burner (no impingement)
- Independent combustion systems
- Separate sealed holding bath for reduced oxide formation
- Separate melt chamber with submerged metal flow
- High K-Mold results (B – AA)
- Small footprint for “in cell” use
- Automatic charging elevator
- Adoption of high efficiency burner(s) ensures that oxidation loss is drastically reduced.
- Melting burners have separate combustion fans and quick release fittings for easier maintenance.
- Holding burner recuperates heat from the exhaust system to further improve efficiency

Melting Capacity

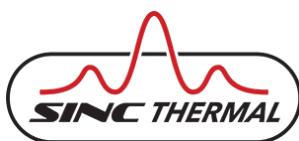
Melting capacity range – 500 – 3,000 kg/h
(1,000 – 6,600 lbs/hr)

Note: higher temperatures up to 785°C (1,450°F) are possible with increased cleaning frequency.

Installed burner power - ~383 – 2326 kWh
(~1.3 – 7.9 million Btuh)

Energy consumption (natural gas) - ~38 – 233 m³/h
(~1,350 - 8,200 ft³/hr)

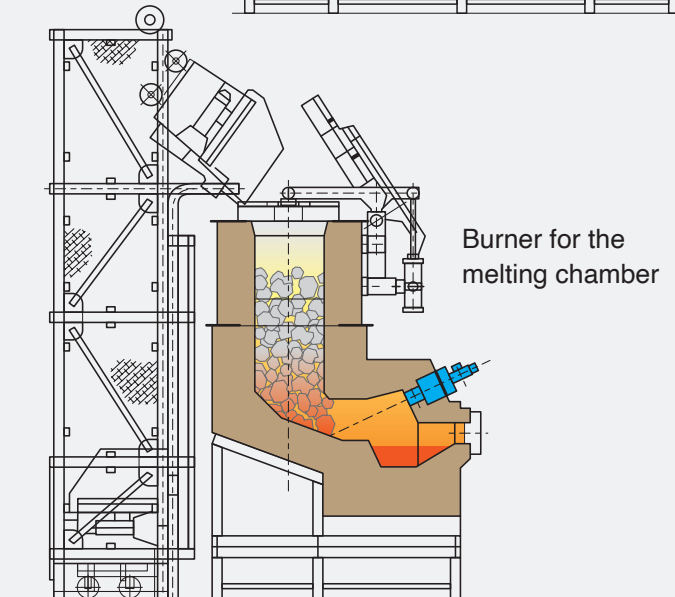
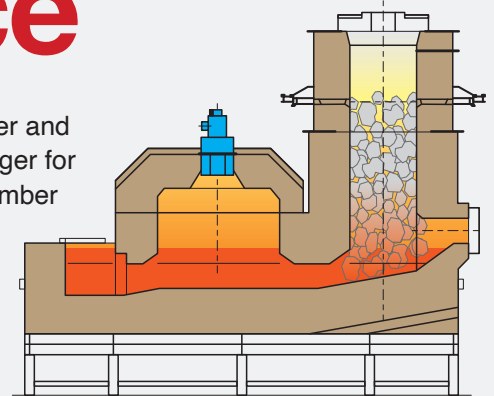
Metal loss – holding at $\leq 720^{\circ}\text{C}$ ($\leq 1,325^{\circ}\text{F}$) - ,
< 0.02% Melting - < 1.5%



In Partnership with Gillespie & Powers

1464 Hoff Industrial Drive, St. Louis, MO 63366
Tel: +1.314.423.9460 | Fax: +1.314.428.4431
sales@sincthermal.com | www.sincthermal.com

Flat flame burner and thermal exchanger for the holding chamber



Operating Benefits

- Reduced cleaning time for holding bath
- Flat flame burner avoids surface impingement
- Sealed bath zone restricts air ingress and reduces surface oxidation
- Metal loss reduction
- <0.004% in holding bath through reduced oxidation
- Energy savings for holding energy
- Exhaust recuperator for holding burner
- Ceramic fiber upper wall and roof insulation
- Reduced oxide contamination of melt
- No flame impingement, no air ingress = lower gas levels
- Holding temperature stability

Specifications subject to change. ©Copyright 2024 V06302024