



AFECO

HEATING SYSTEMS

- ▶ Industrial Ovens & Furnaces
- ▶ Ferrous & Nonferrous Heat Treatment Plants
- ▶ Aluminum Die Casting Recycling Plants
- ▶ Aluminum Scrap/Chip Recycling Plant
- ▶ Advanced Electrical & Gas Fired Heat Processing Technology for Metal Industries

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AFECO
HEATING SYSTEMS



Introduction of Company

“AFECO” is a privately owned Company. With a strong foundation of qualified & skilled manpower and cutting-edge technology, it has grown & known as a “MECHATRONIX” Company in India

- ❑ Established in 1990.
- ❑ We are leading Furnace manufacturer since 25 years
- ❑ We have successfully installed 1000 + Furnaces all over the Globe.
- ❑ 30% Market share for export in Middle east & Gulf Country.
- ❑ 15 Numbers Experienced Engineers.
- ❑ 25 Numbers Skilled Labour, Total 40 Number Staff.
- ❑ An ISO 9001-2008 Certified
- ❑ 30000 Sqft Manufacturing Facility.

ENERGY EFFICIENT FURNACES & IT'S TECHNOLOGY

- The current market scenario is like nothing but every aspect of any manufacturing is comes at ENERGY SAVING.
- That may be in terms of Electricity, Fuel ,Gas, manpower, time etc.
- Keeping Global Energy availability & its future use & savings AFECO has emerged as a challenging manufacturer in terms of Making Energy Efficient Equipment in Heat Treatment, Non Ferrous Metal Melting & as well as Holding Application.
- Day by day technology changes & needs, time changes.
- This requires more energy saving with respect to Environment.

AFECO HEATING SYSTEMS- Step towards Energy efficient Furnace Manufacturing

Alternative Heating Technologies :

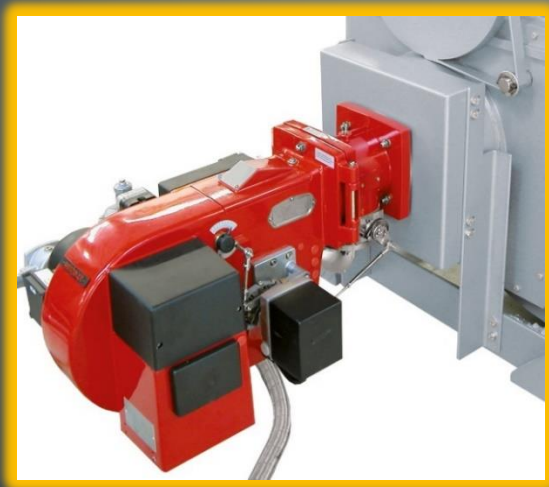
The application of alternative heating technologies depends on the requirements for melt quality, productivity and energy efficiency. In principle either electrically or gas-fired furnaces can be used. In this context, with respect to costs the local pricing for the alternative energy play a decisive role.

1. GAS HEATING
2. ELECTRICAL HEATING

1. GAS HEATING:

Gas-fired furnaces are ideal for Non-Ferrous metals like, Copper, Brass, Aluminum melting, particularly if equipped with exhaust gas discharge over the crucible edge. Side exhaust gas discharge is best if a high melt quality is required. However, a higher melt quality means a lower energy efficiency since a fuel-fired furnace with side exhaust gas discharge consumes approx. 20-25 % more energy than a furnace with an exhaust gas discharge over the crucible edge.

Fuel-fired furnaces provide for optimal energy efficiency in combination with highest melt quality due to their burner system that includes heat recovery via Recuperator. The hot exhaust gases from the furnace preheat the combustion air for the burner via a heat exchanger. This system leads to savings of up to 25 % compared to conventional fuel-fired furnaces with a side exhaust gas discharge.



Two-stage burner, mounted on furnace frame



Side-wall exhaust gas vent for AF- 12 models, see additional equipment

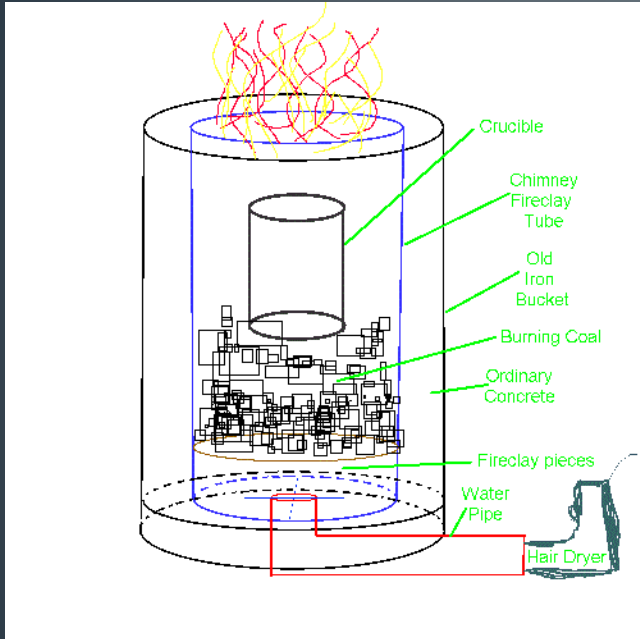
2.ELECTRICAL HEATING:

If the melt quality and energy efficiency take priority, an electrically heated furnace is the best choice. The heating is controlled very steadily and precisely. The melt is not polluted through emissions from a fuel-fired heating. Electrically heated furnaces can achieve up to 85 % of the melting performance of fuel-fired furnaces with a side exhaust gas discharge. If the furnaces are used only for holding, we recommend the Electrical Holding Crucible less Furnace models, which are very energy efficient due to their very good insulation and reduced connected load.



Silicon Carbide
Heaters

Current (Old) Scenario in Brass/Cu/Al Melting



Melting with Coal/wood OR Oil (Diesel/Furnace Oil)

Advantages:

- Easily available.
- Lowest cost
- Cheap construction & maintenance.

Disadvantages:

- Very Low melting performance
- More time consumption since the crucible is not heated from the inside properly to get maximum melt in minimum time.
- High rate of pollutant emission . CO₂ ,CO.
- Blocking of burners nozzles due to dirt in oil/gas
- Maintenance issue.

New trend — technology for Melting- Gas Fired Furnaces

Melting with Gas fired System



Advantages:

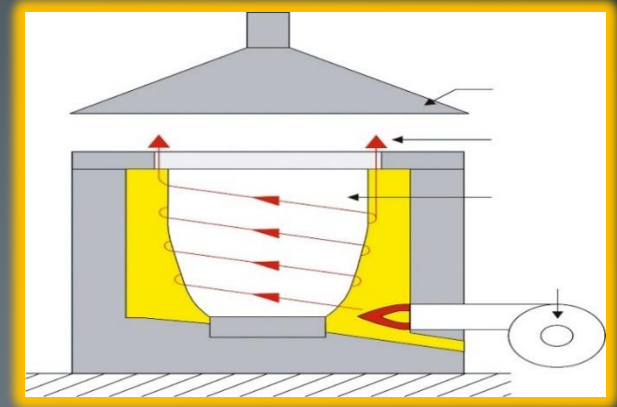
- Gas also Easily available.
- Lowest cost
- Ease of construction & Ease of maintenance.
- No emission of pollutant.
- Quick Heat generation.
- Low gas consumption since the crucible is not just heated from the outside but part of the heat also enters the crucible from above
- High melt rate

Disadvantages:

- No as such disadvantage apart from continuous supply.

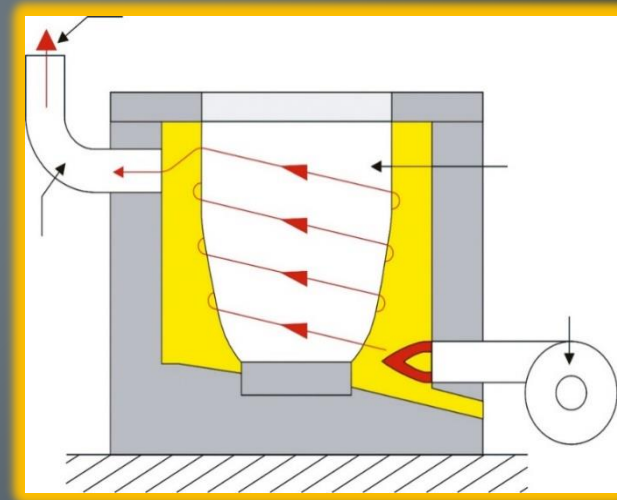
Types of Gas Firing exhaust Systems & benefits :

- Very high melting performance, ideal for use as a melting furnace
- Low Fuel consumption since the crucible is not just heated from the outside but part of the heat also enters the crucible from above. Energy savings of up to 20 % compared to furnaces with a side exhaust gas discharge.



Exhaust gas discharge over the crucible edge

- High melt quality due to low burn-off and reduced hydrogen inclusions in the melt
- Swing lid-reduction of power consumption up to 50 % during holding with a closed swing lid
- Operator exposed to less heat in the area above the crucible
- Best melt quality if a bath control for precise temperature control is used
- Lower melting performance compared to furnaces with exhaust gas discharge over the crucible edge

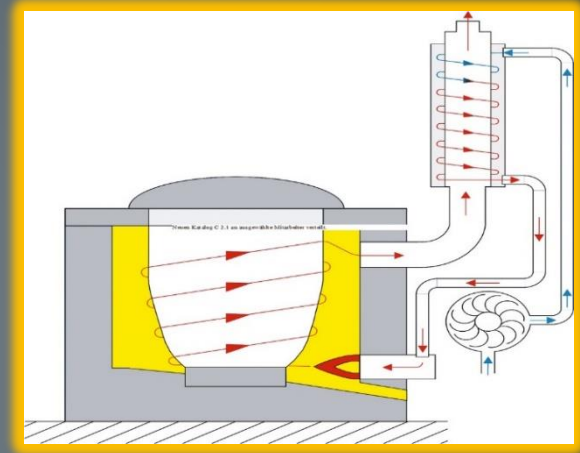


Side Exhaust Gas Discharge Without Recuperator

with Recuperator Technology

Depending on the utilization the relatively higher acquisition costs pay off already after a short period of time.

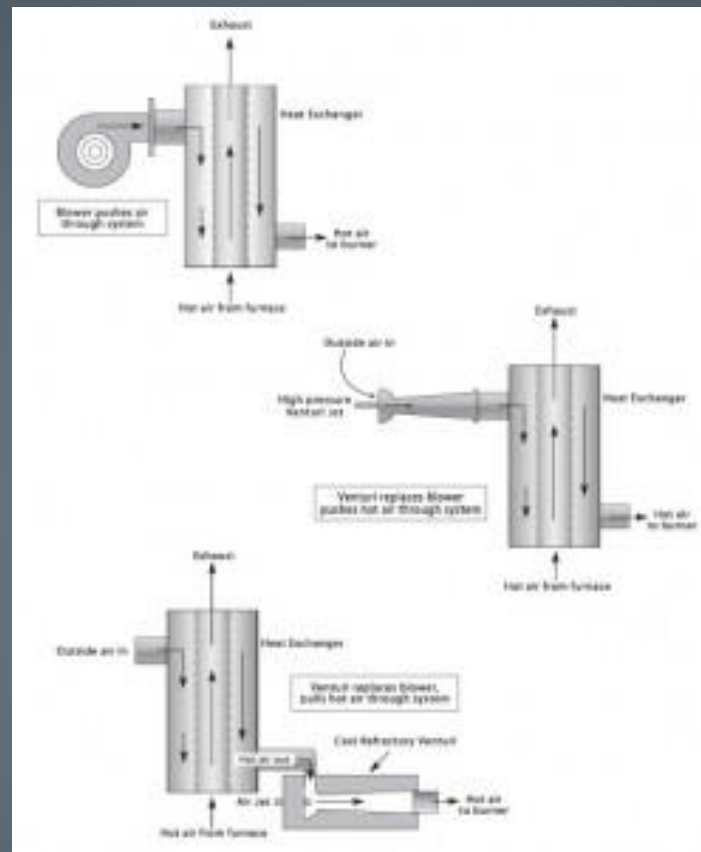
- Burner systems with a Recuperator system save around 25 % of the power compared to furnaces with a side exhaust gas discharge
- High melt quality due to low burn-off and reduced hydrogen absorption in the melt
- Reduced power consumption by up to 50 % during holding with a closed swing lid
- Operator exposed to less heat in the area above the crucible
- Best melt quality if a bath control for a precise temperature control is used
- Lower melting performance than furnaces with exhaust gas discharge over the crucible edge



Side exhaust gas discharge with Recuperator technology

Depending on utilization the hot exhaust gases from the furnace are guided through a heat exchanger in order to preheat the combustion air for the burner. The system provides for energy savings of up to 25 % compared to ordinary fuel-heated furnaces with side exhaust gas discharge. The higher purchase costs are amortized within a short time.

Recuperator:



Types of Gas fired Melting Furnaces:



1. Tilting Melting Gas fired Furnace
 - A. Crucible Type
 - B. Skelener Type



2. Stationary Melting Gas fired Furnace

Gas Fired Melting Furnace Major Systems:



1. **Crucible**: which contain raw material & heat up & hold the molten metal.

2. **Burner** : Most important part/system to GAS firing. With different rations & capacities used

3. **Control Box** : To ensure desired temperature , measure & control the firing sequence / Cycle.

4. **Furnace Body** : made up of MS/Steel material with desired insulation. Holds crucible, top cover, exhaust pipe, Recuperator, firing system.

1. Tilting Melting Furnace:

A. Crucible Type Melting Furnace

- These type crucible furnaces are excellent for melting and pouring directly into the transfer ladles.
- It is available in cubical shell shape and round shape of the furnace.
- The furnace is tilted by the hydraulic / motorized / geared mechanism.
- LPG consumption is 0.1-0.3 Kg/Kg of Brass molten metal.
- Furnaces are available in different capacity and can be customized as per clients specifications from 50 kg up to 3000 Kg crucible.
- Hydraulic Tilting system with flame resistant hydraulic fluid (i.e. water glycol)



Naksharta Melting,
Kolhapur

Actual Site Photograph

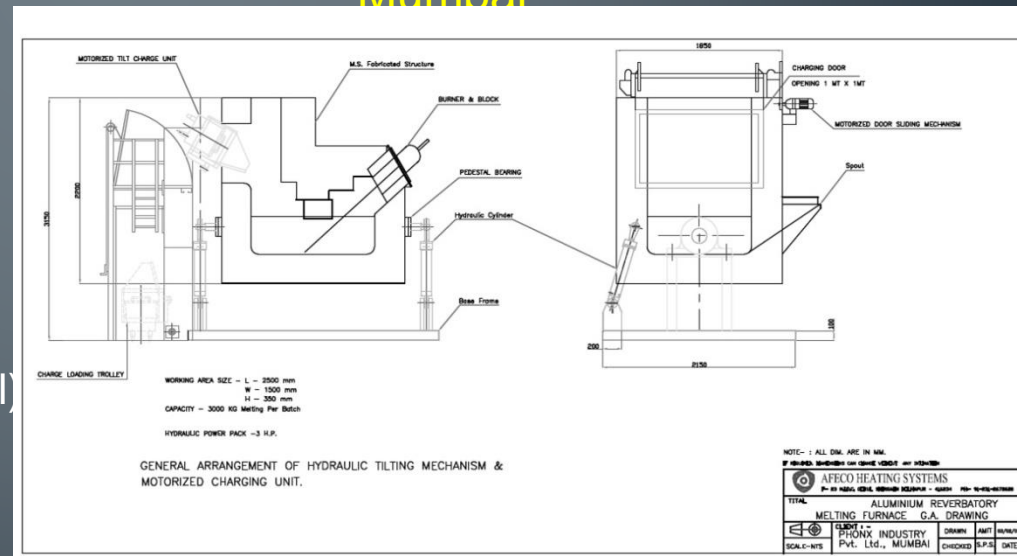
1. Tilting Melting Furnace

A. Crucible Type Melting Furnace

- These type crucible less – SKELENER furnaces are excellent for melting and pouring directly into the transfer ladles with Hydraulic tilting.
- It is available in box shape of the furnace.
- The furnace is tilted by the hydraulic / motorized / geared mechanism.
- LPG consumption is 0.1-0.2 Kg/Kg of Brass molten metal.
- Furnaces are available in different capacity and can be customized as per clients specifications from 500 kg up to 5000 Kg capacity & more as per requirement.
- Hydraulic Tilting system with flame resistant hydraulic fluid (i.e. water glycol)
- Its having direct firing & continuous melting which gives better melting as well as very efficient fuel consumption.



Phoenix Industries
Mumbai



1. Stationary Melting Furnace:

- These type crucible furnaces are excellent for melting and Holding application.
- It is available in cubical shell shape and round shape of the furnace.
- LPG consumption is 0.1-0.2 Kg/Kg of Brass molten metal.
- Furnaces are available in different capacity and can be customized as per clients specifications from 50 kg up to 3000 Kg crucible.
- Gas firing system is Provided in a such a way that furnace body can be shifted or burner body can be detached from furnace body.



Furnace

Crucible Furnaces with Recuperative Burner Gas-Fired, for Melting and Holding

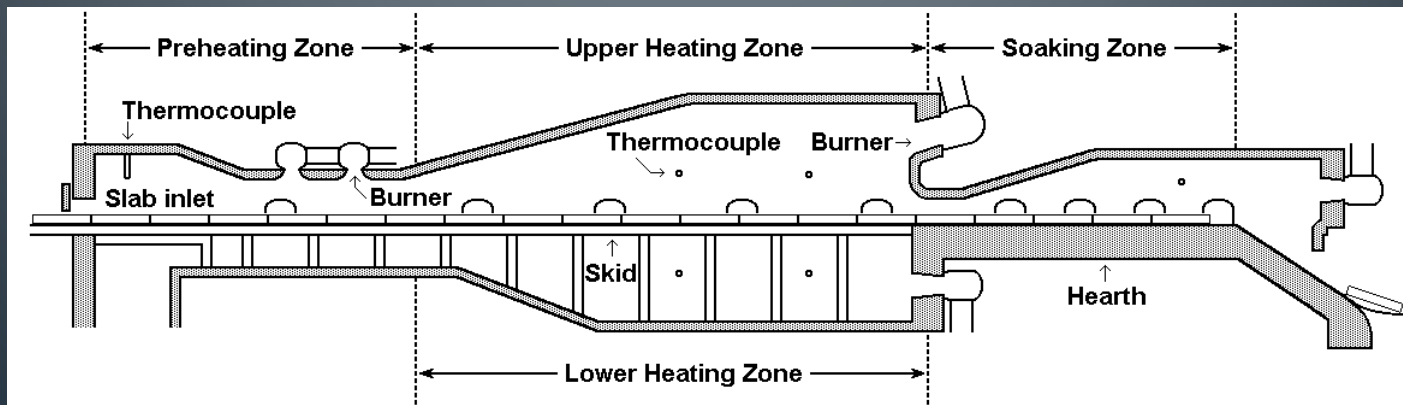
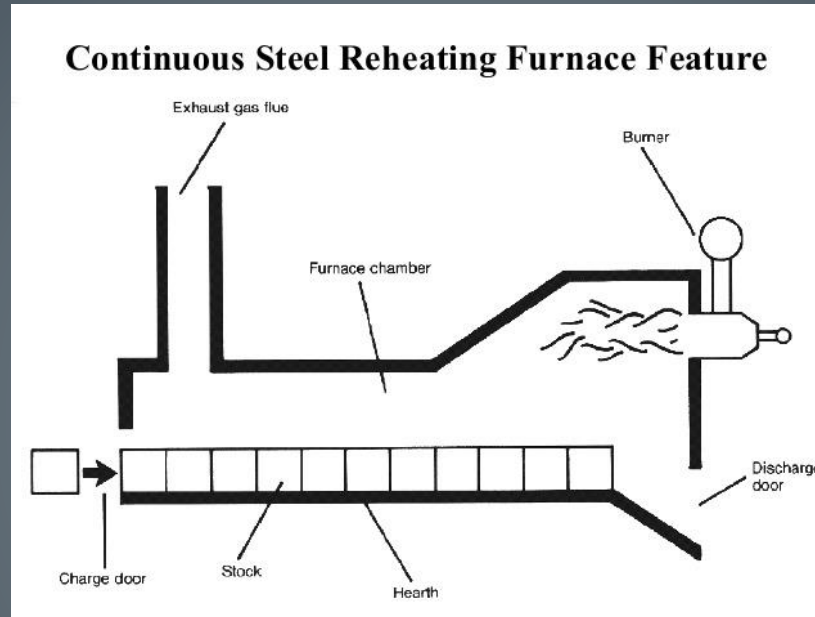
The fuel-heated melting furnaces in the product line fitted with the side exhaust gas discharge provide for optimum energy utilization combined with highest quality melt. Fitted with a burner system including heat-recovery system using a recuperative burner, the energy efficiency of ordinary fuel-heated melting furnaces is significantly improved.

- T max 1100 °C for aluminum and zinc alloys
- Two-stage output control: High load for melting operation, low load for holding operation with automatic switching between both modes
- Modern burner system with optimized flame guide: High efficiency provided by over-pressure operation to keep out entrained air
- Heat exchanger in the exhaust gas duct to preheat the combustion air for the burners
- **Energy savings of up to 25 %** in comparison to other fuel-heated melting furnaces featuring side-wall exhaust gas vents



Billet Heaters:

Manually operated Energy efficient with Recuperative Gas/OIL Fired.



Billet Heaters Customers:

Oil Fired Billet Heaters (Reheaters)

Sahyadri Forge – Sangli

Sadamate Forge – Palus

Jina Bakul Forge – Belgaum

Some calculative report on Gas fired Furnace:

Natural Gas calorific values:

NG /Kg – 12500 kcal/ Kg

Gas cost per Kg – 40-60 Rs. (Approx.)

Current PNG (piped natural gas)cost – 27-29 Rs. Per M³

For 300 Kg Melting furnace with Tilting mechanism

Approx. ROI will be 24 months to 30 months.

(Some factor may affects on ROI – Human(Operator) error, no proper controlling of furnace, Exhaust ,crucible health etc.)

Chart

Model	T max	Crucible	Capacity		Melting output ³		Consumpti on holding lid	Consumpti on melting	Burner output	Outer dimensions in mm			Weight in kg
			Kg Al	Kg Cu	Kg Al/h	Kg Cu/h	closed KWh/h	KWh/kg		kW	W	D	
	°C							AL					
AH 50/GF/01	1200	TP 287	180	550	220 ¹	-	10	1.3 - 1.5	300	2030	1700	1510	1800
AH 100/GF/02	1200	TP 412	330	970	240 ¹	-	11	1.3 - 1.5	300	2140	1900	1710	2200
AH 200/GF/03	1200	TP 412 H	370	1200	260 ¹	-	13	1.3 - 1.5	300	2140	1900	1810	2400
AH 300/GF/04	1200	TP 587	570	-	400 ¹	-	15	1.3 - 1.5	390	2650	2030	1810	2600
AH 500/GF/05	1200	TBN 800	750	-	420 ¹	-	17	1.3 - 1.5	450	2650	2080	1910	2900
AH 1000/GF/06	1200	TBN 1100	1000	-	450 ¹	-	19	1.3 - 1.5	450	2650	2080	2080	3300

Model	Capacity	Control
AH 50/GF/01	50 Kg	With PID/Normal type On off
AH 100/GF/02	100 Kg	With PID/Normal type On off
AH 200/GF/03	200 Kg	With PID/Normal type On off
AH 300/GF/04	300 Kg	With PID/Normal type On off
AH 500/GF/05	500 Kg	With PID/Normal type On off
AH 1000/GF/06	1000 Kg	With PID/Normal type On off

* These

some standard conditions.

Case Study:

Nakshatra Melting ,Kolhapur - 2017

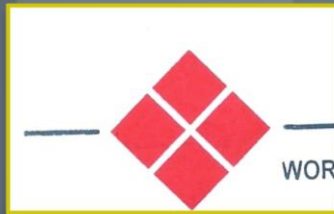
- Our esteemed customer ,now using gas fired Tilting Furnace for melting purpose.
- Previously used to melt using coal/wood coal to get melt.
- That gives more human hr consumption, less melt performance & pollution.
- After installing GAS fired Furnace melting ratio increased by 40% than previous melt.
- The annual savings increased in by 17%.
- Got clean environment at work place. Smoke free,Co2 free.

Mane Industries, Kolhapur- 2005

- Our esteemed customer ,now using gas fired Tilting Furnace for melting purpose.
- The annual savings increased in by 23%.
- Got clean environment at work place. Smoke free,Co2 free.

Given % data based on customer input

SOME OF OUR CUSTOMERS



Thank You