

US Furnaces

Higher Profits! Low Operating Costs!

\$0.04/lb Processed

As much as 15% to 25% Profit

*****Unsurpassed Integrated Afterburner System**

EPA Approved Permit Assistance

*****On Site Installation & Full Training**

Smooth and easy operation

*****Large Network of RSI Sow Buyers**

Our furnace construction is made from the best products available to give you years of service out of your operation. The latest in burner and control design is used to provide you with the most energy efficient melting process. The EPA wants the "Latest Available Technology" and we provide it.

Test results performed on the furnace shown, charging 55% recovery materials, are as follows:

1,500 lb. loads melted in 20 to 25 minutes

Production shift (8 hrs.) output averaged 1,300 lb. per hour

Cost for natural gas per pound of aluminum output was 2.5 cents per pound.

Note that the customer has been getting these results on a daily basis.

Reports back from our customers have shown that the cost difference between our furnace and the other manufacturer's is made up by increased recovery rates, lower fuel costs, and reduced rebuild costs, in less than one year. That's money that was going up the stack! Furthermore, there were no instances of excess emissions. None of our competitor's furnace owners can say that. These benefits continue on for years of reliable service. All of our customers are totally satisfied and are willing to tell you so. We will put you in touch with them at your request.

US Furnaces MAX-4000 Aluminum Sweat Furnace Specifications

Chamber capacity and door openings:

Primary chamber: 4 ft. high, 7 ft. deep, 7 ft. wide with a 4 ft. by 7 ft. door opening.

Holding chamber: 4000 lb. molten aluminum capacity with a full opening door the size of the chamber.

Doors:

- Two Hydraulic guillotine doors w/ power unit
- Lined with 6" thick refractory, 1" insulation, and 304 stainless anchors
- Adjustable door seals

Primary and Holding Chamber (main furnace)

- 8' 6" wide, 13'6" long, 8' high main structure, 13' high w/ door headers
- 2- 1 million BTU (1.25 BTU max. output) primary chamber burners
- 1- 1 million BTU (1.5 BTU max. output) holding chamber burner

Afterburner & Stack

- 5' high, 60" diameter lower section
- 3' high, 60" diameter upper section
- Special cone shaped top for smoother flows (18" high)
- 1- "T" draft control stack section 4' high
- 4- 30" diameter by 4' high stack sections
- Afterburner mounting stand (4'6" high) with furnace to afterburner transition section
- Lower draft control door
- Removable access hatch door
- 1- 1.5 million BTU burner

Primary Furnace Lining Materials (all materials are 2500 deg. or better materials)

10 inch thick brick walls w/ insulation

10 inch thick poured refractory sub-walls (holding chamber sub-walls and floor poured with special non wetting material)

10 inch thick poured refractory floors

6 inch thick removable roof sections (2) w/ insulation and 304 stainless anchors.

Afterburner & Stack Lining Materials:

- Insulation and arch bricked lower afterburner section 6 inches thick
- 3000 degree poured refractory afterburner floor, turning vane, restriction ring, and upper afterburner section
- Three inch thick refractory lined stack sections

Burners and Controls

- 2- Eclipse Ratio Air Medium Velocity Primary Burners 1 million BTU ea. (1.25 BTU max. output ea.)
- 1- Eclipse Therm Air 1 million BTU Holding Chamber Burner (1.5 million BTU max. output ea.)
- 1- Eclipse Therm Air 1 million BTU Afterburner (Note: All burners are natural gas or propane)
- All burners controlled by 4 to 20 mA output temperature controls with digital readout and solid state drive actuators
- Afterburner temperature recorded by data logger with software provided
- Automated stack draft controller
- Customized control panel with motor starters, relays, timers, flame safety units, fuses, and terminal connections.
- Valve trains meeting the latest FM and CSA requirements as in: Dual solenoid valve protection, 1 second shutdown actuator main gas valves with proof of closure, high/low gas pressure switches, and airflow switches.

Operating Parameters

- Afterburner temperature range: 0 to 2200 degrees F. Normal set point at 1650 deg.
- Primary temperature range: 0 to 2200 degrees F. Normal set point at 1600 deg.
- Holding Chamber temperature range: 0 to 2200 degrees F. Normal set point at 1450 deg.
- Average load charging: 1500 lb of scrap (aluminum with 75% steel) every 25 minutes

1500 lb. of scrap (aluminum with 50% steel) every 20 minutes

Note: Material is loaded on a table and pushed into the chamber by use of a ram on a forklift.

Average Output and Costs

- Recovery rates are based on a 10 hour run time with the furnace shut down at the end of the shift. Better production rates and reduced fuel costs can be accomplished by running 2- 10 hour shifts which can increase production rates by 25% and reduce fuel costs by 50%.
- 25% Recovery material (whole transmissions): 1000 lb. (molten aluminum) per hour at a fuel cost of \$0.03 (3 cents) per lb.
- 50% Recovery material: 1350 lb. (molten aluminum) per hour at a fuel cost of \$0.025 (2.5 cents) per lb.
- Average total cost to run the furnace with operator, forklift and electricity: \$0.05 to \$0.07 per lb.
- Note: Production rates and fuel costs provided by customers using this furnace. Quotes directly from them are available upon request.

Advantages

The US Furnaces MAX-4000 can provide you with the best recovery rates from the material that is charged into the unit. All molten metal drains into a separate holding chamber with a controlled temperature.

Furnaces without a holding chamber have 10% to 15% higher melt losses due to the molten metal reaching temperatures of 1700 + degrees F.

The afterburner residence time calculations for US Furnaces use the volume of the afterburner chamber only at 1.1 seconds (min. requirement is 0.8 sec.). The temperature of said chamber is controlled and maintained independently. When the charge door is opened there is no temperature drop in the afterburner what so ever. Note that in some cases we are allowed to use the holding chamber volume as part of the calculation making the retention time over 2 seconds.

The stack volume is not allowed in many states for the calculations. Other brands of furnaces that use the entire stack volume for the calculations must place the data logger probe at the top of the stack. In most cases, the primary chamber temperatures exceed 1800 deg. to maintain the 1600 deg. required at the probe. Warm up time with the other furnaces are as long as 3 hours. At these temperatures you can expect higher melt loss rates and higher fuel costs per pounds of output. Also there are can be violations due to stack temperature drops when the charge door is opened.

Test runs on the US Furnaces MAX-4000 have shown a maximum visible opacity of 5% for no more than 2 minutes throughout a process hour. The scrap charged into the furnace was of the heavy combustible type of material. Lighter combustible material visible emissions were at 0% opacity throughout the process hour. There were no temperature drops in the afterburner throughout the process day. The entire furnace warm up time is about 1 hour.

Utilities:

Following is the electrical and fuel services required for hooking up the MAX-4000 furnace, depending on the fuel and power available. Note that the fuel requirements are for full demand and will be much lower during the normal production day:

- Natural Gas = 6000 CFH @ 5 PSIG
- Propane Gas = 2600 CFH @ 15 PSIG
- #2 Fuel Oil = 46 GPH @ 5 PSIG

Electrical:

- 230 / 3 / 60 – 20 Amp circuits
- 460 / 3 / 60 – 15 Amp circuits
- Note: A 30 Amp 120 volt circuit from a step-down control transformer is required for control voltage.

Note: Should material costs to us be reduced at any point in the manufacture of your furnace, we will pass that savings on to you.

Terms as will be described in a contract: 60% down payment, 30% upon delivery of all materials, and 10% upon start up.

Price quotes of equipment as stated is good for a period of 30 days.

Buyer is responsible for the following:

1. All shipping from points of manufacture (main furnace, refractory, burners & control components).
2. All crane and rigging fees.
3. All labor personnel for pouring material and assembly of the unit: 2 of your men (preferably the future furnace operators) throughout the entire project. 2 extra men will be required for labor during times of mixing and installing material (3 four hour sessions).
4. A welder will be required for mounting brackets, installing forms, shields (materials provided by seller). US Furnace personnel will instruct the welder in the fabrication of loading tables, rake-out tools, tracks, etc. (materials supplied by buyer).
5. An electrician will be required to run electrical service to customers disconnects, control panel, and junction boxes (located at each burner).
6. A plumber will be required to run the main gas service to the furnace and the long runs of pipe to each valve train or burner (valve trains supplied by US Furnaces).
7. All permit fees and service fees are to be paid by the buyer. US Furnaces will assist buyer and environmental engineers with the permit process and guarantees compliance as per state and federal regulations. US Furnaces and Recycling Services International will not be held responsible for delays in permit issuance. Final payment is due upon completion of the installation.
8. It is advisable that at least one of your maintenance personnel assist us and be available for full maintenance and troubleshooting procedure training while all burner components are being installed.
9. The average start up time is 4 weeks from the date of the arrival of the installers (Recycling Services International).
10. A remote control door operation is available at an additional cost.

Description of Purchase Specifications:

US Furnaces LLC Max-4000 Special Aluminum Sweat Furnace with the following:

- 2- Hydraulic cylinder / hydraulic power unit type operated doors
- 3- 1 million BTU gas primary burners in primary chamber
- 1- 1 million BTU gas holding chamber burners

1- 1 million BTU gas afterburner chamber burner
Valve trains for each burner w/ all plumbing fittings (does not include service line to valve train manifold)
5000 LB. holding chamber capacity
Integrated 60" dia. afterburner sections (2) on stand
4- 30" stack sections
1- Draft control stack section w/ motorized damper
1- Control panel (pre-wired) complete with controls, relays, fuel selection switch system, motor starters, overloads, flame safety units, timers, interlocks, lights, labels, and draft controller.
1- Data logger type temperature recorder w/ software, wire, download cable, and training.
1- Remote control system for primary door operation.
Junction boxes for running long runs of conduit and wire. Note that all flex conduit lines & wire going to the junction boxes from burner components are supplied by US Furnaces. All hard piped conduit and wire for long runs is supplied by the customer in the field.
Brick, insulation, anchors, form material, refractory, and equipment used to install said material (mixer, vibrators, brick saw, hand tools) are supplied by US Furnaces.
Curing process, startup and training are also provided in the purchase price.