L&L Special FURNACE CO, INC

ADC Series

Dual Chamber Furnaces For Heat Treating Aluminum 1100°F / 400°F (593°C / 260°C)

APPLICATIONS

Electric dual chamber heat treat furnace, specifically designed for performing a wide variety of aerospace and precision aluminum heat treating applications. The system is designed to perform annealing, aging and solution aluminum heat treating. The bottom chamber is a high temperature chamber designed to operate between 400°F and 1100°F, and is primarily designed for solution heat treating and annealing. The top chamber is designed to operate between 200°F and 500°F for aluminum aging. A roll away quench tank is located under the furnace which allows for quickly quenching loads in water.

OPERATIONS

Loads for solution heat-treat are placed on the furnace floor or in a customized basket. When the cycle is complete an audible alarm sounds to notify the operator. The door is then opened and the parts are manually quenched in the quench tank located in front of the furnace (typical quench time is under 3 seconds). Loads for annealing are placed in the bottom chamber and held at the required temperature for the required amount of time. Loads for aging are performed in a similar manner in the top chamber.

FEATURES

CLOSE TEMPERATURE UNIFORMITY

Top Chamber:±10°F / 5.5°C above 200°F / 93°C within the stated working zone.

Bottom Chamber: ±10°F /5.5°C above 500°F / 260°C within the stated working zone.

SINGLE ZONE AND EVEN ELEMENT PLACEMENT

Incoloy sheathed tubular elements are supported in 304 stainless steel holders incorporated into the liner. The elements of each chamber are evenly spaced along the sides. Power to each chamber is controlled by a single zone SCR.

EFFICIENT MULTILAYERED INSULATION

The top chamber is insulated with 4" of a combination of insulating firebrick and high efficiency insulating board. The roof is 4" of ceramic fiber modules. The bottom chamber is insulated with 5" of a combination of insulating firebrick and high efficiency insulating board. The roof is 5" of ceramic fiber modules

HEAVY DUTY INTEGRATED CASE

Both chambers are mounted in one integrated 10 gauge steel case with structural stiffeners and lifting rings. The entire case is primed with 800ºF silicone paint and finished in machine enamel.

ROLL OUT QUENCH TANK

A roll out quench is included. When this is not in use it is simply moved to a "park" position under the furnace.

FAN AND BAFFLE SYSTEM

Each chamber has a high volume recirculating fan located in the back. The fan is sized to allow for over 100 volume changes per minute. Each chamber has a stainless steel baffle system. The high convection air cooled fans in both chambers pull air through the work zone through the fan and then forces the air out along the heated sidewalls. The air is once again pulled through the work zone and the cycle is repeated. There are a series of holes and louvers to allow for air flow to be dampened or increased as needed for an extremely tight temperature gradient.

DOUBLE PIVOTED PLUG DOORS

Both doors are double pivoted horizontal doors to allow the door to be opened so that the hot face stays away from the operator. Each door is equipped with a tadpole gasket for an extremely tight seal.

DIGITAL PID CONTROL AND HIGH LIMIT SYSTEM

The primary controls are microprocessor based program controls and there are digital overtemperature protection systems with back up contactors for both chambers. All fuses, transformers, contactors, and controls are housed in a NEMA 1 panel. Thermocouple break protection is included. Limit switches shut off furnace power when doors are opened or the backs are removed. Lighted NEMA 13 On/Off switch included. Control voltage is transformed to 120 volts. The control circuit and each power branch circuit are fully fused. Customer must connect fused power supply to single point on panel. Each chamber has an audible alarm to notify the operator that the cycle is complete. The top chamber has a single input circular chart recorder. The bottom chamber is equipped with a 2 input circular chart recorder. This allows for the recording of the bottom chamber temperature along with the recording of the quench tank temperature. Each chamber has 3 thermocouples, one for temperature control, one for overtemperature control and one for recording temperatures. The quench tank has one type J thermocouple for recording the temperature of the quench solution.

TESTING AND INSTRUCTIONS

The furnace is power tested to insure proper watt ratings. A complete instruction manual includes easy start up instructions, theory of operation, maintenance instructions, parts list, and a detailed trouble shooting guide. Ladder logic diagram and panel layouts are prepared on CAD for easy readability.

WARRANTY

The furnace is warranted for one year except for elements and thermocouples which are warranted for six months.

OPTIONS

- **JIC CONTROL OPTION:** This includes a NEMA 12 control cabinet, all oil tight switches and a panel mounted fused disconnect switch
- **INSTRUMENT CERTIFICATION:** All instruments are checked and verified to NIST standards.
- **RAMP/SOAK PROGRAM CONTROLS:** Various options are available, including multi-program program controllers
- **TEMPERATURE RECORDERS:** Round chart and Video recorders in single or multi-pen.
- **AEROSPACE PACKAGE FOR ASM 2750F COMPLIANCE:**
  - Lot Calibrated Thermocouples With Certification
  - Instrument Calibration With Certification
  - 3 Day Start Up Service Within The Continental USA
  - **Each Chamber:**
    - 1" NPT Uniformity Survey Port
    - (4) T/C Reference Ports, (1) At Each Corner Of The Work Zone
    - T/C Reference Ports Adjacent to Control and Overtemp T/C

Model Number	Inside Dimensions			Outside Dimensions			K.W. Bottom	K.W. Top	Max Load	Approx Ship WT
	W	H	D	W	H	D				
ADC 813	18	12	36	96	94	120	24	12	125	3,200
ADC 814	18	12	48	86	94	132	30	15	175	3,800
ADF 816	18	12	72	96	94	156	36	18	250	4,500

Custom sizes are available – contact Factory for quote. Dimensions are in inches. Weight is in pounds. 240 or 460 volts is normal. 208, 380 and 575 volts are optional. 3 phase is normal although single phase is available. Specifications are subject to change without notice.

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