

HEAT TREAT EQUIPMENT

Quality Used Heat Treating Equipment

Allcase System #1[®] Furnace Line

The Allcase furnace line consists of the following equipment.

- 1. U-3596 Allcase, System #1[®], Top Cool & Quench, 36-48-36**
- 2. U-3597 Uni-Draw[®] Furnace, UDG-14, 36-48-36**
- 3. U-3598 RX-2T 6000 CFH Endothermic Gas Generator**
- 4. U-3599 WGD Dunk Washer, 36-48-36**
- 5. U-3600 Algas SDI Ammonia Vaporizer**
- 6. U-3601 DEDP #1 36-48 Charge Car**
- 7. U-3602 SLT Scissors Lift Tables, 36-48-36**
- 8. U-3604 ST Storage Tables, 36-48-36 (not shown)**

U-3596 Super Allcase 36-48-36 Gas-Fired IQ Furnace

The SUPER ALLCASE is a batch type atmosphere furnace equipped with gas fired alloy Trident[®] tube heating and an integral quench tank with vestibule.

The unit includes the following features:

- Thirty-six (36) inches wide by forty-eight (48) inches long by thirty-six (36) inches high effective work dimensions
- 1400°F to 1800°F operating temperature range
- System #1 automatic internal handling
- Heavy duty 5" diameter super alloy rollers and rails
- Long life cast alloy fan
- Vibration absorbing fan mounting for increased fan and bearing life
- Atmosphere piping for endothermic atmosphere with natural gas enriching, process air, and process ammonia
- Proportional flow control valves for enriching gas and process air
- Waukee-Tronic flow sensors for enriching gas, process air, and process ammonia. The flow rate signals are sent to the PLC/PLC/CASEmate for display on the operator interface. The flows can also be sent to the optional TAL Supervisory Network if it is purchased.
- Low flow RX atmosphere control
- Automatic nitrogen purge
- FNC (Ferritic Nitrocarburizing) Package

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FNC processes add nitrogen and carbon to the surface of ferrous metals at low temperatures around 1060°F. Several atmosphere gas combinations can be used for the FNC process. This package is based on using steady flows of 60% RX and 40% ammonia for the atmosphere.

The FNC atmosphere gas flows are manually controlled by the furnace operator. The PLC/CASEmate controller will be used for temperature control only.

Flow of the FNC process atmosphere gases will begin with the furnace heated above 1400°F before introducing the atmosphere and heated above 1400°F and burning the atmosphere out at the end of the process. Cycles using a nitrogen purge, at the beginning and end of each cycle, can also be used.

The FNC package includes:

- Large valved flow meter for process ammonia
- Flow switches as required for process atmosphere
- Controls, etc. to allow operation with FNC or RX atmospheres
- Check valves to prevent backflow of FNC or RX atmospheres

NOTES:

The FNC process includes the use of a combustible atmosphere in an enclosed chamber below the auto ignition temperature. This must be approached with a degree of caution.

PURCHASER must provide an uninterruptible source of nitrogen for the automatic nitrogen purge system. The nitrogen purge supply must include safeguards that guarantee that the source of purging nitrogen does not become depleted during operation.

The FNC package does not include any atmosphere analyzing equipment for process monitoring. PURCHASER to supply any analyzing equipment required.

- Heavy duty refractory insulation with arched roof that promotes atmosphere recirculation
- 13 1/2" wall insulation for reduced heat losses
- Recuperation
- Automatic plunger cooling
- Shim stock port
- Top cool chamber
- Large capacity 2,990 gallon quench tank
- High flow 16,000GPM, 20 HP quench agitation system
- Variable speed agitation
- 36 KW quench heating for 160°F operation
- Air cooled quench oil cooler for 160°F operation
- Bag type quench oil filtering system

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PLC/CASEmate[®]

The PLC CASEmate System will provide programmable control of furnace temperature, Furnace atmosphere carbon potential, and quench temperature. Up to 100 process cycles can be stored. The system not only controls the ALLCASE process cycle, it also provides alarm and annunciator type functions for problems that may arise during operation. If a process problem occurs the alarm sounds and an error message appears on the screen.

The system is based on an Allen-Bradley SLC 5/05 PLC programmable controller and PanelView Plus 1000 touchscreen and keypad operator interface.

The large PanelView display provides more information, on one display, than typical commercial controllers. Viewing or inputting information from one large display reduces the chances for confusion and errors that can occur when scrolling through many limited displays.

The Control System includes:

- SURFACE S-1 oxygen probe with burnout feature (Burnout feature allows the probe to have a mild bum-out at the probe tip to minimize carbon build-up and increase the accuracy and life of the probe. The probe burnout occurs every time the furnace is cycled plus at timed intervals if long carburizing cycles are run.)
- Probe reference air supply air filter, solenoid valve, flow meter, piping and wiring
- Probe burnout air supply air filter, solenoid valve, flow meter, piping and wiring
- Heavy duty solenoid valve for time proportioned control of enriching gas
- Heavy duty solenoid valve for time proportioned control of process air additions
- Honeywell DC2 500 digital furnace temperature hi-limit
- Honeywell UDC 2500 digital quench temperature hi-limit
- The stocked ALLCASE does not include a recorder
- The controller furnace temperature hi-limit instrument and quench temperature hi-limit instrument will be located in the motor control cabinet mounted on the side of the ALLCASE quench tank

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U-3597 Uni-Draw[®] Gas Fired Temper Furnace 1400°F

The Uni-DRAW Temper Furnace is designed to be used as a companion unit to the ALLCASE furnace. The furnace comes equipped with a high capacity recirculating fan.

The Uni-DRAW sales price includes the following features

- Thirty-six (36) inches wide by forty-eight (48) inches long by thirty-six (36) inches high effective work dimensions
- Gas fired 500,000 BTU/HR heating system for operation to 1400°F
- Steady state temperature uniformity of $\pm 10^{\circ}\text{F}$ from 350°F to 1400°F
- 6,200 CFM 10/5 HP two speed recirculating fan mounted on the rear wall for ease of maintenance
- Unique round design (US Patent 4,963,091) that results in a circular wind flow along the inside of the furnace walls. This circular flow travels the full length of the furnace. A second circular wind flow, in the center of the furnace, travels back to the recirculating fan. This flow pattern provides excellent temperature uniformity and wind flow through the work load.
- 6" modular ceramic fiber wall and door insulation coated with rigidizer is used for low heat loss, low heat storage, and ease of maintenance
- Pneumatically operated vertical door lift with hand valve control
- Heavy duty cast alloy roller rail hearth (Cast HH (25 Cr - 12 Ni) rails and trunnion type rollers)
- Soft seal type door for reduced heat loss and excellent temperature uniformity
- Temperature control will be provided by a PLC/TEMPmate included in the Network Control System pricing
- Temperature data collection will be provided by the Network Control System
- Honeywell UDC 2500 digital temperature hi-limit

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U-3598 RX-2T 6000 CFH Endothermic Atmosphere Gas Generator

The modular style RX-2T endothermic gas generator will be supplied to provide up to 6,000 CFH RX- atmosphere gas. The generator will be constructed from vacuum cast insulating cylinders wrapped with insulating blanket and mounted in metal sleeves. The sleeves are mounted on legs to provide access to the ring burners and reaction tube inlets. The reaction tubes are mounted vertically in the generator and are removed from the top.

The modular style RX generator includes the following features:

- Honeywell UDC-3200 Temperature Controllers
- Honeywell UDC-2500 High Limit Instruments
- Rotary Lobe Style Mixture Pump
- Continuous Lubrication System
- Portable Oxygen Analyzer for Premix Setup
- Spark Ignited Pilots with Flame Supervision
- SBS End-O-Therm gas-to-air heat exchanger
- Back-up mixture pump
- ESA-6200 process controller



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U-3599 WGD Dunk Washer, 36-48-36

The Dunk Washer is intended to be used as a companion unit to the ALLCASE furnace. The WGD washer is a gas fired unit designed for cleaning parts that have been oil quenched. It is intended for use with loads that can be cleaned by dunking the load in hot wash solution and agitating the load up and down while immersed. After the timed agitation cycle, a quiescent period allows oil in the wash solution to float to the surface and be skimmed off. A final spray off is provided as the load is raised from the wash solution.

The WGD Dunk Washer sales price includes the following features:

- Thirty-six (36) inches wide by forty-eight (48) inches long by thirty-six (36) inches high effective work dimensions
- High efficiency small bore 300,000 BTU per hour immersion tube heating system
- Make-up water via float switch and solenoid valve
- Plate type oil separator system including a stainless steel tank with stainless steel plates, float valve, pump, and etc. This system skims oil off the surface of the wash solution plus it separates oil out of the wash solution.
- Allen-Bradley MicroLogix 1000 PLC controller with PanelView 300 Micro operator interface for control of washer cycle
- Honeywell UDC 2500 temperature controller



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U-3601 DEDP #1 36-48 Charge Car

The charge car is designed to move tray loads between ALLCASE furnaces and companion equipment.

The charge car sales price includes the following features:

- Thirty-six (36) inches wide by forty-eight (48) inches long by thirty-six (36) inches high effective work dimensions
- Power mast with 50'-0" Duct-O-Bar conductor system
- DEDP#1 double ended double powered System #1® handling



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U-3602 SCISSORS LIFT TABLE

The scissors lift table is designed to provide easy loading and unloading of ALLCASE trays. A self-contained hydraulic unit provides variable loading elevations for the ALLCASE trays.

The scissors lift sales price includes the following features:

- Thirty-six (36) inches wide by forty-eight (48) inches long by thirty-six (36) inches high effective work dimensions
- Foot switch elevation control



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U-3600 Ammonia Vaporizer

