WESMAN

INDUSTRIAL FURNACES DIVISION

Uttis®

MULTI PURPOSE BATCH TYPE SEALED QUENCH FURNACE

CBUT/ CBUR SERIES

WESMAN UTTIS MULTIPURPOSE CHAMBER-TYPE SEALED QUENCH FURNACES deliver excellent performance for conventional heat treatment processes such as

- **Case Hardening**
- **Carburizing**
- **Neutral hardening and Tempering**
- **Carbonitriding**
- **Ferritic Nitro Carburizing**

ABOUT WESMAN UTTIS

These furnaces combine design technology from UTTIS, Romania and Wesman's expertise in manufacturing them for more than 25 years. Accumulating advanced furnace techniques and new outcomes from various industrial fields, Wesman UTTIS Sealed Quench Furnaces are distinguished by simple design, ease of operation and maintenance, and low running costs.

FURNACES DESIGN AND RANGE

WESMAN UTTIS CHAMBER-TYPE SEALED QUENCH FURNACES WITH INTEGRATED DOUBLE WALLED OIL QUENCH TANK are available in two design types and several standard sizes, but can also be supplied in a wide range to meet exact requirements. The basic design types are:

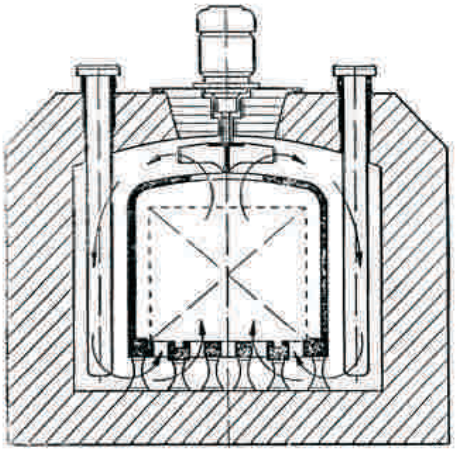

FIGURE 1

TYPE CBUT: STRAIGHT-THROUGH

(LOADING FROM HEATING CHAMBER SIDE AND UNLOADING FROM QUENCHING CHAMBER ON OPPOSITE SIDE)

- Two chambers working at the same time
- Higher productivity efficiency
- Temperature and carbon potential are at equilibrium while loading, leading to less soot formation
- Visual checks of heating chamber for easy maintenance

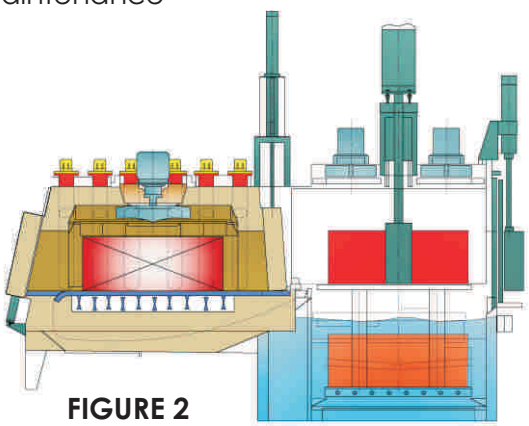

FIGURE 2

TYPE CBUR: STRAIGHT-IN-OUT

(LOADING AND UNLOADING FROM SINGLE DOOR ON QUENCHING CHAMBER SIDE)

- Ideally suited to process components with very low case depth
- Higher productivity for shorter cycle processes
- Compact structure with less space required as no charge car loading track
- Charge car for loading not required

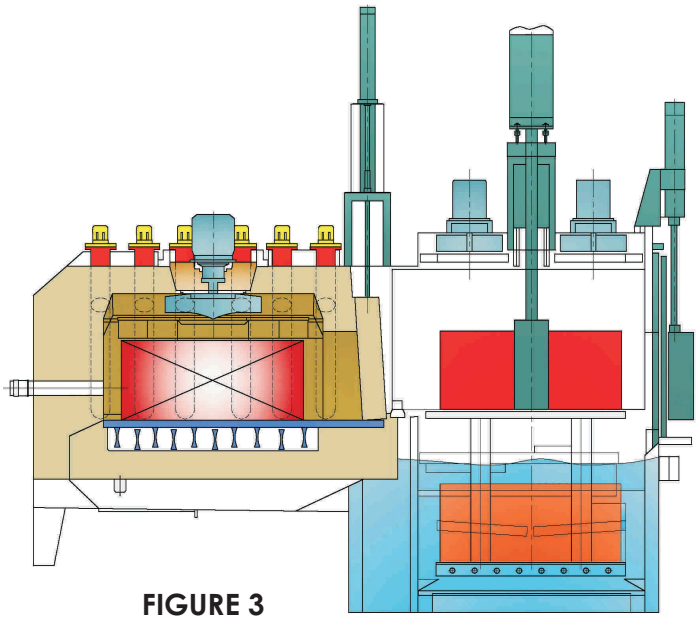

FIGURE 3

HEATING SYSTEM

ELECTRICALLY HEATED: Metallic radiant tubes with cage type heating elements are vertically installed between brick lining and muffle side wall. Power for heaters is through thyristor controller which ensures optimum heat to charge. Heaters are 115 VAC which offer guaranteed satisfactory performance without using transformer.

GAS FIRED: High-efficiency recuperative burner systems with low Nox content come fitted in vertically installed centrifugally cast metallic radiant tubes. These burners feature low noise output, uniform radiation and easy assembly/ disassembly for maintenance.

HEATING CHAMBER DESIGN

The heating chamber is lined with calcium silicate boards and special high-temperature insulation bricks which are extremely durable and immune to carburizing atmosphere. the furnace hearth has nitride-bonded silicon carbide plates with large openings to ensure uniform penetration of charge by furnace atmosphere. Nitride-bonded silicon carbide muffle pieces surrounding the hearth on sides and roof protect the charge from direct radiation, and also promote uniform temperature and atmosphere distribution throughout charge.

QUENCHING SYSTEM

Double-walled gaslight quenching tank suitable for hot oil quenching is provided. Oil temperature and level are monitored and set automatically. Options of water and air cooling are available, along with oil circulation by centrifugal pump with mechanical seal.

PROCESS TECHNOLOGY

Control of furnace atmosphere carbon level is required for carburizing and hardening, which hinges on furnace temperature and oxygen probe along with an advanced microprocessor based Carbon Potential Controller. The following process techniques are available:

- **ENDO GAS FROM AN ENDO GAS GENERATOR** as protective gas with additional hydrocarbon for C-Level controlled carburizing. For carbonitriding small amounts of ammonia can be used
- **ATMOSPHERE SIMILAR TO ENDO GAS** using methanol and nitrogen, or methanol with additional hydrocarbons. Only for processes above 800^{0}C
- **DIRECT GASSING WITH AIR AND HYDROCARBONS** such as LPG/ propane or natural gas, but only for processes above 850^{0}C. This high-efficiency process provides quick, uniform and reproducible carbon transfer with substantial savings in cycle time and gas consumption. Most suitable for longer cycles.
- **FERRITIC-NITROCARBURIZING** can also be optionally offered, for basic hardening followed by nitro-carburizing in the same furnace on the same batch.

CONTROL TECHNOLOGY

Independent of which process is used, the hardening, carburizing or carbonitriding cycles are controlled automatically through a Gas Mixing Panel, which controls and monitors flow rates of process and protective gases through solenoid and motorized valves.

All furnace functions are controlled by PLC. An Operator Panel allows pre-programming and running of systematic heat treatment programs with pre-defined temperature and carbon potential gradients, allowing flexible setup and execution of process parameters and sequences. A SCADA interface provides operational and process control, standard recipe management, report generation etc.

Optional software to link the furnace to the organization's MIS is also available. Fully automatic operation from a control room with minimal human supervision is also available, suited to large installations with multiple furnaces to reduce manpower costs.

KEY CONSTRUCTION FEATURES AND ADVANTAGES

- Fabricated from heavy duty structural steel plates, reinforced and welded
- Roof, walls and hearth brick-lined with special high-insulation refractory bricks minimizing heat loss and low skin temperature
- Silicon carbide muffle in heating chamber with flat perforated hearth, solid vertical side walls and arch for excellent atmosphere and temperature uniformity with zero cold spots in charge
- Flat hearth and absence of skids ensures low fixtures weight, increasing net loading
- Pneumatically operated brick-lined doors specially designed with wedge locking mechanism for front and rear
- Stainless steel inner door to guarantee maximum sealing
- Totally enclosed drive system for charge transfer from heating to quenching chamber with special transfer chain made from anti carburizing alloy
- Direct-driven two-speed high-volume recirculation fan mounted on roof
- Hydro-Pneumatically operated quench elevator and inner door with specially designed guide tubes for smooth jerk-free movement
- Vertically mounted variable-speed agitators with guiding oil baffle
- On-demand flame curtain gets activated only when unloading doors operates
- Standard version has atmosphere or forced cooling features suitable for operating temperatures up to 1000^{0}C
- Imported critical components used for longer life and reliability
- Conformity to CQI 9 and AMS 2750D standards
- Access ladder and catwalk included for maintenance and fume exhaust hoods.
- All elements easily accessible and removable for easy maintenance
- Extremely safe and simple in operation

STANDARD AVAILABLE SIZES:

Common and standard available sizes are listed below. Other sizes may also be available on request. Figures below are charge space dimensions. Fixture dimensions are normally kept 50 mm less than charge space dimensions.

STANDARD AVAILABLE AND COMMON SIZES ARE GIVEN BELOW.OTHER SIZES MAY BE AVAILABLE ON REQUEST

FURNACE MODEL CBUT AND CBUR	CHARGE LENGTH in mm	CHARGE WIDTH in mm	CHARGE HEIGHT in mm	GROSS CAPACITY in kg
TYPE 1/1	900	600	500	400
TYPE 2/1	1200	750	600	600
TYPE 2/2	1200	750	750	1000
TYPE 3/2	1200	900	750	1000
TYPE 3/3	1200	900	900	1500

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