



UBQ

Universal Batch Quench Furnace



UBQ: Universal Batch Quench Furnace

Ultimate in flexibility and versatility

The AFC-Holcroft advantage

AFC-Holcroft's integral quench furnaces are designed for neutral hardening, carburizing, carbonitriding, normalizing, and annealing where a controlled environment is required during the heating and quenching portions of the cycle. An optional atmosphere cooling chamber can be provided in addition to our integral oil, salt, water, or polymer quench systems. The furnaces are designed for a normal operating temperature range of 1450 – 1750 °F with a maximum of 2000 °F.

Objectives

In developing the modularly constructed universal batch system, our objective was to build a system with state-of-the-art technology which is easily serviceable, delivers the highest production as compared to other commercially available systems, delivers consistently high quality with predictable and repeatable results, and is able to perform a large variety of metallurgical processes. After you have examined our brochure, talk to one of our satisfied customers or visit one of AFC-Holcroft's installations in your area. See for yourself why people call us The First Family of Complete Universal Batch Systems.

Quality

Universal batch systems are designed to provide excellent temperature uniformity and uniform distribution of atmosphere in the entire work area. Our patented "upflow" quench agitation provides high volume and velocity for uniform quenching of work. Reliability, predictability, and repetitiveness are a trademark of our systems. Our systems produce consistently high-quality product with close metallurgical tolerances, day after day.

Productivity

In a typical batch system, productivity is measured in terms of gross load, recovery rates, and ability to quench or uniformly cool these large loads. Our universal batch systems handle gross loads of 1100 to 6000 pounds. In all sizes, we maintain a ratio of 3:1 in internal chamber radiating area to work surface area, and provide larger 8-inch diameter radiant tubes to effectively and uniformly heat the products at a faster heat-up rate than other comparable systems. In our UBQ 36-48-36 system, the 12,650 sq. in. surface area of the radiant tubes delivers a large number of BTUs to the product at an optimal rate.



IntensiQuench UBQ System.

Our quench capacity is approximately 1 gallon of quenchant per pound of quench load. This, coupled with our upflow quench agitation system, not only provides uniform quench severity, but also minimizes instantaneous temperature rise of the quench media.

Serviceability

Universal batch systems are designed and built to perform reliably for long periods with minimal maintenance. Of course, if any component has to be repaired or replaced, our modular plug-style construction enables quick and easy replacement from outside with minimal downtime.

Flexibility

Universal batch systems are developed to provide the flexibility of metallurgical processes and layout. Our systems can be arranged close to plant walls to provide the most effective use of floor space. They can be fully automated to minimize operator interaction and installed in line with modern "flex" production centers.

Companion equipment

AFC-Holcroft's universal batch systems are offered complete with all companion equipment such as tempering furnaces, pre-oxidation furnaces, spray-dunk washers, forced air cool stations, scissors lifts, stationary tables, and our complete line of fully

automated transfer cars designed for maximum reliability. Our universal batch systems can be fully integrated into "production cells" with automatic transportation and controls. Over two hundred worldwide successful units in the last ten years are a testimonial to the success of our universal batch systems.

Innovative features and technologies make the AFC-Holcroft difference

Universal Batch Furnace

The AFC-Holcroft universal batch furnace casing is fabricated of 3/16-inch and 1/4-inch steel plates suitably reinforced with structural steel to form a gas-tight chamber. The walls of the furnace are insulated by 9 inches of insulating firebrick backed by 4-1/2 inches of insulating block. Ceramic fiber modules are utilized in the roof of the furnace and the floor is lined with insulating firebrick. The hearth consists of two cast alloy roller rail assemblies supported by alloy piers for superior atmosphere circulation under the load. These heavy-duty roller rails are provided in super alloy materials to minimize maintenance. Hearth height is 50 inches above the floor.

AFC-Holcroft offers both gas-fired and electric heating systems. The gas-fired heating system consists of alloy U-tube assemblies mounted vertically in the roof to provide more effective utilization of available

tube heating area. We offer optional high-efficiency recuperators for further energy savings. Our electric heating system consists of vertical tubes containing bayonet-type elements on either side of the work load. This design permits external element maintenance without the necessity of completely cooling the furnace chamber. All of our radiant tubes are bung mounted for easy removal and replacement.

A high-capacity recirculating fan is provided in the heating chamber to provide sufficient atmosphere circulation to obtain uniform atmosphere consistency within the furnace chamber. The fan is supplied with an air-cooled insulated bearing housing and is bung mounted so it can be removed as a complete assembly without entering the furnace chamber. No water piping is required to the fan, reducing utility costs.

The quench tank is fabricated of 1/4-inch plate and reinforced with structural members to form a rigid, liquid-tight and gas-tight chamber. The AFC-Holcroft quench systems are designed to obtain an upward flow of recirculated quenchant through the work load area. Vertically mounted propeller-type agitators are mounted on the sides of the vestibule. Our space-saving narrow quench tank design has a capacity of approximately 1 gallon per pound of gross load and requires only a shallow 24-inch pit to obtain the 50-inch hearth height. A double deck elevator system is provided to minimize reloading times.

The universal furnace is designed to operate with an external handler to minimize internal furnace mechanisms. The rear handler drive is mounted in the back wall of the furnace to provide for automatic transfer of the work load from the furnace to the quench tank after a completed cycle.

Pioneering Technologies

Austempering – UBQA

AFC-Holcroft is the clear leader of integral molten salt quench furnace design. Our integral austemper quench systems operate in a temperature range of 350 – 800 °F. Our patented water injection system can provide quench severities equivalent to a water quench and can through harden up to 6-inch-thick cross sections. Our universal batch quench austemper furnaces are designed for neutral hardening, carburizing, carbonitriding, carbo austempering, normalizing, annealing, austempering steel, and austempering ductile irons (ADI).

Intensive Quenching – UBQI

A spin-off of our successful UBQA furnace design, the UBQI was developed for the growing IntensiQuenchSM market. Intensive quenching is a very rapid and uniform cooling of steel parts that causes the simultaneous formation of martensite throughout the whole part surface, creating a firm shell. IntensiQuench martensite is characterized by finer structure with higher dislocation density and improved mechanical properties – “micro-hammered” – through higher residual compressive stresses. This strong martensite case or shell minimizes part distortion.

RapidGAS™ atmosphere system

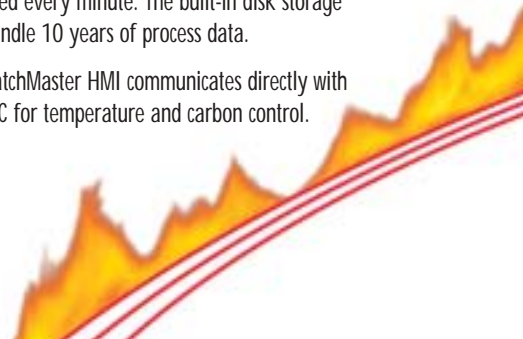
AFC-Holcroft's proprietary RapidGAS atmosphere control system provides the required protective furnace atmosphere without a separate endothermic generator. RapidGAS controls the generation of the protective atmosphere directly in the furnace chamber. A multi-gas analyzer system and simple oxygen probe are used to control the direct injection of the

required additive gasses. The RapidGAS system requires approximately 1/10 of the gas flow of a traditional endothermic system and is capable of operating soot-free at higher carbon potentials, reducing carburizing cycles by as much as 50%. The precision control provided by RapidGAS provides superior metallurgical performance with a nearly 50% reduction of intergranular oxides and a more uniform case depth from root to pitch line. Reduced capital investment and maintenance costs, reduced atmosphere gas consumption, reduced cycle times, and improved quality all add up to increased profits with RapidGAS.

BatchMaster

AFC-Holcroft's popular BatchMaster INDIVIDUAL batch furnace management package is based upon a subset of our highly successful ProcessMaster[®] heat-treating supervisory system. The main operator HMI interface is a NEMA 4 industrial panel PC with a 15-inch-wide color LCD touch screen. This HMI communicates directly to the batch furnace PLC controller for complete operational control. A variety of standard screens are provided for viewing mechanism and recipe status, control loops, process trending and other analog and digital status. All process parameters are read every second and recorded every minute. The built-in disk storage will handle 10 years of process data.

The BatchMaster HMI communicates directly with the PLC for temperature and carbon control.



Precision 3D engineered modular UBQ.

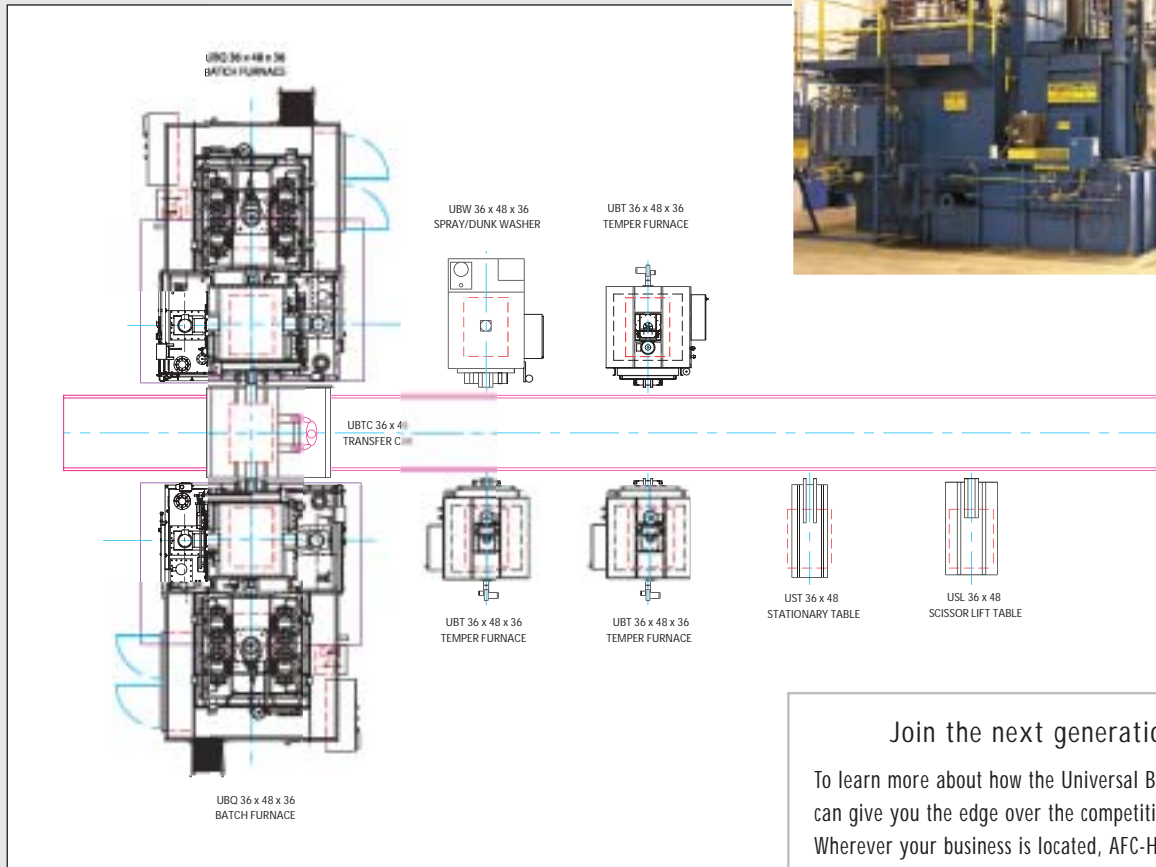


Turnkey complete UBQ system installation and integration.



UBQ with BatchMaster PC control system.

Standard UBQ Arrangement and Components



Join the next generation today!

To learn more about how the Universal Batch Quench Furnace can give you the edge over the competition, contact us. Wherever your business is located, AFC-Holcroft can provide you access to an unparalleled level of consultation and support that ensures you get the maximum value from your investment dollar.

UNIVERSAL BATCH QUENCH (UBQ)

Model	Effective Load Size	Gross Load Capacity (pounds) @ 1750 °F	Heating Rates (lbs/hr)		Energy Requirements			Atmosphere Required (CFH)	Quench Tank		Dimensions		
			1550 °F	1700 °F	BTU x 1000	KW	HP Motors		Volume (Gallons)	Agitation (GPM)	L	W	H
UBQ-243624	24" x 36" x 24"	1100	1100	600	1000	60	20	500	1100	6750	16' 0"	10' 0"	13' 0"
UBQ-364836	36" x 48" x 36"	3500	2700	2400	1200	144	30	750	3500	16000	20' 0"	13' 0"	17' 11"
UBQ-367236	36" x 72" x 36"	6000	2875	2560	1800	216	40	1000	5950	24000	22' 0"	13' 0"	17' 11"



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