

## DUAL CHAMBER OVER/UNDER HEAT TREATING FURNACES 2,350°F/1,250°F (1,285°C/675°C)

### APPLICATIONS

The QD Series Dual Chamber Heat Treating furnaces feature a 2,350°F (1,285°C) high heat chamber for hardening and a 1,250°F (675°C) recirculating oven for tempering. The over/under configuration saves floor space. The hardening furnace is mounted on top, with the tempering oven below. Agitated and heated quench tanks are optional. The kilns achieve high precision by including highly accurate controls, solid-state contactors for fast cycle times, two zone control (top and bottom) on the hardening furnace, and very even spacing of elements. The tempering oven features a powerful fan and recirculation muffle for high uniformity.



# FEATURES

## HIGH TEMPERATURE UNIFORMITY

The hardening furnace is uniform to within +/-20°F (+/-10°C) above 1,500°F (815°C). The tempering oven is uniform to within +/-10°F (+/-5°C) above 300°F (150°C).

## TWO ZONES AND EVEN ELEMENT PLACEMENT

The elements of each furnace are divided into top and bottom zones. The control output is routed through two input switches that allow adjustment of the total time onto each zone. There are thermocouples mounted in the top and bottom with a selector switch to read the temperature differential. The elements of the hardening furnace are evenly spaced on the door, back, sides and bottom. The tempering furnace has no door or back elements. The elements are supported in proprietary high temperature ceramic element holders. These provide perfect support for the coiled element as well as excellent radiating characteristics. The smooth surface prevents premature failure of the element as it expands and contracts. Iron-aluminum-chrome alloy elements are standard, although nickel-chrome elements are optional.

## EFFICIENT MULTILAYERED INSULATION

Both chambers are insulated with 4-1/2" of low K factor refractory firebrick as the primary insulation. This is backed up by 2" of very low K factor mineral wool board on all surfaces except the bottom, which has 2" of hard calcium silicate backup for solid hearth support. This yields an excellent combination of strength, insulating quality and fast heat-up and cooldown time. All refractory is coated with a special facing that prolongs firebrick life and helps prevent spalling and dusting. The refractory sections are available completely shaped for easy replacement without cementing. All sections fit together with engineered heat locks that improve the insulating integrity of the furnace. No asbestos is used.

## 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 800°F silicone paint and finished in machine enamel.

## FAN AND RECIRCULATION MUFFLE

The tempering oven features a back mounted four bladed alloy fan. It is belt driven with a 3/4 H.P. motor. A heat dissipator protects the bearings. The removable recirculation muffle is constructed of 304 stainless steel. This has a solid bottom for use as the hearth. The muffle protects the work from direct radiation of the elements and creates a recirculation pattern for the air.

## HARDENING FURNACE FEATURES CERAMIC HEARTH

The standard hearth is a 3/4" thick ceramic plate elevated 1-1/2" above the bottom elements.

## DOUBLE PIVOTED PLUG DOORS

Both doors are double pivoted horizontal doors with 1/2" refractory plugs for a superb heat lock around the door seal. The double pivoting allows the door to be opened so that the hot face stays away from the operator.

## DIGITAL PID CONTROL AND HIGH LIMIT SYSTEM

The standard controls are Honeywell UDC 2500 digital PID 3 mode tuning controls. All fuses, transformers, contactors and controls are housed in a NEMA 1 panel. Quiet, long-life solid-state relays are standard. SCR power controls are optional. The thermocouples are Type K. Thermocouple break protection is included. Limit switches shut off furnace power when doors are opened or the backs are removed. A lighted NEMA 13 on/off switch is included. Control voltage is transformed to 120 volts. A Honeywell UDC 1200 digital high limit backup control with manual reset, backup contactors and separate thermocouple is standard for both chambers. The control circuit and each power branch circuit are fully fused. The customer must connect fused power supply to a single point on the panel.

## TESTING AND INSTRUCTIONS

The furnace is power tested to ensure proper watt ratings. A complete instruction manual includes easy startup instructions, theory of operation, maintenance instructions, parts list and a detailed troubleshooting guide. A ladder logic diagram and panel layout 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. Zone switches are percentage timers.
- **HIGH K.W.:** Available on hardening furnace.
- **SCR POWER CONTROL:** For greater precision.
- **INERT ATMOSPHERE CONTROL:** Available on one or both chambers. Mixing panels for natural gas and nitrogen are available for neutral hardening.
- **RAMP/SOAK PROGRAM CONTROLS**
- **TEMPERATURE RECORDERS:** Round and strip chart recorders in single or multi-pen.
- **VERTICAL DOORS:** A counterbalanced vertical door is available for the hardening chamber only. Manual hand crank, pneumatic or electric operation.
- **SPECIAL HEARTHS:** Silicon-carbide or alloy hearth.
- **AGITATED, HEATED QUENCH TANKS:** These provide superior quenching results. Request Bulletin QT.

# SPECIFICATIONS

Model Number	Hard Chamber Actual Inside Dimension			Temp Chamber Uniform Inside Dimension			Temp Chamber Inside Recirc Muffle dimension			Outside Dimensions			Hard Chamb K.W.	Temp Chamb K.W.	Max Load Lbs	Apprx Ship Lbs
	W	H	D	W	H	D	W	H	D	W	H	D				
QD 524	16	18	25	12	11	20	11	11	20	54	75	56	13.5	10.0	110	2,000
QS 814	19	15	25	15	9	20	14	8	20	57	72	57	14.0	10.0	125	2,300
QD 824	19	21	25	15	15	20	14	14	20	57	84	57	17.0	12.0	150	2,700
QD 836	19	21	37	15	15	32	14	14	32	57	84	69	22.5	17.5	200	3,300
QD 236	25	21	37	21	15	32	20	14	32	63	84	73	27.0	21.0	300	3,500

Dimensions are in inches. Weight is in pounds. 240 or 460 volts is normal; 208, 380 and 575 volts are optional. Three phase is normal, although single phase is available. Inside tempering chamber dimensions are also working dimensions for that chamber. Specifications are subject to change without notice.