

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

### APPLICATIONS

The QDS 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 furnaces 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 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 & EVEN ELEMENT PLACEMENT

The elements of the hardening 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 in the hardening furnace are evenly spaced on the top, bottom and sides for even heating. Elements in the tempering oven are on the sides. 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. The standard elements are iron-aluminum-chrome alloy.

## EFFICIENT MULTILAYERED INSULATION

Both chambers are insulated with 2-1/2" 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 alloy fan. It is belt driven with a 1/6 H.P. motor. A heat dissipator protects the bearings. The removable recirculation muffle is constructed of 304 stainless steel. The muffle protects the work from direct radiation of the elements and creates a recirculation pattern for the air.

## HARDENING FURNACE HAS CERAMIC HEARTH

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

## SPRING LOADED VERTICAL PLUG DOOR

The hardening furnace door is a spring loaded swing up vertical door. The spring holds the door tightly closed, counterbalances it while opening, and holds it up while open. The hot face of the door is kept from the operator. There is a 1/2" refractory plug that protrudes into the furnace chamber and provides an effective heat lock, as well as a 2" refractory seal around the perimeter of the door. The tempering oven door is a single pivoted horizontal door hinged on the left. It also has a 1/2" plug for a heat lock.

## DIGITAL PID CONTROL 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 contactors are standard. There is two zone control (top and bottom) on the hardening furnace. The thermocouples are Type K. Thermocouple break protection is included. Limit switches shut off power when doors are opened or the backs are removed. Control voltage is transformed to 120 volts. A NEMA 13 lighted on/off switch is included. The control circuit and each power branch circuit are fully fused. A Honeywell UDC 1200 digital high limit backup control with manual reset, backup contactors and separate thermocouple is standard for each chamber. The customer must connect the 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:** Includes a NEMA 12 control cabinet, oil tight switches and a fused disconnect switch. Zone switches are percentage timers.
- **HIGH K.W.:** Available on hardening furnace. Approximately 30% higher. Check with factory.
- **SCR POWER CONTROL:** For greater precision.
- **INERT ATMOSPHERE CONTROL:** Available on one or both chambers.
- **RAMP/SOAK PROGRAM CONTROLS**
- **TEMPERATURE RECORDERS:** Round & strip chart.
- **SPECIAL HEARTHS:** Silicon carbide or alloy hearth.
- **AGITATED, HEATED QUENCH TANKS:** These provide superior quenching results. Request QT and QTS Bulletin.

# 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				
QDS 124	13	12	25	10	10	20	10	12	22	55	78	56	9.8	8.0	125	1,300
QDS 814	13	12	37	10	10	32	10	12	34	55	78	68	13.8	12.0	175	1,600

Dimensions are in inches. Weight is in pounds. 240 or 460 is normal. 208, 380 and 575 are optional. Single phase is normal although 3 phase is available. Inside tempering chamber dimensions are also working dimensions for that chamber. Specifications are subject to change without notice.