

TCH-891H -Vacuum Epoxy Cure Oven

The **TCH-891H** Vacuum Epoxy Cure Oven is a part of our program for High Precision Epoxy Molding equipment line.

The Oven comes as a "Plug-and-Play" ready to use system, including vacuum pump, precision vacuum gauge, optional O₂ analyzer etc. Moreover the oven is shipped with a predefine program including all process phases required as per the best of our knowledge for epoxy vacuum cure. The customer engineers should only fine-tune the temperature and vacuum parameters as per specific product needs.

The large Box type chamber made in stainless steel highly polished, is design for easy of cleaning. Large observation window and light inside for clear view of interior.

Special feedthrough ports on requirements.

The chamber is pumped by rotary direct-drive two stage vacuum pump exhaust filter and inlet assimilation trap. The assimilation trap will reduce or eliminate the undesirable effects of mechanical vacuum pump oil back streaming to the chamber while the exhaust filter reduce oil lose in the surrounding area. The vacuum pump is located inside the oven frame for space saving but seats on the floor to reduce vacuum chamber vibration.

The pressure is continuously measured by remote Convection Controller (10^{-3} to 10^{+3} mBar).

The pumping sequence is automatically controlled and permits fast pumping through main vacuum valve or stepped pumping through by-pass valve with controlled pumping rate.

The slow/controlled air evacuations prevents epoxy "boiling" as trapped air is evacuated reducing voids in the molding and content of Oxygen down to less than 10 ppm. Furthermore using Dry N₂ backfilling, the Oxygen level can be reduced under 1ppm, without requiring continues N₂ bleeding.

Optional Oxygen Analyzer is used to monitor the Oxygen level in the chamber. With the optional Oxygen Analyzer the vacuum-purge process is automated to achieve required level.

The system has a manual vent valve for chamber venting in case of power failure.

The **TCH-891H** is a "heated shelf" type, with four independent control circuits assuring uniform temperature distribution. Moreover the high thermal conductance of four Aluminum heated shelves assures temperature uniformity within $\pm 3^{\circ}$ between the shelves and along any of the shelves in steady state.

The oven control includes four independent controls and four safeties overheat protection. Each of the four shelves is independently controlled in a Master-Slave configuration, assuring precise temperature control regardless of load.

The oven is microprocessor driven and can perform temperature and vacuum preprogrammed profiles. Built-in lithium battery back-up retains process values in an event of power failure. Even in power failure, all memory is retained by microprocessor for more than one year.

The standard program includes:

- Slow/controlled air evacuations to prevent epoxy "boiling" as trapped air is evacuated reducing voids in the molding and content of Oxygen down to 10 ppm.
- Backfilling with Dry Nitrogen to further reduce the Oxygen content (less than 1 ppm) in the chamber and improve the heat exchange otherwise reduced due to low pressure.
- Ramp and soak heat control as per Epoxy manufacturer requirements.

The headed shelves are assuring precise temperature control of the product. Furthermore recognizing the possible high cost of the components to be cure, 4 (four) backup independent control loops assure the Over Temperature protection of each of the shelves.

Optional Oxygen monitor can be integrated in the process control loop, but for most of the application the Oxygen monitoring is not required

With our high power PLC controller automatically operation of the system and friendly interface, reliable industrial processes are possible.

The microprocessor programmable controller features:

- 99 steps (Fixed temperature, auto-start, auto-stop, ramp, soak and pressure control.)
- 10 preset temperatures - store up to 10 set temperatures
- Process and step timer
- Key lock feature and different "login" protected levels engineer, operator, service, etc
- Self-diagnostic function alerts users both visually and audibly if malfunction occurs
- Heater circuit automatically turns off if Over Temperature circuit has been triggered
- The system is protected against electrical power momentary fluctuation and/or failure
- Continues recording of 4 temperature points with accuracy of +/- 1°C
- Optional RS232 communication is available, allowing data transfer to a client PC

The indicator tower (signal tower) will indicates the status of the system.

Audible alarm and indicator tower lights are use to alert the operator at end of cure cycle and/or an alarm condition occurs.

Equipment and device will be protected against damage due to power failure for both of momentary and long duration.

Adjustable temperature set point prevents chamber opening and hot surface being exposed at any time.

The **TCH-891H** is designed to be easy to transfer.

The need for Preventive Maintenance is reduced to vacuum pump service and periodic vacuum chamber cleaning.

Technical Data

Chamber interior dimension	600x600x600 mm, 216liter volume (7.6 cu ft)
Operating Temperature Range	Up to 200°C
Temperature accuracy	±1°C at 175°C
Temperature max ramp speed	10°/min
Temperature programming	Up to 99 ramp-and-soak steps
Operating Vacuum Range	Less than 30 mTorr
Pump-Down Time:	5 min up to 50 mTorr (empty chamber, room temperature)
Vacuum sensor type	Convection Vacuum Gauge
Range	10 ⁻³ mBar to 10 ⁺³ mBar
Chamber material	Stainless steel 304L
Number of Shelves, maximum	4
Space between Shelves	128 mm
Overhaul dimensions	780(W)x870(D)x1750(H)mm (without signal tower)
Weight:	approx.190 Kg