

BPI® Computer ChemTemp III™



For use only by qualified personnel in a laboratory environment. Due to high operating temperature, access should be restricted.

BPI# 7792 (110v)
BPI# 207805 (220v)

Specifications

The BPI® Computer ChemTemp III™ is a dual-bath chemical tempering oven for hardening glass lenses. The two baths are individually heated and either may be designated for tempering crown, photochromic, or two hour Corning® lenses. A microcomputer housed in the front panel takes care of all timing and temperature control functions. The user simply selects the desired configuration with switches on the front panel, loads a tray (2 trays) of lenses into the unit, closes the door and presses the start button.

When both tanks of tempering compound have reached their desired temperatures (400° C for photochromic, 440° C for crown glass, 450° C for Corning® lenses), the tempering cycle will start. The lenses will be preheated for 20 minutes by holding them over the hot salt, and then they will be lowered slowly into the baths.

At the end of the 16 hour (or 2 hour) tempering cycle, they will be removed from the baths, and the oven will be turned off. A new batch of lenses may be started by simply pushing the START button. In case of power failures, the backup batteries will keep the timing and motor functions active - when the salt becomes dangerously cool, the lenses will be removed from the salt and the timing suspended until the salt is again hot enough.

Unpacking

When unpacking your system, please check to ensure that no concealed damage has occurred in transit. If such is noted, save the shipping carton and immediately notify the shipping company's damage control inspector in your area so a claim may be processed. Failure to do this may void any future claim and replacement. Also, call BPI® Customer Service so arrangements for a replacement may be made.

Caution

For use only by qualified personnel in a laboratory environment. The molten salts used in chemical tempering are very hot (400-450°C - about the same temperature as burning paper), and they consist of potassium nitrate and sodium nitrate, which are strong oxidizers.

NEVER expose any organic substance (including

HEIGHT	WIDTH	LENGTH	VOLTAGE	WEIGHT	FUSE	AMPERAGE
22 in.	16.5 in.	15.5 in.	110v or 220v.	90 lbs.	20 amps. 250v.	13 amps.
55.88 cm	41.91 cm	39.37 cm		40.82 kg		
THE SET-UP KIT INCLUDES THE FOLLOWING PRODUCTS:						
• 2 Tanks of salt		• 1 Tank removal tool				
• 2 Racks (lenses)		• 1 Instruction manual				
• 2 Lids		• 1 Battery back-up				

skin, wood, paper and plastic) to the molten salt, as instant combustion may result. Metals other than stainless steel will be quickly corroded, and in some cases, may burn. Always keep the safety door closed except when loading or unloading lens racks. Special caution should be exercised when the solid salt is being melted, as sudden shifts of "iceberg" may cause splatters of molten salt.

Product is dangerous if directions and precautions are not followed. In case of fire do NOT use water on the molten salt as splattering will occur. This unit is intended for use with glass lenses only. Plastic lenses will burn in molten salt.

Due to high operating temperatures, access to the instrument must be restricted to qualified personnel.

Assembly

Place your system on a level work surface convenient to an electrical receptacle. The 115 volt version of this unit uses 15 amps of current and therefore requires its own dedicated circuit. The BPI® Computer ChemTemp III™ oven is shipped with major components already assembled. Cables need to be correctly plugged in before the unit is powered up for the first time.

The cables to check are:

1. The 12 pin white plug to the back of the unit;
2. The 2 thermocouples that sense temperature. (These are the thin metal rods that are inserted into the salt baths and are plugged into the yellow sockets inside the upper chamber).
3. The cable from the battery box to the mating 4 pin cable from the main unit;
4. The connections to the batteries inside the box are the RED wire to the POSITIVE terminal of one battery and the BLACK wire to the NEGATIVE terminal of the same battery. The other battery has WHITE to POSITIVE and GREEN to NEGATIVE. The batteries used are EVEREADY 732 or equivalent.

The salt baths are normally shipped in the unit with the type of salt in each tank labeled with a tag. The switch settings on the front panel should be set to correspond to the types of salt and then the tags should be removed, as they will not survive the temperatures at which the tempering unit operates. Be sure to check all of the switch settings.

If the tags have been removed, the careful examination of the surface of the solid salts may determine which type of salt is in each container. The photochromic salt has a wax-like surface texture and the crown salt has a crystalline texture.

The Lens Racks are normally shipped not installed in the main unit. The tape should be removed from the racks before use. Place the lids on the tanks for heating up the unit (always use the forked removal tool when handling the lids). Close the glass door. Plug the main power cord into an appropriate grounded receptacle. The ChemTemp oven is now ready to be used.

Operation

Turn ON the main power switch. This does an automatic RESET of the computer and activates the battery backup (assumes the batteries test OK and are connected as per steps 3 and 4 above).

Select the process time: 2 hours for Corning® 2 hour lenses, 16 hours for other crown and photochromic lenses.

If the TIME/TEMP switch is in the time position, the tanks selected will then show 16 hour or 2 hour times remaining. The 2 hour Corning® lenses must be run in a 'CROWN' tank position. If a 2 hour cycle is selected, any crown position will be treated as a 2 hour Corning® position and will be heated to 450°C. Any tanks designated 'PHOTO' will still be run at 400°C so as not to damage the salt. Do not temper anything in the photo salt during the 2 hour cycle.

If the TANK 1 and TANK 2 switches are set to ON then both salt baths will begin to heat up with a typical time required to heat both tanks being about 2½ hours. Activating only one bath requires longer heating time and uses less electricity. During the heating procedure the temperature of each tank may be monitored by setting the display switches to TEMP and TANK desired (1 or 2).

The target temperatures for crown is 440°C, for photochromic is 400°C, for 2 hour Corning® lenses 450°C. When the salt has melted, and you are ready to temper lenses, remove the tank lids. The two lens racks may be loaded with glass lenses correctly sorted by type (CROWN, PHOTOCHROMIC, or 2 HOUR CORNING® LENSES) to match the salts installed in unit.

NOTE: The unit may be operated as all CROWN, all PHOTOCHROMIC, or all 2 HOUR CORNING® LENSES if the correct salts are in each tank. Please note that the crown salt used for the two hour cycle must never be used for plain crown or vice-versa.

Open the glass door. Place the lens racks (complete with lenses) on the arms which are at the upper end of their travel, locate the racks in the notches on the arms MAKING SURE THAT THE RACKS HANG STRAIGHT.

Do NOT place a rack over a tank that is not to be heated.

Close the glass door. This is a good time to check that the thermocouple temperature probe wires are well back in the corner of the tanks out of the way of the racks.

Push the momentary lever switch to the START position and release. The automatic timing sequence as described above is now started. There will be a 20 minute countdown while the lenses are brought up to temperature over the tanks.

During the tempering cycle the temperature of each tank as well as the time remaining can be monitored by using the DISPLAY switches.

The choices are TANK 1 or TANK 2 and TIME or TEMP (displayed in degrees C). If the tempering procedure needs to be aborted at any time, push the momentary lever switch to the RESET position and release. This will raise the arms and cancel the cycle. The tempering cycle cannot be restarted where it left off.

Battery Back-up

The BPI® Computer ChemTemp III™ has battery backup power for the computer and the motor. If electrical power should be lost at any time during the cycle, the salt will begin to cool off. It will take about 30 minutes before the salt cools to a dangerously low temperature.

If the batteries are connected (see assembly instructions) and test OK, then the computer will continue to run as though nothing has happened. When it sees that the temperature has become too low, it will send a command to the motor to withdraw the lenses from the tanks, and then it will wait until the temperature in both tanks has reached its proper value before putting the lenses back into the salt and resuming its timing.

If the backup system is not functional then the power failure will have the same effect as RESET: as soon as power returns, the lenses will be withdrawn from the tanks and the cycle will be lost. For this reason, if momentary power failures are common in your area, we strongly recommend that the backup batteries be installed and checked at regular intervals.

The battery box has two switches and an indicator light on top of the box. The momentary push-button switch when pressed will light the indicator if the battery checks OK. Throwing the two position switch to the other position and again pressing the push-button switch will check the other battery.

Salt Replacement

The BPI® Computer ChemTemp III™ is supplied with two full tanks of salt. If you want a different combination of salts, or when it comes time to replace the salts, follow the instructions below, reading this entire section before beginning.

1. With the salt in a molten state, open the glass door, and secure it. Place the tank lids over the tanks for safety.
2. Turn OFF the main power switch and immediately go to step 3.
3. Unplug the thermocouple at the yellow connector on the inside back wall of the upper chamber. Remove the thermocouple from the tank.
4. Wait several hours for the salt to cool down to room temperature.
5. The tank may now be removed from the unit by pulling straight up on the handles provided.
6. Turn the tank upside down to remove the block of salt.
7. If the salt does not come out, melt it out with water.

Caution

The tank, tank lid, metal portion of the thermocouple, and inner chamber are extremely hot and therefore should not be touched.

Fresh Salt

- To replace with fresh salt follow the steps below:
- 1. Place the empty tank into its original position in the main unit.
- 2. Plug the thermocouple into the yellow socket with the metal rod inside the tank in its original position.
- 3. The tank will hold approximately 6 pounds of salt but the salt must added in smaller portions because in powder form the volume is too large. First fill the tank about half way with powdered salt.
- 4. Turn on the MAIN power switch and the TANK(S) on switch for the tank(s) being re-filled.
- 5. As the tank is heated the salt will begin to melt and the volume available for more powdered salt will increase. Continue to add powdered salt until the liquid salt level with all the added salt reaches about one and a half inches from the top. Remember that the

glass door should always be closed whenever the salt is hot and you are not actually working in the chamber. It is important to be prompt in adding salt when the first few layers are being melted. The temperature sensor (thermocouple) may not reach the molten salt, and until the salt level is at least high enough to partially cover the sensor there will be no temperature regulation, causing possible boiling and decomposition of the liquid salt.

Advanced Features

If the thermocouple or thermocouple circuit fails, (Open circuit) the display will read '-E-' for the temperature in that tank. The lens racks will be removed from the salt and the cycle will be paused.

If you suspect that the temperature calibration is incorrect, you will need a separate thermocouple thermometer to check this unit. Bring the salt up to operating temperature and when the reading is fairly steady (at 400, 440 or 450°C, depending), check that tank's temperature with the separate thermometer. If the readings don't agree to within about 5 degrees, calibration of the Chem Tempering unit is called for. Set the switches as follows:

16 Hour/2 Hour: "16 Hour"
Tank 1 Photo/Crown: "Photo"

Tank 1/ Tank 2: to whichever tank is in need of calibration
Time/Temp: "Temp"

When you then press and hold the "Start" switch, the unit goes into temperature calibration mode (and stays there as long as you continue to hold the switch in "Start") and the red LED flashes. To raise the DISPLAY number to match the reading on your thermometer, rock the Tank 1 Photo/Crown switch to "Crown" and back. The DISPLAY temperature should go up one digit. Repeat the rocking action until the DISPLAY matches the separate thermometer reading. To lower the DISPLAY number, rock the Time / Temp switch to "Time" and back. The DISPLAY temperature should go down one digit. Repeat the rocking action until the DISPLAY matches the separate thermometer reading. Release the "Start" switch to leave calibration mode.

Caution: If your unit has Photo salt in Tank 1, when you want to start your unit's cycle, be sure the Time / Temp switch is in "Time", other wise the unit will just try to enter calibrate mode when you hit start, instead of actually starting. We usually recommend putting Crown salt in Tank 1 to avoid this confusion!

The cycle clock only runs if the temperature is not more than 3° below the target temperature. (2 hour: 450°C, 16 hour crown: 440°C, 16 hour photo: 400°C). Before pressing 'START' put the 'TIME/TEMP switch in the 'TIME' position to monitor the cycle.