



Denver Glass Machinery, Inc.
2800 S. Shoshone ST. Englewood CO 80110
(303) 781-0980 Fax (303) 781-9067
Website: www.denverglass.com
E-mail: info@denverglass .com

Furnace element replacement

For all coil type elements.

The proper installation of your new elements is imperative to the life of the coils. First of all, we are going to assume that the unit has cooled enough to start. Then make sure that the power has been disconnected at the plug or circuit breaker.

First: Removing old elements.

1. Unscrew the screw(s) that hold the control panel to the furnace body and let the panel swing open on its hinges.
2. With a large screwdriver and wrench, remove the terminal lugs (4 or 6) that clamp the wires to the element tails.
3. With a small cold chisel and hammer, remove the dabs of mortar that are retaining the elements inside the chamber. Chip them off as completely as possible without damaging the shelf.
4. Remove the elements. They will break apart as you pull them out, so don't be too concerned about it.
 - **Once the elements have been removed, clean the shelves thoroughly. We cannot express the importance of this enough.**
 - Vacuum any loose particles out first.
 - Then use a strong magnet to make certain that there are no leftover pieces of the elements still on the shelves.
 - If your elements melted, check the area where it occurred for any pooling of metal and chip it out of the shelf. **It must be removed.**
 - Vacuum again.

Shelf preparation.

1. Using the mortar, fill any areas on the shelves that may have gotten chipped in the process of removing the elements and cleaning.
2. Mix a small amount of shelf coat with some water so that it has the consistency of paint and put a very thin coat of mortar on the shelves.
3. **Wait for the mortar to dry completely. It is very important that you do not install the elements into the wet mortar.** You can speed up the drying process by setting a fan to blow into the furnace.

Installing the new elements.

1. Even though it is necessary to work the elements into position, you should not force them. **They can be broken.** Start with the top elements. They are the hardest to reach and it's best to get them out of the way first.

2. Once the elements have been installed, wrap them with strips of newspaper every 8" or so (see attached drawing). Apply dabs of element putty to the shelf casting where you have wrapped the element with the paper. Do not get putty on the elements (this is what the paper is for). Keep your hands wet while working with the putty. Take a small amount and roll into a ball about ping pong ball size. Press it onto the shelf. It will stick to the casting better if you feather it out a bit.
3. Now on the outside where the elements come through,
 - If you haven't already removed the mullite tubes, do so and pack the area around the element tails with fiber blanket. This is to stop the outgassing from the chamber past the tails.
 - Push it far enough into the hole so that the mullite tube does not just push through it and defeat the purpose.
 - Also, you do not need to pack it in so tight that you would create a problem next time you need to change the elements. All that we need to do here is stop the chimney effect.
 - Reinstall the mullites. (It is highly recommended that you change the grommets every time you install new elements. They are inexpensive and a very important part of the system.)

Reconnecting the wires.

1. Make certain that your wires look good. Some discoloring is normal, but if they appear encrusted or have become brittle, replace them. (You should always have some on hand.)
2. If the element tails are so long that they would touch the panel box when it swings back shut, cut them off with a hacksaw or a large bolt cutter. Leave one and one half to two inches outside the furnace wall.
3. While placing the terminal lug, situate it so that the screw contacts the element tail and the wire is compressed into the point of the lug.
4. With your large screwdriver and wrench, tighten the lugs as tight as you can.
5. Close the control panel and screw it shut.

Start up.

1. Ramp to 175 degrees over one hour and hold for one hour. This will dry the mortar dabs.
2. Depending on how much glass is in your pot, set your ramp to temp.
 - Empty pot: 24 hrs to temp.
 - Half full: 36 hrs to 1000 degrees, then 12 hrs more to temp.
 - Full: 60 hrs to 1000 degrees, then 12 hrs more to temp.

The environment inside an electric furnace is very static. There is no input of outside air to be burned. There is no wind and there is no outgassing. It is just a chamber of hot air. The extreme high temperatures required in a gas furnace are not necessary in an electric furnace. It is recommended that you never go over 2200 degrees.