# Lindberg/Blue M Furnace



# University of Notre Dame

# Department of Electrical Engineering

Contacts
For problems, clarifications of procedures, or general information pertaining to this machine, please contact lab staff at **staff-ndnf-list@nd.edu**.

**In Case of Emergency, Please Contact Notre Dame Security at 911**

This horizontal tube furnace is capable of operating up to 1000 °C. It is typically used for metal annealing to produce ohmic contacts and curing (spin on glass and BCB resists).

## Operating instructions:

1. Enable the machine from iLab.
2. Standby condition check:
    a. Temp SP: 150 degree C on furnace WATLOW display (TC reading on the digital thermometer ~ 95 degree C)
    b. Flow meter reading: 30 (~35ml/min)
    c. Gas selection: Nitrogen
3. Remove the quartz boat bar from the furnace by holding firmly the SS handle, slowly pull it out to the right side until it is fully out of furnace, and set it on the fixture jaw.
    a. During the process, avoid bumping the bar into anything! No replacement we have!!
    b. Put on the additional rubber glove if the handle feel hot.
4. With the quartz bar sitting safely on the fixture, load your sample into the boat at the very left end of bar. Verify the TC touches the left end of tube so it reads the temp near the sample.
5. GENTLY put it back into the furnace till the cap sits nicely around the furnace tube right end. DON'T PUSH OR FORCE the quartz cap.
6. Select desired gas and set up the gas flow to read 30 on the flow meter.
    a. Ar, $O_2$, $N_2$ and forming gas (10% $H_2$ balanced in Ar) available. The selection of gas is achieved by pointing the middle valve left or right, and the side valves pointing to front or back.
    b. Gas selection is always at $N_2$ when not in use.
7. Set up the furnace temp to desired value. There is an offset between furnace and TC readings but rely on the TC reading. It may take a while to reach to the desired temp.
8. After the annealing, wait until the TC reads about 100 degree C or below, and follow the above step 3-5 to unload sample.
9. Put the furnace back to standby conditions.
10. Collect your belongings, clean the SS table and log out from iLab.