

Standard operating procedures for using the Arc Melting Furnace (ABJ-338).

Precautions:

1) When connecting gas to the system, make sure all gas lines are properly purged prior to operation.

This will avoid allowing air to enter the furnace and oxidizing the zone. This should be done especially after changing gas supplies.

2) Do not operate the furnace if any exterior surface temperature exceeds 150°F- refer to the Error! Reference source not found. section of this manual if this occurs.

3) Maximum operating pressure should not exceed 2-3 P.S.I.G.

4) Do not open the furnace after operation until the sample and electrode have cooled completely.

A. START-UP PROCEDURES:

Check the following;

1. The VACUUM VALVE is in the CLOSED position.
2. The gas flow meter valve is closed, turned completely clockwise.

With all of the above valves in the appropriate positions, you may now do the following:

1. Turn On Chiller.
2. Open your main gas supply.
3. Turn ON your main power.

Open the arc furnace and load it with your samples;

1. Pull open the four clamps provided to hold the bell jar closed. Open the bell jar by pulling up on the handle located on the front and swing it all the way back until it rests on the rubber stop.
2. Place your samples in the hearth cavity.

Close the bell jar;

1. When complete make sure to secure the hearth with the four clamps.

B. ATMOSPHERE PREPARATION:

INERT GAS

1. All that is necessary is to adjust the flow control valve on the GAS flow meter to maintain the desired chamber pressure as indicated on the compound gauge.

VACUUM

1. Turn ON the vacuum pump.

2. Turn the vacuum valve to the OPEN position to pump down the bell jar, and to the CLOSED position to stop pumping. Note: When pumping, the pressure in the bell jar will rapidly decrease to 27-28" hg.

C. OPERATION:

1) Turn on the welder power supply.

2) Turn ON the vacuum pump.

3) Open the vacuum valve by turning the actuator knob counter-clockwise.

a.) Pressure in the bell jar will decrease to 27-28" hg.

4) Allow vacuum pump to evacuate for about 45 seconds.

5) Close the vacuum valve by turning the actuator knob clockwise.

6) Open the gas flow control valve on the flow meter.

a.) The pressure in the bell jar will increase.

7) Allow gas to flow until the pressure reaches 0 PSI.

8) Evacuate a second time as described in 3 -5 above.

9) Back-fill with gas a second time as described in 6-7 above.

10) Evacuate a third time.

11) Back-fill with gas a third time.

12) Now continue with either atmosphere you wish to operate in-vacuum or gas or you may run in partial pressure if desired.

13) Look inside the view port and adjust the electrode so it is approximately 1/4" from the work piece.

14) Adjust the amperage control on your welder front control panel.

15) Swing the welding glass shutter over the view port.

16) Depress the foot control.

17) Move the electrode towards the work piece until the arc starts. When an arc has started immediately back off the foot control to about 1/4.

18) After the arc has begun, move the stinger over the sample to melt. You may need to increase or decrease as necessary the position of the foot pedal.

19) When the melt is complete, remove your foot from the foot control to stop melting, and move the stinger rod at least 1" from the work.

20) When the samples are cool you may open the furnace.

D. SHUTDOWN:

After you have completed your use of the furnace, the following should be done to shut down and secure the furnace.

1) Allow the water and inert gas to flow (or vacuum system to run) until the furnace is cooled completely.

2) When the furnace has cooled the water and gas (or vacuum system) may be turned off and the furnace can now be opened and unloaded.

3) Unload the furnace.

4) Clean the pocket that was used.

5) After cleaning, close the cover and leave closed until your next run. We suggest you evacuate the furnace in vacuum for approximately 25 minutes to attain a satisfactory vacuum level inside and then isolate it (close the vacuum valve and turn off the pump in that order). By doing this, you will be removing any moisture that may have entered when it was opened, making it easier to evacuate in the future. Also, you could check the rate of rise at the same time.

5) You may turn off the water supply.

6) You may wish to switch off the main power on your welder power supply control panel.

7) This furnace system is now secure.