MIG Aluminum Welding Seminar Training

**Before Class**

The materials for the MIG welding seminar are located in Locker #13. For each class, you should have a bucket of samples (at least seven (7) coupons for each person) of 1/8” 6061 Aluminum 3”x2”. If the bucket isn’t full, have some staff members cut new samples and debur the edges. There are more aluminum samples in Locker #11. In the bucket there should also be a C-Clamp and a baggie of contact tips. Make sure you have at least four (4) extra .035” tips for students. Extra contact tips are in Locker #13 in the pullout drawer labeled “Aluminum .035”

Another important thing to make sure of is that the ventilation is off before the seminar. If someone is using the welding lab before you, TURN OFF THE VENTILATION ASAP. You don’t want to be shouting over that fan for two hours.

Unlock the MIG #8 and #9 welders ahead of time. Check function of feeder and power source. Check shielding gas as well and bleed the lines before class. MIG #8 has one C25 tank and one Argon tank and MIG #9 has one CO2 and one Argon tank. Also check to make sure that there are some MIG welding pliers on the bench.

1. Welding Lockers
   1. Key #’s 88-94
   2. **ONLY CHECK OUT THE PLASTIC FOB KEY**
      1. **IF THAT IS NOT THERE, THE LOCKER IS ALREADY CHECKED OUT**
   3. Each locker contains
      1. Welding helmet
      2. Welding jacket(s)
         1. Each locker has two jackets of various sizes
         2. Sizes are on the locker door (outside and inside)
      3. MIG Welding gloves
   4. **Make sure you check the locker when they return the key**
      1. **There is a chart on the inside of every locker door with the contents of that specific locker**
   5. Follow the chart by the toolcrib window for lockers and sizing
   6. **Place this slip behind the door in the corresponding slot**
2. When student turns in key, CHECK LOCKER TO MAKE SURE EVERYTHING IS PUT BACK
   1. CHECK HELMET TOOL NUMBER AND MAKE SURE IT MATCHES AND CHECK CONDITION
      1. NO BURNS/CRACKS IN HEADGEAR OR LENSES
   2. CHECK JACKET SIZES AND QUANTITIES AND CONDITION
      1. NO EXCESSIVE BURNS/HOLES
   3. CHECK GLOVES
      1. COMPLETE PAIR
      2. NO BURNS/CRUSTY FINGERS

* Introduce yourself as the instructor and any experience you have
* Show where the safety supplies are located
  + First aid kit is on the wall with the ventilation switch
  + Emergency Stops are by the ventilation switch and the precision welding table
  + Fire extinguishers are by the doors (one by each set of doors)
  + Eye wash is located by the set of doors by the precision welding table
  + Emergency Shower is in the hallway to the left and by the canoe
  + I also take the time to explain clothing to them now
    - NO SYNTHETIC MATERIALS IN THE LAB (this means NO windpants OR LEGGINGS!)
    - Make sure pants are not excessively full of holes or tattered.
    - Closed toed shoes that cover all of the foot (No flats)
    - Warn them that the ventilated toe box on athletic shoes will probably allow sparks to come through
    - Safety glasses must be worn underneath the welding helmet
    - Welding jackets are required in the lab. No welding in long sleeve shirts
    - Welding gloves are required and “Mechanix” gloves are not a viable alternative
    - Suggest to button all the way to the collar and keep your sleeves buttoned and inside the gloves
* MIG welder parts
  + Open the door on the spoolgun on the MIG welder so students can see the driverolls and wire
    - Explain that the wire is pulled from the spool via the drive rolls and is pushed through the gun liner until it comes out the contact tip when the trigger is pulled
  + Take apart the Spoolgun
    - Show the contact tip and how it is placed in the diffuser
    - Show how to clean the gas nozzle and how clean it should be prior to welding
  + Explain the display now
    - Make sure the display reads MIG PULSE
    - Explain that the arc length reading should be set to 50
    - Show them where the power switch is located
    - Show the jog/purge switches
    - Show the chart on the flip-down drawer on the front of the welder and what chart to use
      * Pulse Chart for PULSE MIG mode
      * MIG Chart for MIG mode

**Machine setup**

When the MIG light is illuminated, the unit is in MIG Welding mode. This is the basic mode for welding steel or aluminum welding.

**SETUP**

To enter MIG welding mode, depress the SETUP button once to go to GUN selection.

Rotate the right knob to select the gun being used. Select MIG for standard MIG gun or SPL for spoolgun.

Depress SETUP a second time to illuminate the PROCESS light. Rotate right knob until MIG is displayed (for MIG only units NOT USED will be displayed).

Depress SETUP button again to illuminate the WIRE light. Adjust left knob to select wire type, adjust right knob to select wire size.

Depress SETUP button again to illuminate TIMERS light. For description of the TIMERS, refer to TIMERS menu in the manual.

Depress SETUP button again to exit menus and enter MIG welding mode.

**OPERATION**

Adjust welding Voltage with left knob and Wire Feed Speed with right knob.

Refer to MIG welding chart for proper Voltage and Wire Feed Speed setting in reference to material type, material thickness, wire, and gas.

When the PULSE MIG is illuminated, the unit is in Pulse MIG Welding mode. This mode is ideal for Aluminum welding. Steel cannot be welded on PULSE MIG setting.

**SETUP**

To enter Pulse MIG welding mode, depress the SETUP button once to go to GUN selection. Rotate the right knob to select the gun being used. Select SPL for spoolgun.

Depress SETUP a second time to illuminate the PROCESS light. Rotate right knob until PULS is displayed.

Depress SETUP button again to illuminate the WIRE light. Adjust left knob to select wire type, adjust right knob to select wire size.

Depress SETUP button again to exit WIRE menu and enter TIMERS menu. The TIMERS light will illuminate. For description of the TIMERS, refer to TIMERS menu in the manual.

Depress SETUP button again to exit menus and enter PULSE welding mode.

**OPERATION**

Adjust right knob for proper Wire Feed speed and adjust left knob to change

Arc Length if required. Arc length will default to 50 if never adjusted previously. Refer to Pulse MIG welding chart for proper Wire Speed setting for metal and metal thickness being welded.

All Pulse MIG programs are setup with the gases listed in the Pulse MIG welding

chart. If alternate gases are used, adjust Arc Length and/or Sharp Arc (Arc Control) to adjust arc characteristics.

**ARC LENGTH**

Arc length can be adjusted from 0-99. All Pulse MIG programs are set with a value of

50. Adjusting the Arc Length will vary the length of the welding arc cone.

If a gas is used other than what is listed on the Pulse MIG welding program chart, the

Arc Length can be adjusted to help customize your arc to the gas being used.

**ARC CONTROL**

Pulse MIG welding mode: Depress ARC CONTROL button to enter Arc Control menu for sharp arc. SHRP will appear on the left display and the corresponding setting will appear on the right display. The setting can be adjusted from 0-50 and all Pulse MIG welding programs are designed with a setting of 25. Adjusting the Sharp Arc setting will vary the width of the

welding arc cone. If a gas is used other than what is listed on the Pulse MIG welding program chart, the Sharp Arc can be adjusted to help customize your arc to the gas being used.

* Turn on the gas
  + **BACK OUT REGULATOR**
    - Seriously. Back out the regulator.
  + Open up the tank all the way
  + Turn regulator to 20CFH
  + Show common problems
    - Voltage wrong
    - Stickout wrong
    - Travel speed wrong
    - Don’t forget about the poster on the door!
  + Start running beads
  + Show fillet weld
  + Show Lap weld
  + Show butt weld

Let students weld now

* Mig Weld cleanup
  + KEEP MACHINES ON
  + Sweep up benches and floor
  + Bleed lines
    - Turn off tank
    - Press button on MIG gun
    - Once gauges read “0”, back out regulator
    - Shut off gas lines
    - Shut off welder
* Changing tanks
  + Verify all gas is actually gone
  + Purge the lines as normal
  + Take off the regulator on the empty tank
  + PUT A TANK COVER ON THE EMPTY TANK NOW
  + Find the new tank
  + Take off tank cover and blow out any dirt by quickly opening and closing the valve
  + Install regulator
  + Mark “M T” on the empty tank 3 times and take to the loading dock and place in the EMPTY CYLINDER rack
  + Make sure remaining tanks are secure
* Changing wire
  + Replacement wire is in Hall Locker #13
  + Take off contact tip and gas nozzle off the gun
  + Lift up the door to the wirefeeder/spoolgun
  + Disengage the drive rolls by flipping the lever back
    - MAKE SURE NOT TO MESS WITH THE TENSION KNOB
  + Pull wire through the end of the gun
  + Take the empty spool off
  + Put new spool on
    - Remember to replace the spool lock
  + Feed wire through the back of the feeder
  + Push the wire through the two guides
  + Lock the drive rolls back down
    - MAKE SURE NOT TO MESS WITH THE TENSION KNOB
  + Hit the JOG button on the wirefeeder until wire comes out of the end of the gun
  + Replace contact tip and gas nozzle on the gun