MIG 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” mild steel 3”x2”. If the bucket isn’t full, have some staff members cut new samples and deburr the edges. In the bucket there should also be a C-Clamp, diagonal cutters, 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 “Bernard .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 4 large MIG welders and the plasma cutter ahead of time. Check function of feeder and power source. Check shielding gas as well and bleed the lines before class. Large CO2 tanks are used for the large welders and small C25 takes are used for the small MIG welders. The large C25 tank that is hooked up to the lines is if your shielding gas runs out before the end of the seminar, use in emergencies. Also check to make sure that all stations have a pair of MIG welding pliers on the bench.

**Proper Procedure for Checkout**

1. Determine what size jacket the student will need (most popular sizes are Large/Extra Large)
2. Have student checkout key for locker
   1. ONLY CHECKOUT THE KEY ON THE PLASTIC FOB
   2. TOOL NUMBER IS KEY NUMBER
   3. **THIS SLIP NOW GOES BEHIND THE DOOR IN THE CORRESPONDING HOLDER**
   4. **ONLY ONE KEY PER STUDENT!!**
3. 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 opposite wall
  + Fire extinguishers are by the doors (one by each set of doors)
  + Eye wash is located by the set of doors by the precision table
  + Emergency shower is located in the hallway, to the left, 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
* General shop tour
  + Show them the plasma cutter and let them know that we’ll be using that later in the seminar
  + Show the four large MIG Welders and that they are for STEEL over 1/8” thick
  + Talk about welding 2 and 3
    - Welding 2
      * Aluminum 1/8” and under, all stainless steels
    - Welding 3
      * Aluminum over 1/8”
* MIG welder parts
  + Open the door on the wire feeder unit on the large 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 MIG gun
    - 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 wirefeeder display now
    - Make sure the toggle switch is selected to wirefeed speed (OIO)
    - Explain that the voltage dial does nothing
      * Show them what happens when the voltage is selected on the display
    - Show them where the power switch is located
    - Show the jog/purge switches
    - Show the trigger hold function
  + Explain the power source panel now
    - Voltage is only controlled with the crank handle
      * Clockwise to increase voltage, counter clockwise to decrease
  + Machine setup
    - Large MIG Welders
      * Explain to them the chart that is on the side of the welders
      * Wirespeed is AMPERAGE
      * Large welders are .035” wire
      * Remind them that you shouldn’t be above 28volts or below 20volts
        + 24volts is a good number to start at, adjust from there
    - MIG 3 and 4 – Millermatic 252
      * Explain to them the chart that is inside the pull-down door on the front of the welders
      * .035” wire
    - Turn on the gas
      * Open up manifold lines to welders
        + Inline is on, perpendicular is off
      * **BACK OUT REGULATOR**
        + Seriously. Back out the regulator.
      * Open up the tank all the way
      * Turn regulator to 30PSI
  + 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 purge button on the wirefeeder
      * Hold trigger on MIG 3 and 4
    - Once gauges read “0”, back out regulator
    - Shut off gas lines
    - Shut off welders
* Plasma Cutter
  + Show how to hook up the air line
  + Explain the controls and front panel
  + Explain proper cutting technique
  + Demonstrate
  + Show how to bleed the lines
  + Clean up
* Discovery Center Tour
  + Show them the three small MIG welders and say that they are for STEEL under 1/8” thick
  + Small Welder Operation
    - Open the panel on the Millers and show them how to read the chart
    - Talk about the Auto-set feature on the Miller 140 & 180
    - Small welders are .030” wire
    - Show contact tip to see wire size
    - Gas pressure should be at 20CFH
    - Show them how to change the plug on the MM180 and where to plug the 208v plug into
  + Talk about how to position the fume hoods
  + Talk about check out procedure
* 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
  + 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
    - Hold trigger on all in one MIG welders
  + Replace contact tip and gas nozzle on the gun