**Mig Aluminum Welding**

Setting up for the seminar, you will need some 1/8” aluminum welding samples, a few extra contact tips (labelled “Aluminum 0.035” in one of the drawers in locker #13), welding pliers and maybe a couple small c-clamps. Follow the regular checkout procedure for the welding lockers (jackets and gloves), getting everyone am appropriate locker and a set of safety glasses.

For the seminar begin with safety, showing everyone first where relevant safety equipment is:

* First Aid kit
* E-stops
* Fire Extinguishers
* Eye wash and safety shower

Talk about the health risks:

* Verify grounding of table, do not complete welding circuit with yourself
* High electric and magnetic fields are produced when welding, people with pacemakers should see a doctor before using equipment
* Hot parts can and will burn, pickup hot pieces with pliers, don’t use gloves
* Fumes and gases produced when welding can be noxious, keep your face out of the clouds, use an exhaust snorkel
* Gas cylinders contained highly pressurized gases, the cylinders can explode if damaged, i.e. if dropped and the regulator breaks off
* Turn gases off when not in use and use in a well ventilated area

Then go through proper attire:

* Long pants, denim, without holes are good, no synthetic materials (yoga pants, windpants, etc)
* Use close-toed, preferably leather, shoes (we now have leather covers (spats) available)
* Safety glasses must be worn under helmet
* Welding jackets must be worn; long sleeve shirts are not a substitute
* Welding gloves are required, “Mechanix“ gloves or the like are not a substitute
* Button up the collar and if you have them; keep long sleeves buttoned in the gloves.

Begin with the spool gun, showing them how the spool attaches and runs wires through the drive rolls to the gun itself, the diffuser, the contact tip, and nozzle. Point out, but don’t adjust the tensioners. Demonstrate how to replace a contact tip, and how to not burn one out (proper torch angle and distance from work piece). Follow it up with machine set up listed below, including grounding the machine, turning on the gas and how to read the welding charts.

**Machine Setup:** Choose between normal mig welding and pulse mig welding and set the following for regular mig.

Process GMAW MIG

Process GUN SPG

Wire Al 4xx 0.035

Timers

Run-in speed-speed of the wire prior to the welding arc being struck 25-125%

Pre-flow-amount of time the shielding gas will flow after the trigger depressed and the welding arc will be allowed to be active 0-5 sec

Post-flow- amount of time the shielding gas will flow after the arc has been shut off 0-10 seconds

Spot timer- the amount of time the arc will be active before is shuts off automatically 0-120 seconds

Display- toggle between actual amps or wire feed speed

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Start Power- 100-250 as a percent of wire feed speed

Start time- time range for hot start to be on 0-0.5 seconds

Start Arc Length - Range for start arc length 0-99

Ramp Time- Timer range that it take to go from hot start to set WFS 0.1-5.0

**Machine Operation**

**Mig**: **Volts/Wire Feed speed** (current) dictated by the left knob and WFS controller on the spool gun

* Dependent upon thickness of metal and shielding gas
* For 1/8” aluminum with argon shielding gas (from chart): 19/340

**Arc Control: INDU**

* Inductance can be adjusted 0-99
* Controls fluidity of the weld
* Dependent on wire & shielding gas, 30 is recommended for aluminum/argon



**Pulse Mig**: **Arc length/Wire-feed** (current)

* The wire-feed is adjusted from the wheel on the spool gun handle and recommendations are read from the chart
* Adjusting the arc length 0-99 (left knob) will vary the length of the welding arc cone and the voltage will be adjusted automatically
* All pulse mig programs are set with a value of 50, if alternate gases are being used the arc length can be used to adjust the weld



**Arc Control: SHRP**

* Sharp Arc can vary from 0-50
* All pulse mig programs are designed with a setting of 25
* Adjusting the Sharp Arc will vary the width of the welding arc cone



The sharp arc can be adjusted to customize the arc to the gas being used