**Foundry Aluminum Casting Procedures**

Foundry Checklist:

1. Safety
   1. Clothing
      1. Closed toed leather shoes
      2. No synthetic clothing
      3. Hair up and out of the face
      4. PPE (Personal Protective Equipment)
         1. Leather apron
         2. Aluminized gloves and spats
         3. Safety glasses
         4. Face mask
      5. PPE must be worn by partner pair during:
         1. Opening of the foundry when lit/hot
         2. When pouring
         3. Only exception—do not need face mask during lighting (to avoid catching fumes under mask)
   2. Fire procedure
      1. Do not use water, only use sand to smother
         1. Smother, back off and let burn in sand pit
      2. Use fire extinguisher for only for non-metal fires
         1. Using on metal can cause molten metal to blow away (ask Ron)
   3. Safety partner
      1. All Safety Partners must have gone through Safety Training Class (Foundry Fundamentals)
         1. One of the partners in the pair has to be certified\*
   4. Ready all tools
      1. Prep all foundry tools and have in location needed for pouring procedure
         1. Foundry tools include spoon, crucible lifter, hook, lid bar, ingot molds, lid bricks, drossing bin, and flask platform
            1. Make sure there is no sand in ingot molds
            2. Make sure flask platform is level to the best of your ability
            3. Make sure foundry is level to best of your ability
            4. Make sure drossing bin is empty
            5. Make sure lid bricks are lined up and above the sand (do a cold run to test)
            6. Make sure all tools are clean
         2. Make sure gas line and cords are not in an area for tripping or at risk for fire
   5. Lighting Foundry
      1. Close off vents to squirrel cage fan
      2. Confirm the gas valve near foundry is closed
      3. Turn on fan (plug in at extension cord). There should be no air pressure because baffled.
      4. Open both propane tank valves
      5. Light ball of paper and place in foundry
      6. Slowly open gas valve until there is flame
      7. Slowly open baffle till you start seeing flame swirl
      8. Continue steps 6 and 7 until reach desired flame
         1. Desired flame should be reaching to top of bottom with appropriate sounds
      9. Place crucible with your metal into foundry
      10. Partners lift lid onto foundry
      11. Adjust flame using step viii (8) until there is a light flame coming out of viewing hole or top of foundry
   6. Pouring procedures
      1. Observe metal as it’s melting and continue adding until you have sufficient amount for your cast
         1. It is best to add metal after a melted pool forms
            1. Do not drop or splash metal. Slowly introduce to pool using tongs or spoon.
            2. Adding too much metal to a small pool will freeze the pool, so add gradually
      2. Metal is ready to pour when all metal in crucible has **just** melted and three minutes has past.
         1. The safety partner should have a three minute timer ready to go and begin when the metal is melted
         2. At 2-1/2 minutes be prepped to pull lid off and prepare to pour
         3. At three minutes, partners remove lid and place on blocks in sand pit
         4. Lead Partner (Pouring Partner) uses drossing spoon and removes dross into ready ingot container
         5. Pouring Partner uses crucible lift, with hook in other hand, to remove crucible from foundry.
            1. Safety partner is to the pouring partner’s back and left side

Sufficiently back so pourer can evacuate in case of emergency, about 2-3 steps

* + - 1. Pouring partner side steps to flask area, engages hook and begins pour
         1. Pour should be a constant stream until you see a full button which has been formed

Like a quarter inch or more, should not be too thin

* + - * 1. If doing single pour, when flask is full and button has formed, pour excess into ingot molds, return crucible to foundry
        2. If doing multiple pours do not make ingots, return crucible to foundry and go to step 7
      1. Partners return lid to foundry
         1. If no other pours are happening shut down foundry, go to Step 9 (Shut down foundry)
      2. For multiple pours, add metal to crucible
         1. Follow steps 1 - 7
      3. Shut down foundry procedures:
         1. Turn off gas valves at tanks
         2. Turn off gas valve near foundry
         3. Turn off fan
         4. Return all equipment, including PPE, to proper places
      4. Removing flask and retrieving part
         1. Wait minimum 30 minutes to an hour for part to cool
         2. Bring flask to molding bench and knock out sand
         3. Grab part with pliers or gloves (part will still be hot)

Note do not use aluminized gloves to grab part

Part may be quenched, if desired, in Forge quench tank

* + - * 1. Put all burnt sand in 50 gal storage drum and return flask to shelf with two sides together
      1. **Pay for gas use—at this time the cost is $5.00 per pour—pay at the front marking what you are pouring for: Foundry gas.**