

# FSL 3D Casting

## Equipment

- Furnace
- Melting furnace
- Vibratory Tumbler with water recycle system (Raytech TV-10)
- Vacuum table with Bell Jar
- Vacuum Pump
- Welding gloves
- Crucibles
- Long Crucible tongs
- 2.5" flask with rubber base

## Supplies

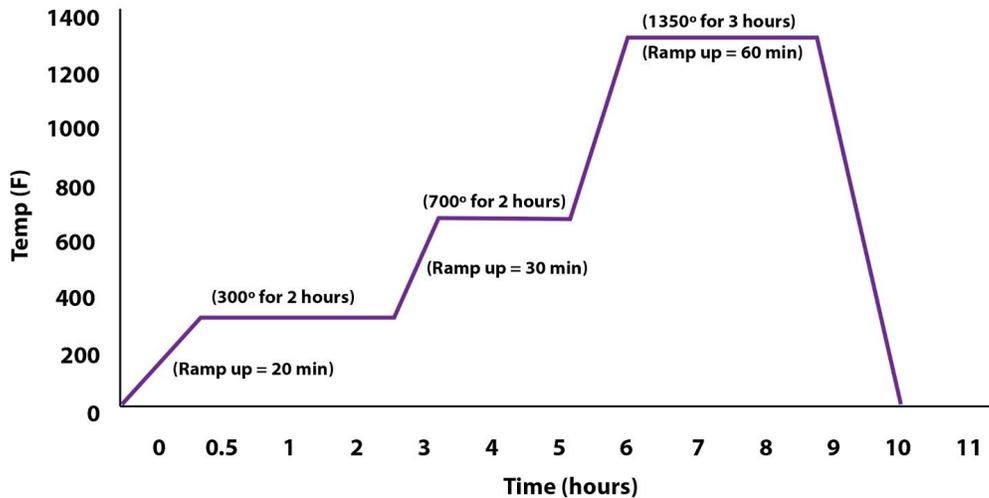
- Grain metal to melt
- Borax
- wax sprue
- Investment
- Deburring compound (liquid)
- Shine Compound (liquid)
- Cylinder ceramic media (rough)
- Triangle ceramic media (medium)
- Red Media (smooth)

## Procedures

1. Making the mold
  - a. Select model to be cast and attach it to a sprue.
  - a. Insert the sprue and model into rubber base.
  - b. Place the metal flask into the rubber base.
  - c. Select Investment and mix with water to proper consistency. Place the mixture into Bell Jar and vacuum 30 seconds after boil.
  - d. Pour the investment into the flask, making sure to cover the model completely. When filling the flask be sure to leave room for the investment to boil.
  - e. Place the flask into the Bell jar and vacuum 30 seconds past boil. Release the Bell jar of vacuum, and let stand for 10 min.
  - f. Remove rubber base from flask.
0. Burnout Cycle (program Furnace)

a.

## HEAT SCHEDULE



Starting temp (°F)	Time at temp (min)	Ramp up time (min)	Desired temp (°F)
Ambient	0	20	300
300	120	30	700
700	120	60	1350
1350	180	0	0

b. Place flask into the furnace and run above burnout cycle.

- a. Get the melting furnace ready before the end of burnout.
0. Pouring Mold
  - a. Place metal pellets into crucible, with a pinch of Borax.
  - a. Ramp up the melting Furnace from 700°f to 1200°f then to the casting temperature of metal being used.
  - b. Once the Burnout cycle is done and the molds are still at 1300°f, remove them from furnace and place them upside down (spout upwards) onto the vacuum table with proper gasket. Switch vacuum table from invest to cast, and turn on vacuum pump.
  - c. Put on welding gloves and use long tongs and grab crucible and pour metal into mold.
  - d. Well the Metal is still hot grab the mold with tongs and submerge into water. Model should fall out.
0. Polishing (Bronze)
  - a. Remove sprue and base from model and smooth out area.

- a. Using the Tumbler, place the Cylinder ceramic media into bowl. Fill reservoir with 2 gallons of water and Deburring compound. Run tumble for 3 hour intervals and check the model, if needed run up to 9 hours at this phase.
- b. Once done with rough step remove media and replace with Triangle ceramic media run for 3 hour intervals until satisfactory, could take 6 hours.
- c. Remove media and place with final smoothing media in bowl and replace deburring compound with new water and polish compound.