

# Instructions Sheet For Chrome Cobalt Alloys

## **WAXING:**

Commercially made wax or plastic patterns are available for most of the framework.

## **SPRUNG:**

If possible, sprue through a hole centrally located in the mold. This allows the flow of metal to the center of the framework to be casted and locates the central sprue to the center of the flask. Additionally, this will prevent premature cooling of the mold during casting. Also, the shorter sprues allow the material to enter the mold quickly. Location and amount of sprues are at discretion of lab technician. Advisable to wax together tips of the clasp to help prevent incomplete casting of clasp.

## **INVESTING:**

After the wax model is completed, proceed with investing via manufacturers recommended instructions (i.e. Multi Vest or Neoloy's)

## **BURN-OUT:**

Recommended cycle:

1. Start up at 750° F - 850° F
2. After 1 hour, increase to 1800° F - 1900° F
3. Hold at 1800° F - 1900° F for 30 minutes minimum

Use spacers between the flask bottom and the hearth of the furnace. When molds are standard, insure that air can circulate freely between the molds. This allows for a complex wax burn-out and no residue left. Mold temperature of 1800° F is sufficient for all types of castings. Total time for burn-out will be 2-3 hours. If accuracy of burn-out furnace in doubt, add additional 1 hour.

## **CASTING:**

Virtually any type of centrifugal casting machine is satisfactory. Electric casting machines are not recommended due to occasional electrical coupling problems. Induction casting machines are highly recommended because of speed in melting and resultant elements of the alloy being retained.

Using the oxy-acetylene torch-Equipped with a No.4 or No.6 tip, pressure adjusted to 10 pounds of acetylene and 4 pounds of oxygen.

Adjust flame with inner core between 1/2" and 1" long. Total length of flame to be 2 1/2"-3" long. Do not hold torch too close to alloy as a sparking action will occur.

Melting temperature is 2530°F - 2600°F & casting temperature is 2450°F. Oxide surface generally apparent as is typical in all non-precious alloys. If misrun occurs, allow for additional slumping. Occasional variance in heating sometimes required from one batch of alloy to the next. Exercise care to not over heat the alloy to insure properties of the alloy. Keep torch on the alloy unit centrifugal motion in effect to prevent misrun.

After casting, allow flask to cool until red has disappeared, Quenching of the alloy not recommended in water as warpage may occur although various lab technicians do quench (using their own technique).

## **FINISHING:**

Sandblast casting thoroughly to remove all evidence of investment particles and oxide surface. Do not overheat casting when removing sprues.

Elector polish via manufacturer's recommended instructions. Rubber wheel casting to remove other imperfections.

**REPAIR AND JOINING PROCEDURES FOR CAST APPLIANCES:**

Following a pick-up (if necessary), the fractured parts should be invested in a refractory investment material. A cobalt chromium welding alloy should be used. For joining small pieces of metal, filling in perforations or small extensions it is possible to use an elector-weld procedure. For large areas to be joined or filled in a oxyacetylene torch in recommended.

**A. Electro Weld Procedure**

1. A small piece of filler weld material is placed over the parts to be welders or the area to be filled or extended. Use a fluoride flux.
2. The electoweld machine is turned on
3. Bench cool
4. Trim excess, finish as usual

**B. Oxyacetelene Torch Procedure:**

1. Apply heat to the areas to be joined. Use a fluoride flux.
2. When areas to be joined turn red, apply the welding material until it fills in the desire area.
3. Bench cool
4. trim excess, finish as usual

**CLEANING RECOMMENDATIONS FOR APPLIANCES IN ORAL USE:**

At least once a day the appliance should be removed from the mouth and cleaned. It can be cleaned with a soft toothbrush and toothpaste. It should then be rinsed thoroughly and placed back in the mouth.

**PROPERTIES**

Tensile Strength	95,000 PSI (66.5 Kgf/mm <sup>2</sup> )
Yield Strength (0.2 Offset)	83,000 PSI (58.8 Kgf/mm <sup>2</sup> )
Elongation	8% Minimum
Reduction of Area	8% Minimum
Rockwell Hardness	C25-C34
Brinell Hardness	255-313