

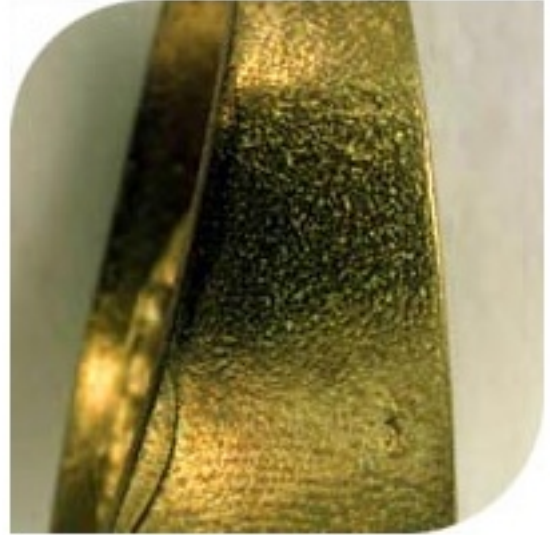


## PROBLEM SOLVING: Rough Casting

### causes:

1. Rough master model
2. Rough waxes
3. Flask too hot
4. Metal too hot
5. Improper sprue
6. Steam dewaxed for too long
7. Flask not cured before burn-out
8. Wrong powder - water ratio used in mix
9. Flasks heated too rapidly

As the title suggests this is where the pieces are not completely filled with metal during the casting process.



### Rough master model

**Solution** - Re-finish master and re-make mould.

The finished casting will never be better than the model. The time spent preparing the model will be repaid in the quality of the casting made from it. Remove file marks, rough edges and pin holes in the model as these defects will follow through to the finished casting. Rhodium plating of the model will prevent tarnishing during the vulcanisation of the rubber.

### Rough waxes

**Solution** - Too much release agent is used. Rough wax patterns can be caused by excess talc or release agents on the mould. Any rough surface of the wax is transferred directly to the surface of the investment and in turn directly to the surface of the cast item.

### Flask too hot

**Solution** - Reduce the flask temperature. If the burn-out temperature is higher than 750°C the investment will begin to break down. The metal then penetrates into the pores of the investment thus exhibiting a rough surface finish.

### Metal too hot

**Solution** - Reduce the casting temperature. If the temperature of metal is too high there is an adverse reaction with the investment producing sulphur gas. This is then entrapped into the metal just under the skin and will appear as gas porosity which will then show up on polishing looking like a rough surface finish.



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### **Improper sprue**

**Solution** - Modify the sprueing system. Avoid choke sprues and sharp bends in sprues. Any restriction in the sprue can create turbulence in the metal flow causing mould erosion and rough surface finish. Care should also be taken in attaching the wax patterns to the main sprue. Avoid leaving depressions or cavities as they cause protrusions of investment that could break off during casting and cause inclusions in the metal.

### **Steam dewaxed for too long**

**Solution** - Steam dewax for a maximum of 1 hour. The simple objective of steam dewaxing is to remove the wax from the mould cavity. Once this is achieved the mould should be removed from the steam, to leave it there any longer would only erode the surface finish of the investment.

### **Flask not cured before burn-out**

**Solution** - Solution Leave to stand for at least one hour before start of dewax. If dewax is started too quickly ie before the investment has fully cured, as the wax leaves the cavity it can erode the surface of the investment.

### **Wrong powder - water ratio used in mix**

**Solution** - In most cases rough surface finish is caused by the investment being too soft. This can happen if the water ratio within the investment is too high. It is imperative that you follow the manufacturers instructions regarding the powder:water ratio.

### **Flasks heated too rapidly**

**Solution** - Follow recommended burn-out cycle. If the heating cycle is too rapid the majority of the wax cannot escape before the flask reaches a high temperature. This will then cause the wax within the cavity to boil and erode the surface giving a rough surface finish on the castings. The main sprue should always be made from a wax with a lower melting temperature than the wax for the actual patterns. This will allow the wax to flow out of the mould cavity without boiling inside, thus reducing mould erosion. We would also recommend using the SRS burn-out cycle.

