



PROBLEM SOLVING: Brittle Prongs on Casting

causes:

1. Improperly alloyed metal
2. Flask temperature too cold
3. Metal temperature too cold
4. Carbon residues in prong area of mould
5. Too much old metal in cast

Improperly alloyed metal

Solution - Pre-alloy gold and master alloy. Avoid using poor quality metal. Poor quality metals can contain oxides and sulphides which will cause thin sections to become very brittle and liable to breakage.

Flask temperature too cold

Solution - Increase flask temperature. If the metal is introduced into a cold flask there will be a chilling effect which will cause small crystals to be formed in the solidifying metal. This metal structure is weak and therefore liable to breakage.

Inadequate air flow through oven

Solution - Increase air flow and exhaust in oven. Check burnout oven to ensure there is an adequate air supply and exhaust. Drill a few holes in the bottom of the door, make sure that the exhaust vents are open and large enough this will improve air flow, thus improving burnout. If you notice a yellow ring on the investment around the button after casting, a rotten egg smell when quenching, or a dark colour in the investment next to the casting you are more than likely getting a sulphur gas reaction in the oven. Improving the air flow and extending the burnout time will eradicate these problems.

Carbon residues in prong area of mould

Solution - Increase time at top temperature during burn-out. The presence of carbon may encourage decomposition of the investment at temperatures as low as 750°C. This could then cause inclusions to fall into the small prong area causing brittleness. Ensure that the furnace does not exceed 730°C.

Too much old metal in cast

Solution - Use a maximum of 50% scrap or refine metal. Re-melting of contaminated scrap material can introduce a considerable quantity of copper oxide into the melt.

