



## PROBLEM SOLVING: Metal Cracking

### causes:

1. Quenching too soon
2. Metal cast too cold
3. Incorrect sprueing
4. Contamination of gold or alloy
5. Oxide build up in metal

This problem is most commonly associated with silica alloys

### Quenching too soon

**Solution** - Wait 15-20 minutes before quenching. Quench cracking may occur if the cast is quenched too quickly. These cracks will appear clean and jagged and may vary in the amount of fractures. Allow sufficient cooling time dependant on the melt temperature, flask temperature and the size of the flask. Generally a minimum of 15 minutes is required.



### Metal cast too cold

**Solution** - Increase casting temperature. If molten metal is cast before reaching the correct casting temperature cracks may appear in any part of the piece due to metal having a poor tensile strength. Non-fill of pieces closest to the tree button may also occur.

### Incorrect sprueing

**Solution** - Modify the sprueing system. Gate size and locations are very important for a quality cast. Occasionally gates will be so small that metal cannot fill the cavity properly. Cracks will be clean and probably occur at the thinnest portion of the piece.

### Contamination of gold or alloy

**Solution** - Refine the metal. If the alloy becomes contaminated with other metals or chemical compounds cracks may occur. Usually discolouration of the surface will occur in addition to the cracking.

### Oxide build up in metal

**Solution** - Refine the metal. Oxides are formed when the alloys used for gold are exposed to air, chemical compounds such as investment powder, overheating, calcium sulphate reactions from the investment powder and graphite from crucibles or over use of metal. In general terms control of equipment, clean shop habits and regular rejuvenation of metal will help to ensure a quality cast without cracking.

