



## PROBLEM SOLVING: Inclusions in Casting

### causes:

1. Sharp corners or bends in sprueing
2. Crucible old and deteriorating
3. Oxide build up in crucible
4. Foreign particle or oxides in metal

Inclusions can be classified in two ways:

Foreign particles which were introduced from outside, for example particles of investment.

Inclusions formed by reaction with alloy elements, for example oxides and sulphides of copper and silver. Sharp corners or bends in sprueing



### Crucible old and deteriorating

**Solution** - Replace crucible. The most common type of crucible used in induction melting are graphite. Serious problems can occur if the graphite breaks down to powder form and is poured into the mould with the metal. The main problem therefore, is graphite inclusions which show themselves as small black deposits that form at the tree base. As the accumulation of graphite increases the tree will become darker and the black deposits will eventually spread into the cast piece.

### Oxide build up in crucible

**Solution** - Clean or replace crucible. Another common source of this problem is polluted crucibles where residues of slag can cause oxide build up. It is often more cost effective to replace the crucible rather than to have to scrap castings.

### Foreign particle or oxides in metal

**Solution** - Refine the metal. Particles such as copper oxide can exist in contaminated metal. When melted these are then introduced into the piece and can migrate to the surface. These oxides can then fall away during any subsequent pickling operation and leave a depression in the casting.