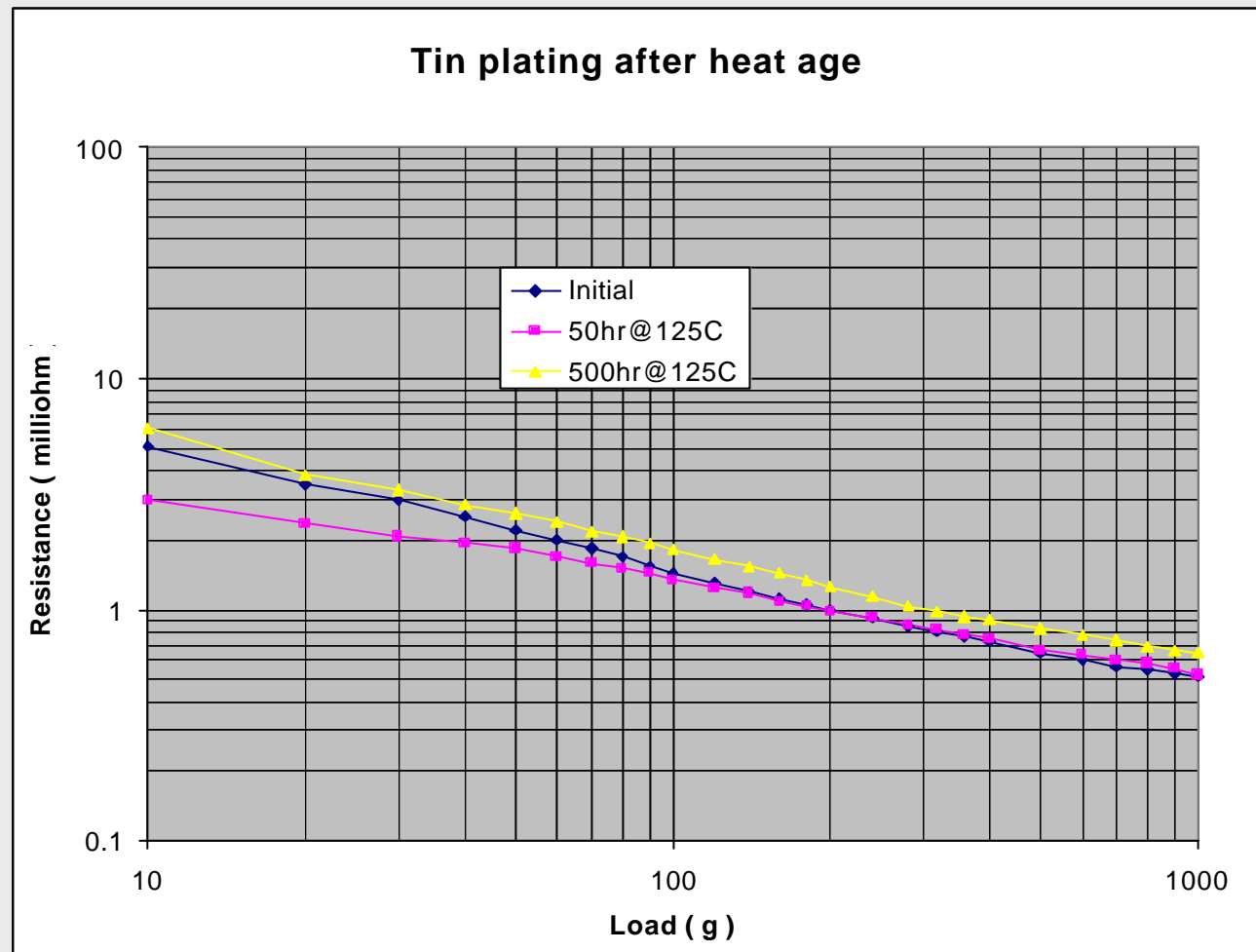


Lead-free: Contact Resistance

- ◆ **Some lead free connectors will be used as separable interfaces.**
- ◆ **These contacts need to retain stable contact resistance**
- ◆ **Parts were tested in various conditions:**
 - ❖ **As plated**
 - ❖ **After heat aging**
 - 125 C for 0, 50 and 500 hours
 - ❖ **After exposure to corrosive environment**
 - mixed flowing gas, class II, 48 hours
- ◆ **Parts were tested by contact resistance, using a soft gold ball to detect films or contaminants on the surface**
 - ❖ **No wipe was used in testing**

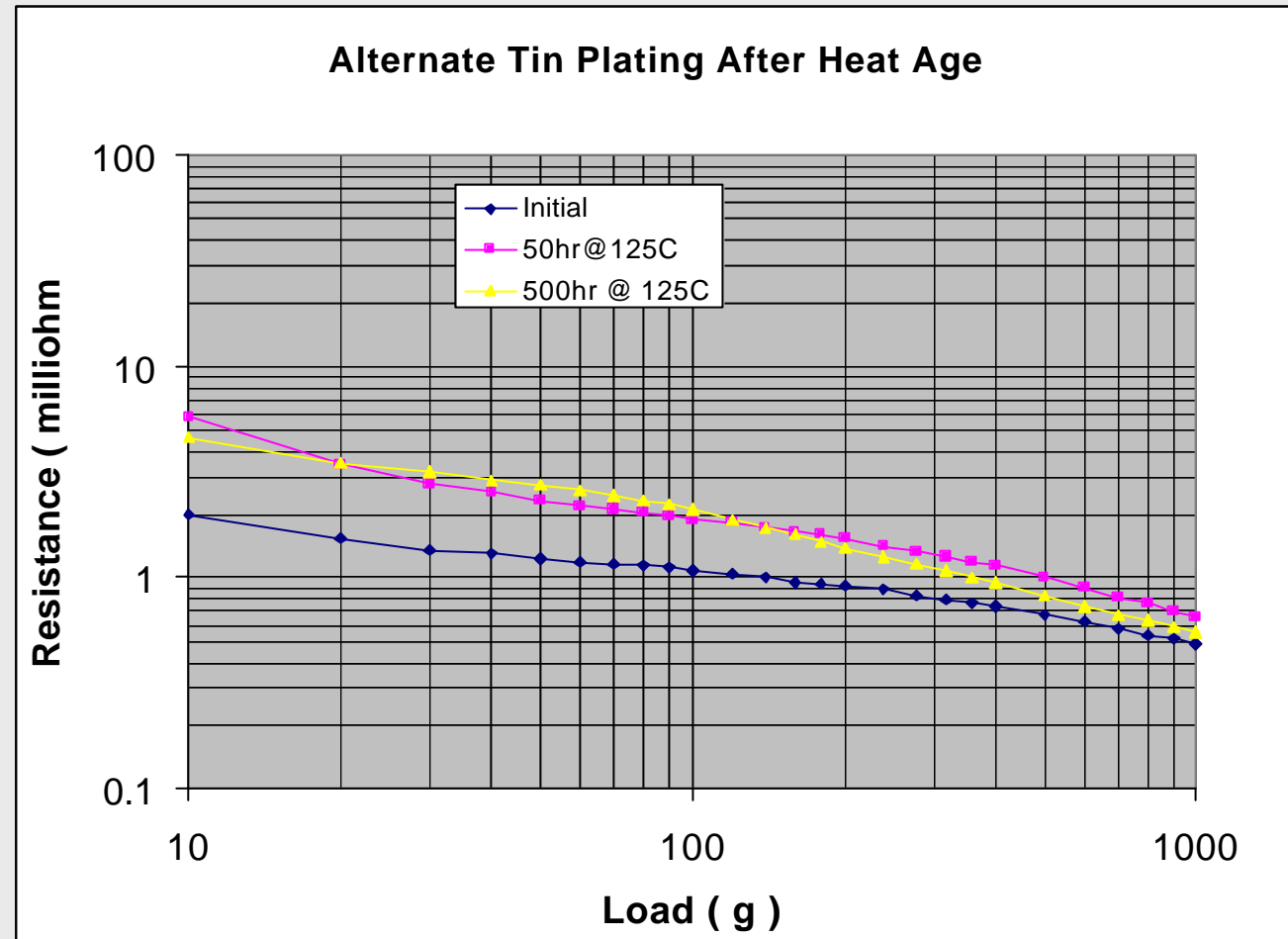
Resistance: Tin After Heat Aging

- Low and stable contact resistance after aging
- Contact resistance at 200 g is less than 2 milliohms
- Each line is the average of 9 curves



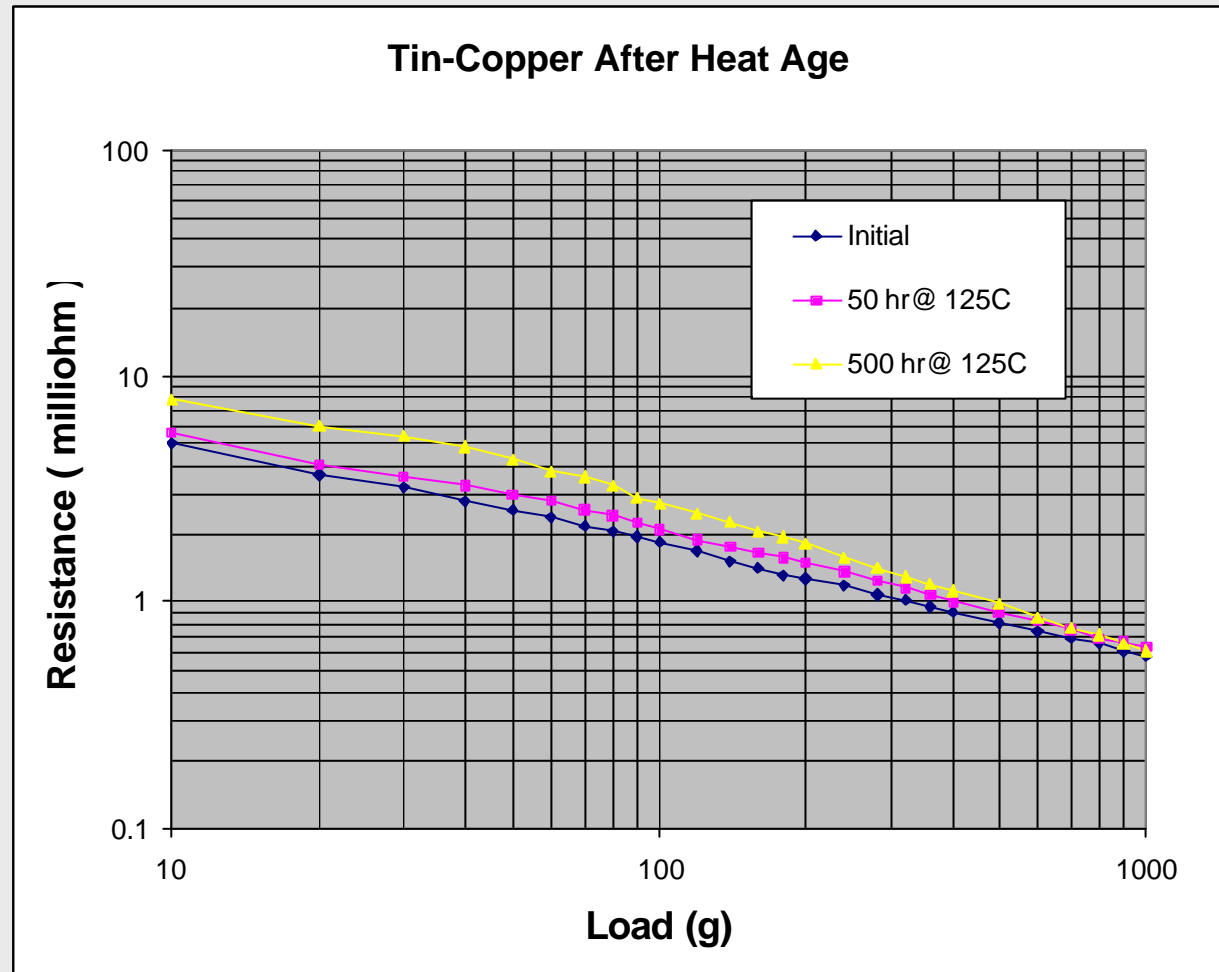
Resistance: Tin After Heat Aging

- Low and stable contact resistance after aging
- Contact resistance at 200 g is less than 2 milliohms
- Each line is the average of 9 curves
- This is a second source tin plating bath



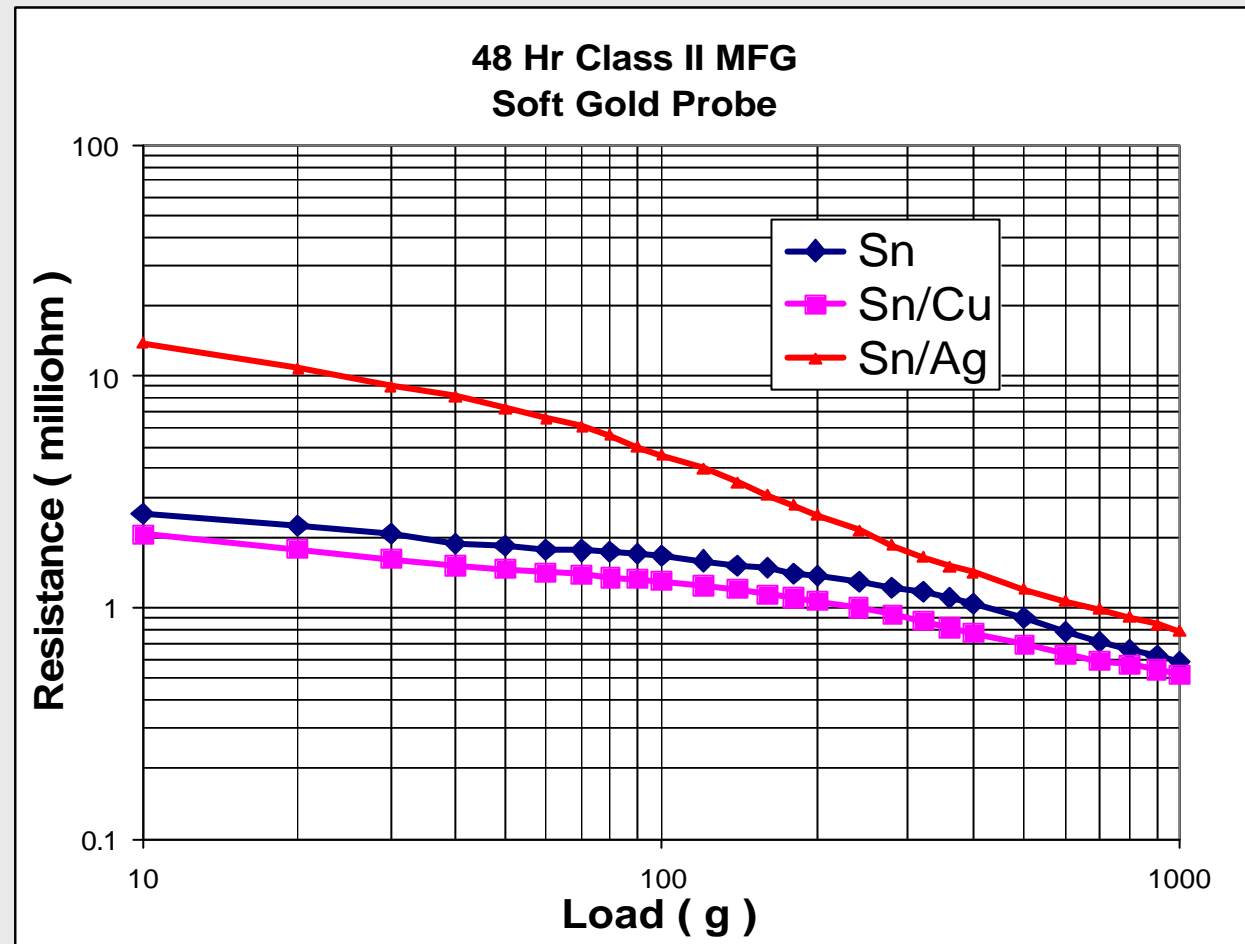
Resistance: Tin-Copper After Heat Aging

- Low and stable contact resistance after aging
- Contact resistance at 200 g is less than 2 milliohms
- Each line is the average of 9 curves

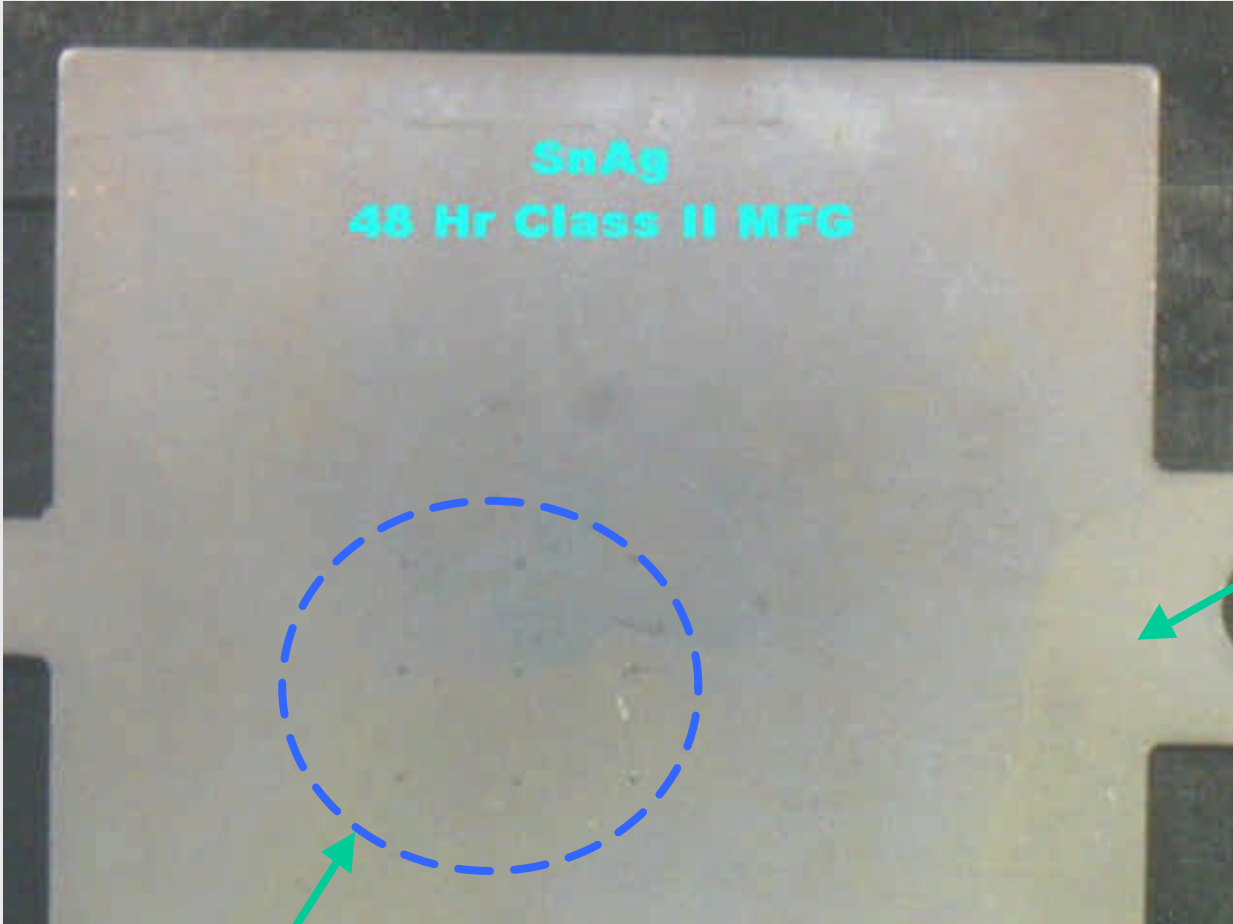


Contact resistance: MFG

- Tin and tin-copper show low and stable resistance
- Tin-silver (3%) deposits with silver rich islands, which are reactive in a corrosive environment
- Tin-silver surface also discolored after exposure



Resistance: tin-silver deposits



Nine points of contact resistance testing

Green discoloration due to corrosion of silver rich regions

Resistance: A rejected tin-copper

- Contact resistnace of one of the the rejected tin-copper coatings
- Coating had excessive brighteners that were not stable and diffused to the surface after aging

