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Shelf-Life and Dry Baking Parameters.

Shelf-Life

Shelf-Life is a function of solderability. Solderability of any final finish degrades over time due to oxidation or intermetallic compound formation of different finishes.

Per IPC-4552 ENIG shall remain solderable for up to 6 months under controlled storage conditions.

Per IPC-4553 Im Ag shall remain solderable for up to 6 months under controlled storage conditions.

Per the IPC the solderability of OSP shall be per the procurement documentation. OSP shelf life depends upon the OSP vendor and grade. For example Entek Cu-56 has a shelf life range of 3 to 6 months. Entek Plus-HT has a shelf life range of 6 to 12 months.

Per IPC-1601 Tin/Lead Hot Air Solder Leveling has an acceptable shelf life ranging from 6 months to a year.

Under controlled storage conditions the solderability shelf life may be extended to 12 months or more. To verify solderability of boards held in long term storage it is advisable to sacrifice one board from the manufactured lot in question for use as a solder sample. A solder sample processed through the assembly process verifies not only solderability of the final finish but compatibility with the overall assembly process as well. Solderability shall be in question on boards that are not stored properly.

Moisture absorption

Printed circuit boards are hygroscopic. They shall absorb moisture to the point of equilibrium. Whereas boards readily absorb moisture they require help to force the moisture back out. IPC-1601 "Printed Board Handling and Storage Guidelines" specification section 3.4 and Table 3-1 provides guidance on the dry baking of printed circuit boards.

Table 3-1 Recommendations for Printed Board Baking Profiles

Final Finish	Temperature	Time	Comments
Tin	105 – 125 °C	4 – 6 Hours	Baking may reduce solderability. See 3.4.1.5
Silver	105 – 125 °C	4 – 6 Hours	Silver may tarnish. See 3.4.1.4
Nickel/Gold	105 – 125 °C	4 – 6 Hours	Usually no issue with extended bake on Nickel/Gold finish. See 3.4.1.2
Organic Coating	See 3.4.1.1		
HASL/HAL	105 – 125 °C	4 – 6 Hours	Final surface thickness below 0.77 µm [30 µin] may turn into pure intermetallics and render the printed board unsolderable

For complete handling, baking and storage parameters refer to IPC-1601.