

Available PCB Surface Finishes

PCB Surface Finishes vary in price, shelf life, and typical uses. While each finish has its own benefits, in most cases, the process, product or environment will determine the surface finish that is best suited for your application. The following list will provide you with decision guidance.

Surface Finish	Thickness	Appr. Shelf-life*	Typical uses	Notes
HAL (Hot Air Solder Level)	5-45µm	12 months	- Soldering	- Not RoHS compliant!
HAL Lead Free RoHS - Compliant	5-45µm	12 months	- Soldering	- Excellent wettability - Excellent reflow quality - Good for hand soldering - High process temp. - Not for finepitch PCB - Poor coplanarity

Solder thickness may vary and is therefore considered unfavorable in higher technology SMD applications.

Immersion (chem.) Tin RoHS - Compliant	> 1µm	9 months	- Soldering	- Good wettability - Good reflow quality - Good for press-fit-techn. - Good coplanarity - Perfect for finepitch PCB - Good for SMD - Low process temp. - Very little twist & bow
Immersion (chem.) Silver RoHS - Compliant	0.2-0.3µm	12 months	- Soldering	- See Immersion Tin
Immersion (chem.) Gold (ENIG) RoHS - Compliant	3-5µm Ni 0.1µm Au	12 months	- Soldering - Flex / Flex-Rigid - Bonding (Alu wire) - Touch pads	- See Immersion Silver - Excellent wettability - Very low oxidation

The ENIG finish has historically been the best fine pitch (flat) surface and lead-free option.

Galvanic Gold (Soft Gold) RoHS - Compliant	3-5µm Ni >1µm soft Au	12 months	- Soldering - Bonding (Alu / Gold) - Pogo Pin Contacts	
Electroplated Hard Gold RoHS - Compliant	3-5µm Ni >0.8µm Au	12 months	- Gold fingers	

* Approximate shelf life is taken from process suppliers specifications and must be seen as a guideline!