Surface finish	Shelf- life, Finished PCB	Advantages	Disadvantages	General spec of surface finish	Soldering temperature	Primary applications	Soldering aging (hr)	Cost
HASL	12 months	Lower soldering temperature, better reliability; Good wettability and solderability;	Not RoHs free compliant; Relative poor flatness;	Surface on pad: 2- 5um; Barrel wall ≤25um;		Consumer electronics, Industrial	48	Low
HASL Lead free	12 months	Good wettability and solderability; environment-friendly;	Relative poor flatness; High soldering temperature and strong smell of working environment;	Surface on pad: 2- 5um; Barrel wall ≤25um;	270℃	Consumer electronics, automotive, Industrial, military	48	Low
ENIG	12 months	Good uniformity, flatness, conductivity and wettability; Good electrical property;	Easy to oxidize with blacken pad, moderate solderability; High cost;	Ni : 3-5um Au: 0.03-0.08um		Telecom&networking, automotive, Industrial, aerospace, military,	24	High
OSP	6 months	1, Good uniformity, flatness, conductivity and wettability; 2, Very low cost; 3, Environmental friendly, low energy consumption	1, Difficult for visual inspection, not for multi-reflow process; 2, Easy to scratch on the surface; 3, Specific requirement to storage condition; 4, Short shelf-life;	0.1-0.5um	245℃	Public security surveillance, consumer electronics	24	Very low
Immersion tin	6 months	1, Good uniformity, flatness; 2, Good solderability;	1, Special process control required, relative poor heat resistance; 2, Easy aging, discolor that may impact solderability; 3, Special requirement to environment protection;	0.8-1.2um	260℃	Telecom&networking	24	medium

Surface finish	Shelf- life, Finished PCB	Advantages	Disadvantages	General spec of surface finish	Soldering temperature	Primary applications	Soldering aging (hr)	('Act
Immersion silver	6 months	 Good flatness and solderability; Good for RoHs process; Low contact impedance, good conductivity, good for signal transmission; Suitable for horizontal plating line and good for thinner board thickness; 	the surface; 3, SMIA effect,difficult to control;	0.1-0.5um	260℃	Telecom&networking, consumer electronics	24	medium high
Electro-tin	6 months	1, Environmental friendly, lead free plating; 2, Low tension; 3, Plating thickness can be up to 15um; 4, Good solderability;	1, Specific requirement to storage condition, exposure to the air will result in tin whisker on the edge of plated area; 2, Bigger crystal particle size; 3, Soft surface, easy to scratch;	0.1-12um	260℃	Telecom&networking, automotive, power supply	48	medium high
Electro- silver	6 months	1, Good flatness and solderability; 2, Good for lead free process; 3, Low contact impedance, good conductivity, good for signal transmission; 4, Plating thickness can be up to 15um;	1, Special requirement to environment and safety protection; 2, Specific requirement to working condition to segregate PCB with air exposure; 3, Difficult to control for uniformity on the marginal area; 4, Extremely high cost;	0.1-8um	260℃	Telecom&networking,	48	Very high
Electro- gold	12months	1, Good solderability; 2, Long shelf-life; 3, Good contact and high wear resistance;	1, High cost; 2, Difficult solderability control; 3, Difficult control for adhesion of solder mask;	Ni: 3-5um Au: 0.01-0.05um	260℃	Telecom&networking, consumer electronics	48	High