PROPCB

PCB surface finish comparison table

Pokrycie	Advantages	Disadvantages	Ideal for:
HASL (leaded)	Low cost Good solderability Long shelf life	Uneven surface May not be suitable for small gauge components Contains lead Not RoHS compliant Different in coating thickness across small and large pads	General purpose electronics Low cost applications
HASL-LF (lead-free)	Does not contain lead RoHS compliant Good solderability Good for designs with small gauge components	Similar to HASL, but with lower thermal resistance Coating thickness may vary, which may cause deviations from design specifications with tight tolerances	RoHS compliant products General purpose electronics
ENIG (immersion gold)	Resistant to corrosion Flat, uniform soldering surface Excellent solderability Long shelf life RoHS compliant Suitable for applications requiring high reliability	Relatively higher cost compared to HASL Low thermal shock resistance Nickel coating is susceptible to oxidation during manufacturing Brittle under mechanical stress	Electronics that require high reliability Designs with small gauge components Mobile devices
Immersion silver	Good solderability RoHS compliant Cost-effective - lower cost compared to ENIG Low signal loss - for applications requiring signal integrity	Susceptible to tarnishing and oxidation Lower durability	Budget products requiring RoHS compliance Applications requiring higher reliability
OSP (Organic Solderability Preservative)	Low cost Environmentally friendly Suitable for short production cycles Flat, thin surface	Limited shelf life Lower durability compared to other coatings Coating may be damaged during soldering, modifications or repairs Not suitable for high temperature applications	Short production cycles Cost-oriented designs
Hard gold	Very durable and resistant to mechanical wear Ideal for mechanical components, such as connectors RoHS compliant	High cost Used only on specific areas of the PCB due to price	Connectors Edge connectors Areas exposed to mechanical wear
Graphite varnish	Low cost Good conductivity for through hole components	Lower shelf life and durability Limited use in mass production	Vias Areas of short term contact during operation Cost-oriented production