

**Liquid photoimageable solder mask  
( KSM-S6189KM01/KSM-19H01)**

KSM-S6189KM01/KSM-19H01 is two-component , screen printing , high precision , lye-development solder mask ink. It is applicable to double-sided board and multi-layer board for making thin and intensive circuit. It has good screen printing adaptability and good surfacing. The post cured film provides excellent adhesion , resistance to chemicals and heat.

Properties of Ink

Items	Features	Notes
Color	Black and matt	
Fineness	≤8μm	0 ~25μm Fineness gauge
Mix ratio	Base/Hardener=3:1	Weight ratio
Solid content after mixing	74±3%	
Viscosity after mixing (25℃)	300±50 dPa · s	VT-04F
Density after mixing (25℃)	1.30 ~1.50 g/ml	
Pot life after mixing	24 hour	Store below 25℃ in dark
Environment standard	In compliance with RoHs directives	SGS testing
Pre-baking limit	75℃ , 70 min	
Exposure energy	300 ~600 mJ/cm <sup>2</sup>	The effective value through the polyester film
Package	Base :750g , Hardener :250 g	According to customer requirements
	Base :3kg , Hardener :1kg	
Shelf life	6 months since the date of manufacture	Store below 25℃ in dark

Properties of the film (after post cured)

Items	Features	Notes
Pencil hardness	≥6H	Pencil harder
Solvent resistance	Good	25℃, C <sub>2</sub> H <sub>5</sub> OH , 20min
Acid resistance	Good	25℃, 10vol%H <sub>2</sub> SO <sub>4</sub> ,20min
Alkali resistance	Good	25℃, 10vol%NaOH ,20min
Insulation resistance	≥1.0×10 <sup>12</sup> Ω	IPC-SM-840D 3.8.2
Resistance to molten solder	288℃ ×10secends ×3times OK	IPC-SM-840D 3.7.3
Resistance to flame	UL94V-0	Certified number:UL-E189612

Attention :

1. The base and hardener should be mixed according to the ratio and stirred thoroughly before using.
2. We will offer you special diluent or DPM if the ink need dilute.
3. The values above are based on experiments in our lab. Experiments need to be carried out in order to get proper using condition.

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Directions of use

1.Working procedure

Procedure	Content
(1) Mixing	Mixing a small amount main agent with hardener and stirring thoroughly, then mixing the mixture above with the remanent main agent , add appropriate diluent and stirring 5 ~10 minutes. The viscosity of ink is adjusted to $120 \pm 20$ ps if printed by hand. And it is adjusted to $180 \pm 20$ ps if printed by machine. it is adjusted to $200 \pm 40$ ps if it is aluminum tamponade .The viscosity of ink mixed above is measured at 25 °C . Please use the special diluent of our company if the viscosity of ink needs to adjust.
(2) Remain time	10 ~15 minutes after stirring uniformly
(3) Screen mesh	Ordinary boards:43T ; Chemical-plating Aurum or Tin boards:36T
(4) Pre-baking	1. Single side printing separately First side :72 ~76°C ,15 ~18min Second side : 72 ~76°C , 30 ~35min 2. Double sides printing simultaneously : 72 ~76°C , 30 ~50min
(5) Exposure	300 ~500 mJ/cm <sup>2</sup> , Black ink :600 ~750 mJ/cm <sup>2</sup> (the effective value through the polyester film)
(6) Developing	Developing solution :0.8 ~1.2wt%Na <sub>2</sub> CO <sub>3</sub> or K <sub>2</sub> CO <sub>3</sub> aqueous solution Developing solution temperature :28 ~32°C Spray pressure :1.5 ~2.5 kg/cm <sup>2</sup> Developing time :40~90 seconds
(7) Post cure	Spray Tin board :150°C × (60 ~120) min Chemical-plating Aurum board:150°C × (45 ~55) min Thick copper plate , boards printed with black ink should be post-baked in subsection:75°C × (60 ~120) min+100°C × 30 min+150°C × (60 ~90) min

**2. Caution**

1. Requirements of working place :the temperature should be 20~24℃ and humidity is 55~65% in the room for printing and exposure without dust. Please work in the place without UV ray , or it will cause photo polymerization if the ink is used in the irradiation of white ray or sunlight.
2. Mixing the main agent with hardener and stirring thoroughly and using only in room temperature.
3. Appropriate film thickness is from 18 to 22μm. Thinner film will reduce the resistance to heat , chemicals and plating. Thicker film will cause excess under-cut and reduce the degree of dryness because the irradiation can not cure the botton layer of the ink.
4. The screen boards can not be pasted with adhesion tape directly or else the remanent mucus will cause hollow pot on board.
5. The ink can not be printed into the accessory hole. Developing time should be increased if ink gets into the accessory hole or there will be uncleaned.
6. The condition and allowed range of pre-baking vary with the oven type and different number of boards in the oven. Experiments need to be carried out to get proper condition.
7. Exposure energy varies with the board material and ink thinkness. Experiments should be carried out to determine the minimum width , surface gloss and the sensitization of the botton surface and then set proper condition.
8. Inadequate developing temperature and time may cause unclean developing and over of them can cause excess under-cut and the feature of ink will be influenced because of the attack of ink surface. Please control the concentration of developing solution , temperature , pressure and developing time strictly. Experiments need to be carried out to get proper condition.
9. The ink is easy to remove when the temperature and time of post-baking is deficient. It will reduce the resistance to plating aurum and molten solder when the post-baking time is over 2.5 hours. Experiments need to be carried out to set proper conditions of spraying tin and plating aurum.
10. Experiment whether the ink can afford attack of the process of wave crest solder when the flux is rosin.
11. Taphole boards are baked in subsection : 75℃×60~120 min+100℃×30 min+150×60 min.
12. Please set proper post-baking tine of solder resist to suit for printing marking ink. Deficient or over hardening can reduce the feature of ink.
13. Condition of chemical-plating aurum : A. use 36T screen for printing. B. The sensitization of exposure energy is 10 to 12 step. C. Under-cut is controlled below 1 mil after developing or the film will easily be attacked by the liquid medicine in the process of chemical-plating aurum. D. The film need to cure through the UV bump again if the exposure is not enough . E. Chemical-plate aurum or tin first and then print marking ink. or excess hardening will reduce the resistance to chemical properties.