



产 品 说 明 书 Product Instruction

产品名称：
环保三防漆

Product Name:

Environmentally Friendly Conformal Coating

产品型号：
M988

Product Model:

M988

厂商名称：珠海长先新材料科技股份有限公司

Manufacturer: Zhuhai Changxian New Material Technology Co., Ltd.

厂商地址：珠海市高栏港经济区精细化工区浪湾路

Address: Langwan Road, Fine Chemical Industry Zone, Gaolan Port Economic Zone, Zhuhai, China

联系厂商：0755-26852595 Email: szwkb@changxiankeji.com

Contact: 0755-26852595

M988 环保三防漆

M988 Environmentally Friendly Conformal Coating

产品描述:

Product Overview:

M988 由有机硅改性丙烯酸树脂、醇醚类环保溶剂及特殊助剂配制而成，属于单组分固化体系。产品气味低、毒性低，安全环保，不含芳烃、丙酮等有毒物质，对环境和操作人员更加友好。本品含荧光剂，便于涂覆检测，适用于涂刷、浸渍和喷涂工艺，并符合 RoHS、REACH 及无卤等环保要求。

M988 适用于各种电子及电器元器件的防潮保护，特别适用于同时采用硅胶灌封和三防漆涂覆的工艺，可解决不同材料体系之间可能出现的界面不干燥问题。

M988 is a single-component conformal coating formulated with silicone-modified acrylic resin, environmentally friendly glycol ether solvents, and special additives. It features low odor and low toxicity and contains no aromatic hydrocarbons, acetone, or similar toxic substances, making it more environmentally and operator friendly. The coating contains a fluorescent tracer for inspection and is suitable for brushing, dipping, and spraying. It complies with RoHS, REACH, and halogen-free environmental requirements.

M988 provides moisture protection for a wide range of electronic and electrical components. It is particularly suitable for processes that combine silicone potting with conformal coating, helping prevent interfacial non-drying caused by incompatibility between different material systems.

性能指标:

Performance Specifications:

- 颜色/外观: 黄色透明液体
- 比重 (25° C): 0.88 ± 0.02
- 粘度 (25° C, 涂-4 杯, s): 12-18
- 配套稀释剂: X-98
- 30° C、55% RH 干燥时间 (铜片): 表干 30-40 min; 实干 24 h
- 80° C 干燥时间 (铜片): 表干 3-10 min; 实干 2-4 h
- 推荐固化条件: 60-80° C 烘烤 3-5 min, 然后室温固化
- 室温达到最佳性能时间: 7 天
- 不挥发物含量: $28.5 \pm 2\%$
- 电气性能:
- 击穿强度: $\geq 40 \text{ kV/mm}$
- 体积电阻率: $\geq 1 \times 10^{13} \Omega \cdot \text{cm}$
- 化学性能:
- 中性盐雾试验 (5% NaCl, $35 \pm 2^\circ \text{C}$, 72 h): 无腐蚀
- 防潮性能 (MIL-46058C): $\geq 5 \times 10^9 \Omega$
- 对铜腐蚀: 无
- 耐霉菌试验 (MIL-46058C): 0 级
- 使用温度: -40° C 至 +120° C
- 备注: 以上数据为实验室测试结果, 仅供参考。客户使用时应根据自身产品的具体要求进行测试验证。

- Color/Appearance: Transparent yellow liquid
- Specific Gravity at 25°C: 0.88 ± 0.02
- Viscosity at 25°C (Tu-4 cup, s): 12-18
- Recommended Thinner: X-98
- Drying Time on Copper at 30°C and 55% RH: Touch dry: 30-40 minutes; Fully dry: 24 hours
- Drying Time on Copper at 80°C: Touch dry: 3-10 minutes; Fully dry: 2-4 hours
- Recommended Curing Conditions: Heat at 60-80°C for 3-5 minutes, followed by curing at room temperature
- Time to Reach Optimum Properties at Room Temperature: 7 days
- Non-Volatile Content: $28.5 \pm 2\%$
- Electrical Properties:
- Dielectric Strength: ≥ 40 kV/mm
- Volume Resistivity: $\geq 1 \times 10^{13} \Omega \cdot \text{cm}$
- Chemical Properties:
- Neutral Salt Spray Test (5% NaCl, $35 \pm 2^\circ\text{C}$, 72 h): No corrosion
- Moisture Resistance (MIL-46058C): $\geq 5 \times 10^9 \Omega$
- Copper Corrosion: None
- Mold Resistance Test (MIL-46058C): Grade 0
- Service Temperature Range: -40°C to $+120^\circ\text{C}$
- Note: The above values are laboratory test results provided for reference only. Customers should verify performance according to the specific requirements of their products.

使用工艺:

Application Procedure:

- 1、线路板清洁: 建议在线路板组装后进行清洁, 去除灰尘、油污及焊接残留物, 以提高附着力并防止元件和焊点腐蚀。
 - 2、M988 适用于涂刷、浸渍和喷涂工艺, 推荐涂层厚度为 25-50 μm 。用户可根据施工工艺及所需膜厚, 使用配套稀释剂调节工作粘度和漆膜厚度。
 - 3、M988 在使用过程中, 特别是在敞口容器中, 溶剂会逐渐挥发, 使比重和粘度增大, 影响操作及成膜均匀性, 并可能影响防潮和电气性能。因此应定期补充 X-98 稀释剂。采用涂刷或浸渍工艺时, 建议少量多次取用, 以减少吸收空气中的潮气。
 - 4、长时间停用时, 应将 M988 从敞口容器中倒出并密封保存, 以免溶剂挥发过快或吸收空气中的潮气而出现发白。已使用的涂料不得倒回原包装桶中, 以免带入潮气并影响产品稳定性。
 - 5、在阴雨天气或空气湿度较大时, 产品使用过程中可能因吸收空气中的水分而出现发白。通常经过烘烤后发白现象可消失, 不会影响产品性能。
 - 6、本补救应用仅适用于低松香含量的残留物; 如残留物过多, 应先进行清洗。
1. PCB Cleaning: Clean the circuit board after assembly to remove dust, oil, and soldering residues. Proper cleaning improves adhesion and helps prevent corrosion of components and solder joints.
 2. M988 is suitable for brushing, dipping, and spraying. The recommended coating thickness is 25-50 μm . Adjust the working viscosity and film thickness with the recommended thinner according to the application process and required coating thickness.
 3. During use, especially in an open container, solvent evaporation increases the specific gravity and viscosity, making application more difficult and causing an uneven film that may reduce moisture protection and electrical performance. Replenish X-98 thinner periodically. For brushing or dipping, dispense small quantities at a time to minimize moisture absorption from the air.
 4. If M988 will not be used for an extended period, transfer it from the open container into a sealed container to prevent excessive solvent evaporation or whitening caused by moisture absorption. Do not return used coating

to the original container, as introduced moisture may affect product stability.

5. In rainy weather or under high-humidity conditions, the coating may absorb moisture from the air and appear white during application. The whitening will normally disappear after baking and does not affect product performance.
6. This remedial application is suitable only for residues with low rosin content. If excessive residue is present, clean the surface first.

包装、储运及保质期:

Packaging, Storage, Transportation and Shelf Life:

- 包装:

4 L/桶或 20 L/桶。

- 储运:

本品为易燃化学品。请远离火源和热源，按相关法规搬运，并储存于阴凉、避光、干燥处。

- 保质期:

密闭保存，在 5-25° C 条件下保质期为 6 个月。

- Packaging:

4 L pail or 20 L drum.

- Storage and Transportation:

This product is flammable. Keep away from ignition sources and heat. Handle in accordance with applicable regulations and store in a cool, dry place protected from light.

- Shelf Life:

Six months when stored in sealed containers at 5-25° C.

安全操作须知:

Safe Handling Instructions:

安全使用须知不在此列出。操作前请阅读本产品的化学品安全说明书（MSDS），该文件可向本公司业务专员索取。

Safety instructions are not listed in this document. Before use, read the Material Safety Data Sheet (MSDS), which is available from our sales representative.

温馨提示:

Please Note:

- 由于我们的产品会持续优化和改进，本手册中的相关信息可能会根据实际情况进行调整，不另行通知。如需获取最新版本或了解更多信息，欢迎随时联系我们的销售团队。
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- Do not mix this product with other products.
- We strictly control product quality and supply products in accordance with applicable product standards. Custom products are supplied according to mutually agreed specifications. Application conditions vary and are beyond our control. Users should therefore test and evaluate the product and the information provided in this manual and the recommended application procedures to determine suitability for their specific use.