

# 突起電極を利用したパネルめっき膜厚の均一化 —基板保持治具の改善

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## Uniformity Formation of Panel Plating by Using Convexity—Modification of Cathode Holder

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**概要** パネルめっきでは、まずパネル全面を銅めっきし、続いて薄膜レジストを用いてエッチングにより微細配線を形成する。そのため、銅めっきの均一性は配線の微細化に重要である。パネル周辺部では膜厚が厚くなり、配線の微細化を困難にする。本研究では、パネル周辺に設置されている基板保持治具（突起電極）を改善し膜厚を均一にした。突起電極の絶縁形状を変化させ、2次電流密度分布を数値解析し電流密度分布を求めた。パネルカソード側からそれに面した突起電極の側壁を含んで絶縁することにより、1.0%以下の最小電流密度不均一性を得た。突起電極が高く、また長いほど均一性が増大した。縦型めっき装置の実ライン実験では、2.98%と著しい均一性を得た。

### Abstract

For the panel plating process, the whole panel is initially electrodeposited with copper and after applying thin photo resist film, the fine conductor lines are chemically etched. Uniformity of copper thickness is a critical factor to achieve fine etching of the conductors. However, thickness of electrodeposit is originally higher at the panel edge, which often makes fine line etching difficult. In this report, the panel holders at the panel surroundings was modified in order to obtain the uniform copper thickness. Current distributions on the panel was simulated by the secondary current distribution by changing the insulating area and shape of the cathode holder (convexity). Less than 1.0 percent minimum current nonuniformity was achieved by insulating the convexity from the cathode side including convexity sidewall. The higher and the longer the convexity, the copper thickness uniformity was improved. The results were applied to the actual panel plating machine and a drastic improvement of 2.98 percent maximum current non uniformity was achieved.

**Key Words:** Build up, Printed Circuit Board, Panel Plating, Uniformity, Convexity