

## 電気透析による無電解ニッケルめっき浴の長寿命化

### Electro Dialysis for a Continuous Long-Life Electroless Nickel Process

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#### 抄 録

無電解ニッケルめっき浴は老化に伴い、亜りん酸イオン、硫酸イオン、ナトリウムイオンが蓄積し、めっき反応を阻害するため、一定濃度以上になると廃棄更新しなければならない。これらの不要成分を有効成分であるニッケルイオン、次亜りん酸イオン、有機酸イオンの損失を抑えながら除去することにより、めっき液の長寿命化を図ることができる。

本報告では、2段階の電気透析法を用いることにより、不要成分を選択的に除去して、無電解ニッケルめっき浴の長寿命化について検討を行った。まず第1段階目でニッケルと亜りん酸、次亜りん酸、ナトリウム、硫酸を分離し、第2段階目では第1段階目で取られた次亜りん酸をめっき液中に戻すプロセスとなっている。電気透析を用いた結果、亜りん酸、ナトリウム、硫酸の濃度が一定になり、めっき析出速度の低下もなく、めっき皮膜の品質も安定して得られ、無電解ニッケルめっき浴の長寿命化が可能となった。

#### ABSTRACT

In electroless nickel plating, phosphorous acid ion, sulfuric acid ion and sodium ion accumulate in the bath solution, resulting in prevention of further plating reaction as the bath ages. Therefore, the bath solution must be discarded and re-made with a brand new solution when ion concentration of above described components exceeds a certain amount. Removing these unwanted components by suppressing the loss of effective components such as nickel ion, hypophosphate ion made it possible to lengthen the bath life.

In this report, we introduce how a long-running process for electroless nickel plating is made possible by selectively removing unnecessary components in the bath through two-step electro-dialysis.

The electro-dialysis consists of two stages. In the first stage nickel, phosphorous acid, hypophosphorous acid, sodium and sulfuric acid are removed and in the second stage hypophosphorous acid undesirably removed in the first stage is returned back to the plating bath.

As a result of having used electro-dialysis, we were able to keep the density of phosphorous acid, sodium and sulfuric acid at a constant level and also to keep the plating precipitation rate at a

constant speed and to achieve stable quality of plated film as well as to lengthen the life of electroless nickel plating bath.

Key Words : Electro dialysis, Long-Life, Electroless Nickel