

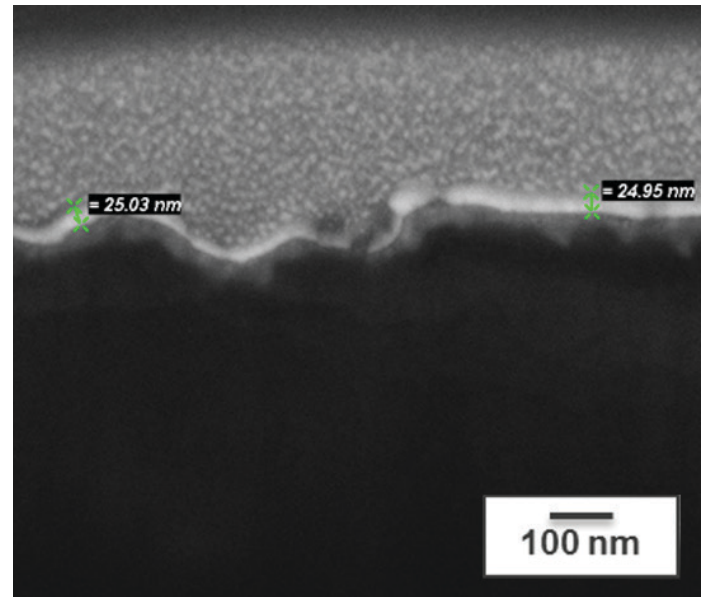
Enklad Pretreatment

High Performance Pretreatment for Memory Disk

Better Pretreatment For a Higher Quality Electroless Nickel.

The **Enklad Pretreatment** process is the next generation zincate preplate system for aluminum memory disk substrates that provides an improved base layer for electroless nickel plating. The smoother and more uniform surface provided by Enklad Pretreatment allows for lower particle deposit inclusion without modifying the nickel operating parameters.

The Enklad Pretreatment system consists of a cleaner-etch and two step zincate. The cleaner-etch is specially formulated for easier operation and creates a surface topography with fewer defects. The zincate is thinner and more uniform than previous generation processes and demonstrates exceptional adhesion.



*Average zincate layer thickness ranges from 25-60 nm

KEY FEATURES

- Improved overall finish quality after electroless nickel
- Low foaming cleaner-etch with a high cloud point for ease of operation
- Two step zincate that creates a uniform zinc initiation layer with excellent adhesion
- Reduced pitting after etch
- Drop-in replacement for existing industry standard pretreatments
- Less drag-in contamination between zincate and nickel bath due to lower metal content



MacDermid Enthone

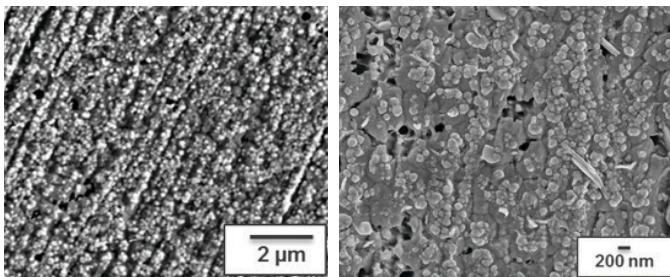
Enklad Pretreatment

High Performance Pretreatment for Memory Disk

A Higher Quality Initiation Layer and Better Process Control

The Enklad Pretreatment consists of two completely upgraded chemical processes: The Enklad Cleaner-Etch, and the Enklad Zincate. The upgraded cleaner-etch produces less pitting of the aluminum substrate with more uniform and mild etching while also preparing the disk surface for the zincate. The formulation is low foaming with an exceptionally high cloud point for ease of operation. The newly developed zincate chemistry deposits a thinner, more uniform coating that has exceptional adhesion to the aluminum surface. Due to lower metal content, the second zincate step also features reduced risk of drag out contamination into the subsequent electroless nickel bath, improving process control.

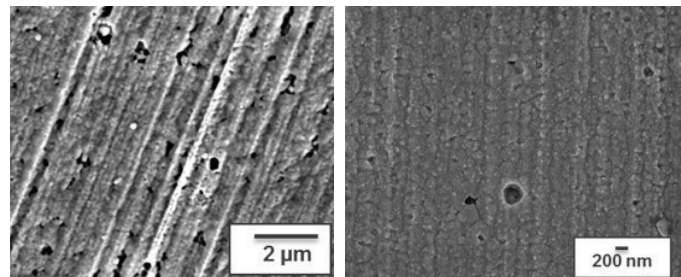
Industry Standard Pretreatment



10,000x SEM

50,000x SEM

Enklad EN Pretreatment

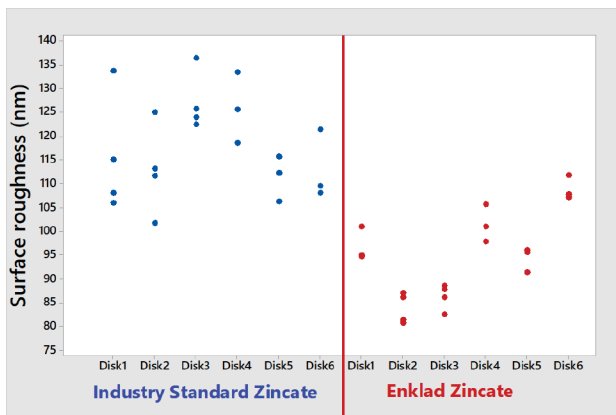


10,000x SEM

50,000x SEM

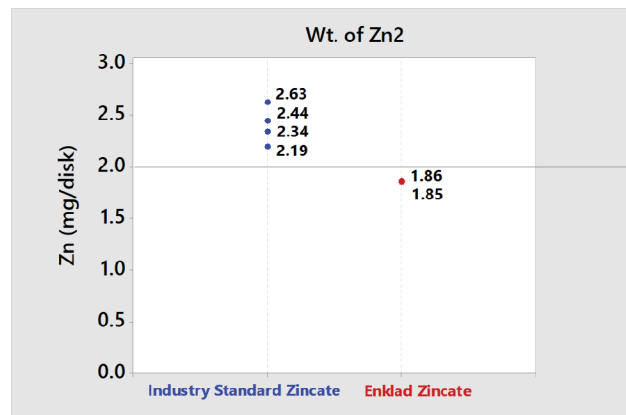
Higher Quality Nickel Coating Starts From The Bottom Up

Surface Roughness by Laser Profilometry



Enklad Zincate produces a smoother surface than the industry standard zincate, providing a better electroless nickel initiation layer.

Coating Weight by ICP



Enklad Zincate deploys approximately 15% less zinc when compared to the industry standard zincate, as measured by total weight deposited on the disk as measured by ICP.