

# M-Speed HF

Copper Treatment for High Speed Innerlayers

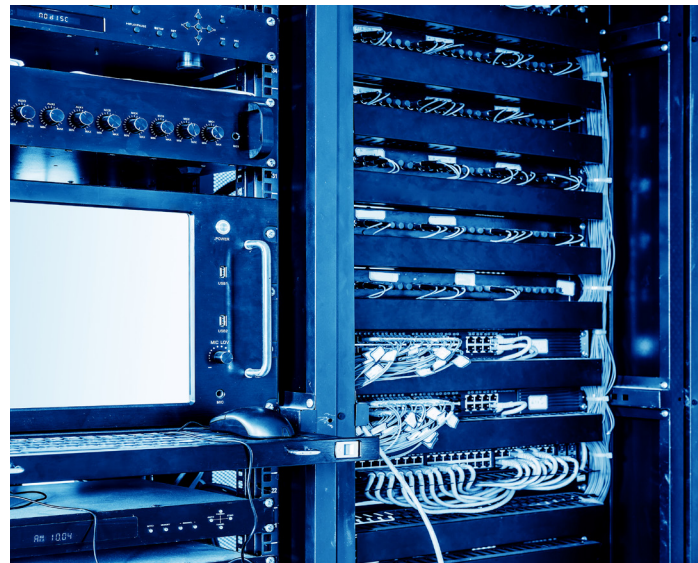
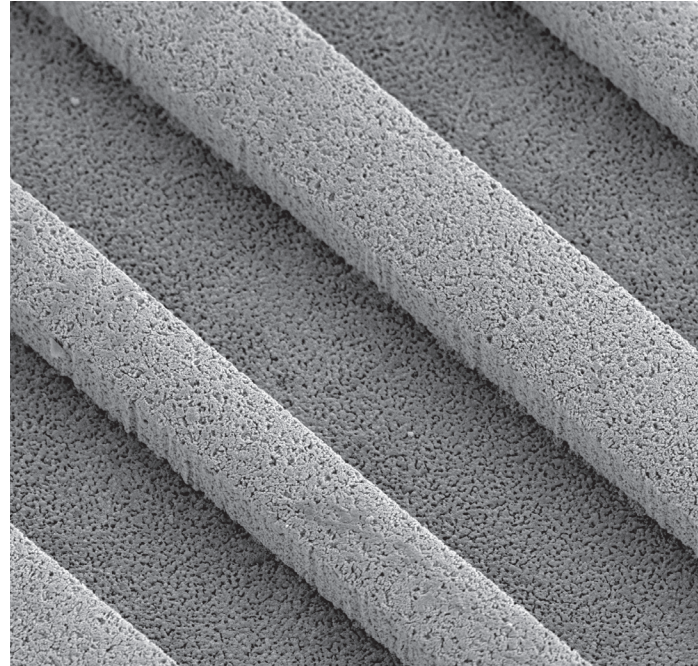
## No Limits for High Speed, High Frequency Applications.

**M-Speed HF** is an alternative oxide process developed to meet the needs of next generation high speed data rate requirements. Delivering the renowned reliability of MacDermid Alpha chemistry technology in a new low etch process. Reduced signal loss and high adhesion without compromise. The unique low etch process provides a low profile surface topography to optimize maximum signal integrity for high speed applications and uniform trace geometry for controlled impedance designs. The M-Speed HF process offers superior adhesion and thermal-mechanical reliability despite the low peak to valley roughness.

The M-Speed HF system achieves industry-leading performance by utilizing standard alternative oxide process equipment in combination with a novel post-dip process. The process is compatible with virtually all laminate materials, and creates exceptional adhesion to low and ultra-low loss dielectric systems. To meet the challenges of next generation digital designs, choose M-Speed HF.

## KEY FEATURES

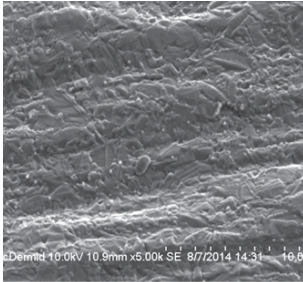
- Reduced copper roughness for reduced signal attenuation
- Precision etch rates for controlled impedance designs
- Environmentally friendly - reduced chemical consumption and waste
- Superior reliability for high layer-count designs



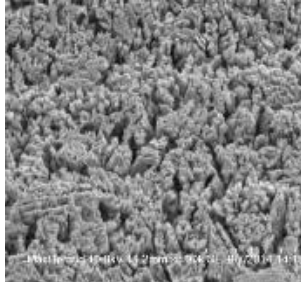
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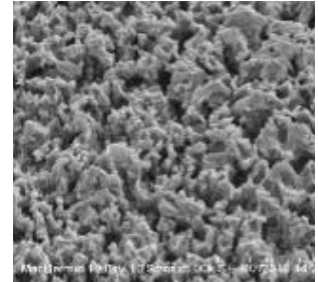
## Complete Chemical Process For High Frequency Printed Circuit Board Applications



Before M-Speed



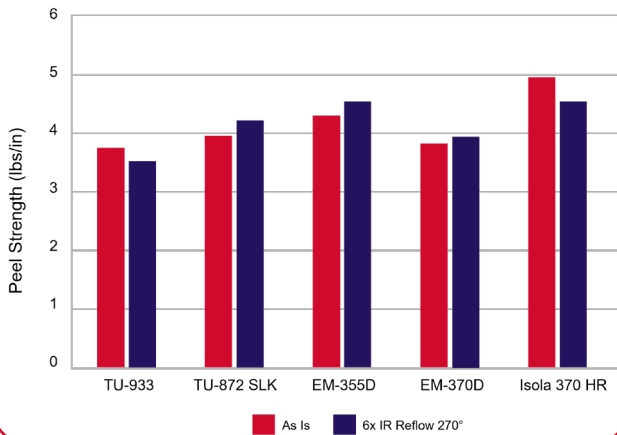
After M-Speed HF



Alternative Oxide Comparison

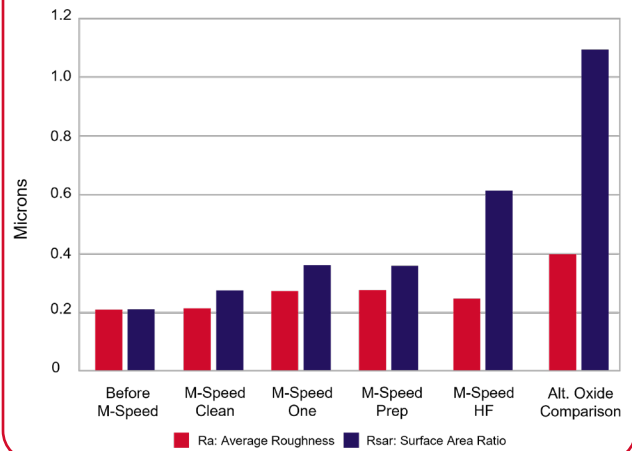
### Adhesion

M-Speed HF Adhesion on Low Loss Materials



### Surface Roughness

ZYGO Surface Roughness



M-Speed Clean

M-Speed HF  
Pre-Dip

M-Speed HF

M-Speed HF  
Post-Dip

Rinse and Dry

