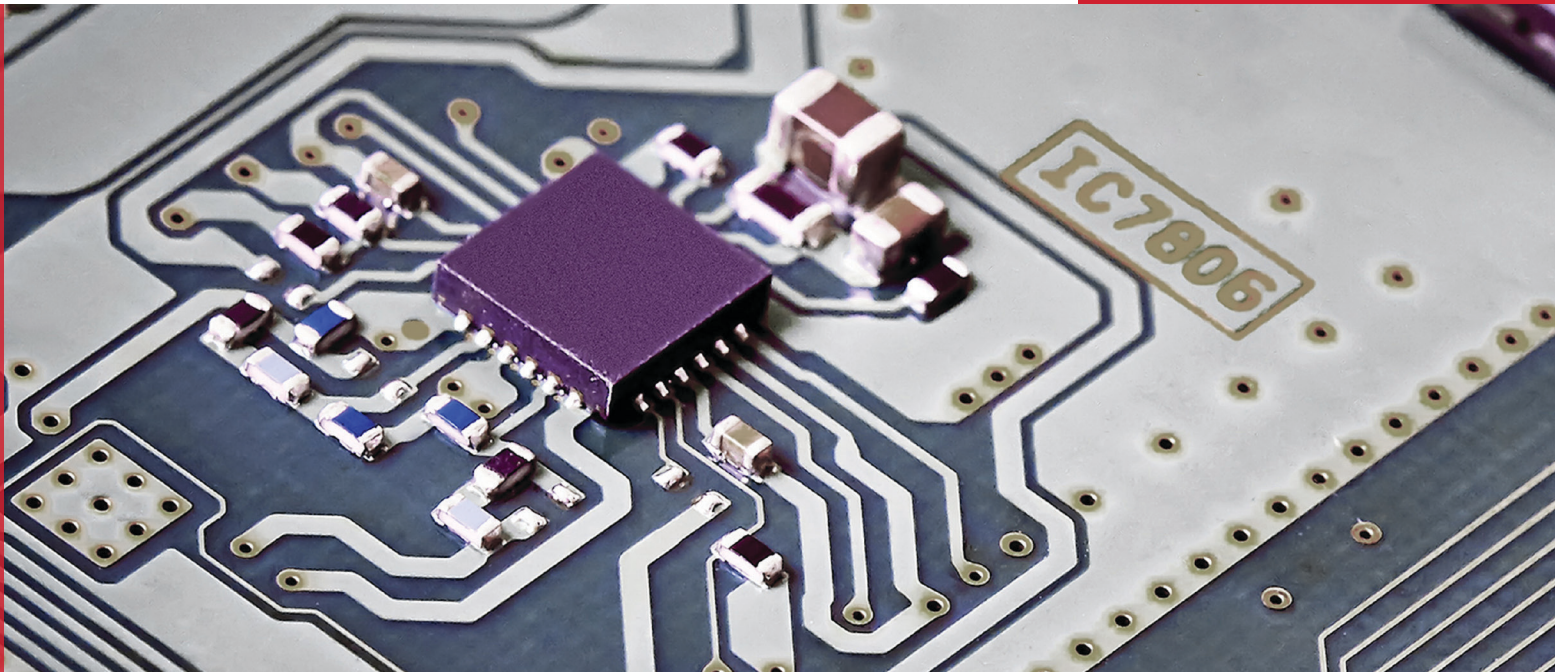




# MacDermid Enthone



## SEMICONDUCTOR LEADFRAME PACKAGING

*Product Overview*



**MacDermid Alpha**  
ELECTRONICS SOLUTIONS

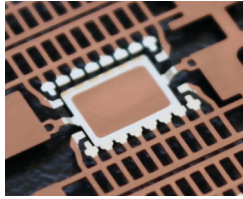


[macdermidalpha.com](http://macdermidalpha.com)

CIRCUITRY SOLUTIONS

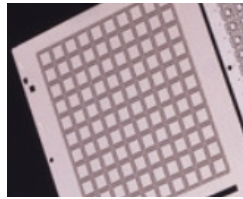
# Semiconductor Leadframe Packaging

## Product Overview



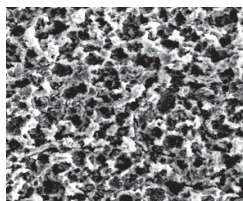
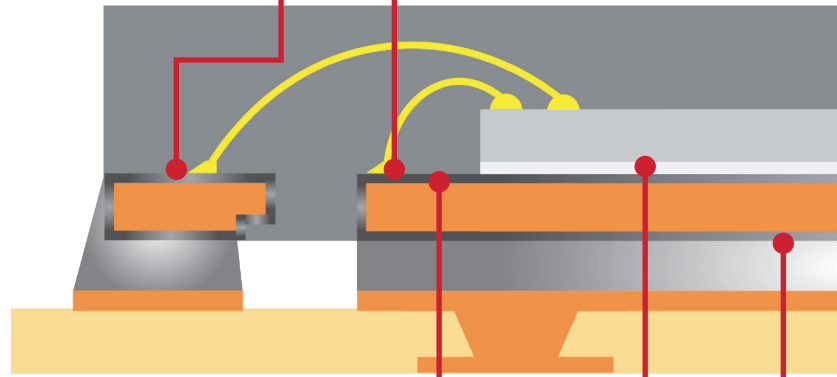
### Silvrex JS-5

High speed electrolytic silver spot plating process providing excellent wire bonding capability.



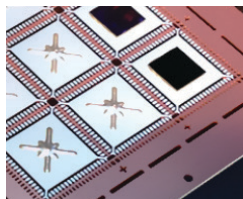
### SULFAMEX, PALLADEX®, AUTRONEX®

Electrolytic Nickel, Palladium and Gold plating chemistries providing whisker free, wire bondable, and solderable leadframe finishes for Pre Plate Frame Metallization.



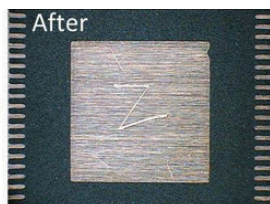
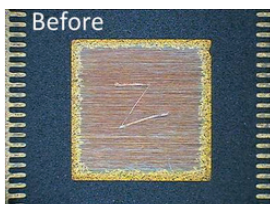
### PackageBond HT-U

Chemical leadframe roughening process providing exceptional chemical and physical bonding of epoxy mold compounds to the leadframe surface for MSL-1 reliability.



### ATROX® Die Attach Adhesives

Conductive die attach adhesives and films that provide consistent wetting, bond line, and adhesion of die to substrate.



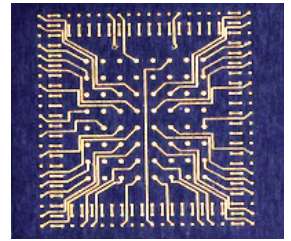
### PED-2020 Electrolytic Deflash

Electrolytic deflash process to remove unwanted mold compound residues from leadframe surfaces.

Our customers are utilizing our decades of industry expertise in every area of the electronics manufacturing industry to push the envelope of what is possible in lead frame packaging designs. From specialty applications to technology enabling solutions allowing for thinner, faster devices – we have everything you need to bridge that performance gap to your next generation product.

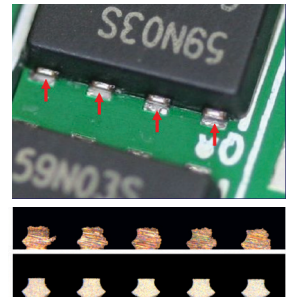
### PackagePlate

Electroless Copper, Nickel and Immersion Gold plating solutions allowing conductive pathways plated on or through epoxy mold compound enabling higher functionality.



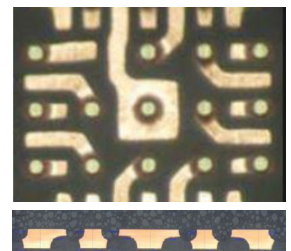
### PackagePrep CE Tin S

Immersion tin process that preserves solderability on singulated leadless packages forming solder fillets for AOI inspection and enhanced package reliability.



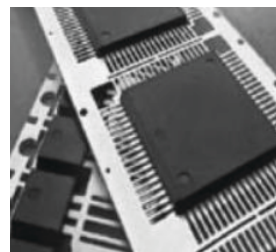
### Package Etch FL

High speed, high resolution back etch process. Provides superior cleanliness that allows for a new standard for high IO count lead frame packages.



### REEL-SATIN® 2544 LF

Electrolytic pure tin deposit exhibiting low stress and excellent soldering properties. This low-whisker formulation ensures excellent device life-span and reliability when assembled.





# Semiconductor Leadframe Packaging

## Product Overview

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**Lead Frame Adhesion Promotion** - MacDermid Enthone's **PackageBond HT-U** process is engineered to meet or exceed today's high reliability QFN requirements such as MSL-1. The PackageBond HT-U process improves the bond between the epoxy mold compound and copper leadframe by micro-roughening of the copper surface and the deposition of an organo-metallic coating to prevent delamination caused by moisture sensitivity or CTE mismatch.

**Sidewall Terminal Solderability** - Exposed copper on the edge of singulated sidewall terminated packages prevents conventional solder fillets from forming. **PackagePrep CE Tin S** deposits an easily soldered metal finish on the exposed copper edges. During reflow, solder wicks up the side of the QFN flanks. The solder fillets formed are easily inspected by existing top-down AOI as well as visual inspection and improve package reliability.

**Advanced Package Metallization** - Opening up a new generation in design opportunities for IC packaging, the **PackagePlate** line of plating processes was developed from over a decade of experience in molded interconnect device (MID) plating utilizing laser direct structuring (LDS) technology. Selectively formed traces and vias are plated for AoP (Antenna on Package), PoP (Package on Package) and selective EMI shielding for increased functionality.

**Die Attach Adhesion** - **ATROX**<sup>®</sup> ultra-high conductivity die attach adhesives and conductive films provide advanced and power semiconductor packaging with higher thermal conductivity interfaces to help extend device reliability and functionality. The ATROX Hybrid Silver Sintering Technology line of materials are a 'drop-in' replacement for standard conductive adhesives and are designed for today's high volume manufacturing processes.

**Epoxy Mold Compound Deflash** - **PED-2020 Electrolytic Deflash** is an economical, stable, and easy to use process designed to loosen mold flash and resin bleed commonly encountered on semiconductor packages after molding, ensuring complete terminal plating.

**Package Back Etching Process** - **PackageEtch FL** is a high speed continuous alkaline etch system designed for the back etching of high I/O packages such as multi-row QFN's. The excellent uniformity and vertical etch characteristics imparted by the PackageEtch FL are especially useful in defining small feature sizes. The process can accommodate a wide array of metallic etch resists including gold, silver, tin, nickel, nickel-tin, and nickel-palladium-gold.

**Leadframe Tin Plating** - **Reel-Satin 2544LF** process is a high-speed, high efficiency, low foam tin electroplating system designed for the rapid deposition of pure tin at high current density. Reel-Satin 2544LF is a pure Tin, lead-free, plating alternative providing a low stressed deposit that yields a uniform grain size which significantly reduces the tendency of whisker growth while providing excellent solderability.

**Pre Plate Frame Metallization** - **Sulfamex**, **Palladex**, and **Autronex** products can be sequentially electroplated onto a leadframe producing multi-layer surface finishes that are wire bondable and solderable. These products produce high quality, full and selective surfaces used for pre-plated leadframe applications.

**Bond Pad Finish** - The **SILVREX JS-5** process is a neutral type high speed plating system which produces a pure silver deposit with a brightness of 0.4 to 0.8 on the GAM scale. The Silvrex JS-5 is engineered to provide excellent wire bondability across a number of applications including IC leadframes.



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