

# HELIOFAB AG 7921

High Brightness Spot Silver for LED Leadframe Packages

## Long Lasting Brightness for LED Leadframe Packages.

In the manufacturing of high output LED packages, proper selection of materials that provide long lasting brightness and proper color emission is extremely important.

**HELIOFAB AG 7921** is a spot silver electroplating solution for LED leadframes that delivers a bright white finish with excellent functional properties.

The HELIOFAB AG 7921 finish is highly solderable and wire bondable and has reflective properties that improve LED light output without degrading over time. A wide current density operating window and long bath life ensures the process can provide a consistent finish enabling uniform product quality. With HELIOFAB AG 7921, manufacturers of leadframe based LEDs can achieve higher GAM values consistently for parts plated in the process.



## KEY FEATURES

- Bright white deposit with average GAM values of 2.0
- Finish maintains color and reflectivity under stressful environmental conditions
- Stable bath performance over a wide current density range of 10 to 70 ASD
- Plating performance unchanged through 100 AH/L bath life
- Spot plating cost savings
- Meets specifications for die attach solderability and wire bondability
- Production-proven and OEM approved

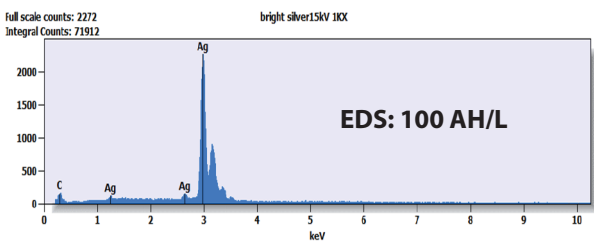
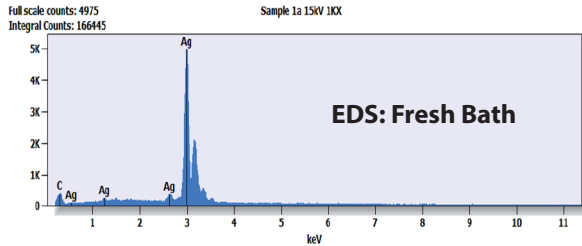


**MacDermid Enthone**

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## Consistent Bright White Silver Spot Plating



EDS study of the deposit from the HELIOFAB AG 7921 shows that the bath produces a similar silver deposit with a fresh or aged bath.

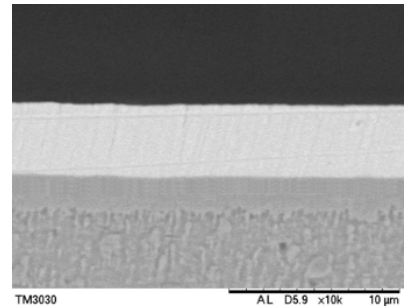
| Attribute                                   | New Makeup      | After 100 AH/L w/ Replenishment |
|---|-----------------|---------------------------------|
| Ag metal (g/L)                              | 80.2            | 79.6                            |
| pH  | 12.5            | 12.4                            |
| Rate ( $\mu\text{m}/\text{min}$ ) at 40 ASD | 10.2            | 10.0                            |
| Carbonate (g/l)                             | 0               | 22.82                           |
| Deposit Appearance                          | White bright    | White bright                    |
| GAM Value                                   | 1.9-2.1         | 1.9-2.0                         |
| Exposure to 80°C for 60 min                 | No color change | No color change                 |

Bath aging does not impact the silver spot plating performance of the HELIOFAB AG 7921 process.

## Excellent Physical Properties vs. Competing Spot Silver Processes

| Characteristic            | HELIOFAB AG 7921 | Competitor |
|---------------------------|------------------|------------|
| Brightness GAM            | 1.9 to 2.1       | 1.6 to 1.8 |
| Reflectivity %            | 98 to 100        | 95 to 98   |
| Bright CMD                | 3370             | 3102       |
| Lumen (Lm)                | 8.79             | 8.47       |
| Luminous Decay 1000 Hours | Pass             | Decrease   |

Competing spot silver plating processes do not meet the optimal reflectivity performance required for long lasting LED output.



HELIOFAB AG 7921 plates a uniform silver on top of the lead frame surface without voids or macro roughness.

| Functional Test                | HELIOFAB AG 7921               |
|--------------------------------|--------------------------------|
| Gold Wirebond Pull Test        | > 5 g                          |
| Adhesion (shear strength test) | Pass (after chip solder paste) |

HELIOFAB AG 7921 meets wire bonding and solderability requirements for LED leadframes



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