SHEPHERD TECHNOLOGIES
A Division of The Shepherd Color Company

# High Performance LDS Additives

## LD 51

A high-performance copper based seed-forming LDS additive designed for the next generation of mobile and telecommunications applications. Offering a 70% reduction in dielectric loss (Df) over traditional LDS additives. High purity, chrome-free and light in color, LD51 is amenable to incorporation into a range of thermoplastics and thermosets. Maintaining exceptional LDS activity across a broad power range. Performing well at low power ranges. Non-conductive and non-magnetic, non-bleeding, non-migratory, non-warping. Ready-to-use fine powder form.

## LD 38

High performance copper chromite seed-forming LDS additive. Suitable for integrated circuit and semiconducting packaging applications. Surface treated for easy and optimal dispersion. Ready-to-use fine powder form. High purity, yielding negligible levels of magnetic traces in structured areas. Heat stable under all compounding, molding and curing conditions. Non-conductive and non-magnetic, non-bleeding, non-migratory, non-warping. Compatible with all LDS resin systems and polymers. Useful on its own at a wide range of power settings. Performs particularly well at low power levels. Improved melt flow and viscosities in most polymer melts. Performs in thermoset and thermoplastic applications.

## LD 26

Finest particle size high performance copper chromite seed-forming LDS additive. Surface treated for easy and optimal dispersion. Ready-to-use fine powder form. High purity, yielding negligible levels of magnetic traces in structured areas. Particularly good in thermoset resins. Improved performance in fine-pitch applications. Heat stable under all compounding, molding and curing conditions. Non-conductive and non-magnetic, non-bleeding, non-migratory, non-warping. Compatible with all LDS resin systems and polymers. Useful on its own at a wide range of power settings. Performs well at low power levels. Improved melt flow and viscosities in most polymer melts.

## LD 14

Traditional high performance copper chromite seed-forming LDS additive. Ready-to-use fine powder form. High purity, yielding negligible levels of magnetic traces in structured areas. Heat stable under all compounding, molding and curing conditions. Non-conductive and non-magnetic, non-bleeding, non-migratory, non-warping. Easy to disperse. Compatible with all LDS resin systems and polymers. Useful at a wide range of power settings.

## LD 5

A well-performing economical copper chromite seed-forming LDS additive. Ready-to-use fine powder form. Good purity, yielding minimal levels of magnetic traces in structured areas. Heat stable under all compounding, molding and curing conditions. Non-conductive and non-magnetic, non-bleeding, non-migratory, non-warping. Easy to disperse. Compatible with all LDS resin systems and polymers. Useful on its own at a wide range of power settings.

## Technical Information

| Properties | LD 51* | LD 38* | LD 26* | LD 14* | LD 5* |
|---|---|---|---|---|---|
| Copper as metal, % | 20 | 27 | 27 | 27 | 26 |
| Chromium as metal, % | < 0.01 | 45 | 45 | 45 | 45 |
| Screened for magnetic traces? | No | Yes | No | No | No |
| Surface treated for dispersion? | No | Yes | Yes | No | No |
| Controlled dielectric properties (Dk, Df) | Yes | No | No | No | No |
| Controlled soluble ions | No | Yes | No | No | No |
| Trace Iron (weight %) | < 0.1 | < 0.1 | <0.1 | < 0.1 | < 0.2 |
| Trace Manganese (weight %) | < 0.1 | < 0.1 | <0.1 | < 0.1 | < 0.2 |
| Trace Cobalt (weight %) | < 0.1 | < 0.1 | <0.1 | < 0.1 | < 0.1 |
| Specific Gravity | 7.8 | 5.3 | 5.3 | 5.4 | 5.4 |
| pH | 5.5 | 4.7 | 4.5 | 6.5 | 6.3 |
| Percent moisture (weight %) | 0.3 | 0.4 | 0.3 | 0.1 | 0.2 |
| Mean particle size (microns) | 0.9 | 0.8 | 0.7 | 1.5 | 2 |
| Heat Stability (°C) | 500 | 800 | 800 | 800 | 800 |

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*Typical Values