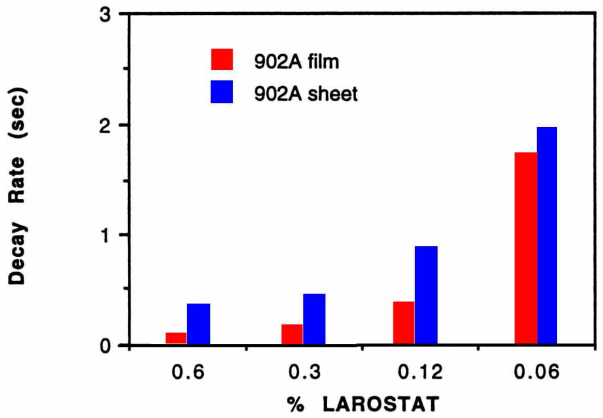
Technical Bulletin

LAROSTAT® 902 A & 902 AS ANTISTATS

LAROSTAT 902 A is an effective non-amine based antistat for polyolefins. It can be internally compounded into polyolefins to produce antistatic film and packaging materials for protection of computer parts and other sensitive electronic components. It can be compounded into plastic films without imparting a greasy feel to the surface and is more antistatically effective and less corrosive than ethoxylated amine based antistats. It exhibits good water resistence when internally incorporated in polyethylene films. It can also be applied as an effective topical antistat. It is also water soluble. LAROSTAT 902 A offers the following advantages:

- Provides superior antistatic performance meeting Military Specification B-81705C in packaging.
- Non-amine antistat.
- Does not affect polyethylene film quality or clarity at use concentrations.
- Non-reactive with polycarbonates.
- Does not retard in-line printability.
- Available as 100% active liquid or dry powder (60% active).
- Resistant to prolonged shower exposure.
- Effective at 12% relative humidity.
- Less corrosive than Ethoxylated amine antistats.

LAROSTAT 902 A reduces the surface resistivity and static decay rate of extruded and molded polyethylene (PE) films and sheet stock. Without antistatic protection, polyethylene exhibits a surface resistivity $>10^{14}$ ohms/sq and a static decay time of greater than 60 seconds for 5000 volts to zero discharge. LAROSTAT 902 A was compounded into polyethylene resin at concentrations from 0.06 to 0.60 percent by weight and the resin was blown into film (1 mil) or molded into sheets (6 mil). These samples were then conditioned for at least 24 hours at 76°F and 12% relative humidity, in accordance with MILSPEC B-81705C and Federal Test Method Standard No. 101C Electrostatic Properties of Materials #4046. The static dissipative performance was then measured under these conditions with outstanding results. See the data in the graph below.



LAROSTAT 902 A is a very effective antistatic agent for internal incorporation in polyethylene. It meets the military specification of less than 2 seconds static decay rate at concentrations as low as 0.06% in both film and sheet. The use level of LAROSTAT 902 A will be application dependent (ie. higher concentrations may be required for meeting military specifications, whereas lower concentrations will be adequate to eliminate static for processing applications). The preceding data was generated in low density PE (LDPE). Higher concentration levels may be necessary for high density PE (HDPE) and polypropylene (PP).

Typical Properties	902A	902AS
Appearance @ 25°C	Clear Liquid	White Powder
Specific Gravity @ 25°C	0.981	- - - - - - -
Viscosity, #3 Spindle @ 12rpm	1990 cps	- - - - - - -
Flash Point, PMCC, °F	>200	>200
Thermal Stability	210°C	- - - - - - -
Solubility in Water	>50gms/100gms	Dispersible
Solubility in Methanol	>50gms/100gms	- - - - - - -
Solubility in TCE	>50gms/100gms	- - - - - - -
Particle Size, microns	- - - - - - -	10 – 25

Specifications	902A	902AS
Appearance @ 25 °C	Clear Liquid	- - - - - - -
Water, %	- - - - - - -	1.00 – 3.00
Activities, %	- - - - - - -	58 – 62
Acid Value	23 – 35	- - - - - - -
Residue on Ignition, %	- - - - - - -	36 – 40

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Polycarbonate Compatibility

Because of increasing concern from electronics manufacturers over the potential corrosiveness of antistatic additives in packaging materials, samples of polyethylene film containing LAROSTAT® 902 A were submitted to an independent testing laboratory for evaluation of their reactivity toward polycarbonate. It is generally recognized that these products can be considered non-corrosive: if they are placed into intimate contact with polycarbonate samples at elevated temperatures and stress levels for a period of 5 days, and no crazing or stress cracking occurs up to 1700 psi at 120°F.

The evaluation of LAROSTAT 902 A involved 0.0025 inch polyethylene film containing 0.3% wt. wrapped around polycarbonate coupons. The samples were then subjected to varying temperatures and stress levels for five days, after which they were visibly inspected for crazing or stress cracking. The highest levels at which the polycarbonate showed no evidence of deterioration are indicated below.

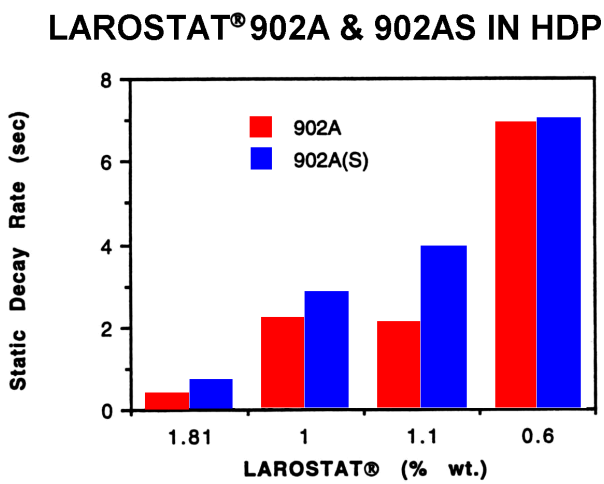
Temperature	Highest Compatible Stress Level (PSI)
73°F	3400
120°F	2000
158°F	1000
185°F	1000

This is an advantage LAROSTAT antistatic agents offer over ethoxylated fatty amines, which have been linked with crazing. The maximum stress level used in this test was 3400 psi.

Please refer to the Material Safety Data Sheet (MSDS) for this product for instructions on safe and proper handling and disposal.

HDPE

LAROSTAT 902 A is also an effective antistatic agent for HDPE. The following graph represents a comparison of the static decay rate of LAROSTAT 902 A neat vs. LAROSTAT 902 AS in HDPE. These products were evaluated in molded step down plaques (1/16”-1/4”). As the data in the graph suggests, either version of LAROSTAT 902 A will provide antistatic activity; however, if the electrical requirement is for MIL SPEC B-81705C (< 2 second static decay rate) the usage level in HDPE should be a minimum 1.8% of LAROSTAT 902 A / 902 AS antistatic agent based on activity. All specimens were equilibrated at 12 % relative humidity for 24 hours prior to testing (Federal Test Method Standard No. 101C Electrostatic Properties of Materials #4046).



Shelf Life

BASF will endorse the results on the certificate of analysis for a period of up to one year from the date of manufacture for material in original, unopened, properly stored containers. Beyond one year, we recommend the quality of the material be confirmed prior to use, by retesting the certificate of analysis parameters.

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For More Information

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To place orders for delivery in the United States please call our toll free number (800) 443-6460. To place orders for delivery in Canada please call BASF Canada at (800) 267-2955.

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Including product literature and Material Safety Data Sheets please call (847) 249-6750.

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