DATA SHEET

NYACOL® A1530 – A1540 – A1550 Series

Aqueous Dispersions of Colloidal Antimony Pentoxide Flame Retardant Additives

NYACOL® A1530, A1530G, A1540N, A1550, A1550pH7

Nyacol Nano Technologies, Inc. offers aqueous colloidal antimony pentoxide as a synergist with halogenated flame retardants in textiles, adhesives, coatings and water-based systems.

ADVANTAGES OVER CONVENTIONAL ANTIMONY TRIOXIDE SYSTEMS

- Better penetration of the substrate.
- Less pigmenting or whitening effect for deep mass tone colors.
- Easier handling and processing. Liquid dispersions will not clog spray guns.
- Translucency for coatings, films and laminates.
- Easy compounding; no special dispersing equipment required.
- High FR efficiency for minimal added weight or change in hand.

PRODUCTS

NYACOL A1530, A1530G, A1540N, A1550 and A1550pH7 are water-based dispersions of nano-sized antimony pentoxide used with halogenated flame retardants to increase their efficiency when used in flame retardant treatments of materials such as textiles, nonwovens, adhesive latices, and coatings.

TYPICAL PROPERTIES

	A1530	A1530G	A1540N	A1550	A1550pH7
Antimony Pentoxide (Sb_2O_5), % by weight:	29	29	38	48	48
pH:	5	5	8	5	7
Viscosity in centipoise:	5	5	5	10	10
Specific Gravity:	1.37	1.37	1.60	1.81	1.80

FORMULATING GUIDELINES

The total amount and ratio of flame retardants needed depend upon the severity of the test requirements and the material being treated. In most cases, optimum flame retardant performance in a halogen/antimony system is attained when the halogen and antimony are used at a 3:1 mole ratio. Exceptions are PVC and PVDC latices, which contain high levels of chlorine, so we recommend that the antimony pentoxide be added to your formulation until the complete system passes the required flame test.

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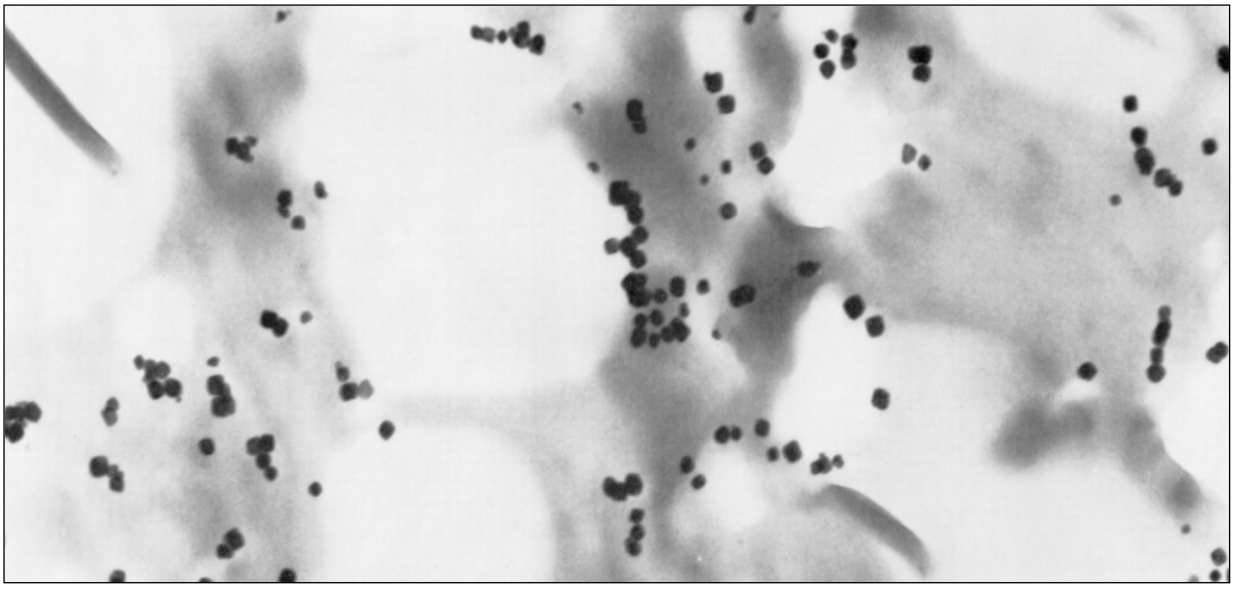
Electron Micrographs

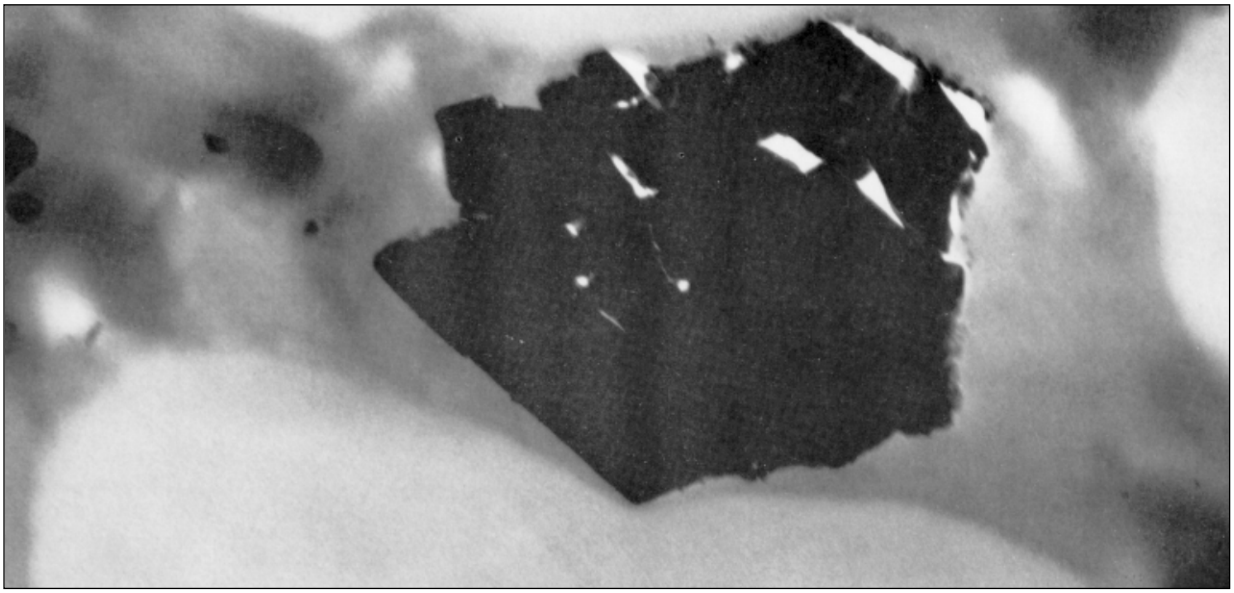
ANTIMONY OXIDES IN ACRYLONITRILE BUTADIENE STYRENE

Approximately 55,000 magnification



NANO-SIZED PARTICLES OF NYACOL ANTIMONY PENTOXIDE

Average size approx. 0.03 microns



PIGMENT GRADE ANTIMONY TRIOXIDE

Average size approx. 1.0 microns

FORMULATION EXAMPLE

This simple FR application for the finishing of nonwoven polyester fiber padding for automotive interiors consists of a 'hard' PVC latex, NYACOL A1550 or A1550pH7, water and some ammonia solution: To 10 parts NYACOL A1550 or A1550pH7, add 40 parts water with sufficient ammonia to bring the pH to 9. Mix the water and the A1550 or A1550pH7, and add 50 parts PVC latex. These ingredients are mixed, sprayed onto the nonwoven padding, and heat-cured.

TEXTILE FINISHES

Complex textile finishes often contain additives such as softeners, anti-soil agents, anti-static agents and cross-linkers, and are beyond the scope of these guidelines. Please contact Nyacol Nano Technologies, Inc. for recommendations for commercial manufacturers of flame retardant textile finishes that use NYACOL brand antimony pentoxide.

COMPOUNDING INFORMATION

NYACOL A1530, A1530G, A1550 and A1550pH7 aqueous dispersions are supplied at approximately pH 5 or pH 7 and, in nearly all applications, should have the pH adjusted before compounding with any latex. This adjustment assures full utilization of the colloidal particles without agglomeration or latex destabilization. Follow the latex manufacturer's recommendations for the optimum pH. Neutralize using ammonium hydroxide, which will volatilize during the drying and curing of latex film.

Please note: Never add NYACOL A1550 or A1550pH7 directly to a latex, but dilute to 40% Sb_2O_5 or less.

It is essential to dilute either the NYACOL dispersion or the latex with as much water as is practical before mixing these ingredients.

Neoprene-type or PVDC latices often recommend avoiding the use of ammonia. A 15% solution of sodium hydroxide can be used, or use NYACOL A1540N, which is neutralized with sodium hydroxide.

NYACOL A1530 and A1530G: Typical latices require an approximate pH of 9. This will require approximately 0.5 kilograms of 28% ammonium hydroxide to 10 kilograms of A1530 and A1530G. Add with good mixing.

NYACOL A1550 and A1550pH7: Dilute with water to 40% Sb_2O_5 or less, then neutralize with ammonium hydroxide.

NYACOL A1540N: As an alternative we recommend NYACOL A1540N, 40% pentoxide dispersions which are neutralized with sodium hydroxide.

STORAGE AND HANDLING

NYACOL antimony pentoxide sols should be stored in a cool dry area. Shelf life is guaranteed for one year. Mixing in the drum may be necessary if the product is stored for an extended amount of time.

See the Safety Data Sheet for specific handling recommendations. Please note that these products should be protected from freezing. Should the product freeze, thaw the material and remix before use.

PACKAGING

	SIZE	WEIGHT
A1530	55 gallon drum / 208 liters	600 pounds net / 272 kilograms net
A1530G	55 gallon drum / 208 liters	600 pounds net / 272 kilograms net
A1540N	30 gallon drum / 113 liters	375 pounds net / 170 kilograms net
A1550	30 gallon drum / 113 liters	450 pounds net / 204 kilograms net
A1550pH7	30 gallon drum / 113 liters	452 pounds net / 205 kilograms net

CUSTOM PRODUCTS

Nyacol Nano Technologies, Inc. can vary specific properties such as the particle size distribution, pH, concentration, and packaging for your specific application. Contact us for details on availability, price and minimum order size for custom products.

NON-FR PRODUCTS

Nyacol Nano Technologies, Inc. also manufactures colloidal materials for the ceramic, catalyst, metal casting and oil refining industries. These products include oxides of aluminum, antimony, cerium, tin, yttrium and zirconium. Custom products are also available. Contact Nyacol Nano Technologies, Inc. for information on these products.

FOR ADDITIONAL INFORMATION OR TO PLACE AN ORDER

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