PRODUCT CATALOG

THIRTY-SEVENTH EDITION

Monsanto

0557414

1969

TOWOLDMON0041148
WATER_PCB-00032194

Monsanto manufactures and markets hundreds of chemicals, chemical fibers, plastics and petroleum products for virtually every industry.

Animal and poultry feed additives • fertilizer materials • herbicides • insecticides • blasting materials • chemical monomers • petrochemicals • crude oil • natural gas • Lion gasoline • oils • detergent chemicals • heavy chemicals • industrial • food-grade phosphates.

The information in this catalog provides basic data on these products. For more detailed literature, call or write the Monsanto office nearest you, or write:

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Advertising & Market Development Dept.
800 North Lindbergh Boulevard
St. Louis, Missouri 63166

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Monsanto products are sold through the following divisions:

Agricultural Division
Hydrocarbons and Polymers Division
Inorganic Chemicals Division
International Division
New Enterprise Division
Organic Chemicals Division
Packaging Division
Plastic Products and Resins Division
Textiles Division

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AGRICULTURAL and FARM PRODUCTS

FEED SUPPLEMENTS

DIAMMONIUM PHOSPHATE, FEED GRADE

INORGANIC DIVISION

FORMULA: $(NH_4)_2HPO_4$

MOLECULAR WEIGHT: 132.068

STANDARD FORM: Crystals

TYPICAL ANALYSIS:

Phosphorus	23.1%
Nitrogen	20.7% (Min.)
P_2O_5	53.0% (Min.)

USES: DAP is a concentrated, economical source for non-protein nitrogen and phosphorus in ruminant animal feeds.

SHIPPING INFORMATION: DiAmmonium Phosphate (Feed Grade); 80-lb. net multi-wall paper bags; bulk boxes, hopper cars, and bulk trucks.

MHA® METHIONINE HYDROXY ANALOG

Calcium salt of DL-alpha-hydroxy-gamma-methylmercaptobutryic acid

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Powder.

SPECIFICATIONS: Assay, 90% as calcium salt of Methionine Hydroxy Analog; 1% moisture max.; screen analysis, 1% max. on 20 mesh; density 30 lb./cu. ft. (tapped).

PROPERTIES: Nutritionally equivalent to DL-methionine on a gravimetric basis (1.09 lbs. Methionine Hydroxy Analog; 90% , eq. to 1.0 lbs. DL-methionine, 98%). Free methionine hydroxy analog is a metabolite in the animal's utilization of methionine.

USES: As a feed supplement in poultry feed to supply requirement of methionine.

SHIPPING INFORMATION: Rail: Condition powders, regulators or tonics, animal or poultry, NOIBN. Truck: Feed Supplements, not frozen, 50-lb. bags.

MONOSODIUM PHOSPHATE

INORGANIC DIVISION

(*Also See Page 31*)

FORMULA: NaH_2PO_4

MOLECULAR WEIGHT: 119.99

STANDARD FORM: Powder and granular.

PROPERTIES: Contains not less than 58% P_2O_5; pH value of 1% solution 4.6.

GRADES: Food; commercial.

USES: A source of phosphorus for potentiated poultry feeds.

SHIPPING INFORMATION: Sodium Phosphate, 100-lb. bags; 350 and 100-lb. drums.

PHOSPHATE FEED SOLUTION

INORGANIC DIVISION

STANDARD FORM: Liquid.

PROPERTIES: A special grade of Phosphoric Acid prepared for a phosphate supplement in animal feeds, molasses, and mineral mixes. Phosphorus content—23.7% . Not recommended for other uses.

SHIPPING INFORMATION: Phosphate Feed Solution containing not more than 58% Phosphoric Anhydride by weight. Tank cars and tank trucks.

SACCHARIN (CALCIUM AND SODIUM) U.S.P.

See Page 18

SANTOQUIN® ANTIOXIDANT

See Page 65

SUPLIFOS® 25 SODIUM TRIPOLYPHOSPHATE

INORGANIC DIVISION

FORMULA: $Na_5P_3O_{10}$

STANDARD FORM: Granular.

TYPICAL ANALYSIS:

P	25% minimum
As	75 ppm maximum
F	250 ppm maximum
Pb	30 ppm maximum

SHIPPING INFORMATION: 100 lb. bags, bulk box, hopper cars, and bulk trucks.

UREA, FEED GRADE COATED MICROPRILLS

AGRICULTURAL DIVISION

STANDARD FORM: Urea microprills with an inorganic material as a coating agent.

ANALYSIS:

Nitrogen (Min.)	42.0%
Moisture (Max.)	0.6%
Biuret (Max.)	1.0%

USES: As a protein source for use in ruminant feeds.

SHIPPING INFORMATION: Urea Feed Grade (not for human consumption or pharmaceutical use). 80-lb. multi-wall paper bags with polyethylene lining. Also in bulk.

FERTILIZERS

DIAMMONIUM PHOSPHATE, FERTILIZER GRADE

AGRICULTURAL DIVISION

FORMULA: $(NH_4)_2HPO_4$

MOLECULAR WEIGHT: 132.068

STANDARD FORM: Crystals

TYPICAL ANALYSIS:

Assay	98.4%
P_2O_5	53.7%
NH_3	25.5%

SHIPPING INFORMATION: Fertilizer Compound (Manufactured Fertilizer) NOIBN, Dry, 80-lb. multi-wall bags. Bulk hopper cars and bulk trucks.

NITROGEN FERTILIZER SOLUTIONS

AGRICULTURAL DIVISION

STANDARD FORM: Clear water solution.

ANALYSIS: Varying analysis containing ammonia, ammonium nitrate and water or ammonia, ammonium nitrate, urea and water to suit varying weather and manufacturing conditions.

USES: Formulation of mixed fertilizers and for direct application to the soil.

SHIPPING INFORMATION: Nitrogen Fertilizer Solution (total ammonium content does not exceed 50% by weight). Insulated and uninsulated tank cars of 8,000 and 10,000 gal. capacity and tank trucks of approximately 4,000 gal. capacity.

TRI-UNA-SOL® FERTILIZER SOLUTION

AGRICULTURAL DIVISION

STANDARD FORM: Clear water solution.

ANALYSIS: Varying analysis of 28, 30 and 32% nitrogen containing urea, ammonium nitrate and water.

USES: Direct application to the soil and formulation of mixed liquid fertilizers.

SHIPPING INFORMATION: Nitrogen Fertilizer Solution. (The total ammonia content does not exceed 50% .) Insulated and uninsulated tank cars of 8,000 and 10,000 gal. capacity and tank trucks of approximately 4,000 gal. capacity.

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WATER_PCB-00032201

AMMONIUM NITRATE FERTILIZER PELLETS

AGRICULTURAL DIVISION

STANDARD FORM: Ammonium Nitrate in pelleted form coated with a conditioning agent.

ANALYSIS:

Nitrogen (Min.)	33.5%
Moisture	.35%
Water insoluble	3.0%

SHIPPING INFORMATION: Ammonium Nitrate Fertilizer containing 90% or more Ammonium Nitrate with no organic coating, Fertilizer Compounds (Mfg. Fert.) NOIBN dry in paper, polyethylene bags and in bulk. (Dangerous Placards Applied.) Multiwall paper bags with polyethylene lining, packaged in 100-lb. bags, 80-lb. bags and 50-lb. bags.

E-2® AMMONIUM NITRATE FERTILIZER PELLETS

AGRICULTURAL DIVISION

STANDARD FORM: Ammonium Nitrate in pelleted form uncoated.

ANALYSIS:

Nitrogen (Min.)	33.5%
Moisture	.3%

SHIPPING INFORMATION: Ammonium Nitrate Fertilizer containing 90% or more ammonium nitrate with no organic coating, Fertilizer Compounds (Mfg. Fert.) NOIBN dry in paper, polyethylene bags and in bulk. (Dangerous Placards Applied). Multiwall paper bags with polyethylene lining, packaged in 100-lb. bags, 80-lb. bags, and 50-lb. bags. Also shipped in 50-lb. polyethylene bags and in bulk.

AMMONIUM NITRATE 83% SOLUTION

AGRICULTURAL DIVISION

ANALYSIS: Typical.

Ammonium Nitrate	83.8%
Water	16.2%
Chlorides	2ppm
Iron	2ppm

USES: Manufacture of military explosives, Pyrotechnic compositions, insecticides and absorbent for nitrogen oxide as well as fertilizer uses.

SHIPPING INFORMATION: Nitrogen Fertilizer Solution (total ammonium content does not exceed 50% by weight). 8,000 and/or 10,000 gal. aluminum steam coiled tank cars.

AMMONIA, AQUA

AGRICULTURAL DIVISION

MOLECULAR WEIGHT: 35.05

STANDARD FORM: Liquid.

PROPERTIES: Pungent, water-white liquid; wt. per gal. 7.48 lbs. (26°Be.).

USES: A source of nitrogen for plants, either applied directly to the soil or to irrigation water for the formulation of mixed fertilizers, for oxidation in lead chamber sulphuric acid plants and to supply nitrogen requirements and pH control in yeast culture.

SHIPPING INFORMATION: Ammoniacal Liquor (containing not more than 35% Ammonia (NH_3) by weight). Tank cars or tank trucks.

AMMONIA, ANHYDROUS

AGRICULTURAL DIVISION

MOLECULAR WEIGHT: 17.03

PROPERTIES: Colorless gas, at normal temperatures and pressure, .0597 times as heavy as air; below critical temperature, 271.2°F., readily condenses by application of pressure to a colorless liquid, wt. per gal. 5.33 lbs.; B.P.-28°F.

USES: A source of nitrogen for plant food, either applied direct or for formulation of mixed fertilizers, liquid or dry. Used as nitrogen source by textile, rubber, paper, petroleum industries, among others.

SHIPPING INFORMATION: Anhydrous Ammonia (Dangerous Placards Applied). Tank cars and tank trucks.

NUTRIUM® FERTILIZER

AGRICULTURAL DIVISION

SPECIFICATIONS: Nitrogen—29% min. guarantee Ammonia N 16.2% Nitrate N 12.8% . A. P. A. 14% min. guarantee.

PHYSICAL PROPERTIES: 62 lbs./cu. ft. bulk density.

SHIPMENTS: 30, 40 and 50 ton box cars, bag or bulk, 60-70 ton hopper cars—bulk. Truck pickups 5 ton min., Luling, La., plant. (No contract or common carrier truck deliveries).

SPECIAL NOTE: We will ship mixed cars of *Nutrium* and *E-2* Ammonium Nitrate Fertilizer from Luling, La., only. The delivered price on each product will be determined by the total tonnage in the car for the destination concerned. For example, if 40 tons of *Nutrium* and 10 tons of Ammonium Nitrate Fertilizer are shipped for a total of 50 tons, each product would be priced on the 50 ton car basis.

PHOSPHATIC FERTILIZER SOLUTION

AGRICULTURAL DIVISION

STANDARD FORM: Liquid.

PROPERTIES: Recommended only for use in manufacture of fertilizers. Because this is a crude product no guarantee of analysis is made except for P_2O_5 content which will vary from 54.5% to 58% P_2O_5 (75-80% acid).

SHIPPING INFORMATION: Tank cars and tank trucks. Phosphatic fertilizer solution.

PHOSPHOLEUM® *Super Phosphoric Acid.*

AGRICULTURAL DIVISION

GENERAL INFORMATION: A clear liquid containing approximately 76% P_2O_5 and equivalent to 105% H_3PO_4. It is an azeotiopic mixture of orthophosphoric and polyphosphoric acids which on dilution with water hydrolyze to orthophosphoric acid. Sp. Gr., 1.90 approx. at 75°F.; viscosity, 800 centipoises at 75°F.; temperature rise, 60°F. on dilution to 75% H_3PO_4; freezing point, less than minus 50°C.

GRADE: Food.

USES: High analysis liquid fertilizer formulation, metal phosphatizing and aluminum Bright Dip Bath Component.

SHIPPING INFORMATION: Phosphoric Acid. Tank cars and tank trucks.

UREA FERTILIZER GRADE COATED PELLETS

AGRICULTURAL DIVISION

STANDARD FORM: Urea in pelleted form coated with an inorganic material as a conditioning agent.

ANALYSIS:

Nitrogen (Min.)	45.0%
Moisture (Max.)	.5%
Biuret (Max.)	1.0%

SHIPPING INFORMATION: Urea having value only for fertilizer purposes (Fertilizer Compound NOIBN). 80-lb. multi-wall bags with polyethylene lining. Also in bulk.

UREA FERTILIZER GRADE UNCOATED PELLETS

AGRICULTURAL DIVISION

STANDARD FORM: Urea in pelleted form without coating agent.

ANALYSIS:

Nitrogen (Min.)	46.0%
Moisture (Max.)	.5%
Biuret (Max.)	1.0%

SHIPPING INFORMATION: Urea having value only for fertilizer purposes (Fertilizer Compound NOIBN). Multi-wall paper bags with polyethylene lining in 80-lb. bags. Also in bulk.

PRE-EMERGENCE HERBICIDES

AVADEX® HERBICIDE

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid and granular.

GENERAL INFORMATION: Liquid contains 45.7% s-2,3-dichloroallyl diisopropylthiocarbamate, or 4 pounds active ingredient per gallon. Granules contain 10% active ingredient.

USES: Controls wild oats and certain other weeds in sugar beets, flax and certain other crops. Liquid mixed with water, applied as a ground or aerial spray.

AVADEX® BW HERBICIDE

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

GENERAL INFORMATION: Contains 46.3% 2,3,3-trichloroallyl diisopropylthiocarbamate, or 4 pounds active ingredient per gallon.

USES: Controls wild oats in barley, spring wheat, Durum wheat and peas. Mixed with water, applied as a ground or aerial spray.

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WATER_PCB-00032202

FAR-GO® HERBICIDE

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

GENERAL INFORMATION: Contains 46.3% 2,3,3-trichloroallyl diisopropylthiocarbamate, or 4 pounds active ingredient per gallon.

USES: Controls wild oats in barley, spring wheat and Durum wheat. Mixed with water, applied as a ground or aerial spray.

LIMIT® HERBICIDE

AGRICULTURAL DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: Contains 48.13% a-chloro-N-N-diallylacetamide (4 pounds active ingredient per gallon) and 11.54% 2,4-dichlorophenoxyacetic acid (1 pound active ingredient per gallon).

USES: Controls annual grasses and broadleaf weeds in sugar cane and corn.

RAMROD® HERBICIDE

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Wettable powder and granular.

GENERAL INFORMATION: Granules contain 20% 2-chloro-N-isopropylacetanilide. Wettable powder contains 65% 2-chloro-N-isopropylacetanilide.

USES: Controls both grassy and many broadleaf weeds in hybrid seed corn, field corn and seed soybeans.

RANDOX® HERBICIDE

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid and granular.

GENERAL INFORMATION: Liquid contains 47.1% a-chloro-N-N-diallylacetamide, or 4 pounds of active ingredient per gallon. Granules contain 20% CDAA as active ingredient.

USES: Controls annual grasses in corn, soybeans, onions, sorghum and certain other crops.

RANDOX® T HERBICIDE

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid and granular.

GENERAL INFORMATION: Liquid contains 28.1% a-chloro-N-N-diallylacetamide and 57.6% trichlorobenzyl chloride, or 3.1 pounds of CDAA and 6.3 pounds of TCBC as active ingredient per gallon. Granules contain 11.7% CDAA and 23.3% TCBC as active ingredient.

USES: Controls annual grasses and certain broadleaf weeds in corn.

ROUNDUP® HERBICIDE

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Wettable powder and granular.

GENERAL INFORMATION: Contains 2-chloro-N-isopropylacetanilide plus 2,4-dichlorophenoxyacetic acid.

USES: Controls annual grasses and broadleaf weeds in field corn.

VEGADEX® HERBICIDE

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid and granular.

GENERAL INFORMATION: Liquid contains 46.4% 2-chloroallyl diethyldithiocarbamate, or 4 pounds active ingredient per gallon. Granules contain 20% CDEC per gallon.

USES: Controls certain annual grasses and broadleaf weeds in a variety of vegetable crops.

SHIPPING INFORMATION: Weed Killing Compound, NOIBN.

WALLOP® HERBICIDE-INSECTICIDE

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Granular.

PROPERTIES: Contains 10% Parathion (o-o-diethyl o-p-nitrophenyl phosphorothioate) plus 8.3% *Ramrod* (2-chloro-N-isopropylacetanilide).

GENERAL INFORMATION: A combination herbicide and insecticide for use in areas of known resistant corn rootworms.

USES: Used to control resistant corn rootworms and certain weeds in hybrid seed corn and field corn.

HANDLING PRECAUTIONS: DANGER statement. POISON emblem and antidote required by law.

POST-EMERGENCE HERBICIDES

LAMBAST® HERBICIDE

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

GENERAL INFORMATION: A "contact" herbicide containing 25.5% 2,4-bis (3-methoxypropylamino)-6-methylthio-s-triazine, or 2 pounds active ingredient per gallon.

USES: Controls lambsquarter and certain other weeds in safflower. Mixed with water, applied as a ground or aerial spray.

LION® HERBICIDAL OIL NO. 1

HYDROCARBONS AND POLYMERS DIVISION—
LITERATURE AVAILABLE

STANDARD FORM: Liquid.

GENERAL INFORMATION: A post-emergence contact herbicide produced by carefully controlled petroleum refining. It is completely volatile and leaves no residue. It is non-corrosive, and its fumes are non-toxic.

USES: A safe and economical herbicide for weed control in cotton and soybeans. Applied as a spray.

SHIPPING INFORMATION: Petroleum Naphtha. Tank cars.

LION® HERBICIDAL OIL NOS. 6 AND 7

HYDROCARBONS AND POLYMERS DIVISION—
LITERATURE AVAILABLE

STANDARD FORM: Liquid.

GENERAL INFORMATION: Non-selective, general contact herbicides produced by carefully controlled refining from a crude oil naturally high in aromatic compounds. They are slowly volatile and leave no permanently toxic or oily residues when used at recommended rates. Kill only those plants on which they are actually sprayed.

USES: For control of weeds and grasses on railroad rights-of-way, and wherever a general contact herbicide is required. Applied as a spray.

SHIPPING INFORMATION: Petroleum distillate fuel oils not suitable for illuminating purposes. Tank cars.

ROGUE® HERBICIDE

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

GENERAL INFORMATION: Contains 46% 3,4-dichloropropionanilide, or 4 pounds active ingredient per gallon.

USES: Controls barnyard grass (watergrass) and certain other weeds in rice. Mixed with water, applied as a ground or aerial spray.

SHIPPING INFORMATION: Weed Killing Compound, NOIBN.

HORMONE HERBICIDES

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: Hormone-type herbicides selectively destroy certain species of unwanted weed and brush pests, depending upon the formulation used. These organic herbicides enter the circulatory system of susceptible plants to completely upset the growth pattern, resulting in death from alteration of enzyme activity.

WEED KILLERS:

2,4-D AMINE: Contains 49.5% dimethylamine salt of 2,4-dichlorophenoxyacetic acid, equivalent to 41.1% or 4 pounds 2,4-D acid per gallon.

2,4-D ISOPROPYL ESTER: Contains 45.2% isopropyl ester of 2,4-dichlorophenoxyacetic acid, equivalent to 38% or 3.34 pounds 2,4-D acid per gallon.

2,4-D BUTYL ESTER: A low concentrate formulation containing 41.4% butyl ester of 2,4-dichlorophenoxyacetic acid, equivalent to 33% or 2.67 pounds 2,4-D acid per gallon.

2,4-D BUTYL ESTER CONCENTRATE: A high concentrate formulation containing 57.6% butyl ester of 2,4-dichlorophenoxyacetic acid, equivalent to 46% or 4 pounds 2,4-D acid per gallon.

2,4-D LOW VOLATILE ESTER: Contains 69.7% isooctyl ester of 2,4-dichlorophenoxyacetic acid, equivalent to 46.2% or 4 pounds 2,4-D acid per gallon.

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WATER_PCB-00032203

2,4-D GRANULAR: A formulation of 2,4-dichlorophenyoxyacetic acid low volatile ester on 20-40 mesh attapulgite clay granules. Contains 30.2% isooctyl ester of 2,4-dichlorophenoxyacetic acid, equivalent to 20% or 10 pounds 2,4-D acid per 50 pound bag.

MCP AMINE: Similar in action to 2,4-D, but certain crops, such as flax, rice, oats and some clovers, are more tolerant of MCP than 2,4-D. Formulation contains 52.0% dimethylamine salt of 2-methyl-4-chlorophenoxyacetic acid, equivalent to 42.5% or 4.0 pounds of the acid per gallon.

CROP-GUARD®: A highly concentrated formulation of 51.4% isobutyl ester and 26.5% butyl ester of 2,4-dichlorophenoxyacetic acid, equivalent to 62.2% or 6.0 pounds of 2,4-D acid per gallon.

FIELD-CLEAN®: A highly concentrated formulation of 94.5% isooctyl ester of 2,4-dichlorophenoxyacetic acid, equivalent to 62.7% or 6 pounds of 2,4-D acid per gallon.

BRUSH KILLERS:

2,4-D/2,4,5-T AMINE: Contains 29.7% triethylamine salt of 2,4-dichlorophenoxyacetic acid and 28.5% triethylamine salt of 2,4,5-trichlorophenoxyacetic acid, equivalent to 20.3% or 2 pounds of 2,4,5-T acid per gallon.

2,4-D/2,4,5-T BUTYL ESTER: Contains 27.5% butyl ester of 2,4-dichlorophenoxyacetic acid and 26.7% butyl ester of 2,4,5-trichlorophenoxyacetic acid, equivalent to 21.9% or 2 pounds of 2,4-D acid and 21.9% or 2 pounds of 2,4,5-T acid per gallon.

2,4-D/2,4,5-T LOW VOLATILE ESTER: Contains 34.5% isooctyl ester of 2,4-dichlorophenoxyacetic acid and 33.0% isooctyl ester of 2,4,5-trichlorophenoxyacetic acid. Equivalent to 22.9% or 2 pounds of 2,4-D acid and 22.9% or 2 pounds of 2,4,5-T acid per gallon.

2,4,5-T AMINE: Contains 56.5% triethylamine salt of 2,4,5-trichlorophenoxyacetic acid, equivalent to 40.5% or 4 pounds of 2,4,5-T acid per gallon.

2,4,5-T BUTYL ESTER: Contains 37.5% isobutyl ester of 2,4,5-trichlorophenoxyacetic acid and 15.3% of n-butyl ester of 2,4,5-trichlorophenoxyacetic acid, equivalent to 43.3% or 4 pounds of 2,4,5-T acid per gallon.

2,4,5-T LOW VOLATILE ESTER: Contains 65.3% isooctyl ester of 2,4,5-trichlorophenoxyacetic acid, equivalent to 45.4% or 4 pounds of 2,4,5-T acid per gallon.

BRUSH-O-CIDE®: A highly concentrated formulation of 46.6% isooctyl ester of 2,4-dichlorophenoxyacetic acid and 44.5% isooctyl ester of 2,4,5-trichlorophenoxyacetic acid. Equivalent to 30.9% or 3 pounds of 2,4-D acid and 30.9% or 3 pounds of 2,4,5-T acid per gallon.

BRUSH-BLITZ®: A highly concentrated formulation of 88.0% isooctyl ester of 2,4,5-trichlorophenoxyacetic acid, equivalent to 61.1% or 6 pounds of 2,4,5-T acid per gallon.

SHIPPING INFORMATION: Weed Killing Compound (NOIBN); Brush Killing Compound (NOIBN).

INSECTICIDES

ETHYL PARATHION

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 291.3.

STANDARD FORM: Liquid.

PROPERTIES: Dark brown liquid; crystallizing point 0°C. minimum; 10.5-10.7 lbs./gal. at 77°F. (25°C.).

GENERAL INFORMATION: Parathion is the designated common name of the German developed insecticide, O-O-diethyl O-p-nitrophenyl phosphorothioate, having the synonyms of E-605; O,O-diethyl O-p-nitrophenyl thiophosphate; diethyl p-nitrophenyl thionophosphate. It controls a broad range in insects, as well as mites, and has residual effect. It therefore possesses certain advantages over standard insecticides and miticides and has established its place among the ranks of modern and effective organic insecticides.

HANDLING PRECAUTIONS: DANGER statement. POISON emblem and antidote required by law.

Parathion is an extremely poisonous material and the customer should clearly understand that it must be handled and formulated with great care. Parathion is highly toxic by any route, whether it be by swallowing, inhaling or absorption through the skin. In addition, the customer must be told that formulations containing this material are also extremely toxic and the same care should be exercised with all formulations to insure safe use.

Complete precautionary information is available upon request.

SHIPPING INFORMATION: Parathion. Liquid (Chemicals, NOIBN); Class B poison and product label required; not mailable, 55-gal. ICC 17C, 16 gauge, black iron drums lined with one coat A & W 4A lacquer, 2-inch and ¾-inch Trisure fittings in head, 550-lbs. net.

Monsanto sells Ethyl Parathion only to agricultural insecticide formulators who are skilled in the handling, formulation and distribution of poisonous insecticides.

METHYL PARATHION

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 263.3.

STANDARD FORM: Liquid.

PROPERTIES: Technical methyl parathion, a semi-solid, is sold as an 80% solution in xylene. This very concentrated solution, a liquid above 65°F. (18.3°C.), begins to crystalize as the temperature drops. For this reason, methyl parathion should be stored at temperatures above 65°F. (18.3°C.). Must not be heated above 131°F. (55°C.). 10.2-10.3 lbs./gal. at 77°F. (25°C.).

GENERAL INFORMATION: Methyl Parathion, O,O-dimethyl O-p-nitrophenyl phosphorothioate, is approved for use on cotton, fruits, vegetables, forage and other crops. At dosages of up to one pound of technical material per acre, it will effectively control a wide spectrum of insects. It is particularly effective for the control of boll weevil, but is not effective against the bollworm, the pink bollworm, or two-spotted mite.

Monsanto sells Methyl Parathion only to agricultural insecticide formulators who are skilled in the handling, formulation and distribution of poisonous insecticides.

HANDLING PRECAUTIONS: DANGER statement. POISON emblem and antidote required on label.

Methyl Parathion is an extremely poisonous material and the customer should clearly understand that it must be handled and formulated with great care. Methyl Parathion is highly toxic by any route, whether it be by swallowing, inhaling or absorption through the skin. In addition, the customer must be told that formulations containing this material are also extremely toxic and the same care should be exercised with all formulations to insure safe use.

SHIPPING INFORMATION: Methyl Parathion, Liquid (Chemicals, NOIBN); Class B poison and product label required; not mailable, 55-gal. ICC 17C, 16-gauge, black iron drums, lined with one coat A & W 4A lacquer. 2-inch and ¾-inch Trisure fittings in head, 550-lb. net.

NIRAN® 6-3 INSECTICIDE

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: Contains 58.26% O,O-diethyl O-p-nitrophenyl phosphorothioate and 29.01% O,O-dimethyl O-p-nitrophenyl phosphorothioate as active ingredients. Equivalent to 6 pounds of ethyl parathion and 3 pounds of methyl parathion per gallon.

USES: Controls bollworms and boll weevils in cotton and certain other crops.

HANDLING PRECAUTIONS: DANGER statement. POISON emblem and antidote required by law.

NIRAN® 10-G INSECTICIDE

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Granular.

PROPERTIES: Contains 10% O-O-diethyl O-p-nitrophenyl phosphorothioate as the active ingredient.

USES: Used to control resistant corn rootworms.

HANDLING PRECAUTIONS: DANGER statement. POISON emblem and antidote required by law.

NIRAN® 10-10 INSECTICIDE (SOIL)

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Granular.

PROPERTIES: Contains 10% Parathion (O-O-diethyl O-p-nitrophenyl phosphorothioate) plus 10% Aldrin (9.5% w Hexachlorohexahydro-endo, exodimethanonaphthalene and 0.5% w of related compounds).

USES: Used to control resistant corn rootworms and other soil borne insects.

HANDLING PRECAUTIONS: DANGER statement. POISON emblem and antidote required by law.

SANTOCHLOR® para-DICHLOROBENZENE

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 147.01.

STANDARD FORM: Crystals.

PROPERTIES: White crystals; crystallizing point 52.8°C. min.

GRADES: Standard crystal sizes: No. 0 (approx. ¼ inch pellets)—For peachtree borers and for insecticide and miscellaneous uses. No. 1 (approx. ½ inch nuggets)—For shaker top cans. No. 34 (approx. rice-size granules)—A combination of two uniformly sized crystals. For shaker top cans and for compressing into cakes. No. 814—80% min. between 8 and 16 mesh. Blocking mix—Mixture of sizes under 7 mesh. Fines—Mixture of sizes less than 16 mesh.

USES: As a mothicide, for masking odors, for the control of peachtree borers. When vapors are confined, *Santochlor* is very effective for mildew control.

SHIPPING INFORMATION: Paradichlorobenzol. 200-lb. and 100-lb. fiber drums.

TOWOLDMON0041158
WATER_PCB-00032204

STABILIZED METHYL PARATHION

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 263.3.

STANDARD FORM: Liquid.

PROPERTIES: Stabilized Methyl Parathion is a light brown mobile liquid sold as a 80% solution in xylene plus stabilizer. Crystallizing point 61°F. (16°C.). Must not be heated above 131°F. (55°C.) 9.8 lbs./gal. at 77°F. (25°C.).

GENERAL INFORMATION: Stabilized Methyl Parathion O,O-dimethyl O-p-nitrophenyl phosphorothioate, is recommended for use in the manufacture of dust formulations only. Approved for use on cotton. At dosages of 0.25 to 0.5 lbs. of technical material per acre, Methyl Parathion will effectively control a wide spectrum of insects including aphids, some mite species, cotton leafworm, and boll weevil. It is not effective against the bollworm, the pink bollworm or two-spotted spider mite.

Monsanto sells Stabilized Methyl Parathion only to agricultural insecticide formulators who are skilled in the handling, formulation and distribution of poisonous insecticides.

HANDLING PRECAUTIONS: DANGER statement. POISON emblem and antidote required by law.

Methyl Parathion is an extremely poisonous material and the customer should clearly understand that it must be handled and formulated with great care. Methyl Parathion is highly toxic by any route, whether it be by swallowing, inhaling or absorption through the skin. In addition, the customer must be told that formulations containing this material are also extremely toxic and the same care should be exercised with all formulations to insure safe use.

SHIPPING INFORMATION: Methyl Parathion, Liquid (Chemicals, NOIBN): Class B poison and produce label required; not mailable. 55-gal. ICC 17C, 16 gauge black iron drums, lined with one coat of A & W 4A lacquer, 2-inch and ¾-inch Trisure fittings in head. 540-lbs. net.

WALLOP® HERBICIDE-INSECTICIDE

See listing under "PRE-EMERGENCE HERBICIDES."

PRESERVATIVE

STOP SCALD* FRUIT SPRAY

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

ANALYSIS:

**Active Ingredient:	
1,2-dihydro-6-ethoxy-2,2,4-trimethylquinoline	70%
Inert Ingredients:	30%

**Equal to 6 pounds of ethoxyquin per gallon

STANDARD FORM: Liquid.

USE: Mixed with water and used as either a spray or a dip. *Stop Scald* prevents common scald of apples and pears in storage.

SHIPPING INFORMATION: Chemicals NOIBN, 1 gallon and 5 gallon containers.

BUILDING PRODUCTS

FOME-COR® BOARDS

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

Fome-Cor board is a sandwich laminate of polystyrene foam between paperboard liner facings.

The polystyrene foam core combined with one of several facings contributes many unusual properties: light-weight, moisture barrier, insulation, rigidity, embossability, durability for outdoor and indoor applications, dimensional stability, and structural strength.

Fome-Cor boards are available in sizes ranging from 24" to 72" wide and 40" to 140" long.

Type	Thickness	Foam #/cu. ft.	Facing (both sides) #/1000 sq. ft.
245A	¼"	4.5	42# Natural Kraft
245M	¼"	4.5	42# Mottled Kraft
250A	½"	5.0	42# Natural Kraft
327P	3/16"	2.7	42# Kraft (one side) 50# Clay-coated Kraft (other side)
327W	3/16"	2.7	50# Clay-coated Bleached Kraft
*327WL	3/16"	2.7	50# Clay-coated Bleached Kraft
*320BSL	¼"	2.0	42# Self-extinguishing, High Wet and Natural Jute
420A	¼"	2.0	42# Natural Kraft
**420AE	¼"	2.0	42# Natural Kraft
*420AL	¼"	2.0	42# Natural Kraft
420SE	¼"	2.0	38# Self-extinguishing, Natural Jute
420M	¼"	2.0	42# Natural Kraft
425SE	¼"	2.5	38# Self-extinguishing, Natural Jute
820A	½"	2.0	42# Natural Kraft

*Longboard form: Scored and folded (accordion) every 24" along width. Bundles 480 feet long available.

**Edge crush: 1" compressed edge along board length for lap-joint construction.

PACKAGE AND SIZES: Skid Packaging Fully Protected — Stock standard sizes and custom mill sizes. Standard sizes: Widths 48", 60", 72" — all 96" long.

Box Package — Stock standard sizes only: 24" x 36", 36" x 48", 48" x 96", 40" x 60", 30" x 40", 28" x 44", 28" x 22".

USES: Mobile Home Insulation and Barrier — Light-weight, easy-to-install *Fome-Cor* longboard and lap-joint board gives maximum moisture protection and superior insulation over competitive sheathing materials in Mobile Home subroof and sidewall applications.

Displays and Graphic Arts — Strong, light-weight, embossable and dimensionally stable. *Fome-Cor* panels are particularly appealing to designers and users of Point-of-Purchase materials.

Fome-Cor is easily die-cut, embossed, scored and folded. *Fome-Cor* panels, available with a range of facings, natural kraft, clay-coated bleached kraft, and mottled kraft are ideal for printing, silk-screening, illustration, and mounting.

Automotive — The versatility of *Fome-Cor* finds wide application in automobiles and trucks. Being an excellent insulant and moisture barrier, it can be used as door panels, quarter panels, head liners, and package trays.

Containers — *Fome-Cor* can be processed on conventional equipment to make boxes and cartons. This, together with its highly moisture and chemical resistant core, light-weight, dimensional stability and insulation valve, has led to widespread interest and commerical applications in packaging.

GER-PAK® POLYETHYLENE SHEETING

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

Moisture vapor barrier in rolls.

USES: Under concrete slabs, over studding, concealed flashing, crawl space lining, closing in, concrete curing, protective tarps.

STOCK SIZES: .001" to .010" gauge, 1 ft. to 40 ft. width, 50 ft. to 100 ft. length, natural, black, white colors.

GER-PAK® TAPE: 2" x 100' rolls.

MONSANTO® SEWER AND DRAIN PIPE

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

Light-weight, high-impact styrene pipe for gravity flow, buried.

USES: Downspout runoff, house to sewer or septic tank, foundation footing drain, septic leaching field, storm drain, lawn, farm highway drainage.

STOCK SIZES: 3", 4", 6" diameters, 10 ft. lengths, in standard and perforated types. Fittings and cement also available.

MONSANTO® VINYL GUTTERS AND DOWNSPOUTS

PLASTIC PRODUCTS & RESINS DIVISION—LITERATURE AVAILABLE

New maintenance for white vinyl rain carrying equipment offered as complete system. Manufactured of tough, solid vinyl, components will not chip, rust, wear away, blister, peel, support fire or conduct electricity. Doesn't need painting. Standard "K" ("OG") shape as designated by U. S. Department of Commerce.

SHIPPING:

Gutter — twenty 10-ft. lengths	per carton
Downspout — twenty 10-ft. lengths	per carton
Collector — 24	per carton
Connector — 20	per carton
End Cap RH — 20	per carton
End Cap (LH) — 20	per carton
Inside Corner — 24	per carton
Outside Corner — 24	per carton
Elbow (A & B) — 24	per carton
Gutter Hanger — 300	per carton
Monsanto® Adjustable Hanger — 100	per carton
Downspout Hanger — 100	per carton
Cement-Tube — 12	per carton

MONSANTO® VINYL SIDING

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

For maintenance-free exteriors, this solid vinyl siding system doesn't need painting and maintains its sparkling surface beauty year after year. No surface finish to chip or peel — the color goes all the way through. It is self-extinguishing and extremely resistant to corrosion such as seaside or in heavy industrial atmospheres. It shrugs off the impact of driving hail, rocks and accidental bumps. It does not require bonding or grounding for lightning protection. Available in 8" and 6" horizontal siding with or without backerboard. Also available in vertical.

PACKAGING: Vinyl Siding: 2 squares (200 square feet) per carton.

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WATER_PCB-00032205

PROTECTIVE SHEETING

GER-PAK® POLYETHYLENE SHEETING

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

USES: Mulch, greenhouse covers, fumigation covers, row covers, pond liners, silage covers, protective tarps.

STOCK SIZES: .001" to .010" gauge, 1 ft. to 40 ft. width, 40 ft. to 2" x 100 ft. rolls.

GER-PAK® TAPE: 2 in. x 100 ft. rolls.

SILENT-COR® SOUND DEADENING BOARD

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

Silent-Cor sound deadening board is a flat sheet laminate of closed cell polystyrene and paper facings designed to reduce level of sound transmitted through walls, ceilings and floors.

SIZES:

Width	Length	Thickness
4′	8′	¼″
4′	10′	¼″
4′	12′	¼″

PACKING: Taped 20 sheets per bundle.
Net Weight: approx. 105 lbs./bdl. 4′ x 8′
approx. 131 lbs./bdl. 4′ x 10′
approx. 157 lbs./bdl. 4′ x 12′

TiRamic* FLEXIBLE CERAMIC PANELS

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

Highest quality ceramic tiles 1" x 1" or 2" x 2" chemically coupled into urethane grouting to form a panel 24" x 24". The appearance and maintenance advantages of ceramic tile are supplemented and enhanced by the stain resistant grout which also exhibits bacteriostatic and fungistatic activity. The resilient grout matrix permits conformity to minor irregularities in substrate, movement due to temperature variation, thermal shock and minor substrate cracking. Invisible seams may be sealed to form waterproof surface. Recommended in any area where good appearance, durability, clean sanitary conditions are desired such as kitchens, restrooms, locker rooms, showers, hospitals, food handling areas, etc.

TYTRON* FLOORING SYSTEM

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

Unique material made and installed by Monsanto as a system to provide unsurpassed advantages in high performance flooring applications. High level appearance, low time and cost of maintenance and extreme durability recommend its use in heavily trafficked areas such as lobbies, corridors, public areas, educational facilities and transport. Special values such as stain resistance suggest use in food service areas, hospitals and laboratories. Suitability for renovation work is enhanced by one-day installation.

TEXTILES DIVISION

MAN-MADE FIBERS

ACRILAN® ACRYLIC FIBER

STANDARD FORM: Staple and tow.

GENERAL INFORMATION: Full range of deniers in a variety of staple lengths or tow. Solution dyed *Acrilan* also available.

USES: Awning fabrics, blankets, carpets (including indoor-outdoor), comforters, deep pile fabrics, flannel-type fabrics, furniture wraps, half hose, jersey knits, knitting yarns, pile fabrics, pile liners, sweaters, wool system blends, worsted blends, woven goods and upholstery fabrics and sand bags.

BLUE "C"® NYLON AND CUMULOFT® NYLON

STANDARD FORM: Filament yarns.

GENERAL INFORMATION: Available in monofilament, textile multi-filament and modified cross-section yarns; also textured yarns, tire yarn and industrial yarns.

USES: Carpets, coated fabrics, cordage, hosiery, industrial webbing, raschel knitting, surgical hosiery, texturizing, thread, tire cord, tricot fabrics, cordage, upholstery fabrics, woven fabrics, weaving and braiding, and military fabrics.

BLUE "C"® POLYESTER

STANDARD FORM: Staple and tow.

GENERAL INFORMATION: Deniers and staple lengths suitable for blending with cotton, rayon and other textile fibers.

USES: Apparel fabrics, industrial and military fabrics, woven and knitted, and carpets and rugs.

CONSUMER PACKAGED PRODUCTS

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

Product line includes *Cushion Mat, Safe-T-Edge, Super Mat* and *Tidy Mat* plastic floor runners from 6 ft. prepackaged rolls to 100 ft. bulk rolls; plastic DUB'L-TUF® tarps, grommeted, 5′ x 7′ to 15′ x 20′ size; Sure-Hold self-adhering grommets that stick to any plastic sheeting; plastic drop cloths; plastic utility covers.

GARDEN HOSE (MONSANTO®, GERING® BRANDS)

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

Complete dealer lines of vinyl and rubber-vinyl garden hose products.

ELECTRONIC PRODUCTS

INSTRUMENTS

COUNTERS

See Page 16

DIGITAL CLOCK MODEL 505A

See Page 16

DIGITAL PROGRAMMER MODEL 501A

See Page 16

SIGNAL SOURCES

See Page 16

LIGHT-EMITTING DIODES AND ARRAYS

INFRARED EMITTER MI 20B1

Gallium Arsenide Diode

NEW ENTERPRISE DIVISION--LITERATURE AVAILABLE

The MI 20B1 is an infrared radiation source consisting of a gallium arsenide mesa diode mounted on a TO-18 header with a protecting cover of epoxy.

When the device is forward biased above 1.0 volts it emits sharply peaked radiation at 0.9 microns by recombination radiation of electrons injected into the p-layer.

The MI 20B1 matches efficiently with silicon detectors, providing enough radiated power to work in common mode isolation, card reading, and chopping applications. It is used to take advantage of total electrical isolation by photon coupling with solid state reliability, low input power, and excellent external radiated power.

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WATER_PCB-00032206

VISIBLE LIGHT EMITTER MV 10B

Gallium Arsenide Phosphide Diode

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

The MV 10B is Monsanto's visible light-emitting diode made with gallium arsenide phosphide semiconductor. These diodes are designed for use as indicator lights and are compatible with solid state circuits. They feature high reliability, low power requirements and fast switching capability.

A mesa diode die is mounted on a TO-18 header and protected with a transparent epoxy lens. The emitted red light is noncoherent and has a narrow spectral width. The surface brightness of the diode emitting area exceeds 50 foot lamberts.

VISIBLE LIGHT EMITTER MV 10A

Gallium Arsenide Phosphide Diode

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

The MV 10A is a diffused semiconductor injection-electroluminescent mesa diode made from gallium-arsenide-phosphide. When biased in the forward direction it emits incoherent red light with a sharp spectral distribution.

It is packaged in a small coaxial package allowing high packing density for those applications where space is critical. An epoxy lens protects the active area and serves as a window for the emission. The device can be soldered directly into printed circuit boards.

These devices can be used for film annotation, graticule illumination and as indicators, taking advantage of their high reliability, low power consumption and small size.

VISIBLE AND NEAR INFRARED LASERS ML 30C1

Gallium Arsenide Phosphide Semiconductor Laser

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

The ML 30C1 is a Gallium Arsenide Phosphide semiconductor laser which is available with emission at any desired wave length between 6,500 A and 8,300 A. These lasers are designed for operation at 77° K. They are mounted on standard TO-46 solid Kovar headers and the coherent radiation exits from a rectangular window in the side of the header cap. There are no interfering optical surfaces imposed in the light path. The cap, which is provide to mechanically protect the laser chip, is designed with a vent in the top to facilitate operation while immersed upright in liquid nitrogen. While operated on a cold finger in vacuum or on a partially immersed heat sink above the cryogen, the bottom of the header should be in thermal contact with the heat sink.

5 x 7 VISIBLE ARRAY MA 10A2

Gallium Arsenide Phosphide Diodes

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

The MA 10A2 5 x 7 Array is a solid state read-out made with thirty-five MV 10A gallium arsenide phosphide diodes mounted in a metal heat sink. The anode is common to the heat sink, and the cathodes are addressed individually from the rear of the display.

The array can be used to display all numbers, letters and a variety of special characters. Each element is lit when forward biased 10 to 100 ma at about 1.65 volts.

The display is used for visual read-out and film annotation applications which require solid-state reliability, high brightness, small size and low power consumption.

MATERIALS

COOLANOL® 15 DIELECTRIC COOLANT AND HEAT TRANSFER MEDIUM

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: A clear light colored liquid with dielectric, heat transfer and hydraulic properties — over an operating range of below —100° F to —250° F.

USES: Dielectric coolant and heat transfer medium for ground, airborne, and space applications. Was fluid selected for environmental control system in Gemini space capsule.

SHIPPING INFORMATION: Chemicals NOIBN. 1-qt. and 1-gal. hermetically sealed cans.

COOLANOL® 25 DIELECTRIC COOLANT FOR ELECTRONIC EQUIPMENT

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: A clear, oily liquid with dielectric, heat transfer and hydraulic properties — over an operating range of below —80° F to —300° F.

USES: Dielectric coolant for airborne and ground environmental electronic equipment. Also utilized in hydraulic applications in electronic equipment.

SHIPPING INFORMATION: Chemicals NOIBN. 1-qt. cans; 1-gal. cans; 5-gal. cans; 54-gal. drums.

COOLANOL® 35 DIELECTRIC COOLANT FOR ELECTRONIC EQUIPMENT

ORGANIC DIVISION—LITERATURE AVAILABLE

Coolanol 35 coolant-dielectric is a fluid for cooling electronic equipment in ground, shipboard and airborne applications. Chemically and operationally similar to *Coolanol* 45, *Coolanol* 35 is especially suited for low-temperature applications, with an operating range of —80° to 400°F.

COOLANOL® 45 DIELECTRIC COOLANT FOR ELECTRONIC EQUIPMENT

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: A clear, amber liquid with dielectric, heat transfer and hydraulic properties — over a —65°F. to 400°F. temperature range.

USES: Dielectric coolant for both airborne and ground environmental electronic equipment. Also utilized in hydraulic applications in electronic equipment.

SHIPPING INFORMATION: Chemicals NOIBN. 1-qt. cans; 1-gal. cans; 5-gal. cans; 54-gal. drums.

GALLIUM ANTIMONIDE *Electronic Grade*

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Single crystal Czochralski nominal diameter 2.5 centimeters weighing up to several hundred grams.

PURITY: Undoped and doped in various ranges of carrier concentrations, resistivities, mobilities and Hall coefficients.

USES: Ultra-high purity Gallium Antimonide for use in the manufacture of electronic semiconductor devices.

SHIPPING INFORMATION: Special containers according to form and quantity. Individual ingots packaged in polyethylene sleeves with data sheet.

GALLIUM ARSENIDE *Electronic Grade*

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Single and polycrystal ingots boat grown and Czochralski weighing up to several hundred grams. Also epitaxial wafers 1.5 centimeters in diameter.

PURITY: Undoped and doped in various ranges of carrier concentrations, resistivities, mobilities and Hall coefficients.

USES: Ultra-high purity Gallium Arsenide for use in the manufacture of electronic semiconductor devices.

SHIPPING INFORMATION: Special containers according to form and quantity. Individual ingots packaged in polyethylene sleeves with data sheet.

GALLIUM ARSENIDE PHOSPHIDE ALLOYS

Electronic Grade

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Epitaxial wafers 1.5 cm. in diameter of gallium arsenide phosphide on gallium arsenide and film thickness up to 200 microns.

PURITY: Available in various ranges of carrier concentrations, resistivities, mobilities and Hall coefficients.

USES: Ultra-high purity for use in the manufacture of electronic semiconductor devices.

SHIPPING INFORMATION: Special containers according to form and quantity. Individual ingots packaged in polyethylene sleeves with data sheet.

GALLIUM PHOSPHIDE *Electronic Grade*

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Polycrystalline ingots with semicircular cross section approximately 2.0 cm. wide and weighing approximately 50 grams.

PURITY: Available in various ranges of carrier concentrations, resistivities, mobilities and Hall coefficients.

USES: Ultra-high purity for use in the manufacture of electronic semiconductor devices.

SHIPPING INFORMATION: Special containers according to form and quantity. Individual ingots packaged in polyethylene sleeves with data sheet.

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TOWOLDMON0041161
WATER_PCB-00032207

INDIUM ARSENIDE *Electronic Grade*

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Single crystal Czochralski nominal diameter 1.5 centimeter and polycrystal ingots with rectangular cross section 1.5 × 2.0 centimeters and weighing up to several hundred grams.

PURITY: Available in various ranges of carrier concentrations, resistivities, mobilities and Hall coefficients.

USES: Ultra-high purity Indium Arsenide for use in the manufacture of electronic semiconductor devices.

SHIPPING INFORMATION: Special containers according to form and quantity. Individual ingots packaged in polyethylene sleeves with data sheet.

INDIUM ANTIMONIDE *Electronic Grade*

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Single crystal Czochralski nominal diameter 2.5 centimeters weighing up to several hundred grams.

PURITY: Undoped and doped in various ranges of carrier concentrations, resistivities, mobilities and Hall coefficients.

USES: Ultra-high purity Indium Antimonide for use in manufacture of electronic semiconductor devices.

SHIPPING INFORMATION: Special containers according to form and quantity. Individual ingots packaged in polyethylene sleeves with data sheet.

INDIUM PHOSPHIDE *Electronic Grade*

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Polycrystal ingots with semi-circular cross section approximately 2.0 centimeters wide and weighing approximately 50 grams.

PURITY: Available in various ranges of carrier concentrations, resistivities, mobilities and Hall coefficients.

USES: Ultra-high purity Indium Phosphide for use in the manufacture of electronic semiconductor devices.

SHIPPING INFORMATION: Special containers according to form and quantity. Individual ingots packaged in polyethylene sleeves with data sheet.

OS-45® TYPE IV HIGH TEMPERATURE HYDRAULIC FLUID FOR AIRCRAFT

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: A clear amber liquid with outstanding hydraulic properties over a −65°F. to 550°F. temperature range.

USES: High temperature hydraulic for both airborne and ground environmental applications.

SHIPPING INFORMATION: Chemicals NOIBN, 1-qt. cans; 1-gal. cans; 5-gal. cans; 54-gal. drums.

SILICON *Electronic Grade*

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Single-crystal float zone ingots; single-crystal Czochralski ingots; slices, lapped wafers and polished wafers of both float zone and Czochralski material; epitaxial silicon wafers; polycrystal silicon as rods, chunks or unit crucible charges.

PURITY: Less than 0.2 parts per billion base boron content. Dopants added to achieve resistivity levels desired by customers.

GENERAL INFORMATION: Material available in various electrical resistivity ranges, conductivity types, diameters, lengths, wafer thicknesses, etc., according to individual customer requirements.

USES: Single-crystal silicon used directly in the manufacture of semiconductor devices such as diodes, rectifiers, transistors and solar cells. Epitaxial wafers are also used for transistors and diode manufacture as well as integrated circuits. Polycrystal silicon is used in the production of single-crystal ingots via the Czochralski or float zone techniques.

SHIPPING INFORMATION: Special containers according to form and quantity. Data sheets on material enclosed with shipment.

EQUIPMENT AND INSTRUMENTS

BRINK® CASCADE IMPACTOR

INORGANIC DIVISION—ENGINEERING SALES DEPARTMENT—LITERATURE AVAILABLE

STANDARD FORM: Model B is a 1¼" diameter by 15" mg hollow cylinder container, five in-line stages each of which has a jet that uses a collection cup as an impaction plate. Material of construction is 316 stainless steel. Used in conjunction with Model BMS-9.

PERFORMANCE CHARACTERISTICS: Collects mist particles from a gas stream in several fractions ranging from greater than 3 microns to less than 0.5 microns at pressures up to 100 psig.

INDUSTRIAL APPLICATIONS: Sampling various air and gas streams for assessment, monitoring and control of air pollution, process stream contamination, etc.

SHIPPING INFORMATION: Express, parcel post, air freight, etc.

BRINK® COALESCER

INORGANIC DIVISION—ENGINEERING SALES DEPARTMENT—LITERATURE AVAILABLE

STANDARD FORM: Fiber bed packed between metal or polyester screens in cylindrical or circular form.

PERFORMANCE CHARACTERISTICS: Coalescence and separation of finely dispersed or emulsified liquid phases under a variety of environmental conditions.

INDUSTRIAL APPLICATIONS: Separation of various aqueous and organic liquid phases. Test units are available.

SHIPPING INFORMATION: In crates by truck, rail or ship.

BRINK® FILTER

INORGANIC DIVISION—ENGINEERING SALES DEPARTMENT—LITERATURE AVAILABLE

STANDARD FORM: Fiber bed packed between metal or polyester screens in cylindrical, circular or rectangular form.

PERFORMANCE CHARACTERISTICS: Removes very fine solid particulate matter from gas and liquid streams at efficiencies up to 99.9+%, depending on design at low initial pressure drops. Operates in a wide range of environments similar to the *Brink* Mist Eliminator.

INDUSTRIAL APPLICATIONS: Used for removal and/or collection of small quantities of solids which may be valuable or toxic or contaminating, etc., such as platinum catalyst in nitric acid plants, air-borne dusts, radio-active materials, virus, bacteria, organic or carbonaieus materials, etc. Test units are available.

SHIPPING INFORMATION: In crates by truck, rail or ship.

BRINK® MIST ELIMINATOR

INORGANIC DIVISION—ENGINEERING SALES DEPARTMENT—LITERATURE AVAILABLE

STANDARD FORM: Fiber bed packed between metal or polyester screens in cylindrical, circular or rectangular form. High efficiency and high velocity types available.

PERFORMANCE CHARACTERISTICS: Removes sub-micron liquid mists and entrainment from all types of gas streams at efficiencies up to 99.9+%, depending on design at pressure drops as low as a few inches of water. Will operate over a wide range of temperatures and pressures in acidic to basic environments.

INDUSTRIAL APPLICATIONS: Solution to air pollution and in-process contamination mist problems in plants manufacturing chlorine, sulfuric acid, nitric acid, phosphoric acid, ammonia, sulfinated detergents, chlorinated products, respectively. Also used in many other chemical processes and in general applications such as compressed air and other gases. Test units are available.

SHIPPING INFORMATION: In crates by truck, rail or ship.

BRINK® MIST SAMPLER

INORGANIC DIVISION—ENGINEERING SALES DEPARTMENT—LITERATURE AVAILABLE

STANDARD FORM: Model BMS-9 consists of a glass cycline and a glass fiber filter. Removes mist particles from gas streams at essentially atmospheric pressure. Sampler is contained in a temperature-controlled cabinet. A calibrated orifice meter is included.

PERFORMANCE CHARACTERISTICS: Collects mist particles in two fractions; greater than 3 microns, and equal to and less than 3 microns for measurement and analysis to determine mist loadings in gas streams.

INDUSTRIAL APPLICATIONS: Sampling various air and gas streams for assessment, monitoring and control of air pollution etc.

SHIPPING INFORMATION: Express, parcel post, air freight, etc.

TOWOLDMON0041162
WATER_PCB-00032208

BRINK® SPRAY CATCHER

INORGANIC DIVISION—ENGINEERING SALES DEPARTMENT

STANDARD FORM: Fiber bed packed between metal screens in rectangular or circular frames.

PERFORMANCE CHARACTERISTICS: Removes entrainment and spray particles from all types of gas streams down to low micron sizes with essentially 100% efficiency at pressure drops of 1-2" of water. Will operate over a wide range of temperatures and pressures in acidic to basic environments.

INDUSTRIAL APPLICATIONS: Removal of entrainment and spray from in-process and exit gas streams to reduce air pollution, yield losses, product contamination, etc. Useful following absorbing towers, distillation columns, evaporators, reactors, etc. in a variety of processes.

SHIPPING INFORMATION: In crates by truck, rail or ship.

OSCILLATING DISK RHEOMETERS

ORGANIC DIVISION—LITERATURE AVAILABLE

Monsanto® Oscillating Disk Rheometer

TABLE MODEL 10 — for determination of processing and vulcanization characteristics of rubber and rubber-like polymers: viscosity, induction time, scorch safety, rate of cure, time to optimum cure (or any percentage thereof), state of cure, and reversion — and measurement of rheological properties of raw polymers. Presents data as a cyclic trace of modulus of rubber compound versus cure time.

TABLE MODEL 100 — for determination of same parameters as Table Model 10 but presents data in a convenient, continuous line trace of modulus versus cure time. Specifically designed for application in process quality control.

MODEL MP-10 — for determination of the complex dynamic modulus at high shear rate as well as all of the functions performed by the Table Model 10.

MODEL MP-100 — for determination of the complex dynamic modulus at high shear rate as well as all of the functions performed by the Table Model 100.

MODEL MP-V — for determination of the complex dynamic modulus at high shear rate as well as all of the functions performed by both the Table Model 10 and Table Model 100.

RHEOMETER DIMENSIONS
Table Models: Length 42", width 24", height 41".
Model MP's: Length 62", width 24", height 65".

FLAT BED RECORDER
Table Models: 8½" x 11".
Model MP's: 11" x 17".

FINISH
Table Models: Laboratory green, baked enamel.
Model MP's: Two-tone gray, baked enamel.

APPROXIMATE SHIPPING WEIGHTS
Table Models: 600 lbs.
Model MP's: 1100 lbs.

POWER REQUIREMENTS
Table Models: 115 Volt, 30 amp, Single Phase.
Model MP's: 115 Volt, 20 amp, Single Phase and 220/440 Volt, 5 Amp, Three Phase.

COMPRESSED-AIR REQUIREMENTS
60 psi line, cylinder or portable compressor, operating pressure 50 psi. (Regulator valve and gauge built into Rheometer.)

COUNTERS

MONSANTO ELECTRONICS TECHNICAL CENTER,
620 PASSAIC AVENUE, WEST CALDWELL, N.J. 07006
Phone (201) 228-3800 TWX (710) 734-4334

MODEL 100A—Compact half-rack unit; Operating Modes: Frequency, 5 Hz to 12.5 MHz; frequency ratio, 1 to 10^9; time interval, 10 usec to 10^6 sec; single period, 10 usec to 10^4 sec; totalize, 0 to 10^9. 5 digit readout; crystal clock with aging rate of 5 parts in 10^7/day; sensitivity, 50 mV. Price $575.00

MODEL 101A—Same as Model 100A plus BCD (1-2-4-8 code) output and provision for external time base. Price $675.00

MODEL 103A—Compact, low-cost half-rack unit. Operating modes: Frequency, 5 Hz to 12.5 MHz; frequency ratio 1 to 10, time interval 1 sec to 10^3 sec; totalize, 0 to 10^{14}. 4 digit readout; 5 or 6 digit readout available as options. Line frequency clock with crystal clock available as options. Basic price $345.00

MODEL 1500A PLUG-IN COUNTER—Operating Modes: Frequency (dc to 125 MHz) to 3 GHz with plug-in; Single period (1 usec to 10^8 sec); Period average (0.1 usec to 10 sec); Totalize direct, 0 to 10^8, prescaled, 10 to 10^{16}; Input scaling 10 to 10^8; frequency ratio 10^{-8} to 10^{16}. Remotely programmable; sensitivity, 100 mv, 8 digit readout; crystal aging rate, 3 parts in 10^9/day. Price (standard mainframe) $2,850.00.

MODEL 1505A—Mainframe operating modes: Frequency, dc to 70 MHz; Single period, 1 usec to 10^7 sec; Period Average, 0.1 usec to 10 sec; Totalize, direct, 0 to 10^8, prescaled, 10 to 10^{16}; Input scaling, 10 to 10^8, Frequency ratio, 10^{-8} to 10^{16}; Sensitivity, 100 mV; Crystal aging rate, 1 part in 10^7/day; 6-digit readout; 7- or 8-digit options available; BCD output option available. Price $1,995.00.

MODEL 1510A—Mainframe operating modes: Frequency dc to 135 MHz to 3 GHz with plug-in; Totalize, 0 to 10^8; Frequency ratio 10^{-8} to 10^{16}; Sensitivity 100 mV; Crystal aging rate, 3 parts in 10^9/day; 1 part in 10^9/day or 5 parts in 10^9/day options available; BCD output (1-2-4-8 code, negative true); Remotely programmable option available; Basic Price: $2,495.

MODEL 1515A—Main frame operating modes: Frequency, dc to 70 MHz; Totalize 0 to 10^8; Frequency ratio, 10^{-8} to 10^{16}; Sensitivity, 100mV; Crystal aging rate, 1 part in 10^7/day; 1 part in 10^9/day or 3 parts in 10^9/day options available; Internal time base output scaled from 0.1 Hz to 10 MHz in decade steps available at rear panel; Provision for externally supplied time base from 100 Hz to 10 MHz; 6-digit readout; 7- or 8-digit options available; BCD output option available; Basic Price, $1,695.00.

DIGITAL CLOCK MODEL 505A

MONSANTO ELECTRONICS TECHNICAL CENTER,
620 PASSAIC AVENUE, WEST CALDWELL, N.J. 07006
Phone (201) 228-3800 TWX (710) 734-4334

MODEL 505A DIGITAL CLOCK — Highly compact half-rack continuous 24-hour digital clock, BCD printer output, provision for externally or internally supplied print command, programmed contact closure outputs, plus other remote control features. Price $675.00.

DIGITAL PROGRAMMER MODEL 501A

MONSANTO ELECTRONICS TECHNICAL CENTER,
620 PASSAIC AVENUE, WEST CALDWELL, N.J. 07006
Phone (201) 228-3800 TWX (710) 734-4334

MODEL 501A DIGITAL PROGRAMMER — Quick, convenient, push-button selection of predetermined test conditions, programmable by contact closure or logic level; stores up to 10 programs, 64 information bits/program on easily interchangeable cards. Price $375.00.

SIGNAL SOURCES

MONSANTO ELECTRONICS TECHNICAL CENTER,
620 PASSAIC AVENUE, WEST CALDWELL, N.J. 07006
Phone (201) 228-3800 TWX (710) 734-4334

MODEL 300A PULSE GENERATOR—Single or dual pulse operation; "Pulse A", "Pulse B" or "Pulse A, delayed Pulse B" outputs (through common channel) selectable at front panel; Either voltage or current pulses available; Output voltage level continuously adjustable from 0.2 V to 10 V into 50Ω (either polarity) or 0 to 400 mA into 0Ω. 4 calibrated steps plus overlapping vernier; Output characteristics, jitter <0.05%; overshoot <3%; preshoot <2%; flat top pertubrations <3%; Rise and/or fall time continuously adjustable from 10 nsec to 1 msec in 6 calibrated decade ranges plus overlapping vernier; Pulse period adjustable from 50 nsec to 200 msec in 7 calibrated steps plus overlapping vernier; Pulse B can be delayed with respect to pulse A from 10 nsec to 100 msec in 5 calibrated decade steps plus overlapping vernier; Widths of pulses A and B independently adjustable from 25 nsec to 100 msec in 6 calibrated decade steps plus overlapping vernier; Base line offset, 0 to ±2 V, dc, in 5 calibrated steps plus overlapping vernier; offset polarity independent of pulse output polarity; Pulse output can be triggered (or synchronized) by externally supplied signal from 5 Hz to 20 MHz; Pulse trains can be gated by externally supplied gate signal; Vernier control of pulse period; pulse width, and pulse B delay can be externally programmed by analog voltages. Price, $1,100.00.

MODEL 3100A FREQUENCY SYNTHESIZER—Frequency range, dc to 1.3 MHz; Resolution, 0.01 Hz over entire frequency range; stability better than 1 part in 10^9/day; Internally supplied 1 Hz or 100 Hz ramps provide sweeping of up to 100% of any selected decade; Provision for external sweeping of up to 150% of any selected decade; discrete frequency programming within any selected decade through use of externally supplied step functions; Full-range digital frequency programming option available; Any individual harmonic is lower than 45 dB below fundamental; Spurious content at least 50 dB below synthesized output; Calibrated output adjustable from +20 dBm (2.23 V, rms) to −70 dBm (70.9 uV, rms) in decade steps; overlapping uncalibrated vernier adds 0 to 20 dB attenuation when desired; Fixed −20 dBm (22.3 mV, rms) output also available; can be used simultaneously with variable output; Provision for amplitude modulation up to 50% from dc to 40 KHz; Provision for frequency modulation from dc to 100 KHz; deviation range, +75% of any selected decade. Price $3,950.00.

0557429

TOWOLDMON0041163
WATER_PCB-00032209

FOOD INGREDIENTS

ACIDULANTS

ADIPIC ACID, FOOD (F.C.C.) AND TECHNICAL GRADES

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 146.14

STANDARD FORM: White crystalline powder.

SPECIFICATIONS: *Food Grade:* White crystalline powder; Assay 99.7% min.; Melting point first meniscus 152.0°C. min.; complete melt 152.9°C. min.; Ash 12 ppm max.; Iron 2 ppm max.; Water 0.2% max.

Technical grade: Assay 99.7% min.; M. P. 152.0°C. min.; Ash 12 ppm max.; Color (20 grams in 100 ml methanol) APHA 10 max.; Water 0.2% max.; Iron 2 ppm max.

GRADES: Food and Technical.

USES: *Food Grade:* Used as an acidulant in any food where not precluded by the standard of identity.

Technical Grade: Used in the manufacture of nylon, plasticizers, surfactants, detergents, waxes, paper finishes, coatings, saturated and unsaturated polyesters, etc. Its chief function is to control viscosity and impart softness and flexibility to cured resins.

SHIPPING INFORMATION: Acid NOIBN dry, 50 lb. bag.

CWS® FUMARIC ACID, FOOD (F.C.C.) GRADE

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: White, finely ground powder.

SPECIFICATIONS: White, finely ground powder; Assay 98.3% min. fumaric acid, 0.39% DSS (dioctyl sodium sulfosuccinate); max. particle size 5-25 microns.

USES: Used now in dry beverage basis because of its rapid solubility in cold water. Should be considered wherever a rapidly soluble, fruit flavored acid is needed.

SHIPPING INFORMATION: Acid NOIBN dry.

FUMARIC ACID, FOOD (F.C.C.) AND TECHNICAL GRADES

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 116.07

STANDARD FORM: Fine crystals or granular.

SPECIFICATIONS: *Food Grade:* Fine crystals or granular; Assay 99.6% min.; Moisture 0.25% max.; Iron 3 ppm max.

Technical Grade: Assay 99.6% min.; Ash 0.01% max.; Color (5% in alcohol) APHA 10 max.; Iron 3 ppm max.; Moisture 0.25% max.

GRADES: Food and Technical.

USES: *Food Grade:* Used in fruit-flavored beverages, pie fillings, gelatin desserts, wine, refrigerated biscuit doughs, jelling aids and sour rye bread. Should be considered wherever citric acid, tartaric acid, malic acid or potassium bitartrate are now used.

Technical Grade: A resin intermediate in surface coatings, printing ink and polyester resins.

SHIPPING INFORMATION: Acid NOIBN dry. 250-lb. fiber drums and 50-lb. bags.

H. T.® MONOCALCIUM PHOSPHATE

See Page 18

LACTIC ACID, FOOD AND TECHNICAL GRADES

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 90.08

STANDARD FORM: Liquid.

SPECIFICATIONS: *Food Grade:* Clear liquid; Color 50 APHA max.; Assay for 50% concentration, 50% min. total acidity as lactic acid; for 88% concentration, 88% min. total acidity as lactic acid.

Technical Grade: Clear liquid; Color 200 APHA max.; Assay for 50% concentration, 50% min. total acidity as lactic acid; for 88% concentration, 88% min. total acidity as lactic acid.

GRADES: Food and Technical.

USES: *Food Grade:* Used as a food acidulant in green olives, carbonated beverages, jams, jellies, sherbets, food emulsifiers, dried egg whites, pickle products, beer, cheese and other dairy products.

Technical Grade: Used as a pH adjuster in tanning, textile finishing and cellophane waterproofing; as a raw material for plastizers and alkyd resins; as an intermediate for lactic acid esters and salts.

SHIPPING INFORMATION: Lactic Acid 50% concentration in 500-lb. (net) drums. 88% concentration in 525-lb. (net) drums.

MONOAMMONIUM PHOSPHATE

See Page 29

MONOSODIUM PHOSPHATE

See Pages 8 and 31

PHOSPHORIC ACID *75, 80 and 85%*

See Page 30

FLAVORINGS

CAFFEINE ANHYDROUS U.S.P.

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 870.98

STANDARD FORM: Crystalline Powder.

SPECIFICATIONS: White powder; no foreign odor; M.P. 236.0 min.; moisture 0.25% max.

GRADES: Anhydrous powder or hydrated powder.

USES: Used in soft drinks for its distinctive taste and as a mild stimulant. Used in pharmaceutical preparations for increased wakefulness, to stimulate mental activity and for diuretic activity. Prevalent along or in combination with asprin and acetophenetidin.

SHIPPING INFORMATION: Chemicals NOIBN. 100-lb. fiber drums.

ETHAVAN® ETHYLVANILLIN

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 166.17

STANDARD FORM: Fine crystalline needles.

SPECIFICATIONS: NF, Fine white crystalline needles, completely soluble in ethyl alcohol 95% (1:2); ash 0.03% max.; M.P. 76.5°C. min.

GENERAL INFORMATION: *Ethavan* is a flavoring and aromatic. It has a flavor similar to, but not identical to vanillin. The relative flavoring strength is approximately three times that of vanillin.

USES: Chocolate syrups, chocolate coatings, cookie fillings, icings, bakery products, etc.

SHIPPING INFORMATION: Chemicals NOIBN, 100-lb. drums; 25-lb. fiber drums.

METHYL SALICYLATE U.S.P.

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: U.S.P., Colorless liquid; assay 98% min.; Color APHA 10 max.; Odor-characteristic; Refractive Index at 20°C.—1.5350-1.5380; Specific Gravity at 25°C.—1.180-1.185; Solubility in 70% alcohol (1:7) complete; Turbidity, non; Solubility in normal Potassium Hydroxide (1:10); Heavy metals 20 ppm max.; Weight per gallon, 9.9 lbs.; meets all requirements of U.S.P.

USES: As a synthetic oil of wintergreen, Monsanto® Methyl Salicylate U.S.P. can be used whenever the "wintergreen" or mint flavor or aroma is wanted. As a flavor in soft drinks, cream wafers, lozenges, hard candy and in the fondants of sandwich cookies and chewing gum. In pharmaceuticals as a masking agent for disagreeable tasting drugs and as a pleasant flavor in mouthwashes, cough syrups and dentifrices. It has additional uses in insecticides, disinfectants, etc.

SHIPPING INFORMATION: 500-lb. drums-returnable; 500 and 50-lb. drums-nonreturnable. Methyl Salicylate (Essential Oil NOIBN).

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TOWOLDMON0041164
WATER_PCB-00032210

VANILLIN MONSANTO*

Vanillin U.S.P.; also known as methylprotocatechuic aldhyde and 3-methoxy-4-hydroxybenzaldhyde.

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 152.14

STANDARD FORM: Fine crystals.

SPECIFICATIONS: U.S.P., fine, white crystalline needles; M.P. 81.6°C.-83.0°C.; no foreign flavor (in sugar solution); moisture 0.06% max.; solubility in alcohol (1:2) complete.

USES: As a vanilla "base" in flavor extracts, baked goods, confections, soft drink flavors and ice cream. As an odorant in paper and rubber.

SHIPPING INFORMATION: Chemicals NOIBN, 100-lb. drums; 25-lb. fiber drums.

LEAVENING AGENTS

DICALCIUM PHOSPHATE, ANHYDROUS AND DIHYDRATE

See Page 30

H. T.® MONOCALCIUM PHOSPHATE

Monohydrate.

INORGANIC DIVISION

FORMULA: $Ca(H_2PO_4)_2 \cdot H_2O$

MOLECULAR WEIGHT: 252.07

STANDARD FORM: Powder to granular.

PROPERTIES: A free-flowing bead form of MCP; soluble in water, giving an acid reaction.

GRADES: Differ in particle size only. Regular for phosphated and self-rising flour and baking powder. Granular for baking powder. Fine for bread improvers and yeast food. All grades meet Food Chemicals Codex requirements. Special grades will be supplied on request.

USES: Leavening agent in biscuits and crackers and acid leavening agent in pancakes; sole acid agent or mixed with sodium aluminum sulfate or sodium acid pyrophosphate in baking powders; in making self-rising, phosphated plain flour and prepared flours; to control pH of solution in malt. Used as ingredient in manufacture of glass.

SHIPPING INFORMATION: Phosphate of Calcium. 100-lb. bags; 350-lb. drums.

LEVN-LITE* *Sodium Aluminum Phosphate*

INORGANIC DIVISION—LITERATURE AVAILABLE

USES: As a leavening in cake mixes; characterized by its delayed leavening properties; meets Food Chemicals Codex requirements.

SHIPPING INFORMATION: Sodium Aluminum Phosphate. Packaged in 100-lb. fiber drums.

PAN-O-LITE® *Sodium Aluminum Phosphate*

INORGANIC DIVISION—LITERATURE AVAILABLE

USES: As a leavening agent in pancake mixes and cake mixes; characterized by its delayed leavening properties. Meets Food Chemicals Codex requirements.

SHIPPING INFORMATION: Sodium Aluminum Phosphate. Packaged in 100-lb. fiber drums.

PY-RAN® ANHYDROUS MONOCALCIUM PHOSPHATE

INORGANIC DIVISION

FORMULA: $CaH_2P_2O_8$ or $CaH_4(PO_4)_2$

MOLECULAR WEIGHT: 234.06

PROPERTIES: An anhydrous monocalcium phosphate used as an acid component for leavening agents in self-rising flours and corn meal, also baking powders and prepared mixes. Has delayed leavening properties. Meets Food Chemicals Codex requirements.

SHIPPING INFORMATION: Phosphate of Calcium. 100-lb. bags.

SODIUM ACID PYROPHOSPHATE

INORGANIC DIVISION

FORMULA: $Na_2H_2P_2O_7$

MOLECULAR WEIGHT: 221.94

STANDARD FORM: Powder.

PROPERTIES: White powder, soluble in water; min. neutralizing value 74; pH of 1% solution 4.2.

GRADES: Food and Industrial. Food Grade meets Food Chemicals Codex requirements.

USES: As baking acid for prepared flours, refrigerated doughs, doughnut flours; in manufacture of baking powders and baking creams; in oil well drilling muds.

SHIPPING INFORMATION: Sodium Phosphate. 100-lb. bags; 325 and 100-lb. drums.

STABIL-9® LEAVENING AGENT

INORGANIC DIVISION—LITERATURE AVAILABLE

FORMULA: Sodium Aluminum Phosphate blended with calcium phosphates.

USES: A leavening in self-rising flour and mixes. Meets Food Chemicals Codex requirements.

SHIPPING INFORMATION: Sodium Aluminum Phosphate. Packaged in 100-lb. bags.

NON-NUTRITIVE SWEETENERS

SACCHARIN, CALCIUM, N.F., F.C.C.

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 444.50

STANDARD FORM: Powder.

SPECIFICATIONS: N.F., white crystalline powder, 15.0 max. loss on drying (4 hrs./120-125°C.), 95.0-100.5% assay (on dry basis).

USES: Used as a non-nutritive sweetner for all low-calorie foods and beverages and for pharmaceuticals, toothpaste, mouthwashes and tobacco products.

SHIPPING INFORMATION: Chemicals NOIBN, 100-lb. drums.

SACCHARIN, SODIUM, N.F., F.C.C.

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 205.19

STANDARD FORMS: Powder and granular.

SPECIFICATIONS: N.F., 1:8 solubility in water. Powder: White powder, 5.8% max. moisture, 2.5% max. retained on 80 mesh. Granular: 14.6% max. loss on drying at 125°.

USES: Used as a non-nutritive sweetener for all low-calorie foods and beverages and for pharmaceuticals, toothpaste, mouthwashes and tobacco products.

SHIPPING INFORMATION: Chemicals NOIBN, 100-lb. drums.

SACCHARIN, U.S.P.

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 183.18

STANDARD FORM: White powder.

SPECIFICATIONS: U.S.P., White powder, 0.5% max. moisture, 227.0°C. or higher melting point, 98.0% min. purity, 0.4% max. retained on 80 mesh.

USES: Used as a non-nutritive sweetener for all low-calorie foods and beverages, and for toothpastes, mouthwashes and pharmaceutical preparations and tobacoc products.

SHIPPING INFORMATION: Chemicals NOIBN, 100-lb. drums.

PRESERVATIVES

BENZOIC ACID, U.S.P., F.C.C.

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 122.12

STANDARD FORM: Fine powder. or crystalline flakes.

SPECIFICATIONS: U.S.P., White crystalline needles or fine powder; assay 99.5% min.; solution in alcohol (1:2.5) and in 10% sodium carbonate (1:6) clear and colorless; meets U.S.P. test for carbonizable impurities; 2% max. powder retained on 60 mesh.

USES: Used in medicinal preparations and as a preservative in foodstuffs.

SHIPPING INFORMATION: Food Preserving Compound NOIBN 100-lb. fiber drums.

0557431

TOWOLDMON0041165
WATER_PCB-00032211

SODIUM BENZOATE, U.S.P., F.C.C.

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 144.11

STANDARD FORM: Powder or flakes.

SPECIFICATIONS: U.S.P., Thin white flakes or white powder; solubility in water (10:100 at 25°C.) complete; solubility in 90% ethyl alcohol (1:50 at 25°C.) complete; moisture 0.50% max.; assay 99.0% min.

USES: For preserving foods, tobacco and medicinal preparations.

SHIPPING INFORMATION: Sodium Benzoate. 100-lb. fiber drums.

SODIUM BISULFITE ANHYDROUS

See Page 22

BUFFERING AGENTS/COAGULANTS/DISPERSING AGENTS/EMULSIFIERS/PROTEIN INTERACTANTS/ SEQUESTRANTS/NUTRITION SUPPLEMENTS

ADIPIC ACID, FOOD AND TECHNICAL GRADES

See Page 17

BENZOIC ACID, U.S.P. AND TECHNICAL

See Page 18

DICALCIUM PHOSPHATE, ANHYDROUS AND DIHYDRATE

See Page 30

DISODIUM PHOSPHATE, DUOHYDRATE

See Page 31

FUMARIC ACID, FOOD AND TECHNICAL GRADES

See Page 17

H. T.® MONOCALCIUM PHOSPHATE

Monohydrate

See Page 18

MONOSODIUM PHOSPHATE

See Pages 8 and 31

PHOSPHORIC ACID *75, 80 and 85%*

See Page 30

SODIUM ACID PYROPHOSPHATE

See Page 18

SODIUM HEXAMETAPHOSPHATE

See Page 31

SODIUM TRIPOLYPHOSPHATE

See Page 31

TETRASODIUM PYROPHOSPHATE

See Page 32

TRICALCIUM PHOSPHATE

See Page 30

TRISODIUM PHOSPHATE, CRYSTALLINE

See Page 32

FUNCTIONAL FLUIDS: AIRBORNE, INDUSTRIAL, SPECIALTY

AIRBORNE AND SPECIALTY

COOLANOL® 45 DIELECTRIC COOLANT FOR ELECTRONIC EQUIPMENT

See Page 14

OS-45® TYPE IV HIGH TEMPERATURE HYDRAULIC FLUID FOR AIRCRAFT

See Page 15

SKYDROL® 500-A FIRE RESISTANT HYDRAULIC FLUID FOR JET AIRCRAFT

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Moisture .20% max.; neutralization number 0.10 max.; sp. gr. 25°/25°C. 1.060-1.066; viscosity at 100°F. 11.7 ±0.4 cs.

PROPERTIES: A clear, purple, fire-resistant hydraulic fluid with excellent lubricity. Operational at −65°F.

USES: Hydraulic fluid for hydraulic systems in turbo jet and turbo prop aircraft, which must be operational at −65°F.

SHIPPING INFORMATION: Hydraulic system fluids other than petroleum. 1-qt. cans; 1-gal. cans; 5-gal. cans; 54-gal. drums.

SKYDROL® 500-B FIRE RESISTANT HYDRAULIC FLUID FOR JET AIRCRAFT

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: A clear, purple-colored fluid with excellent lubricity. Operational over a temperature range of −65°F. to +225°F.

USES: Hydraulic fluid for systems in turbo jet and turbo prop aircraft, or other systems requiring or desiring a fire resistant hydraulic fluid operational over the range of −65°F. to +225°F.

SHIPPING INFORMATION: Hydraulic fluids other than petroleum. 1-qt. cans; 1-gal. cans; 5-gal. cans; 54-gal. drums.

SKYDROL® 7000 FIRE RESISTANT HYDRAULIC FLUID FOR AIRCRAFT

ORGANIC DIVISION—LITERATURE AVAILABLE

TYPICAL ANALYSIS: Cloud point below 0°F.; moisture 0.25% max.; neutralization number 0.2 max.; sp. gr. 1.080 to 1.086 at 25°/25°C.; pour point −70°F. or lower.

PROPERTIES: A clear, green fire-resistant hydraulic fluid with outstanding lubricity, stability, non-corrosiveness, excellent viscosity-temperature characteristics, and resistance to oxidation.

USES: Hydraulic fluid in aircraft cabin superchargers, expansion turbines for air-conditioning systems and the aircraft hydraulic system itself.

SHIPPING INFORMATION: Hydraulic system fluids other than petroleum. 1-qt. cans; 1-gal. cans; 5-gal. cans; 54-gal. drums.

0557432

TOWOLDMON0041166
WATER_PCB-00032212

INDUSTRIAL

PYDRAUL® 135 HYDRAULIC FLUID

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Viscosity at 100°F.—141 SSU, 210°F.—41 SSU; moisture—0.10% max.; neutralization number (acid)—0.40 max.; sp. gr. at 25°/25°C.—1.186-1.197.

PROPERTIES: A blue-green liquid, synthetic base, fire-resistant hydraulic fluid with excellent lubricity and pumping characteristics for use at operating temperatures down to about 20°F.; non-corrosive, extremely stable to both heat and air; 135 is shear stable and undergoes no appreciable change in viscosity after years of service.

USES: Low-viscosity fluid for use in outdoor hydraulics, injection molding, die casting, Askania-type regulators, fork lift trucks and other mobile equipment, steam and gas turbine controls, steel mill hydraulics, including handling equipment, roll mill coilers, etc.

SHIPPING INFORMATION: Hydraulic system fluids other than petroleum. Tank cars, tank trucks, 55-gal. steel drums and 5-gal. cans.

PYDRAUL® 230 HYDRAULIC FLUID

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Viscosity at 100°F.—230 SSU, 210°F.—44 SSU; moisture—0.10% max.; neutralization number (acid)—0.30 max.; sp. gr. at 25°/25°C.—1.150 to 1.180.

PROPERTIES: A blue-green liquid, synthetic-base, fire-resistant hydraulic fluid with excellent lubricity and pumping characteristics; non-corrosive, extremely stable to both heat and air; recoverable and reclaimable by filtration; is shear stable and undergoes no appreciable change in physical characteristics and properties after years of service.

USES: A high performance, low cost, medium viscosity, fire-resistant fluid for die-casting machines, hydraulic presses, automatic welding machines and similar applications requiring a medium viscosity safety fluid.

SHIPPING INFORMATION: Hydraulic system fluids other than petroleum. Tank cars, tank trucks, 55-gal. steel drums and 5-gal. cans.

PYDRAUL® 312 HYDRAULIC FLUID

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Viscosity at 100°F.—312 SSU, 210°F.—50 SSU; moisture—0.10% max.; neutralization number (acid)—0.30 max.; sp. gr. at 25°/25°C.—1.080-1.140.

PROPERTIES: A blue-green liquid, synthetic base, fire-resistant hydraulic fluid with excellent lubricity and pumping characteristics; non-corrosive, extremely stable to both heat and air; recoverable by filtration; 312 is shear stable and undergoes no appreciable change in viscosity after years of service.

USES: A high performance, low cost fire-resistant fluid for die-casting machines, hydraulic presses, automatic welding machines, injection molding equipment and similar applications requiring a medium viscosity fluid.

SHIPPING INFORMATION: Hydraulic system fluids other than petroleum. Tank cars, tank trucks, 55-gal. steel drums and 5-gal. cans.

PYDRAUL® 540 HYDRAULIC FLUID

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Viscosity at 100°F.—535 SSU, 210°F.—54 SSU; moisture—0.08% (max.) neutralization number 0.40 (max.); sp. gr. at 25°/25°C.—1.160 to 1.200.

PROPERTIES: A blue-green liquid, synthetic-base; fire-resistant hydraulic fluid of high viscosity and excellent lubricity and pumping characteristics.

USES: A fire-resistant hydraulic fluid designed for equipment requiring a high viscosity fluid, such as large forging presses and extrusion presses.

SHIPPING INFORMATION: Hydraulic system fluids other than petroleum. Tank cars, tank trucks, 55-gal. steel drums and 5-gal. cans.

PYDRAUL® A-200 HYDRAULIC FLUID

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Viscosity at 100°F.—230 SSU, 210°F.—41.9 SSU; moisture—0.05% max.; neutralization number (acid)—0.80-1.10 max.; sp. gr. at 25°/25°C.—1.415-1.430.

PROPERTIES: A cloudy blue liquid, straight synthetic, fire-resistant hydraulic fluid with excellent lubricity; non-corrosive, extremely stable to both heat and air; is designed to be permanent; fluid spilled and leaked can be easily reclaimed by filtration; does not thicken with use; resists "breakdown" even under extreme conditions; passes ASTM-D-665-A rust test with perfect score; A-200 is shear stable and undergoes no loss of viscosity after years of severe use.

USES: Fire resistant hydraulic fluid in die-casting machines, hydraulic presses, automatic welding machines and similar applications requiring a medium viscosity fluid.

SHIPPING INFORMATION: Hydraulic system fluids other than petroleum. 55-gal. steel drums; 5-gal. cans, tank cars, tank trucks.

PYDRAUL® 60 HYDRAULIC FLUID

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Viscosity at 100°F.—60 SSU, 210°F.—34 SSU; moisture—0.10% max.; neutralization number (acid)—0.25 max.; sp. gr. at 25°/25°C.—1.088-1.091.

PROPERTIES: A cloudy blue liquid, straight synthetic fire resistant hydraulic fluid with excellent lubricating and pumping characteristics; non-corrosive.

USES: A fire resistant hydraulic fluid in systems requiring extremely low viscosity.

SHIPPING INFORMATION: Hydraulic system fluids other than petroleum. 55-gal. steel drums and 5-gal. cans, tank cars, tank trucks.

PYDRAUL® 150 HYDRAULIC FLUID

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Viscosity at 100°F.—150 SSU, 210°F.—50 SSU; moisture—0.15% max.; neutralization number (acid)—0.17 max.; sp. gr. at 25°/25°C.—1.119-1.135.

PROPERTIES: A cloudy blue liquid, straight synthetic fire resistant hydraulic fluid of low viscosity with excellent lubricity and low temperature pumping characteristics; non-corrosive.

USES: Fire resistant hydraulic fluid in equipment which operates out of doors at low temperatures part or all of the time, such as Askania Regulator Equipment, fork-lift trucks and similar equipment with cold weather fluid requirements.

SHIPPING INFORMATION: Hydraulic system fluids other than petroleum. 55-gal. steel drums; 5-gal. cans, tank cars, tank trucks.

PYDRAUL® 280 HYDRAULIC FLUID

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Viscosity at 100°F.—270 SSU, 210°F.—39 SSU; moisture—0.15% max.; neutralization number (acid) 0.2-0.5; sp. gr. at 25°/25°C.—1.385 to 1.405.

PROPERTIES: A cloudy blue liquid, straight synthetic, fire-resistant fluid with excellent lubricity and pumping characteristics; non-corrosive, extremely stable to both heat and air; shear stable, recoverable and reclaimable by filtration; designed for long service life in the medium viscosity range.

USES: Fire-resistant hydraulic fluid in die-casting machines, hydraulic presses, automatic welding machines and similar applications requiring a medium viscosity fluid.

SHIPPING INFORMATION: Hydraulic system fluids other than petroleum. Tank cars, tank trucks, 55-gal. steel drums and 5-gal. cans.

PYDRAUL® 625 HYDRAULIC FLUID

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Viscosity at 100°F.—625 SSU, 210°F.—45 SSU; moisture—0.15% max.; neutralization number (acid)—0.30 max.; sp. gr. at 25°/25°C.—1.340-1.370.

PROPERTIES: A cloudy blue liquid, straight synthetic fire resistant hydraulic fluid of high viscosity with excellent lubricity and pumping characteristics; non-corrosive.

USES: A fire resistant hydraulic fluid in equipment requiring a high viscosity medium, such as large forging presses, extrusion presses and some die-casting machines.

SHIPPING INFORMATION: Hydraulic system fluids other than petroleum. 55-gal. steel drums; 5-gal. cans, tank cars, tank trucks.

PYDRAUL® F-9 HYDRAULIC FLUID

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Viscosity at 100°F.—245 SSU, 210°F.—45 SSU; moisture—0.20% max.; neutralization number (acid)—0.30 max.; sp. gr. at 25°/25°C.—1.270-1.300.

PROPERTIES: A cloudy blue liquid; straight synthetic fire resistant fluid with excellent lubricity and pumping characteristics; non-corrosive, extremely stable to both heat and air; recoverable by filtration; designed for long service life.

0557433

TOWOLDMON0041167
WATER_PCB-00032213

USES: Fire resistant hydraulic fluid in die-casting machines, hydraulic presses, automatic welding machines and similar applications requiring a medium viscosity fluid.

SHIPPING INFORMATION: Hydraulic system fluids other than petroleum. 55-gal. steel drums and 5-gal. cans, tank cars, tank trucks.

PYDRAUL® AC COMPRESSOR LUBRICANT

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Viscosity at 100°F.—405 SSU, 210°F.—42 SSU; moisture—0.15% max.; neutralization number (acid)—0.15 max; sp. gr. at 25°/25°C.—1.340-1.360.

PROPERTIES: A clear blue, mobile straight synthetic fire resistant air compressor lubricant with excellent lubricity; non-corrosive.

USES: A fire and explosion resistant lubricant for air compressors, such as those used in air separation plants, plant air systems, ammonia synthesis plants, gas transmission booster stations and other type processing plants.

SHIPPING INFORMATION: Chemicals NOIBN. 55-gal. steel drums; 5-gal. cans, tank cars, tank trucks.

PYDRAUL® AC WINTER GRADE 28 — COMPRESSOR LUBRICANT

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Viscosity at 100°F.—28 cs.; 210°F.—3.8 cs.; moisture—0.15% max.; neutralization number (acid)—0.15 max.; sp. gr. at 25°/25°C.—1.275—1.295.

PROPERTIES: A clear blue, mobile straight synthetic fire-resistant air compressor lubricant with excellent lubricity; non-corrosive.

USES: Similar to *Pydraul* AC with lower viscosity. Can be used at ambient temperature down to about 20°F.

SHIPPING INFORMATION: Chemicals NOIBN. 55-gal. steel drums; 5-gal. cans, tank cars, tank trucks.

THERMINOL® FR — HEAT TRANSFER LIQUIDS

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: Clear, colorless liquids with boiling points above their maximum recommended use temperatures. They are thermally and oxidatively stable to these maximum recommended use temperatures and extremely fire resistant. Underwriters' Laboratories, Incorporated, listed.

USES: *Therminol* FR liquids are fire-resistant heat transfer media produced to rigid specifications important to heat transfer. There are five *Therminol* FR products: *Therminol* FR-L₀ Temp, *Therminol* FR-0, *Therminol* FR-1, *Therminol* FR-2, and *Therminol* FR-3. They differ in their low temperature pumpability and in their maximum recommended bulk fluid temperature. These temperatures range between −40°F. and 600°F.

SHIPPING INFORMATION: Chemicals NOIBN, tank cars, tank trucks, 55-gal. steel drums and 5-gal. cans.

THERMINOL® 66 and THERMINOL® 77 — HEAT TRANSFER LIQUIDS

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: Clear, yellowish liquids with high boiling points above their maximum recommended bulk fluid temperatures, thermally stable to their maximum recommended bulk fluid temperatures. Not fire resistant.

USES: *Therminol* 66 and *Therminol* 77 are heat transfer media produced to rigid specifications important to heat transfer where bulk fluid operating temperatures in excess of 600°F. are required. *Therminol* 66 has a wide range capability between 15°F. and 650°F. and exhibits the greatest overall efficiency in heat transfer. *Therminol* 77 exhibits the highest temperature capability to 700°F. and above with minimum pumpability at 65°F.

SHIPPING INFORMATION: Chemicals NOIBN, tank cars, tank trucks, 55-gal. steel drums and 5-gal. cans.

SANTOWAX® OMP ORGANIC COOLANT FOR NUCLEAR REACTORS

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Solid.

PROPERTIES: A high boiling thermal and radiation resistant heat transfer medium.

USES: Organic nuclear reactor coolant and high temperature industrial heat transfer medium.

SHIPPING INFORMATION: Chemicals NOIBN, tank cars, tank trucks, 55-gal. steel drums and 5-gal. cans.

HEAVY CHEMICALS

ALUMINUM CHLORIDE SOLUTION 32° Bé.

INORGANIC DIVISION

MOLECULAR WEIGHT: 266.7

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Neutral salt, low in iron content; solutions have an acid reaction but contain no free acid. $AlCl_3 \cdot 6H_2O$, 50.3%; Al_2O_3, 10.6%; Fe, 0.005%.

USES: Carbonizing fine wool such as piece goods, raw stock or sliver, resulting in an exceptionally white, lofty wool; carbonizing colored goods where it has very little stripping action; soap manufacture for treatment of glycerine lyes where chloride of alumina is more desirable than sulfate.

SHIPPING INFORMATION: Aluminum Chloride Liquid. Tank cars; tank trucks.

ALUMINUM SULFATE

See Page 68

BATTERY ACID

INORGANIC DIVISION

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Practically colorless liquid; H_2SO_4 93.2% min.; iron 0.005% max.; nitrogen compounds (as HNO_3) 0.001% max.; sp. gr.—1.835.

USES: Electrolyte is sulfuric acid, especially adapted to the needs of the storage battery trade.

SHIPPING INFORMATION: Sulfuric Acid. "Corrosive" label required. Tank trucks and tank cars.

CARBON DIOXIDE

INORGANIC DIVISION

FORMULA: CO_2

MOLECULAR WEIGHT: 44.0

PROPERTIES: Marketed in liquid form which is colorless and odorless.

USES: As inert gas atmosphere, for fire extinguishers, in carbonated beverages, and for carbon dioxide blasting.

SHIPPING INFORMATION: Carbon Dioxide. Steel cylinders and tank cars.

CAUSTIC POTASH

INORGANIC DIVISION

FORMULA: KOH

MOLECULAR WEIGHT: 56.1

STANDARD FORM: 45% Solution.

GRADES: Available as both technical grade and low chloride grade.

USES: Due to the greater solubility of the salts of Caustic Potash permitting higher solids content in liquid formulations. Caustic Potash has use in formulating liquid soaps and detergents. In the manufacture of many Organic and Inorganic Potassium salts, petroleum refining, and in detergents.

SHIPPING INFORMATION: Caustic Potash, Liquid. 10,000, 8,000 and 4,000 gal. lined and coiled tank cars. Tank trucks also available.

MIXED ACID *Nitrating Acid*

INORGANIC DIVISION

STANDARD FORM: Liquid.

TYPICAL ANALYSIS:

	80-15	45-53
Nitric Acid (HNO_3)	80.0 %	45.0 %
Sulfuric Acid (H_2SO_4)	15.0 %	53.0 %
Oxides of Nitrogen (N_2O_3)	0.25%	0.25%

USES: Nitrating in the chemical industry, particularly in the manufacture of explosives and dyestuffs. Special mixtures can be furnished to meet individual requirements.

SHIPPING INFORMATION: Nitrating Acid. Corrosive liquid (white label required). 110-gal. drums; 75 and 50-ton tank cars.

MURIATIC ACID *Hydrochloric Acid*

INORGANIC DIVISION—LITERATURE AVAILABLE

FORMULA: HCl

MOLECULAR WEIGHT: 36.47

0557434

TOWOLDMON0041168
WATER_PCB-00032214

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: 18° Be., 27.9% HCl; 20° Be., 31.5% HCl; 22° Be., 35.2% HCl.

USES: Used extensively in the starch, glucose, gelatin, steel galvanizing, paper, leather and glass industries.

†*HYDROCHLORIC ACID PLANTS. Complete plants offered by Engineering Sales Department to electrolyze by-product HCl and produce pure chlorine and hydrogen.*

NITRIC ACID

INORGANIC DIVISION—LITERATURE AVAILABLE

FORMULA: HNO_3

MOLECULAR WEIGHT: 63.01

STANDARD FORM: 36° Be., 38° Be., 40° Be., and 42° Be.

TYPICAL ANALYSIS: % HNO_3; 36° Be., 52.3% ; 38° Be., 56.5% ; 40° Be., 61.4% ; 42° Be., 67.2% ; strong acid 95-98%, sp. gr. will not vary more than .05° terms of Be.; H_2SO_4, 0.05% max.

USES: Manufacture of insecticides, dyestuffs, drugs, pharmaceuticals, explosives, photoengraving, nitrates and nitro products.

SHIPPING INFORMATION: Nitric Acid. Corrosive liquid (white label required). Tank trucks; 50-ton tank cars.

SLAG, CALCIUM SILICATE

INORGANIC DIVISION

STANDARD FORM: Granular solid'

PROPERTIES: CaO, 47.18% ; SiO_2, 40.44% ; Al_2O_3, 7.62% ; Fe_2O_3, 0.20% ; F, 2.62% ; P, 0.55% ; K_2O, 0.97% ; Na_2O, 0.44% ; MgO, 0.02% ; Mn, 0.12% ; SO_3, 0.59% ; C, 0.10% .

USES: Constituent of glass mix.

SHIPPING INFORMATION: Slag. Bulk.

SODIUM BISULFITE ANHYDROUS

Also known as Sodium Metabisulfite.

ORGANIC DIVISION—LITERATURE AVAILABLE

FORMULA: $Na_2S_2O_5$

MOLECULAR WEIGHT: 190.11

STANDARD FORM: Faint yellow, free-flowing crystals.

TYPICAL ANALYSIS: SO_2-66.6% ; NA_2SO_4-0.7% ; Na_2SO_3-1.25% .

GRADES: Meets Food Chemicals Codex and U.S.P. requirements for Sodium Bisulfite USP.

USES: In dye manufacture; as source fo SO_2 for reducing sodium bichromate to basic chrome sulfate in tanning; bleaching of vegetable tan extracts; production of hydrosulfite for vat dyeing; antichlor in bleaching ground wood, etc.

SHIPPING INFORMATION: Sodium Bisulfite—dry.

SODIUM BISULFATE NITRE CAKE

INORGANIC DIVISION

FORMULA: $NaHSO_4$

MOLECULAR WEIGHT: 120.07

STANDARD FORM: Globular.

TYPICAL ANALYSIS: 38% available H_2SO_4.

USES: Used in viscose rayon spinning baths, dyeing woolen goods; refining nickel ores; manufacture of sulfate pulp; in tanneries for pickling, deliming and making one-bath tan solutions; as an acid scour for household use; as a bowl cleaner in sanitary trade.

SHIPPING INFORMATION: Nitre Cake. 100-lb. bags and 400-lb. drums.

SODIUM CHLORIDE *(Rock Salt)*

INORGANIC DIVISION—CONTACT PRODUCT PLANNING DEPT.

FORMULA: NACl

STANDARD FORM: Mine Run or Screen Grades.

CHEMICAL PURITY: 98.5 to 99.1% NACl depending upon grade.

SHIPPING INFORMATION: Normal shipment—Barge loads; 1400 tons each. Rail shipment at various transfer points.

PRODUCING POINT: Cote Blanch Island, La. 131 miles west of New Orleans on Intercoastal Waterway.

SANTOSITE® SODIUM SULFITE ANHYDROUS TECHNICAL

ORGANIC DIVISION—LITERATURE AVAILABLE

FORMULA: Na_2SO_3

MOLECULAR WEIGHT: 126.06

STANDARD FORM: Powder.

TYPICAL ANALYSIS: Tan to slightly pink crystalline powder; assay (Na_2SO_3) 97.7% min.; color of filtrate from 10% solution in water not darker than APHA 70.

PROPERTIES: Will oxidize to sodium sulfate if not kept dry. Normally contains less than 1% sodium chloride; less than 0.1% iron; less than 0.2% insoluble; less than 0.2% organic matter. The balance of impurity is sodium sulfate. The unfiltered water solution has a brown color due to suspended Fe (OH_3). Normally all of the product will pass through a No. 20 U. S. Standard sieve.

USES: As a reducing agent in oxygen removal from boiler feed water; depressant in ore flotation; manufacture of rubber and cordage.

SHIPPING INFORMATION: Sodium Sulfite. 100-lb. paper bags and hopper cars.

SULFUR DIOXIDE, LIQUID

INORGANIC DIVISION—LITERATURE AVAILABLE

FORMULA: SO_2

MOLECULAR WEIGHT: 64.07

STANDARD FORM: Liquid.

SPECIFICATIONS: Colorless; non-volatile residue 0.0025% max.; moisture 0.005% max.

USES: In leather tanning, oil refining, refrigeration, air conditioning, sugar refineries; antichlor in textiles; hydrosulfite in textiles; diluent in manufacture of sulfuric acids; manufacture of sulfuryl chloride; fruit preservation; wine making; manufacture of gelatin and corn products.

SHIPPING INFORMATION: Sulfur Dioxide. Tank cars and 1-ton containers.

SULFURIC ACID AND OLEUM

INORGANIC DIVISION—LITERATURE AVAILABLE

FORMULA: H_2SO_4

MOLECULAR WEIGHT: 98.08

STANDARD FORM: 60° Be.; 66° Be.; 98% H_2SO_4; all strengths oleum.

SULFURIC ACID PLANTS. Complete manufacturing plants using the contact process and Monsanto® vanadium catalyst offered by Engineering Sales Department.

USES: Used extensively in steel mills, enameling works, oil refineries, pigment works, by-product gas plants, fertilizer plants, tanneries and many other industries.

SHIPPING INFORMATION: Sulfuric Acid. Tank trucks; tank cars.

NUCLEAR SOURCES

Radioactive Sources

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ORGANIC CHEMICALS

ACIDS AND ANHYDRIDES (CARBOXYLIC)

ADIPIC ACID, FOOD AND TECHNICAL GRADES

See Page 17

0557435

TOWOLDMON0041169
WATER_PCB-00032215

BENZOIC ACID, U.S.P. AND TECHNICAL

See Page 18

FUMARIC ACID, FOOD AND TECHNICAL GRADES

See Page 17

MALEIC ANHYDRIDE

ORGANIC DIVISION

MOLECULAR WEIGHT: 98.06

STANDARD FORM: Briquettes, fused mass.

SPECIFICATIONS: White briquettes or fused mass, crystallizing point (as produced) 52.5°C. min.; water solution (4 gms. in 10 ml); clear and colorless; assay 99.5% min.; color of melt 20 APHA max. Heat test color (2 hrs. @ 140°C.) 40 APHA max.

USES: Used alone or in combination with other acids in the manufacture of alkyd and polyester resins; a versatile intermediate for chemical synthesis.

SHIPPING INFORMATION: Maleic Anhydrides 50-lb. bags; 250-lb. fiber drums; tank cars, tank trucks.

MODAFLOW® RESIN MODIFIER

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Very viscous clear liquid free of solids.

GENERAL INFORMATION: Soluble in toluene, kerosene, petroleum ether, carbon tetrachloride, ethyl acetate, higher alcohols. Insoluble in water, ethanol and methanol.

USES: An additive for improving flow, leveling and adhesion properties of surface coating formulations — especially enamels, vinyls, epoxies and polyesters. Uses at 0.1—2.0% based on resin solids.

SHIPPING INFORMATION: Chemicals NOIBN, 55-gal. non-returnable drums, 20-gal. drums and 5-gal. cans.

PHTHALIC ANHYDRIDE

See Page 56

SALICYLIC ACID U.S.P.

ORGANIC DIVISION

MOLECULAR WEIGHT: 138.12

STANDARD FORM: Needles or powder.

SPECIFICATIONS: U.S.P. Grade: White needles or powder; assay 99.5% min.; M.P. 158.0°C. min.; conforms to U.S.P. test for carbonizable substances; ash 0.05% max.; powder 0.4% max. retained on 100 mesh. Industrial Grade: Light tan powder; M.P. 158.0°C. at start.

GRADES: U.S.P. and industrial.

USES: Manufacture of medicinals and dyestuffs; industrial preservative; *intermediate in many organic syntheses.*

SHIPPING INFORMATION: Salicylic Acid. 200-lb. and 100-lb. fiber drums. Industrial Grade. 250-lb. fiber drums.

5-SULFOSALICYLIC ACID *TECHNICAL*

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 218

STANDARD FORM: Tan crystalline solid.

ASSAY: 93% 5-sulfosalicylic acid (min.).

USES: Metal ion chelator, dye intermediate, preparation of surfactants, catalysts and grease additives.

CONTAINERS: 200-lb. net polyethylene lined fiber drums.

SHIPPING CLASSIFICATION: Acid NOIBN Dry.

TPSA® TETRAPROPENYLSUCCINIC ANHYDRIDE

(Dodecenylsuccinic Anhydride)

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 266

STANDARD FORM: Liquid.

GENERAL INFORMATION: The dodecenyl substituent is present in a number of isomeric forms.

SPECIFICATIONS: Appearance: clear light yellow, viscous liquid; Liquid color: 400 APHA (max.); Neutral Number: 395-432 mg. KOH/g. refractive index @ 25°C. 1.4740-1.4780.

USES: Corrosion inhibitor, epoxy curing agent, intermediate.

CONTAINERS: 450-lb. net 55-gal. drums; bulk.

SHIPPING CLASSIFICATION: Chemicals, NOIBN.

AMINES

ortho-ANISIDINE

ORGANIC DIVISION

MOLECULAR WEIGHT: 123.15

STANDARD FORM: Liquid.

SPECIFICATIONS: Appearance, reddish brown to amber liquid; Crystallizing Point 5.3°C. min. (with low seeds); Distilling Range: first drop 223.0°C. minimum, 95% (1-96) within 1.5°C. and to include 224.5°C. (Decomposes at 226.0°C.)

USES: A component of azo dyes.

CONTAINERS: 55-gallon, 18-gauge drums.

SHIPPING CLASSIFICATION: Poisonous Liquid NOS (Dye Intermediate NOIBN).

para-ANISIDINE

Also known as para-methoxy-aniline and para-aminoanisoles

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 123.15

STANDARD FORM: Cast solid or flakes.

SPECIFICATIONS: Brownish crystalline mass or flakes when produced, darkens on aging; crystallizing point 57.2°C. min.; distillation range: first drop 241.0°C. min.; 95% 1.0°C. max.; to incl. 242.0 ± 0.2°C. Solution in HCl complete.

USES: A component of various azo dyestuffs; intermediate in chemical synthesis. CAUTION: This product is toxic. Avoid breathing its vapors. Avoid contact with the skin.

SHIPPING INFORMATION: Dye Intermediate NOIBN "Poison" label required. 475-lb. galv. steel drums, 150-lb. fiber drum.

tertiary-BUTYLAMINE

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 73.14

STANDARD FORM: Volatile liquid.

ASSAY: 98% minimum.

USES: Intermediate.

CONTAINER: 300-lbs. net 55-gal. drums; bulk.

SHIPPING CLASSIFICATION: Flammable liquid NOS (t-butylamine-Chemicals NOIBN).

ortho-CHLOROANILINE

Also known as ortho-amino-chlorobenzene and 2-chloroamino-benzene

ORGANIC DIVISION

MOLECULAR WEIGHT: 127.57

STANDARD FORM: Liquid.

SPECIFICATIONS: Amber liquid that discolors readily in air; assay 99.0% min.; crystallizing point −2.3°C. min. Distillation range: first drop 208.0°C. min.; 95% (1-96 ml) 1.0°C. max.; to incl. 209.0°C.

USES: An intermediate in the production of dyestuffs and insecticides. CAUTION: This product is toxic. Avoid skin contact and breathing its vapor.

SHIPPING INFORMATION: Dye intermediate NOIBN "Poison" label required. 550-lb. steel drums.

para-CHLOROANILINE

Also known as para-amino-chlorobenzene and 4-chloro-aminobenzene

ORGANIC DIVISION

MOLECULAR WEIGHT: 127.57

STANDARD FORM: Cast solid, flakes.

SPECIFICATIONS: Yellow-white solid; crystallizing point 69.5°C. min. Assay 99% min.; Distillation range: first drop 230.0°C. min.; 95% (1-96 ml) 1.5°C. max. Incl. 231.7° ± 0.2°C.

USES: Dyestuffs intermediate. CAUTION: This product is toxic. Avoid skin contact and breathing its vapor.

SHIPPING INFORMATION: Dye Intermediate NOIBN "Poison" label required. 500-lb. steel drums.

CYCLOHEXYLAMINE *Also known as hexahydroaniline*

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 99.17

STANDARD FORM: Liquid.

0557436

TOWOLDMON0041170
WATER_PCB-00032216

SPECIFICATIONS: Clear, practically colorless liquid; sp. gr. 0.869-0.873 at 15.5°/15.5°C. Distillation range: first drop 132.0°C. min.; 95% (1-96 ml) 4.0°C. max.; dry point 137.0°C. max.

USES: Dyestuff intermediate; petroleum additive; corrosion inhibitor in boiler systems, petroleum oils, greases, glycol and methanol antifreezes; organic synthesis; synthetic sweeteners.

SHIPPING INFORMATION: Chemical NOIBN. 385-lb. galv. drums, bulk.

3,4-DICHLOROANILINE (3,4-DCA)

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 162

STANDARD FORM: Cast solid.

SPECIFICATIONS: Appearance, white to tan solid, darkens with age; Crystallizing Point, 70.5° min.; assay 99.0% min.

USES: Intermediate in synthesis of biologically active compounds; dye intermediate.

CONTAINERS: 600-lbs. net—55 gal. drums.

SHIPPING INFORMATION: Poisonous solid (NOS—Dye Intermediate, NOIBN).

DICYCLOHEXYLAMINE

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 181.31

STANDARD FORM: Liquid.

SPECIFICATIONS: Clear, practically colorless liquid; sp. gr. 0.913-0.919 at 15.5°/15.5°C. Distillation range; first drop 252.0°C. min.; 95% (1-96 ml) 4.0°C. max.; dry point 258.0°C. max.

USES: As a corrosion inhibitor (see Cyclohexylamine) and in production of dicyclohexyl ammonium nitrate (used as a vapor-phase rust inhibitor, Shell Oil Company patent), rust-preventative oil additives, dyes and dry-cleaning soaps.

SHIPPING INFORMATION: Chemical NOIBN. 410-lb. steel drums.

DODECYLANILINE *(Formerly Alkylaniline C-12)*

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

GENERAL INFORMATION: Dark reddish brown liquid, darkens on age; infrared analysis shows 90-95% of the alkyl substitution is in the para position; the dodecyl substituent is present in a number of isomeric forms.

USES: Corrosion inhibitor, intermediate for synthesis of hydrocarbon soluble chemicals.

CONTAINERS: 375-lbs. net—55-gal. drums—bulk.

SHIPPING INFORMATION: Chemicals NOIBN.

ortho-NITROANILINE

Also known as ortho-aminonitro-benzene

ORGANIC DIVISION

MOLECULAR WEIGHT: 138.12

STANDARD FORM: Flakes.

SPECIFICATIONS: Orange flakes; crystallizing point 69.7°C. min.

PROPERTIES: Tends to form lumps on standing. Milling to desired fineness just before use is recommended. Addition of 0.5% tricalcium phosphate reduces the caking tendency.

USES: Manufacture of lakes and toners (dyes) such as ONA Black, ONA Orange and Hansa Yellow 5G; synthesis of coccidiostats, photographic anti-fogging agents and benzotriazoles (a rust inhibitor patented by Proctor and Gamble). CAUTION: This product is toxic. Avoid skin contact and breathing its dust.

SHIPPING INFORMATION: Dye Intermediate NOIBN "Poison" label required. 175-lb. fiber drums.

para-NITROANILINE

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 138.12

SPECIFICATIONS: Appearance, yellow to amber crystals; Ash 0.2% max.; Color of HCl solution, NPA, No. 4 max.; Inorganic Chlorides, as Cl, 0.020% max.; Melting Point 147.9°C. min.

USES: Manufacture of anti-oxidants, anti-ozonants, gasoline gum inhibitors; medical compounds for poultry, dyestuffs, color and pigments.

CONTAINERS: 350-lb. fiber drums.

SHIPPING INFORMATION: para-Nitroaniline (Dye Intermediate NOIBN).

ortho-PHENETIDINE

Also known as ortho-aminophenylethyl ether, ortho-aminophenetole and 2-amino-ethoxybenzene.

ORGANIC DIVISION

MOLECULAR WEIGHT: 137.18

STANDARD FORM: Liquid.

SPECIFICATIONS: Dark red liquid; crystallizing point −4.0°C. min. Distillation range: first drop 231.0°C. min.; 95% (1-96 ml) 2.0°C. max.; and to incl. 232.3° ± 0.2°C.

USES: An intermediate in the production of dyestuffs. CAUTION: This product is toxic. Avoid contact with skin and breathing its vapors.

SHIPPING INFORMATION: Dye Intermediate NOIBN. "Poison" label required. 475-lb. steel drums.

para-PHENETIDINE

Also known as para-aminophenylethyl ether, para-aminophenetole and 4-amino-ethoxybenzene.

ORGANIC DIVISION

MOLECULAR WEIGHT: 137.18

STANDARD FORM: Liquid.

SPECIFICATIONS: Light yellow liquid; crystallizing point 4.2°C. min.; distillation range: first drop 248.3°C. min.; 95% (1-96 ml) 2.0°C. max.; and to incl. 250.0° ± 0.2°C.

USES: An intermediate in the production of dyestuffs and pharmaceuticals. CAUTION: This product is toxic. Avoid breathing its vapors and avoid contact with the skin.

SHIPPING INFORMATION: Dye Intermediate NOIBN. "Poison" label required. 480-lb. steel drums.

FLAVORINGS

CAFFEINE ANHYDROUS U.S.P.

See Page 17

ETHAVAN® *Ethylvanillin*

See Page 17

METHYL SALICYLATE U.S.P.

See Page 17

SACCHARIN (CALCIUM AND SODIUM) U.S.P.

See Page 18

VANILLIN MONSANTO* *Vanillin U.S.P.*

See Page 18

HALOGEN-CONTAINING COMPOUNDS (MISC.)

ACL® SANITIZER AND BLEACHING COMPOUND

See Page 71

AROCLOR® POLYCHLORINATED POLYPHENYLS

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquids, resins or solids.

PROPERTIES: Chlorinated aromatic hydrocarbons varying from water-white mobile liquids and pale yellow viscous oils to light amber resins and opaque crystalline solids.

GENERAL INFORMATION: *Aroclor* liquids have excellent electrical characteristics, high dielectric strength and resistivity, low power factor; certain of the liquids have a high dielectric constant as compared with mineral oils.

USES: *Aroclor* liquids are used as dielectrics for condensers or capacitors and transformers. They are used to impregnate carbon resistors, and when combined with other plastic materials, they are excellent sealers or impregnating agents for a variety of electrical apparatus. *Aroclor* compounds also find use as liquid thermostat fluids; vacuum diffusion pump fluids; swelling agents for automotive transmission seals; and, as additives and base stocks for specialty lubricants, oil and greases.

SHIPPING INFORMATION: Resin Synthetic NOIBN without filler. 600-lb. steel drums; 500-lb. net fiber drums; 100-lb. net bags.

BENZYL CHLORIDE *Also known as alpha-chlorotoluene.*

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 126.58

STANDARD FORM: Liquid.

0557437

TOWOLDMON0041171
WATER_PCB-00032217

SPECIFICATIONS: Clear, colorless liquid; sp. gr. 1.104-1.110 at 15.5°/15.5°C. Boiling range at 760 mm 2°C. max. including 179.4°C.

USES: A highly reactive aralkyl halide used in the production of the following: dyestuffs; perfume bases such as benzyl alcohol, acetate and other esters; plasticizers; resins; wetting agents; germicides; rubber accelerators; gasoline gum inhibitors; benzyl benzoate; and pharmaceuticals.

SHIPPING INFORMATION: Chemicals NOIBN, Corrosive liquid (white label required). 475-lb. nickel drums; 2000-gal. 2-compartment nickel tank trucks.

BENZYL CHLORIDE, *Inhibited with 0.25% triethylamine*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Same as for preceding product.

CONTAINERS: 475-lb. lacquer-lined drums.

ortho-DICHLOROBENZENE

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 147.01

STANDARD FORM: Liquid.

SPECIFICATIONS: Appearance, practically clear; Color, 30 APHA max.; Crystallizing Point, minus 7.0°C. max.; Distilling Range—first drop 177.7°C. min.—90% (1-91 ml.) 4.1°C. max.—dry point 188.5°C. max.

USES: Degreasing formulations; tar, grease, paint and carbon removers; spotting agents in dry cleaning; metal polishes; wool and felt scouring; insecticide formulations; and treating of sewage and garbage for odor control.

SHIPPING INFORMATION: ortho-Dichlorobenzol. 55-gal., 18-gauge black iron drums, bulk.

GUAIACOL

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 124.13.

STANDARD FORM: Light yellow liquid.

SPECIFICATIONS: Crystallizing Point 27.5°C. min.

USES: Chemical intermediate in the manufacture of flavors, perfumes and pharmaceuticals. Also used as an "anti-skinning" agent for paints and as an inhibitor in certain petroleum specialties.

SHIPPING INFORMATION: Chemicals NOIBN, 500-lb. drums.

ortho-NITROCHLOROBENZENE

Also known as ortho-chloronitrobenzene.

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 157.56

STANDARD FORM: Cast solid.

SPECIFICATIONS: Green-yellow crystalline mass; crystallizing point 31.8°C. min. (dry basis).

USES: An intermediate in the synthesis of o-aminophenol (dyestuffs intermediate and photographic developer), dichlorobenzidine (chrome-dyestuffs intermediate), and many other organic intermediate chemicals; and a solvent in synthetic-petroleum processes. CAUTION: This material is toxic. Avoid breathing its vapors. Avoid contact with the skin. Toxicity reference: U. S. Public Health Bulletin No. 271 (1941).

SHIPPING INFORMATION: Dye Intermediate NOIBN "Poison" label required. 600-lb. steel drums; tank cars.

para-NITROCHLOROBENZENE

Also known as para-chloronitrobenzene.

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 157.56

STANDARD FORM: Flakes.

SPECIFICATIONS: Appearance light yellow flakes or crystalline mass; crystallizing point 82.5°C. min.

USES: In the manufacture of disodium-benzene-meta-disulfonate; para-aminophenol; 2-chloro-5-nitrobenzene sulfonic acid; 2,6-dichloro-4-nitroaniline; and 5-amino-2-aniline benzene sulfonic acid; pharmaceutical acetophenetidine "Diasone" an agent for treatment of Hansen's disease (Abbott patent;) and a variety of anti-oxidants and gum inhibitors. CAUTION: This product is toxic. Avoid breathing its vapors and avoid contact with the skin. Toxicity refrence: U. S. Public Health Bulletin No. 271 (1941).

SHIPPING INFORMATION: Dye Intermediate NOIBN "Poison" label required. 325-lb. fiber drums.

MONSANTO® PENTA *Pentachlorophenol, Technical.*

See Page 65

PHTHALYL CHLORIDE *Phthaloyl Chloride.*

ORGANIC DIVISION

MOLECULAR WEIGHT: 203.03

STANDARD FORM: Liquid.

SPECIFICATIONS: Yellowish liquid; assay 95.0% min.; crystallizing point 9.0°C. min.

USES: Manufacture of plasticizers and resins, general organic synthesis.

SHIPPING INFORMATION: Chemicals NOIBN. Corrosive liquid (white label required). 605-lb. nickel drums.

SANTOCHLOR® para-DICHLOROBENZENE

See Page 11

SANTOPHEN® 1 GERMICIDE

ortho-benzyl-parachlorophenol.

See Page 65

SANTOPHEN® 1 SOLUTION

See Page 66

TCC *3, 4, 4' Trichlorocarbanilide.*

See Page 66

MONOMERS

ACRYLONITRILE

HYDROCARBONS AND POLYMERS DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 53.03

STANDARD FORM: Liquid.

PROPERTIES: A bi-functional hydrocarbon, it is stable under ordinary conditions, yet can be made to react with a wide variety of other materials. Will copolymerize with most commercial vinyl monomers, will join chemically with a variety of natural or synthetic resin-formers.

USES: Production of synthetic textile fibers, nitrile synthetic rubber, copolymers, and chemical intermediates.

INDUSTRIAL USERS: Chemical, Rubber, Textile.

SHIPPING INFORMATION: Tank cars, drums (350 lbs.), tank trucks, Barges, Tankers, Rail & Truck; Acrylonitrile (Chemicals, NOIBN).

BUTADIENE

HYDROCARBONS AND POLYMERS DIVISION

MOLECULAR WEIGHT: 54.0

STANDARD FORM: Liquified Gas.

SPECIFICATIONS: 99% minimum; inhibited with tertiary butyl catechol.

PROPERTIES: Highly reactive hydrocarbon containing 2 double bonds; polymerizes and co-polymerizes readily, particularly if oxygen is present.

USES: Production of styrene-butadiene rubbers, acrylonitrile-butadiene rubbers, and poly butadiene rubbers; production of various types of latex for use in paints and as binder for non-woven fabrics; raw material for adiponitrile production; manufacture of tetrahydrophthalic anhydride; production of acrylonitrile-butadiene-styrene plastics.

INDUSTRY USERS: Rubber; plastics; surface coatings; chemical manufacture.

SHIPPING INFORMATION: Butadiene. Pressure tank cars. ICC Red gas label; MCA warning label.

ETHYLBENZENE

HYDROCARBONS AND POLYMERS DIVISION

STANDARD FORM: Clear Liquid.

USES: Production of styrene monomer, paint solvents.

SHIPPING INFORMATION: Tank cars, tank trucks, barges, tankers. Ethylbenzene: Flammable liquid (red label).

METHANOL

HYDROCARBONS AND POLYMERS DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 32.04

STANDARD FORM: Liquid.

USES: Methanol is used for the manufacture of formaldehyde, as an antifreeze; as a solvent; a denaturant; and as a chemical intermediate.

INDUSTRIAL USERS: Chemical, Petroleum.

SHIPPING INFORMATION: Tank cars, tank trucks, barges; drums (350-lbs.) Rail & Truck; Methanol. Liquid.

0557438
TOWOLDMON0041172
WATER_PCB-00032218

STYRENE MONOMER

HYDROCARBONS AND POLYMERS DIVISION—
LITERATURE AVAILABLE

STANDARD FORM: Liquid inhibited with TBC.

PROPERTIES: An aromatic hydrocarbon with an aliphatic side chain containing a double bond which permits polymerization, copolymerization and other reactions. A colorless material that polymerizes and copolymerizes with other light-colored materials to yield clear or light-colored products.

USES: Production of styrene molding compounds, synthetic rubber, copolymers, ion exchange resins, polyesters, sytrene modified oils and alkyds for surface coatings.

INDUSTRIAL USERS: Plastics, surface coatings, Chemicals, Rubber.

SHIPPING INFORMATION: Tank trucks, tank cars, barges, Tankers; drums. Styrene Liquid.

VINYL ACETATE MONOMER

HYDROCARBONS AND POLYMERS DIVISION—
LITERATURE AVAILABLE

MOLECULAR WEIGHT: 86.1

STANDARD FORM: Liquid at ordinary temperature and pressure.

SPECIFICATIONS: HQ Grade — Vinyl Acetate Monomer — DPA is also available containing Diphenylamine Inhibitor.

PROPERTIES: A reactive monomer having a double bond which permits polymerization, copolymerization and other reactions.

USES: Production of latices for the paint and surface coatings industry and copolymers for extrusion and molding compounds.

INDUSTRY USERS: Paint manufacturers; chemical manufacturers.

SHIPPING INFORMATION: Vinyl Acetate. Tank cars, tank trucks, barges, tankers. Apply "Dangerous" placards.

VINYL CHLORIDE MONOMER

HYDROCARBONS AND POLYMERS DIVISION—
LITERATURE AVAILABLE

MOLECULAR WEIGHT: 62.50

STANDARD FORM: Liquefied gas shipped either inhibitor free or inhibited with phenol.

PROPERTIES: A reactive monomer having a double bond which permits polymerization, copolymerization and other reactions.

USES: Production of polyvinyl chloride resins, compounds, copolymers and chemical intermediates.

INDUSTRIAL USERS: Chemical manufacturers.

SHIPPING INFORMATION: Tank cars, cylinders (200 lbs.). Rail & Truck: Vinyl Chloride Monomer "Dangerous" Placards Apply.

PHARMACEUTICALS

PHENACETIN U.S.P.

ORGANIC DIVISION

MOLECULAR WEIGHT: 179.21

STANDARD FORM: Crystalline powder.

SPECIFICATIONS: White crystalline powder; solubility in ethyl alcohol 95% (1:15) complete; M.P. 135.0°C. min.; ash 0.05% max.; 5% max. powder retained on 100 mesh.

USES: Commonly used pharmaceutical product, primarily as an anti-pyretic. Prescribed alone or in combination with aspirin and caffeine.

SHIPPING INFORMATION: Chemical NOIBN. 200-lb. and 100-lb. fiber drums.

ASPIRIN

ORGANIC DIVISION

MOLECULAR WEIGHT: 180.15

STANDARD FORM: Crystalline solid.

SPECIFICATIONS: White crystals; assay 99.5% min.; solubility in ethyl alcohol 95% (1:5) complete; solubility in 10% Na_2CO_3 (1:20) complete; ash 0.05% max.; conforms to U.S.P. test for heavy metals, carbonizable impurities, chloride, sulfate and free salicylic acid.

GRADES: 20 mesh; 40 mesh; 80 mesh.

USES: Acetylsalicylic Acid is analgesic and antipyretic. It is used for the treament of acute and chronic rheumatic states, and for headache, neuralgia and influenza.

SHIPPING INFORMATION: Acetylsalicylic Acid. 250-lb. and 100-lb. fiber drums.

CAFFEINE ANHYDROUS U.S.P.

See Page 17

METHAPYRILENE FUMARATE

Thenylpyramine Fumarate

ORGANIC DIVISION

MOLECULAR WEIGHT: 870.98

STANDARD FORM: Powder.

SPECIFICATIONS: White crystalline powder; ash 0.05% max.; assay 99.0% min.; moisture 0.5% max.; M.P. 133°C. min.

USES: In pharmaceutical and antihistaminic preparations.

SHIPPING INFORMATION: Chemicals NOIBN. 100-lb. and 25-lb. fiber drums; 5-lb. fiberpaks.

METHAPYRILENE HYDROCHLORIDE

Thenylpyramine Hydrochloride
N,N-dimethyl-N'-2-pyridyl-N'-2-thenylethylene-diamine hydrochloride.

ORGANIC DIVISION

MOLECULAR WEIGHT: 297.85

STANDARD FORM: Crystalline solid.

SPECIFICATIONS: White or yellow-white crystals; assay 99.2% min.; ash 0.05% max.; moisture 0.1% max.; M.P. 161.5°C. min. to start; 1.0% max. retained on 40 mesh.

GRADES: Thenylpyramine can also be supplied in the form of the fumarate salt, which is preferred in certain applications.

USES: In pharmaceutical preparations for antihistaminic activity or for sleep inducing (non-prescription).

SHIPPING INFORMATION: Chemicals NOIBN. 100-lb. and 25-lb. fiber drums; 5-lb. fiberpaks.

PHENOLPHTHALEIN U.S.P.

ORGANIC DIVISION

MOLECULAR WEIGHT: 318.31

STANDARD FORM: Crystals.

SPECIFICATIONS: White crystals; M.P. 259.0°C. min.; solubility in alcohol (1:15) complete; acidity (ml N/1000 NaOH/2 gm. sample) 3.0 ml max.; ash 0.1% max.; arsenic 0.001% max.; conforms to U.S.P. test for fluorine and heavy metals; trace max. retained on 100 mesh.

USES: Pharmaceutical preparations as a gentle irritant purgative.

SHIPPING INFORMATION: Chemicals NOIBN. 250-lb. and 100-lb. fiber drums.

PHENOLPHTHALEIN, YELLOW

ORGANIC DIVISION

SPECIFICATIONS: Fine yellow powder; loss on drying (3 hrs./ 110°C.) 0.50% max.; ash 0.10% max.

USES: Pharmaceutical preparations as gentle irritant purgative.

PHENOLS

BISPHENOL A

See Page 50

ortho-CHLOROPHENOL

Also known as ortho-hydroxy-chlorobenzene and 2-chloro-hydroxybenzene

ORGANIC DIVISION

MOLECULAR WEIGHT: 128.56

STANDARD FORM: Liquid.

SPECIFICATIONS: Yellow-to-brown liquid; monochlorophenol 98.0% min. Distillation range; first drop 173.0°C. min.; 95% (1-96 ml) 2.0°C. max.; dry point 178.0°C. max.

USES: An intermediate for the production of alizarin dyes, pyrocatechol, tertiary-butylacatechol, etc. CAUTION: This product is toxic. Avoid breathing its vapors and avoid skin contact.

SHIPPING INFORMATION: Dye Intermediate NOIBN. Product label required. 500-lb. steel drums.

0557439

TOWOLDMON0041173
WATER_PCB-00032219

para-CHLOROPHENOL

Also known as para-hydroxy-chlorobenzene and 4-chloro-hydroxybenzene

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 128.56

STANDARD FORM: Cast solid.

SPECIFICATIONS: Appearance crystalline mass; crystallizing point 43°C. min.

USES: An intermediate in the manufacture of Quinizarin Violet, Celliton Fast Red, Violet RN, Indanthrene Brown BRH and Alizarin Cyanine Green dyes; poultry-feed supplement to prevent coccidiosis (Givaudan Patent); and germicides, miticides and pharmaceuticals.

SHIPPING INFORMATION: Dye Intermediate NOIBN. Product label required. 550-lb. galv. drums, bulk.

2, 4-DICHLOROPHENOL

Also known as 2,4-dichloro-hydroxybenzene.

ORGANIC DIVISION

MOLECULAR WEIGHT: 163.01

STANDARD FORM: Cast Solid.

SPECIFICATIONS: Yellow-to-brown crystalline mass; crystallizing point 41.5°C. min.; distillation range: first drop 214.2°C. min.; 95% (1-96 ml) 3.0°C. max.

USES: An intermediate in the production of dyestuffs, herbicides, germicides and fungicides. CAUTION: Care should be exercised in handling this material. Avoid skin contact and breathing its vapor.

SHIPPING INFORMATION: Chemicals, NOIBN. 600-lb. steel drums.

DIHYDROXY DIPHENYL SULFONE

Also known as sulfonyl bis phenol.

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Fine powder.

TYPICAL ANALYSIS: Dihydroxy Diphenyl Sulfone.

PURITY	
65-82%	of 4,4' ISOMER
35-18%	of 2,4' ISOMER

SPECIFICATIONS: Crystallizing point 220-234°C., moisture 0.5% max.

PROPERTIES: Readily nitrated and sulfonated and converted to esters, ethers, etc. Can be chlorinated but less readily than phenol.

USES: Electroplating bath addition agent (U. S. Steel "Ferrostan" patent); base for phenolic resins; intermediate in organic synthesis, and antioxidant in polyvinyl chloride resin manufacture.

SHIPPING INFORMATION: Chemical NOIBN. 200-lb. fiber drums.

para-NITROPHENOL

Also known as para-hydroxy-nitrobenzene

ORGANIC DIVISION

MOLECULAR WEIGHT: 139.11

STANDARD FORM: Granules.

SPECIFICATIONS: Brown granular mass M.P. (dry basis) 112.0°C. min.; assay 99.0% min.; water-insoluble material 0.20% max.; methanol-insoluble material 0.20% max.

USES: An intermediate in the production of dyestuffs from para-aminophenol, photographic chemicals such as para-aminophenol and methyl para-aminophenol and parathion insecticides; fungicide to prevent mold growth on chrome-tanned leather. CAUTION: This product is toxic. Avoid breathing its dust or vapors and avoid contact with the skin.

SHIPPING INFORMATION: Dye Intermediate NOIBN. Product label required. 200-lb. fiber drums.

NONYLPHENOL *Alkyl Phenol*

See Page 72

PHENOL

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 94.11

STANDARD FORM: Solid or liquid solutions.

SPECIFICATIONS: U.S.P.: White crystalline solid; crystallizing point 40.6°C. min. Distillation range: first drop 180.0°C. min.; 100% (first drop to dry point) 2.0°C. max.; 50% to dry point 0.2°C. max. Solutions: Colorless mobile liquids; assay: liquid 85% , 85.0-86.0% ; liquid 90% , 90.0-91.0% ; liquid 92% , 92.0-93.0% .

GRADES: Crystalline solid, U.S.P.; liquid 85% ; liquid 90% ; liquid 92% .

USES: An intermediate in the production of molding resins, varnishes, enamels, lacquers, paints, plywood adhesives, explosives, tanning materials, pharmaceuticals, medicinals, antiseptics, germicides, preservatives, deodorants, soaps, embalming fluids, vermin exterminators, insecticides, oil additives, rubber compounds, photographic chemicals, and dyestuffs; a disinfectant; a selective solvent in lubricant production; and in textile printing. CAUTION: This product is toxic. Avoid breathing its vapors and contact with the skin.

SHIPPING INFORMATION: Phenol. "Poison" label required. Tank cars; tank trucks; 475-lb. steel drums; 200-lb. tins.

SULFONIC ACIDS

CHLOROSULFONIC ACID

INORGANIC DIVISION—LITERATURE AVAILABLE

FORMULA: $ClSO_2OH$

MOLECULAR WEIGHT: 116.53

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Heavy mobile liquid; assay 99.3% $ClSO_3H$; Fe—3 ppm.

USES: In chlorosulfonation reactions. CAUTION: Chlorosulfonic acid reacts violently with water forming hydrochloric and sulfuric acids.

SHIPPING INFORMATION: Chlorosulfonic Acid. Corrosive liquid (white label required). 700-lb., 55-gal. steel and stainless steel drums; 8-lb. bottles single; 80-lb. cases of ten; tank cars and tank trucks.

DDBSA 99-B

See Page 70

DDBSA 99U-B

See Page 70

PHENOLSULFONIC ACID

98 + % para isomer; remainder ortho isomer.

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 174.17

STANDARD FORM: Oily liquid or crystalline mass. (65% aqueous solution).

PROPERTIES: Light brown-to-black liquid or crystalline mass depending on temperature; assay 65% min.

SPECIFICATIONS: Assay 65.0-67.5% free phenol 2.0% max.; free sulfuric acid 3.0% max.; sp. gr. at 15.5°/15.5°C. 1.345-1.365.

USES: Ferrostan process for tin plating (U. S. Steel Co. patent); manufacture of pharmaceuticals, dyestuffs, tanning agents, and other chemical intermediates.

SHIPPING INFORMATION: Acid NOIBN liquid. 600-lb. steel drums.

TOLUENESULFONIC ACID

Mixture of about 80% para and 20% ortho isomers.

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 172.20

STANDARD FORM: Liquid or semi-crystalline solid.

SPECIFICATIONS: Viscous liquid or semi-crystalline solid. Toluenesulfonic acid 95.0% min.; H_2SO_4 1.0% max.; toluene 0.4% max.; sulfone 1.5% max.

USES: Acid catalyst in production of alkyd resins, phenol-formaldehyde resins and phthalate esters; and in other organic syntheses; production of dyes, acid-resistant cements, cresols, herbicides, epoxy-resin varnishes and tung-oil coatings; and refining of toluene.

SHIPPING INFORMATION: Chemical NOIBN. 575-lb. steel drums, bulk.

SULFUR-CONTAINING COMPOUNDS (MISC.)

SODIUM meta-NITROBENZENE SULFONATE

ORGANIC DIVISION

MOLECULAR WEIGHT: 225.15

STANDARD FORM: Wet powder.

SPECIFICATIONS: Acidity 7% max. as H_2SO_4; water 21% max.; assay 70% min.; sulfates 2% max. as Na_2SO_4.

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TOWOLDMON0041174
WATER_PCB-00032220

USES: An electroplating-bath additive; an intermediate in the manufacture of dyestuffs; a mild oxidant in synthetic-fiber dye baths.

SHIPPING INFORMATION: Chemical NOIBN. 250-lb. Polyethylene-lined fiber drums.

para-TOLUENESULFONAMIDE

Also known as para-toluene-sulfonic acid amide and para-sulfonamido-toluene.

ORGANIC DIVISION

MOLECULAR WEIGHT: 171.22

STANDARD FORM: Crystalline powder.

SPECIFICATIONS: White, crystalline powder; crystallizing point (dried material) 136.9°C. min.; moisture 0.5% max.

USES: In the preparation of antiseptics and pharmaceuticals, plasticizers and resins (as a base), and in the preparation of dyestuffs; and as a fungicide for protective coatings.

SHIPPING INFORMATION: Chemicals NOIBN. 275-lb. fiber drums.

para-TOLUENESULFONYL CHLORIDE

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 190.65

STANDARD FORM: Briquettes.

SPECIFICATIONS: White briquettes. Assay 98% min.; crystallizing point 66.5°C. min. (toluene free).

USES: As an intermediate in preparation of dyestuffs such as Brilliant Sulfon Red, Polar Red, Polar Yellow, azo and tri-phenylmethane dyes; tanning materials; pharmaceuticals; acid resistant cements; anti-oxidants; disinfectants; and photographic chemicals.

SHIPPING INFORMATION: Chemicals NOIBN. 300-lb. fiber drums. Product label required.

METHYL PCT *(O, O-dimethyl phosphorochloridothioate)*

ORGANIC DIVISION

MOLECULAR WEIGHT: 160.51

STANDARD FORM: Liquid.

SPECIFICATIONS: Light yellow liquid; assay 96% min.; specific gravity 25°/15.5°C., 1.315-1.325.

USES: Widespread use in the manufacture of biological toxicants. This chemical intermediate will allow the incorporation of the dialkyl thiophosphoryl group into any system with a suitable reactive center. The well-known contribution to the group to flame resistance polymer stabilization, and biological activity will suggest many uses.

CONTAINERS: 500-lb. 55-gallon, 16 gauge, lacquer-lined steel drums.

SHIPPING CLASSIFICATIONS: Corrosive Liquid NOS. (Chemicals NOIBN.) Product label required.

ETHYL PCT *(O, O-diethyl phosphorochloridothioate)*

ORGANIC DIVISION

MOLECULAR WEIGHT: 188.53

STANDARD FORM: Liquid.

SPECIFICATIONS: Colorless to yellow liquid; assay 99.0% min. specific gravity 25°/15.5°C., 1.190-1.200.

USES: Widespread use in the manufacture of biological toxicants. This chemical intermediate will allow the incorporation of the dialkyl thiophosphoryl group into any system with a suitable reactive center. The well-known contribution to the group to flame resistance polymer stabilization and biological activity will suggest many uses.

CONTAINERS: 525-lb. 55-gallon, 16 gauge, lacquer-lined steel drums.

SHIPPING CLASSIFICATIONS: Chemicals NOIBN. Product label required.

SANTICIZER® 1-H PLASTICIZER

See Page 55

SANTICIZER® 3 PLASTICIZER

See Page 55

SANTICIZER® 8 PLASTICIZER

Mixture of N-Ethyl-ortho- and para-Toluenesulfonamides.

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 199.27

STANDARD FORM: Liquid.

SPECIFICATIONS: Light yellow, viscous liquid; odor slight, characteristic; unsubstituted amide 9-13%; acidity (as acetic acid) 0.80 meq/100 gms. max.; color of melt 200 APHA max.

PROPERTIES: Readily miscible with all common organic solvents except the petroleum hydrocarbons in which it is only very slightly soluble. In water, soluble to approx. 0.13% at 23°C., 0.21% at 48°C.; solubility in water decreased by presence of ammonia but increased by other alkalies; soluble in castor oil, slightly soluble in chinawood oil; insoluble in linseed oil; retentivity in cellulose acetate approx. 90 parts by weight to 100 of acetate; imparts a high degree of plasticity. A solvent for both nitrocellulose and cellulose acetate.

USES: An excellent plasticizer for cellulose acetate, giving a brilliance and polish not obtainable with other plasticizers.

SHIPPING INFORMATION: Resin Plasticizer. 530-lb. and 50-lb. drums.

SANTOLITE® MHP RESINS

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Hard resin.

SPECIFICATIONS: Hard, practically colorless resin; refractive index (25 gms. in 75 gms. normal butyl acetate) 1.4275—1.4325; penetration (200 gm. load for 5 seconds at 25°C.) 2.0 mm. max.

GENERAL INFORMATION—PROPERTIES: An aryl sulfonamide-formaldehyde resin similar to *Santolite* MS in characteristics, except that it is much harder, softening at about 62°C., brittle at normal temperatures. Nearly colorless, well adapted to specialty and heat-sealing lacquers, fabric coatings, molding compositions and the like. Being incompatible with drying oils it cannot be used as a varnish material.

USES: Can be used in spraying, dipping or brushing lacquers to make clear, colorless, odorless coatings of good gloss and adhesion. It does not materially increase the viscosity of the solution and permits the building up of a high-solids content in the lacquer. Compatible with all the common plasticizers.

CONTAINERS: 60-lb. cased cans.

SHIPPING INFORMATION: Resin Synthetic NOIBN Without Filler.

SANTOLITE® MS *80% Industrial Resin.*

See page 50

SANTONOX® ANTIOXIDANT

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Solid.

SPECIFICATIONS: Appearance, light gray to light tan powder; Ash, 0.1% max.; melting point, 150°C. min.; moisture, 1.0% max.; fineness, 50 mesh (trace, max.).

PROPERTIES: *Santonox* is probably the best antioxidant available for both low and high density polyethylene. It maintains the melt index and recovery of the polyethylene in extrusion operations better than competitive products. It has little or no effect on electrical properties.

USES: *Santonox* is used as an antioxidant for polyethylene. It offers the best price performance characteristics of all the available antioxidants. *Santonox* is approved by the FDA as an antioxidant for high pressure (low density) polyethylene at 0.05% level for all applications except fatty foods. (Antioxidant for synthetic resins.)

SHIPPING INFORMATION: Chemicals NOIBN. 150-lb. fiber containers.

SANTONOX® R ANTIOXIDANT

See Page 53

SANTOWHITE® CRYSTALS

See Page 62

OTHER ORGANIC CHEMICALS

ACETONE

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 58.08

STANDARD FORM: Liquid.

SPECIFICATIONS: Clear water-white liquid. Color APHA 5 max.; specific gravity 20°C/20°C., 0.791 to 0.793; distillation range, 1.0°C. to include 56.1°C.; moisture 0.5% max.

USES: Solvent, chemical intermediate.

SHIPPING INFORMATION: Acetone NOIBN. Flammable liquid and product labels required. Tank car, tank wagon.

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TOWOLDMON0041175
WATER_PCB-00032221

BENZYL BENZOATE N.F.

ORGANIC DIVISION

MOLECULAR WEIGHT: 212.24

STANDARD FORM: Liquid.

SPECIFICATIONS: Essentially colorless liquid; crystallizing point 18.3°C. min.; refractive index 1.568-1.570 at 20°C.; total chlorine 0.03% max.; assay 99.0% min.; sp. gr. 25°/25°C. 1.117-1.120.

PROPERTIES: High-boiling ester having a pleasant odor.

USES: A miticide (acaracide); fixative in perfumes; preparation of delousing and insect-repellent formulations; medicinally in the treatment of scabies.

SHIPPING INFORMATION: Insect Repellent NOIBN. 500-lb. drums.

BIPHENYL *Also known as diphenyl and phenylbenzene*

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 154.20

STANDARD FORM: Flakes.

SPECIFICATIONS: Colorless to pale yellow crystallized solid or flakes. Freezing point 68.7°C. min.

USES: Biphenyl is used as a wrapping-paper impregnate to reduce citrus-fruit spoilage; a dye carrier and accelerator for synthetic fibers; in the manufacture of ceramics; a low-pressure, high-temperature, non-corrosive heat-transfer medium; and a raw material in the manufacture of a great variety of products, since it is easily chlorinated, sulfonated, nitrated and hydrogenerated.

SHIPPING INFORMATION: Diphenyl. 100-lb. bags; 225-lb. bbls.; 100-lb. kegs.

CYANURIC ACID

INORGANIC DIVISION—LITERATURE AVAILABLE

USES: Intermediate for chlorine derivatives; cross-linking agent in polyepoxide resins; in manufacture of fire-retardant plastics.

TYPICAL ANALYSIS: White crystalline solid; Cyanuric Acid 95% min.; Ammelide 2.5%; chlorides (as Cl) 0.1%; Ammonia (as NH_3) 0.05%; Moisture 0.6% max.; Apparent density 0.6 gm/cc; pH (1 gm/100 ml H_2O) 3.9.

SHIPPING INFORMATION: Packed in 200-lb. net open head fiber drums with a polyethylene bag liner. Shipped as Acid, NOIBN. Dry.

CYCLOHEXANOL

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 100.16

STANDARD FORM: Liquid.

SPECIFICATIONS: Appearance, colorless, viscous liquid; Color 10 APHA max.; Unsaturates (as Phenol), 0.01% max.; Ketones (as Cyclohexanone), 0.05% max.

USES: Intermediate for plasticizers; in dry cleaning and textile industries; solvent in dyestuff operations; manufacture of cyclohexanone and adipic acid.

CONTAINERS: 55-gal. steel drums, bulk.

SHIPPING INFORMATION: Lacquer Solvent NOIBN. Product label required.

ETHYL ACETATE

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Available at following Assays: 99.5%, 85-88%, 95-98%.

SPECIFICATIONS: Clear and free of foreign sediment; color not greater than 5 APHA units; ester content is minimum 99.5% (as Ethyl Acetate); odor is non-residual; water is maximum 0.05%.

USES: Coatings solvent; cellophane coatings solvent; other miscellaneous solvent uses.

INDUSTRIAL USERS: Surface coatings manufacturers (metal, wood, etc.), cellophane manufacturers.

SHIPPING INFORMATION: Tank trucks and tank cars only.

FORMALDEHYDE

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORMS: Available in assays of 37%, 44%, 50% and 52% methanol free and 37%, 44% methanol inhibited (7%).

SPECIFICATIONS: Clear and free of foreign sediment; color not greater than 5 APHA; sp. gr. 1.0925-1.1136 (depending on methanol content); assay 37.0% by weight, minimum; acidity no greater than 0.02% as formic acid; iron no greater than 1 part per million; methanol 0 to 1% (methanol-free) and 7 to 8% (inhibited).

USES: A preservative, disinfectant and chemical intermediate used in the preparation of melamine and phenolic resins.

INDUSTRIAL USERS: Chemical manufacturers.

SHIPPING INFORMATION: Tank trucks. Rail & Truck: Formaldehyde, Liquid.

GLACIAL ACETIC ACID

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: A 99.7% minimum as acetic acid. Material is water white.

SPECIFICATIONS: Clear and free of foreign sediment; color not greater than 5 APHA units; assay minimum 99.7% as acetic acid.

USES: Manufacture of cellulose acetate; manufacture of vinyl acetate; manufacture of acetic ester, proprietary vitamins and foods.

INDUSTRIAL USERS: Textile industry; cellulose acetate industry; vinyl acetate industry. Pharmaceuticals and foods.

SHIPPING INFORMATION: Tank trucks and tank cars only.

HBPA® HYDROGENATED BISPHENOL A

See Page 51

SODIUM BENZOATE, U.S.P. AND TECHNICAL

See Page 19

PHOSPHORUS and PHOSPHORUS DERIVATIVES

AMMONIUM PHOSPHATES

DIAMMONIUM PHOSPHATE

INORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 132.068

STANDARD FORM: Crystalline or powdered material.

PROPERTIES: Brilliant white crystalline or powdered material; stable in air; very soluble in water; pH value of 1% solution 7.75; above 70°C. aqueous solutions lose ammonia readily.

DISSOCIATION PRESSURE: According to Britzke and Dumajew (Gmelin's Handbuch der anorganische Chemie, Ammoniak, p.423) and Warren (JACS 49, 1904, 1927):

Temp. °C.	98	111	125	135	147
NH_3 in mm. Hg.	3.2	10.7	26.0	55.2	123.4

GRADES: Food (meets Food Chemicals Codex requirements).

USES: As a source of phosphorus and non-protein nitrogen for ruminant feeds; Fire retardant; yeast food by yeast producers and breweries; as bread improvers, to control pH of soda crackers; catalyst for urea-formaldehyde resins; chrome dyeing of wool; source of N and P_2O_5 for soluble fertilizers.

SHIPPING INFORMATION: Phosphate of Ammonia, 100-lb. bags; 300 and 100-lb. fiber drums.

ETHYL AMMONIUM PHOSPHATE

INORGANIC DIVISION

TYPICAL ANALYSIS: 65% solution of Ethyl Acid Phosphate neutralized with ammonia 33% P_2O_5; sp. gr. @ 25°C., 1.21 or 10.1 lbs. per gal.

SHIPPING INFORMATION: Chemicals. 135-lb. and 500-lb. drums.

MONOAMMONIUM PHOSPHATE

INORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 115.07

STANDARD FORM: Crystalline or powdered material.

PROPERITES: A brilliant white crystalline or powdered material; stable in air; soluble in hot and cold water; pH of 1% solution 4.7.

GRADES: Food (meets Food Chemicals Codex requirements).

USES: Flameproofing paper, wood, textiles; prevents afterglow in matches; for special medicinal purposes; nutrient solutions; manufacture of yeast, vinegar, yeast foods, bread improvers; acidulent in dye bath.

SHIPPING INFORMATION: Phosphate of Ammonia. 100-lb. bags; 300 and 100-lb. fiber drums.

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TOWOLDMON0041176
WATER_PCB-00032222

TRIETHYLAMMONIUM PHOSPHATE

INORGANIC DIVISION

GENERAL INFORMATION: An additive for non-aqueous materials for stabilizing corrosive and iron-sensitive liquids such as lacquers in metal containers.

SHIPPING INFORMATION: Flammable Liquid, NOS. (Chemicals, NOIBN.) 40-lb. and 450-lb. drums.

CALCIUM PHOSPHATES

CALCIUM PYROPHOSPHATE

INORGANIC DIVISION

FORMULA: $Ca_2P_2O_7$

MOLECULAR WEIGHT: 254.10

STANDARD FORM: Powder.

PROPERTIES: Finely subdivided powder; contains CaO, 43.8%; P_2O_5, 55.5%. Meets Food Chemicals Codex requirements.

USES: Food fortification and vitamin tablets as a mineral supplement and dentifrice polishing agent.

SHIPPING INFORMATION: Calcium Phosphate. 100-lb. bags; 400-lb. bbls.; 100-lb. drums.

DICALCIUM PHOSPHATE, ANHYDROUS

INORGANIC DIVISION

FORMULA: $CaHPO_4$

MOLECULAR WEIGHT: 136.06

STANDARD FORM: Finely divided powder.

TYPICAL ANALYSIS: Total P_2O_5-51.3% total CaO. Meets Food Chemicals Codex requirements.

PROPERTIES: White, tasteless, finely divided powder.

USES: Primarily as a polishing agent in tooth pastes and powders, and as a mineral supplement in foods and cereals.

SHIPPING INFORMATION: Calcium Phosphate. 50-lb. bags; 350 and 100-lb. drums.

DICALCIUM PHOSPHATE, DIHYDRATE

INORGANIC DIVISION

FORMULA: $CaHPO_4 \cdot 2H_2O$

MOLECULAR WEIGHT: 172.09

STANDARD FORM: Powder.

TYPICAL ANALYSIS: Phosphorus 18.1%; calcium 23.7%. Meets Food Chemicals Codex requirements.

PROPERTIES: White tasteless crystalline powder; soluble in dilute citric acid solution; very slightly soluble in water; insoluble in alcohol and glycerin. The stabilized dentifrice grade is prepared specially for use in dentifrices and does not set-up hard when used to formulate tooth paste.

GRADES: Regular U.S.P. grade +stabilized dentifrice grades.

USES: Medicinal: mineral supplement for foods and cereals; polishing ingredient in tooth pastes and powders.

SHIPPING INFORMATION: Calcium Phosphate. 60 and 100-lb. bags; 100 and 225-lb. fiber drums.

H. T.® MONOCALCIUM PHOSPHATE,

Monohydrate

See Page 18

LUSTRE-PHOS® DENTIFRICE ABRASIVE

INORGANIC DIVISION

PROPERTIES: White tasteless crystalline powder, insoluble in water and alcohol.

GRADES: Dentifrice grades.

USES: In dentrifices as a controlled abrasive to impart optimum cleaning and polishing of the teeth.

SHIPPING INFORMATION: Dicalcium Phosphate. 60-lb. and 100-lb. bags.

PY-RAN® ANHYDROUS MONOCALCIUM PHOSPHATE

See Page 18

TRICALCIUM PHOSPHATE

INORGANIC DIVISION

FORMULA: $3Ca_3(PO_4)_2 \cdot Ca(OH)_2 \cdot 3H_2O$

MOLECULAR WEIGHT: 1,058.7

USES: Toothpaste and tooth powder formulations; as a mineral supplement in foods and pharmaceuticals; to prevent caking in salt, sugar, talc and other powder materials. Meets Food Chemicals Codex requirement.

SHIPPING INFORMATION: Phosphate of Calcium. 60-lb. bags and 150-lb. drums.

PHOSPHORIC ACIDS

PHOSPHORIC ACID *75, 80 and 85%*

INORGANIC DIVISION—LITERATURE AVAILABLE

FORMULA: H_3PO_4

MOLECULAR WEIGHT: 98.00

GRADES: N.F.; food, meets Food Chemicals Codex requirements; commercial, clear, water-white liquid.

SPECIFICATIONS: Clear, water-white liquid miscible with water in all proportions; 75%, 80% and 85% H_3PO_4.

PHOSPHORIC ACID PLANTS. Complete, wet phosphoric acid manufacturing plants using the Prayon process offered by Engineering Sales Department.

USES: Manufacture of sodium phosphates, ammonium phosphates calcium phosphates and other phosphates; drying agent in the synthesis of various intermediate chemicals and dyes; process engraving and litho trades; the manufacture of gelatin; substitute for tartaric and citric acids in jelly, preserves and soft drinks; opacifier in glass manufacture; manufacture of certain pharmaceutical chemicals and dental cements; manufacture of rustproofing compounds; silage preservation; defecating and clarifying agent in sugar; for brightening the color of silk; dyeing of cotton; calico printing; water softening and correction of alkalinity; electro polishing of stainless and carbon steels; steel pickling; manufacture of special bricks; petroleum catalyst; aluminum bright dip bath component.

SHIPPING INFORMATION: Phosphoric Acid. 200 and 700-lb. stainless steel drums; 700-lb. lacquer lined drums; tank cars and tank trucks.

PHOSPHOLEUM® SUPER PHOSPHORIC ACID

INORGANIC DIVISION—LITERATURE AVAILABLE

FORMULA: H_3PO_4

MOLECULAR WEIGHT: 98.00

GRADES: Industrial, commercial liquid.

SPECIFICATIONS: Clear miscible with water in all proportions 105% H_3PO_4.

USES: Natural desiccant; sequestrant for trace minerals; catalyst or dehydrator in organic synthesis; drying agent in the synthesis of various intermediate chemicals and dyes; manufacture of rustproofing compounds; steel pickling; manufacture of special bricks; petroleum catalyst.

SHIPPING INFORMATION: Phosphoric Acid. Tank cars and tank trucks.

POTASSIUM PHOSPHATES

MONOPOTASSIUM PHOSPHATE

INORGANIC DIVISION—LITERATURE AVAILABLE

FORMULA: KH_2PO_4

MOLECULAR WEIGHT: 136.09

STANDARD FORM: White crystals.

TYPICAL ANALYSIS: P_2O_5, 51.69%; K_2O, 34.31%; ignition loss 13.24%; SO_3 none; pH 4.6.

USES: To control pH of culture media in penicillin manufacture; special medicinal purposes; soluble fertilizers.

SHIPPING INFORMATION: Potassium Phosphate. 350 and 150-lb. net drums; 100-lb. bags.

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TOWOLDMON0041177

WATER_PCB-00032223

TETRAPOTASSIUM PYROPHOSPHATE

INORGANIC DIVISION

FORMULA: $K_4P_2O_7$

MOLECULAR WEIGHT: 330.34

STANDARD FORM: Powder.

PROPERTIES: White powder, hygroscopic in air; pH value in 1% solution 10.4 at 25°C.; solubility 190 gms. in 100 gms. water at 25°C.

USES: In textile oils and soaps to increase emulsifying values and to prevent formation of insoluble hard water soaps; clarifying agent; to improve cleansing action of soaps.

SHIPPING INFORMATION: Potassium Phosphate. 350 and 150-lb. drums.

TRIPOTASSIUM PHOSPHATE

INORGANIC DIVISION

FORMULA: K_3PO_4

MOLECULAR WEIGHT: 212.27

STANDARD FORM: Powder.

PROPERTIES: White crystalline powder soluble in water; insoluble in alcohol; very hygroscopic.

GRADES: Hydrated.

USES: Used in synthetic (cold) rubber manufacturing.

SHIPPING INFORMATION: Potassium Phosphate. 300-lb. net fiber drums.

SODIUM PHOSPHATES

DISODIUM PHOSPHATE, ANHYDROUS

INORGANIC DIVISION

FORMULA: Na_2HPO_4

MOLECULAR WEIGHT: 141.98

STANDARD FORM: Powder.

PROPERTIES: Soluble in water; insoluble in alcohol; on exposure to air will absorb 2-7 mols H_2O depending on humidity and temperature; losses molecular water at 240°C. forming tetrasodium pyrophosphate; pH of 1% solution 8.8 at 25°C. One lb. anhydrous product equivalent to 2.5 lbs. crystalline (dodecahydrate).

GRADES: Food (Granular and Powdered); Medicinal, U.S.P.

USES: For boiler water treatment; in making glazes for potteries, porcelains and chinaware; as an emulsifier in making process cheese; in various chemical processes; in manufacture of dyestuffs such as Schnitzler's green; in the preparation of enamels; in tinning and soldering; in leather tanning; as a bath ingredient in galvanoplastic work; in the manufacture of pigments such as cobalt phosphate; in the weighing of milk and impregnating of textiles in dyeing and calico printing; in the adjustment of condensed milk; medicinal.

SHIPPING INFORMATION: Disodium Phosphate. 100-lb. bags; 350 and 100-lb. drums.

DISODIUM PHOSPHATE, DUOHYDRATE

INORGANIC DIVISION

FORMULA: $Na_2HPO_4 \cdot 2H_2O$

MOLECULAR WEIGHT: 178.0

STANDARD FORM: Crystalline powder.

PROPERTIES: Soluble in water, insoluble in alcohol; equivalent to 82% of sodium phosphate, di, anhydrous (see preceding product for further information on properties.)

GRADES: Food (conforms with Federal and State Pure Food Laws).

USES: Especially recommended for use in preventing coagulation during condensation of milk and as an emulsifying agent in processing cheese.

SHIPPING INFORMATION: Disodium Phosphate. 100-lb. bags.

INSOLUBLE METAPHOSPHATE

INORGANIC DIVISION

FORMULA: $(NaPO_3)_x$

MOLECULAR WEIGHT: (102)x

STANDARD FORM: Powder.

PROPERTIES: Insoluble in water and alcohol.

GRADE: Powdered.

USES: Primarily in toothpastes and powders. Considered compatible with fluorides in toothpastes.

SHIPPING INFORMATION: Sodium phosphate. 60-lb. bags; 325 and 100-lb. drums.

IP-61® SODIUM TRIMETAPHOSPHATE

INORGANIC DIVISION—LITERATURE AVAILABLE

FORMULA: $(Na_3PO_3)_3$

MOLECULAR WEIGHT: 305.94

STANDARD FORM: Dry Powder.

PROPERTIES: *IP-61* is a salt of a strong base and a strong acid. Chemically it has no buffering or sequestering power and hence no inherent detergent building properties. However, when reacted with caustic soda, *IP-61* is converted rapidly and completely to sodium tripolyphosphate.

SHIPPING INFORMATION: Sodium Phosphate.

LEVN-LITE® LEAVENING AGENT

See Page 18

MONOSODIUM PHOSPHATE

INORGANIC DIVISION

FORMULA: NaH_2PO_4

MOLECULAR WEIGHT: 119.99

STANDARD FORM: Powder and granular.

PROPERTIES: Contains not less than 58% P_2O_5; pH value o 1% solution 4.6.

GRADES: Food; commercial.

USES: Acid phosphate in metal cleaners, water conditioner, electroplate solution buffer, textile dyeing aid. Emulsified in process cheese, mineral supplement, pharmaceutical ingredient.

SHIPPING INFORMATION: Sodium Phosphate. 100-lb. bags; 350 and 100-lb. drums.

OILFOS® GLASSY SODIUM PHOSPHATE

INORGANIC DIVISION

STANDARD FORM: Dry powder.

PROPERTIES: *Oilfos* is used exclusively for controlling viscosity of oil well drilling muds.

SHIPPING INFORMATION: Sodium Phosphate. 100-lb. net paper bags; triotex bags.

PAN-O-LITE® LEAVENING AGENT

See Page 18

SODIUM ACID PYROPHOSPHATE

See Page 18

SODIUM HEXAMETAPHOSPHATE

INORGANIC DIVISION—LITERATURE AVAILABLE

FORMULA: An amorphous glass of composition equivalent to $Na_{16}P_{14}O_{45}$.

AVERAGE MOLECULAR WEIGHT: 1490

STANDARD FORMS: Glass platelets, granules and powder.

TYPICAL ANALYSIS: 32.5% total Na_2O; 67.0% total P_2O_5; pH 1% solution, 6.9; less than 1.0 ppm Pb; less than 1.0 ppm F; 0.1 ppm As_2O_3; trace SO_4; 0.010% iron.

PROPERTIES: Infinitely soluble in water. Bulk density—glass platelets, 77.5 lbs./cu. ft.; granules, 99.5 lbs./cu. ft.; powder, 100.0 lbs./cu. ft.

USES: Water softener; in treatment of boiler water; in dishwashing compositions and detergents; deflocculating agent; textile and food processing.

SHIPPING INFORMATION: Sodium Phosphate, NOIBN. 100-lb. net multiwall paper bags; 100-lb. net burlap bags.

SODIUM TRIPOLYPHOSPHATE

INORGANIC DIVISION

FORMULA: $Na_5P_3O_{10}$

MOLECULAR WEIGHT: 367.93

STANDARD FORM: Granules or powder.

PROPERTIES: White granular material or white powder; water-soluble with excellent water-softening and detergent properties; pH 9.5 of 1% solution. A calcium sequestering agent and also has a high binding power for most of the metals of Group II and Group IV.

USES: Soap builder; detergent and water softener; conditioning oil drilling muds; eliminates scum and soap curds in hard water.

SHIPPING INFORMATION: Sodium Phosphate. 100-lb. bags; 350 and 100-lb. drums

0557444

TOWOLDMON0041178
WATER_PCB-00032224

SQ PHOSPHATE* SEQUESTRANT

INORGANIC DIVISION

STANDARD FORM: Dry powder.

TYPICAL ANALYSIS: P_2O_5 63.0%; Na_2O 36.0%; pH 1% solution 7.9.

PROPERTIES: *SQ Phosphate* is a glassy polyphosphate with high calcium sequestering properties. It is used in formulating industrial cleaning compounds such as dishwashing and dairy cleaners.

SHIPPING INFORMATION: Sodium Phosphate. 100-lb. net paper bags or triotex bags.

STABIL-9® LEAVENING AGENT

See Page 18

TRISODIUM PHOSPHATE, ANHYDROUS

INORGANIC DIVISION

FORMULA: Na_3PO_4

MOLECULAR WEIGHT: 164

STANDARD FORM: Granular, nearly white crystals.

TYPICAL ANALYSIS: Assay, Na_3PO_4—97.9%. Loss on ignition at 550°C.—1.0%.

USES: The same as ordinary Trisodium Phosphate but where higher concentration or less bulk is desired, one pound is equivalent to 2.33 pounds of the crystalline grade.

SHIPPING INFORMATION: Trisodium Phosphate. 100-lb. bags; 350 and 100-lb. drums.

TRISODIUM PHOSPHATE, CRYSTALLINE

INORGANIC DIVISION—LITERATURE AVAILABLE

FORMULA: $Na_3PO_4 \cdot 12H_2O$

MOLECULAR WEIGHT: 380.16

STANDARD FORM: Crystalline material.

SPECIFICATIONS: White crystalline material, uniformly sized; quickly soluble in water giving an alkaline reaction; pH of 1% solution 11.8.

USES: Principally in cleaners and detergents for both household and industrial use; in fruit cleaning to remove insecticide sprays and inhibit growth of fruit mold; in water treatment for softening and conditioning water.

SHIPPING INFORMATION: Trisodium Phosphate. 100-lb. bags; 325 and 100-lb. drums.

TETRASODIUM PYROPHOSPHATE

INORGANIC DIVISION—LITERATURE AVAILABLE

FORMULA: $Na_4P_2O_7$

MOLECULAR WEIGHT: 265.95

STANDARD FORM: Crystals or granules.

PROPERTIES: White crystalline material or white granular powder; pH of 1% solution 10.2; solubility; 6 parts in 100 parts of water at 15°C., 40 parts in 100 parts of water at 100°C.

GRADES: Anhydrous.

USES: As a soap builder; conditioning oil drilling wells; in bleaching, especially for straw, and as an ink eradicator; in manufacture of iron pyrophosphate and other pyrophosphates; household and industrial cleaner and detergent; in dye bath for putting certain types of dye in complete solution; electroplating; metal cleaning; electrolytic separation of various metals; as emulsifier in process cheese manufacture; degumming textiles; stabilizing hydrogen peroxide baths; reagent for de-inking newsprint.

SHIPPING INFORMATION: Sodium Phosphate. Regular—100-lb. paper bags; 200-lb. and 100-lb. drums; Powdered—100-lb. paper bags; 350-lb. and 100-lb. drums.

OTHER PHOSPHORUS AND PHOSPHORUS DERIVATIVES

ALKOPHOS® *Aluminum Acid Phosphates.*

INORGANIC DIVISION

STANDARD FORM: Liquid.

PROPERTIES:

	Alkophos C	Alkophos CE
P_2O_5	33.1%	36.0%
Al_2O_3	8.6%	11.0%
Sp. Gr. 25°/15.5°C.	1.47%	1.60%

USES: Coating for electrical steel transformer and motor laminations; binder for high temperature insulation brick and other refractories; high temperature water insoluble binder or adhesive.

SHIPPING INFORMATION: Aluminum phosphate. 175-lb. and 650-lb. drums.

ALKYL ACID PHOSPHATES

INORGANIC DIVISION—LITERATURE AVAILABLE

TYPICAL ANALYSIS:

Phosphoric Acid Ester	P_2O_5 %	Sp. Gr. @ 25°C.	Lbs. per Gal.	Acid No. Mg. KOH/g
Amyl	40	1.09	9.1	362
n-Butyl	40	1.13	9.4	396
Ethyl	54	1.29	10.7	523
n-Propyl	45	1.21	10.1	455

USES: Additions to paint and varnish compositions to improve adhesion to metal surfaces; as catalyst in urea resin formation; as polymerizing agents for resins and oils.

SHIPPING INFORMATION: Acids Liquid NOIBN. Amyl: 135-lb. and 500-lb. drums. n-Butyl: 135-lb. and 500-lb. drums. Ethyl: 150-lb. and 575-lb. drums. n-Propyl: 140-lb. and 525-lb. drums.

CRESYL DIPHENYL PHOSPHATE *(Gasoline Grade)*

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Clear, light amber liquid.

SPECIFICATIONS: Color NPA 1.5 max.; sp. gr. 1.200—1.215 at 25/25°C.; Phosphorus 8.7—9.2%; Acidity 0.2 mg. KOH/gram max.

GENERAL INFORMATION: Soluble in aromatic and alifatic solvents; insoluble in water. Soluble in gasoline at dosage normally used.

USES: Effective in combating abnormal combustion due to glowing combustion chamber deposits and fouled spark plugs. A proved surface ignition control agent and combustion deposit modifier. Recommended dosage 0.4—0.6 cc Cresyl Diphenyl Phosphate per gallon of gasoline (varies depending on lead content of gasoline.)

SHIPPING INFORMATION: Gasoline Additives, containing less than 50% Petroleum Oil (Chemicals, NOIBN). 55-gal. non-returnable black iron drums; tank cars and tank trucks.

CRESYL DIPHENYL PHOSPHATE

(Plasticizer Grade)

SANTICIZER® 140

See Page 56

DEQUEST® 2000 *Deflocculating and sequestering agent*

INORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Pale yellow aqueous solution, 50% active, sp. gr. 1.33 @ 20°/10°C., pH (1% solution @ 25°C.) <2.0.

PROPERTIES: A highly effective, hydrolytically stable organophosphorus deflocculating and sequestering agent which not only forms stable chelates with all heavy metal ions but also, as a strong electrolyte, has excellent dispersing ability and exhibits threshold inhibiting effect in preventing the precipitation of insoluble minerals.

USES: Useful in any aqueous system for the prevention of scale formation or to inhibit precipitation. A particularly effective additive in acid cleaner formulations for the control of extraneous metal ions and to improve soil or scale removal. Stabilizes solutions of hydrogen peroxide. Effective rust remover.

SHIPPING INFORMATION: Tank cars; tank trucks; 15 gal. and 30 gal. polyethylene lined fiber drums and 55 gal. polyethylene coated steel drums.

DEQUEST® 2006 *Deflocculating and sequestering agent*

INORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Pale yellow aqueous solution, 40% active, sp. gr. 1.41 — 20°/10°C., pH (1% solution @ 25°C.) 10.0-11.0.

PROPERTIES: DEQUEST 2006 is a solution of the sodium salt of DEQUEST 2000. (See above.)

USES: An excellent deflocculating and sequestering agent. DEQUEST 2006 has the same performance qualities as DEQUEST 2000. In its sodium salt form it is directly useful in neutral or alkaline systems for the removal or prevention of scale or to prevent mineral precipitation. An effective agent for deflocculating clays, cements, resins, pigments and the like. A particularly effective additive for alkaline cleaners (such as bottle washing formulas or dairy cleaners) or in general purpose detergents to improve soil removal and counteract water hardness or other mineral interferences. By controlling "tramp" metal ions, DEQUEST 2006 is effective in stabilizing peroxide bleaching baths and in the stabilization of soaps and detergents.

FERROPHOSPHORUS *Iron Phosphide.*

INORGANIC DIVISION

STANDARD FORM: Chill cast lumps, egg size, ½ inch or less.

TYPICAL ANALYSIS: A gray alloy of iron and phosphorus which fractures easily; contains 23-26% phosphorus.

0557445

TOWOLDMON0041179
WATER_PCB-00032225

USES: Used in iron and steel castings to increase fluidity; in sheet steel to prevent sticking of sheets in final rolling; in wire to give stiffness and better surface for drawing; paint pigment; neutron barrier in radiation shielding concrete and densification of drilling muds and explosives.

SHIPPING INFORMATION: Ferrophosphorus. Bulk; 500-lb. bbls.

METHYL DIPHENYL PHOSPHATE

(Offered as Phostene® Brand of MDP)

See Page 35

PHOSPHORUS, ELEMENTAL

INORGANIC DIVISION—LITERATURE AVAILABLE

PROPERTIES: Light yellow, wax-like semi-transparent solid; burns spontaneously in air to form P_2O_5; M.P.44. 1°C.; very soluble in carbon bisulfide; insoluble in water.

GRADES: Monsanto process of manufacture provides over 99.9% purity.

USES: Manufacture of phosphorus alloys, phosphoric anhydride, phosphorus compounds, phosphoric acid, rodent poisons, flares, smoke screens, etc.

SHIPPING INFORMATION: Phosphorus Yellow, toxic and inflammable (yellow label required.) 400-lb. drums; tank cars.

PHOSPHORUS OXYCHLORIDE

INORGANIC DIVISION—LITERATURE AVAILABLE

FORMULA: $POCl_3$

MOLECULAR WEIGHT: 153.35

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Water-white liquid; assay 99.75% $POCl_3$; sp. gr. 15.5°C./15.5°C., 1.685; free Cl_2, trace; PCl_3, 0.12%; distillation range °C.: first drop 106.7, 1-96 ml 1.0, dry point 107.9.

USES: A chlorinating agent and catalyst in the preparation of various intermediates, dyestuffs, medicinals; reagent in the preparation of acetic anhydride and organic phosphates.

CAUTION: Care must be exercised in handling this product. Avoid breathing its vapors. Avoid contact with the skin. It reacts with water with explosive violence.

SHIPPING INFORMATION: Phosphorus Oxychloride. Corrosive liquid (white label required). 725-lb. nickel drums; 4,000 and 8,000-gal. nickel tank cars.

PHOSPHORUS PENTASULFIDE

INORGANIC DIVISION

FORMULA: P_2S_{10}

MOLECULAR WEIGHT: 444.58

STANDARD FORM: Light greenish yellow granular powder.

PROPERTIES: Monsanto is unique in offering both highly reactive and low reactive grades distilled for highest purity.

USES: Manufacture of lubricating oil additives; thiophosphate insecticides; thiophosphate salts for ore flotation; also as a catalyst in production of blown asphalt; and as an intermediate in organic synthesis.

SHIPPING INFORMATION: Phosphorus Pentasulfide. 150 and 325-lb. drums.

PHOSPHORUS PENTOXIDE *(Phosphoric Anhydride)*

INORGANIC DIVISION

FORMULA: P_2O_5

MOLECULAR WEIGHT: 141.96

STANDARD FORM: White microcrystalline powder.

PROPERTIES:

Vapor Pressures: (after J. C. Southard and R. A. Nelson—JACS, 59, 911 -1937-)

p =vapor pressure in cm. of mercury
T =absolute temperature
A (low temperature form)
B (high temperature form)
L (liquid)

$\text{Log}_{10}p = 9.792—(5000/T)$
$\text{Log}_{10}p = 11.113—(7930/T)$
$\text{Log}_{10}p = 6.809—(4320/T)$

Atmospheric sublimation temperature: 358.9°C.
Heat of vaporization:
A—22,800 calories per gm. molecule
B—36,200 calories per gm. molecule
L—19,700 calories per gm. molecule
Heat of fusion: 16,500 calories per gm. molecule
Probable molecular formula of vapor: P_4O_{10}

TYPICAL ANALYSIS: P_2O_5—99.5% lower oxides .01% as P_2O_5; color 60% water solution 50 APHA.

USES: As a desiccant; in the production of alkyl phosphates; a catalyst in air blown asphalt; in the manufacture of fluorophosphates; in the making of phosphorus insecticides; and in the production of oil additives.

SHIPPING INFORMATION: Phosphoric Anhydride. (Flammable —yellow label required). 400 and 60-lb. drums.

PHOSPHORUS TRICHLORIDE

INORGANIC DIVISION—LITERATURE AVAILABLE

FORMULA: PCl_3

MOLECULAR WEIGHT: 137.35

TYPICAL ANALYSIS: Water-white liquid; assay 99.75% PCl_3; sp. gr. 15.5°C./15.5°C. 1.586; distillation range °C.: first drop 74.8, 1-96 ml 0.9, dry point 76.0.

USES: A chlorinating agent and catalyst in the preparation of various intermediates and dyestuffs; reagent in the preparation of acetic anhydride, organic phosphates, germicides and medicinals; manufacture of phosphorus oxychloride and phosphorus pentachloride; in producing iridescent metallic deposits.

CAUTION: Care must be exercised in handling this product. Reacts with water. Avoid breathing its vapors. Avoid contact with the skin.

SHIPPING INFORMATION: Phosphorus Chloride. "Corrosive liquid" label required. 675-lb. (approx.) nickel drums; 4,000 and 8,000-gal. nickel tank cars.

TRICRESYL PHOSPHATE

See Pages 36 and 54

TRIPHENYL PHOSPHATE

See Page 54

TRIPHENYL PHOSPHITE

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 310.28

SPECIFICATIONS: Light yellow solid or oily liquid; sp. gr. 1.179 to 1.183; free phenol 0.5% max.; hydrolyzable chlorine 0.01% max.; color APHA 50 max.; refractive index at 25°C. 1.587 to 1.590.

PROPERTIES: A crystalline solid at slightly below room temperature; at higher temperatures is an oily liquid weighing about 9.85 lbs. per gal.

USES: A color improver and metal scavenger in alkyd resin production. Also used as a stabilizer in polyvinyl chloride compounds. Monsanto's patent No. 2572571 covers this and resellers and users must be licensed.

SHIPPING INFORMATION: Chemicals NOIBN. 55 and 5-gal. drums.

PETROCHEMICALS

BENZENE

HYDROCARBONS AND POLYMERS DIVISION

FORMULA: C_6H_6

MOLECULAR WEIGHT: 78.1

STANDARD FORM: Liquid.

GENERAL INFORMATION: Benzene is an aromatic hydrocarbon, used in the manufacture of styrene, phenol, cyclohexane, synthetic detergents, and many other organic chemicals and intermediates.

SHIPPING INFORMATION: Benzol. Flammable liquid. Red label. Barges, tank cars, tank trucks.

BUTENE-2 CONCENTRATE

HYDROCARBONS AND POLYMERS DIVISION

FORMULA: $CH_3CH=CHCH_3$

MOLECULAR WEIGHT: 56.1

STANDARD FORM: Liquid (under pressure).

GENERAL INFORMATION: Butene-2 Concentrate is a colorless olefinic hydrocarbon used as a cross-linking agent in the manufacture of chemical intermediates and in specialty solvent applications. It is predominantly *cis* and *trans* butene-2.

SHIPPING INFORMATION: Liquefied petroleum gas. Flammable gas; red gas label. Tank cars, tank trucks.

BUTYLENES *Mixed Isomers*

HYDROCARBONS AND POLYMERS DIVISION

FORMULA: C_4H_8

MOLECULAR WEIGHT: 56.1

STANDARD FORM: Liquid (under pressure).

GENERAL INFORMATION: Mixed butylenes are used in the manufacture of polymers and chemical intermediates. Principal constituents are *iso*-butylene and *n*-butene-1.

SHIPPING INFORMATION: Liquefied petroleum gas (mixed butylenes). Flammable gas; red gas label. Tank cars, tank trucks.

0557446

TOWOLDMON0041180
WATER_PCB-00032226

C_9 AROMATIC CONCENTRATE *Mixed Isomers*

HYDROCARBONS AND POLYMERS DIVISION

FORMULA: $(CH_3)_3C_6H_3$

MOLECULAR WEIGHT: 120.2

STANDARD FORM: Liquid.

GENERAL INFORMATION: This is a highly concentrated C_9 aromatic stream containing primarily tri-methyl-benzene isomers. It is used in specialty solvent applications and in manufacture of chemical intermediates.

SHIPPING INFORMATION: Petroleum Naphtha. Tank cars, tank trucks.

DICYCLOPENTADIENE CONCENTRATE

HYDROCARBONS AND POLYMERS DIVISION

FORMULA: $C_5H_6C_5H_6$

MOLECULAR WEIGHT: 132.20

STANDARD FORM: Liquid.

GENERAL INFORMATION: Dicyclopentadiene concentrate contains approximately 85% dicyclopentadiene, and is used in manufacture of hydrocarbon resins, insecticides, surface coatings, and chemical intermediates.

SHIPPING INFORMATION: Petroleum naphtha; tank cars.

ETHYLENE

HYDROCARBONS AND POLYMERS DIVISION

STANDARD FORM: Gas

FORMULA: C_2H_4

MOLECULAR WEIGHT: 28.05

TYPICAL ANALYSIS: 99.80% min.

USES: Major uses are in the production of polyethylene, ethyl alcohol, ethylene glycol and styrene and various other chemical intermediates.

SHIPPING INFORMATION: Ethylene Gas by Pipeline.

ISOPRENE CONCENTRATE

HYDROCARBONS AND POLYMERS DIVISION

FORMULA: $CH_2=CHC(CH_3)=CH_2$

MOLECULAR WEIGHT: 68.1

STANDARD FORM: Liquid.

GENERAL INFORMATION: Isoprene concentrate contains approximately 60% isoprene, in a mixture with other C_5 hydrocarbons. It is used in the production of isoprene monomer for cis-polyisoprene rubber, and as a raw material for resins and intermediates.

SHIPPING INFORMATION: Petroleum Oil, NOIBN (Petroleum partially refined). Flammable liquid. Red label. Tank trucks.

METHYLACETYLENE/ALLENE CONCENTRATE

HYDROCARBONS AND POLYMERS DIVISION

FORMULA: $CH\equiv C—CH_3/CH_2=C=CH_2$

MOLECULAR WEIGHT: 40.1

STANDARD FORM: Liquid (under pressure).

GENERAL INFORMATION: Methylacetylene/allene concentrate is a reactive light hydrocarbon for chemical synthesis. It has reactive properties similar to those of acetylene, yielding interesting specialty derivatives.

SHIPPING INFORMATION: Liquefied petroleum gas. Flammable gas; red gas label. Tank cars.

PARA/META XYLENES

HYDROCARBONS AND POLYMERS DIVISION

FORMULA: $(CH_3)_2C_6H_4$

MOLECULAR WEIGHT: 106.2

STANDARD FORM: Liquid.

GENERAL INFORMATION: Para/Meta xylenes are used in the production of chemical intermediates such as terephthalic acid, dimethyl terephthalate and isophthalic acid.

SHIPPING INFORMATION: Xylol. Flammable liquid; red label; barges.

PIPERYLENE CONCENTRATE

HYDROCARBONS AND POLYMERS DIVISION

FORMULA: $CH_3-CHCH=CHCH_2$

MOLECULAR WEIGHT: 68.11

STANDARD FORM: Liquid.

GENERAL INFORMATION: Piperylene concentrate contains approximately 50% trans and cis-piperylenes, and is used in manufacture of hydrocarbon resins and chemical intermediates.

SHIPPING INFORMATION: Petroleum Oil, NOIBN (Petroleum partially refined). Flammable. Red label. Tank cars.

PROPYLENE

HYDROCARBONS AND POLYMERS DIVISION

FORMULA: $CH_3CH=CH_2$

MOLECULAR WEIGHT: 42.1

STANDARD FORM: Liquid (under pressure).

GRADES: 92% min. purity.

GENERAL INFORMATION: Propylene is an olefinic hydrocarbon raw material used in manufacture of alcohols, acrylonitrile, phenol and other chemical intermediates. The other principal component is propane.

SHIPPING INFORMATION: Liquefied petroleum gas. Flammable gas; red gas label. Tank cars, tank trucks.

RESIN OIL

HYDROCARBONS AND POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: Resin Oil is a highly unsaturated alkyl-aromatic hydrocarbon mixture used in the manufacture of high-grade petroleum resins.

SHIPPING INFORMATION: Petroleum naphtha. Barges, tank cars, tank trucks.

RESIN PR

HYDROCARBONS AND POLYMERS DIVISION

DESCRIPTION: A heavy aromatic petroleum residue.

USES: In the production of petroleum coke, carbon black and miscellaneous other industrial applications.

SHIPPING INFORMATION: "Resinous petroleum residue—by-product of ethylene production." In barges, tank cars and trucks.

TOLUENE

HYDROCARBONS AND POLYMERS DIVISION

FORMULA: $CH_3C_6H_5$

MOLECULAR WEIGHT: 92.1

STANDARD FORM: Liquid.

GENERAL INFORMATION: Toluene is an aromatic hydrocarbon, used in the manufacture of a variety of organic intermediates and in a broad range of solvent applications.

SHIPPING INFORMATION: Toluol. Flammable liquid; red label. Barges, tank cars, tank trucks.

PETROLEUM ADDITIVES

CRESYL DIPHENYL PHOSPHATE

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Light amber fluid.

TYPICAL PROPERTIES:

Specific Gravity @ 60/60°F	1.20
Viscosity, @ 0°F., cs.	1900
@ 100°F., cs.	17
@ 210°F., cs.	2.9
Flash Point, °F.	450
Crystallizing Point, °C., max.	−35
Refractive Index @ 77°F.	1.560
Boiling Point (760 mm), °F.	734
Acidity, % as H_3PO_4	0.01
Phosphorus, % (wt.)	8.7-9.2
Wt. per gal.	10.06 lbs.

USES: Cresyl Diphenyl Phosphate, added as a supplementary scavenger to gasoline containing TEL fluid, will control surface ignition and spark plug fouling.

SHIPPING INFORMATION: Gasoline additive containing less than 50% petroleum oil/chemicals NOIBN. Tank cars, 55-gal. non-returnable black iron drums containing approximately 545 lbs. net.

0557447

TOWOLDMON0041181
WATER_PCB-00032227

METHYL DIPHENYL PHOSPHATE

(offered as Phostane® Brand of MDP)

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Clear, oily liquid.

SPECIFICATIONS: Color APHA 200 max.; sp. gr. 1.225—1.235 at 25°/25°C.; phosphorus 11.5% min.; pour point ~85°F.

USES: Effective in combating abnormal combustion due to glowing combustion chamber deposits and fouled spark plugs. A proved surface ignition control agent and combustion deposit modifier.

SHIPPING INFORMATION: Carbon, Gum or Sludge Removing Compounds, NOIBN; 55-gal., non-returnable black iron drums, tank cars, tank trucks.

PC-1244®

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Clear, light yellow liquid.

TYPICAL PROPERTIES:

Specific Gravity 60/60°F.	0.86
Viscosity @ 100°F., cs.	32.7
Wt. per gal.	7.72 lbs.

USES: *PC-1244* is an additive whose presence in low concentration suppresses foaming tendencies in lubricating oil formulations. Defoamer *PC-1244* is an oil-dispersable solution of a non-metallic compound in petroleum distillate.

SHIPPING INFORMATION: Chemicals NOIBN. 55-gal. non-returnable black iron drums and 5-gal. drums.

SANTOLENE® C FUEL OIL ADDITIVE

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: Viscosity @ 100°F. 259 SUS, Flash Point, °F. 170 sp. gr. 60°/60°F. 0.884.

USES: Corrosion and rust inhibitor in light petroleum distillates resulting in significant reduction of rusting and corrosion of pipelines and other petroleum product transmission equipment.

SHIPPING INFORMATION: Petroleum Oil NOIBN. 55-gal. steel drums; tank cars.

SANTOLUBE® 70A OIL ADDITIVE

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: An oily viscous liquid having the following typical properties: sp. gr. 0.926 at 60°/60°F.; Saybolt Universal viscosity 240 seconds at 210°F.

USES: Rust inhibitor for turbine oils.

SHIPPING INFORMATION: Petroleum Oil NOIBN. 55-gal. steel drums.

SANTOLUBE® 392 OIL ADDITIVE

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: Flash Point 330°F.; phosphorus 7.3%; sulfur 15.2%; zinc 6.3%; viscosity at 100°F. 1260 SUS, at 210°F. 60 SUS; sp. gr. at 60°/60°F. 1.104.

USES: An effective inhibitor and motor oil anti-oxidant for upgrading the quality of straight base oils when used alone and which is also used in combination with detergent-dispersant additives (e.g., *Santolube* 203-C, 333, 401, 410) to meet operating conditions imposed by passenger cars, trucks, tractors and other equipment powered by petroleum fuels.

SHIPPING INFORMATION: Chemicals, NOIBN, 55-gal. black iron drums or tank cars.

SANTOLUBE® 393 OIL ADDITIVE (ZINC DIALKYL DITHIOPHOSPHATE)

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: A liquid with the following typical properties: Viscosity at 100°F. of 150 centistokes; Flash Point 260°F.; sp. gr. 60°/60°F. of 1.120.

USES: An effective and versatile anti-oxidant and bearing corrosion inhibitor for lubricating oils. Finds wide application in compounding Premium and Heavy Duty Motor Oils.

SHIPPING INFORMATION: Chemicals NOIBN. 55-gal. black iron drums; tank cars.

SANTOLUBE® 394-C OIL ADDITIVE

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: All amber, viscous liquid with the following approximate properties: viscosity 15 to 25 cts. at 210°F.; sp. gr. 1.02 at 60°/60°F.; phosphorus 4.7%; sulfur 13.1%.

USES: An effective and versatile anti-oxidant and bearing corrosion inhibitor for engine lubricating oils. Finds wide application in compounding Premium and Heavy Duty Motor Oils.

SHIPPING INFORMATION: Petroleum Oils NOIBN. 55-gal. steel drums; tank cars.

SANTOLUBE® 693

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Dark viscous liquid.

TYPICAL PROPERTIES:

Barium, % wt.	1.9
Calcium, % wt.	4.6
Nitrogen, % wt.	0.6
Phosphorous, % wt.	1.1
Sulfur, % wt.	3.0
Zinc, % wt.	1.05
Specific Gravity, 60/60°F.	1.030
Viscosity at 210°F., cs.	139
TBN	140
Wt. per gal.	8.58 lbs.

USES: *Santolube* 693 is a complete additive package designed for high quality diesel lubricants. The product also provides very good automotive MS performance when used at high performance diesel concentrations.

SHIPPING INFORMATION: Petroleum oil NOIBN. Tank cars; 55-gal. non-returnable black iron drums (54 gals. net).

SANTOLUBE® 698

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Dark viscous liquid.

TYPICAL PROPERTIES:

Barium, % wt. min.	2.0
Calcium, % wt. min.	3.25
Nitrogen, % wt. min.	0.24
Phosphorus, % wt. min.	0.70
Sulfur, % wt. min.	2.4
Zinc, % wt. min.	0.60
Specific Gravity, 60/60°F.	1.010
Viscosity, cs. at 210°F.	50
Wt. per gal.	8.4 lbs.

USES: *Santolube* 698 is a low ash additive package for Series III/MIL-L-45199A engine oil formulations. API Service MS performance with *Santolube* 698 has also been demonstrated as measured by the Sequence IIA, IIIA and Sequence V tests.

SHIPPING INFORMATION: Petroleum oil NOIBN. Tank cars; 55-gal. non-returnable black iron drums (54-gals. net).

SANTOLUBE® 875 OIL ADDITIVE

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: An oily liquid fluid having the following typical properties: sp. gr. 60/60°F., 1.03; Wt. per gal. 60/60°F., 8.57; Viscosity @ 210°F. SUS, 275; Flash Point COC°F., 350; Calcium, % wt., 4.3; Phosphorus, % wt., 1.21; Sulfur, % wt., 2.85; and, Zinc, % wt., 1.30.

USES: *Santolube* 875 is a multi-functional crankcase lubricant additive designed at 5.3% to 5.5% volume to give 1965 "MS" and Mil Spec. MIL-L-2104B performance.

SHIPPING INFORMATION: Petroleum Oil NOIBN. 55-gal. steel drums; tank cars and tank trucks.

SANTOLUBE® 899

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Dark viscous liquid.

TYPICAL PROPERTIES:

Calcium, % wt.	4.0
Zinc, % wt.	1.05
Phosphorus, % wt.	0.95
Nitrogen, % wt.	0.8
Sulfur, % wt.	2.4
Specific Gravity, 60/60°F.	1.01
TBN	115
Wt. per gal.	8.4 lbs.

USES: *Santolube* 899 is a complete additive package designed to give excellent Automotive MS performance.

SHIPPING INFORMATION: Petroleum oil NOIBN. Tank cars; drums, non-returnable black iron, containing 54 gals.

SANTOPOID® 22-RI GEAR OIL ADDITIVE

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: A foam-inhibited, dark, oily liquid having superior rust preventive properties and the following typical properties: sp. gr. 60°/60°F. 1.135%; flash point 300°F.; sulfur 13.3%; phosphorous 4.0%; chlorine 14.5%; zinc 3.7%.

USES: Used in compounding gear lubricants as defined by the American Petroleum Institute as GL-4 type service. Also used in compounding gear lubricants complying with MIL-L-002105A Ordinance (this specification will be called MIL-L-2105B when it receives full acceptance by the armed services as anticipated).

0557448

TOWOLDMON0041182
WATER_PCB-00032228

SHIPPING INFORMATION: Lubricating oil additive, containing less than 50% petroleum oil (chemicals NOIBN). 54-gal. black iron drums; tank cars.

SANTOPOID® 23-RI GEAR OIL ADDITIVE

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: A foam-inhibited, dark liquid having superior rust preventive properties and the following typical properties: Pour Point +15°F.; flash point 300°F.; sp. gr. 60°/60°F. 1.130; vis. at 100°F. 750 SUS; sulfur 13.3% ; chlorine 14.0% ; phosphorus; 4.1% ; zinc 3.7% .

USES: To compound multi-purpose Hypoid lubricants providing adequate performance in automotive axles equipped with limited-slip mechanisms, also to formulate gear lubricants complying with MIL-L-002105A Ordinance (this specification will be called MIL-L-2105B when it receives full acceptance by the armed forces as anticipated).

SHIPPING INFORMATION: Lubricating oil additive containing less than 50% petroleum oil (Chemicals NOIBN). 54-gal. black iron drums; tank cars.

SANTOPOUR® C OIL ADDITIVE

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: A dark liquid with the following typical properties: Flash Point 360°F.; viscosity 1020 SUS at 210°F.; sp. gr. 60°/60°F. 0.910.

USES: An effective and economical pour point depressant for all types of wax-bearing oils. Effective at concentrations as low as 0.02% .

SHIPPING INFORMATION: Petroleum Oil NOIBN. 55-gal. black iron drums; tank cars.

TRICRESYL PHOSPHATE

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Amber liquid.

TYPICAL PROPERTIES:

Specific Gravity 60/60°F.	1.162
Flash Point, °F.	470
Crystallizing Point	less than −31°F.
Phosphorus, % wt., min.	7.9
Wt. per gal.	9.7 lbs.

USES: TCP has been proven effective as a mild EP additive in certain hydraulic and synthetic oils. Approval under Military Specification MIL-L-7078E has been achieved with Monsanto TCP.

SHIPPING INFORMATION: Resin plasticizer. Tank cars, tank trucks; 55-gal. black iron, non-returnable drums.

PETROLEUM PRODUCTS and CHEMICALS

LION® PETROLEUM PRODUCTS/CHEMICALS

GASOLINES

LION® PREMIUM GASOLINE WITH LIONITE® ADDITIVES

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: This high-octane premium gasoline is refined through advanced processing methods at the Lion Refinery, El Dorado, Ark. Equipment employed is of modern design, including a Model IV fluid-type catalytic cracking unit, a Thermofor catalytic cracking unit, a vapor recovery and polymerization unit, alkylation unit, chemical treating plant and other related equipment. *Lionite*, a petroleum-type additive, is employed to impart special properties to the finished product.

USES: Automotive fuel.

SHIPPING INFORMATION: *Lion* Premium Gasoline with *Lionite* is marketed only through *Lion* service stations.

LION® REGULAR GASOLINE WITH LIONITE® ADDITIVES

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: This high-octane regular gasoline is refined through advanced processing methods at the Lion Refinery, El Dorado, Ark. Equipment employed is of modern design, including a Model IV fluid-type catalytic cracking unit, a Thermofor catalytic cracking unit, a vapor recovery and polymerization unit, alkylation unit, chemical treating plant and other related equipment. *Lionite*, a petroleum-type additive, is employed to impart special properties. While the octane rating of *Lion* Regular Gasoline is not as high as for *Lion* Premium Gasoline, this product is outstanding in octane for regular grade gasolines.

USES: Automotive fuel.

SHIPPING INFORMATION: *Lion* Regular Gasoline with *Lionite* is marketed only through *Lion* service stations.

PREMIUM GASOLINE *Unbranded*

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: Premium gasoline, refined to high standards of quality and performance, is available in grades ranging from 98 to 100-octane ratings.

USES: Automotive fuel.

SHIPPING INFORMATION: Gasoline (Dangerous placards applied). Railroad tank car, transport trucks, barges, and pipe line.

REGULAR GASOLINE *Unbranded*

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: Regular gasoline, refined to excellent standards of quality and performance, is available in 92 to 94-octane ratings.

USES: Automotive fuel.

SHIPPING INFORMATION: Gasoline (Dangerous placards applied). Railroad tank car, transport trucks, barges, and pipe line.

GEAR LUBRICANTS

LION® ALL-PURPOSE GEAR LUBRICANT

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: An exceptional, premium quality, extreme pressure gear oil. It is specially fortified with carefully selected additives to promote longer gear life under the most severe operations. It is recommended for rear axles of hypoid, spiral bevel and spur gear types. Meets MIL-L-2105 specifications.

SAE GRADES: 80, 90, 140 and 250.

SHIPPING INFORMATION: Lubricating Oil. 427-lb. and 120-lb. drums and 40-lb. pails.

LION® GEAR LUBRICANT MINERAL

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: A "regular" type, or straight mineral, gear oil made from an exclusive high quality base of fully refined lubricating oil. This lubricant is used in transmissions, differentials, and other gear sets when a "regular" type gear oil or straight mineral oil is recommended. It is not recommended for extreme pressure or severe service conditions.

SHIPPING INFORMATION: Lubricating Oil. 427-lb., 120-lb. drums, 40-lb. pails.

LION® INDUSTRIAL OILS

AZALEA® OILS

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: A fine line of carefully refined turbine grade oils. They are of the finest quality, and all contain rust inhibitors, oxidation inhibitors and anti-foam agents. This broad line of oils makes it possible to select just the proper oil for a specific use. Lion *Azalea* Oils are used in hydraulic systems, high speed spindles, electric motor bearings, steam turbines, speed reducers, etc.

SHIPPING INFORMATION: Lubricating Oil. 55-gal. drums; and 5-gal. cans.

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TOWOLDMON0041183
WATER_PCB-00032229

BAIZE® OILS

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: Made from a high quality, naphthenic crude and fully refined oil. They have high film strength and good stability, together with heat resisting properties. These oils are recommended for speed governors on engines, ring oiled bearings, electric motors and generators; gas, gasoline and diesel engines employing either air or mechanical injections, and other instances where products having the Baize properties are recommended. Lion *Baize* oils contain oxidation inhibitors and anti-foam agents.

SHIPPING INFORMATION: Lubricating Oil, 55-gal. drums; and 5-gal. cans.

CODA® OILS

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: These are fully processed, straight mineral oils and are usually designated as "engine oils." They are used under a wide range of conditions such as those found to exist with centrifuge machines, cream separators and spindles. They are also used on ring oiled bearings, chain-oiled or hand-oiled bearings, machine tools, woodworking machinery, rock product machinery and conveying equipment.

SHIPPING INFORMATION: Lubricating Oil. 55-gal. drums; 5-gal. cans.

CYLINDER OIL *Mineral and Compounded.*

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: For lubrication of steam cylinders and valves, steam niggers and bearings. A filtered, steam refined cylinder oil which gives excellent results with medium pressure steam. A good general purpose oil for saw-mill use. It comes in a 5% compound for average saturated steam pressures (150 to 175-lb.) and an 8% compound for excessively wet steam.

GRADES: A, B, C, D, E.

SHIPPING INFORMATION: Lubricating Oil. 55-gal. drums.

OILS - LUBRICATING

NEUTRAL OILS *(Conventionally Refined)*

HYDROCARBONS & POLYMERS DIVISION

Designation	SSU Viscosity 100°F.	Pour Point — °F.	Color ASTM Max.
70/75@100	70-75	−50	2
100@100	95-105	−30	2
150@100	140-160	−25	2
200@100	190-210	−15	3
300@100	290-310	−10	3.5
500@100	480-520	−5	4
750@100	730-770	0	4.5
1200@100	1150-1250	+15	4.5
90/95@210	1450-1650	+25	5
2000@100	1900-2100	+25	5

For shipment in tank cars and/or transports.

GREASES

LION® AC TRACT ROLLER GREASE

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Semi-fluid.

GENERAL INFORMATION: A stringy, tacky lubricant of a semi-fluid consistency which is suitable for lubricating the roller bearings and seals in truck wheels, track idlers and support rollers. Exceeds specifications established by Allis-Chalmers Manufacturing Company.

SHIPPING INFORMATION: Lubricating Grease. 35-lb. pails.

LION® ALL WEATHER CHASSIS GREASE

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Buttery.

GENERAL INFORMATION: A lubricant for use in the general lubrication of chassis parts not requiring a special grease. It is manufactured from viscous, high-quality oils and a special calcium base. It is highly adhesive, tacky and water proof. This product is made in both summer and winter grades.

SHIPPING INFORMATION: Lubricating Grease. 400-lb., 120-lb. drums, 35-lb. pails and 5-lb. containers.

LION® BARIUM 4-in-1 GREASE

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Short-fiber grease.

GENERAL INFORMATION: An all-purpose, barium-type lubricant for use on wheel bearings, chassis, universal joints and water pumps. It is highly water-resistant, and stable up to approximately 350°F. This lubricant has the necessary cohesiveness and adhesiveness to stay in place in universal joints. It is pumpable in temperatures as low as 40°F., and has the property of almost complete freedom from drippage. NLGI Grade 2.

SHIPPING INFORMATION: Lubricating Grease. 400-lb., 120-lb. drums, 35-lb. pails.

LION® COTTON PICKER SPINDLE GREASE

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Semi-fluid.

GENERAL INFORMATION: A special heat-resistant lubricant produced especially for cotton picker spindles. It has an extremely low pour point, and will also provide superb lubrication at high temperatures.

SHIPPING INFORMATION: Lubricating Grease. 35-lb. pails and containers.

LION® MULTI-PURPOSE A. F. GREASE

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Buttery.

GENERAL INFORMATION: A lithium base, multi-purpose grease for use on anti-friction bearings. It pumps readily even at winter temperatures, resists water washing and stands up in severest service. Maximum continuous usable temperatures 350°F.

NLGI GRADES: #1 and #2.

SHIPPING INFORMATION: Lubricating Grease. 400-lb. and 120-lb. drums, 35-lb. pails.

LION® WHEEL BEARING GREASE

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Fibrous.

GENERAL INFORMATION: A sodium-base grease for use in wheel bearings and universal joints. It provides high resistance to heat, pressure and moisture, and does not tend to melt and run out on brake linings.

NLGI GRADE: #3.

SHIPPING INFORMATION: Lubricating Grease. 35-lb. pails and 5-lb. containers.

OILS — LIGHT

AROMATIC OILS

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: An unsaturated hydrocarbon raw material used in manufacturing petroleum resins and aromatics.

SHIPPING INFORMATION: Petroleum Naphtha and/or Aromatic Concentrates. Railroad tank cars and tank trucks.

BURNER OIL

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: Used in oil-fired residential heating units. Made in Grades No. 1, 2 and 3.

SHIPPING INFORMATION: Petroleum Distillate Fuel Oil, not suitable for illuminating purposes. Railroad tank cars, transport trucks and barges, and pipe lines.

BUTANE-PROPANE MIXTURE

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: A liquefied petroleum gas used for home heating and as a motor fuel in engines especially equipped to use this fuel.

SHIPPING INFORMATION: Liquefied Petroleum Gas. (Dangerous placards applied). Railroad tank cars and transport trucks.

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TOWOLDMON0041184
WATER_PCB-00032230

DIESEL FUEL

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: A product of petroleum refining for use as fuel in diesel engines.

SHIPPING INFORMATION: Petroleum Distillate Fuel Oil, not suitable for illuminating purposes. Railroad tank cars, transport trucks and barges, and pipe lines.

ETHYLENE

See Page 34

HERBICIDAL OIL NO. 1

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

GENERAL INFORMATION: A post-emergence contact herbicide produced by carefully controlled petroleum refining. It is completely volatile and leaves no residue. It is non-corrosive and its fumes are non-toxic.

USES: A safe and economical herbicide for weed control in cotton and soybeans. Applied as a spray.

SHIPPING INFORMATION: Naphtha. Tank cars and transport trucks.

HERBICIDAL OILS NOS. 6 & 7

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

GENERAL INFORMATION: Non-selective, general contact herbicides produced by carefully controlled refining from a crude oil naturally high in aromatic compounds. They are slowly volatile and leave no permanently toxic or oily residues when used at recommended rates. Kill only those plants on which they are actually sprayed.

USES: For control of weeds and grasses on railroad rights-of-way, and wherever general contact herbicides are required. Applied as a spray.

SHIPPING INFORMATION: Petroleum Distillate Fuel Oil, not suitable for illuminating purposes. Tank cars.

INK OIL

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: A lightweight oil for mixing with inks in printing.

SHIPPING INFORMATION: Petroleum Distillate Fuel Oil, not suitable for illuminating purposes. Tank cars and tank trucks.

KEROSENE

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: A product of petroleum refining for use as fuel in oil-burning stoves and lamps, and in various internal combustion engines.

SHIPPING INFORMATION: Refined Oil. Illuminating, and/or Kerosene. Railroad tank cars, transport trucks or barges, and pipe line.

PROPANE

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: A liquefied petroleum gas used for home heating.

SHIPPING INFORMATION: Liquefied Petroleum Gas. (Dangerous placards applied). Railroad tank cars and transport trucks.

PROPYLENE

See Page 34

RESIDUAL FUEL OIL

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: A fuel oil for use in firing furnaces and boilers on locomotives, steamships and in industrial plants; made in grades No. 4, 5 and 6.

SHIPPING INFORMATION: Petroleum Residual Fuel Oil. Tank cars, tank trucks, and barges.

TRACTOR DISTILLATE

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: A product of petroleum refining for general use as a fuel in internal combustion engines on tractors.

SHIPPING INFORMATION: Petroleum Distillate Fuel Oil, not suitable for illuminating purposes. (Dangerous placards applied). Tank cars and tank trucks.

LION® MOTOR OILS

LION® HDX MOTOR OIL

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

GENERAL INFORMATION: A motor oil with the oxidation stability, corrosion preventive properties and detergent-dispersant characteristics necessary for use in both high-speed diesel and gasoline engines under heavy duty service conditions. Exceeds U. S. Ordnance Specification 2104A Sup. 1 and requirements for API Classifications MS-DG-DM.

SAE GRADES: 10 through 50, inclusive.

SHIPPING INFORMATION: Lubricating Oil. 55-gal.; 5-gal. cans; 24/1 qt. cans.

MULTI-TEMP® NATURALUBE® MOTOR OIL

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: A superior all-weather oil for automobile engines providing an extra safety margin for protection under extremes of temperature, climate and other operating conditions. Naturalube Multi-Temp exceeds MIL-L-2104B performance level and is especially recommended for modern high-compression engines. It also meets MS test sequences as established by automotive manufacturers. It has a high Viscosity Index and it is highly desirable for use under heavy duty service conditions in modern automobiles. Meets API Classification MS and MS Test sequences.

SAE GRADES: 10W-30.

SHIPPING INFORMATION: Lubricating Oil. 55-gal. drums, 24/1-quart cans.

NATURALUBE® AUTOMATIC TRANSMISSION FLUID

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: A superior quality, fully guaranteed automatic transmission fluid, approved by Armour Research Foundation for use in all transmissions and applications requiring Type "A" Suffix "A".

SHIPPING INFORMATION: Lubricating Oil. 55-gal. drums, 24/1-quart cans.

NATURALUBE® EXTRA HEAVY DUTY MOTOR OIL

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

GENERAL INFORMATION: A newly developed motor oil to meet the exacting requirements for top performance of modern high compression automobile engines. Its ability to remove power-destroying engine deposits keeps in check the engine's octane requirement increase, and reduces knock and pre-ignition. Its anti-acid properties protect engines against acid wear, and its high natural film strength protects against friction wear. Its oxidation stability and detergent-dispersant characteristics, together with the characteristics described above, make it highly desirable for use under heavy duty service conditions of modern driving. Meets requirements for API Classifications MS-DG-DM and U. S. Ordnance Specification MIL-L-2104B & MIL-L-2104A & MS Test sequences.

SAE GRADES: 10 through 50 inclusive.

SHIPPING INFORMATION: Lubricating Oil. 55-gal. drums: 5-gal. cans; cases: 24/1-quart cans.

NATURALUBE® MOTOR OIL

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

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TOWOLDMON0041185
WATER_PCB-00032231

GENERAL INFORMATION: A motor oil reinforced with special additives for use in internal combustion engines where operating conditions are more severe than in light duty. This oil has high oxidation stability and contains properties which tend to prevent bearing corrosion. Meets requirements for API Classification ML-MM.

SAE GRADES: 10 through 50 inclusive.

SHIPPING INFORMATION: Lubricating Oil. 55-gal.; 5-gal. cans; cases: 24/1-quart cans.

NATURALUBE® OUTBOARD MOTOR OIL

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: A specially-selected straight run mineral oil produced without chemical detergent additives and designed as a superior lubricant for two-cycle engines. It may be used for outboards, chain saws, power lawn mowers, power generators, air-cooled motors, motor scooters and motor bikes. Its natural detergent action makes it a highly recommended oil for use in two-cycle engines.

SHIPPING INFORMATION: Lubricating Oil. 55-gal. drums, 24/1-quart cans, and 48/8 oz. cans.

NATURALUBE® OUTBOARD MOTOR OIL NEW IMPROVED

HYDROCARBONS & POLYMERS DIVISION

New Improved *Lion Naturalube* Outboard Motor Oil is developed from the famous Smackover crude oil and fortified with superior additives.

The development of this new outboard oil is an important step forward for owners of two cycle engines of 10 horsepower or more. It meets the rigid test requirements set by Homolite Motor Generators, McCullough Chain Saws and the Outboard Boating Club of America. In addition, Scott's and Johnson's 75 horsepower endurance test requirements for quality and stability are surpassed by this oil.

This new product, recommended for use in motors of 10 horsepower and larger, will increase plug life, reduce pre-ignition, ring sticking and port plugging. It mixes readily with any gasoline forming a stable oil-fuel mixture to assure proper lubrication during operation.

Owners of chain saws, lawn mowers and other two-cycle engines will benefit from using New Improved *Lion* Outboard Oil.

This product comes in a new attractive one-quart plastic bottle.

SUPER DUTY NATURALUBE® MOTOR OIL

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

GENERAL INFORMATION: A motor oil for diesel and heavy duty use to meet specification requirements under the most demanding conditions, especially in engines using high sulfur content fuels. Meets requirements for Caterpillar Series 3 lubricants and for API Classifications DM-DS. Meets U. S. Ordnance Specification MIL-L-45199 & MS Test sequences.

SAE GRADES: 10 through 40 inclusive.

SHIPPING INFORMATION: Lubricating Oil. 55-gal. drums; and 5-gal. cans; 24/1 qt. cans.

TIGER® MOTOR OIL

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: A straight mineral motor oil for lubrication of engines in light duty service. Meets requirements for API Classifications ML-MM.

SAE GRADES: 10 through 50, inclusive.

SHIPPING INFORMATION: Lubricating Oil. 55-gal. drums; cases: 24/1-quart cans.

LION* ASPHALT PRODUCTS

INDUSTRIAL ASPHALTS

LION* 5A60® PRIMER

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: Lion 5A60 Primer is a fast drying asphalt primer for use in conjunction with E-120-A Asphalt. It leaves a film of "live" asphalt which flexes readily with the hot coating to form a durable coating-to-metal bond.

TYPICAL PROPERTIES:

Flash Point, T.O.C., °F.	95
Viscosity, Saybolt Furol at 77°F., sec.	35
Weight, lbs./gal. at 60°F.	7.3
Solids Content, % by weight	49

SHIPPING INFORMATION: Petroleum Asphalt (other than paint, stain or varnish). 5-gal. pails; 55-gal. drums.

LION* ASBESTOS ASPHALT ROOF COATING

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: Asbestos roof coating is a mixture of high-grade petroleum asphalt and petroleum solvent, to which selected asbestos (rock) fiber has been added. The asphalt from which this product is made does not contain coal tar, free carbon, or cracked residues. The material is in liquid form and requires no heating. This product complies with Federal Specification SS-R-451.

USES: This material is recommended as a heavy-duty finish for added protection on smooth-surfaced roll roofing or built-up roofs; for preserving metal roofs, and for renewing old, dry, smooth-surfaced roll roofing. The high asbestos content permits the sealing of small cracks, joints, seams and nail holes, and increases the fire-proofing qualities of the roof. Higher resistance to the drying-out action of the sun assures minimum expense for upkeep. Excellent results are obtained in weatherproofing exposed foundations, concrete surfaces exposed to moisture, and in dampproofing structures both above and below grade.

SHIPPING INFORMATION: Roofing Coating. 55-gal. drums; 5-gal. pails; 1-gal. pails (6 in case).

LION* ASPHALT PLASTIC ROOFING CEMENT

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Heavy liquid.

GENERAL INFORMATION: This material is carefully compounded from high-grade petroleum asphalt, naphthas, especially treated mineral fillers, and asbestos fibers. It adheres tightly to metal, felt, wood, glass and concrete surfaces. It also has the property of being able to cover and adhere to wet or dry metal and saturated roofing-felt surfaces. Manufactured under U.S. Patent No. 2,393,774. This product complies with Federal Specification SS-C-153.

USES: This material is recommended for repair of breaks, cracks and holes in all types of roofs, and for sealing and waterproofing around chimneys, skylights, valleys, vent pipes and base and cap flashings. It also is useful for sealing the walls of boiler settings, and for dampproofing interior and exterior walls, both above and below grade, where heavy film thickness is desirable for maximum protection. Important farm uses include the repair of watering tanks and as a pruning cement.

SHIPPING INFORMATION: Roofing Cement. 500-lb. drums; 50-lb. pails; 10-lb. pails (6 in case); 5-lb. pails (12 in case); 2¼-lb. pails (18 in case); 1-lb. pails (36 in case).

LION* BLIND NAILING ROOFING CEMENT

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

GENERAL INFORMATION: A compound of high grade petroleum asphalt, petroleum solvent and selected asbestos (rock) fiber. It eliminates the need of nailing the lower edge of roll roofing and avoids the leak hazard created by nail holes. The completed job provides a roof with much longer life. Important additional uses of this extremely durable and adhesive material include the cementing of patches when damaged roofs are being repaired.

USES: This cement is especially recommended for use in applying selvage-edge roll roofing. It also is highly recommended for applying felt which has not been saturated.

SHIPPING INFORMATION: Roofing Cement. 55-gal. drums; 5-gal. pails; 1-gal. pails.

LION* BONDITE® ADHESIVE ASPHALT

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Solid, liquefied by heating.

GENERAL INFORMATION: This product is an effective asphalt adhesive designed especially for bonding wooden block flooring and wooden screeds to concrete slab foundations easily and quickly. It is flexible enough to allow for expansion and contraction during temperature changes, yet holds flooring and screeds firmly in place without fear of disbonding. *Bondite®* Asphalt may be applied at ambient temperatures from 45° to 105° F. It is intended for use on dry concrete slabs above grade which have been poured over a moisture vapor barrier.

SHIPPING INFORMATION: Petroleum Asphalt (other than paint, stain or varnish). 5-gal. pails.

TOWOLDMON0041186
WATER_PCB-00032232

LION® COLD PROCESS ASPHALT

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Liquid.

GENERAL INFORMATION: A liquid material prepared from a high-grade asphalt with a petroleum solvent. It is easier to handle than the solid type because it is already prepared and ready for application by brush or spray. No heating, thinning, special equipment or skilled labor is necessary. *Lion* Asphalt Roof Coating does not contain coal tar, free carbon or cracked residues. It resists brittleness and cracking in cold weather and maintains firm body in hot weather.

USES: This product is recommended for added protection as a surface finish on smooth-surfaced roll roofing or on built-up roofs; for preserving metal roofs; for renewing old, dry, smooth-surfaced roll roofing.

SHIPPING INFORMATION: Petroleum Asphalt (other than paint, stain or varnish). 55-gal. drums; 5-gal. pails; 1-gal. pails (6 in case).

LION® COLD PROCESS LAP ASPHALT

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

GENERAL INFORMATION: This quick-setting liquid asphalt is especially compounded for use as an adhesive in construction of built-up roofing with cold process felts.

USES: Cold Process Cement eliminates the necessity of using nails on the lower edge of roll roofing when applied shingle style. Only the upper edge of the roofing should be nailed. Not to be used on non-saturated felt.

SHIPPING INFORMATION: Petroleum Asphalt (other than paint, stain or varnish). 55-gal. drums; 5-gal. pails and 1-gal. pails (6 in case).

LION® DEAD LEVEL ROOFING ASPHALT

Petroleum Asphalt

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Solid.

GENERAL INFORMATION: A roofing asphalt developed especially for use on flat roofs with poor drainage.

SHIPPING INFORMATION: Petroleum Asphalt (other than paint, stain or varnish). 400-lb. metal drums, 150-lb. metal drums, and 100-lb. fiber cartons.

LION® DRY-KILN MASTIC

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Heavy liquid.

GENERAL INFORMATION: Used for coating interior of dry kilns to reduce heat loss and to protect wood, mortar and metal surfaces against corrosion incident to the curing of lumber.

SHIPPING INFORMATION: Roofing Cement. 500-lb. metal drums.

LION® E-120® A ASPHALT

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: *Lion E-120*-A Asphalt is a pipe coating having certain physical characteristics not obtainable by conventional processing. Compounded from a specially processed asphalt and an inert, finely divided filler, to produce a coating which has, in addition to properties of Lion E-120, improved resistance to deformation, a faster set-up time, and increased resistance to the effects of cathodic protection. It applies smoothly and withstands mechanical stresses during coating and handling. It provides excellent resistance to sag at high temperatures and retains its flexibility in low temperatures. Use SA60 Primer in conjunction with E-120A.

TYPICAL PROPERTIES:

Weight, lbs./gal. at 60°F.	9.95
Flash Point, C.O.C., above °F.	575
Softening Point (R&B), °F.	240
Penetration at 77°F., 100g/5 sec., 1/10mm	5
Penetration at 32°F., 200g./60 sec., 1/10mm	3
Penetration at 115°F., 50g./5 sec., 1/10mm	10
Penetration at 150°F., 50g./5 sec., 1/10mm	27
Viscosity, Saybolt Furol at 375°F., sec.	750
Ash (Mineral Filler) % by weight	19
Settlement Ratio	1.02
High Temp. Sag Test at 160°F., 24 hrs., inches	None
Low Temp. Crack Test, 6 hrs. at 0°F.	No Crack
Peel Test, 60°F. to 160°F.	No Peel
Break Test at 85°F., 1" Mandrill	No Break
Deformation Test at 85°F., 100 hrs., 2 PSI, mils	5.5
Deformation Test at 115°F., 6 hrs., 2 PSI, mils	11
Impact Test at 32°F., 2" dia. steel ball from 1 ft.	No Crack
Water Absorption, 35 weeks, % by weight	0.7
Resistivity, ohm-cm., above	1×10^{16}
Resistivity, after 35 weeks immersion, ohm-cm, above	1×10^{13}
Voltage Breakdown, volts per mil. above	1000
Cathodic Disbonding (when used with 5A60 Primer), —1.50 volts for 7 days, square inches	0.05

SHIPPING INFORMATION: Pipe Coating or Moisture or Condensation or Rust Preventive. 120-lb. cartons.

LION® E-120® HL ASPHALT

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: *Lion E-120*-HL is an asphalt especially designed for protection of underground pipelines transmitting hot gas or oil. *E-120*-HL has a markedly high degree of resistance to puncture, soil stress and high temperature distortion. A high degree of stability gives excellent retention of physical properties during application and service.

TYPICAL PROPERTIES:

Weight, lbs./gal. at 60°F.	10.0
Flash Point, C.O.C., above °F.	600
Softening Point (R&B), °F.	280
Penetration at 77°F., 100 g./5 sec., 1/10 mm.	6.5
Penetration at 32°F., 200 g./60 sec., 1/10 mm.	4.5
Penetration at 115°F., 50 g./5 sec., 1/10 mm.	10
Penetration at 135°F., 50 g./5 sec., 1/10 mm.	15
Penetration at 150°F., 50 g./5 sec., 1/10 mm.	21
Penetration at 165°F., 50 g./5 sec., 1/10 mm.	30
Viscosity at 425°F., cps.	850
Viscosity at 475°F., cps.	335
Ash, Wt. %	19.0
Settlement Ratio at 425°F.	1.03
High Temperature Sag Test (180°F. for 24 hours)	No Sag
Low Temperature Crack Test, 0°F. for 6 hours	No Crack
Deformation Test at 115°F., 6 hrs., 2 PSI, mils	4
Deformation Test at 150°F., 6 hrs., 2 PSI, mils	29
Impact Test at 32°F., 2" dia. steel ball from 1 ft.	No Crack

Use *E-120*-HL Primer in conjunction with *E-120*-HL Coating.

SHIPPING INFORMATION: Pipe Coating or moisture or condensation or rust preventive. 120-lb. cartons.

LION® E-120® HL PRIMER

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: *Lion E-120*-HL Primer is formulated specifically for use with *E-120*-HL Coating. It dries quickly to form a tough coating-to-metal bond which maintains its durability even at elevated temperatures. *E-120*-HL has excellent resistance to disbonding from structures under cathodic protection. Coverage rates of *E-120*-HL Primer will be about 400-600 square feet per gallon.

TYPICAL PROPERTIES:

Flash Point, T.O.C., °F.	100
Viscosity, Saybolt Furol at 77°F., sec.	35
Weight, lbs./gal. at 60°F.	7.5
Solids Content, % by weight	47

SHIPPING INFORMATION: Petroleum Asphalt (other than paint, stain, or varnish). 5 gal. pails; 55 gal. drums.

LION® METAL COATING NO. 3

Roof Coating

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid, manufactured in three grades: light, medium and heavy.

GENERAL INFORMATION: A black, semi-glossy, dense, highly impermeable, adhesive film designed to protect metals from corrosive influences. The composition contains high-grade petroleum asphalt, asbestos fiber, specially treated mineral fillers, and a small content of solvent to permit ready application at ordinary atmospheric temperatures. Films of Coating No. 3 offer lasting protection, do not crack and peel on exposure to weather, and have high resistance to abrasion and impact.

SPECIFICATIONS:

Requirement	*Light* (Brush)	**Medium (Spray)	Heavy (Trowel)
Weight—lbs. per gal. at 60°F.	7.8	8.3	8.8
Solids content, %	65	68	75
Mineral filler (Ash), %	15	20	25
Flash point, Pensky-Martens, °F.	102	102	102
Cracking or disbonding at 20°F.	None	None	None
Time to dry to touch, 1/16" film, hrs.	1.5	1.5	1.5
Time to dry firm, 1/16" film, max. hrs.	24	24	24
Lineal shrinkage, %	18	15	12
Flow of coating at 325°F., inches	0.0	0.0	0.0
Corrosion of steel, copper, aluminum	None	None	None
Salt spray test, 1/16" film, protection of steel panel, min., hrs.	500	500	500
Outdoor weathering performance		Excellent	
Fire resistance of cured film, 6" Bunsen flame applied for 3 min.		Excellent. No falling asphalt droplets. Fire duration less than one minute after flame removed.	
Vapor transmission, wet cup, grains per sq. ft. per hr., ⅛" film, 0-50% R.H. at 90°F.	0.01	0.01	0.02

**Can also be brushed at temperatures of 75°F. or above. (Made under the process of U. S. Patent No. 2,393,774.)

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WATER_PCB-00032233

USES: This product is used on pipes and tanks to be buried underground and as a protective film on bridges, butane tanks, metal culverts, gas holders, metal roofs, gutters, hoppers, pipes, pontoons, railings and, in general, all metal surfaces where a tough film is needed to protect from corrosion and rust. Sound deadening properties also are provided, as when used on the interior of hulls of metal boats.

SHIPPING INFORMATION: Roofing Coating. 55-gal. drums; 5-gal. pails.

LION NŌKŌRŌDE® BRUSH ASPHALT

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: A brush-applied heavy asphalt cutback for sealing laps and joints on coverings for insulations, and as a brush-applied vapor seal.

SHIPPING INFORMATION: Roofing Cement. 5-gal. pails; 55-gal. drums.

LION NŌKŌRŌDE® BUTTER ASPHALT

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: *Lion Nokorode* Butter Asphalt is a unique compound made possible by combining a hydrocarbon polymer with a special asphalt. Butter Asphalt is a 100% non-volatile compound which has a softening point above 200°F. and retains adherence down to −110°F. Some of the various uses of Butter Asphalt are as an insulation adhesive (particularly useful for plastic foam insulations), joint compound, bedding compound and ship joint, caulking compound, etc. Applied by trowel at ambient temperatures, sprayable at elevated temperatures.

TYPICAL PROPERTIES:

Flash Point, C. O. C. °F., Min.	340
Pounds per gallon at 77°F.	9.5
Softening Point (R&B), °F.	218
Penetration at 77°F., 100 gms., 5 sec., mm/10	300+
Shrinkage	None
Corrosion to steel, copper, aluminium	None
Permeability, Perm-inch	0.0027
Bend Test; ¼" thick film 1" mandrel, 180° Bend; good to °F.	−20
Suggested Service Temperature Range, °F.	−110 to +140
Butter Test	Pass
Resistance to oils, greases, and solvents	Not resistant

SHIPPING INFORMATION: Petroleum Asphalt (other than paint, stain or varnish). 5-gal. pails and 55-gal. drums.

LION NŌKŌRŌDE® CAR CEMENT

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: A sealing compound for use in sealing joints and minor openings, the underframe, and the roof of railroad cars. This cement air-dries to a coating which seals out moisture, chemicals and fumes to prevent corrosion.

SHIPPING INFORMATION: Vehicle body sealer or sound deadener. 5-gal. pails; 55-gal. drums.

LION NŌKŌRŌDE® CHASSIS BLACK

HYDROCARBONS & POLYMERS DIVISION

GENERAL INFORMATION: *Lion Nokorode* Chassis Black is an asphalt base coating supplied as a concentrate. Before using it should be diluted by adding approximately 60 parts by volume mineral spirits to 100 parts by volume Chassis Black. The resulting material will give a tough, durable coating which will air dry in 4 to 10 minutes. The drying time will depend on the degree of dilution and the grade of mineral spirits used. Mineral spirits with a boiling range of 240 to 315°F. is preferred.

TYPICAL PROPERTIES OF CHASSIS BLACK AS RECEIVED:

Flash, Tag open cup, °F.	75+
Viscosity, Saybolt Fural @ 122°F	66
Solids, weight %	54
Pounds per gallon at 60°F., approx.	7.4

TYPICAL PROPERTIES AFTER DILUTION:

Viscosity, Saybolt Universal sec., @ 77°F.	115
Solids, weight %	35
Consistency	Spray or Brush
Dry time, minutes	4 to 10
Pounds per gallon at 60°F., approx.	6.9

USES: Applied to paint frames, radiators, springs, axles and flat metal parts of automobiles, buses, etc., to give them a pleasing appearance and prevent corrosion.

SHIPPING INFORMATION: Liquid Petroleum Asphalt. 5-gal. pails; 55-gal. drums; bulk quantities.

LION NŌKŌRŌDE® COACH BUILDERS SOUND DEADENER

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: A semi-liquid material composed of selected asphalts, petroleum solvents, fillers and additives. Developed especially for use on side, roof and floor panels of large commercial and passenger vehicles where the panels are subject to more flexing than is usual in automobiles or cabinets. Application prevents noises caused by vibration, and corrosion preventive properties protect metal surfaces.

SHIPPING INFORMATION: Vehicle Body Sealer or Sound Deadener. 5-gal. pails; 55-gal. drums.

LION NŌKŌRŌDE® COACH BUILDERS UNDERCOATING

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: A semi-liquid material which dries to form a tough film. When applied to the underbody of commercial and passenger vehicles, it protects against moisture conditions, chemicals, and prevents points of corrosion from being started by abrasion due to flying gravel. Adds years to the life of the vehicle and reduces maintenance costs. Much more flexible for large units than regular underbody coating.

SHIPPING INFORMATION: Vehicle Body Sealer or Sound Deadener. 5-gal. pails; 55-gal. drums.

LION NŌKŌRŌDE® CONSTRUCTION ASPHALTS

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: Hot applied asphalt for hot setting, bonding and vapor sealing of low temperature insulations. Meets ASTM specifications.

GRADES: Grade B, 145-155°F. softening point; Grade C, 180-200°F. softening point.

SHIPPING INFORMATION: Petroleum Asphalt (other than paint, stain of varnish). 100-lb. cartons.

LION NŌKŌRŌDE® D-41 ASPHALT

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: A primer for surfaces prior to the application of *Lion Nokorode* Construction Asphalts. Meets government and ASTM sepcifications.

SHIPPING INFORMATION: Petroleum Asphalt (other than paint, stain or varnish). 55-gal. drums; 5-gal. pails.

LION NŌKŌRŌDE® E KOTE

Petroleum Asphalt

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: A hot applied asphaltic coating for water-front and underwater service. Made from an asphalt base and mineral filler which gives excellent protection to metal surfaces under severe conditions of service. Recommended for application to ballast tanks, penstocks, steel piers, metal surfaces in lock constructions, and general water-front application.

SHIPPING INFORMATION: Petroleum Asphalt (other than paint, stain or varnish). 120-lb. cartons.

LION NŌKŌRŌDE® GOVERNMENT RUST PREVENTIVES

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: Various types of materials manufactured to meet exacting Government standards. These materials have been tested and approved by the Government laboratories as meeting their specifications and Certificates of Compliance are supplied covering same.

Following is a list giving the *Lion Nokorode* designation and the Government Specification for which it is approved:

Lion Nokorode Designation	Government Specification
C081	MIL-C-11796A, Class 1
963	MIL-C-11796A, Class 3
731	MIL-C-16173B, Grade 1
733A	MIL-C-16173B, Grade 3
Crate Top Coating	JAN-P-102—MIL-C-102A
Army Cote 827	AXS-1827 (Amendment 1)
Army Cote 827	Fed. Spec. TT-C-520
E-011	MIL-C-3254, Type 2

SHIPPING INFORMATION: 5-gal. pails; 55-gal. drums.

LION NŌKŌRŌDE® K KOTE

Roofing Cement

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: An asphalt base, mastic composition containing a high volume content of screened ground cork and a small amount of long fiber asbestos. Applied with spray equipment or trowel K Kote cures to a tough and abrasion-resisting film with excellent insulating and weather-and-vapor barrier properties. K Kote, usually applied by spray, has a pleasing appearance with the cork particles uniformly distributed throughout to decrease the thermal conductivity of the film. A ¼" film of K Kote compared to a bare steel surface can reduce the loss of heat up to 65%. Yet the film acts as a weather and vapor barrier to protect underlying surfaces from condensation, corrosion and weathering elements; and sound deadening value is given to ducts, walls, etc. Upon curing the film becomes fire resistant and does not support combustion.

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TOWOLDMON0041188
WATER_PCB-00032234

TYPICAL PROPERTIES AND PERFORMANCE:

	Medium	Heavy
Application ranges for K Kote:		
Spray application	60°-100°F.	80°-100°F.
Trowel application	—	60°-100°F.
Flash, Tag Open Cup, °F.	100 +	100 +
Pounds per Gallon at 60°F., approx.	6.8	6.7
Solids, by wt., %	60 +	60 +
Approx. Solids, by vol., %	68	70
Sag of sprayed ⅛ " film, less than inches	⅛	⅛
Sag of sprayed ¼ " film, less than, inches	—	¼
Dry to touch, ⅛ " spray coat, minutes	45	45
Dry firm, ⅛ " spray coat, hours	36	36
Dry to touch, ¼ " spray coat, minutes	—	60
Dry firm, ¼ " spray coat, hours	—	84
Approximate volume of cork in cured film, %	53	55
Film Shrinkage on curing, %	29	25
Water vapor permeability at 90°F., wet cup, spray coat:		
Grams per 100 sq. in. per 24 hrs., ¼ " film, 0-50% R.H.	0.025	0.03
Grains per sq. ft. per hour, ¼ " film, 0-50% R.H.	0.020	0.025
Perm-inch (grains per sq. ft.-hr.-inch Hg-inch thickness)	0.007	0.008

Fire resistance of cured film, 6" Bunsen flame applied for 3 minutes: Excellent. No falling of asphalt droplets. Fire duration less than one minute after flame is removed.

Corrosion of steel, copper, aluminum	None	None
Resistance to abrasion by sandblast	Excellent	Excellent
Outdoor Weathering performance	Excellent	Excellent

Resistance to solutions of acids, ¼ " cured film immersed for 60 days at room temperature, 10% HCl, 10% H_2SO_4, and 10% , 30% and 85% H_3PO_4: No appreciable attack. Not recommended for nitric acid solutions or strong solutions of acetic acid.

Resistance to solutions of salts, ¼ " cured film immersed for 60 days at room temperature, 45% Ammonium Nitrate and saturated solution of Ammonium Sulfate: No appreciable attack

Resistance to alkalies: Not recommended in strong alkaline solutions unless topcoated with Lion Nokorode Seal Kote.

Resistance to oils, greases, solvents	Not resistant	Not resistant
Flow of cured ¼ " film on metal panel, vertical at 325° F.	None	None
Temperature range of cured film	−40°F. to 275°F.	

THERMAL CONDUCTIVITY OF LION KOKORODE K KOTES AND VARIOUS MATERIALS AT ROOM TEMPERATURE—BTU PER HR.—SQ. FT.—°F—INCH

Lion Nokorode K Kotes, cured film (Lower value for fluffy spray application, higher value for dense trowel application)	0.5 to 0.
Cord Board	0.3
Fiber Insulating Board	0.4
Mineral Wool	0.4
Cellular Glass (9 lbs./cu. ft.)	0.4
Yellow Pine	1.0
Asbestos Fiber (36 lbs./cu. ft.)	2.1
Asphalt	1.2
Dry Sand	2.2
Steel	310
Aluminum	1400
Copper	2600

USES: All surfaces where a combination of insulation vapor, and weather protection, and sound-deadening values are of benefit, can be economically covered in one application.

SHIPPING INFORMATION: Roofing Cement, 4.6-gal. pails; 51-gal. drums.

LION NŌKŌRŌDE® LOW TEMP

Roofing Cement

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: A catalytic asphalt base (U.S. Patent No. 2,460,756) formulation containing selected oils and mineral fillers for use as a bedding and joint compound for low temperature insulation. It cures to a black, non-tacky but permanently soft compound with a firm shrinkage in thickness of approx. 14%. Low Temp. is an excellent seal to decrease transmission of vapors through joints and layers of insulation to prevent build-up of destructive moisture beneath the insulation. Plasticity of the coating is retained at low temperatures. This is an excellent protective coating to prevent corrosion of surfaces by industrial atmospheres, but due to its softness, Low Temp is not recommended as an outside coating except where exposed at joints and seams. This material can be applied by stiff brush or trowel within a temperature range of 60°/110°F. and can be sprayed with industrial type of mastic spray equipment. Compound has satisfactory behavior over the wide temperature range from minus 100°F. to plus 200°F.

TYPICAL PROPERTIES AND PERFORMANCE:

Flash, Pensky-Martens Closed Tester, °F.	100 +
Pounds per gallon at 60°F., approx.	10.3
Solids, by wt., %	82 +
Sag at 77°F. of freshly troweled ¼ " film on cellular glass, inches	Less than ¼
Dry to touch ¼ " film, days	2
Dry firm, ¼ " film	Non-drying. Remains soft and plastic
Film shrinkage, %	14
Corrosion of steel, copper, aluminum	None
Outdoor weathering performance	Satisfactory, but because of softness not recommended as outside coating.
Water vapor permeability at 90°F., wet cup, trowel coat:	
Grams per 100 sq. in. per 24 hours, ⅛ " cured film, 0-50% R.H.	0.025
Grains per sq. ft. per hour, ⅛ " cured film, 0-50% R.H.	0.020
Perm-inch (grains per sq. ft.-hr.-inch Hg-inch thickness)	0.004
Resistance to oils, greases, solvents	Not resistant
Resistance to 10% and 30% NaOH	No attack on coating
Resistance to 10% HCl, 10% H_2SO_4, and 10% H_3PO_4	Not resistant
Salt fog resistance, ⅛ " film, complete protection of steel panels, min.	500 hrs.
Flow of cured ⅛ " film at 200°F.	None
Low temperature test, ¼ " coating cured on cellular glass block and through temperature cycle of −7°F., −10°F., +7°F., −100°F., +7°F.	No cracking or disbonding of coating or fracture of block surface.
Suggested temperature range of coating	−100°F. to +200°F.

COVERAGE REQUIREMENTS

As bedding compound and between layers of insulation:	
⅛ " wet film	5.9 gal./100 sq. ft.
¼ " wet film	7.8 gal./100 sq. ft.
As joint compound, ⅛ " joints, per 100 sq. ft. of block:	
Size 2" x 12" x 18"	2¼ gal.
Size 3" x 12" x 18"	3⅛ gal.
As joint compound, ⅛" x 2" joints:	
Per 100 lineal feet	1⅛ gal.

SHIPPING INFORMATION: Roofing Cement. 5-gal. pails; 55-gal. drums.

LION NŌKŌRŌDE® ROOF PERM

Roof Coating

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: This product is made from asphalts which have the ability to expand and contract with roof decks and buildings even after years of weathering. It has a unique breathing action which allows moisture vapor to escape and, at the same time, prevents liquid water from entering. Little maintenance is needed other than regular inspection. It is easily applied by brush, spray or screed for new roofs or excellent for repairing old roofs. This product is available in a Fire Retardant Grade for added safety.

SHIPPING INFORMATION: Roofing Coating, 5-gal. pails; 55-gal. drums.

LION NŌKŌRŌDE® ROOF SEAL

Roof Coating

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: A triple purpose solvent cut-back asphalt base mastic with great adhesive strength, outstanding weathering qualities and virtual impermeability to moisture. No top cover is needed for this product. It will not support combustion in its cured state. It can be applied by spray, brush or screed. Available in a Fire Retardant Grade for greater safety.

SHIPPING INFORMATION: Roofing Coating, 5-gal. pails; 55-gal. drums.

LION NŌKŌRŌDE® SEAM AND BACKING CEMENT

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: A trowel-applied, mineral-filled asphalt base backing cement for use on masonry and concrete walls in construction of cold chambers and for filling joints, seams, and laps.

SHIPPING INFORMATION: Roofing Cement, 50-lb. pails; 550-lb. drums.

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WATER_PCB-00032235

LION NŌKŌRŌDE® SEAL KOTE

Roofing Cement

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: Solvent cutbacks of a selected asphalt base containing the proper proportions of asbestos, and other mineral fillers to cure to a highly weatherproof, tough and adherent film upon the evaporation of the solvent. Seal Kotes are applied as vapor seals over insulation and to various surfaces, such as metal and masonry areas, to protect from moisture and atmospheric corrosion which (especially in industrial areas) is accelerated by various dusts, fumes and fogs of corrosive chemicals. The tough and flexible film is highly impermeable and offers a high degree of protection under conditions of total or intermittent water immersion. Available in brush, spray, and heavy grades.

TYPICAL PROPERTIES AND PERFORMANCE:

Grade	Light	Medium	Heavy
Application by	Brush	Spray or Brush Spray 50-120°F. Brush 80-120°F.	Trowel or Caulking 50-110°F. (Can be sprayed if above 90°F.)
Application Temp.	50-120°F.		
Flash-Pensky-Martens, °F., min.	100	100	100
Solids, %, min.	65	68	75
Corrosion of steel, copper, aluminum	None	None	None
Lineal shrinkage, %, max.	20	20	15
Decrease in Film Thickness on Curing, %	35	35	30
Flow of cured film at 325°F.	None	None	None
Approximate weight, lbs./gal. at 60°F.	7.8	8.5	8.8
Dry to touch, 1/8" film, hrs., max.	2.0	2.0	2.0
Dry firm 1/8" film, hrs., max.	24	24	24
Salt fog resistance, 1/8" film, complete protection of steel panel, hrs., min.	500	500	500
Resistance to abrasion by sandblast	Excellent	Excellent	Excellent
Cracking or disbonding of 1/8" cured film on steel panels, rapid temp. change from 140°F. to −60°F.	None	None	None
Outdoor weathering performance	Excellent	Excellent	Excellent
Water Vapor permeability at 90°F., Wet Cup: Grams per 100 sq. in. per 24 hrs., 1/8" cured film, 0-50% R.H.	0.011	0.012	0.016
Grains per sq. ft. per hour, 1/8" cured film, 0-50% R.H.	0.010	0.011	0.015
Perm-inch (grain per sq. ft.-hr.-inch Hg-inch thickness)	0.0016	0.0018	0.0023
Thermal conductivity, estimated of cured film	1.7 BTU/hr.-sq. ft.-°F.-inch		
Fire resistance of cured film, 6" Bunsen flame applied for 3 min.	Excellent, No falling of asphalt droplets. Fire duration less than one minutes after flame is removed.		
Resistance to solutions of acid, 60 day immersion of steel panels coated with 1/8" film	No appreciable attack, blistering or hardening of coating or corrosion of panels by 10% HCl, 10% H_2SO_4, and 10%, 30% and 85% solutions of phosphoric acids. Not recommended for nitric acid solutions.		
Resistance to solutions of alkalies and salts, 60 day immersion of steel panels coated with 1/8" film	No appreciable attack, blistering or hardening of coating or corrosion of panels by solutions of 10% and 30% NaOH, 45% ammonium nitrate, and saturated solution of ammonium sulfate.		
Resistance to oils, greases, solvents	Poor. Not recommended for application in locations where exposed to solvents of asphalt.		

USES: Metal buildings, metal roofs, barges, pontoons, bridge structures, concrete silos, storage tanks, tank cars and industrial piping are but a few of the structures being protected from corrosion and weathering. Also an excellent vapor seal for all types of insulation.

SHIPPING INFORMATION: Roofing Cement. 5-gal. pails; 55-gal. drums.

LION NŌKŌRODE® SEAL KOTE—

Sealing Compound

No Flash and Regular Fire Retardant Grades

HYDROCARBONS & POLYMERS DIVISION

TYPICAL PROPERTIES AND PERFORMANCE:

	Lion Nokorode Seal Kote Fire-Retardant (No Flash)		*Lion Nokorode* Seal Kote Fire-Retardant (Regular)	
Application by	Spray	Trowel	Spray	Trowel
Application Temp.	50-120°F. (Brush) 80-120°F.)	50-120°F. (Can be sprayed above 90°F.)	50-120°F. (Brush, 80-120°F.)	50-120°F. (Can be sprayed above 90°F.)
Tag open cup. °F. min.	No Flash	No Flash	100	100
Solids, % Min.	64	67	71	73
Corrosion to steel, copper, aluminum	None	None	None	None
Decrease in film thickness on curing, %	35	30	35	30
Flow of cured film at 325°F.	None	None	None	None
Approximate wt., lbs./gal. @ 60°F.	10.2	10.0	9.1	9.2
Dry to touch, 1/8" films, hrs., max.	1.5	1.5	2.0	2.0
Dry to firm, 1/8" film, hrs., max.	18	18	24	24
Salt fog resistance, 1/8" cured film, complete protection of steel panel, hrs., min.	500	500	500	500
Resistance to abrasion by sandblast	Excellent	Excellent	Excellent	Excellent
Cracking or disbonding of 1/8" cured film on steel panel, rapid temp. change from 140°F. to −60°F.	None	None	None	None
Outdoor weather performance	Excellent	Excellent	Excellent	Excellent
Water vapor permeability at 90°F., wet cup: Grams per 100 sq. in. per 24 hrs., 1/8" cured film, 0-50% R.H.	0.019	0.023	0.021	0.25
Grains per sq. ft. per hr., 1/8" cured film, 0-50% R.H.	0.018	0.022	0.020	.023
Perm-inch (grain per sq. ft.-hr.-inch Hg-inch thickness)	0.0031	0.0036	0.0035	0.0039
Thermal conductivity, estimated of cured film, BTU/hr.-sq. ft., °F., in.	1.7	1.7	1.7	1.7
Fire Retardant Properties: Uncured film	Excellent	Excellent	Poor	Poor
Cured film	Excellent	Excellent	Excellent	Excellent

LION NŌKŌRŌDE® SP ASPHALT

Patroleum Asphalt

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: A spray or brush applied asphalt-solvent blend. A primer for porous surfaces prior to the application of Lion Nokorode Seal Kotes, Seal Perm, K Kote and Low Temp. Also an excellent black coating with good hiding power.

SHIPPING INFORMATION: Petroleum Asphalt (other than paint, stain or varnish). 5-gal. pails; 55-gal. drums.

LION NŌKŌRŌDE® SEAL PERM

Roofing Cement

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: An asphalt plastic recommended as a breathing type of weatherproof barrier over high temperature insulation, walls and other areas. Particular properties of Seal Perm permit moisture vapor from insulation or walls to escape through the cured film, as might be required by normal breathing action or by temperature increase, but liquid water cannot enter. This coating functions as an excellent weather barrier and has highly desirable film properties, forming a tough, strong and abrasion and weather-resistant covering which is light in weight. This coating is not an emulsion, and unlike emulsions, moisture transmitted through the cured film is in vapor form and water soluble salts are not wicked to the surface to cause unsightly staining. Seal Perm is available in spray and trowel consistency. Also available in Fire Retardant Grades.

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Grade	*Lion Nokorode* Seal Perm Spray	*Lion Nokorode* Seal Perm Trowel	*Lion Nokorode* Seal Perm. Fire Retardant Spray	*Lion Nokorode* Seal Perm. Fire Retardant Trowel
Temp. Range of Coating for Application	60°-100°F.	60°-100°F.	60°-100°F.	60°-100°F.
Flash, Tag Open Cup, °F.	100+	100+	No Flash	No Flash
Pounds per Gal. at 60°F., approx.	8.0	8.1	10.4	10.1
Solids, by Weight	58+	63+	44	54
Decrease in Film Thickness on Curing	30%	25%	33%	28%
Specific Gravity at 77°/77°F. Cured Film	0.97	0.98	0.92	0.92
Thermal Conductivity of Cured Film, est'd., BTU per hr.-sq. ft.-°F.-inch	1.5	1.5	1.5	1.5
Sag of Sprayed ¼" Film at 77°F.	None	—	None	None
Dry to Touch, ⅛" coat, hours	1	½	1	½
Dry Firm, ⅛" coat, hours	24	12	24	12
Corrosion of steel, copper, or aluminum	None	None	None	None
Resistance to abrasion by sandblast	Excellent	Excellent	Excellent	Excellent
Outdoor weathering performance	Excellent	Excellent	Excellent	Excellent
Fire resistance of cured film, 6" Bunsen flame applied for 3 minutes	Excellent. Fire duration less than 30 seconds.		Excellent. Fire duration less than 5 seconds.	
Flow or cured ¼" film at 325°F.	None	None		
Service range of cured film	—20° to 275°F.		—20° to 275°F.	
Water Vapor Permeability at 90° F., wet cup: Grams per 100 sq. in. per 24 hrs., ⅛" cured film, 0-50% R.H.	0.20	0.25	0.16	0.21
Grains per sq. ft. per hr., ¼" cured film, 0-50% R.H.	0.19	0.24	0.15	0.19
Perm-inch (grains per sq. ft.-hr.-inch Hg-inch thickness)	0.032	0.040	0.027	0.034
Resistance of coating to 10% H_2SO_4, and 10%, 30%, and 85% solutions of phosphoric acids	Excellent. No noticeable attack on coating in 30 days.			
Resistance of coating to 10% and 30% NaOH, ammonium nitrate and saturated solution of ammonium sulfate	Excellent. No noticeable attack on coating in 30 days.			
Resistance to oils, greases, solvents	Poor	Poor	Poor	Poor

USES: Particularly recommended for weatherproofing insulation placed on vessels or pipes with a surface temperature above 212°F.

SHIPPING INFORMATION: Roofing Cement. 55-gal. drums; 5-gal. pails.

LION NŌKŌRŌDE® UNDER CAR SEALER AND SILENCER

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: A compound of selected asphalts, petroleum solvents, fillers and additives which forms a tough, protective, sound deadening film when applied to the underbody of automobiles. This dense coating offers protection against rust, muffles, noise protects against abrasion caused by flying gravel, and seals out dust. When properly applied by spray to the underbody, fenders, and hood of the automobile it lasts for the life of the car. Produced by Lion Oil Company under U. S. Patent No. 2,393,774.

SHIPPING INFORMATION: Vehicle body sealer or sound deadener. 5-gal. pails; 54-gal. drums.

LION NŌKŌRŌDE® NO. 2002 UNDERCOATING AND SOUND DEADENER

HYDROCARBONS & POLYMERS DIVISION

GENERAL INFORMATION: A compound of asphalts, petroleum solvents, fillers and additives designed to protect the underbody of automobiles. This coating offers protection against rust, muffles noise and seals out dust. It is applied to automobile underbodies, fenders and hoods by spray. It has a high sound-deadening value; therefore is suitable for dampening in body construction or industrial uses. Manufactured under U. S. Patent No. 2,393,774.

SHIPPING INFORMATION: Vehicle body sealer or sound deadener. 5-gal. pails; 54-gal. drums.

LION NŌKŌRŌDE® WATERPROOFING COMPOUND

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: A solvent cut-back of selected asphalt base containing proper proportions of asbestos and other mineral fillers to cure to a highly waterproof, tough and adherent film upon evaporation of the solvent. It is made specifically for waterproofing below-grade structures.

TYPICAL PROPERTIES AND PERFORMANCE:

Flash Point, Pensky-Martens, Min.	100°F
Non-volatile Matter, Min.	71%
Lineal Shrinkage, Max.	20%
Decrease in Film Thickness on Curing, Max.	37%
Avg. Weight, Lbs./Gal. at 60°F.	8.5
Ash, Min.	13%
Desicdized Resinous Clays, Min.	8%
Slump — 3/32 in. film on vertical surface at 100°F.	None
Water Vapor Permeability at 90°F. wet cup, perm inch (grain per sq. ft.-hour-inch Hg-inch thickness)	0.0023
Resistance to Abrasion by Sandblast	Excellent
Resistance of ⅛-inch dry film thickness over a firm substrate to Hydrostatic Pressure exerted by an 80 ft. Head of Water	Excellent
Voltage Breakdown, Volts per mill thickness	500+
Fire Resistance of Cured Film, 6-inch Bunsen flame applied for 3 minutes	No falling of asphalt droplets. Fire duration less than one minute after flame is removed.
Resistance to solutions of Acids, 60-day immersion of steel panels coated with 3/32" inch film	No appreciable attack, blistering or hardening of coating or corrosion of panels by 18% HCL, 10% H_2SO_4, and 10%, 30% and 85% solutions of phosphoric acids.
Resistance to solutions of Alkalies and Salts, 60-day immers on of steel panels coated with 3/32" inch film	No appreciable attack, blistering or hardening of coating or corrosion of panels by solutions of 10% and 30% NaOH, 45% Ammonium Nitrate, and saturated solution of Ammonium Sulphate.
Elongation after 4 years	10% Minimum
Sheer Strength, lbs. per sq. in. when applied to polished steel	150+

Meets requirements of Federal Specifications MIL-C-82052 (Docks).

LION* PAPER LAMINANT

HYDROCARBONS & POLYMERS DIVISION

GENERAL INFORMATION: Used in manufacturing laminated waterproof paper bags.

SHIPPING INFORMATION: Petroleum Asphalt (other than paint, stain or varnish). Tank cars.

LION* POLE COMPOUND

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Heavy liquid.

GENERAL INFORMATION: For use in filling crevices and holes in utility line poles. Protects wood by sealing out moisture.

SHIPPING INFORMATION: Roofing Cement. 5-gal. metal pails.

LION* SOLID ROOFING ASPHALT

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: A solid—liquefied by heating.

GENERAL INFORMATION: A firm, adhesive waterproofing bitumen, designed for use as a hot application material. It is made by a combination of vacuum distillation and oxidation and contains no undesirable materials such as are produced by the cracking process. It is non-corrosive and does not contain free carbon, coal tar, or cracked residues. Careful processing minimizes the possibility of breakdown of the petroleum molecules completely preserving the characteristics of strength and toughness.

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SPECIFICATIONS: This product is prepared in five grades: 135/148° melt; 140/160° melt; 160/180° melt; 180/200° melt and 180/200° C.F. melt. The 180/200° C.F. does not require a gravel or slag cover. Lion Solid Roofing Asphalts, depending upon grade, comply with the following specifications: AASHO M115-52, Type A; ASTM D449-49, Type A; Federal SS-A-666 Am. 1, Type I, Class A; ASTM D-449-49, Type C. Lion Solid Roofing Asphalt also can be supplied within a softening point range of 150/165°F. to comply with SS-A-666 Am. 1, Type II, Grade 1, Class A, and within a softening point range of 165/190°F. to comply with SS-A-666, Am. 1, Type II, Grade 2, Class A.

USES: Lion Solid Roofing Asphalt is used as a hot application material for built-up roofs of various specifications.

SHIPPING INFORMATION: Petroleum Asphalt (other than paint, stain or varnish). 400-lb. metal drums, 100-lb. fiber cartons.

PAVING ASPHALTS

ASPHALT CEMENTS AND CUTBACK ASPHALTS

HYDROCARBONS & POLYMERS DIVISION

GENERAL INFORMATION: Asphalt cements and slow-curing, medium-curing, and rapid-curing asphaltic paving materials of all grades can be supplied. The base asphalts are propane-extracted and vacuum-reduced from crude oils of highest quality.

SPECIFICATIONS: Products are available to comply with requirements of most federal, ASTM, AAHSO, state, county and municipal specifications.

USES: Products cover the entire range of asphaltic materials required in construction, from asphalt cements for heavy-duty highways to seal and maintenance cutbacks and slow-curing oils for dust palliatives.

SHIPPING INFORMATION: Petroleum Asphalt (other than paint, stain or varnish). Tank cars, trucks, 400-lb. drums; 55-gal. drums; depending upon the product type and shipping distance.

LION* COLAY PAVING ASPHALT

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

(Developed by Lion Oil Company)

STANDARD FORM: Solid.

GENERAL INFORMATION: Colay Paving Asphalt is especially designed for use in preparing a ready-mixed paving, patching and resurfacing material, marketed by contractors as Colay Asphaltic Paving Material. It is designed to furnish high-type pavement surfacing and low-cost pavement maintenance to localities which do not have access to an asphalt mixing plant.

Lion Oil Company does not sell the ready-mixed Colay Asphaltic Paving Material. Lion sells Colay Paving Asphalt which is used in a special process developed by Lion Oil Company to produce the ready-mixed Colay Asphaltic Paving Material. In this process, Colay Paving Asphalt is combined with crushed limestone or slag, blended sands and mineral filler at centrally located mixing plants to produce Colay Asphaltic Paving Material which requires no job-site preparation. All moisture is removed from the aggregate, which is then screened into separate sizes for proper proportioning by weight before mixing. Colay Paving Asphalt is added to the proportioned mixture and the combined materials then go through a process which thoroughly coats all the aggregate with asphalt.

Colay Paving Asphalt is produced from an especially selected asphaltic base crude oil. Upon request, natural latex may be added to Colay Paving Asphalt at the refinery. Valuable properties are excellent resistance to weathering, high ductility and strong adhesiveness. The natural high tendency to resist displacement by water has been increased. Stock-piled mixes have been water flooded for prolonged periods without sign of distress. Colay contains no petroleum solvents and there is unlike other materials which depend on the evaporation of their cure-retarding agents to reach a satisfactory "set" condition.

SPECIFICATIONS: Colay Mix No. 1 is designed for use as a sealing and wearing course on old bituminous surfaces which have only minor irregularities, but which are cracked to the extent that water can seep into the base. Mix No. 2 is designed for use on old pavement which is in need of a leveling course as well as a sealing and wearing surface. Mix No. 3 is designed for construction of a surface course on a new or reshaped base. Precise specifications will depend upon special requirements, aggregate to be used, and other variable factors.

USES: Colay Paving Asphalt is used in preparing ready-mixed Colay Asphaltic Paving Material to provide an asphaltic concrete street and highway pavement, for surfacing playgrounds and parking areas, and for similar purposes.

SHIPPING INFORMATION: Petroleum Asphalt (other than paint, stain or varnish). Tank cars.

LION* D-80 JOINT COMPOUND

HYDROCARBONS & POLYMERS DIVISION

STANDARD FORM: Solid.

GENERAL INFORMATION: A compound developed by Lion for use as a superior, hot-poured, concrete joint compound.

SHIPPING INFORMATION: Paving joints, roadway expansion, asphalt base, 400-lb. metal drums.

LION* MEMBRANE LINING

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

(Manufactured Under U. S. Patent No. 2,450,756).

STANDARD FORM: Solid—Liquefied by heating.

GENERAL INFORMATION: This hot application (400°F.) asphalt was originated and developed by Lion Oil Company under patent No. 2,450,756, catalytically blown asphalt, using phosphorous pentoxide as the catalyst.

TYPICAL PROPERTIES:

Flash point C.O.C., min.	425°F.
Softening point (R&B)	175° to 200°F.
Penetration at 77°F., 100 g., 5 sec.	50-60
Penetration at 32°F., 200g., 60 sec., min.	30
Penetration at 115°F., 50 g., 5 sec., max.	120
Ductility at 77°F., 5 cm., per minute, min.	3.5 cm.
Loss at 325°F., 5 hours, max.	1.0%
Penetration after loss on heating, 77°F., 100 g., 5 sec., % of original, min.	60.0%
Bitumen (soluble in carbon tetrachloride), min.	97.0%

PLASTICS

RESINS

PLASTICIZERS

NYLON RESIN

NYLON 6/6 AND 6/10 RESIN

Monsanto® Nylon Resin for molding and extrusion

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Natural and colored pellets.

GENERAL INFORMATION: Prime 6/6 and 6/10 resin for molding and extrusion.

GRADES include general purpose, color, heat, light and hydrolysis stabilized.

USES: Fasteners, insulation, gears, bearings and monofilament.

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STYRENE RESINS/PLASTICS

LUSTRAN® ABS AND SAN MOLDING AND EXTRUSION MATERIALS

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

Lustran *ABS* (Acrylonitrile-butadiene-styrene)

Extrusion	Molding	
761	740	Highest shock resistance, greatest elongation, greatest flexibility.
	640	High shock resistance, good tensile strength, intermediate rigidity.
461	440	Medium shock resistance, intermediate rigidity, high tensile strength, hard surface, high gloss.
261	240	Highest tensile strength, highest gloss, best chemical resistance, best abrasion resistance.
	720 }	
	620 }	Excellent for use in applications requiring
	420 }	higher heat resistances.
	220 }	
	262 }	Physical properties same as 61 series. Primary
	462 }	use for profile extrusions with high gloss
	762 }	application.

Lustran *SAN* (styrene-acrylonitrile)

Extrusion & Molding

20 Series. Transparency, high strength, highest rigidity, chemical resistance to such chemicals as acids, bases and petroleum derivatives.

LUSTREX® STYRENE EXTRUSION MATERIALS

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: *Lustrex* styrene is furnished in pellets, either natural or colored.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Can be extruded as sheeting or as profile shapes for various applications requiring high impact strength.

USES: *Lustrex* styrene is widely used for such applications as: Refrigerator door liners, toys, lighting fixtures and games.

INDUSTRIAL USERS: Automotive, Construction, Electronics, Machinery and Appliances, Packaging, Toys, Housewares, Furniture, Lighting.

SHIPPING INFORMATION: Hopper Cars (Dri-Flo), fiberboard containers (1,000 lbs.), multiwall bags (50 lbs.), drums (350 lbs.). Rail: Plastics, Synthetic, Other Than Liquid, NOIBN. Truck: Plastics, Granules.

LUSTREX® STYRENE MOLDING MATERIALS

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORMS: *Lustrex* styrene, one of the lightest and most widely used thermoplastic molding materials, is available for compression molding, injection molding and extrusion in all types of machines and molds. Special formulations available for sheet extrusion and vacuum forming applications. Special formulations for general purpose application: *Lustrex* Hi-Flow 55 (improved flow), *Lustrex* Hi-Flow 66 (good flow, moderate set-up), *Lustrex* Hi-Flow 77 (good flow, fast set-up); medium and high impact strength applications. *Lustrex* Hi-Test 42-1 and *Lustrex* Hi-Test 48 (medium impact). *Lustrex* Hi-Test 88, 88-2, 88-5, 93 (high impact); High-Heat general purpose applications; *Lustrex* High-Heat 99, 101, 102. *Lustrex* Hi-Test 91 (heat resistant, high impact.)

GENERAL INFORMATION: Other special formulations available for applications requiring ultra-violet light stability (general purpose and impact *Lustrex* perma tone) and dust resistance (general purpose and impact formulations of *Lustrex* Lo-Stat).

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Molding Compound. *Lustrex* styrene is tasteless, odorless and non-toxic with high dimensional stability, hardness, rigidity and dielectric strength. It can be molded to any sharply defined detail and finish. Available in a broad range of transparent, translucent and opaque colors as well as crystal.

USES: A wide range of typical applications includes: Refrigerator parts, toys, packaging, air conditioner cabinets, radios, housewares, wall tile, television components, displays, electrical equipment, lighting fixtures, furniture drawers and phonograph records.

INDUSTRIAL USERS: Automotive, Construction, Electronics, Machinery and Appliances, Packaging, Toys, Housewares, Furniture, Lighting.

SHIPPING INFORMATION: Hopper cars (Dri-Flo) fiberboard containers (1000 lbs.), multiwall bags (50 lbs.), drums (350 lbs.). Rail: Plastics, Synthetic, Other Than Liquid, NOIBN. Truck: Plastics, Granules.

LYTRON® LATICES

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Water emulsion.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Aqueous dispersion of polystyrene and styrene copolymers. Used as a binder, saturant or coating.

USES: *Lytron* Latices are used as opacifiers in liquid detergent systems, bowl cleaners, pharmaceutical products, and related items. Also, in textile saturating in the preparation of shoe components such as box toes and shoe counters. Used for stiffening foam rubber, in water-based paints, specialty paper coatings and adhesives.

SHIPPING INFORMATION: Steel Drums (475 lbs.), tank cars, tank trucks. Rail: Plastics, Synthetic Liquid, NOIBN. Truck: Plastics, Liquid, NOI.

LYTRON® RESINS

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Powder.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Protective colloid. Film former. Promotes adhesion, stabilizes, hardens and thickens aqueous systems.

USES: Alkali-soluble or solvent-soluble resins for use in adhesives, coatings, and as a stabilizer, emulsifying agent, protective colloid, and pigment dispersant. Soil release agent.

INDUSTRIAL USERS: Adhesive Manufacturers, Textile Processors, Surface Coating Manufacturers, Producers of Emulsion Floor Waxes and Detergents.

SHIPPING INFORMATION: Bags. Rail: Plastics, Synthetic, Other Than Liquid, NOIBN. Truck: Plastics, Granules.

RJ-100® AND RJ* 101 RESINS

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Supplied in flake form.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Low molecular weight styrene-allyl alcohol copolymer resin raw materials. Can be used as hard resin additives or more commonly as raw materials for esters, ester adducts, ester emulsions, etc. The use of *RJ-100* and RJ 101 in these derivatives ensures excellent chemical and corrosion resistance in both organo and aqueous soluble coatings.

USES: Derivatives used as exterior latex modifiers (RF-6318), industrial primer vehicles, water-soluble coatings, in printing inks, in alkyd and polyester manufacture, in urethane coatings.

SHIPPING INFORMATION: 50-lb. bags.

POLYVINYL ACETATES

GELVA® COPOLYMER SOLUTIONS

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Water white or slightly yellow solvent solutions.

PROPERTIES: Available in two types of solvent solutions—*Gelva* C-254B in benzene and *Gelva* C-254H in a mixture of hexane-heptane. Viscosity of *Gelva* C-254B is 1200 cps., while *Gelva* C-254H has a viscosity of 500 cps. Both materials are supplied at 35% solids.

USES: An effective release coating for pressure sensitive tapes. Gives controlled release when used in combination with common backsizing agents which have been applied to paper from organic solutions.

SHIPPING INFORMATION: Available in 55-gallon, resin-lined, closed-head, steel drums, 420 lbs. net weight for *Gelva* C-254B; 350 lbs. net weight for *Gelva* C-254H. Also shipped in truckload quantities (20,000 lbs. min.).

GELVA® MULTIPOLYMER SOLUTIONS

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Water white or slightly yellow solvent solutions.

PROPERTIES: Available in five standard types. GMS-260 and 263 are acrylic containing copolymers. GMS-264, 269 and 270 are maleate-acetate copolymers. GMS-260 and 263 dry to produce permanently tacky films. All give films which are water resistant and have outstanding adhesion. Solvents range from ester-aliphatic hydrocarbon blends to alcohol. Solids content ranges from 40-55%. Viscosity from 500 to 40,000 cps at 25°C.

USES: Primary application is in the adhesive field, including pressure sensitive adhesives and laminating adhesives for difficult-to-bond surfaces. Also useful in surface coating and specialty paper coating applications.

SHIPPING INFORMATION: Available in non-returnable, open-head steel drums containing 400-440 pounds net weight.

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GELVA® POLYVINYL ACETATE COPOLYMER RESINS

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: White, fine beads.

PROPERTIES: Available in six grades of carboxylated polyvinyl acetate resins which have all the properties of polyvinyl acetate but are also soluble in dilute alkali. The resins are also soluble in organic solvents. Films produced from solvent solutions are water resistant, yet may be removed with dilute alkali. Viscosity of 86 grams of resin in 1000 ml. of ethanol ranges from 10 cps. for *Gelva* C-3 V-10 to 110 cps. for *Gelva* M-7 V-100. Softening points range from 123°C. to 180°C. The copolymers have outstanding adhesion to such materials as metals, leather and cellulosics.

USES: Typical applications include hot melt and solvent adhesives; heat-sealable, clear coatings for paper and plastic films with excellent gloss, printability, grease-proofness, wet rub and abrasion resistance; sizing for rayon, cotton and acetate yarns; anti-tarnish lacquers for silver and other metals and temporary protective coatings for metal and painted surfaces. The alkali soluble nature of these coatings allows easy removability when required.

SHIPPING INFORMATION: Available in non-returnable fiber drums, 100 lbs. net weight.

GELVA® POLYVINYL ACETATE EMULSIONS

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Aqueous dispersions of polyvinyl acetate resins—milk-white in color.

PROPERTIES: Available in a full range of homopolymers and copolymers which vary in viscosity, particle size, molecular weight, film forming properties and emulsifying systems. Some grades are borax stable, dextrine compatible and have varying solvent tolerance. Emulsions are also compatible with a wide range of plasticizers, resins and extenders, pigments and dyes. Films and coatings produced from the different emulsions vary in adhesion, tensile strength, hardness, heat-sealing temperature, water resistance and other physical properties.

USES: Typical applications are in the manufacture of adhesives for paper, wood, vinyl, leather, cloth, polyethylene, foil and a wide variety of surfaces; as binders for paper pulp, cork and textile fabrics; as coatings for paper, cloth, wood, metals and ceramics; as fast drying, tough, odorless paints; as coatings and impregnators for paper and paperboard; as pigment binders for paper and paperboard coatings; and as textile sizes and finishes.

SPECIFIC USES: Each grade of emulsion generally has a number of broad end uses. However, in some cases, the emulsions are highly suited for specific applications. *Gelva* Latex 925 makes a high pick resistant, non-yellowing, odorless pigment binder for paper coatings. *Gelva* Emulsion TS-100 is used in making adhesives with good performance on difficult surfaces such as vinyl, Mylar polyester film and similar surfaces. *Gelva* Emulsions S-98 and S-97, which are dextrine compatible, are used in making remoistenable adhesives. *Gelva* Emulsions S-51 and 900 are used as wet-end additives in producing tough, bend-resistant paperboard. *Gelva* Emulsion S-55 has superior compounding stability, quick tack and bond strength and is used in a wide number of adhesive applications. *Gelva* Emulsions TS-30, TS-70 and TS-71 are used in formulating quality exterior and interior paints. Films cast from *Gelva* C-3 Emulsion are highly water resistant, but, due to carboxyl groups on the polymer chain, are soluble in dilute alkali. Other emulsions are available for specific adhesive, paint and paper coating applications.

SHIPPING INFORMATION: Available in non-returnable steel drums or fiber containers, 500 lbs. net weight; in tank trucks and in rail tank cars.

GELVA® POLYVINYL ACETATE POWDERS 700 and 702

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: White or cream-colored free-flowing powders.

PROPERTIES: Available in two grades of spray-dried powder—*Gelva* Powder 700 and *Gelva* Powder 702. *Gelva* Powder 700 has excellent stability and promotes cohesive and adhesive strength, toughness, flexibility and resiliency to dry mix adhesives and cementitious products. *Gelva* Powder 702 is used where borax and/or dextrine stability is required. Used to produce joint compounds, other building products and adhesives in dry powder form.

USES: Principal applications are in the manufacture of dry mix joint compounds, adhesives and cement patching materials.

SHIPPING INFORMATION: Available in polyethylene lined Kraft bags, 50 lbs. net weight.

GELVA® POLYVINYL ACETATE RESINS

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Granules and lumps.

PROPERTIES: Available in six different grades with viscosities ranging from 1.35 cps. to 900 cps. (86 grams of resin in 1000 ml. of benzene). *Gelva* Resins are thermoplastic, transparent, colorless, odorless and tasteless with excellent adhesion to a wide variety of surfaces. The grades also differ in tensile strength, flexibility and softening point. Soluble in ketones, esters, chlorinated and aromatic hydrocarbons, and certain alcohols. Compatible with many plasticizers, including phthalates and phosphates.

USES: Typical applications for *Gelva* Resins include hot melt and solvent based adhesives, paper and textile coatings, printing inks, and as a base for chewing gum.

SHIPPING INFORMATION: Available in multi-wall bags, 50 lbs. net weight. *Gelva* Resins V-1½ shipped in non-returnable fiber drums, 66 lbs. net weight.

GELVA® RESIN SOLUTIONS

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Viscous solvent solutions of polyvinyl acetate.

PROPERTIES: Available in two types of *Gelva* solutions—V-55-E34 in ethyl alcohol and V-7-M50 in methyl alcohol. Viscosity ranges from approximately 2,500 cps. for V-7-M50 to approximately 50,000 cps. for V-55-E34. Total solids range from 34% to 50%. Films and coatings produced from the solutions have excellent gloss, clarity and water resistance. They are also non-corrosive and neutral.

USES: Can be used for bonding paper, wood, glass, leather, textiles, ceramics, metal foil and many plastic materials. Used in shoe cements, in laminating metal foil to cellophane and for preparing plastic wall tile adhesives. In the paper industry solutions are used to produce transparent high gloss coatings, which adhere well to surfaces and are unusually stable to light and oxygen. Also used as overprint varnishes, greaseproof coatings and pigment binders.

SHIPPING INFORMATION: Available in non-returnable steel drums, 400 lbs. net weight, and in truckloads (20,000 lbs. min.) and carloads (30,000 lbs. min.).

POLYVINYL ALCOHOL RESINS

GELVATOL® POLYVINYL ALCOHOL RESIN

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: White, high bulk density powder.

PROPERTIES: Available in a large number of grades which differ in degree of polymerization, per cent hydrolysis and residual acetate content. Resins are water soluble and glycerine is the most widely used plasticizer. Viscosity of a 4% aqueous solution ranges from approximately 2 cps. for *Gelvatol* 40-10 to 60 cps. for *Gelvatol* 1-90. The resins are non-dusting, have high bulk densities which make storage easier, and provide clear solutions in water. Films cast from *Gelvatol* are extremely tough and have excellent solvent, oil and grease resistance, high tensile strength, and a high degree of impermeability to most gases.

USES: Typical applications include dry mix adhesives and building products; textile sizing and finishing; paper coating and sizing; as protective colloids or surface active agents for emulsion polymerization; as binders for china, ceramics, etc.; as photo sensitive coatings on stencil screens and printing plates; and as water soluble films for packaging soaps, detergents, chemicals, etc.

SHIPPING INFORMATION: Available in multi-wall paper bags, 50-lbs. net.

POLYVINYL BUTYRAL FILM

SAFLEX® VINYL BUTYRAL

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: A continuous adhesive film supplied in clear, translucent, tinted or gradated color, for the plastic interlayer in laminated safety glass.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Laminating material. Tough and resilient; transparency of a superior quality; excellent adhesion to glass.

USES: *Saflex* is used as a protective interlayer for laminating safety glass in automotive, aircraft, and architectural applications. Functional properties which Saflex provides in addition to safety are heat and glare control, sound reduction and resistance to bullets and burglars. Saflex is also used to laminate reflective coatings, painted designs and embedments between layers of glass for sundry exterior and interior applications such as mirrors, room dividers, shower stalls and table tops.

SHIPPING INFORMATION: Standard 15 ga. and 30 ga. film supplied in 750 ft. and 1,500 ft. rolls; shipments made in tubes or on pallets. Rail: Plastics, sheets, not woven, NOIBN. Truck: Plastic film, transparent or translucent other than cellulose, not woven, not printed in sheets, not further processed than cut to size.

POLYVINYL BUTYRAL RESINS

BUTVAR® RESINS

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: White free-flowing powder.

PROPERTIES: Produced in seven types or grades varying in viscosity and hydroxyl content. Viscosity of a 10% solution in 95% ethanol ranges from approximately 55 cps. (for Butvar B-79) to

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1570 cps. (for Butvar B-72A). The resins are generally soluble in alcohols, glycol esters and certain mixtures of polar and non-polar solvents. They are compatible with a number of plasticizers including phthalates, phosphates, castor oils and others.

USES: Used in making metal primers and conditioners; wood primers and sealers; structural and hot melt adhesives; textile coatings and printing inks. As a coating for rainwear and other textiles. *Butvar* provides outstanding adhesion, flexibility, abrasion resistance, water resistance and is transparent. As an additive to metal and wood coatings and primers, the resins upgrade intercoat adhesion, flexibility, impact and abrasion resistance, and flow properties. Can be used to upgrade coating performance of such thermosetting materials as phenolics, ureas, melamines, epoxies, alkyds, polyurethanes and polyesters.

SHIPPING INFORMATION: Available in lined, non-returnable fiber drums, 125 lbs. net weight. *Butvar* B-98 is available in 115 lb. net weight fiber drums.

POLYVINYL BUTYRAL RESIN DISPERSION

BUTVAR® RESIN DISPERSION BR

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Aqueous dispersion of plasticized polyvinyl butyral resin. Milk-white in color.

PROPERTIES: *Butvar* Dispersion BR has a viscosity of 1500 cps. and contains 40 parts plasticizer per 100 parts resin. Films cast from Dispersion BR are tough, light transparent and dry at room temperature. It dries clear, colorless films which are unaffected by boiling water. Films are strong and adhere well to a range of surfaces; resistance to water, heat and sunlight is excellent.

USES: Used in textile industry to impart abrasion resistance, durability, strength, slippage control and reduced color crocking to a variety of materials. Used as abrasion resistant finish for automobile seat belts and parachute harnesses. They are also used in the textile industry as a soft, full-bodied finish for rayon, cotton, or nylon; as a durable, non-raveling finish for filament yarns; and as a finish for curtain and drapery fabrics, glass fabrics, upholstery goods, webbing, awnings, canvas and duck. Also used as a rug backing, and grease-proof, washable coatings for wallpaper, window shades and packaging materials. Can be formulated for use as a strippable coating for metal and other substrates.

SHIPPING INFORMATION: Available in non-returnable 55-gallon steel drums, 425 lbs. net. Less than one drum lots packaged in 5-gallon containers.

POLYVINYL FORMAL RESINS

FORMVAR® RESINS

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: White, free-flowing powder.

PROPERTIES: Available in six basic grades varying in viscosity and solubility. Viscosity of a 5% solution in ethylene chloride ranges from 5-11 cps. for *Formvar* 5/95 to 50-80 cps. for *Formvar* 15/95S. The resins are soluble in phenols, some chlorinated hydrocarbons, and in mixtures of alcohols and aromatic hydrocarbons. Plasticizers for the resins include phthalates, phosphates, glycollates and many others.

USES: *Formvar* 15/95E is widely used in making tough, heat-resistant wire enamels for hermetic systems. Enamels are solderable, bondable, have high cut-through and burnout resistance, and excellent resistance to common refrigerants. *Formvar* resins are also used in structural and hot melt adhesives; in wash primers, can and drum linings; and as wood sealers and knot sealers.

SHIPPING INFORMATION: Available in non-returnable fiber drums—*Formvar* 5/95, 100 lbs. net; *Formvar* 12/85, 110 lbs. net; and *Formvar* 15/95, 130 lbs. net.

VINYL RESINS/PLASTICS

OPALON® POLYVINYL CHLORIDE DISPERSION RESINS

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Finely divided white powder.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Specially developed resins for use in preparing plastisols and organosols through simple stir-in techniques.

Opalon 400—Low temperature gelling and fusing resin
Opalon 410—General purpose resin
Opalon 440—Low emulsifier resin, high clarity, low moisture pick up

USES: Fabric and paper coatings, slush and rotational molding, dip coatings, and vinyl foam.

SHIPPING INFORMATION: Multiwall bags (40 lbs.). Rail: Plastics, Synthetic, Other Than Liquid, NOIBN. Truck: Plastics, Powder.

OPALON® POLYVINYL CHLORIDE GENERAL PURPOSE RESINS

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: White free-flowing powder.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Specially developed resins to give excellent physical and electrical properties as well as exceptionally good color, high clarity, and outstanding heat stability in a wide variety of dry blending and compounding applications.

Opalon 600—Lowest molecular weight resin for specialty molding and extrusion applications

Opalon 610—Very low molecular weight resin for flooring, injection molding, and extrusion applications

Opalon 630—Medium-low molecular weight resin for injection molding, calendering, profile extrusion, and wire and cable applications

Opalon 650—Medium-high molecular weight resin for calendering, wire and cable, profile extrusion, and injection molding applications

Opalon 660—High molecular weight resin for wire and cable, profile extrusion, and calendering applications

USES: For dry blending and compounding operations. Typical end uses include wire and cable insulation and jacketing, flooring, rain wear, upholstery, electrical tape, garden hose, clear packaging films, welting and molded shoe components.

SHIPPING INFORMATION: Hopper cars; fiberboard containers (1,000 lbs.); multiwall bags (50 lbs.). Rail: Plastics, Synthetic, Other Than Liquid, NOIBN. Truck: Plastics, Granules.

OPALON® POLYVINYL CHLORIDE WIRE AND CABLE COMPOUNDS

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Free-flowing ⅛" cubes in natural, black, white, and other colors.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Formulated to meet the most exacting UL, military, and industry specifications, *Opalon* compounds combine a high level of physical and electrical properties with fast extrusion rates and excellent extruded surface appearance.

Opalon 1022—Primary Insulation, T, TW
Opalon 1025—Primary Insulation, T, TW (semi-rigid)
Opalon 1038—Primary Insulation, Jacketing, T, TW, 80°C. (⅛")
Opalon 1040—Primary Insulation, T, TW, THW
Opalon 1041—Primary Insulation, T, TW, THW, 80-90° appliance wire
Opalon 1102—Rural and urban telephone distribution wire
Opalon 1219—General purpose low temperature jacketing
Opalon 1309—SPT, Molded plugs
Opalon 1408-1—Primary Insulation, 90°C., 105°C., low odor
Opalon 1431—Primary Insulation, 90°C.
Opalon 1444—Primary Insulation, —55°C. to 105°C. military wire
Opalon 4700—Semi-rigid molding and extrusion applications

USES: In addition to the wire and cable applications, the high level of toughness and excellent extruded appearance recommend *Opalon* compounds for a variety of profile extrusion and injection molding applications.

SHIPPING INFORMATION: Hopper cars; fiberboard containers (1,000 lbs.); multiwall bags (50 lbs.). Rail: Plastics, Synthetic, Other Than Liquid, NOIBN. Truck: Plastics, Granules.

STYMER® COPOLYMER RESINS

See Page 70

ULTRON® POLYVINYL CHLORIDE

Flexible Film and Sheeting.

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Flexible film, embossed or plain, in gauges .0027 to .020" and widths up to 75". Specially formulated film with "built-in" properties and varying degrees of flexibility are available for specific industrial and agricultural applications.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Fabricating material. *Ultron* film is noted for its uniformity of gauge and color clarity. Water resistant, abrasion resistant. Available as translucent, opaque or transparent film which may be printed, embossed or molded. Tasteless, tough, pliable and long-lasting. *Ultron* film is highly adaptable to various manufacturing techniques such as laminating and heat sealing.

USES: Low temperature formulations are used as protective coverings for machinery. Industrial applications include moisture barriers, industrial and electrical tapes. As a laminating material, *Ultron* has proven valuable for wall covering materials, flooring, glass batt insulation, paper and swimming pool liners.

INDUSTRIAL USERS: Agriculture, Automotive, Construction, Machinery and Appliance, Textiles, Furniture, Housewares, Wire and Cable, Luggage.

SHIPPING INFORMATION: Cardboard Box, (150 lbs.) Heavy duty Kraft paper wrap, (350 lbs.) Rail: Plastics, sheets not woven NOIBN. Truck: Transparent or translucent material: Plastic film, transparent or translucent other than cellulose, not woven, not printed in rolls exceeding 8½" in diameter. Opaque: Plastic film or sheeting not woven, other than cellulose, other than transparent or translucent.

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VYRAM® RIGID VINYL COMPOUNDS FOR EXTRUSION AND MOLDING

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Free-flowing 1/8 inch cubes in natural and colors.

Vyram 2736 — A type 2 high impact rigid vinyl extrusion compound for industrial applications.

Vyram 2746 — An intermediate impact rigid vinyl extrusion compound for industrial applications.

Vyram 2745 — An intermediate rigid vinyl extrusion compound ultra violet outdoor stabilized for structural applications.

Vyram 2810 — A clear blow molding compound for non-food packaging applications.

Vyram 2850 — A clear blow molding compound for food packaging applications.

Vyram 3000 — An intermediate impact rigid vinyl extrusion and injection molding material formulated expressly for pipe and fittings. Meets NSF requirements for use with potable water.

Vyram 3602 — An intermediate impact rigid vinyl extrusion compound for extrusion of pipe. Meets NSF requirements for use with potable water.

PROPERTIES: Balanced combinations of high strength, toughness, chemical resistance, abrasion resistance, non-combustible and ultra-violet light resistance. This product's ease of fabrication, uniform quality and increased extrusion rates mean lower processing costs and improved part quality.

SHIPPING INFORMATION: Hopper cars; fiberboard containers (1,000 lbs.); multiwall bags (50 lbs.). Rail: Plastics, Synthetic, Other Than Liquid, NOIBN. Truck: Plastics, Granules.

POLYETHYLENES

MONSANTO® POLYETHYLENE BLOW MOLDING COMPOUNDS

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Pelleted blow molding compounds are available in natural color with or without anti-stat.

GENERAL PROPERTIES AND PERFORMANCE CHARACTERISTICS: *Monsanto* Polyethylene, natural, is chemically inert, non-toxic and odorless. Products blow molded from *Monsanto* Polyethylene resins are tough with a high impact resistance, good gloss and color, and suitable for packaging a wide variety of household and industrial chemicals, foods, and toiletries.

MPE 200	High Density (.950) blow molding resin
MPE 201	High Density (.950) blow molding resin, anti-stat
MPE 210	High Density (.955) blow molding resin
MPE 211	High Density (.955) blow molding resin, anti-stat
MPE 215	High Density (.956) blow molding resin
MPE 216	High Density (.955) blow molding resin, anti-stat
MPE 220	High Density (.960) blow molding resin
MPE 80	Low Density for squeeze bottles

USES: Some of the typical applications are: Bleach, detergent, and milk bottles, "squeeze" bottles, and molded liners.

SHIPPING INFORMATION: Hopper cars; fiberboard containers (1,600 lbs.); multiwall bags (50 lbs.). Rail: Plastics, Synthetic, Other Than Liquid, NOIBN. Truck: Plastics, Granules.

MONSANTO® POLYETHYLENE EXTRUSION COATING MATERIALS

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Supplied in pellet form.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Paper and coating resin. Fortifies surface with high gloss and scuff resistance. Heat sealable. Improves printability of wax coatings.

USES: A reinforcement for paper and board coatings for packaging and coating for flexible packaging materials.

MPE 70	General Purpose
MPE 72 } MPE 73 }	High-speed coating and laminating resins
MPE 75	Approved milk carton and military barrier coating resin
MPE 77	Versatile, high-strength

SHIPPING INFORMATION: Hopper cars; fiberboard containers (1,600 lbs.); multiwall bags (50 lbs.). Rail: Plastics, Synthetic, Other Than Liquid, NOIBN. Truck: Plastics, Granules.

MONSANTO® POLYETHYLENE FILM AND SHEET MATERIAL

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Supplied in pelleted form.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Extruding material. *Monsanto* Polyethylene is a tough, impact-resistant resin, extruded as film and sheeting. It is chemical-resistant, flexible over wide temperature ranges, non-toxic, odorless, nonpolar, low dielectric, and easily processed by dry blending into a wide range of colors.

USES: Packaging films, vapor barrier materials, agriculture films, and high clarity films.

MPE 35	High clarity, medium impact
MPE 90	General purpose packaging and industrial film — no slip
MPE 91	General purpose packaging and industrial film — low slip
MPE 93	General purpose packaging and industrial film — high slip

SHIPPING INFORMATION: Hopper cars; fiberboard containers (1,600 lbs.); multiwall bags (50 lbs.). Rail: Plastics, Synthetic, Other Than Liquid, NOIBN. Truck: Plastics, Granules.

MONSANTO® POLYETHYLENE WIRE AND CABLE COMPOUNDS

HYDROCARBONS & POLYMERS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Pelleted form, natural and black.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Extruding material. *Monsanto* Polyethylene is used for wire insulation and jacketing. All compounds contain electrical grade antioxidants, are of high purity, low dielectric, and can be processed by dry blending into a wide range of colors.

MPE 23 & 25	Natural LDPE compound for insulation
MPE 12 & 14	Black LDPE compound for line and drop wire and general purpose jacketing
MPE 11	Black LDPE compound for infantry field wire insulation
MPE 19	Black LDPE compound for telephone cable jacketing, requiring maximum stress crack resistance
MPE 27	Foamable natural LDPE compound for CATV and coaxial cables
MPE 240	Natural HDPE for insulation
MPE 251	Black HDPE for telephone cable jacketing, especially REA types

SHIPPING INFORMATION: Synthetic Resin Granules. Hopper cars; fiberboard containers (1,600 lbs.); multiwall bags (50 lbs.); 10 mil polyethylene bags (50 lbs.) for wire and cable compounds. Rail: Plastics, Synthetic, Other Than Liquid, NOIBN. Truck: Plastics, Granules.

PHENOLIC RESINS

RESINOX® PHENOLIC *Lump, Flake and Resin Compound*

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Powder, lump or flake.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Industrial Resin. Excellent resistance to high heat, maximum bond strength and good chemical resistance.

USES: Manufacturing of resinoid grinding wheels, brake linings, pulp moldings and for bonding of foundry sand in the production of shell molds and cores.

INDUSTRIAL USERS: Automotive, Chemicals, Electronics, Jets, Missiles, Machinery and Appliance, Foundry, Abrasives.

SHIPPING INFORMATION: Multiwall bags (50 lbs.); non-returnable fiber drums (200-275 lbs.). Rail—Plastics, Synthetic, Other Than Liquid, NOIBN. Truck—Plastics, Powder.

RESINOX® LIQUID PHENOLIC RESINS

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Water solutions.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Industrial Resin. Excellent resistance to high heat, maximum bond strength and good chemical resistance.

USES: For impregnating or coating filler materials such as paper, cloth, wood (compreg) veneers, glass and mineral wool fibers. Bonding material for resinoid grinding wheels. Resin impregnated paper for automotive battery separators. For glass and rock wool thermal and acoustical insulation. Foundry sand core binder.

INDUSTRIAL USERS: Foundry, Automotive, Chemicals, Construction, Electronics, Jets, Missiles, Machinery and Appliance, Pulp and Paper.

SHIPPING INFORMATION: Steel drums (450-550 lbs.); tank cars, tank trucks. Rail—Plastics, Synthetic, Liquid, NOIBN; Truck—Plastics, Liquid, NOI.

RESINOX® PHENOLIC RESIN VARNISHES

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Supplied in alcohol solutions for laminating filler materials—paper, cloth, glass or asbestos. Special high heat resistant formulations are available for use with glass, asbestos and similar fillers for jet and rocket components.

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PROPERTIES AND PERFORMANCE CHARACTERISTICS: Industrial Resins. Provides tough, durable, heat resistant bonds that also resist acids and weak alkalies.

USES: For impregnating laminate filler materials such as paper, cloth, glass or asbestos. Special high heat resistant formulations are available for jet and rocket components. Used in decorative laminate core stock; electrical and mechanical grade laminates for radio, TV and home electrical appliances; as well as gears, ball-bearing races, pulleys; bushings for light and heavy machinery, cars, planes and ships; oil, chemical and paper filters; sand binders for shell molding.

INDUSTRIAL USERS: Foundry, Automotive, Chemicals, Construction, Electronics, Jets, Missiles, Machinery and Appliances, Pulp and Paper, Rubber.

SHIPPING INFORMATION: Steel drums (450-550 lbs.); tank cars; tank trucks.

RESINOX® PHENOL-FORMALDEHYDE RESIN LIQUID SOLUTION

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Phenolic liquid, solutions.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Surface coating resin. Imparts high heat resistance and promotes good chemical resistance.

USES: Baked enamel and industrial finishes for can, drum and tank car linings, special primers and coatings and wire enamels.

INDUSTRIAL USERS: Paint, Varnish and Lacquer, Automotive, Chemical, Machinery and Appliance.

SHIPPING INFORMATION: Steel drums (450 lbs.). Rail—Plastics, Synthetic Liquid, NOIBN. Truck—Plastics, Liquid, NOI.

MELAMINE AND UREA RESINS

RESIMENE® MELAMINE AND RESIMENE® UREA FORMALDEHYDE

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Supplied in organic liquid solution.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Surface coating resin. Imparts improved surface hardness, weathering, alkali and chalk resistance. Promotes fast cure and excellent color retention. New high solids, low cost melamine resins have been added to the line. Some of these are also water-soluble.

USES: Melamine and urea-formaldehyde resins improve baked enamel and industrial finishes on appliances, automobiles and other fabricated metal items. Some high soluble melamine resins may also be used as crosslinkers for water-soluble industrial coatings.

INDUSTRIAL USERS: Paint, Varnish and Lacquer, Automotive, Chemical, Machinery and Appliance.

SHIPPING INFORMATION: Steel drums (450 lbs.). Rail—Plastics, Synthetic, Liquid, NOIBN. Truck—Plastics, Liquid, NOI.

RESIMENE® MELAMINE

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Available in syrup and water-alcohol, soluble spray-dry powders.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Industrial resin. Produce laminates displaying strong durable surface that is heat, flame and chemical resistant. Color stability and high electrical arc resistance are additional characteristics.

USES: *Resimene* Melamine syrup and powder solutions can be combined with paper, cloth and glass fibers to provide a durable surface for all types of furniture, counter tops, cabinets, walls and industrial electrical components.

INDUSTRIAL USERS: Chemicals, Construction, Electronics, Missiles, Machinery and Appliances, Pulp and Paper.

SHIPPING INFORMATION: Multiwall bags (50 lbs.); fiber drums (200 lbs.). Rail—Plastics, Synthetic, Other Than Liquid, NOIBN. Truck—Plastics, powder.

RESLOOM® MELAMINE

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Available in powder (*Resloom* HP) or liquid form (M-75, M-80) as a series of essentially monomeric melamine resins.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Textile resin. Permanently effective to fabrics made from a wide range of textile fibers.

USES: To impart shrinkage control, wrinkle resistance and textural effects to cotton, rayons, synthetics and wools.

INDUSTRIAL USERS: Textiles.

SHIPPING INFORMATION: M-75, M-80 — 500 lb. drums; *Resloom* HP—100 lb. drums; (except *Resloom* HP, which is in powder form). Powder: Rail—Plastics, Synthetic, Other Than Liquid, NOIBN. Truck—Plastics, Powder, Liquid; Rail—Plastics, Synthetic Liquid, NOIBN. Truck—Plastics, Liquid, NOI.

COAL TAR RESINS

MONTAR® SYNTHETIC RESINS

See Page 53

SULFONAMIDE RESINS

SANTOLITE® MHP RESINS

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Hard resin.

SPECIFICATIONS: Hard, practically colorless resin; refractive index (25 gms. in 75 gms. normal butyl acetate) 1.4275-1.4325; penetration (200 gm. load for 5 seconds at 25°C.) 2.0 mm. max.

GENERAL INFORMATION—PROPERTIES: An aryl sulfonaminde-formaldehyde resin similar to *Santolite* MS in characteristics, except that it is much harder, softening at about 62°C., brittle at normal temperatures. Nearly colorless, well adapted to specialty and heat-sealing lacquers, fabric coatings, molding compositions and the like. Being incompatible with drying oils it cannot be used as a varnish material.

USES: Used in spraying, dipping or brushing lacquers to make clear, colorless, odorless coatings of good gloss and adhesion. It does not materially increase the viscosity of the solution and permits the building up of a high-solids content in the lacquer. Compatible with all the common plasticizers.

CONTAINERS: 60-lb. cased cans.

SHIPPING CLASSIFICATION: Resin Synthethic NOIBN Without Filler.

SANTOLITE® MS *80% Industrial Resin.*

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Light-colored viscous liquid; free-flowing at temperatures above 20°C.; composition 78.8—81.2% *Santolite* MS, 18.8 to 21.2% solvent.

PROPERTIES: Soft, practically colorless resin made by the condensation of formaldehyde and aromatic sulfonamides.

USES: *Santolite* MS like *Santolite* MHP, is compatible with both nitrocellulose and cellulose acetate; as a solvent for both, it can be used in any proportion. Forms brittle compositions with both resins but the addition of a plasticizer makes such combinations permanently flexible.

SHIPPING INFORMATION: Resin Synthetic NOIBN Without Filler. 450-lbs. approx., 55-gal. drums; 45-lbs. approx. 5-gal. drums.

RESIN MATERIALS

ADIPIC ACID, FOOD AND TECHNICAL GRADES

See Page 17

BISPHENOL A

ORGANIC DIVISION

MOLECULAR WEIGHT: 228.28

STANDARD FORM: White flakes.

SPECIFICATIONS: Off-white flakes; crystallizing point 154.2°C. min.; iron 0.7 ppm max.; free phenol 0.15 max.; moisture 0.15% max.; color in acetone (25:30 ml) 150 APHA max.

USES: An intermediate in the production of epoxy resins (used in surface coatings, adhesives, die-making, laminating, potting, encapsulating and as rigid foams); polycarbonate resins (used in heat-resistant, dimensionally stable, electrically-insulating films, moldings and fibers); oil-soluble phenolic resins; and as an oxidant for oils, greases and vinyl compositions.

SHIPPING INFORMATION: Chemicals NOIBN. 50-lb. bags.

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DIBUTYL FUMARATE

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 248

STANDARD FORM: Liquid.

SPECIFICATIONS: Acidity 0.20 meq/100 grams max.; Color 40 APHA max.; Crystallizing Point —21.0°C. min.; Moisture (KF in methanol) 0.10% max.; Sp. Gr. 25°/25°C. 0.982-0.986.

USES: Internal plasticizing resin former for copolymerizing with vinyl acetate and vinyl chloride for adhesives, textile, paint and paper coatings. Intermediate for chemical synthesis.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal., 18-gauge steel drums with tight heads. 2-inch and ¾ -inch openings in the head. Gross weight: 498 lbs. Also tank cars or tank trucks 2,000-gal. minimum.

DIBUTYL MALEATE

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 248

STANDARD FORM: Liquid.

SPECIFICATIONS: Acidity 0.12 meq/100 grams max.; Color 10 APHA max.; Moisture (KF in methanol) 0.15% max.; sp. gr. 1.117 ±0.005.

USES: Internal plasticizing resin former for copolymerizing with vinyl acetate and vinyl chloride for adhesives, textile, paint and paper coatings. Intermediate for chemical synthesis.

SHIPPING INFORMATION: Resins Plasticizer, 55-gal., 20-gauge steel drums with tight heads. 2-inch and ¾ -inch openings in the head. Gross weight: 540 lbs. Also tank cars or tank trucks—2,000-gal. minimum.

DIOCTYL FUMARATE (DOF)

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Acidity 0.20 meq/100 gms. max.; Color, APHA 75 max.; Moisture (KF in Methanol) 0.10% max.; sp. gr. 25°/25°C., 0.937-0.940.

PROPERTIES: Dioctyl Fumarate is a clear mobile liquid important as a monomer for polymerization and copolymerization. Polymers varying in physical properties from hard brittle resins to soft, internally plasticized elastic materials, can be made by various monomers and adjusting reaction conditions.

USES: Copolymers of Dioctyl Fumarate with vinyl acetate, vinyl chloride, acrylic and styrene for surface coatings, free films, synthetic lubrication, pigment binders, paper coatings and floor waxes.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal. drums, gross 475 lbs.; tank cars and tank trucks.

DIOCTYL MALEATE (DOM)

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Acidity 0.20 meq/100 gms. max.; Color APHA 50 max.; Moisture (KF in Methanol) 0.10% max.; sp. gr. 25°/25°C., 0.940-0.943.

PROPERTIES: Dioctyl Maleate is a clear mobile liquid especially important as a monomer for polymerization and copolymerization. Polymers varying in physical properties from hard brittle resins to soft, internally plasticized elastic materials, can be made by using various monomers and adjusting reaction conditions.

USES: Copolymers of Dioctyl Maleates with vinyl acetate, vinyl chloride styrene and acrylates are of special value in the following: surface coatings; free films; adhesives; oil additives; elastomers; paper coatings; and, pigment binders.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal. drums, 475 lbs. gross; tank cars and tank trucks.

EMA® RESINS *(Ethylene Maleic Anhydride Copolymers)*

INORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Fine water-soluble powders available as both straight-chain and cross-linked polymers in a variety of molecular weights.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: The *EMA* resins are easily converted to the free-acid form; and to its sodium and amide-ammonium salts; and are readily reacted with alcohols and substituted alcohols and with amines to form esters and resins. By selecting the proper reactant, the following types of derivatives can be prepared: transparent film-formers, polymeric liquids, waxy solids and polyampholytes.

SUGGESTED USES: Beneficiation agent for clays used in oil-well drilling muds; stabilizers and thickeners in liquid detergent and cosmetic formulations; thickeners for water-based latex paints, textile sizes, textile print pastes and binders; suspending agents for ink pigments, thickener for aqueous resin systems, adhesives, binder for foundry cores, etc.

SHIPPING INFORMATION: Multiwall bags (50 lbs.), F. O. B. Texas City, Texas. Rail and Truck, Sizing NOIBN.

FUMARIC ACID, FOOD AND TECHNICAL GRADES

See Page 17

HBPA® HYDROGENATED BISPHENOL A

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 240.35

STANDARD FORM: Cast solid.

SPECIFICATIONS (TENTATIVE): Color 30% in Methanol 50 APHA max.; Hydroxyl number 430 min.; Ash 0.03% max.; Iron 3 ppm max.; Moisture 0.3% max.

USES: Alkyds and unsaturated polyesters to impart chemical resistant properties.

CONTAINERS: Light-gauge metal cans.

SHIPPING INFORMATION: Chemicals NOIBN.

MALEIC ANHYDRIDE

See Page 23

PHOSGARD® C-22-R ORGANOPHOSPHORUS COMPOUND

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Viscous liquid.

SPECIFICATIONS: Appearance clear viscous liquid; Color APHA 50 max.; Refractive Index 25°C., 1.492-1.494; Acidity 0.05 meq/gm max.; Chlorine 27% min.

PROPERTIES: *Phosgard* C-22-R is a flame retardant organophosphorus compound with high efficiency through high phosphorus and chlorine content, essentially non-volatile, excellent color stability on UV and heat exposure, long storage stability and good hydrolytic stability.

USES: *Phosgard* C-22-R gives excellent flame retardance in Urethane foams, phenolics, polymethylmethacrylates, polyester resins and epoxies.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal. drums, 672 lbs. gross; tank cars and tank trucks.

PHTHALIC ANHYDRIDE

ORGANIC DIVISION

MOLECULAR WEIGHT: 148.11

STANDARD FORM: White flakes or fused mass.

SPECIFICATIONS: Solubility in benzene (1:20) clear. Assay 99.5% min.; C.P. 130.8°C. min.

USES: An intermediate in the production of alkyd and polyester resins; dyestuffs; perfume bases; alcohol denaturants; pharmaceuticals; and plasticizers such as octyl phthalate, dibutyl phthalate, dimethyl phthalate, diethyl phthalate and phthalyl glycollates.

SHIPPING INFORMATION: Phthalic Anhydride. 80-lb. bags; tank cars; tank trucks.

RJ-100® AND RJ' 101 STYRENE ALLYL ALCOHOL COPOLYMER

See Page 46

STYRENE MONOMER

See Page 26

VINYL CHLORIDE MONOMER

See Page 26

FORMALDEHYDE RESINS

RESIMENE® MELAMINE AND RESIMENE® UREA-FORMALDEHYDE RESINS

See Page 50

RESINOX® PHENOL-FORMALDEHYDE RESINS

See Page 50

0557464

TOWOLDMON0041198

WATER_PCB-00032244

UREA, INDUSTRIAL GRADE UNCOATED PELLETS

INORGANIC DIVISION

STANDARD FORM: Urea pelleted form without coating agent.

ANALYSIS:

Nitrogen (Min.)	46.0%
Moisture (Max.)	.5%
Biuret (Max.)	1.0%

USES: Urea Formaldehyde resins for adhesives, plastics, paper and textiles; chemical intermediate, cosmetics, detergents, explosive stabilizer, paints, dentifrice, fermentation, finishes.

SHIPPING INFORMATION: Urea. 80-lb. multiwall paper bags with polyethylene lining. Also in bulk.

PLASTICIZERS

AROCLOR® POLYCHLORINATED POLYPHENYLS

See Page 24

DI-2-ETHYLHEXYL ADIPATE (DOA)

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 370.56

STANDARD FORM: Liquid.

SPECIFICATIONS: Clear oily liquid; color APHA 25 max.; odor mild; acidity (as adipic acid) 0.02% max.; sp. gr. 0.924 ±0.003 at 25°/25°C.

USES: A primary plasticizer which imparts excellent low temperature flexibility to polyvinyl chloride resins and synthetic rubbers. Used in conjunction with DOP and *Santicizer* 160 to make quality vinyl garden hose. Imparts low viscosity to vinyl plastisols for cloth coating, wire coating, etc. Imparts excellent heat and light stability and superior softness to vinyl film and upholstery.

SHIPPING INFORMATION: Resin Plasticizer. 55 and 5-gal. drums; tank cars, tank trucks wherever possible.

DI-2-ETHYLHEXYL PHTHALATE (DOP)

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 390.54 (Pure compound)

STANDARD FORM: Liquid.

SPECIFICATIONS: Color APHA 25 max.; odor, very slight characteristic; sp. gr. 0.980-0.985 at 25°/25°C.; refractive index 1.4845-1.4858 at 25°C.; acidity (as phthalic) 0.01% max.

PROPERTIES: Di (2-EthylHexyl) Phthalate (DOP) is the largest volume plasticizer consumed in polyvinyl-chloride resin. It imparts very good low temperature flexibility, low volatility and good heat and light stability to a vinyl composition. It is often used with *Santicizer* 141 to give a composition of improved light stability, resistance to embrittlement and aging, flame resistance and ease of processing. In vinyl electrical compositions, DOP imports excellent electrical characteristics with good aging properties.

USES: This plasticizer is widely used in plasticizing polyvinyl chloride for electrical insulation. DOP is also compatible with most of the other resins commonly used in the plastics industry. It is an excellent general purpose plasticizer for use in vinyl plastics. It has been widely used in such vinyl applications as shower curtains, aprons, rainwear, upholstery, draperies, garden hose and many others which require good flexibility and aging characteristics.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal. (445-lb.) and 5-gal. (40-lb.) black iron drums; tank cars, tank trucks wherever possible.

DI-N-OCTYL, N-DECYL ADIPATE (DNODA)

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Appearance, clear oily liquid; color, APHA 50 max.; sp. gr. 25°/25°C., 0.914-0.922; refractive index, 25°C., 1.444-1.450; moisture, 0.10% max.; acidity, 0.35 meq/100 gms. max.

PROPERTIES: DNODA is a primary plasticizer for polyvinyl chloride and imparts excellent low temperature flexibility and efficiency along with softness, superior hand and drape, permanence, water resistance, heat and light stability. It has the best balance of properties of all adipates and on a cost/performance basis is the first choice of all low temperature flexibilizing plasticizers.

USES: The major use of DNODA is as a low temperature flexibilizing, specialty plasticizer used with basic type esters, such as DOP. It finds widespread use in film, sheeting and coated fabric. It will improve flexibility in garden hose and extrusion compounds and improve low temperature exposure characteristics of electrical jacketing formulae.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal. (415-lb.) and 5-gal. (40-lb.) black iron drums; tank cars, tank trucks wherever possible.

DI-N-OCTYL, N-DECYL PHTHALATE (DNODP)

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Appearance, clear oily liquid; Acidity, as Phthalic, 0.01% max.; Color, APHA, 50 max.; Odor slight ester; Refractive Index, @ 25°C., 1.4810-1.4840; sp. gr., 25°/25°C., 0.9680-0.9770.

PROPERTIES: DNODP is widely used in PVC to impart superior low temperature flexibility and low processing volatility. It is miscible with most common solvents, thinners and oils.

USES: This plasticizer is useful in imparting excellent cold temperature flexibility along with good heat and light stability in film and sheeting. It is widely used in 80°C. and 90°C. appliance wiring. It imparts excellent flexibility to profile extrusions.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal. drums, 480-lb. gross; 5-gal. drums, 46-lbs. gross; tank truck and tank cars.

DIBUTYL PHTHALATE

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 278.34

STANDARD FORM: Liquid.

SPECIFICATIONS: Clear, oily liquid; color APHA 20 max.; odor slight; acidity (as phthalic acid) 0.01% max.; sp. gr. 1.044-1.048 at 25°/25°C.; refractive index 1.4895-1.4915 at 25°C.; assay (ester content) 99% min.; sulfur (copper-strip test) negative.

USES: One of the most widely used plasticizers for nitrocellulose and polyvinyl acetate; miscible with all the common organic solvents and with oils; soluble in water only to 0.001% at 30°C.; excellent light stability which permits its use in colorless, white or delicately tinted products. The stability of dibutyl phthalate and its high solvent power for most plastic materials make it one of the most acceptable plasticizers for general use in cellulosics and vinyl acetate.

SHIPPING INFORMATION: Dibutyl Phthalate. 475-lb. steel drums; 40-lb. drums; tank cars; tank trucks.

DICYCLOHEXYL PHTHALATE (DCHP)

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 330

STANDARD FORM: White granules.

SPECIFICATIONS: Appearance, white granules; color of melt, 100 APHA max.; odor, moderate aromatic, slight phthalic; moisture in methanol, 0.1% maximum; melting point, 63°C, minimum; acidity (as phthalic acid), 0.01% max.; ester content 99.0% min.

PROPERTIES: Dicyclohexyl Phthalate is an excellent primary plasticizer for ethyl cellulose, polystyrene, acrylics and chlorinated rubber. It is partially compatible with cellulose acetate butyrate, polyvinyl butyral, polyvinyl chloride and incompatible with cellulose acetate.

USES: This plasticizer is widely used as a plasticizer for nitrocellulose lacquers where it contributes adhesion, oil resistance, heat sealability and hardness. It is also used in combination with liquid plasticizers for plasticizing polyvinyl acetate to make heat sealing adhesives.

SHIPPING INFORMATION: Resin Plasticizer, 350-lb. metal containers.

DIETHYL PHTHALATE

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 222.23

STANDARD FORM: Liquid.

SPECIFICATIONS: Clear, water white oily liquid; Color, APHA 10 max.; Acidity (as Phthalic Acid) 0.01% max.; Odor, slight aromatic; Moisture, 0.15% max. (KF in methanol); Specific Gravity, 1.117 ±0.005 at 25°/25°C.

USES: A plasticizer for cellulose acetate for use in molding compounds. It gives improved properties in polyvinyl acetate for adhesives and surface coatings. It imparts quick tack to polyvinyl emulsions. It has had FDA approval for use in food packaging for some time.

SHIPPING INFORMATION: Diethyl Phthalate. 55-gal., 20-gauge steel drums with tight heads, 2-inch and ¾-inch openings in head. Gross weight 540-lbs. Also available in tank cars and trucks, 2,000-gal. minimum.

DIISODECYL ADIPATE (DIDA)

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 426.67

STANDARD FORM: Liquid.

SPECIFICATIONS: Clear oily liquid; color APHA 50 max.; odor mild; acidity (as adipic acid) 0.04% max.; sp. gr. 0.916 ±0.003 at 25°/25°C.; moisture (by KF in methanol) 0.10% max.

USES: A low volatile, low temperature plasticizer for polyvinyl chloride resins. It is similar to dioctyl adipate in properties imparted to vinyls, but has the advantage of lower volatility. Diisodecyl adipate is an excellent coplasticizer with DIOP or DIDP for vinyl plastisols and organosols. DIDA imparts very low initial viscosity to plastisols and a negligible increase in viscosity on storage.

SHIPPING INFORMATION: Resin Plasticizer. 55 and 5-gal. drums; tank cars, tank trucks wherever possible.

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TOWOLDMON0041199
WATER_PCB-00032245

DIISODECYL PHTHALATE (DIDP)

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 446.65

STANDARD FORM: Liquid.

SPECIFICATIONS: Clear oily liquid; color APHA 50 max.; odor slight; acidity (as phthalic acid) 0.01% max.; sp. gr. 0.962 to 0.973 at 25°/25°C.

USES: A general purpose primary plasticizer for polyvinyl chloride *being similar* to dioctyl phthalate (DOP) but with lower volatility characteristics and superior resistance *to soapy water extraction.* Especially useful for wire compounds, floor tile and vinyl plastisols where it imparts low initial viscosity and very little viscosity build-up on prolonged storage at elevated temperatures (40-50°C.). For the electrical industry Monsanto offers DIDP-E, a special grade of DIDP stabilized with 0.25% Bisphenol A for improved electrical characteristics and retention of physical properties of heat aging.

SHIPPING INFORMATION: Resin Plasticizer. 55 and 5-gal. drums; tank cars, tank trucks wherever possible.

DIISOOCTYL PHTHALATE (DIOP)

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 390.55

STANDARD FORM: Liquid.

SPECIFICATIONS: Clear, oily liquid; color APHA 35 max.; odor slight; acidity (as phthalic acid) 0.10% max.; sp. gr. 0.980 to 0.985 at 25°/25°C.

USES: General purpose primary plasticizer for polyvinyl chloride. Uses similar to those for DOP. DIOP superior for vinyl organosols and plastisols having lower initial viscosity and lower viscosity *build-up on* storage than DOP.

SHIPPING INFORMATION: Resin Plasticizer. 55 and 5-gal. drums; tank cars, tank trucks wherever possible.

DIMETHYL PHTHALATE

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 194.18

STANDARD FORM: Liquid.

SPECIFICATIONS: *Clear, water-white oily liquid; color* APHA not darker than 10; odor not more than slightly aromatic; acidity (as phthalic acid) 0.01% max.; sp. gr. 1.190 ±0.001 at 25°/25°C.; refractive index 1.5133 ±0.001 at 25°C.; sulfur (copper-strip test) negative.

PROPERTIES: A solvent plasticizer for cellulose acetate; miscible with all common organic solvents and with oils (except petroleum oils); solubility in water 0.4% at 32°C.; excellent light stability; B.P. 282°C.; crystallizing point 0°C.; wt. per gal. 10 lbs.

USES: Widely used in cellulose acetate molding compounds and polyvinyl acetate adhesives. Its metor use is primarily in the cellulose acetate field where, as a general rule, it is used in combination *with diethyl phthalate or some other plasticizer.*

SHIPPING INFORMATION: Dimethyl Phthalate. 530 and 40-lb. steel drums. Tank cars and tank trucks wherever possible.

DIPHENYL PHTHALATE

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 318.31

STANDARD FORM: Fused solid.

SPECIFICATIONS: Essentially white fused solid; free acid (as phthalic acid) 0.20% max.; free phenol 0.20% max.

PROPERTIES: Crystallizing point approx. 69°C.; readily soluble in ketones, esters and chlorinated hydrocarbons; solubility in alcohols, turpentine and linseed oil rather low, approx. 5.0 grm. per 100 cc. of solvent at 25°C.; completely insoluble in water and gives increased water resistance to all compositions in which it is used.

USES: Compatible with nitrocellulose and with the sulfonamide, phenolic, polystyrene and vinyl types of synthetic resins. In nitrocellulose lacquers produces hard coatings that have excellent gloss retention and weather resistance. Mixtures of diphenyl phthalate with either *Santolite* MS—80% or *Santolite* MHP Industrial Resins are excellent plasticizers for nitrocellulose in odorless, flexible, adhesive coatings. Especially recommended for vinyl resins, polystyrene, ethyl cellulose and some of the natural resins such as damar.

SHIPPING INFORMATION: Resin Plasticizer. 400-lb. fiber drums.

DITRIDECYL PHTHALATE (DTDP)

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: *Clear oily liquid:* Color, APHA 100 max. Specific gravity 0.948 to 0.955 at 25°/25°C. Refractive Index at 25°C. 1.4813 to 1.4860. Acidity as Phthalic Acid 0.015% max.

USES: DTDP is a practically colorless liquid of low viscosity and excellent electrical properties. Its high boiling point assures low volatility. It is widely used in wire compounds. It imparts excellent soapy water resistance and low volatility to film and sheeting. Its viscosity stability in plastisol applications is excellent.

DYTROL® *Paint brush preserver.*

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Appearance, clear, oily liquid; color, APHA 60 max.; sp. gr. 25°/25°C., 1.088-1.091; refractive index at 25°C., 1.507-1.510; moisture, 0.10% max.

PROPERTIES: *Dytrol* is a non-volatile, non-flammable, pleasant smelling liquid that possesses a strong softening action on paints, lacquers, varnishes, etc. It is non-toxic and miscible with most common solvents, thinners and oils.

USES: The characteristics of *Dytrol* suggests its use as a preservative for paint brushes. It is also useful as a reconditioner for paint brushes containing dried paint or for removing paint from the skin after a paint job.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal. (495-lb.) and 5-gal. (45-lb.) steel drums; tank trucks.

HB-40® PARTIALLY HYDROGENATED TERPHENYL

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: A clear, mobile, high-boiling hydrocarbon; almost colorless, oily liquid with faint, pleasant odor; sp. gr. 1.001-1.007 at 25°/15.6°C.; wt. per gal. 8.37 (average); refractive index 1.5600-1.5750 at 25°C.; insoluble in water; miscible in all proportions at room temperature with several solvents and oils.

USES: Low-cost, secondary plasticizer for vinyl sheeting, films and fabric or paper coatings. Plasticizer for vinyl protective coatings and adhesives. Used to plasticize vinyl profile extrusions, tubing, wire coating and injection- and slush-molding compounds. Plasticizer for styrene-water dispersion paints, paper coatings, adhesives and styrene casting resins.

SHIPPING INFORMATION: Resin Plasticizer. Tank cars; 460-lb. drums.

MOD-EPOX® EPOXY RESIN MODIFIER

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid (solid below 77°F.)

SPECIFICATIONS: Color, APHA 50 max.; neutralization number (mg. of KOH/grm.), 0.08 max.

PROPERTIES: *Mod-Epox* is a unique modifier for epoxy resins. It reduces the viscosity of liquid epoxy resins, accelerates the cure, improves compressive yield strength, electrical characteristics and adhesive characteristics. It does not adversely affect such important characteristics as hardness, solvent resistance or water resistance. Since *Mod-Epox* is considerably lower in price than the epoxy resins the use of this product results in decreased costs.

USES: *Mod-Epox* is used in the tool and die industry, electronic potting compounds, encapsulations, adhesives, surface coatings, body solder compounds and other applications being developed in epoxy resins.

SHIPPING INFORMATION: Chemicals NOIBN. 55-gal. (510-lb.) and 5-gal. (45-lb.) galvanized drums.

MONTAR® SYNTHETIC RESINS

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Resin.

PROPERTIES: A series of related brown-to-black resins of the following characteristics:

	Softening Point	% Cl	% CaO	% Fe
Montar 3	86-168°C.	50-52	5-10	0.3-0.6
Montar 4	92-206°C.	54-56	5-10	0.5-1.0
Montar 5	155-230°C.	53-56	1-3	0.1-0.2
Montar 6	135-190°C.	59-61	2-5	0.2-0.4
Montar 9	130-175°C.	—	—	0.2-0.4

USES: Used primarily to impart fire resistance and to reduce cost of resin formulations.

SHIPPING INFORMATION: Coal Tar Resins. Catch-weight drums.

SANTONOX® ANTIOXIDANT

See Page 28

SANTONOX® R ANTIOXIDANT

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Solid.

SPECIFICATIONS: Appearance, light colored crystalline material; ash 0.05% max.; melting point, 155°C. min.; heat loss, 1.0% max.

PROPERTIES: *Santonox* R is probably the best antioxidant available for both high and low pressure polyethylene. It offers the *same advantages as Santonox;* but, *in addition,* offers the added advantages of lower color, reduced odor, larger particle size and 10-15% greater efficiency.

USES: *Santonox* R is used as an antioxidant for polyethylene. It has been approved by the FDA as an antioxidant in high pressure (low density) polyethylene at a 0.05% level for all usea except fatty foods.

SHIPPING INFORMATION: Chemicals NOIBN. 150-lb. fiber containers.

0557466

TOWOLDMON0041200
WATER_PCB-00032246

SANTOWHITE® POWDER

See Page 62

TRICRESYL PHOSPHATE

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 368.36

STANDARD FORM: Liquid.

SPECIFICATIONS: Clear, practically colorless liquid; sp. gr. 1.165 ±0.008 at 25°/25°C.; acidity (as H_3PO_4) 0.01% max.; potassium permanganate test, no change in 30 minutes.

PROPERTIES: High boiling point; relatively non-volatile, evaporation loss less than 0.10% in 100 hours at 100°C. Refractive index is approx. 1.556 and 20°C. Viscosity increases rapidly at temperatures below normal; at approx. −35°C. a solid transparent mass without crystalline structure. Miscible with all the common solvents and thinners, linseed, chinawood and castor oils; solubility in water less than 0.002% at 85°C., imparts good moisture resistance to nitrocellulose films. The ortho isomer which is reputed to be the toxic element in normal tricresyl phosphate, has been virtually eliminated from *Monsanto* Tricresyl Phosphate thereby reducing toxicity dangers to a minimum and making the product more suitable for many applications. Elimination of the ortho isomer causes no impairment in plasticizing qualities.

USES: The standard fire-retarding plasticizer for nitrocellulose and vinyls.

SHIPPING INFORMATION: Resin Plasticizer. 530-lb. and 45-lb. steel drums; tank cars; tank trucks wherever possible.

TRIPHENYL PHOSPHATE

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 326.28

STANDARD FORM: Flakes.

SPECIFICATIONS: White flakes, faintly aromatic; M.P. 48.5°C. min. start; permanganate test, no change in 30 minutes; acidity (as H_3PO_4), 0.003% max.

PROPERTIES: Miscible with the common solvents and thinners and with vegetable oils; solubility in water 0.001% at 34°C., 0.002% at 54°C.; imparts some moisture resistance to cellulose-acetate films. Retentivity in cast cellulose-acetate films nearly 80%; that is, it can be incorporated in the proportion of 8-10 of acetate without separation and blooming. Imparts good flexibility and gives clear, tough compositions without tendency toward tackiness. One of its most valuable properties is that of fire retarding. When used alone on cellulose-acetate films an amount of triphenyl phosphate equal to 20% of the cellulose-acetate weight produces films which will not support combustion.

USES: Triphenyl phosphate is primarily used as a flame retardant plasticizer for cellulosics. It also is of interest in heat sealing coatings and adhesives.

SHIPPING INFORMATION: Resin Plasticizer. 225-lb. fiber drums.

TRIBUTYL PHOSPHATE (TBP)

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Appearance, clear mobile liquid; sp. gr., 25°/25°C., 0.973-0.979; Color, APHA 20 max.; Acidity (as H_3PO_4) 0.03% max.; Odor, characteristic ester; Moisture (KF) 0.2% max.

PROPERTIES: Tributyl Phosphate is a practically colorless liquid of low viscosity. It is a primary plasticizer and solvent for nitrocellulose, cellulose acetate and chlorinated rubbers. It is recommended as an anti-foaming agent and high boiling solvent used in 2,4-D concentrates and uranium recovery.

USES: Anti-foaming agent at 1% or less in rubber-based paints and similar emulsions. Solvent and blending agent for 2,4-D acid concentrates.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal. drums, 490 lbs. gross; 5-gal. drums, 46 lbs. gross; tank trucks and tank cars.

TRIBUTOXY ETHYL PHOSPHATE (TBEP)

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Appearance, clear mobile liquid; Odor, mild ester; Color, APHA 75 max.; Acidity, as Acetic acid, 0.06% max.; Refractive Index @ 25°C., 1.4345-1.4438. Moisture (KF) 0.12% max.; sp. gr. 20°/20°C., 1.017-1.023.

PROPERTIES: TBEP is a colorless liquid plasticizer which is a strong solvent for most resins, particularly cellulose acetate and polyvinyl acetate.

USES: Plasticizer for leveling agent for self-polishing floor waxes. Offers flame retardance, but not as good as TCP. Imparts good low temperature flexibility to resins.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal. drums, 500 lbs. gross; 5-gal. drums, 46 lbs. gross; tank trucks and tank cars.

TRIPHENYL PHOSPHITE

See Page 33

SANTICIZER® 140 PLASTICIZER

See Page 56

SANTICIZER® 141 PLASTICIZER

See Page 56

SANTICIZER® 160 PLASTICIZER

Butyl Benzyl Phthalate

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 312.35

STANDARD FORM: Liquid.

SPECIFICATIONS: Color APHA 40 max.; sp. gr. 1.113-1.121 at 25°/25°C.; acidity (as phthalic acid) 0.02% max.

PROPERTIES: A clear oily liquid plasticizer having a slight characteristic odor. Gives good low temperature performance; possesses good heat and light stability and low volatility.

USES: A relatively non-volatile plasticizer for polyvinyl chloride, polyvinyl chloride-acetate, polyvinyl butyral, ethyl cellulose and nitrocellulose. Superior to many other commonly used plasticizers in its permanence, oil resistance, flexibility and stability. Because of its high plasticizing efficiency, it is of outstanding value in increasing output of processing equipment such as extruders and calenders. Used successfully in vinyl organosols which are useful for coatings and films. An excellent plasticizer for polyvinyl butyral and for low-molecular weight polystyrene, which is further polymerized later for coating and impregnating work.

The FDA has amended the following food regulations: §121.2511 — Plasticizers in Polymeric Substances. §121.2514 — Resinous and Polymeric Coatings, §121.2520 — Adhesives, §121.2526 — Resinous and Polymeric Coatings for Paper and Paper Board. §121.2569 — Resinous and Polymeric Coatings, Polyolefins, and §121.2571 — Components of Paper and Paper Board in Contact With Dry Foods for the use of Butyl Benzyl Phthalate in food packaging applications.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal. and 5-gal. drums; tank cars; tank trucks.

SANTICIZER® 213 PLASTICIZER

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Sp. gr. 1.040-1.045 at 25°/25°C.; acid value, 0.25 meq./100 gms; color APHA 75 max.

PROPERTIES: A clear, oily liquid with unusual properties in PVC, particularly in plastisols.

USES: Low-cost primary plasticizer for polyvinyl chloride. *Santicizer* 213 has the unique ability to reduce "surface tack" of vinyl surfaces. It is of special value in plastisol formulations—contributes low initial viscosity, slow viscosity build-up, and fast fusion in a single plasticizer. *Santicizer* 213 improves mold release in plastisol molded vinyls.

SHIPPING INFORMATION: Resin Plasticizer. Tank cars, tank trucks; 55-gal. and 5-gal. drums.

SANTICIZER® 214 PLASTICIZER

See Page 56

SANTICIZER® 215 PLASTICIZER

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Clear, oily liquid, free of sediment or turbidity; color APHA 100 max.; acidity 0.12% max.; sp. gr. 0.974-0.980 at 25°/25°C.

USES: *Santicizer* 215 is a low-cost phthalate type ester designed for use in the electrical wiring field. Its primary use is in competitive 60°T, TW and NM applications. It can also be used in semi-rigid insulation and as the vinyl cover jacket in type NM wiring for homes.

SHIPPING INFORMATION: Resin Plasticizer. Tank cars; tank trucks.

SANTICIZER® 218 PLASTICIZER

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Clear, oily liquid; color APHA 25 max.; acidity 0.20 meq./100 gms. max.; moisture 0.15% max.; refractive index 1.494-1.498 at 25°C.; sp. gr. 1.048-1.052 at 25°/25°C.

USES: *Santicizer* 218 is an unusually effective plasticizer for general purpose polyvinyl acetate emulsion adhesives. Economy plus such properties as low viscosity build-up, good speed of set, good film formation and more extensible films are particularly attractive to adhesives formulators.

SHIPPING INFORMATION: Available in tank truck and tank car shipments. Also in 55 and 5-gal. drums.

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SANTICIZER® 262 PLASTICIZER

Alkyl Benzyl Phthalate

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Clear, oily liquid; color APHA 100 max.; acidity 0.37 max.; moisture 0.15% max.; sp. gr. 1.048-1.057 at 25°/25°C.; Refractive index 1.519-1.523 at 25°C.

USES: A monomeric plasticizer offering high permanence, comparable to low molecular weight polymerics, and still retains the easy processing features of monomeric plasticizers in film and sheeting, coated fabrics, laminates, upholstery, plastisols, organosols and acrylic lacquers.

SHIPPING INFORMATION: Resin Plasticizers; 5- and 55-gal. drums.

SANTICIZER® 268 PLASTICIZER

Phthalate

ORGANIC DIVISION

STANDARD FORM: Liquid.

SPECIFICATIONS: Clear, oily liquid; acidity 0.35 meq/100 grams max.; color APHA 70 max.; moisture (KF in methanol) 0.15% max.; sp. gr. at 25°/25°C. 1.108-1.115; refractive index at 25°C. 1.530-1.535.

USES: Stain-resistant plasticizer for use in homogenous floor coverings.

SHIPPING INFORMATION: Resin Plasticizer.

SANTICIZER® 602 PLASTICIZER

Isooctyl Isodecyl Phthalate.

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Clear, oily liquid; color APHA 50 max.; odor mild; acidity (as phthalic acid) 0.01% max.; sp. gr. 0.971-0.977 at 25°/25°C.

USES: A primary plasticizer for polyvinyl chloride with lower volatility than dioctyl phthalate (DOP). Imparts lower initial viscosity and less viscosity build-up in plastisols than DOP. Has excellent soapy-water-extraction and alkali resistance. Used in vinyl floor tile, film and sheeting.

SHIPPING INFORMATION: Resin Plasticizer. Tank cars; tank trucks.

SANTICIZER® 9 PLASTICIZER

Mixture of ortho and para-Toluenesulfonamides.

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 171.21

STANDARD FORM: Fine granules.

SPECIFICATIONS: Appearance, fine white to light cream colored particles; moisture, 1.0% max.; color (33⅓% by weight in acetone) APHA 85 max.

PROPERTIES: Solubility quite low in coal-tar hydrocarbons and negligible in petroleum hydrocarbons; readily soluble in most other solvents, and in hot linseed, chinawood and castor oils; soluble in water only about 1.0% at 34°C., but more soluble in alkali; least soluble Monsanto plasticizer in ethylene dichloride and benzene; solubility in ethylene dichloride approx. 4%, in benzene approx. 1.5%, each at 30°C.

USES: *Santicizer* 9 differs greatly from other plasticizers in its action. Relatively small amounts impart a gloss to polished articles, give smooth working and uniform curing of molded thermosetting products. Blends readily with most synthetic resins, does not impart the softening action of liquid plasticizers. Particularly valuable to the makers of molding compositions. In some phenol-aldehyde resins it appears to act not only as a lubricant, but also as a promoter, giving more uniform and thorough curing. In amounts of about 20 parts per 100, has a temporary plasticizing action on protein compounds, such as corn protein and soybean protein. In melamine coating and laminating resins, *Santicizer* 9 promotes solution stability and compatibility, improves flowout during baking or curing, and increases impact strength and abrasion resistance.

SHIPPING INFORMATION: Resin Plasticizer, 250-lb. fiber drums.

SANTICIZER® 3 PLASTICIZER

N-Ethyl para-Toluene Sulfonamide.

ORGANIC DIVISION—LITERATURE AVAILABLE

Available on Special Manufacturing only.

MOLECULAR WEIGHT: 199.27

STANDARD FORM: Crystalline solid.

SPECIFICATIONS: Practically White crystalline solid; C.P. 58.0°C. min.; acidity (as acetic acid) 0.10% max.; moisture (by KF in methanol) 0.25% max.

USES: *Santicizer* 3 is a solid, sulfonamide plasticizer. It has limited compatability with commonly used resins but is widely used in combination with other plasticizers. Either in combination or alone it imparts high gloss, toughness and hardness. It sharpens the softening point of some thermoplastics, especially the cellulose esters. Its use makes possible such products as heat-sealing lacquer coatings and adhesives. It is compatible with cellulose acetate to the extent of 50 parts per 100 parts of resin. In addition to its effect on toughness and gloss, it improves the flow of molding compositons and lowers moisture permeability. It is about as compatible with polyvinyl formal as with cellulose acetate and its use improves flow and imparts excellent gloss.

SHIPPING INFORMATION: Resin Plasticizer. 400-lb. steel drums.

SANTICIZER® 8 PLASTICIZER

Mixture of N-Ethyl-ortho- and para-Toluenesulfonamides.

ORGANIC DIVISION—LITERATURE AVAILABLE

Available on Special Manufacturing only.

MOLECULAR WEIGHT: 199.27

STANDARD FORM: Liquid.

SPECIFICATIONS: Light yellow, viscous liquid; odor slight characteristic; unsubstituted amide 9-13% acidity (as acetic acid) 0.80 meq/100 gms. max.; color of melt 200 APHA max.

PROPERTIES: Readily miscible with all common organic solvents except the petroleum hydrocarbons in which it is only very slightly soluble. In water, soluble to approx. 0.13% at 23°C., 0.21% at 48°C.; solubility in water decreased by presence of ammonia but increased by other alkalies; soluble in castor oil, slightly soluble in chinawood oil; insoluble in linseed oil; retentivity in cellulose acetate approx. 90 parts by weight to 100 of acetate; imparts a high degree of plasticity. A solvent for both nitrocellulose and cellulose acetate.

USES: An excellent plasticizer for cellulose acetate, giving a brilliance and polish not obtainable with other plasticizers. Being practically insoluble in petroleum hydrocarbons, is a valuable plasticizer for coatings designed to withstand gasoline and related products. Has some plasticizing action on such protein compounds as casein, glue, soybean protein and corn protein. May be used alone or in conjunction with other materials such as glycerine or similar compounds; greatly increases the flexibility of shellac with considerable softening effect; also very useful with polyvinyl acetate adheaives. *Santicizer* 8 is one of the best plasticizers known for synthetic polyamides such as nylon and related resins.

SHIPPING INFORMATION: Resin Plasticizer. 530-lb. and 50-lb. drums.

SANTICIZER® 1-H PLASTICIZER

N-Cyclohexyl para-Toluenesulfonamide.

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 253.36

STANDARD FORM: Yellow-brown fused mass.

SPECIFICATIONS: C.P. 82.5°C. min.; moisture 0.15% max.; color of melt APHA 300 max.

PROPERTIES: *Santicizer* 1-H is a solid plasticizer which is relatively light stable and of a low order of toxicity. It is soluble in alcohol, esters, ketones, aromatic hydrocarbons and vegetable oils. It is insoluble in water. It is compatible with a wide variety of resins including most of the cellulosic and vinyl resins.

USES: *Santicizer* 1-H is used in special crystallizing finishes, paper coatings, textile coatings and adhesives. It is a useful plasticizer in nitrocellulose lacquers, imparting a relatively sharp softening point. It is also used to incorporate incompatible components such as paraffin wax for producing special coating effects such as crystallizing lacquers. For improved adhesion where flexibility in nitrocellulose is required, it is used in combination with dibutyl phthalate or *Santicizer* 160. It improves the moisture resistance of cellulose acetate and improves flexibility, hardness and light stability of ethyl cellulose. It is compatible with and imparts good flexibility to shellac and kauri resin.

SHIPPING INFORMATION: Resin Plasticizer. Approx. 320 lbs. fiber drums.

SANTICIZER® M-17 PLASTICIZER

Methyl Phthalyl Ethyl Glycollate.

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 266.24

STANDARD FORM: Liquid.

SPECIFICATIONS: Color APHA 20 max.; sp. gr. 1.217-1.227 at 25°/25°C.; acidity (as acetic acid) 0.02% max.; odor, slight characteristic; sulfur (copper-strip test) negative.

PROPERTIES: A solvent for both nitrocellulose and cellulose acetate; imparts a high degree of plasticity undiminished even in extremely thin films exposed to air currents for a long time. Very light-stable and may be used in transparent or tinted articles without danger of yellowing. Readily miscible with other organic solvents; solubility in water 0.09% at 30°C., but imparts a considerable degree of resistance to moisture penetration to both nitrocellulose and cellulose acetate film.

USES: Probably the best cellulose acetate plasticizer available. Dissolves *Santolite* resins, and as both are very resistant to petroleum products and compatible with so many film-forming materials, they make an excellent combination for producing gasoline-resistant coatings.

SHIPPING INFORMATION: Resin Plasticizer. 550-lb. steel drums; 5-gal. drums. Tank cars; tank trucks.

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SANTICIZER® E-15 PLASTICIZER

Ethyl Phthalyl Ethyl Glycollate.

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 280.27

STANDARD FORM: Liquid.

SPECIFICATIONS: Color APHA 20 max.; sp. gr. 1.180-1.185 at 25°/25°C.; acidity (as acetic acid) 0.01% max.; odor slight; sulfur (copper-strip test) negative.

PROPERTIES: Miscible with the common organic solvents except the petroleum hydrocarbons; when heated miscible with vegetable oils but partially separates on cooling; solubility in water 0.0175% at 30°C.

USES: Solvent for both nitrocellulose and cellulose acetate and for most resins. Light-fast; does not evaporate even from the thinnest films. With both cellulose acetate and nitrocellulose gives clear, tough, flexible films which have high resistance to moisture penetration. Highly recommended for use with cellulose acetate. Has been approved by Bureau of Animal Industry as a nontoxic plasticiser; may be used in cellulose-based lacquers for paper or in foils for food wrapping and packaging.

SHIPPING INFORMATION: Resin Plasticizer. 535-lb. steel drums; 5-gal. drums; tank cars, tank wagons.

SANTICIZER® B-16 PLASTICIZER

Butyl Phthalyl Butyl Glycollate.

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 336.37

STANDARD FORM: Liquid.

SPECIFICATIONS: Color APHA 45 max.; sp. gr. 1.093-1.105 at 25°/25°C.; acidity (as acetic acid) 0.02% max.; essentially odorless; sulfur (copper strip test) negative.

PROPERTIES: A practically colorless liquid plasticizer; B.P. 219°C. at 5 mm.; does not crystallize at temperatures as low as −35°C.; water solubility 0.0012% at 30°C.; extremely light-stable; darkens on heating above 290°C.

USES: A widely used polyvinyl chloride plasticizer where a tasteless and non-toxic composition is required; has complete FDA approval for use in vinyl food wrappings. Imparts good heat and light stability. Especially useful in beverage tubing, food packaging, hospital sheeting and anatomical restorations. Solvent for nitrocellulose; compatible with most resins, imparting good flexibility. Miscible with castor, linseed and chinawood oils; somewhat retards gel formation in the latter on heating. An excellent plasticizer for chlorinated rubber, from 10 to 25 parts per 100 usually required. An exceptionally good plasticizer for polystyrene. Mixtures of *Santicizer* B-16 and *Santolite* resins may be used to plasticize casein and corn protein.

SHIPPING INFORMATION: Resin Plasticizer. 500-lb. steel drums; 5-gal. drums; tank cars; tank wagons.

SANTICIZER® 140 PLASTICIZER

Mixed Cresyl Phenyl Phosphate.

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Clear mobile liquid; color APHA 40 max.; sp. gr. 1.203-1.213 at 25°/25°C.; refractive index 1.550-1.570 at 25°C.; acidity (as H_3PO_4) 0.01% max.; moisture (by KF in methanol) 0.15 max.

PROPERTIES: An essentially odorless and colorless liquid plasticizer; B.P. approx. 258°C. at 10 mm.; pour point −37°C. approx.

USES: Quite similar to tricresyl phosphate in that it imparts flame retardance, excellent permanence, and chemical stability and equal heat and light stability; gives better low-temperature flexibility and abrasion resistance; is a stronger solvent and slightly more efficient than tricresyl phosphate. Can be used wherever tricresyl phosphate is used. Improved flexibility imparted by *Santicizer* 140 makes it preferable to tricresyl phosphate in many applications such as vinyl sheeting, lacquers and paper coating. Considerably more compatible than tricresyl phosphate with cellulose acetate. As a liquid, it is much easier to handle so it is often used in cellulose acetate, especially in conjunction with other active plasticizers. Other resins with which it is useful are cellulose nitrate, ethyl cellulose, cellulose acetate-propionate, polyvinyl formal and polyvinyl butyral.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal. and 5-gal. drums; tank cars; tank trucks.

SANTICIZER® 141 PLASTICIZER

Alkyl Aryl Phosphate.

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Color APHA 40 max.; odor, slight characteristic; sp. gr. 1.089-1.093 at 25°/25°C.; refractive index 1.507-1.510 at 25°C.; acidity (as H_3PO_4) 0.01% max.; moisture (by KF in methanol) 0.10% max.

PROPERTIES: *Santicizer* 141 combines into one compound the non-flammability of tricresyl phosphate, and the efficiency and permanence of other vinyl plasticizers. Imparts superior low-temperature flexibility, improved abrasion and moisture resistance and good electrical properties. Gives excellent resistance to embrittlement and deterioration to polyvinyl-chloride compositions exposed to sunlight.

USES: Excellent for use in polyvinyl chloride films, sheets, extrusions, moldings, organosols and plastisols—in any application where an efficient, permanent, flame-retardant plasticizer is required. Small amounts (5-7 PHR) considerably improve light stability of vinyl compounds. Especially recommended in flexible films for curtains, aprons, rainwear and hospital sheeting and in soft, pliable coatings for tablecloths, upholstery and drapery. Suitable for use in products that touch the human body. *Santicizer* 141 has FDA approval as a nontoxic plasticizer for food packaging.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal. and 5-gal. steel drums; tank cars; tank wagons.

SANTICIZER® 148

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PHYSICAL PROPERTIES: Clear oily liquid; Color: APHA 30 max.; Odor: Slight, sweet; Acidity (meq/100 g.): 0.02, max.; Moisture: 0.06% , max.; Refractive Index at 25°C.: 1505; Specific Gravity at 25°/25°C.: 1.07.

PROPERTIES: An alkyl diaryl phosphate with a pour point of −65°C, a flash point of 437°F and viscosities at 99°C of 2.96 cs and at 25°C of 21.8 cs. Its weight per gallon is 8.9 lbs.

USES: *Santicizer* 148 is a flexibilizing, flame-retarding phosphate particularly useful as a plasticizer for polyvinyl chloride resins for use in wall coverings, film and sheeting and drapery backings. It can also be used per se or in a gelled form as an air filter, dirt pick-up media which meets UL requirements for flame retardance and Bureau of Standards requirements for dirt pick-up.

SANTICIZER® 214 PLASTICIZER

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Color, APHA 100 max.; appearance, clear oily liquid, essentially free of suspended matter or turbidity; acidity 0.15 meq/100 gms. max.; moisture (KF in methanol), 0.15% max.; refractive index at 25°C., 1.481-1.486, sp. gr. 25°/25°C., 0.948-0.956.

PROPERTIES: *Santicizer* 214 is an unusual primary plasticizer for polyvinyl chloride. The initial plastisol viscosity of this material is very low. It allows formulators to produce a low viscosity formulation which is harder than usual after curing.

USES: *Santicizer* 214 imparts unique properties to polyvinyl chloride compounds. In proper concentration it gives the finished product a hard, tough surface, especially in vinyl coatings on metal.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal. (440-lb.) and 5-gal. (40-lb.) black iron drums; tank cars; tank trucks.

SANTICIZER® 405 PERMANENT PLASTICIZER

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Appearance, clear oily liquid; Color 50 ml: 50 ml, 95% ethanol, APHA 100 max.; Acidity, 1.0 meq./100 gms., 1.0 max.; Odor, slight ester; Moisture (KF methanol) 0.15 max.; Specific Gravity, 25°/25°C., 1.128-1.132; Viscosity, 25°C, 105-135 ks.

PROPERTIES: *Santicizer* 405 has unusually excellent permanence in three major vinyl application areas: migration resistance; extraction resistance; and, low volatility.

USES: *Santicizer* 405 is used to impart superior permanence in industrial tapes, vinyl upholstery, baby pants and electrical, 105°C. wire and cable insulation.

SHIPPING INFORMATION: Resin Plasticizer, 55 gal. 490 lbs., drums, 5 gal., 44 lbs., drums, tank car and tank truck.

SANTICIZER® 409 PERMANENT PLASTICIZER

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Appearance, clear, viscous liquid; color of solution (50 ml.: 50 m 2-B alcohol), 100 APHA max.; moisture (by KF in methanol), 0.15 max.; odor, very faint ester; sp. gr., 25°/25°C., 1.081-1.084; viscosity at 25°C., 2900 to 3500 cks.; acidity, 2.0 meq/100 gms. max.

PROPERTIES: *Santicizer* 409 combines the ideal properties of several plasticizers for polyvinyl chloride in one primary polymeric plasticizer. *Santicizer* 409 has low specific gravity, color and toxicity. Polyvinyl chloride compositions plastidized with *Santicizer* 409 show excellent compatibility, excellent permanence, super electrical properties, fast fusion, good low-temperature flexibility, good heat and light stability and excellent retention of physical properties.

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USES: Because of its excellent electrical properties, *Santicizer* 409 is especially useful in wire coatings and tapes. It is also widely used in high-quality film and sheeting (adhesive backed), organosol fabric coatings, refrigerator gasketing and in other applications requiring a high degree of permanence and resistance to extraction. It is compatible with polyvinyl chloride, ethyl cellulose, cellulose acetate-butyrate and nitrocellulose.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal. (450-lb.) and 5-gal. (45-lb.) steel drums; tank cars.

SANTICIZER® 411 PERMANENT PLASTICIZER

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Viscous, some solids on standing.

SPECIFICATIONS: Color APHA 100 max. (50% ethanol solution); Acidity 1.0% max.; odor, slight characteristic; sp. gr. 1.104-1.110 at 25°C.

USES: *Santicizer* 411 is a low-cost permanent polymeric plasticizer with unusual resistance to solvent extraction and rubber migration. *Santicizer* 411 is designed for application in outerwear, baby pants, coated cloth (for automobile and furniture upholstery, etc.), wall covering, wire coatings, modified plastisols and organosols, vinyl-metal laminates, and high density foam vinyl where its excellent resistance-to-extraction and rubber migration properties are required.

SHIPPING INFORMATION: Resin Plasticizer. Tank cars, tank trucks; 55-gal. and 5-gal. drums.

SANTICIZER® 462 PERMANENT PLASTICIZER

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Appearance, clear oily liquid; Color, APHA 150 max.; Odor characteristic ester; Acidity meq/100 gms. 0.24%; Moisture (KF in Methanol) .15 max.; Refractive Index @ 25°C., 1.507-1.510; sp. gr. 25°/25°C., 1.073-1.076.

PROPERTIES: *Santicizer* 462 offers excellent humidity compatibility, DOP-like processability, good plastisol viscosity, minimum migration and low volatility.

USES: *Santicizer* 462 finds excellent application in coatings for rubber saturated paper, for cloth coatings, foamed vinyl outerwear and general purpose unsupported film and sheeting.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal. drums, 480 lbs. net; 5-gal. drums, 40 lbs. net; and tank cars and tank trucks.

SANTICIZER® 465

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PHYSICAL PROPERTIES: Clear oily liquid; Color: APHA 100; Acidity: 0.08 meq/100 g.; Moisture: 0.05%; Refractive Index at 25°C.: 1.523; sp. gr. 25°/25°C.: 1.15; Viscosity at 100°F.: 205 cs, and at 210°F.: 11.5 cs.

PROPERTIES: A permanent plasticizer with especially low per se viscosity, a high degree of permanence and compatibility in various resins, especially PVC, and extremely processable.

USES: For use in permanent, essentially non-migrating and non-extractable PVC plastisol systems. Recommended for wall coverings, glove dipping, film and sheeting, adhesive-backed film, electrical tape, plastisol and PVAc adhesives.

SANTICIZER® 480 PERMANENT PLASTICIZER

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Appearance clear oily liquid; Acidity meq/100 gma., 0.60%; Color APHA 125 max.; Moisture (KF in Methanol) .15% max.; sp. gr. 25°/25°C. 1.039-1.046.

PROPERTIES: *Santicizer* 480 has been designed to offer low cost permanence.

USES: *Santicizer* 480 finds application in supported and unsupported film and sheeting, coated fabrics, foamed vinyl and wall coverings.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal. drums, 500 lbs. gross; 5-gal. drums, 45 lbs. gross; tank cars and tank trucks.

SANTICIZER® 481 PERMANENT PLASTICIZER

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Appearance, clear oily liquid; Acidity meq/100 gms., 0.86% max.; Color APHA 175 max.; Moisture (KF in Methanol) 0.15% max.; sp. gr. 25°/25°C. 1.072-1.078.

PROPERTIES: *Santicizer* 481 has good extraction resistance, low cost and permanence comparable to Santicizer 409.

USES: *Santicizer* 481 has good electrical properties in 90C wire insulation, high efficiency in film and sheeting and expanded vinyl.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal. drums, 490 lbs. gross; 5-gal. drums, 45 lbs. gross and tank cars and tank trucks.

SANTICIZER® 482 PERMANENT PLASTICIZER

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Appearance clear oily liquid; Acidity meq/100 gms. 1.1 max.; Color, APHA 225 max.; Moisture (KF in Methanol) 0.15% max.; sp. gr. 25°/25°C., 1.097-1.103.

PROPERTIES: *Santicizer* 482 is designed to meet the permanence requirements of vinyl insulation. 105°C wire and cable coatings. It has overall good permanence.

USES: *Santicizer* 482 finds good use in appliance wiring and in industrial machinery wiring. It has very low migration to rubber materials and nitrocellulose.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal. drums, 490 lbs. gross; 5-gal. drums, 45 lbs. gross; and tank cars and tank trucks.

SANTICIZER® 483 PERMANENT PLASTICIZER

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Appearance clear oily liquid; Acidity meq/100 gms. 0.24 max.; Color APHA 125 max.; Moisture (KF in Methanol) 0.15% max.; sp. gr. 25°/25°C., 1.045-1.052.

PROPERTIES: *Santicizer* 483 is a permanent plasticizer designed for plastisols. It has a low "per se" viscosity, low initial viscosity and low viscosity build-up for long shelf life.

USES: *Santicizer* 483 has excellent application in plastisol coated paper and fabrics.

SHIPPING INFORMATION: Resin Plasticizer. 55-gal. drums, 520 lbs. gross; 5-gal. drums, 45 lbs. gross; and tank cars and tank trucks.

SANTICIZER® 630 MODIFIED-PHTHALATE PLASTICIZER

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Color, APHA 70 max.; acidity, 0.12 meq/100 gms. max.; moisture (by KF in methanol), 0.10% max.; refractive index at 25°C., 1.5095-1.5160; sp. gr. 25°/25°C., 0.987-0.994.

PROPERTIES: *Santicizer* 630 is a low cost, primary plasticizer for polyvinyl chloride plastics. In some characteristics *Santicizer* 630 is superior to Dioctyl Phthalate especially in migration resistance to nitrocellulose and in plastisol-viscosity stability. Since this material is much more volatile than Dioctyl Phthalate, it is not recommended for applications where permanence is essential.

USES: *Santicizer* 630 is useful in formulating vinyl plastisols, extrusions, coatings or sheeting compounds. It imparts to vinyl compounds properties comparable to those imparted by DOP, but it costs less.

SHIPPING INFORMATION: Resin Plasticizer. Tank trucks and tank cars only.

SANTICIZER® 631 MODIFIED-PHTHALATE PLASTICIZER

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Color APHA 40 max.; acidity, 0.12 meq/100 gms., max.; moisture (by KF in methanol), 0.10% max.; refractive index at 25°C., 1.4990-1.5045; sp. gr. 25°/25°C., 0.984-0.990.

PROPERTIES: *Santicizer* 631 is a low cost, primary plasticizer for polyvinyl chloride plastics. It offers a unique balance of cost versus performance in this resin. *Santicizer* 631 is better than DOP in migration resistance to nitrocellulose and in plastisol-viscosity stability.

USES: *Santicizer* 631 is useful in formulating vinyl plastisols, extrusions, coatings or sheeting compounds. It imparts properties to PVC compounds in the range of those imparted by DOP and is used when cost is a decisive factor. It lies between *Santicizer* 630 and DOP in price versus performance.

SHIPPING INFORMATION: Resin Plasticizer. Tank trucks and tank cars only.

SANTICIZER® 636 *2-Ethylhexyl Isodecyl Phthalate*

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Color, APHA 75 max.; acidity, 0.12 meq/100 gms. max.; moisture (by Karl Fischer), 0.10% max.; refractive index at 25°C., 1.478-1.488; sp. gr. 25°/25°C., 0.969-0.977.

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TOWOLDMON0041204
WATER_PCB-00032250

PROPERTIES: *Santicizer* 636 is a practically colorless, high-boiling liquid of low viscosity and excellent electrical properties. It is miscible with most common solvents, thinners and oils. *Santicizer* 636 combines good low temperature properties, good resistance to migration and to water extraction, and excellent heat and light stability.

USES: *Santicizer* 636 is especially useful in plastisols where it offers lower viscosity build-up on aging than does Dioctyl Phthalate. It is also useful in electrical compounds where the higher molecular weight and lower volatility result in improved permanence of these products in end applications.

SHIPPING INFORMATION: Resin Plasticizer. Tank trucks and tank cars only.

SANTICIZER® 644 PLASTICIZER

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Clear, oily liquid, free of sediment or turbidity; color APHA 50 max.; acidity 0.35 meq/100 grams, max.; sp. gr. 0.917-0.922 at 25°/25°C.

USES: *Santicizer* 644 is a primary plasticizer for PVC and other resins to which it imparts excellent low temperature flexibility. Its use assures low volatility, excellent efficiency and superior flexibility. *Santicizer* 644 offers low initial viscosity and excellent viscosity stability in plastisols. *Santicizer* 644 is predominately used in vinyl film, sheeting and coated fabric to impart flexibility without sacrificing volatility or efficiency. Plastisols widely use *Santicizer* 644 to provide excellent viscosity characteristics along with improved fusion characteristics.

SHIPPING INFORMATION: Resin Plasticizer. Tank cars, tank trucks; 55-gal. and 5-gal. drums.

SANTICIZER® 683 PLASTICIZER

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Clear oily liquid free of sediment or turbidity; color APHA 40 max.; acidity 0.12 meq/100 gms. max.; sp. gr. 0.975-0.981 at 25°/25°C.

USES: *Santicizer* 683 is a modified phthalate ester. It is offered as a low-cost primary plasticizer for polyvinyl chloride. In some characteristics it is superior to DOP. It is particularly good in plastisols because of low initial viscosity and viscosity stability imparted. Resistance to N/C migration is excellent. *Santicizer* 683 is used in compounding vinyl plastisols, extrusions, coatings, film and sheeting.

SHIPPING INFORMATION: Resin Plasticizer. Tank cars, tank trucks.

SANTOLITE® MHP RESINS

See Pages 28-50

SANTOLITE® MS *80% Industrial Resin*

See Page 50

HB-40® PARTIALLY HYDROGENATED TERPHENYL

See Page 53

PACKAGING

PLASTIC BOTTLES AND CONTAINERS

PACKAGING DIVISION

TYPE: Blow molded thermoformed containers.

STOCK: High and low density polyethylene available in stock shaped containers.

CUSTOM: Custom designed containers to meet specific market requirements can be produced in an unlimited number of shapes. Dependent upon the specific needs, these custom containers can be made from polyethylene (high or low density), polypropylene, styrene, nylon, vinyl (rigid and flexible), acetal and many other thermoplastics.

SIZE: 5cc capacity to 15 gallons.

USES: Safe, lightweight containers for a wide variety of consumer and industrial products.

PLASTIC CLOSURES

PACKAGING DIVISION

TYPE: Injection molded.

GENERAL INFORMATION: These closures are available in a variety of sizes as companion pieces to many plastic containers.

PLASTIC FITMENTS

PACKAGING DIVISION

TYPE: Injection molded.

STOCK: Variety of fitments for plastic containers for dispensing liquids or powders in drop, spray, squirt, shake or pour form.

CUSTOM: Fitments can be designed to meet specific dispensing requirements.

PLASTIC FOOD TUBS

PACKAGING DIVISION

DESCRIPTION: Plastic cottage cheese, salad and dip containers 8, 12, 16, 16 tall, 32 reg., 32 squat oz. sizes. Clear and opaque lids are available.

Margarine tubs: ½ lb. soft margarine containers.

Made of specially formulated plastic resin to give a high-gloss, high-impact, table-ready container. Food tubs and lids are available with printing to specification.

Literature available on the cottage cheese tubs.

PLASTIC MEAT TRAYS (CLEAR)

PACKAGING DIVISION—LITERATURE AVAILABLE

DESCRIPTION: Clear meat trays from Polyflex® film.

Industry Number	Tray Size Inches (Approx.)	Per Case
1S	5 x 5 x ½	1,000
2S	8 x 5½ x ½	1,000
4S	9 x 7 x ½	1,000
8S	9¼ x 7¾ x ½	1,000
9S	12 x 9 x ½	500
10S	10½ x 5½ x ½	1,000
12S	10½ x 4 x ½	500
13S	10½ x 4 x ½	1,000
16S	12 x 7 x ½	500
17S	8 x 4 x ½	1,000
20S	8 x 6¼ x ½	1,000

An innovation in meat packaging, the new clear plastic trays allow the consumer to examine all sides of the meat, offer freezer-ready packaging and will fit most wrapping equipment.

PLASTIC VENDING CUPS

PACKAGING DIVISION—LITERATURE AVAILABLE

DESCRIPTION: Plastic vending cups.

7 oz. hot drink cups
8¼ oz. hot drink cups
7 oz. insulated hot drink cups
7 oz. cold cups
9 oz. cold drink cups (translucent)
Packed 2,000 to a case

END USE: Designed to fit and vend from any major hot or cold drink vending machine.

GER-PAK® SHEETING

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

DESCRIPTION: Low density polyethylene, in stock rolls up to 100 feet long. Longer lengths, colors and special embossing available.

END USE: Covering equipment, dust partitions, temporary glazing.

GAUGES: Any thickness from .001″ to .010″, in widths up to 40 feet.

GER-PAK® TAPE

PLASTIC PRODUCTS AND RESINS DIVISION

DESCRIPTION: Pressure sensitive polyethylene tape with preslit paper backing. In cutter edge dispenser.

END USES: Patching, sealing, closing plastic and paper bags or liners.

SIZE: .004″ gauge, 2″ wide and 100′ long, clear or black.

MONSANTO® BAGS AND LINERS

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

DESCRIPTION: Low density polyethylene bags and liners, available either individually or in continuous rolls of Hand-E-Roll film serrated for easy detachment.

END USES: Packaging bulk chemical, lining boxes, cans or drums, protection against water damage.

GAUGES AND SIZES: Thicknesses from .001″ to .010″, in widths up to 56″ flat face, with or without gussets. Lengths to 114 inches.

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TOWOLDMON0041205
WATER_PCB-00032251

POLYFLEX® SHEET

PACKAGING DIVISION—LITERATURE AVAILABLE

DESCRIPTION: Biaxially oriented polystyrene sheet available in rolls.

Types	End Uses
Code 0116 (thermofolding grade) gauges .00275″ and .00475″.	Document protectors, wallet inserts.
Code 0401 (thermoforming grade) clear and color in gauges .005″, .0075″, .010″, .0125″, .015″ controlled monomer.	Trays and inner packages for food products.
Code 0404 (thermoforming grade) clear in gauges .005″, .0075″, .010″, .0125″, .015″, and .020″ controlled monomer.	Trays and inner packages for highly sensitive foods.

POLYFLEX® FILM

PACKAGING DIVISION—LITERATURE AVAILABLE

PACKAGING GRADE FILM: Code 0301. Gauges .001″, .00125″, .0015″, .002″. Available on rolls.

DESCRIPTION: Biaxially oriented polystyrene, crystal clear, excellent dimensional stability, heat sealable, heat shrinkable and "breathing" characteristics necessary for packaging fresh produce.

VUEPAK® CELLULOSE ACETATE SHEET

PACKAGING DIVISION

DESCRIPTION: Transparent, rigid packaging material available in rolls and sheets in gauges .005″, .0075″, .010″, .015″ and .020″.

END USES: Fabricated display packages, signs, document protectors.

ASTROTURF® RECREATIONAL SURFACES

AstroTurf® recreational surfaces are a series of all-weather, nylon surfaces engineered for a variety of recreational uses. They have been designed for multi-use, durable performance, and safe traction.

GOLF CHAMPIONSHIP GREEN SURFACE

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

STANDARD FORM: This product is composed of a nylon pile surface of green, grass-like blades bonded to an energy-absorbing foam pad. It is placed directly over a smooth stabilized subsurface. The system weighs about 1-lb./sq. ft. and is about 1 in. thick. Supplied in roll goods approximately 14 ft. 4 in. wide and typical average lengths of 100 ft. Seaming and installation techniques permit coverage of any size or shape greens.

USES: Durable, permanent golf greens engineered for proper ball reaction. For use on championship courses or for private home installations.

GOLF PRACTICE PUTTING GREEN SURFACE

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

STANDARD FORM: This product is composed of a pile surface having a pile of green nylon grass-like blades. There is a portable putting surface available which has a foam backing. Portable installations may be placed on any suitable smooth surface, such as compacted dirt, grass, concrete, or asphalt, or on a smooth hard surface in the home. For permanent installations, the surface is placed directly over a smooth stabilized subsurface. A variety of sizes and shapes are available from stock or any size or shape green to individual requirements can be made from roll goods approximately 14 ft. 4 in. wide.

USES: Outdoor or indoor permanent or portable practice putting greens or golf strips. This surface is intended for putting only and is not used for driving or chipping. A practice green for home, club, motel, institution, apartment house or industrial area.

GOLF TEE SURFACE

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

STANDARD FORM: This product is composed of a nylon pile surface of green, grass-like blades bonded to a foam pad. Permanent installations require an engineered stabilized sub-surface.

USES: Outdoor permanent golf tees with long-lasting properties far surpassing those of a normal grass green.

LAWN SURFACE

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

STANDARD FORM: This product consists of a nylon surface pile of green, grass-like blades. The product weighs about ⅓ lb./sq. ft. and is about ⅜ in. thick. Supplied in roll goods 14ft. 4 in. wide and typical average length of 100 ft. Seaming and installation techniques permit coverage of areas of any size or shape.

USES: General landscaping and lawn uses. Excellent for decks, patios and lawns.

MULTI-PURPOSE SURFACE

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

STANDARD FORM: This product is composed of a nylon pile surface of green, grass-like blades bonded to a foam pad. The complete system weighs about ½ lb./sq. ft. and is about ½ in. thick. A smooth stabilized subsurface is required. Supplied in roll goods approximately 14 ft. 6 in. wide and typical average lengths of 100 ft. Seaming and installation techniques permit coverage of areas of any size or shape.

USES: Broad utility in a multitude of outdoor and indoor recreational activities. Ideal for field houses, gymnasiums, track installations, pool areas, patio areas, entrance systems, locker rooms, golf cart paths, etc. The perfect surface for school, motel, apartment house, industrial area and institution.

PLAYGROUND SAFETY SURFACES

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

STANDARD FORM: This product is a surface system composed of a nylon pile of green grass-like blades, foam pad, and fiber pad underlay to yield a durable surface with superior shock absorbing properties. The complete system weighs about 1⅝ lbs./sq. ft. and is about 1 in. thick. A smooth stable subsurface is required. Supplied in roll goods approximately 14 ft. 6 in. wide and typical average lengths of 100 ft. Seaming and installation techniques permit coverage of areas of any size or shape.

USES: System engineered for outdoor or indoor safety playing surface with excellent foot traction under wet or dry conditions, combined with superior cushioning properties for maximum safety.

STADIUM (ATHLETIC FIELD) SURFACE

NEW ENTERPRISE DIVISION

STANDARD FORM: This product is composed of a nylon pile surface of green, grass-like blades, foam pad, and fiber pad underlay carefully engineered to give a durable playing surface for top-flight competition. A smooth stabilized subsurface is required. Supplied in roll goods approximately 14 ft. 6 in. wide and typical average lengths of 100 ft. Seaming and installation techniques permit coverage of areas of any size or shape.

USES: The stadium grade offers the ultimate playing surface for outdoor or indoor competitive sports and has been proven in high school, college, and professional service in installations throughout the country. The product is designed for use in football, baseball, soccer, lacrosse, field hockey, rugby, hurling, cricket, and softball. Used in professional, college and school stadia. Also practice and intra-mural fields. Engineered for superior traction with the proper shoes, safety qualities and multi-use.

TENNIS SURFACE

NEW ENTERPRISE DIVISION—LITERATURE AVAILABLE

STANDARD FORM: This product is based on a pile of green nylon grass-like blades in a polyester backing fabric undercoated with latex. In the portable version, the pile surface is bonded to a polyvinyl chloride foam pad and may be laid over any suitable smooth surface, such as wood, compacted dirt, concrete or asphalt; this product weighs about ½-lb./sq. ft. and is about ½ in. thick. In the permanent version, the pile surface is laid directly over a smooth stabilized subsurface; this product weighs about ½ lb./sq. ft. and is about ¼-inch thick. Supplied in roll goods approximately 14 ft. 6 in. wide and typical average length of 120 ft. Seaming and installation techniques permit coverage of areas of any size or shape.

USES: Indoor or outdoor, permanent or portable tennis, lawn bowling.

TOWOLDMON0041206
WATER_PCB-00032252

RUBBER CHEMICALS

ACCELERATORS FOR NATURAL AND SYNTHETIC RUBBERS

ORGANIC DIVISION

THIAZOLE TYPE

EL-SIXTY® *1, 3-bis (2-benzothiazolylmercaptomethyl) urea.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: (Treated to reduce dusting). Appearance and condition—buff powder; ash—0.5% max.; fineness (200 mesh) —0.5% max. retained; heat loss—0.5% max.; melting point—220°C. min.; dedusting agent—5.0 ±1.5% ; sp. gr.—1.38 at 25°C.

USES: Vulcanization accelerator for natural and synthetic rubbers. May be used alone but, for best results, an activator is usually desirable. Gives excellent processing and curing characteristics to many types of compounds. Effective in compounds containing high loads of retarding pigments such as clay.

SHIPPING INFORMATION: Rubber Accelerator, NOIBN.

SANTOCURE® *N-cyclohexyl-2-benzothiazolesulfenamide.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—light tan or buff pellets or powder; ash—0.5% max.; fineness (20 mesh)—trace max. retained; melting point—94°C. min.; moisture—1% max.; ether insolubles—5.0% max. when shipped; sp. gr.—1.27 at 25°C.

USES: Delayed action vulcanization accelerator for natural and synthetic rubbers. Activators are sometimes desirable but not always needed. Exceptionally safe at processing temperatures but powerful at curing temperatures. Give high modulus and tensile.

SHIPPING INFORMATION: Rubber Accelerator, NOIBN.

SANTOCURE® 26 *2-(2,6-dimethyl-4-morpholinothio benzothiazole)*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition, light tan or buff powder or pellets; ash 0.5% max.; fineness (10 mesh) trace max. retained; melting point 94°C. min.; moisture 0.5% max.; ether insolubles 2.0% max. when produced; sp. gr. 1.24-1.30 at 25°C.

USES: Delayed action vulcanization accelerator for natural and synthetic rubbers. Activators are sometimes desirable but not always needed. Exceptionally safe at processing temperatures but powerful at curing temperatures. Gives high modulus and tensile.

SHIPPING INFORMATION: Rubber Accelerator, NOIBN.

SANTOCURE® MOR *2-(morpholinothio)-benzothiazole*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition, buff to brown flakes; ash, 0.5% max.; melting point, 80°C. min.; moisture, 0.5% max.; ether insolubles, 1.0% max. when shipped; specific gravity (approx.) 1.34 at 25°C.

USES: *Santocure* MOR is used in the same way as the other *Santocure* products and responds in much the same manner to secondary accelerators. In most applications, its delayed action appears to lie between *Santocure* NS and *Santocure* 26.

SHIPPING INFORMATION: Rubber Accelerator, NOIBN.

SANTOCURE® MOR-90 *Blend of SANTOCURE MOR and Thiofide*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance, light buff to brown flakes; ash, 0.5% max.; moisture, 0.5% max.; ether insolubles, 12% max. when shipped; crystallizing point, 70°C. min.; specific gravity (approx.) 1.36 at 25°C.

USES: Vulcanization accelerator for natural and synthetic rubbers.

SHIPPING INFORMATION: Rubber Accelerator, NOIBN.

SANTOCURE® NS *N-tert-butyl-2-benzothiazolesulfenamide.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition, light tan or buff powder or pellets; ash 0.5% max.; fineness (20 mesh) trace max. retained; melting point 104°C. min.; moisture 0.5% max.; ether insolubles 1% max. (when shipped); sp. gr. 1.26-1.32 at 25°C.

USES: Delayed action vulcanization accelerator for natural and synthetic rubbers. *Santocure* NS is used in the same way and for the same purposes as *Santocure*. It provides even greater delayed action. *Santocure* NS is a little stronger than *Santocure* and it is customary to reduce the dosage by about 10% when making the substitution.

SHIPPING INFORMATION: Rubber Accelerator, NOIBN.

THIOFIDE® MBTS *2,2'-dithiobis (benzothiazole); also called benzothiazyl disulfide and 2,2'-dibenzothiazyl disulfide.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—cream powder; ash—0.5% max.; fineness (100 mesh)—0.1% max. retained; melting point—168°C. min.; moisture—0.5% max.; petroleum ether extractable—6.5 ±1.5% ; sp. gr.—1.54 at 25°C.

USES: Vulcanization accelerator for natural and synthetic rubbers. An activator is usually desirable. Safe handling when properly activated. Can be used successfully in a wide variety of stocks. *Thiofide* is treated to reduce dusting and aid dispersion.

SHIPPING INFORMATION: Rubber Accelerator, NOIBN.

THIOTAX* MBT *2-mercaptobenzothiazole.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition, cream to light yellow powder; ash 0.5% max.; assay (MBT content) 91% min.; fineness (100 mesh) trace max. retained; melting point 170°C. min.; dedusting agent 2.0-4.5% ; moisture 0.5% max.; sp. gr. 1.50 at 25°C.

USES: Vulcanization accelerator for natural and synthetic rubbers. An activator is not needed but is often desirable. Activator must be adjusted carefully to avoid scorch difficulties. *Thiotax* is treated to reduce dusting and dispersion.

SHIPPING INFORMATION: Rubber Accelerator, NOIBN.

ALDEHYDE AMINE TYPE

A-32* *Reaction product of butyraldehyde and butylidene aniline.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—red-yellow to orange liquid, may be faintly turbid; moisture—no liquid separation on standing; sp. gr.—1.01 at 25°C.

USES: Vulcanization accelerator for natural and synthetic rubbers. Used mostly for hard rubber.

SHIPPING INFORMATION: Rubber Accelerator, NOIBN.

A-100* *Reaction product of butyraldehyde, acetaldehyde and aniline.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—dark, red brown oily liquid; moisture—no liquid separation on standing; sp. gr.—1.01 at 25°C.

USES: Vulcanization accelerator for natural and synthetic rubbers. Used mostly for hard rubber.

SHIPPING INFORMATION: Rubber Accelerator, NOIBN.

ULTRA TYPE

METHASAN® *(Zinc Dimethyldithiocarbamate)*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—white powder; ash, 25-28% weight; fineness (200 mesh)—0.5% max. retained; heat loss, (2 hrs. @ 100°C) 0.5% max.; melting point 248°C minimum; specific gravity (@ 25°C) approx. 1.66.

USES: As a secondary accelerator for *Thiofide* and *Santocure*. Exceptionally effective at low concentrations.

SHIPPING INFORMATION: Rubber Accelerator, NOIBN.

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TOWOLDMON0041207
WATER_PCB-00032253

MONO THIURAD® *Bis(dimethylthiocarbamyl)sulfide; also called tetramethylthiuram monosulfide.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: (Standard Powder) Appearance and condition—lemon yellow powder; ash—0.5% max.; fineness (200 mesh)—1% max. retained, (100 mesh)—trace max. retained; melting point—103°C. min.; moisture—0.5% max.; sp. gr.—1.39 at 25°C.

USES: Vulcanization accelerator for natural and synthetic rubbers. Available in oiled and unoiled powder and pellet form.

SHIPPING INFORMATION: Rubber Accelerator, NOIBN.

R-2* CRYSTALS *Reaction product of carbon disulfide and 1,1'-methylenedipiperidine.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition, gray white pellets; melting point 58°C. min.; sp. gr. 1.22 at 25°C.

USES: Vulcanization accelerator for natural and synthetic rubbers. Used mostly in cements and latex.

SHIPPING INFORMATION: Rubber Accelerator, NOIBN.

RZ-100* *(N,N-dimethylcyclohexamine salt of dibutyldithiocarbamic acid)*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—up to ½" yellow orange lumps; assay (by N_2), 98.0% minimum; crystallizing point, °C, 82.5 minimum.

USES: Very fast accelerator for curing at room or slightly elevated temperature.

SHIPPING INFORMATION: Rubber Accelerator, NOIBN.

THIURAD® *Bis(dimethylthiocarbamyl)disulfide; also called tetramethylthiuram disulfide.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: (Standard Powder) Appearance and condition—light buff to white powder; ash—0.5% max.; fineness (100 mesh)—trace max. retained; melting point—144°C. min.; heat loss—0.5% max.; sp. gr.—1.41 at 25°C.

USES: Sulfur bearing vulcanization accelerator for natural and synthetic rubbers. Available in oiled and unoiled powder form and pellet form.

SHIPPING INFORMATION: Rubber Accelerator, NOIBN.

ACCELERATOR B* *Additive*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Accelerator B is a physical blend of 2 parts *Thiurad* and 1 part *Thiotax*. *Thiurad* and *Thiotax* accelerators are commonly used in this ratio as accelerators for butyl. Monsanto pre-blends the two compounds, offering the 2:1 mix as a convenience for the user.

SHIPPING INFORMATION: Rubber Accelerator, NOIBN.

GUANIDINE TYPE

DPG *Diphenylguanidine.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition, pinkish-white powder; ash 0.3% max.; fineness (100 mesh) trace max. retained; melting point 146°C. min.; heat loss 0.5% max.; dedusting agent 1.0 –3.5%; sp. gr. 1.20 at 25°C.

USES: Vulcanization accelerator for natural and synthetic rubbers. Used mostly as a secondary for thiazoles. DPG is treated to reduce dusting and aid dispersion.

SHIPPING INFORMATION: Rubber Accelerator, NOIBN.

GUANTAL® *Diphenylguanidine phthalate.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—white powder; ash—0.3% max.; fineness (200 mesh)—0.5% max. retained; melting point—178°C. min.; heat loss—3.5% max.; sp. gr.—1.20 at 25°C.

USES: Vulcanization accelerator for natural and synthetic rubbers. Used mostly as a secondary for thiazoles.

SHIPPING INFORMATION: Rubber Accelerator, NOIBN.

THIOCARBANILIDE TYPE

A-1* THIOCARBANILIDE *Also called 1,3-diphenyl-2-thiourea and N,N'-diphenylthiourea.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—gray powder; ash—0.5% max.; fineness (100 mesh)—trace max. retained; melting point—148°C. min.; heat loss—0.75% max.; sp. gr.—1.32 at 25°C.

USES: Vulcanization accelerator for natural and synthetic rubbers—special applications.

SHIPPING INFORMATION: Chemicals NOIBN.

ANTIOXIDANTS AND ANTIOZONANTS

FLECTOL® H *polymerized 1,2-dihydro-2,2,4-trimethylquinoline.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition, brown powder or flakes; ash —0.5% max.; fineness: powder-200 mesh 0.5% max. retained, flakes-40 mesh 90.0% min. retained; moisture —1% max.; sp. gr.—1.03 at 25°C.; melting range, initial melt 75-100°C.

USES: For protection of rubber against heat deterioration and normal aging. It causes less discoloration than most other full-power antioxidants. It is an accelerator for Neoprene vulcanization. *Flectol* H is excellent for reducing frosting on dry heat cured compounds. For maximum protection use 1% to 3% based on the rubber.

SHIPPING INFORMATION: Rubber Preservative, NOIBN.

SANTOFLEX® AW *6-ethoxy-1,2-dihydro-2,2,4-trimethylquinoline.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—dark viscous liquid; heat loss—1% max.; insolubles (benzene)—trace max.; sp. gr.—1.04 at 45°C.

USES: For reducing the harmful effect of ozone attack and in this respect it appears to be somewhat more effective with SBR than natural rubber. It is particularly suggested for compounds used in dynamic service where waxes are sometimes not desirable. 2% on the hydrocarbon is usually sufficient. *Santoflex* AW is a fairly good antioxidant for the prevention of the usual deterioration on aging. It also has considerable merit as a flex-cracking inhibitor. Discolors and stains very badly.

SHIPPING INFORMATION: Rubber Preservative, NOIBN.

SANTOFLEX® DD *6-Dodecyl-1,2-dihydro-2,2,4-trimethylquinoline.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—dark, viscous liquid; ash—0.1% max.; nitrogen content—3.1% max.; sp. gr.—0.93 at 45°C.

USES: For inhibiting flex-cracking and oxidation. It is especially recommended for rubber articles used in dynamic service but is equally effective in any type of rubber compound. It causes rather severe discoloration and staining. 1% to 2% on the hydrocarbon is usually sufficient but up to 4% can be used with improved results.

SHIPPING INFORMATION: Rubber Preservative, NOIBN.

SANTOFLEX® 13 *N-(1,3-Dimethylbutyl)-N'-phenyl-P-phenylenediamine*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—dark crystals below melting point, dark liquid above melting point; ash—0.1% maximum; crystallizing point range, °C.—40-44; specific gravity @ 60°C.—0.938-1.00; SUS viscosity @ 60°C., sec.—135-170; heat loss, 3 hrs. @ 70°C., %—1.0 maximum.

USES: Outstanding antidegradant for all commonly used elastomers. It is an exceptionally efficient, antioxidant, copper and manganese inhibitor, and flex-cracking inhibitor. Serves as an excellent polymer stabilizer while retaining carry-over activity as an antiozonant/antioxidant.

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TOWOLDMON0041208
WATER_PCB-00032254

SANTOFLEX® 13-S *1 part Santoflex-13 and 1 part carbon black.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance—black granules; specific gravity* (@ 25°C.—1.09-1.13*; bulk density (@ 25°C.—45 lbs./cu. ft.; acetone extractables, % —50 ±1.5.

*Specific gravity measured on *unground product* as produced, in a water medium, for better quality control. For compounding purposes, the Sp. Gr. range (@ 25°C. on finely ground product is 1.25-1.32.

USES: Outstanding antidegradant for all commonly used elastomers. Recommended where solid handling is preferred and is an efficient antiozonant, antioxidant, copper and manganese inhibitor, and flex-cracking inhibitor.

SANTOFLEX® 17 *N,N'-Bis-(1-ethyl-3-methylpentyl)-p-phenylenediamine*

ORGANIC DIVISION—LITERATURE AVAILABLE

TYPICAL PROPERTIES: Appearance and condition, dark reddish brown liquid; sediment, trace max.; heat loss 2 hr. @ 105°C. 0.5% max.; copper content 10 ppm max.; vapor pressure @ 25°C. less than 1 micron; Sp. Gr. 0.90 approx.; wt. per gal. 7.5 lbs.

USES: An antiozonant to protect against degradation in poly unsaturated elastomers.

SHIPPING INFORMATION: Rubber Preservative, NOIBN.

SANTOFLEX® IP *N-Isopropyl-N'-phenyl-p-phenylenediamine*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition, dark gray to black flakes; ash 0.5% max.; crystallizing point range 72-76°C; Sp. Gr. (approx.) 1.04 (@ 25°C.

USES: *Santoflex* IP is an outstanding antidegradant for the protection of rubbers against oxidation, ozone, flex-cracking and poisoning by copper and manganese. It has high activity with all commonly used elastomers and may be used with other protective agents to achieve enhanced effects.

Santoflex IP disperses most easily during mill or Banbury mixing. It stains and discolors rather severely. Depending upon the application, the recommended dosage varies from 1 to 3% on the rubber.

SHIPPING INFORMATION: Rubber Preservative, NOIBN.

SANTOFLEX® 75 *Mixture of N,N'-diphenyl-p-phenylenediamine (DPPD), 75%, and 6- dodecyl-1,2-dihydro-2,2,4-trimethylquinoline ("Santoflex" DD), 25%.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—dark flakes; ash—0.5% max.; sp. gr.—1.10 at 25°C.

USES: For reducing aging and oxidation effects. *Santoflex* 75 contains a high percentage of N,N'-diphenyl-p-phenylenediamine. It is designed for those who wish to use a high dosage of this material, with a lower amount of regular antioxidant. More than 0.4% on the hydrocarbon is liable to cause blooming.

SHIPPING INFORMATION: Rubber Preservative, NOIBN.

SANTOFLEX® 77 *N,N'-Bis(1,4-dimethylpentyl)-p-phenylenediamine*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance—reddish-brown liquid; ash, 0.5% maximum; specific gravity @ 27°C.—0.894-0.906; SUS viscosity @ 38°C., sec.—135-150; heat loss, 2 hrs. @ 105°C.—1.0 maximum.

USES: Antiozonant for all commonly used elastomers, with particular effectiveness in static applications. Gives good short-term dynamic protection.

SANTOFLEX® 217 *N,N'-Bis-(1-methylheptyl)-p-phenylenediamine.*

ORGANIC DIVISION—LITERATURE AVAILABLE

TYPICAL PROPERTIES: Appearance and condition, dark reddish brown liquid; sediment, trace max.; heat loss 2 hr. (@ 105°C., 0.5% max.; copper content 10 ppm max.; vapor pressure @ 25°C., less than 1 micron; Sp. Gr. (@ 80°F., 0.90 approx.; wt per gallon 7.5 lb.

USES: An Antiozonant to protect against degradation in poly unsaturated elastomers.

SHIPPING INFORMATION: Rubber Preservative, NOIBN.

SANTOVAR® A *2,5-di-(tert-amyl) hydroquinone.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—buff powder; ash—0.5% max.; fineness (100 mesh)—trace max. retained; melting point—172°C. min.; heat loss—1% max.; sp. gr.—1.05 at 25°C.

USES: For the protection of uncured rubber against oxidation. It also inhibits oxygen attack on unsaturated resins and oils. Cold flow of uncured compositions is reduced by a stiffening effect of *Santovar* A. Excellent for adhesives or other uncured films. It is non-staining and non-discoloring. Use 10.5% to 4% on the material to be protected.

SHIPPING INFORMATION: Rubber Preservative, NOIBN.

SANTOWHITE® 54 *Modified hindered phenol.*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition, clear, viscous, straw-colored liquid; ash 0.25% max.; crystallizing point, will not crystallize but forms glass below −10°C.; heat loss 0.5% max.; sp. gr. (approx) 0.906 at 25°C.

USES: *Santowhite* 54 is an outstanding antioxidant from the standpoints of discoloration and staining. It is easily emulsified for use in latex and incorporates readily in dry rubbers. It is employed at 1 to 2% based upon the hydrocarbon.

SHIPPING INFORMATION: Rubber Preservative, NOIBN.

SANTOWHITE® 54-S RUBBER ANTIOXIDANT *(Solid form of Santowhite 54)*

ORGANIC DIVISION—LITERATURE AVAILABLE

COMPOSITION: Two parts of active material and 1 part of inert filler.

USES: Antioxidant (See *Santowhite* 54).

SHIPPING INFORMATION: Rubber Preservative, NOIBN.

SANTOWHITE® CRYSTALS *4,4'-thiobis-(6-tert-butyl-m-cresol).*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—light gray to tan powder; ash—0.5% max.; fineness (50 mesh)—trace max. retained; melting point—150°C. min.; moisture—1% max.; sp. gr.—1.10 at 25°C.

USES: For the protection of light colored rubber from oxidation. It is also useful in any rubber product used in contact with surfaces such as lacquer or enamel which are subject to staining by ordinary antioxidants. *Santowhite* Crystals provides excellent protection against normal aging. Use 1% to 2% on the hydrocarbon. Excellent for the protection of non-staining Neoprene compounds against heat deterioration.

SHIPPING INFORMATION: Rubber Preservative, NOIBN.

SANTOWHITE® L RUBBER PRESERVATIVE *(Essentially) thiobis-(di-sec-amylphenol).*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—dark, viscous liquid; ash—0.25% max.; heat loss—0.5% max.; softening point—0°C. max.; sp. gr.—0.99 at 50°C.

USES: For protection of rubber and rubber latex from oxidation. It is easily emulsified and has no effect on latex stability. It is a non-staining and non-discoloring antioxidant of medium strength.

SHIPPING INFORMATION: Rubber Preservative, NOIBN.

SANTOWHITE® MK RUBBER PRESERVATIVE

(Reaction product of 6-tert-butyl-m-cresol and SCl_2.)

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—dark, viscous liquid; ash—0.5% max.; heat loss—5% max.; softening point—20° to 35°C.; sp. gr.—1.06 at 25°C.

USES: For protection of rubber from oxidation. It is excellent from the standpoints of staining and discoloration. Use 1% to 2% on the hydrocarbon. Gives good protection to uncured SBR latex compounds.

SHIPPING INFORMATION: Rubber Preservative, NOIBN.

SANTOWHITE® POWDER *4,4'-butylidenebis (6-tert-butyl-m-cresol).*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—white powder; ash—0.3% max.; fineness (100 mesh)—trace max. retained; melting point—209°C. min.; heat loss—0.5% max.; sp. gr.—1.03 at 25°C.

USES: For protection of latices and dry rubber against oxidation. It is unexcelled from the standpoints of staining and discoloration. Use 1% to 2% on the hydrocarbon.

SHIPPING INFORMATION: Rubber Preservative, NOIBN.

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SPECIAL MATERIALS

INSOLUBLE SULFUR 60

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—greenish yellow powder; fineness (45 mesh)—trace max. retained; heat loss—1.4% max.; insolubles (carbon disulfide) 55% min.; sp. gr. —2.0 at 25°C.

USES: Used to retard sulfur bloom on uncured natural rubber or synthetic rubber surfaces. Used in the same amount as regular sulfur. With this type of sulfur there is usually a slightly enhanced rate of cure.

SHIPPING INFORMATION: Sulphur.

NITROL* ELASTOMER MODIFIER *(1 part N-[2-methyl-2-Nitropropyl]-4-Nitrosoaniline 2 parts inert diluent.)*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—light gray powder; assay—31.6-35.0%; fineness (100 mesh)—2% max. retained; heat loss—0.5% max.

USES: Improves hysteresis of rubber vulcanizates (lowers heat build-up).

SHIPPING INFORMATION: Flammable Solid NOS (Chemicals NOIBN).

SULFASAN® R VULCANIZING AGENT *(4,4'-dithiodimorpholine.)*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—gray to tan powder; ash—0.5% max.; heat loss—0.5% max.; melting point—122°C. min.; fineness (100 mesh)—0.1% max. retained, (200 mesh)—2.0% max. retained; sulfur—26 to 29%; sp. gr.—1.36 at 25°C.

USES: Vulcanizing agent. Stocks containing *Sulfasan* R give excellent aging and freedom from cured bloom. It does not discolor white compounds. Especially effective with Sulfenamide accelerators.

SHIPPING INFORMATION: Chemicals, NOIBN.

VOCOL* RUBBER ACCELERATOR

(Metallic salt of dialkyl-phosphorodithioate acid)

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—clear to yellow green liquid, approximately 100% active; soluble in benzene, alcohols and miscible with oils.

USES: Low cost, non-blooming, fast curing activator for EPDM elastomers.

SHIPPING INFORMATION: Rubber Accelerator; NOIBN.

VOCOL* S RUBBER ACCELERATOR *(62% VOCOL on 38% Inert Carrier)*

ORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS: Appearance and condition—solid, off-white pellets, 62% soluble in benzene, alcohols.

USES: Low cost, non-blooming, fast curing activator for EPDM elastomers.

SHIPPING INFORMATION: Rubber Accelerator, NOIBN.

RUBBER INSTRUMENTS

OSCILLATING-DISK RHEOMETER

See Page 16

MONOMERS FOR SYNTHETIC RUBBER

See Page 25

ACRYLONITRILE

See Page 25

STYRENE MONOMER

See Page 26

SPECIALTY PRODUCTS

ADHESIVES

PHENOLIC AND RESORCINOL RESINS

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquids.

PROPERTIES: Various products are available for requirements demanding an extremely high degree of water resistance. Bonds can be made capable of withstanding continuous boiling.

USES: Glues for plywood, hardboard, particle board and general woodworking. Used for hot and cold pressing and for radio frequency work.

INDUSTRIAL USERS: Plywood, Hardboard, Particle Board and General Woodworking Industries.

SHIPPING INFORMATION: Metal drums (500-lbs.); tank trucks and tank cars. Glues Liquid, NOIBN.

UREA AND MELAMINE RESINS

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquids; dry powders.

PROPERTIES: Various products are available for uses requiring varying degrees of water and weather resistance, speed of set and strength.

USES: Hot and cold setting adhesives for the plywood and woodworking industries. Bonding agent for particle board. Can be formulated for high frequency equipment.

INDUSTRIAL USERS: Plywood, Particle Board, and Forest Products Industries.

SHIPPING INFORMATION: Fiber drums (250-lbs.) for powdered melamine resins. Metal drums (500 lbs.), tank trucks and tank cars for liquid urea resins. Dry Powders: Rail—Plastics, Synthetic, other than liquid, NOIBN. Truck—Plastics, Powder, Liquid: Rail—Plastics, Synthetic, NOIBN. Truck—Plastics, Liquid, NOI.

ADHESIVES COMPONENTS

GELVA® POLYVINYL ACETATE—RESINS & EMULSIONS

See Pages 46 and 47

GELVATOL® POLYVINYL ALCOHOL

See Page 47

BUTVAR® POLYVINYL BUTYRAL

See Pages 47 and 48

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WATER_PCB-00032256

ANTI-CAKING FLOW CONDITIONERS

SANTOCEL® SILICA AEROGEL *(for Industrial Applications.)*

INORGANIC DIVISION—LITERATURE AVAILABLE

TYPICAL ANALYSIS:

Range of Various Grades

	Unit	SANTOCEL
Bulk Density	lb/cu. ft.	5-6
Particle Size (AV)	microns	3-5
Surface Area	sq. meters/gm	130-398
Oil Absorption	gm. oil/gm	3.0-3.5
SiO_2	%	90.0-96
Volatile	%	3.5-5.0
Na_2SO_4	%	0.03-3
pH	—	3.5-3.8
Index of Refraction	—	1.45-1.46
Absolute density	lb/gal.	17.1

GRADES: *Santocel* C, *Santocel* CS, *Santocel* CX, *Santocel* 54, *Santocel* FR-C, *Santocel* 62, *Santocel* Z.

USES: Flatting agent to produce matte finishes in coatings of all types (lacquers, varnishes, vinyl resin coatings and resin dispersions); bodying agent in printing inks; bulking agent for dry powders, free-flowing and anticaking agent for dry powders; insecticide for stored industrial grains; application aid for rubber cements; reinforcing agent for silicone rubbers; bodying agent to make lubricating greases; dry grinding aid for DDT and other sticky powders; to raise heat distortion point, as in molded brake linings; mold lubricants for hard rubber; bodying agent for paint removers; antisettling agent for pigments; antislip agent in paste floor waxes; flatting agent for free film and textile coatings. Imparts thixotropy properties to polyester and epoxy resins dispersions and solutions; thickening and thixotropic agent for polyvinyl chloride plastisols and plasticizer dispersions.

SHIPPING INFORMATION: Silica NOIBN less than 10 lb. per cu. ft. Multiwall bags, C, CS, FR-C—25-lb.; CX—15-lb.; 54—20-lb.

SANTOCEL® SILICA AEROGEL *(for Thermal Insulation.)*

INORGANIC DIVISION

STANDARD FORM: *Santocel* A—sugar-sized particles.

TYPICAL ANALYSIS: Approximate analysis for all insulation grades of *Santocel*: SiO_2, 93.0-96.0% ; volatile* 0.5-1.5% ; Na_2SO_4, 2.5-3.5% ; Fe_2O_3 and Al_2O_3, 1% .

*Volatile in water, alcohol, acetaldehyde.

PROPERTIES: Known technically as a silica aerogel, it possesses the lowest coefficient of thermal conductivity known. Dry bulk density: *Santocel* A, 5-lbs. per cu. ft.; absolute density 17.1 lbs. per gal.; specific heat 0.234; angle of repose 12.5°; thermal conductivity (mean temp. 60°F.) 0.150 BTU/Hr./Ft.²/in./°F.

USES: Adapted for any use where efficiency or space saving is a factor in thermal insulation, especially in freezers, shipping containers, insulated trucks, trailers and freight cars, liquid oxygen manufacture and storage, and cold-storage room doors.

SHIPPING INFORMATION: Silica NOIBN, less than 10 lb. per cu. ft. Multiwall paper bags 20-lbs. net.

ANTI-FOAMING AGENTS

PC-1244® DEFOAMER

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Clear light yellow liquid.

SPECIFICATIONS: Color ASTM 0.5; Sp. Gr. 0.86 at 60°/60°F.; viscosity, SUS at 100°F., 190; 7.72-lbs. per gallon.

GENERAL INFORMATION: Solubility—PC-1244 is soluble in benzene, toluene, kerosene, petroleum ether, carbon tetrachloride, isopropanol, tertiary amyl alcohol, butyl cellosolve and ethyl acetate. It is not soluble in water, methanol, ethanol and methyl cellosolve.

USES: Foam control in non-aqueous systems. In paraffin wax formulations it not only controls foam, but also imparts a leveling action. Unusually effective in neutral or acidic media.

SHIPPING INFORMATION: Chemicals NOIBN. 55-gal. nonreturnable black iron drums; 5-gal. cans; tank cars.

ANTI-SLIP AND ANTI-SOIL AGENTS

SYTON® AS-200, AS-240, AS-250 COLLOIDAL SILICA

INORGANIC DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: Most carpet fabrics can have their soiling properties improved by a treatment of a very finely divided colloidal silica dispersion. Wool-rayon blends, cotton and other synthetic carpets can be markedly improved against soiling by a silica sol treatment. Pure wool carpets are less subject to improvement than the synthetics or blends. In combination with certain film formers, paper surfaces can be made soil resistant. When directly applied to hard surfaces, soil resistance results. Available in 30% , 40% & 45% solids content.

USES: For use as an anti-soilant for pile fabrics.

SHIPPING INFORMATION: Colloidal Silica, liquid (NB freezes 32°F. Keep from freezing). 550-lb. drums.

SYTON® C-30 AND 200 COLLOIDAL SILICA

INORGANIC DIVISION

TYPICAL ANALYSIS:

	Syton C-30	Syton 200
SiO_2	30%	30%
Water	70%	70%
Na_2SO_4	0.15%	0.10%
Sp. Gr.	1.2	1.2
pH	10.0	8.7
Appearance	Milky white dispersion	Slightly turbid liquid
Ultimate particle size	350-400 angstroms	100-250 angstroms

GENERAL INFORMATION: Colloidal dispersion of silica in water. Will freeze at 32°F. and the silica is precipitated irreversible.

USES: Anti-blocking agent in water finishes. Gloss control agent in water finishes. Increase bond strength of rubber latex adhesives. Increase modulus of latex film and thread. Surface harden water base laminating resins. Suspending agent for pigments in water systems. Mold lubricant. Binder for precision casting molds. Flame retarding agent for water-based paints. Improves soil resistance of hard surfaces. Improves scrub and soil resistance of water-based paints.

SHIPPING INFORMATION: Colloidal Silica, liquid (NB: Freezes 30°F. Keep from freezing) 550-lb. drums.

SYTON® C-40 & 240 COLLOIDAL SILICA

INORGANIC DIVISION—LITERATURE AVAILABLE

Typical Physical and Chemical Properties

	C-40	240
SiO_2	40	40
Water	60	60
Specific Gravity	1.28-1.30	1.28-1.30
Viscosity Centipoise (25°C, Brookfield #1 Spindle)	7	7
Appearance**	Milky White Dispersion	Slightly turbid liquid
pH at 25°C	9.8	9.0
Compatibility	Excellent with nonionic and anionic surfactants	
Ultimate particle size	350-400 Angstroms 35-40 millimicrons	100-250 Angstroms 10-25 millimicrons
Clarity (% transmission by Electrophotometer)	10	60
Lbs. per gallon	10.77	10.77
Lbs. SiO_2 per gallon	4.30	4.30

***The visual differences can be related to differences in ultimate particle size using light scattering techniques.*

A 40% concentration of SiO_2 in the form of colloidal silica sol. Have the same application as the 30% grades with added advantage of freight warehouse and handling savings. These particles are rigid, chemically inert, pure SiO_2. The colloidal suspension has a low viscosity and may be applied by rolling, spraying, brushing or dipping. *Syton* is used where frictionizing, reinforcing or surface modifying properties are desired. Heat stability tests show that *Syton* undergoes no increase in viscosity when heated even as long as 200 hours at 77°C in a closed container. If the water is allowed to evaporate, either at room or higher temperatures, *Syton* 240 or *Syton* C-40 will exhibit a greater tendency toward formation of silica scale or deposits due to higher silica concentrations.

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WATER_PCB-00032257

SYTON® C-50 AND 250 COLLOIDAL SILICA

INORGANIC DIVISION

Typical Physical and Chemical Properties

	C-50	250
SiO_2	50	50
Water	50	50
Specific Gravity	1.38	1.38
Viscosity Centipoise (25°C., Brookfield #1 Spindle)	20	17.5
pH at 25°C.	9.6	9.6

A 50% concentration of SiO_2 in the form of colloidal silica sol. Same applications as 30% and 40% with added benefits of freight, warehouse and handling savings.

SYTON® DS, DS-40, DS-50 AND DS-200, DS-240, DS-250 COLLOIDAL SILICA

INORGANIC DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: Extremely fine colloidal aqueous dispersions of silica. In textile spinning: controls the slippage between fibers, thereby increasing tensile strength of spun yarns, permitting less twist in some cases, or fewer breaks during spinning and weaving. In textile finishing: controls slippage in woven rayons, gives dry worsted-like hand, delusters in higher concentrations.

USES: Spinning, wet processing and finishing textiles.

SHIPPING INFORMATION: Colloidal Silica, liquid (NB: Freezes 32°F. Keep from freezing). 550-lb. drums.

SYTON® W-200, W-240, W-250 COLLOIDAL SILICAS

INORGANIC DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: The *Syton* W series is an extremely fine colloidal aqueous silica dispersion and is used in wax emulsions primarily to give anti-slip properties to the wax applications. Available in 30%, 40% & 45% solids content.

USES: For use as an anti-slip agent in wax emulsion polishing compounds.

SHIPPING INFORMATION: Colloidal Silica, liquid (NB: Freezes 32°F. Keep from freezing). 550-lb. drums.

ANTIOXIDANTS

SANTOQUIN® ANTIOXIDANT *ethoxyquin, 1-2-dihydro-6-ethoxy 2,2,4 trimethylquinoline*

AGRICULTURAL DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: *Santoquin* is added to manufactured animal feeds to protect the important nutrients against oxidative destruction. The addition of 0.0125% or 0.25 pounds liquid or 6 ounces dry form per ton of complete animal feeds will preserve the carotenes and xanthoplyll pigments as well as Vitamins A and E.

Santoquin is also an antioxidant used in dehydrated forage crops for the preservation of carotenes and Vitamin E. The use level permitted in the Regulation issued by the United States Food and Drug Administration is 0.015% or 0.3 pounds liquid form per ton of forage crops.

LIQUID FORM: Dark liquid — varies from yellow to black but biological activity is independent of color. *Santoquin* liquid is a 100% biologically active antioxidant.

DRY FORM (MIXTURE #8): Contains 66.6% *Santoquin* liquid and 33.4% food grade vermiculite (verxite). A brown, free-flowing granular material with a density of 23 pounds per cubic foot.

EMULSION FORM: Contains 70% *Santoquin* liquid, 7% emulsifier, and 23% water. *Santoquin* emulsion should be diluted with water to provide uniform distribution. To be used in preserving dehydrated forage crops only.

SOPANOX® ortho-TOLYL BIGUANIDE

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 200.24

STANDARD FORM: Powder.

SPECIFICATIONS: White to off-white powder; assay 90% min.; loss on drying 5% max.; melting point 138°C. min.; trace retained on a 30 mesh sieve; alcohol insolubles 0.5% max.

PROPERTIES: An amino compound effective in minute quantities in restraining the oxidation of soap and the resulting rancidity, discoloration and other adverse qualities, all of which must be avoided in producing a product of highest grade.

USES: Our experience shows that *Sopanox* satisfies the exacting demands of manufacturers of soaps produced from animal or vegetable oils, filled or unfilled. Particularly valuable in preventing discoloration of refined toilet soaps.

SHIPPING INFORMATION: Chemicals NOIBN. 150-lb. leverpaks.

BACTERIOSTATS/DISINFECTANTS/FUNGICIDES FUNGISTATS/GERMICIDES

ACL® SANTICIZER AND BLEACHING COMPOUND

See Page 71

MONSANTO® PENTA *Pentachlorophenol, Technical.*

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 266.35

STANDARD FORM: Flakes. *Monsanto* Penta Oiled also available. Contains 3-lbs. oil per 100-lbs. of PENTA TECHNICAL. Oil decreases somewhat the dusting tendency of the product.

SPECIFICATIONS: Dark, grayish flakes; crystallizing point 174.0°C. min.; alkali insoluble material 1.0% max.; assay 96.0% min.; pine oil solution NPA 5.5 max. Meets Federal Specification TT-W-570.

PROPERTIES: Chlorophenolic odor; bulking value 45.5 lbs. per cu. ft.; stable under ordinary conditions; relatively non-hygroscopic and unreactive chemically; soluble to various degrees in organic solvents; relatively insoluble in water.

USES: Highly toxic to fungi, termites and many forms of bacteria. Used industrially where the growth of microorganisms must be prevented or controlled; to protect wood against rot, termites and Lyctus (Powder-Post) beetles; as an effective herbicide. Penta is used frequently in oil solutions or as the sodium salt (see *Santobrite*).

SHIPPING INFORMATION: Pentachlorophenol. 100-lb. fiber container; 50-lb. multiwall paper bags. Oiled Penta 16½-gal. lever-pak; 51-lb. multiwall paper bags.

SANTOBRITE® SODIUM PENTACHLOROPHENATE, TECHNICAL

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 288.36

STANDARD FORM: Neutral powder, pellets, fines or briquettes.

SPECIFICATIONS: Light tan powder, pellets, fines or briquettes; assay 88.0% min.; free alkali (as NaOH) 0.5-0.9%.

PROPERTIES: Comparatively odorless; stable under ordinary atmospheric conditions when stored in dry place; bulking value: briquettes 40-50 lbs./ft.³, pellets 35-40 lbs./ft.³, powder 55-65 lbs./ft.³; soluble in water and various organic polar solvents. Relatively inert toward organic compounds.

USES: A water-soluble industrial preservative, fungicide and herbicide. Used for the manufacture of termite-resistant cellulose insulating board and for the preservation of wood, cellulose products, textiles, starches, adhesives, leather, oils, paints, latex and rubber. Also for control of slime and algae; manufacture of herbicides; as a fermentation disinfectant; for control of sap stain in green lumber.

SHIPPING INFORMATION: Sodium Pentachlorophenate. 100-lb. fiber containers.

FDA STATUS: Regulated.

SANTOPHEN® 1 GERMICIDE *ortho-benzyl-parachlorophenol.*

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 218.68

STANDARD FORM: Flaked solid.

SPECIFICATIONS: White to light tan or pink flakes; crystallizing point 45.0°C. min.; Sp. Gr. 1.186-1.190 at 55°/15.5°C.; free acidity (as HCl) 0.01% max.; odor slight phenolic max.

PROPERTIES: *Santophen* 1 possesses high bactericidal and fungicidal activity, but low toxicity to higher animals. When properly formulated for disinfectant use, it is considered nonirritating in use dilutions. Insoluble in water, but highly soluble in alcohol and other organic solvents; dispersible in aqueous media with the aid of soaps or synthetic dispersing agents. Noncorrosive to most metals or other engineering materials. *Santophen* 1 can be easily rendered water soluble by converting it to the sodium salt.

USES: Used as the active chemical agent for finished products that destroy harmful microorganisms that attack human beings, animals and naturally derived materials.

SHIPPING INFORMATION: Disinfectant Other Than Medicinal NOIBN. 55 and 22-gal. lacquer-lined drums.

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WATER_PCB-00032258

SANTOPHEN® 1 SOLUTION *75% SANTOPHEN 1, 25% isopropanol.*

ORGANIC DIVISION

STANDARD FORM: Liquid

SPECIFICATIONS: Straw to amber colored liquid: assay 75.0 to 77.0%; Sp. Gr. 1.080-1.090 at 15.5°/15.5°C.; color Barrett Std. No. 3 max.; moisture 0.25% max.

USES: Used as the germicidal active principle, or as an enhancing agent for disinfectants. *Santophen* 1 solution is convenient for formulators who normally dissolve the compound in isopropyl alcohol. The use of *Santophen* 1 solution saves one step in formulation procedures.

SHIPPING INFORMATION: Disinfectant other than medicinal NOIBN. 55 and 15-gal. drums.

TCC *3, 4, 4' Trichlorocarbanilide.*

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 315.6

STANDARD FORM: Micronized and unmicronized.

SPECIFICATIONS: Fine white to grayish white powder; loss on drying at 110°C., 0.15%; melting point 250.0°C. (first meniscus); particle size:

micronized	20 microns max. 3 microns ave.
unmicronized	0.1% retained on a 30 mesh screen

USES: 3,4,4' trichlorocarbanilide is recommended for incorporation into soap and other topically applied preparations as a degerming agent.

SHIPPING INFORMATION: Chemicals, NOIBN, 100-lb. fiber drums — micronized, 200-lb. fiber drums—unmicronized.

CHEMICAL SPECIALTY CATALYSTS

VANADIUM SULFURIC ACID CATALYST

ENGINEERING SALES—INORGANIC DIVISION

GENERAL INFORMATION: Sold in conjunction with complete plants of Monsanto design and also for replacement purposes in any contact plant.

USES: In manufacture of sulfuric acid by contact process. (Not suitable for other purposes).

SHIPPING INFORMATION: Chemicals NOIBN. 50-Liter Lever-pak.

CURING AGENTS

CATALYST AC SERIES

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORMS: Catalyst AC is light yellow liquid compatible in resin baths with most cationic, anionic, anionic and nonionic softeners and penetrants. Catalyst AC is used with *Resloom* HP finishes. Catalysts AC-4 and AC-6 are clear, compatible liquids. AC-7 is an organometallic catalyst designed for curing formaldehyde-containing resins used in the textile industry.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Speeds cure of cyclic-urea and melamine treating resins.

USES: To provide rapid and uniform resin cure and retention in treatment of fabrics, including rayons, cottons and the synthetics.

INDUSTRIAL USERS: Textiles.

SHIPPING INFORMATION: AC—475-lb. drums; AC-2 thru AC-7—500-lb. drums; All AC series can be shipped in liquid bulk. Glue Catalyst NOIBN.

DECORATIVE & FUNCTIONAL OVERLAY PAPERS

MONPREG® *Impregnated Papers*

PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Thermosetting resin-impregnated papers for either decorative or functional applications.

PROPERTIES: Low-cost, hot-press, low-pressure surfacing overlay for lamination to various types of substrate.

USES: Decorative — Provides durable, decorative, and color stable surface for low-cost substrates used in the manufacture of furniture, cabinets, wall paneling, etc. In the cured form, this surface exhibits excellent resistance to wear, scratching, heat and chemicals.

Functional — Provides check resistance and good paintability for plywood and other wood-type substrates which are used as sign boards, concrete forms, shelving and either interior or exterior paneling.

SHIPPING INFORMATION: Both types of MONPREG are shipped either in roll form or in precut sheet form. In either case it is wrapped in polyethylene and packaged in heavy duty cardboard boxes.

FIRE RETARDANTS

ACID, PHOSPHORIC

See Page 30

DIAMMONIUM PHOSPHATE

See Page 29

MONOAMMONIUM PHOSPHATE

See Page 29

PHOS-CHEK® FIRE RETARDANT

INORGANIC DIVISION—LITERATURE AVAILABLE

SPECIFICATIONS:

	Phos-Chek 202	*Phos-Chek* 259* and 465*
% P_2O_5	47.0 min.	48.5 min.
Viscosity, cps. @ 75°F. (1)	1,000-1,500	50 min. 100 max.
Corrosion: (2)		
On Aluminum	1 mil/yr. max.	less than 5 mils/yr. max.
On Copper	1 mil/yr. max.	less than 1 mil/yr. max.

(1) Brookfield Viscometer, 60 rpm, Spindle #4 on a 13% solution.
(2) Alternating 30 sec. immersion and drain cycles @ room temp. for 72 hours.

USES: For preparing fire fighting solutions. 202 is designed for application from aircraft; 259 and 465 are applied from ground equipment.

*465 is designed for immediate application; 259 is more stable and can be stored indefinitely.

PHOS-CHEK® P/30

See Page 68

PHOSGARD® C-22-R

See Page 51

PLASTICIZERS *(See particularly Aroclor; Santicizer 140, 141, 148; Tricresyl Phosphate; Tributoxy Phosphate).*

TETRATHAL® FLAME RETARDANT

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: White flakes.

PROPERTIES: Molecular weight, 285.9; chlorine content, 49.6%; melting range, 254°-255°F.

USES: Tetrathal (tetrachlorophthalic anhydride) is a versatile, effective, low-cost flame retardant for polyester resins used in building construction, transportation, chemical and food preparation equipment manufacture. In addition, flame resistant urethane foams can be made using polyols based on Tetrathal, as can alkyd and epoxy surface coatings.

SHIPPING INFORMATION: 50-pound bags.

FLAVORINGS

See Page 17

0557479

TOWOLDMON0041213
WATER_PCB-00032259

METAL PROCESSING COMPOUNDS

BONE ASH (NATURAL)

INORGANIC DIVISION—LITERATURE AVAILABLE

PROPERTIES: A very finely divided bone ash used as a mold-wash for coating molds used in casting copper wire, bars, ingots and slabs. A superior mold coating for certain steel and aluminum casting operations. This product is also used in producing high-grade chinaware.

SHIPPING INFORMATION: Bone Ash.

MOULD COAT *Synthetic Bone Ash*

INORGANIC DIVISION—LITERATURE AVAILABLE

PROPERTIES: A synthetic bone ash (calcium phosphate) with properties similar to the natural product.

USES: As shown above.

NFB® 80 AND 85 *Non-fuming Aluminum Bright Dip Bath.*

INORGANIC DIVISION

FORMULA: 80% H_3PO_4 + trace additives
85% H_3PO_4 + trace additives

STANDARD FORM: Liquid.

TYPICAL ANALYSIS:	*NFB*® 80	*NFB*® 85
Sp. Gravity at 15.5°C.	1.64	1.7
P_2O_5	58.0%	61.6%
H_3PO_4	80.0%	85.0%
Copper	.01%	.01%

USES: Proprietary solutions used exclusively in the aluminum bright dipping industry as direct replacements for 80% and 85% phosphoric acid and various additives now used. It decreases nitric oxide fumes and chemical cost of operations, frequently with improved work quality.

SHIPPING INFORMATION: Phosphoric Acid, Tank car and tank truck.

ODORANTS

COUMARIN

ORGANIC DIVISION—LITERATURE AVAILABLE

MOLECULAR WEIGHT: 146.14

STANDARD FORM: Crystalline solid.

SPECIFICATIONS: White crystals; melt (liquid) clear and colorless; M.P. 68.8°C. min.; solubility in ethyl alcohol (1:10) complete; moisture 0.10% max.; ash 0.05% max.; conforms to N.F. test for acetanilid.

GRADES: Crystals.

USES: Deodorizing and odor enhancing agent; used in perfumes, soaps, tobacco, inks, rubber and other products where aromatic ingredients are required.

SHIPPING INFORMATION: Chemicals NOIBN. 200 and 25-lb. fiber drums.

METHYL SALICYLATE U.S.P.

See Page 17

SANTOMASK® II ODOR-MASKING AGENT

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

SPECIFICATIONS: Clear, light yellow liquid; pleasant characteristic odor; Sp. Gr. 25°/25°C. 1.18 to 1.20; color NPA 2.0 max.; chill test, clear @ 0°C.

USES: Odor-masking ingredient for interior paints, printing inks and similar products having objectionable natural odors. Will not affect drying time, color durability and other characteristics of paints and inks.

SHIPPING INFORMATION: Chemicals NOIBN. 250 and 45-lb. drums.

VANILLIN MONSANTO* *Vanillin U.S.P.*

See Page 18

PAINT/COATING INGREDIENTS

BENTHAL® ALKYD RESIN INTERMEDIATE

ORGANIC DIVISION

STANDARD FORM: White flakes.

TYPICAL ANALYSIS: Moisture 0.20% max.; C.P. 121.5°C. (min.); bulking value 12.7 lbs./gal.

USES: *Benthal* is used in short oil alkyds which are primarily baking finishes for appliance and automotive enamels. By reducing excess amounts of alcohols in the formulation and introducing *Benthal* in quantities of 3-20% by weight on the phthalic anhydride, enamels show substantial improvement in gloss, hardness and durability. The *Benthal* acts as a chain terminator hence retarding the viscosity increase until low acid values are obtained in the resin.

SHIPPING INFORMATION: Resin Plasticizer. 200-lb. net wt. fiber drums, 50-lb. bags.

BISPHENOL A

See Page 29

BUTVAR® POLYVINYL BUTYRAL

See Pages 47 and 48

D. P. SOLUTION® *Dibutylamine Pyrophosphate.*

INORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: Pale straw-colored liquid; wt. per gal. 8.2 lbs.; 40% sol. in equal parts of ethyl alcohol and acetone.

USES: An anticorrosion agent in lacquers and cotton solutions; an agent to prevent the settling of *Santocel* flattening agent in flat lacquer formulations; for light and heat stabilization of vinyl chloride and vinyl copolymer resins.

SHIPPING INFORMATION: Chemicals NOIBN. 55 and 5-gal. Heresite-lined steel drums.

DIBUTYL FUMARATE

See Page 51

DIBUTYL MALEATE

See Page 51

DIOCTYL FUMARATE (DOF)

See Page 51

DIOCTYL MALEATE (DOM)

See Page 51

FORMVAR® POLYVINYL FORMAL

See Page 48

GELVA® POLYVINYL ACETATE

See Pages 46 and 47

GELVATOL® POLYVINYL ALCOHOL

See Page 47

HBPA® HYDROGENATED BISPHENOL A

See Page 51

0557480

TOWOLDMON0041214
WATER_PCB-00032260

LAMPBLACK

INORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Powder.

PROPERTIES:

Grade Black	% Free Carbon	#Oil/#Black Oil Absorption	Tinting Strength*	Under Tone	Top Tone
#1	99.57	1.14	238	Blue	Black
AA	87.97	1.65	225	Blue-Brown	Brown-Black
#2	99.42	1.26	208	Blue-Gray	Gray-Black
#8	91.46	1.54	205	Blue	Brown-Black
S-100	98.08	1.37	170	Blue	Black
HTA	98.62	1.42	160	Blue	Blue-Black
B-5	98.92	1.34	140	Blue	Blue-Black
#10	99.29	1.25	100	Blue-Gray	Gray
#10C	99.10	1.26	105	Blue-Gray	Gray

*NOTE: The figures in the column TINTING STRENGTH are relative values using No. 10 Lampblack as a standard. For example: A value of 225 for tinting strength of AA Lampblack means that this black is 2¼ times as intense as No. 10 Lampblack.

USES: Pigment in paints, varnishes, enamels, inks, leather finishes, stencils, crayons, polishes; in pressed forms as electrodes, carbon brushes and molded carbon products.

SHIPPING INFORMATION: Lampblack NOIBN when wt. per cu. ft. is under 17-lbs.; Lampblack Compressed when wt. per cu. ft. is 17-lbs. or over. Paper bags and cartons.

MALEIC ANHYDRIDE

See Page 23

MERTONE® WB-4 *Precoat for Reproduction Papers.*

INORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

PROPERTIES: A 30% colloidal dispersion of silica in water; odorless.

USES: As a precoat on blueprint and other reproduction papers for clearer, more legible prints. On blueprint a darker, more lively blue is obtained. Also used on diazo paper, blueprint cloth, negative paper and Van Dyke paper. Precoating is performed by coaters. U. S. reissue patent No. 23510 (Andrews Paper and Chemical Co.) relates to the precoating of photosensitive papers with colloidal silica.

SHIPPING INFORMATION: Chemicals NOIBN. 55-gal. lined steel drums.

MODAFLOW® RESIN MODIFIER

See Page 23

PHENOLIC VARNISHES

See Pages 49 and 50

PHOS-CHEK® P/30 *Fire Retardant*

INORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: White Solid.

TYPICAL ANALYSIS: pH (10% slurry) 6.5, phosphorus content (as %P) 32% , particle size (+200 mesh) 0.5% .

PROPERTIES: A finely divided, free-flowing powder, contains a very high phosphorus content, is nearly neutral, and has very low solubility in water.

USES: A highly effective fire retardant, it is useful in intumescent latex and alkyd paints. It is highly non-leachable from coatings which may come into contact with water. Also effective as a flame retardant for rigid polyurethane foam.

SHIPPING INFORMATION: Polyethylene lined fiber drums, 300 pounds (net). Chemicals NOI.

PHTHALIC ANHYDRIDE

See Page 51

RESIMENE® MELAMINE RESIN

See Page 50

RESIMENE® UREA RESIN

See Page 50

RESINOX® PHENOLIC RESIN VARNISH

See Pages 49 and 50

RJ-100® AND RJ* 101 STYRENE-ALLYL ALCOHOL COPOLYMERS

See Page 46

SANTOCEL® *Silica Aerogel*

See Page 64

SANTOCEL® 62 FLATTING AGENT

INORGANIC DIVISION—LITERATURE AVAILABLE

Flatting agent for clear and pigmented protective and decorative coatings. High flatting efficiency, short dispersion times in pebble mill or high speed mixers. Yields final film of excellent smoothness. Settling on storage only slight and can be easily redispersed.

SANTOCEL® L FLATTING AGENT

INORGANIC DIVISION—LITERATURE AVAILABLE

A silica aerogel used as an additive for drying emulsion paint films without flucculation. Improves hiding power of TiO_2, film integrity and thixotropic properties.

SANTOMASK® II ODOR-MASKING AGENT

See Page 67

STYRENE-ALLYL ALCOHOL RJ-100® AND RJ* 101

See Page 46

SYTON® AS-200 COLLOIDAL SILICA

DISPERSION FOR WATER-BASED PAINTS

See Page 64

UREA SOLUTIONS

See Page 63

PAPER CHEMICALS

ALUMINUM SULFATE

ORGANIC DIVISION

FORMULA: $Al_2(SO_4)_3 \cdot 14.5\ H_2O$ (dry); $Al_2(SO_4)_3$ (liq.)

MOLECULAR WEIGHT: 603.35.

STANDARD FORMS: Dry: white powder, ranging to small lumps. Liq: Clear liquid.

USES: Paper sizing and water treatment.

SHIPPING INFORMATION: Aluminum Sulfate. 100-lb. paper bags.

FDA status approved by prior sanction.

MERSIZE® *Paper Sizing Agent.*

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Paste, powder and liquid.

GENERAL INFORMATION: *Mersize TFL 70%, 77%* and *80%* solids paste sizes: *Mersize RM Dry* a dry granular powder. *Mersize DFS* 70% and 80% : Solid paste sizes used for maximum efficiency in unbleached and semi-bleached papers; *Mersize CD-2* a 50% solids solution; *Mersize CD-2* a dry powder.

USES: *Mersize TFL* and *Mersize RM Dry* are forms of chemically fortified rosin-based sizes that are ready to use in a paper mill to reduce sizing costs, improve resistance to ink, water and other aqueous solutions, give better feathering resistance and more uniform dependable sizing. *Mersize CD-2* and *Mersize CD-2 Dry* are used in conjunction with typical rosin sizes to obtain the same results.

SHIPPING INFORMATION: Tank cars, 500-lb. steel drums and 50-lb. bags. Rosin Sizing NOIBN.

FDA status: Approved for use in paper coming in direct contact with food.

0557481

TOWOLDMON0041215
WATER_PCB-00032261

SALT CAKE SODIUM SULFATE, ANHYDROUS TECHNICAL

ORGANIC DIVISION

MOLECULAR WEIGHT: 142.06

STANDARD FORM: Powder.

TYPICAL ANALYSIS: The 93-95% grade is typical white salt cake. The 98-99% grade is a special material having a light tan color and Na_2SO_4 content of approximately 99%.

USES: Manufacture of sulfate pulp and glass.

SHIPPING INFORMATION: Salt Cake. Bulk car loads.

SANTOBRITE® SODIUM PENTACHLOROPHENATE *Paper Mill Slimicide.*

See Page 65

SANTOSITE® SODIUM SULFITE ANHYDROUS

ORGANIC DIVISION—LITERATURE AVAILABLE

FORMULA: Na_2SO_3

MOLECULAR WEIGHT: 126.06

STANDARD FORM: Powder.

TYPICAL ANALYSIS: Tan to slightly pink crystalline powder; assay (Na_2SO_3) 97.7% min.; color of filtrate from 10% solution in water not darker than APHA 70.

PROPERTIES: Will oxidize to sodium sulfate if not kept dry. Normally contains less than 1% sodium chloride; less than 0.1% iron; less than 0.2% insoluble; less than 0.2% organic matter. The balance of impurity is sodium sulfate. The unfiltered water solution has a brown color due to suspended Fe (OH_3). Normally all of the product will pass through a No. 20 U. S. Standard sieve.

USES: Manufacture of paper, highly efficient in the semi-chemical pulping of straw and wood for paper manufacture.

SHIPPING INFORMATION: Sodium Sulfite. 100-lb. paper bags and hopper cars.

SANTOSIZE® PAPER SIZING AGENT

ORGANIC DIVISION

GENERAL USE INFORMATION: Santosize 70% and 80% pale unfortified rosin size and Santosize DSN 70% and 80% FF grade dark rosin size, are used in specific applications where higher efficiency Mersize TFL is not required.

SHIPPING INFORMATION: Rosin Sizing Liquid. Tank cars, 500-lb. and 55-gal. drums.

FDA status: Approved for use in paper coming in direct contact with food.

SCRIPSET® 100, 500 SERIES *Paper Coating Resins*

Specialty Coating Resins

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: *Scripset 100, 450*—Low-viscosity, clear liquids. *Scripset 500, 520, 530, 540 & 550*—Free-flowing white powders.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Paper coating resin. Outstanding polyelectrolyte resins which improve the surface characteristics and printability of paper products and have good wax hold-out properties. Also used as resin binders in clay coatings.

USES: Paper manufacturing.

INDUSTRIAL USERS: Paper and Pulp Industry.

SHIPPING INFORMATION: Plastics Synthetic.

FDA status: Regulated.

SCRIPTITE® SERIES WET-STRENGTH RESINS

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORMS: *Scriptite* 330—Finely divided powder *Scriptite* 400—Trans. colloidal solution

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Melamine Formaldehyde and Urea Formaldehyde resins.

USES: To impart exceptional wet-strength to paper and paperboard.

SHIPPING INFORMATION: (310) Plastics, Synthetic Liquid. (330) Plastics Synthetic Dry.

FDA status: Approved by prior sanction.

SODIUM HEXAMETAPHOSPHATE

See Page 31

STEROX® DF, STEROX® DJ AND STEROX® NJ *Detergents*

See Page 71

SYTON® P AND P-200 COLLOIDAL SILICA

ORGANIC DIVISION—LITERATURE AVAILABLE

GENERAL INFORMATION: The application of an extremely fine colloidal aqueous dispersion of silica applied either by spray or roller to multiwall paper bags or most any type of paperboard boxes or liner board will materially reduce slippage between the coated surfaces. *Syton* P is proving to be the most effective anti-skid agent.

USES: For use on paper containers to make slip-resistant coatings.

SHIPPING INFORMATION: Colloidal Silica, liquid (NB: Freezes 32°F. Keep from freezing). 550-lb. drums.

FDA status: Exempt "generally recognized as safe".

TRISODIUM PHOSPHATE, ANHYDROUS and CRYSTALLINE

See Page 32

NOTE: For complete listing of all pulping, paper-making and coating chemicals, request "Chemicals for the Paper Industry" from Cellu-Chem Department, St. Louis, Missouri, 63166.

SWEETENERS

SACCHARIN (CALCIUM AND SODIUM) U.S.P.

See Page 18

DIETOSE® CALCIUM CYCLAMATE U.S.P.

DIETOSE® SODIUM CYCLAMATE N.F.

TANNING AGENTS

SANTOTAN® KR BASIC CHROME SULFATE

INORGANIC DIVISION

FORMULA: Contains approximately 50% of $Cr_2(SO_4)_2(OH)_2$

STANDARD FORM: Crystals.

TYPICAL ANALYSIS: Dark green crystals; solution in water (5:500) clear; basicity ($Cr_2O_3(SO_3)$ 101-105; basicity (Schorlemmer) 37.3-39.7; chromium as Cr_2O_3 23.9% min.

USES: In chrome tanning of calf, cow and horse hides and sheepskins.

SHIPPING INFORMATION: Tanning Extract Dry NOIBN. 100-lb. paper bags.

ZINC OXIDE, TECHNICAL

INORGANIC DIVISION

FORMULA: ZnO

MOLECULAR WEIGHT: 81.38

SPECIFICATIONS: Light gray or tan powder assaying 90.0% min. ZnO.

GENERAL INFORMATION: This technical grade has been found acceptable in the rubber trade and paper manufacture.

SHIPPING INFORMATION: Zinc Oxide Dry. 50-lb. bags.

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TOWOLDMON0041216
WATER_PCB-00032262

TEXTILE CHEMICALS

BUTVAR® RESINS
See Page 47

CATALYST AC
See Page 66

GELVATOL® RESINS
See Page 47

LYTRON® LATICES
See Page 46

GELVA® RESINS
See Page 47

RESLOOM® MELAMINE
See Page 50

STYMER® COPOLYMER RESINS
PLASTIC PRODUCTS AND RESINS DIVISION—LITERATURE AVAILABLE

STANDARD FORM: *Stymer* LF is vinyl resin, soluble with ammonium hydroxide; *Stymer* S is styrene copolymer resin, soluble in water.

PROPERTIES AND PERFORMANCE CHARACTERISTICS: Textile Resin. Outstanding as sizing agents for acetate. *Stymer* LF-25 designed as durable size. *Stymer* S is water soluble removable size.

USES: Sizes for filament acetates.

INDUSTRIAL USERS: Textiles.

SHIPPING INFORMATION: *Stymer* LF-25—drums (100 lbs.). *Stymer* S—multiwall bags (50 lbs.); drums (250 lbs.). Rail & Truck: Sizing NOIBN.

SYTON® AS-200 COLLOIDAL SILICA DISPERSION
See Page 64

THICKENING AGENTS

EMA® RESINS
See Page 51

SANTOCEL® Z AEROGELS
INORGANIC DIVISION—LITERATURE AVAILABLE

Designed to perform thixotropic and thickening functions in polyvinyl chloride plastisols and in various plasticizer dispersions. Offers the following advantages to vinyl plastisol manufacturers: more efficient on a cost/performance basis; 65-70% more efficient thickening power; at low and shear rates; imparts higher degree of thixotropy at equivalent loading levels; less tendency to settle.

WOOD PRESERVATIVE

MONSANTO® PENTA *Pentachlorophenol, Technical.*
See Page 65

SURFACE ACTIVE AGENTS, DETERGENTS and BLEACHES

ANIONIC SURFACE ACTIVE AGENTS

DDBSA 99-B *Alkyl Benzene Sulfonic Acid—Biodegradable*
INORGANIC DIVISION

MOLECULAR WEIGHT: 316

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Active 98.0%; Total Sulfate as H_2SO_4, 1.0%; water and unsulfonated matter 1.0%.

GENERAL INFORMATION: It is produced by the sulfonation of refined linear alkyl benzene with SO_3 and contains a minimum amount of free sulfuric acid. It can be neutralized with various bases.

USES: Intermediate for the preparation of neutral alkyl aryl sulfonates. Primary use is in liquid detergents. See uses of *Santomerse*

SHIPPING INFORMATION: Washing compound liquid. NOIBN. Tank cars and tank trucks; 450-lb. drums.

DDBSA 99U-B *Alkyl Benzene Sulfonic Acid Anhydrous—Biodegradable*
INORGANIC DIVISION

MOLECULAR WEIGHT: 316

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Active 98% total sulfate as H_2SO_4, 0.7%; water and unsulfonated matter 1.3%.

GENERAL INFORMATION: DDBSA 99U-B is a concentrated sulfonic acid derived from the SO_3 sulfonation of refined linear alkyl benzene.

USES: DDBSA 99U-B is a special low moisture content version of DDBSA, developed for use in solvent based emulsions.

SHIPPING INFORMATION: Washing compound NOIBN, liquid. Tank cars and tank trucks; 450-lb. drums.

SANTOMERSE® NO. 1-B *Alkyl Benzene Sulfonate—Biodegradable*
INORGANIC DIVISION

PROPERTIES: Neutral flakes, granular and powder form. 40% active.

GENERAL INFORMATION: *Santomerse* No. 1-B is an anionic high-foaming, all-purpose surface active agent which is stable in acid and alkaline solutions. It is used in all types of detergent formulations and has wide application wherever good wetting is essential. Product has ready blending and fast pouring qualities.

SHIPPING INFORMATION: Washing compound, dry. 75-lb. bags and 175-lb., 200-lb. and 225-lb. drums depending on type of flake.

SANTOMERSE® 85-B *Alkyl Benzene Sulfonate—Biodegradable*
INORGANIC DIVISION

PROPERTIES: Neutral flakes or powder. 86% active, 13% sodium sulfate, 1% moisture.

GENERAL INFORMATION: *Santomerse* 85-B is an 86% active anionic surface active agent designed for use where a high active content is desirable and the presence of small amounts of sodium sulfate is not detrimental. Has F.D.A. approval for indirect food additives.

SHIPPING INFORMATION: Washing compound NOIBN powder, 200-lb. fiber drums.

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TOWOLDMON0041217
WATER_PCB-00032263

SANTOMERSE® ME-B SLURRY *Sodium Alkyl Benzene Sulfonate—Biodegradable*

INORGANIC DIVISION

PROPERTIES: Slurry.

TYPICAL ANALYSIS: Active 57-60%, total solids 60-63%. Unsulfonated oils as is basis 1.0% (P.E. extraction), alcohol insoluble 1.0%.

GENERAL INFORMATION: *Santomerse* ME-B Slurry is a special high solid, high active linear alkyl benzene sulfonate developed for detergent formulations.

USES: Used in spray or drum dried products as well as liquid detergents. Light color gives flexibility in finished products color.

SHIPPING INFORMATION: Washing compound, NOIBN, liquid. Tank truck and tank car; 4,000 gal. minimum.

NONIONIC SURFACE ACTIVE AGENTS

STEROX® AJ *Tridecanolethylene oxide condensates. (Polyoxyethylene ether)*

INORGANIC DIVISION

STEROX® AJ-100 *Polyoxyethylene Ether*

INORGANIC DIVISION—LITERATURE AVAILABLE

PROPERTIES: *Sterox* AJ-100 is 100% active in a soft paste form. *Sterox* AJ is 85% active and a clear liquid. Each is soluble in water, and produces a moderate amount of foam. Extremely efficient as a surface active agent.

USES: Recommended for powdered detergent formulations, as an emulsifier in a variety of applications, and as an aid in textiles, paper and leather processing. Product has good acid stability.

SHIPPING INFORMATION: Polyoxyethylene Ether. Tank cars and tank trucks; 450-lb. drums.

STEROX® AWS *Built nonionic detergent*

INORGANIC DIVISION—LITERATURE AVAILABLE

PROPERTIES: Built nonionic detergent with controlled sudsing. Has two optical brighteners for both cotton and synthetic fabrics. pH of a .25% solution in water is 10.3.

USES: Designed for the automatic home laundry machines and industrial cleaning jobs. Low sudsing quality of AWS reduces laundry machine breakdowns and increases cleaning ability.

SHIPPING INFORMATION: Washing compound — dry. Tank cars and tank trucks; 100 pound bags and drums.

STEROX® CD *Tall oilethylene oxide condensate (Polyoxyethylene ester)*

INORGANIC DIVISION—LITERATURE AVAILABLE

PROPERTIES: Nonionic, 100% active surface-active agent with high detergent action accompanied by low foaming. Compatible with other type detergents and builder materials. Light amber liquid.

USES: Mixed with builder materials, an unusually high cleaning action is obtained with little sudsing. Used as a dedusting and conditioning agent for detergent compositions. Used in insecticide and herbicide formulations. Excellent rewetting agent for paper towels and products to increase water absorbency.

SHIPPING INFORMATION: Washing Compound NOIBN Liquid. Tank cars and 475-lb. drums.

STEROX® DF *Dodecyl phenol-ethylene oxide condensate. (Alkyl aryl polyoxyethylene ether)*

INORGANIC DIVISION

PROPERTIES: Liquid, 100% active miscible with water at room temperature. Soluble in nonpolar solvents. Excellent emulsifier. Chemically stable, low foaming.

USES: Designed as an intermediate for sulfation, thus producing high fonming, highly soluble surface active agents for liquid detergents. Per se, an excellent emulsifier, oil soluble, useful in metal cleaning, textile and paper processing, etc.

SHIPPING INFORMATION: Polyoxyethylene Ether. Tank cars and tank trucks; 470-lb. drums.

FDA STATUS: Regulated.

STEROX® DJ *Dodecyl phenol-ethylene oxide condensate. (Alkyl aryl polyoxyethylene ether)*

INORGANIC DIVISION

PROPERTIES: Liquid, 100% active, soluble in water. Low odor and color. Higher molecular weight than *Sterox* DF. Chemically stable, low foaming. Optimum detergency.

USES: For low foaming powdered and liquid detergents. Excellent detergency properties. Low odor and color levels give more sales appeal to finished detergents.

SHIPPING INFORMATION: Polyoxyethylene Ether. Tank cars and tank trucks; 470-lb. drums.

FDA STATUS: Regulated.

STEROX® NJ *Nonyl phenol-ethylene oxide condensate. (Alkyl aryl polyoxyethylene ether)*

INORGANIC DIVISION

PROPERTIES: Liquid, 100% active soluble in water. Chemically stable, medium foam. Low odor and color levels.

USES: General purpose nonionic for use in powdered and liquid detergents, textile, leather and paper processing, metal cleaning, toxicant formulations, deduster, etc.

SHIPPING INFORMATION: Polyoxyethylene Ether. Tank cars and tank trucks; 470-lb. drums.

FDA STATUS: Regulated.

STEROX® NK *Nonyl phenol-ethylene oxide condensate. (Alkyl aryl polyoxyethylene ether)*

INORGANIC DIVISION

PROPERTIES: Liquid, 100% active soluble in water. Cloud point of 66-70°C., chemically stable, medium foam. Slightly higher molecular weight than *Sterox* NJ.

USES: *Sterox* NK has excellent solubility and solubilizing power which gives it good wetting and detergency properties.

SHIPPING INFORMATION: Washing compound, NOIBN liquid polyoxyethylene ether. Tank car and tank trucks; 470-lb. unlined steel drums.

BLEACHING COMPOUNDS

ACL® SANITIZER AND BLEACHING COMPOUND

INORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Powder and granular. A series of solid, organic chlorine liberating compounds, useful as active ingredients in household and commercial laundry bleaches, scouring cleansers, machine dishwashing compounds, sanitizing agents, etc.

PRODUCT DESCRIPTION:

ACL Product	Chemical Name	Typical % Available Chlorine
ACL-85	Trichloroisocyanuric Acid	90
ACL-66	(Monotrichloro) tetra-(monopotassium dichloro)-penta-isocyanurate	66
ACL-59	Potassium dichloroisocyanurate	60
ACL-60	Sodium dichloroisocyanurate	62

SHIPPING INFORMATION: Bleach Assistant Compound NOIBN. Fiber drums with polyethylene bag liner. *ACL-85* and *ACL-59* 270-lbs. net. *ACL-70* 225-lbs. net.

ACL-60; powder — 240-lb. net; granular — 200-lb. net.

DETERGENT INTERMEDIATES

ALKYLATE 215, 225 AND 230 *(Alkyl Benzene—Biodegradable)*

INORGANIC DIVISION

FORMULA: $C_6H_5C_nH_3$

MOLECULAR WEIGHT:	215	225	230
	231-241	240-248	255-264

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Appearance, water white liquid; Residue, less than 0.005 volume %; Sp. Gr. (60/60°F.) 0.85-0.86; Color (before sulfonation) less than 10 APHA; Refractive Index 25°C.—1.4815-1.4830; Bromine No. 0.05; Unsulfonatables 1.0%.

USES: Alkylate is an ether extraction alkyl benzene 1.2% specifically designed for use in the manufacture of synthetic organic detergents. Product is low 2 phenyl.

SHIPPING INFORMATION: Petroleum Alkylate Detergent Intermediate. 8,000, 10,000 and 20,000 gal. tank cars, 390-lbs. net (440-lbs. gross) weight, black iron drums, nonreturnable.

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WATER_PCB-00032264

DODECYLPHENOL *(Alkyl Phenol)*

INORGANIC DIVISION

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Appearance, clear sparkling liquid; Odor, characteristic phenolic; Color, 50 APHA; 95% Distillation Range, 317-327°C.; Hydroxyl No. 212; Refractive Index (27°C.), 1.5054; Water 0.02%.

USES: Dodecylphenol is an alkyl phenol which is combined with ethylene oxide, PCl_3 or $POCl_3$ for use in the paper, leather, and textile industry.

SHIPPING INFORMATION: Dodecylphenol (Chemicals, NOIBN); 415-lbs. net (465-lbs. gross) Heresite lined drums; 10,000 and 8,000 gal. tank cars; 4,000 gal. tank trucks.

NONYLPHENOL *(Alkyl Phenol)*

INORGANIC DIVISION

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Appearance, clear sparkling liquid; Odor, characteristic phenolic; Color, 35 APHA; 95% Distillation Range, 294-304°C.; Hydroxyl No. 245; Refractive Index (27°C.), 1.5110; Water 0.02%.

USES: Monsanto's nonylphenol is an alkyl phenol specifically designed for use in the manufacture of synthetic organic detergents.

SHIPPING INFORMATION: Nonylphenol (Chemicals, NOIBN); 415-lb. net (465-lbs. gross) Heresite lined drums; 10,000, 8,000 and 4,000 gallon tank cars.

VACUUM PUMP FLUID

SANTOVAC® 5 *Vacuum Diffusion Pump Fluid*

ORGANIC DIVISION—LITERATURE AVAILABLE

STANDARD FORM: Liquid.

TYPICAL ANALYSIS: Viscosity at 100°F — 360 cs; vapor pressure @ 25°C., 2.7×10^{-10} torr; boiling point at 0.5 torr, 270°C.; molecular weight, 446; density, g/cc, 1.20.

PROPERTIES: A light straw color, five ring polyphenyl ether with excellent thermal and oxidation stability which provides low ultimate pressure without the need for deep refrigeration, easy clean up and very low backstreaming characteristics.

USES: As vacuum diffusion pump fluid in applications such as space chambers, particle accelerators, vacuum tube evacuation, mass spectrometers and research projects.

SHIPPING INFORMATION: Chemicals NOIBN, case lots; 5-gal. cans; 1-gal. cans; 1-qt. cans and ml. bottles.

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TOWOLDMON0041219
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DISTRICT SALES OFFICES ALL DIVISIONS

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SUITE 400
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Plastic Products & Resins Division

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North Seventh St. & Monroe Ave.
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