RESEARCH

29TH EDITION

MONSANTO

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monsanto chemical company





Monsanto Chemical Company is one of the largest chemical and plastics companies in America. The company is "basic" in phosphorus and phosphates, plastics, and many organic chemicals . . . relying on no other company for raw materials. As a basic producer, supplies of chemicals and plastics from Monsanto are stable in price and the user is most assured of steady, dependable delivery.

Monsanto is organized into six divisions, each operating in the production, sales, and servicing of its own groups of products.

these divisions are:





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the organic chemicals division,

. . . with headquarters at 800 No. Twelfth Blvd., Roberts Building, St. Louis 1, Missouri, produces a wide variety of organic chemicals. These are used as intermediates for the manufacture of other chemicals and for a wide variety of "specialty" processing and product applications. Among the Organic Chemicals Division products are plasticizers, rubber processing compounds, oil additives, wood preservatives, herbicides, insecticides, bacteriostats, pharmaceutical chemicals, functional fluids, resin-forming chemicals, penta wood preservative, flavors and condiments, as well as industrial organic chemicals such as phenol, nitrobenzene, cresols, and others.

the inorganic chemicals division,

. . . with headquarters at 710 No. Twelfth Blvd., Illinois Terminal Building, St. Louis 1, Missouri, produces a variety of inorganic chemicals, primarily based on elemental phosphorus. Monsanto is the world's largest producer of pure elemental yellow phosphorus; and the research, development, and manufacturing facilities of the division convert the element into hundreds of compounds that are essential materials in a variety of industries. Among the products produced by the Inorganic Chemicals Division are phosphoric acids; "builders" for soap and detergent formulation; leavening agents for baking powders, self-rising flours and prepared mixes; water soluble fertilizer chemicals; mineral feed supplements; a variety of synthetic detergents; polishing agents. The Inorganic Chemicals Division also supplies a variety of processing specialties based on silica aerogels.

the plastics division.

. . . with headquarters at Springfield, Mass., is one of the most diversified producers of resins and plastics in the country. The Plastics Division produces its own basic monomers for styrene,

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ethylene, vinyl, and acrylonitrile polymers and copolymers and offers molders, coaters, extruders, and fabricators a wide variety of plastics compositions. Among these are styrene-type plastics; phenol-formaldehyde resin and plastics; melamines, cellulosics, polyethylene, and vinyl butyral compositions for molding, coating, extruding, laminating, and impregnating. Monsanto is a pioneer in compositions for safety glass inter-layer and a major supplier of polystyrene molding compounds.

the merchandising division,

. . . with headquarters at 800 No. Twelfth Blvd., Roberts Building, St. Louis 1, Missouri, markets the company's consumer products. Among the Merchandising Division's products are "all", controlled sudsing detergents for automatic washing machines; Rez, penetrating sealer wood finishes; home gardening products.

the overseas division,

. . . with headquarters at 1700 So. Second St., St. Louis 4, Missouri, markets all the company's products for export. All Monsanto products for overseas purchase can be obtained through this division.

the research and engineering division,

. . . with headquarters at 1700 So. Second St., St. Louis 4, Missouri, offers engineering and construction facilities in the erection of vanadium-catalyst sulfuric acid plants (which can convert any primary or waste source of sulfur to acid) and De Nora Cell chlorine plants.

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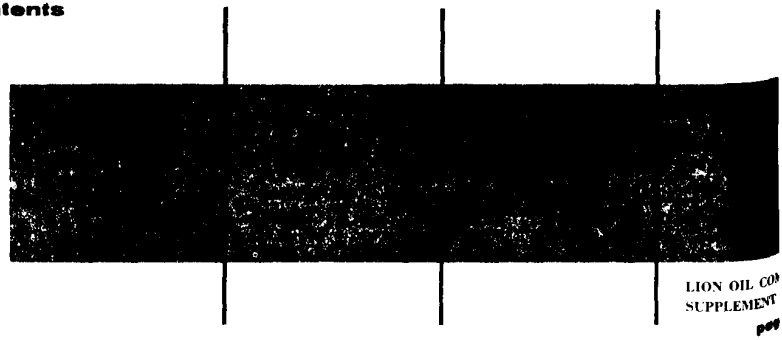
Monsanto products are produced in 29 plants and sold and serviced from 35 sales offices located throughout the world. Subsidiary companies are located in Canada, Great Britain, Argentina, Australia, Japan, and Mexico.

Some process in the manufacture of almost every product produced by industry requires the use of one or more chemicals available from Monsanto.

contents



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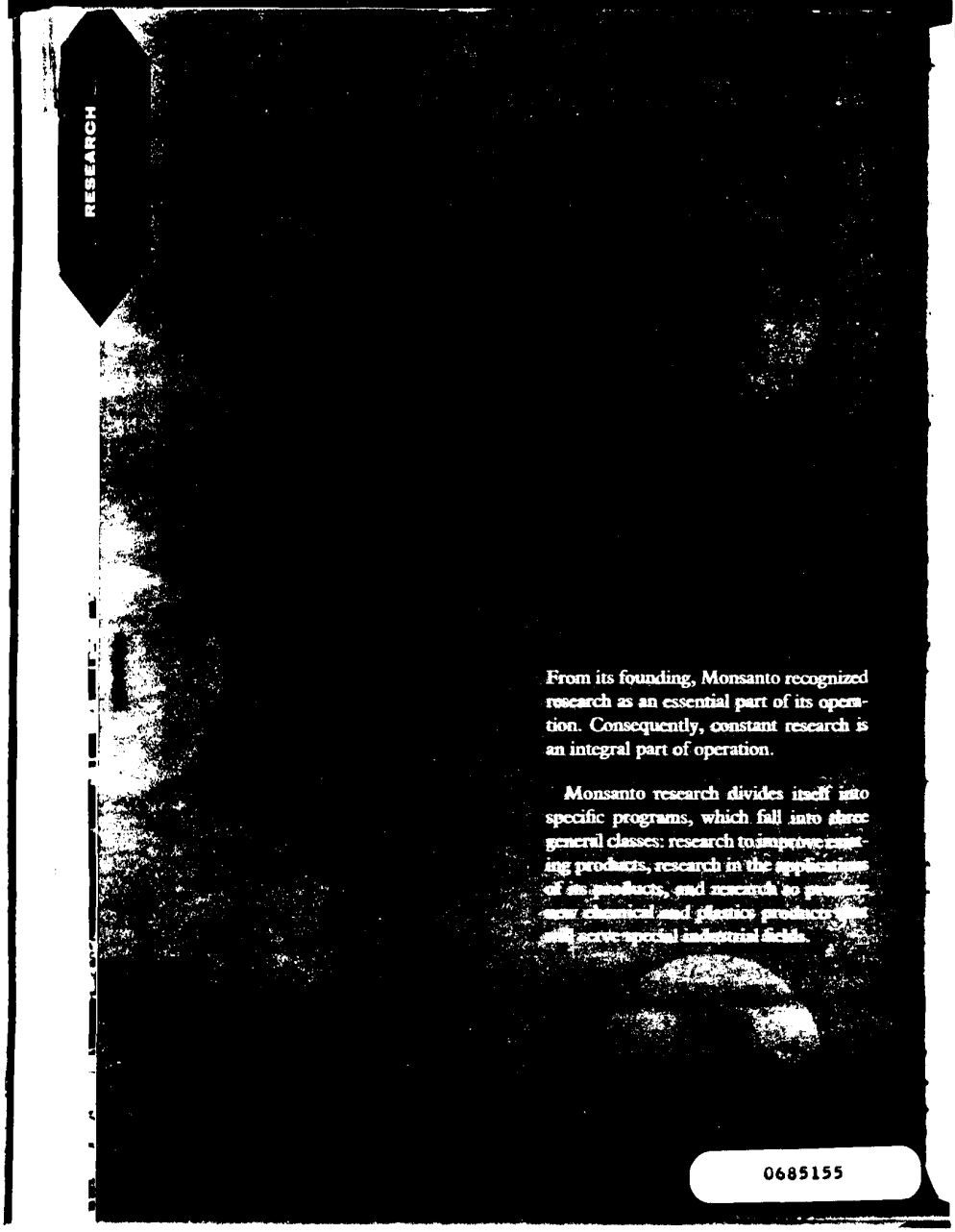

From its founding, Monsanto recognized research as an essential part of its operation. Consequently, constant research is an integral part of operation.

Monsanto research divides itself into specific programs, which fall into three general classes: research to improve existing products, research in the applications of its products, and research to produce new chemical and plastics products that will serve special industrial fields.

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existing product research

. . . insures Monsanto customers that the products they buy will be made by the most efficient process that research can devise, thus making available chemical materials at the most reasonable possible price. It also assures customers that the products will be delivered at maximum purity, in the most useful physical forms, and packaged in the most practical, convenient-to-use manner.

application research

. . . insures Monsanto customers that research effort is available in working out problems of application. This service is part of Monsanto's sales service. Technically trained representatives work with processors and manufacturers in their plants, conducting trials, evaluating effects, making modifications in conditions or compositions of material until the application of a Monsanto product is completely ready to run on a steady, mass production basis. In addition, research teams are constantly "trying" new chemicals and plastics in new applications that may prove profitable to specific industries. When such new applications are discovered in paper, textile, baking, rubber, petroleum, plastics molding, and dozens of other fields, the developments are presented to Monsanto customers in the industry. This liaison with continuous application research is an important extra advantage in purchasing chemicals and plastics from Monsanto.

exploratory research

. . . continuously prepares and evaluates new organic, inorganic, and polymer-type compounds . . . seeking new chemicals and plastics that will do a better job in the many fields Monsanto products serve. Organic research is constantly exploring new organic compounds that will make improved selective herbi-

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cides, better plasticizers, more efficient oil additives, more easily converted organic intermediates, and many others. Plastics research investigates new molecular structures of polymers and co-polymers, searching for better molding, extruding, coating compositions. Inorganic research studies new leavening agents; new detergent compounds, wetting agents; new chemicals for deflocculating; for plant feeding. Through this continuous exploring and screening of new chemical and resin compounds, Monsanto creates new products for industry.

technical service

. . . assistance to customers is an integral part of Monsanto's sales service. When a Monsanto product has application in a customer's process or product, the purchaser is aided by Monsanto in its application. This technical service ranges from aiding plastics molders in selection of materials and in their start-up of running a new plastic part to devising a new chemical intermediate for the large scale manufacture of a new chemical compound.

Monsanto's Rubber Service Department is a complete facility for working out chemicals and processing aids needed by rubber and rubber products makers.

Monsanto's Baking Laboratories provide technical service on problems of leavening in prepared cake, biscuit, pancake, muffin mixes and for leavening and fortifying self-rising flours.

Monsanto's Wood Adhesives Laboratories provide guidance in the selection and formulation of adhesives for plywood, veneering, assembly gluing, as well as service in the use of bonding agents for shaped plywood, molding granulated wood, and bonding hardboard.

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Monsanto's Engine Testing Laboratory provides the oil industry with service facilities for evaluation and formulation of detergent oil additives, viscosity index improvers, corrosion inhibitors, and pour point depressants.

Textile Service Laboratories provide guidance in the use of Monsanto's textile resins in the applications to cotton texturing, imparting crush resistance and firmer hand to synthetic fabrics, in the use in controlling shrinkage of wool.

The Agricultural Chemicals Laboratories offer guidance in the handling and formulating of insecticidal and herbicidal chemicals.

The foregoing are only partial listings of the technical service facilities. In every major industrial field in which Monsanto products serve, customers have available technical service in their use. This service is available through the Monsanto representative. Companies who are not yet customers and who may not be contacted regularly by Monsanto representatives can be directed to the proper facilities within Monsanto by writing to Monsanto Chemical Company, Industrial Service Department, St. Louis 4, Missouri.

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trade-marks . . .

THE FOLLOWING LIST contains the major trade-marks owned by Monsanto, arranged alphabetically. The trade-marks are enclosed by quotation marks and the generic name of the product follows. For some products, grade designations follow the trade-mark outside of the quotation marks.

In addition to the following list, Monsanto owns the trade-mark "Monsanto," the block "M" design mark and the slogan, "Serving Industry . . . Which Serves Mankind."

Trade-marks which are registered in the U. S. Patent Office are marked with an asterisk (*). Registered trade-marks must be identified when they appear in print. This can be done either by the statement that they are registered marks; by use of an asterisk after the trade-mark referring to the abbreviated notice, "Reg. U. S. Pat. Off." as a footnote or the letter R enclosed within a circle, thus ®, following the mark.

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"A-12" Rubber Accelerator
"A-100" Rubber Accelerator
"Actamer"* Bacteriostat for soap and cosmetics
"Alkophos"* Aluminum Acid Phosphates
"All"* Controlled Sudsing Detergent
"Areskap"* Sodium Butyl-o-Phenylphenolsulfonate
"Aresket"* Sodium Butylbiphenylsulfonate
"Aresklene"* Disodium Dibutyl-o-Phenylphenoldisulfonate
"Arochlor"* Polychlorinated Polyphenyls
"Benthal"* Alkyd Resin Intermediate
"Bogey"* Insecticide
"Butasan"* Rubber Accelerator
"Butvar"* Vinyl Butyral Coating Resin
"Cedar Rez" Color-Toned Penetrating Wood Sealer
"Color-Toned Rez" Penetrating Wood Sealers
"Coumarin Modified"
"D-Leet"* Herbicide
"D. P. Solution"* Lacquer Additive
"Driftwood Rez" Color-Toned Penetrating Wood Sealer
"El-Sixty"* Rubber Accelerator
"Ethasan"* Rubber Accelerator
"Ethavan"* Flavoring and Aromatic
"Ethyl Thiurad" Rubber Accelerator
"Fibestos"* Cellulose-Acetate Sheets
"Flectol"*H Rubber Antioxidant
"Folium"* Water-Soluble Plant Food
"Guantal"* Rubber Accelerator
"HB-40" Partially Hydrogenated Terphenyl
"HB-20"* Hydrocarbon Plasticizer
"Insoluble Sulfur 60"
"Krilium"* Soil Conditioner
"Lauxein"* Casein and Soybean Adhesives
"Lauxite"* Urea, Phenolic, Melamine & Resorcinol Resins
"Lustrex"* Styrene Coating Resins
"Lustrex"* Styrene Molding Materials
"Lytron"* Sand Conditioner
"Mahogany Rez" Color-Toned Penetrating Wood Sealer
"Medo-Green" Silage Grade Sodium Metabisulfite
"Merlon"* KR, S and BR, Textile Processing and Finishing Agent
"Mersize"* CD-2 Paper Sizing Agent
"Mersize"* RM Paper Sizing Agent
"Mertax" Rubber Accelerator
"Mertone"* WB-2 and WB-4 Precoat for Reproduction Paper
"Methasan"* Rubber Accelerator
"Mono Thiurad"* Rubber Accelerator
"Monsanto Detergent MXP"
"Monsanto Fire Retardant A"
"Monsanto Penta" Pentachlorophenol, Technical
"Montar"* Synthetic Resins
"Niran"* Insecticide
"Nitron"* Cellulose-Nitrate Sheets
"Oilfos"* Glassy Sodium Phosphate
"Opalon"* Vinyl Chloride Coating Resin
"Opalon"* Vinyl Chloride and Vinyl Chloride Copolymer for Extruding, Calendering & Injection Material
"Opalon"* Vinyl Chloride Molding Material
"Orlon" Polyethylene Coating Material
"Orlon" Polyethylene Extruding, Calendering & Laminating Material
"Orlon" Polyethylene Molding Material
"Phos-Pho-Tex"* Water Softener
"Py-ran"* Anhydrous Monocalcium Phosphate
"Pydraul"* F-9 Industrial Hydraulic Fluid and Synthetic Lubricant
"R-2" Rubber Accelerator
"Redwood Rez" Color-Toned Penetrating Wood Sealer
"Resimene"* Melamine Laminating Resins
"Resimene"* Melamine Molding Compound
"Resimene"* Melamine and Urea Coating Resins
"Resinox"* Phenolic Bonding, Impregnating & Coating Resins
"Resinox"* Phenolic Laminating Resins
"Resinox"* Phenolic Molding Material
"Resloom" HP and M-75 Essentially Monomeric Melamine Textile Resins
"Rez" Wood Sealer and Primer
"Rezgard"* Fire Retardant for Textiles
"RZ-50"*-A Rubber Accelerator
"RZ-50"*-B Rubber Accelerator
"SA-326" ortho-Biphenyl Biguanide
"Saflex"* Vinyl Butyral Laminating Plastic for Safety Glass
"Sage Rez" Color-Toned Penetrating Wood Sealer
"Santicizer"* 1-H Plasticizer
"Santicizer"* 3 Plasticizer
"Santicizer"* 8 Plasticizer
"Santicizer"* 9 Plasticizer
"Santicizer"* B-16 Plasticizer
"Santicizer"* E-15 Plasticizer
"Santicizer"* M-17 Plasticizer
"Santicizer"* 140 Plasticizer
"Santicizer"* 141 Plasticizer
"Santicizer"* 160 Plasticizer
"Santicizer"* 601 Plasticizer
"Santicizer"* 602 Plasticizer
"Santicizer"* 603 Plasticizer
"Santobane"* DDT Insecticide
"Santobrite"* Sodium Pentachlorophenate, Technical
"Santocel"* Silica Aerogel for Industrial Applications
"Santocel"* Silica Aerogel for Thermal Insulation
"Santochlor"* para-Dichlorobenzene Insecticide
"Santocure"* Rubber Accelerator
"Santocure"* NS Rubber Accelerator
"Santoflex"* AW Rubber Antioxidant
"Santoflex"* B Rubber Antioxidant
"Santoflex"* BX Rubber Antioxidant
"Santoflex"* 35 Rubber Antioxidant
"Santolene"* C Petroleum Additive Rust Inhibitor
"Santolene"* F Fuel Oil Additive
"Santolite"* MHP Industrial Resin
"Santolite"* MS (80%) Industrial Resin
"Santolube"* 31 Oil Additive
"Santolube"* 70 Oil Additive
"Santolube"* 382 Oil Additive
"Santolube"* 388 Oil Additive
"Santolube"* 394-C Oil Additive
"Santolube"* 395-X Oil Additive
"Santomask"* II Odor-Masking Agent
"Santomerse"* Alkyl Aryl Sulfonates
"Santophen"* 1 Germicide

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"Santophen"® 1 Solution
"Santopoid"® 32 Oil Additive
"Santopoid"® 33 Oil Additive
"Santopoid"® 34 Oil Additive
"Santopoid"® S Oil Additive
"Santopour"® Oil Additive
"Santopour"® B Oil Additive
"Santoquin"® 6-Ethoxy-1,2-dihydro-2,2,4-Trimethyl Quinoline, Livestock Feed Preservative
"Santosite"® Sodium Sulfite Anhydrous, Technical
"Santotan"® KR Basic Chrome Sulfate
"Santovar" A, Rubber Antioxidant
"Santowhite"® Crystals Rubber Antioxidant
"Santowhite"® L Rubber Antioxidant
"Santowhite"® MK Rubber Antioxidant
"Santowhite"® Powder Rubber Antioxidant
"Satinwood Rez" Clear Self-Leveling Interior Finish
"Scripture"® 33 Melamine Formaldehyde Paper Resin
"Scripture"® Series 50-59 Styrene Copolymers for Paper
"Skydrol"® Aircraft Hydraulic Fluid
"Sopanox"® ortho-Tolyl Biguanide
"Sterox"® No. 5 Polyoxyethylene Thioether
"Sterox"® No. 6 Polyoxyethylene Thioether
"Sterox"® AJ Polyoxyethylene Ether
"Sterox"® AJ-100 Polyoxyethylene Ether
"Sterox"® CD Polyoxyethylene Ester
"Sterox"® SE Polyoxyethylene Thioether
"Sterox"® SK Polyoxyethylene Thioether
"Stymer"® LF, R and S Textile Sizing Agents
"Sulfasan"® R 4,4'-Dithiodimorpholine
"Syton"® C-15 and C-30 Silica Sols
"Syton"® W-20 and DS Silica Sols
"Thiofide"® Rubber Accelerator
"Thiofide"® S Rubber Accelerator
"Thiotax" Rubber Accelerator
"Thiurad"® Rubber Accelerator
"Ultron"® Vinyl Chloride Film and Sheets
"Vanillin Monsanto"
"Vuepak"® Cellulose Acetate Rigid Film
"White Rez" Penetrating Wood Sealer

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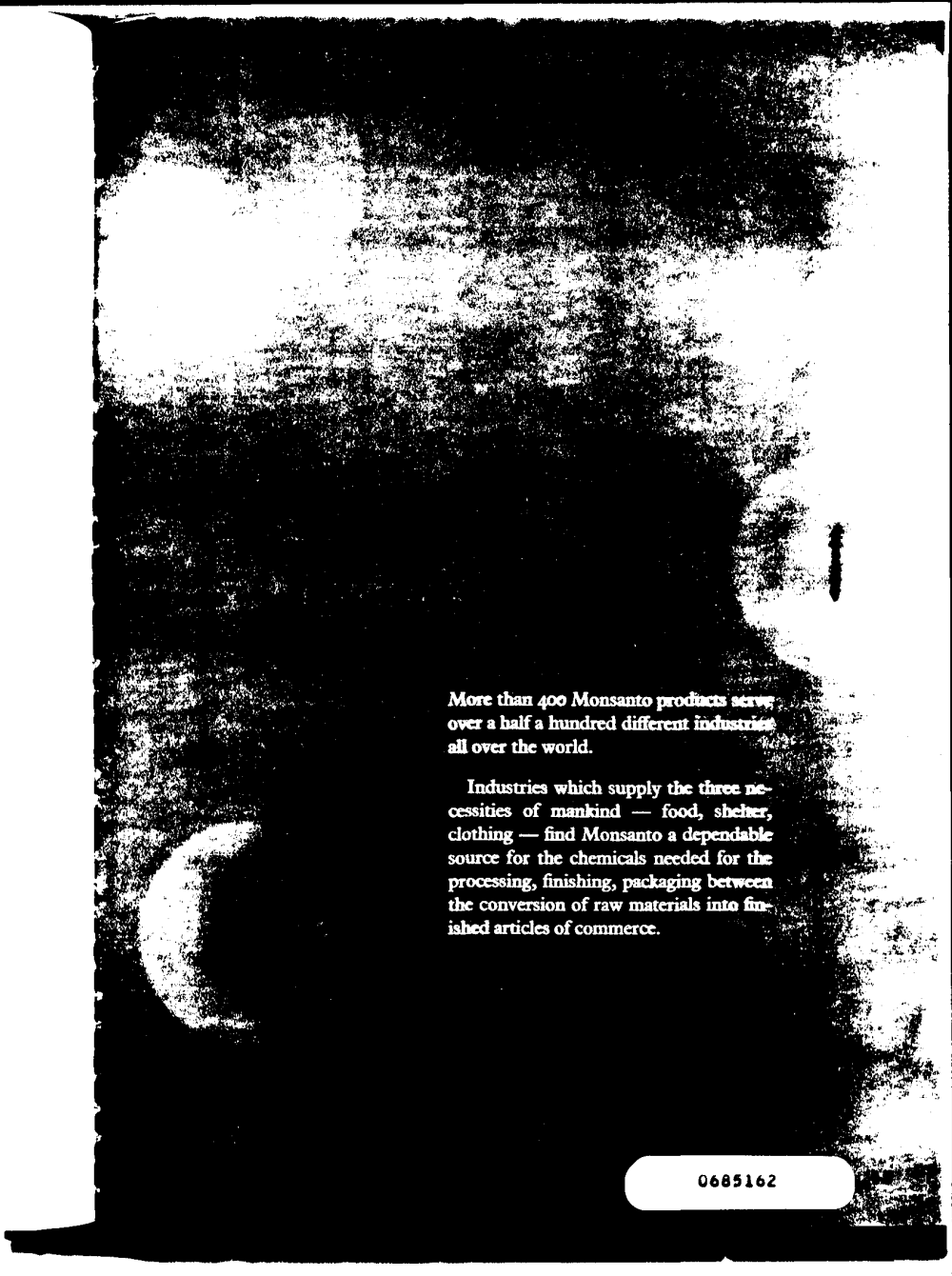

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In the field of agriculture, Monsanto supplies weed killers and insecticides; food processing is supplied with mineral supplements, preservatives, flavors, condiments and phosphate leavening agents; textile chemicals range from spinning aids to fabric finishes for imparting crush and shrink resistance.

Monsanto supplies basic chemical needs to the iron and steel industry, from ferrophosphorus for special steels to the melamine resins for formulation into finishes for stoves, automobiles and refrigerators.

Monsanto organics are the intermediates and raw materials for many pharmaceuticals, ranging from aspirin to penicillin precursors. Monsanto supplies the plastics industry with resins and molding powders. Monsanto plastics include both thermosetting and thermoplastic types. Special formulations are made for paper and fabric coating and also for extruding, laminating and calendering.

Exterior and interior plywood panels, as well as fine furniture, owe the strength of their glue bonds to Monsanto adhesives. Tires and rubber articles, from stair treads to hot water bottles, are processed with rubber chemicals found in Monsanto's product list.

The fifty-odd industries which use Monsanto products, represent a cross section of international business. Products from these industries are so many and so diverse that every hour of his life the average person uses something that owes at least part of its manufacture to a Monsanto chemical.

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by Bruce Galloway, N.Y.

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"A-32" — ORGANIC DIVISION ***(Rubber Service)***

Standard Form: Liquid.

Specifications: Reaction product of butyraldehyde and butylidene aniline, of complex chemical structure. Red-yellow to orange-brown oily liquid, slightly turbid when cold; Sp. Gr. 0.98; flash point approx. 175°F.; moisture, no separation on standing; soluble in benzene, chloroform, acetone and solvent naphtha.

Uses: Zinc oxide and fatty acid usually desirable but not always necessary. Gives high modulus and tensile. Flat curing and easy to process. Often useful as an activator of thiazole-type accelerator. Excellent for hard rubber.

Containers: 400 and 150-lb. steel drums.

Shipping Classification: Rubber Accelerators NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

"A-100" — ORGANIC DIVISION ***(Rubber Service)***

Standard Form: Liquid.

Specifications: Reaction product of butyraldehyde, acetaldehyde and aniline. Dark reddish-brown oily liquid; Sp. Gr. 1.04; flash point approx. 185°F.; moisture, no separation on standing; soluble in benzene, chloroform, acetone and solvent naphtha.

Uses: Excellent for hard rubber vulcanizates, either natural or synthetic. Use 1.0–2.0% on the rubber. Gives tough, horny vulcanizates with little tendency toward brittleness.

Containers: 150-lb. steel drums.

Shipping Classification: Rubber Accelerators NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

ACCELERATOR B ***(Blend of 2 parts "Thiurad" and 1 part "Thiotax")*** — ORGANIC DIVISION ***(Rubber Service)***

Standard Form: Powder.

Uses: This is a physical blend of the ratio commonly used for butyl rubber stocks and affords convenience in weighing.

Containers: 150-lb. fiber drums.

Shipping Classification: Rubber Accelerators NOIBN.

"BUTASAN" ***(Zinc Dibutyl-dithiocarbamate)*** — ORGANIC DIVISION ***(Rubber Service)***

Standard Form: Powder or pellets.

Specifications: Cream-colored powder or pellets; Sp. Gr. 1.24; powder, 0.5% max. retained on 200 mesh; M.P. 102 C. min.; moisture 0.5% max.; soluble in carbon disulfide, benzene, chloroform and gasoline; insoluble in water and dilute caustic.

Uses: An ultra accelerator for latex; also used as an activator for thiazole-type accelerators.

Containers: 100-lb. drums.

Shipping Classification: Rubber Accelerators NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

DPG ***(Diphenylguanidine*** — ORGANIC DIVISION ***(Rubber Service)***

Standard Form: Powder.

Specifications: White powder; trace max. on 100 mesh, moisture 0.5% max.; ash 0.3% max.; M.P. 145°C. min.; Sp. Gr. 1.15; petroleum ether extractable 1.0–3.0%.

Uses: Sometimes used alone in mechanical-type compounds. On 100 parts rubber use 1.0–1.5% with 2–4 sulfur. Widely used as an activator. DPG is treated to reduce dusting and aid dispersion.

Containers: 150-lb. fiber drums; 50-lb. paper bags.

Shipping Classification: Rubber Accelerators NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

"EL-SIXTY" ***[1,3 bis (2-benzothiazolyl-mercaptomethyl) urea]*** — ORGANIC DIVISION ***(Rubber Service)***

Standard Form: Powder.

Specifications: Buff to light tan-colored powder; 99.5% min. through 200 mesh; moisture less than 0.5%; ash less than 0.5%; M.P. 220°C. min.; Sp. Gr. 1.29.

Uses: Requires zinc oxide and fatty acid. May be used alone but for best results an activator is usually desirable. Gives excellent processing and curing characteristics to many types of compounds. Very effective in compounds containing high loads of retarding pigments such as clay. "El-Sixty" is treated to reduce dusting and aid dispersion.

Containers: 150-lb. fiber drums; 50-lb. paper bags.

Shipping Classification: Rubber Accelerators NOIBN.

Literature: "El-Sixty—An Accelerator for Rubber Vulcanization," 20-page booklet; "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

"ETHASAN" ***(Zinc Diethyl-dithiocarbamate)*** — ORGANIC DIVISION ***(Rubber Service)***

Standard Form: Oiled or unoiled powder or pellets.

Specifications: White powder or pellets; Sp. Gr. 1.44; powder 0.5% max. retained on 200 mesh; M.P. 175°C. min.; moisture 0.5% max.

Uses: An ultra accelerator used for latex, activation of thiazoles and straight acceleration.

Containers: 100-lb. fiber drums.

Shipping Classification: Rubber Accelerators NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

"ETHYL THIURAD" ***(Tetraethyl-thiuram-disulfide)*** — ORGANIC DIVISION ***(Rubber Service)***

Standard Form: Powder or pellets.

Specifications: Gray-to-white powder or pellets; ash 0.5% max.; M.P. 67°C. min.; Sp. Gr. 1.26; very soluble in acetone, benzene and naphtha.

Uses: Either as a primary or secondary accelerator in the same manner as "Thiurad" and "Mono Thiurad." In activity, it is stronger than "Mono Thiurad" and weaker than "Thiurad."

Containers: 100-lb. fiber drums.

Shipping Classification: Rubber Accelerators NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

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"GUANTAL" (*Diphenylguanidine Phthalate*)
— ORGANIC DIVISION ***(Rubber Service)***

Standard Form: Powder.

Specifications: White to light gray powder; 0.5% max. on 200 mesh; heat loss 3.5% max. (mostly in the hydrate); ash 0.3% max.; M.P. 178°C. min.; Sp. Gr. 1.20.

Uses: Very weak when used alone. Excellent as a low-scorch activator for thiazole-type accelerators.

Containers: 150-lb. fiber drums; 50-lb. paper bags.

Shipping Classification: Rubber Accelerators NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

"MERTAX" (*2-Mercaptobenzothiazole purified*)
— ORGANIC DIVISION ***(Rubber Service)***

Standard Form: Powder.

Specifications: Light yellow powder; M.P. 175°C. min.; ash 0.3% max.; 0.5% ma . retained on 200 mesh, trace max. retained on 100 nesh; moisture 0.5% max.; mercaptobenzothiazole content 97% min.; Sp. Gr. 1.42.

Uses: Same as for "Thiotax" but gives a material of higher purity, less color, less odor and less taste.

Containers: 50-lb. paper bags; 150-lb. fiber drums.

Shipping Classification: Rubber Accelerators NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

"METHASAN" (*Zinc Dimethyl-dithiocarbamate*)
— ORGANIC DIVISION ***(Rubber Service)***

Standard Form: Oiled or unoiled powder and pellets.

Specifications: White powder or pellets; powder, 0.5% max. retained on 200 mesh; M.P. 248°C. max.; moisture 0.5% max.; Sp. Gr. 1.66.

Uses: An ultra accelerator used for latex, activation of thiazoles and straight acceleration. In latex, it is too slow for most practical applications.

Containers: 100-lb. fiber drums.

Shipping Classification: Rubber Accelerators NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

"MONO THIURAD" (*Tetramethyl-thiuram-monosulfide*)
— ORGANIC DIVISION ***(Rubber Service)***

Standard Form: Oiled or unoiled powder or pellets.

Specifications: Lemon-yellow powder or pellets; powder, 1% max. on 200 mesh, trace max. on 100 mesh; moisture 0.5% max.; ash 0.5% max.; M.P. 103°C. Min.; Sp. Gr. 1.39.

Uses: A very good activator for thiazole accelerators, somewhat safer to handle in this respect than "Thiurad." Gives low-compression set. Good results when used alone. Use 0.25–0.50% on the rubber or synthetic with normal sulfur.

Containers: 100-lb. fiber drums.

Shipping Classification: Rubber Accelerators NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

"R-2" CRYSTALS — ORGANIC DIVISION ***(Rubber Service)***

Standard Form: Crystalline solid.

Specifications: Reaction product of carbon bisulfide, 1,1'-methylene dipiperidine; light brown, coarse c line solid; Sp. Gr. 1.11: M.P. 59°C. min.; solub acetone, benzene and naphtha; solubility in Solvesso clear solution.

Uses: An ultra accelerator for latex and fast-curing ce

Containers: 50-lb. fiber drums.

Shipping Classification: Rubber Accelerators NOIB

Literature: "Monsanto Chemicals for the Rubber Indus 46-page booklet.

"RZ-50-A" (*Formerly called RZ-50) (50% solution of N, N-dimethylcyclohexylamine salt of dibutyldithiocarbamic acid)* — ORGANIC DIVISION ***(Rubber Service)***

Standard Form: Clear brown liquid.

Specifications: Color (NPA) 8.0 max. (when produc insolubles, trace max.; Sp Gr. 0.964.

Uses: A very fast accelerator for curing at room or slig elevated temperatures. Curing speed can be increas the inclusion of "Thiotax" in the compound. "RZ- very useful in fast curing cements for spreader and bining work. Causes practically no discoloration ages well.

Containers: 40-lb. cans.

Shipping Classification: Rubber Accelerators NO

Literature: "Monsanto Chemicals for the Rubber In try," 46-page booklet.

"RZ-50-B" (*50% mixture of N, N-dimethylcyclohexylamine salt of dibutyldithiocarbamic acid with emulsifying agents)* — ORGANIC DIVISION ***(Rubber Ser***

Standard Form: Clear dark brown liquid.

Specifications: Sp. Gr. 0.976 at 25°C.; turbid point or below.

Uses: This form is especially designed for use in stable emulsion is prepared by stirring it into an volume of water. 1% "RZ-50-B" is a good starting po latex compounding.

Containers: 40-lb. cans.

Shipping Classification: Rubber Accelerators NOI

Literature: "Monsanto Chemicals for the Rubber Ind 46-page booklet.

"SANTOCURE" (*N-Cyclohexyl-2-benzothiazole-sulfenamide)* — ORGANIC DIVISION ***(Rubber Service)***

Standard Form: Powder.

Specifications: Light tan or buff-colored powder; max. retained on 20 mesh; M.P. 94°C. min.; Sp. Gr. moisture 1.0% max.; ash 0.5% max.; solubility i ether 95% min.

Uses: Requires zinc oxide and fatty acid. Activato sometimes desirable but not always needed. Gives c results in natural, reclaimed and synthetic rubbers. tionally safe at processing temperatures but powe curing temperatures. Gives high modulus and Fairly low melting point makes dispersion easy.

Containers: 50-lb. paper bags; 150-lb. fiber drums.

Shipping Classification: Rubber Accelerators NOI

0685167

TOWOLDMON0007031

...ew "Santocure—An Accelerator for Rubber Vul-...," 52-page booklet; "Monsanto Chemicals for the ...Industry," 46-page booklet.

...CURE" NS ***(N-tert-butyl-2-benzothiazole-...)*** **—ORGANIC DIVISION** ***(Rubber Service)***

...d Form: Powder.

...ications: Light tan or buff powder; trace max. ...d on 20 mesh; M.P. 105°C. min.; Sp. Gr. 1.29: ...e 0.5% max.; ash 0.5% max.; ether insolubles ...max.

...Requires zinc oxide and fatty acid. Has similar ...r to "Santocure" in compounded rubbers, but ...ves greater delayed action at processing tempera-...d faster curing at higher temperatures. Particu-...ful for natural rubber stocks containing high ...

...ers: 150-lb. fiber drums; 50-lb. paper bags.

...g Classification: Rubber Accelerators NOIBN.

...ure: "Santocure NS Technical Data," 5-page bulletin.

...ANILIDE ("A-1") ***(Also called N-N'-...diphenylurea)*** **—ORGANIC DIVISION** ***(Rubber Service)***

...d Form: Powder.

...ications: Gray powder; trace max. on 100 mesh; ...6°C. min.; Sp. Gr. 1.32; ash 0.5% max.; moisture ... max.; test must avoid decomposition conditions.

...ctivates thiazole accelerators but used best as straight ...tor in fast-curing stocks such as tube repair gum. ...ates neoprene latex. Also used as a flotation agent ...id inhibitor.

...ers: 150-lb. fiber drums; 50-lb. paper bags.

...g Classification: Rubber Accelerators NOIBN.

...ure: "Monsanto Chemicals for the Rubber Industry," ... booklet.

...DE" [2-2'-*dithiobis* (*benzothiazole*) (*MBTS*)]

...IC DIVISION ***(Rubber Service)***

...d Form: Powder.

...ications: Cream powder; Sp. Gr. 1.50; M.P. 168°C. ...moisture 0.5% max.; ash 0.5% max.; petroleum ...xtractable 1.5-3.0%.

... Requires zinc oxide and fatty acid and an activator is ...y desirable. Safe handling when properly activated, ... be used successfully in a wide variety of stocks. ...ide" is treated to reduce dusting and aid dispersion.

...ers: 150-lb. fiber drums; 50-lb. paper bags.

...ing Classification: Rubber Accelerators NOIBN.

...ure: "Monsanto Chemicals for the Rubber Industry," ... booklet.

...S" S ***("Thiofide" in seed form)***

...DIVISION ***(Rubber Service)***

...d Form: Seeds.

...ions: Cream to buff colored agglomerates. 20% ...ained on 10 mesh, 20% max. through 40 mesh; ...0.5% max.; ash 0.5% max.

... form is designed to give maximum speed and ...ses of dispersion. Further it is essentially free flowing and handles very easily in the rubber factory. The individual particles of "Thiofide" in the Seeds are quite small. This fact, plus the good dispersion, usually makes it possible to reduce the dosage by about 10%.

Containers: 50-lb. fiber drums.

Shipping Classification: Rubber Accelerators NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

"THIOTAX" ***(2-Mercaptobenzothiazole)***
—ORGANIC DIVISION ***(Rubber Service)***

Standard Form: Powder.

Specifications: Light yellow powder; M.P. 170°C. min.; ash 0.5% max.; 0.5% max. retained on 200 mesh, trace max. retained on 100 mesh; moisture 0.5% max.; mercaptobenzothiazole content 94% min.; Sp. Gr. 1.42.

Uses: Requires zinc oxide and fatty acid. An activator is not needed but is often desirable. Activator must be adjusted carefully to avoid scorch difficulties.

Containers: 150-lb. fiber drums; 50-lb. paper bags.

Shipping Classification: Rubber Accelerators NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

"THIURAD" ***(Tetramethyl-thiuram-disulfide)***
—ORGANIC DIVISION ***(Rubber Service)***

Standard Form: Oiled or unoiled powder or pellets.

Specifications: Cream to white powder or pellets; powder, trace max. on 100 mesh; moisture 0.5% max.; ash 0.5% max.; Sp. Gr. 1.41; M.P. 146°C. min.

Uses: Requires zinc oxide and fatty acid. An excellent activator for thiazole accelerators. Also used as straight accelerator in two ways. In stocks containing normal sulfur use 0.15–0.50% on the rubber; for good aging and heat resistance use 2.0–4.0% and no sulfur. Excellent when used in same manner in Buna N and GRS.

Containers: 100-lb. fiber drums.

Shipping Classification: Rubber Accelerators NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

ACRYLONITRILE—PLASTICS DIVISION

Molecular Weight: 53.03

Formula: $CH_2 = CHCN$

Standard Form: Liquid

Specifications: Form, clear liquid; color, water white, not over 15 APHA Platinum-Cobalt Scale; distillation range, 74.0–79.5°C (at 760 mm); refractive index n_D 25°C, 1.3880–1.3895; water, 0.6–1.0%; inhibitor, 35–45 ppm (Monsanto MQ); acidity not greater than 0.02% (calculated as acetic acid); aldehydes not greater than 100 ppm (calculated as acetaldehyde); divinylacetylene, not greater than 15 ppm; hydrogen cyanide not greater than 5 ppm; iron (soluble) not greater than 0.2 ppm; methyl vinyl ketone not greater than 0.10%; peroxides not greater than 5 ppm (calculated as hydrogen peroxide); non-volatile matter not greater than 0.05%; stability not less than 4 hours (exposed to oxygen at 100 pounds per square inch and 100°C).

(*Continued on next page*)

0685168

TOWOLDMON0007032

RESEARCH

a

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

Uses: Production of synthetic fibers, adhesives, GR-N type synthetic rubbers, insecticides, surface active agents, pharmaceuticals and surface coatings; polymers and co-polymers with desirable properties; reaction with cellulosic materials (cyanoethylation) to modify or improve their properties.

Containers: 55-gal. nonreturnable steel drums; tank cars.

Shipping Classification: Acrylonitrile (chemicals NOIBN)

Literature: TX-13 "Acrylonitrile in Adhesives," "Organic Syntheses Based on Acrylonitrile."

ACETANILID, U.S.P. — ORGANIC DIVISION

Molecular Weight: 135.16

Formula: $NHCOCH_3$



Standard Form: Crystalline solid.

Specifications: White powder; ash 0.05% max.; conforms to U.S.P. tests for carbonizable impurities; solubility in ethyl alcohol 95% (1:4) complete; M.P. 114.0°C. min.; 2.0% max. powder retained on 80 mesh.

Uses: Pharmaceutical product.

Grades: Powder.

Containers: 225 and 100-lb. fiber drums.

Shipping Classification: Acetanilid.

ACETIC ACID — INORGANIC DIVISION

Formula: CH_3COOH

Uses: Used in dyeing where a weak acid is required in the dye bath; manufacture of acetate solvents, cellulose acetate and formation of other acetates, such as aluminum, lead, sodium and ammonium acetate. Also used in manufacture of fish glue; as an antichlor; coagulation of rubber latex; destruction of fungi; disinfectant in gelatin; pickling foodstuffs; giving added detergency and firmness to soap; stabilizing olive oil; protecting seedlings from injury due to root rot and damping off; hardening and developing solutions for photographic films. (See table in general data section.)

Grades:
Glacial 99½% Technical.

Glacial: 99% $C_2H_4O_2$: Sp. Gr. 1.0581; freezing point +58.3°F.

Containers: Aluminum drums; tank cars; tank trucks.

Shipping Classification: Acetic Acid.

ACETOPHENETIDIN, U.S.P. (*Also known as phenacetin*) — ORGANIC DIVISION

Molecular Weight: 179.21

Formula: $NHCOCH_3$



OC_2H_5

Standard Form: Crystalline powder.

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

Uses: Pharmaceutical product.

Containers: 200, 100 and 50-lb. fiber drums; 25-lb. b

Shipping Classification: Chemicals NOIBN.

para-ACETYLAMINOBENZENESULFONYL CHLO (*Also known as N-acetylsulfanilyl chloride and para-acetylaminobenzene sulfonchloride*) — ORGANIC DIVI

Molecular Weight: 233.67

Formula: $NHCOCH_3$



SO_2Cl

Standard Form: Crystals.

General Information—Properties: Light tan-to-bro powder or fine crystals; assay 97.5% min.

Uses: An intermediate in the manufacture of sulfa dru

Containers: 150-lb. steel drums.

Shipping Classification: Chemicals NOIBN.

N-ACETYL-p-AMINOPHENOL — ORGANIC DIVISION

Molecular Weight: 151.16

Formula: OH



$NHCOCH_3$

Standard Form: Powder.

Specifications: White powder; ash 0.2% max.; 98.0% min.; M.P. 169°C. min.; moisture 0.5% max.

Uses: N-acetyl-p-aminophenol is used as an analgesic antipyretic in pharmaceutical preparations.

Containers: 200, 100 and 50-lb. fiber drums; 25-lb. bo

Shipping Classification: Chemicals NOIBN.

Literature: "N-Acetyl-para-Aminophenol." Technical B letin ODB-53-10.

ACETYLSALICYLIC ACID, Starch Granulations — ORGANIC DIVISION

Standard Form: Granules.

Specifications: Made with acetylsalicylic acid, U. white, pink or green granules. Assay starch granul 10%, 90.0% min.—91.0% max.; starch granulation 84.0% min.—85.0% max.; starch granulation 20%, 80 min.—81.0% max.; free salicylic acid conforms to U. test on acetylsalicylic acid.

MESH:

Retained on—	12–50 MESH	20–M
12-mesh screen	Trace, max.	
14-mesh screen	5.0% min.	
	15.0% max.	
16-mesh screen	20.0% min.	
	35.0% max.	

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TOWOLDMON0007033

...mesh screen 60.0% min.
75.0% max. 10% max.
...ugh—
...mesh screen 10.0% max.
...harmaceutical product.
...10%, 12–50 mesh, white; 16%, 12–50 mesh, white; ...–50 mesh, white; 10%, 12–50 mesh, pink; 10%, 20 ...ink; 10%, 12–50 mesh, green; 10%, 20 mesh, green.
...ers: 250-lb. fiber drums; 25-lb. boxes.
...g Classification: Acetylsalicylic Acid.

...ALICYLIC ACID, U.S.P. (*Aspirin*)
...IC DIVISION

...ular Weight: 180.15

...ula:



...d Form: Crystalline solid.

...cations: White crystals or powder; assay 99.5% ...olubility in ethyl alcohol 95% (1:5) complete; solubil- ...10% Na_2CO_3 (1:20) complete; ash 0.05% max.; ...ms to U.S.P. test for heavy metals, carbonizable ...ties, chloride, sulfate and free salicylic acid.

...(All tests made on U. S. standard screens.)

	20-MESH	40-MESH	80-MESH
...ed on—			
...-mesh screen	Trace max.		
...-mesh screen	5.0% min. 10.0% max.		
...0-mesh screen		Trace max.	
...0-mesh screen	45.0% min. 60.0% max.		
...0-mesh screen		10.0% min. 20.0% max.	
...0-mesh screen	70.0% min. 85.0% max.		Trace max.
...0-mesh screen		45.0% min.	2.0% max.
...ough—			
...-mesh screen	10.0% max.		
...0-mesh screen		25.0% max.	

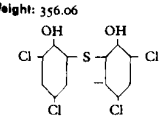
...: Pharmaceutical product.
...es: Crystals, 20 mesh; crystals, 40 mesh; powder, 80

...iners: 250-lb. fiber drums; 25-lb. boxes.
...ping Classification: Acetylsalicylic Acid.

**...AMER" (*bithionol—generic name accepted by ...cil on Chemistry and Pharmacy, American ... Association*) [*2,2'-thiobis-(4,6-dichloro-*
...—ORGANIC DIVISION**

...ecular Weight: 356.06

...ula:



...dard Form: White powder.

...fications: Gray-white to white powder; ash 0.1% ...; assay 99.0% min.; melting point 187.0°C. min.; ... max. retained on 50 mesh screen.

Uses: Bacteriostat in deodorant soaps, personal deodorants, industrial handcleansers, toiletries, cosmetics and pharmaceutical preparations. Exhibits high bacteriostatic activity against gram-positive bacteria and pathogenic fungi and is highly substantive to skin. Possesses low oral toxicity and is nonirritating and nonsensitizing to human skin.

Containers: 200 and 50-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

Literature: Technical Bulletin O-104.

ADIPIC ACID—ORGANIC DIVISION

Molecular Weight: 146.14

Formula: $HOOC(CH_2)_4COOH$

Standard Form: White powder.

Specifications: Assay 99.6% min.; M.P. 151.0°C. min.; ash 50 ppm max.; color (20 grams in 100 ml methanol) APHA 75 max.

Uses: A resin intermediate in the surface coating and polyester industries where it is used for viscosity control and to impart softness and flexibility to the cured resins. Other fields for which adipic acid serves as an intermediate include: low temperature plasticizers for vinyls, cellulosics and rubber; hot melt and thermosetting adhesives; yarn sizings and textile finishes; and synthetic lubricating oils and greases.

Containers: 50-lb. bags.

Shipping Classification: Acid, NOIBN, dry (Adipic Acid).

AGRICULTURAL PRODUCTS (See page 71)
(Consumer Products)

ADHESIVES (See plastics)

"ALKOPHOS" (*Aluminum Acid Phosphates*)
—INORGANIC DIVISION

Standard Form: Liquids and solids.

General Information—Properties:

	B	C	D	E
Physical Condition	Solid	Liquid	Solid	Liquid
Al_2O_3%	15.8	8.6	22.2	12.8
P_2O_5%	61.0	33.1	37.8	33.9
SiO_2%	—	—	10.0	—
Ignition Loss %	23.2	59.3	30.0	53.3
pH of 1% Solution	2.2	2.2	2.7	2.7
Ratio: Al_2O_3:$3P_2O_5$	1.0	1.0	1.67	1.67

"Alkophos" D contains 20% kaolin as a parting agent.

Uses: These products are offered as bonding agents for refractories, for high-temperature cements and for refractory paints. They afford high green strength which makes possible molded shapes set in place without firing and fired in place to yield high temperature nonslagging refractories.

Containers: B—200-lb. barrels; C—150-lb. carboys, 600-lb. lacquer-lined drums; D—400-lb. barrels; E—650-lb. lacquer-lined drums.

Shipping Classification: Aluminum phosphate.

Literature: Technical Bulletin P-33.

TOWOLDMON0007034

ALKYL ACID PHOSPHATES
(Also known as alkyl phosphoric acids)
—INORGANIC DIVISION

General Information—Properties:

AVERAGE PHYSICAL PROPERTIES

PHOSPHORIC ACID ESTER	P_2O_5 %	VISCOSITY SUS AT 100°F.	SP. GR. AT 25°C.	LBS. PER GAL.	pH 2% SOL.	ACID NO. mg KOH/g
Amyl	36	700	1.10	9.2	1.5	360
n-Butyl	39	320	1.12	9.3	2.5	420
Ethyl	51	580	1.30	10.8	2.3	550
i-Propyl	45	1100	1.19	10.0	2.4	410
Methyl	64	600	1.46	12.2	2.1	630
n-Propyl	45	520	1.20	10.0	1.5	450
n-Octyl	27	360	1.025	8.4	2.3	294

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.

Containers:
Amyl acid phosphate—500-lb. lacquer-lined drums; 13-gal. carboys.
n-Butyl acid phosphate—13-gal. carboys; 500-lb. lacquer-lined drums.
Ethyl acid phosphate—13-gal. carboys; 575-lb. lacquer-lined drums.
n-Propyl acid phosphate—525-lb. lacquer-lined drums.
Methyl acid phosphate—13-gal. carboys; 500-lb. lacquer-lined drums.
n-Octyl acid phosphate—13-gal. carboys; 450-lb. lacquer-lined drums.
i-Propyl acid phosphate—13-gal. carboys; 525-lb. lacquer-lined drums.

Shipping Classification: Acids Liquid NOIBN.

Literature: "Alkyl Phosphoric Acids," Technical Bulletin *P-120.*

ALKYL BENZENE—INORGANIC DIVISION

Molecular Weight: 246

Standard Form: Liquid.

Typical Analysis: Clear liquid; residue, less than 0.005 percent of volume; color, 25 APHA; Sp. Gr. 25°C./15.5°C. 0.866; refractive index 1.4868; bromine number 0.2; less than 0.1% unsulfonated.

General Information—Properties: A refined alkyl benzene designed primarily for use in manufacture of synthetic organic detergents.

Containers: 375-lb. net wt. black iron nonreturnable drums; 8,000 and 4,000-gal. tank cars.

Shipping Classification: Petroleum Oil—NOIBN.

Literature: "Alkyl Benzene," Technical Bulletin I-148.

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. $Al_2Cl_6 \cdot 12H_2O$, 50.3%; Al_2O_3, 10.6%; Fe, 0.005%.

Uses: Carbonizing fine wool such as piece goods, raw stock or shoddy, resulting in an exceptionally white, lofty wool; carbonizing colored goods where it has very little stripping action; soap manufacture for treatment of glycerin lyes where chloride of alumina is more desirable than sul... (See table in general data section.)

Containers: Tank cars; tank trucks.

Shipping Classification: Aluminum Chloride Liquid.

ALUMINUM SULFATE, COMMERCIAL DRY
—INORGANIC DIVISION

Molecular Weight: 603.35

Formula: $Al_2(SO_4)_3 \cdot 14.5\ H_2O$

Standard Form: Powder to lumps.

Typical Analysis:
Al_2O_3, 17.2%; FeO, 0.35%; Fe_2O_3, 0.01%.

Uses: Paper sizing and water treatment. Monsanto also ...*vides a slab form (6"x6"x18") for stock solutions* conta... 15.5–16.0% Al_2O_3. (See table in general data section.)

Grades: Papermaker's Alum.

Containers: 100-lb. paper bags.

Shipping Classification: Aluminum Sulfate.

ALUMINUM SULFATE, COMMERCIAL LIQUID
—INORGANIC DIVISION

Molecular Weight: 603.35

Formula: $Al_2(SO_4)_3$

Standard Form: Liquid.

Typical Analysis: Al_2O_3, 8%; FeO, 0.45%; Fe_2O_3, 0.0...

Uses: Paper sizing and water treatment.

Containers: Tank trucks and tank cars.

Shipping Classification: Aluminum Sulfate.

ALUMINUM SULFATE, IRON FREE
—INORGANIC DIVISION

Molecular Weight: 603.35

Formula: $Al_2(SO_4)_3 \cdot 14.5\ H_2O$

Standard Form: Powder.

Typical Analysis: Al_2O_3, 17.2%; Fe_2O_3, 0.01%.

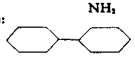
Uses: Sizing fine papers; manufacture of satin-white... dry colors; tanning white leathers; dyeing operations; ...facture of aluminum stearate.

Containers: *100-lb. paper bags.*

Shipping Classification: Aluminum Sulfate.

ortho-AMINOBIPHENYL, TECHNICAL
(Also known as ortho-aminodiphenyl)
—INORGANIC DIVISION

Formula:



Standard Form: Cast solid.

Specifications: Purplish crystalline mass; crysta... point 47.0°C. min.; assay 94.5% min; Distillation ... first drop 295.0°C. min.; 95% (1–96 ml) 8.0°C. ma... point 310.0°C. max.

Uses: An intermediate in dyestuff synthesis; produc... resins and varnishes; synthesis of rubber products; s... Specifically used in making phenanthridine derivati... carbazole. CAUTION: This product is toxic. ... breathing its vapors and avoid contact with the skin.

Containers: 475-*lb.* steel drums; tank cars.

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TOWOLDMON0007035

ing Classification: Dye Intermediate NOIBN. "Poison" label required.

ONIUM ETHYL PHOSPHATE

...re of mono- and diethyl ammonium phosphates)

...GANIC DIVISION

...dard Form: Liquid.

...ical Analysis: P_2O_5, 38.0%.

...eral Information—Properties: Water-white to yellow-...ral liquid of ammoniacal odor; Sp. Gr. 1.23 at 25°C.; ...s per gal. 10.37 lbs.; pH 75% solution 7.0–7.2; viscosity ...ps. at 25°C. Chemical constitution: 35% monoethyl ...monium phosphate; 50% diethyl ammonium phosphate ...15% monoethyl ammonium hydrogen phosphate. In ...film is liquid at relative humidities above 40%; not ...ble to heat; when subjected to elevated temperatures for ...length of time as a solution or while on any article, will ...se ammonia with a reduction in pH; at temperatures ...er 15°C. crystals will form in solution and dissolve with ...se in temperature or on dilution.

...: Flameproofing agent for paper, textiles, wood and ...r combustible materials.

...tainers: 500-lb. net steel drums.

...ping Classification: Ammonium Phosphate.

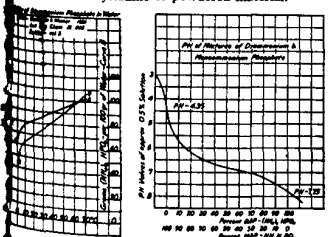
...ONIUM PHOSPHATE, DI

...known as diammonium hydrogen phosphate, sec-...y ammonium phosphate and ammonium phosphate, ...ic) — INORGANIC DIVISION

...lecular Weight: 132.068

...mula: $(NH_4)_2HPO_4$

...dard Form: Crystalline or powdered material.



...eral Information—Properties: Brilliant white crystal-...e or powdered material; stable in air; very soluble in ...er; pH value of 1% solution 7.75; above 70°C. aqueous ...ions lose ammonia readily.

...ociation Pressure: According to Britzke and Dumajew ...melin's Handbuch der anorganische Chemie, Ammoniak, ...433) and Warren (JACS 49, 1904, 1927):

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

...: Fire retardant, yeast food by yeast producers and ...eries; as bread improvers, to control pH of soda ...ers; catalyst for urea-formaldehyde resins; chrome ...ing of wool; source of N and P_2O_5 for soluble fertilizers.

...: Food (meets all U.S. Pure Food Law requirements).

...tainers: 100-lb. bags; 300 and 100-lb. fiber drums.

...ping Classification: Phosphate of ammonia.

Literature: "Concentrated Water-Soluble Fertilizers," booklet; "You Can Sell More and More," (Soluble Fertilizer) booklet; "Soluble Fertilizers," booklet.

AMMONIUM PHOSPHATE, MONO

(Also known as ammonium acid phosphate, primary ammonium phosphate, ammonium dihydrogen phosphate, ammonium phosphate, monobasic, and ammonium biphosphate) — INORGANIC DIVISION

Molecular Weight: 115.07

Formula: $NH_4H_2PO_4$

Standard Form: Crystalline or powdered material.

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

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.

Grades: Food (meets all U. S. Pure Food Law requirements).

Containers: 100-lb. bags; 300 and 100-lb. fiber drums.

Shipping Classification: Phosphate of ammonia.

Literature: "Concentrated Water-Soluble Fertilizers," booklet; "You Can Sell More and More," (Soluble Fertilizer) booklet; "Soluble Fertilizers," booklet.

ortho-ANISIDINE

(Also known as ortho-methoxyaniline and ortho-aminoanisole) — ORGANIC DIVISION

Molecular Weight: 123.15

Formula: OCH_3



Standard Form: Liquid.

Specifications: Reddish-brown to amber liquid; crystallizing point 5.3°C. min. Distillation range: first drop 223.0°C. min.; 95% 1.2°C. max.; dry point 226.0°C. max. Solution in HCl complete.

Uses: A component of azo dyes and chemical intermediate. CAUTION: This product is toxic. Avoid breathing its vapors and avoid contact with the skin.

Containers: 475-lb. steel drums.

Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

para-ANISIDINE

(Also known as para-methoxyaniline and para-aminoanisole) — ORGANIC DIVISION

Molecular Weight: 123.15.

Formula: OCH_3



Standard Form: Cast solid.

Specifications: Fused, crystalline mass; crystallizing point 57.2°C. min. Distillation range: first drop 240.0°C. min.;

(Continued on next page)

0685172

TOWOLDMON0007036

95% 2.0°C. max.; dry point 243.0°C. max. 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.

Containers: 200 and 450-lb. galv. steel drums.

Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

antioxidants, rubber

"FLECTOL" H *(Polymerized 1,2-dihydro-2,2,4-trimethyl-quinoline)* — ORGANIC DIVISION *(Rubber Service)*

Standard Form: Powder.

Specifications: Tan powder; 0.5% max. on 200 mesh; moisture 1% max.; M.P. 120°C. min.; Sp. Gr. 1.08; soluble in benzene, alcohol and naphtha.

Uses: An excellent antioxidant as a protector against heat deterioration and normal aging. It causes less discoloration than most other full-power antioxidants. Small dosages, on the order of 0.25% on the rubber, may be used in light colored compounds. "Flectol" H has practically no value as an antiflex material and should not be used in articles required to withstand severe flexing. It is a strong accelerator for Neoprene vulcanization but has no effect on the vulcanization of natural rubber, GR-S and Buna N types. Very good to reduce frosting on dry heat cured compounds. For maximum protection use 1% to 2% on the rubber.

Containers: 150-lb. fiber drums; 50-lb. paper bags.

Shipping Classification: Chemicals NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

"SANTOFLEX" AW (6-Ethoxy-1,2-dihydro-2,2,4-trimethylquinoline) — ORGANIC DIVISION *(Rubber Service)*

Standard Form: Dark, viscous liquid.

Specifications: Heat loss 1.0% max.; Sp. Gr. 1.04 at 45°C.; benzene insolubles trace max.

Uses: The chief function of this material is to reduce the harmful effect of ozone attack and in this respect it appears to be somewhat more effective with GR-S than natural rubber. It is particularly suggested for compounds used in dynamic service where waxes are sometimes not desirable. 1% to 2% on the hydrocarbon is usually sufficient. It is a fairly good antioxidant for the prevention of the usual deterioration on aging. It also has considerable merit as a flex-cracking inhibitor. It causes discoloration and staining.

Containers: 450-lb. steel drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

"SANTOFLEX" B *(1,2-dihydro-2,2,4-trimethyl-6-phenylquinoline)* — ORGANIC DIVISION *(Rubber Service)*

Standard Form: Solid.

Specifications: Dark waxy lumps; Sp. Gr. 1.11; ash 0.1% max.; insolubles in benzene trace max.

Uses: It is an outstanding flex-cracking inhibitor and antioxidant. It is especially recommended for rubber articles used in dynamic service but is equally effe[ctive] in any type of rubber compound. "Santoflex" B causes severe discoloration and staining, so its use is li[mited] to black or dark-colored articles. 1% to 2% on the [hydro]carbon is usually sufficient but up to 4% can be us[ed] for improved results. "Santoflex" B, BX and 35 give go[od] protection to Neoprene compounds against heat deteri[oration].

Containers: 300-lb. drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Monsanto Chemicals for the Rubber Indu[stry]," 46-page booklet.

"SANTOFLEX" BX *(Blend of 85% "Santoflex" B and 15% N,N'-diphenyl-para-phenylenediamine)* — ORGANIC DIVISION *(Rubber Service)*

Standard Form: Solid.

Specifications: Waxy, dark gray, lumpy solid; Sp. Gr. [1.] ash 0.3% max.; insolubles in benzene 1% max.

Uses: "Santoflex" BX behaves in the same way as "S[antoflex]" B. Due to the presence in the blend of N,N'-diph[enyl]-p-phenylenediamine, flex-cracking resistance is some[what] enhanced. A normal dosage is 1% to 2% on the h[ydro]carbon and more than 2½% is apt to cause blooming.

Containers: 300-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Monsanto Chemicals for the Rubber Indu[stry]," 46-page booklet.

"SANTOFLEX" 35 *(Blend of 65% "Santoflex" B and 35% N,N'-diphenyl-para-phenylenediamine)* — ORGANIC DIVISION *(Rubber Service)*

Specifications: Waxy, dark gray, lumpy solid; Sp. Gr. [1.] ash 0.5% max.; insolubles in benzene 1.5% max.

Uses: It contains a rather high percentage of N,N'-diph[enyl]-p-phenylenediamine. It is designed for those who w[ant] use a high dosage of this material, with a lower amo[unt] regular antioxidant. More than 1% on the hydrocarb[on] liable to cause blooming.

Containers: 300-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Monsanto Chemicals for the Rubber Indu[stry]," 46-page booklet.

"SANTOVAR" A *(2,5-di-tert-amylhydroquinone)* — ORGANIC DIVISION *(Rubber Service)*

Standard Form: Powder.

Specifications: Buff powder; moisture 1% max., [100] max. on 100 mesh; ash 0.5% max.; M.P. 172°C. min.; Sp. Gr. 1.05; soluble in acetone.

Uses: "Santovar" A is an outstanding antioxidant for [the] protection of uncured rubber. It also inhibits oxygen [and] on unsaturated resins and oils. Cold flow of uncu[red] compositions is reduced by a stiffening effect of "Santo[var]" A. Excellent for adhesives or other uncured films. It [is] nonstaining and nondiscoloring. Use 0.5% to 4% on [the] material to be protected.

Containers: 125-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Monsanto Chemicals for the Rubber Indust[ry]," 46-page booklet.

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...WHITE" CRYSTALS [(Essentially) 4,4'-...tert-butyl-m-cresol)] — ORGANIC DIVISION ...Service)

...d Form: Powder.

...ations: Light gray to tan powder; trace retained on ...; moisture 1.0% max.; M.P. 140°C. min.; Sp. Gr. ...ash 0.5% max.; soluble in acetone and alcohol.

... This nonstaining and nondiscoloring antioxidant is ...d for use in light-colored articles. It is also useful ... rubber product used in contact with surfaces such ...er or enamel which are subject to staining by ...y antixoidants. "Santowhite" Crystals provide excel-...ection against normal aging. Use 1% to 2% on the ...rbon. Excellent for the protection of nonstaining ...e compounds against heat deterioration.

...ers: 125-lb. fiber drums.

...g Classification: Chemicals NOIBN.

...re: "Monsanto Chemicals for the Rubber Industry," ... booklet.

...WHITE" L

...ially) Thiobis (di-sec-amylphenol). The structure ...plex. — ORGANIC DIVISION *(Rubber Service)*

...d Form: Dark, viscous liquid.

...ications: 0.25% max. ash; heat loss 0.5% max.; ...g point 0°C. max.; Sp. Gr. 0.98.

... A nonstaining and nondiscoloring antioxidant of ... strength. It is easily emulsified for use in latex ... no effect on latex stability.

...ners: 425-lb. steel drums.

...g Classification: Chemicals NOIBN.

...re: "Monsanto Chemicals for the Rubber Industry," ...e booklet.

...OWHITE" MK *(Reaction product of 6-tert-...-cresol and SCl_2)* — ORGANIC DIVISION ...r Service)

...d Form: Liquid.

...ifications: Dark viscous liquid; ash 0.5% max.; heat ... 5.0% max.; Sp. Gr. 1.06; soluble in acetone, alcohol, ...e and carbon tetrachloride; insolubles (Skellysolve ...5% max.; softening point 20-30°C.

...: The action of "Santowhite" MK is the same as ...owhite" Crystals, but the degree of protection against ... is not as high. It is excellent from the standpoints of ...g and discoloration. Use 1% to 2% on the hydro-...on. Gives good protection to uncured GRS latex ...pounds.

...ainers: 150-lb. steel drums.

...ing Classification: Chemicals NOIBN.

...re: "Monsanto Chemicals for the Rubber Industry," ...e booklet.

...TOWHITE" POWDER [4,4'-butylidene-bis ...-butyl-m-cresol)] — ORGANIC DIVISION ...r Service)

...d Form: Powder.

...ifications: White powder, ash 0.3% max.; trace max. ... 100 mesh; M.P. 209°C. min.; moisture 0.5% max.; ... Gr. 1.02.

Uses: "Santowhite" Powder is a full strength antioxidant. It is unexcelled from the standpoints of staining and discoloration. Performs well in latex and dry rubbers. Use 1% to 2% on the hydrocarbon.

Containers: 125-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

"ARESKAP" SODIUM BUTYL-ortho-PHENYLPHENOLSULFONATE — INORGANIC DIVISION

Standard Form: Liquid or dry powder.

Uses: Wetting, penetrating and spreading agent; spreading agent in insecticidal compositions, embalming fluids, metal pickling.

Containers: "Areskap"-50 (liquid)—250-lb. wooden bbls. Dry "Areskap"-100 (powder)—115-lb. drums.

Shipping Classification: Washing Compounds NOIBN.

Literature: "Areskap—Aresket—Aresklene," Technical Bulletin I-113.

"ARESKET" SODIUM BUTYLBIPHENYLSULFONATE — INORGANIC DIVISION

Standard Form: Dry powder.

Uses: Wetting, penetrating and spreading agent.

Containers: Dry "Aresket"-300 (powder)—115-lb. drums.

Shipping Classification: Washing Compounds NOIBN.

Literature: "Areskap—Areket—Aresklene," Technical Bulletin I-113.

"ARESKLENE" DISODIUM DIBUTYL-ortho-PHENYLPHENOLDISULFONATE — INORGANIC DIVISION

Standard Form: Paste.

Specifications: "Aresklene"—375: light brown paste, slightly aromatic; sulfates, trace; chlorides, trace; not soluble in solvents which are immiscible with water; pH approx. 7.5–8.5 for 1% solution of dry material at 25°C.; soluble (10–90 parts solvent) in alcohol, acetone, dibutyl tartrate, ethylene glycol.

Uses: Wetting, penetrating and spreading agent used in kierboiling; scouring and dyeing textiles; industrial cleaners; deodorant preparations; insecticidal formulations; metal cleaning; stabilizer and wetting agent in latex used to treat cord or other fabrics.

Containers: 185-lb. steel drums.

Shipping Classification: Washing Compounds NOIBN.

Literature: "Areskap—Aresket—Aresklene," Technical Bulletin I-113.

"AROCLOR" POLYCHLORINATED POLYPHENYLS — INORGANIC DIVISION

Standard Form: Liquids, resins or solids.

General Information—Properties: Chlorinated aromatic hydrocarbons varying from water-white mobile liquids and pale yellow viscous oils to light amber resins and opaque crystalline solids. Refractive indices above 1.6125. In general are stable on long heating at 150°C.; not affected by boiling

(Continued on next page)

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with sodium hydroxide solution. (The light oils can be distilled at atmospheric pressure without appreciable decomposition and the viscous oils and resins distill readily under vacuum.) Viscous oils and resins almost odorless and tasteless at ordinary temperatures.

Most "Aroclor" materials flux readily with resinous and pitch-like materials to give products having a decreased fire hazard. (Viscous oils and resins do not support combustion when heated alone even at their boiling points—temperatures above 360°C.) All 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. The oils and resins easily soluble in most common organic solvents and drying oils; hard crystalline materials are, in general, less soluble; all are insoluble in water. The more viscous oils and resins have excellent adhesive properties. All forms are thermoplastic, apparently undergo no further condensation or hardening upon repeated melting and cooling. Nondrying; when exposed to air no noticeable oxidation or hardening takes place. The clear resins have rather low vaporization losses; at 65.8°C. (150°F.) less than 0.04 gm. per sq. in. of surface per month.

Uses: Liquid "Aroclors" are used as dielectrics for condensers or capacitors and transformers. Solid "Aroclors" are used to impregnate carbon resistors, and when combined with other plastic materials, the "Aroclors" are excellent sealers or impregnating agents for a variety of electrical apparatus, wire coatings and tape. "Aroclors" are used as plasticizers and resins in lacquers including nitrocellulose, ethyl cellulose and cellulose acetate butyrate; to extend varnish resins and oils and as plasticizer and resin extenders *for rubber-base paints, including chlorinated* rubber styrene, butadiene and vinyls. In these protective coatings for metal, masonry and wood, "Aroclors" impart adhesion, resistance against moisture, acids, alkalies or other corrosive influence and they improve electrical insulating properties, durability and reduce flammability. They function as sealers in waterproofing compounds, wood preservative formulations, caulking compounds and putty. Employed in asphaltic siding materials and cellulose products impregnated or laminated with asphaltic materials, the "Aroclors" plasticize the asphalt, reduce flammability and improve durability. For printing inks; in precision-casting waxes, floor waxes and other wax products. Used widely in synthetic adhesives including ethyl cellulose, styrene, vinyls and rubber-base materials, "Aroclors" improve adhesion and resistance against corrosive influences. Selected liquid "Aroclors" are used as nonflammable hydraulic fluids for die-casting machines. They are used as actuating media for thermostats. "Aroclors" are useful in cutting oils as extreme pressure lubricants, as high-temperature lubricants and as grinding fluids. "Aroclor" 1248 is employed as a nonflammable, liquid-phase, heat-transfer medium for continuous operation in closed systems at temperatures up to 300°C. and at normal atmospheric pressure.

Containers: 600-lb. steel drums; 500-lb. net fiber drums.

Shipping Classification: Resin Synthetic NOIBN Without Filler.

Literature.

"The Aroclors Physical Properties and Suggested Applications," *Technical Bulletin O-P-115.*

"Aroclor 1254 Co-Plasticizer with DOP for Vinyl Organosols and Pastes," Technical Bulletin P-134.

"Aroclors as Co-Plasticizers for Polyvinyl Chloride," Technical Bulletin P-131.

"Aroclors as Used in Chlorinated Rubber," Technical Bulletin P-124.

"Aroclors in Formulating High Styrene Copolymer Surface Coatings," Technical Bulletin P-126.

"Aroclors as Used to Extend or Substitute Carnau[ba]
Technical Bulletin P-132.

"An Indirect Aroclor Heater for Unit Chemical Op[erations]
Technical Bulletin P-130.

"Aroclor—a Nonflammable Hydraulic Fluid for D[iesel]
ing Systems," Technical Bulletin P-137.

"Aroclor Incombustible Lubricants Used in High [Vacuum]
Compressors," Technical Bulletin P-128.

BATTERY ACID (*Electrolyte*) — INORGANIC DIVISI[ON]

Standard Form: Liquid.

Typical Analysis: Practically colorless liquid; [min.]
93.2% min.; iron 0.005% max.; nitrogen compo[unds]
HNO_3) 0.001% max.; Sp. Gr. 1.210–1.835. (Acids o[f]
strengths should be calculated in proportion to abov[e]
fication on H_2SO_4 content.)

Uses: *Electrolyte* is sulfuric acid, especially adapte[d]
needs of the storage battery trade. Various strengths
furnished to meet the needs of the individual purch[aser]

Containers: Tank trucks; 50-ton tank cars.

Shipping Classification: Sulfuric Acid. "Corrosiv[e]
required.

"BENTHAL" ALKYD RESIN INTERMEDIATE — ORGANIC DIVISION

Specifications: Light yellow flakes; ash 0.03%
M.P. 118°C. (min. to start); odor characteristic.

Typical Analysis: Phthalic anhydride 4.5–5.5%;
acid 94.5–95.5%.

Uses: A technical benzoic acid containing 5% phth[alic]
hydride marketed specifically for the resin indust[ry]
ticularly effective in alkyds when added with
anhydride during processing. "Benthal" has the fo[llowing]
special advantages: reduces the acid value; reduces
retards yellowing on baking at elevated temperatu[res]
after bodying; improves stability and flow.

Containers: 200-lb. net wt. fiber drums.

Shipping Classification: Resin Plasticizer.

BENZENESULFONIC ACID, TECHNICAL — ORGANIC DIVISION

Molecular Weight: 158.17

Formula: SO_3H



Standard Form: Liquid or crystalline mass.

General Information—Properties: Greenish-black
liquid or crystalline mass; crystallizing point 28.5°C
H_2SO_4 20.0–25.0%; benzenesulfonic acid 70.0–75.0
Gr. 1.45 approx. at 25°/15.5°C.

Uses: An intermediate in organic synthesis; a cr[ystal]
certain condensation reactions.

Containers: 500-lb. steel drums.

Shipping Classification: Dye Intermediate NOIB[N]

ENZOIC ACID — ORGANIC DIVISION

Molecular Weight: 122.12

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"Corrosive" lab

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COOH

Form: Fine powder or crystalline needles.

Specifications: *U.S.P. Grade:* White crystalline needles or powder; assay 99.5% min.; solution in alcohol (1:2.5); 5% sodium carbonate (1:6) clear and colorless; meets test for carbonizable impurities; 5% max. powder on 100 mesh.

Technical Grade: White to yellowish-white granules or powder; assay 99.0% min.; solution in 10% Na_2CO_3 (1:6) slightly cloudy or opalescent and practically colorless.

Uses: U.S.P. grade used in medicinal preparations; preservative in foodstuffs. Technical grade used in the manufacture of benzoates and benzoyl compounds; intermediate in the manufacture of dyes; mordant in calico printing; curing agent in alkyd resins; color stabilizer in baking powders; dispersing agent in grinding of pigments.

Grades: U.S.P. and Technical.

Containers: U.S.P.—100, 50 and 25-lb. fiber drums; 100-lb. drums (for milled material). Technical Grade—200-lb. drums.

Shipping Classification: U.S.P. Grade: Food Preserving Chemicals NOIBN. Technical Grade: Dye Intermediate NOIBN.

Literature: "Benzoic Acid and the Benzoates," 16-page booklet.

BENZOATE, U.S.P. — ORGANIC DIVISION

Molecular Weight: 212.24

Formula:



Standard Form: Liquid.

Specifications: Essentially colorless liquid; crystallizing point 18.5°C. min.; refractive index 1.568–1.570 at 20°C.; free chlorine 0.04% max.

General Information—Properties: High-boiling ester having a pleasant odor.

Uses: A miticide; fixative in perfumes; preparation of dressing and insect repellent formulations; medicinally in the treatment of scabies.

Containers: 475, 125-lb. and 5-gal. drums.

Shipping Classification: Insect Repellent NOIBN.

YL CHLORIDE (*Also known as alpha-chlorotoluene*)

ANIC DIVISION

Molecular Weight: 126.58

Formula:



Standard Form: Liquid.

Specifications: Clear to slightly turbid, colorless to yellow liquid; Sp. Gr. 1.105–1.110 at 15.5°/15.5°C. Distillation range: first drop 177.5°C. min.; 95% (1–96 ml) 3.0°C. max.; dry point 185.0°C. max.

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 various pharmaceuticals. CAUTION: This product is irritating to the skin. Vapors are highly irritating to the eyes. Avoid contact with the skin. Avoid breathing its vapors.

Containers: 475-lb. nickel drums; 2,000 gal. 2-compartment nickel tank trucks.

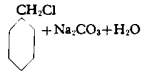
Shipping Classification: Chemicals NOIBN. Corrosive liquid (white label required).

Literature: "Benzyl Chloride," Technical Bulletin O-80.

BENZYL CHLORIDE, STABILIZED — ORGANIC DIVISION

Molecular Weight: 126.58

Formula:



Standard Form: Liquid.

Specifications (for material recovered from stabilized solution): Colorless to yellow liquid; Sp. Gr. 1.105–1.110 at 15.5°/15.5°C. Distillation range: first drop 177.5°C. min.; 95% (1–96 ml) 3.0°C. max.; dry point 185.0°C. max.

General Information—Properties: This form of benzyl chloride is stabilized by the addition of 23 pounds of 10% sodium carbonate solution to 450 pounds of the chloride. The wet material is a milky-white emulsion from which water may separate into a definite layer at either the bottom or top, depending upon the temperature and the concentration of Na_2CO_3. The concentration of Na_2CO_3 slowly decreases on standing.

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 various pharmaceuticals. CAUTION: This product is irritating to the skin. Vapors are highly irritating to the eyes. Avoid contact with the skin. Avoid breathing its vapors.

Containers: 473-lb. steel drums.

Shipping Classification: Chemicals NOIBN. Corrosive liquid (white label required).

Literature: "Benzyl Chloride," Technical Bulletin O-80.

BICYCLOHEXYL (*Also known as dicyclohexyl*)

— ORGANIC DIVISION

Molecular Weight: 166.30.

Formula: $C_6H_{11}—C_6H_{11}$.

Standard Form: Liquid.

General Information—Properties: Clear mobile liquid; aromatic odor; freezing point −1°C.; Sp. Gr. 0.883 at 25°/15.6°C.; refractive index 1.4785 at 25°C.; distillation range 5–95% between 238–248°C. (corr.); viscosity 36.0 SUS at 100°F.; soluble in organic solvents; insoluble in water.

Uses: Suggested as a high-boiling solvent, plasticizer, dielectric.

(*Continued on next page*)

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Containers: 400-lb. steel drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Phenylcyclohexane and Bicyclohexyl," Technical Bulletin P-110.

BIPHENYL — ORGANIC DIVISION

(Also known as diphenyl and phenylbenzene)

Molecular Weight: 154.20

Formula: $C_6H_5—C_6H_5$

Standard Form: Crystalline solid.

General Information—Properties: Faint yellow crystals; freezing point 68.7–69.0°C.

Uses: Intermediate for many derivatives.

Containers: 100-lb. bags; 225-lb. net bbls.; 100-lb. net kegs.

Shipping Classification: Biphenyl.

BONE ASH — INORGANIC DIVISION

General Information—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 Classification: Bone Ash.

Literature: "Bone Ash," Technical Bulletin I-154.

BORON PHOSPHATE — INORGANIC DIVISION

Molecular Weight: 105.85

Formula: BPO_4

Typical Analysis: P_2O_5 66.8%; B_2O_3 32.1%; ignition loss 1.25; free acid 0.23.

Uses: Used in the manufacture of special glasses.

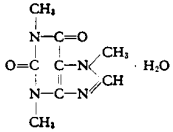
Containers: 400-lb. barrels.

Shipping Classification: Chemicals NOIBN.

CAFFEINE, U.S.P. — ORGANIC DIVISION

Molecular Weight: 212.21 (Anhydrous, 194.19)

Formula:



Standard Form: Crystalline powder.

Specifications: White powder. Loss on drying at 80°C.: anhydrous powder 0.25% max.; hydrated flakes 5.75–6.50%. M.P. 236°C. mm.; meets U.S.P. test for carbonizable impurities.

Uses: Pharmaceutical product.

Grades: Anhydrous powder or hydrated powder.

Containers: 100 and 25-lb. fiber drums; 10 and 5-lb. boxes.

Shipping Classification: Chemicals NOIBN.

CALCIUM PHOSPHATE, DI, ANHYDROUS

(Also known as phosphate of lime, secondary phosphate of lime, dicalcium orthophosphate and dibasic calcium phosphate) — INORGANIC DIVISION

Molecular Weight: 136.07

Formula: $CaHPO_4$

Standard Form: Finely divided powder.

Typical Analysis: Phosphorus 22.3%; calcium 29.0%.

General Information—Properties: White, tasteless, fine divided powder. Conforms with all food and drug Insoluble in alcohol; soluble in dilute citric acid solu Solubility in CO_2—free water in gms. per liter:

ANHYDROUS	30°C.	50°C.	68°C.	100
CaO	0.0414	0.667	0.0985	0.
P_2O_5	0.0866	0.1630	0.2234	0.
DIHYDRATE				
CaO	0.0954	0.2617	0.3409	0.
P_2O_5	0.2066	0.6182	0.3245	0.

Uses: Mineral supplement in pharmaceuticals, foods cereals; polishing agent in tooth pastes and powders.

Grades: Medicinal; food; dentifrice; ADR.

Containers: 100-lb. bags; 350 and 100-lb. fiber drums.

Shipping Classification: Calcium Phosphate.

CALCIUM PHOSPHATE, DI, DIHYDRATE — INORGANIC DIVISION

Molecular Weight: 172.10

Formula: $CaHPO_4 \cdot 2H_2O$

Standard Form: Powder.

Typical Analysis: Phosphorus 18.1%; calcium 23.7%.

General Information—Properties: White tasteless cry line powder; soluble in dilute citric acid solution; slightly soluble in water; insoluble in alcohol and glyc The stabilized dentifrice grade is prepared specially for in dentifrices and does not set-up hard when used to for late tooth paste.

Uses: Medicinal; mineral supplement for foods and cer polishing ingredient in tooth pastes and powders.

Grades: Regular food grade; stabilized dentifrice grade accepted by American Dental Association; U.S.P. forms with U.S.P. XIII.

Containers: 60 and 100-lb. bags; 100 and 225-lb. drums.

Shipping Classification: Calcium Phosphate.

CALCIUM PHOSPHATE, DI, FEED GRADE — INORGANIC DIVISION

Formula: $CaHPO_4$

Standard Form: Granules.

Typical Analysis:

	18½% P	21% P
pH	7.2–7.5	7.2–7.5
P	19.0%	21.0%
Ca	28.5%	27.0%
F	0.004%	0.004%
Pb	1 ppm	1 ppm
Moisture	5%	5%

Uses: Mineral supplement in the manufacture of animal feeds.

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...ic calci... ...18½% and 21%.

...ers: 100-lb. bags; bulk hopper and box cars.

...ng Classification: Di Calcium Phosphate, Feed

...ure: "Monsanto Di Calcium Phosphate Feed Supple-" booklet.

...29.0%.

...eless, fine... drug law... id solutio...

...M PHOSPHATE, MONO

...own as primary calcium phosphate, calcium ... phosphate, monobasic calcium phosphate, ...acid phosphate and acid phosphate of lime)*

100.1... 0.10... 0.2...

...ANIC DIVISION

...rd Form: Powder or granules.

0.31... 0.75...

...al Information—Properties: A white stable mate-...ble in water, giving an acid reaction.

...foods ...wders.

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

...r drums.

...des: Regular for phosphated and self-rising flour and ...g powder. Granular for baking powder. All grades ...U. S. Pure Food Law requirements. Special grades ...be supplied on request.

...ners: 100-lb. bags; 350-lb. drums.

...ping Classification: Calcium Phosphate.

23.7%.

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...M PHOSPHATE, TRI

...own as tribasic calcium phosphate, normal cal-...phate, neutral calcium phosphate and tertiary ...phosphate)* —INORGANIC DIVISION

...ula: $3Ca_3(PO_4)_2 \cdot Ca(OH)_2$

...nd cerea...

...dard Form: Powder.

...ce grade... S.P.—co...

...ral Information—Properties: White amorphous pow-..., odorless and tasteless; practically insoluble in water. ...plies with all Federal and State food laws. Conforms ...specifications listed in National Formulary and ac-...ed by the Council on Dental Therapeutics of the ...rican Dental Association.

5-lb. fib...

...: A mineral supplement in foods to supply calcium and ...phorus; base or polishing agent in tooth powder; ingre-...t in making milk glasses; antacid; conditioner to prevent ...king in salt, sugar, talc and other powdered material. ...suspension agent in polystyrene manufacture.

...des: Dentifrice; conditioner (salt, sugar, etc.); and ...dicinal. (All material conforms to requirements of the ...S. Pure Food Laws.)

...ainers: 60-lb. bags; 150-lb. fiber drums.

...ping Classification: Calcium Phosphate.

...IUM PYROPHOSPHATE (*Normal*)

...RGANIC DIVISION

...lecular Weight: 254.20

...ula: $Ca_2P_2O_7$

...dard Form: Powder.

of anim...

...ral Information—Properties: Finely subdivided pow-..., contains CaO, 43.8%; P_2O_5, 55.5%.

Uses: Food fortification and vitamin tablets as a mineral supplement.

Containers: 100-lb. bags; 400-lb. bbls.; 100-lb. drums.

Shipping Classification: Calcium Phosphate.

CALCIUM SILICATE SLAG —INORGANIC DIVISION

Standard Form: Granular solid.

General Information—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.

Containers: Bulk.

Shipping Classification: Slag.

CHLORAMINE-T, N.F. (*Also known as N-sodium-N-chloro-para-toluenesulfonamide*) —INORGANIC DIVISION

Molecular Weight: 281.70

Formula:



Standard Form: Crystalline powder.

Specifications: White or faintly yellow powder or crystals; solubility in water (2:15) complete; moisture 18.0–20.0%; available chlorine 24.5–25.2%; assay 97.3% min.; trace max. retained on 10 mesh; 1.0–10.0% retained on 35 mesh.

Uses: A water-soluble, chlorine-bearing powder used as a germicide, disinfectant and deodorant.

Containers: 300, 100 and 50-lb. fiber drums; 25-lb. boxes.

Shipping Classification: Disinfectants Other Than Medicinal NOIBN.

Literature: "Chloramine-T, N.F.," Technical Bulletin No. O-101.

CHLORINE-CAUSTIC SODA, CAUSTIC POTASH AND SODIUM SULFIDE PLANTS—

Complete manufacturing plants using DeNora Mercury Cells offered by Engineering Sales Department.

meta-CHLOROANILINE (*Also known as meta-amino-chlorobenzene and 3-chloroaminobenzene*)

—INORGANIC DIVISION

Molecular Weight: 127.57

Formula: NH_2

Cl

Standard Form: Liquid.

Specifications: Clear, light yellow liquid; crystallizing point −10.6°C. min. Distillation range: first drop 228.0°C. min.; 95% (1–96 ml) 1.0 C. max.; dry point 231.0°C. max.

Uses: An intermediate in the manufacture of azo dyestuffs. CAUTION: This product is toxic. Avoid breathing its vapors. Avoid contact with the skin.

Containers: 525-lb. galv. drums.

Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

0685177

TOWOLDMON0007042

ortho-CHLOROANILINE (*Also known as ortho-amino-chlorobenzene and 2-chloroaminobenzene*)
— ORGANIC DIVISION

Molecular Weight: 127.57

Formula:



Standard Form: Liquid.

Specifications: Discolors readily on exposure to air; crystallizing point −2.3°C. min. Distillation range: first drop 208.0°C. min.; 95% (1–96 ml) 1.0°C. max.; dry point 210.0°C. max. Solution in HCl very slight opalescence max.

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

Containers: 550-lb. steel drums.

Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

para-CHLOROANILINE (*Also known as para-amino-chlorobenzene and 4-chloroaminobenzene*)
— ORGANIC DIVISION

Molecular Weight: 127.57

Formula:



Standard Form: Cast solid.

Specifications: Yellowish-white solid; crystallizing point 69.5°C. min. Distillation range: first drop 229.0°C. min.; 95% (1–96 ml) 1.5°C. max.; dry point 233.0°C. max. Solution in HCl slight opalescence max.

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

Containers: 500-lb. steel drums.

Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

CHLORO-IPC (*C-IPC, also known as O-Isopropyl N-(3-Chlorophenyl) Carbamate*) — ORGANIC DIVISION

Molecular Weight: 213.66

Formula:



Standard Form: Crystalline solid.

Specifications: Light brown solid; assay 99% min.; crystallizing point 36°C. min.

General Information: To facilitate handling, a solution of 70% chloro IPC and 30% xylene is also available.

Uses: Herbicide, particularly useful for selective control of certain annual grassy weeds in crops.

Containers: For solid—450, 250 and 60-lb. drums; for solution—55-gal. drums.

Shipping Classification: Rail—Weed Killing Compound NOIBN; Truck—Herbicide, Agricultural NOIBN, other than liquid.

Literature: "Chloro-IPC for Weed Control," Technical Bulletin O-114.

ortho-CHLOROPHENOL, TECHNICAL (*Also known as ortho-hydroxychlorobenzene and 2-chlorohydroxybenzene*) — ORGANIC DIVISION

Molecular Weight: 128.56

Formula:



Standard Form: Liquid.

Specifications: Yellow-to-brown liquid; monochlorophenols (from Cl content) 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 in the production of dyestuffs and various other organic products. CAUTION: This product is toxic. Avoid breathing its vapors. Avoid contact with the skin.

Containers: 500-lb. steel drums.

Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

para-CHLOROPHENOL (*Also known as para-hydroxychlorobenzene and 4-chlorohydroxybenzene*)
— ORGANIC DIVISION

Molecular Weight: 128.56

Formula:



Standard Form: Cast solid.

Specifications: Yellowish-to-brown crystalline mass; crystallizing point 42.5°C. min.; Sp. Gr. 1.256–1.262 at 45/15.5°C.

Uses: An intermediate in the production of dyestuffs, in synthesis of pharmaceuticals. CAUTION: Care should be exercised in handling this product. Avoid contact with the skin.

Containers: 545-lb. galv. drums.

Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

CHLOROSULFONIC ACID (*Also known as sulfonic chlorohydrin*) — INORGANIC DIVISION

Molecular Weight: 116.53

Formula: $ClSO_3OH$

Standard Form: Liquid.

Specifications: Heavy mobile liquid; assay 98.5% min.

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

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8.5% min.
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...: 700-lb., 55-gal. steel and stainless steel ...lb. bottles single; 80-lb. cases of ten; tank cars.

...Classification: Chlorosulfonic Acid. Corrosive ...te label required).

...ONED REZ" EXTERIOR PENETRATING
"Cedar Rez,*" "Driftwood Rez,*" "Mahog-... "Redwood Rez,*" "Desert Sage Rez,*" ...o Rez,*" "Flamingo Rez,*" "Charcoal Rez,*" ...reen Rez,*" "Spruce Blue Rez,*" "Clay ...dalwood Rez,*" "Fir Green Rez*")

...ING DIVISION

...Information—Properties: A pigmented penetrat-..., to protect and preserve beauty of California red-... western cedar.

...ilable for Master Painters in a more highly pig-...mulation.

...plied to bare wood siding, shakes or shingles, ...ned Rez" products penetrates wood pores, ma-...ducing absorption of moisture. They resist bleach-...coloration, conceal effects of weather exposure. ...be used as interior finish to produce tinted, sub-... grain pattern on paneling, doors and woodwork. ...dy-to-use and may be applied by brush or spray. ...covers from 200 to 350 sq. ft. depending on sur-...itions.

...: 5-gal. cans; 1-gal. cans (4 /case); 1-qt. cans (12 / ...ster Painters in (1-gal. and 5-gal. only).

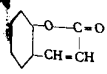
...Classification: Wood Filler Liquid.

...: Rez Color-Toned Color Card.

...RIN MONSANTO" *(Coumarin, N. F.)*

...C DIVISION

...Weight: 146.14



...Form: Crystalline solid.

...tions: White crystals; melt (liquid) clear and color-...P. 68.8°C. min.; solubility in ethyl alcohol (1:10) ...; moisture 0.10% max.; ash 0.05% max.; conforms ... test for acetanilid.

...Odor principle; used in perfumes, soaps, tobacco, ...bber and other products where aromatic ingre-...s required.

...Crystals; 60-mesh powder.

...: 100-lb. fiber drums; 25 and 5-lb. cans.

...Classification: Chemicals NOIBN.

...: "Coumarin Monsanto," folder with Solubility ..."Something About the Senses," 32-page booklet.

...YLAMINE *(Also known as hexahydroaniline)*

...VISION

...Weight: 99.17



Standard Form: Liquid.

Specifications: Clear, practically colorless liquid; Sp. Gr. 0.870–0.874 at 15.5°/15.5°C. Distillation range: first drop 132.0°C. min.; 95% (1–96 ml) 4.0°C. max.; dry point 137.5°C. max.

Uses: Dyestuff intermediate; petroleum additive; corrosion inhibitor; organic synthesis.

Containers: 375-lb. (approx.) 55-gal. drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Cyclohexylamine and Dicyclohexylamine," Technical Bulletin O–74.

DEFOAMER PC-1244—ORGANIC DIVISION

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.

Containers: 55-gal. nonreturnable black iron drums; 5-gal. cans; tank cars.

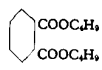
Shipping Classification: Chemicals NOIBN.

Literature: "Defoamer PC-1244," Technical Bulletin O-76.

DIBUTYL PHTHALATE—ORGANIC DIVISION

Molecular Weight: 278.34

Formula:



Standard Form: Liquid.

Specifications: Clear, oily liquid; color APHA 20 max.; odor slight; acidity (as phthalic acid) 0.01% max.; Sp. Gr. 1.0455 ±0.001 at 25°/25°C.; refractive index 1.4905 ±0.001 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.

Containers: 465-lb. steel drums; 40-lb. drums.

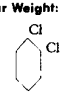
Shipping Classification: Dibutyl Phthalate.

Literature: "Monsanto Plasticizers," 64-page booklet.

ortho-DICHLOROBENZENE, TECHNICAL —ORGANIC DIVISION

Molecular Weight: 147.01

Formula:



Standard Form: Liquid.

(Continued on next page)

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TOWOLDMON0007044

Specifications: Colorless to slightly yellow liquid; Sp. Gr. 1.305–1.313 at 15.5°/15.5°C.; crystallizing point −7°C. max.; distillation range, first drop 175°C. min.; 90% (1–91 ml) 5°C. max.; 100% 14°C. max.

Uses: Primarily used as a solvent and insecticide. Used alone or in combination with other solvents for grease and carbon removal; used as a general solvent because of low order of toxicity and relative safeness from fire hazard; as an ingredient in wool scouring formulations, paint removers, metal polishes and shoe dyes; for controlling Lyctus powder post beetles and termites.

Containers: 55-gal. steel drums; tank cars.

Shipping Classification: ortho-Dichlorobenzol.

Literature: "Chemicals for Termite Control," Technical Bulletin O-13; "Monsanto ortho-Dichlorobenzene for Chemical Processing & Consumer Product Industries," folder.

2,5-DICHLORONITROBENZENE

(Also known as 1-nitro-2,5-dichlorobenzene)

Molecular Weight: 192.01

Formula:



Standard Form: Cast solid.

Specifications: Light yellow to light brown crystalline solid; crystallizing point 52.5°C. min.

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

Containers: 600-lb. steel drums; tank cars.

Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

2,4-DICHLOROPHENOL, TECHNICAL

(Also known as 2,4-dichlorohydroxybenzene)

—ORGANIC DIVISION

Molecular Weight: 163.01

Formula:



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. CAUTION: Care should be exercised in handling this material. Avoid contact with the skin. Avoid breathing its vapors.

Containers: 600-lb. (approx.) steel drums.

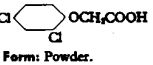
Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

2,4-DICHLOROPHENOXYACETIC ACID *(2,4-D)*

—ORGANIC DIVISION

Molecular Weight: 221.04

Formula:



Standard Form: Powder.

Specifications: Fine white powder; assay 99.0% min.; 138°C. min.

Uses: A selective herbicide with hormone-like prope

Containers: 200-lb. fiber drums; 50-lb. bags.

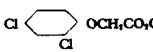
Shipping Classification: Weed Killing Compound NO

Literature: "2,4-D for Weed Control," Technical Bu O-50; "Formulating 2,4-D for Weed Control," bo "Chemical Brush Control in Pastures and on Gr Lands," booklet; "Chemical Weed Control on Right Way," booklet; "Controlling Weeds with Chemical Spra booklet; "Chemical Weed Control in Small Gra booklet.

2,4-DICHLOROPHENOXYACETIC ACID—BUTOXYETHOXYPROPYL ESTER—ORGANIC DIVI

Molecular Weight: 379.3

Formula:



Standard Form: Liquid.

Specifications: Brown liquid; total 2,4-D as acid min.; total 2,4-D as ester 94.2% min.

Properties: Sp. Gr. approx. 1.17 at 25°/25°C.; 2,4- equivalent is approx. 5.38 lbs. per gal.

Uses: As a selective herbicide where oil solubi extremely low volatility are desired.

Containers: 55-gal. steel drums.

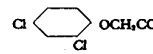
Shipping Classification: Rail—Weed Killing Co NOIBN; Truck—Herbicide Agricultural NOIBN

Literature: "2,4-D for Weed Control," Technical O-50; "Controlling Weeds with Chemical Sprays," "Formulating 2,4-D for Weed Control," booklet; cal Weed Control on Rights-of-Way," booklet; "C Weed Control in Small Grains," booklet; "C Brush Control in Pastures and on Grazing booklet.

2,4-DICHLOROPHENOXYACETIC ACID—BUTYL ESTER *(Also known as 2,4-D butyl butyl 2,4-dichlorophenoxyacetate)*—ORGANIC DIV

Molecular Weight: 277.14

Formula:



Standard Form: Liquid.

Specifications: Light brown liquid; assay 99% Gr. 1.235–1.245 at 25°/25°C.

General Information—Properties: Has herbicid erties similar to those of 2,4-D acid. Is oil solub acid equivalent approx. 8.15 lbs. per gal.

Uses: As a selective herbicide where volatil hazard.

Containers: 55-gal. steel drums.

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ing Classification: Weed Killing Compound NOIBN.

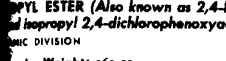
ture: "2,4-D for Weed Control," Technical Bulletin "Formulating 2,4-D for Weed Control," booklet; ical Brush Control in Pastures and on Grazing ," booklet; "Chemical Weed Control on Rights-of- " booklet; "Chemical Weed Control in Small Grains."

CHLOROPHENOXYACETIC ACID—
PYL ESTER (Also known as 2,4-D isopropyl
d isopropyl 2,4-dichlorophenoxyacetate)

IC DIVISION

ecular Weight: 263.12

ula:



ard Form: Liquid.

ications: Pale yellow liquid; assay 99% min.; crystal- point 5°C. min.; Sp. Gr. 1.255–1.270 at 25°/25°C.

eral Information—Properties: Possesses herbicidal erties similar to those of the free acid. Has the advan- of being oil soluble; 2,4-D Acid equivalent approx. lbs. per gal.

: For same general purposes as free acid where vola- is not a hazard.

ainers: 55-gal. steel drums.

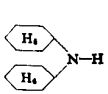
ping Classification: Weed Killing Compound NOIBN.

ture: "2,4-D for Weed Control," Technical Bulletin ; "Formulating 2,4-D for Weed Control," booklet; mical Brush Control in Pastures and on Grazing ," booklet; "Chemical Weed Control on Rights-of- booklet; "Controlling Weeds with Chemical ," booklet; "Chemical Weed Control in Small ," booklet.

CLOHEXYLAMINE—ORGANIC DIVISION

ecular Weight: 181.31

ula:



ard Form: Liquid.

ications: Clear, practically colorless liquid; Sp. Gr. 3-0.919 at 15.5°/15.5°C. Distillation range: first drop .0°C. min.; 95% (1-96 ml) 4.0°C. max.; dry point .0°C. max.

: An intermediate in the manufacture of oil additives, ticides and corrosion inhibitors.

ainers: 375-lb. steel drums.

ping Classification: Chemicals NOIBN.

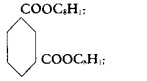
ture: "Cyclohexylamine and Dicyclohexylamine," ical Bulletin O-74; "Dicyclohexylamine as used in rust prevention," folder.

HYL HEXYL) PHTHALATE (D.O.P.)
own as dioctyl phthalate or D.O.P.)

IC DIVISION

ecular Weight: 390.54 (Pure compound)

Formula:



Standard Form: Liquid.

Specifications: Color APHA 25 max.; odor, very slight characteristic; Sp. Gr. 0.980–0.985 at 25°/25°C.; refractive index 1.4810–1.4880 at 25°C.; acidity (as phthalic ; max.

General Information — Properties: Di (2-Ethyl Hexyl) Phthalate (D.O.P.) 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, D.O.P. imparts excellent electrical characteristics with good aging properties.

Uses: This plasticizer is widely used in plasticizing polyvinyl chloride for electrical insulation. D.O.P. 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

Containers: 55-gal. (440-lb.) and 5-gal. (40-lb.) black iron drums; tank cars.

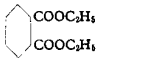
Shipping Classification: Resin Plasticizer.

Literature: "Dioctyl Phthalate," Technical Bulletin O-82; "Aroclor 1254 Co-Plasticizers with DOP," Technical Bulletin P-134; "Monsanto Plasticizers," 64-page booklet.

DIETHYL PHTHALATE—ORGANIC DIVISION

Molecular Weight: 222.23

Formula:



Standard Form: Liquid.

Specifications: Clear, water-white oily liquid; color APHA not darker than 10; odor very slightly aromatic; acidity (as phthalic acid) 0.01% max.; Sp. Gr. 1.117 ±0.005 at 25°/25°C.; refractive index 1.5000 ±0.001 at 25°C.; sulfur (copper-strip test) negative.

General Information—Properties: B.P. 295°C.; wt. per gal. 9.35 lbs.; miscible with all the common organic solvents and diluents.

Uses: Generally used in mixture with dimethyl phthalate as a plasticizer for cellulose acetate. Evaporation rate of diethyl phthalate is too high for successful use as a regular nitrocellulose plasticizer, and it is not a solvent for cellulose acetate. Mixtures of diethyl and dimethyl phthalates usually give better results than can be obtained by either one alone. Also used as a fixative in perfumes.

Containers: 500-lb. steel drums; 45-lb. drums; tank cars.

Shipping Classification: Diethyl Phthalate.

Literature: "Monsanto Plasticizers," 64-page booklet.

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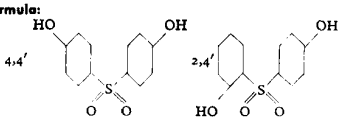
TOWOLDMON0007046

DIHYDROXY DIPHENYL SULFONE

(Also known as sulfonyl bis phenol) — ORGANIC DIVISION

Formula:



Standard Form: Powder.

Typical Analysis:

	PURITY
Dihydroxy Diphenyl Sulfone	69–79% of 4,4′ ISOMER 31–21% of 2,4′ ISOMER

Specifications: Crystallizing point 217–227°C., min.; moisture less than 0.5% max.

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

Uses: Electroplating bath addition agent; base for phenolic resins; suggested as intermediate in organic synthesis.

Containers: 150-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Dihydroxy Diphenyl Sulfone (NT Grade)," Technical Bulletin O-118.

DIISODECYL ADIPATE *(DIDA)* — ORGANIC DIVISION

Molecular Weight: 426.67

Formula: $(CH_2)_4(COOC_{10}H_{21})_2$

Standard Form: Liquid.

Specifications: Clear oily liquid; color APHA 100 max.; odor mild; acidity (as adipic acid) 0.1% max.; Sp. Gr. 0.919 ±0.003 at 20°/20°C.

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 co-plasticizer 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.

Containers: 55 and 5-gal. drums; tank cars.

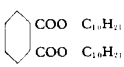
Shipping Classification: Resin Plasticizer.

Literature: "Diisodecyl Adipate," Technical Bulletin O-113; "Monsanto Plasticizers," 64-page booklet.

DIISODECYL PHTHALATE *(DIDP)* — ORGANIC DIVISION

Molecular Weight: 446.65

Formula:



Standard Form: Liquid.

Specifications: Clear oily liquid; color APHA 100 max.; odor slight; acidity (as phthalic acid) 0.01% max.; Sp. Gr. 0.9645–0.9665 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 impa initial viscosity and very little viscosity build-up o longed storage at elevated temperatures (40–50°C.).

Containers: 55 and 5-gal. drums; tank cars.

Shipping Classification: Resin Plasticizer.

Literature: "Di-Isodecyl Phthalate (DIDP)," Te Bulletin O-108; "Monsanto Plasticizers," 64-page b

DIISOOCTYL PHTHALATE *(DIOP)* — ORGANIC DI

Molecular Weight: 390.55

Formula: $C_6H_4[COOC_8H_{10}(CH_3)CHCH_3]_2$

Standard Form: Liquid.

Specifications: Clear oily liquid; color APHA 3 odor slight; acidity (as phthalic acid) 0.01% max.; 0.980 to 0.985 at 25°/25°C.

Uses: General purpose primary plasticizer for p chloride. Uses similar to those for DOP. DIOP supe vinyl organosols and plastisols having lower initial v and lower viscosity build-up on storage than DOP.

Containers: 55 and 5-gal. drums; tank cars.

Shipping Classification: Resin Plasticizer.

Literature: "Monsanto Plasticizers," 64-page bookle

DIMETHYL PHTHALATE — ORGANIC DIVISION

Molecular Weight: 194.18

Formula:



Standard Form: Liquid.

Specifications: Clear, water-white oily liquid; color not darker than 10; odor not more than slightly ar acidity (as phthalic acid) 0.01% max.; Sp. Gr. 1.190 at 25°/25°C.; refractive index 1.5133 ±0.001 at sulfur (copper-strip test) negative.

General Information—Properties: A solvent pla for cellulose acetate; miscible with all common solvents and with oils (except petroleum oils); solut water 0.4% at 32°C.; excellent light stability; B.P. crystallizing point 0°C.; wt. per gal. 10 lbs.

Uses: Widely used but does not meet very rigid pla requirements. Its use is restricted almost entirely cellulose acetate field where, as a general rule, it is combination with diethyl phthalate or some other plas

Containers: 500 and 40-lb. steel drums.

Shipping Classification: Dimethyl Phthalate.

Literature: "Monsanto Plasticizers," 64-page bookl

2,4-DINITROANILINE — ORGANIC DIVISION

(Also known as 1-amino-2,4-dinitrobenzene)

Molecular Weight: 183.12

Formula:



Standard Form: Powder.

0685182

TOWOLDMON0007047

...ness: Bright yellow powder; M.P. 177.5°C. min.; ...(total) 0.15% max.

...e intermediate in the preparation of dyestuffs.
...ON: This product is toxic. Avoid breathing its dust. ...ntact with the skin.

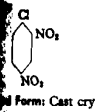
...ew: 225-lb. fiber drums.

...g Classification: Dye Intermediate NOIBN.
...label required.

...ROCHLOROBENZENE, TECHNICAL
...e as *1-chloro-2,4-dinitrobenzene*)

...C DIVISION

...ar Weight: 202.56



...l Form: Cast crystalline solid.

...Analysis:

2,4-DINITRO-CHLOROBENZENE	ISOMERIC DINITRO-CHLOROBENZENES
95% approx.	5% approx.
90% approx.	10% approx.

...roduction of explosives, photographic chemicals and ...henol; intermediate in the preparation of dyestuffs. ...ION: This product is toxic. Avoid breathing its ... Avoid contact with the skin.

...e 2 grades of cast crystalline solids with min. crystal... points of 48.0°C. and 46.5°C.

...ers: 600-lb. steel drums.

...g Classification: Dinitrochlorobenzol. "Poison" ...quired.

...L ADIPATE *(DOA)*— ORGANIC DIVISION

...ular Weight: 370.56

...a: $(CH_2)_4[COOCH_2CH(C_2H_5)C_4H_9]_2$

...ard Form: Liquid.

...ications: Clear oily liquid; color APHA 100 max.; ... mild; acidity (as adipic acid) 0% max.; Sp. Gr. ...±0.003 at 20°/20°C.

... A primary plasticizer which imparts excellent low ...erature flexibility to polyvinyl chloride resins and ...etic rubbers. Used in conjunction with DOP and ...cizer 160 to make quality vinyl garden hose. Imparts ...viscosity to vinyl plastisols for cloth coating, wire ..., etc. Imparts excellent heat and light stability and ...or softness to vinyl film and upholstery.

...iners: 55 and 5-gal. drums; tank cars.

...ng Classification: Resin Plasticizer.

...ture: "Dioctyl Adipate," Technical Bulletin O-106; ...nsanto Plasticizers," 64-page booklet.

...CTYL, *n*-DECYL) PHTHALATE *(DNODP)*
...NIC DIVISION

...ard Form: Liquid.

...ications: Clear oily liquid; color APHA 50 max.; ...light; acidity (as phthalic acid) 0.01% max.; Sp. Gr. ...0.977 at 25°/25°C.

Uses: An unexcelled primary plasticizer for polyvinyl chloride. Imparts low volatility and excellent low temperature flexibility to vinyl compositions. It is especially useful in vinyl electrical wire compounds which must withstand rigorous heat aging tests and low temperature flexibility tests. It is a superior plasticizer for vinyl film and sheeting and offers low initial viscosities and low viscosity build-up in vinyl plastisols.

Containers: 55 and 5-gal. drums; tank cars.

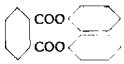
Shipping Classification: Resin Plasticizer.

Literature: "Di (N-Octyl, N-Decyl) Phthalate (DNODP)," Technical Bulletin O-109; "Monsanto Plasticizers," 64-page booklet.

DIPHENYL PHTHALATE — ORGANIC DIVISION

Molecular Weight: 318.31

Formula:



Standard Form: Fused solid.

Specifications: Essentially white fused solid; free acid (as phthalic acid) 0.20% max.; free phenol 0.20% max.

General Information—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 gm. 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 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.

Containers: 400-lb. fiber drums.

Shipping Classification: Resin Plasticizer.

Literature: "Monsanto Plasticizers," 64-page booklet.

"D.P. SOLUTION" LACQUER ADDITIVE
— INORGANIC DIVISION

Standard Form: Liquid.

General Information—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" in flat lacquer formulations; for light and heat stabilization of vinyl chloride and vinyl copolymer resins.

Containers: 55 and 5-gal. Heresite-lined steel drums.

Shipping Classification: Chemicals NOIBN.

Literature: "D.P. Solution 4519," Technical Release No. 105.

EMULSIFIER L— ORGANIC DIVISION

Standard Form: Liquid.

Specifications: Dark brown viscous liquid at 25°C.; moisture 0.45% max.; pH (1% solution at 25°C.) 6.5–8.0.

(Continued on next page)

0685183

TOWOLDMON0007048

Uses: To produce emulsifiable concentrates of insecticides, herbicides, fungicides or other formulations.

Containers: 55-gal. steel drums.

Shipping Classification: Washing Compound NOIBN Liquid.

Literature: "Emulsifiers for the Agricultural Industry," Technical Bulletin P-142.

"ETHAVAN" *(Ethyl Vanillin)*— ORGANIC DIVISION

Molecular Weight: 166.17

Formula: 

Standard Form: Fine crystalline needles.

Specifications: Fine white crystalline needles; completely soluble in ethyl alcohol 95% (1:2); ash 0.05% max.; M.P. 76.5°C. min.

Uses: A flavoring and aromatic. Has a flavor similar to that of vanillin but not identical with it. The relative flavoring strength of "Ethavan" approximates three times that of vanillin.

Containers: 100-lb. fiber drums; 25 and 5-lb. cans.

Shipping Classification: Chemicals NOIBN.

Literature: "Ethavan," leaflet with solubility tables; "Something About the Senses," 32-page booklet.

ETHYL ACETATE— ORGANIC DIVISION

Molecular Weight: 88.10

Formula: $CH_3COOC_2H_5$

Standard Form: Liquid.

Typical Analysis: Water-white liquid; Sp. Gr. min. 0.900 to max. 0.910 at 15.5°C.; ester content 98–99%; boiling range start to dry between 73.8 to 80.0°C. at 760 millimeters; dryness—mixes with not less than 10 volumes 60° gasoline without turbidity at 20°C.; acidity less than 0.02% as acetic acid.

Uses: A nitrocellulose solvent, more active than either butyl or amyl acetate, evaporating faster with less resistance to moisture blush. Blends of all three with appropriate diluents, such as alcohols (ethyl, butyl and amyl), yield thinners and solvent mixtures of excellent cutting power and moisture resistance, good flow and leveling, and compatibility with various resins and oils. Used in the artificial leather industry and in formulating lacquers and finishes for wood, metals, textiles and paper.

Containers: 55-gal. steel drums; 5 and 1-gal. cans; tank cars; tank trucks.

Shipping Classification: Ethyl Acetate.

ETHYL BENZENE— ORGANIC DIVISION

Molecular Weight: 106.16

Formula: $C_6H_5CH_2CH_3$ ()

Standard Form: Liquid.

Specifications: Form, clear liquid; assay, 99.0% (Minimum); benzene less than 0.10%; diethylbenzene less than 0.06%; color less than 15 APHA; specific gravity (15.5° 0.8690–0.8710; distillation range, 135.4°C–136.6°C.; ity, neutral; solubility: water, immiscible, common org solvents, miscible; refractive index (20°C), 1.495–1.

General Information—Properties: An aromatic hyd carbon of dependable purity. It possesses solvent prop ties similar to xylene. Its chemical reactions include on tion, nitration, sulfonation, hydrogenation, dehydrog tion, halogenation, alkylation, and acylation.

Uses: Production of styrene monomer and chlorostyre It can be the starting point for the manufacture of a v variety of organic compounds, of dyes and pharmaceuti

Containers: 55-gal. nonreturnable steel drums; tank

Shipping Classification: Ethylbenzene.

Literature: TX-12 "Ethylbenzene," Technical Bulletin

ETHYLENE DICHLORIDE— ORGANIC DIVISION

Molecular Weight: 98.95

Formula: CH_2ClCH_2Cl

Standard Form: Liquid.

Specifications: Form, clear liquid; acidity, 0.001% (as HCl); specific gravity 25°C/25°C, 1.2450–1.2550; d lation range °C, the 90% (by volume) between 5% 95% shall distill within 1.5°C, of 83.5°C.

Uses: Solvent for fats and oils, various resins, cell esters and other products; fumigants; dry-cleaning so mixtures; paint, varnish and finish removers; meta greasing; organic syntheses.

Containers: 55-gal. nonreturnable drums; tank cars.

Shipping Classification: Ethylene dichloride.

FERRIC ORTHOPHOSPHATE— INORGANIC DIVISION

Molecular Weight: 561.59

Formula: $FePO_4 \cdot Fe_2H(PO_4)_6 \cdot H_2O$

Standard Form: Powder.

General Information—Properties: Light buff-col powder; very slightly soluble in water; more readily so in dilute hydrochloric acid.

Uses: Suggested as an addition agent in the fortificat foods.

Grades: Food.

Containers: 100-lb. net fiber drums.

Shipping Classification: Chemicals NOIBN.

FERROPHOSPHORUS *(Iron Phosphide)* — ORGANIC DIVISION

Standard Form: Chill cast lumps, egg size, ½ inch

Typical Analysis: A gray alloy of iron and phos which fractures easily; contains 23–26% phosphorus

Uses: Used in iron and steel castings to increase fluid sheet steel to prevent sticking of sheets in final in wire to give stiffness and better surface for drawing pigment.

Containers: Bulk; 500-lb. bbls.

Shipping Classification: Ferrophosphorus.

FORMALDEHYDE— PLASTICS DIVISION

Formula: HCOH

0685184

TOWOLDMON0007049

'orm: An aqueous solution containing 37% by dissolved formaldehyde gas and 0 to 9%

ons: Clear and free of foreign sediment; color not in 5 APHA; specific gravity 1.0900–1.1136 on methanol content); assay 37.0% by weight, acidity no greater than 6.5 equivalents per % as formic acid); iron no greater than 1 part ; methanol 0 to 4% (methanol-free) and 6 to ed).

emical intermediate; used in the preparation of s and disinfectants; reacts with phenol in the e of plastics products having various properties.

: 55-gal. nonreturnable drums; tank cars; tank

Classification: Formaldehyde.

ACID — ORGANIC DIVISION

Weight: 116.07

HOOC(CH=)COOH(trans)

Form: Fine white granular crystals.

ons: Assay 99.6% min.; ash 0.02% max.; color hol) APHA 10 max.

s a resin intermediate in the surface coating, and polyester industries. Its high melting point higher softening point resins of those types; thalic alkyds, straight fumaric alkyds, up- ing oils and adducts with rosin and terpenes. is as the acidulant for gelatin.

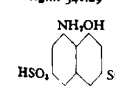
: 50-lb. bags.

Classification: Acid NOIBN Dry.

IGANIC DIVISION

ophthol-3,6-sodium Acid Disulfonate)

Weight: 341.29



'orm: Powder.

ons: Gray powder; 84–88% monosodium salt.

ntermediate in the manufacture of dyestuffs.

: 100-lb. bags.

Classification: Dye intermediate NOIBN.

RTIALLY HYDROGENATED

—ORGANIC DIVISION

'orm: Liquid.

formation—Properties: A clear, mobile, high- rocarbon; almost colorless, oily liquid with faint, lor; density 1.004 ±0.003 at 25°/15.6°C.; wt. 17 (average); refractive index 1.5675 ±0.0075 at luble in water; miscible in all proportions at erature with a number of solvents and oils.

' cost secondary plasticizers for vinyl sheeting, ed vinyl fabric or paper coatings. Plasticizer for ive coatings and adhesives. Used to plasticize e extrusions, tubing, wire coating and injection olding compounds made from vinyl resins. or styrene water dispersion paints, paper coat- ers and styrene casting resins.

Containers: Tank cars; 400-lb. drums.

Shipping Classification: Resin Plasticizer.

Literature: "HB-40," Technical Bulletin P-104.

"HI-GLOSS REZ" INTERIOR LUSTER WOOD FINISH

—MERCHANDISING DIVISION

General Information—Properties: A clear, synthetic resin for high-gloss interior wood finish. Useful over "Rez", "White Rez" or "Color-Toned Rez" treated surfaces to provide high luster finish; or deluxe satin finish when rubbed with pumice and oil. Comes ready-to-use for brush application. One gallon covers approximately 300 to 400 sq. ft.

Containers: 1-gal. cans (4 /case); 1-qt. cans (12 /case); 1-pt. cans (24 /case).

Shipping Classification: Wood Filler Liquid.

Literature: Rez Color Card Folder.

HOUSEHOLD PRODUCTS (See page 71)
(Consumer Products)

HYDROCHLORIC ACID *(Muriatic Acid)*

—INORGANIC DIVISION

Molecular Weight: 36.47

Formula: HCl

Standard Form: Liquid.

Typical Analysis: 18°Bé., 27.9% HCL; 20°Bé., 31.5% HCl; 22°Bé., 35.2% HCl.

Uses: Used extensively in the starch, glucose, gelatin, steel galvanizing, paper, leather and glass industries. (See table in general data section.)

Grades: 18°Bé.; 20°Bé.; 22°Bé.

Containers: Tank trucks; 30 to 40-ton tank cars.

Shipping Classification: Muriatic Acid.

"INSOLUBLE SULFUR 60" — ORGANIC DIVISION

Standard Form: Powder.

Specifications: Greenish-yellow powder; 100% through 50 mesh; heat loss 1.4% max.; CS_2 insoluble 50.0% min.

Uses: Curing agent; in the rubber industry replaces regular sulfur where blooming of the raw stock is undesirable.

Containers: 100-lb. paper bags.

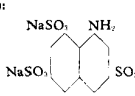
Shipping Classification: Sulfur Ground.

Literature: "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

KOCH ACID — ORGANIC DIVISION
(1-naphthylamine-3,6,8-trisulfonic acid, disodium salt)

Molecular Weight: 427

Formula:



Standard Form: Powder.

Typical Analysis: 85–90% disodium salt.

Uses: An intermediate in the manufacture of dyestuffs.

Containers: 100-lb. bags.

TOWOLDMON0007050

LAMPBLACK — INORGANIC DIVISION

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
BTA	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 $2\frac{1}{4}$ 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.

Containers: Paper bags and cartons.

Shipping Classification: Lampblack NOIBN when wt. per cu. ft. is under 17-lbs.; Lampblack Compressed when wt. per cu. ft. is 17-lbs. or over.

Literature: "Monsanto Lampblacks," Technical Booklet I-155.

LEAD ORTHOPHOSPHATE, TRI — INORGANIC DIVISION

Molecular Weight: 811.59

Formula: Essentially $Pb_3(PO_4)_2$

Typical Analysis: PbO, 81.8%; P_2O_5, 18.0%; H_2O, 0.2%.

General Information—Properties: White, dense microcrystalline powder; insoluble in water.

Uses: Suggested as a pigment.

Containers: 100-lb. fiber drums.

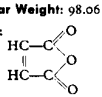
Shipping Classification: Chemicals NOIBN.

Literature: "Lead Phosphates," Technical Bulletin P-31.

MALEIC ANHYDRIDE — ORGANIC DIVISION

Molecular Weight: 98.06

Formula:



Standard Form: Briquettes.

Specifications: White briquettes; crystallizing point 52.0°C. min.; water solution (4 gms. in 10 ml) clear and colorless; iron 0.0005% max.

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

Containers: 200-lb. fiber drums.

Shipping Classification: Maleic Anhydride.

"MEDO-GREEN" SILAGE GRADE SODIUM meta BISULFITE — INORGANIC DIVISION

Molecular Weight: 190.13

Formula: $Na_2S_2O_5$

Uses: Used in putting up grass silage to prevent bacter activity, which causes fermentation and decay. Insures sweet smelling silage of green color and high carotene co tent and good palatability.

Containers: 100-lb. bags.

"MERLON" TEXTILE PROCESSING AND FINISHI AGENTS — PLASTICS DIVISION

Textile chemicals recommended for processing and fini ing textile fibers and fabrics.

"MERSIZE" PAPER SIZING AGENT — ORGANIC DIVISION

Standard Form: Paste and dry flakes.

General Information: "Mersize" RM is a complete for fied rosin size available as 70% and 77% solids, pastes a in dry form. "Mersize" CD-2 is an additive used to form rosin size and is available as a 50% solids liquid and dry form.

Uses: "Mersize" is used in paper manufacture to impr water resistance. It reduces sizing costs and makes possi higher, more uniform sizing as compared to rosin size.

Containers: Liquid form: 6,000, 8,000 and 10,000-gal. ta cars; 500-lb. drums. Dry form: 50-lb. bags.

Shipping Classification: Rosin Sizing NOIBN.

Literature: "Better Sizing at Lower Cost with Mer CD-2," booklet; "Mersize RM," booklet; "Mersize Dry," Technical Data Sheet.

"MERTONE" WB-2 and WB-4 PRECOAT FOR REPRODUCTION PAPERS — INORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: A 15% and 30% respectively colloidal dispersion of silica in water; odorless

Uses: As a precoat on blueprint and other reproduction papers for clearer, more legible prints. On blueprint darker, more lively blue is obtained. Also used on dia paper, blueprint cloth, negative paper and Van Dyke pap Precoating is performed by coaters. A license from Mon santo is required to employ the silica precoat process whi uses "Mertone."

Containers: 55-gal. lined steel drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Mertone WB-2," Technical Bulletin I-124.

METHANOL — PLASTICS DIVISION

Molecular Weight: 32.04

Formula: CH_3OH

Standard Form: Liquid.

Uses: Methanol is one of the best-known organic solve and chemical intermediates. It is commonly used as automotive anti-freeze.

Containers: 55-gal. nonreturnable drums; tank cars.

Shipping Classification: Methanol.

0685186

TOWOLDMON0007051

HIONINE HYDROXY ANALOGUE (MHA)
lcium salt of DL-alpha-hydroxy-gamma-
ylmercaptobutyric acid) — ORGANIC DIVISION

Molecular Weight: 338.2

Equivalent Weight: 169.1

Formula: $CH_3—S—CH_2—CH_2—\underset{\displaystyle OH}{\underset{|}{CH}}—COOCa_{1/2}$.

Specifications: Assay, 25% calcium salt of methionine hydroxy analogue 1% moisture max.; color, 200 Hazen max.; screen analysis, 1% max. on 20 mesh; toxicity, LD_{50} equal to or greater than 7 gm per kg. rat; density 30 lb./cu. ft. (tapped).

General Information—Properties: Nutritionally equivalent to DL-methionine on a molecular basis, 1.2 lb. of MHA (calcium salt) being equivalent to 1 lb. of DL-methionine. The methionine hydroxy analogue appears to be a metabolite in the animal's utilization of methionine.

Uses: As feed supplement in poultry feed to supply requirement of methionine. Also being investigated to supply methionine requirement in suckling pigs.

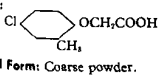
Containers: 100, 50 and 25-lb. Leverpaks.

Literature: "Monsanto's Methionine Hydroxy Analogue," folder.

THYL-4-CHLOROPHENOXYACETIC ACID (MCP)
RGANIC DIVISION

Molecular Weight: 200.62

Formula:



Standard Form: Coarse powder.

Specifications: Tan to brown powder; assay 90% min. ester isomer, 96% min. total MCP isomers; moisture 0.5% max.

Uses: Possesses herbicidal properties similar to 2,4-D. However, specificity and tolerance are different on certain weeds and some crops, such as flax and rice.

Containers: Fiber drums.

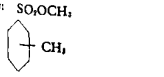
Shipping Classification: Weed Killing Compound NOIBN Rail; Agricultural Herbicide NOIBN—Other than Liquid—Truck.

Literature: "MCP-90," Technical Data Sheet.

THYL TOLUENESULFONATE — ORGANIC DIVISION

Molecular Weight: 186.22

Formula:



Standard Form: Liquid.

Specifications: Light amber to light brown liquid; assay % min., chlorides 0.01% max.; moisture 0.25% max.

Uses: Dye intermediate, alkylating agent. Catalyst for alkyd and other organic ester preparations, photographic chemicals and pharmaceutical intermediates.

Containers: 500-lb. net, steel drums.

Shipping Classification: Chemicals NOIBN.

MONOCHLOROBENZENE — ORGANIC DIVISION

Molecular Weight: 112.56

Formula:



Standard Form: Liquid.

Specifications: Clear, almost colorless liquid. Distillation range: first drop 131.5°C. min.; 95% (1–96 ml) 0.5°C. max.; 100% 1.0°C. max.; dry point 133.0°C. max.

Uses: Used principally as an intermediate in the preparation of the various substituted chlorobenzenes which are in turn intermediates for the preparation of dyestuffs, explosives, insecticides and various other organic chemicals. Also used as an organic solvent.

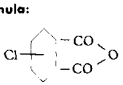
Containers: 450-lb. steel drums; tank cars.

Shipping Classification: Chlorobenzol.

MONOCHLOROPHTHALIC ANHYDRIDE
(Mixture of 3 & 4 isomers) — ORGANIC DIVISION

Molecular Weight: 182.56

Formula:



Standard Form: Flakes.

Specifications: Appearance practically white flakes; assay 98.5 to 103.0%; free chlorides 0.01% max.; crystallizing point 59.5 to 64.5°C.

Uses: As a dye intermediate.

Containers: 200-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

"MONSANTO DETERGENT MXP"
— INORGANIC DIVISION

General Information—Properties: Non-dusty, built detergent based on a non-ionic synthetic wetting agent.

Uses: A highly efficient detergent with controlled sudsing action. Especially applicable where minimum suds are required. Since it is built with water-softening chemicals it is effective in either hard or soft water.

Containers: 100-lb. bags; 300 and 100-lb. drums.

Shipping Classification: Washing Compound NOIBN Powder.

Literature: "Monsanto Detergent MXP," Technical Bulletin I-122.

"MONSANTO FIRE RETARDANT A"
— INORGANIC DIVISION

General Information—Properties: A substantially neutral mixture of ammonium phosphates containing a wetting agent to improve penetration.

Uses: Flame-retardant treatment of wood and paper.

Containers: 100-lb. bags; 300 and 100-lb. fiber drums.

(Continued on next page)

0685187

TOWOLDMON0007052

Shipping Classification: Ammonium Phosphate.

Literature: "Monsanto Fire Retardant A," Technical Bulletin I-29.

"MONSANTO PENTA" (PENTACHLOROPHENOL, TECHNICAL)— ORGANIC DIVISION

Molecular Weight: 266.35

Formula: OH



Standard Form: Flakes.

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.

General Information—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.

"Monsanto Penta" and its solutions and formulations may be irritating to the skin and mucous membranes and are somewhat toxic to man and the higher animals. Precautions suggested for handling should be observed.

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").

Containers: 100-lb. fiber drums, 50-lb. paper bags.

Shipping Classification: Pentachlorophenol.

Literature:
"Monsanto Penta (Santophen 20)," Technical Bulletin O-25.
"Chemicals for Termite Control," Technical Bulletin O-13.
"Determination of Chlorophenols and Their Salts in Impregnated Materials," Technical Bulletin O-24.
"Toxicology and Dermatology of Pentachlorophenol and Sodium Pentachlorphenate," booklet.
"Wood Preserving Applications with Monsanto's Penta," 7-page booklet.
"MP (Maximum Protection)," folder.
"Monsanto Products for Paint Preservation," Bulletin 12054-H.
"Penta the Best Protection for Poles and Cross Arms," booklet.
"Penta to Preserve Wood on the Farm," booklet.
"Fence Posts, Make Them Last," folder.
"Monsanto Pentachlorophenol . . . In Industrial Construction," folder.
"Weed Control With Santobrite and Santophen 20," booklet.
"Chemical Weed Control on Rights of Way," booklet.
"Chemical Weed Control in Orchards and Vineyards," booklet.
"Specify Monsanto Penta," 16-page booklet.
"Your Answer Book on Penta Wood Preservation," 40-page booklet.
"Sweet's Catalog Reprint" (with Treating Plant List).

"MONTAR" SYNTHETIC RESINS— ORGANIC DIVISION

Standard Form: Resin.

General Information—Properties: A series of related brown-to-black resins of the following typical characteristics:

	SOFTENING POINT	% Cl	% CaO	% R
"Montar" 3	120–170°C.	50–52	5–10	0.3–0.5
"Montar" 4	140–200°C.	54–56	5–10	0.5–0.7
"Montar" 5	120–250°C.	53–55	1–3	0.1–0.3
"Montar" 6	150–210°C.	59–61	2–5	0.2–0.4
"Montar" 9	130–160°C.	—	—	0.2–0.4

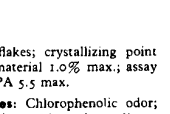
Containers: 100-lb. paper bags.

Shipping Classification: Coal Tar Resin.

"NIRAN" INSECTICIDE *(Monsanto Parathion)* —ORGANIC DIVISION

Molecular Weight: 291.27

Formula:



Standard Form: Liquid.

Specifications: Brown liquid; assay 98.5% min.; crystallizing point 0°C. min.; Sp. Gr. 1.26–1.28 at 25°/25°C.

General Information—Properties: Miscible with aromatic and polar solvents; only slightly miscible in paraffin solvents and water. Relatively noncorrosive to metals of construction and containers. Toxic to animals but has low plant toxicity.

Uses: Insecticide having high activity against a wide variety of insects and mites. May be formulated as an emulsion, dust, wettable powder or aerosol.

Containers: 5-gal. drums; 55-gal. steel drums.

Shipping Classification: Insecticide Agricultural NOI, Liquid. Class B "Poison" label required.

Literature: "Niran," Technical Bulletin O-52; "Handling Parathion Safely," folder.

NITRATING ACID *(Mixed Acid)*— INORGANIC DIVISION

Standard Form: Liquid.

Typical Analysis:	80-15	45-5
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 %	0.35

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

Containers: 110-gal. drums; 75 and 50-ton tank cars.

Shipping Classification: Nitrating Acid Corrosive liquid (white label required).

NITRIC ACID— INORGANIC DIVISION

Molecular Weight: 63.01

Formula: HNO_3

Standard Form: 36° Bé., 38° Be., 40° Be., and 42° Be.

Typical Analysis: % HNO_3: 36° Be., 52.3%; 38° Be., 56.5%; 40° Bé., 61.4%; 42° Be., 67.2%. Sp. Gr. will vary more than 0.5° terms of Be., H_2SO_4, 0.05% max., 0.002% max. Also higher strengths

Uses: Manufacture of insecticides, dyestuffs, drugs, pharmaceuticals, explosives, photoengraving, nitrates and other products. (See table in general data section

Containers: Tank trucks; 50-ton tank cars

Shipping Classification: Nitric Acid. Corrosive liquid (white label required).

0685188

TOWOLDMON0007053

o-NITROANILINE — ORGANIC DIVISION

(Also known as ortho-aminonitrobenzene)

Molecular Weight: 138.12

Formula: NH_2, NO_2

Standard Form: Flakes.

Specifications: Yellow-to-orange flakes; M.P. 70.0°C. min.; Assay: 98.70% min.

General Information—Properties: Has a tendency to set-up in lumps on standing. It is recommended that it be milled to proper fineness just before using. The addition of 0.5% tricalcium phosphate reduces the caking tendency. CAUTION: This product is toxic. Avoid breathing its dust and avoid contact with the skin.

Uses: An intermediate in the preparation of dyestuffs and in the manufacture of medicinals.

Containers: 175-lb. fiber drums; steel tank cars.

Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

o-NITROANISOLE — ORGANIC DIVISION

(Also known as ortho-nitrophenylmethyl ether and methoxynitrobenzene)

Molecular Weight: 153.13

Formula: OCH_3, NO_2

Standard Form: Liquid.

Specifications: Light reddish or light amber liquid; crystallizing point 9.6°C. min. dry basis. Distillation range: first drop 270.0°C. min.; 95% 2.0°C. max.; dry point 273.0°C. max.; nitrophenol 0.05% max.

Uses: Production of such dye intermediates as ortho-anisidine and dianisidine; various organic syntheses. CAUTION: This product is toxic. Avoid breathing its vapors and avoid contact with the skin.

Containers: 550-lb. steel drums.

Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

o-NITROBIPHENYL, TECHNICAL

(Also known as ortho-nitrodiphenyl) — ORGANIC DIVISION

Molecular Weight: 199.20

Formula: NO_2

Standard Form: Crystalline solid, or oily liquid.

General Information—Properties: Light greenish-yellow to dark reddish-brown crystalline solid or oily liquid; crystallizing point 34.5°C. min.; B.P. 325°C. approx.

Uses: An intermediate in chemical synthesis where it is useful in some applications as an alternate for substituted nitrobenzenes. A plasticizer with wide compatability and low rate of hydrolysis; compatible with the cellulose esters and ethers, polyvinyl chloride, polyvinyl butyral, polyvinyl acetate, polystyrene, rosin and rosin esters, modified phenolic resins, oil-soluble phenolics, alkyd resins and vegetable oils.

Containers: 525-lb. steel drums.

Shipping Classification: Dye Intermediate NOIBN.

Literature: "ortho-Nitrobiphenyl Technical Plasticizer & Chemical Intermediate," Technical Bulletin O-78; "ortho-Nitrobiphenyl Technical Toxicity Data," Technical Bulletin O-D-700; "Monsanto Plasticizers," 64-page booklet.

meta-NITROCHLOROBENZENE — ORGANIC DIVISION

(Also known as meta-chloronitrobenzene)

Molecular Weight: 157.56

Formula: Cl, NO_2

Standard Form: Cast solid.

Specifications: Greenish-yellow crystalline mass, clear when melted; crystallizing point 43.9°C. min.

Uses: For conversion into various dyestuff intermediates, chloroanilines and chlorobenzidines. CAUTION: This product is toxic. Avoid breathing its vapors. Avoid contact with the skin. Toxicity reference: U. S. Public Health Bulletin No. 271 (1941).

Containers: 550-lb. drums.

Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

ortho-NITROCHLOROBENZENE — ORGANIC DIVISION

(Also known as ortho-chloronitrobenzene)

Molecular Weight: 157.56

Formula: Cl, NO_2

Standard Form: Cast solid.

Specifications: Greenish-yellow crystalline mass; crystallizing point 31.7°C.

Uses: Preparation of dyestuff intermediates and organic synthesis. CAUTION: This material is toxic. Avoid breathing its vapors. Avoid contact with the skin. Toxicity reference: U. S. Public Health Bulletin No. 271 (1941).

Containers: 550-lb. steel drums; tank cars.

Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

Literature: "ONCB: Properties & Reactions," Technical Bulletin O-11.

para-NITROCHLOROBENZENE

(Also known as para-chloronitrobenzene)

— ORGANIC DIVISION

Molecular Weight: 157.56

Formula: Cl, NO_2

Standard Form: Flakes.

(Continued on next page)

0685189

TOWOLDMON0007054

Specifications: Light greenish-yellow flaked solid; can also be supplied in fused form; crystallizing point 82.5°C. min.

Uses: Preparation of dyestuff intermediates and pharmaceuticals. CAUTION: This product is toxic. Avoid breathing its vapors and avoid contact with the skin. Toxicity reference: U. S. Public Health Bulletin No. 271 (1941).

Containers: 325-lb. fiber drums.

Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

para-NITROPHENOL — ORGANIC DIVISION

(Also known as para-hydroxynitrobenzene)

Molecular Weight: 139.11

Formula: OH



Standard Form: Granules

Specifications: Brown granular mass; M.P. (dry basis) 112.0°C. min.; assay 96.5% min.; water-insoluble material 0.20% max.; methanol-insoluble material 0.45% max.

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

Containers: 200-lb. fiber drums.

Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

"OILFOS" GLASSY SODIUM PHOSPHATE — INORGANIC DIVISION

Standard Form: Dry powder.

General Information—Properties: "Oilfos" is used exclusively for controlling viscosity of oil well drilling muds.

Containers: 100-lb. net paper bags; triotex bags.

Shipping Classification: Phosphate of Soda.

ortho-PHENETIDINE — ORGANIC DIVISION

(Also known as ortho-aminophenylethyl ether, ortho-aminophenetole and 2-aminoethoxybenzene)

Molecular Weight: 137.18

Formula: OC_2H_5



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.; dry point 234.0°C. max.; solubility in HCl complete.

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

Containers: 450-lb. steel drums.

Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

para-PHENETIDINE — ORGANIC DIVISION

(Also known as para-aminophenylethyl ether, para-aminophenetole and 4-aminoethoxybenzene)

Molecular Weight: 137.18

Formula: OC_2H_5



Standard Form: Liquid.

Specifications: Dark red liquid; crystallizing point 4.0°C. min. Distillation range: first drop 248.0°C. min.; 95% (1–96 ml) 2.0°C. max.; dry point 251.0°C. max.; solubility in HCl opalescent max.

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

Containers: 450-lb. steel drums.

Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

PHENOL — ORGANIC DIVISION

(Also known as carbolic acid and hydroxybenzene)

Molecular Weight: 94.11

Formula: OH



Standard Form: Solid or liquid.

Specifications: *Crystalline solid, U.S.P.:* White crystalline solid; melt, colorless mobile liquid; solution in water (1:1) clear and colorless; non-volatile residue (100°C.) 0.01% max.; 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.
Liquids: Colorless mobile liquids; assay: liquid 85%, 85–86.0%; liquid 88%, 88.0–89.0%.

Uses: An intermediate in the production of dyestuffs; production of resins for molding; preparation of varnishes, enamels, lacquers and paints; selective solvent in the manufacture of lubricating oils; disinfectant; textile printing; production of explosives, synthetic tanning materials, pharmaceuticals and medicinals, antiseptics, germicides and preservatives, deodorants, soaps, embalming fluid, vermin exterminators, rubber compounds and photographic chemicals. CAUTION: This product is toxic. Avoid breathing vapors and contact with the skin.

Grades: Crystalline solid, U.S.P.; liquid 85%; liquid 88%

Containers: 475-lb. steel drums; 200-lb. tins; tank cars.

Shipping Classification: Phenol. "Poison" label required.

Literature: "Safe Handling of Phenol," booklet.

PHENOLPHTHALEIN, U.S.P. — ORGANIC DIVISION

Molecular Weight: 318.31

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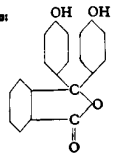
TOWOLDMON0007055

Formula:



Standard Form: Powder.

Specifications: White powder; 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 fluorane and heavy metals; trace max. retained on 100 mesh.

Uses: Pharmaceutical preparations.

Containers: 250, 100 and 50-lb. fiber drums; 25-lb. boxes.

Shipping Classification: Chemicals NOIBN.

PHENOLPHTHALEIN, YELLOW, Not U.S.P.

—ORGANIC DIVISION

Standard Form: Powder.

Specifications: Yellow powder; M.P. 257.0°C. min.; loss on drying 0.50% max.; ash 0.10% max.; acidity (ml N/1000 sodium hydroxide per 2 gm. sample) 5.0 ml max.; solution in ethyl alcohol 95% (1:15) complete; none retained on 20 mesh.

Uses: Pharmaceutical preparations.

Containers: 150, 100 and 50-lb. fiber drums; 25-lb. boxes.

Shipping Classification: Chemicals NOIBN.

PHENOLSULFONIC ACID —ORGANIC DIVISION

Molecular Weight: 174.17

Formula: $HOC_6H_4SO_3H$

Standard Form: Liquid or crystalline mass.

General Information—Properties: Available as either a 65% or 70% aqueous solution. Light brown-to-black liquid or crystalline mass depending on temperature; assay 65% min. or 70% min., contains small amounts of free sulfuric acid, phenols and sulfones.

Uses: An intermediate in chemical manufacture and in tin plating operations.

Containers: 600-lb. steel drums.

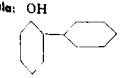
Shipping Classification: Acid NOIBN Liquid.

o-PHENYLPHENOL, TECHNICAL

—ORGANIC DIVISION

Molecular Weight: 170.20

Formula:



Standard Form: Crystalline mass.

Specifications: White to yellow solid; crystallizing point, 56-60°C., Sp. Gr. @ 90/15.5°C., 1.066 to 1.078.

Uses: An intermediate in the manufacture of bactericides, germicides and preservatives; as a "carrier" in dyeing Dacron.

Containers: 475-lb. steel drums.

Shipping Classification: Insecticide Agricultural NOIBN other than liquid.

Literature: Technical Data Sheet.

PHOSPHATIC FERTILIZER SOLUTION

—INORGANIC DIVISION

Standard Form: Liquid.

General Information—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).

Containers: Tank cars and tank trucks.

Shipping Classification: Phosphatic fertilizer solution.

PHOSPHORIC ACID *(Orthophosphoric Acid)*

—INORGANIC DIVISION

Molecular Weight: 98.00

Formula: H_3PO_4

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

General Information—Properties: Density and composition of water solutions of orthophosphoric acid at 15°/4°C.

DENSITY GM./CC.	DECREASE PER 1°C.	$\%H_3PO_4$	$\%P_2O_5$	%P
1.100	0.00030	17.52	12.69	5.54
1.150	0.00035	25.25	18.29	7.98
1.200	0.00045	32.52	23.55	10.28
1.250	0.00050	39.22	28.41	12.40
1.300	0.00055	45.51	32.96	14.39
1.339	0.00055	50.00	36.21	15.81
1.350	0.00060	51.22	37.10	16.19
1.400	0.00060	56.85	41.17	17.97
1.450	0.00060	62.27	45.10	19.68
1.500	0.00065	67.35	48.78	21.29
1.550	0.00070	72.11	52.23	22.79
1.581	0.00077	75.00	54.32	23.71
1.600	0.00075	76.75	55.59	24.26
1.650	0.00075	81.30	58.88	25.70
1.693	0.00080	85.00	61.56	26.87
1.700	0.00080	85.63	62.02	27.07
1.750	0.00080	89.88	65.10	28.41
1.800	0.00080	94.15	68.19	29.76
1.850	0.00080	98.13	71.07	31.02
1.874	0.00080	100.00	72.43	31.61

The density of more concentrated acids increases approximately linearly (within the range 72.44% to 85% P_2O_5) with the excess P_2O_5 over 72.44% according to the equation: Density at 15°/4°C. = 1.874 + 0.0171 ($\%P_2O_5$ — 72.43).

Uses: To increase translucency and improve color of porcelains and as a vitrifying agent and flux; manufacture of sodium phosphates, ammonium phosphates, calcium phosphates and other phosphates; production of albumin derivatives; drying agent in the synthesis of various intermediate chemicals and dyes; process engraving and litho trades; penetrant to aid in the absorption of the gum on envelopes; 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; glycerophosphate manufacture and purification of hydrogen peroxide; for brightening the finish on rope and twine; coagulant of rubber latex; manufacture of rustproofing compounds; silage preservation; defecating and clarifying agent in sugar; for brightening the color of silk; dyeing of cotton; calico printing; water soften-

(Continued on next page)

0685191

TOWOLDMON0007056

ing and correction of alkalinity; bright polishing of aluminum; electro polishing of stainless and carbon steels; steel pickling; manufacture of special bricks; petroleum catalyst.

Grades: U.S.P.; food, meets all U.S. Pure Food Law requirements; commercial, clear, water-white liquid; Phosilage, meets all U.S. Food Law requirements.

Containers: 53/55-gal. (675-lb. approx.) oak bbls.; 15 and 55-gal. stainless steel drums; 13-gal. carboys; tank cars and tank wagons.

Shipping Classification: Phosphoric Acid.

Literature: "Phosphoric Acid," Technical Bulletin I-26; "The Handling of 75% Phosphoric Acid in Tank Car Quantities," booklet; "Phosphoric Acid as a Catalyst," leaflet.

PHOSPHOROUS ACID — INORGANIC DIVISION

Molecular Weight: 82.00

Formula: H_3PO_3

Specifications: Clear, water-white liquid, miscible with water in all proportions as 70% H_3PO_3.

General Information—Properties: Typical values: Sp. Gr. 1.420 at 25°C.; electrical conductivity—approx. 0.15 reciprocal ohms; boiling point 70% solution—125°C. at 760 mm. Solution becomes saturated at −20°C. and freezes solid at approx. −50°C. Refractive index of supercooled 100% H_3PO_3 at 30°C. is 1.4420.

Uses: Intermediate in production of phosphites. Strong though sometimes slow reducing agent.

Containers: 13-gal. carboys.

Shipping Classification: Acids, NOIBN, liquid.

Literature: "Phosphorous Acid," Technical Bulletin P-32.

PHOSPHORUS, ELEMENTAL — INORGANIC DIVISION

(Also known as yellow phosphorus and white phosphorus)

General Information—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.

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

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

Containers: 400-lb. drums; tank cars.

Shipping Classification: Phosphorus Yellow. Toxic and inflammable (yellow label required).

Literature: "Phosphorus the Light Bearer," booklet.

PHOSPHORUS OXYCHLORIDE

(Also known as phosphoryl chloride)

— INORGANIC DIVISION

Molecular Weight: 153.35

Formula: $POCl_3$

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 It reacts with water with explosive violence.

Containers: 725-lb. nickel drums; 4,000 and 8,000 nickel tank cars.

Shipping Classification: Phosphorus Oxychloride. Corrosive liquid (white label required).

Literature: "Phosphorus Trichloride and Phosphorus Oxychloride," Technical Bulletin I-35.

PHOSPHORUS PENTASULFIDE — INORGANIC DIVISION

Molecular Weight: 222.26

Formula: P_2S_5

Standard Forms: Yellow powder, lump or solid.

Uses: Manufacture of oil additives, insecticides, organic tion chemicals.

Containers: 150-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

PHOSPHORUS PENTOXIDE

(Also known as phosphoric anhydride, phosphoric and solid P_2O_5) — INORGANIC DIVISION

Molecular Weight: 141.96

Formula: P_2O_5

Standard Form: White microcrystalline powder.

Typical Analysis: P_2O_5—99.5%; lower oxides .01 P_2O_3; color 60% water solution 50 APHA.

General Information—Properties:

VAPOR PRESSURES: [after J. C. Southard and R. A. Nel J.A.C.S., 59,911 (1937)]

p = vapor pressure in cm. of mercury
T = absolute Temperature

A (low temperature form) $\log_{10}p = 9.792 - (50$
B (high temperature form) $\log_{10}p = 11.113 - (79$
L (liquid) $\log_{10}p = 6.809 - (45$

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}

Uses: As a desiccant; in the production of alkyl phosph a catalyst in air blown asphalt; in the manufactur fluorophosphates; in the making of phosphorus insectici and in the production of oil additives.

Containers: 400 and 60-lb. drums.

Shipping Classification: Phosphoric Anhydride. (Ph mable—yellow label required.)

PHOSPHORUS TRICHLORIDE — INORGANIC DIVISION

Molecular Weight: 137.35

Formula: PCl_3

Typical Analysis: Water-white liquid; assay 99. PCl_3; Sp. Gr. 15.5°C./15.5°C. 1.586; distillation range first drop 74.8, 1–96 ml 0.9, dry point 76.0.

Uses: A chlorinating agent and catalyst in the preparat various intermediates and dyestuffs; reagent in the pr tion of acetic anhydride, organic phosphates, germicid medicinals; manufacture of phosphorus oxychlorid

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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.

Containers: 675-lb. (approx.) nickel drums; 4,000 and 8,000-gal. nickel tank cars.

Shipping Classification: Phosphorus Chloride. "Corrosive" liquid label required.

Literature: "Phosphorus Trichloride and Phosphorus Oxychloride," Technical Bulletin 1-35.

PHTHALIC ANHYDRIDE — ORGANIC DIVISION

Molecular Weight: 148.11

Formula:



Standard Form: Flakes.

Specifications: White flakes; assay essentially 100%.

Uses: An intermediate in the production of dyestuffs, perfume bases, alcohol denaturants, pharmaceuticals and plasticizers such as dibutyl phthalate, dimethyl phthalate, diethyl phthalate, phthalyl glycolates and alkyd and polyester resins.

Containers: 80-lb. bags.

Shipping Classification: Phthalic Anhydride.

PHTHALYL CHLORIDE *(Phthaloyl Chloride)*

ORGANIC DIVISION

Molecular Weight: 203.03

Formula:



Standard Form: Liquid.

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

Uses: Manufacture of plasticizers and resins.

Containers: 500-lb. nickel drums.

Shipping Classification: Chemicals NOIBN. Corrosive liquid (white label required).

plastics, adhesives

CASEIN AND SOYBEAN ADHESIVES — PLASTICS DIVISION

Standard Form: Dry Powder.

General Properties and Performance Characteristics: Exceptionally good for low-temperature applications and glue bonding where superior water-resistance is desired.

Uses: Bonding and cold setting glues used in the manufacture of plywood, furniture, case goods of all types. Also used in Monsanto's patented No-Clamp Process for making plywood as well as in nail pressure gluing operations.

Containers: Multiwall bags and fiber drums.

Shipping Classification: Glue, dry or liquid, NOIBN.

Literature: Product Information Bulletin, Data Sheet.

"LAUXITE" UREA, PHENOLIC, MELAMINE AND RESORCINOL RESINS — PLASTICS DIVISION

Standard Form: Dry powders; liquids.

General Properties and Performance Characteristics: Various properties are available for requirements demanding water and weather resistance, gluing, strength and quick-setting.

Uses: Bonding, cold setting and impregnating adhesives and glues for furniture, plywood and aircraft. Used for hot and cold pressing and for radio frequency equipment. "Lauxite" is also used in the molding of diversified components from granulated wood.

Containers: Multiwall bags and fiber drums for solids; metal drums and tank cars for liquids.

Shipping Classification: Glue, dry or liquid, NOIBN.

Literature: Data Sheets, Product Information Bulletins.

bonding, impregnating and coating resins

"BUTVAR" VINYL BUTYRAL — PLASTICS DIVISION

Standard Form: Dry resin.

General Properties and Performance Characteristics: Good resistance to alkalis, sunlight, vegetable oils, greases and water. Forms coatings with good tensile strength, impact and abrasion resistance.

Uses: Used in compounding protective metal coatings, linings, wood sealers applied by spray or brush methods. Offered in four grades, varying in solubility or in polyvinyl alcohol content.

Containers: Multiwall paper bags.

Shipping Classification: Synthetic plastics O T Liquid NOIBN—Rail; Synthetic resin powder—Truck.

Literature: Product Information Bulletin; Data Sheets.

"LUSTREX" STYRENE — PLASTICS DIVISION

Standard Forms: Plasticized or unplasticized powders or latices.

General Properties and Performance Characteristics: "Luxtrex" latices form the basis of new post-plasticized styrene system for water-base paints. "Lustrex" alkali soluble resin is a stabilizer, film hardener and adhesion promoter in water emulsion systems.

Uses: Main vehicle and protective colloid for water-base paints. Treating resin for industrial uses such as battery separators.

Containers: Drums or tank cars for liquid types; multiwall bags for solid types.

Shipping Classification: Resins synthetic—varies according to type and use.

Literature: Product Information Bulletin; Data Sheet.

"LYTRON" SAND CONDITIONER — PLASTICS DIVISION

Standard Form: Finely divided, pale yellow powder.

(Continued on next page)

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General Properties and Performance Characteristics: Reduces clay balling, leads to more economical, cleaner castings.

Uses: A polyelectrolite designed especially for foundry sand systems. Improves sand workability and packability for better metal casting molds.

Containers: Nonreturnable fiber drums.

Shipping Classification: Synthetic plastic O T liquid NOIBN—Rail; Synthetic resin granules—Truck.

Literature: Product Information Bulletin; Data Sheet.

"OPALON" VINYL CHLORIDE — PLASTICS DIVISION

Standard Form: Dry Powder ("Opalon" 410).

General Properties and Performance Characteristics: When fused, plastisols of "Opalon" 410 provide tough, abrasion-resistant coatings, foams, sponges or moldings which are also resistant to alkalis, acids, greases, oils and temperature variations. Because "Opalon" 410 vinyl resin is a "stir-in" type, plastisol compounding is faster, and resulting plastisols have low viscosity.

Uses: Used in formulating quality vinyl plastisols which may in turn be used to coat cloth and paper, produce cast film or expanded products like foams and sponges; vinyl plastisols based on "Opalon" 410 are also used in slush molding and dip coating of wire products.

Containers: Multiwall bags.

Shipping Classification: Synthetic plastic other than liquid NOIBN—Rail; Synthetic resin granules—Truck.

Literature: Product Information Bulletin; Data Sheet, technical data.

"ORIZON" POLYETHYLENE — PLASTICS DIVISION

Standard Forms: Pellets and compounds.

General Properties and Performance Characteristics: Modified properties are obtainable with polyethylene when mixed with other resins, rubbers, waxes and fillers. For example, polyethylene as a wax reinforcement coating gives paper or board coatings higher gloss, greater scuff resistance, stronger heat seals and improved printability.

Uses: Military and commercial protective packaging, coverings; multiwall bags and drum liners.

Containers: Multiwall bags.

Shipping Classification: Synthetic plastic other than liquids NOIBN—Rail; Synthetic resin granules—Truck.

Literature: Technical Bulletins; Data Sheets.

POLYVINYL BUTYRAL — PLASTICS DIVISION

Standard Forms: Dry powder; resin solutions and dispersions.

General Properties and Performance Characteristics: Tough, resilient, high adhesion and good transparency.

Uses: As cloth and paper coating; adhesive, metal conditioners and component of baked coatings.

Containers: Resins—lined fiber drums; Dispersions—55-gal. nonreturnable drums; Solutions—55-gal. nonreturnable drums.

Shipping Classification: Dry—Synthetic resin granules; Solutions and dispersions—(rail or truck) Lacquer NOIBN.

Literature: Data sheet.

"RESIMENE" MELAMINE AND UREA — PLASTICS DIVISION

Standard Form: Resins in liquid solution.

General Properties and Performance Characteristics: Impart improved soap resistance, surface hardness, fast cure, better gloss.

Uses: Baked enamel and industrial finishes for appliances, automobiles and other fabricated metal items.

Containers: Nonreturnable steel drums.

Shipping Classification: Resins synthetic—varies according to type and use.

Literature: Product Information Bulletins; Data Sheets.

"RESINOX" PHENOLIC — PLASTICS DIVISION

Standard Forms: (a) Liquid or dry powder for foundry use. (b) Dry powder, ground lump or liquid resins for bonding abrasive grains and impregnating other materials; (c) special solids solution for baked enamel and industrial finishes (designated P97).

General Properties and Performance Characteristics: (a) Shell molding resins permit high production, close tolerances and superior finish. Core binder resins help increase foundry core making up to 50%. (b) Good heat and chemical resistance, insulation and strength. (c) When properly cured, coatings formulated with "Resinox" resins become resistant to acids, alkalis and almost all solvents. Excellent coating properties free from pinholes normally associated with heat reactive phenolic resins. Wide range of compatibility with unusual modifiers; good package stability.

Uses: (a) Bonding agent for shell molding and as core binders for metal casting. Monsanto also supplies phenolic resins for core binding. (b) Impregnants or bonding materials for grinding wheels, brake linings, insulation and similar industrial uses. (c) For use in can, drum and tank car linings requiring a high degree of chemical and solvent resistance; also for pipe linings, air conditioning equipment coatings, special primers, etc.

Containers: Liquids—drums, tank cars; solids—fiber drums.

Shipping Classification: Synthetic resins; varnish or lacquer glue—varies according to type and use. (Varnish—Rail label required.)

Literature: Technical Bulletins; Data Sheets.

calendering, extruding and laminating materials

"OPALON" VINYL CHLORIDE AND VINYL CHLORIDE COPOLYMERS — PLASTICS DIVISION

Standard Forms: In resin form for further compounding for calendering, extrusion, injection and compression molding. In compound and dry blend form for extrusion of wire insulation, profile shapes and injection molding of a wide variety of products and components. "Opalon" resins specially suited for dry blend operations and for preparation of plastisols.

General Properties and Performance Characteristics: Ease of processing, color uniformity, toughness, light weight, flexibility and durability imparted by "Opalon" in film and sheeting. Heat and light stability and chemical resistance, as well as extraordinary durability, recommend

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...lon" resins for profile extrusions. Quick and uniform ...rsion of "Opalon" 410 paste resins by simple stir-in ...ess yields low viscosity plastisols that produce tough, ...sion-resistant film and coatings with exceptional water ...chemical resistance. Color stability, toughness and high ...ent and filler "loadability" realized with "Opalon" ...lymers in flooring and phonograph record uses.

...s: Calendered film and sheeting. Extrusions including ...den hose, welting, belting, gasketing and assorted pro- ...shapes. Widely used for wire coating. Plastisol applica- ...include textile and paper coatings, slush molding, ...ing, film castings, flooring, expanded products like ...and sponges. "Opalon" 306B resin was specially ...loped for vinyl flooring and "Opalon" 505 for phono- ...ph records.

...tainers: Multiwall bags.

...ping Classification: Synthetic plastic O/T liquid ...BN—Rail; Synthetic resin granules—Truck.

...rature: Data Sheets; Product Information Bulletins.

...ZON" POLYETHYLENE — PLASTICS DIVISION

...dard Forms: Comes in pelleted form, natural or colored. ...y be extruded as film and sheeting, pipe, tubing and ...erous profile shapes. Can be calendered into film and ...ting and laminated immediately or in subsequent ...eration.

...eral Properties and Performance Characteristics: ...tical application range extends from +90°C. to below ...5°C. Lightest of all commercial plastics with a Sp. Gr. ...0.91–0.92. Chemical-resistant, flexible, nontoxic, odor- ...s, nonpolar, low dielectric. Tough and impact-resistant, ...is easily processed into a wide range of colors.

...s: Extruded piping, tubing, wire coating and sheathing, ...files and filaments. Laminated coating for paper, plastic ...ms, metal foils and textile fabrics or as an adhesive ...tween such materials.

...tainers: Multiwall bags.

...ping Classification: Synthetic plastic other than liquid ...OIBN—Rail; Synthetic resin granules—Truck.

...rature: Product Information Bulletins; Data Sheets.

...SMENE" MELAMINE — PLASTICS DIVISION

...dard Forms: Soluble, spray-dried powders for laminat- ...g paper, cloth and fibers.

...eral Properties and Performance Characteristics: ...oduces tough, durable, decorative surfaces in an unlimited ...or range, that will not stain or discolor, resists scratching, ...ms easily.

...s: In mar-resistant decorative laminates for furniture, ...unter tops, etc.

...tainers: Fiber drums.

...ping Classification: Glue, dry, NOIBN.

...rature: Data Sheets; Product Information Bulletins.

...NOX" PHENOLIC — PLASTICS DIVISION

...dard Forms: Supplied as solutions, applied as laminat- ...g, bonding, impregnating resins for paper, fibers.

...eral Properties and Performance Characteristics: ...ovides strong, heat-resistant (up to 300°F.) bonds that are ...o resistant to solvents, water, weak acids and alkalies.

Uses: Electrical and mechanical grades used for coil forms, switch gear, safety helmets, gears; used in treating paper core of melamine laminates.

Containers: Drums or tank cars.

Shipping Classification: Synthetic resins; varnish or liquid glue—varies according to type and use (varnish: red label required).

Literature: Data Sheets, Product Information Bulletins.

"SAFLEX" VINYL BUTYRAL — PLASTICS DIVISION

Standard Forms: Continuous adhesive film in clear, uniform density color, or graduated color.

General Properties and Performance Characteristics: Tough and resilient; excellent adhesion to glass; transparency of superior quality; reduces sun glare, softens TV picture.

Uses: Protective interlayer for laminating safety glass in automotive and TV applications.

Containers: Fiber drums; fiber boxes on pallets.

Shipping Classification: Plastic sheets not woven—Rail; Synthetic resin sheeting, plain IOP—Truck.

fabricating materials

"NITRON" CELLULOSE NITRATE — PLASTICS DIVISION

Standard Forms: 20" x 50" sheets in a variety of thicknesses and an almost limitless range of colors. For heat forming, blow molding, stamping, machining and other standard fabricating methods.

General Properties and Performance Characteristics: Exceptional toughness, beauty and pattern variety. Resilient but not elastic, resists weak acids and alkalies. Outstanding dimensional stability.

Uses: Eyeglass frames, drafting instruments, toilet seats, hamper tops, piano keys and cutlery handles.

Containers: Single fiber and bulk fiber boxes on skids.

Shipping Classification: Cellulose derivative, plastic sheets pyroxylin.

Literature: Data Sheet, Technical Information Bulletins.

"ULTRON" VINYL CHLORIDE *(Flexible Film)* — PLASTICS DIVISION

Standard Forms: Flexible film, embossed or plain, in thickness up to 10 gauge and widths up to 72". Specially formulated film with varying degrees of flexibility for industrial and agricultural applications are also available.

General Properties and Performance Characteristics: Outstanding color range and uniform gauge. Water-resistant, abrasion-resistant. Available as translucent, opaque or transparent film which may be printed, embossed or molded. Can be sealed by electronic or heat methods. Can be cemented or taped.

Uses: Draperies, shower curtains, tablecloths, wall coverings, aprons, rainwear and inflatable items. Low temperature formulations are used for outer garments and protective coverings for machinery and al fresco-stored material and supplies. "Ultron" has proved a valuable greenhouse grow-

(Continued on next page)

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ing tool and an important aid to farmers seeking a waterproof, weather-resistant silage cover. Industrial uses include moisture vapor barriers, electrical tapes, etc.

Containers: Fiber boxes. Jumbo rolls furnished on request.

Shipping Classification: Plastic film other than cellulose, not exceeding .010" in thickness.

Literature: Data Sheets, specialty application bulletins.

"ULTRON" VINYL CHLORIDE *(Rigid Sheets)*

—PLASTICS DIVISION

Standard Forms: "Ultron" rigid vinyl is available in unplasticized planished or calendered sheets, 20" x 50" trimmed size (approx. 21 1/2" x 51 1/2" untrimmed), and in calendered rolls of standard widths up to 51 1/2". Wider rolls are available on request. Calender finish rolls and sheets may be obtained in white, black and colors, opaque or translucent.

General Properties and Performance Characteristics: Self-extinguishing from the flammability angle; resists blackening even after prolonged exposure to ultra-violet rays. Readily vacuum formed into a wide variety of products ranging from lighted displays to multi-compartment packages.

Uses: Among the outstanding formulations offered in "Ultron" rigid vinyl are opaque white and translucent white. The former, because of its excellent opacity, is ideally suited for the printing of advertising novelties and displays. In translucent white formulation, "Ultron" rigid vinyl offers the industry's first material of its type especially developed for translucent, wall-to-wall ceilings.

Containers: Fiber boxes and bulk fiber boxes on skids.

Shipping Classification: Plastic Sheeting.

Literature: Data Sheets.

"VUEPAK" CELLULOSE ACETATE—PLASTICS DIVISION

Standard Forms: This crystal-clear rigid film for packaging is available in continuous, untrimmed and slit-to-size rolls up to 60" wide and 2,000' long, .005" to .020" thick. Also in stock size sheets, the material is adaptable to all standard fabricating methods.

General Properties and Performance Characteristics: Can be fabricated on fast automatic machines into square, rectangular or cylindrical shapes, can be quickly and economically fabricated by vacuum forming. Combines readily with other packaging materials such as metal, paper, boxboard, foil, etc. May be printed, embossed or hot-stamped.

Uses: For "see-through" packaging of products ranging from small hardware items to women's fashion accessories. Also ideally suited for transparent protective sleeves, bill-fold swing arms; used in lamination of advertisements and promotional material, giving such printed matter permanent display value.

Containers: Single fiber boxes; bulk fiber boxes on skids; fiber drums.

Shipping Classification: Sheet: by truck and rail, cellulose film not printed, in sheets, not further processed than cut-to-size. Rolls: by truck and rail, cellulose film not printed, in rolls exceeding 8 1/2" in diameter.

Literature: Data Sheet, Product Information Bulletin.

molding materials

"LUSTREX" STYRENE—PLASTICS DIVISION

Standard Forms: Molding compounds for injection molding, compression molding and extrusion in all types of machines and molds. Extruded sheets of "Lustrex" styrene suitable for drape and vacuum forming. General purpose materials designated "Lustrex" L; improved-flow general purpose "Lustrex" Hi-Flow 55; static-dissipating, "Lustrex" LDA; medium impact, "Lustrex" LHA; rubber modified high impact styrene, "Lustrex" Hi-Test 88. "Lustrex" LXC is a copolymer designed for high heat applications.

General Properties and Performance Characteristics: Available in wide range of transparent, translucent and opaque colors and crystal. Hard, rigid, with dimensional stability, good chemical resistance, tasteless, odorless, nontoxic. An excellent electric insulator. "Lustrex" L molds satisfactory up to 180°F. "Lustrex" Hi-Flow 55 has excellent plasticity, flows fast and sets fast. "Lustrex" LDA ideal for products where static-free properties are required. "Lustrex" LHA has good gloss and up to twice the strength of general purpose styrene. "Lustrex" Hi-Test 88 has about five times the impact and eight to ten times elongation of general purpose styrene. "Lustrex" LXC has exceptional heat resistance up to 234°F.

Uses: A wide range of applications includes battery cases, refrigerator parts, housings, wall tile, light fixtures, housewares, toys and packaging. "Lustrex" LXC is used for military items and electrical appliances. "Lustrex" Hi-Test 88 may be extruded for vacuum forming applications.

Containers: Multiwall bags; fiber drums and bulk boxes.

Shipping Classification: Synthetic plastic other than liquid NOIBN—Rail; Synthetic resin granules—Truck.

Literature: Data Sheets, Product Information Bulletins, Color Styling Bulletins.

"OPALON" VINYL CHLORIDE—PLASTICS DIVISION

Standard Forms: Dry, free-flowing dustless powders; some compounds are also available in granular diced cubes.

General Properties and Performance Characteristics: Outstanding heat stability coupled with ease of molding, short molding cycles, and uniformity of products produced. "Opalon" dry blend materials may be compounded in a number of formulations to satisfy varied application requirements for hardness, flexibility, temperature resistance and finish. Resistant to moisture, oxidation, most acids and alkalies, common organic solvents, and petroleum. Formulated as opaque, translucent or transparent compounds.

Uses: "Opalon" 300 and 300FM dry blended molding materials are widely used for injection and compression molding of such diverse products as appliance parts, toys, masks, grommets, welting, belting, gasketing, sporting goods, wiring devices and equipment housings, knobs and handles. "Opalon" 505 Copolymer developed for phonograph record compounds.

Containers: 50-lb. multiwall paper bags.

Shipping Classification: Synthetic plastic other than liquid NOIBN—Rail; Synthetic resin granules—Truck.

"ORIZON" POLYETHYLENE—PLASTICS DIVISION

Standard Forms: Pelleted extrusion and molding compounds pounds for injection, compression or blow molding.

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General Properties and Performance Characteristics: application range extends from +90°C. to below -60°C. Lightest of all commercial plastics with a Sp. Gr. of 0.91-0.92. Chemical-resistant, flexible, nontoxic, odorless, nonpolar, low dielectric. Tough and impact-resistant, easily processed into a wide range of colors.

Uses: Housewares, toys, packaging, industrial parts, bottles, caps and closures.

Containers: Multiwall bags.

Shipping Classification: Synthetic plastic other than liquid NOIBN—Rail; Synthetic resin granules—Truck.

Literature: Product Information bulletins; Data Sheets.

"MELMENE" MELAMINE—PLASTICS DIVISION

Standard Forms: Thermosetting molding compound with mineral and cellulose fillers for compression and transfer molding.

General Properties and Performance Characteristics: Excellent resistance to alkalies, oils and greases, weak acids. Produces very hard, durable moldings with good weathering and aging characteristics.

Uses: Electrical, electronic and radar components.

Containers: Drums.

Shipping Classification: Synthetic plastics O/T liquid NOIBN—Rail: Synthetic resin powder—Truck.

Literature: Data Sheet, Technical Information bulletin.

"PLENOX" PHENOLIC—PLASTICS DIVISION

Standard Forms: Thermosetting materials supplied as molding compounds with various fillers. Particularly suitable for compression, transfer and plunger molding.

General Properties and Performance Characteristics: Resists alcohol, oils, greases, weak acids. Tasteless and odorless. High heat resistance, durability, superior dielectric strength and torque strength.

Uses: For heavy-duty products, such as equipment housings, handles for electrical appliances, closures, electrical switch gear, telephone handsets.

Containers: Multiwall bags and fiber drums.

Shipping Classification: Synthetic plastic other than liquid NOIBN—Rail; Synthetic resin powder—Truck.

Literature: Data Sheets, Product Information Bulletins.

Paper and textile resins

CATALYSTS—PLASTICS DIVISION

Standard Forms: Catalyst AC is light yellow liquid compatible in resin baths with most cationic, anionic and nonionic softeners and penetrants. Catalyst AC-2 is used with "Resloom" HP finishes. Catalyst AC-4 and AC-6 are clear, compatible liquids.

General Properties and Performance Characteristics: Speeds cure of 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.

Containers: Metal drums and tank trucks.

Shipping Classification: Chemicals NOIBN.

Literature: Technical Bulletins and Data Sheets.

"MERLON" VINYL ACETATE, STYRENE, VINYL BUTYRAL—PLASTICS DIVISION

Forms Supplied: "Merlon" KR as acetate dispersions in water; "Merlon" S as water dispersion of unplasticized styrene; "Merlon" BR as 40% plasticized vinyl butyral in water.

General Properties and Performance Characteristics: Gives woolens, rayon, synthetics and cottons firm, durable finishes.

Uses: Textile treating resins that furnish durable finishes and coatings without curing or after-treatment.

Containers: 55-gal. lined drums.

Shipping Classification: Synthetic plastics liquid NOIBN—Rail; Synthetic resins liquid—Truck.

Literature: Technical Bulletins and Data Sheets.

"RESLOOM" ESSENTIALLY MONOMERIC MELAMINE—PLASTICS DIVISION

Standard Forms: "Resloom" HP supplied as hygroscopic, crystalline powder. "Resloom" M-75 supplied as clear liquid.

General Properties and Performance Characteristics: Give lively hand, durable resistance and washability to dress goods and suitings.

Uses: To impart shrinkage control, wrinkle-resistance and durability to woolens, rayon, synthetics and cottons.

Containers: "Resloom" HP: Multiwall bags, fiber drums and metal pails. "Resloom" M-75: Metal drums and tank trucks.

Shipping Classification: "Resloom" HP: Synthetic plastic other than liquid—Rail; Synthetic resin powder—Truck. "Resloom" M-75: Synthetic plastic liquid NOIBN—Rail; Synthetic resin liquid—Truck.

Literature: Technical Bulletins and Data Sheets.

"SCRIPTITE" 33 MELAMINE FORMALDEHYDE —PLASTICS DIVISION

Standard Forms: Dry, finely divided powder.

General Properties and Performance Characteristics: Provides greater wet strength in paper.

Uses: Paper treating resins.

Containers: Polyethylene-lined multiwall bags containing 50-lbs. of resin.

Shipping Classification: Synthetic plastics O/T liquid NOIBN—Rail, Synthetic resin powder—Truck.

Literature: Data Sheet and Technical Information Bulletin.

"SCRIPTITE" SERIES 50-59 STYRENE COPOLYMERS—PLASTICS DIVISION

Standard Forms: Dry, white powder.

General Properties and Performance Characteristics: Outstanding as resin binders in clay coatings.

Uses: Paper manufacturing.

Containers: Polyethylene-lined multiwall bags containing 50-lbs. of resin.

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Shipping Classification: Synthetic plastic O/T liquid NOIBN—Rail; Synthetic resin powder—Truck.

Literature: Technical Information Sheets.

"STYMER" VINYL, STYRENE — PLASTICS DIVISION

Standard Forms: "Stymer" LF is vinyl resin, soluble with ammonium hydroxide; "Stymer" R is vinyl resin, soluble in water; "Stymer" S is styrene resin, soluble in water.

General Properties and Performance Characteristics: Outstanding sizing for solution-dyed yarns, filament yarns of acrylic and polyester types.

Uses: Sizes for acetate, rayon and other synthetic fibers.

Containers: Paper bags; fiber drums.

Shipping Classification: Synthetic plastic other than liquid —Rail; Synthetic resin powder—Truck.

Literature: Technical Bulletins and Data Sheets.

POTASSIUM METAPHOSPHATE — INORGANIC DIVISION

Molecular Weight: 118.08

Formula: KPO_3

Standard Form: Powder.

General Information—Properties: White powder; M.P. approx. 810°C.; practically insoluble in water; insoluble in alcohol.

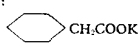
Uses: Suggested for ceramic glazes; phosphate glasses; polishing agent.

Containers: 200-lb. net drums.

Shipping Classification: Potassium Phosphate.

POTASSIUM PHENYLACETATE 64% SOLUTION — ORGANIC DIVISION

Formula:



Standard Form: Liquid.

Specifications: Clear, pale yellow liquid with characteristic odor; assay 64.0% min.; pH range 7.0–8.0; refractive index 1.475–1.482 at 25 C.; Sp. Gr. at 25°/25°C. 1.250–1.270.

General Information—Properties: Use of the liquid form of the potassium salt facilitates the handling of phenylacetic acid and reduces the odor problem. Two pounds of the solution are equivalent to one pound of phenylacetic acid.

Uses: As a precursor in the manufacture of Penicillin G.

Containers: 540-lb. drums; tank cars.

Shipping Classification: Chemicals NOIBN.

POTASSIUM PHOSPHATE, DI — INORGANIC DIVISION

Molecular Weight: 174.18

Formula: K_2HPO_4

Standard Form: White hygroscopic powder.

General Information—Properties: Anhydrous; white hygroscopic powder, highly soluble, 100 gms. water will dissolve 233 gms. K_2HPO_4 at 25°C.; insoluble in alcohol; concentrated aqueous solutions are miscible with glycerin; pH of 1% solution 9.2, very hygroscopic; at 25°C. and 35% relative humidity, K_2HPO_4 absorbs water to form a 70% solution.

Uses: Humectant; fermentation correcting salt balance, evaporated milk, nutrient solutions; medicinals, [illegible] fertilizers.

Containers: 300 and 150-lb. drums.

Shipping Classification: Potassium Phosphate.

POTASSIUM PHOSPHATE, MONO — INORGANIC DIVISION

(Also known as potassium dihydrogen phosphate and potassium biphosphate)

Molecular Weight: 136.09

Formula: KH_2PO_4

Standard Form: White crystals.

Typical Analysis: P_2O_5, 51.69%; K_2O, 34.31%; ignition loss 13.24%; SO_4 none; pH 4.6.

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

Containers: 350 and 150-lb. net drums; 100-lb. bags.

Shipping Classification: Potassium Phosphate.

Literature: "Concentrated Water Soluble Fertilizers" booklet.

POTASSIUM PHOSPHATE, TRI — INORGANIC DIVISION

Molecular Weight: 212.27

Formula: K_3PO_4

Standard Form: Powder.

General Information—Properties: White crystalline powder; soluble in water; insoluble in alcohol; very hygroscopic.

Uses: Used in synthetic (cold) rubber manufacturing.

Grades: Hydrated.

Containers: 300-lb. net fiber drums.

Shipping Classification: Potassium Phosphate.

POTASSIUM PYROPHOSPHATE, TETRA — INORGANIC DIVISION

Molecular Weight: 330.34

Formula: $K_4P_2O_7$

Standard Form: Powder.

General Information—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 value and to prevent formation of insoluble hard water soaps; clarifying agent; to improve cleansing action of soaps.

Containers: 350 and 150-lb. drums.

Shipping Classification: Washing Compound Dry

Literature: "Tetra Potassium Pyrophosphate," Technical Bulletin P-23.

"PYDRAUL F-9" FUNCTIONAL FLUID — ORGANIC DIVISION

Standard Form: Liquid.

Typical Analysis: Moisture 0.2% max., neutralization number acid 0.15 max.; Sp. Gr. 1.26 to 1.28 at 25°/25°C.

General Information—Properties: A light amber, [illegible] fire-resistant hydraulic fluid with excellent lubricity, pumping characteristics; noncorrosive, extremely stable to both heat and air.

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sphate," Technic

JID

nax.; neutralizatio
) 1.28 at 25°/25°C.
ight amber, mobil
ellent lubricity an
extremely stable

: Hydraulic fluid in die casting machines, hydraulic
es, automatic welding machines and similar applica-

ainers: 55-gal. steel drums.

pping Classification: Chemicals NOIBN.

erature: "Pydraul F-9," Technical Bulletin; "Pydraul
for hydraulic equipment operating near possible sources
gnition," booklet.

RAN" ANHYDROUS MONO CALCIUM SPHATE — INORGANIC DIVISION

lecular Weight: 234.17

mula: $CaH_4P_2O_8$ or $CaH_4(PO_4)_2$

eral Information—Properties: An anhydrous mono
ium phosphate used as an acid component for leavening
n in self-rising flours and corn meal, also baking
ders and prepared mixes. Conforms with all Federal
d State Pure Food Laws.

ainers: 100-lb. bags.

pping Classification: Phosphate of Calcium.

DORANTS, RUBBER — ORGANIC DIVISION

see Vanillin and Coumarin)

eral Information—Properties: Monsanto provides,
t does not manufacture, the following types of rubber
odorants for the convenience of its customers.
URODEX NO. 19—Pale yellow liquid; deodorizes; 0.15–
o lbs. used in 100 lbs. of rubber.
URODEX NO. 188—Pale yellow liquid; odor, lily; 0.20–
o lbs. used in 100 lbs. of rubber.
URODEX NO. 198—Pale yellow liquid; odor, musk;
20–0.50 lbs. used in 100 lbs. of rubber.

ainers: 5-lb. bottles.

ZGARD" — INORGANIC DIVISION

dard Form: A white, water-soluble crystalline powder.

eral Information—Properties: An alkaline mixture of
ame-retarding chemicals to give proper balance to flame
inguishing, elimination of afterglow and retention of
ngle strength. It is used for treatment of all types of
llulose fabrics.

: Fire retardant for textiles.

ainers: 100-lb. bags; 300-lb. fiber drums.

pping Classification: Chemicals NOIBN.

erature: "Monsanto Rezgard," Technical Bulletin I-28.

T" WOOD SEALER AND PRIMER (Clear)

CHANDISING DIVISION

eral Information—Properties: A synthetic resin prim-
r and sealer. Provides a penetrating, preserving and pro-
ctive "seal" for all wood surfaces, especially soft woods;
ouglas Fir Plywood, pine, cedar, etc. Controls grain raise;
inimizes moisture absorption and checking; equalizes
er density and gives hard, uniform surface for smooth,
y, economical and durable finishes with paint, enamel or
n. One gallon covers approx. 600 sq. ft.

: A primer and sealer under wax or varnish for high-
c finish for new or old floors. Eliminates dusting when
lied to bare concrete floors.

ainers: 50-gal. drums; 5-gal. cans; 1-gal. cans (6/case);
t. cans (12/case); 1-pt. cans (24/case).

Shipping Classification: Wood Filler Liquid.

Literature: Rez Color Card Folder.

"REZITE" CLEAR EXTERIOR FINISH

— MERCHANDISING DIVISION

General Information—Properties: A synthetic resin base formulated with a mildewcide to control mildew formation on exterior wood.

A clear, gloss exterior wood finish developed through extensive practical application in the field. New and different in the field of exterior finishes Rezite builds a *clear gloss* film that protects wood against the weathering effects of sun and moisture . . . preserving the *natural color* and grain pattern of the wood. Rezite may also be applied over Rez color-tones to achieve a gloss finish if desired. One gallon covers approx. 300–800 sq. ft. depending upon porosity of wood and number of coats applied.

Containers: 5-gal.; 1-gal. (4/case); quarts (12 case).

Shipping Classification: Wood Filler Liquid.

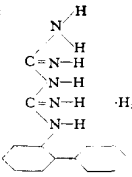
Literature: Leaflet, "New Monsanto Rezite."

"SA-326" ortho-BIPHENYL BIGUANIDE

— ORGANIC DIVISION

Molecular Weight: 271.32

Formula:



·H_2O (hydrate)

Standard Form: Powder.

General Information—Properties: White to faintly pink powder; M.P. above 150°C on dried material; ash not over 0.5%.

Solubility	25°C.	75°C.
Water	0.1%	0.3%
Alcohol	10%	25%
Carbitol	25%	85%
Cellosolve	40%	65%

Uses: A soap antioxidant 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. Particularly valuable in preventing discoloration of refined toilet soaps.

Containers: 50-lb. paper bags; 150-lb. fiber drums.

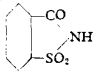
Literature: "SA-326," Technical Bulletin P-101.

SACCHARIN, U.S.P.

(Also known as saccharin insoluble, and ortho-sulfobenzimide) — ORGANIC DIVISION

Molecular Weight: 183.18

Formula:



(Continued on next page)

0685199

TOWOLDMON0007064

Standard Form: Powder and coarse powder.

Specifications: White crystalline powder; assay 98% min.; M.P. 227.0 C. min.; loss on drying 0.50% max.; solubility in 10% Na_2CO_3(1:5) complete.

Uses: Sweetener for tooth pastes, mouth washes and pharmaceutical preparations. Approximately 500 times the sweetening power of sugar.

Containers: 100-lb. fiber drums; 25 and 5-lb. cans.

Shipping Classification: Chemicals NOIBN.

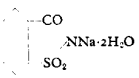
Literature: "Saccharin Monsanto, the Perfect Sweetener," folder; "Recipes enjoy the sweet things of life with Saccharin," booklet of saccharin-sweetened food recipes.

SACCHARIN, SODIUM, U.S.P. — ORGANIC DIVISION

(Also known as soluble saccharin and sodium ortho-sulfobenzimide)

Molecular Weight: 241.21

Formula:



Standard Form: Powder, granules, crystals.

Specifications: White crystals or powder; solubility in water (1:8) complete. Loss on drying at 125°C.: crystals 14.0% min., 14.35% max.; powder 5.3% min., 5.8% max.

Uses: Sweetener in tooth pastes, mouth washes and pharmaceutical preparations; in beverages and food in place of sugar for diabetics. Crystals approximately 375 times the sweetening power of sugar; powder approximately 425 times the sweetening power of sugar.

Grades: Soluble granular crystals; soluble powder.

Containers: 100-lb. fiber drums; 25 and 5-lb. cans.

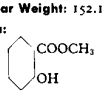
Shipping Classification: Chemicals NOIBN.

Literature: "Saccharin Monsanto, the Perfect Sweetener," folder; "Recipes enjoy the sweet things of life with Saccharin," booklet of saccharin-sweetened food recipes.

SALICYLATE, METHYL, U.S.P. — ORGANIC DIVISION

Molecular Weight: 152.14

Formula:



Standard Form: Water-white liquid.

Specifications: Clear, colorless liquid; assay 98.0% min.; solubility in 70% ethyl alcohol (1:7) complete; solubility in N KOH (1:10) complete; Sp. Gr. 1.180–1.185 at 25°, 25°C.; conforms to U.S.P. test for heavy metals.

Uses: Pharmaceutical product; flavoring agent in foodstuffs and beverages; odorant in printing inks and insecticides.

Containers: 500 and 50-lb. drums.

Shipping Classification: Methyl Salicylate.

Literature: "Methyl Salicylate Monsanto," folder; "Something About the Senses," 32-page booklet.

SALICYLATE, SODIUM, U.S.P. — ORGANIC DIVISION

Molecular Weight: 160.11

Formula:



Standard Form: Powder or crystals

Specifications: White powder or crystals; assay (as received) 99.5% min.; conforms to U.S.P. tests for heavy metals and carbonizable impurities; powder trace max. retained on 60 mesh, 1.0% on 80 mesh, 2.0% on 100 mesh.

Uses: Pharmaceutical product.

Containers: 200 and 100-lb. fiber drums; 25-lb. cartons.

Shipping Classification: Chemicals NOIBN.

SALICYLIC ACID *(ortho-Hydroxybenzoic Acid)* — ORGANIC DIVISION

Molecular Weight: 138.12

Formula:



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.
"B" Grade: White needles; assay 99.5% min.; M.P. 158.0°C. at start.

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

Grades: U.S.P. and technical.

Containers: 150 and 100-lb. fiber drums; 25-lb. cartons.

Shipping Classification: Salicylic Acid.

SALT CAKE *(Sodium Sulfate, Anhydrous, Technical)* — INORGANIC DIVISION

Molecular Weight: 142.06

Standard Form: Powder.

Grades: 93–95% and 98–99%.

General Information—Properties: The 93–95% grade is a typical white salt cake. The 98–99% grade is a special material having a brownish color and Na_2SO_4 content approximately 99%.

Uses: Manufacture of sulfate pulp, glass, sodium sulfide; treatment of boiler feed waters.

Containers: Bulk car loads.

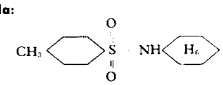
Shipping Classification: Salt Cake.

"SANTICIZER" 1-H PLASTICIZER — ORGANIC DIVISION

(N-cyclohexyl para-Toluenesulfonamide)

Molecular Weight: 253.36

Formula:



Standard Form: Yellowish brown fused mass.

Specifications: C.P. 83.5°C. min.; moisture 0.25% max.; color of melt APHA 250 max.

TOWOLDMON0007065

...eral Information—Properties: "Santicizer" 1-H is a ...plasticizer which is relatively light stable and of ... order of toxicity. It is soluble in alcohol, esters, ke..., aromatic hydrocarbons and vegetable oils. It is ...luble in water. It is compatible with a wide variety of ...s including most of the cellulosic and vinyl resins.

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...race ma...
...100 mes...

...cartons.

...d)

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...s to U.S...
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...; indust...
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...lb. carto...

...chnical)

...% grade
...is a spec...
...content

...ium sulf...

...ic divis...

...0.25%...

"Santicizer" 1-H is used in special crystallizing ..., paper coatings, textile coatings and adhesives. It ...eful plasticizer in nitrocellulose lacquers, imparting a ...rely sharp softening point. It is also used to incorpor... incompatible components such as paraffin wax for pro... special coating effects such as crystallizing lacquers. ...improved adhesion where flexibility in nitrocellulose is ...ired, it is used in combination with dibutyl phthalate or ...nicizer" 160. It improves the moisture resistance of ...lose acetate and improves flexibility, hardness and light ...lity of ethyl cellulose. It is compatible with and im... good flexibility to shellac and kauri resin.

...tainers: 400-lb. (approx.) fiber drums.

...ping Classification: Resin Plasticizer.

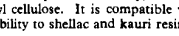
...erature: "Monsanto Plasticizers", 64-page booklet.

...ICIZER" 3 PLASTICIZER — ORGANIC DIVISION

...d para-Toluene Sulfonamide)

...ecular Weight: 199.27

...ula:



...dard Form: Crystalline solid.

...ifications: Practically white crystalline solid; C.P. ...°C. min.; acidity (as acetic acid) 0.10% max.; Sp. Gr. ...1-1.176 at 65°/65°C.

... "Santicizer" 3 is a solid, sulfonamide type plasticizer. ...compatibility with commonly used resins is limited but ...ually used in combination with other plasticizers. Either ...bination or alone it imparts high gloss, toughness and ...ness. It sharpens the softening point of some thermo... ...ics, especially the cellulose esters. Its use makes pos... ...se such products as heat sealing lacquer coatings and ad... ...es. It is compatible with cellulose acetate to the extent ...30 parts per 100 parts of resin. In addition to its effect ...toughness and gloss, it improves the flow of molding ...positions and lowers moisture permeability. Its com... ...ility with polyvinyl formal is approximately the same ...with cellulose acetate and its use improves flow and im... ...an excellent gloss.

...tainers: 400-lb. fiber drums.

...ping Classification: Resin Plasticizer.

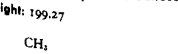
...erature: "Monsanto Plasticizers", 64-page booklet; ...nicizer 3," Technical Bulletin O-81.

...ICIZER" 8 PLASTICIZER — ORGANIC DIVISION

...s of N-Ethyl-ortho- and para-Toluenesulfonamides)

...ecular Weight: 199.27

...ula:



...dard Form: Liquid.

...ifications: Light yellow, viscous liquid; odor slight, ...acteristic; unsubstituted amide 9–13%; acidity (as acetic ...) 0.1% max.

General Information—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 china wood 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 glycerin or similar compounds; greatly increases the flexibility of shellac with considerable softening effect; also very useful with polyvinyl-acetate adhesives. "Santicizer" 8 is one of the best plasticizers known for synthetic polyamides such as nylon and related resins.

Containers: 500 and 50-lb. drums.

Shipping Classification: Resin Plasticizer.

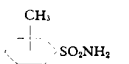
Literature: "Monsanto Plasticizers," 64-page booklet; "Santicizer 8—Use In Adhesives," "Santicizer 8—Use In Coatings," "Santicizer 8—Use In Moldings," Technical Data Sheets.

"SANTICIZER" 9 PLASTICIZER — ORGANIC DIVISION

(Mixture of ortho- and para-Toluenesulfonamides)

Molecular Weight: 171.21

Formula:



Standard Form: Fine granules.

General Information—Properties: Solubility quite low in coal-tar hydrocarbons and negligible in petroleum hydrocarbons; readily soluble in most other solvents, and in hot linseed, china wood and castor oils; soluble in water only about 1.0% at 34°C., but this is increased by the presence of alkali; least soluble of Monsanto plasticizers 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 phenolaldehyde 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.

Containers: 250-lb. fiber drums.

Shipping Classification: Resin Plasticizer.

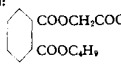
Literature: "Monsanto Plasticizers," 64-page booklet.

TOWOLDMON0007066

"SANTICIZER" B-16 PLASTICIZER — ORGANIC DIVISION
(Butyl Phthalyl Butyl Glycolate)

Molecular Weight: 336.37

Formula:



Standard Form: Liquid.

Specifications: Color APHA 45 max.; Sp. Gr. 1.098 ±0.005 at 25°/25°C.; refractive index 1.490 ±0.002 at 25°C.; acidity (as acetic acid) 0.02% max.; essentially odorless; sulfur (copper strip test) negative.

General Information—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 nontoxic composition is required; has received Bureau of Animal Industry 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 china wood oils; somewhat retards gel formation in the latter on heating. Swells crepe rubber but appears to have no effect on vulcanized rubber; 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.

Containers: 500-lb. steel drums.

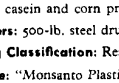
Shipping Classification: Resin Plasticizer.

Literature: "Monsanto Plasticizers," 64-page booklet.

"SANTICIZER" E-15 PLASTICIZER — ORGANIC DIVISION
(Ethyl Phthalyl Ethyl Glycolate)

Molecular Weight: 280.27

Formula:



Standard Form: Liquid.

Specifications: Color APHA 20 max.; Sp. Gr. 1.182 ±0.003 at 25°/25°C.; refractive index 1.498 ±0.002 at 25°C.; acidity (as acetic acid) 0.02% max.; odor slight; sulfur (copper-strip test) negative.

General Information—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 greatly increased resistance to moisture penetration. Highly recommended for use with cellulose acetate. Has been approved by Bureau of Animal Industry as a nontoxic plasticizer; may be used in cellulose-based lacquers for paper or in foils to be used for food wrapping and packaging.

Containers: 500-lb. steel drums.

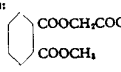
Shipping Classification: Resin Plasticizer.

Literature: "Monsanto Plasticizers," 64-page booklet.

"SANTICIZER" M-17 PLASTICIZER — ORGANIC DI
(Methyl Phthalyl Ethyl Glycolate)

Molecular Weight: 266.24

Formula:



Standard Form: Liquid.

Specifications: Color APHA 20 max.; Sp. Gr. 1.220 ±0.0 at 25°/25°C.; refractive index 1.504 ±0.002 at 25°C.; ac (as acetic acid) 0.02% max.; odor, slight character sulfur (copper-strip test) negative.

General Information—Properties: A solvent for both trocellulose and cellulose acetate; imparts a high degr plasticity undiminished even in extremely thin films posed to air currents for a long time. Very light-stable may be used in transparent or tinted articles without da of yellowing. Not miscible with castor, linseed, or c wood oils or with petroleum hydrocarbons, readily mi with other organic solvents; solubility in water 0.09 30°C. but imparts a considerable degree of resistan moisture penetration to both nitrocellulose and cellu acetate films.

Uses: Probably the best cellulose-acetate plasticizer able. Dissolves "Santolite" resins, and as both are resistant to petroleum products and compatible wi many film-forming materials, they make an excellent bination for producing gasoline-resistant coatings.

Containers: 550-lb. steel drums.

Shipping Classification: Resin Plasticizer.

Literature: "Monsanto Plasticizers," 64-page booklet.

"SANTICIZER" 140 PLASTICIZER
(Mixed Cresyl Phenyl Phosphates) — ORGANIC DIVISI

Standard Form: Liquid.

Specifications: Clear mobile liquid; color APHA 40 m Sp. Gr. 1.208 ±0.005 at 25°/25°C.; refractive index 1.5 0.010 at 25°C.; acidity (as H_3PO_4) 0.01% max.

General Information—Properties: An essentially odo and colorless liquid plasticizer; B.P. approx. 258°C. mm.; pour point —37°C. approx.

Uses: Quite similar to tricresyl phosphate in that it im flame retardance, excellent permanence and chemical ity and equal heat and light stability; gives better temperature characteristics and abrasion resistance stronger solvent and slightly more efficient than tri phosphate.

Can be used wherever tricresyl phosphate is used. Impr flexibility imparted by "Santicizer" 140 makes it prefe to tricresyl phosphate in many applications such as sheeting, lacquers and paper coating. Considerably compatible than tricresyl phosphate with cellulose It is a liquid, making it much easier to handle than tri phosphate. Therefore, has found considerable use in lose acetate, especially when used in conjunction with active plasticizers.

Other resins with which it is useful are cellulose ethyl cellulose, cellulose acetate-propionate, polyvinyl mal and polyvinyl butyral.

Containers: 55 and 5-gal. drums; tank cars.

TOWOLDMON0007067

...g Classification: Resin Plasticizer.

...ure: "Monsanto Plasticizers," 64-page booklet; ...izer 140," Technical Bulletin O-88.

...IZER" 141 PLASTICIZER — ORGANIC DIVISION

...dard Form: Liquid.

...ications: Color APHA 100 max.; odor, slight char-...istic; Sp. Gr. 1.089–1.093 at 25°/25°C.; refractive index ...1.510 at 25°C.; acidity (as H_3PO_4) 0.01% max.

...eral Information—Properties: "Santicizer" 141 com-...ines into one compound the nonflammability of tricresyl ...hosphate, and the efficiency and permanence of older vinyl ...plasticizers. Imparts superior low-temperature flexibility, ...improved abrasion and moisture resistance and good elec-...trical properties. Gives excellent resistance to embrittlement ...and deterioration to polyvinyl-chloride compositions which ...are exposed to sunlight. Compatible in amounts up to and ...including 300 parts of plasticizer per 100 parts of resin.

...A flame-retardant plasticizer developed by Monsanto ...primarily for use in vinyl plastics. Excellent for use in ...polyvinyl-chloride films, sheets, extrusions, moldings, ...pastisols and plastisols—in any application where an ...inherent, permanent, flame-retardant plasticizer is re-...quired. Especially recommended in making flexible films ...for curtains, aprons, rainwear, and hospital sheeting, or ...washable coatings for tablecloths, upholstery and dra-...peries. "Santicizer" 141 possesses low toxicity and is suit-...able for products that will come in intimate contact with ...the human body. Useful in food wrappings and has been ...approved by the Bureau of Animal Industry as a nontoxic ...plasticizer.

...ainers: 55-gal. steel drums; tank cars.

...ping Classification: Resin Plasticizers.

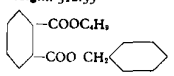
...ature: "Monsanto Plasticizers," 64-page booklet; ...Plasticizer 141," Technical Bulletin O-89.

...CIZER" 160 PLASTICIZER — ORGANIC DIVISION

...Benzyl Phthalate)

...lecular Weight: 312.35

...ula:



...dard Form: Liquid

...ications: Color APHA 40 max.; Sp. Gr. 1.113–1.121 ...°/25°C.; acidity (as phthalic acid) 0.02% max.

...eral Information—Properties: A clear, oily, liquid ...plasticizer having a slight characteristic odor. Shows good ...low-temperature performance; possesses good heat and ...light stability and low volatility.

...A relatively non-volatile plasticizer for polyvinyl ...chloride, polyvinyl chloride-acetate, polyvinyl butyral, ...ethyl cellulose and nitrocellulose. In addition, compatible ...with cellulose triacetate, polyvinyl formal, cellulose acetate-...butyrate, cellulose-propionate, polyvinyl acetate and acryl-...ates. Superior to many of the commonly used plasticizers in ...permanence, oil resistance, flexibility and stability.'

...excellent vinyl plasticizer where stability and flexibility ...are required. Because of its high plasticizing efficiency, it is ...outstanding value in increasing output of processing ...equipment such as extruders and calenders. Used success-...fully in vinyl organosols which are useful in the coating and ...film field.

...effective in cellulosic lacquers, imparting toughness, ...flexibility, low-moisture vapor transfer; has good perma-...nence and heat and light stability. An excellent plasticizer for polyvinyl butyral and for low molecular weight poly-styrene which is further polymerized later for coating and impregnating work.

Containers: 55 and 5-gal. drums; tank cars.

Shipping Classification: Resin Plasticizer.

Literature: "Monsanto Plasticizers," 64-page booklet; "Santicizer 160," Technical Bulletin O-92.

"SANTICIZER" 601 PLASTICIZER — ORGANIC DIVISION

Standard Form: Liquid.

Specifications: Clear, oily liquid; color APHA 50 max.; odor mild; acidity (as phthalic acid) 0.01% max.; Sp. Gr. 0.977 ±0.009 at 25°/25°C.

Uses: A primary plasticizer for polyvinyl chloride with lower volatility and better low temperature flexibility than dioctyl phthalate (DOP). Intermediate in properties between DOP and di (N-octyl, N-decyl) phthalate (DNODP).

Containers: Tank cars.

Shipping Classification: Resin Plasticizer.

Literature: Technical Data Sheet.

"SANTICIZER" 602 PLASTICIZER — ORGANIC DIVISION

Standard Form: Liquid.

Specifications: Clear oily liquid; color APHA 75 max.; odor mild; acidity (as phthalic acid) 0.01% max.; Sp. Gr. 0.972 ±0.005 at 25°/25°C.

Uses: A primary plasticizer for polyvinyl chloride with lower volatility than dioctyl phthalate (DOP). Has excellent resistance to soapy water extraction and alkali. Used in vinyl floor tile, plastisols and film and sheeting.

Containers: Tank cars.

Shipping Classification: Resin Plasticizer.

Literature: Technical Data Sheet.

"SANTICIZER" 603 — ORGANIC DIVISION

Standard Form: Liquid.

Specifications: Clear oily liquid free of sediment or turbidity; color APHA 100 max.; acidity 0.01% max. as phthalic acid; odor, characteristically mild: Sp. Gr. 0.977 to 0.987 at 25°/25°C.

General Information—Properties: A low cost primary plasticizer that offers an attractive pound/volume cost. Its good color and low odor enable the film, sheeting, extrusion and plastisol compounder to effect cost saving with minimum loss of quality.

Uses: "Santicizer" 603 is a low cost primary plasticizer for polyvinyl chloride and copolymer type resins. "Santicizer" 603 imparts good low temperature flexibility and has permanence good enough for most applications. This plasticizer is useful in calendered vinyl products such as film and sheeting for shower curtains, drapes and upholstery. "Santicizer" 603 imparts good viscosity characteristics to vinyl plastisols and organosols and is useful in the formulation of slush molding compounds for dolls and formulations for coated fabrics.

Containers: Bulk shipments only, 1,000-gal. min.

Shipping Classification: Resin Plasticizer.

Literature: "Santicizer 603, Primary Plasticizer for Polyvinyl Chloride," Technical Data Sheet.

0685203

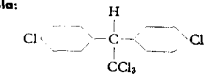
TOWOLDMON0007068

"SANTOBANE" DDT INSECTICIDE (*Monsanto's Dichloro-Diphenyl-Trichloroethane, Technical; also known as 2,2-bis(para-chlorophenyl)-1,1,1-trichloroethane*)

— ORGANIC DIVISION

Molecular Weight: 354.50

Formula:



Standard Form: Flakes or granular powder.

Specifications: Fine or medium granular powder or flakes with a white-to-cream color; characteristic odor; crystallizing point 89.0°C. min.; organically bound chlorine 49.0–51.0%; pH of water extract, 6.0–8.0.

General Information—Properties: Bulking value of powder approx. 45-lbs. per cu. ft; of flake approx. 35-lbs. per cu. ft.; soluble to varying degrees in common organic solvents; relatively insoluble in water.

Uses: When properly formulated possesses broad insecticidal qualities, acting both as a contact and stomach poison. An insecticide base used in dusting powders, emulsions, aerosols, wettable powders and solutions for the control of various agricultural and household insects.

Containers: 100-lb. bags.

Shipping Classification: Chemicals NOIBN.

Literature: "How to Control Insects with Santobane, Monsanto DDT," 20-page booklet; "A Guide for Formulating Santobane, Monsanto DDT," 21-page booklet.

"SANTOBRITE" SODIUM PENTACHLOROPHENATE, TECHNICAL — ORGANIC DIVISION

Molecular Weight: 288.36

Formula: ONa



Standard Form: Neutral powder, pellets or briquettes.

Specifications: Light tan powder, pellets or briquettes Assay 88.0% min. Free alkali (as NaOH) 0.5–0.9%.

General Information—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.

"Santobrite" and its solutions may be irritating to the skin and mucous membranes of some individuals, and are somewhat toxic to man and the higher animals. For detailed information on uses and methods of handling, write for listed literature.

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.

Containers: Briquettes: 100-lb. bulk fiber drums; powder: 100-lb. fiber drums; pellets: 100-lb. fiber drums.

Shipping Classification: Sodium Pentachlorophenate.

Literature:
"Santobrite for the Preservation of Adhesives," Technical Bulletin O-1.
"Santobrite for Microorganism Control in the Pulp and Paper Industry," Technical Bulletin O-5.
"Santobrite for the Control of Slime and Algae," Technical Bulletin O-15.
"Santobrite for the Preservation of Rubber Latex," Technical Bulletin O-17.
"Santobrite," Technical Bulletin O-23.
"Determination of Chlorophenols and Their Salts in Impregnated Materials," Technical Bulletin O-24.
"Santobrite for Pre-emergence Weed Control," Technical Bulletin O-91.
"Weed Control with Santobrite and Santophen 20," booklet.
"Monsanto Santobrite for Fungicidal Soap Wrap Paper," Bulletin 22654-H.
"Toxicology and Dermatology of Pentachlorophenol and Sodium Pentachlorophenate," booklet.
"Monsanto Products for Paint Preservation," Bulletin 12054-H.

"SANTOCEL" SILICA AEROGEL FOR INDUSTRIAL APPLICATIONS — INORGANIC DIVISION

Typical Analysis: SiO_2, 90% min.; Na_2SO_4, 2.7% max.; Al_2O_3 and Fe_2O_3, 1.0%; volatile* 4.0–6.0%; pH (4.0 g. in 100 cc. H_2O) 3.5–4.0.
*Volatile portion is water, alcohol and acetaldehyde.

General Information—Properties: Colors, white-to-transparent in vehicles; absolute density 17.1 lbs. per gal., 0.0585 gal. per lb.; refractive index 1.464; oil absorption 2.5 g. oil/g. "Santocel" by ASTM. Dry bulk density: "Santocel" 54, 45 lbs. per cu. ft.; "Santocel" C, CS and DCS, 5–6 lbs. per cu. ft.; "Santocel" CX, 2–3 lbs. per cu. ft. Average particle size: "Santocel" 54, 0.5–3.0 microns; "Santocel" C, CS and DCS, 3–5 microns; "Santocel" CX, 1–3 microns.

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; built agent for dry powders, free-flowing and anticaking agent for dry powders; insecticide for stored industrial grain; 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; as 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 resin dispersions and solutions.

Grades: "Santocel" 54, "Santocel" C, "Santocel" CS, "Santocel" DCS, "Santocel" CX (all ground, crude).

Containers: Multiwall bags, 5 ply, net wt. 20-lbs. for 25-lbs. for C, CS and DCS, 15-lbs. for CX.

Shipping Classification: Insulating Material NOIBN.

Literature: "Santocel for Industrial Applications," "Santocel 54 for Flatting," booklets.

"SANTOCEL" SILICA AEROGEL FOR THERMAL INSULATION — INORGANIC DIVISION

Standard Form: "Santocel" A—sugar-sized particles.

Typical Analysis: Approximate analysis for all insulating grades of "Santocel": SiO_2, 93.0–96.0%; volatile* 1.5%; Na_2SO_4, 2.5–3.5%; Fe_2O_3 and Al_2O_3, 1%.
*Volatile is water, alcohol, acetaldehyde.

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General Information—Properties: Known technically as a silica aerogel, it possesses the lowest coefficient of thermal conductivity known. Dry bulk density: "Santocel" A, 8 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.

Containers: Multiwall paper bags 20-lbs. net.

Shipping Classification: Insulating Material NOIBN.

Literature: "Santocel as Thermal Insulation," Technical Bulletin I-134.

"SANTOCHLOR" para-DICHLOROBENZENE

— ORGANIC DIVISION

Molecular Weight: 147.01

Formula:



Standard Form: Crystals.

General Information—Properties: White crystals; crystallizing point 52.8°C. min.

Uses: As an intermediate in the production of dyestuffs; as deodorant; mothicide, larvacide, and in control of peach tree borers.

Grades: Standard crystal sizes:
No. 0 (approx. ¼-inch pellets)—For peach tree 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.
814—80% min. between 8 and 16 mesh.
Packing mix—Mixture of sizes under 7 mesh.
Mixture of sizes less than 16 mesh.

Containers: 200 and 100-lb. fiber drums.

Shipping Classification: Paradichlorobenzol.

Literature: "Santochlor for the Control of Peach Tree and Lesser Fruit Borers," Technical Bulletin O-18; "Santochlor for Gothes Moth Control," folder; "Santochlor," Technical Bulletin O-54; "Santochlor for Mildew Control," Technical Bulletin O-63.

"SANTOLENE" C FUEL OIL ADDITIVE

— ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: An oily liquid having the following typical properties: Saybolt Universal viscosity 75 seconds at 100°F.; flash point 150°F. min.; neutralization number 84 to 100.

Uses: Corrosion and rust inhibitor for use in light petroleum products.

Containers: 55-gal. steel drums; tank cars.

Shipping Classification: Petroleum Oil NOIBN.

Literature: "Santolene C," Brochure.

"SANTOLENE" F FUEL OIL ADDITIVE

— ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: An oily liquid having the following typical properties: Saybolt Universal viscosity 75 seconds at 210°F.; Sp. Gr. 0.98 at 60° 60°F.; sulfur 1.9%; barium 7.5%.

Uses: Sludge inhibitor for fuel oils to prevent burner screen clogging and reduce rusting. Concentrations as low as 0.02% have been used satisfactorily.

Containers: 55-gal. steel drums; tank cars.

Shipping Classification: Petroleum Oil NOIBN.

"SANTOLITE" MHP INDUSTRIAL RESIN

— ORGANIC DIVISION

Standard Form: Hard resin.

Specifications: Hard, practically colorless resin; refractive index (25 gms. in 75 gms. normal butyl acetate) 1.4280–1.4310; 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.

Exceptional features of this resin are the ease with which it may be worked into practically any formula using a cellulose ester and the wide variation of properties obtained by its use. Its high degree of solubility makes very concentrated solutions possible; its extreme compatibility with plasticizers and cellulose esters removes much of the danger of blushing, sweating and separation.

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 Classification: Resin Synthetic NOIBN Without Filler.

Literature: "Santolite MHP and Santolite MS-80%," Technical Bulletin O-94; "Monsanto Plasticizers," 64-page booklet.

"SANTOLITE" MS (80%) INDUSTRIAL RESIN

— ORGANIC DIVISION

Standard Form: Liquid.

Specifications: Light-colored, viscous liquid; free-flowing at temperatures above 20°C.; composition 80% "Santolite" MS, 20% normal butyl acetate.

General Information—Properties: Soft, practically colorless resin made by the condensation of formaldehyde with aromatic sulfonamides.

Uses: "Santolite" MS, like all the "Santolite" resins, is compatible with both nitrocellulose and cellulose acetate; being a solvent for both, it can be used in any proportion. Forms brittle compositions with both these esters but the addition of a plasticizer makes such combinations permanently flexible. Readily miscible with all the common organic solvents and thinners except petroleum hydrocarbons;

(Continued on next page)

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not miscible with varnish and paint oils. Excellent for water-white lacquers which will not be exposed to extreme weather conditions, its high gloss and lack of color being unusual in the resin field.

Containers: 540-lbs. approx., 55-gal. drums; 45-lbs. approx., 5-gal. drums.

Shipping Classification: Resin Synthetic NOIBN Without Filler.

Literature: "Santolite MHP and Santolite MS-80%," Technical Bulletin O-94; "Monsanto Plasticizers," 64-page booklet.

"SANTOLUBE" 31 OIL ADDITIVE — ORGANIC DIVISION

Standard Form: Liquid or crystalline mass.

General Information—Properties: Essentially a phosphite ester of an alkylated phenol. Typical inspection data: Sp. Gr. 1.04 at 60°/60°F.; color NPA 4; phosphorus 5.7%; nitrogen 0.22%; chlorine 0.05%.

Uses: As an addition agent for engine oils where improvement in oiliness, film strength and oxidation resistance is desirable; from 0.25 to 0.5% is usually found to be the optimum concentration.

Containers: 55-gal. steel drums; tank cars.

Shipping Classification: Chemicals NOIBN.

Literature: "Santolube 31," Technical Bulletin O-33.

"SANTOLUBE" 70 OIL ADDITIVE — ORGANIC DIVISION

Standard Form: Liquid.

General Information—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.

Containers: 55-gal. steel drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Santolube 70," Technical Bulletin O-86.

"SANTOLUBE" 382 OIL ADDITIVE — ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: A dark, viscous liquid with the following approximate properties: Saybolt Universal viscosity 65–75 seconds at 210°F.; Sp. Gr. 0.995 at 60°/60°F.; phosphorus 0.38–0.46%; sulfur 4.55–5.35%; barium 6.25–6.45%.

Uses: A detergent-dispersant, inhibitor-type additive for motor oils. Also functions as a pour point depressant. Recommended for compounding Heavy Duty oils of the MIL-O-2104 type.

Containers: 55-gal. steel drums; tank cars.

Shipping Classification: Petroleum Oil NOIBN.

"SANTOLUBE" 388 OIL ADDITIVE — ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: Specifications are as follows: Saybolt Universal viscosity 55–85 seconds at 210°F.; phosphorus 0.45–0.55%; sulfur 5–6%; barium 6.07–6.25%.

Uses: A detergent-dispersant, inhibitor-type additive for motor oils. Also functions as a pour point depressant. Recommended for compounding Heavy Duty oils of the MIL-O-2105 type.

Containers: 55-gal. steel drums; tank cars.

Shipping Classification: Petroleum Oil NOIBN.

Literature: "Santolube 388," Technical Bulletin O-84.

"SANTOLUBE" 394-C OIL ADDITIVE

— ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: An 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 antioxidant and bearing corrosion inhibitor for engine lubricating oils. Finds wide application in compounding Premium and Heavy Duty motor oils.

Containers: 55-gal. steel drums; tank cars.

Shipping Classification: Petroleum Oils NOIBN.

Literature: "Santolube 394-C," Technical Bulletin O-

"SANTOLUBE" 395-X OIL ADDITIVE

— ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: An amber liquid with the following typical characteristics: viscosity 12 to 18 cts. at 210°F.; Sp. Gr. 1.005 at 60°/60°F.; phosphorus 3.5%; sulfur 11%; barium 1.1%.

Uses: An oxidation and bearing corrosion inhibitor for crankcase oils designed to meet Premium motor oil requirements as defined by the American Petroleum Institute.

Containers: 55-gal. steel drums; tank cars.

Shipping Classification: Petroleum Oils NOIBN.

Literature: "Santolube 395-X," Technical Bulletin O-

"SANTOMASK" II ODOR-MASKING AGENT

— ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: Clear, light yellow liquid; pleasant characteristic odor; flash point approx. 210° (Cleveland open cup method); flow point below 0°C.; per gal. approx. 8.7 lbs.

Uses: Odor-masking ingredient for interior paints, printing inks and similar products having objectionable paint odors. In addition to masking odors, may reduce or eliminate irritation to eyes, nose and throat caused by volatile components of some interior paints. Will not affect drying time, color durability and other characteristics of paints and inks.

Containers: 33 and 5-gal. drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Santomask II," Technical Bulletin O-16.

"SANTOMERSE" ALKYL ARYL SULFONATES

— INORGANIC DIVISION

General Information—Properties: The salts of a homologous series of substituted aromatic sulfonic acids. The "Santomerse" series consists of four products, each distinctive in character and developed to meet a certain industrial need.

"Santomerse" No. 1—neutral flakes and granular 40% active

"Santomerse" 80—neutral flakes 80% (min.) active

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tomerse" No. 3—neutral powder 100% active
tomerse" No. 3—paste (75% "Santomerse" No. 3 in
ater)

s: Highly efficient surface-active wetting, spreading,
erating, emulsifying agents and detergents used in the
lowing industries: textile, paper, leather, adhesive, rub-
insecticide, dust collection, soap, cosmetic, ceramic,
rgent, metal cleaning, plating, emulsions, dyes, phar-
eutical, embalming fluid, laundry, steel, paint, cement,
, felt, color, etc.

tainers: "Santomerse" No. 1—75-lb. bags; 175, 220
225-lb. drums; "Santomerse" 80—200-lb. drums;
tomerse" No. 3 (powder)—115-lb. drums; "Santo-
se" No. 3 (paste)—175 -lb. steel drums.

pping Classification: Washing Compound NOIBN.

rature: "Santomerse No. 1," Technical Bulletin I-118;
tomerse D, S, No. 3 & No. 3 Paste," Technical
letin I-123.

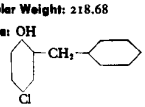
NTOPHEN" 1 GERMICIDE

o-benzyl-parachlorophenol, Technical)

RGANIC DIVISION

lecular Weight: 218.68

ula:



ndard Form: Flaked solid.

ecifications: White to light tan or pink flakes; crystalliz-
point 45.0°C. min.; Sp. Gr. 1.202–1.206 at 55°/55°C.;
acidity (as HCl) 0.01% max.; odor slight phenolic max.

eral Information—Properties: "Santophen" 1 pos-
high bactericidal and fungicidal activity, but low tox-
to higher animals. When properly formulated for dis-
ant use, it is considered nonirritating in use dilutions.
uble in water, but highly soluble in alcohol and other
ic solvents; dispersible in aqueous media with the aid
soaps or synthetic dispersing agents. Noncorrosive to
ost metals or other engineering materials.

es: Used as the active principle, or as an enhancing agent
disinfectants.

ainers: 55 and 22-gal. lacquer-lined drums.

pping Classification: Disinfectant Other Than Medici-
l NOIBN.

rature: "Santophen I—a Versatile Germicide," booklet.

NTOPHEN" 1 SOLUTION

% Santophen 1, 25% Isopropanol)

RGANIC DIVISION

ndard Form: Liquid.

ecifications: Straw to amber colored liquid; assay 75.0
77.0%; Sp. Gr. 1.082 to 1.095 at 15.5°/15.5°C.

es: Used as the active principle, or as an enhancing agent
disinfectants. Santophen I Solution is supplied as a
venience to formulators who desire a product that is
e readily added to formulations than Santophen I flake
which completely eliminates dusting and caking prob-
where they exist.

ainers: 55 and 15-gal. drums.

pping Classification: Disinfectant other than medicinal
OIBN.

"SANTOPOID" 32 OIL ADDITIVE — ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: A foam-inhibited, dark, oily, viscous liquid with the following typical properties: Sp. Gr. 1.19 at 60°/60°F.; sulfur 7.4–9.0%; chlorine 24.5–27.5%; phosphorus 0.49–0.59%; Saybolt Universal viscosity 80–90 seconds at 210°F.; flash point 250°F.; color, ASTM (dilute) 5¾ max.

Uses: Recommended for compounding gear lubricants designed to meet Military Specification MIL-L-2105.

Containers: 55-gal. steel drums; tank cars.

Shipping Classification: Petroleum Oil NOIBN.

Literature: "Santopoids 29, 32 & 33," Technical Bulletin O-83.

"SANTOPOID" 33 OIL ADDITIVE — ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: A foam-inhibited, dark, oily, viscous liquid with the following typical properties: Sp. Gr. 1.13 at 60°/60°F.; flash point 250°F.; Saybolt Universal viscosity 60 at 210°F.; sulfur 8.5%; chlorine 26.0%; phosphorus 0.56%.

Uses: Recommended for compounding gear lubricants designed to meet Military Specification MIL-L-2105.

Containers: 55-gal. steel drums; tank cars.

Shipping Classification: Petroleum Oil NOIBN.

Literature: "Santopoids 29, 32 & 33," Technical Bulletin O-83.

"SANTOPOID" 34 OIL ADDITIVE — ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: A foam-inhibited, amber, oily, viscous liquid with the following typical properties; Sp. Gr. 1.12 at 60°/60°F.; flash point 250°F. min.; sulfur 8.1%; chlorine 25.0%; phosphorus 0.54%.

Uses: Recommended for compounding gear lubricants designed to meet Military Specification MIL-L-2105.

Containers: 55-gal. steel drums; tank cars.

Shipping Classification: Petroleum Oil NOIBN.

"SANTOPOID" S OIL ADDITIVE — ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: A dark, oily, viscous liquid, chemically a chlornaphtha xanthate; Sp. Gr. approx. 1.19 at 60° 60°F.; flash point 250°F.; viscosity 63 cts. at 100°F.; sulfur 11%; chlorine 31%.

Uses: "Santopoid" S at 10% by weight in mineral oil is approved under Federal Specification VV-L-761 for extreme pressure lubricants. Normally 7.5% by weight is sufficient to compound commercial lubricants satisfactory for hypoid and other gears. Lower percentages are used for milder E. P. Products.

Containers: 55-gal. steel drums; tank cars.

Shipping Classification: Petroleum Oil NOIBN.

Literature: "Santopoid S and Santopoid S-RI," Technical Bulletin O-32.

"SANTOPOUR" OIL ADDITIVE — ORGANIC DIVISION

Standard Form: Liquid.

(*Continued on next page*)

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TOWOLDMON0007072

General Information—Properties: A dark liquid with the following typical characteristics: flash point 400°F.; Saybolt viscosity 60 at 210°F.; color ASTM (dil.) 8; neutralization number 0.15; pour point plus 10°F.

Uses: A pour point depressant for petroleum oils.

Containers: 55-gal. drums; tank cars.

Shipping Classification: Petroleum Oil NOIBN.

Literature: "Santopour-Santopour B," Technical Bulletin O-61.

"SANTOPOUR" B OIL ADDITIVE — ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: A dark liquid with the following typical characteristics: flash point 400°F.; Saybolt viscosity 55 at 210°F.; color ASTM (dil.) 8; neutralization number 0.3; pour point 0°F.

Uses: A pour point depressant for petroleum oils.

Containers: 55-gal. drums; tank cars.

Shipping Classification: Petroleum Oil NOIBN.

Literature: "Santopour-Santopour B," Technical Bulletin O-61.

"SANTOQUIN" *(6 Ethoxy 1,2-Dihydro 2,2,4-Trimethyl Quinoline)* — ORGANIC DIVISION

Molecular Weight: 217.3

Formula: $C_{14}H_{19}NO$

Standard Form: Liquid.

Specifications: Yellow liquid; refractive index 1.569 to 1.572 at 25°C.; Sp. Gr. 1.029 to 1.031 at 25°/25°C.

Uses: A preservative to reduce oxidative loss of carotene in dehydrated alfalfa.

Containers: 55 and 5-gal. drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Santoquin, An Antioxidant for Carotene Preservation," Technical Data Sheet.

"SANTOSITE" SODIUM SULFITE ANHYDROUS, TECHNICAL — INORGANIC DIVISION

Molecular Weight: 126.06

Formula: Na_2SO_3

Standard Form: Powder.

Specifications: Tan to slightly pink crystalline powder; foreign odor very slight max.; assay (Na_2SO_3) 93.0% min.; color of filtrate from 10% solution in water not darker than APHA 250.

General Information—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, paper and cordage. When added to chrome tanning liquor produces a milder tanning agent which gives leather a tighter grain and a finer break. Highly efficient in the semi-chemical pulping of straw and wood for paper manufacture; is being developed as an impregnant to facilitate grinding of pulp wood logs.

Containers: 100-lb. paper bags.

Shipping Classification: Sodium Sulfite.

Literature: "Santosite for Removing Oxygen from Boiler Feed Water," Technical Bulletin O-26; "Santosite ... Milder Pulping Agent," folder.

"SANTOTAN" KR BASIC CHROME SULFATE — INORGANIC DIVISION

Formula: Contains approx. 50% of $Cr_2(SO_4)_3(OH)_3$

Standard Form: Crystals.

Specifications: Dark green crystals; solution in water (5:500) clear; basicity (Cr_2O_3/SO_3) 101–105; basicity (Schlemmer) 37.3–39.7; chromium as Cr_2O_3 23.9% min.

Uses: In chrome tanning of calf, cow and horse hides and sheepskins.

Containers: 100-lb. paper bags.

Shipping Classification: Tanning Extract Dry NOIBN.

SATINWOOD REZ — MERCHANDISING DIVISION

General Information—Properties: A synthetic resin base final finish coating with low sheen for interior wood of types and particularly designed for use over Clear Rez for natural wood finish; White Rez for "bleached" effect, or use as a final interior finish over all Rez Color-Tones. One gallon covers approx. 400 to 500 sq. ft.

Containers: 1-gal. (4/case); quarts (12/case); pints (... case).

Shipping Classification: Wood Filler Liquid.

Literature: Rez Color Card Folder.

"SKYDROL" FUNCTIONAL FLUID — ORGANIC DIVISION

Standard Form: Liquid.

Typical Analysis: Cloud point below 0°F.; moisture 0.25% max.; neutralization number 0.2 max.; specific gravity 1.080 to 1.086 at 25°/25°C.; pour point max. 70°F. or lower.

General Information—Properties: A clear, green, mobile fire-resistant hydraulic fluid with outstanding lubricity, stability, noncorrosiveness, excellent viscosity-temperature characteristics, and resistance to oxidation.

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

Containers: 475, 45 and 9-lb. drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Skydrol," booklet; "Skydrol" Service Manual.

SODIUM ACID PYROPHOSPHATE *(Also known as disodium dihydrogen pyrophosphate, acid sodium pyrophosphate)* — INORGANIC DIVISION

Molecular Weight: 221.97

Formula: $Na_2H_2P_2O_7$

Standard Form: Powder.

General Information—Properties: White powder, soluble in water; min. neutralizing value 74; pH of 1% solution ...

Uses: As baking acid for prepared flours, doughnut flour, in manufacture of baking powders and baking creams, ... well drilling muds.

0685208

TOWOLDMON0007073

...Food and commercial. Food grade meets all U. S. ...Pure Food Law requirements.

...ers: 100-lb. bags; 325 and 100-lb. drums.

...g Classification: Sodium Phosphate.

...BENZOATE — ORGANIC DIVISION

...ular Weight: 144.11

...a: C_6H_5COONa

...d Form: Powder.

...ications: *U.S.P. Grade*: Thin white flakes or white ...; solubility in water (10:18 at 25°C.) complete; solu... in 90% ethyl alcohol (1:50 at 25°C.) complete; ...ml N/10 NaOH to 0.20 ml N/10 HCl per 2.0 grams; ...e 0.50% max.; assay 99.0% min. (dry basis); ...ide (as NaCl) 0.05% max.; sulfates (as Na_2SO_4) ...% max.

...ical Grade: White or slightly tinted powder: assay ...% min. (dry basis); solution in water (10:18) essentially ...ar but slightly inferior to U.S.P. quality; chlorides ...aCl) 0.6% max.; sulfates (as Na_2SO_4) 0.6% max.

...n U.S.P. Grade: For preserving foods, tobacco and ...inal preparations.

...ical Grade: As an industrial preservative and rust ...itor.

...des: U.S.P. and Technical.

...ainers: 100, 50 and 25-lb. fiber drums.

...ping Classification: Sodium Benzoate.

...ature: "Preserving with Monsanto Sodium Benzoate," ...; "Benzoic Acid and the Benzoates," 16-page booklet.

...M BISULFATE (*Nitre Cake*)

...GANIC DIVISION

...lecular Weight: 120.07

...mula: $NaHSO_4$

...dard Form: Globular.

...ypical Analysis: 37% H_2SO_4 available.

...s: Used to replace either sulfuric acid or combination of ...uric acid and Glauber's salt. One hundred lbs. nitre cake ...pproximately equivalent to 39.8 lbs. 66° sulfuric acid and ...47 lbs. Glauber's salt.

...Used principally in viscose rayon spinning baths; dyeing ...oden goods; refining nickel ores; manufacture of sulfate ...; in tanneries for pickling, deliming and making one-...h tan solutions; as an acid scour for household use; in ...iculture for disinfecting soil; as a bowl cleaner in sanitary ...de.

...ainers: 100-lb. polyethylene bags; 100-lb. plywood ...; 330 and 400-lb. fiber drums; 470-lb. steel drums; ...k carloads.

...pping Classification: Sodium Bisulfate (Nitre Cake).

...UM BISULFITE — INORGANIC DIVISION

...lecular Weight: 104.07 (Solution); 190.13 (Anhydrous).

...rmula: $NaHSO_3$ (Solution); $Na_2S_2O_5$ (Anhydrous).

...dard Form: Solution: 33°Bé. containing approx. 21% ...; wt. per gal. 10.78 lbs. Anhydrous (sodium metabisul... 66% SO_2 (approx.).

Typical Analysis:

	SOLUTION	ANHYDROUS
SO_2	21.5%	66%
Na_2SO_4	3.00	1.5
Fe	0.006	0.002

Uses: In dye manufacture; as source of SO_2 for reducing sodium bichromate to basic ...rome sulfate in tanning; bleaching of vegetable tan ext...s; production of hydrosulfite for vat dyeing; antichlor in bleaching ground wood; bleaching dyes out of wooden coloring drums used for dyeing leather; antichlor in pulp bleaching; antichlor in laundries; bleaching of straw, rabbit fur, sugar syrups, glue and glucose.

Containers: Liquid—550-lb. tight hardware bbls.; Anhydrous—400-lb. fiber drums; 100-lb. moisture-proof paper bags.

Shipping Classification: Sodium Bisulfite Dry or Sodium Bisulfite Liquid.

SODIUM FERRIC PYROPHOSPHATE

— INORGANIC DIVISION

Formula: $Na_8Fe_4(P_2O_7)_5 \cdot xH_2O$

Standard Form: Powder.

General Information—Properties: A finely subdivided powder; soluble in hydrochloric acid; insoluble in water; contains min. of 15.5% iron.

Uses: For iron enrichment of flour, cereals, food beverages. It does not induce rancidity in cereal products.

Containers: 100-lb. net weight containers.

Shipping Classification: Chemicals NOIBN.

SODIUM HEXAMETAPHOSPHATE

— INORGANIC DIVISION

Average Molecular Weight: 1490

Formula: An amorphous glass of composition equivalent to $Na_{13}P_{14}O_{42}$.

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.

General Information—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.

Containers: 100-lb. net multiwall paper bags; 100-lb. net burlap bags.

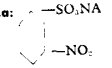
Shipping Classification: Sodium Phosphate, NOIBN.

Literature: "Sodium Phosphates for Industry," booklet.

SODIUM *meta*-NITROBENZENE SULFONATE, TECHNICAL — ORGANIC DIVISION

Molecular Weight: 225.15

Formula:



Standard Form: Wet powder.

(Continued on next page)

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TOWOLDMON0007074

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

Uses: As an intermediate in the manufacture of dye stuffs; as an electroplating bath additive.

Containers: 250-lb. polyethylene-lined fiber drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Sodium meta-Nitrobenzene Sulfonate," Technical Data Sheet.

SODIUM METAPHOSPHATE, LOW pH

—INORGANIC DIVISION

Formula: $(NaPO_3)_x$

General Information—Properties: Clear, water-soluble glass; very hygroscopic pH of 1% solution 5.5.

Containers: 100-lb. net fiber drums.

Shipping Classification: Sodium Phosphate.

SODIUM METAPHOSPHATE *(Insoluble)*

—INORGANIC DIVISION

Standard Form: Powder.

General Information—Properties: White powder, generally stated to be the monometaphosphate—$NaPO_3$; soluble in hot concentrated H_2SO_4; insoluble in water.

Uses: Suggested as a mild abrasive; has mild polishing power; softens hard water, probably by base ion exchange method.

Containers: 100-lb. bags.

Shipping Classification: Sodium Phosphate.

SODIUM PHOSPHATE, DI, ANHYDROUS

(Also known as phosphate of soda, sodium phosphate dibasic, secondary sodium phosphate and exsiccated sodium phosphate) —INORGANIC DIVISION

Molecular Weight: 141.98

Formula: Na_2HPO_4

Standard Form: Powder.

General Information—Properties: Soluble in water; insoluble in alcohol; on exposure to air will absorb 2–7 mols H_2O depending on humidity and temperature; loses 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*).

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 weighting of silk and impregnating of textiles in dyeing and calico printing; in the adjustment of condensed milk; medicinal.

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

Containers: 100-lb. bags; 350 and 100-lb. drums.

Shipping Classification: Disodium Phosphate

SODIUM PHOSPHATE, DI, DUOHYDRATE *(Also known as phosphate of soda, sodium phosphate dibasic, secondary sodium phosphate)* —INORGANIC DIVISION

Molecular Weight: 178.0

Formula: $Na_2HPO_4 \cdot 2H_2O$

Standard Form: Crystalline powder.

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

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

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

Containers: 100-lb. bags.

Shipping Classification: Disodium Phosphate.

SODIUM PHOSPHATE, MONO —INORGANIC DIVISION

(Also known as sodium phosphate, monobasic; sodium dihydrogen phosphate; sodium biphosphate; monosodium orthophosphate and acid sodium phosphate)

Molecular Weight: 119.99

Formula: NaH_2PO_4

Standard Form: Powder.

General Information—Properties: Contains not less than 58% P_2O_5; pH value of 1% solution 4.6.

Uses: For conditioning boiler water and in electroplating.

Grades: Food; commercial.

Containers: 100-lb. bags; 350 and 100-lb. drums.

Shipping Classification: Sodium Phosphate.

SODIUM PHOSPHATE, TRI —INORGANIC DIVISION

(Also known as normal sodium phosphate; sodium phosphate, tribasic; tertiary sodium phosphate and TSP)

Molecular Weight: 380.16

Formula: $Na_3PO_4 \cdot 12H_2O$

Standard Form: Crystalline material.

Specifications: White crystalline material, uniformly and 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.

Containers: 100-lb. bags; 325 and 100-lb. drums.

Shipping Classification: Trisodium Phosphate.

Literature: "T.S.P.," leaflet.

SODIUM PYROPHOSPHATE, TETRA

(Also known as sodium pyrophosphate, pyrophosphate of soda, normal pyrosodium phosphate, alkaline sodium pyrophosphate and TSPP) —INORGANIC DIVISION

Molecular Weight: 265.95

Formula: $Na_4P_2O_7$

Standard Form: Crystals or granules.

General Information—Properties: White crystalline material or white granular powder; pH of 1% solution 10.4. Solubility: 6 parts in 100 parts of water at 15°C.; 40 parts in 100 parts of water at 100°C.

Uses: As a soap builder; conditioning oil drilling muds; bleaching, especially for straw, and as an ink eradicator.

0685210

TOWOLDMON0007075

facture of iron pyrophosphate and other pyrophos-
household and industrial cleaner and detergent; in
th for putting certain types of dye in complete solu-
lectroplating; metal cleaning; electrolytic separation of
metals; as emulsifier in process cheese manufacture;
ming textiles; stabilizing hydrogen peroxide baths;
for de-inking newsprint.

Anhydrous.

Containers: Regular—100-lb. paper bags; 300-lb. and 100-
ums; Powdered—100-lb. paper bags; 350-lb. and 100-
ums.

Shipping Classification: Sodium Phosphate.

Literature: "Tetra Sodium Pyrophosphate," Technical
in I-24.

TRICHLOROACETATE—ORGANIC DIVISION

Molecular Weight: 185.47

Formula: CCl_3COONa

Standard Form: Powder.

General Information—Properties: Light to dark tan
er; assay 90% min.

Uses: Possesses herbicidal properties. Particularly useful
controlling perennial grassy weeds. Useful against annual
s in certain crops.

Containers: Fiber drums.

Shipping Classification: Weed Killing Compound NOIBN
; Agricultural Herbicide NOIBN—other than liquid
truck.

TRIPOLYPHOSPHATE—INORGANIC DIVISION

Molecular Weight: 367.93

Formula: $Na_5P_3O_{10}$

Standard Form: Granules or powder.

General Information—Properties: White granular mate-
or white powder; water-soluble with excellent water-
ning and detergent properties; pH 9.5 of 1% solution.
calcium sequestering agent and also has a high binding
wer for most of the metals of Group II and Group IV.

Uses: Soap builder; detergent and water softener; condition-
oil drilling muds; eliminates scum and soap curds in
d water.

Containers: 100-lb. bags; 350 and 100-lb. drums.

Shipping Classification: Phosphate of Soda.

"SQ" PHOSPHATE—INORGANIC DIVISION

Standard Form: Dry powder.

Typical Analysis: P_2O_5 63.0%; Na_2O 36.0%; pH 1% soln. 7.9.

General Information—Properties: "SQ" Phosphate is a glassy poly phosphate with high calcium sequestering properties. It is used in formulating industrial cleaning compounds such as dishwashing and dairy cleaners.

Containers: 100-lb. net paper bags or triotex bags.

Shipping Classification: Phosphate of soda.

"STEROX" NO. 5 POLYOXYETHYLENE THIOETHER

—INORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: Nonionic surface-active agent and detergent with fast wetting speed and good solution properties. Highly resistant to precipitation by metallic salts. Compatible with other types of detergents, builder materials and most enzyme desizing agents. 85% active liquid with inorganic salts; Sp. Gr. 1.056 at 25°C.; pour point 20°F. pH 6-8.

Uses: Wetting and scouring agent in textile operations. Component for liquid detergent formulations. Useful as a wetting agent and detergent in baths of high metallic salt concentration.

Containers: 450-lb. net 55-gal. steel drums.

Shipping Classification: Washing Compound Liquid.

Literature: "Sterox No. 5, Sterox No. 6," Technical Bulletin P-136.

"STEROX" NO. 6 POLYOXYETHYLENE THIOETHER

—INORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: Nonionic surface-active agent, designed especially for operations where exceptionally fast wetting and high scouring efficiency is desired. Compatible with principal textile operations. 85% active liquid without inorganic salts; Sp. Gr. 1.041; pour point 20 F. pH 6-8.

Uses: Designed especially for textile operations where fast wetting, good scouring and emulsification of grease soil are needed. Scouring efficiency particularly advantageous for raw wool and woolen piece goods scouring. Effective re-wetting agent for textiles.

Containers: 450-lb. net 55-gal. steel drums.

Shipping Classification: Washing Compounds Liquid.

Literature: "Sterox No. 5, Sterox No. 6," Technical Bulletin P-136.

"STEROX" AJ POLYOXYETHYLENE ETHER

—INORGANIC DIVISION

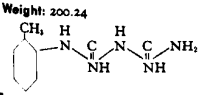
Standard Form: Liquid.

"SOPANOX" ortho-TOLYL BIGUANIDE

ANIC DIVISION

Molecular Weight: 200.24

Formula:



Standard Form: Powder.

Specifications: White to off-white powder; assay 90%
; loss on drying 5% max.; melting point 138°C. min.

General Information—Properties: An amino compound
ctive in minute quantities in restraining the oxidation of
and the resulting rancidity, discoloration and other
verse qualities, all of which must be avoided in producing
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.

Containers: 140-lb. drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Sopanox," Technical Bulletin O-P-100.

TOWOLDMON0007076

General Information—Properties: "Sterox" AJ is an 85% active nonionic surface active agent for use in detergent formulations, etc. It has a faint, pleasing odor and is particularly suited for household detergents and detergent sanitizer formulations.

Containers: 425-lb. net steel drums.

Shipping Classification: Washing Compound—NOIBN Liquid.

Literature: "Sterox AJ," Technical Bulletin I-147.

"STEROX" AJ-100 POLYOXYETHYLENE ETHER

—INORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: "Sterox" AJ-100 is a 100% active nonionic surface active agent recommended for use in agricultural emulsions, detergent formulations, etc. In general, "Sterox" AJ, which is 85% active, is recommended for general use, but "Sterox" AJ-100 may be used where added water is detrimental.

Containers: 425-lb. net drums.

Shipping Classification: Washing Compound—NOIBN.

"STEROX" CD POLYOXYETHYLENE ESTER

—INORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: Nonionic, 100% active surface-active agent with exceptionally high detergent action accompanied by unusually low foaming. Compatible with other type detergents and builder materials. Light amber liquid; Sp. Gr. 1.050 at 25 C.; pour point 50 F. pH 7-8.

Uses: Mixed with builder materials, an unusually high cleaning action is obtained with the singular quality of very 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. Dispersing agent with low foam characteristics for powdered materials.

Containers: 450-lb. net steel drums.

Shipping Classification: Washing Compound Liquid.

Literature: "Sterox CD," Technical Bulletin I-129.

"STEROX" SE POLYOXYETHYLENE THIOETHER

—INORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: Light amber liquid 100% nonionic-type, surface-active agent and detergent. Compatible with other types of wetting agents, detergents and builders. Good solution properties and high resistance to precipitation by metallic salts; Sp. Gr. 1.0495 at 25 C.; pour point 60 F. pH 6-8.

Uses: Detergent powders and liquids. Penetrant for starch adhesives. Textile mill specialty compounds.

Containers: 450-lb. net 55-gal. steel drums.

Shipping Classification: Washing Compound Liquid.

Literature: "Sterox SE, Sterox SK," Technical Bulletin I-133.

"STEROX" SK POLYOXYETHYLENE THIOETHER

—INORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: Light amber liquid 100% active nonionic-type, surface-active agent and detergent. Extremely fast wetting action, good detergency and emulsifying properties; Sp. Gr. 1.0345 at 25°C.; pour point 55 F. pH 6-8.

Uses: Wetting agent and penetrant for insecticidal and herbicidal formulations. Wetting agent with low foam characteristics for wet collection dust systems. De-emulsifier for some hydrocarbon-water emulsions.

Containers: 450-lb. net 55-gal. steel drums.

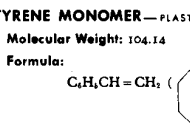
Shipping Classification: Washing Compound Liquid.

Literature: "Sterox SE, Sterox SK," Technical Bulletin I-133.

STYRENE MONOMER—PLASTICS DIVISION

Molecular Weight: 104.14

Formula:



Standard Form: Liquid.

Specifications: Color (APHA Platinum-Cobalt Scale) 10 over 15 units; free from suspended matter and sediment; assay 99.5% min.; viscosity 0.87 cps. max. at 25°C.; Sp. Gr. 0.9038–0.9057 at 25°/25°C.; refractive index not less 25°C. 1.5434; tertiary butyl catechol 10 ppm. min., 15 ppm max.; aldehydes (benzaldehyde) 0.02% max.; peroxide (ethyl peroxide) 0.01% max.; chlorine 0.01%; sulfur 0.01 max.; polymer content not greater than 0.20%; complete soluble as a 10% solution in dioxane, toluene and methethyl ketone.

General Information—Properties: An aromatic hydrocarbon with an aliphatic side chain containing a double bo which permits polymerization, copolymerization and oth reactions. A colorless material that polymerizes and copolymerizes with other light-colored materials to yield clear light-colored products.

Uses: Production of styrene molding compounds; GR type synthetic rubber; styrenated oils for surface coat resins; styrene-modified alkyds for air drying and bak finishes; low-pressure laminating resins; dispersions of sty rene polymers and copolymers for modifying properties paper and textiles; ion exchange resins.

Containers: 55-gal. nonreturnable steel drums; tank c

Shipping Classification: Styrene Liquid.

Literature: TX-10 "Styrene Modified Alkyd type resins," TX-11 "Styrene Modified Natural Oils," "A Sketch Bo of Profitable Products," "Build a Bigger Business" (sum mary of end uses).

SUCCINIC ANHYDRIDE—ORGANIC DIVISION

Molecular Weight: 100.07

Formula:



Standard Form: Crystals.

Specifications: White crystalline material; crystalline point 118.0°C. min.; assay 99.0% min.

Uses: In the manufacture of pharmaceuticals and var resins.

Containers:
Shipping Cla

SULFASAN"

ORGANIC DIV

Standard Fo

Specification
moisture 0.5
Sp. Gr. 1.29

Uses: "Sulfas
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"Sulfasan" f
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reverse the ar

Containers:

Shipping Cla

Literature:
dustry," 46-p

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Molecular W

Formula: SO

Standard For

Specification
max., moistur

Uses: In leath
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in textiles; dil
facture of sulf
manufacture

Containers:

Shipping Cla

Literature:
ical Bulletin

LFURIC ACI

Molecular We

Formula: H_2S

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Typical Anal
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in the Genera

Uses: Used ex
refineries, pigr
plants, tanner

Containers:

Shipping Clas

LFURIC ACI

Complete mar
nd Monsanto
Sales Departm

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TOWOLDMON0007077

Containers: 250-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

"SULFASAN" R *(4,4'-dithiodimohorpline)*

—ORGANIC DIVISION

Standard Form: Powder.

Specifications: Coarse, gray powder; ash 0.3% max.; moisture 0.5% max.; M.P. 122°C. min.; sulfur 26–27.5%; Sp. Gr. 1.29; flash point 250°F. min.

Uses: "Sulfasan" R is a sulfur bearing material. Its stability at ordinary processing temperatures is good, but at curing temperatures it probably breaks down and liberates sulfur, morpholine and perhaps other compounds. It gives great freedom from scorch in compounds such as natural rubber treads loaded with HAF black. Usually it is used along with some regular sulfur, but the total dosage must be reduced to keep modulus and hardness in line. Stocks containing "Sulfasan" R give excellent aging. It does not discolor white compounds. Some acidic materials such as pine tar reverse the anti-scorch property.

Containers: 150-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

SULFUR DIOXIDE, LIQUID —INORGANIC DIVISION

Molecular Weight: 64.07

Formula: SO_2

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.

Containers: Tanks; 1-ton cylinders.

Shipping Classification: Sulfur Dioxide.

Literature: "The Safe Handling of Sulfur Dioxide," Technical Bulletin O-49.

SULFURIC ACID —INORGANIC DIVISION

Molecular Weight: 98.08

Formula: H_2SO_4

Standard Form: 60°Bé.; 66°Bé.; 98% H_2SO_4; various strengths oleum.

Typical Analysis: For complete data on sulfuric acid content and freezing points of the various grades, see the tables in the General Data Section.

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

Containers: Tank trucks; tank cars.

Shipping Classification: Sulfuric Acid.

SULFURIC ACID PLANTS

Complete manufacturing plants using the contact process and Monsanto Vanadium Catalyst offered by Engineering Sales Department.

SURFACE COATINGS —MERCHANDISING DIVISION

(See page 72) (Consumer Products)

"SYTON" C-15 AND C-30 SILICA SOL

—INORGANIC DIVISION

Typical Analysis:

	"SYTON" C-30	"SYTON" C-15
SiO_2	30.0% ±0.4	15.0% ±0.4
H_2O	70.0% ±0.4	85.0% ±0.4
NaCl	Trace	Trace
pH	9.8 ±0.2	9.8 ±0.2
Color	Milky White	Milky White
Specific Gravity	1.20	1.09
Freezing Point	32°F.	32°F.

General Information—Properties: Permanent colloidal dispersions of silica (SiO_2) in water. "Syton" will freeze at 32°F. and the silica is precipitated irreversibly. A special grade—"Syton" FS—is offered for overseas shipments during winter months.

Uses: Recommended as an antiblocking and gloss controlling agent in water-based finishes, latex, etc.; to improve bond strength of rubber adhesives and increase modulus of latex films and thread and to control tack; as a liquid dusting agent or mold lubricant; to raise the heat distortion point of plastics and similar systems; to surface-harden water-based laminating resins; and to increase surface friction of paper.

Containers: 55 and 5-gal. lined nonreturnable drums.

Shipping Classification: Colloidal Silica, Liquid.

Literature: "Syton for Industrial Applications," Technical Bulletin I-100.

"SYTON" W-20 AND DS SILICA SOLS

—INORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: Milky-white liquid-stable dispersion of 15% and 30% respectively colloidal silica particles in water; odorless, nontoxic.

Uses: A textile chemical recommended for improving wool, worsted, cotton and rayon spinning efficiency; finishing agent for delustering, reducing slippage, increasing seam strength of acetate, rayon, nylon and silk fabrics.

Containers: 55 and 5-gal. lined nonreturnable drums.

Shipping Classification: Colloidal Silica, Liquid.

Literature: "Profitable Spinning of Wool and Wool Blends with Syton," booklet; "Syton Colloidal Silica Dispersion in Textile Finishes," Technical Bulletin I-110; "Syton Oil Application on Woolen Systems," Technical Bulletin I-130; "Syton Oil Application on Worsted System," Technical Bulletin I-127; "Syton on Tape Condensers and Rub Aprons," PTI 10-5.5; "Syton on Synthetics for the Woolen System," Technical Bulletin I-126.

THENYLPYRAMINE FUMARATE —ORGANIC DIVISION

Molecular Weight: 870.98

Formula: $(C_{14}H_{18}N_3S)_2[(CHCO_2H)_2]_3$

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: Thenylpyramine fumarate is used in pharmaceutical and antihistaminic preparations.

0685213

TOWOLDMON0007078

Containers: 100 and 25-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

THENYLPYRAMINE HYDROCHLORIDE

(N, N-dimethyl-N'-2-pyridyl-N'-2-thenylethylenediamine hydrochloride) — ORGANIC DIVISION

Molecular Weight: 297.85

Formula: $C_{14}H_{20}N_3SCl$

Standard Form: Crystalline solid.

Specifications: White or yellowish-white crystals; assay 99.0% min.; ash 0.05% max.; moisture 0.5% max.; M.P. 160.0°C. min. to start; trace max. retained on 40 mesh.

Uses: In pharmaceutical preparations where antihistaminic activity is desired.

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

Containers: 100 and 25-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

THIOPHOSPHORYL CHLORIDE — ORGANIC DIVISION

Molecular Weight: 169.41

Formula: $PSCl_3$

Standard Form: Colorless Mobile Liquid.

Typical Analysis: Boiling range: 1st drop 119°C.; dry point 123°C.; 95% (2.5–97.5 ml) 3°C.

Uses: Manufacture of insecticides, oil additives and gasoline additives.

Containers: 675-lb. nickel drums.

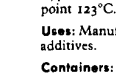
Shipping Classification: Chemicals NOIBN. "Corrosive" Liquid label required.

THIOPHOSPHORYL CHLORIDE, TECHNICAL

— ORGANIC DIVISION

Molecular Weight: 169.42

Formula:



Standard Form: Liquid.

Typical Analysis: Colorless to light straw liquid. Distillation range: first drop 119°C.; 95% (2.5–97.5 ml) 3°C.; dry point 123°C.; Sp. Gr. 25°/15.5°C. 1.631.

Uses: Intermediate in insecticide manufacture.

Containers: 675-lb. nickel drums.

Shipping Classification: Chemicals NOIBN.

THIOUREA *(Also known as thiocarbamide, sulfocarbamide, and sulfourea)* — ORGANIC DIVISION

Molecular Weight: 76.12

Formula: NH_2CSNH_2

Standard Form: Crystals.

Specifications: White crystals; moisture 0.50% max.; ash 0.1% max.

Uses: In manufacture of thioglycolic acid; as an intermediate in the production of pharmaceuticals; in the manufacture of vulcanization accelerators; as an ingredient of insecticidal compositions; mothproofing agent in treating furs, feathers, skins and fabrics; an intermediate in the production of resins and waxes.

Containers: 75-lb. paper bags.

Shipping Classification: Chemicals NOIBN.

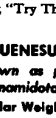
Literature: "Thiourea," Development Department Bulletin 28; "Try Thiourea," folder.

para-TOLUENESULFONAMIDE

(Also known as para-toluenesulfonic acid amide, para-sulfonamidotoluene) — ORGANIC DIVISION

Molecular Weight: 171.22

Formula:



Standard Form: Crystalline powder. (A refined powder is available.)

Specifications: Light brownish, crystalline powder; crystallizing point (dried material) 135.0°C. min.; ash 0.1% max.; alcohol-insoluble material 0.6% max.; moisture 0.5% max.

Uses: As an intermediate in the production of active chlorine-bearing compounds; as an intermediate in the production of dyestuffs; as a plasticizer; as a base in the production of plasticizers and resins.

Containers: 225 and 275-lb. fiber drums (refined).

Shipping Classification: Chemicals NOIBN.

para-TOLUENESULFONCHLORIDE — ORGANIC DIVISION

Molecular Weight: 190.65

Formula:



Standard Form: Crystals.

Specifications: Grayish-white or yellowish crystals; 95% min.; crystallizing point 65.5°C. min. (dry basis).

Uses: As a condensing agent, as an intermediate in dyestuff synthesis, in preparation of methyl and ethyl cellulose and the manufacture of synthetic tanning materials.

Containers: 387-lb. (approx.) gumwood bbls.

Shipping Classification: Chemicals NOIBN.

TOLUENESULFONIC ACID, TECHNICAL

— ORGANIC DIVISION

Molecular Weight: 172.20

Formula:



Standard Form: Liquid or semicrystalline solid.

Specifications: Viscous liquid or semicrystalline solid; a greenish-to-black color; toluenesulfonic acid 94.0% min.; H_2SO_4 1.0% max.; water 2.0% max.; toluene 0.2% max.

General Information—Properties: A mixture of approximately 80% para isomer and 20% ortho isomer.

Uses: In the manufacture of dyestuff intermediates; as a catalyst in certain organic reactions.

TOWOLDMON0007079

ers: 100-lb. steel drums.

g Classification: Chemicals NOIBN.

-TRICHLOROBENZENE—ORGANIC DIVISION

ular Weight: 181.46

ula:



ard Form: Liquid.

al Information—Properties: Clear, essentially colorliquid; Sp. Gr. 1.448–1.458 at 25.0°/15.5°C.; crystallizpoint 16.7°C. min. Distillation range: first drop 212.5°C. 95% 2.0°C. max. Dry point 218.0°C. max.

1, 2, 4-Trichlorobenzene is a fairly pure compound erentiated from trichlorobenzene, technical; used as a al intermediate principally in the manufacture of

ers: 55-gal. steel drums.

g Classification: Trichlorobenzene.

OROBENZENE, TECHNICAL—ORGANIC DIVISION

ular Weight: 181.46

ula:



ard Form: Liquid.

ications: Practically clear, colorless to light yellow li-id; Sp. Gr. 1.460–1.477 at 15.5°/15.5°C.; crystallizing **0.0°C. max. Distillation range: first drop 205.0°C. 5% 213.0°C. min.; 90% 215.0°C. min. Dry point .0°C. max.**

al Information—Properties: Essentially a mixture various isomers of trichlorobenzene.

e: In organic synthesis, as a solvent, as an insecticide garbage deodorant.

ainers: 55-gal. steel drums.

ping Classification: Trichlorobenzene.

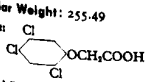
ature: "Chemicals for Termite Control," Technical letin O-13.

5-TRICHLOROPHENOXYACETIC ACID (2,4,5-T)

RGANIC DIVISION

olecular Weight: 255.49

ormula:



ard Form: Powder.

ecifications: White-to-gray powder; assay 98.0% min.; .P. 152.0°C. min. at end; ash 0.5% max.; moisture 0.5%

eral Information—Properties: Insoluble in water, ble in alcohol; readily forms esters and amine salts. A ective herbicide having high plant toxicity for many cies.

e: Either by itself or in the form of a salt or ester as a rbicide. Is of particular value for brush control.

Containers: 200 and 50-lb. fiber drums.

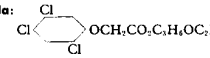
Shipping Classification: Weed Killing Compound NOIBN.

Literature: "Formulating 2,4,5-T for Weed Control," booklet; "Chemical Weed Control on Rights-of-Way," booklet; "Chemical Brush Control in Pastures and on Grazing Lands," booklet.

2,4,5-TRICHLOROPHENOXYACETIC ACID—BUTOXYETHOXYPROPYL ESTER—ORGANIC DIVISION

Molecular Weight: 413.7

Formula:



Standard Form: Liquid.

Specifications: Dark brown liquid; total 2,4,5-T as acid 58.5% min.; total 2,4,5-T as ester 94.7% min.

Properties: Sp. Gr. approx. 1.23 at 25°/25°C.; 2,4,5-T acid equivalent is approx. 5.97 lbs. per gal.

Uses: As a selective herbicide where oil solubility and extremely low volatility are desired. Of particular value for brush control.

Containers: 55-gal. steel drums.

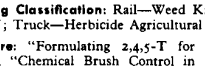
Shipping Classification: Rail—Weed Killing Compound NOIBN; Truck—Herbicide Agricultural NOIBN Liquid.

Literature: "Formulating 2,4,5-T for Weed Control," booklet; "Chemical Brush Control in Pastures and on Grazing Lands," booklet; "Chemical Weed Control on Rights-of-Way," booklet.

2,4,5-TRICHLOROPHENOXYACETIC ACID—BUTYL ESTER—ORGANIC DIVISION

Molecular Weight: 311.6

Formula:



Standard Form: Liquid or solid.

Specifications: Reddish brown liquid or solid; assay 98% min.; crystallizing point 28°C. min.

Uses: For same general purposes as 2,4,5-T acid but is soluble in oil. Is more convenient to use where volatility is not a hazard.

Containers: 55-gal. steel drums.

Shipping Classification: Rail—Weed Killing Compound NOIBN; Truck—Herbicide Agricultural NOIBN other than liquid.

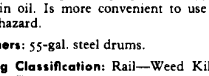
Literature: "Formulating 2,4,5-T for Weed Control," booklet; "Chemical Brush Control in Pastures and on Grazing Lands," booklet; "Chemical Weed Control on Rights-of-Way," booklet.

2,4,5-TRICHLOROPHENOXYACETIC ACID ISOPROPYL ESTER *(Also known as 2,4,5-T isopropyl ester and isopropyl 2,4,5-trichlorophenoxyacetate)*

—ORGANIC DIVISION

Molecular Weight: 297.57

Formula:



(Continued on next page)

0685215

TOWOLDMON0007080

Standard Form: Cast solid.

Specifications: Tan-to-brown solid; assay 98.0% min.; crystallizing point 46°C. min.; free acidity (as 2,4,5-T) 2.0% max.

Uses: For same general purposes as the free acid but is directly soluble in oil. Is more convenient to use where volatility is not a hazard.

Containers: 250-lb. fiber drums.

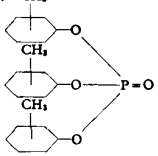
Shipping Classification: Rail—Weed Killing Compound NOIBN; Truck—Herbicide Agricultural NOIBN other than liquid.

Literature: "Formulating 2,4,5-T for Weed Control," booklet; "Chemical Weed Control on Rights-of-Way," booklet; "Chemical Brush Control in Pastures and on Grazing Lands," booklet.

TRICRESYL PHOSPHATE — ORGANIC DIVISION

Molecular Weight: 368.36

Formula:



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.

General Information—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 at 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, china wood 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 Tricresyl Phosphate Monsanto, 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. Being a solvent for nitrocellulose, it has a high retentivity and can be used in large proportions without danger of sweating or separation. Widely used in vinyl resins, particularly in electrical applications; has good electrical properties and imparts flame resistance to the composition. Compatible with most lacquer resins and gives firm, tough, flexible films of excellent weathering qualities.

Containers: 500-lb. and 50-lb. steel drums; tank cars.

Shipping Classification: Resin Plasticizer.

Literature: "Monsanto Plasticizers," 64-page booklet.

TRIETHYLAMMONIUM PHOSPHATE (*TEAP*) — ORGANIC DIVISION

Standard Form: Liquid—40% solution in proprietary solvent.

Specifications: Liquid solution; Sp. Gr. 0.97 to 0.[illegible] 77°F.; flash point approx. 50°F.; pH 4.4 to 4.8.

Uses: An additive for nonaqueous materials for stabil[illegible] corrosive and iron-sensitive liquids in metal containers.

Containers: 55-gal. lacquer lined steel drums.

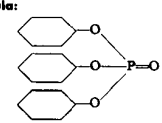
Shipping Classification: Chemicals NOIBN. (Flamm[illegible] —red label required.)

Literature: "TEAP," leaflet.

TRIPHENYL PHOSPHATE — ORGANIC DIVISION

Molecular Weight: 326.28

Formula:



Standard Form: Flakes.

Specifications: White flakes, faintly aromatic; M.P. 48[illegible] min. start; permanganate test, no change in 30 min[illegible] acidity (as H_3PO_4), 0.003% max.

General Information—Properties: Miscible with the [illegible] mon solvents and thinners and with vegetable oils; solub[illegible] in water 0.001% at 34°C., 0.002% at 54°C.; imparts [illegible] moisture resistance to cellulose-acetate films. Retentiv[illegible] cast cellulose-acetate films nearly 80%; that is, it can b[illegible] corporated in the proportion of 8–10 of acetate wi[illegible] separation and blooming. Imparts good flexibility and [illegible] clear, tough compositions without tendency toward t[illegible] ness. One of the most valuable properties of triph[illegible] phosphate is that of fire retarding. When used in[illegible] cellulose-acetate films an amount of triphenyl phos[illegible] equal to 20% of the cellulose-acetate weight produces [illegible] which will not support combustion.

Uses: Chiefly as a plasticizer and fire retardant.

Containers: 225-lb. fiber drums.

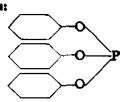
Shipping Classification: Resin Plasticizer.

Literature: "Monsanto Plasticizers," 64-page booklet.

TRIPHENYL PHOSPHITE — ORGANIC DIVISION

Molecular Weight: 310.28

Formula:



Specifications: Color APHA 150 max.; refractive index 25°C. 1.586 to 1.589.

General Information—Properties: A crystalline solid slightly below room temperature; at higher temperatures an oily liquid weighing about 9.85 lbs. per gal.

Uses: A color improver and metal scavenger in alkyd [illegible] production. Also used as a stabilizer in polyvinyl chlo[illegible] compounds. Monsanto's patent No. 2572571 covers [illegible] and resellers and users must be licensed.

Containers: 55 and 5-gal. drums.

Shipping Classification: Chemicals NOIBN.

0685216

TOWOLDMON0007081

ADIUM SULFURIC ACID CATALYST

ENGINEERING SALES

eral Information: Sold in conjunction with complete ts of Monsanto design and also for replacement pur- es in any contact plant.

s: In manufacture of sulfuric acid by contact process. t suitable for other purposes.)

tainers: 50-liter Leverpak.

ipping Classification: Chemicals NOIBN.

LLIN MONSANTO" (*Vanillin U.S.P.; also known thylprotocatechuic aldehyde and 3-methoxy-4-xybenzaldehyde*)—ORGANIC DIVISION

lecular Weight: 152.14

mula:



ndard Form: Fine crystals.

ifications: Fine, white crystalline needles; M.P. 81.6°C. ; no foreign flavor (in sugar solution); loss on drying % max.; solubility in alcohol (1:2) complete.

s: As a flavoring agent in foodstuffs and beverages and n odorant in rubber.

Containers: 100-lb. fiber drums; 25 and 5-lb. cans.

Shipping Classification: Chemicals NOIBN.

Literature: "Vanillin Monsanto," leaflet with solubility tables; "Something About the Senses," 32-page booklet.

VINYL CHLORIDE—PLASTICS DIVISION

Molecular Weight: 62.50

Formula: $CH_2 = CHCl$

Standard Form: Liquid.

General Information—Properties: A reactive monomer having a double bond which permits polymerization, copolymerization and other reactions.

Uses: Production of polymers, copolymers; chemical intermediate.

Shipping Classification: Vinyl Chloride (inhibited).

ZINC OXIDE, TECHNICAL—INORGANIC DIVISION

Molecular Weight: 81.38

Formula: ZnO

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 is also used as an insecticide.

MONSANTO

Products Manufactured by Monsanto Chemicals Limited and Available through Riches-Nelson, Inc., 342 Madison Avenue, New York 17, New York.

CHLOR-X-CRESYLIC	ETHYL SILICATE, 40% SILICA
CRESANTOL 3	PARACHLOROMETACRESOL
CRESANTOL 14	PARACHLOROMETAXYLENOL
CRESANTOL 15	PHENOL SULPHONIC ACID
CRESANTOL 15 R	SODIUM SULPHATE
Pure Para CRESOL	SODIUM SULPHITE
Pure Meta CRESOL	TETRAETHYLORTHOSILICATE
Ortho CRESOTINIC ACID	VANILLIN (ex Eugenol)
Meta CRESOTINIC ACID	

0685217

TOWOLDMON0007082

agricultural products

[redacted]

[redacted]

[redacted]

...ation—Properties: "Rez" Color-Toned ...ented, penetrating wood sealers. They ... and checking, add color-tone when ... "Rez" Color-Toned redtil like weeping ...ering. They may be used outside for ... and for tinting siding, shakes or shingles. ...may be used inside for grained tints on ...and furniture. Apply to bare wood only.

...the warm, cedar-brown hue of aged ...

...—a rich, dark charcoal gray.

...the pleasing yellow-gray characteristic of ...

...ax"—the pale green of driftwood.

...ez"—the pearly hue of bleached ...

..."—a rich, dark Christmas-tree green.

...n"—the pleasing, smoky gray of ...

...ez"—the rich hue of dark red cedar.

...n Rez"—the living yellow-green ... woods.

...ey"—the soft, ruddy color of Cali...

...l Rez"—the pale, rich tan of ...

...e Rez"—the soft blue-green of age...

...e Rez"—the rich golden tint of ripe ...

...e wood.

...and 1-gal. cans; 1-qt. cans; 1-pt. cans.

...fication: Wood Filler Liquid.

...ers, pamphlets, and color cards.

...ation—Properties: A clear, synthetic resin ...interior wood finish. Useful over "Rez", ..."Color-Toned Rez" treated surfaces to pro... finish; or deluxe satin finish when rubbed ...l oil. Comes ready-to-use for brush applica... covers approximately 300 to 400 sq. ft.

...l. cans (4 /case); 1-qt. cans (12 /case); 1-pt.

... Color Card Folder.

...ation—Properties: A synthetic resin primer ...vides a penetrating, protective "seal" for all ...aces, especially soft woods; Douglas fir ply-

...ation, cedar, etc. Contains ...

...ation—Properties: "White Rez" is a specially-pigmented wiping sealer designed to be applied to bare wood and wiped. The amount of wiping controls the degree of blonding or bleached effects. "White Rez" may be tinted by adding color-in-oil. "White Rez" penetrates and seals the wood pores so that the finish coat of "Satin-wood Rez" goes on smoothly.

Uses: A blonding wood sealer for interior use only. For wall paneling, doors, unfinished furniture and any other raw wood.

Containers: 5 and 1-gal. cans; 1-qt. cans; 1-pt. cans.

Shipping Classification: Wood Filler Liquid.

Literature: Folders and pamphlets.

...ation—Properties: ...

...ation: Wood Filler Liquid.

Literature: Rez Color Card Folder.

Literature: Rez Color Card Folder.

TOWOLDMON0007084

RESEARCH

MONSANTO PRODUCTS

GENERAL DATA

0685220

TOWOLDMON0007085

TESTING LIQUIDS WITH THE BAUME HYDROMETER

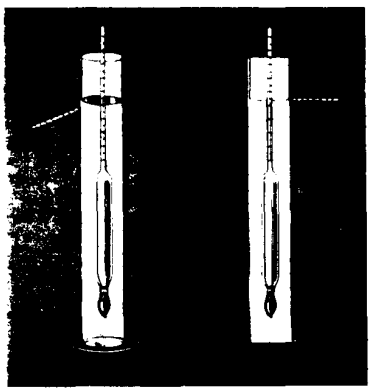
MONSANTO PRODUCTS, when made to a Baumé specification, may vary 0.2° Bé. above but never below the specified strength. The hydrometer used should be of limited range, not more than 10° Bé., and should be at least 10" in length. Its accuracy should be certified by the manufacturer. Our own hydrometers are tested against standard glasses certified by the U. S. Bureau of Standards.

Method of Reading the Hydrometer*

The correct method of reading the hydrometer is illustrated in Figs. 1 and 2. The sample of liquid is placed in a clear glass jar or cylinder and the hydrometer carefully immersed in it to a point slightly below that to which it naturally sinks, and is then allowed to float freely.

The reading should not be taken until the liquid and the hydrometer are free from air bubbles and are at rest.

In taking the reading the eye should be placed slightly below the plane of the surface of the liquid (Fig. 1) and then raised slowly until this surface, seen as an ellipse, becomes a straight line (Fig. 2). The point at which this line cuts the hydrometer scale should be taken as the reading of the instrument (Fig. 2).



Method of Reading Baumé Hydrometer

*U. S. Bureau of Standards, Circ. No. 57

0685221

TOWOLDMON0007086

In case the liquid is not sufficiently clear to allow the reading to be made as above described, it will be necessary to read from above the liquid surface and to estimate as accurately as possible the point to which the liquid rises on the hydrometer stem. It should be remembered, however, that the instrument is calibrated to give correct indications when read at the principal surface of the liquid. It will be necessary, therefore, to correct the reading at the upper meniscus by an amount equal to the height to which the liquid creeps up on the stem of the hydrometer. The amount of this correction may be determined with sufficient accuracy for most purposes by taking a few readings on the upper and the lower meniscus in a sample of the clear liquid and noting the difference.

The magnitude of the correction will obviously depend upon the length and value of the subdivisions of the hydrometer scale and must be determined in each case for the particular hydrometer in question.

Correcting for Temperature

The thermometer must be used along with the hydrometer in testing any liquid.

Hydrometers do not indicate the correct strength of a liquid unless read at the exact temperature indicated on the spindle, that is, at 60° F. Accurate readings may be obtained by bringing the liquid to this temperature by cooling or warming, but in most instances a correction can be applied with sufficient accuracy by reference to the following tables. For all liquids listed in this booklet, except ammonia, the correction is added when the test is made above 60°F. and subtracted when made below 60°F. For ammonia the reverse is true.

Conversion Formulae for Density Scales

Heavy Liquids

$$\text{Degrees Twaddell} = (\text{Sp. Gr.} - 1)200$$

$$\text{Sp. Gr.} = \frac{\text{Deg. Tw.} + 200}{200}$$

$$\text{Degrees Baumé} = 145 - \frac{145}{\text{Sp. Gr.}}$$

$$\text{Sp. Gr.} = \frac{145}{145 - \text{Deg. Bé.}}$$

Light Liquids

$$\text{Degrees Baumé} = \frac{140}{\text{Sp. Gr.}} - 130$$

$$\text{Sp. Gr.} = \frac{140}{130 + \text{Deg. Bé.}}$$

THE DILUTION AND CONCENTRATION OF LIQUIDS AND MIXTURES

Rectangle Method

THE FIGURES expressing the percentage concentration of two solutions (or those of one solution, and the figure 0 *for water*, where dilution with water is desired) are written in the two left hand corners of a rectangle, and the figure expressing the desired concentration is placed on the intersection of the two diagonals of this rectangle.

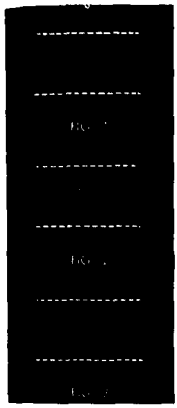
Now subtract the figures on the diagonals, and write the result at the other end of the respective diagonal. These figures then indicate what quantities of the solutions whose concentration is given on the other end of the respective *horizontal* line, must be taken to obtain a solution of the desired concentration. For example, to make a 12% solution, by mixing an 8% and a 15% solution we prepare Fig. 1, which indicates that we have to take 3 parts by weight of the 8% solution, and 4 parts by weight of the 15% solution to obtain (7 parts by weight of) the 12% solution.

0685222

TOWOLDMON0007087

Again, if we wish to dilute a 25% solution so as to obtain a 9% solution, we place the figure 25 in, for example, the upper left corner of a rectangle and place figure 0 (concentration of the solution in pure water) in the lower left corner, and then place the figure 9 (desired concentration) at the point of intersection of the diagonals, and subtracting across the diagonals, we obtain Fig. 2: 9 parts by weight of the 25% solution, if mixed with 16 parts by weight of water, will give 25 parts by weight of a 9% solution.

In diluting to a given Baumé strength or specific gravity, the percentage composition, corresponding to the Baumé of specific gravity, must be taken from the following tables. For instance, supposing a 32° Baumé chloride of alumina solution is to be diluted to 8° Baumé with water. By reference to table on page 74, a 32° Baumé solution contains 27.88% Al_2Cl_6, and an 8° Baumé solution contains 6.50% Al_2Cl_6. These percentages must be used in finding the weights of chloride of alumina and water to be mixed by the above method. According to the scheme as outlined above, the percentages are arranged as in Fig. 3 and the subtractions made along the diagonals, the lower from the higher. Thus when 32° Baumé chloride of alumina is mixed with water in the proportion 6.50 pounds to 21.38 pounds, 27.88 pounds of solution will be obtained at 8° Baumé.



WEIGHTS PER GALLON AT 60°

	Pounds
Acetic Acid 56%	8.90
Acetic Acid 70%	8.96
Acetic Acid 80%	8.97
Acetic Acid 84%	8.96
Acetic Acid Glacial	8.83
Alcohol Proprietary Solvent (Mersol)	6.79
Aluminum Chloride 32° Bé	10.70
Aqua Ammonia 16° Bé	7.99
Aqua Ammonia 18° Bé	7.89
Aqua Ammonia 20° Bé	7.78
Aqua Ammonia 26° Bé	7.48
Battery Acid 1.400	11.67
Diacetone Technical	7.65
Ethyl Acetate	7.46
Hydrochloric Acid 18° Bé	9.52
Hydrochloric Acid 20° Bé	9.67
Hydrochloric Acid 22° Bé	9.83
Merclor 22° Bé	9.83
Nitric Acid 36° Bé	11.09
Nitric Acid 38° Bé	11.30
Nitric Acid 40° Bé	11.51
Nitric Acid 42° Bé	11.74
Oleum 25% (at 15° C.)	16.12
Oleum 60% (at 15° C.)	17.52
Phosphoric Acid 75%	13.19
Sodium Bisulfite 33° Bé	10.79
Sulfuric Acid 59° Bé	14.06
Sulfuric Acid 60° Bé	14.22
Sulfuric Acid 66° Bé	15.30
Sulfuric Acid 98%	15.37

Weight per Gallon = Sp. Gr. x 8.337
1 Cubic Foot = 7.481 gallons
1 Gallon = 3.785 liters

0685223

TOWOLDMON0007088

CONVERSION TABLES FOR UNITS OF VOLUME AND WEIGHT

Cu. In	1	0 0,5787	0 0,2143	0 5541	0 03463	0 01732	0 004329	16 39
Cu. Ft	1728	1	0 03704	957 5	59 84	29 92	7 481	28320
Cu. Yd	46656	27	1	25850	1616	807 9	202 0	764600
Fl. Oz	1 805	0 001044	0 0,3868	1	0 0625	0 03125	0 007813	29 57
Pint	28 88	0 01671	0 0,6189	16	1	0 5	0 125	473 2
Quart	57 75	0 03342	0 001238	32	2	1	0 25	946 4
Gallon	231	0 1337	0 004951	128	8	4	1	3785
Cc. (Ml.)	0 06102	0 0,3531	0 0,1308	0 03381	0 002113	0 001057	0 0,2642	1
Liter	61 02	0 03531	0 001308	33 81	2 113	1 057	0 2642	1000
Cu. Meter	61020	35 31	1 308	33810	2113	1057	264 2	1000000

TO CONVERT FROM	MULTIPLY BY					
	To Grain	To Oz. Troy	To Lb. Troy	To Oz. Av.	To Lb. Av.	To Gram
Grain	1	0 002083	0 0,1736	0 002286	0 0,1429	0 06480
Oz. Troy	480	1	0 08333	1 097	0 06857	31 10
Lb. Troy	5760	12	1	13 17	0 8229	373 2
Oz. Av	437 5	0 9115	0 07596	1	0 0625	28 35
Lb. Av.	7000	14 58	1 215	16	1	453 6
Gram	15 43	0 03215	0 002679	0 03527	0 002205	1
Kilogram	15432	32 15	2 679	35 27	2 205	1000

NOTE: The small subnumeral following a zero indicates that the zero is to be taken that number of times, thus $0.0_3 1428$ is equivalent to 0.0001428.

1 gallon = 8.345 lbs. av. of water at 4° C. (39° F.)
8.337 lbs. av. of water at 15.56° C. (60° F.)
8.330 lbs. av. of water at 20° C. (68° F.)
8.321 lbs. av. of water at 25° C. (77° F.)

1 lb. av. = 0.1198 gallon of water at 4° C. (39° F.)
0.1199 gallon of water at 15.56° C. (60° F.)
0.1200 gallon of water at 20° C. (68° F.)
0.1202 gallon of water at 25° C. (77° F.)

For purposes of rough calculation:

gallons $\times \frac{100}{12}$ = pounds of water

pounds of water $\times \frac{12}{100}$ = gallons

GENERAL DATA

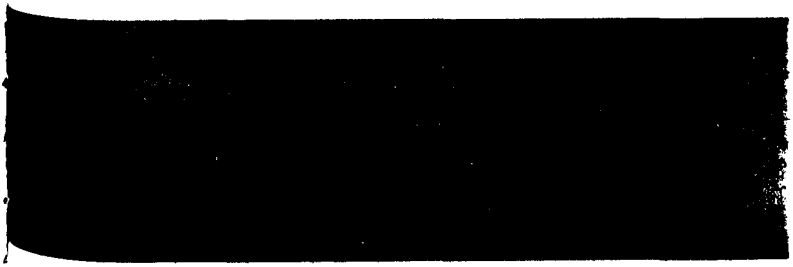
0685224

TOWOLDMON0007089

ENSITIES AND CONCENTRATIONS OF SODIUM HYDROXIDE SOLUTIONS

0 0,1	0.77	1.66	1.012	0.08	10.10	28.00	21.69	34.35	1.310	3.06	366.58
0 02	1.55	3.23	1.023	0.17	20.43	29.00	22.47	35.25	1.321	3.19	382.79
0 76	2.32	4.77	1.034	0.26	30.99	30.00	23.24	36.13	1.332	3.33	399.21
	3.10	6.27	1.045	0.35	41.77	31.00	24.02	36.99	1.342	3.47	415.78
0 0,2	3.87	7.73	1.056	0.44	52.77	32.00	24.79	37.83	1.353	3.61	432.57
0 0,3											
0 0,3	4.65	9.16	1.067	0.53	63.99	33.00	25.57	38.65	1.363	3.75	449.51
0 00	5.42	10.56	1.079	0.63	75.43	34.00	26.34	39.45	1.374	3.89	466.67
	6.20	11.93	1.089	0.73	87.09	35.00	27.12	40.24	1.384	4.04	483.98
0 00	6.97	13.29	1.101	0.83	98.99	36.00	27.89	41.01	1.394	4.19	501.50
0 00	7.75	14.60	1.112	0.93	111.10	37.00	28.67	41.76	1.404	4.33	519.17
1											
	8.52	15.89	1.123	1.03	123.43	38.00	29.44	42.50	1.415	4.48	537.06
	9.30	17.15	1.134	1.13	135.97	39.00	30.22	43.21	1.425	4.63	555.03
	10.07	18.39	1.145	1.24	148.75	40.00	30.99	43.92	1.435	4.78	573.28
	10.85	19.61	1.156	1.35	161.74	41.00	31.77	44.60	1.444	4.94	591.61
	11.62	20.80	1.167	1.46	174.96	42.00	32.54	45.28	1.454	5.09	610.13
	12.40	21.96	1.178	1.57	188.39	43.00	33.32	45.93	1.464	5.25	628.76
	13.17	23.11	1.190	1.69	202.05	44.00	34.09	46.57	1.473	5.40	647.57
	13.95	24.23	1.201	1.80	215.91	45.00	34.87	47.20	1.483	5.56	666.59
To	14.72	25.33	1.212	1.92	230.01	46.00	35.64	47.83	1.492	5.72	685.79
Kilogra	15.50	26.41	1.223	2.04	244.33	47.00	36.42	48.44	1.502	5.88	705.16
0 0,648	16.27	27.47	1.234	2.16	258.85	48.00	37.19	49.05	1.511	6.05	724.72
0 03110	17.05	28.51	1.245	2.28	273.60	49.00	37.97	49.65	1.521	6.21	744.45
0 3737	17.82	29.53	1.256	2.41	288.56	50.00	38.74	50.23	1.530	6.38	764.36
0 07935	18.60	30.53	1.267	2.53	303.74	51.00	39.52	50.82	1.540	6.55	784.45
0 4936	19.37	31.51	1.278	2.66	319.13	52.00	40.29	51.39	1.549	6.72	804.77
0 001	20.14	32.47	1.289	2.79	334.73	53.00	41.06	51.95	1.558	6.89	825.10
1	20.92	33.42	1.300	2.93	350.55						

DATA FOR SODIUM HYDROXIDE SOLUTIONS AT 176°F



0685225

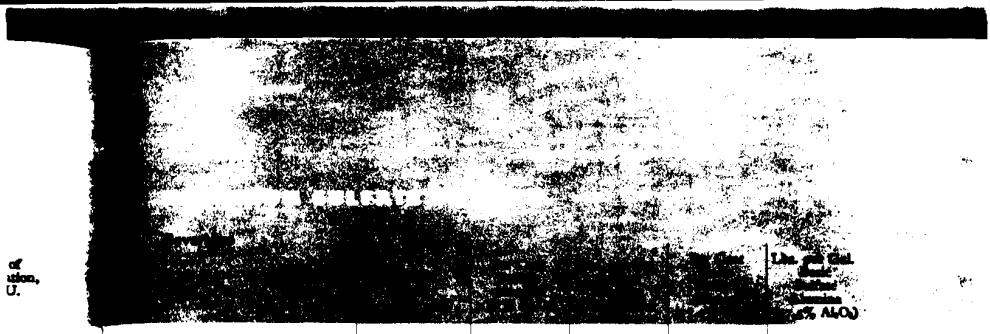
TOWOLDMON0007090

−40	10.12	0.0234	25.45	601.9
−35	11.74	0.0235	22.14	598.3
−30	13.56	0.0236	19.35	594.7
−25	15.61	0.0238	16.95	591.1
−20	17.91	0.0239	14.89	587.4
−15	20.46	0.0240	13.15	583.6
−10	23.30	0.0241	11.63	579.9
− 5	26.46	0.0242	10.32	576.1
0	29.95	0.0244	9.19	572.2
5	33.79	0.0245	8.20	568.3
10	38.02	0.0246	7.34	564.4
15	42.67	0.0248	6.583	560.4
20	47.75	0.0249	5.920	556.3
25	53.50	0.0250	5.336	552.2
30	59.39	0.0252	4.820	548.1
35	65.91	0.0253	4.364	543.9
40	73.03	0.0255	3.959	539.7
45	80.75	0.0256	3.599	535.3
50	89.09	0.0258	3.278	531.0
55	98.03	0.0259	2.992	526.5
60	107.7	0.0261	2.734	522.0
65	118.1	0.0263	2.503	517.5
70	129.2	0.0264	2.296	512.8
75	141.1	0.0266	2.109	508.1
80	153.9	0.0268	1.940	503.4
85	167.4	0.0270	1.788	498.5
90	181.8	0.0271	1.650	493.5
95	197.3	0.0273	1.524	488.5
100	213.8	0.0275	1.408	483.4
105	231.2	0.0277	1.305	478.2
110	249.6	0.0280	1.210	472.9
115	269.2	0.0282	1.122	467.4
120	289.9	0.0284	1.042	461.9
125	311.6	0.0286	0.970	456.3

Sp. Gr. Liquid 0.6364 at 32°F.

0685226

TOWOLDMON0007091



0.00	1.000	0.00	0.00	0.00	0.00
0.50	1.0035	0.53	0.044	0.6	0.050
1.00	1.0069	1.07	0.090	1.1	0.092
1.50	1.0105	1.64	0.138	1.7	0.150
2.0	1.0140	2.16	0.181	2.3	0.195
2.5	1.0175	2.70	0.228	2.9	0.246
3.0	1.0211	3.28	0.279	3.5	0.298
3.5	1.0247	3.79	0.323	4.1	0.350
4.0	1.0284	4.40	0.376	4.7	0.403
4.5	1.0320	4.97	0.427	5.3	0.456
5.0	1.0357	5.52	0.476	6.0	0.518
5.5	1.0394	6.10	0.528	6.7	0.581
6.0	1.0432	6.73	0.585	7.3	0.635
6.5	1.0469	7.33	0.638	7.9	0.690
7.0	1.0507	7.98	0.700	8.5	0.745
7.5	1.0545	8.56	0.751	9.2	0.809
8.0	1.0584	9.18	0.808	9.8	0.865
8.5	1.0623	9.82	0.860	10.5	0.931
9.0	1.0662	10.43	0.925	11.1	0.988
9.5	1.0701	11.05	0.980	11.8	1.05
10.0	1.0741	11.65	1.04	12.4	1.11
10.5	1.0781	12.26	1.10	13.1	1.18
11.0	1.0821	12.90	1.16	13.8	1.25
11.5	1.0861	13.53	1.22	14.4	1.30
12.0	1.0902	14.13	1.28	15.1	1.37
12.5	1.0943	14.71	1.34	15.7	1.43
13.0	1.0985	15.32	1.40	16.4	1.50
13.5	1.1027	15.98	1.47	17.1	1.57
14.0	1.1069	16.60	1.53	17.7	1.63
14.5	1.1111	17.25	1.59	18.4	1.70
15.0	1.1154	17.90	1.66	19.1	1.77
15.5	1.1197	18.48	1.72	19.9	1.86
16.0	1.1240	19.13	1.79	20.4	1.91
16.5	1.1284	19.80	1.86	21.1	1.99
17.0	1.1328	20.40	1.92	21.8	2.06
17.5	1.1373	21.06	1.99	22.4	2.12
18.0	1.1417	21.73	2.06	23.1	2.20
18.5	1.1462	22.43	2.14	23.7	2.26
19.0	1.1508	23.10	2.21	24.4	2.34
19.5	1.1554	23.78	2.28	25.1	2.42

0685227

TOWOLDMON0007092

ALUMINUM SULFATE 60°/60°F.—Continued

20.0	1.1600	24.38	2.35	25.7	2.49
20.5	1.1647	24.99	2.42	26.4	2.56
21.0	1.1694	25.60	2.49	27.1	2.64
21.5	1.1741	26.22	2.56	27.7	2.71
22.0	1.1789	26.87	2.64	28.4	2.79
22.5	1.1837	27.50	2.71	29.1	2.87
23.0	1.1885	28.16	2.78	29.8	2.95
23.5	1.1934	28.85	2.86	30.3	3.02
24.0	1.1983	29.50	2.94	31.1	3.11
24.5	1.2033	30.18	3.02	31.7	3.18
25.0	1.2083	30.85	3.10	32.4	3.27
25.5	1.2134	31.54	3.18	33.1	3.35
26.0	1.2185	32.24	3.27	33.8	3.44
26.5	1.2236	32.95	3.35	34.5	3.52
27.0	1.2288	33.63	3.44	35.2	3.61
27.5	1.2340	34.35	3.52	35.9	3.70
28.0	1.2393	35.03	3.61	36.7	3.79
28.5	1.2446	35.75	3.70	37.3	3.87
29.0	1.2500	36.46	3.79	38.1	3.96
29.5	1.2554	37.20	3.88	38.8	4.06
30.0	1.2609	37.90	3.98	39.7	4.15
30.5	1.2664	38.58	4.06	40.3	4.24
31.0	1.2719	39.30	4.16	41.0	4.33
31.5	1.2775	40.02	4.25	41.8	4.42
32.0	1.2832	40.73	4.35	42.5	4.52
32.5	1.2889	41.49	4.45	43.3	4.62
33.0	1.2946	42.20	4.54	44.1	4.72
33.5	1.3004	42.96	4.64	44.9	4.82
34.0	1.3063	43.71	4.75	45.7	4.92
34.5	1.3122	44.48	4.86	46.5	5.03
35.0	1.3182	45.20	4.95	47.4	5.13
35.5	1.3242	46.00	5.07	48.3	5.24
36.0	1.3303	46.80	5.18	49.2	5.35
36.5	1.3364	47.58	5.29	50.1	5.46

FREEZING POINTS OF 0.6% BASIC ALUM SOLUTIONS

0685228

TOWOLDMON0007093

ALUMINUM CHLORIDE 60°/60°F.

0.00	1.0000	0.00	0.00	17.50	1.1373	14.73	2.53
0.50	1.0035	0.35	0.038	18.00	1.1417	15.16	2.60
1.00	1.0069	0.75	0.113	18.50	1.1462	15.60	2.69
1.50	1.0105	1.17	0.178	19.00	1.1508	16.05	2.78
2.00	1.0140	1.58	0.242	19.50	1.1554	16.53	2.88
2.50	1.0175	2.00	0.307	20.00	1.1600	16.94	2.96
3.00	1.0211	2.40	0.370	20.50	1.1647	17.43	3.06
3.50	1.0247	2.78	0.430	21.00	1.1694	17.88	3.15
4.00	1.0284	3.16	0.490	21.50	1.1741	18.33	3.25
4.50	1.0320	3.58	0.557	22.00	1.1789	18.78	3.34
5.00	1.0357	4.00	0.625	22.50	1.1837	19.22	3.43
5.50	1.0394	4.38	0.686	23.00	1.1885	19.68	3.53
6.00	1.0432	4.81	0.756	23.50	1.1934	20.13	3.62
6.50	1.0469	5.20	0.820	24.00	1.1983	20.57	3.72
7.00	1.0507	5.63	0.890	24.50	1.2033	21.03	3.81
7.50	1.0545	6.05	0.962	25.00	1.2083	21.50	3.90
8.00	1.0584	6.50	1.04	25.50	1.2134	21.98	4.02
8.50	1.0623	6.92	1.11	26.00	1.2185	22.38	4.12
9.00	1.0662	7.32	1.18	26.50	1.2236	22.82	4.21
9.50	1.0701	7.75	1.25	27.00	1.2288	23.20	4.30
10.00	1.0741	8.13	1.32	27.50	1.2340	23.70	4.41
10.50	1.0781	8.57	1.39	28.00	1.2393	24.13	4.50
11.00	1.0821	9.00	1.47	28.50	1.2446	24.58	4.61
11.50	1.0861	9.46	1.55	29.00	1.2500	25.02	4.72
12.00	1.0902	9.90	1.63	29.50	1.2554	25.53	4.83
12.50	1.0943	10.28	1.70	30.00	1.2609	25.99	4.94
13.00	1.0985	10.70	1.77	30.50	1.2664	26.45	5.04
13.50	1.1027	11.15	1.85	31.00	1.2719	26.92	5.16
14.00	1.1069	11.60	1.93	31.50	1.2775	27.38	5.27
14.50	1.1111	12.05	2.02	32.00	1.2832	27.88	5.40
15.00	1.1154	12.50	2.10	32.50	1.2889	28.33	5.50
15.50	1.1197	12.95	2.19	33.00	1.2946	28.78	5.62
16.00	1.1240	13.37	2.27	33.50	1.3004	29.24	5.73
16.50	1.1284	13.83	2.35	34.00	1.3063	29.68	5.85
17.00	1.1328	14.30	2.44	34.50	1.3100	30.00	5.92

*$Al_2Cl_6+12H_2O$, chloride of alumina crystal. For chloride of alumina 32° Bé. twice the above pounds per gallon of solution.

TOWOLDMON0007094

ACETIC ACID 60°/60°F

1.0000	0	1.0469	34	1.0735	68
1.0016	1	1.0480	35	1.0739	69
1.0032	2	1.0491	36	1.0743	70
1.0047	3	1.0502	37	1.0747	71
1.0062	4	1.0512	38	1.0750	72
1.0077	5	1.0523	39	1.0752	73
1.0093	6	1.0533	40	1.0754	74
1.0108	7	1.0543	41	1.0756	75
1.0123	8	1.0553	42	1.0757	76
1.0137	9	1.0562	43	1.0758	77
1.0152	10	1.0572	44	1.0758	78
1.0167	11	1.0581	45	1.0758	79
1.0181	12	1.0590	46	1.0758	80
1.0195	13	1.0599	47	1.0757	81
1.0210	14	1.0607	48	1.0756	82
1.0224	15	1.0617	49	1.0754	83
1.0238	16	1.0625	50	1.0752	84
1.0252	17	1.0633	51	1.0749	85
1.0266	18	1.0641	52	1.0746	86
1.0280	19	1.0648	53	1.0741	87
1.0294	20	1.0656	54	1.0736	88
1.0308	21	1.0663	55	1.0730	89
1.0321	22	1.0670	56	1.0723	90
1.0334	23	1.0676	57	1.0715	91
1.0347	24	1.0683	58	1.0706	92
1.0360	25	1.0689	59	1.0696	93
1.0373	26	1.0695	60	1.0684	94
1.0385	27	1.0701	61	1.0670	95
1.0398	28	1.0707	62	1.0654	96
1.0410	29	1.0712	63	1.0635	97
1.0422	30	1.0717	64	1.0614	98
1.0434	31	1.0722	65	1.0590	99
1.0446	32	1.0727	66	1.0563	100
1.0457	33	1.0731	67		

0685230

TOWOLDMON0007095

HYDROCHLORIC ACID (Muriatic Acid)*

1.00	1.0069	1.40	15.25	1.1176	23.33
2.00	1.0140	2.82	15.50	1.1197	23.75
3.00	1.0211	4.25	15.75	1.1219	24.16
4.00	1.0284	5.69	16.0	1.1240	24.57
5.00	1.0357	7.15	16.1	1.1248	24.73
5.25	1.0375	7.52	16.2	1.1256	24.90
5.50	1.0394	7.89	16.3	1.1265	25.06
5.75	1.0413	8.26	16.4	1.1274	25.23
6.00	1.0432	8.64	16.5	1.1283	25.39
6.25	1.0450	9.02	16.6	1.1292	25.56
6.50	1.0469	9.40	16.7	1.1301	25.72
6.75	1.0488	9.78	16.8	1.1310	25.89
7.00	1.0507	10.17	16.9	1.1319	26.05
7.25	1.0526	10.55	17.0	1.1328	26.22
7.50	1.0545	10.94	17.1	1.1336	26.39
7.75	1.0564	11.32	17.2	1.1345	26.56
8.00	1.0584	11.71	17.3	1.1354	26.73
8.25	1.0603	12.09	17.4	1.1363	26.90
8.50	1.0623	12.48	17.5	1.1372	27.07
8.75	1.0642	12.87	17.6	1.1381	27.24
9.00	1.0662	13.26	17.7	1.1390	27.41
9.25	1.0681	13.65	17.8	1.1399	27.58
9.50	1.0701	14.04	17.9	1.1408	27.75
9.75	1.0721	14.43	18.0	1.1417	27.92
10.00	1.0741	14.83	18.1	1.1426	28.09
10.25	1.0761	15.22	18.2	1.1435	28.26
10.50	1.0781	15.62	18.3	1.1444	28.44
10.75	1.0801	16.01	18.4	1.1453	28.61
11.00	1.0821	16.41	18.5	1.1462	28.78
11.25	1.0841	16.81	18.6	1.1471	28.95
11.50	1.0861	17.21	18.7	1.1480	29.13
11.75	1.0881	17.61	18.8	1.1489	29.30
12.00	1.0902	18.01	18.9	1.1498	29.48
12.25	1.0922	18.41	19.0	1.1508	29.65
12.50	1.0943	18.82	19.1	1.1517	29.83
12.75	1.0964	19.22	19.2	1.1526	30.00
13.00	1.0985	19.63	19.3	1.1535	30.18
13.25	1.1006	20.04	19.4	1.1544	30.35
13.50	1.1027	20.45	19.5	1.1554	30.53
13.75	1.1048	20.86	19.6	1.1563	30.71
14.00	1.1069	21.27	19.7	1.1572	30.90
14.25	1.1090	21.68	19.8	1.1581	31.08
14.50	1.1111	22.09	19.9	1.1590	31.27
14.75	1.1132	22.50	20.0	1.1600	31.45
15.00	1.1154	22.92	20.1	1.1609	31.64

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TOWOLDMON0007096

HYDROCHLORIC ACID (Muriatic Acid)*—Continued

20.2	1.1619	31.82	23.2	1.1904	37.58
20.3	1.1628	32.01	23.3	1.1914	37.80
20.4	1.1637	32.19	23.4	1.1924	38.03
20.5	1.1647	32.38	23.5	1.1934	38.26
20.6	1.1656	32.56	23.6	1.1944	38.49
20.7	1.1666	32.75	23.7	1.1953	38.72
20.8	1.1675	32.93	23.8	1.1963	38.95
20.9	1.1684	33.12	23.9	1.1973	39.18
21.0	1.1694	33.31	24.0	1.1983	39.41
21.1	1.1703	33.50	24.1	1.1993	39.64
21.2	1.1713	33.69	24.2	1.2003	39.86
21.3	1.1722	33.88	24.3	1.2013	40.09
21.4	1.1732	34.07	24.4	1.2023	40.32
21.5	1.1741	34.26	24.5	1.2033	40.55
21.6	1.1751	34.45	24.6	1.2043	40.78
21.7	1.1760	34.64	24.7	1.2053	41.01
21.8	1.1770	34.83	24.8	1.2063	41.24
21.9	1.1779	35.02	24.9	1.2073	41.48
22.0	1.1789	35.21	25.0	1.2083	41.72
22.1	1.1798	35.40	25.1	1.2093	41.99
22.2	1.1808	35.59	25.2	1.2103	42.30
22.3	1.1817	35.78	25.3	1.2114	42.64
22.4	1.1827	35.97	25.4	1.2124	43.01
22.5	1.1836	36.16	25.5	1.2134	43.40
22.6	1.1846	36.35			
22.7	1.1856	36.54			
22.8	1.1866	36.73			
22.9	1.1875	36.93			
23.0	1.1885	37.14			
23.1	1.1895	37.36			

*This table has been approved and adopted as a standard by the Manufacturing Chemists' Association of the United States.

Specific gravity determinations were made at 60°F. compared with water at 60°F.

From the specific gravities, the corresponding degrees Baumé were calculated by the following formula:

$$\text{Baumé} = 145 - \frac{145}{\text{Sp. Gr.}}$$

Allowance for Temperature

At 10° to 15° Bé. correction of 1/40° Bé. or 0.0002 Sp. Gr. for every 1°F.
At 15° to 22° Bé. correction of 1/30° Bé. or 0.0003 Sp. Gr. for every 1°F.
At 22° to 25° Bé. correction of 1/28° Bé. or 0.00035 Sp. Gr. for every 1°F.

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TOWOLDMON0007097

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10.00	1.0741	12.86	21.25	1.1718	28.02
10.25	1.0761	13.18	21.50	1.1741	28.36
10.50	1.0781	13.49	21.75	1.1765	28.72
10.75	1.0801	13.81	22.00	1.1789	29.07
11.00	1.0821	14.13	22.25	1.1813	29.43
11.25	1.0841	14.44	22.50	1.1837	29.78
11.50	1.0861	14.76	22.75	1.1861	30.14
11.75	1.0881	15.07	23.00	1.1885	30.49
12.00	1.0902	15.41	23.25	1.1910	30.86
12.25	1.0922	15.72	23.50	1.1934	31.21
12.50	1.0943	16.05	23.75	1.1959	31.58
12.75	1.0964	16.39	24.00	1.1983	31.94
13.00	1.0985	16.72	24.25	1.2008	32.31
13.25	1.1006	17.05	24.50	1.2033	32.68
13.50	1.1027	17.38	24.75	1.2058	33.05
13.75	1.1048	17.71	25.00	1.2083	33.42
14.00	1.1069	18.04	25.25	1.2109	33.80
14.25	1.1090	18.37	25.50	1.2134	34.17
14.50	1.1111	18.70	25.75	1.2160	34.56
14.75	1.1132	19.02	26.00	1.2185	34.94
15.00	1.1154	19.36	26.25	1.2211	35.33
15.25	1.1176	19.70	26.50	1.2236	35.70
15.50	1.1197	20.02	26.75	1.2262	36.09
15.75	1.1219	20.36	27.00	1.2288	36.48
16.00	1.1240	20.69	27.25	1.2314	36.87
16.25	1.1262	21.03	27.50	1.2340	37.26
16.50	1.1284	21.36	27.75	1.2367	37.67
16.75	1.1306	21.70	28.00	1.2393	38.06
17.00	1.1328	22.04	28.25	1.2420	38.46
17.25	1.1350	22.38	28.50	1.2446	38.85
17.50	1.1373	22.74	28.75	1.2473	39.25
17.75	1.1395	23.08	29.00	1.2500	39.66
18.00	1.1417	23.42	29.25	1.2527	40.06
18.25	1.1440	23.77	29.50	1.2554	40.47
18.50	1.1462	24.11	29.75	1.2582	40.89
18.75	1.1485	24.47	30.00	1.2609	41.30
19.00	1.1508	24.82	30.25	1.2637	41.72
19.25	1.1531	25.18	30.50	1.2664	42.14
19.50	1.1554	25.53	30.75	1.2692	42.58
19.75	1.1577	25.88	31.00	1.2719	43.00
20.00	1.1600	26.24	31.25	1.2747	43.44
20.25	1.1624	26.61	31.50	1.2775	43.89
20.50	1.1647	26.96	31.75	1.2804	44.34
20.75	1.1671	27.33	32.00	1.2832	44.78
21.00	1.1694	27.67	32.25	1.2861	45.24

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TOWOLDMON0007098

NITRIC ACID*—Continued

32.50	1.2889	45.68	41.25	1.3976	64.93
32.75	1.2918	46.14	41.50	1.4010	65.67
33.00	1.2946	46.58	41.75	1.4044	66.42
33.25	1.2975	47.04	42.00	1.4078	67.18
33.50	1.3004	47.49	42.25	1.4112	67.95
33.75	1.3034	47.95	42.50	1.4146	68.73
34.00	1.3063	48.42	42.75	1.4181	69.52
34.25	1.3093	48.90	43.00	1.4216	70.33
34.50	1.3122	49.35	43.25	1.4251	71.15
34.75	1.3152	49.83	43.50	1.4286	71.98
35.00	1.3182	50.32	43.75	1.4321	72.82
35.25	1.3212	50.81	44.00	1.4356	73.67
35.50	1.3242	51.30	44.25	1.4392	74.53
35.75	1.3273	51.80	44.50	1.4428	75.40
36.00	1.3303	52.30	44.75	1.4464	76.28
36.25	1.3334	52.81	45.00	1.4500	77.17
36.50	1.3364	53.32	45.25	1.4536	78.07
36.75	1.3395	53.84	45.50	1.4573	79.03
37.00	1.3426	54.36	45.75	1.4610	80.04
37.25	1.3457	54.89	46.00	1.4646	81.08
37.50	1.3488	55.43	46.25	1.4684	82.18
37.75	1.3520	55.97	46.50	1.4721	83.33
38.00	1.3551	56.52	46.75	1.4758	84.48
38.25	1.3583	57.08	47.00	1.4796	85.70
38.50	1.3615	57.65	47.25	1.4834	86.98
38.75	1.3647	58.23	47.50	1.4872	88.32
39.00	1.3679	58.82	47.75	1.4910	89.76
39.25	1.3712	59.43	48.00	1.4948	91.35
39.50	1.3744	60.06	48.25	1.4987	93.13
39.75	1.3777	60.71	48.50	1.5026	95.11
40.00	1.3810	61.38			
40.25	1.3843	62.07			
40.50	1.3876	62.77			
40.75	1.3909	63.48			
41.00	1.3942	64.20			

*This table has been approved and adopted as a standard by the Manufacturing Chemists' Association of the United States.

Specific gravity determinations were made at 60°F. compared with water at 60°F.

From the specific gravities, the corresponding degrees Baumé were calculated by the following formula:

$$\text{Baumé} = 145 - \frac{145}{\text{Sp. Gr.}}$$

Allowance for Temperature

At from 10° to 20° Bé. correction of 1/30° Bé. or .00029 Sp. Gr. for every 1°F.
At from 20° to 30° Bé. correction of 1/23° Bé. or .00044 Sp. Gr. for every 1°F.
At from 30° to 40° Bé. correction of 1/20° Bé. or .00060 Sp. Gr. for every 1°F.
At from 40° to 48.5° Bé. correction of 1/17° Bé. or .00084 Sp. Gr. for every 1°F.

0685234

TOWOLDMON0007099

ULFURIC ACID*

0	1.0000	0.00	32.0	36	1.3303	42.63	−70
				37	1.3426	43.99	−60
1	1.0069	1.02	31.2	38	1.3551	45.35	−53
2	1.0140	2.08	30.5	39	1.3679	46.72	−47
3	1.0211	3.13	29.8	40	1.3810	48.10	−41
4	1.0284	4.21	28.9				
5	1.0357	5.28	28.1	41	1.3942	49.47	−35
				42	1.4078	50.87	−31
6	1.0432	6.37	27.2	43	1.4216	52.26	−27
7	1.0507	7.45	26.3	44	1.4356	53.66	−23
8	1.0584	8.55	25.1	45	1.4500	55.07	−20
9	1.0662	9.66	24.0				
10	1.0741	10.77	22.8	46	1.4646	56.48	−14
				47	1.4796	57.90	−15
11	1.0821	11.89	21.5	48	1.4948	59.32	−18
12	1.0902	13.01	20.0	49	1.5104	60.75	−22
13	1.0985	14.13	18.3	50	1.5263	62.18	−27
14	1.1069	15.25	16.6				
15	1.1154	16.38	14.7	51	1.5426	63.66	−33
				52	1.5591	65.13	−39
16	1.1240	17.53	12.6	53	1.5761	66.63	−49
17	1.1328	18.71	10.2	54	1.5934	68.13	−59
18	1.1417	19.89	7.7	55	1.6111	69.65	†
19	1.1508	21.07	4.8				
20	1.1600	22.25	+ 1.6	56	1.6292	71.17	†
				57	1.6477	72.75	†
21	1.1694	23.43	− 1.8	58	1.6667	74.36	†
22	1.1789	24.61	− 6.0	59	1.6860	75.99	− 7
23	1.1885	25.81	−11	60	1.7059	77.67	+12.6
24	1.1983	27.03	−16				
25	1.2083	28.28	−23	61	1.7262	79.43	27.3
				62	1.7470	81.30	39.1
26	1.2185	29.53	−30	63	1.7683	83.34	46.1
27	1.2288	30.79	−39	64	1.7901	85.66	46.4
28	1.2393	32.05	−49	64½	1.7957	86.33	43.6
29	1.2500	33.33	−61	64¾	1.8012	87.04	41.1
30	1.2609	34.63	−74	64¾	1.8068	87.81	37.9
				65	1.8125	88.65	33.1
31	1.2719	35.93	−82	65¼	1.8182	89.55	24.6
32	1.2832	37.26	−96	65½	1.8239	90.60	13.4
33	1.2946	38.58	−97	65¾	1.8297	91.80	− 1
34	1.3063	39.92	−91				
35	1.3182	41.27	−81	66	1.8354	93.19	−29

*This table has been approved and adopted as a standard by the Manufacturing Chemists' Association of the United States.

†Below −40°.

Specific gravity determinations were made at 60°F., compared with water at 60°F.

0685235

TOWOLDMON0007100

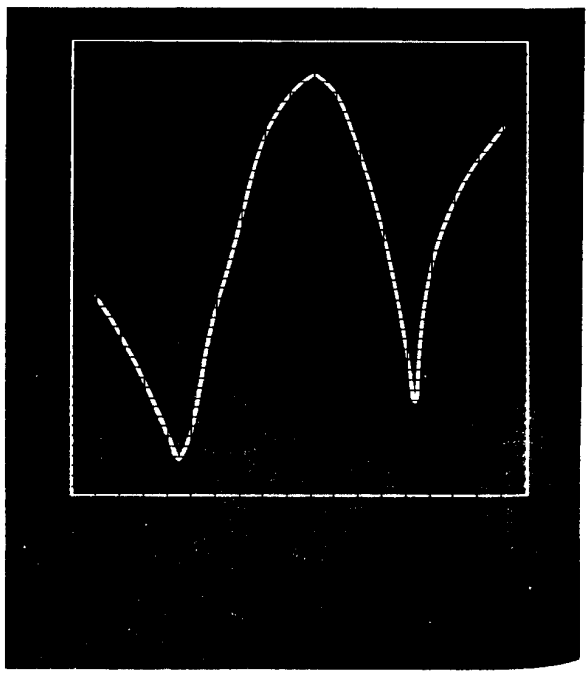
Allowance for Temperature

At 10° Bé. .029° Bé. or .00023 Sp. Gr. for every 1°F.
At 20° Bé. .036° Bé. or .00034 Sp. Gr. for every 1°F.
At 30° Bé. .035° Bé. or .00039 Sp. Gr. for every 1°F.
At 40° Bé. .031° Bé. or .00041 Sp. Gr. for every 1°F.
At 50° Bé. .028° Bé. or .00045 Sp. Gr. for every 1°F.
At 60° Bé. .026° Bé. or .00053 Sp. Gr. for every 1°F.
At 63° Bé. .026° Bé. or .00057 Sp. Gr. for every 1°F.
At 66° Bé. .0235° Bé. or .00054 Sp. Gr. for every 1°F.

For temperatures above 60°F., the correction is added to the observed indication; below 60°F. subtracted.

Oleum Freezing Point Diagram

ADOPTED—1941



0685236

TOWOLDMON0007101

BLE OF COMPARATIVE PROPERTIES OF MONSANTO PLASTICIZERS

470°F. (243°C.)	Tricresyl Phosphate
450°F. (232°C.)	Santicizer 140 Diisodecyl Phthalate
437°F. (225°C.)	Triphenyl Phosphate
435°F. (224°C.)	Diphenyl Phthalate Santicizer 141
430°F. (221°C.)	Diisooctyl Phthalate
425°F. (218°C.)	Dioctyl Phthalate Diisodecyl Adipate Di(n-Octyl,n-Decyl) Phthalate
420°F. (215°C.)	Santicizer 9
390°F. (199°C.)	Santicizer 160 Santicizer B-16
386°F. (190°C.)	Santicizer E-15
380°F. (193°C.)	Santicizer M-17
377°F. (192°C.)	Dioctyl Adipate
371°F. (188°C.)	Santicizer 3
345°F. (174°C.)	Santicizer 8
340°F. (170°C.)	Dibutyl Phthalate
305°F. (152°C.)	Diethyl Phthalate
306°F. (149°C.)	Dimethyl Phthalate
289°F. (143°C.)	Ortho-nitrobiphenyl

420°C.	Tricresyl Phosphate
405°C.	Diphenyl Phthalate
390°C. (approx.)	Santicizer 140
386°C.	Dioctyl Phthalate
375°C. (approx.)	Santicizer 141
370°C.	Santicizer 160
370°C. (approx.)	Triphenyl Phosphate
360°C.	Santicizer 9
350°C.	Santicizer 1-H
345°C.	Santicizer B-16
340°C.	Dibutyl Phthalate Santicizer 3 Santicizer 8
330°C. (approx.)	Ortho-Nitrobiphenyl
320°C.	Santicizer E-15
310°C.	Santicizer M-17
298°C.	Diethyl Phthalate
282°C.	Dimethyl Phthalate

*From vapor pressure curves.

446.3	Diisodecyl Phthalate
426.6	Dissodecyl Adipate
418.3	Di(n-Octyl,n-Decyl) Phthalate
390.5	Dioctyl Phthalate
370.6	Dioctyl Adipate
368.4	Tricresyl Phosphate
362.4	Santicizer 141
340.3	Santicizer 140
336.4	Santicizer B-16
326.3	Triphenyl Phosphate
318.3	Diphenyl Phthalate
312.4	Santicizer 160
280.3	Santicizer E-15
278.3	Dibutyl Phthalate
266.3	Santicizer M-17
253.0	Santicizer 1-H
222.2	Diethyl Phthalate
199.3	Santicizer 3 Santicizer 8
199.2	Ortho-Nitrobiphenyl
194.2	Dimethyl Phthalate
171.2	Santicizer 9

83.5°C.	Santicizer 1-H
69°C.	Diphenyl Phthalate
58.0°C.	Santicizer 3
49°C.	Triphenyl Phosphate
34.5°C.*	Ortho Nitrobiphenyl
20°C.*	Santicizer E-15
0°C.	Dimethyl Phthalate
0°C.	Santicizer 8
−0.3°C.*	Diethyl Phthalate
−30°C.	Di(n-Octyl,n-Decyl) Phthalate Dibutyl Phthalate Santicizer 160 Santicizer B-16 Santicizer M-17 Tricresyl Phosphate
Less than −35°C.	Santicizer 140 Dioctyl Phthalate Diisooctyl Phthalate Diisodecyl Phthalate Diisooctyl Adipate Dioctyl Adipate

*Supercools readily.

0685237

TOWOLDMON0007102

TABLE OF COMPARATIVE PROPERTIES OF MONSANTO PLASTICIZERS—Continued

1.613 (approx.)	Ortho-Nitrobiphenyl
1.560	Santicizer 140
1.556	Tricresyl Phosphate
1.540	Santicizer 8
1.536	Santicizer 160
1.513	Dimethyl Phthalate
1.508	Santicizer 141
1.504	Santicizer M-17
1.500	Diethyl Phthalate
1.498	Santicizer E-15
1.491	Dibutyl Phthalate
1.490	Santicizer B-16
1.484	Dioctyl Phthalate
1.485	Diisooctyl Phthalate
1.483	Diisodecyl Phthalate
1.482	Di(n-Octyl,n-Decyl) Phthalate
1.451	Diisodecyl Adipate
1.446	Dioctyl Adipate

1.220	Santicizer M-17
1.208	Santicizer 140
1.190	Santicizer 8
1.190	Dimethyl Phthalate
1.182	Santicizer E-15
1.162	Tricresyl Phosphate
1.117	Diethyl Phthalate
1.117	Santicizer 160
1.098	Santicizer B-16
1.091	Santicizer 141
1.045	Dibutyl Phthalate
0.982	Dioctyl Phthalate
0.983	Diisooctyl Phthalate
0.973	Di(n-Octyl,n-Decyl) Phthalate
0.966	Diisodecyl Phthalate
0.924	Dioctyl Adipate
0.916	Diisodecyl Adipate

10.18	Santicizer M-17
10.08	Santicizer 140
9.93	Santicizer 8
9.93	Dimethyl Phthalate
9.87	Santicizer E-15
9.70	Tricresyl Phosphate
9.33	Diethyl Phthalate
9.33	Santicizer 160
9.17	Santicizer B-16
9.11	Santicizer 141
8.72	Dibutyl Phthalate
8.21	Dioctyl Phthalate
8.2	Diisooctyl Phthalate
8.12	Di(n-Octyl,n-Decyl) Phthalate
8.07	Diisodecyl Phthalate
7.72	Dioctyl Adipate
7.65	Diisodecyl Adipate

APHA 200	Santicizer 8
APHA 100	Santicizer 14 Diisodecyl Adipate Diisodecyl Phthalate Dioctyl Adipate
APHA 60 (molten)	Santicizer 3
APHA 50	Di(n-Octyl, Decyl) Phthalate
APHA 45	Santicizer 8
APHA 40	Tricresyl Phosphate Santicizer 1 Santicizer 7
APHA 35	Diisooctyl Phthalate
APHA 25	Dioctyl Phthalate
APHA 20	Dibutyl Phthalate Santicizer 4 Santicizer 5
APHA 20 (molten)	Triphenyl Phosphate
APHA 15	Diethyl Phthalate
APHA 10	Dimethyl Phthalate

*Distilled Water APHA 0

**Listerine APHA 550

*Distilled Water APHA 0
**Listerine APHA 550

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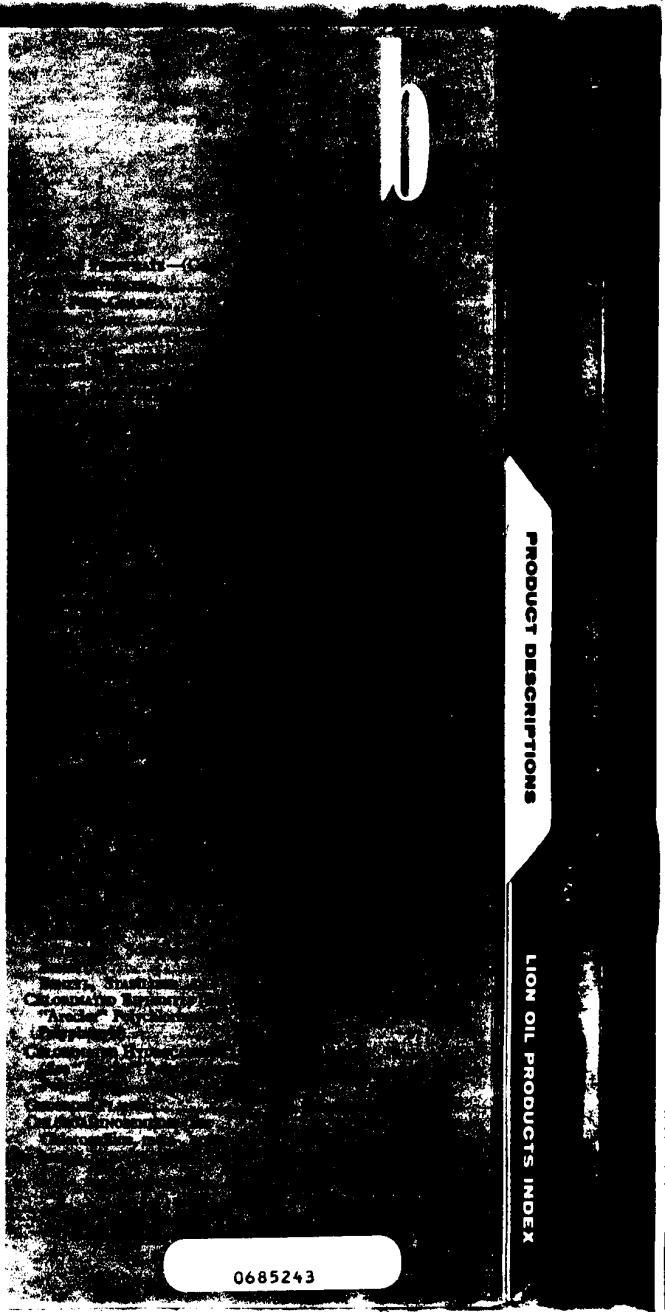

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SODIUM HEXAMETAPHOSPHATE	Inorganic	63
SODIUM METAPHOSPHATE, LOW pH	Inorganic	64
SODIUM PHOSPHATE, DI, ANHYDROUS	Inorganic	64
SODIUM PHOSPHATE, MONO	Inorganic	64
SODIUM SULFATE, ANHYDROUS, TECHNICAL (Salt Cake)	Inorganic	54
TEX ("PHOS-PHO-TEX") WATER SOFTENER	Merchandising	72
WETTING AGENTS		
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"ARESKET" SODIUM BUTYLBIPHENYLSULFONATE	Inorganic	27
"ARESKLENE" DISODIUM DIBUTYL-ortho-PHENYLPHENOLDISULFONATE	Inorganic	27
"SANTOMERSE" ALKYL ARYL SULFONATES	Inorganic	60
"STEROX" No. 5 POLYOXYETHYLENE THIOETHER	Inorganic	65
"STEROX" No. 6 POLYOXYETHYLENE THIOETHER	Inorganic	65
"STEROX" AJ POLYOXYETHYLENE ETHER	Inorganic	65
"STEROX" AJ-100 POLYOXYETHYLENE ETHER	Inorganic	66
"STEROX" SE POLYOXYETHYLENE THIOETHER	Inorganic	66

	Division or Department	Page No.
WETTING [illegible] "STEROX" [illegible]	Inorganic	66
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[illegible]	Organic	53
WOOD [illegible]	Organic	41
[illegible]	Organic	58
XANTHOG[illegible]	Organic Rubber Serv.	66
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ZINC OXIDE, TECHNICAL	Inorganic	71

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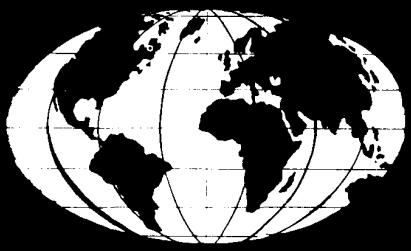
TOWOLDMON0007126

RESEARCH

GENERAL DATA



MONSANTO is an efficient organization of service and supply to users of chemicals. Thirty-nine plants, twenty-nine district offices, together with representatives in sixty different countries make possible the manufacture and rapid distribution of more than 1000 chemicals, plastics and petroleum products for almost every modern industry everywhere. Listed below are the complete addresses of the Monsanto offices located to serve these industries. For any information about Monsanto products or service, please contact the office nearest you or the central office, 1700 South Second Street, St. Louis 4, Missouri.

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TOWOLDMON0007127

domestic sales offices

AKRON 11, OHIO
920 Brown Street
Telephone Hemlock 4-6191
ATLANTA 5, GEORGIA
1401 Peachtree Street N.E.
Telephone Elgin 0778
BOSTON 49, MASSACHUSETTS
Everett Station
Telephone Everett 7-5010
CHARLOTTE 2, NORTH CAROLINA
1117 Johnston Building
Telephone 5-4870
CHICAGO 54, ILLINOIS
Merchandise Mart Building
Telephone Whitehall 4-6750
5415 W. Madison Street
Telephone Columbus 1-6563
CINCINNATI 6, OHIO
2330 Victory Parkway
Telephone Woodburn 1-3677
CLAYTON 5, MISSOURI
7 N. Brentwood
Telephone Vo. 3-6900
CLEVELAND 15, OHIO
427 Hanna Building
Telephone Superior 1-3830
COLUMBUS 12, OHIO
1147 Chesapeake Avenue
Telephone Hudson 8-9771
DALLAS 2, TEXAS
1108 Jackson Street
Telephone Sterling 5801
DETROIT 2, MICHIGAN
827 Fisher Building
Telephone Trinity 2-3188
EL DORADO, ARKANSAS
Lion Oil Building
Telephone Union 3-3111
HOUSTON 2, TEXAS
904 City National Bank Building
Telephone Atwood 6421
KANSAS CITY 10, MISSOURI
1020 East 63rd Street
Telephone Delmar 8131
LITTLE ROCK, ARKANSAS
210 North Woodrow Street
Telephone Franklin 6-2437
LOS ANGELES 15, CALIFORNIA
714 W. Olympic Boulevard
Telephone Richmond 7-7201
MEMPHIS, TENNESSEE
4671 Kaye Road
Telephone Whitehall 8-4451
MINNEAPOLIS 2, MINNESOTA
Foshay Tower
Telephone Filmore 4651
MONTGOMERY, ALABAMA
504-7 Shepherd Building
Telephone 34796
NEW ORLEANS, LOUISIANA
1508 National Bank of Commerce Building
Telephone Canal 2133

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NEW YORK 22, NEW YORK
445 Park Avenue
Telephone Plaza 9-8200

PHILADELPHIA, PENNSYLVANIA
600 Old Lancaster Road
Bryn Mawr, Pennsylvania
Telephone Lawrence 5-4460

ST. LOUIS 1, MISSOURI
Roberts Building
800 N. 12th Boulevard
Telephone MA. 1-8900

SAN FRANCISCO 4, CALIFORNIA
111 Sutter Street
Telephone Yukon 6-6232

SANTA CLARA, CALIFORNIA
2790 Lafayette
Telephone Cherry 3-0414

SEATTLE 4, WASHINGTON
911 Western Avenue
Telephone Main 4203

SPRINGFIELD 2, MASSACHUSETTS
812 Monsanto Avenue
Telephone Linden 3-2211

WILMINGTON 2, DELAWARE
4335 Governor Printz Boulevard
Telephone 8-6423

WASHINGTON 6, D. C.
Suite 301
918 16th Street N.W.
Telephone Executive 3-4224

foreign sales offices

ADELAIDE, AUSTRALIA
256 Flinders Street
South Australia

BOMBAY, INDIA
Wakefield House
11, Sprott Road
Ballard Estate

BRISBANE, QUEENSLAND, AUSTRALIA
Eagle Farm Road N.E. 2

BUENOS AIRES, ARGENTINA
Av. Alem 619-3° Piso

CALCUTTA 1, INDIA
The Exchange
5, Mission Row

LONDON S.W. 1, ENGLAND
Victoria Station House
Victoria Street

MELBOURNE, VICTORIA, AUSTRALIA
Somerville Road
West Footscray W-12

MONTREAL, CANADA
425 St. Patrick Street
Ville La Salle
Telephone Wellington 8421

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TOWOLDMON0007129

NEW DELHI, INDIA
3/8 Ajmerigate Extension Scheme
Near Turkman Gate
OAKVILLE, ONTARIO
(Monsanto Oakville Ltd., subsidiary
of Monsanto Can. Ltd.)
SYDNEY, N.S.W., AUSTRALIA
106 Mullens Street
Rozelle
TORONTO, CANADA
183 Front Street East
Telephone Waverly 1143
VANCOUVER, CANADA
1550 Rand Avenue
Telephone Ke. 8030

divisional offices and associated companies

CHEMSTRAND CORPORATION
Decatur, Alabama
INORGANIC CHEMICALS DIVISION
710 N. Twelfth Blvd.
St. Louis 1, Mo.
MOBAY CHEMICALS COMPANY
1901 S. Second St.
St. Louis 4, Mo.
ORGANIC CHEMICALS DIVISION
800 N. Twelfth Blvd.
St. Louis 1, Mo.
OVERSEAS DIVISION
1700 S. Second St.
St. Louis 4, Mo.
PLASTICS DIVISION
Indian Orchard
Springfield 2, Mass.
RESEARCH & ENGINEERING DIVISION
1700 S. Second St.
St. Louis 4, Mo.
RUBBER CHEMICAL SALES
920 Brown Street
Akron 11, Ohio
TEXTILE CHEMICALS DEPARTMENT
Springfield 2, Mass.
SHAWINIGAN RESINS CORPORATION
Springfield 2, Mass.
MONSANTO-ARGENTINA SAIC (en formacion)
Edificio Ultramar
Avenida Alem 619-3° Piso
Buenos Aires, Argentina
MONSANTO CHEMICALS (AUSTRALIA) LTD.
Somerville Road, W. Footscray W. 12
Melbourne, Australia
MONSANTO CANADA LTD.
425 St. Patrick St., Ville La Salle
Montreal, Quebec, Canada
MONSANTO CHEMICALS, LTD.
Victoria Station House, Victoria St.
London S.W. 1, England
LA SOCIETE MONSANTO-BOUSSOIS, S. A.
Paris, France

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MONSANTO CHEMICALS OF INDIA, LTD.
Wakefield House
11, Sprott Road
Ballard Estate, Bombay 1, India
MONSANTO-KASEI CHEMICAL COMPANY
No. 6,6-Chome, Ginza-Nishi, Chou-ku
Tokyo, Japan
MONSANTO, S.A.
Tonala N. 136
Mexico, D.F., Mexico
MONSANTO MEXICANA, S.A.
Tonala N. 136
Mexico, D.F., Mexico
MONSANTO OVERSEAS S.A.
Panama, R. P.
CABLE ADDRESS
"Monsanto" St. Louis Codes: ABC, 6th and 7th Acme, Bentley's and Bentley's Second

manufacturing plants

ADDYSTON, OHIO
ANNISTON, ALABAMA
AVON, CALIFORNIA
BRISBANE, AUSTRALIA
CAMDEN, NEW JERSEY
CAMPANA, ARGENTINA
CARONDELET, MISSOURI
COLUMBUS, OHIO
EL DORADO, ARKANSAS
EPIERRE, FRANCE
EVERETT, MASSACHUSETTS
GHENT, BELGIUM
KEARNY, NEW JERSEY
LECHERIA, D.F., MEXICO
LONG BEACH, CALIFORNIA
LULING, LOUISIANA
MAGNOLIA, ARKANSAS
MELBOURNE, AUSTRALIA
MONSANTO, IDAHO
MONSANTO, ILLINOIS
MONSANTO, TENNESSEE
NAGOYA, JAPAN
NEWPORT, ENGLAND
NITRO, WEST VIRGINIA
NORFOLK, VIRGINIA
OAKVILLE, CANADA
PORTO MARGHERA, ITALY
RUABON, NORTH WALES
SAINT LOUIS, MISSOURI
SANTA CLARA, CALIFORNIA
SEATTLE, WASHINGTON
SPRINGFIELD, MASSACHUSETTS
STOCKHOLM, SWEDEN
TEXAS CITY, TEXAS
TRENTON, MICHIGAN
VANCOUVER, CANADA
VILLE LA SALLE (MONTREAL), CANADA
WINGLES, FRANCE
YOKKAICHI, JAPAN

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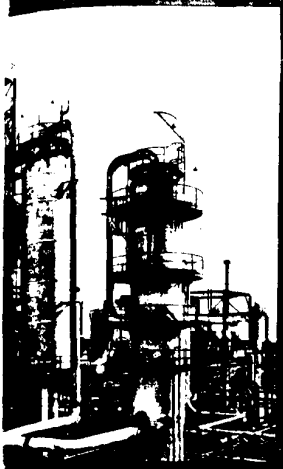

DIVISION OF MONSANTO CHEMICAL COMPANY

LION

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GENERAL DATA

PRODUCT DESCRIPTIONS

LION OIL PRODUCTS INDEX

TOWOLDMON0007132

TOWOLDMON0007133

Lion Oil Company is the newest division of Monsanto: it became an integral part of the Monsanto organization on Sept. 23, 1955.

The Lion Oil Division engages in all phases of oil production, from exploration to the refining, processing, and marketing of petroleum products. Lion also is one of the nation's largest producers of nitrogen fertilizers, with an output of approximately 270,000 tons of nitrogen annually from two chemical plants.

From wells in Arkansas, Colorado, Kansas, Louisiana, Mississippi, Montana, New Mexico, North Dakota and Texas, Lion produces approximately 27,000 barrels of oil each day, and annually produces approximately 14.5 billion cubic feet of natural gas. The refinery manufactures more than 60 quality

an 60 quality petroleum products ufactured at Lion Oil Company's at El Dorado, Arkansas. The re- ers 256 acres, and processes ap- ly 27,500 barrels of crude oil daily.

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TOWOLDMON0007134

petroleum products, ranging from high-octane premium gasoline to paving asphalts.

Lion's two chemical manufacturing plants are located at El Dorado, Arkansas, and at Luling, Louisiana, near New Orleans. The El Dorado plant has a daily capacity of approximately 580 tons of anhydrous ammonia, the plant's basic product. A large portion of the ammonia, which is produced from natural gas, air and water, is used in the manufacture of aqua ammonia, pelleted ammonium nitrate and sulphate of ammonia fertilizers, and nitrogen fertilizer solutions.

The Barton Plant at Luling, Lion's newest chemical installation, is located on the Mississippi River. It has a daily capacity of approximately 350 tons of anhydrous ammonia, much of which is used in the manufacture of other nitrogen products, as at the El Dorado Plant. The Barton Plant also includes a unit for the production of solid (dry ice) and liquid carbon dioxide from by-products gas of the ammonia process.

Facilities at the Barton Plant include a wharf on the Mississippi River where river barges and ocean-going tankers may be located with aqua ammonia or anhydrous ammonia, using high-speed pumping equipment.

Lion's service station marketing area includes Alabama, Arkansas, Kentucky, Louisiana, Mississippi, Missouri, Tennessee and Texas, where Lion's refined products are sold at retail through approximately 1,800 service stations. Sales of petroleum and chemical products at the wholesale level are made in all states of the nation and in several foreign countries.



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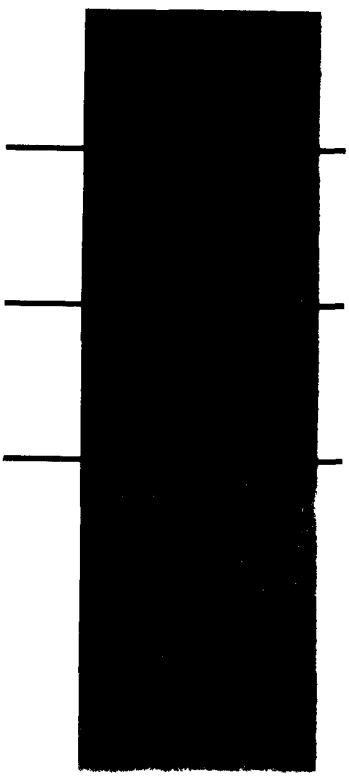
contents



TOWOLDMON0007136



lion oil products

asphalt products

Acid-Proof Asphalt Coating
Asbestos Asphalt Roof Coating
Asphalt Plastic Cement
Asphalt Roof Coating
Blind Nailing Cement
Code 2 Primer
Colay Asphaltic Paving Material
Cold Process Lap Cement
Crate-Top Coating
D-80 Joint Compound
Dead Level Roofing Asphalts
Dry-Kiln Mastic
E-120 Pipe Coating
Erection Asphalt
Flux Oils
Ink Asphalt (HSP)
Membrane Lining
Metal Coating No. 3
Paper Laminant
Paving Asphalts
Pole Compound
Road Oil No. 2
Solid Roofing Asphalt



chemical products

Ammonium Nitrate Pelleted Fertilizer
Anhydrous Ammonia
Aqua Ammonia
Carbon Dioxide (liquid)
Dry Ice
Nitric Acid
Nitrogen Fertilizer Solutions
Sulphate of Ammonia
Sulphuric Acid



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TOWOLDMON0007137

gasolines

Lion Premium Gasoline with Lionite
Lion Regular Gasoline with Lionite
Premium Gasoline (unbranded)
Regular Gasoline (unbranded)

greases, oils, and gear lubricants

AC Track Roll Grease
A. F. Grease
All-Purpose Gear Lubricant
B. & R. Grease
Bearing Oil
Bentone Grease
Blaco
Brick Oil (form oil)
Castor Machine Oil
Chassis Lubricant
Cotton Picker Spindle Oil
Cup Grease
Electric Motor and Dynamo Oil
Engine Oil
4-In-1 Barium Grease
Gasoline Pump Grease (Repello Grease)
Gear and Tractor Roller Lubricant
Gear Lubricant No. 360
High-Pressure Industrial Grease
High-Pressure Journal Oil
Hydraulic Oil
Lava Compound
Multi-Purpose Lubricant (ultra-white)
Outside Gear Lubricant
Pressure Gun Lubricant
Refrigerator Oil
Rock Drill Lubricant
Steam Cylinder Oil (compounded)
Steam Cylinder Oil (mineral)
Water Pump Grease
Wheel Bearing and Universal Joint Grease

light oils

Burner Oil
Diesel Fuel
Herbicidal Oil No. 1
Herbicidal Oil No. 6
Ink Oil
Kerosene
Residual Fuel Oil
Tractor Distillate

motor oils

Naturalube DHD
Naturalube DHD-Super Duty
Naturalube Heavy Duty
Naturalube Reinforced
Tiger

nokorode products

Brush Cement
Car Cement
Coach Builders Sound Deadener
Coach Builders Undercoating
Construction Asphalts
D41 Primer
E Kote
Grease Type Rust Preventives
Industrial Sound Deadener
K Kote
Low Temp
Mastic Type Rust Preventives
Oil Type Rust Preventives
Seal Kote
Seal Perm
Seal Prime
Seam and Backing Cement
Sign Kote
Solvent Type Rust Preventives
Undercar Sealer and Silencer
Vehicle

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Lion's Chemical Plant at El Dorado, Arkansas produces approximately 450,000 tons of [illegible] genous chemicals annually for industry and agriculture. The plant covers 130 acres on a [illegible] acre site.

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TOWOLDMON0007139

lion oil products

asphalt products

ACID-PROOF ASPHALT COATING

Standard Form: Liquid.

General Information: Used as an inside coating for brass shell casings for protection against corrosion and also for industrial uses where resistance to mild acids is required. Meets joint Army-Navy Specification JAN-P-450, Types I and II.

Containers: 55-gal. drums.

Shipping Classification: Liquid asphalt.

ASBESTOS ASPHALT ROOF COATING

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.

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 fireproofing 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.

Containers: 55-gallon drums; 5-gallon pails; 1-gallon pails (6 in case).

Shipping Classification: Roofing cement.

ASPHALT PLASTIC CEMENT

(MANUFACTURED UNDER U. S. PATENT No. 2,393,774)

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.

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, [illegible] and cap flashings. It also is useful for sealing [illegible] boiler settings, and for dampproofing [illegible] walls, both above and below [illegible] thickness is desirable for maximum [illegible]. Important farm uses include the repair [illegible] and as a pruning cement.

Containers: [illegible] drums; 30-pound pails; 10-pound pails [illegible]; 5-pound pails (12 in case); 2½-pound pails [illegible]; 1-pound pails (36 in case).

Shipping Classification: Roofing cement.

ASPHALT ROOF COATING

Standard Form: Liquid.

General Information: A liquid material prepared from a high-grade asphalt with a petroleum solvent. It is easier to [illegible] than the solid type because it is already prepared and ready for application by brush or spray. No heating, [illegible], 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.

Specifications: Melting point, above 170°F.

Containers: 55-gallon drums; 5-gallon pails; 1-gallon pails (6 in case).

Shipping Classification: Asphalt, roofing, having a melt point of 135°F. or over.

BLIND NAILING CEMENT

Standard Form: Jelly.

General Information: A jelly-like asphalt cement with great adhesive strength.

Uses: This product is highly recommended for applying roll roofing and for cementing coverings to table tops and kitchen cabinets. Lion Blind Nailing Cement eliminates the use of exposed nails, thus giving roll roofing a better seal and a longer life.

Containers: 55-gallon drums; 5-gallon pails; 1-gallon pails (6 in case).

Shipping Classification: Asphalt.

Literature: "Lion Asphalt Products Used in Construction and Repair of Buildings", folder; "Roof Repairs Are Easy!", folder, published by Lion Oil Company.

CODE 2 PRIMER

Standard Form: Liquid.

General Information: A primer especially developed for application to steel pipe before coating with E-120 Pipe Coating.

Containers: 5-gal. and 55-gal. drums.

Shipping Classification: Liquid asphalt.

(Continued on next page)

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TOWOLDMON0007140

COLAY ASPHALTIC PAVING MATERIAL

(DEVELOPED BY LION OIL COMPANY)

Standard Form: Solid.

General Information: Colay is a paving, patching, and resurfacing material, designed to furnish high-type pavement surfacing and low-cost pavement maintenance to localities which do not have access to an asphalt mixing plant. All the necessary ingredients are combined at a centrally located mixing plant, consequently Colay requires no job-site preparation. Colay is a combination of crushed limestone or slag, blended sands, and mineral filler. All moisture is removed from the aggregate, which is then screened into separate sizes for proper proportioning by weight before mixing. An asphalt especially designed for this product is added to the proportioned mixture and the combined materials then go through a process which thoroughly coats all the aggregate with asphalt. Colay is produced from an especially selected asphaltic base crude oil. Over 90% of its content is 100 penetration asphalt. Other valuable properties are excellent resistance to weathering, high ductility, and strong adhesiveness. The natural high tendency to resist displacement by water has been increased. Stockpiled mixes have been water flooded for prolonged periods without sign of distress. Colay contains no petroleum solvents and therefore is unlike other hot plant-mix and road-mix materials, which are cold-laid and which depend on the evaporation of their cure-retarding agents to reach a satisfactory "set" condition.

Uses: Colay is used to provide an asphaltic concrete street and highway pavement, for surfacing playgrounds and parking areas, and for similar purposes.

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.

Containers: Tank cars.

Shipping Classification: Asphalt.

Literature: "Colay Asphaltic Paving Material", booklet published by Lion Oil Company.

COLD PROCESS LAP CEMENT

Standard Form: Liquid.

General Information: This quick-setting liquid asphalt is especially compounded for use as a seal in conjunction with roofing nails. Application is by a three or four-knot roofing brush.

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.

Containers: 55-gallon drums; 5-gallon pails and 1-gallon pails (6 in case).

Shipping Classification: Asphalt.

Literature: "Lion Asphalt Products Used in Construction and Repair of Buildings", folder; "Roof Repairs Are Easy!", folder, published by Lion Oil Company.

CRATE-TOP COATING

Standard Form: Liquid.

General Information: A mixture of asbestos, and and solvent for packaging and packing materials overseas shipment. Provides protection against w and moisture, and retains plastic conditions ov wide range of temperatures. Manufactured to m Army-Navy Specification P-102.

Containers: 5-gal. metal pails and 55-gal. metal dru

Shipping Classification: Roofing cement.

D-80 JOINT COMPOUND

Standard Form: Solid.

General Information: A compound developed by Li for use as a superior, hot-poured, concrete joint co pound.

Containers: 400-lb. metal drums.

Shipping Classification: Paving joint compound.

DEAD LEVEL ROOFING ASPHALTS

Standard Form: Solid.

General Information: A roofing asphalt develope especially for use on flat roofs with poor drainage

Containers: 400-lb. metal drums.

Shipping Classification: Asphalt, roofing, having melting point of 135°F.

DRY-KILN MASTIC

Standard Form: Heavy liquid.

General Information: Used for coating interior dry kilns to reduce heat loss and to protect wo mortar, and metal surfaces against corrosion incid to the curing of lumber.

Containers: 500-lb. metal drums.

Shipping Classification: Roofing cement.

E-120 PIPE COATING

Standard Form: Solid, liquefied by heating.

General Information: Lion E-120 Pipe Coating is blend of asphaltic resins and hydrocarbons contain natural wax combinations and a 425 mesh filler, p viding a compound with low moisture absorption, h electrical resistivity, and strong mechanical properti Once the coating is set, the film is firm and tough withstand handling of pipes under normal constr tion conditions; and yet retain the flexibility requi at lower atmospheric temperatures. This coating do not produce fumes irritating to workmen and applica tion temperatures may be carried up to 525°F. witho danger of breakdown or decomposition of the coati

Specifications:

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., 100 g./5 sec.	8
Penetration at 32°F., 200 g./60 sec.	5
Penetration at 115°F., 50 g./5 sec.	14
Penetration at 150°F., 50 g./5 sec.	34
Ash (Mineral Filler), % by weight	19
Settlement ratio, maximum	1.02

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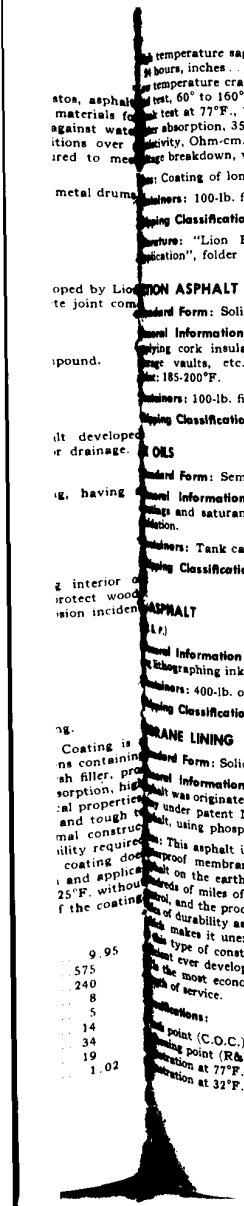

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25°F. withou
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9.95
575
240
8
5
14
34
19
1.02

temperature sag test at 160°F.,
hours, inches ..... None
temperature crack-test at —20°F. ..... None
test, 60° to 160°F. ..... None
test at 77°F., 1" Mandrill ..... None
absorption, 35 weeks, % by weight . 0.9
tivity, Ohm-cm., above ..... 1 x 10^{16}
ge breakdown, volts per mil, above ... 1000

: Coating of long distance transmission pipelines.

ainers: 100-lb. fiber cartons.

ping Classification: Asphalt.

ature: "Lion E-120 Pipe Coating—Properties-
lication", folder published by Lion Oil Company.

ION ASPHALT

dard Form: Solid.

eral Information: An asphalt compound used in
lying cork insulation to structures such as cold
ge vaults, etc. Odorless when cold. Melting
: 185-200°F.

ainers: 100-lb. fiber cartons.

ping Classification: Asphalt.

OILS

dard Form: Semi-solid.

eral Information: Used in the manufacture of
ings and saturants, and solid roofing asphalts by
dation.

ainers: Tank cars.

ping Classification: Petroleum fuel oil, residual.

ASPHALT

L.P.)

eral Information: An asphalt used in manufactur-
lithographing ink.

ainers: 400-lb. open-head casings.

ping Classification: Liquid asphalt.

RANE LINING

dard Form: Solid—liquefied by heating.

eral Information: This hot application (400°F.)
alt was originated and developed by Lion Oil Com-
y under patent No. 2,450,756, catalytically blown
alt, using phosphorous pentoxide as the catalyst.

: This asphalt is used to produce a thick, tough,
proof membrane, formed by spraying the hot
alt on the earth's surface. It has been applied to
dreds of miles of canals and reservoirs for seepage
rol, and the product has shown unusual character-
of durability as well as a toughness and flexibility
makes it unexcelled for this purpose. Not only
this type of construction probably one of the most
ent ever developed for the control of seepage but
the most economical, both in initial cost and in
th of service.

ifications:

point (C.O.C.), min. ..... 425°F.
ning point (R&B) ..... 175° to 200°F.
ration at 77°F., 100 g., 5 sec. 50–60
ration at 32°F., 200 g., 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%

Containers: 400-lb. metal drums, tank cars and tank trucks.

Shipping Classification: Asphalt.

Literature: "Lion Membrane Lining for Control of Seepage and Erosion", Technical Bulletin CA, published by Lion Oil Company.

METAL COATING No. 3

Standard Form: Liquid, manufactured in four grades: light, medium, heavy and extra 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.

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.

Specifications:

REQUIREMENT	LIGHT (Brush)	*MEDIUM (Spray)	HEAVY (Trowel)	EXTRA HEAVY (Trowel)
Weight—lbs. per gal. at 60°F.	7.8	8.3	8.8	10.2
Solids content, %	65	68	75	80
Mineral filler (Ash), %	15	20	25	30
Flash point, Pensky-Martens, °F.	102	102	102	102
Cracking or disbonding at —20°F.	None	None	None	None
Time to dry to touch, 1/16" film, hrs.	1.5	1.5	1.5	1.5
Time to dry firm, 1/16" film, max. hrs.	24	24	24	24
Lineal shrinkage, %	18	15	12	10
Flow of coating at 325°F., inches	0.0	0.0	0.0	0.0
Corrosion of steel, copper, aluminum	None	None	None	None
Salt spray test, 1/16" film, protection of steel panel, min., hrs.	500	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.			

(*Continued on next page*)

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Vapor transmission, wet cup, grains per square foot per hour, 1" film, 0-50% R.H. at 90 F.	0.01	0.01	0.02	0.03

*Can also be brushed at temperatures of 75°F. or above. Made under the process of U. S. Patent No. 2,393,774.

Containers: 55-gallon drums; 5-gallon pails.

Shipping Classification: Roofing cement.

Literature: "Lion Metal Coating No. 3—Properties-Application", folder published by Lion Oil Company.

PAPER LAMINANT

General Information: Used in manufacturing laminated waterproof paper bags.

Containers: Tank cars.

Shipping Classification: Liquid asphalt.

PAVING ASPHALTS

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 steam and vacuum-reduced from crude oils of highest quality.

Specifications: Products are available to comply with requirements of most federal, ASTM, 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. Joint compounds are marketed for sealing concrete highways, undersealing asphalt for sub-sealing, and asphaltic center stripe cutback for center-line marking.

Containers: Tank cars, trucks, 400-lb. drums, 55-gal. drums, and 100-lb. fiber cartons, depending upon the product type and shipping distance.

Shipping Classification: Asphalt.

POLE COMPOUND

Standard Form: Heavy liquid.

General Information: For use in filling crevices and holes in utility line poles. Protects wood by sealing out moisture.

Containers: 5-gal. metal pails.

Shipping Classification: Roofing cement.

ROAD OIL No. 2

(DUST PALLIATIVE OIL)

Standard Form: Liquid.

General Information: An oil developed by Lion for use as a low-cost, dust-laying oil for roads and streets.

Containers: 55-gal. drums; tank cars and tank trucks.

Shipping Classification: Liquid asphalt.

SOLID ROOFING ASPHALT

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 oxidation and contains no undesirable materials as are produced by the cracking process. It is corrosive and does not contain free carbon, coal or cracked residues. Careful processing minimizes possibility of breakdown of the petroleum molecules completely preserving the characteristics of strength and toughness.

Specifications: This product is prepared in four grades 115/130° melt; 140/160° melt; 160/180° melt, 180/200° melt. Lion Solid Roofing Asphalts, depending upon grade, comply with the following specifications: AASHO M115-42, Type B; ASTM D449-49, Type ASTM D449-47T, Type B; Federal SS-A-666 Am. Type 1, Class A, and Navy No. 7YG Grade AR ASTM D-449-49, Type C. Lion Solid Roofing Asphalt also can be supplied within a softening point range 150/165°F. to comply with SS-A-666 Am. 1, Type Grade 1, Class A, Navy No. 7YG Grade AR3, or within a softening point range of 165/190°F. to comply with SS-A-666, Am. 1, Type II, Grade 2, Class A, Navy No. 7YG Grade AR3.

Uses: Lion Solid Roofing Asphalt is used as a hot application material for built-up roofs of various specifications.

Containers: 100-lb. fiber cartons.

Shipping Classification: Asphalt, roofing, having melt point of 135°F. or over.

Literature: "Roof Repairs Are Easy" folder "Asphalt Products Used in Construction and Repair Buildings", folder.

chemical products

AMMONIUM NITRATE PELLETED FERTILIZER

Formula: $(NH_4)\ NO_3$

Standard Form: Ammonium Nitrate Crystals in pellet form coated with a diatomaceous material as a conditioning agent.

Analysis:

Nitrogen (max.)	33.5
Moisture (min.)	.3
Water Insoluble	.3

Containers: Multiwall kraft paper bags with asphalt laminated plies; packaged in 80-pound and 100-pound bags. Also in bulk.

Shipping Classification: Ammonium Nitrate Fertilizer containing 90% or more Ammonium Nitrate with organic coating. Fertilizer Mfg. NOIBN Dry, in paper bags
(DANGEROUS PLACARDS APPLIED)

ANHYDROUS AMMONIA

Molecular Weight: 17.03

Formula: NH_3

General Information—Properties: Colorless gas at normal temperatures and pressures, 0.597 times as heavy as air; below critical temperature, 271.4°F., readily condenses by application of pressure to a mobile less liquid, wt. per gal. 5.33 lbs. B. P. -28°F.

Uses: A source of nitrogen for plant use either applied directly to the soil or in irrigation water and

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formulation of mixed fertilizers; for partial neutralization of phosphatic liquids in the formulation of liquid fertilizers.

Containers: Tank cars; standard 150, 100, 50 pound bottle-type or horizontal-type cylinders.

Shipping Classification: Anhydrous Ammonia (Dangerous Placards Applied).

QUA AMMONIA

Molecular Weight: 35.05.

Formula: NH_4OH.

Standard Form: Liquid.

General Information—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.

Containers: Tank cars, barges and boats.

Shipping Classification: Ammoniacal Liquor (containing not more than 35 per cent Ammonia (NH_3) by weight.)

ARBON DIOXIDE

Formula: CO_2.

Molecular Weight: 44.0.

General 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.

Containers: Steel cylinders and tank cars.

Shipping Classification: Carbon Dioxide.

RTILIZER

T ICE

Formula: CO_2.

Molecular Weight: 44.0.

General Properties: Solid CO_2 (Carbon Dioxide).

Uses: Refrigeration.

Containers: 50-pound blocks packaged in kraft paper.

Shipping Classification: Carbon Dioxide.

TRIC ACID

(SEE PAGE 42) (MONSANTO CHEMICALS)

Formula: (HNO_3).

Standard Form: Add—Clear solution approximately 44% HNO_3, 44% Water.

NOTE: At this time all Nitric Acid produced by Lion is being used for processing Ammonium Nitrate, either in liquid or solid form.

ROGEN FERTILIZER SOLUTIONS

Standard Form: Clear water solution.

Specifications:

	LION NITROGEN SOLUTIONS NO. 1	NO. 2	NO. 3	NO. 49
AMMONIUM NITRATE PERCENT	65.0	55.5	66.8	60.0
ANHYDROUS AMMONIA PERCENT	22.2	26.3	16.6	34.0
WATER PERCENT	12.8	18.2	16.6	6.0
NITROGEN CONTENT % NITRATE	11.38	9.71	11.69	10.50
NITROGEN CONTENT % AMMONIA	29.63	31.34	25.34	38.50
TOTAL NITROGEN CONTENT	41.0	41.0	37.0	49.0

Properties:

	LION NITROGEN SOLUTIONS NO. 1	NO. 2	NO. 3	NO. 49
APPROXIMATE SPEC. GRAVITY AT 60° F.	1.139	1.79	1.182	1.042
APPROXIMATE WT./GALLON AT 60° F. LBS.	9.49	8.99	9.86	8.71
APPROXIMATE VAPOR PRESSURE PSI. AT 104°.	10.0	17.0	1.0	50.0
APPROXIMATE TEMPERATURE AT WHICH SALT BEGINS TO CRYSTALLIZE	21°F	—25°F	48°F	—52°F

Uses: Formulation of mixed fertilizers and for direct application to the soil and in irrigation water.

Containers: Insulated and uninsulated Tank Cars of 8,000 and 10,000 gallon capacity.

Shipping Classification: Nitrogen Fertilizer Solution (The total ammonia content does not exceed 50 percent by weight.)

SULPHATE OF AMMONIA

Formula: $(NH_4)_2SO_4$.

Molecular Weight: 132.14.

Standard Form: Sulphate of Ammonia Crystals, commercial grade, conditioned with approximately 0.3% clay.

Average Analysis:

Nitrogen	21.0 % Minimum
Moisture	0.03% Average
Water Insoluble	0.27% Average

Uses: A source of Nitrogen for plant food either for direct application to the soil or for formulation of mixed fertilizers.

Shipping Classification: Fertilizer Compounds (Mfg. Fert.) NOIBN, Dry, Ammonium Sulphate Fertilizer. In BULK—in PAPER BAGS.

SULPHURIC ACID

(SEE PAGE 67) (MONSANTO CHEMICALS)

gasolines

LION PREMIUM GASOLINE with Lionite

Standard Form: Liquid.

General Information: This high-octane premium gasoline is refined through advanced processing methods at

(*Continued on next page*)

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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 in the finished product.

Uses: Automotive fuel.

Shipping Classification: Lion Premium Gasoline with Lionite is marketed only through Lion service stations.

LION REGULAR GASOLINE with Lionite

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 Classification: Lion Regular Gasoline with Lionite is marketed only through Lion service stations.

PREMIUM GASOLINE (UNBRANDED)

Standard Form: Liquid.

General Information: Premium gasoline, refined to high standards of quality and performance, is available in grades ranging from 90 to 95-octane.

Uses: Automotive fuel.

Containers: Railroad tank car or tank truck shipment, only.

Shipping Classification: Gasoline.

REGULAR GASOLINE (UNBRANDED)

Standard Form: Liquid.

General Information: Regular gasoline, refined to excellent standards of quality and performance, is available in 84 to 87-octane ratings.

Uses: Automotive fuel.

Containers: Railroad tank car or tank truck shipment, only.

Shipping Classification: Gasoline.

greases, oils, and gear lubricants

AC TRACK ROLL GREASE

Consistency: Granular.

General Information: A grease approved by Allis-Chalmers for use on tractor rollers.

Containers: 25-lb. pails.

Shipping Classification: Lubricating grease.

A. F. GREASE

Consistency: Buttery.

General Information: A water-resistant, lithium-base grease with a high melting point for use on anti-friction bearings. Stable up to approximately 400°F.

Grades: #1 and #2.

Containers: 25-lb., 100-lb., 230-lb., and 415-lb. drums.

Shipping Classification: Lubricating grease.

ALL-PURPOSE GEAR LUBRICANT

Standard Form: Liquid.

General Information: A lubricant especially produced for transmission and differential gears (including hypoid gears) which are subject to extreme operating pressures. Made with high-viscosity petroleum oils and blended with an extreme pressure base which is non-corrosive.

SAE Grades: 90, 140, and 250.

Containers: 40-lb., 100-lb., 230-lb., and 415-lb. drums.

Shipping Classification: Lubricating grease.

B. & R. GREASE

Consistency: Granular.

General Information: An aluminum-base grease designed for use on ball and roller bearings. Oxidation stability to 300°F.

Grades: #1, #2, #3.

Containers: 25-lb., 100-lb., 230-lb., and 415-lb. drums.

Shipping Classifications: Lubricating grease.

BEARING OIL

Standard Form: Liquid.

General Information: An oil recommended for lubrication of most types of bearings. It contains corrosion and oxidation inhibitors for the lubrication of bearings where high film strength is necessary.

Grade: 4344.

Containers: 54-gal. drums.

Shipping Classification: Lubricating oil.

BENTONE GREASE

Consistency: Buttery.

General Information: An all-purpose bentone-base grease which does not contain soap, has a high melting point, and is water resistant. This grease will remain stable at temperatures above 500°F., and is especially useful in lubricating ball and roller bearings and electric motors subject to high temperatures.

Grade: #1.

Containers: 25-lb., 100-lb., 230-lb., and 415-lb. drums.

Shipping Classification: Lubricating grease.

BLACO

Standard Form: Liquid.

General Information: Black oil with high film strength for use on chains and open gears.

Containers: 54-gal. drums.

Shipping Classification: Fuel oil residual.

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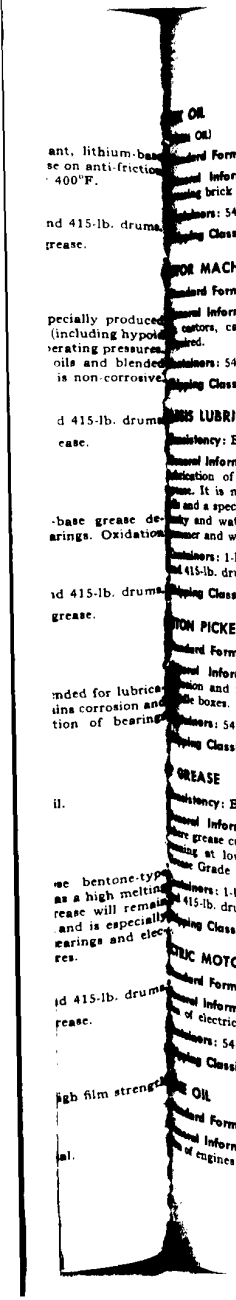

...ant, lithium-base ...se on anti-friction ... 400°F.

...nd 415-lb. drums. ...grease.

...pecially produced ...(including hypoid ...erating pressures ... oils and blended ... is non-corrosive.

...d 415-lb. drums ...ease.

...-base grease de... ...arings. Oxidation ...

...id 415-lb. drums ...grease.

...nded for lubrica... ...ains corrosion and ...tion of bearings ...

...il.

...se bentone-type ...as a high melting ...rease will remain ...and is especially ...earings and elec... ...res.

...id 415-lb. drums ...rease.

...gh film strength ...

...al.

... OIL

...OIL)

...dard Form: Liquid.

...ral Information: A light-bodied oil for use in ...ing brick and concrete presses or molds.

...ainers: 54-gal. drums.

...ping Classification: Lubricating oil.

...OR MACHINE OIL

...dard Form: Liquid.

...ral Information: A light, stringy type oil for use ...ractors, cams, and parts where this type oil is ...ired.

...ainers: 54-gal. drums.

...ping Classification: Lubricating oil.

...SIS LUBRICANT

...sistency: Buttery.

...ral Information: A lubricant for use in the general ...lubrication of chassis parts not requiring a special ...ease. It is manufactured from viscous, high-quality ...il and a special calcium base. It is highly adhesive, ...ty and waterproof. This product is made in both ...mer and winter grades.

...ainers: 1-lb. and 5-lb. cans; 25-lb., 100-lb., 230-lb., ...d 415-lb. drums.

...ping Classification: Lubricating grease.

...ON PICKER SPINDLE OIL

...dard Form: Liquid.

...ral Information: A light-bodied oil containing ...tion and rust inhibitors for use in cotton picker ...dle boxes.

...ainers: 54-gal. drums.

...ping Classification: Lubricating oil.

... GREASE

...sistency: Buttery.

...ral Information: A calcium-base grease for use ...here grease cups are employed in lubricating bearings ...ning at low temperatures and light load. NLGI ...ease Grade #2 and #3.

...ainers: 1-lb. and 5-lb. cans; 25-lb., 100-lb., 230-lb., ...d 415-lb. drums.

...ping Classification: Lubricating grease.

...TRUC MOTOR AND DYNAMO OIL

...dard Form: Liquid.

...ral Information: An oil recommended for lubrica... ...of electric motor and dynamo bearings.

...ainers: 54-gal. drums.

...ping Classification: Lubricating oil.

... OIL

...dard Form: Liquid.

...ral Information: An oil recommended for lubrica... ...of engines and machinery in general.

Grades: 43, 45, 50, 55, 63, 72.

Containers: 54-gal. drums.

Shipping Classification: Lubricating oil.

4-in-1 BARIUM GREASE

Consistency: 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 400°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 Grease Grade #2.

Containers: 25-lb., 100-lb., 230-lb., and 415-lb. drums.

Shipping Classification: Lubricating grease.

GASOLINE PUMP GREASE (REPELLO GREASE)

Consistency: Buttery.

General Information: A specialized grease for lubrication of gasoline pumps, made to resist chemical breakdown in the presence of gasoline.

Containers: 25-lb. pail.

Shipping Classification: Lubricating grease.

GEAR AND TRACTOR ROLLER LUBRICANT

(LION MINERAL GEAR LUBRICANT)

Standard Form: Liquid.

General Information: A straight mineral gear lubricant for use in transmission and differential gears and in tractor rollers.

SAE Grades: 80, 90, 110, 140, 250.

Containers: 40-lb., 100-lb., 230-lb., and 415-lb. drums.

Shipping Classification: Lubricating grease.

GEAR LUBRICANT No. 360

Standard Form: Liquid.

General Information: A special hypoid gear lubricant with high oxidation stability developed for use in extremely high pressure-type gears.

Containers: 54-gal. drums.

Shipping Classification: Lubricating grease.

HIGH-PRESSURE INDUSTRIAL GREASE

Consistency: Fibrous.

General Information: A high-pressure, sodium-base grease for use where temperatures are moderate and where water resistance is not a problem.

Grades: #0, #1, #2, #3, #4, #5.

Containers: 25-lb., 100-lb., 230-lb., and 415-lb. drums.

Shipping Classification: Lubricating grease.

HIGH-PRESSURE JOURNAL OIL

Standard Form: Liquid.

General Information: An oil for use in industrial plants where journal bearings are lubricated by hand or by reservoir.

(Continued on next page)

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Grades: 60, 72, 72X, 90.

Containers: 54-gal. drums.

Shipping Classification: Lubricating oil.

HYDRAULIC OIL

Standard Form: Liquid.

General Information: A light-bodied oil recommended for most types of hydraulic systems.

Containers: 54-gal. drums.

Shipping Classification: Lubricating oil.

LAVA COMPOUND

Standard Form: Varies from liquid to semi-liquid.

General Information: An adhesive compound for use on gears, cams, and chains where a tacky substance is required.

Grades: #1, #2, #3, #4, #5.

Containers: 25-lb. pails; 100-lb. drums, 415-lb. drums.

Shipping Classification: Lubricating grease.

MULTI-PURPOSE LUBRICANT (ULTRA-WHITE)

Consistency: Buttery.

General Information: A white, water-resistant, lithium-base lubricant with a high melting point for use where color is a factor, such as in food machinery. It also is used in lubricating ice plant machinery because of its high water resistance.

Grade: #2.

Containers: 25-lb., 100-lb., 230-lb., and 415-lb. drums.

Shipping Classification: Lubricating grease.

OUTSIDE GEAR LUBRICANT

Standard Form: Liquid to semi-liquid.

General Information: A heavy gear lubricant for use on open gears and on equipment in the open, where high pressures and friction are factors to be considered.

Grades: #1, #2, #3, #4.

Containers: 54-gal. drums.

Shipping Classification: Lubricating grease.

PRESSURE GUN LUBRICANT

Consistency: Short-fiber grease.

General Information: A sodium-base grease for use in pressure guns in lubricating sleeve, ball and roller bearings. NLGI Grease Grade #3.

Containers: 5-lb. cans; 25-lb., 100-lb., 230-lb., and 415-lb. drums.

Shipping Classification: Lubricating grease.

REFRIGERATOR OIL

Standard Form: Liquid.

General Information: An oil recommended for lubrication of refrigerator and ice machines where an oil of low pour point is required.

Containers: 54-gal. drums.

Shipping Classification: Lubricating oil.

ROCK DRILL LUBRICANT

Standard Form: Liquid.

General Information: An oil which withstands h pressures for use in lubricating rock crushers and r drills.

Containers: 54-gal. drums.

Shipping Classification: Lubricating oil.

STEAM CYLINDER OIL

(COMPOUNDED)

Standard Form: Liquid.

General Information: A highly filtered, compounded o adapted for use in steam cylinders where lubricati in the presence of steam is desired.

Grades: 5% compounded: 1405 and 1605; 8% com pounded: 1308, 1408, and 1608.

Containers: 54-gal. drums.

Shipping Classification: Lubricating oil.

STEAM CYLINDER OIL

(MINERAL)

Standard Form: Liquid.

General Information: A straight mineral oil, uncom pounded, highly filtered, adapted for use in ste cylinders, or where steam or water is used.

Grades: 1300 and 1400.

Containers: 54-gal. drums.

Shipping Classification: Lubricating oil.

WATER PUMP GREASE

Consistency: Buttery.

General Information: A specialized calcium grease w high resistance to water for use in water pumps automobiles. It has a high melting point and resistan to chemical break-down in the presence of hot water.

Containers: 1-lb. and 5-lb. cans.

Shipping Classification: Lubricating grease.

WHEEL BEARING AND UNIVERSAL JOINT GREA

Consistency: Fibrous.

General Information: A sodium-base grease for use wheel bearings and universal joints. It provides hi resistance to heat, pressure and moisture, and does tend to melt and run out on brake linings. NLGI Gre Grade #3.

Containers: 1-lb. and 5-lb. cans; 25-lb., 100-lb., 230-lb and 415-lb. drums.

Shipping Classification: Lubricating grease.

light oils

BURNER OIL

Standard Form: Liquid.

General Information: Used in oil-fired residential h ing units. Made in Grades No. 2 and No. 3.

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Containers: Tank cars and tank trucks.

Shipping Classification: Distillate fuel oil, not suitable for illuminating purposes.

DIESEL FUEL

Standard Form: Liquid.

General Information: A product of petroleum refining for use as fuel in diesel engines.

Containers: Tank cars and tank trucks.

Shipping Classification: Distillate fuel oil not suitable for illuminating purposes.

HERBICIDAL OIL No. 1

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.

Containers: Tank cars.

Literature: Booklets, "Instructions for Use of Lion Herbicidal Oil No. 1 for Control of Weeds and Grasses in Cotton" and "Instructions for Use in the Control of Weeds and Grasses in Soybeans."

Shipping Classification: Naphtha.

HERBICIDAL OIL No. 6

Standard Form: Liquid.

General Information: A non-selective, general contact herbicide produced by carefully controlled refining from a crude oil naturally high in aromatic compounds. It is slowly volatile and leaves no permanently toxic or oily residue when used at recommended rates. Kills only those plants on which it is 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.

Containers: Tank cars.

Literature: Folder, "Instructions for Use of Lion Herbicidal Oil No. 6 on Railroad Rights-of-Way."

Shipping Classification: Distillate fuel oil (not suitable for illuminating purposes).

LION OIL

Standard Form: Liquid.

General Information: A lightweight oil for mixing with inks in printing.

Containers: 54-gal. drums.

Shipping Classification: Distillate fuel oil, not suitable for illuminating purposes.

KEROSENE

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.

Containers: Tank cars and tank trucks.

Shipping Classification: Refined oil, illuminating.

RESIDUAL FUEL OIL

Standard Form: Liquid.

General Information: A fuel oil for use in firing furnaces and boilers on locomotives, steamships, and in industrial plants.

Containers: Tank cars and tank trucks.

Shipping Classification: Petroleum, residual fuel.

TRACTOR DISTILLATE

Standard Form: Liquid.

General Information: A product of petroleum refining for general use as a fuel in internal combustion engines on tractors.

Containers: Tank cars and tank trucks.

Shipping Classification: Distillate fuel oil, not suitable for illuminating purposes.

motor oils

All Lion Naturalube Motor Oils are made from a basically different crude oil, and possess an extremely tough protective film, great penetrating power and adhesiveness, non-corrosiveness, and the ability to loosen and remove hard carbon deposits.

NATURALUBE DHD OIL

Standard Form: Liquid.

General Information: A motor oil with the oxidation stability, bearing corrosion preventive properties, and detergent-dispersant characteristics necessary for use in both high-speed diesel and gasoline engines under heavy duty service conditions. Meets U. S. Army specifications MIL-0-2104 and requirements for API Classification MS-DG.

SAE Grades: 10 through 60, inclusive.

Containers: 54-gallon, 30-gallon and 15-gallon drums, 5-gallon cans.

Shipping Classification: Lubricating oil.

Literature: Folders No. 470 and 475; Four-Page Letter No. 450 (also in Spanish); Six-Page Letter No. 451 (also in Spanish).

NATURALUBE DHD-SUPER DUTY OIL

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 sulphur content fuels. This oil meets U. S. Army requirements for Military Series 2, and it also meets specifications established by Caterpillar. It meets requirements for API Classification MS-DG-DS.

SAE Grades: 10 through 60, inclusive.

Containers: 54-gallon, 30-gallon and 15-gallon drums.

Shipping Classification: Lubricating oil.

Literature: Folders No. 470 and 475; Four-Page Letter No. 450 (also in Spanish).

NATURALUBE HEAVY-DUTY MOTOR OIL

Standard Form: Liquid.

General Information: A motor oil with high oxidation

(Continued on next page)

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stability, bearing corrosion preventive properties, and detergent-dispersant characteristics for use in automobile engines under heavy-duty service conditions of modern driving, and for cars with hydraulic valve lifters. Meets requirements for API Classification ML-MM-MS-DG.

SAE Grades: 10 through 60, inclusive.

Containers: 54-gallon, 30-gallon and 15-gallon drums; 5-gallon cans; cases: 4 5-quart cans and 24 1-quart cans.

Shipping Classification: Lubricating oil.

Literature: Folders No. 470 and 475; Four-Page Letter No. 450 (also in Spanish).

NATURALUBE REINFORCED MOTOR OIL

Standard Form: Liquid.

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 60, inclusive.

Containers: 54-gallon, 30-gallon and 15-gallon drums; 5-gallon cans; cases: 4 5-quart cans and 24 1-quart cans.

Shipping Classification: Lubricating oil.

Literature: Folder No. 470; Four-Page Letter No. 450 (also in Spanish); Six-Page Letter No. 451 (also in Spanish).

TIGER MOTOR OIL

Standard Form: Liquid.

General Information: A straight mineral motor oil for lubrication of engines in light duty service. Meets requirements for API Classification ML.

SAE Grades: 10 through 60, inclusive.

Containers: 54-gallon, 30-gallon and 15-gallon drums; cases: 24 1-quart cans.

Shipping Classification: Lubricating oil.

nokorode products

(SEALANTS, RUST PREVENTIVES)

BRUSH CEMENT

General Information: A heavy asphalt cutback used in sealing laps and joints on coverings for insulations, and as a brush applied vapor seal.

Containers: 5-gal. pails; 55-gal. drums.

Shipping Classification: Roofing cement.

Literature: "Nokorode Uses and Specifications Sheet".

CAR CEMENT

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.

Containers: 5-gal. pails; 55-gal. drums.

Shipping Classification: Roofing cement.

Literature: "Nokorode Uses and Specifications Sheet".

COACH BUILDERS SOUND DEADENER

General Information: A semi-liquid material compo of selected asphalts, petroleum solvents, fillers, additives. Developed especially for use on side, ro and floor panels of large commercial and passen vehicles where the panels are subject to more flex than is usual in automobiles or cabinets. Applicat prevents noises caused by vibration, and corro preventive properties protect metal surfaces.

Containers: 5-gal. pails; 55-gal. drums.

Shipping Classification: Auto body sealer or sou deadening compound.

Literature: "Nokorode Uses and Specifications Sheet".

COACH BUILDERS UNDERCOATING

General Information: A semi-liquid material wh dries to form a tough film. When applied to the und body of commercial and passenger vehicles, it protec against moisture conditions, chemicals, and preve points of corrosion from being started by abrasion d to flying gravel. Adds years to the life of the vehic and reduces maintenance costs.

Containers: 5-gal. pails; 55-gal. drums.

Shipping Classification: Auto body sealer or sou deadening compound.

Literature: "Nokorode Uses and Specifications Sheet".

CONSTRUCTION ASPHALTS

General Information: Hot applied asphalts for l setting, bonding and vapor sealing of low temperat insulations.

Grades: Grade B, 145-155°F. softening point; Grade 180-200°F. softening point.

Containers: 100-lb. cardboard cartons.

Shipping Classification: Asphalt, roofing, having a point 135°F. or over.

D 41 PRIMER

General Information: An asphalt primer for surfa prior to the application of Nokorode construction a phalts. Meets Government and ASTM specifica It may be applied by spray or brush.

Containers: 5-gal. pails; 55-gal. drums.

Shipping Classifications: Liquid asphalt.

Literature: "Nokorode Uses and Specifications Sheet".

E KOTE

General Information: A hot applied asphaltic coat for water-front and underwater service. Made from asphalt base and mineral filler which gives excell protection to metal surfaces under severe condition service. Recommended for application to ballast ta penstocks, steel piers, metal surfaces in lock cons tions, and general water-front applications.

Containers: 5-gal. pails; 55-gal. drums.

Shipping Classification: Roofing cement.

Literature: "Nokorode Uses and Specifications Sheet".

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GREASE TYPE RUST PREVENTIVES

General Information: Grease type products compounded to have the physical and adhesive properties necessary to form films to protect highly finished metal surfaces from damage and corrosion. Nokorode 84, 431 and 82 have been prepared to comply with the requirements of U. S. Army specifications 2-84 B, 2-121, and 2-82-C, and are made with a microwax base. Nokorode 47 is a petrolatum type compound designed for coating of precision metal parts prior to packaging and meets U. S. Army specification AXS-1347. Nokocodes CO81, CO91 and 963 are hot application, petrolatum corrosion preventives. They are non-drying materials, and comply with the requirements of military specification MIL-C-11796 (ORD), Classes 1, 2, and 3.

Containers: 5-gal. pails; 55-gal. drums.

Shipping Classification: Lubricating grease.

Literature: "Nokorode Uses and Specifications Sheets".

INDUSTRIAL SOUND DEADENER

General Information: Semi-liquid compound used on many types of fabricated sheet metal panels, such as are used in cabinets, to prevent vibration noises and eliminate "tinniness" of thin-gauge panels.

Containers: 5-gal. pails; 55-gal. drums.

Shipping Classification: Auto body sealer or sound deadener compound.

Literature: "Nokorode Uses and Specifications Sheet".

K KOTE

General Information: An asphalt plastic containing a high content of ground cork to form a weatherproof insulating coating. Films of ¼" to ¾" cured thickness will save 65 to 80% of heat loss. The service range is −50°F. to +275°F. It may be applied by spray or trowel and is available in one grade.

Containers: 5-gal. pails; 55-gal. drums.

Shipping Classification: Roofing cement.

Literature: "Nokorode Uses and Specifications Sheet".

LOW TEMP

General Information: A catalytic asphalt formulation containing mineral filler for use as a bedding and joint compound for low temperature insulation. It has a service range of −100°F. to +200°F. May be applied by spray or trowel, and is available in one grade.

Containers: 5-gal. pails; 55-gal. drums.

Shipping Classification: Roofing cement.

Literature: "Nokorode Uses and Specifications Sheet".

PLASTIC TYPE RUST PREVENTIVES

General Information: Mastic type materials made to meet various needs in packaging and protecting metal surfaces and equipment from rust and corrosion. The various products in this category meet the following Government specifications: JAN-P-102; AXS-1827 (Amendment 1); Federal specification TT-C-520; MIL-C-3254, Type II.

Containers: 5-gal. pails; 55-gal. drums.

Shipping Classification: (1) roofing cement. (2) auto body sealer or sound deadening compound.

Literature: "Nokorode Uses and Specifications Sheets".

OIL TYPE RUST PREVENTIVES

General Information: Prepared from a highly refined mineral oil plus agents which increase the affinity for metal. Nokorode 2-112, of the viscosity of an SAE 10 oil, complies with the requirements of U. S. Army specification No. 2-112 and is recommended for preservation of metals under conditions of high humidity and severe moisture condensation. Suggested applications are on all types of assembled machinery, gear boxes and finished surfaces in storage. Nokorode 2-126 is made in two grades and complies with the requirements of U. S. Army specification No. 2-126. It is a lubricating preservative oil for spark ignition and diesel types of internal combustion engines, providing protection against high humidity, moisture condensation and acidic products of engine combustion.

Containers: 5-gal. pails; 55-gal. drums.

Shipping Classification: (1) lubricating oil. 2 petroleum oil, NOIBN.

Literature: "Nokorode Uses and Specifications Sheets".

SEAL KOTE

General Information: An asphalt base plastic which forms a non-breathing vapor and weather barrier over insulation, and a coating for protection of metals and other surfaces against corrosion. Available in brush, spray, heavy and extra-heavy trowel grades.

Containers: 5-gal. pails; 55-gal. drums.

Shipping Classification: Roofing cement.

Literature: "Nokorode Uses and Specifications Sheet".

SEAL PERM

General Information: An asphalt plastic which forms a breathing type barrier for weatherproofing high temperature insulations. May be applied by spray or trowel and is available in one grade.

Containers: 5-gal. pails; 55-gal. drums.

Shipping Classification: Roofing cement.

Literature: "Nokorode Uses and Specifications Sheet".

SEAL PRIME

General Information: An asphalt-solvent blend primer for porous surfaces prior to the application of Nokorode Seal Kote, Seal Perm, K Kote, and Low Temp. Also useful as a black coating with excellent hiding power. It may be applied by spray or brush.

Containers: 5-gal. pails; 55-gal. drums.

Shipping Classification: Liquid asphalt.

Literature: "Nokorode Uses and Specifications Sheet".

SEAM AND BACKING CEMENT

General Information: A mineral-filled, asphalt base plastic for use as a backing cement on masonry and concrete walls in construction of cold chambers, and for filling joints, seams and laps. Applied by trowel.

Containers: 10-lb. and 50-lb. pails, and 500-lb. drums.

Shipping Classification: Roofing cement.

Literature: "Nokorode Uses and Specifications Sheet".

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SIGN KOTE

General Information: An asphalt base coating for application to the unprotected back of metal signs. Sign Kote prevents corrosion of the metal and can greatly extend the life of the sign by protecting it against the effects of fumes and fogs which contain various corrosive chemicals. Dries to a tough, black, semi-glossy film. Applied by brush.

Containers: 5-gal. pails; 55-gal. drums.

Shipping Classification: Roofing cement.

Literature: "Nokorode Uses and Specifications Sheet".

SOLVENT TYPE RUST PREVENTIVES

General Information: Compounds prepared to provide a film of coating for protection of metal surfaces against corrosion. Nokorode 73 complies with the requirements of U. S. Army Ordnance Department, specification AXS-673, Rev. 2, and forms a uniform, thin black coating which is of such hardness that handling at high atmospheric temperatures does not injure the film. Nokorode 731 consists of a petroleum solvent and a non-volatile asphalt base plus suitable additives for protection of metal surfaces on exposure to outdoor weather conditions. The base is formed by air blowing in the presence of a catalyst, U. S. Patent No. 2,450,756. Properties of Nokorode 731 comply with requirements of grade 1, military specification MIL-C-16173. Nokorode 081 is an all-purpose rust preventative with a hard film for exterior metal surfaces and complies with the requirements of military specification MIL-C-6708, Type 1.

Containers: 5-gal. pails; 55-gal. drums.

Shipping Classification: Liquid asphalt.

Literature: "Nokorode Uses and Specifications Sh

UNDERCAR SEALER AND SILENCER

General Information: A compound of selected asph petroleum solvents, fillers, and additives which f a tough, protective, sound-deadening film when ap to the underbody of automobiles. Its dense and l lasting coating offers protection against rust, m noise, protects against abrasion caused by flying gr and seals out dust. It is applied to automobiles un bodies, fenders, and hoods by spray. Produced Lion Oil Company under U. S. Patent No. 2,393,

Containers: 5-gal. pails; 55-gal. drums.

Shipping Classification: Auto body sealer or sil deadening compound.

Literature: Nokorode 4-Page Letter, Nokorode M Manual; Nokorode 4-Page Folder.

VEHICLE

General Information: An asphalt base vehicle to a aluminized to obtain an aluminum paint with excell weathering and vapor seal properties. Produces attractive aluminum coating for all types of surf and weather and vapor barriers.

Containers: 5-gal. pails; 55-gal. drums.

Shipping Classification: Liquid asphalt.

Literature: "Nokorode Uses and Specifications Sh

The Barton Plant, Lion's newest chemical instal lation, is located on a 1,400-acre site 14 miles up stream from New Orleans, Louisiana, on the Mississippi River. It produces approximately tons of anhydrous ammonia daily, a large por of which is used in the manufacture of ot nitrogenous chemicals

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lion oil products index

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ASBESTOS ASPHALT ROOF COATING
ASPHALT PLASTIC CEMENT
ASPHALT ROOF COATING
BLIND NAILING CEMENT
CODE 2 PRIMER
COLAY ASPHALTIC PAVING MATERIAL
COLD PROCESS LAP CEMENT
CRATE-TOP COATING
D-80 JOINT COMPOUND
DEAD LEVEL ROOFING ASPHALTS
DRY-KILN MASTIC
E-120 PIPE COATING
ERECTION ASPHALT
FLUX OILS
INK ASPHALT (HSP)
MEMBRANE LINING
METAL COATING NO. 3
PAPER LAMINANT
PAVING ASPHALTS
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ANHYDROUS AMMONIA
AQUA AMMONIA
CARBON DIOXIDE liquid
DRY ICE
NITRIC ACID
NITROGEN FERTILIZER SOLUTIONS
SULPHATE OF AMMONIA
SULPHURIC ACID

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LION PREMIUM GASOLINE WITH LIONITE
LION REGULAR GASOLINE WITH LIONITE
PREMIUM GASOLINE unbranded
REGULAR GASOLINE unbranded

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AC TRACK ROLL GREASE
A. F. GREASE
ALL-PURPOSE GEAR LUBRICANT
B & R. GREASE
BEARING OIL
BENTONE GREASE
BLACO
BRICK OIL (form oil)
CASTOR MACHINE OIL
CHASSIS LUBRICANT
COTTON PICKER SPINDLE OIL
CUP GREASE
ELECTRIC MOTOR AND DYNAMO OIL
ENGINE OIL
4 IN 1 BARIUM GREASE
GASOLINE PUMP GREASE (Repello Grease)
GEAR AND TRACTOR ROLLER LUBRICANT
GEAR LUBRICANT NO. 360
HIGH-PRESSURE INDUSTRIAL GREASE
HIGH-PRESSURE JOURNAL OIL
HYDRAULIC OIL
LAVA COMPOUND
MULTI-PURPOSE LUBRICANT (ultra-white)
OUTSIDE GEAR LUBRICANT
PRESSURE GUN LUBRICANT
REFRIGERATOR OIL
ROCK DRILL LUBRICANT
STEAM CYLINDER OIL (compounded)
STEAM CYLINDER OIL (mineral)
WATER PUMP GREASE
WHEEL BEARING AND UNIVERSAL JOINT GREASE

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DIESEL FUEL
HERBICIDAL OIL NO. 1
HERBICIDAL OIL NO. 6
INK OIL
KEROSENE
RESIDUAL FUEL OIL
TRACTOR DISTILLATE

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NATURALUBE DHD
NATURALUBE DHD-SUPER DUTY
NATURALUBE HEAVY DUTY
NATURALUBE REINFORCED
TIGER

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BRUSH CEMENT
CAR CEMENT
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INDUSTRIAL SOUND DEADENER
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MASTIC TYPE RUST PREVENTIVES
OIL TYPE RUST PREVENTIVES
SEAL KOTE
SEAL PERM
SEAL PRIME
SEAM AND BACKING CEMENT
SIGN KOTE
SOLVENT TYPE RUST PREVENTIVES
UNDERCAR SEALER AND SILENCER
VEHICLE

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lion oil company plants and sales offices

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Lion Oil Company
Lion Oil Building
El Dorado, Arkansas
Phone: Union 3-3111

manufacturing plants

El Dorado Chemical Plant
Lion Oil Company, El Dorado, Arkansas
Phone: Union 3-3151

Lion Oil Refinery
El Dorado, Arkansas
Phone: Union 3-4111

Barton Chemical Plant
Lion Oil Company, Luling, Louisiana
Phone: Luling 2911

sales offices chemical department

Home Offices
El Dorado, Arkansas
Phone: Union 3-3151

Gulf Coast District
National Bank of Commerce Building,
New Orleans, La.
Phone: Canal 2133

Midwestern District
Des Moines, Iowa
office in process of being established

Southeastern District
Atlanta, Georgia
office in process of being established

Southwestern District
El Dorado, Arkansas
Phone: Union 3-3151

petroleum department

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