29TH EDITION



buyers guide for

CHEMICALS, PLASTICS AND PETROLEUM PRODUCTS

Monsanto

where creative chemistry...works wonders for you

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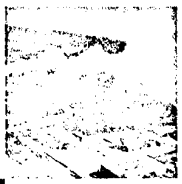
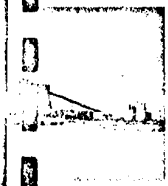
monsanto chemical company







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

Monsanto is organized into seven 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 St. Louis, 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, creosols, and others.

the inorganic chemicals division,

. . . with headquarters at St. Louis, 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, 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 resins 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.

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the overseas division,

. . . with headquarters at St. Louis, 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 St. Louis, 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.

the lion oil company division,

. . . with headquarters at El Dorado, Arkansas, engages in all phases of oil production from exploration to the refining, processing and marketing of petroleum products. Among Lion Oil Company's products are anhydrous ammonia, nitrogen fertilizers, and solid and liquid carbon dioxide.

the domestic subsidiaries and affiliates division,

. . . with headquarters at St. Louis, Missouri, administers Monsanto's interests in its domestic subsidiary, associated and affiliated companies.

Monsanto products are produced, sold and serviced from plants and 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.

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contents

introduction *research* *technical service & counsel* **3-11**	*trade marks* *who monsanto serves* *product description* **12-73**	*general data* *product information & tables* **83-100**	*product index* *product group index* *sales organization and distribution* **102-121**

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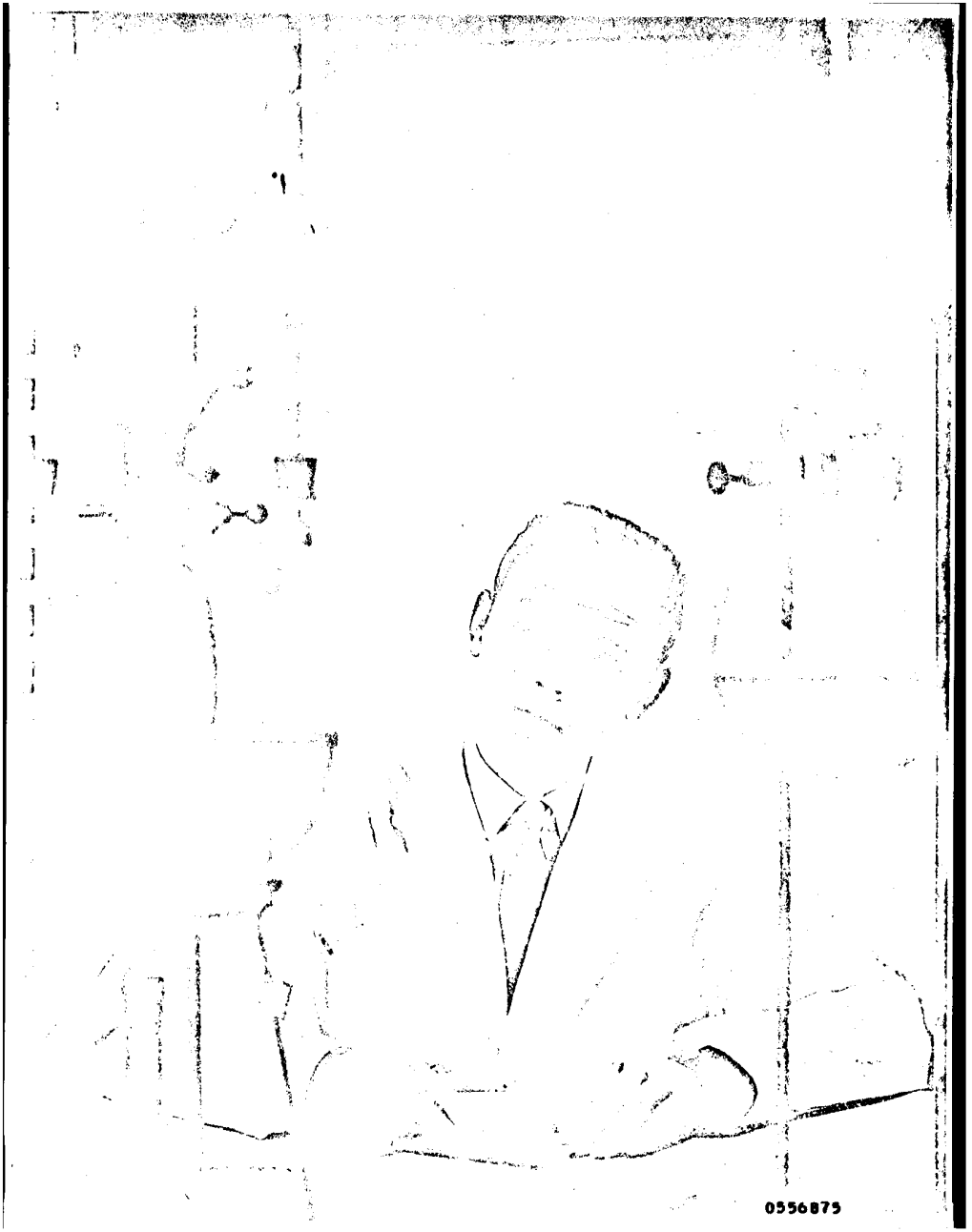

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existing product research

. . . 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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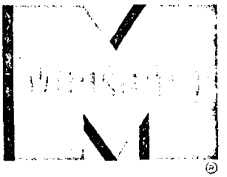

trade-marks . . .

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, "Where Creative Chemistry Works Wonders For You."

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-32"* Rubber Accelerator
"A-100" Rubber Accelerator
"ACL"* Chlorine-bearing Chemical Compositions
"Actamer"* Bacteriostat for Soap and Cosmetics
"AE-1"* High Molecular Weight Alcohol
"Alkophos"* Aluminum Acid Phosphates
"Areskap"* Sodium Butyl-o-Phenylphenolsulfonate
"Aresket"* Sodium Butylbiphenylsulfonate
"Aresklene"* Disodium Dibutyl-o-Phenylphenoldisulfonate
"Aroclor"* Polychlorinated Polyphenyls
"Bear" Lampblack
"Benthal"* Alkyd Resin Intermediate
"Block M"* Almost all products sold
"Blue Spruce Rez" Color-Toned Penetrating Wood Sealer
"Bogey"* Insecticide
"Butasan"* Rubber Accelerator
"Cedar Rez" Color-Toned Penetrating Wood Sealer
"Charcoal Rez" Color-Toned Penetrating Wood Sealer
"C-I-A"* Lubricating Oils
"Clay Rez" Color-Toned Penetrating Wood Sealer
"Closet Clinic" Scale Model Display Closets
"Colay" A Binder for Asphaltic Concrete Paving Materials
"Coumarin Monsanto"
"D41 Primer" Asphalt Base Primer for use prior to Vapor Sealing, Dampproofing, and Waterproofing with Construction Asphalts
"D-80" Joint Compound
"D-Leet"* Herbicide
"D. P. Solution"* Lacquer Additive
"Desert Sage Rez" Color-Toned Penetrating Wood Sealer
"Driftwood Rez" Color-Toned Penetrating Wood Sealer
"Drilcon"* Oil Well Drilling Mud Adjuvants
"E-120" Asphalt Base Coating
"El-Sixty"* Rubber Accelerator
"Elastopar" Chemical Compounds for Addition to Synthetic Elastomers
"Ethasan"* Rubber Accelerator
"Ethavan"* Flavoring and Aromatic
"Ethyl Thiurad" Rubber Accelerator
"Fibestos"* Cellulose-Acetate Sheets
"Fir Green Rez" Color-Toned Penetrating Wood Sealer
"Flamingo Rez" Color-Toned Penetrating Wood Sealer
"Flectol"* H Rubber Antioxidant
"Flippants" Effervescent Lozenge Used to Allay a Craving for Tobacco
"Foliator"* Aspirating Devices
"Folium"* Water-Soluble Plant Food
"Guantal"* Rubber Accelerator
"HB-40"* Partially Hydrogenated Terphenyl
"HB-20"* Hydrocarbon Plasticizer
"Humpal"* Pallets
"Insoluble Sulfur 60"
"Jax"* Plant Food
"K Kote" Weather Proof Insulating Coating Containing a High Content of Ground Cork
"Krilium"* Soil Conditioner
"Laux Rez"* Prime Coat for Wood, Cement, Plaster or Brick
"Lauxein"* Casein and Soybean Adhesives
"Lauxite"* Urea, Phenolic, Melamine & Resorcinol Resins
"Lion" Aluminum Paint Vehicle
"Lion" Anti-freeze
"Lion" Asphalt Base Coating Composition
"Lion" Dry Ice
"Lion" Gear Lubricant
"Lion" Ink Asphalt
"Lion" Lap Cement
"Lion"* Lubricating Oils
"Lion" Membrane Asphalt
"Lion" Nailing Cement
"Lion" Paving Asphalt
"Lion" Plastic Cement
"Lion" Roofing Asphalt
"Lion D-80" Joint Compound for Filling Paving Joints
"Lion" & Design Motor Fuel Oils, Lubricating Oils, and Greases
"Lion" & Design of a Lion on a Pedestal Anti-freeze
"Lion" & Design of a Lion on a Pedestal* Fertilizers
"Lion" displayed against a solid circle* Lubricating Oils
"Lionite"* Motor Fuel Additive
"Lion Naturalube"* Lubricating Oils
"Lion Nökörōde" Used to Identify a Wide Variety of Moisture Vapor Barriers, Underbody Coatings, Rust Preventives and Industrial Mastics
"Lion Petroleum Products" & Design of a Lion on a Pedestal* Motor Fuel Oils
"Loamaker"* Soil Conditioner
"Low Temp" Bedding and Joint Compound for Low Temperature Insulation
"Lustrex"* Styrene Coating Resins
"Lustrex"* Styrene Molding Materials
"Lustron"* Artificial Resins
"Lytron"* Sand Conditioner
"Mahogany Rez" Color-Toned Penetrating Wood Sealer
"Medo-Green"* Silage Grade Sodium Metabisulfite
"Merloam"* Soil Conditioner
"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
"Meta-Green" Silage Grade Sodium Metabisulfite
"Methasan"* Rubber Accelerator
"M H A"* Methionine Hydroxy Analogue Calcium
"Mono Thiurad"* Rubber Accelerator
"Monsanto"* Almost All Products Sold
"Monsanto Detergent MXP"
"Monsanto Fire Retardant A"
"Monsanto Penta" Pentachlorophenol, Technical
"Monsanto Polyethylene" Polyethylene Extruding, Calendering, and Laminating Materials
"Montar"* Synthetic Resins
"Naturalube"* Lubricating Oils
"Niran"* Insecticide
"Nitron"* Cellulose-Nitrate Sheets
"Noclamp"* Glue
"Noshock"* Chemical Coating Agent for Treating Rugs, Textiles, and other Fibrous Materials
"Nutrium"* Fertilizer
"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
"OS-45"* Functional Fluids
"Paramount"* Glue
"PC-1244" Foam Suppressants
"Phos-Pho-Tex"* Water Softener
"Plastics Merchandiser"* Periodical Publication
"Prairie Green Rez" Color-Toned Penetrating Wood Sealer

(Continued on next page)

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"Pydraul"* F-9 Industrial Hydraulic Fluid and Synthetic Lubricant
"Pydraulic"* F-9 Industrial Hydraulic Fluid and Synthetic Lubricant
"Pyran"* Anhydrous Monocalcium Phosphate
"R-2" Rubber Accelerator
"Randox"* Selective Herbicide
"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 (Clear)
"Rezgard"* Fire Retardant for Textiles
"Rhyme" Detergent for General Washing and Cleaning Purposes
"RZ-50"* A Rubber Accelerator
"RZ-50"* B Rubber Accelerator
"SA-326" ortho-Biphenyl Biguanide
"Saccharin Monsanto"* Saccharin
"Saflex"* Vinyl Butyral Laminating Plastic for Safety Glass
"Sandalwood 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
"Santoglue"* Adhesive Cement
"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
"Santopar" Chemical Compounds for Addition to Synthetic Elastomers
"Santophen"* I Germicide
"Santophen"* I 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
"Santosal"* Resinous Plastic Solutions
"Santoseal"* Adhesive Cements
"Santosite"* Sodium Sulfite Anhydrous, Technical
"Santotan"* KR Basic Chrome Sulfate
"Santovar"* A, Rubber Antioxidant
"Santovis"* Chemical Adjuvants for use in Petroleum Products
"Santowhite"* Crystals Rubber Antioxidant
"Santowhite"* L Rubber Antioxidant
"Santowhite"* MK Rubber Antioxidant
"Santowhite"* Powder Rubber Antioxidant
"Satinwood Rez" Clear Self-Leveling Interior Finish
"Scriptite"* 33 Melamine Formaldehyde Paper Resin
"Scriptite"* Series 50-59 Styrene Copolymers for Paper
"Seal Kote" Weatherproofing Moisture Vapor Barrier Available in Four Grades
"Seal Perm" Breathing Type Weather Proof Moisture Vapor Barrier
"Seal Prime" Asphalt Base Primer for Porous Surfaces Prior to Application of Moisture Vapor Barriers
"Skydro"* Aircraft Hydraulic Fluid
"Skydrol"* Aircraft Hydraulic Fluid
"Skytrol"* Aircraft Hydraulic Fluid
"Sopanox"* ortho-Tolyl Biguanide
"Sted"* Detergents
"Sted-ette" Detergents
"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
"Syndraul"* Functional Fluid
"Syndrol"* Functional Fluid
"Syton"* C-15 and C-30 Silica Sols
"Syton"* W-20 and DS Silica Sols
"Tenet" Detergents
"Tepid" Detergents
"Thiofide"* Rubber Accelerator
"Thiofide"* S Rubber Accelerator
"Thiotax" Rubber Accelerator
"Thiurad"* Rubber Accelerator
"Thridol" Herbicides
"Ultron"* Vinyl Chloride Film and Sheets
"Vanillin Monsanto"
"Vegadex" Herbicides
"Vuepak"* Cellulose Acetate Rigid Film
"Vyram"* Synthetic Resins
"Wheat-Tone Rez" Color-Toned Penetrating Wood Sealer
"Where Creative Chemistry Works Wonders for You" For a Variety of Products
"White Rez" Penetrating Wood Sealer

*Trademarks which are registered in the United States Patent Office are marked with an asterisk.

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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. Monsanto petroleum products range from high-octane gasoline to paving asphalts.

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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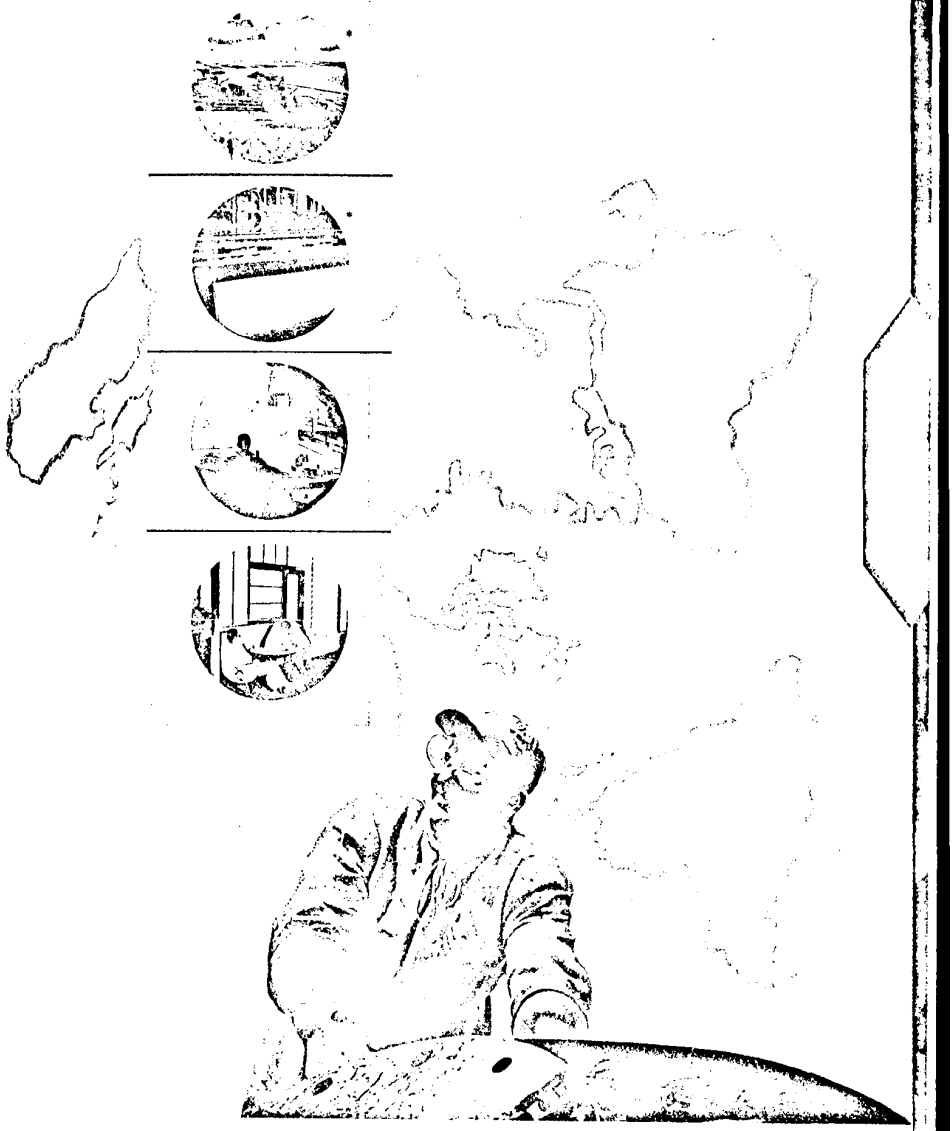

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*Photo by Ewing Galloway, N.Y.

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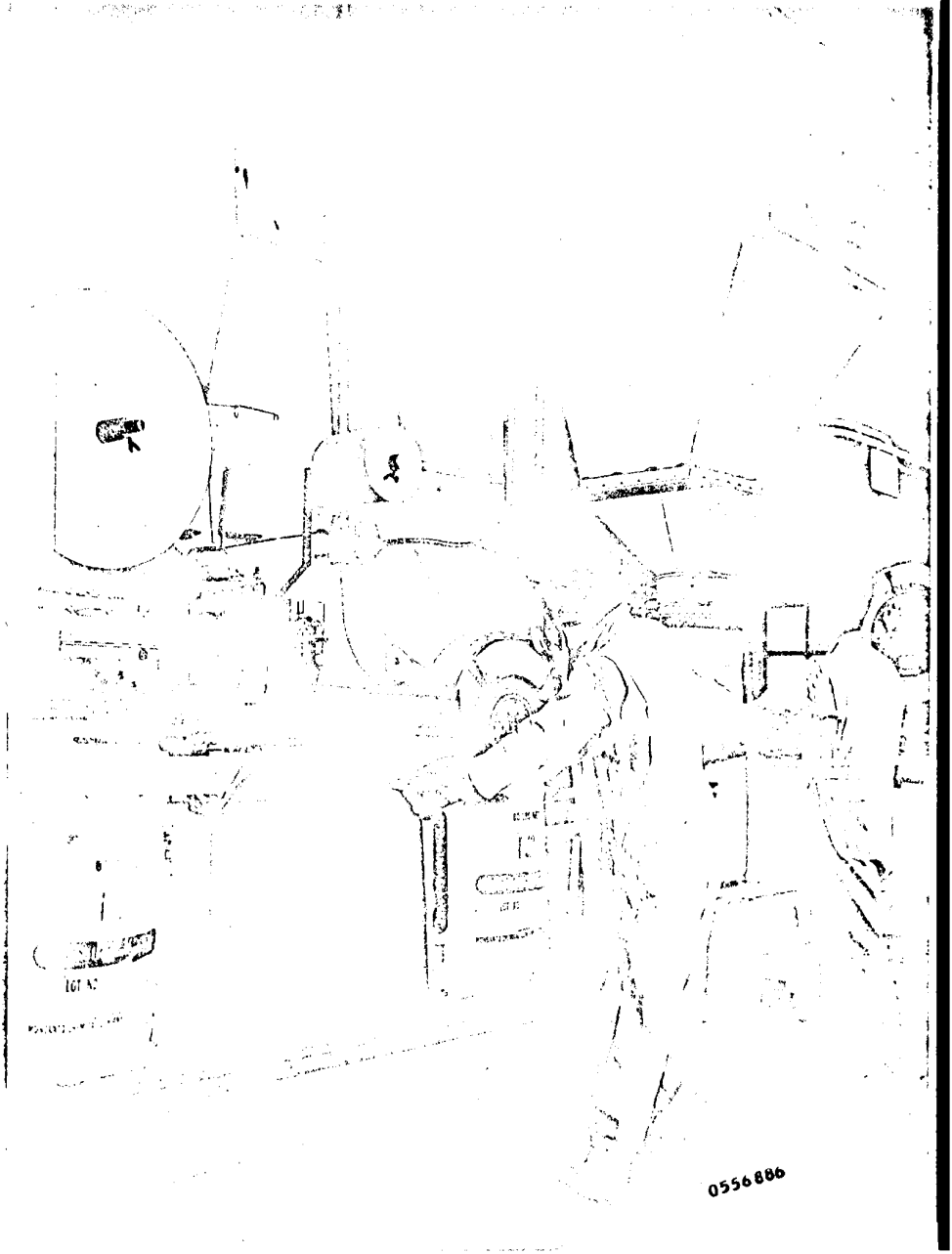
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monsanto products

accelerators, rubber

"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. DI G 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.

(Continued on next page)

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WATER_PCB-00002178

"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% max. retained on 200 mesh, trace max. retained on 100 mesh; 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 with 1,1'-methylene dipiperidine; light brown, coarse crystalline solid; Sp. Gr. 1.11; M.P. 59°C. min.; soluble in acetone, benzene and naphtha; solubility in Solvesso No. 1, clear solution.

Uses: An ultra accelerator for latex and fast-curing cements.

Containers: 50-lb. fiber drums.

Shipping Classification: Rubber Accelerators NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 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 produced); insolubles, trace max.; Sp. Gr. 0.964.

Uses: A very fast accelerator for curing at room or slightly elevated temperatures. Curing speed can be increased by the inclusion of "Thiotax" in the compound. "RZ-50" is very useful in fast curing cements for spreader and combining work. Causes practically no discoloration and ages well.

Containers: 40-lb. cans.

Shipping Classification: Rubber Accelerators NOIBN.

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

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

Standard Form: Clear dark brown liquid.

Specifications: Sp. Gr. 0.976 at 25°C.; turbid point 10°C. or below.

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

Containers: 40-lb. cans.

Shipping Classification: Rubber Accelerators NOIBN.

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

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

Standard Form: Powder.

Specifications: Light tan or buff-colored powder; trace max. retained on 20 mesh; M.P. 94°C. min.; Sp. Gr. 1.27; moisture 1.0% max.; ash 0.5% max.; solubility in ethyl ether 95% min.

Uses: Requires zinc oxide and fatty acid. Activators are sometimes desirable but not always needed. Gives excellent results in natural, reclaimed and synthetic rubbers. Exceptionally safe at processing temperatures but powerful at curing temperatures. Gives high modulus and tensile. Fairly low melting point makes dispersion easy.

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

Shipping Classification: Rubber Accelerators NOIBN.

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WATER_PCB-00002179

Literature: "Santocure—An Accelerator for Rubber Vulcanization," 52-page booklet; "Monsanto Chemicals for the Rubber Industry," 46-page booklet.

"SANTOCURE" NS *(N-tert-butyl-2-benzothiazolesulfenamide)*— ORGANIC DIVISION *(Rubber Service)*

Standard Form: Powder.

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

Uses: Requires zinc oxide and fatty acid. Has similar behavior to "Santocure" in compounded rubbers, but shows even greater delayed action at processing temperatures and faster curing at higher temperatures. Particularly useful for natural rubber stocks containing high pH blacks.

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

Shipping Classification: Rubber Accelerators NOIBN.

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

THIOCARBANILIDE ("A-1") *(Also called N-N'-diphenyl thiourea)*— ORGANIC DIVISION *(Rubber Service)*

Standard Form: Powder.

Specifications: Gray powder; trace max. on 100 mesh; M.P. 146°C. min.; Sp. Gr. 1.32; ash 0.5% max.; moisture 0.75% max.; test must avoid decomposition conditions.

Uses: Activates thiazole accelerators but used best as straight accelerator in fast-curing stocks such as tube repair gum. Accelerates neoprene latex. Also used as a flotation agent and acid inhibitor.

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

Shipping Classification: Rubber Accelerators NOIBN.

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

"THIOFIDE" [2-2'-*dithiobis (benzothiazole)* (*MBTS*)] — ORGANIC DIVISION *(Rubber Service)*

Standard Form: Powder.

Specifications: Cream powder; Sp. Gr. 1.50; M.P. 168°C. min.; moisture 0.5% max.; ash 0.5% max.; petroleum ether extractable 1.5-3.0%.

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

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

Shipping Classification: Rubber Accelerators NOIBN.

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

"THIOFIDE" S *("Thiofide" in seed form)* —ORGANIC DIVISION *(Rubber Service)*

Standard Form: Seeds.

Specifications: Cream to buff colored agglomerates, 20% max. retained on 10 mesh, 20% max. through 40 mesh; moisture 0.5% max.; ash 0.5% max.

Uses: This form is designed to give maximum speed and completeness 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).

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WATER_PCB-00002180

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

Uses: Production of synthetic fibers, adhesives, GR-N type synthetic rubbers, insecticides, surface active agents, pharmaceuticals and surface coatings; polymers and copolymers 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 — ORGANIC 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 in ethyl alcohol 95% (1:15); complete; M.P. 135.0 C. min.; ash 0.05% max.; 5% max. powder retained on 100 mesh.

Uses: Pharmaceutical product.

Containers: 200 and 100-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

ACETYLSALICYLIC ACID, Starch Granulations — ORGANIC DIVISION

Standard Form: Granules.

Specifications: Made with acetylsalicylic acid, U.S.P.; white, pink or green granules. Assay: starch granulation 10%, 90.0% min.—91.0% max.; starch granulation 15%, 84.0% min.—85.0% max.; starch granulation 20%, 80.0% min.—81.0% max.; free salicylic acid conforms to U.S.P. test on acetylsalicylic acid.

MESH: Retained on—	12–50 MESH	20-MESH
12-mesh screen	Trace, max.	
14-mesh screen	5.0% min.	
	15.0% max.	
16-mesh screen	20.0% min.	
	35.0% max.	
20-mesh screen	60.0% min.	
	75.0% max.	10% max.
Through—		
40-mesh screen	10.0% max.	

Uses: Pharmaceutical product.

Grades: 10%, 12–50 mesh, white; 15%, 12–50 mesh, white; 20%, 12–50 mesh, white; 10%, 12–50 mesh, pink; 10%, 20 mesh, pink; 10%, 12–50 mesh, green; 10%, 20 mesh, green.

Containers: 250 and 100-lb. fiber drums.

Shipping Classification: Acetylsalicylic Acid.

ACETYLSALICYLIC ACID, U.S.P. (*Aspirin*) — ORGANIC DIVISION

Molecular Weight: 180.15

Formula:



Standard Form: Crystalline solid.

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

MESH: (All tests made on U. S. standard screens.)	20-MESH	40-MESH	80-MESH
Retained on—			
20-mesh screen	Trace max.		
30-mesh screen	5.0% min.		
	10.0% max.		
40-mesh screen		Trace max.	
45-mesh screen	45.0% min.		
	60.0% max.		
50-mesh screen		10.0% min.	
		20.0% max.	
60-mesh screen	70.0% min.		Trace max.
	85.0% max.		
80-mesh screen		45.0% min.	2.0% max.

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Through—
100-mesh screen 10.0% max.
140-mesh screen 25.0% max.

Uses: Pharmaceutical product.

Grades: Crystals, 20 mesh; crystals, 40 mesh; powder, 80 mesh.

Containers: 250 and 100-lb. fiber drums.

Shipping Classification: Acetylsalicylic Acid.

"ACTAMER" [2,2'-thiobis-(4,6-dichlorophenol)]
—ORGANIC DIVISION

Specifications: White powder; ash 0.6%, max.; assay 99.0%, min.; color of Solution (10:100 of Acetone); 100 APHA max.; loss on drying 0.025%, max.; screen test retained on 50 mesh 1.0%, max., retained on 200 mesh 20.0%, max.; melting point 187°C. min. (first meniscus).

Uses: Actamer is an excellent and proven skin degerming agent, recommended for incorporation in soaps and other topically applied preparations. Also used in pharmaceutical preparations.

Containers: 200 and 50-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

Literature: Technical Bulletin O-120.

ADHESIVES (See plastics, adhesives)

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 25 max.; water 0.3%, max.; iron 2 PPM 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. Saturated polyesters which are made by processing adipic acid with diols or triols are the basic resins for making isocyanate type materials such as polyurethane foams, coatings, adhesives and elastomers.

Containers: 50-lb. bags.

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

AGRICULTURAL PRODUCTS (See page 71)
ORGANIC DIVISION

"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: $Al_2O_3:P_2O_5$	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.

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.

(Continued on next page)

TOWOLDMON0005672
WATER_PCB-00002182

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 1-148.

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 sulfate. (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 provides a slab form (6"x6"x18") for stock solutions containing 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, 0.02%.

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%; TOTAL Fe 0.007%.

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

Containers: 100-lb. paper bags.

Shipping Classification: Aluminum Sulfate.

AMMONIUM ETHYL PHOSPHATE

(Mixture of mono- and diethyl ammonium phosphates)

—INORGANIC DIVISION

Standard Form: Liquid.

Typical Analysis: P_2O_5, 38.0%.

General Information—Properties: Water-white to yellow-tinged liquid of ammoniacal odor; Sp. Gr. 1.23 at 25° C.; wt. per gal. 10.37 lbs.; pH 7.5% solution 7.0–7.2; viscosity 65 cps. at 25° C. Chemical constituents: 35% monoethyl diammonium phosphate; 50% diethyl ammonium phosphate and 15% monoethyl ammonium hydrogen phosphate. In thin film is liquid at relative humidities above 40%; not stable to heat; when subjected to elevated temperatures for any length of time as a solution or while on any article, will liberate ammonia with a reduction in pH; at temperatures below 15° C. crystals will form in solution and dissolve with a rise in temperature or on dilution.

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

Containers: 500-lb. net steel drums.

Shipping Classification: Ammonium Phosphate.

AMMONIUM NITRATE PELLETED FERTILIZER

—INORGANIC DIVISION

Formula: $(NH_4)\ NO_3$

Standard Form: Ammonium Nitrate Crystals in pelleted form coated with a diatomaceous material as a conditioning agent.

Analysis:
Nitrogen (max.).....33.5 %
Moisture (min.).....0.35 %
Water Insoluble.....3.0 %

Containers: Multiwall kraft paper bags with two asphalt laminated plies; packaged in 80-pound bags and 100-pound bags. Also in bulk.

Shipping Classification: Ammonium Nitrate Fertilizer containing 90% or more Ammonium Nitrate with no organic coating. Fertilizer compounds (Mfg. Fert.) NOIBN Dry, in paper bags.
(DANGEROUS PLACARDS APPLIED)

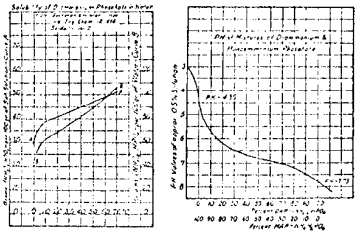
AMMONIUM PHOSPHATE, DI

(Also known as diammonium hydrogen phosphate, secondary ammonium phosphate and ammonium phosphate, dibasic) —INORGANIC DIVISION

Molecular Weight: 132.068

Formula: $(NH_4)_2HPO_4$

Standard Form: Crystalline or powdered material.



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TOWOLDMON0005673
WATER_PCB-00002183

General Information—Properties: Brilliant white crystalline or powdered material; stable in air; very soluble in water; pH value of 1% solution 7.75; above 70 C. aqueous solutions lose ammonia readily.
Dissociation Pressure: According to Britzke and Dumajew (Gmelin's Handbuch der anorganische Chemie, Ammoniak, p. 423) and Warren (JACS 49, 1904, 1927):

Temp. °C.	98	113	125	135	147
NH_3 in mm. Hg.	3.2	10.7	26.0	55.2	123.4

Uses: Fire retardant, yeast food by yeast producers and breweries; as bread improver; to control pH of soda crackers; catalyst for urea-formaldehyde resins; chrome dyeing of wool; source of N and P_2O_5 for soluble fertilizers.

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.

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.

ANHYDROUS AMMONIA — INORGANIC DIVISION

Molecular Weight: 17.03.

Formula: NH_3.

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

Uses: A source of nitrogen for plant food, either applied directly to the soil or in irrigation water, and for the 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).

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: 495-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.; 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.

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TOWOLDMON0005674
WATER_PCB-00002184

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 effective in any type of rubber compound. "Santoflex" B causes rather severe discoloration and staining, so its use is limited to black or dark-colored articles. 1% to 2% on the hydrocarbon is usually sufficient but up to 4% can be used with improved results. "Santoflex" B, BX and 35 give good protection to Neoprene compounds against heat deterioration.

Containers: 300-lb. drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 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. 1.12; ash 0.3% max.; insolubles in benzene 1% max.

Uses: "Santoflex" BX behaves in the same way as "Santoflex" B. Due to the presence in the blend of N,N'-diphenyl-p-phenylenediamine, flex-cracking resistance is somewhat enhanced. A normal dosage is 1% to 2% on the hydrocarbon and more than 2½% is apt to cause blooming.

Containers: 300-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Monsanto Chemicals for the Rubber Industry," 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. 1.14; ash 0.5% max.; insolubles in benzene 1.5% max.

Uses: It contains a rather high percentage of N,N'-diphenyl-p-phenylenediamine. It is designed for those who wish to use a high dosage of this material, with a lower amount of regular antioxidant. More than 1% on the hydrocarbon is liable to cause blooming.

Containers: 300-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

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

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

Standard Form: Powder.

Specifications: Buff powder; moisture 1% max.; trace 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 attack on unsaturated resins and oils. Cold flow of uncured compositions is reduced by a stiffening effect of "Santovar" A. Excellent for adhesives or other uncured films. It is 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 Industry," 46-page booklet.

"SANTOWHITE" CRYSTALS *[(Essentially) 4,4'-thiobis-(6-tert-butyl-m-cresol)]* — ORGANIC DIVISION *(Rubber Service)*

Standard Form: Powder.

Specifications: Light gray to tan powder; trace retained on 50 mesh; moisture 1.0% max.; M.P. 140 C. min.; Sp. Gr. 1.097; ash 0.5% max.; soluble in acetone and alcohol.

Uses: This nonstaining and nondiscoloring antioxidant is designed for use in light-colored articles. It is also useful in any rubber product used in contact with surfaces such as lacquer or enamel which are subject to staining by ordinary antioxidants. "Santowhite" Crystals provide excellent protection against normal aging. Use 1% to 2% on the hydrocarbon. Excellent for the protection of nonstaining Neoprene compounds against heat deterioration.

Containers: 125-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

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

"SANTOWHITE" L *[(Essentially) Thiobis (di-sec-amylphenol)] The structure is complex.* — ORGANIC DIVISION *(Rubber Service)*

Standard Form: Dark, viscous liquid.

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

Uses: A nonstaining and nondiscoloring antioxidant of

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medium strength. It is easily emulsified for use in latex and has no effect on latex stability.
Containers: 425-lb. steel drums.

Shipping Classification: Chemicals NOIBN.

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

"SANTOWHITE" MK *(Reaction product of 6-tert-butyl-m-cresol and SCl_2)* — ORGANIC DIVISION *(Rubber Service)*

Standard Form: Liquid.

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

Uses: The action of "Santowhite" MK is the same as "Santowhite" Crystals, but the degree of protection against aging is not as high. It is excellent from the standpoints of staining and discoloration. Use 1% to 2% on the hydrocarbon. Gives good protection to uncured GRS latex compounds.

Containers: 150-lb. steel drums.

Shipping Classification: Chemicals NOIBN.

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

"SANTOWHITE" POWDER [*4,4'-butylidene-bis (6-tert-butyl-m-cresol)*] — ORGANIC DIVISION *(Rubber Service)*

Standard Form: Powder.

Specifications: White powder, ash 0.3% max.; trace max. on 100 mesh; M.P. 209°C. min.; moisture 0.5% max.; Sp. 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.

AQUA AMMONIA — INORGANIC DIVISION

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.)

"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—Aresket—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 — ORGANIC 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 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

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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 Carnauba Wax," Technical Bulletin P-132.
"An Indirect Aroclor Heater for Unit Chemical Operation," Technical Bulletin P-130.
"Aroclor—a Nonflammable Hydraulic Fluid for Die-Casting Systems," Technical Bulletin P-137.
"Aroclor Incombustible Lubricants Used in High Pressure Compressors," Technical Bulletin P-128.

asphalt products

ACID-PROOF ASPHALT COATING—LION OIL DIVISION

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: Petroleum Asphalt (other than paint, stain or varnish).

ALUMINUM PAINT VEHICLE—LION OIL DIVISION

Standard Form: Liquid.

General Information: After the addition of aluminum pigment, Lion Aluminum Paint Vehicle is applied to obtain a highly weather resistant, tightly adhering protective film. It has been examined by leading pigment manufacturers and approved by them as a quality product for use with their pigments.

Containers: 55-gal. drums; and 5-gal. pails.

Shipping Classification: Petroleum Asphalt (other than paint, stain or varnish).

Literature: Aluminum Paint Vehicle folder.

ASBESTOS ASPHALT ROOF COATING
—LION OIL DIVISION

Standard Form: Liquid.

General Information: Asbestos roof coating is a mixture of high-grade petroleum asphalt and petroleum solvent, to which selected asbestos (rock) fiber has been added. The asphalt from which this product is made does not contain coal tar, free carbon, or cracked residues. The material is in liquid form and requires no heating.

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—LION OIL DIVISION

(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, and base and cap flashings. It also is useful for sealing the walls of boiler settings, and for dampproofing interior and exterior walls, both above and below grade, where heavy film thickness is desirable for maximum protection.

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Important farm uses include the repair of watering tanks and as a pruning cement.

Containers: 500-pound drums; 50-pound pails; 10-pound pails (6 in case.); 5-pound pails (12 in case); 2 ½-pound pails (18 in case); 1-pound pails (36 in case).

Shipping Classification: Roofing cement.

ASPHALT ROOF COATING—LION OIL DIVISION

Standard Form: Liquid.

General Information: A liquid material prepared from a high-grade asphalt with a petroleum solvent. It is easier to handle than the solid type because it is already prepared and ready for application by brush or spray. No heating, thinning, special equipment or skilled labor is necessary. Lion Asphalt Roof Coating does not contain coal tar, free carbon or cracked residues. It resists brittleness and cracking in cold weather and maintains firm body in hot weather.

Uses: This product is recommended for added protection as a surface finish on smooth-surfaced roll roofing or on built-up roofs; for preserving metal roofs; for renewing old, dry, smooth-surfaced roll roofing.

Containers: 55-gallon drums; 5-gallon pails; 1-gallon pails (6 in case).

Shipping Classification: Petroleum Asphalt (other than paint, stain or varnish).

BLIND NAILING CEMENT—LION OIL DIVISION

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: Petroleum Asphalt (other than paint, stain or varnish).

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—LION OIL DIVISION

Standard Form: Liquid.

General Information: A primer especially developed for application to steel before coating with E-120 Coating.

Containers: 5-gal. and 55-gal. drums.

Shipping Classification: Liquid asphalt.

COLAY PAVING ASPHALT—LION OIL DIVISION

(DEVELOPED BY LION OIL COMPANY)

Standard Form: Solid.

General Information: Colay Paving Asphalt is especially designed for use in preparing a ready-mixed paving, patching, and resurfacing material, marketed by contractors as Colay Asphaltic Paving Material. It is designed to furnish high-type pavement surfacing and low-cost pavement maintenance to localities which do not have access to an asphalt mixing plant.

Lion Oil Company does not sell the ready-mixed Colay Asphaltic Paving Material. Lion sells Colay Paving Asphalt which is used in a special process developed by Lion Oil Company to produce the ready-mixed Colay Asphaltic Paving Material. In this process, Colay Paving Asphalt is combined with crushed limestone or slag, blended sands and mineral filler at centrally located mixing plants to produce Colay Asphaltic Paving Material which requires no job-site preparation. All moisture is removed from the aggregate, which is then screened into separate sizes for proper proportioning by weight before mixing. Colay Paving Asphalt is added to the proportioned mixture and the combined materials then go through a process which thoroughly coats all the aggregate with asphalt.

Colay Paving Asphalt is produced from an especially selected asphaltic base crude oil. Upon request, natural latex may be added to Colay Paving Asphalt at the refinery. Valuable properties are excellent resistance to weathering, high ductility, and strong adhesiveness. The natural high tendency to resist displacement by water has been increased. Stockpiled mixes have been water flooded for prolonged periods without sign of distress. Colay contains no petroleum solvents and therefore is unlike other materials which depend on the evaporation of their cure-retarding agents to reach a satisfactory "set" condition.

Uses: Colay Paving Asphalt is used in preparing ready-mixed Colay Asphaltic Paving Material to provide an asphaltic concrete street and highway pavement for surfacing playgrounds and parking areas, and for similar purposes.

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 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: Petroleum Asphalt (other than paint, stain or varnish).

Literature: "Colay Asphaltic Paving Material", booklet published by Lion Oil Company.

COLD PROCESS LAP CEMENT—LION OIL DIVISION

Standard Form: Liquid.

General Information: This quick-setting liquid asphalt is especially compounded for use as an adhesive in construction of built-up roofing with cold process felts.

Uses: Cold Process Cement eliminates the necessity of using nails on the lower edge of roll roofing when applied shingle style. Only the upper edge of the roofing should be nailed.

Containers: 55-gallon drums; 5-gallon pails and 1-gallon pails (6 in case).

Shipping Classification: Petroleum Asphalt (other than paint, stain or varnish).

Literature: "Lion Asphalt Products Used in Construction and Repair of Buildings", folder; "Roof Repairs Are Easy!", folder, published by Lion Oil Company.

CORKBOARD ERECTION ASPHALT—LION OIL DIVISION

Standard Form: Solid.

General Information: An asphalt compound used in applying cork insulation to structures such as cold storage

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vaults, etc. Odorless when cold. Melting point: 185-200°F.

Containers: 100-lb. fiber cartons.

Shipping Classification: Petroleum Asphalt (other than paint, stain or varnish).

CRATE-TOP COATING—LION OIL DIVISION

Standard Form: Liquid.

General Information: A mixture of asbestos, asphalt, and solvent for packaging and packing materials for overseas shipment. Provides protection against water and moisture, and retains plastic conditions over a wide range of temperatures. Manufactured to meet Military Specification MIL-C-102A.

Containers: 5-gal. metal pails and 55-gal. metal drums.

Shipping Classification: Roofing cement.

D-80 JOINT COMPOUND—LION OIL DIVISION

Standard Form: Solid.

General Information: A compound developed by Lion for use as a superior, hot-poured, concrete joint compound.

Containers: 400-lb. metal drums.

Shipping Classification: Paving joints, roadway expansion, asphalt base.

DEAD LEVEL ROOFING ASPHALTS—LION OIL DIVISION

Standard Form: Solid.

General Information: A roofing asphalt developed especially for use on flat roofs with poor drainage.

Containers: 400-lb. metal drums.

Shipping Classification: Asphalt, roofing, having a melting point of 135°F.

DRY-KILN MASTIC—LION OIL DIVISION

Standard Form: Heavy liquid.

General Information: Used for coating interior of dry kilns to reduce heat loss and to protect wood, mortar, and metal surfaces against corrosion incident to the curing of lumber.

Containers: 500-lb. metal drums.

Shipping Classification: Roofing cement.

E-120 COATING—LION OIL DIVISION

Standard Form: Solid, liquefied by heating.

General Information: Lion E-120 Coating is a blend of asphaltic resins and hydrocarbons containing natural wax combinations and a 425 mesh filler, providing a compound with low moisture absorption, high electrical resistivity, and strong mechanical properties. This material lends itself for application to pipes, tanks. Once the coating is set, the film is firm and tough to withstand handling under normal construction conditions; and yet retain the flexibility required at lower atmospheric temperatures. This coating does not produce fumes irritating to workmen and application temperatures may be carried up to 525°F. without danger of breakdown or decomposition of the coating.

Typical Properties:

Weight, lbs./gal. at 60°F.	9.95
Flash point, C.O.C., above, °F.	575
Softening point (R&B) °F.	240
Penetration at 77°F., 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
High temperature sag test at 160°F., 24 hours, inches	None
Low temperature crack-test at—20°F.	None
Peel test, 60° to 160°F.	None
Break test at 77°F., 1" Mandrill	None
Water absorption, 35 weeks, % by weight	0.9
Resistivity, Ohm-cm., above	1×10^{15}
Voltage breakdown, volts per mil, above	1000

Containers: 150-lb. fiber cartons.

Shipping Classification: Petroleum Asphalt (other than paint, stain or varnish).

Literature: "Lion E-120 Coating—Properties-Application", folder published by Lion Oil Company.

FLUX OILS—LION OIL DIVISION

Standard Form: Semi-solid.

General Information: Used in the manufacture of coatings and saturants, and solid roofing asphalts by oxidation.

Containers: Tank cars.

Shipping Classification: Petroleum fuel oil, residual.

INK ASPHALT—LION OIL DIVISION

(H. S. P.)

General Information: An asphalt used in manufacturing lithographing ink.

Containers: 400-lb. open-head casings.

Shipping Classification: Petroleum Asphalt (other than paint, stain or varnish).

MEMBRANE LINING—LION OIL DIVISION

(MANUFACTURED UNDER U. S. PATENT No. 2,450,756.)

Standard Form: Solid—liquefied by heating.

General Information: This hot application (400°F.) asphalt was originated and developed by Lion Oil Company under patent No. 2,450,756, catalytically blown asphalt, using phosphorous pentoxide as the catalyst.

Uses: This asphalt is used to produce a thick, tough, waterproof membrane, formed by spraying the hot asphalt on the earth's surface. It has been applied to hundreds of miles of canals and reservoirs for seepage control, and the product has shown unusual characteristics of durability as well as a toughness and flexibility which makes it unexcelled for this purpose. Not only is this type of construction probably one of the most efficient ever developed for the control of seepage but it is the most economical, both in initial cost and in length of service.

Typical Properties:

Flash point (C.O.C.), min.	425°F.
Softening point (R&B)	175° to 200°F.
Penetration at 77°F., 100 g., 5 sec.	50-60
Penetration at 32°F., 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%

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WATER_PCB-00002189

Containers: 400-lb. metal drums, tank cars and tank trucks.

Shipping Classification: Petroleum Asphalt (other than paint, stain or varnish).

Literature: "Lion Membrane Lining for Control of Seepage and Erosion", Technical Bulletin CA, published by Lion Oil Company.

METAL COATING No. 3—LION OIL DIVISION

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.			
Vapor transmission, wet cup, grains per square foot per hour, 1/8" 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—LION OIL DIVISION

General Information: Used in manufacturing laminated waterproof paper bags.

Containers: Tank cars.

Shipping Classification: Petroleum Asphalt (other than paint, stain or varnish).

PAVING ASPHALTS—LION OIL DIVISION

General Information: Asphalt cements and slow-curing, medium-curing, and rapid-curing asphaltic paving materials of all grades can be supplied. The base asphalts are 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: Petroleum Asphalt (other than paint, stain or varnish).

POLE COMPOUND—LION OIL DIVISION

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—LION OIL DIVISION

(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: Petroleum Asphalt (other than paint, stain or varnish).

SOLID ROOFING ASPHALT—LION OIL DIVISION

Standard Form: A solid—liquefied by heating.

General Information: A firm, adhesive waterproofing bitumen, designed for use as a hot application material. It is made by a combination of vacuum distillation and oxidation and contains no undesirable materials such as are produced by the cracking process. It is non-corrosive and does not contain free carbon, coal tar, or cracked residues. Careful processing minimizes the possibility of breakdown of the petroleum molecules, completely preserving the characteristics of strength and toughness.

(Continued on next page)

TOWOLDMON0005680
WATER_PCB-00002190

Specifications: This product is prepared in four grades: 115/130° melt; 140/160° melt; 160/180° melt, and 180/200° melt. Lion Solid Roofing Asphalts, depending upon grade, comply with the following specifications: AASHO M115-42, Type B; ASTM D449-49, Type A; ASTM D449-47T, Type B; Federal SS-A-666 Am. 1, Type 1, Class A, and Navy No. 7YG Grade AR1; ASTM D-449-49, Type C. Lion Solid Roofing Asphalt also can be supplied within a softening point range of 150/165°F. to comply with SS-A-666 Am. 1, Type II, Grade 1, Class A, Navy No. 7YG Grade AR2, and within a softening point range of 165/190°F. to comply with SS-A-666, Am. 1, Type II, Grade 2, Class A, and 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 a melt point of 135°F. or over.

Literature: "Roof Repairs Are Easy!" folder; "Lion Asphalt Products Used in Construction and Repair of Buildings", folder.

BATTERY ACID (*Electrolyte*) — INORGANIC DIVISION

Standard Form: Liquid.

Typical Analysis: Practically colorless liquid; H_2SO_4 93.2% min.; iron 0.005% max.; nitrogen compounds (as HNO_3) 0.001% max.; Sp. Gr. 1.210–1.835. (Acids of lower strengths should be calculated in proportion to above specification on H_2SO_4 content.)

Uses: Electrolyte is sulfuric acid, especially adapted to the needs of the storage battery trade. Various strengths can be furnished to meet the needs of the individual purchaser.

Containers: Tank trucks; 50-ton tank cars.

Shipping Classification: Sulfuric Acid. "Corrosive" label required.

"BENTHAL" ALKYD RESIN INTERMEDIATE — ORGANIC DIVISION

Standard Form: Light yellow flakes.

Typical Analysis:
Assay (total acid as benzoic) 102.5-103.6%; Phthalic anhydride 4.5–5.5%; benzoic acid 94.5–95.5%; ash 0.03% max.; iron 10ppm max.; M.P. 118°C. (min. to start); odor characteristic.

Uses: "Benthal" is used in short oil alkyds which are primarily baking finishes for appliance and automotive enamels. By reducing excess amounts of alcohols in the formulation and introducing "Benthal" in quantities of 3–20% by weight on the phthalic anhydride, enamels show substantial improvement in gloss, hardness and durability. The "Benthal" acts as a chain terminator hence retarding the viscosity increase until low acid values are obtained in the resin.

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 viscous liquid or crystalline mass; crystallizing point 28.5°C. min.; H_2SO_4 20.0–25.0%; benzenesulfonic acid 70.0–75.0%; Sp. Gr. 1.45 approx. at 25°. 15.5°C.

Uses: An intermediate in organic synthesis; a catalyst in certain condensation reactions.

Containers: 500-lb. steel drums.

Shipping Classification: Dye Intermediate NOIBN.

BENZOIC ACID — ORGANIC DIVISION

Molecular Weight: 122.12

Formula: COOH



Standard Form: Fine powder, flakes or crystalline needles.

Specifications: *U.S.P. Grade:* White crystalline needles or fine powder; assay 99.5% min.; solution in alcohol (1:2.5); in 10% sodium carbonate (1:6) clear and colorless; meets U.S.P. test for carbonizable impurities; 5% max. powder retained on 100 mesh.

Technical Grade: White to yellowish-white flakes or powder; assay 99.0% min.; solution in 10% Na_2CO_3 (1:6) slightly turbid or opalescent and practically colorless. Melting point: 122.0°C min. Ash: 0.10% max.

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; modifying agent in alkyd resins; color stabilizer in baking varnishes; 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. fiber drums (for milled material). Technical Grade—200-lb. fiber drums.

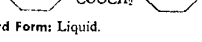
Shipping Classification: U.S.P. Grade: Food Preserving Compound NOIBN. Technical Grade: Dye Intermediate NOIBN.

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

BENZYL BENZOATE, U.S.P. — ORGANIC DIVISION

Molecular Weight: 212.24

Formula:



Standard Form: Liquid.

Specifications: Essentially colorless liquid; crystallizing point 18.3°C. min.; refractive index 1.568–1.570 at 20°C.; total chlorine 0.04% max.

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

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

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Containers: 500-lb. drums.

Shipping Classification: Insect Repellent NOIBN.

BENZYL CHLORIDE (*Also known as alpha-chlorotoluene*) — ORGANIC 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. Boiling range at 760 mm 2°C max. including 179.4°C.

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

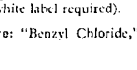
Shipping Classification: Chemicals NOIBN. Corrosive liquid (white label required).

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.

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.

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.

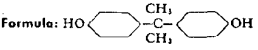
Uses: Intermediate for many derivatives.

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

Shipping Classification: Biphenyl.

BISPHENOL A — ORGANIC DIVISION

Molecular Weight: 228.28

Formula: 

Standard Form: White flakes.

Specifications: White flakes; Crystallizing point: 154°C min.; Ash 0.02% max.; Iron 1.5 ppm max.; Free Phenol 0.3% max.; Moisture 0.20% max.; Color in Acetone (25:30 mc)

Before heating: APHA 225 max.
After heating: APHA 400 max.

Uses: Bisphenol A is a resin intermediate in the manufacture of epoxy resins by reaction with epichlorohydrin. These resins have wide application in the surface coatings field as well as in the die making, laminates, potting and encapsulating applications. Epoxy resins can be used for producing adhesives, rigid foams, oil soluble phenolic resins and may be employed as an antioxidant for oils, greases and vinyl compositions.

Containers: 50-lb. bags.

Shipping Classification: Chemicals NOIBN.

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

(*Continued on next page*)

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WATER_PCB-00002192

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.

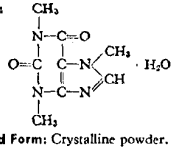
Containers: 400-lb. barrels.

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. min.; meets U.S.P. test for carbonizable impurities.

Uses: Pharmaceutical product.

Grades: Anhydrous powder or hydrated powder.

Containers: 100-lb. fiber drums.

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, finely divided powder. Conforms with all food and drug laws. Insoluble in alcohol; soluble in dilute citric acid solution. Solubility in CO_2—free water in gms. per liter:

	30°C.	50°C.	68°C.	100.1°C.
ANHYDROUS				
CaO	0.0414	0.667	0.0985	0.1046
P_2O_5	0.0866	0.1630	0.2234	0.2461
DIHYDRATE				
CaO	0.0954	0.2617	0.3409	0.3109
P_2O_5	0.2066	0.6182	0.3245	0.7591

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

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

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

Containers: 60 and 100-lb. bags; 100 and 225-lb. fiber 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	7.7–7.5
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.

Grades: 18½% and 21%.

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

Shipping Classification: Di Calcium Phosphate, Feed Grade.

Literature: "Monsanto Di Calcium Phosphate Feed Supplements," booklet.

CALCIUM PHOSPHATE, MONO

(Also known as primary calcium phosphate, calcium dihydrogen phosphate, monobasic calcium phosphate, calcium acid phosphate and acid phosphate of lime)

—INORGANIC DIVISION

Standard Form: Powder or granules.

General Information—Properties: A white stable material; soluble in water, giving an acid reaction.

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

Grades: Regular for phosphated and self-rising flour and

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WATER_PCB-00002193

baking powder. Granular for baking powder. All grades meet U. S. Pure Food Law requirements. Special grades will be supplied on request.

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

Shipping Classification: Calcium Phosphate.

CALCIUM PHOSPHATE, TRI

(Also known as tribosic calcium phosphate, normal calcium phosphate, neutral calcium phosphate and tertiary calcium phosphate) —INORGANIC DIVISION

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

Standard Form: Powder.

General Information—Properties: White amorphous powder, odorless and tasteless; practically insoluble in water. Complies with all Federal and State food laws. Conforms with specifications listed in National Formulary and accepted by the Council on Dental Therapeutics of the American Dental Association.

Uses: A mineral supplement in foods to supply calcium and phosphorus; base or polishing agent in tooth powder; ingredient in making milk glasses; antacid; conditioner to prevent caking in salt, sugar, talc and other powdered material. As suspension agent in polystyrene manufacture.

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

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

Shipping Classification: Calcium Phosphate.

CALCIUM PYROPHOSPHATE (*Normal*)

—INORGANIC DIVISION

Molecular Weight: 254.20

Formula: $Ca_2P_2O_7$

Standard Form: Powder.

General Information—Properties: Finely subdivided powder; 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.

CARBON DIOXIDE—INORGANIC DIVISION

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.

CAUSTIC POTASH—INORGANIC DIVISION

Molecular Weight: 56.1

Formula: KOH

Standard Form: 45% Solution.

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

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

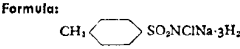
Containers: 8,000 gal. and 4,000 gal. coiled tank cars.

Shipping Classification: Caustic Potash.

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

Molecular Weight: 281.70

Formula:



CH_3 — $SO_2NClNa \cdot 3H_2O$

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-lb. fiber drums; 125-lb. lever-paks.

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*)

—ORGANIC DIVISION

Molecular Weight: 127.57

Formula: NH_2



Cl

Standard Form: Liquid.

Specifications: Clear, light yellow liquid; crystallizing point —10°C. approx. 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,

(Continued on next page)

0556903

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WATER_PCB-00002194

herbicides and medicinals.
CAUTION: This product is toxic. Avoid breathing its vapors. Avoid contact with the skin.

Containers: 550-lb. galv. drums.

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

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

—ORGANIC DIVISION

Molecular Weight: 127.57

Formula:



Standard Form: Liquid.

Specifications: Amber liquid which 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.

ortho-CHLOROPHENOL, (*Also known as ortho-hydroxychlorobenzene and 2-chlorohydroxybenzene*)

—ORGANIC DIVISION

Molecular Weight: 128.56

Formula:



Standard Form: Liquid.

Specifications: Yellow-to-brown liquid; monochlorophenol (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-hydroxy-chlorobenzene 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. 1.258 ±0.003 at 45.0°/15.5°C.

Uses: An intermediate in the production of dyestuffs; in the 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 sulfuric chlorohydrin*—INORGANIC DIVISION

Molecular Weight: 116.53

Formula: $ClSO_2OH$

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.

Containers: 700-lb., 55-gal. steel and stainless steel drums; 8-lb. bottles single; 80-lb. cases of ten; tank cars.

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

"COLOR-TONED REZ" EXTERIOR and INTERIOR PENETRATING SEALERS ("*Cedar Rez,**" "*Driftwood Rez,**" "*Mahogany Rez,**" "*Redwood Rez,**" "*Desert Sage Rez,**" "*Wheat-tone Rez,**" "*Flamingo Rez,**" "Charcoal Rez,*" "*Prairie Green Rez,**" "*Blue Spruce Rez,**" "*Clay Rez,**" "*Sandalwood Rez,**" "*Fir Green Rez**") —ORGANIC DIVISION

General Information—Properties: A pigmented penetrating sealer, to protect and preserve all species of wood.

**Also available for Master Painters in a more highly pig-*

0556904

TOWOLDMON0005685
WATER_PCB-00002195

mented formulation.

Uses: Applied to bare wood siding, shakes or shingles, "Color-Toned Rez" products penetrates wood pores, materially reducing absorption of moisture. They resist bleaching and discoloration, conceal effects of weather exposure. May also be used as interior finish to produce tinted, subdued color grain pattern on paneling, doors and woodwork. Comes ready-to-use and may be applied by brush or spray. One gallon covers from 200 to 350 sq. ft. depending on surface conditions.

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

Shipping Classification: Wood Filler Liquid.

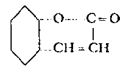
Literature: Rez Color-Toned Color Card.

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

— ORGANIC DIVISION

Molecular Weight: 146.14

Formula:



Standard Form: Crystalline solid.

Specifications: White crystals; melt (liquid) clear and colorless; M.P. 68.8 C. min.; solubility in ethyl alcohol (1:10) complete; moisture 0.10% max.; ash 0.05% max.; conforms to N. F. test for acetanilid.

Uses: Odor principle; used in perfumes, soaps, tobacco, inks, rubber and other products where aromatic ingredients are required.

Grades: Crystals.

Containers: 200 and 25-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

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

CYCLOHEXYLAMINE (*Also known as hexahydroaniline*)

— ORGANIC DIVISION

Molecular Weight: 99.17

Formula:



Standard Form: Liquid.

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

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

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

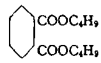
Shipping Classification: Chemicals NOIBN.

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: 475-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.

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.

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WATER_PCB-00002196

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

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

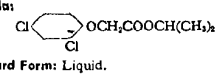
Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

2,4-DICHLOROPHENOXYACETIC ACID—ISOPROPYL ESTER *(Also known as 2,4-D isopropyl ester and isopropyl 2,4-dichlorophenoxyacetate)*

— ORGANIC DIVISION

Molecular Weight: 263.12

Formula:



Standard Form: Liquid.

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

General Information—Properties: Possesses herbicidal properties similar to those of the free acid. Has the advantage of being oil soluble; 2,4-D Acid equivalent approx. 8.75 lbs. per gal.

Uses: For same general purposes as free acid where volatility is not a hazard.

Containers: 55-gal. steel drums.

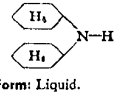
Shipping Classification: Weed Killing Compound NOIBN.

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

DICYCLOHEXYLAMINE — ORGANIC DIVISION

Molecular Weight: 181.31

Formula:



Standard Form: Liquid.

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

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

Containers: 375-lb. steel drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Cyclohexylamine and Dicyclohexylamine," Technical Bulletin O-74; "Dicyclohexylamine as used in VPI for rust prevention," folder.

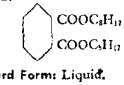
DI (2-ETHYL HEXYL) PHTHALATE (D.O.P.)

(Also known as dioctyl phthalate or D.O.P.)

— ORGANIC DIVISION

Molecular 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) 0.01% 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. (445-lb.) and 5-gal. (40-lb.) black iron drums; tank cars.

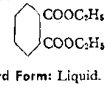
Shipping Classification: Resin Plasticizer.

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.

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General Information—Properties: B.P. 298°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; 55-lb. drums; tank cars.

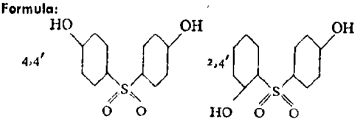
Shipping Classification: Diethyl Phthalate.

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

DIHYDROXY DIPHENYL SULFONE — ORGANIC DIVISION

(Also known as sulfonyl bis phenol)

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 220–234°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) 0.04% max.; Sp. Gr. 0.916 ± 0.003 at 25°/25°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.

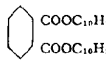
Shipping Classification: Resin Plasticizer.

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 imparts low initial viscosity and very little viscosity build-up on prolonged storage at elevated temperatures (40–50°C.).

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

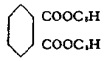
Shipping Classification: Resin Plasticizer.

Literature: "Di-Isodecyl Phthalate (DIDP)," Technical Bulletin O-108; "Monsanto Plasticizers," 64-page booklet.

DIISOOCTYL PHTHALATE *(DIOP)* — ORGANIC DIVISION

Molecular Weight: 390.55

Formula:



Standard Form: Liquid.

Specifications: Clear oily liquid; color APHA 35 max.; odor slight; acidity (as phthalic acid) 0.01% max.; Sp. Gr. 0.980 to 0.985 at 25°/25°C.

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

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

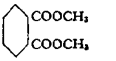
Shipping Classification: Resin Plasticizer.

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

DIMETHYL PHTHALATE — ORGANIC DIVISION

Molecular Weight: 194.18

Formula:



Standard Form: Liquid.

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

General Information—Properties: A solvent plasticizer for cellulose acetate; miscible with all common organic solvents and with oils (except petroleum oils); solubility in water 0.4% at 32°C.; excellent light stability; B.P. 282°C.; crystallizing point 0°C.; wt. per gal. 10 lbs.

Uses: Widely used but does not meet very rigid plasticizer requirements. Its use is restricted almost entirely to the

(Continued on next page)

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WATER_PCB-00002198

cellulose acetate field where, as a general rule, it is used in combination with diethyl phthalate or some other plasticizer.

Containers: 530 and 40-lb. steel drums.

Shipping Classification: Dimethyl Phthalate.

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

2,4-DINITROCHLOROBENZENE, TECHNICAL

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

—ORGANIC DIVISION

Molecular Weight: 202.56

Formula:



Standard Form: Cast crystalline solid.

Typical Analysis:

	2,4-DINITRO-CHLOROBENZENE	ISOMERIC DINITRO-CHLOROBENZENES
48.0°C.	95% approx.	5% approx.

Uses: Production of explosives, photographic chemicals and dinitrophenol; intermediate in the preparation of dyestuffs. CAUTION: This product is toxic. Avoid breathing its vapors. Avoid contact with the skin.

Containers: 600-lb. steel drums.

Shipping Classification: Dinitrochlorobenzol. "Poison" label required.

DIOCTYL ADIPATE *(DOA)*—ORGANIC DIVISION

(Also known as Di 2 ethyl hexyl adipate)

Molecular Weight: 370.56

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

Standard Form: Liquid.

Specifications: Clear oily liquid; color APHA 25 max.; odor mild; acidity (as adipic acid) 0.02% max.; Sp. 0.924 ±0.003 at 25°/25°C.

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

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

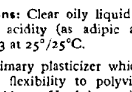
Shipping Classification: Resin Plasticizer.

Literature: "Dioctyl Adipate," Technical Bulletin O-106; "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. 5.9 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—80%, or "Santolite" MHP Industrial Resins are excellent plasticizers for nitrocellulose in odorless, flexible, adhesive coatings. Especially recommended for vinyl resins, polystyrene, ethyl cellulose and some of the natural resins such as damar.

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.

"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-lb. metal pails.

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

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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.

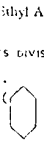
Uses: A nitrocellulose solvent; more active than either butyl or amyl acetate, evaporating faster with less resistance to moisture blush. Blends of all three with appropriate diluents, such as alcohols (ethyl, butyl and amyl), yield thinners and solvent mixtures of excellent cutting power and moisture 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—PLASTICS 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°C), 0.8690–0.8710; distillation range, 135.4 C–136.6°C.; acidity, neutral; solubility: water, immiscible, common organic solvents, miscible; refractive index (20 C), 1.495–1.497.

General Information—Properties: An aromatic hydrocarbon of dependable purity. It possesses solvent properties similar to xylene. Its chemical reactions include oxidation, nitration, sulfonation, hydrogenation, dehydrogenation, halogenation, alkylation, and acylation.

Uses: Production of styrene monomer and chlorostyrenes. It can be the starting point for the manufacture of a wide variety of organic compounds, of dyes and pharmaceuticals.

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

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% max. (as HCl); specific gravity 25°C 25°C, 1.2450–1.2550; distillation range °C, the 90% (by volume) between 5% and 95% shall distil within 1.5°C, of 83.5°C.

Uses: Solvent for fats and oils, various resins, cellulose esters and other products; fumigants; dry-cleaning solvent mixtures; paint, varnish and finish removers; metal degreasing; organic syntheses.

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

Shipping Classification: Ethylene dichloride.

FERRIC ORTHOPHOSPHATE—INORGANIC DIVISION

Molecular Weight: 561.59

Formula: $FePO_4{\cdot}Fe_4H(PO_4)_3{\cdot}6H_2O$

Standard Form: Powder.

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

Uses: Suggested as an addition agent in the fortification of foods.

Grades: Food.

Containers: 100-lb. net fiber drums.

Shipping Classification: Chemicals NOIBN.

FERROPHOSPHORUS (Iron Phosphide)

—INORGANIC DIVISION

Standard Form: Chill cast lumps, egg size, ½ inch or less.

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

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

Containers: Bulk; 500-lb. bbls.

Shipping Classification: Ferrophosphorus.

FORMALDEHYDE—PLASTICS DIVISION

Formula: HCOH

Standard Form: An aqueous solution containing 37% and 44% by weight of dissolved formaldehyde gas and 0 to 9% methanol.

Specifications: Clear and free of foreign sediment; color not greater than 5 APHA; specific gravity 1.0900–1.1136 (depending on methanol content); assay 37.0% by weight, minimum; acidity no greater than 6.5 equivalents per million (.03% as formic acid); iron no greater than 1 part per million; methanol 0 to 4% (methanol-free) and 6 to 9% (inhibited).

Uses: A chemical intermediate; used in the preparation of preservatives and disinfectants; reacts with phenol in the manufacture of plastics products having various properties.

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

Shipping Classification: Formaldehyde.

FUMARIC ACID—ORGANIC DIVISION

Molecular Weight: 116.07

Formula: $HOOC(CH_2)COOH$(trans)

Standard Form: Fine white granular crystals.

Specifications: Assay 99.6% min.; ash 0.01% max.; color (5% in alcohol) APHA 10 max.; iron 0.0003% max.; moisture 0.25% max.

Uses: It is a resin intermediate in the surface coating, printing ink and polyester industries. Its high melting point results *in higher softening point resins of those types;* modified phthalic alkyds, straight fumaric alkyds, upgraded drying oils and adducts with rosin and terpenes. Another use is as the acidulant for gelatin.

Containers: 250-lb. fibre drums.

Shipping Classification: Acid NOIBN Dry.

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gasolines

LION PREMIUM GASOLINE with Lionite
—LION OIL DIVISION

Standard Form: Liquid.

General Information: This high-octane premium gasoline is refined through advanced processing methods at the Lion Refinery, El Dorado, Ark. Equipment employed is of modern design, including a Model IV fluid-type catalytic cracking unit, a Thermofor catalytic cracking unit, a vapor recovery and polymerization unit, alkylation unit, chemical treating plant and other related equipment. Lionite, a petroleum-type additive, is employed to impart special properties 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
—LION OIL DIVISION

Standard Form: Liquid.

General Information: This high-octane regular gasoline is refined through advanced processing methods at the Lion Refinery, El Dorado, Ark. Equipment employed is of modern design, including a Model IV fluid-type catalytic cracking unit, a Thermofor catalytic cracking unit, a vapor recovery and polymerization unit, alkylation unit, chemical treating plant and other related equipment. Lionite, a petroleum-type additive, is employed to impart special properties. While the octane rating of Lion Regular Gasoline is not as high as for Lion Premium Gasoline, this product is outstanding in octane for regular grade gasolines.

Uses: Automotive fuel.

Shipping Classification: Lion Regular Gasoline with Lionite is marketed only through Lion service stations.

PREMIUM GASOLINE (UNBRANDED)
—LION OIL DIVISION

Standard Form: Liquid.

General Information: Premium gasoline, refined to high standards of quality and performance, is available in grades ranging from 90 to 97-octane.

Uses: Automotive fuel.

Containers: Railroad tank car, transport trucks or barges, only.

Shipping Classification: Gasoline (Dangerous placards applied).

REGULAR GASOLINE (UNBRANDED)
—LION OIL DIVISION

Standard Form: Liquid.

General Information: Regular gasoline, refined to excellent standards of quality and performance, is available in 85 to 89-octane ratings.

Uses: Automotive fuel.

Containers: Railroad tank car, transport trucks or barges, only.

Shipping Classification: Gasoline (Dangerous placards applied).

greases, oils, and gear lubricants

AC TRACK ROLL GREASE—LION OIL DIVISION

Consistency: Semi-fluid.

General Information: A stringy, tacky lubricant of a semi-fluid consistency which is suitable for lubricating the roller bearings and seals in truck wheels, track idlers and support rollers.

Containers: 25-lb. pails.

Shipping Classification: Lubricating grease.

A. F. GREASE—LION OIL DIVISION

Consistency: Buttery.

General Information: A new lithium base, multi-purpose grease for use on anti-friction bearings. It pumps readily even at winter temperatures, resists water washing and stands up in severest service. Maximum continuous usable temperature 300°F.

Grades: #1 and #2.

Containers: 25-lb., 100-lb., 230-lb., and 415-lb. drums.

Shipping Classification: Lubricating grease.

ALL-PURPOSE GEAR LUBRICANT—LION OIL DIVISION

Standard Form: Liquid.

General Information: An exceptional, premium quality, extreme pressure gear oil. It is specially fortified with carefully selected additives to promote longer gear life under the most severe operations. It is recommended for rear axles of hypoid, spiral bevel and spur gear types. Meets MIL-2-105 specification.

SAE Grades: 80, 90, 140 and 250.

Containers: 40-lb., 100-lb., 230-lb., and 415-lb. drums.

Shipping Classification: Lubricating grease.

B. & R. GREASE—LION OIL DIVISION

Consistency: Buttery to Granular.

General Information: Designed for use in ball and roller bearings where temperatures are too high to use regular calcium base greases. It has fair resistance to water, with a maximum continuous usable temperature of 250°F.

Grades: #1, #2, and #3.

Containers: 25-lb., 100-lb., 230-lb., and 415-lb. drums.

Shipping Classification: Lubricating grease.

BEARING OIL 4344—LION OIL DIVISION

Standard Form: Liquid.

General Information: A premium quality, inhibited industrial oil for bearings and general purpose machinery, especially selected for high natural resistance to oxidation, sludging, and corrosion. The addition of special oxidation and rust inhibitors increases the useful life and protective properties. Because of its exceptional film strength and lubricity, it is excellent for paper mill circulation systems.

Grade: 4344.

Containers: 54-gal. drums.

Shipping Classification: Lubricating oil.

BENTONE GREASE—LION OIL DIVISION

Consistency: Buttery.

General Information: An all-purpose bentone-type grease which does not contain soap, has a high melting point, and is water resistant. This grease will remain stable at temperatures up to 400°F., and is especially useful in lubricating ball and roller bearings and electric motors

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subject to high temperatures.

Grade: #1.

Containers: 25-lb., 100-lb., 230-lb., and 415-lb. drums.

Shipping Classification: Lubricating grease.

BLACO—LION OIL DIVISION

Standard Form: Liquid.

General Information: Black oil with high film strength for use on chains and open gears.

Containers: 54-gal. drums.

Shipping Classification: Petroleum residual fuel oil.

CASTOR MACHINE OIL—LION OIL DIVISION

Standard Form: Liquid.

General Information: A light, stringy type oil for use on castors, cams, and parts where this type oil is required.

Containers: 54-gal. drums.

Shipping Classification: Lubricating oil.

CHASSIS LUBRICANT—LION OIL DIVISION

Consistency: Buttery.

General Information: A lubricant for use in the general lubrication of chassis parts not requiring a special grease. It is manufactured from viscous, high-quality oils and a special calcium base. It is highly adhesive, tacky and waterproof. This product is made in both summer and winter grades.

Containers: 1-lb. and 5-lb. cans; 25-lb., 100-lb., 230-lb., and 415-lb. drums.

Shipping Classification: Lubricating grease.

COTTON PICKER SPINDLE OIL—LION OIL DIVISION

Standard Form: Liquid.

General Information: A light-bodied oil containing corrosion and rust inhibitors for use in cotton picker spindle boxes.

Containers: 54-gal. drums.

Shipping Classification: Lubricating oil.

CUP GREASE—LION OIL DIVISION

Consistency: Buttery to Granular.

General Information A water resistant, calcium soap grease that is recommended for compression cups and packed bearings. Maximum continuous usable temperature 175°F. NLGI Grease Grades #2 and #3.

Containers: 1-lb. and 5-lb. cans; 25-lb., 100-lb., 230-lb., and 415-lb. drums.

Shipping Classification: Lubricating grease.

ENGINE OIL—LION OIL DIVISION

Standard Form: Liquid.

General Information: A premium quality, straight mineral-type oil. In its many grades, it has literally thousands of industrial uses. It is used in general lubrication, including use on plain and anti-friction bearings and in crankcases with either splash or circulating systems. Because of its high lubricity, tenacious oil film, and resistance to breakdown, it is highly desirable for lubrication of electric motor bearings. It is well adapted for use in systems which provide filtration of oil, and can be used with any type of filtration, either centrifuge, settling, active earth, or bag types.

Grades: 43, 45, 50, 56, 63, 72.

Containers: 54-gal. drums.

Shipping Classification: Lubricating oil.

4-in-1 BARIUM GREASE—LION OIL DIVISION

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 350°F. This lubricant has the necessary cohesiveness and adhesiveness to stay in place in universal joints. It is pumpable in temperatures as low as 40°F., and has the property of almost complete freedom from drippage. NLGI Grease Grade #2.

Containers: 25-lb., 100-lb., 230-lb., and 415-lb. drums.

Shipping Classification: Lubricating grease.

GASOLINE PUMP GREASE (REPELLO GREASE) —LION OIL DIVISION

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 OIL DIVISION

Standard Form: Liquid.

General Information: A straight mineral oil gear lubricant which is highly resistant to oxidation. It possesses an unusually high natural film strength. It is a safe, effective lubricant for transmission and differential gears and tractor rollers where recommended by manufacturers.

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—LION OIL DIVISION

Standard Form: Liquid.

General Information: Lubricant for industrial gears which withstands extreme pressure. Its high and long lasting E.P. properties make it tough and wear resistant. It is recommended for hypoid, spiral bevel, spur and worm gear types as well as heavy duty transmissions.

Containers: 54-gal. drums.

Shipping Classification: Lubricating grease.

HIGH-PRESSURE JOURNAL OIL—LION OIL DIVISION

Standard Form: Liquid.

General Information: A premium quality industrial oil with a wide variety of applications. It is an outstanding lubricant for journal bearings; ring oiling, bath and splash; circulating systems where oil may or may not be reconditioned; chain, belt and roller.

Grades: 60, 72, 72X, 90.

(Continued on next page)

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Containers: 54-gal. drums.

Shipping Classification: Lubricating Oil.

HYDRAULIC OIL — LION OIL DIVISION

Standard Form: Liquid.

General Information: A hydraulic fluid for most types of hydraulic systems, providing smooth, efficient, and economic hydraulic operation over a wide range of temperatures. It has outstanding resistance to chemical breakdown, has high film strength and provides exceptional wear prevention.

Grades: Light, medium.

Containers: 54-gal. drums.

Shipping Classification: Lubricating oil.

LAVA COMPOUND — LION OIL DIVISION

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 ULTRA-WHITE GREASE — LION OIL DIVISION

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.

PRESSURE GUN LUBRICANT — LION OIL DIVISION

Consistency: Buttery.

General Information: A calcium soap grease for use in pressure guns to lubricate general farm machinery, and as a general purpose grease for sleeve, ball and roller bearings.

Containers: 5-lb. cans; 25-lb., 100-lb., 230-lb., and 415-lb. drums.

Shipping Classification: Lubricating grease.

REFRIGERATOR AND COMPRESSOR OIL — LION OIL DIVISION

Standard Form: Liquid.

General Information: An oil of low pour point which has the ability to resist foaming, has good lubricating qualities, and shows good resistance to chemical reaction with refrigerants.

Grades: Light, medium, heavy.

Containers: 54-gal. drums.

Shipping Classification: Lubricating oil.

ROCK DRILL LUBRICANT — LION OIL DIVISION

Standard Form: Liquid.

General Information: An oil which withstands high pressures for use in lubricating rock crushers and rock drills.

Containers: 54-gal. drums.

Shipping Classification: Lubricating oil.

STEAM CYLINDER OIL *(Mineral and Compounded)* — LION OIL DIVISION

Standard Form: Liquid.

General Information: For lubrication of steam cylinders and valves, steam niggers, and bearings. A filtered, steam refined cylinder oil which gives excellent results with medium pressure steam. A good general purpose oil for sawmill use. It comes in a 5% compound for average saturated steam pressures (150 to 175 lb. pressure) and an 8% compound for excessively wet steam.

Grades: 1300, 1308, 1400, 1405, 1408, 1605, and 1608.

Containers: 54-gal. drums.

Shipping Classification: Lubricating oil.

WATER PUMP GREASE — LION OIL DIVISION

Consistency: Granular.

General Information: A specialized calcium grease with high resistance to water for use in water pumps on automobiles. It has a high melting point and resistance 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 GREASE — LION OIL DIVISION

Consistency: Fibrous.

General Information: A sodium-base grease for use in wheel bearings and universal joints. It provides high resistance to heat, pressure and moisture, and does not tend to melt and run out on brake linings. NLGI Grease Grade #3.

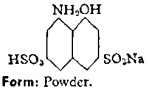
Containers: 1-lb. and 5-lb. cans; 25-lb., 100-lb., 230-lb., and 415-lb. drums.

Shipping Classification: Lubricating grease.

H ACID — ORGANIC DIVISION
(8-Amino-1-naphthol-3,6-sodium Acid Disulfonate)

Molecular Weight: 341.29

Formula:



Standard Form: Powder.

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

Uses: An intermediate in the manufacture of dyestuffs.

Containers: 100-lb. bags.

Shipping Classification: Dye intermediate NOIBN.

"HB-20" PARTIALLY HYDROGENATED ALKYL-ARYL HYDROCARBON — ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: Light amber to dark brown liquid; Refractive Index at 25°C., approximately 1.54; Specific Gravity at 25/15.5°C., approximately 0.96.

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Uses: A low-cost extender type plasticizer for vinyls.

Containers: Tank cars; 450-lb. drums.

Shipping Classification: Resin Plasticizer.

"HB-40" PARTIALLY HYDROGENATED TERPHENYL — ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: A clear, mobile, high-boiling hydrocarbon; almost colorless, oily liquid with faint, pleasant odor; density 1.004±0.003 at 25°/15.6°C.; wt. per gal. 8.37 (average); refractive index 1.5675±0.0075 at 25°C.; insoluble in water; miscible in all proportions at room temperature with a number of solvents and oils.

Uses: Low cost secondary plasticizer for vinyl sheeting, free films and vinyl fabric or paper coatings. Plasticizer for vinyl protective coatings and adhesives. Used to plasticize vinyl profile extrusions, tubing, wire coating and injection and slush molding compounds made from vinyl resins. Plasticizer for styrene water dispersion paints, paper coatings, adhesives and styrene casting resins.

Containers: Tank cars; 460-lb. drums.

Shipping Classification: Resin Plasticizer.

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

"HI-GLOSS REZ" INTERIOR LUSTER WOOD FINISH — ORGANIC 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.

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.

LAMPBLACK — INORGANIC DIVISION

Standard Form: Powder.

Properties:

GRADE	% FREE CARBON	#OIL/#BLACK OIL ABSORPTION	TINTING STRENGTH*	UNDERTONE	TOPTONE
#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 2¼ times as intense as No. 10 Lampblack.

Uses: Pigment in paints, varnishes, enamels, inks, leather finishes, stencils, crayons, polishes; in pressed forms as electrodes, carbon brushes and molded carbon products.

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.

light oils

BURNER OIL — LION OIL DIVISION

Standard Form: Liquid.

General Information: Used in oil-fired residential heating units. Made in Grades No. 2 and No. 3.

Containers: Railroad tank cars, transport trucks and barges.

(Continued on next page)

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Shipping Classification: Petroleum distillate fuel oil, not suitable for illuminating purposes.

BUTANE-PROPANE MIXTURE—LION OIL DIVISION

Standard Form: Liquid.

General Information: A liquefied petroleum gas used for home heating and as a motor fuel in engines especially equipped to use this fuel.

Containers: Railroad tank cars and transport trucks.

Shipping Classification: Liquefied petroleum gas. (Dangerous placards applied.)

DIESEL FUEL—LION OIL DIVISION

Standard Form: Liquid.

General Information: A product of petroleum refining for use as fuel in diesel engines.

Containers: Railroad tank cars, transport trucks and barges.

Shipping Classification: Distillate fuel oil not suitable for illuminating purposes.

HERBICIDAL OIL No. 1—LION OIL DIVISION

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—LION OIL DIVISION

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: Petroleum distillate fuel oil not suitable for illuminating purposes.

INK OIL—LION OIL DIVISION

Standard Form: Liquid.

General Information: A lightweight oil for mixing with inks in printing.

Containers: 54-gal. drums.

Shipping Classification: Petroleum distillate fuel oil, not suitable for illuminating purposes.

KEROSENE—LION OIL DIVISION

Standard Form: Liquid.

General Information: A product of petroleum refining for use as fuel in oil-burning stoves and lamps, and in various internal combustion engines.

Containers: Railroad tank cars, transport trucks and barges.

Shipping Classification: Refined oil, illuminating.

PROPANE—LION OIL DIVISION

Standard Form: Liquid.

General Information: A liquefied petroleum gas used for home heating.

Containers: Railroad tank cars and transport trucks.

Shipping Classification: Liquefied petroleum gas. (Dangerous placards applied.)

RESIDUAL FUEL OIL—LION OIL DIVISION

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 oil.

TRACTOR DISTILLATE—LION OIL DIVISION

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: Petroleum distillate fuel oil, not suitable for illuminating purposes. (Dangerous placards applied.)

"LYTRON" TEXTILE PROCESSING AND FINISHING AGENTS—PLASTICS DIVISION

Textile chemicals recommended for processing and finishing textile fibers and fabrics.

MALEIC ANHYDRIDE—ORGANIC DIVISION

Molecular Weight: 98.06

Formula:



Standard Form: Briquettes.

Specifications: White briquettes; crystallizing point (as produced) 52.5°C. min.; water solution (4 gms. in 10 ml); clear and colorless; assay 99.5% min.

Uses: Used alone or in combination with other acids in the manufacture of alkyd and polyester-type resins; a versatile intermediate for chemical synthesis. Also used for producing esters for internal plasticization, size for paper and textiles and in agricultural chemicals.

Containers: 200-lb. fiber drums.

Shipping Classification: Maleic Anhydride.

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"MERSIZE" PAPER SIZING AGENT
—ORGANIC DIVISION

Standard Form: Paste, powder, and liquid.

General Information: "Mersize RM 70%" and "Mersize RM 77%" are 70% and 77% solids paste sizes; "Mersize RM Dry" a dry granular powder; "Mersize CD-2" a 50% solids solution; "Mersize CD-2 Dry" a dry powder.

Uses: "Mersize RM 70%", "Mersize RM 77%" and "Mersize RM Dry" are forms of chemically fortified rosin-based sizes that are ready to use in a paper mill to reduce sizing costs, improve resistance to ink, water and other aqueous solutions, give better feathering resistance and more uniform, dependable sizing. "Mersize CD-2" and "Mersize CD-2 Dry" are used in conjunction with typical rosin sizes to obtain the same results.

Containers: Tank cars, 500-lb. steel drums and 50-lb. bags.

Shipping Classification: Rosin Sizing NOIBN.

Literature: "Mersize RM" and "Better Sizing at Lower Cost with Mersize CD—", booklets.

"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 a darker, more lively blue is obtained. Also used on diazo paper, blueprint cloth, negative paper and Van Dyke paper. Precoating is performed by coaters. A license from Monsanto is required to employ the silica precoat process which uses "Mertone."

Containers: 55-gal. lined steel drums.

Shipping Classification: Chemicals NOIBN.

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

"META-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 bacterial activity, which causes fermentation and decay. Insures a sweet smelling silage of green color and high carotene content and good palatability.

Containers: 80-lb. bags.

METHANOL—PLASTICS DIVISION

Molecular Weight: 32.04

Formula: CH_3OH

Standard Form: Liquid.

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

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

Shipping Classification: Methanol.

METHAPYRILENE FUMARATE *(Thenylpyramine Fumarate)*—ORGANIC DIVISION

Molecular Weight: 870.98

Formula: $(C_{14}H_{13}N_3S)_2[(CHCO_2H)_2]_3$

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: Methapyrilene fumarate is used in pharmaceutical and antihistaminic preparations.

Containers: 100 and 25-lb. fiber drums, 5-lb. fibrepaks.

Shipping Classification: Chemicals NOIBN.

METHAPYRILENE HYDROCHLORIDE *(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, 5-lb. fibrepaks.

Shipping Classification: Chemicals NOIBN.

METHIONINE HYDROXY ANALOGUE *(MHA) (Calcium salt of DL-alpha-hydroxy-gamma-methylmercaptobutyric 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 (a calcium salt) being equivalent to 1 lb. of DL-methionine. Free 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-lb. Leverpaks.

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

METHYL PARATHION *(80% Solution)*
—ORGANIC DIVISION

Standard Form: Clear yellow liquid.

Specifications: Assay, 80-82%; p-Nitrophenyl, 0.5% maximum; Specific gravity at 25°/25°C., 1.2 (approx.)

Uses: Insecticide (concentrate) used for controlling cotton aphid, desert spider mite, cotton leaf worm, boll weevil, and others. Highly toxic; handled only by qualified formulators of insecticides.

(Continued on next page)

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Containers: 55-gal. black iron drums.

Shipping Classification: Methyl Parathion, liquid (Insecticides, Agricultural, NOIBN. liquid).

METHYL SALICYLATE U.S.P. *(Synthetic)*

— ORGANIC DIVISION

Specifications: Colorless liquid; assay, essentially 100%; color, APHA 10 maximum; odor, characteristic; refractive index at 20°C., 1.535 to 1.538; specific gravity at 25 /25°C., 1.180 to 1.185; solubility in 70% alcohol (1:7), complete; solubility in Normal Potassium Hydroxide (1:10), Turbidity, none; color, faint yellow, maximum; heavy metals, meets USP; weight per gallon, 9.9 pounds; meets all requirements of USP.

Uses: Methyl Salicylate U.S.P. (Synthetic) is widely used in sprays, as well as various kinds of insecticides, mouth washes, perfumes, pharmaceuticals, in masking gummed tape and paper, as an odor principle in polishes, printing and copying inks, and in covering disagreeable odors of such products as pastes and glues. Used for food flavoring, candy lozenges, chewing gum and root beer.

Containers: 500-lb. drums—returnable; 500 and 50-lb. drums—non-returnable.

Shipping Classification: Methyl Salicylate (Essential Oil NOIBN).

Literature: Folder: "Methyl Salicylate Monsanto."

METHYL TOLUENESULFONATE — ORGANIC DIVISION

Molecular Weight: 186.22

Formula: SO_2OCH_3



Standard Form: Liquid.

Specifications: Light amber to light brown liquid; assay 94% 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: 560-lb. net, steel drums

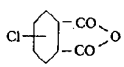
Shipping Classification: Chemicals NOIBN.

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 DDT

(Dichloro-Diphenyl-Trichlorethane, Technical)

— ORGANIC DIVISION

Standard Form: Fine or medium granular powder or flakes.

Specifications: Color, white to cream; Crystallizing point, 89°C. (minimum); Organically bound chlorine, 49–51% by weight; pH of water extract, 6.8 to 8.0.

Uses: Insecticides for a wide variety of agricultural, industrial, or household pests.

Containers: Bags or drums.

Shipping Classification: Chemicals Viz.:—DDT(Dichloro-Diphenyl-Trichloroethane) Dry.

"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.

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. "Monsanto Penta" Oiled also available. Contains 3-lbs. oil per 100-lbs. of PENTA TECHNICAL. Oil decreased somewhat the dusting tendency of the product.

Specifications: Dark, grayish flakes; crystallizing point 174.0°C. min.; alkali insoluble material 1.0% max.; assay 96.0% min.; pine oil solution NPA 5.5 max.

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

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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. leverpak, 50-lb. paper bags.

Oiled Penta 16½-gal. leverpak, 51-lb. paper bag.

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 Pentachlorphenol 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	% Fe
"Montar" 3	120–170°C.	50–52	5–10	0.3–0.6
"Montar" 4	140–200°C.	54–56	5–10	0.5–1.0
"Montar" 5	180–250°C.	53–56	1–3	0.1–0.2
"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.

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.

ADVANCED-FORMULA NATURALUBE D.H.D. OIL —LION OIL DIVISION

Standard Form: Liquid.

General Information: A motor oil with the oxidation stability, corrosion preventive properties and detergent-dispersant characteristics necessary for use in both high-speed diesel and gasoline engines under heavy duty service conditions. Meets U. S. Army Specifications MIL-L-2104 as revised 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: Advanced-Formula Naturalube folder.

NATURALUBE D.H.D.-SUPER DUTY OIL —LION OIL DIVISION

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 requirements for Caterpillar Series 2 lubricants and for API Classification MS-DG-DM-DS.

SAE Grades: 10 through 60, inclusive.

Containers: 54-gallon, 30-gallon and 15-gallon drums.

Shipping Classification: Lubricating oil.

Literature: Four-Page Letter No. 450 (also in Spanish).

ADVANCED-FORMULA NATURALUBE H.D. MOTOR OIL—LION OIL DIVISION

***Standard Form:** Liquid.*

General Information: A newly developed motor oil to meet the exacting requirements for top performance of modern high compression automobile engines. Its ability to remove power-destroying engine deposits keeps in check the engine's octane requirement increase, and reduces knock and pre-ignition. Its anti-acid properties protect engines against acid wear, and its high natural film strength protects against friction wear. Its oxidation stability and detergent-dispersant characteristics, together with the characteristics described above, make it highly desirable for use under heavy duty service conditions of modern driving. Meets requirements for API Classification ML-MM-MS-DG and U. S. Army Specification MIL-L-2104 as revised.

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: Advanced-Formula Naturalube folder.

NATURALUBE REINFORCED MOTOR OIL —LION OIL DIVISION

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: Four-Page Letter No. 450 (also in Spanish).

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TIGER MOTOR OIL—LION OIL DIVISION

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.

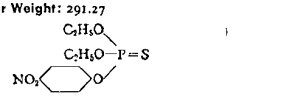
Containers: 54-gallon, 30-gallon and 15-gallon drums; cases: 24/1-quart cans.

Shipping Classification: Lubricating oil.

"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 paraffinic 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 NOIBN Liquid. Class B "Poison" label required.

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

NITRATING ACID *(Mixed Acid)*—INORGANIC DIVISION

Standard Form: Liquid.

Typical Analysis:

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

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

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° Bé., 40° Bé., and 42° Bé.

Typical Analysis: % HNO_3: 36° Bé., 52.3%; 38° Bé., 56.5%; 40° Bé., 61.4%; 42° Bé., 67.2%; Strong acid 95–98%. Sp. Gr. will not vary more than 0.5° terms of Bé.; H_2SO_4 0.05% max.

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

Containers: Tank trucks; 50-ton tank cars.

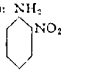
Shipping Classification: Nitric Acid. Corrosive liquid (white label required).

ortho-NITROANILINE —ORGANIC DIVISION

(Also known as ortho-aminonitrobenzene)

Molecular Weight: 138.12

Formula:



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, medicinals, benzothiazole and photographic agents.

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

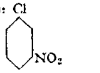
Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

meta-NITROCHLOROBENZENE—ORGANIC DIVISION

(Also known as meta-chloronitrobenzene)

Molecular Weight: 157.56

Formula:



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: 600-lb. drums.

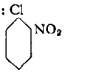
Shipping Classification: Dye Intermediate NOIBN. "Poison" label required.

ortho-NITROCHLOROBENZENE—ORGANIC DIVISION

(Also known as ortho-chloronitrobenzene)

Molecular Weight: 157.56

Formula:



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: 600-lb. steel drums; tank cars.

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

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

para-NITROCHLOROBENZENE — ORGANIC DIVISION
(Also known as para-chloronitrobenzene)

Molecular Weight: 157.56

Formula: Cl



Standard Form: Flakes.

Specifications: Light yellow flakes or crystalline mass; crystallizing point 82.3°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.

NITROGEN FERTILIZER SOLUTIONS
— INORGANIC DIVISION

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.)

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 99.0% min.; water-insoluble material 0.20% max.; methanol-insoluble material 0.20% 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.

nokorode products

(UNDERBODY COATINGS, SEALANTS, RUST PREVENTIVES)

UNDER CAR SEALER AND SILENCER
— LION OIL DIVISION

General Information: A compound of selected asphalts, petroleum solvents, fillers, and additives which forms a tough, protective, sound deadening film when applied to the underbody of automobiles. This dense coating offers protection against rust, muffles noise, protects against abrasion caused by flying gravel, and seals out dust. When properly applied by spray to the underbody, fenders, and hood of the automobile it lasts for the life of the car. Produced by Lion Oil Company under U. S. Patent No. 2,393,774.

Packaged in: 5 gal. pails; 54 gal. drums.

Shipping Classification: Auto body sealer or sound deadening compound.

Literature: Nokorode Brochure; Nokorode 4-page Letter; Nokorode Job Manual.

#2002 UNDERCOATING AND SOUND DEADENER
— LION OIL DIVISION

General Information: A compound of asphalts, petroleum solvents, fillers, and additives designed to protect the underbody of automobiles. This coating offers protection against rust, muffles noise, and seals out dust. It is applied to automobile underbodies, fenders, and hoods by spray. It has a high sound-deadening value; therefore is suitable for dampening in body construction or industrial uses. Manu-

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factured under U. S. Patent No. 2,393,774.

Packaged in: 5 gal. pails; 54 gal. drums.

Shipping Classification: Auto body sealer or sound deadening compound.

vapor and weather barrier and accessories

SEAL KOTE—LION OIL DIVISION

General Information: Solvent cutbacks of a selected asphalt base containing the proper proportions of asbestos, and other mineral fillers to cure to a highly weatherproof, tough and adherent film upon the evaporation of the solvent. Seal Kotes are applied as vapor seals over insulation and to various surfaces, such as metal and masonry areas, to protect from moisture and atmospheric corrosion which (especially in industrial areas) is accelerated by various dusts, fumes, and fogs of corrosive chemicals. The tough and flexible film is highly impermeable and offers a high degree of protection under conditions of total or intermittent water immersion. Available in brush, spray, heavy and extra-heavy trowel grades.

Uses: Metal buildings, metal roofs, barges, pontoons, bridge structures, concrete silos, storage tanks, tank cars, and industrial piping are but a few of the structures being protected from corrosion and weathering. Also an excellent vapor seal for all types of insulation.

Typical Properties and Performance:

	GRADE			
	LIGHT (Brush)	MEDIUM (Spray or Brush)	HEAVY (Trowel or Caulking)	EXTRA-HEAVY (Trowel or Pressure Caulking)
Application temperature	50–120°F.	Spray 50–120°F. Brush 80–120°F.	50–100°F.	50–120°F.
Flash, Pensky-Martens, °F., Min.	100	100	100	100
Solids, % Min.	65	68	75	80
Lineal Shrinkage	20	20	15	12
Flow of cured film at 325°F.	None	None	None	None
Approx. weight, lbs/gal. at 60°F.	7.8	8.2	8.8	10.2
Dry to touch, 3/32" film, hrs. max.	2.0	2.0	2.0	2.0
Dry firm, 3/32" film, hrs. max.	24	24	24	24
Salt fog resistance, 1/16" film, complete protection of steel panel, hrs., min.	500	500	500	500
Vapor transmission, wet cup, grams per 100 sq. in. per 24 hrs., 1/8" film, 0–50% RH	0.01	0.01	0.01	0.01
Fire resistance of cured film, 6 in. Bunsen flame applied for 2 minutes	Excellent. No falling of asphalt droplets. Fire duration less than one minute after flame is removed.			
Resistance to solution of acid, 60 day immersion of steel panels coated with 3/32" film	No appreciable attack, blistering or hardening of coating or corrosion of panels by 10% HCl, 10% H_2SO_4 and 10%, 30% and 85% solution of phosphoric acid.			
Resistance to solutions of alkalies and salts, 60 day immersion of steel panels coated with 3/32" film	No appreciable attack, blistering or hardening of coating or corrosion of panels by solutions of 10% and 30% NaOH, 45% ammonium nitrate, and saturated solution of ammonium sulfate.			

Packaged in: 5 gal. pails; 55 gal. drums.

Shipping Classification: Roofing Cement.

Literature: Nokorode Uses and Specifications Sheet; Moisture and Vapor-Proof Barriers 4-Page Letter.

K KOTE—LION OIL DIVISION

General Information: An asphalt base, mastic composition containing a high volume content of screened ground cork and a small amount of long fiber asbestos. Applied with spray equipment or trowel, K Kote cures to a tough and abrasion-resisting film with excellent insulating and weather-and-vapor barrier properties. K Kote, usually applied by spray, has a pleasing appearance with the cork particles uniformly distributed throughout to decrease the thermal conductivity of the film. A 1/8" film of K Kote compared to a bare steel surface can reduce the loss of heat up to 65%. Yet the film acts as a weather and vapor barrier to protect underlying surfaces from condensation, corrosion and weathering elements; and sound deadening value is given to ducts, walls, etc. Upon curing the film becomes fire resistant and does not support combustion.

Uses: All surfaces where a combination of insulation, vapor and weather protection, and sound-deadening values are of benefit, can be economically covered in one application.

Typical Properties and Performance:

	Standard or Spray	Industrial or Trowel
Pounds per gal. at 60°F. approx. after aged	6.4	6.6
Flash Point, Tag Open Cup, °F.	100+	100+
Solids of wt., %	60	61
Approx. solids by volume, %	68	72
Dry to touch, 1/8" spray coat, min.	45	45
Dry firm, 1/8" spray coat, hours	24	24
Approximate volume of cork in cured film, %	55	57
Lineal shrinkage, %	16	15

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Resistance to abrasion by sand blast	Excellent	Excellent
Outdoor weathering performance	Excellent	Excellent
Flow of cured ¼" film on metal panel, vertical at 325°F.	None	None
Temperature range of coating	−40 to 300°F.	−40 to 300°F.

Packaged in: 4.6 gal. pails; 51 gal. drums.

Shipping Classification: Roofing Cement.

Literature: Nokorode Uses and Specifications Sheet; Moisture and Vapor Proof Barrier 4-Page Letter.

SEAL PERM—LION OIL DIVISION

General Information: An asphalt plastic recommended as a breathing type of weatherproof barrier over high temperature insulation, walls and other areas. Particular properties of Seal Perm permit moisture vapor from insulation or walls to escape through the cured film, as might be required by normal breathing action or by temperature increase, but liquid water can not enter. This coating functions as an excellent weather barrier and has highly desirable film properties, forming a tough, strong, and abrasion and weather-resistant covering which is light in weight. This coating is not an emulsion, and unlike emulsions, moisture transmitted through the cured film is in vapor form and water soluble salts are not wicked to the surface to cause unsightly staining. Seal Perm is available in spray and trowel consistency.

Uses: Particularly recommended for weatherproofing insulation placed on vessels or pipes with a surface temperature above 212°F.

Typical Properties and Performance:

	Trowel	Spray
Flash, Pensky-Martin, °F.	100+	100+
Pounds per gal. at 60°F., approx.	7.45	8.0
Solids by weight, %	63+	58+
Volume shrinkage on curing, %	34–36	40
Sag of sprayed or trowel ⅛" film	None	None
Sag of sprayed or trowel ¼" film, less than	⅛ to 3/16"	¼"
Dry to touch ⅛" film, minutes	30 to 45	30
¼" film, minutes	45	45
Resistance to abrasion by sandblast	Good	Excellent
Outdoor weathering performance	Excellent	Excellent
Flow of cured film at 325°F.	None	None
Permeability at 77°F., wet cup, sprayed film:		
Permeability value, g/hr/cm/mm. Hg		$3–10^7$
Grams/100 sq. in./24 hrs., 3/32" wet film, 0–50% R.H., 90°F.		0.50
Perms, 3/32" wet film, 0–50% R.H., 90°F.		0.66

Packaged in: 5 gal. pails; 55 gal. drums.

Shipping Classification: Roofing Cement.

Literature: Nokorode Uses and Specifications Sheet; Moisture and Vapor-Proof Barrier 4-Page Letter.

LOW TEMP—LION OIL DIVISION

General Information: A catalytic asphalt base (U. S. Patent No. 2,450,756) formulation containing selected oils and mineral fillers for use as a bedding and joint compound for low temperature insulation. It cures to a black, non-tacky but permanently soft compound with a film shrinkage in thickness of approximately 14%. Low Temp is an excellent seal to decrease transmission of vapors through joints and layers of insulation to prevent build-up of destructive moisture beneath the insulation. Plasticity of the coating is retained at low temperatures. This is an excellent protective coating to prevent corrosion of surfaces by industrial atmospheres, but due to its softness, Low Temp is not recommended as an outside coating excepting where exposed at joints and seams. This material can be applied by stiff brush or trowel within a temperature range of 60°/110°F. and can be sprayed with industrial type of mastic spray equipment. Compound has satisfactory behavior over the wide temperature range from minus 100°F. to plus 200°F.

Typical Properties and Performance:

Pounds per gal. at 60°F., approx.	10.4
Solids by wt., %	87
Flash, Pensky-Martens Closed Tester, °F.	100+
Dry to touch, ¼" film, days	2
Dry firm, ¼" film	Non-drying, remains soft and plastic
Film Shrinkage	14%
Outdoor weathering performance	Satisfactory, but due to softness not recommended as outside coating.
Salt fog resistance ⅛" film, complete protection of steel panels, min. hrs.	500

Packaged in: 5 gal pails; 55 gal. drums.

Shipping Classification: Roofing Cement.

Literature: Nokorode Uses and Specifications Sheet.

BRUSH CEMENT—LION OIL DIVISION

General Information: A brush applied heavy asphalt cutback for sealing laps and joints on coverings for insulations, and as a brush applied vapor seal.

Packaged in: 5 gal. pails; 55 gal. drums.

Shipping Classification: Roofing Cement.

Literature: Nokorode Uses and Specifications Sheet.

SEAL PRIME—LION OIL DIVISION

General Information: A spray or brush applied asphalt-solvent blend. A primer for porous surfaces prior to the application of Nokorode Seal Kotes, Seal Perm, K Kote and Low Temp. Also an excellent black coating with good hiding power.

Packaged in: 5 gal. pails; 55 gal. drums.

Shipping Classification: Petroleum Asphalt (other than paint, stain or varnish).

Literature: Nokorode Uses and Specifications Sheet.

D-41 PRIMER—LION OIL DIVISION

General Information: A primer for surfaces prior to the application of Nokorode Construction Asphalts. Meets government and ASTM specifications.

Packaged in: 5 gal. pails; 55 gal. drums.

Shipping Classification: Petroleum Asphalt (other than paint, stain or varnish).

Literature: Nokorode Uses and Specifications Sheet.

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VEHICLE—LION OIL DIVISION

General Information: An asphalt base vehicle to be aluminized to obtain paint with excellent weathering and vapor seal properties for all types of surfaces and weather and vapor barriers.

Packaged in: 5 gal. pails; 55 gal. drums.

Shipping Classification: Petroleum Asphalt (other than paint, stain or varnish).

Literature: Nokorode Uses and Specifications Sheet.

SEAM AND BACKING CEMENT—LION OIL DIVISION

General Information: A trowel-applied, mineral-filled asphalt base backing cement for use on masonry and concrete walls in construction of cold chambers and for filling joints, seams, and laps.

Packaged in: 50 lb. pails; 500 lb. drums.

Shipping Classification: Roofing Cement.

Literature: Nokorode Uses and Specifications Sheet.

CONSTRUCTION ASPHALTS—LION OIL DIVISION

General Information: Hot applied asphalt for hot setting, bonding and vapor sealing of low temperature insulations.

Grades: Grade B, 145–155°F. softening point; Grade C, 180–200°F. softening point.

Packaged in: 150 lb. drums.

Shipping Classification: Roofing Asphalt.

Literature: Nokorode Uses and Specifications Sheet.

E KOTE—LION OIL DIVISION

General Information: A hot applied asphaltic coating for water-front and underwater service. Made from an asphalt base and mineral filler which gives excellent protection to metal surfaces under severe conditions of service. Recommended for application to ballast tanks, penstocks, steel piers, metal surfaces in lock constructions, and general water-front application.

Packaged in: 5 gal. pails; 55 gal. drums.

Shipping Classification: Roofing Cement.

Literature: Nokorode Uses and Specifications Sheet.

Industrial rust preventives and mastics

82S—LION OIL DIVISION

General Information: This is a heavy-duty rust preventive grease coating consisting of a firm microwax base containing suitable inhibitors to impart high film adhesion to metal surfaces. This material is of such consistency that it can be readily applied by swabbing at ordinary temperatures. After solvent evaporation, a firm, flexible, and non-drying semi-transparent film remains to give a high degree of protection against corrosive influences.

Uses: Some suggested applications are on metal tanks, hoppers, stored equipment, farm equipment, pipes, bridges, barges, and rigging.

Packaged in: 5 gal. pails; 55 gal. drums.

Shipping Classification: Petroleum Oil, NOIBN.

Literature: Nokorode Uses and Specifications Sheet.

9G54A—LION OIL DIVISION

General Information: A low viscosity, oil-base rust preventive of the non-drying type. Application of a thin film, usually by dipping, gives excellent protection to metal surfaces against conditions of high humidity and other atmospheric corrosive influences. Having a low viscosity, economy of a high coverage is obtained and in addition the protection is greater than usually found in heavier bodied slushing oils. The thin coating does not interfere with handling, assembly, or inspection.

Uses: Application of a thin film of 9G54A during the assembly of metal parts is desirable to offer protection during shipment and in storage. Also it is an ideal economical coating for application and protection of metal sheet and strips and wire.

Packaged in: 5 gal. pails; 55 gal. drums.

Shipping Classification: Petroleum Oil, NOIBN.

Literature: Nokorode Uses and Specifications Sheet.

COACH BUILDERS SOUND DEADENER—LION OIL DIVISION

General Information: A semi-liquid material composed of selected asphalts, petroleum solvents, fillers, and additives. Developed especially for use on side, roof, and floor panels of large commercial and passenger vehicles where the panels are subject to more flexing than is usual in automobiles or cabinets. Application prevents noises caused by vibration, and corrosion preventive properties protect metal surfaces.

Packaged in: 5 gal. pails; 55 gal. drums.

Shipping Classification: Auto body sealer or sound deadening compound.

Literature: Nokorode Uses and Specifications Sheet.

COACH BUILDERS UNDERCOATING—LION OIL DIVISION

General Information: A semi-liquid material which dries to form a tough film. When applied to the underbody of commercial and passenger vehicles, it protects against moisture conditions, chemicals, and prevents points of corrosion from being started by abrasion due to flying gravel. Adds years to the life of the vehicle and reduces maintenance costs. Much more flexible for large units than regular underbody coating.

Packaged in: 5-gal. pails; 55 gal. drums.

Shipping Classification: Auto body sealer or sound deadening compound.

Literature: Nokorode Uses and Specifications Sheet.

INDUSTRIAL SOUND DEADENER—LION OIL DIVISION

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. Used for stamped bath tubs, kitchen sinks, etc.

Packaged in: 5 gal. pails; 55 gal. drums.

Shipping Classification: Auto body sealer or sound deadening compound.

Literature: Nokorode Uses and Specifications Sheet.

CAR CEMENT—LION OIL DIVISION

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

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which seals out moisture, chemicals, and fumes to prevent corrosion.

Packaged in: 5 gal. pails; 55 gal. drums.

Shipping Classification: Roofing Cement.

Literature: Nokorode Uses and Specifications Sheet.

SIGN KOTE — LION OIL DIVISION

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.

Packaged in: 5 gal. pails; 55 gal. drums.

Shipping Classification: Roofing Cement.

Literature: Nokorode Uses and Specifications Sheet.

approved government specification compounds

GOVERNMENT RUST PREVENTIVES
— LION OIL DIVISION

General Information: Various types of materials manufactured to meet exacting Government standards. These materials have been tested and approved by the Government laboratories as meeting their specifications and Certificates of Compliance are supplied covering same.

Following is a list giving the Nokorode designation and the Government Specification for which it is approved:

Nokorode Designation	Government Specification
2-122	USA 2-122
2-126, Grade 1	USA 2-126, Grade 1
2-126, Grade 2	USA 2-126, Grade 2
84	USA 2-84B (Amendment 1)
2-121	USA 2-121
82	USA 2-82C
47	AXS 1347
Co81	MIL-C-11796A, Class 1
Co91	MIL-C-11796, Class 2
963	MIL-C-11796A, Class 3
73	AXS-673 (Revision 2)
081	MIL-C-6708, Type 1
GO-31	MIL-C-972, Grade 1
731	MIL-C-16173A, Grade 1
732	MIL-C-16173A, Grade 2
733A	MIL-C-16173A, Grade 3
Crate Top Coating	JAN-P-102—MIL-P-102
Army Cote 827	AXS-1827 (Amendment 1)
Army Cote 827	Fed. Spec. TT-C-520
E-011	MIL-C-3254, Type 2

Containers: 5 gal. pails; 55 gal. drums.

Literature: Nokorode Uses and Specifications Sheets.

"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.

OS-45 COOLANT FOR ELECTRONIC EQUIPMENT
— ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: A clear, amber liquid with outstanding properties at both low and high temperatures. Formulated to meet USAF specification MIL-H-8446. Typical Properties: Viscosity approximately 2000 centistokes at −65°F.; 4.0 centistokes at 210°F.

Uses: Coolant for airborne electronic equipment operating from −65° to +400°F. High temperature aircraft hydraulic fluid.

Containers: One quart, 1, 5, 55 gallon black iron drums.

Shipping Classification: Chemicals NOIBN.

Literature: OS-45 High temperature Hydraulic Fluid, Technical Data Sheet ODB-53-15.

ortho-PHENETIDINE — ORGANIC DIVISION
(Also known as ortho-aminophenylethyl ether, ortho-aminophenetole and 2-aminoethoxybenzene)

Molecular Weight: 137.18

Formula: OC_2H_5, NH_2



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: 475-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, NH_2



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.; solution 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: 480-lb. steel drums.

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

PHENOL — ORGANIC DIVISION
(Also known as carbolic acid and hydroxybenzene)

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WATER_PCB-00002214

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 (1:15) clear and colorless; 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%, 85.0–86.0%; liquid 90%, 90.0–91.0%; liquid 92%, 92.0–93.0%.

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 its vapors and contact with the skin.

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

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

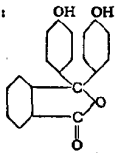
Shipping Classification: Phenol. "Poison" label required.

Literature: "Safe Handling of Phenol," booklet, phenol facts book.

PHENOLPHTHALEIN, U.S.P. — ORGANIC DIVISION

Molecular Weight: 318.31

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 and 100-lb. fiber drums.

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.

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:

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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 softening 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, *t*−96 ml 1.0, dry point 107.9.

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

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

Containers: 725-lb. nickel drums; 4,000 and 8,000-gal. 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, ore flotation chemicals.

Containers: 150-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

PHOSPHORUS PENTOXIDE

(Also known as phosphoric anhydride, phosphoric oxide 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% as P_2O_5; color 60% water solution 50 APHA.

General Information—Properties:

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

p = vapor pressure in cm. of mercury

T = absolute Temperature

A (low temperature form) $\quad \log_{10}p = 9.792-(5000/T)$

B (high temperature form) $\quad \log_{10}p = 11.113-(7930/T)$

L (liquid) $\quad \log_{10}p = 6.809-(4320/T)$

Atmospheric sublimation temperature: 358.9°C.

Heat of vaporization:

A—22,800 calories per gm. molecule

B—36,200 calories per gm. molecule

L—19,700 calories per gm. molecule

Heat of fusion: 16,500 calories per gm. molecule

Probable molecular formula of vapor: P_4O_{10}

Uses: As a desiccant; in the production of alkyl phosphates; a catalyst in air blown asphalt; in the manufacture of fluorophosphates; in the making of phosphorus insecticides; and in the production of oil additives.

Containers: 400 and 60-lb. drums.

(Continued on next page)

TOWOLDMON0005706
WATER_PCB-00002216

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

PHOSPHORUS TRICHLORIDE—INORGANIC DIVISION

Molecular Weight: 137.35

Formula: PCl_3

Typical Analysis: Water-white liquid; assay 99.75% PCl_3; Sp. Gr. 15.5°C./15.5°C. 1.586; distillation range °C.: first drop 74.8, 1–96 ml 0.9, dry point 76.0.

Uses: A chlorinating agent and catalyst in the preparation of various intermediates and dyestuffs; reagent in the preparation of acetic anhydride, organic phosphates, germicides and medicinals; manufacture of phosphorus oxychloride and phosphorus pentachloride; in producing iridescent metallic deposits. CAUTION: Care must be exercised in handling this product. Reacts with water. Avoid breathing its vapors. Avoid contact with the skin.

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: White flakes.

Specifications: Solubility in benzene (1:20) clear. Assay 99.5% min.; C.P. 130.8°C. min.

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: 605-lb. nickel drums.

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

plastics, adhesives

"LAUXEIN" 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 glues used in the manufacture of plywood, furniture, case goods of all types. Also used in Monsanto's patented No-Clamp Process for mating 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 AND MELAMINE; PHENOLIC 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 and impregnating adhesives and glues for furniture, plywood and aircraft. Used for hot and cold pressing and for radio frequency equipment. 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

"LYTRON" SAND CONDITIONER—PLASTICS DIVISION

Standard Form: Finely divided, pale yellow powder.

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.

"LYTRON" STYRENE—PLASTICS DIVISION

Standard Form: Powders or latices.

General Properties and Performance Characteristics: "LYTRON" latices form the basis of post-plasticized styrene system for water-base paints and coatings. "Lytron" 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 and coatings. Treating resin for industrial uses such as battery separators, rubber compounding and additives for emulsion waxes.

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TOWOLDMON0005707
WATER_PCB-00002217

Containers: Drums, tank trucks 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.

"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, tear strength and resistance to weathering and ageing.

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 Form: Resin solutions.

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: Solutions—55-gal. nonreturnable drums.

Shipping Classification: Solutions—(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, faster cure, better gloss.

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

Containers: Nonreturnable steel drums, tank cars and tank trucks.

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) 50% solids solution for baked enamel, industrial finishes (designated P97), and wire coating enamels (designated 455B).

General Properties and Performance Characteristics: (a) Shell molding resins permit high production, close tolerances and superior finish. Core binder resins can increase foundry core making up to 50%. (b) Good heat and chemical resistance, insulation and strength. (c) When properly cured, coatings formulated with "Resinox" P97 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 urea 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, wire coating enamel, etc. (d) Bonding material (with Resimene melamine resin) for glass and rock wool thermal and acoustical insulation and other industrial applications.

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

Shipping Classification: Synthetic resins; varnish or liquid glue—varies according to type and use. (Varnish—red 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" for film and sheeting. Heat and light stability and chemical resistance, as well as extraordinary durability, recommend "Opalon" resins for profile extrusions. Quick and uniform dispersion of "Opalon" 410 paste resins by simple stir-in process yields low viscosity plastisols that produce tough, abrasion-resistant film and coatings with exceptional water and chemical resistance. Color stability, toughness and high pigment and filler "loadability" realized with "Opalon" copolymers in flooring and phonograph record uses.

Uses: Calendered film and sheeting "Opalon" 300 FM and "Opalon" 330 FM recommended for fast blending and easy processing ability in various extrusions including garden hose, welting, belting, gasketing and assorted profile

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shapes. Widely used for wire coating. "Opalon" 410 for plastisol applications include textile and paper coatings, slush molding, dipping, film castings, flooring, expanded products like foams and sponges. "Opalon" 306B resin was specially developed for flexible vinyl flooring, vinyl-asbestos flooring and "Opalon" 510 for phonograph records

Containers: Multiwall bags.

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

Literature: Data Sheets; Product Information Bulletins.

"ORIZON" POLYETHYLENE — PLASTICS DIVISION

Standard Forms: Comes in pelleted form, natural or colored. May be extruded as film and sheeting, pipe, tubing and numerous profile shapes. Can be calendered into film and sheeting and laminated immediately or in subsequent operation.

General Properties and Performance Characteristics: Practical application range extends from +90°C. to below −75°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, it is easily processed into a wide range of colors.

Uses: Extruded piping, tubing, wire coating and sheathing, profiles and filaments. Laminated coating for paper, plastic films, metal foils and textile fabrics or as an adhesive between such materials.

Containers: Multiwall bags.

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

Literature: Product Information Bulletins; Data Sheets.

"RESIMENE" MELAMINE — PLASTICS DIVISION

Standard Forms: Soluble, spray-dried powders for laminating paper, cloth and fibers.

General Properties and Performance Characteristics: Produces tough, durable, decorative surfaces in an unlimited color range, that will not stain or discolor, resists scratching, cleans easily.

Uses: In mar-resistant decorative laminates for furniture, counter tops, etc.

Containers: Fiber drums.

Shipping Classification: Glue, dry, NOIBN.

Literature: Data Sheets; Product Information Bulletins.

"RESINOX" PHENOLIC — PLASTICS DIVISION

Standard Forms: Supplied as solutions, applied as laminating, bonding, impregnating resins for paper, fibers.

General Properties and Performance Characteristics: Provides strong, heat-resistant (up to 300°F.) bonds that are also 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 10P—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 and Sheeting)* — PLASTICS DIVISION

Standard Forms: Flexible film, embossed or plain, in thickness up to 20-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 growing tool and an important aid to farmers seeking a waterproof, weather-resistant silage cover. Industrial uses include moisture vapor barriers, electrical tapes. Also used in the manufacture of electrolyte molds, printing plates, drawing instruments, light-diffusing panels, calculators, lamp shades and Christmas lighting displays.

Containers: Fiber boxes. Jumbo rolls furnished on request.

Shipping Classification: Plastic film other than cellulose, not exceeding .020" in thickness.

Literature: Data Sheets, specialty application bulletins.

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"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. 21½" x 51½" untrimmed), and in calendered rolls of standard widths up to 51½". 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, filing tabs, diagrammatic drawings, fabricated parts and transparent windows.

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 8½" 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 as "Lustrex" Hi-Flow 77 (regular flow), "Lustrex" Hi-Flow 66 (medium flow), "Lustrex" Hi-Flow 55 (soft flow); 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 and nontoxic. An excellent electric insulator. Hi-Flow 77 is satisfactory up to 180°F. Hi-Flow 66 was developed for thin-thick molded sections. "Lustrex" Hi-Flow 55 has excellent plasticity, flows fast and sets fast. "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. Hi-Heat 99A offers medium heat resistance up to 193°F. with excellent flow properties. "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.

MONSANTO POLYETHYLENE— PLASTICS DIVISION

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

General Properties and Performance Characteristics: Practical application range extends from +90°C. to below −75°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, it is easily processed into a wide range of colors.

Uses: Housewares, toys, packaging, industrial parts, bottles, vials and closures, molded liners.

Containers: Multiwall bags.

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

Literature: Product Information bulletins; Data Sheets.

"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, 300 FM and 330 FM 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" 510 Copolymer developed for phonograph record compounds.

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Containers: 50-lb. multiwall paper bags.

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

"RESIMENE" 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, and high arc resistance.

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.

"RESINOX" PHENOLIC—PLASTICS DIVISION

Standard Forms: Thermosetting materials supplied as molding compounds with various fillers. Particularly suitable for compression, transfer and plunger molding. Six types of "Resinox" resins are supplied: general purpose, impact-resistant, electrical grade, arc-resistant, heat-resistant, and closure compounds.

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, washing machine agitators, radio cabinets and automotive ignition parts and special purpose compounds.

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.

"LYTRON" STYRENE—PLASTICS DIVISION

Forms Supplied: "Lytron" S-1 and S-2. As water dispersion and unplasticized styrene.

General Properties and Performance Characteristics: Gives woolens, rayon and cottons slip resistant finishes.

Uses: Textile treating resins that furnish durable finishes 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: 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: A melamine resin to give wet strength to 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" 40 UREA-FORMALDEHYDE —PLASTICS DIVISION

Standard Forms: Dry, finely divided powder.

General Properties and Performance Characteristics: A urea resin to give wet strength to 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.

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Uses: Paper manufacturing.

Containers: Polyethylene-lined multiwall bags and lever paks 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.

"STYMER" VINYL, STYRENE — PLASTICS DIVISION

Standard Forms: "Stymer" LF is vinyl resin, soluble with ammonium hydroxide; "Stymer" S is styrene resin, soluble in water.

General Properties and Performance Characteristics: Outstanding sizing for solution-dyed yarns, filament yarns, and acetate rayons.

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.

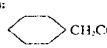
Uses: Suggested for ceramic glazes; phosphate glasses; polishing agent.

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 in* evaporated milk, nutrient solutions; medicinals, soluble 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_3 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 values 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, mobile, fire-resistant hydraulic fluid with excellent lubricity and pumping characteristics; noncorrosive, extremely stable to both heat and air.

(Continued on next page)

0556931

TOWOLDMON0005712
WATER_PCB-00002222

Uses: Hydraulic fluid in die casting machines, hydraulic presses, automatic welding machines and similar applications.

Containers: 55-gal. steel drums.

Shipping Classification: Hydraulic Systems Fluids, other than petroleum.

Literature: "Pydraul F-9," Technical Bulletin; "Pydraul F-9 for hydraulic equipment operating near possible sources of ignition," booklet.

"PYDRAUL 60" FUNCTIONAL FLUID

—ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: A clear, blue, oily, fire resistant hydraulic fluid with excellent lubricating and pumping characteristics; highly resistant to mechanical shear and breakdown, inert to the common metals of construction, and having good viscosity index properties.

Uses: Hydraulic fluid in systems requiring low viscosity.

Containers: 55-gal. drums.

Shipping Classification: Chemicals NOIBN.

Literature: Technical Bulletin O-D-601.

"PYDRAUL 150" FUNCTIONAL FLUID

—ORGANIC DIVISION

Standard Form: Liquid.

Typical Analysis: Moisture 0.25% max.; neutralization number acid 0.15 max.; Sp. Gr. 1.115–1.135 at 25°/25°C.

General Information—Properties: A light amber, fire-resistant hydraulic fluid of low viscosity with excellent lubricity and low temperature pumping characteristics; non-corrosive, extremely stable to both heat and air.

Uses: Fire-resistant hydraulic fluid in equipment which operates out of doors at low temperatures part or all of the time; such as Askania Regulating Equipment, fork-lift trucks and Ross carriers.

Containers: 55-gal. steel drums and 5-gal. cans.

Shipping Classification: Hydraulic Systems Fluids, other than petroleum.

Literature: "Pydraul 150" data sheet.

"PYDRAUL 600" FUNCTIONAL FLUID

—ORGANIC DIVISION

Standard Form: Liquid.

Typical Analysis: Moisture 0.15% max.; neutralization number acid 0.15 max.; Sp. Gr. 1.35–1.37 at 25°/25°C.

General Information—Properties: A light amber, fire-resistant hydraulic fluid of high viscosity with excellent lubricity and pumping characteristics; non-corrosive, extremely stable to both heat and air.

Uses: Fire-resistant hydraullc fluid in equipment requiring a high viscosity medium; such as in large forging presses, extrusion presses, and die casting machines.

Containers: 55-gal. steel drums and 5-gal. cans.

Shipping Classification: Hydraulic Systems Fluids, other than petroleum.

Literature: "Pydraul 600" data sheet.

"PYDRAUL AC" FUNCTIONAL FLUID

—ORGANIC DIVISION

Standard Form: Liquid.

Typical Analysis: Neutralization number acid 0.05; Sp. Gr. 1.35 at 60°/60°F.

General Information—Properties: A light amber, mobile, fire-resistant air compressor lubricant with excellent lubricity; noncorrosive, extremely stable to heat and air.

Uses: Fire and explosion resistant lubricant for air compressors; such as those used in gas transmission booster stations, ammonia synthesis plants, and process plants.

Containers: 55-gal. steel drums and 5-gal. cans.

Shipping Classification: Chemicals NOIBN.

Literature: "Pydraul AC" Monsanto Technical Bulletin MO ODB-56-27.

"PY-RAN" ANHYDROUS MONO CALCIUM PHOSPHATE—INORGANIC DIVISION

Molecular Weight: 234.17

Formula: $CaH_4P_2O_8$ or $CaH_4(PO_4)_2$

General Information—Properties: An anhydrous mono calcium phosphate used as an acid component for leavening agents in self-rising flours and corn meal, also baking powders and prepared mixes. Conforms with all Federal and State Pure Food Laws.

Containers: 100-lb. bags.

Shipping Classification: Phosphate of Calcium.

REODORANTS, RUBBER—ORGANIC DIVISION

(Also see Vanillin and Coumarin)

General Information—Properties: Monsanto provides, but does not manufacture, the following types of rubber reodorants for the convenience of its customers.
CURODEX NO. 19—Pale yellow liquid; deodorizes; 0.15–0.20 lbs. used in 100 lbs. of rubber.
CURODEX NO. 188—Pale yellow liquid; odor, lily; 0.20–0.50 lbs. used in 100 lbs. of rubber.
CURODEX NO. 198—Pale yellow liquid; odor, musk; 0.20–0.50 lbs. used in 100 lbs. of rubber.

Containers: 5-lb. bottles.

"REZGARD"—INORGANIC DIVISION

Standard Form: A white, water-soluble crystalline powder.

General Information—Properties: An alkaline mixture of flame-retarding chemicals to give proper balance to flame extinguishing, elimination of afterglow and retention of tensile strength. It is used for treatment of all types of cellulose fabrics.

Uses: Fire retardant for textiles.

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

Shipping Classification: Chemicals NOIBN.

Literature: "Monsanto Rezgard," Technical Bulletin I-28.

"REZ" WOOD SEALER AND PRIMER (Clear)

—ORGANIC DIVISION

General Information—Properties: A synthetic resin primer and sealer. Provides a penetrating, preserving and protective "seal" for all wood surfaces, especially soft woods; Douglas Fir Plywood, pine, cedar, etc. Controls grain raise; minimizes moisture absorption and checking; equalizes fiber density and gives hard, uniform surface for smooth, easy, economical and durable finishes with paint, enamel or stain. One gallon covers approx. 600 sq. ft.

0556932

TOWOLDMON0005713
WATER_PCB-00002223

Uses: A primer and sealer under wax or varnish for high-grade finish for new or old floors. Eliminates dusting when applied to bare concrete floors.

Containers: 50-gal. drums; 5-gal. cans; 1-gal. cans (6/case); 1-qt. cans (12/case); 1-pt. cans (24/case).

Shipping Classification: Wood Filler Liquid.

Literature: Rez Color Card Folder.

"REZITE" CLEAR EXTERIOR FINISH

— ORGANIC 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."

SACCHARIN, U.S.P.

(Also known as saccharin insoluble, and ortho-sulfobenzimide) — ORGANIC DIVISION

Molecular Weight: 183.18

Formula:



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.

Shipping Classification: Chemicals NOIBN.

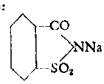
Literature: "Saccharin Monsanto, the Perfect Sweetener," folder; "Recipes enjoy the sweet things of life with Saccharin," booklet of saccharin-sweetened food recipes.

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.

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.

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.

TOWOLDMON0005714
WATER_PCB-00002224

"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: 200 and 100-lb. fiber drums.

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 typical white salt cake. The 98–99% grade is a special material having a brownish color and Na_2SO_4 content of approximately 99%.

Uses: Manufacture of sulfate pulp, glass, sodium sulfide, treatment of boiler feed waters.

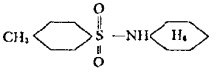
Containers: Bulk car loads.

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.

General Information—Properties: "Santicizer" 1-H is a solid plasticizer which is relatively light stable and of a low order of toxicity. It is soluble in alcohol, esters, ketones, aromatic hydrocarbons and vegetable oils. It is insoluble in water. It is compatible with a wide variety of resins including most of the cellulosic and vinyl resins.

Uses: "Santicizer" 1-H is used in special crystallizing finishes, paper coatings, textile coatings and adhesives. It is a useful plasticizer in nitrocellulose lacquers, imparting a relatively sharp softening point. It is also used to incorporate incompatible components such as paraffin wax for producing special coating effects such as crystallizing lacquers. For improved adhesion where flexibility in nitrocellulose is required, it is used in combination with dibutyl phthalate or "Santicizer" 160. It improves the moisture resistance of cellulose acetate and improves flexibility, hardness and light stability of ethyl cellulose. It is compatible with and imparts good flexibility to shellac and kauri resin.

Containers: 280-lb. Iverpaks.

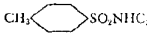
Shipping Classification: Resin Plasticizer.

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

"SANTICIZER" 3 PLASTICIZER — ORGANIC DIVISION
(N-Ethyl para-Toluene Sulfonamide)

Molecular Weight: 199.27

Formula:



Standard Form: Crystalline solid.

Specifications: Practically white crystalline solid; C.P. 58.0°C. min.; acidity (as acetic acid) 0.10% max.; Sp. Gr. 1.166–1.176 at 65°/65°C.

Uses: "Santicizer" 3 is a solid, sulfonamide type plasticizer. Its compatibility with commonly used resins is limited but is widely used in combination with other plasticizers. Either in combination or alone it imparts high gloss, toughness and hardness. It sharpens the softening point of some thermoplastics, especially the cellulose esters. Its use makes possible such products as heat sealing lacquer coatings and adhesives. It is compatible with cellulose acetate to the extent of 50 parts per 100 parts of resin. In addition to its effect on toughness and gloss, it improves the flow of molding compositions and lowers moisture permeability. Its compatibility with polyvinyl formal is approximately the same as with cellulose acetate and its use improves flow and imparts excellent gloss.

Containers: 430-lb. steel drums.

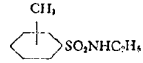
Shipping Classification: Resin Plasticizer.

Literature: "Monsanto Plasticizers", 64-page booklet; "Santicizer 3," Technical Bulletin O-81.

"SANTICIZER" 8 PLASTICIZER — ORGANIC DIVISION
(Mixture of N-Ethyl-ortho- and para-Toluenesulfonamides)

Molecular Weight: 199.27

Formula:



Standard Form: Liquid.

Specifications: Light yellow, viscous liquid; odor slight, characteristic; unsubstituted amide 9–13%; acidity (as acetic acid) 0.05% 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 45°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: 530 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.

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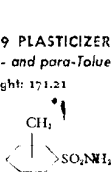
TOWOLDMON0005715
WATER_PCB-00002225

"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 ether 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.

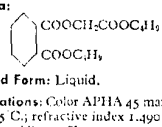
Literature: "Monsanto Plasticizers," 64-page booklet.

"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.

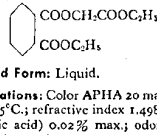
Literature: "Monsanto Plasticizers," 64-page booklet.

"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: 535-lb. steel drums.

Shipping Classification: Resin Plasticizer.

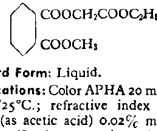
Literature: "Monsanto Plasticizers," 64-page booklet.

"SANTICIZER" M-17 PLASTICIZER — ORGANIC DIVISION

(Methyl Phthalyl Ethyl Glycolate)

Molecular Weight: 266.24

Formula:



Standard Form: Liquid.

Specifications: Color APHA 20 max.; Sp. Gr. 1.223 ±0.005 at 25°/25°C.; refractive index 1.504 ±0.002 at 25°C.; acidity (as acetic acid) 0.02% max.; odor, slight characteristic; sulfur (copper-strip test) negative.

General Information—Properties: A solvent for both nitrocellulose and cellulose acetate; imparts a high degree of plasticity undiminished even in extremely thin films exposed to air currents for a long time. Very light-stable and may be used in transparent or tinted articles without danger of yellowing. Not miscible with castor, linseed, or china wood oils or with petroleum hydrocarbons, readily miscible with other organic solvents; solubility in water 0.09% at 30°C. but imparts a considerable degree of resistance to moisture penetration to both nitrocellulose and cellulose-acetate films.

Uses: Probably the best cellulose-acetate plasticizer available. Dissolves "Santolite" resins, and as both are very resistant to petroleum products and compatible with so

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TOWOLDMON0005716
WATER_PCB-00002226

many film-forming materials, they make an excellent combination 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 DIVISION

Standard Form: Liquid.

Specifications: Clear mobile liquid; color APHA 40 max.; Sp. Gr. 1.208 ±0.005 at 25°/25°C.; refractive index 1.560 ± 0.010 at 25°C.; acidity (as H_3PO_4) 0.01% max.

General Information—Properties: An essentially odorless and colorless liquid plasticizer; B.P. approx. 258°C. at 10 mm.; pour point —37°C. approx.

Uses: Quite similar to tricresyl phosphate in that it imparts flame retardance, excellent permanence and chemical stability and equal heat and light stability; gives better low-temperature characteristics and abrasion resistance; is a stronger solvent and slightly more efficient than tricresyl phosphate.

Can be used wherever tricresyl phosphate is used. Improved flexibility imparted by "Santicizer" 140 makes it preferable to tricresyl phosphate in many applications such as vinyl sheeting, lacquers and paper coating. Considerably more compatible than tricresyl phosphate with cellulose acetate. It is a liquid, making it much easier to handle than triphenyl phosphate. Therefore, has found considerable use in cellulose acetate, especially when used in conjunction with other active plasticizers.

Other resins with which it is useful are cellulose nitrate, ethyl cellulose, cellulose acetate-propionate, polyvinyl formal and polyvinyl butyral.

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

Shipping Classification: Resin Plasticizer.

Literature: "Monsanto Plasticizers," 64-page booklet; "Santicizer 140," Technical Bulletin O-88.

"SANTICIZER" 141 PLASTICIZER—ORGANIC DIVISION

Standard Form: Liquid.

Specifications: Color APHA 100 max.; odor, slight characteristic; Sp. Gr. 1.089–1.093 at 25°/25°C.; refractive index 1.507–1.510 at 25°C.; acidity (as H_3PO_4) 0.01% max.

General Information—Properties: "Santicizer" 141 combines into one compound the nonflammability of tricresyl phosphate, and the efficiency and permanence of older vinyl plasticizers. Imparts superior low-temperature flexibility, improved abrasion and moisture resistance and good electrical properties. Gives excellent resistance to embrittlement and deterioration to polyvinyl-chloride compositions which are exposed to sunlight. Compatible in amounts up to and including 300 parts of plasticizer per 100 parts of resin.

Uses: A flame-retardant plasticizer developed by Monsanto especially for use in vinyl plastics. Excellent for use in polyvinyl-chloride films, sheets, extrusions, moldings, organosols and plastisols—in any application where an efficient, permanent, flame-retardant plasticizer is required. Especially recommended in making flexible films for curtains, aprons, rainwear, and hospital sheeting, or soft, pliable coatings for tablecloths, upholstery and draperies. "Santicizer" 141 possesses low toxicity and is suitable 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.

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

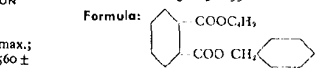
Shipping Classification: Resin Plasticizers.

Literature: "Monsanto Plasticizers," 64-page booklet; "Santicizer 141," Technical Bulletin O-89.

"SANTICIZER" 160 PLASTICIZER—ORGANIC DIVISION
(Butyl Benzyl Phthalate)

Molecular Weight: 312.35

Formula:



Standard Form: Liquid

Specifications: Color APHA 40 max.; Sp. Gr. 1.113–1.121 at 25°/25°C.; acidity (as phthalic acid) 0.02% max.

General 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.

Uses: 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 acrylics. Superior to many of the commonly used plasticizers in its permanence, oil resistance, flexibility and stability.

An excellent vinyl plasticizer where stability and flexibility are desired. Because of its high plasticizing efficiency, it is of outstanding value in increasing output of processing equipment such as extruders and calenders. Used successfully in vinyl organosols which are useful in the coating and free film field.

Very effective in cellulosic lacquers, imparting toughness, flexibility, low-moisture vapor transfer; has good permanence and heat and light stability. An excellent plasticizer for polyvinyl butyral and for low molecular weight polystyrene 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" 213 PLASTICIZER—ORGANIC DIVISION

Standard Form: Liquid.

Product Description: Water-white liquid; very slight odor; Specific Gravity 1.040–1.045 at 25°/25°C.; Acid value, 0.33 meq./100 gms.

Uses: Low-cost primary plasticizer for polyvinyl chloride. "Santicizer" 213 has the unique ability to reduce "surface tack" of vinyl surfaces. It is of special value in plastisol formulations—contributes low initial viscosity, slow viscosity build-up, and fast fusion in a *single* plasticizer. "Santicizer" 213 improves mold release in plastisol molded vinyls.

Containers: Tank cars; 55-gallon drums.

Shipping Classification: Resin Plasticizer.

"SANTICIZER" 602 PLASTICIZER *(Iso Octyl Iso Decyl Phthalate)*—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.

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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 PLASTICIZER (*Butyl Decyl Phthalate*) — 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.

"SANTICIZER" 606 PLASTICIZER — ORGANIC DIVISION

Standard Form: Liquid.

Specifications: Clear oily liquid free of sediment and turbidity; odor is characteristically mild; color, APHA 100 maximum; Specific Gravity, 1.004 to 1.014 at 25°/25°C.

Uses: A low cost, premium quality plasticizer for vinyl-asbestos and flexible vinyl floor tile formulations. "Santicizer" 606 imparts fast fusion, resistance to staining resistance to greases, oils, alkalis, and soapy water, also improved dimensional stability and flexibility.

Containers: Tank cars; tank trucks.

Shipping Classification: Resin Plasticizer.

Literature: Technical Data Sheet "SANTICIZER" 606.

"SANTICIZER" 611 PLASTICIZER — ORGANIC DIVISION

Standard Form: Liquid.

Product Description: Clear oily liquid free of sediment and turbidity; acidity, 0.02% maximum (as phthalic acid); odor is characteristically mild; color, APHA 75 maximum; Specific Gravity 1.029 to 1.039 at 25°/25°C.

Uses: A low cost premium quality plasticizer for vinyl-asbestos and flexible vinyl floor tile formulations. "Santicizer" 611 imparts high resistance to staining, oil, grease, and kerosene extraction. "Santicizer" 611 is recommended for plastisols, extrusions, and sheeting for its good flexibility, rapid fusion, and excellent resistance to grease, oil, and kerosene extraction.

Containers: Tank cars; tank trucks.

Shipping Classification: Resin Plasticizer.

Literature: Technical Data Sheet "SANTICIZER" 611.

"SANTICIZER" 613 PLASTICIZER — ORGANIC DIVISION

Standard Form: Liquid.

Product Description: Clear oily liquid free of sediment and turbidity; acidity, 0.02% maximum (as phthalic acid); odor is characteristically mild; color, APHA 50 maximum; Specific Gravity, 1.005 to 1.065 at 25°/25°C.

Uses: A low-cost, quality plasticizer for vinyl-asbestos and flexible vinyl floor tile formulations. It contributes excellent resistance to staining, oil, grease, and kerosene extraction. "Santicizer" 613 is recommended for use in plastisols, extrusions, and sheeting to impart good color, flexibility, rapid fusion, and high resistance to grease, oil, and kerosene extraction.

Containers: Tank cars; tank trucks.

Shipping Classification: Resin Plasticizer.

Literature: Technical Data Sheet "SANTICIZER" 613.

"SANTOBRITE" SODIUM PENTACHLOROPHENATE, TECHNICAL — ORGANIC DIVISION

Molecular Weight: 288.36

Formula:



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 Im-

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pregnated 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 gms. in 100 cc. H_2O) 3.5–4.0.
*Volatile portion is water, alcohol and acetaldehyde.

General Information—Properties: Colors, white-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; bulking agent for dry powders, free-flowing and anticaking agent for dry powders; insecticide for stored industrial grains; application aid for rubber cements; reinforcing agent for silicone rubbers; bodying agent to make lubricating greases; dry grinding aid for DDT and other sticky powders; to raise heat distortion point, as in molded brake linings; mold lubricants for hard rubber; bodying agent for paint removers; antisettling agent for pigments; antislip agent in paste floor waxes; flatting agent for free film and textile coatings. Imparts thixotropy properties to polyester and epoxy resins dispersions and solutions.

Grades: "Santocel" 54, "Santocel" C, "Santocel" CX, "Santocel" CS, "Santocel" DCS, "Santocel" CF (unground, crude).

Containers: Multiwall bags, 5 ply, net wt. 20-lbs. for 54, 25-lbs. for C, CS and DCS, 15-lbs. for CX.

Shipping Classification: Insulating Material NOIBN.

Literature: "Santocel for Industrial Applications," and "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 insulation grades of "Santocel": SiO_2, 93.0–96.0%; volatile* 0.5–1.5%; Na_2SO_4, 2.5–3.5%; Fe_2O_3 and Al_2O_3, 1%.
*Volatile is water, alcohol, acetaldehyde.

General Information—Properties: Known technically as a silica aerogel, it possesses the lowest coefficient of thermal conductivity known. Dry bulk density: "Santocel" A, 5-lbs. per cu. ft.; absolute density 17.1 lbs. per gal.; specific heat 0.234; angle of repose 12.5°; thermal conductivity (mean temp. 60°F.) 0.150 BTU/Hr./Ft.²/in./°F.

Uses: Adapted for any use where efficiency or space saving is a factor in thermal insulation, especially in freezers, shipping containers, insulated trucks, trailers and freight cars, liquid oxygen manufacture and storage, and cold-storage room doors.

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 a 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. 3-4 (approx. rice-size granules)—A combination of two uniformly sized crystals. For shaker top cans and for compressing into cakes.
No. 814—80% min. between 8 and 16 mesh.
Blocking mix—Mixture of sizes under 7 mesh.
Fines—Mixture of sizes less than 16 mesh.

Containers: 200 and 100-lb. fiber drums.

Shipping Classification: Paradichlorobenzol.

Literature: "Santochlor for the Control of Peach Tree and Stone Fruit Borers," Technical Bulletin O-18; "Santochlor for Clothes 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 250 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%.

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WATER_PCB-00002229

Uses: Sludge inhibitor for fuel oils to prevent burner screen clogging and reduce rusting. Concentrations as low as 0.002% have been used satisfactorily.

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

Shipping Classification: Petroleum Oil NOIBN.

"SANTOLENE H" FUEL OIL ADDITIVE

—ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: A liquid having the following typical properties: Viscosity of 9.59 centistokes at 100 F.; flash point 240 F.; specific gravity 160°/60°F. of 0.829.

Uses: Sludge inhibitor for fuel oils to prevent burner screen and filter clogging and reduce rusting. Concentrations as low as 25 pounds per 1000 barrels of fuel oil have been used satisfactorily.

Containers: 55 gallon black iron drums—tank cars.

Shipping Classification: Chemicals NOIBN.

Literature: "Santolene H" Technical Bulletin 0-87.

"SANTOLENE J" FUEL OIL ADDITIVE

—ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: An amber colored liquid having the following typical properties: Viscosity of 1.30 centistokes at 210°F.; flash point 200°F.; specific gravity at 60°/60°F. of 0.840.

Uses: Fuel oil stabilizing agent designed to prevent color degradation and sediment formation and reduce rusting in fuel oils. A concentration of 25 pounds per 1000 barrels is satisfactory for most base oils.

Containers: 55 gallon black iron drums—tank cars.

Shipping Classification: Chemicals NOIBN.

Literature: "Santolene J"—Technical Bulletin 0-97.

"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; 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" 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 203C" OIL ADDITIVE

—ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: A more concentrated (10% Barium) form of Santolube 203A and 203B. Saybolt Universal viscosity of 450 seconds at 100°F.; Barium concentration 10%; specific gravity 60°/60°F. of 0.981.

Uses: A detergent-dispersant additive designed primarily for use in motor oils. When used with suitable anti-oxidents and corrosion inhibitor (Santolube 393) it is recommended for compounding Heavy Duty Oils of the MIL-L-2104A type. Also recommended for Supplement I and I-G formulations.

(Continued on next page)

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Containers: 55 gallon black iron drums—tank cars.

Shipping Classification: Petroleum Oil NOIBN.

Literature: "Santolube 203C"—Technical Bulletin.

"SANTOLUBE 215" OIL ADDITIVE—ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: A liquid with the following typical properties: Viscosity 155 centistokes at 100°F.; Flash Point 380°F.; Barium 7.2-7.8%; Sulfur 2.70-3.0%; Phosphorus 0.53-0.59%; Zinc 0.56-0.60%.

Uses: One of a number of Monsanto's detergent-dispersant, inhibitor-type additives for motor oils. Recommended for compounding Heavy Duty Oils of the MIL-L-2104-A type.

Containers: 55 gallon black iron drums—tank cars.

Shipping Classification: Petroleum NOIBN.

Literature: Santolubes—Technical Bulletin.

"SANTOLUBE 333" OIL ADDITIVE—ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: A liquid with the following typical properties: Viscosity at 210°F. of 11.0 centistokes; Flash Point 360°F.; Gravity 60°/60°F. of 1.01; Barium Concentration of 10%.

Uses: A detergent-dispersant additive designed primarily for use in Heavy Duty Motor Oils. Recommended for use with Santolube 203C and suitable corrosion inhibitor (Santolube 393) for compounding MIL-L-2104A and Supplement 1 and 1-G oils.

Containers: 55 gallon black iron drums—tank cars.

Shipping Classification: Petroleum Oil NOIBN.

Literature: "Santolube 333"—Technical Bulletin.

"SANTOLUBE 393" OIL ADDITIVE
(Zinc Dihexyl Dithiophosphate)—ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: A liquid with the following typical properties: Viscosity at 100°F. of 150 centistokes flash point 260°F.; specific gravity 60°/60°F. of 1.120.

Uses: An effective and versatile antioxidant and bearing corrosion inhibitor for lubricating oils. Finds wide application in compounding Premium and Heavy Duty Motor Oils. Also effective in gear oils.

Containers: 55 gallon black iron drums—tank cars.

Shipping Classification: Chemicals NOIBN.

Literature: "Santolube 393", Technical Bulletin.

"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-30.

"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 3.7% 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-56.

"SANTOMASK" II ODOR-MASKING AGENT
—ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: Clear, light yellow liquid; pleasant characteristic odor; flash point approx. 210°F. (Cleveland open cup method); flow point below 0°C.; wt. per gal. approx. 8.7 lbs.

Uses: Odor-masking ingredient for interior paints, printing inks and similar products having objectionable natural 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 form 40% active

"Santomerse" 80—neutral flakes 80% (min.) active

"Santomerse" No. 3—neutral powder 100% active

"Santomerse" No. 3—paste (75% "Santomerse" No. 3 in water)

Uses: Highly efficient surface-active wetting, spreading, penetrating, emulsifying agents and detergents used in the following industries: textile, paper, leather, adhesive, rubber, insecticide, dust collection, soap, cosmetic, ceramic, detergent, metal cleaning, plating, emulsions, dyes, pharmaceutical, embalming fluid, laundry, steel, paint, cement, glue, felt, color, etc.

Containers: "Santomerse" No. 1—75-lb. bags; 175, 220 and 225-lb. drums; "Santomerse" 80—200-lb. drums; "Santomerse" No. 3 (powder)—115-lb. drums; "Santomerse" No. 3 (paste)—175 -lb. steel drums.

Shipping Classification: Washing Compound NOIBN.

Literature: "Santomerse No. 1," Technical Bulletin I-118; "Santomerse D, S, No. 3 & No. 3 Paste," Technical Bulletin I-123.

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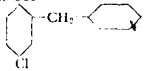
WATER_PCB-00002231

"SANTOPHEN" 1 GERMICIDE
(ortho-benzyl-parachlorophenol, Technical)
— ORGANIC DIVISION

Molecular Weight: 218.6

Formula:



Standard Form: Flaked solid.

Specifications: White to light tan or pink flakes; crystallizing point 45.0 C. min.; Sp. Gr. 1.202–1.206 at 55°/55°C.; free acidity (as HCl) 0.01% max.; odor slight phenolic max.

General Information—Properties: "Santophen" 1 possesses high bactericidal and fungicidal activity, but low toxicity to higher animals. When properly formulated for disinfectant use, it is considered nonirritating in use dilutions. Insoluble in water, but highly soluble in alcohol and other organic solvents; dispersible in aqueous media with the aid of soaps or synthetic dispersing agents. Noncorrosive to most metals or other engineering materials.

Uses: Used as the active principle, or as an enhancing agent for disinfectants.

Containers: 55 and 22-gal. lacquer-lined drums.

Shipping Classification: Disinfectant Other Than Medicinal NOIBN.

Literature: "Santophen I—a Versatile Germicide," booklet.

"SANTOPHEN" I SOLUTION
(75% Santophen I, 25% Isopropanol)
— ORGANIC DIVISION

Standard Form: Liquid.

Specifications: Straw to amber colored liquid; assay 75.0 to 77.0%; Sp. Gr. 1.082 to 1.095 at 15.5°/15.5°C.

Uses: Used as the active principle, or as an enhancing agent for disinfectants. Santophen I Solution is supplied as a convenience to formulators who desire a product that is more readily added to formulations than Santophen I flake and which completely eliminates dusting and caking problems where they exist.

Containers: 55 and 15-gal. drums.

Shipping Classification: Disinfectant other than medicinal NOIBN.

"SANTOPOID 22" GEAR OIL ADDITIVE
— ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: A liquid with the following typical properties: Viscosity 435 SUS at 100°F.; Flash Point 300°F.; sp. gr. 1.129 at 60°/60°F. Typical Analysis: Sulfur 12.0%, Chlorine 16.5%, Phosphorous 3.3%, Zinc 3.5%.

Uses: An outstanding multipurpose gear oil additive. MIL-L-2105 gear oils may be compounded using 5–6%. Gear oils which pass the L-37 high torque test and the Buick 10-A high speed shock test may be formulated using 10–15%.

Containers: 55 gallon black iron drums.

Shipping Classification: Petroleum Oil NOIBN.

Literature: "Santopoid 22", Technical Bulletin 0-129.

"SANTOPOID 22-RI" GEAR OIL ADDITIVE
— ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: A liquid with the following typical properties: Viscosity 690 SUS at 100°F.; Flash Point 300°F.; Specific Gravity 1.135 at 60°/60°F. Typical Analysis: Sulfur 13.3%, Chlorine 14.4%, Phosphorous 4.0%, Zinc 3.6%.

Uses: An outstanding multipurpose gear oil additive modified to give added rust protection. MIL-L-2105 gear oils may be compounded using 6–7%. Gear oils which pass the L-37 high torque test and the Buick 10A high speed shock test may be formulated using 10–15%.

Containers: 55 gallon black iron drums—tank cars.

Shipping Classification: Petroleum Oil NOIBN.

Literature: "Santopoid 22-RI", Technical Bulletin 0-129.

"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" 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" C OIL ADDITIVE— ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: A dark liquid with the following typical properties: Flash Point 360°F.; Viscosity 1020 SUS at 210°F.; Specific Gravity 60°/60°F. 0.910.

Uses: An effective and economical pour point depressant for all types of wax-bearing oils. Effective at concentrations as low as 0.02%.

Containers: 55 gallon black iron drums—tank cars.

Shipping Classification: Petroleum Oil NOIBN.

Literature: "Santopour" C—Technical Bulletin 0-90.

0556941

TOWOLDMON0005722
WATER_PCB-00002232

"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 the Milder Pulping Agent," folder.

"SANTOTAN" KR BASIC CHROME SULFATE — INORGANIC DIVISION

Formula: Contains approx. 50% of $Cr_2(SO_4)_2(OH)_2$

Standard Form: Crystals.

Specifications: Dark green crystals; solution in water (5:500) clear; basicity (Cr_2O_3/SO_3) 101–105; basicity (Schorlemmer) 37.3–39.7; chromium as Cr_2O_3 23.9% min.

Uses: In chrome tanning of calf, cow and horse hides and sheepskins.

Containers: 100-lb. paper bags.

Shipping Classification: Tanning Extract Dry NOIBN.

"SATINWOOD REZ" — ORGANIC DIVISION

General Information—Properties: A synthetic resin base final finish coating with low sheen for interior wood of all types and particularly designed for use over Clear Rez for a natural wood finish; White Rez for "bleached" effect, or for 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 (24/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 minus 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, expansion turbines for air-conditioning systems and the hydraulic system itself in aircraft.

Containers: 475, 45 and 9-lb. drums.

Shipping Classification: Hydraulic system fluids other than petroleum.

Literature: "Skydrol" booklet; "Skydrol" Service Manual.

"SKYDROL 500" FUNCTIONAL FLUID — ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: A clear, purple, mobile fire-resistant hydraulic fluid with excellent lubricity which will operate at temperatures as low as —65°F. Formulated to meet Air Force specification MIL-F-7100.

Uses: Hydraulic fluid for aircraft hydraulic systems which have to operate at —65°F.

Containers: 1, 5, 55 gallon drums.

Shipping Classification: Hydraulic system fluids other than petroleum.

Literature: "Skydrol 500"—Technical Data Sheet OIDB-53-13.

SODIUM ACID PYROPHOSPHATE

(Also known as disodium dihydrogen pyrophosphate and 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 4.2.

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

Grades: Food and commercial. Food grade meets all U. S. and State Pure Food Law requirements.

Containers: 100-lb. bags; 325 and 100-lb. drums.

Shipping Classification: Sodium Phosphate.

0556942

TOWOLDMON0005723
WATER_PCB-00002233

SODIUM BENZOATE—ORGANIC DIVISION

Molecular Weight: 144.11

Formula: C_6H_5COONa



Standard Form: Powder.

Specifications: *U.S.P. Grade:* Thin white flakes or white powder; solubility in water (10:18 at 25°C.) complete; solubility in 95% ethyl alcohol (1:50 at 25°C.) complete; *0.55 ml N to NaOH to 0.20 ml N to HCl per 2.0 grams*; moisture 0.50% max.; assay 99.0% min. (dry basis); chlorides (as NaCl) 0.05% max.; sulfates (as Na_2SO_4) 0.05% max.
Technical Grade: White or slightly tinted powder; assay 99.0% min. (dry basis); solution in water (10:18) essentially complete but slightly inferior to U.S.P. quality; chlorides (as NaCl) 0.6% max.; sulfates (as Na_2SO_4) 0.6% max.

Uses: *U.S.P. Grade:* For preserving foods, tobacco and medicinal preparations.
Technical Grade: As an industrial preservative and rust inhibitor.

Grades: U.S.P. and Technical.

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

Shipping Classification: Sodium Benzoate.

Literature: "Preserving with Monsanto Sodium Benzoate," folder; "Benzoic Acid and the Benzoates," 16-page booklet.

SODIUM BISULFATE *(Nitre Cake)*
—INORGANIC DIVISION

Molecular Weight: 120.07

Formula: $NaHSO_4$
Standard Form: Globular.

Typical Analysis: 37% H_2SO_4 available.

Uses: Used to replace either sulfuric acid or combination of sulfuric acid and Glauber's salt. One hundred lbs. nitre cake is approximately equivalent to 39.8 lbs. 66° sulfuric acid and 147 lbs. Glauber's salt.

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

Containers: 100-lb. polyethylene bags; 100-lb. plywood kegs; 330 and 400-lb. fiber drums; 470-lb. steel drums; bulk carloads.

Shipping Classification: Sodium Bisulfate (Nitre Cake).

SODIUM BISULFITE—INORGANIC DIVISION

Molecular Weight: 104.07 (Solution); 190.13 (Anhydrous).

Formula: $NaHSO_3$ (Solution); $Na_2S_2O_5$ (Anhydrous).

Standard Form: Solution: 33° Bé. containing approx. 21% SO_2; wt. per gal. 10.78 lbs. Anhydrous (sodium metabisulfite): 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 chrome sulfate in tanning; bleaching of vegetable tan extracts; 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 $Na_{16}P_{14}O_{43}$.

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_3; 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.

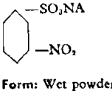
Shipping Classification: Sodium Phosphate, NOIBN.

Literature: *"Sodium Phosphates for Industry,"* booklet.

SODIUM meta-NITROBENZENE SULFONATE, TECHNICAL—ORGANIC DIVISION

Molecular Weight: 225.15

Formula:



Standard Form: Wet powder.

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.

(Continued on next page)

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TOWOLDMON0005724
WATER_PCB-00002234

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, di, 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 sized; quickly soluble in water giving an alkaline reaction; pH of 1% solution 11.8.

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

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

0556944

TOWOLDMON0005725
WATER_PCB-00002235

Grades: Anhydrous.

Containers: Regular—100-lb. paper bags; 300-lb. and 100-lb. drums; Powdered—100-lb. paper bags; 350-lb. and 100-lb. drums.

Shipping Classification: Sodium Phosphate.

Literature: "Tetra Sodium Pyrophosphate," Technical Bulletin I-24.

SODIUM TRIPOLYPHOSPHATE—INORGANIC DIVISION

Molecular Weight: 367.93

Formula: $Na_5P_3O_{10}$

Standard Form: Granules or powder.

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

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

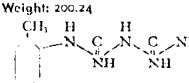
Containers: 100-lb. bags; 350 and 100-lb. drums.

Shipping Classification: Phosphate of Soda.

"SOPANOX" ortho-TOLYL BIGUANIDE
—ORGANIC DIVISION

Molecular Weight: 200.24

Formula:



Standard Form: Powder.

Specifications: White to off-white powder; assay 90% min.; loss on drying 5% max.; melting point 138°C. min.

General Information—Properties: An amino compound effective in minute quantities in restraining the oxidation of soap and the resulting rancidity, discoloration and other adverse qualities, all of which must be avoided in producing a product of highest grade.

Uses: Our experience shows that "Sopanox" satisfies the exacting demands of manufacturers of soaps produced from animal or vegetable oils, filled or unfilled. Particularly valuable in preventing discoloration of refined toilet soaps.

Containers: 140-lb. drums.

Shipping Classification: Chemicals NOIBN.

Literature: "Sopanox," Technical Bulletin O-P-100.

"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 rewetting 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.

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.

TOWOLDMON0005726
WATER_PCB-00002236

"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.

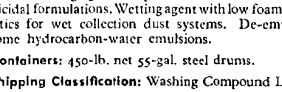
Shipping Classification: Washing Compound Liquid.

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) not over 15 units; free from suspended matter and sediment; assay 99.2-99.6% min.; viscosity 0.87 cps. max. at 25°C.; Sp. Gr. 0.9038-0.9057 at 25/25°C.; refractive index not less n_D 25°C. 1.5434; tertiary butyl catechol 10 ppm. min., 15 ppm. max.; aldehydes (benzaldehyde) 0.02% max.; peroxide (diethyl peroxide) 0.01% max.; chlorine 0.01%; sulfur 0.01% max.; polymer content not greater than 0.20%.

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

Uses: Production of styrene molding compounds; GR-S type synthetic rubber; styrenated oils for surface coating resins; styrene-modified alkyds for air drying and baking finishes; low-pressure laminating resins; dispersions of styrene polymers and copolymers for modifying properties of paper and textiles; ion exchange resins.

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

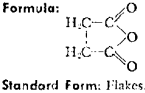
Shipping Classification: Styrene Liquid.

Literature: TX-10 "Styrene Modified Alkyd type resins," TX-11 "Styrene Modified Natural Oils," "A Sketch Book of Profitable Products," "Build a Bigger Business" (summary of end uses).

SUCCINIC ANHYDRIDE — ORGANIC DIVISION

Molecular Weight: 100.07

Formula:



Standard Form: Flakes.

Specifications: White to off-white flakes, crystallizing point 118.0°C. min.; assay 99.0% min.; color (molten)—Barrett 5 max.

Uses: In the manufacture of pharmaceuticals and various resins.

Containers: 250-lb. fiber drums.

Shipping Classification: Dry Intermediate 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 modules 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.

0556946

TOWOLDMON0005727
WATER_PCB-00002237

Shipping Classification: Chemicals NOIBN.

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

SULPHATE OF AMMONIA — INORGANIC DIVISION

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.

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.

"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.

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.

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WATER_PCB-00002238

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.

para-TOLUENESULFONAMIDE

(Also known as para-toluenesulfonic acid amide and para-sulfonamidotoluene) — ORGANIC DIVISION

Molecular Weight: 171.22

Formula:



Standard Form: Crystalline powder. (A refined powder also available.)

Specifications: Light brownish, crystalline powder; crystallizing point (dried material) 135.0°C. min.; ash 0.6% 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; assay 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 esters 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 with a greenish-to-black color; toluenesulfonic acid 94.0% min.; H_2SO_4 1.5% max.; water 3.0% max.; toluene 0.2% max.

General Information—Properties: A mixture of approx. 80% para isomer and 20% ortho isomer.

Uses: In the manufacture of dyestuff intermediates and as a catalyst in certain organic reactions.

Containers: 100-lb. steel drums.

Shipping Classification: Chemicals NOIBN.

1, 2, 4-TRICHLOROBENZENE — ORGANIC DIVISION

Molecular Weight: 181.46

Formula:



Standard Form: Liquid.

General Information—Properties: Clear, essentially colorless liquid; Sp. Gr. 1.448–1.458 at 25.0 /15.5° C.; crystallizing point 16.7 C. min. Distillation range: first drop 212.5 C. min.; 95% 2.0 C. max. Dry point 218.0 C. max.

Uses: 1, 2, 4-Trichlorobenzene is a fairly pure compound as differentiated from trichlorobenzene, technical; used as a chemical intermediate principally in the manufacture of dyestuffs.

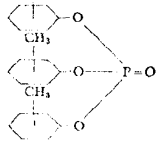
Containers: 55-gal. steel drums.

Shipping Classification: Trichlorobenzene.

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 elec-

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WATER_PCB-00002239

trical properties and imparts flame resistance to the composition. Compatible with most lacquer resins and gives firm, tough, flexible films of excellent weathering qualities.

Containers: 530-lb. and 45-lb. steel drums; tank cars.

Shipping Classification: Resin Plasticizer.

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

TRIETHYLAMMONIUM PHOSPHATE (TEAP)

— INORGANIC DIVISION

Standard Form: Liquid—40% solution in proprietary solvent.

Specifications: Liquid solution; Sp. Gr. 0.97 to 0.99 at 77 F.; flash point approx. 50°F.; pH 4.4 to 4.8.

Uses: An additive for nonaqueous materials for stabilizing corrosive and iron-sensitive liquids in metal containers.

Containers: 55-gal. lacquer lined steel drums.

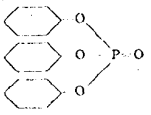
Shipping Classification: Chemicals NOIBN. (Flammable —red label required.)

Literature: "TEAP," leaflet.

TRIPHENYL PHOSPHATE — ORGANIC DIVISION

Molecular Weight: 326.28

Formula:



Standard Form: Flakes.

Specifications: White flakes, faintly aromatic; M.P. 48.5°C. min. start; permanganate test, no change in 30 minutes; acidity (as H_3PO_4), 0.003% max.

General Information—Properties: Miscible with the common solvents and thinners and with vegetable oils; solubility in water 0.001% at 34°C., 0.002% at 54°C.; imparts some moisture resistance to cellulose-acetate films. Retentivity in cast cellulose-acetate films nearly 80%; that is, it can be incorporated in the proportion of 8-10 of acetate without separation and blooming. Imparts good flexibility and gives clear, tough compositions without tendency toward tackiness. One of the most valuable properties of triphenyl phosphate is that of fire retarding. When used alone on cellulose-acetate films an amount of triphenyl phosphate equal to 20% of the cellulose-acetate weight produces films which will not support combustion.

Uses: Chiefly as a plasticizer and fire retardant.

Containers: 225-lb. fiber drums.

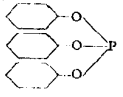
Shipping Classification: Resin Plasticizer.

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

TRIPHENYL PHOSPHITE — ORGANIC DIVISION

Molecular Weight: 310.28

Formula:



Specifications: Light yellow solid or oily liquid; Sp. Gr. 1.179 to 1.183; Free Phenol 0.8% max.; Hydrolyzable chlorine 0.01% max. Color APHA 150 max.; refractive index at 25°C. 1.587 to 1.590.

General Information—Properties: A crystalline solid at slightly below room temperature; at higher temperatures is an oily liquid weighing about 9.85 lbs. per gal.

Uses: A color improver and metal scavenger in alkyd resin production. Also used as a stabilizer in polyvinyl chloride compounds. Monsanto's patent No. 2572571 covers this and resellers and users must be licensed.

Containers: 55 and 5-gal. drums.

Shipping Classification: Chemicals NOIBN.

VANADIUM SULFURIC ACID CATALYST

— ENGINEERING SALES

General Information: Sold in conjunction with complete plants of Monsanto design and also for replacement purposes in any contact plant.

Uses: In manufacture of sulfuric acid by contact process. (Not suitable for other purposes.)

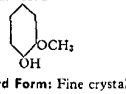
Containers: 50-liter Leverpak.

Shipping Classification: Chemicals NOIBN.

"VANILLIN MONSANTO" (*Vanillin U.S.P.; also known as methylprotocatechuic aldehyde and 3-methoxy-4-hydroxybenzaldehyde*) — ORGANIC DIVISION

Molecular Weight: 152.14

Formula:



Standard Form: Fine crystals.

Specifications: Fine, white crystalline needles; M.P. 81.6°C. min.; no foreign flavor (in sugar solution); loss on drying 0.06% max.; solubility in alcohol (1:2) complete.

Uses: As a flavoring agent in foodstuffs and beverages and as an odorant in rubber.

Containers: 100-lb. fiber drums; 25-lb. metal pails.

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: Liquefied gas inhibited with phenol.

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.

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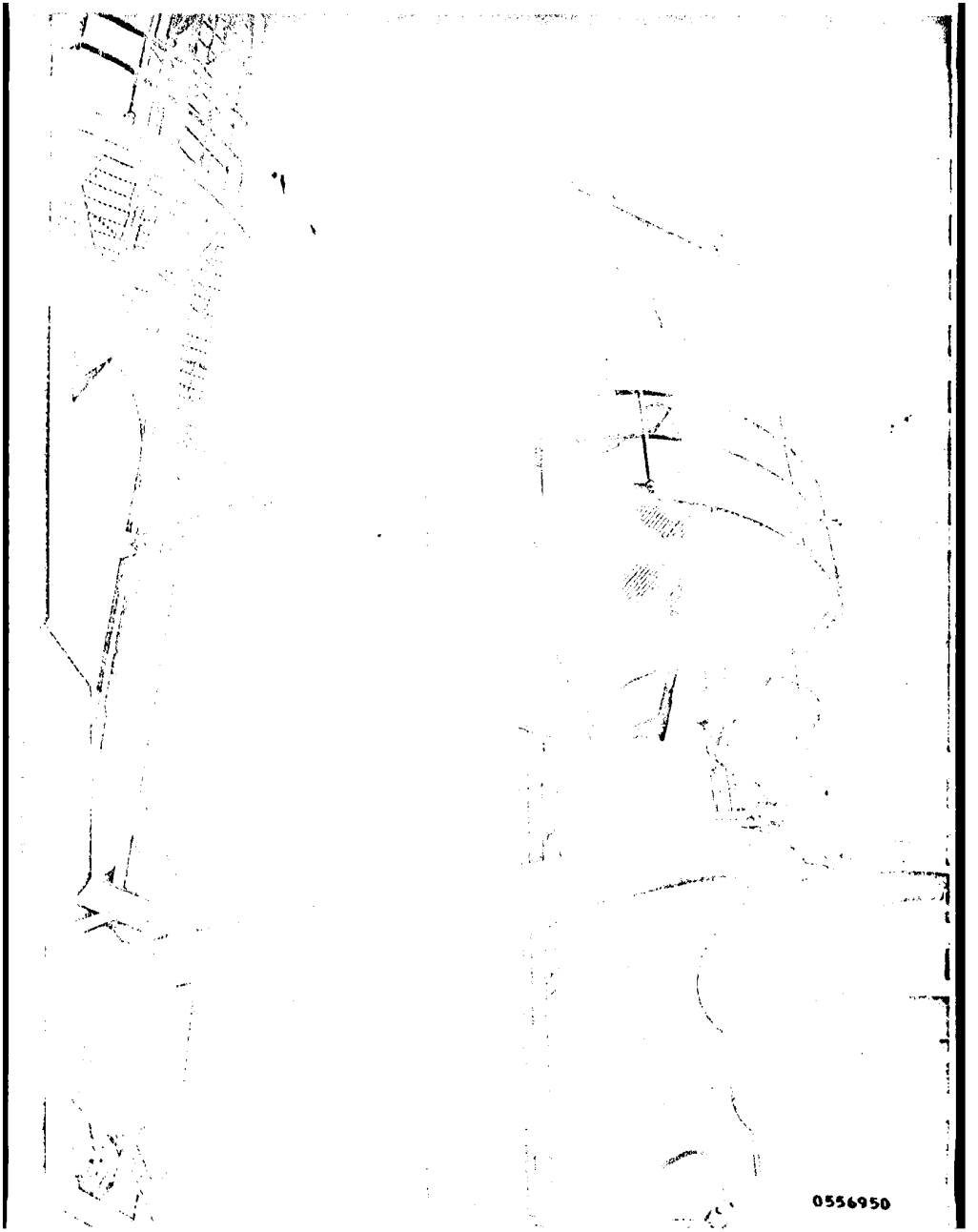
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TESTING LIQUIDS WITH THE BAUMÉ HYDROMETER

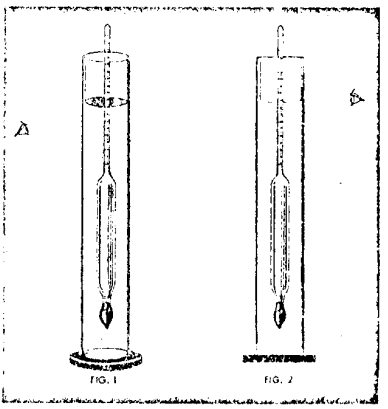
MONSANTO PRODUCTS, when made to a Baumé specification, may vary 0.2° Bé. above but never below the specified strength. The hydrometer used should be of limited range, not more than 10° Bé., and should be at least 10" in length. Its accuracy should be certified by the manufacturer. Our own hydrometers 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

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WATER_PCB-00002242

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 o *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.

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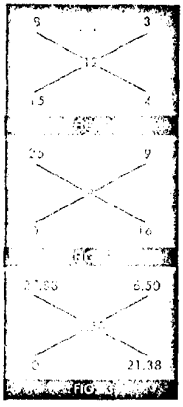
WATER_PCB-00002243

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

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WATER_PCB-00002244

TO CONVERT FROM	MULTIPLY BY: To Cu. In.	To Cu. Ft.	To Cu. Yd.	To Fl. Oz.	To Pint	To Quart	To Gallon	To Cc. (Ml.)	To Liter	To Cu. Meter
Cu. In.	1	$0.0_5 5787$	$0.0_6 2143$	0.5541	0.03463	0.01732	0.004329	16.39	0.01639	$0.0_4 1639$
Cu. Ft.	1728	1	0.03704	957.5	59.84	29.92	7.481	28320	28.32	0.02832
Cu. Yd.	46656	27	1	25850	1616	807.9	202.0	764600	764.6	0.7646
Fl. Oz.	1.805	0.001044	$0.0_3 3868$	1	0.0625	0.03125	0.007813	29.57	0.02957	$0.0_4 2957$
Pint	28.88	0.01671	$0.0_5 6189$	16	1	0.5	0.125	473.2	0.4732	$0.0_3 4732$
Quart	57.75	0.03342	0.001238	32	2	1	0.25	946.4	0.9464	$0.0_3 9464$
Gallon	231	0.1337	0.004951	128	8	4	1	3785	3.785	0.003785
Cc. (Ml.)	0.06102	$0.0_3 3531$	$0.0_4 1308$	0.03381	0.002113	0.001057	$0.0_2 2642$	1	0.001	0.000001
Liter	61.02	0.03531	0.001308	33.81	2.113	1.057	0.2642	1000	1	0.001
Cu. Meter	61020	35.31	1.308	33810	2113	1057	264.2	1000000	1000	1

TO CONVERT FROM	MULTIPLY BY: To Grain	To Oz. Troy	To Lb. Troy	To Oz. Av.	To Lb. Av.	To Gram	To Kilogram
Grain	1	0.002083	$0.0_4 1736$	0.002286	$0.0_4 1429$	0.06480	$0.0_4 6480$
Oz. Troy	480	1	0.08333	1.097	0.06857	31.10	0.03110
Lb. Troy	5760	12	1	13.17	0.8229	373.2	0.3732
Oz. Av.	437.5	0.9115	0.07596	1	0.0625	28.35	0.02835
Lb. Av.	7000	14.58	1.215	16	1	453.6	0.4536
Gram	15.43	0.03215	0.002679	0.03527	0.002205	1	0.001
Kilogram	15432	32.15	2.679	35.27	2.205	1000	1

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

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WATER_PCB-00002245

Per Cent						Per Cent					
Caustic Soda (NaOH)	Equivalent Sodium Oxide (Na_2O)	Degrees Baumé at 60° F. (Am. Std.)	Specific Gravity at 60° F. 60° F.	Lbs. Caustic Per Gal. of Liquid at 60° F.	Grams NaOH per Liter at 60° F.	Caustic Soda (NaOH)	Equivalent Sodium Oxide (Na_2O)	Degrees Baumé at 60° F. (Am. Std.)	Specific Gravity at 60° F. 60° F.	Lbs. Caustic Per Gal. of Liquid at 60° F.	Grams NaOH per Liter at 60° F.
1.00	0.77	1.66	1.012	0.08	10.10	28.00	21.69	34.35	1.310	3.06	366.58
2.00	1.55	3.23	1.023	0.17	20.43	29.00	22.47	35.25	1.321	3.19	382.79
3.00	2.32	4.77	1.034	0.26	30.99	30.00	23.24	36.13	1.332	3.33	399.21
4.00	3.10	6.27	1.045	0.35	41.77	31.00	24.02	36.99	1.342	3.47	415.78
5.00	3.87	7.73	1.056	0.44	52.77	32.00	24.79	37.83	1.353	3.61	432.57
6.00	4.65	9.16	1.067	0.53	63.99	33.00	25.57	38.65	1.363	3.75	449.51
7.00	5.42	10.56	1.079	0.63	75.43	34.00	26.34	39.45	1.374	3.89	466.67
8.00	6.20	11.93	1.089	0.73	87.09	35.00	27.12	40.24	1.384	4.04	483.98
9.00	6.97	13.29	1.101	0.83	98.99	36.00	27.89	41.01	1.394	4.19	501.50
10.00	7.75	14.60	1.112	0.93	111.10	37.00	28.67	41.76	1.404	4.33	519.17
11.00	8.52	15.89	1.123	1.03	123.43	38.00	29.44	42.50	1.415	4.48	537.06
12.00	9.30	17.15	1.134	1.13	135.97	39.00	30.22	43.21	1.425	4.63	555.03
13.00	10.07	18.39	1.145	1.24	148.75	40.00	30.99	43.92	1.435	4.78	573.28
14.00	10.85	19.61	1.156	1.35	161.74	41.00	31.77	44.60	1.444	4.94	591.61
15.00	11.62	20.80	1.167	1.46	174.96	42.00	32.54	45.28	1.454	5.09	610.13
16.00	12.40	21.96	1.178	1.57	188.39	43.00	33.32	45.93	1.464	5.25	628.76
17.00	13.17	23.11	1.190	1.69	202.05	44.00	34.09	46.57	1.473	5.40	647.57
18.00	13.95	24.23	1.201	1.80	215.91	45.00	34.87	47.20	1.483	5.56	666.59
19.00	14.72	25.33	1.212	1.92	230.01	46.00	35.64	47.83	1.492	5.72	685.79
20.00	15.50	26.41	1.223	2.04	244.33	47.00	36.42	48.44	1.502	5.88	705.16
21.00	16.27	27.47	1.234	2.16	258.85	48.00	37.19	49.05	1.511	6.05	724.72
22.00	17.05	28.51	1.245	2.28	273.60	49.00	37.97	49.65	1.521	6.21	744.45
23.00	17.82	29.53	1.256	2.41	288.56	50.00	38.74	50.23	1.530	6.38	764.36
24.00	18.60	30.53	1.267	2.53	303.74	51.00	39.52	50.82	1.540	6.55	784.45
25.00	19.37	31.51	1.278	2.66	319.13	52.00	40.29	51.39	1.549	6.72	804.77
26.00	20.14	32.47	1.289	2.79	334.73	53.00	41.06	51.95	1.558	6.89	825.10
27.00	20.92	33.42	1.300	2.93	350.55						

DATA FOR SODIUM HYDROXIDE SOLUTIONS AT 176°F

Per Cent						Per Cent					
Caustic Soda (NaOH)	Equivalent Sodium Oxide (Na_2O)	Degrees Baumé at 60° F. (Am. Std.)	Specific Gravity at 60° F. 60° F.	Lbs. Caustic Per Gal. of Liquid at 60° F.	Grams NaOH per Liter at 60° F.	Caustic Soda (NaOH)	Equivalent Sodium Oxide (Na_2O)	Degrees Baumé at 60° F. (Am. Std.)	Specific Gravity at 60° F. 60° F.	Lbs. Caustic Per Gal. of Liquid at 60° F.	Grams NaOH per Liter at 60°F.
67.88	52.59	56.9	1.645	9.32	1116.6	71.70	55.55	58.6	1.680	10.05	1204.6
68.43	53.02	57.1	1.650	9.42	1129.1	72.25	55.98	58.9	1.685	10.16	1217.4
68.97	53.44	57.3	1.655	9.52	1141.5	72.79	59.40	59.2	1.690	10.26	1230.2
69.52	53.86	57.6	1.660	9.63	1154.0	73.35	56.83	59.4	1.695	10.37	1243.3
70.08	54.30	57.9	1.665	9.74	1166.8	73.90	57.26	59.7	1.700	10.48	1256.3
70.61	54.71	58.1	1.670	9.84	1179.2	74.43	57.97	60.0	1.705	10.59	1269.0
71.17	55.14	58.3	1.675	9.95	1192.1						

0556955

TOWOLDMON0005736
WATER_PCB-00002246

Temp.	Pressure Lbs. per Sq. In. Abs.	Specific Volume		Heat of Vaporization B.t.u.
		of Liquid Cu. Ft. per Lb.	of Sat. Vapor Cu. Ft. per Lb.	
−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.

0556956

TOWOLDMON0005737
WATER_PCB-00002247

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

0556957

TOWOLDMON0005738
WATER_PCB-00002248

[illegible]	Specific Gravity	Per Cent Sulfate Alumina (17% Al_2O_3)	Lbs. per Gal. Sulfate Alumina (17% Al_2O_3)	Per Cent Basic Sulfate Alumina (17.4% Al_2O_3)	Lbs. per Gal. Basic Sulfate Alumina (17.4% Al_2O_3)
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	3.97
29.5	1.2554	37.20	3.88	38.8	4.06
30.0	1.2609	37.90	3.98	39.7	4.18
30.5	1.2664	38.58	4.06	40.3	4.26
31.0	1.2719	39.30	4.16	41.0	4.35
31.5	1.2775	40.02	4.25	41.8	4.46
32.0	1.2832	40.73	4.35	42.5	4.55
32.5	1.2889	41.49	4.45	43.3	4.66
33.0	1.2946	42.20	4.54	44.1	4.76
33.5	1.3004	42.96	4.64	44.9	4.87
34.0	1.3063	43.71	4.75	45.7	4.98
34.5	1.3122	44.48	4.86	46.5	5.09
35.0	1.3182	45.20	4.95	47.4	5.21
35.5	1.3242	46.00	5.07	48.3	5.34
36.0	1.3303	46.80	5.18	49.2	5.46
36.5	1.3364	47.58	5.29	50.1	5.59

FREEZING POINTS OF 0.6% BASIC ALUM SOLUTIONS

Baumé at 60°F.	Freezing Points, degrees F.
5	31
10	30
15	29
20	27
25	24
30	21
35	38

0556958

TOWOLDMON0005739
WATER_PCB-00002249

Birchoff

Degrees Baumé	Specific Gravity	Per Cent $AlCl_3$	Lbs. Per Gal. $AlCl_3+12H_2O$	Degrees Baumé	Specific Gravity	Per Cent $AlCl_3$	Lbs. Per Gal. $AlCl_3+12H_2O$*
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

*$Al_2Cl_4+12H_2O$, chloride of alumina crystal. For chloride of alumina 32° Bé. twice the above pounds per gallon of solution.

0556959

TOWOLDMON0005740
WATER_PCB-00002250

Specific Gravity	Per Cent. Cane	Specific Gravity	Per Cent. Cane	Specific Gravity	Per Cent. Cane
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		

0556960

TOWOLDMON0005741
WATER_PCB-00002251

By W. T. Ferguson

Degrees Baumé	Specific Gravity 60° / 60° F.	Per Cent Salt	Degrees Baumé	Specific Gravity 60° / 60° F.	Per Cent Salt
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

0556961

TOWOLDMON0005742
WATER_PCB-00002252

Degrees Baumé	Specific Gravity 60°/60°F.	Per Cent HCl	Degrees Baumé	Specific Gravity 60°/60°F.	Per Cent HCl
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	[illegible]	24.8	1.2063	41.24
21.9	1.1779	[illegible]	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.

0556962

TOWOLDMON0005743
WATER_PCB-00002253

by W. C. Ferguson

Degrees Baumé	Specific Gravity 60/60° F.	Per Cent HNO_3	Degrees Baumé	Specific Gravity 60/60° F.	Per Cent HNO_3
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

TOWOLDMON0005744
WATER_PCB-00002254

Degrees Baumé	Specific Gravity 60°/60°F.	Pounds per Gallon
32.50	1.2889	45.68
32.75	1.2918	46.14
33.00	1.2946	46.58
33.25	1.2975	47.04
33.50	1.3004	47.49
33.75	1.3034	47.95
34.00	1.3063	48.42
34.25	1.3093	48.90
34.50	1.3122	49.35
34.75	1.3152	49.83
35.00	1.3182	50.32
35.25	1.3212	50.81
35.50	1.3242	51.30
35.75	1.3273	51.80
36.00	1.3303	52.30
36.25	1.3334	52.81
36.50	1.3364	53.32
36.75	1.3395	53.84
37.00	1.3426	54.36
37.25	1.3457	54.89
37.50	1.3488	55.43
37.75	1.3520	55.97
38.00	1.3551	56.52
38.25	1.3583	57.08
38.50	1.3615	57.65
38.75	1.3647	58.23
39.00	1.3679	58.82
39.25	1.3712	59.43
39.50	1.3744	60.06
39.75	1.3777	60.71
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
41.25	1.3976	64.93
41.50	1.4010	65.67
41.75	1.4044	66.42
42.00	1.4078	67.18
42.25	1.4112	67.95
42.50	1.4146	68.73
42.75	1.4181	69.52
43.00	1.4216	70.33
43.25	1.4251	71.15
43.50	1.4286	71.98
43.75	1.4321	72.82
44.00	1.4356	73.67
44.25	1.4392	74.53
44.50	1.4428	75.40
44.75	1.4464	76.28
45.00	1.4500	77.17
45.25	1.4536	78.07
45.50	1.4573	79.03
45.75	1.4610	80.04
46.00	1.4646	81.08
46.25	1.4684	82.18
46.50	1.4721	83.33
46.75	1.4758	84.48
47.00	1.4796	85.70
47.25	1.4834	86.98
47.50	1.4872	88.32
47.75	1.4910	89.76
48.00	1.4948	91.35
48.25	1.4987	93.13
48.50	1.5026	95.11

*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.

0556964

TOWOLDMON0005745
WATER_PCB-00002255

By W. C. Ferguson and H. P. Talbot*

Degrees Baumé	Specific Gravity at 60°F.	Per Cent H_2SO_4	Freezing Point Degrees F.
0	1.0000	0.00	32.0
1	1.0069	1.02	31.2
2	1.0140	2.08	30.5
3	1.0211	3.13	29.8
4	1.0284	4.21	28.9
5	1.0357	5.28	28.1
6	1.0432	6.37	27.2
7	1.0507	7.45	26.3
8	1.0584	8.55	25.1
9	1.0662	9.66	24.0
10	1.0741	10.77	22.8
11	1.0821	11.89	21.5
12	1.0902	13.01	20.0
13	1.0985	14.13	18.3
14	1.1069	15.25	16.6
15	1.1154	16.38	14.7
16	1.1240	17.53	12.6
17	1.1328	18.71	10.2
18	1.1417	19.89	7.7
19	1.1508	21.07	4.8
20	1.1600	22.25	+ 1.6
21	1.1694	23.43	− 1.8
22	1.1789	24.61	− 6.0
23	1.1885	25.81	−11
24	1.1983	27.03	−16
25	1.2083	28.28	−23
26	1.2185	29.53	−30
27	1.2288	30.79	−39
28	1.2393	32.05	−49
29	1.2500	33.33	−61
30	1.2609	34.63	−74
31	1.2719	35.93	−82
32	1.2832	37.26	−96
33	1.2946	38.58	−97
34	1.3063	39.92	−91
35	1.3182	41.27	−81
36	1.3303	42.63	−70
37	1.3426	43.99	−60
38	1.3551	45.35	−53
39	1.3679	45.72	−47
40	1.3810	48.10	−41
41	1.3942	49.47	−35
42	1.4078	50.87	−31
43	1.4216	52.26	−27
44	1.4356	53.66	−23
45	1.4500	55.07	−20
46	1.4646	56.48	−14
47	1.4796	57.90	−15
48	1.4948	59.32	−18
49	1.5104	60.75	−22
50	1.5263	62.18	−27
51	1.5426	63.66	−33
52	1.5591	65.13	−39
53	1.5761	66.63	−49
54	1.5934	68.13	−59
55	1.6111	69.65	†
56	1.6292	71.17	†
57	1.6477	72.75	†
58	1.6667	74.36	†
59	1.6860	75.99	− 7
60	1.7059	77.67	+12.6
61	1.7262	79.43	27.3
62	1.7470	81.30	39.1
63	1.7683	83.34	46.1
64	1.7901	85.66	46.4
64¼	1.7957	86.33	43.6
64½	1.8012	87.04	41.1
64¾	1.8068	87.81	37.9
65	1.8125	88.65	33.1
65¼	1.8182	89.55	24.6
65½	1.8239	90.60	13.4
65¾	1.8297	91.80	− 1
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.

0556965

TOWOLDMON0005746
WATER_PCB-00002256

From the specific gravities, the corresponding degrees Baumé were calculated by the following formula: Baumé = 145 − 145/Sp. Gr.

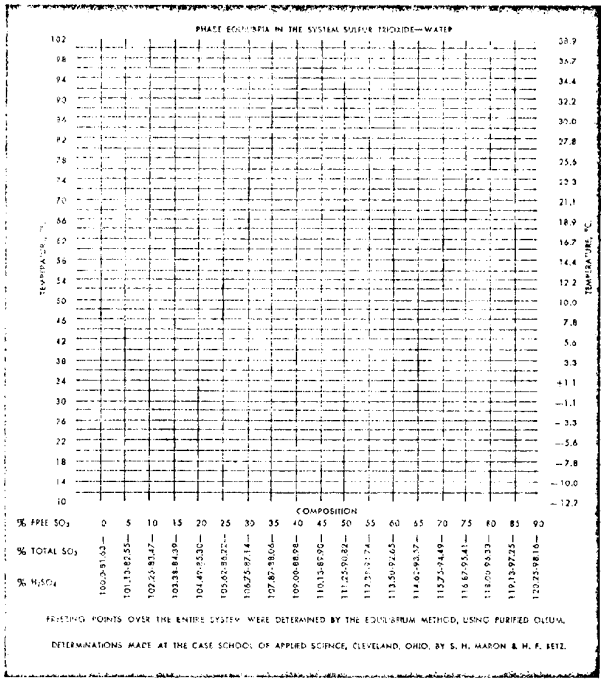
Allowance for Temperature

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



0556966

TOWOLDMON0005747
WATER_PCB-00002257

Flash Points	Boiling Points at 760 MM*	Molecular Weights	Crystallizing Points
470°F. (243°C.) — Tricresyl Phosphate	420°C. — Tricresyl Phosphate	446.3 — Diisodecyl Phthalate	83.5°C. — Santicizer 1-H
450°F. (232°C.) — Santicizer 140 Diisodecyl Phthalate	405°C. — Diphenyl Phthalate	426.6 — Dissodecyl Adipate	69°C. — Diphenyl Phthalate
437°F. (225°C.) — Triphenyl Phosphate	390°C. (approx.) — Santicizer 140	418.3 — Di(n-Octyl,n-Decyl) Phthalate	58.0°C. — Santicizer 3
435°F. (224°C.) — Diphenyl Phthalate Santicizer 141	386°C. — Dioctyl Phthalate	390.5 — Dioctyl Phthalate	49°C. — Triphenyl Phosphate
430°F. (221°C.) — Diisooctyl Phthalate	375°C. (approx.) — Santicizer 141	370.6 — Dioctyl Adipate	34.5°C.* — Ortho Nitrobiphenyl
425°F. (218°C.) — Dioctyl Phthalate Diisodecyl Adipate Di(n-Octyl,n-Decyl) Phthalate	370°C. — Santicizer 160	368.4 — Tricresyl Phosphate	20°C.* — Santicizer E-15
420°F. (215°C) — Santicizer 9	370°C. (approx.) — Triphenyl Phosphate	362.4 — Santicizer 141	0°C. — Dimethyl Phthalate
390°F. (199°C.) — Santicizer 160 Santicizer B-16	360°C. — Santicizer 9	340.3 — Santicizer 140	0°C. — Santicizer 8
386°F. (190°C.) — Santicizer E-15	350°C. — Santicizer 1-H	336.4 — Santicizer B-16	−0.3°C.* — Diethyl Phthalate
380°F. (193°C.) — Santicizer M-17	345°C. — Santicizer B-16	326.3 — Triphenyl Phosphate	−30°C. — Di(n-Octyl,n-Decyl) Phthalate Dibutyl Phthalate Santicizer 160 Santicizer B-16 Santicizer M-17 Tricresyl Phosphate
377°F. (192°C.) — Dioctyl Adipate	340°C. — Dibutyl Phthalate Santicizer 3 Santicizer 8	318.3 — Diphenyl Phthalate	
371°F. (188°C.) — Santicizer 3	330°C. (approx.) — Ortho-Nitrobiphenyl	312.4 — Santicizer 160	
345°F. (174°C.) — Santicizer 8	320°C. — Santicizer E-15	280.3 — Santicizer E-15	
340°F. (170°C.) — Dibutyl Phthalate	310°C. — Santicizer M-17	278.3 — Dibutyl Phthalate	
305°F. (152°C.) — Diethyl Phthalate	298°C. — Diethyl Phthalate	266.3 — Santicizer M-17	Less than −35°C. — Santicizer 140 Dioctyl Phthalate Diisooctyl Phthalate Diisodecyl Phthalate Diisooctyl Adipate Dioctyl Adipate
300°F. (149°C.) — Dimethyl Phthalate	282°C. — Dimethyl Phthalate	253.0 — Santicizer 1-H	
289°F. (143°C.) — Ortho-nitrobiphenyl		222.2 — Diethyl Phthalate	
		199.3 — Santicizer 3 Santicizer 8	
		199.2 — Ortho-Nitrobiphenyl	
		194.2 — Dimethyl Phthalate	
		171.2 — Santicizer 9	

*From vapor pressure curves.

*Supercools readily.

TOWOLDMON0005748
WATER_PCB-00002258

Refractive Index at 25° C.	Density (Grams per cc. at 25° C.)	Weight per Gallon at 25° C.	Color (APHA Max. Standard)
1.613 (approx.) — Ortho-Nitrobiphenyl	1.220 — Santicizer M-17	10.18 — Santicizer M-17	APHA 200 — Santicizer 8
1.560 — Santicizer 140	1.208 — Santicizer 140	10.08 — Santicizer 140	APHA 100 — Santicizer 141, Diisodecyl Adipate, Diisodecyl Phthalate, Dioctyl Adipate
1.556 — Tricresyl Phosphate	1.190 — Santicizer 8	9.93 — Santicizer 8	
1.540 — Santicizer 8	1.190 — Dimethyl Phthalate	9.93 — Dimethyl Phthalate	APHA 60 (molten) — Santicizer 3
1.536 — Santicizer 160	1.182 — Santicizer E-15	9.87 — Santicizer E-15	APHA 50 — Di(n-Octyl,n-Decyl) Phthalate
1.513 — Dimethyl Phthalate	1.162 — Tricresyl Phosphate	9.70 — Tricresyl Phosphate	APHA 45 — Santicizer B-16
1.508 — Santicizer 141	1.117 — Diethyl Phthalate	9.33 — Diethyl Phthalate	APHA 40 — Tricresyl Phosphate, Santicizer 140, Santicizer 160
1.504 — Santicizer M-17	1.117 — Santicizer 160	9.33 — Santicizer 160	APHA 35 — Diisooctyl Phthalate
1.500 — Diethyl Phthalate	1.098 — Santicizer B-16	9.17 — Santicizer B-16	APHA 25 — Dioctyl Phthalate
1.498 — Santicizer E-15	1.091 — Santicizer 141	9.11 — Santicizer 141	APHA 20 — Dibutyl Phthalate, Santicizer E-15, Santicizer M-17
1.491 — Dibutyl Phthalate	1.045 — Dibutyl Phthalate	8.72 — Dibutyl Phthalate	APHA 20 (molten) — Triphenyl Phosphate
1.490 — Santicizer B-16	0.982 — Dioctyl Phthalate	8.21 — Dioctyl Phthalate	APHA 10 — Diethyl Phthalate
1.484 — Dioctyl Phthalate	0.983 — Diisooctyl Phthalate	8.2 — Diisooctyl Phthalate	APHA 10 — Dimethyl Phthalate
1.485 — Diisooctyl Phthalate	0.973 — Di(n-Octyl,n-Decyl) Phthalate	8.12 — Di(n-Octyl,n-Decyl) Phthalate	*Distilled Water APHA 0
1.483 — Diisodecyl Phthalate	0.966 — Diisodecyl Phthalate	8.07 — Diisodecyl Phthalate	"Listerine" APHA 550
1.482 — Di(n-Octyl,n-Decyl) Phthalate	0.924 — Dioctyl Adipate	7.72 — Dioctyl Adipate	
1.451 — Diisodecyl Adipate	0.916 — Diisodecyl Adipate	7.65 — Diisodecyl Adipate	
1.446 — Dioctyl Adipate			

*Distilled Water APHA 0
"Listerine" APHA 550

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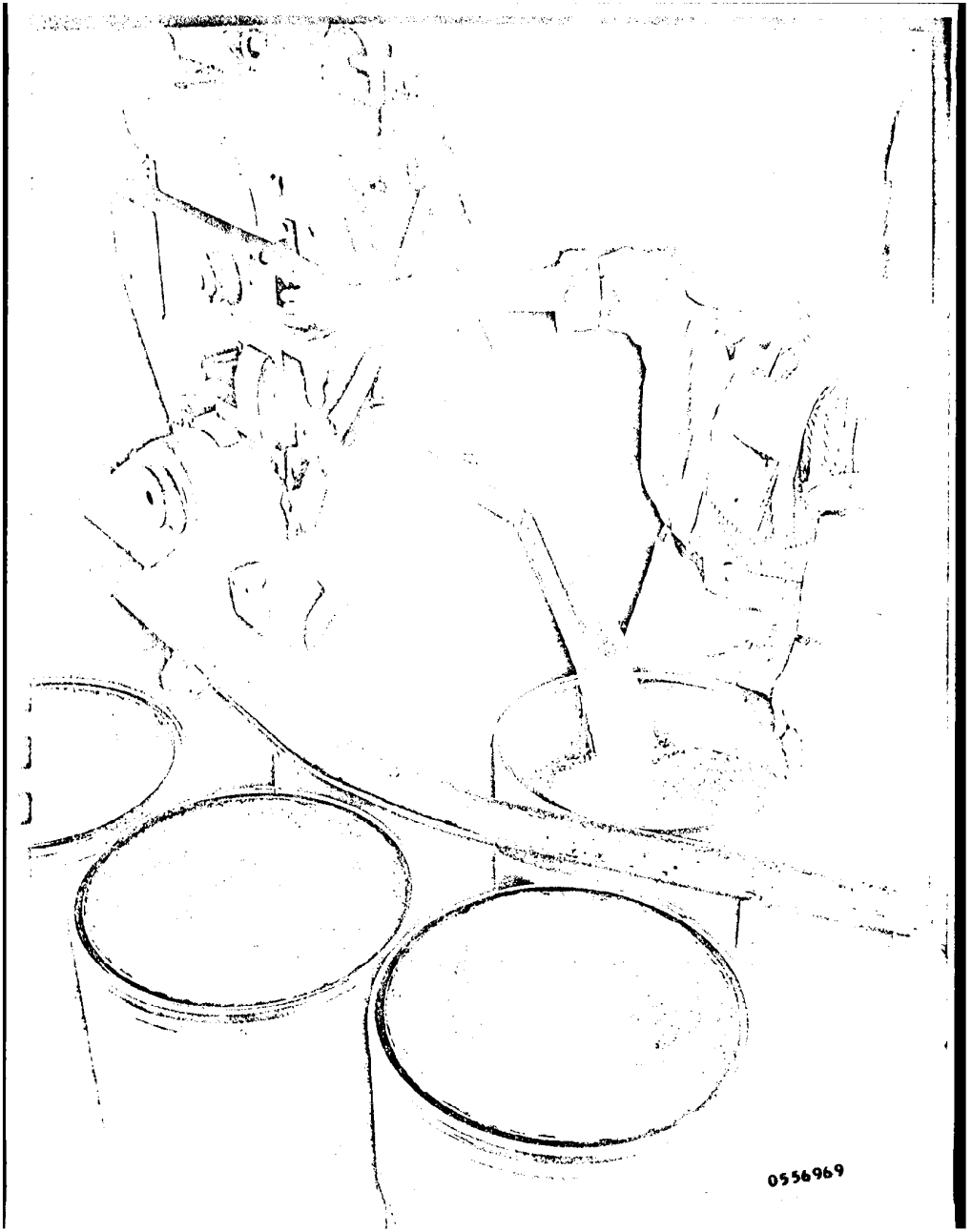
TOWOLDMON0005749
WATER_PCB-00002259


0556969

Products Manufactured by Monsanto Chemicals Limited and Available through Riches-Nelson, Inc., 342 Madison Avenue, New York 17, N. Y.

CHLOR-X-CRESYLIC	Pure Meta CRESOL	PHENOL SULPHONIC ACID
CRESANTOL 3	Ortho CRESOTINIC ACID	SODIUM SULPHATE
CRESANTOL 14	Meta CRESOTINIC ACID	SODIUM SULPHITE
CRESANTOL 15	ETHYL SILICATE, 40% SILICA	TETRAETHYLORTHOSILICATE
CRESANTOL 15 R	PARACHLOROMETACRESOL	VANILLIN (ex Eugenol)
Pure Para CRESOL	PARACHLOROMETAXYLENOL	

products Index (Also see Product Group Index page 111)

for your convenience, the supplying division is given after each product.

turn to page 119 for list of divisional sales offices.

Product	Division	Page No.
"A-1" (THIOCARBANILIDE)	Organic	21
"A-32"	Organic	19
"A-100"	Organic	19
AC TRACK ROLL GREASE	Lion Oil	42
ACCELERATOR B	Organic	19
ACCELERATORS, RUBBER	Organic	19
ACETANILID, U.S.P.	Organic	22
ACETIC ACID	Organic	22
ACETOPHENETIDIN, U.S.P.	Organic	22
ACETYLSALICYLIC ACID, STARCH GRANULATIONS	Organic	22
ACETYLSALICYLIC ACID, U.S.P.	Organic	22
ACID-PROOF ASPHALT COATING	Lion Oil	28
ACID SODIUM PYROPHOSPHATE	Inorganic	74
ACRYLONITRILE	Plastics	21
"ACTAMER"	Organic	23
ADIPIC ACID	Organic	23
ADVANCED-FORMULA NATURALUBE DHD OIL	Lion Oil	49
ADVANCED-FORMULA NATURALUBE HD MOTOR OIL	Lion Oil	49
A. F. GREASE	Lion Oil	42
"ALKOPHOS" (Aluminum Acid Phosphate)	Inorganic	23
ALKYL ACID PHOSPHATES	Inorganic	23
ALKYL ARYL SULFONATES	Inorganic	72
ALKYL BENZENE	Inorganic	23
ALKYL PHOSPHORIC ACIDS	Inorganic	23
ALL-PURPOSE GEAR LUBRICANTS	Lion Oil	42
ALUMINUM ACID PHOSPHATES ("ALKOPHOS")	Inorganic	23
ALUMINUM CHLORIDE SOLUTION 32° Be.	Inorganic	24
ALUMINUM PAINT VEHICLE	Lion Oil	28
ALUMINUM SULFATE, COMMERCIAL (DRY, LIQUID)	Inorganic	24
ortho-AMINOANISOLE	Organic	25
para-AMINOANISOLE	Organic	25
meta-AMINOCHLOROBENZENE	Organic	35
ortho-AMINOCHLOROBENZENE	Organic	36
para-AMINOCHLOROBENZENE	Organic	36
2-AMINOETHOXYBENZENE	Organic	55
4-AMINOETHOXYBENZENE	Organic	55
8-AMINO-1-NAPHTHOL-3,6-SODIUM ACID DISULFONATE	Organic	44
ortho-AMINONITROBENZENE	Organic	50
para-AMINOPHENETOLE	Organic	55
ortho-AMINOPHENYLETHYL ETHER	Organic	55
para-AMINOPHENYLETHYL ETHER	Organic	55
AMMONIA, ANHYDROUS	Inorganic	25
AMMONIUM BIPHOSPHATE	Inorganic	25
AMMONIUM DIHYDROGEN PHOSPHATE	Inorganic	25
AMMONIUM ETHYL PHOSPHATE	Inorganic	24
AMMONIUM NITRATE PELLETED FERTILIZER	Inorganic	24
AMMONIUM PHOSPHATE, DI	Inorganic	24
AMMONIUM PHOSPHATE, MONO	Inorganic	25

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TOWOLDMON0005751
WATER_PCB-00002261

Product	Division	Page No.
Ammonium Sulfate	Inorganic	79
Anhydrous Ammonia	Inorganic	25
ortho-Anisidine	Organic	25
para-Anisidine	Organic	25
Antioxidants, Rubber	Organic	25
Approved Government Specification Compounds	Lion Oil	55
Aqua Ammonia	Inorganic	27
"Areskap" Sodium Butyl-ortho-Phenylphenolsulfonate	Inorganic	27
"Aresket" Sodium Butyl Biphenyl-Sulfonate	Inorganic	27
"Areskelene" Disodium Dibutyl-ortho-Phenylphenoldisulfonate	Inorganic	27
"Aroclor" Polychlorinated Polyphenyls	Organic	27
Asbestos Asphalt Roof Coating	Lion Oil	28
Asphalt Plastic Cement	Lion Oil	28
Asphalt Products	Lion Oil	28
Asphalt Roof Coating	Lion Oil	29
Aspirin	Organic	22

b

Product	Division	Page No.
B. & R. Grease	Lion Oil	42
4-in-1 Barium Grease	Lion Oil	43
Battery Acid (Electrolyte)	Inorganic	32
Bearing Oil 4344	Lion Oil	42
"Benthal"	Organic	32
Bentone Grease	Lion Oil	42
Benzenesulfonic Acid, Technical	Organic	32
Benzoic Acid, Technical	Organic	32
Benzoic Acid, U.S.P.	Organic	32
Benzyl Benzoate, U.S.P.	Organic	32
Benzyl Chloride, Stabilized	Organic	33
ortho-Benzyl-para-Chlorophenol, Technical	Organic	73
Bicyclohexyl	Organic	33
Biphenyl	Organic	33
1,3 Bis (2-Benzothiazolyl Mercaptomethyl) Urea	Organic	19
Bisphenol A	Organic	33
Blaco	Lion Oil	43
Blind Nailing Cement	Lion Oil	29
Bone Ash	Inorganic	33
Boron Phosphate	Inorganic	34
Brush Cement	Lion Oil	53
Burner Oil	Lion Oil	45
Butane-Propane Mixture	Lion Oil	46
"Butysan"	Organic	19
N-tert-Butyl-2-Benzothiazolesulfenamide	Organic	21
Butyl Benzyl Phthalate	Organic	68
Butyl Decyl Phthalate	Organic	69
4,4-Butylidene-bis (6-tert-Butyl-m-Cresol)	Organic	27
Butyl Phthalyl Butyl Glycolate	Organic	67
Caffeine	Organic	34
Calcium Dihydrogen Phosphate	Inorganic	34
Calcium Hydrogen Phosphate	Inorganic	34
Calcium Phosphate, Di, (Anhydrous, Dihydrate, Feed Grade)	Inorganic	34
Calcium Phosphate, Mono	Inorganic	34
Calcium Phosphate, Tri	Inorganic	35
Calcium Pyrophosphate	Inorganic	35
Calcium Salt of DL-alpha-Hydroxy-gamma-Methyl-mercaptobutyric Acid (Methionine Hydroxy Analogue)	Organic	47
Calcium Silicate Slag	Inorganic	35
Caprylic Acid	Organic	55
Carbon Disulfide	Inorganic	35
Car Cement	Lion Oil	54
Castor Machine Oil	Lion Oil	43
Catalysts	Plastics	62
Caustic Potash	Inorganic	35
Chassis Lubricant	Lion Oil	43
Chloramine-T, N. F.	Organic	35
Chlorine-Caustic Soda, Caustic Potash, and Sodium Sulfide Plants	Eng. Sales	35
2-Chloroaminobenzene	Organic	36
3-Chloroaminobenzene	Organic	35
4-Chloroaminobenzene	Organic	36
meta-Chloroaniline	Organic	35
ortho-Chloroaniline	Organic	36
para-Chloroaniline	Organic	36
1-Chloro-2,4-Dinitrobenzene	Organic	49
2-Chloroethoxybenzene	Organic	36
4-Chlorohydroxybenzene	Organic	36
meta-Chloronitrobenzene (meta-Nitrochlorobenzene)	Organic	50
ortho-Chloronitrobenzene		

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TOWOLDMON0005752
WATER_PCB-00002262

C

Product	Division	Page No.
(ortho-NITROCHLOROBENZENE).	Organic	50
para-CHLORONITROBENZENE (para-NITROCHLOROBENZENE)..	Organic	51
ortho-CHLOROPHENOL, TECHNICAL	Organic	36
para-CHLOROPHENOL	Organic	36
CHLOROSULFONIC ACID	Inorganic	36
alpha-CHLOROTOLUENE	Organic	33
COACH BUILDERS SOUND DEADENER	Lion Oil	54
COACH BUILDERS UNDERCOATING.	Lion Oil	54
CODE 2 PRIMER	Lion Oil	29
COLAY PAVING ASPHALT	Lion Oil	29
COLD PROCESS LAP CEMENT	Lion Oil	29
"COLOR-TONED REZ" EXTERIOR PENETRATING SEALERS	Organic	36
CONSTRUCTION ASPHALTS	Lion Oil	54
CORKBOARD ERECTION ASPHALT..	Lion Oil	29
COTTON PICKER SPINDLE OIL	Lion Oil	43
"COUMARIN MONSANTO"	Organic	37
COUMARIN, N.F.	Organic	37
CRATE-TOP COATING	Lion Oil	30
CRESYL PHENYL PHOSPHATES, MIXED	Organic	68
CUP GREASE	Lion Oil	43
CYCLOHEXYLAMINE	Organic	37
N-CYCLOHEXYL-2-BENZOTHIAZOLESULFENAMIDE..	Organic	20
N-CYCLOHEXYL para-TOLUENESULFONAMIDE	Organic	66

d

D-41 PRIMER	Lion Oil	53
D-80 JOINT COMPOUND	Lion Oil	30
DDT MONSANTO (DICHLORO-DIPHENYL-TRICHLOROETHANE, TECH.)	Organic	48
DEAD LEVEL ROOFING ASPHALTS.	Lion Oil	30
DEFOAMER PC-1244	Organic	37
DETERGENT MXP ("MONSANTO DETERGENT MXP")	Inorganic	48
DIAMMONIUM HYDROGEN PHOSPHATE	Inorganic	24
DIBASIC CALCIUM ORTHOPHOSPHATE	Inorganic	34
DIBASIC SODIUM PHOSPHATE (ANHYDROUS, DUOHYDRATE)...	Inorganic	76
DIBUTYL PHTHALATE	Organic	37
ortho-DICHLOROBENZENE, TECH..	Organic	37
para-DICHLOROBENZENE	Organic	70
DICHLORO-DIPHENYL-TRICHLOROETHANE (MONSANTO DDT).	Organic	48
2,4-DICHLOROHYDROXYBENZENE (2,4-DICHLOROPHENOL TECH.).	Organic	38
2,4-DICHLOROPHENOXYACETIC ACID ISOPROPYL ESTER	Organic	38
DICYCLOHEXYL	Organic	33
DICYCLOHEXYLAMINE	Organic	38
DIDA	Organic	39
DIDP	Organic	39
DIESEL FUEL	Lion Oil	46
DI-2-ETHYL HEXYL ADIPATE	Organic	40
DI(2-ETHYL HEXYL) PHTHALATE.	Organic	38
DIETHYL PHTHALATE	Organic	38
1,2-DIHYDRO-2,2,4-TRIMETHYL-6-PHENYLQUINOLINE	Organic	26
1,2-DIHYDRO-2,2,4-TRIMETHYL-QUINOLINE, POLYMERIZED	Organic	25
DIHYDROXY DIPHENYL SULFONE.	Organic	39
DIISODECYL ADIPATE	Organic	39
DIISODECYL PHTHALATE	Organic	39
DIISOOCTYL PHTHALATE	Organic	39
N,N-DIMETHYLCYCLOHEXYL-AMINE SALT OF DIBUTYLDITHIO-CARBAMIC ACID	Organic	20
DIMETHYL PHTHALATE	Organic	39
N,N-DIMETHYL-N'-2'PYRIDYL-N'2-THENYL THYLENEDIAMINE (METHAPYRILENE HYDROCHLORIDE)	Organic	47
2,4-DINITROCHLOROBENZENE, TECHNICAL	Organic	40
DIOCTYL ADIPATE	Organic	40
DIOCTYL PHTHALATE	Organic	38
DIOP	Organic	39
DIPHENYL	Organic	33
DIPHENYLGUANIDINE	Organic	19
DIPHENYLGUANIDINE PHTHALATE.	Organic	20
N,N-DIPHENYL-para-PHENYLENEDIAMINE	Organic	26
DIPHENYL PHTHALATE	Organic	40
N-N'-DIPHENYL THIOUREA	Organic	21
DISODIUM DIBUTYL-ortho-PHENYL-PHENOLDISULFONATE..	Inorganic	27
DISODIUM DIHYDROGEN PYROPHOSPHATE	Inorganic	74
2,4-DI-tert-AMYLHYDROQUINONE.	Organic	26
2-2'-DITHIOBIS (BENZOTHIAZOLE) (MBTS)	Organic	21
4,4'-DITHIODIMORPHOLINE	Organic	78
DOA	Organic	40

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TOWOLDMON0005753
WATER_PCB-00002263

Product	Division	Page No.
DOP	Organic	38
DPG	Organic	19
"D.P. Solution"	Inorganic	40
Dry-Kiln Mastic	Lion Oil	30

e

Product	Division	Page No.
E-120 Coating	Lion Oil	30
E Kote	Lion Oil	54
"El-Sixty"	Organic	19
Engine Oil	Lion Oil	43
"Ethasan"	Organic	19
"Ethavan"	Organic	40
6-Ethoxy-1,2-Dihydro-2,2,4-Trimethylquinoline	Organic	26
6-Ethoxy-1,2-Dihydro-2,2,4-Trimethylquinoline, Purified	Organic	74
Ethyl Acetate	Organic	40
Ethyl Ammonium Phosphate	Inorganic	24
Ethyl Benzene	Plastics	41
Ethylene Dichloride	Organic	41
Ethyl Phthalyl Ethyl Glycolate	Organic	67
"Ethyl Thiurad"	Organic	19
N-Ethyl para-Toluene Sulfonamide	Organic	66
Ethyl Vanillin	Organic	40

f

Product	Division	Page No.
Ferric Orthophosphate	Inorganic	41
Ferrophosphorus (Iron Phosphide)	Inorganic	41
Fire Retardant A ("Monsanto Fire Retardant A")	Inorganic	48
"Flectol" H	Organic	25
Flux-Oils	Lion Oil	30
Formaldehyde	Inorganic	41
Fumaric Acid	Organic	41

g

Product	Division	Page No.
9G54A	Lion Oil	54
Gasolines	Lion Oil	42
Gasoline Pump Grease	Lion Oil	43
Gear and Tractor Roller Lubricant	Lion Oil	43
Gear Lubricant No. 360	Lion Oil	43
Government Rust Preventatives	Lion Oil	55
"Guantal"	Organic	20

h

Product	Division	Page No.
H-Acid	Organic	44
"HB-20" Partially Hydrogenated Alkyl-Aryl Hydrocarbon	Organic	44
"HB-40" Partially Hydrogenated Terphenyl	Organic	45
Herbicidal Oil No. 1	Lion Oil	46
Herbicidal Oil No. 6	Lion Oil	46
Hexahydroaniline (Cyclohexylamine)	Organic	37
High-Pressure Journal Oil	Lion Oil	43
"Hi-Gloss Rez" Interior Luster Wood Finish	Organic	45
Hydraulic Oil	Lion Oil	44
Hydrochloric Acid	Inorganic	45
Hydroxybenzene	Organic	55
ortho-Hydroxy Benzoic Acid	Organic	65
ortho-Hydroxychlorobenzene	Organic	36
para-Hydroxychlorobenzene	Organic	36
para-Hydroxynitrobenzene	Organic	51

i

Product	Division	Page No.
Industrial Rust Preventatives and Mastics	Lion Oil	54
Industrial Sound Deadener	Lion Oil	54
Ink Asphalt	Lion Oil	30
Ink Oil	Lion Oil	46
"Insoluble Sulfur 60"	Organic	45
Iron Phosphide	Inorganic	41
Iso Octyl Iso Decyl Phthalate	Organic	68
Isopropyl 2,4-Dichlorophenoxyacetate (2,4-Dichlorophenoxyacetic Acid)	Organic	38

TOWOLDMON0005754
WATER_PCB-00002264

Product	Division	Page No.
2,4-D Isopropyl Ester (2,4-Dichlorophenoxyacetic Acid)	Organic	38
K		
Kerosene	Lion Oil	46
K Kote	Lion Oil	52
L		
Lampblack	Inorganic	45
"Lauxein" Casein and Soybean Adhesives	Plastics	58
"Lauxite" Urea and Melamine; Phenolic and Resorcinol Resins	Plastics	58
Lava Compound	Lion Oil	44
Lead Orthophosphate, Tri	Inorganic	45
Light Oils	Lion Oil	45
Lion Premium Gasoline with Lionite	Lion Oil	42
Lion Regular Gasoline with Lionite	Lion Oil	42
Low Temp	Lion Oil	53
"Luxtrex" Styrene	Plastics	61
"Lytron" Sand Conditioner	Plastics	58
"Lytron" Styrene	Plastics	58, 62
"Lytron" Textile Processing and Finishing Agents	Plastics	46
M		
Maleic Anhydride	Organic	46
MBTS	Organic	21
Membrane Lining	Lion Oil	30
2-Mercaptobenzothiazole	Organic	21
2-Mercaptobenzothiazole (Purified)	Organic	20
"Mersize" Paper Sizing Agent	Organic	47
"Mertax"	Organic	20
"Mertone" WB-2 and WB-4 Precoat for Reproduction Papers	Inorganic	47
"Meta-Green" Silage Grade Sodium Meta Bisulfite	Inorganic	47
Metal Coating No. 3	Lion Oil	31
Methanol	Plastics	47
Methapyrilene Fumarate (Thenylpyramine Fumarate)	Organic	47
Methapyrilene Hydrochloride (Thenylpyramine Hydrochloride)	Organic	47
"Methasan"	Organic	20
Methionine Hydroxy Analogue (MHA) (Calcium Salt of DL-alpha-Hydroxy-gamma-Methylmercaptobutyric Acid)	Organic	47
ortho-Methoxyaniline	Organic	25
para-Methoxyaniline	Organic	25
Methyl Parathion (80% Solution)	Organic	47
Methyl Phthalyl Ethyl Glycolate	Organic	67
Methyl Salicylate, U.S.P.	Organic	48, 65
Methyl Toluenesulfonate	Organic	48
MHA (Methionine Hydroxy Analogue)	Organic	47
Mixed Acid (Nitrating Acid)	Inorganic	50
mono-Basic Calcium Phosphate	Inorganic	34
mono-Basic Sodium Phosphate	Inorganic	76
Monochlorophthalic Anhydride	Organic	48
"Mono Thiurad"	Organic	20
"Monsanto Detergent MXP"	Inorganic	48
"Monsanto Fire Retardant A"	Inorganic	48
"Monsanto Penta" (Pentachlorphenol, Tech.)	Organic	48
Monsanto Polyethylene	Plastics	61
"Montar" Synthetic Resins	Organic	49
Motor Oils	Lion Oil	49
Multi-Purpose Ultra-White Grease	Lion Oil	44
Muriatic Acid	Inorganic	45
N		
Naturalube DHD Super Duty Oil	Lion Oil	49
Naturalube Reinforced Motor Oil	Lion Oil	49
"Niran" Insecticide (Monsanto Parathion)	Organic	50
Nitrating Acid (Mixed Acid)	Inorganic	50

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TOWOLDMON0005755
WATER_PCB-00002265

Product	Division	Page No.
Nitre Cake	Inorganic	75
Nitric Acid	Inorganic	50
ortho-Nitroaniline (ortho-Aminonitrobenzene)	Organic	50
meta-Nitrochlorobenzene (meta-Chloronitrobenzene)	Organic	50
ortho-Nitrochlorobenzene (ortho-Chloronitrobenzene)	Organic	50
para-Nitrochlorobenzene (para-Chloronitrobenzene)	Organic	51
Nitrogen Fertilizer Solutions	Inorganic	51
"Nitron" Cellulose Nitrate	Plastics	60
para-Nitrophenol	Organic	51
Nokorode Products	Lion Oil	51

O

Product	Division	Page No.
"Oilfos" Glassy Sodium Phosphate	Inorganic	55
"Opalon" Vinyl Chloride	Plastics	59, 61
"Opalon" Vinyl Chloride and Vinyl Chloride Copolymers	Plastics	59
"Orizon" Polyethylene	Plastics	59, 60
Orthophosphoric Acid	Inorganic	56
OS-45 Coolant for Electronic Equipment	Organic	55

P

Product	Division	Page No.
Paper Laminant	Lion Oil	31
Parathion ("Niran" Insecticide)	Organic	50
Paving Asphalts	Lion Oil	31
Pentachlorophenol, Tech. ("Monsanto Penta")	Organic	48
Phenacetin	Organic	22
ortho-Phenetidine	Organic	55
para-Phenetidine	Organic	55
Phenol	Organic	55
Phenolsulfonic Acid	Organic	56
Phenolphthalein, U.S.P.	Organic	56
Phenolphthalein, Yellow, not U.S.P.	Organic	56
Phenylbenzene	Organic	33
Phosphatic Fertilizer Solution	Inorganic	56
Phosphoric Acid	Inorganic	56
Phosphoric Anhydride	Inorganic	57
Phosphoric Oxide and Solid P_2O_5	Inorganic	57
Phosphorous Acid	Inorganic	57
Phosphorus, Elemental (Yellow and White)	Inorganic	57
Phosphorus Oxychloride	Inorganic	57
Phosphorus Pentasulfide	Inorganic	57
Phosphorus Pentoxide	Inorganic	57
Phosphorus Trichloride	Inorganic	58
Phosphoryl Chloride	Inorganic	57
Phthalic Anhydride	Organic	58
Phthaloyl Chloride	Organic	58
Phthalyl Chloride	Organic	58
Pole Compound	Lion Oil	31
Polychlorinated Polyphenyls	Organic	27
Polyoxyethylene Ethers and Thioethers ("Sterox")	Inorganic	77
Polyvinyl Butyral	Plastics	57
Potash, Caustic	Inorganic	35
Potassium Biphosphate	Inorganic	63
Potassium Dihydrogen Phosphate	Inorganic	63
Potassium Metaphosphate	Inorganic	63
Potassium Phenylacetate 64% Solution	Organic	63
Potassium Phosphate, Di	Inorganic	63
Potassium Phosphate, Mono	Inorganic	63
Potassium Phosphate, Tri	Inorganic	63
Potassium Pyrophosphate, Tetra	Inorganic	63
Premium Gasoline (Unbranded)	Lion Oil	42
Pressure Gun Lubricant	Lion Oil	44
Primary-Ammonium Phosphate	Inorganic	25
Primary Calcium Phosphate	Inorganic	34
Propane	Lion Oil	46
"Pydraul-60" Functional Fluid	Organic	64
"Pydraul-150" Functional Fluid	Organic	64
"Pydraul-600" Functional Fluid	Organic	64
"Pydraul AC" Functional Fluid	Organic	64
"Pydraul F-9" Functional Fluid	Organic	63
"Py-Ran" Anhydrous Mono Calcium Phosphate	Inorganic	64
"R-2" Crystals	Organic	20
Refrigerator and Compressor Oil	Lion Oil	44
Regular Gasoline (Unbranded)	Lion Oil	42

0556975

TOWOLDMON0005756
WATER_PCB-00002266

Product	Division	Page No.
Reodorants, Rubber	Organic	64
Residual Fuel Oil	Lion Oil	46
"Resimene" Melamine	Plastics	60, 62
"Resimene" Melamine and Urea	Plastics	59
"Resinox" Phenolic	Plastics	59, 60, 62
"Resloom" Essentially Monomeric Melamine	Plastics	62
"Rezgard"	Inorganic	64
"Rezite" Clear Exterior Finish	Organic	65
"Rez" Wood Sealer and Primer (Clear)	Organic	64
Road Oil No. 2	Lion Oil	31
Rock Drill Lubricant	Lion Oil	44
"RZ-50-A"	Organic	20
"RZ-50-B"	Organic	20

S

82-S	Lion Oil	54
Saccharin, Sodium, U.S.P.	Organic	65
Saccharin, U.S.P.	Organic	65
"Saflex" Vinyl Butyral	Plastics	60
Salicylate, Methyl, U.S.P.	Organic	48, 65
Salicylate, Sodium, U.S.P.	Organic	65
Salicylic Acid	Organic	65
Salicylic Acid (B Grade)	Organic	66
Salt Cake	Inorganic	66
"Santicizer" 1-H Plasticizer	Organic	66
"Santicizer" 3 Plasticizer	Organic	66
"Santoflex" BX	Organic	26
"Santolene" C Fuel Oil Additive	Organic	70
"Santolene" F Fuel Oil Additive	Organic	70
"Santolene" H Fuel Oil Additive	Organic	71
"Santolene" J Fuel Oil Additive	Organic	71
"Santolite" MHP Industrial Resin	Organic	71
"Santolite" MS (80%) Industrial Resin	Organic	71
"Santolube 70" Oil Additive	Organic	71
"Santolube 203 C" Oil Additive	Organic	71
"Santolube 215" Oil Additive	Organic	72
"Santolube 333" Oil Additive	Organic	72
"Santolube 393" Oil Additive	Organic	72
"Santolube 394-C" Oil Additive	Organic	72
"Santolube 395-X" Oil Additive	Organic	72
"Santomask" II Odor-Masking Agent	Organic	72
"Santomerse" Alkyl Aryl Sulfonates	Inorganic	72
"Santophen" I Germicide	Organic	73
"Santophen" I Solution	Organic	73
"Santopoid" S Oil Additive	Organic	73
"Santopoid 22" Gear Oil Additive	Organic	73
"Santopoid 22-R1" Gear Oil Additive	Organic	73
"Santopoid 33" Oil Additive	Organic	73
"Santopour" C Oil Additive	Organic	73
"Santoquin"	Organic	74
"Santosite" Sodium Sulfite Anhydrous, Tech	Organic	74
"Santotan" KR Basic Chrome Sulfate	Inorganic	74
"Santovar" A	Organic	26
"Santowhite" Crystals	Organic	26
"Santowhite" L	Organic	26
"Santowhite" MK	Organic	27
"Santowhite" Powder	Organic	27
"Scriptite" 33 Melamine Formaldehyde	Plastics	62
"Scriptite" 40 Urea-Formaldehyde	Plastics	62
"Scriptite" Series 50-59 Styrene Copolymers	Plastics	62
Seal Kote	Lion Oil	52
Seal Perm	Lion Oil	53
Seal Prime	Lion Oil	53
Seam and Backing Cement	Lion Oil	54
Secondary-Ammonium Phosphate	Inorganic	24
Secondary Sodium Phosphate	Inorganic	76
Sign Kote	Lion Oil	55
Silica Aerogel for Industrial Applications	Inorganic	70
Silica Aerogel for Thermal Insulation	Inorganic	70
"Skydrol" Functional Fluid	Organic	74
"Skydrol 500" Functional Fluid	Organic	74
Sodium Acid Pyrophosphate	Inorganic	74
Sodium Benzoate	Organic	75
Sodium Benzoate, Technical	Organic	75
Sodium Biphosphate	Inorganic	76
Sodium Bisulfate	Inorganic	75
Sodium Bisulfite	Inorganic	75
Sodium Butylbiphenylsulfonate	Inorganic	27

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TOWOLDMON0005757
WATER_PCB-00002267

Product	Division	Page No.
Sodium Butyl-ortho-Phenylphenosulfonate	Inorganic	27
N-Sodium-N-Chloro-para-Toluenesulfonamide	Organic	35
Sodium Dihydrogen Phosphate	Inorganic	76
Sodium Ferric Pyrophosphate	Inorganic	75
Sodium Hexametaphosphate	Inorganic	75
Sodium Meta Bisulfite (Silage Grade) ("Meta Green")	Inorganic	47
Sodium Metaphosphate	Inorganic	76
Sodium Metaphosphate, Low PH	Inorganic	76
Sodium meta-Nitrobenzene Sulfonate	Organic	75
Sodium Pentachlorophenate, Tech.	Organic	69
Sodium Phosphate, Di (Anhydrous, Duohydrate)	Inorganic	76
Sodium Phosphate, Mono	Inorganic	76
Sodium Pyrophosphate (Tetra)	Inorganic	76
Sodium Phosphate, Tri (Anhydrous, Crystalline)	Inorganic	76
Sodium Salicylate, U.S.P.	Organic	65
Sodium Sulfate, Anhydrous, Tech.	Inorganic	66
Sodium Sulfide Plants	Eng. Sales	35
Sodium Ortho-Sulfobenzimide	Organic	65
Sodium Tripolyphosphate	Inorganic	77
Solid Roofing Asphalt	Lion Oil	31
"Sopanox" ortho-Tolyl Biguanide	Organic	77
"SQ" Phosphate	Inorganic	77
Steam Cylinder Oil (Mineral and Compounded)	Lion Oil	44
"Sterox" Polyoxyethylene Esters, Ethers and Thioethers	Inorganic	65
"Sterox" No. 5 Polyoxy-ethylene Thioether	Inorganic	77
"Sterox" No. 6 Polyoxy-ethylene Thioether	Inorganic	77
"Sterox" AJ Polyoxyethylene Ether	Inorganic	77
"Sterox" AJ-100 Polyoxy-ethylene Ether	Inorganic	77
"Sterox" CD Polyoxyethylene Ester	Inorganic	78
"Sterox" SE Polyoxyethylene Thioether	Inorganic	78
"Sterox" SK Polyoxyethylene Thioether	Inorganic	78
"Stymer" Vinyl, Styrene	Plastics	63
Styrene Monomer	Plastics	78
Succinic Anhydride	Organic	78
"Sulfasan" R	Organic	78
ortho-Sulfobenzimide	Organic	65
para-Sulfonamidotoluene	Organic	80
Sulfonyl Bis Phenol	Organic	39
Sulfur Dioxide, Liquid	Inorganic	79
Sulfuric Acid	Inorganic	79
Sulfuric Acid Plants	Eng. Sales	79
Sulfuric Chlorohydrin	Inorganic	36
Sulphate of Ammonia	Inorganic	79
"Syton" C-15 and C-30 Silica Sol	Inorganic	79
"Syton" W-20 and DS Silica Sol	Inorganic	79
Teap	Inorganic	81
Tertiary Calcium Phosphate	Inorganic	35
Tert. Sodium Phosphate	Inorganic	76
Tetramethyl-Thiuram-Disulfide	Organic	21
Tetramethyl-Thiuram-Monosulfide	Organic	20
Tetra Sodium Pyrophosphate	Inorganic	76
Thenylpyramine Fumarate (Methapyrilene Fumarate)	Organic	47
Thenylpyramine Hydrochloride	Organic	47
Thiobis (Di-sec-Amylphenol)	Organic	26
2,2'-Thiobis-(4,6-Dichloro-Phenol)	Organic	23
4,4-Thiobis-(6-tert-Butyl-m-Cresol)	Organic	26
Thiocarbanilide ("A-1")	Organic	21
"Thiofide"	Organic	21
"Thiofide" S	Organic	21
Thiophosphoryl Chloride	Organic	79, 80
"Thiotax"	Organic	21
"Thiurad"	Organic	21
Tiger Motor Oil	Lion Oil	50
para-Toluene Sulfonamide	Organic	80
Toluenesulfonamides N-Ethyl, ortho, para Mixtures	Organic	66, 67
para-Toluene Sulfonchloride	Organic	80
Toluenesulfonic Acid, Technical	Organic	80
para-Toluenesulfonic Acid Amide	Organic	80
ortho-Tolyl Biguanide	Organic	77
Tractor Distillate	Lion Oil	46

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TOWOLDMON0005758
WATER_PCB-00002268

Product	Division	Page No.
TRIBASIC CALCIUM PHOSPHATE	Inorganic	35
TRIBASIC SODIUM PHOSPHATE	Inorganic	76
1,2,4-TRICHLOROBENZENE	Organic	80
TRICRESYL PHOSPHATE	Organic	80
TRIETHYLAMMONIUM PHOSPHATE	Inorganic	81
TRIPHENYL PHOSPHATE	Organic	81
TRIPHENYL PHOSPHITE	Organic	81
TSP	Inorganic	76
TSPP	Inorganic	76

U

Product	Division	Page No.
"ULTRON" VINYL CHLORIDE (FLEXIBLE FILM AND SHEETING)	Plastics	60
"ULTRON" VINYL CHLORIDE (RIGID SHEETS)	Plastics	71
UNDERBODY COATINGS	Lion Oil	51
UNDERCAR SEALER AND SILENCER	Lion Oil	51
NO. 2002 UNDERCOATING AND SOUND DEADENER	Lion Oil	51

V

Product	Division	Page No.
VANADIUM SULFURIC ACID CATALYST	Eng. Sales	81
"VANILLIN MONSANTO"	Organic	81
VAPOR AND WEATHER BARRIER AND ACCESSORIES	Lion Oil	52
VEHICLE	Lion Oil	54
VINYL CHLORIDE	Plastics	81
"VUEPAK" CELLULOSE ACETATE	Plastics	61

W

Product	Division	Page No.
WATER PUMP GREASE	Lion Oil	44
WHEEL BEARING AND UNIVERSAL JOINT GREASE	Lion Oil	44

Z

Product	Division	Page No.
ZINC DIBUTYL-DITHIOCARBAMATE	Organic	19
ZINC DIETHYL DITHIOCARBAMATE	Organic	19
ZINC DIHEXYL DITHIOPHOSPHATE	Organic	72
ZINC DIMETHYL DITHIOCARBAMATE	Organic	20
ZINC OXIDE, TECHNICAL	Inorganic	81

0556978

TOWOLDMON0005759
WATER_PCB-00002269

	Division	Page No.
AGRICULTURAL CHEMICALS		
FEED ADDITIVES		
CALCIUM PHOSPHATE, DI—FEED GRADE METHIONINE HYDROXY ANALOGUE (MHA)	Organic	47
"SANTOQUIN"	Organic	74
FERTILIZERS		
AMMONIA, ANHYDROUS	Inorganic	25
AMMONIUM NITRATE PELLETED FERTILIZER	Inorganic	24
AMMONIUM SULFATE	Inorganic	79
AQUA AMMONIA	Inorganic	27
NITROGEN FERTILIZER SOLUTIONS	Inorganic	51
PHOSPHATIC FERTILIZER SOLUTION	Inorganic	56
SULPHATE OF AMMONIA	Inorganic	79
HERBICIDES		
2,4-DICHLOROPHENOXY-ACETIC ACID ISOPROPYL ESTER	Organic	38
INSECTICIDES		
"NIRAN" INSECTICIDE (MONSANTO PARATHION)	Organic	50
"SANTOBANE" DDT INSECTICIDE	Organic	48
"SANTOCHLOR" PARA-DICHLOROBENZENE	Organic	70
WOOD PRESERVATIVES		
"SANTOBRITE" SODIUM PENTACHLOROPHENATE, TECH.	Organic	69
"MONSANTO PENTA" (PENTACHLOROPHENOL, TECH.)	Organic	49
SILAGE PRESERVATIVE		
"META-GREEN" SILAGE GRADE SODIUM META BISULFITE	Inorganic	74
ASPHALT PRODUCTS		
ACID-PROOF ASPHALT COATING	Lion Oil	28
ALUMINUM PAINT VEHICLE	Lion Oil	28
ASBESTOS ASPHALT ROOF COATING	Lion Oil	28
ASPHALT PLASTIC CEMENT	Lion Oil	28
ASPHALT ROOF COATING	Lion Oil	29
BLIND NAILING CEMENT	Lion Oil	29
CODE 2 PRIMER	Lion Oil	29
COLAY PAVING ASPHALT	Lion Oil	29
COLD PROCESS LAP CEMENT	Lion Oil	29
CORKBOARD ERECTION ASPHALT	Lion Oil	29
CRATE-TOP COATING	Lion Oil	30
D-80 JOINT COMPOUND	Lion Oil	30
DEAD LEVEL ROOFING ASPHALTS	Lion Oil	30
DRY-KILN MASTIC	Lion Oil	30
E-120 COATING	Lion Oil	30
FLUX-OILS	Lion Oil	30
INK ASPHALT	Lion Oil	30
MEMBRANE LINING	Lion Oil	30
METAL COATING No. 3	Lion Oil	31
PAPER LAMINANT	Lion Oil	31
PAVING ASPHALTS	Lion Oil	31
POLE COMPOUND	Lion Oil	31
ROAD OIL No. 2	Lion Oil	31
SOLID ROOFING ASPHALT	Lion Oil	31
DETERGENT INTERMEDIATE		
ALKYL BENZENE	Inorganic	23
PHOSPHATE SALTS		
POTASSIUM PHOSPHATE, MONO	Inorganic	63
POTASSIUM PHOSPHATE, TRI.	Inorganic	63
POTASSIUM PYROPHOSPHATE, TETRA	Inorganic	63
SODIUM ACID PROPHOSPHATE	Inorganic	76
SODIUM PHOSPHATE, DI (ANHYDROUS, DIHYDRATE)	Inorganic	76
SODIUM PHOSPHATE, MONO	Inorganic	76
SODIUM PHOSPHATE, TRI (ANHYDROUS, CRYSTALLINE)	Inorganic	76
SODIUM PYROPHOSPHATE, TETRA	Inorganic	76
SODIUM TRIPOLYPHOSPHATE.	Inorganic	77
"SQ" PHOSPHATE	Inorganic	77
SURFACE ACTIVE AGENTS		
"ARESKAP" SODIUM BUTYL-ortho-PHENYLPHENOL-SULFONATE	Inorganic	27
"ARESKET" SODIUM BUTYL-BIPHENYL-SULFONATE	Inorganic	27
"ARESKLENE" DISODIUM DIBUTYL-ortho-PHENYL-PHENOLDISULFONATE	Inorganic	27
"SANTOMERSE" ALKYL ARYL SULFONATES	Inorganic	60
"STEROX" POLYOXYETHYLENE ESTERS, ETHERS AND THIOETHERS	Inorganic	68
"STEROX" NO. 5 POLYOXY-ETHYLENE THIOETHER	Inorganic	77
"STEROX" NO. 6 POLY-OXYETHYLENE THIOETHER.	Inorganic	77

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TOWOLDMON0005760
WATER_PCB-00002270

	Division	Page No.
"Sterox" AJ Polyoxyethylene Ether	Inorganic	77
"Sterox" AJ-100 Polyoxyethylene Ether	Inorganic	77
"Sterox" CD Polyoxyethylene Ester	Inorganic	77
"Sterox" SE Polyoxyethylene Thioether	Inorganic	78
"Sterox" SK Polyoxyethylene Thioether	Inorganic	78
Built Detergents		
"Monsanto Detergent MXP"	Inorganic	48
Flavors and Condiments		
"Ethavan"	Organic	40
Saccharin, U.S.P.	Organic	65
Saccharin, Sodium, U.S.P.	Organic	65
"Vanillin Monsanto"	Organic	81
Fluids		
Functional		
OS-45 Coolant for Electronic Equipment	Organic	55
"Pydraul-60" Functional Fluid	Organic	64
"Pydraul-150" Functional Fluid	Organic	64
"Pydraul-600" Functional Fluid	Organic	64
"Pydraul AC" Functional Fluid	Organic	64
"Pydraul F-9" Functional Fluid	Organic	63
"Skydrol" Functional Fluid	Organic	74
"Skydrol 500" Functional Fluid	Organic	74
Industrial		
Aroclor Polychlorinated Polyphenyls	Organic	27
Biphenyl	Organic	33
Heavy Chemicals		
Aluminum Sulfate, Commercial (Dry, Liquid)	Inorganic	24
Aluminum Sulfate Iron Free	Inorganic	24
Aluminum Chloride Solution 32° Be.	Inorganic	24
Battery Acid (Electrolyte)	Inorganic	32
Chlorosulfonic Acid	Inorganic	36
Hydrochloric Acid	Inorganic	45
Nitrating Acid (Mixed Acid)	Inorganic	50
Salt Cake	Inorganic	66
Sodium Bisulfate	Inorganic	75
Sodium Bisulfite	Inorganic	75
Sulfuric Acid	Inorganic	79
Sulfur Dioxide, Liquid	Inorganic	79
Intermediates		
Acetic Acid	Organic	22
Acrylonitrile	Plastics	21
Ortho-Anisidine	Organic	25
Para-Anisidine	Organic	25
Benzenesulfonic Acid, Technical	Organic	32
Benzoic Acid, Technical	Organic	32
Benzyl Chloride	Organic	33
Benzyl Chloride, Stabilized	Organic	33
Bicyclohexyl	Organic	33
Meta-Chloroaniline	Organic	35
Ortho-Chloroaniline	Organic	36
Para-Chloroaniline	Organic	36
Ortho-Chlorophenol, Technical	Organic	36
Para-Chlorophenol	Organic	36
Alpha-Chlorotoluene	Organic	33
Cyclohexylamine	Organic	37
Ortho-Dichlorobenzene, Technical	Organic	37
2,4-Dichlorophenol, Technical	Organic	38
Dicyclohexylamine	Organic	38
Dihydroxy Diphenyl Sulfone	Organic	38
2,4-Dinitrochlorobenzene, Technical	Organic	40
Ethyl Acetate	Organic	40
Ethyl Benzene	Plastics	41
Ethylene Dichloride	Organic	41
Formaldehyde	Inorganic	41
H-Acid	Organic	44
Methanol	Plastics	47
Methyl Toluenesulfonate	Organic	48
Monochlorophthalic Anhydride	Organic	48
Ortho-Nitroaniline	Organic	50
Meta-Nitrochlorobenzene	Organic	50
Ortho-Nitrochlorobenzene	Organic	50
Para-Nitrochlorobenzene	Organic	51
Para-Nitrophenol	Organic	51
Ortho-Phenetidine	Organic	55
Para-Phenetidine	Organic	55
Phenol	Organic	55
Phenolsulfonic Acid	Organic	56
Phthalyl Chloride	Organic	58
Salicylic Acid (B Grade)	Organic	65
"Santochlor" Para-Dichlorobenzene	Organic	70

0556980

TOWOLDMON0005761
WATER_PCB-00002271

	Division	Page No.
Sodium Benzoate, Technical	Organic	75
Sodium Meta-Nitrobenzene Sulfonate	Organic	75
Styrene Monomer	Plastics	78
Thiophosphoryl Chloride	Organic	79
Para-Toluene Sulfonamide	Organic	80
Para-Toluene Sulfonchloride	Organic	80
Toluenesulfonic Acid, Technical	Organic	80
1,2,4-Trichlorobenzene	Organic	80
Vinyl Chloride	Plastics	81
Lampblack		
Lampblack	Inorganic	45
Nokorode Products		
Approved Government Specification Compounds	Lion Oil	55
Brush Cement	Lion Oil	53
Car Cement	Lion Oil	54
Coach Builders Sound Deadener	Lion Oil	54
Coach Builders Undercoating	Lion Oil	54
Construction Asphalts	Lion Oil	54
E Kote	Lion Oil	54
9G54A	Lion Oil	54
K Kote	Lion Oil	52
D-41 Primer	Lion Oil	53
Government Rust Preventatives	Lion Oil	55
Industrial Rust Preventatives and Mastics	Lion Oil	54
Industrial Sound Deadener	Lion Oil	54
Low Temp	Lion Oil	53
82-S	Lion Oil	54
Seal Kote	Lion Oil	52
Seal Prime	Lion Oil	53
Seal Perm	Lion Oil	53
Seal and Backing Cement	Lion Oil	54
Sign Kote	Lion Oil	55
Underbody Coatings	Lion Oil	51
Undercar Sealer and Silencer	Lion Oil	51
No. 2002 Undercoating and Sound Deadener	Lion Oil	51
Vapor and Weather Barrier and Accessories	Lion Oil	52
Vehicle	Lion Oil	54
Paper Chemicals		
Aluminum Sulfate, Commercial (Dry, Liquid)	Inorganic	24
Salt Cake	Inorganic	66
"Santosite" Sodium Sulfite Anhydrous, Technical	Organic	74
"Mersize" Paper Sizing Agent	Organic	47
Gasolines		
Lion Premium Gasoline with Lionite	Lion Oil	41
Lion Regular Gasoline with Lionite	Lion Oil	42
Premium Gasoline (Unbranded)	Lion Oil	42
Regular Gasoline (Unbranded)	Lion Oil	42
Oils—Lubrication		
AC Track Roll Grease	Lion Oil	42
A.F. Grease	Lion Oil	42
All-Purpose Gear Lubricants	Lion Oil	42
Bearing Oil 4344	Lion Oil	42
4-in-1 Barium Grease	Lion Oil	43
B. & R. Grease	Lion Oil	42
Bentone Grease	Lion Oil	42
Blaco	Lion Oil	43
Castor Machine Oil	Lion Oil	43
Chassis Lubricant	Lion Oil	43
Cotton Picker Spindle Oil	Lion Oil	43
Cup Grease	Lion Oil	43
Engine Oil	Lion Oil	43
Gasoline Pump Grease	Lion Oil	43
Gear and Tractor Roller Lubricant	Lion Oil	43
Gear Lubricant No. 360	Lion Oil	43
High-Pressure Journal Oil	Lion Oil	43
Hydraulic Oil	Lion Oil	44
Multi-Purpose Ultra-White Grease	Lion Oil	44
Pressure Gun Lubricant	Lion Oil	44
Refrigerator and Compressor Oil	Lion Oil	44
Steam Cylinder Oil (Mineral and Compounded)	Lion Oil	44
Water Pump Grease	Lion Oil	44
Wheel Bearing and Universal Joint Grease	Lion Oil	44
Oils—Light		
Burner Oil	Lion Oil	45
Butane-Propane Mixture	Lion Oil	46
Diesel Fuel	Lion Oil	46
Herbicidal Oil No. 1	Lion Oil	46
Herbicidal Oil No. 6	Lion Oil	46
Ink Oil	Lion Oil	46
Kerosene	Lion Oil	46

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TOWOLDMON0005762
WATER_PCB-00002272

	Division	Page No.
Propane	Lion Oil	46
Residual Fuel Oil	Lion Oil	46
Tractor Distillate	Lion Oil	46
Motor Oils		
Advanced-Formula Naturalube DHD Oil	Lion Oil	49
Advanced-Formula Naturalube HD Motor Oil	Lion Oil	49
Naturalube DHD-Super-Duty Oil	Lion Oil	49
Naturalube Reinforced Motor Oil	Lion Oil	49
Tiger Motor Oil	Lion Oil	50
Oil Additives		
Defoamer PC-1244	Organic	37
"Santolene" C Fuel Oil Additive	Organic	70
"Santolene" F Fuel Oil Additive	Organic	70
"Santolene" H Fuel Oil Additive	Organic	71
"Santolene" J Fuel Oil Additive	Organic	71
"Santolube 203C" Oil Additive	Organic	71
"Santolube 215" Oil Additive	Organic	72
"Santolube 333" Oil Additive	Organic	72
"Santolube 393" Oil Additive	Organic	72
"Santolube 394-C" Oil Additive	Organic	72
"Santolube 395-X" Oil Additive	Organic	72
"Santopoid 22" Gear Oil Additive	Organic	73
"Santopoid 22-R1" Gear Oil Additive	Organic	73
"Santopoid 33" Oil Additive	Organic	73
"Santopoid" S Oil Additive	Organic	73
"Santopour" C Oil Additive	Organic	73
Pharmaceuticals		
Acetanilid, U.S.P.	Organic	22
Acetophenetidin, U.S.P.	Organic	22
Acetylsalicylic Acid, U.S.P.	Organic	22
Acetylsalicylic Acid, Starch Granulations	Organic	22
"Actamer"	Organic	23
Benzoic Acid, U.S.P.	Organic	32
Benzyl Benzoate, U.S.P.	Organic	32
Caffeine	Organic	34
Chloramine-T, N.F.	Organic	35
"Coumarin Monsanto"	Organic	37
Methapyrilene Fumarate	Organic	47
Methapyrilene Hydrochloride	Organic	47
Phenol, U.S.P.	Organic	55
Phenolphthalein, U.S.P.	Organic	56
Phenolphthalein, Yellow, Not U.S.P.	Organic	56
Potassium Phenylacetate 64% Solution	Organic	63
Salicylate, Methyl, U.S.P.	Organic	65
Salicylate, Sodium, U.S.P.	Organic	65
Salicylic Acid	Organic	65
Sodium Salicylate, U.S.P.	Organic	65
"Santophen" 1 Germicide	Organic	73
"Santophen" 1 Solution	Organic	73
Sodium Benzoate	Organic	57
"Santomask" 11 Odor-Masking Agent	Organic	72
"Sopanox" Ortho-Tolyl Biguanide	Organic	77
Plasticizers		
"Aroclor" Polychlorinated Polyphenyls	Organic	27
Dibutyl Phthalate	Organic	37
Di-2-Ethyl Hexyl Adipate	Organic	40
Di (2-Ethyl Hexyl) Phthalate	Organic	38
Diethyl Phthalate	Organic	38
Di-Isodecyl Adipate	Organic	39
Di-Isodecyl Phthalate	Organic	39
Di-Isooctyl Phthalate	Organic	39
Dimethyl Phthalate	Organic	39
Diphenyl Phthalate	Organic	40
"HB-20" Partially Hydrogenated Alkyl-Aryl Hydrocarbon	Organic	45
"HB-40" Partially Hydrogenated Terphenyl	Organic	45
"Santicizer" 1-H Plasticizer	Organic	66
"Santicizer" 3 Plasticizer	Organic	66
"Santicizer" 8 Plasticizer	Organic	66
"Santicizer" 9 Plasticizer	Organic	67
"Santicizer" B-16 Plasticizer	Organic	67
"Santicizer" E-15 Plasticizer	Organic	67
"Santicizer" M-17 Plasticizer	Organic	67
"Santicizer" 140 Plasticizer	Organic	68
"Santicizer" 141 Plasticizer	Organic	68

0556982

TOWOLDMON0005763
WATER_PCB-00002273

	Division	Page No.
"Santicizer" 160 Plasticizer	Organic	68
"Santicizer" 213 Plasticizer	Organic	68
"Santicizer" 602 Plasticizer	Organic	68
"Santicizer" 603 Plasticizer	Organic	69
"Santicizer" 606 Plasticizer	Organic	69
"Santicizer" 611 Plasticizer	Organic	69
"Santicizer" 613 Plasticizer	Organic	69
Tricresyl Phosphate	Organic	80
Triphenyl Phosphate	Organic	81
Phosphorus and Phosphorus Derivatives		
Phosphorus, Elemental	Inorganic	57
Ammonium Phosphates		
Ammonium Phosphate, Di	Inorganic	24
Ammonium Phosphate, Mono	Inorganic	25
"Monsanto Fire Retardant A"	Inorganic	48
Calcium Phosphate, Di (Feed Grade) (Anhydrous, Dihydrate)	Inorganic	34
Calcium Phosphate, Mono	Inorganic	34
Calcium Phosphate, Tri	Inorganic	35
Calcium Pyrophosphate	Inorganic	35
"Py-Ran" Anhydrous Mono Calcium Phosphate	Inorganic	64
Phosphoric Acid	Inorganic	56
Phosphorous Acid	Inorganic	57
Potassium Phosphates		
Potassium Metaphosphate	Inorganic	63
Potassium Phosphate, Di	Inorganic	63
Potassium Phosphate, Mono	Inorganic	63
Potassium Phosphate, Tri	Inorganic	63
Potassium Pyrophosphate, Tetra	Inorganic	63
Sodium Phosphates		
"Oilfos" Glassy Sodium Phosphate	Inorganic	55
Sodium Acid Pyrophosphate	Inorganic	74
Sodium Hexametaphosphate	Inorganic	75
Sodium Metaphosphate	Inorganic	76
Sodium Metaphosphate, Low PH	Inorganic	76
Sodium Phosphate, Di (Anhydrous, Duohydrate)	Inorganic	76
Sodium Phosphate, Mono	Inorganic	76
Sodium Phosphate, Tri (Anhydrous, Crystalline)	Inorganic	76
Sodium Pyrophosphate (Tetra)	Inorganic	76
Sodium Tripolyphosphate	Inorganic	77
"SQ" Phosphate	Inorganic	77
Phosphorus Compounds		
Ferrophosphorus (Iron Phosphide)	Inorganic	41
Phosphorus Oxychloride	Inorganic	57
Phosphorus Pentasulfide	Inorganic	57
Phosphorus Pentoxide	Inorganic	57
Phosphorus Trichloride	Inorganic	58
Thiophosphoryl Chloride	Inorganic	79
Special Phosphates		
"Aklophos"	Inorganic	23
Alkyl Acid Phosphates	Inorganic	23
Ammonium Ethyl Phosphate	Inorganic	24
"DP Solution"	Inorganic	40
Triethylammonium Phosphate	Inorganic	81
Resins		
Succinic Anhydride	Organic	78
"Montar" Synthetic Resins	Organic	49
"Santolite" MHP Industrial Resin	Organic	71
"Santolite" MS (80%) Industrial Resin	Organic	71
Adhesives		
"Lauxein" Casein and Soybean Adhesives	Plastics	58
"Lauxite" Urea and Melamine; Phenolic and Resorcinol Resins	Plastics	58
Bonding, Impregnating and Coating Resins		
"Lytron" Styrene	Plastics	58
"Lytron" Sand Conditioner	Plastics	58
"Opalon" Vinyl Chloride	Plastics	59
"Orizon" Polyethylene	Plastics	59
Polyvinyl Butyral	Plastics	59
"Resimene" Melamine and Urea	Plastics	59
"Resinox" Phenolic	Plastics	59
Calendering, Extruding and Laminating Materials		
"Opalon" Vinyl Chloride and Vinyl Chloride Copolymers	Plastics	59
"Orizon" Polyethylene	Plastics	60
"Resimene" Melamine	Plastics	60

0556983

TOWOLDMON0005764
WATER_PCB-00002274

	Division	Page No.
"Resinox" Phenolic	Plastics	60
"Saflex" Vinyl Butyral	Plastics	60
Fabricating Materials		
"Nitron" Cellulose Nitrate	Plastics	60
"Ultron" Vinyl Chloride (Flexible Film and Sheeting)	Plastics	60
"Ultron" Vinyl Chloride (Rigid Sheets)	Plastics	61
"Vuepak" Cellulose Acetate	Plastics	61
Molding Materials		
"Lustrex" Styrene	Plastics	61
"Opalon" Vinyl Chloride	Plastics	61
Monsanto Polyethylene	Plastics	61
"Resimene" Melamine	Plastics	62
"Resinox" Phenolic	Plastics	62
"Lytron" Textile Processing and Finishing Agents	Plastics	46
Paper and Textile Resins		
Catalysts	Plastics	62
"Lytron" Styrene	Plastics	62
"Resloom" Essentially Monomeric Melamine	Plastics	62
"Scriptite" 33 Melamine Formaldehyde	Plastics	62
"Scriptite" Series 50-59 Styrene Copolymers	Plastics	63
"Scriptite" 40 Urea-Formaldehyde	Plastics	62
"Stymer" Vinyl, Styrene	Plastics	63
Resin Intermediates		
Adipic Acid	Organic	23
Bisphenol A	Organic	33
"Benthal"	Organic	32
Fumaric Acid	Organic	41
Maleic Anhydride	Organic	46
Phthalic Anhydride	Organic	58
Triphenyl Phosphite	Organic	81
Rubber Chemicals		
Accelerators, Rubber		
"A-32"	Organic	19
"A-100"	Organic	19
Accelerator B	Organic	19
"Butasan"	Organic	19
DPG	Organic	19
"El-Sixty"	Organic	19
"Ethasan"	Organic	19
"Ethyl Thiurad"	Organic	19
"Guantal"	Organic	20
"Mertax"	Organic	20
"Methasan"	Organic	20
"Mono Thiurad"	Organic	20
"R-2" Crystals	Organic	20
"RZ-50-A"	Organic	20
"RZ-50-B"	Organic	20
"Santocure"	Organic	20
"Santocure" NS	Organic	21
Triocarbanilide ("A-1")	Organic	21
"Thiofide"	Organic	21
"Thiofide" S	Organic	21
"Thiotax"	Organic	21
"Thiurad"	Organic	21
Antioxidants, Rubber		
"Flectol" H	Organic	25
"Santoflex" AW	Organic	26
"Santoflex" B	Organic	26
"Santoflex" BX	Organic	26
"Santoflex" 35	Organic	26
"Santovar" A	Organic	26
"Santowhite" Crystals	Organic	26
"Santowhite" L	Organic	26
"Santowhite" MK	Organic	27
"Santowhite" Powder	Organic	27
Special Materials		
"Insoluble Sulfur 60"	Organic	45
"Sulfasan" R	Organic	78
Triphenyl Phosphate	Organic	81
Silicas		
Calcium Silicate Slag	Inorganic	35
"Mertone" WB-2 and WB-4 Precoat for Reproduction Papers	Inorganic	47
"Santocel" Silica Aerogel for Industrial Applications	Inorganic	70
"Santocel" Silica Aerogel for Thermal Insulation	Inorganic	70
"Syton" C-15 and C-30 Silica Sol	Inorganic	79
"Syton" W-20 and DS Silica Sol	Inorganic	79
Surface Coatings		
"Color-Toned Rez" Exterior Penetrating Sealers	Organic	36
"Rez" Color Toned Penetrating Wood Sealers	Organic	36
"Rezite" Clear Exterior Finish	Organic	65
"Rez" Wood Sealer and Primer (Clear)	Organic	64
Other Products		
Bone Ash	Inorganic	33
Carbon Dioxide	Inorganic	35

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	Division	Page No.
Caustic Potash	Inorganic	35
Chlorine-Caustic Soda, Caustic Potash, and Sodium Sulfide Plants	Eng. Sales	35
"Santotan" KR Basic Chrome Sulfate	Inorganic	74
Sodium Sulfide Plants	Eng. Sales	35
Sulfuric Acid Plants	Eng. Sales	79
Vanadium Sulfuric Acid Catalyst	Eng. Sales	71
Zinc Oxide, Technical	Inorganic	81

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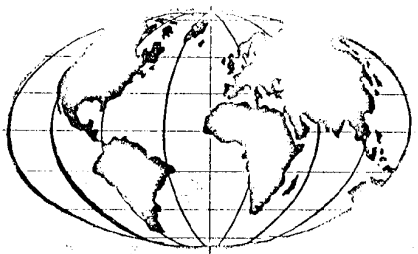

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domestic sales offices

AKRON 11, OHIO
920 Brown Street
Telephone Hemlock 4-1921

ATLANTA 5, GEORGIA
1401 Peachtree Street N.E.
Telephone Trinity 6-0777

BOSTON 49, MASSACHUSETTS
Everett Station
Telephone Everett 7-5010

CHARLOTTE 2, NORTH CAROLINA
1117 Johnston Building
Telephone Franklin 5-4870

CHICAGO 11, ILLINOIS
McGraw Hill Building
520 N. Michigan Avenue
Telephone Whitehall 4-6750

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

DETROIT 23, MICHIGAN
18230 Grand River Road
Telephone Broadway 3-7090

EL DORADO, ARKANSAS
Lion Oil Building
Telephone Union 3-3111

HOUSTON 5, TEXAS
The Olson Building
2472 Bolsover Street
Telephone Jackson 6-2551

LITTLE ROCK, ARKANSAS
224 National Old Line Life Insurance Building
5th & Woodlane Streets
Telephone Franklin 6-2437

LOS ANGELES 22, CALIFORNIA
6670 E. Flotilla St.
Telephone Raymond 3-2492

MEMPHIS, TENNESSEE
1023 Riverside Drive
Telephone Whitehall 8-4451

MINNEAPOLIS 2, MINNESOTA
Foshay Tower
Telephone Federal 9-4651

NEW ORLEANS, LOUISIANA
1220 National Bank of Commerce Building
Telephone Canal 2133

NEW YORK 22, NEW YORK
445 Park Avenue
Telephone Plaza 9-8200

ST. LOUIS 24, MISSOURI
Lindbergh and Olive Street Road
Telephone WYdown 3-1000

SAN FRANCISCO 4, CALIFORNIA
111 Sutter Street
Telephone Yukon 6-6232

SANTA CLARA, CALIFORNIA
P.O. Box 120
Telephone Cherry 3-0414

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SEATTLE 4, WASHINGTON
911 Western Avenue
Telephone Main 4203

SPRINGFIELD 2, MASSACHUSETTS
812 Monsanto Avenue
Telephone State 8-6911

WASHINGTON 6, D. C.
Suite 301
918 16th Street N.W.
Telephone Executive 3-4224

WILMINGTON 99, DELAWARE
2005 Concord Pike Fairfax
Telephone Olympia 8-6423

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
Monsanto House
10-18 Victoria St.

MELBOURNE, VICTORIA, AUSTRALIA
Somerville Road
West Footscray W-12

MONTREAL, CANADA
425 St. Patrick Street
Ville La Salle
Telephone Pontiac 6-8511

NEW DELHI, INDIA
3/8 Ajmeri Gate Extension Scheme
Near Turkman Gate

OAKVILLE, ONTARIO
(Monsanto Oakville Ltd., subsidiary
of Monsanto Can. Ltd.)
Oakville, Ontario, Canada

SYDNEY, N.S.W., AUSTRALIA
106 Mullens Street
Rozelle

TORONTO, CANADA
183 Front Street East
Telephone Empire 8-1141

VANCOUVER, CANADA
1550 Rand Avenue
Telephone Ke. 8030

CABLE ADDRESS
"Monsanto" St. Louis Codes:
ABC, 6th & 7th Acme,
Bentley's and Bentley's Second

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divisional headquarters

DOMESTIC SUBSIDIARIES
& AFFILIATES DIVISION
St. Louis 24, Missouri

INORGANIC CHEMICALS DIVISION
St. Louis 24, Missouri

LION OIL COMPANY DIVISION
El Dorado, Arkansas

ORGANIC CHEMICALS DIVISION
St. Louis 24, Missouri

OVERSEAS DIVISION
St. Louis 24, Missouri

PLASTICS DIVISION
Indian Orchard
Springfield 2, Massachusetts

RESEARCH & ENGINEERING DIVISION
St. Louis 24, Missouri

manufacturing plants

ADDYSTON, OHIO
ANNISTON, ALABAMA
AVON, CALIFORNIA
BRISBANE, AUSTRALIA
CAMDEN, NEW JERSEY
CAMPANA, ARGENTINA
CARONDELET, MISSOURI
EL DORADO, ARKANSAS
EPIERRE, FRANCE
EVERETT, MASSACHUSETTS
GHENT, BELGIUM
GRANGEMOUTH, SCOTLAND
KEARNY, NEW JERSEY
LECHERIA, D.F., MEXICO
LONG BEACH, CALIFORNIA
LULING, LOUISIANA
MAGNOLIA, ARKANSAS
MELBOURNE, AUSTRALIA
MONSANTO, IDAHO
MONSANTO, ILLINOIS
MONSANTO, TENNESSEE
MONZON, SPAIN
NAGOYA, JAPAN
NEWPORT, ENGLAND
NITRO, WEST 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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Monsanto

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