29TH EDITION*
*REVISED

Monsanto

0685291

TOWOLDMON0043375

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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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RESEARCH

GENERAL DATA

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

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

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existing product research

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

application research

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

exploratory research

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

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

technical service

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

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

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

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

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

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

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

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

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MONSANTO

trade-marks . . .

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

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

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

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TOWOLDMON0043386

"*" Rubber Accelerator
"*" Rubber Accelerator
"*" Chlorine-bearing Chemical Compositions
"*" Bacteriostat for Soap and Cosmetics
"*" High Molecular Weight Alcohol
"*" Aluminum Acid Phosphates
"*" Sodium Butyl-o-Phenylphenolsulfonate
"*" Sodium Butylbiphenylsulfonate
"*" Disodium Dibutyl-o-Phenylphenoldisulfonate
"*" Polychlorinated Polyphenyls
" Lampblack
"*" Alkyd Resin Intermediate
M"* Almost all products sold
Spruce Rez" Color-Toned Penetrating Wood Sealer
"*" Insecticide
"*" Rubber Accelerator
Rez" Color-Toned Penetrating Wood Sealer
rcoal Rez" Color-Toned Penetrating Wood Sealer
-A"* Lubricating Oils
Rez" Color-Toned Penetrating Wood Sealer
Clinic" Scale Model Display Closets
" A Binder for Asphaltic Concrete Paving Materials
marin Monsanto"
Primer" Asphalt Base Primer for use prior to Vapor Sealing, Dampproofing, and Waterproofing with Construction Asphalts
" Joint Compound
"* Herbicide
P. Solution"* Lacquer Additive
rt Sage Rez" Color-Toned Penetrating Wood Sealer
lewood Rez" Color-Toned Penetrating Wood Sealer
"* Oil Well Drilling Mud Adjuvants
" Asphalt Base Coating
"* Rubber Accelerator
per" Chemical Compounds for Addition to Synthetic Elastomers
"* Rubber Accelerator
"* Flavoring and Aromatic
Thiurad" Rubber Accelerator
"* Cellulose-Acetate Sheets
Green Rez" Color-Toned Penetrating Wood Sealer
ingo Rez" Color-Toned Penetrating Wood Sealer
"* H Rubber Antioxidant
" Effervescent Lozenge Used to Allay a Craving for Tobacco
"* Aspirating Devices
"* Water-Soluble Plant Food
"* Rubber Accelerator
"* Partially Hydrogenated Terphenyl
"* Hydrocarbon Plasticizer
"* Pallets
luble Sulfur 60"
"* Plant Food
Kote" Weather Proof Insulating Coating Containing a High Content of Ground Cork
"* Soil Conditioner
Rez"* Prime Coat for Wood, Cement, Plaster or Brick
"* Casein and Soybean Adhesives
"* Urea, Phenolic, Melamine & Resorcinol Resins
" Aluminum Paint Vehicle
" Anti-freeze
" Asphalt Base Coating Composition
" 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 Nōkōrōde" 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

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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"* 11 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 Quinoli
Livestock Feed Preservative
"Santoseal"* 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 Produc
"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
Four Grades
"Seal Perm" Breathing Type Weather Proof Moisture Vap
Barrier
"Seal Prime" Asphalt Base Primer for Porous Surfaces Prior
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
Variety of Products
"White Rez" Penetrating Wood Sealer

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

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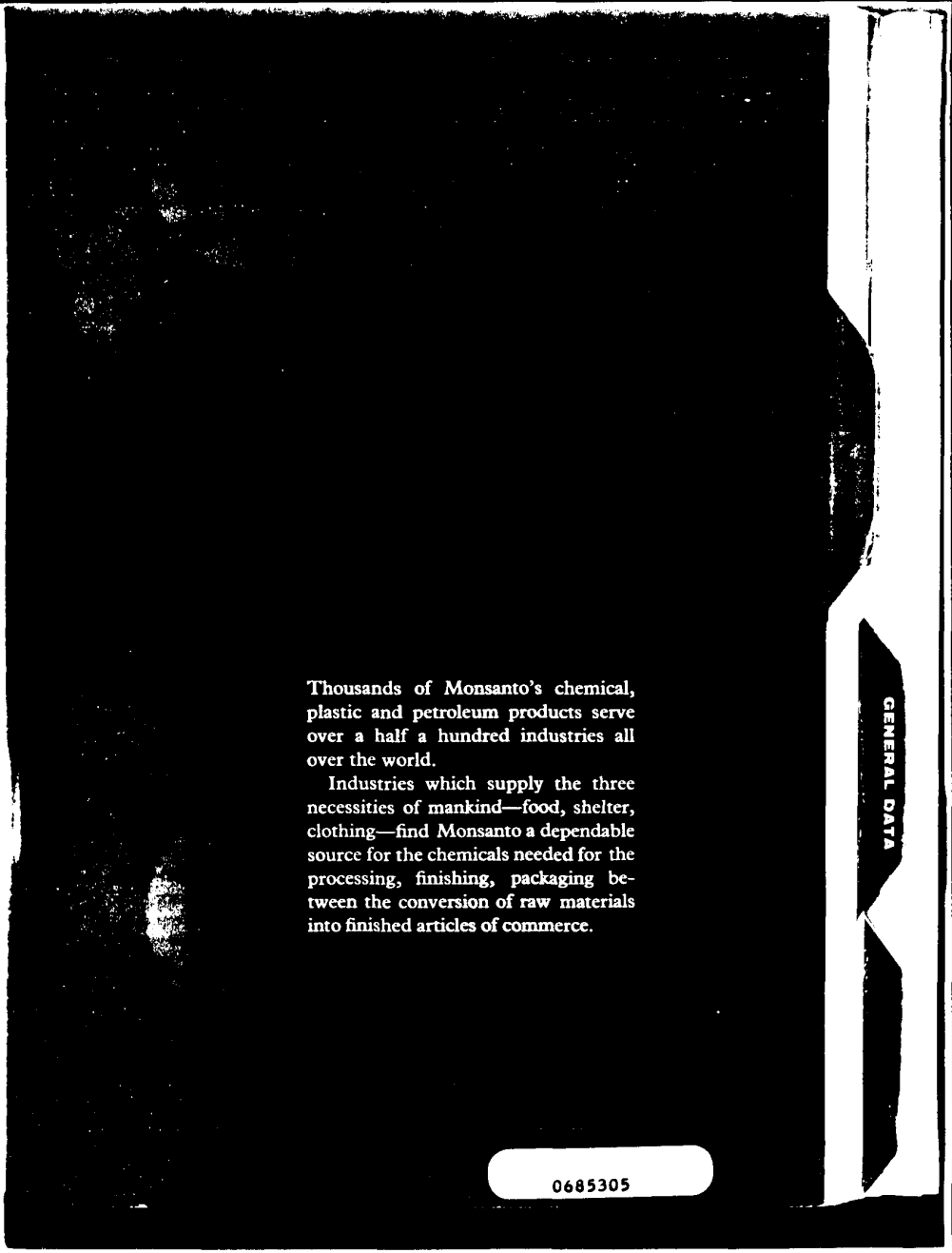

Thousands of Monsanto's chemical, plastic and petroleum products serve over a half a hundred industries all over the world.

Industries which supply the three necessities of mankind—food, shelter, clothing—find Monsanto a dependable source for the chemicals needed for the processing, finishing, packaging between the conversion of raw materials into finished articles of commerce.

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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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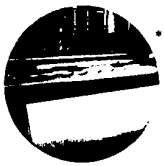







GENERAL DATA

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by Ewing Galloway, N.Y.

TOWOLDMON0043391

RESEARCH

PRODUCT DESC

LION OIL PRODUCTS INDEX

0685308

TOWOLDMON0043392

"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.

Contoiners: 100-lb. drums.

Shipping Classification: Rubber Accelerators NOIBN.

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

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

Standard Form: Powder.

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

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

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

Shipping Classification: Rubber Accelerators NOIBN.

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

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

Standard Form: Powder.

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

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

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

Shipping Classification: Rubber Accelerators NOIBN.

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

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

Standard Form: Oiled or unoiled powder or pellets.

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

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

Containers: 100-lb. fiber drums.

Shipping Classification: Rubber Accelerators NOIBN.

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

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

Standard Form: Powder or pellets.

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

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

Containers: 100-lb. fiber drums.

Shipping Classification: Rubber Accelerators NOIBN.

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

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

Standard Form: Powder.

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

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

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

Shipping Classification: Rubber Accelerators NOIBN.

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

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

Standard Form: Powder.

Specifications: Light yellow powder; M.P. 175°C. min.; ash 0.3% max.; 0.5% 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. 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 quick 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 5°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; 0.5% max. retained on 20 mesh; M.P. 94°C. min.; Sp. Gr. 1.3; moisture 1.0% max.; ash 0.5% max.; solubility in ether 95% min.

Uses: Requires zinc oxide and fatty acid. Activators 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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re: "Santocure—An Accelerator for Rubber Vul-
n," 52-page booklet; "Monsanto Chemicals for the
Industry," 46-page booklet.

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

ard Form: Powder.

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

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

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

ping Classification: Rubber Accelerators NOIBN.

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

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

ard Form: Powder.

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

Activates thiazole accelerators but used best as straight
erator in fast-curing stocks such as tube repair gum.
erates neoprene latex. Also used as a flotation agent
acid inhibitor.

iners: 150-lb. fiber drums; 50-lb. bags.

ping Classification: Rubber Accelerators NOIBN.

ture: "Monsanto Chemicals for the Rubber Industry,"
age booklet.

FIDE" [*2-2'-dithiobis (benzothiazole) (MBTS)*]
ANIC DIVISION **(Rubber Service)**

ndard Form: Powder.

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

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

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

pping Classification: Rubber Accelerators NOIBN.

ture: "Monsanto Chemicals for the Rubber Industry,"
age booklet.

OFIDE" S (*"Thiofide" in seed form*)
ANIC DIVISION **(Rubber Service)**

ard Form: Seeds.

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

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

Containers: 50-lb. fiber drums.

Shipping Classification: Rubber Accelerators NOIBN.

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

"THIOTAX" (*2-Mercaptobenzothiazole*)

—ORGANIC DIVISION **(Rubber Service)**

Standard Form: Powder.

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

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

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

Shipping Classification: Rubber Accelerators NOIBN.

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

"THIURAD" (*Tetramethyl-thiuram-disulfide*)

—ORGANIC DIVISION **(Rubber Service)**

Standard Form: Oiled or unoiled powder or pellets.

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

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

Containers: 100-lb. fiber drums.

Shipping Classification: Rubber Accelerators NOIBN.

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

ACRYLONITRILE—PLASTICS DIVISION

Molecular Weight: 53.03

Formula: $CH_2=CHCN$

Standard Form: Liquid

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

Continued on next page

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TOWOLDMON0043395

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

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

MESH:

Retained on—	12–50 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.
Through—	
40-mesh screen	10.0% max.

Uses: Pharmaceutical product.

Grades: 10%, 12–50 mesh, white; 16%, 12–50 mesh, 20%, 12–50 mesh, white; 10%, 12–50 mesh, pink; mesh, pink; 10%, 12–50 mesh, green; 10%, 20 mesh,

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

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

	20-MESH	40-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.	
	85.0% max.	
80-mesh screen		45.0% min.

TOWOLDMON0043396

SiO_2%	—	—	10.0	—
Ignition Loss %	23.2	59.3	30.0	53.3
pH of 1% Solution	2.2	2.2	2.7	2.7
Ratio:				
Al_2O_3:3P_2O_5	1.0	1.0	1.67	1.67

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

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

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

Shipping Classification: Aluminum phosphate.

Literature: Technical Bulletin P-33.

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 0.5 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

TOWOLDMON0043397

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

Shipping Classification: Petroleum Oil—NOIBN.

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

ALUMINUM CHLORIDE SOLUTION 32° Bé.

—INORGANIC DIVISION

Molecular Weight: 266.7

Standard Form: Liquid.

Typical Analysis: Neutral salt, low in iron content; solutions have an acid reaction but contain no free acid. $AlCl_3 \cdot 12H_2O$, 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 phosphate)

—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°; wt. per gal. 10.37 lbs.; pH 7.5% solution 7.0–7.2; viscosity 60 cps. at 25°C. Chemical constitution: 35% monoethyl diammonium phosphate; 50% diethyl ammonium phosphate and 15% monoethyl ammonium hydrogen phosphate. A thin film is liquid at relative humidities above 40%, is 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 pellet form coated with a diatomaceous material as a conditioning agent.

Analysis:
Nitrogen (max.) 33.5
Moisture (min.) 3
Water Insoluble 3.0

Containers: Multiwall kraft paper bags with two moisture 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 inert organic coating. *Fertilizer compounds* Mfg. NOIBN Dry, in paper bags.
(DANGEROUS PLACARDS APPLIED

AMMONIUM PHOSPHATE, DI

(Also known as diammanium 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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TOWOLDMON0043398

...al Information—Properties: Brilliant white crystal... powdered material; stable in air; very soluble in ... pH value of 1% solution 7.75; above 70°C. aqueous ...ns lose ammonia readily.

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

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

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

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

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

...ing Classification: Phosphate of ammonia.

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

...ONIUM PHOSPHATE, MONO

...nown as ammonium acid phosphate, primary am... phosphate, ammonium dihydrogen phosphate, ...um phosphate, monobasic, and ammonium bi...te) — INORGANIC DIVISION

...ecular Weight: 115.07

...ula: $NH_4H_2PO_4$

...dard Form: Crystalline or powdered material.

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

...es: Flameproofing paper, wood, textiles; prevents after... in matches; for special medicinal purposes; nutrient ...tions; manufacture of yeast, vinegar, yeast foods, bread ...provers; acidulent in dye bath.

...des: Food (meets all U. S. Pure Food Law require...ments).

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

...ipping Classification: Phosphate of ammonia.

...erature: "Concentrated Water-Soluble Fertilizers," book...let; "You Can Sell More and More," (Soluble Fertilizer) ...oklet; "Soluble Fertilizers," booklet.

...YDROUS AMMONIA — INORGANIC DIVISION

...lecular Weight: 17.03.

...rmula: NH_3.

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

...es: A source of nitrogen for plant food, either applied ...ectly to the soil or in irrigation water, and for the formu...tion of mixed fertilizers; for partial neutralization of ...phosphatic liquids in the formulation of liquid fertilizers.

...ainers: Tank cars; standard 150, 100, 50 pound bottle... or horizontal-type cylinders.

...ipping Classification: Anhydrous Ammonia (Danger... 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



NH_2

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.

(Continued on next page)

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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 2% 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. 1.0[illegible]; 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 will 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.; [illegible] 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 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 used 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

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...x" B and ...

...um strength. It is easily emulsified for use in latex ... has no effect on latex stability.

...ainers: 425-lb. steel drums.

...ping Classification: Chemicals NOIBN.

...ature: "Monsanto Chemicals for the Rubber Industry," ...page booklet.

...NTOWHITE" MK *(Reaction product of 6-tert-...n-cresol and SCl_2)* — ORGANIC DIVISION

...er Service)

...dard Form: Liquid.

...cifications: Dark viscous liquid; ash 0.5% max.; heat ... 65°C. max.; Sp. Gr. 1.06; soluble in acetone, alcohol, ...zene and carbon tetrachloride; insolubles (Skellysolve ... 0.5% max.; softening point 20-30° C.

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

...tainers: 150-lb. steel drums.

...pping Classification: Chemicals NOIBN.

...rature: "Monsanto Chemicals for the Rubber Industry," ...page booklet.

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

...er Service)

...dard Form: Powder.

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

...es: "Santowhite" Powder is a full strength antioxidant. ... unexcelled from the standpoints of staining and dis-...oration. Performs well in latex and dry rubbers. Use ...0 to 2% on the hydrocarbon.

...tainers: 125-lb. fiber drums.

...pping Classification: Chemicals NOIBN.

...rature: "Monsanto Chemicals for the Rubber Industry," ...page booklet.

...IA AMMONIA — INORGANIC DIVISION

...lecular Weight: 35.05.

...formula: NH_4OH.

...dard Form: Liquid.

...General Information—Properties: Pungent, water-white ... wt. per gal. 7.48 lbs. 26 Be ...

...es: A source of Nitrogen for plants, either applied ...ectly to the soil or to irrigation water for the formulation ...ked fertilizers, for oxidation in lead chamber sulphuric ... plants, and to supply nitrogen requirements and pH ...trol in yeast culture.

...tainers: Tank cars, barges and boats.

...pping Classification: Ammoniacal Liquor containing ...re 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 1-113.

"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—Arcket—Aresklene," Technical Bulletin 1-113.

"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: 150-lb. steel drums.

Shipping Classification: Washing Compounds NOIBN.

Literature: "Areskap—Aresket—Aresklene," Technical Bulletin 1-113.

"AROCLOR" POLYCHLORINATED POLYPHENYLS — ORGANIC DIVISION

Standard Form: Liquids, resins or solids.

General Information—Properties: Chlorinated aromatic hydrocarbons ranging 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 to 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 material 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 300° 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

(Continued on next page)

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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 DIV

Standard Form: Liquid.

General Information: Used as an inside coating for shell casings for protection against corrosion and al industrial uses where resistance to mild acids is req Meets joint Army-Navy Specification JAN-P-450, I and II.

Containers: 55-gal. drums.

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

ALUMINUM PAINT VEHICLE—LION OIL DIVISION

Standard Form: Liquid.

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

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

Shipping Classification: Petroleum Asphalt (other 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 m of high-grade petroleum asphalt and petroleum sol to which selected asbestos (rock) fiber has been a The asphalt from which this product is made does contain coal tar, free carbon, or cracked residues. material is in liquid form and requires no heating.

Uses: This material is recommended as a heavy finish for added protection on smooth-surfaced roofing or built-up roofs; for preserving metal roofs, for renewing old, dry, smooth-surfaced roll roofing. high asbestos content permits the sealing of small cr joints, seams, and nail holes, and increases the brepro qualities of the roof. Higher resistance to the drying action of the sun assures minimum expense for up Exceilent results are obtained in weatherproofing exp foundations, concrete surfaces exposed to moisture, dampproofing structures both above and below grade.

Containers: 55-gallon drums; 5-gallon pails, 1-gallon (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 [illegible] pounded from high-grade petroleum asphalt [illegible] especially treated mineral fillers, and asbestos fibers adheres tightly to metal, felt, wood, glass, and [illegible] surfaces. It also has the property of being [illegible] adhere to wet or dry metal and saturated roofing [illegible]

Uses: This material is recommended for repair [illegible] cracks, and holes in all types of roofs, and for sealing waterproofing around chimneys, skylights, [illegible] pipes, and base and cap flashings. It also is useful for the walls of boiler settings, and for dampproofing [illegible] and exterior walls, both above and below grade, where [illegible] film thickness is desirable for maximum [illegible]

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ant farm uses include the repair of watering tanks
a pruning cement.

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

ing Classification: Roofing cement.

LT ROOF COATING — LION OIL DIVISION

dard Form: Liquid.

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

: This product is recommended for added protection
rface finish on smooth-surfaced roll roofing or on built-
roofs; for preserving metal roofs; for renewing old, dry,
oth-surfaced roll roofing.

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

ing Classification: Petroleum Asphalt (other than
t, stain or varnish).

NAILING CEMENT — LION OIL DIVISION

dard Form: Jelly.

eral Information: A jelly-like asphalt cement with
t adhesive strength.

: This product is highly recommended for applying
roofing and for cementing coverings to table tops and
hen cabinets. Lion Blind Nailing Cement eliminates
use of exposed nails, thus giving roll roofing a better
and a longer life.

ainers: 55-gallon drums; 5-gallon pails; 1-gallon pails
in case).

ing Classification: Petroleum Asphalt (other than
t, stain or varnish).

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

E 2 PRIMER — LION OIL DIVISION

dard Form: Liquid.

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

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

ing Classification: Liquid asphalt.

AY PAVING ASPHALT — LION OIL DIVISION

(DEVELOPED BY LION OIL COMPANY)

dard Form: Solid.

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

n 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 a sealing and wearing surface. Mix No. 3 is designed for construction of a surface course on a new or reshaped base. Precise specifications will depend upon special requirements, aggregate to be used, and other variable factors.

Containers: Tank cars.

Shipping Classification: 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

(*Continued on next page*)

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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.	[illegible]
Penetration at 115°F., 50 g., 5 sec.	[illegible]
Penetration at 150°F., 50 g., 5 sec.	3[illegible]
Ash (Mineral Filler), % by weight	[illegible]
Settlement ratio, maximum	[illegible]
High temperature sag test at 160°F., 24 hours, inches	No[illegible]
Low temperature crack-test at—20°F.	No[illegible]
Peel test, 60° to 160°F.	No[illegible]
Break test at 77°F., 1" Mandrill	No[illegible]
Water absorption, 35 weeks, % by weight	0[illegible]
Resistivity, Ohm-cm., above	1 x[illegible]
Voltage breakdown, volts per mil, above	100[illegible]

Containers: 150-lb. fiber cartons.

Shipping Classification: Petroleum Asphalt (other [illegible] paint, stain or varnish).

Literature: "Lion E-120 Coating—Properties-App[illegible] tion", folder published by Lion Oil Company.

FLUX OILS—LION OIL DIVISION

Standard Form: Semi-solid.

General Information: Used in the manufacture of coa[illegible] and saturants, and solid roofing asphalts by oxida[illegible]

Containers: Tank cars.

Shipping Classification: Petroleum fuel oil, residual.

INK ASPHALT—LION OIL DIVISION

(H. S. P.)

General Information: An asphalt used in manufact[illegible] lithographing ink.

Containers: 400-lb. open-head casings.

Shipping Classification: Petroleum Asphalt (other [illegible] 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 [illegible] asphalt was originated and developed by Lion Oil Comp[illegible] under patent No. 2,450,756, catalytically blown aspha[illegible] using phosphorous pentoxide as the catalyst.

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

Typical Properties:

Flash point (C.O.C.), min.	425
Softening point (R&B)	175 to 200
Penetration at 77°F., 100 g., 5 sec.	50-[illegible]
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 [illegible]
Loss at 325°F., 5 hours, max.	1.0%
Penetration after loss on heating, 77°F., 100 g., 5 sec., % of original, min.	60.0%
Bitumen (soluble in carbon tetrachloride), min.	97.0%

Containers: 40[illegible] trucks.

Shipping Classi[illegible] paint, stain or va[illegible]

Literature: "Lio[illegible] Seepage and Ero[illegible] by Lion Oil Com[illegible]

TAL COATIN[illegible]

Standard Form: light, medium, h[illegible]

General Inform[illegible] Impermeable, a[illegible] from corrosive i[illegible] grade petroleum[illegible] mineral fillers, [illegible] ready applicatio[illegible] Films of Coatin[illegible] crack and peel [illegible] resistance to abr[illegible]

Uses: This prod[illegible] underground an[illegible] tanks, metal co[illegible] hoppers, pipes, [illegible] metal surfaces w[illegible] corrosion and r[illegible] provided, as wh[illegible] coats.

Specifications:

REQUIREMENT	
Weight—lbs. per [illegible] at 60°F.	
Solids content, [illegible]	
Mineral filler (A[illegible]	
Flash point, Pen[illegible] Martens, °F.	
Cracking or disb[illegible] at—20°F.	
Time to dry to t[illegible] 1 16" film, hr	
Time to dry firm[illegible] 1 16" film, m[illegible]	
Lineal shrinkage	
Flow of coating [illegible] 325 F., inche[illegible]	
Corrosion of ste[illegible] copper, alumi[illegible]	
Salt spray test, [illegible] film, protecti[illegible] steel panel, m[illegible]	
Outdoor weather[illegible] performance	
Fire resistance of [illegible] film, 6" Bunse[illegible] applied for 3 [illegible]	
Vapor transmissi[illegible] cup, grains per [illegible] foot per hour, [illegible] 0-50°, R.H. [illegible]	

*Can also be br[illegible] (Made under th[illegible]

0685320

TOWOLDMON0043404

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

...Classification: Petroleum Asphalt (other than ...m or varnish).

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

...OATING No. 3—LION OIL DIVISION

...d Form: Liquid, manufactured in four grades: ...edium, heavy and extra heavy.

...l Information: A black, semi-glossy, dense, highly ...cable, adhesive film designed to protect metals ...rrosive influences. The composition contains high-...etroleum asphalt, asbestos fiber, specially treated ... fillers, and a small content of solvent to permit ...pplication at ordinary atmospheric temperatures. ...d Coating No. 3 offer lasting protection, do not ...d peel on exposure to weather, and have high ...ce to abrasion and impact.

This product is used on pipes and tanks to be buried ...ound and as a protective film on bridges, butane ... metal culverts, gas holders, metal roofs, gutters, ..., pipes, pontoons, railings and, in general, all ...surfaces where a tough film is needed to protect from ...ion and rust. Sound deadening properties also are ...d, as when used on the interior of hulls of metal

...lications:

...REMENT	LIGHT (Brush)	*MEDIUM (Spray)	HEAVY (Trowel)	EXTRA HEAVY (Trowel)
...ght—lbs. per gal. ...6°F.	7.8	8.3	8.8	10.2
...da content, %	65	68	75	80
...ered filler (Ash), %	15	20	25	30
...sh point, Pensky-...artens, °F.	102	102	102	102
...cking or disbonding ...n—20°F.	None	None	None	None
...me to dry to touch, ...16" film, hrs.	1.5	1.5	1.5	1.5
...me to dry firm, ...16" film, max. hrs.	24	24	24	24
...ical shrinkage, %	18	15	12	10
...ow of coating at ...25°F., inches	0.0	0.0	0.0	0.0
...rosion of steel, ...copper, aluminum	None	None	None	None
...lt spray test, 1 16" ...film, protection of ...steel panel, min., hrs.	500	500	500	500
Outdoor weathering performance	————Excellent————			
...e 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.			
...por transmission, wet ...up, grains per square ...foot per hour, ½" film, ...0-50° F. 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

0685320.01

TOWOLDMON0043405

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 0.2% 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 liquid or crystalline mass; crystallizing point 28.5°C; H_2SO_4 20.0–25.0%; benzenesulfonic acid 70.0–75.0%; Gr. 1.45 approx. at 25°/15.5°C.

Uses: An intermediate in organic synthesis; a 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

Specifications: *U.S.P. Grade:* White crystalline needle fine powder; assay 99.5% min.; solution in alcohol (1:3) in 10% sodium carbonate (1:6) clear and colorless; U.S.P. test for carbonizable impurities; 5% max. retained on 100 mesh.

Technical Grade: White to yellowish-white flakes or powder; assay 99.0% min.; solution in 10% Na_2CO_3 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 lacquers, varnishes; dispersing agent in grinding of pigments.

Grades: U.S.P. and Technical.

Containers: U.S.P.—100, 50 and 25-lb. fiber drums; 500-lb. fiber drums (for milled material). Technical Grade—500-lb. fiber drums.

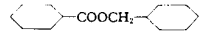
Shipping Classification: U.S.P. Grade: Food Preservative Compound NOIBN. Technical Grade: Dye Intermediate NOIBN.

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 [illegible] ing a pleasant odor.

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

0685321

TOWOLDMON0043406

...ih-black visco...
...at 28.5°C. mi...
...0.0–75.0°C.; S...

...is; a catalyst...

...NOIBN.

...rstalline needl...
...alline needles...
... alcohol (1:2...
...colorless; me...
...% max. powd...

...e flakes or po...
...% Na_2CO_3. (...
...ically colorle...
...max.

...eparations; P...
...ed in the man...
...ds; intermedi...
... calico printi...
...oilizer in bak...
...pigments.

...r drums; 100-...
... Grade—200-...

...Food Preserv...
...ve Intermedi...

...boates," 16-P...

...DIVISION

...id; crystalliz...
...1.570 at 20°...

...oiling ester h...

...eparation of d...
...edicinally in t...

...steiners: 500-lb. drums.

...ping Classification: Insect Repellent NOIBN.

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

...ANIC DIVISION

...lecular Weight: 126.58

...mula:



...ndard Form: Liquid.

...cifications: Clear to slightly turbid, colorless to yellow ...id; Sp. Gr. 1.105–1.110 at 15.5°/15.5°C. Boiling range ...60 mm 2°C max. including 179.4°C.

...s: A highly reactive aralkyl halide used in the production ...the following: dyestuffs; perfume bases such as benzyl ...hol, acetate and other esters; plasticizers; resins; wetting ...ts; germicides; rubber accelerators; gasoline gum inhib...; benzyl benzoate and various pharmaceuticals. CAU...ON: This product is irritating to the skin. Vapors are ...ly irritating to the eyes. Avoid contact with the skin. ...id breathing its vapors.

...tainers: 475-lb. nickel drums; 2,000 gal. 2-compart...nt nickel tank trucks.

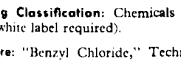
...pping Classification: Chemicals NOIBN. Corrosive ...id (white label required).

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

...YL CHLORIDE, STABILIZED — ORGANIC DIVISION

...lecular Weight: 126.58

...rmula:



...ndard Form: Liquid.

...cifications (for material recovered from stabilized ...lution): Colorless to yellow liquid; Sp. Gr. 1.105–1.110 ...15.5; 15.5 C.

...eral Information—Properties: This form of benzyl ...oride is stabilized by the addition of 23 pounds of 10% ...sium carbonate solution to 450 pounds of the chloride. ...The wet material is a milky-white emulsion from which ...ter may separate into a definite layer at either the bottom ...p, depending upon the temperature and the concen...ion of Na_2CO_3. The concentration of Na_2CO_3 slowly ...creases on standing.

...s: A highly reactive aralkyl halide used in the production ...the following: dyestuffs; perfume bases such as benzyl ...hol, acetate and other esters; plasticizers; resins; wetting ...; germicides; rubber accelerators; gasoline gum inhib...; benzyl benzoate and various pharmaceuticals. CAU...ON: This product is irritating to the skin. Vapors are ...ly irritating to the eyes. Avoid contact with the skin. ...id breathing its vapors.

...tainers: 473-lb. steel drums.

...pping Classification: Chemicals NOIBN. Corrosive ...id (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.

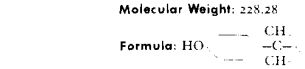
Uses: Intermediate for many derivatives.

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 coating 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)

0685322

TOWOLDMON0043407

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.

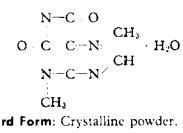
Containers: 400-lb. barrels.

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:

ANHYDROUS	30 C.	50 C.	68 C.	100.1 C.
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; slightly soluble in water; insoluble in alcohol and glycerol. 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	7.2–7.5
P	19.0%	21.0%
Ca	28.5%	27.0%
F	0.004%	0.004%
Pb	1 ppm	1 ppm
Moisture	5%	5%

Uses: Mineral supplement in the manufacture of animal feeds.

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 as 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 flour and prepared flours; to control pH of solution in plating. Used as ingredient in manufacture of glass.

Grades: Regular for phosphated and self-rising flour

0685323

TOWOLDMON0043408

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

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

ing Classification: Calcium Phosphate.

M PHOSPHATE, TRI

own as tribasic calcium phosphate, normal calphosphate, neutral calcium phosphate and tertiary phosphate) — INORGANIC DIVISION

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

dard Form: Powder.

eral Information—Properties: White amorphous powdorless and tasteless; practically insoluble in water. plies with all Federal and State food laws. Conforms specifications listed in National Formulary and ad by the Council on Dental Therapeutics of the ican Dental Association.

s A mineral supplement in foods to supply calcium and phorus; base or polishing agent in tooth powder; ingrein making milk glasses; antacid; conditioner to prevent in salt, sugar, talc and other powdered material. spension agent in polystyrene manufacture.

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

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

ping Classifcotion: Calcium Phosphate.

UM PYROPHOSPHATE (*Normal*)

GANIC DIVISION

ecular Weight: 254.20

mula: $Ca_2P_2O_7$

dard Form: Powder.

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

s: Food fortification and vitamin tablets as a mineral plement.

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

ping Classification: Calcium Phosphate.

UM SILICATE SLAG — INORGANIC DIVISION

dard Form: Granular solid.

eral Information—Properties: CaO, 47.18%; SiO_2, 4%, Al_2O_3, 7.62%; Fe_2O_3, 0.20%; F, 2.62%; P, 0.55%; 0.97%; Na_2O, 0.44%; MgO, 0.02%; Mn, 0.12%; 0.59%; C, 0.10%.

s: Constituent of glass mix.

ainers: Bulk.

ping Classification: Slag.

ON DIOXIDE — INORGANIC DIVISION

mula: CO_2

ecular Weight: 44.0

eral Properties: Marketed in liquid form which is less 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:



Standard Form: Crystalline powder.

Specifications: *White or faintly yellow powder or crystals;* solubility in water 12.15; 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—

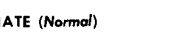
Complete manufacturing plants using DeNora Mercury Cells offered by Engineering Sales Department.

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

— ORGANIC DIVISION

Molecular Weight: 127.57

Formula:



Standard Form: Liquid.

Specifications: Clear, light yellow liquid; crystallizing point —10°C. approx. Distillation range: first drop 228.0 C. min.; 95%, 11–96 ml, 1.0 C. max.; dry point 231.0 C. max.

Uses: An intermediate in the manufacture of azo dyestuffs,

(Continued on next page)

0685324

TOWOLDMON0043409

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; monochloro... (from Cl content) 98.0% min. Distillation range: ... drop 173.0°C. min.; 95% (1–96 ml) 2.0°C. max.; ... point 178.0°C. max.

Uses: An intermediate in the production of dyestuffs ... various other organic products. CAUTION: This prod... is toxic. Avoid breathing its vapors. Avoid contact with ... skin.

Containers: 500-lb. steel drums.

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

para-CHLOROPHENOL (*Also known as para-hydro... chlorobenzene and 4-chlorohydroxybenzene*)

— ORGANIC DIVISION

Molecular Weight: 128.56

Formula:



Standard Form: Cast solid.

Specifications: Yellowish-to-brown crystalline mass; ... tallizing point 42.5°C. min.; Sp. Gr. 1.258 ±0.00... 45.0°/15.5°C.

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

Containers: 545-lb. galv. drums.

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

CHLOROSULFONIC ACID (*Also known as ... 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: Chlo... sulfonic acid reacts violently with water, forming hyd... chloric and sulfuric acids.

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

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

"COLOR-TONED REZ" EXTERIOR and INTER... PENETRATING SEALERS (*"Cedar Rez,*"* *"Driftwo... Rez,*"* *"Mahogany Rez,*"* *"Redwood Rez,*"* *"Dea... Sage Rez,*"* *"Wheat-tone Rez,*"* *"Flamingo Red... "Charcoal Rez,*"* *"Prairie Green Rez,*"* *"Blue Spr... Rez,*"* *"Clay Rez,*"* *"Sandalwood Rez,*"* *"Fir Gr... Rez*"*) — ORGANIC DIVISION

General Information—Properties: A pigmented penetr... ing sealer, to protect and preserve all species of w...

**Also available for Master Painters in a more highly...*

TOWOLDMON0043410

d formulation.

...Applied to bare wood siding, shakes or shingles, ...r-Toned Rez" products penetrates wood pores, ma... reducing absorption of moisture. They resist bleach... and discoloration, conceal effects of weather exposure. ...also be used as interior finish to produce tinted, sub... color grain pattern on paneling, doors and woodwork. ...es ready-to-use and may be applied by brush or spray. ...gallon covers from 200 to 350 sq. ft. depending on sur... conditions.

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

...ping Classification: Wood Filler Liquid.

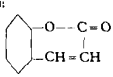
...erature: Rez Color-Toned Color Card.

...MARIN MONSANTO" (Coumarin, N. F.)

...ANIC DIVISION

...lecular Weight: 146.14

...mula:



...dard Form: Crystalline solid.

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

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

...es: Crystals.

...ainers: 200 and 25-lb. fiber drums.

...ping Classification: Chemicals NOIBN.

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

...LOHEXYLAMINE (Also known as hexahydroaniline)

...RGANIC DIVISION

...lecular Weight: 99.17

...mula:



...dard Form: Liquid.

...ecifications: Clear, practically colorless liquid; Sp. Gr. ...869–0.873 at 15.5°/15.5°C. Distillation range: first drop ...0°C. min.; 95% (1–96 ml) 4.0°C. max.; dry point ...0°C. max.

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

...ainers: 375-lb. (approx.) 55-gal. galvanized drums.

...ping Classification: Chemicals NOIBN.

...erature: "Cyclohexylamine and Dicyclohexylamine," ...chnical Bulletin O–74.

...OAMER PC-1244

...GANIC DIVISION

...dard 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.

TOWOLDMON0043411

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.

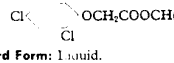
Containers: 600-lb. (approx.) steel drums.

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.

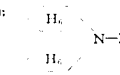
Shipping Classification: Weed Killing Compound NOIBN.

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 additive insecticides and corrosion inhibitors.

Containers: 375-lb. steel drums.

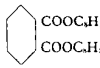
Shipping Classification: Chemicals NOIBN.

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) 0.07% 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, flex 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 plastisol 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 soft characteristics.

Containers: 55-gal. (445-lb.) and 5-gal. 40-lb.) lined iron drums; tank cars.

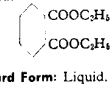
Shipping Classification: Resin Plasticizer

Literature: "Dioctyl Phthalate," Technical Bulletin O-[illegible]; "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, free from suspended matter, not darker than 10; odor very slightly aromatic; acidity (as phthalic acid) 0.01% max.; Sp. Gr. 1.117–1.121 at 25/25°C.; refractive index 1.5000 ± 0.001 at 25°C. (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.

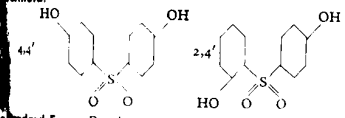
Containers: 500-lb. steel drums; 45-lb. drums; tank cars.

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 chlorinated and converted to ethers, esters, etc. Can be brominated 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.

DIDECYL 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. 0.905 ± 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 cosolvent 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.

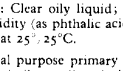
Shipping Classification: Resin Plasticizer.

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.

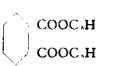
Shipping Classification: Resin Plasticizer.

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.

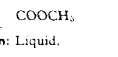
Shipping Classification: Resin Plasticizer.

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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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.

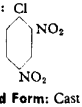
2,4-DINITROCHLOROBENZENE, TECHNICAL

(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.

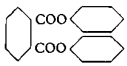
Shipping Classification: Resin Plasticizer.

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, linseed oil rather low, approx. 5.0 gm. per 100 cc. of solvent at 25°C.; completely insoluble in water and gives increased water resistance to all compositions in which it is used.

Uses: Compatible with nitrocellulose and with the sulfonamide, phenolic, polystyrene and vinyl types of synthetic resins. In nitrocellulose lacquers produces hard coatings that have excellent gloss retention and weather resistance. Mixtures of diphenyl phthalate with either "Santicizer 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 alcohol and acetone.

Uses: An anticorrosion agent in lacquers and cotton solutions; an agent to prevent the settling of "Santocel" in 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 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. to max. 0.910 at 15.5°C.; ester content 98–99%;

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start to dry between 73.8 to 80.0°C. at 760 milli-; dryness—mixes with not less than 10 volumes 60° ne without turbidity at 20°C.; acidity less than % as acetic acid.

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

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

ing Classification: Ethyl Acetate.

BENZENE — PLASTICS DIVISION

ular Weight: 106.16

ula: $C_6H_4CH_3CH_3$ (—CH_2—CH_3)

ard Form: Liquid.

ications: Form, clear liquid; assay, 99.0% (Mini-; benzene less than 0.10%; diethylbenzene less than ; color less than 15 APHA; specific gravity (15.5°C), 0-0.8710; distillation range, 135.4°C-136.6°C.; acid-eutral; solubility: water, immiscible, common organic ons, miscible; refractive index (20°C), 1.495-1.497.

eral Information—Properties: An aromatic hydro-on of dependable purity. It possesses solvent proper-similar to xylene. Its chemical reactions include oxida-, nitration, sulfonation, hydrogenation, dehydrogena-, halogenation, alkylation, and acylation.

Production of styrene monomer and chlorostyrenes. n be the starting point for the manufacture of a wide ty of organic compounds, of dyes and pharmaceuticals.

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

ing Classification: Ethylbenzene.

ature: TX-12 "Ethylbenzene," Technical Bulletin.

LENE DICHLORIDE — ORGANIC DIVISION

ecular Weight: 98.95

ula: CH_2ClCH_2Cl

ard Form: Liquid.

ications: Form, clear liquid; acidity, 0.001% max. HCl); specific gravity 25°C 25°C, 1.2450-1.2550; distil-n range °C, the 90% (by volume) between 5% and s shall distill within 1.5°C, of 83.5°C.

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

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

ing Classification: Ethylene dichloride.

ORTHOPHOSPHATE — INORGANIC DIVISION

ecular Weight: 561.59

ula: $FePO_4{\cdot}Fe_2H(PO_4)_2{\cdot}6H_2O$

ard 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, 1½ 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)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.

TOWOLDMON0043415

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 roller bearings and seals in truck wheels, track idler 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 even at winter temperatures, resists water washing, stands up in severest service. Maximum continuous temperature 300°F.

Grades: #1 and #2.

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

Shipping Classification: Lubricating grease.

ALL-PURPOSE GEAR LUBRICANT—LION OIL DIV.

Standard Form: Liquid.

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

SAE Grades: 80, 90, 140 and 250.

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

Shipping Classification: Lubricating grease.

B. & R. GREASE—LION OIL DIVISION

Consistency: Buttery to Granular.

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

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

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

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 machine 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 for lubricating ball and roller bearings and electric

0685331

TOWOLDMON0043416

ct to high temperatures.

de: #1.

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

ping Classification: Lubricating grease.

—LION OIL DIVISION

dard Form: Liquid.

eral Information: Black oil with high film strength e on chains and open gears.

iners: 54-gal. drums.

ping Classification: Petroleum residual fuel oil.

OR MACHINE OIL—LION OIL DIVISION

dard Form: Liquid.

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

iners: 54-gal. drums.

ping Classification: Lubricating oil.

SIS LUBRICANT—LION OIL DIVISION

sistency: Buttery.

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

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

ping Classification: Lubricating grease.

ON PICKER SPINDLE OIL—LION OIL DIVISION

ndard Form: Liquid.

eral Information: A light-bodied oil containing corro- and rust inhibitors for use in cotton picker spindle es.

tainers: 54-gal. drums.

pping Classification: Lubricating oil.

GREASE—LION OIL DIVISION

sistency: Buttery to Granular.

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

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

pping Classification: Lubricating grease.

NE OIL—LION OIL DIVISION

ndard Form: Liquid.

eral Information: A premium quality, straight min- l-type oil. In its many grades, it has literally thousands of ustrial uses. It is used in general lubrication, including on plain and anti-friction bearings and in crankcases h either splash or circulating systems. Because of its h lubricity, tenacious oil film, and resistance to break- n, 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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TOWOLDMON0043417

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

Containers: 54-gal. drums.

Shipping Classification: Lubricating oil.

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

Standard Form: Liquid.

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

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

Containers: 54-gal. drums.

Shipping Classification: Lubricating oil.

WATER PUMP GREASE — LION OIL DIVISION

Consistency: Granular.

General Information: A specialized calcium grease high resistance to water for use in water pumps on mobiles. It has a high melting point and resistance to ical break-down in the presence of hot water.

Containers: 1-lb. and 5-lb. cans.

Shipping Classification: Lubricating grease.

WHEEL BEARING AND UNIVERSAL JOINT G — LION OIL DIVISION

Consistency: Fibrous.

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

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

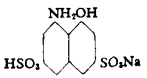
Shipping Classification: Lubricating grease.

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

Uses: An intermediate in the manufacture of dyestu

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 brown liquid; Refractive Index at 25°C., approx 1.54; Specific Gravity at 25/15.5°C., approximately

0685333

TOWOLDMON0043418

A low-cost extender type plasticizer for vinyls.

...ers: Tank cars; 450-lb. drums.

...ng Classification: Resin Plasticizer.

...P PARTIALLY HYDROGENATED

...NYL—ORGANIC DIVISION

...ard Form: Liquid.

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

... Low cost secondary plasticizer for vinyl sheeting, ...ms and vinyl fabric or paper coatings. Plasticizer for ... protective coatings and adhesives. Used to plasticize ...profile extrusions, tubing, wire coating and injection ...lush molding compounds made from vinyl resins. ...izer for styrene water dispersion paints, paper coat-...adhesives and styrene casting resins.

...ners: Tank cars; 460-lb. drums.

...ng Classification: Resin Plasticizer.

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

...OSS REZ" INTERIOR LUSTER WOOD FINISH

...ANIC DIVISION

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

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

...ping Classification: Wood Filler Liquid.

...ure: Rez Color Card Folder.

...OCHLORIC ACID *(Muriatic Acid)*

...GANIC DIVISION

...lecular Weight: 36.47

...ula: HCl

...dard Form: Liquid.

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

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

...s: 18°Bé.; 20°Bé.; 22°Bé.

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

...ping Classification: Muriatic Acid.

...UBLE SULFUR 60"—ORGANIC DIVISION

...dard Form: Powder.

...ifications: 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	C% FREE CARBON	#OIL/#BLACK ABSORPTION	TINTING STRENGTH*	UNDER TONE	TOP TONE
#1	99.57	1.14	238	Blue	Black
AA	87.97	1.65	225	Blue-Brown	Brown-Black
#2	99.42	1.26	208	Blue-Gray	Gray-Black
#8	91.46	1.54	205	Blue	Brown-Black
S-100	98.08	1.37	170	Blue	Black
BTA	98.62	1.42	160	Blue	Blue-Black
B-5	98.92	1.34	140	Blue	Blue-Black
#10	99.29	1.25	100	Blue-Gray	Gray
#10C	99.10	1.26	105	Blue-Gray	Gray

*NOTE: The figures in the column TINTING STRENGTH are relative values using No. 10 Lampblack as a standard. For example: A value of 225 for tinting strength of AA Lampblack means that this black is $2\frac{1}{4}$ times as intense as No. 10 Lampblack.

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

Containers: Paper bags and cartons.

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

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

LEAD ORTHOPHOSPHATE, TRI—INORGANIC DIVISION

Molecular Weight: 811.59

Formula: Essentially $Pb_3(PO_4)_2$

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

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

Uses: Suggested as a pigment.

Containers: 100-lb. fiber drums.

Shipping Classification: Chemicals NOIBN.

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

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)

0685334

TOWOLDMON0043419

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 Contro. 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 ref for use as fuel in oil-burning stoves and lamps, various internal combustion engines.

Containers: Railroad tank cars, transport trucks and b

Shipping Classification: Refined oil, illuminating.

PROPANE—LION OIL DIVISION

Standard Form: Liquid.

General Information: A liquefied petroleum gas used home heating.

Containers: Railroad tank cars and transport trucks.

Shipping Classification: Liquefied petroleum gas. (D gerous placards applied.)

RESIDUAL FUEL OIL—LION OIL DIVISION

Standard Form: Liquid.

General Information: A fuel oil for use in firing fur and boilers on locomotives, steamships, and in indu 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 refinin general use as a fuel in internal combustion engin tractors.

Containers: Tank cars and tank trucks.

Shipping Classification: Petroleum distillate fuel oil, suitable for illuminating purposes. (Dangerous pl applied.)

"LYTRON" TEXTILE PROCESSING AND FINISH AGENTS—PLASTICS DIVISION

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

MALEIC ANHYDRIDE—ORGANIC DIVISION

Molecular Weight: 98.06

Formula:



Standard Form: Briquettes.

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

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

Containers: 200-lb. fiber drums.

Shipping Classification: Maleic Anhydride.

0685335

TOWOLDMON0043420

...E" PAPER SIZING AGENT

...C DIVISION

...d Form: Paste, powder, and liquid.

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

...Mersize RM 70%", "Mersize RM 77%" and "Mersize ...y" are forms of chemically fortified rosin-based sizes ...re ready to use in a paper mill to reduce sizing costs, ...e resistance to ink, water and other aqueous solu... give better feathering resistance and more uniform, ...able sizing. "Mersize CD-2" and "Mersize CD-2 ..." are used in conjunction with typical rosin sizes to ... the same results.

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

...ing Classification: Rosin Sizing NOIBN.

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

...NE" WB-2 and WB-4 PRECOAT FOR ...UCTION PAPERS — INORGANIC DIVISION

...d Form: Liquid.

...al Information—Properties: A 15% and 30% re...ely colloidal dispersion of silica in water; odorless.

... As a precoat on blueprint and other reproduction ... for clearer, more legible prints. On blueprint a ..., more lively blue is obtained. Also used on diazo ..., blueprint cloth, negative paper and Van Dyke paper. ...ting is performed by coaters. A license from Mon... is required to employ the silica precoat process which ... "Mertone."

...iners: 55-gal. lined steel drums.

...ing Classification: Chemicals NOIBN.

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

...A-GREEN" SILAGE GRADE SODIUM meta ...ITE — INORGANIC DIVISION

...ecular Weight: 190.13

...ula: $Na_2S_2O_5$

... Used in putting up grass silage to prevent bacterial ...y, which causes fermentation and decay. Insures a ... smelling silage of green color and high carotene con... and good palatability.

...iners: 80-lb. bags.

...ANOL — PLASTICS DIVISION

...ecular Weight: 32.04

...ula: CH_3OH

...d Form: Liquid.

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

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

...ing Classification: Methanol.

...APYRILENE FUMARATE ...pyramine Fumarate) — ORGANIC DIVISION

...ecular Weight: 870.98

Formula: $(C_{14}H_{18}N_3S)_2[(CHCO_2H)_2]_3$

Standard Form: Powder.

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

Uses: 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 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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TOWOLDMON0043421

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

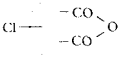
Shipping Classification: Chemicals NOIBN.

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

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

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

Containers: Bags or drums.

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

"MONSANTO DETERGENT MXP"

—INORGANIC DIVISION

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

Uses: A highly efficient detergent with controlled su action. Especially applicable where minimum suds a quired. Since it is built with water-softening chemic is effective in either hard or soft water.

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

Shipping Classification: Washing Compound NO Powder.

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

"MONSANTO FIRE RETARDANT A"

—INORGANIC DIVISION

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

Uses: Flame-retardant treatment of wood and paper.

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

Shipping Classification: Ammonium Phosphate.

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

"MONSANTO PENTA" (PENTACHLOROPHENO TECHNICAL)—ORGANIC DIVISION

Molecular Weight: 266.35

Formula: OH



Standard Form: Flakes. "Monsanto Penta available. Contains 3-lbs. oil per TECHNICAL. Oil decreased somewhat ency of the product.

Specifications: Dark, grayish flakes, 174.0°C. min.; alkali insoluble material 96.0% min.; pine oil solution NPA

General Information—Properties: bulking value 45.5 lbs. per cu. ft.; stable under conditions; relatively non-hygroscopic and unreac cally; soluble to various degrees in organic tively insoluble in water.

"Monsanto Penta" and its solutions and be irritating to the skin and mucous somewhat toxic to man and the higher

suggested

Uses: Hig bacteria. U ams must gainst rot an effectiv ons or as

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ired for handling should be observed.

Highly toxic to fungi, termites and many forms of
eria. Used industrially where the growth of microorgan-
s must be prevented or controlled; to protect wood
st rot, termites and Lyctus (Powder-Post) beetles; as
ffective herbicide. Penta is used frequently in oil solu-
or as the sodium salt (see "Santobrite").

ainers: 100-lb. leverpak, 50-lb. paper bags.
Oiled Penta 16 ½-gal. leverpak, 51-lb. paper bag.

pping Classification: Pentachlorophenol.

erature:
Monsanto Penta (Santophen 20)," Technical Bulletin O-25.
Chemicals for Termite Control," Technical Bulletin O-13.
Determination of Chlorophenols and Their Salts in Im-
pregnated Materials," Technical Bulletin O-24.
xicology and Dermatology of Pentachlorphenol and
odium Pentachlorphenate," booklet.
Wood Preserving Applications with Monsanto's Penta,"
-page booklet.
P (Maximum Protection)," folder.
Monsanto Products for Paint Preservation," Bulletin
-054-H.
nta the Best Protection for Poles and Cross Arms,"
booklet.
nta to Preserve Wood on the Farm," booklet.
ace Posts, Make Them Last," folder.
Monsanto Pentachlorophenol . . . In Industrial Construc-
tion," 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.
ur Answer Book on Penta Wood Preservation," 40-page
booklet.
reet's Catalog Reprint" (with Treating Plant List).

ONTAR" SYNTHETIC RESINS—ORGANIC DIVISION

tandard 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

Nalubes Naturalube Motor Oils are made from a basically fine crude oil, and possess an extremely tough protective film, great penetrating power and adhesiveness, non-corrosive-ness and the ability to loosen and remove hard carbon deposits.

DVANCED-FORMULA NATURALUBE D.H.D. OIL
TION OIL DIVISION

tandard Form: Liquid.

eneral 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).

(Continued on next page)

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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.

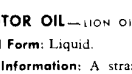
Shipping Classification: Lubricating oil.

"NIRAN" INSECTICIDE *(Monsanto Parathion)*

— ORGANIC DIVISION

Molecular Weight: 291.27

Formula:



Standard Form: Liquid.

Specifications: Brown liquid; assay 98.5% min.; crystallizing point 6°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: 36° HNO: 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 cake 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 vapors 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* NOI "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, 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 NOI "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 chloroaniline 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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ng Classification: Dye Intermediate NOIBN. "Poison" label required.

ture: "ONCB: Properties & Reactions," Technical letin O-11.

NITROCHLOROBENZENE — ORGANIC DIVISION
known as para-chloronitrobenzene)

lecular Weight: 157.56

mula: Cl



NO_2

ndard Form: Flakes.

ecifications: Light yellow flakes or crystalline mass; ltizing point 82.3°C. min.

e: Preparation of dyestuff intermediates and pharmaceu-ls. CAUTION: This product is toxic. Avoid breathing vapors and avoid contact with the skin. Toxicity refer-ce: U. S. Public Health Bulletin No. 271 (1941).

ntainers: 325-lb. fiber drums.

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

OGEN FERTILIZER SOLUTIONS
RGANIC DIVISION

ndard Form: Clear water solution.

ecifications:

	LION NITROGEN SOLUTIONS			
	NO. 1	NO. 2	NO. 3	NO. 49
RONIUM RATE CENT	65.0	55.5	66.8	60.0
STROUS MMONIA CENT	22.2	26.3	16.6	34.0
TER CENT	12.8	18.2	16.6	6.0
TROGEN NTENT NITRATE	11.38	9.71	11.69	10.50
TROGEN NTENT AMMONIA	29.63	31.34	25.34	38.50
TAL TROGEN NTENT	41.0	41.0	37.0	49.0

perties:

	LION NITROGEN SOLUTIONS			
	NO. 1	NO. 2	NO. 3	NO. 49
ROXIMATE C. GRAVITY T 80° F.	1.139	1.79	1.182	1.042
ROXIMATE LBS. GALLON 60° F. LBS.	9.49	8.99	9.86	8.71
ROXIMATE PRESSURE PSI AT 104°	10.0	17.0	1.0	50.0
ROXIMATE MPERATURE AT T SALT BEGINS CRYSTALLIZE	21°F	—25°F	48°F	—52°F

e: 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



NO_2

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-

Continued on next page

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TOWOLDMON0043425

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, $\frac{3}{32}$" film, hrs. max.	2.0	2.0	2.0	2.0
Dry firm, $\frac{3}{32}$" film, hrs. max.	24	24	24	24
Salt fog resistance, $\frac{1}{16}$" film, complete protection of steel panel, hrs., min.	500	500	500	500
Vapor transmission, wet cup, grams per 100 sq. in. per 24 hrs., $\frac{1}{8}$" film, 0–50% RH	0.01	0.01	0.01	0.01
Fire resistance of cured film, 6 in. Bunsen flame applied for 3 minutes	Excellent. No falling of asphalt dro... Fire duration less than one minute... flame is removed.			
Resistance to solution of acid, 60 day immersion of steel panels coated with $\frac{3}{32}$" film	No appreciable attack, blistering... hardening of coating or corrosion... panels by 10% HCl, 10% H_2SO_4, 10%, 30% and 85% solution of p... phoric acid.			
Resistance to solutions of alkalies and salts, 60 day immersion of steel panels coated with $\frac{3}{32}$" film	No appreciable attack, blistering... hardening of coating or corrosion... panels by solutions of 10% and ... NaOH, 45% ammonium nitrate, ... saturated solution of ammonium sul...			

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

Shipping Classification: Roofing Cement.

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

K KOTE—LION OIL DIVISION

General Information: An asphalt base, mastic compou... containing a high volume content of screened ground ... *and a small amount of long fiber asbestos.* Applied ... spray equipment or trowel, K Kote cures to a tough ... abrasion-resisting film with excellent insulating ... weather-and-vapor barrier properties. K Kote, ... applied by spray, has a pleasing appearance with the ... particles uniformly distributed throughout to decrease ... thermal conductivity of the film. A ¼" film of K ... compared to a bare steel surface can reduce the loss of ... up to 65%. Yet the film acts as a weather and vapor ba... to protect underlying surfaces from condensation, corro... and weathering elements; and sound deadening valu... given to ducts, walls, etc. Upon curing the film becom... fire resistant and does not support combustion.

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

Typical Properties and Performance:

	Standard or Spray	Indust... or Tro...
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	65
Approx. solids by volume, %	68	72
Dry to touch, $\frac{1}{8}$" spray coat, min.	45	45
Dry firm, $\frac{1}{8}$" spray coat, hours	24	24
Approximate volume of cork in cured film, %	55	57
Lineal shrinkage, %	16	15

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TOWOLDMON0043426

sistance to abrasion by d blast	Excellent	Excellent
door weathering formance	Excellent	Excellent
ow of cured $\frac{1}{4}$" film on tical panel, vertical at °F	None	None
mperature range of ating	−40 to 300°F.	−40 to 300°F.

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

ipping Classification: Roofing Cement.

erature: Nokorode Uses and Specifications Sheet; isture and Vapor Proof Barrier 4-Page Letter.

L 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.

ypical Properties and Performance:

	Trowel	Spray
ash, Pensky-Martin, °F	100+	100+
ounds per gal. at 60°F., approx.	7.45	8.0
olids by weight, %	63+	58+
olume shrinkage on curing, %	34–36	40
ss of sprayed or trowel $\frac{1}{4}$" film	None	None
ss of sprayed or trowel $\frac{1}{4}$" film, s than	$\frac{1}{8}$ to $\frac{3}{16}$"	$\frac{1}{4}$"
ry to touch $\frac{1}{4}$" film, minutes	30 to 45	30
$\frac{1}{4}$" film, minutes	45	45
sistance to abrasion by sandblast	Good	Excellent
door weathering performance	Excellent	Excellent
ow of cured film at 325°F.	None	None
rmeability at 77°F., wet cup, ayed film:		
Permeability value, g hr cm mm. Hg		$3–10^7$
Grams 100 sq. in. 24 hrs., $\frac{3}{32}$" wet film, 0–50% R.H., 90°F.		0.50
Perms, $\frac{3}{32}$" 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.

TEMP—LION OIL DIVISION

General Information: A catalytic asphalt base (U. S. Pat. No. 2,456,756 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, $\frac{1}{4}$" film, days	2
Dry firm, $\frac{1}{4}$" 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 $\frac{1}{4}$" 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.

(Continued on next page)

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TOWOLDMON0043427

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, 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 sheets, 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 automobile 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 pounding 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 those used in cabinets, to prevent vibration noises and eliminate "tinniness" of thin-gauge panels. Used for stamped steel 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

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...il-base rust p...
...on of a thin fil...
...tection to m...
...nidity and ot...
...: a low viscos...
...id in addition ...
...n heavier bod...
...ot interfere w...

...during the asse...
...protection dur...
...ideal economi...
...metal sheet a...

...OIBN.
...ns Sheet.

R

...rial composed...
...s, and additiv...
..., and floor pan...
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...in automobiles...
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...terial which dr...
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...l reduces maint...
...units than regu...

...er or sound de...

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...ION OIL DIVISI...
...mpound used ...
...anels, such as ...
...uses and elimin...
...for stamped b...

...sealer or sou...

...tions Sheet.

...ound for use ...
...ider frame, and ...
...brics to a coat...

...ish seals out moisture, chemicals, and fumes to prevent ...rosion.

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

...pping Classification: Roofing Cement.

...erature: Nokorode Uses and Specifications Sheet.

...KOTE — ...LION OIL DIVISION

...eral Information: An asphalt base coating for applica... to the unprotected back of metal signs. Sign Kote ...vents corrosion of the metal and can greatly extend the ...e of the sign by protecting it against the effects of fumes ...d fogs which contain various corrosive chemicals. Dries ...s tough, black, semi-glossy film. Applied by brush.

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

...pping Classification: Roofing Cement.

...erature: Nokorode Uses and Specifications Sheet.

...proved government

...olication compounds

...RNMENT RUST PREVENTIVES

...N OIL DIVISION

...eral Information: Various types of materials manufac... to meet exacting Government standards. These ...erials have been tested and approved by the Govern... laboratories as meeting their specifications and ...rtificates of Compliance are supplied covering same. ...llowing is a list giving the Nokorode designation and ... Government Specification for which it is approved:

...korode Designation	Government Specification
...-122	USA 2–122
...-126, Grade 1	USA 2–126, Grade 1
...-126, Grade 2	USA 2–126, Grade 2
...4	USA 2–84B (Amendment 1)
...-121	USA 2–121
...2	USA 2–82C
...47	AXS 1347
...Co83	MIL-C-11796A, Class 1
...Co91	MIL-C-11796, Class 2
...963	MIL-C-11796A, Class 3
...73	AXS-673 (Revision 2)
...083	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-511	MIL-C-3254, Type 2

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

...erature: Nokorode Uses and Specifications Sheets.

...OS" GLASSY SODIUM PHOSPHATE

...RGANIC DIVISION

...dard Form: Dry powder.

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

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

...ping 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)

Continued on next page

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TOWOLDMON0043429

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.

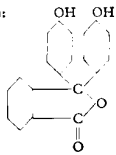
Shipping Classification: Phenol, "Poison" label required.

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 0.12% 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.

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 eit 65% or 70% aqueous solution. Light brown-to- liquid or crystalline mass depending on temperature; 65% min. or 70% min., contains small amounts of sulfuric acid, phenols and sulfones.

Uses: An intermediate in chemical manufacture and plating operations.

Containers: 600-lb. steel drums.

Shipping Classification: Acid NOIBN Liquid.

PHOSPHATIC FERTILIZER SOLUTION

— INORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: Recommended for use in manufacture of fertilizers. Because this is a product no guarantee of analysis is made except for content which will vary from 54.5% to 58% P_2O_5 (75% 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 water in all proportions; 75%, 80% and 85% H_3PO_4.

General Information—Properties: Density and con tion of water solutions of orthophosphoric acid at 15°

DENSITY GM./CC.	DECREASE PER 1°C.	%H_3PO_4	%P_2O_5
1.100	0.00030	17.52	12.69
1.150	0.00035	25.25	18.29
1.200	0.00045	32.52	23.55
1.250	0.00050	39.22	28.41
1.300	0.00055	45.51	32.96
1.339	0.00055	50.00	36.21
1.350	0.00060	51.22	37.10
1.400	0.00060	56.85	41.17
1.450	0.00060	62.27	45.10
1.500	0.00065	67.35	48.78
1.550	0.00070	72.11	52.23
1.581	0.00077	75.00	54.32
1.600	0.00075	76.75	55.59
1.650	0.00075	81.30	58.88
1.693	0.00080	85.00	61.56
1.700	0.00080	85.63	62.02
1.750	0.00080	89.88	65.10
1.800	0.00080	94.15	68.19
1.850	0.00080	98.13	71.07
1.874	0.00080	100.00	72.43

The density of more concentrated acids increases approximately linearly (within the range 72.44% to 85% P_2O_5 the excess P_2O_5 over 72.44% according to the equat

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...ity at 15°/4°C. = 1.874 + 0.0171 (%P_2O_5 — 72.43).

...: To increase translucency and improve color of porce-
... and as a vitrifying agent and flux; manufacture of
...m phosphates, ammonium phosphates, calcium phos-
...s and other phosphates; production of albumin deriva-
...; drying agent in the synthesis of various intermediate
...icals and dyes; process engraving and litho trades;
...erant to aid in the absorption of the gum on envelopes;
...anufacture of gelatin; substitute for tartaric and citric
... in jelly, preserves and soft drinks; opacifier in glass
...facture; manufacture of certain pharmaceutical chem-
... and dental cements; glycerophosphate manufacture
...purification of hydrogen peroxide; for brightening the
...s on rope and twine; coagulant of rubber latex; manu-
...re of rustproofing compounds; silage preservation;
...ning and clarifying agent in sugar; for brightening the
...of silk; dyeing of cotton; calico printing; water soften-
...d correction of alkalinity; bright polishing of alumi-
... electro polishing of stainless and carbon steels; steel
...ng; manufacture of special bricks; petroleum catalyst.

...des: U.S.P.; food, meets all U.S. Pure Food Law re-
...ements; commercial, clear, water-white liquid; Phos-
...s meets all U.S. Food Law requirements.

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

...ping Classification: Phosphoric Acid.

...ature: "Phosphoric Acid," Technical Bulletin I-26;
...e Handling of 75% Phosphoric Acid in Tank Car
...ntities," booklet; "Phosphoric Acid as a Catalyst,"
...et.

...PHOROUS ACID — INORGANIC DIVISION

...ecular Weight: 82.00

...mula: H_3PO_3

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

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

...s: Intermediate in production of phosphites. Strong
...ugh sometimes slow reducing agent.

...ainers: 13-gal. carboys.

...ping Classification: Acids, NOIBN, liquid.

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

...SPHORUS, ELEMENTAL — INORGANIC DIVISION

...known as yellow phosphorus and white phosphorus)

...eral Information—Properties: Light yellow, wax-like,
...-transparent solid; burns spontaneously in air to form
...O... M.P. 44.1°C.; very soluble in carbon bisulfide; insol-
...le in water.

...s: Manufacture of phosphorus alloys, phosphoric anhy-
...de, phosphorus compounds, phosphoric acid, rodent
...ons, flares, smoke screens, etc.

...des: Monsanto process of manufacture provides over
...9% purity.

...ainers: 400-lb. drums; tank cars.

...ping Classification: Phosphorus Yellow. Toxic and
...mmable (yellow label required).

...ature: "Phosphorus the Light Bearer," booklet.

PHOSPHORUS OXYCHLORIDE
(Also known as phosphoryl chloride)
— INORGANIC DIVISION

Molecular Weight: 153.35

Formula: $POCl_3$

Standard Form: Liquid.

Typical Analysis: Water-white liquid; assay 99.75% $POCl_3$; Sp. Gr. 15.5 C. 15.5 C., 1.685; free Cl_2, trace; PCl_3, 0.12%; distillation range C.: first drop 106.7, 1–96 ml 1.0, dry point 107.9.

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

Caution: Care must be exercised in handling this product. Avoid breathing its vapors. Avoid contact with the 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 (as P_2O_3), color by water solution 50 APHA.

General Information—Properties:
VAPOR PRESSURE [after J. C. Southard and R. A. Nelson—J.A.C.S., 63, 911, 1937.]

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

A (low temperature form)	$\text{Log}_{10}p = 9.792 - \frac{5000}{T}$
B (high temperature form)	$\text{Log}_{10}p = 11.113 - \frac{7930}{T}$
L liquid	$\text{Log}_{10}p = 6.809 - \frac{4320}{T}$

Atmospheric sublimation temperature: 358.9 C.
Heat of vaporization:
A—22,800 calories per gm. molecule
B—36,200 calories per gm. molecule
L—15,700 calories per gm. molecule
Heat of fusion 16,500 calories per gm. molecule
Probable molecular formula of vapor: P_2O_5

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 650-lb. drums.

Continued on next page

0685346

TOWOLDMON0043431

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 Characteri Exceptionally good for low-temperature applications glue bonding where superior water-resistance is desired

Uses: Bonding glues used in the manufacture of ply furniture, case goods of all types. Also used in Monsa patented No-Clamp Process for making plywood as 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 A RESORCINOL RESINS — PLASTICS DIVISION

Standard Form: Dry powders; liquids.

General Properties and Performance Characteri Various properties are available for requirements dem ing water and weather resistance, gluing, strength quick-setting.

Uses: Bonding and impregnating adhesives and glue furniture, plywood and aircraft. Used for hot and pressing and for radio frequency equipment. Used i molding of diversified components from granulated wo

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

Shipping Classification: Glue, dry or liquid, NOIBN

Literature: Data Sheets, Product Information Bulletin

bonding, impregnating and coating resins

"LYTRON" SAND CONDITIONER — PLASTICS DIVI

Standard Form: Finely divided, pale yellow powder.

General Properties and Performance Characteri Reduces clay balling, leads to more economical castings.

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

Containers: Nonreturnable fiber drums.

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

Literature: Product Information Bulletin; Data Shee

"LYTRON" STYRENE — PLASTICS DIVISION

Standard Form: Powders or latices.

General Properties and Performance Characteri "LYTRON" latices form the basis of post-plasticized system for water-base paints and coatings. "Lytron soluble resin is a stabilizer, film hardener and promoter in water emulsion systems.

Uses: Main vehicle and protective colloid for water paints and coatings. Treating resin for industrial uses as battery separators, rubber compounding and for emulsion waxes.

Containers:
types; multi

Shipping Cl
ing to type a

Literature: P

OPALON" V

Standard Fo

General Pr
When fused
abrasion-resi
which are al
temperature
is a "stir-in
resulting pla
resistance to

Containers:

Shipping Cla
NOIBN—Ra

Literature: 1
technical dat

ORIZON" P

Standard Fo

General Pro
Modified pro
mixed with
example, poly
paper or boar
stronger heat

Uses: Militar
ings; multiwa

Containers:

Shipping Cl
liquids NOIB

Literature: T

OLYVINYL B

Standard Fo

General Pro
Tough, resili

Uses: As clo
toners and c

Containers:

Shipping Cla
quer NOIBN

Literature: Di

RESIMENE" F

PLASTICS DIVIS

Standard For

General Pro
Impart impro
cure, better gl

Uses: Baked
automobiles a

Containers:
trucks.

Shipping Cla
ing to type an

0685347

TOWOLDMON0043432

...iners: Drums, tank trucks or tank cars for liquid ...; multiwall bags for solid types.

...ping Classification: Resins synthetic—varies accord... type and use.

...ature: Product Information Bulletin; Data Sheet.

...ON" VINYL CHLORIDE — PLASTICS DIVISION

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

...eral Properties and Performance Characteristics: ...n fused, plastisols of "Opalon" 410 provide tough, ...sion-resistant coatings, foams, sponges or moldings ...h are also resistant to alkalis, acids, greases, oils and ...perature variations. Because "Opalon" 410 vinyl resin ...s "stir-in" type, plastisol compounding is faster, and ...ting plastisols have low viscosity, tear strength and ...tance to weathering and ageing.

...iners: Multiwall bags.

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

...ature: Product Information Bulletin; Data Sheet, ...nical data.

...ON" POLYETHYLENE — PLASTICS DIVISION

...dard Forms: Pellets and compounds.

...eral Properties and Performance Characteristics: ...ified properties are obtainable with polyethylene when ...d with other resins, rubbers, waxes and fillers. For ...mple, polyethylene as a wax reinforcement coating gives ...r or board coatings higher gloss, greater scuff resistance, ...ger heat seals and improved printability.

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

...tainers: Multiwall bags.

...ping Classification: Synthetic plastic other than ...ids NOIBN—Rail; Synthetic resin granules—Truck.

...ature: Technical Bulletins; Data Sheets.

...VINYL BUTYRAL — PLASTICS DIVISION

...dard Form: Resin solutions.

...eral Properties and Performance Characteristics: ...ugh, resilient, high adhesion and good transparency.

...: As cloth and paper coating; adhesive, metal condi...ers and component of baked coatings.

...tainers: Solutions—55-gal. nonreturnable drums.

...ping Classification: Solutions—(rail or truck) Lac... NOIBN.

...ature: Data sheet.

...MENE" MELAMINE AND UREA

...STICS DIVISION

...dard Form: Resins in liquid solution.

...eral Properties and Performance Characteristics: ...part improved soap resistance, surface hardness, faster ... better gloss.

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

...tainers: Nonreturnable steel drums, tank cars and tank ...ks.

...ping Classification: Resins synthetic—varies accord... 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 p... ...ration 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

(*Continued on next page*)

0685348

TOWOLDMON0043433

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, uni... density color, or graduated color.

General Properties and Performance Characteri... Tough and resilient; excellent adhesion to glass; tr... parency of superior quality; reduces sun glare, so... TV picture.

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

Containers: Fiber drums; fiber boxes on pallets.

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

fabricating materials

"NITRON" CELLULOSE NITRATE — PLASTICS DIVISION

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

General Properties and Performance Characteristi... Exceptional toughness, beauty and pattern variety. Resili... but not elastic, resists weak acids and alkalies. Outstand... dimensional stability.

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

Containers: Single fiber and bulk fiber boxes on skids.

Shipping Classification: Cellulose derivative, plastic sh... pyroxylin.

Literature: Data Sheet, Technical Information Bulleti...

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

Standard Forms: Flexible film, embossed or plain, in th... ness up to 20-gauge and widths up to 72". Specially for... lated film with varying degrees of flexibility for indust... and agricultural applications are also available.

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

Uses: Draperies, shower curtains, tablecloths, wall co... ings, aprons, rainwear and inflatable items. Low temperat... formulations are used for outer garments and protect... coverings for machinery and al fresco-stored material... supplies. "Ultron" has proved a valuable greenhouse gl... ing tool and an important aid to farmers seeking a wat... proof, weather-resistant silage cover. Industrial uses incl... moisture vapor barriers, electrical tapes. Also used in... manufacture of electrolyte molds, printing plates, draw... instruments, light-diffusing panels, calculators, lamp sh... and Christmas lighting displays.

Containers: Fiber boxes. Jumbo rolls furnished on requ...

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

Literature: Data Sheets, specialty application bulletins.

0685349

TOWOLDMON0043434

"RON" VINYL CHLORIDE *(Rigid Sheets)*

STICS DIVISION

ndard Forms: "Ultron" rigid vinyl is available in plasticized planished or calendered sheets, 20" x 50" med size (approx. 21 1/2" x 51 1/2" untrimmed), and in endered rolls of standard widths up to 51 1/2". Wider rolls available on request. Calender finish rolls and sheets y be obtained in white, black and colors, opaque or nslucent.

neral Properties and Performance Characteristics: lf-extinguishing from the flammability angle; resists ckening even after prolonged exposure to ultra-violet ys. Readily vacuum formed into a wide variety of products nging from lighted displays to multi-compartment ckages.

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

tainers: Fiber boxes and bulk fiber boxes on skids.

pping Classification: Plastic Sheeting.

rature: Data Sheets.

EPAK" CELLULOSE ACETATE — PLASTICS DIVISION

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

neral Properties and Performance Characteristics: n be fabricated on fast automatic machines into square, ctangular or cylindrical shapes, can be quickly and onomically fabricated by vacuum forming. Combines dily with other packaging materials such as metal, paper, rdboard, foil, etc. May be printed, embossed or hot-mped.

es: For "see-through" packaging of products ranging om small hardware items to women's fashion accessories. lso ideally suited for transparent protective sleeves, bill-old swing arms; used in lamination of advertisements and omotional material, giving such printed matter permanent splay value, filing tabs, diagrammatic drawings, fabricated ets and transparent windows.

tainers: Single fiber boxes; bulk fiber boxes on skids; ber drums.

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

erature: Data Sheet, Product Information Bulletin.

lding materials

TREX" STYRENE — PLASTICS DIVISION

ndard Forms: Molding compounds for injection molding, mpression molding and extrusion in all types of machines d molds. Extruded sheets of "Lustrex" styrene suitable r draping and vacuum forming. General purpose materials signated 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" 512 Copolymer developed for phonograph record compounds.

Continued on next page

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TOWOLDMON0043435

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 finish.

Uses: Textile treating resins that furnish durable finish 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 Bulletins.

"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 Bulletins.

"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.

0685351

TOWOLDMON0043436

...: Paper manufacturing.

...ainers: Polyethylene-lined multiwall bags and lever ... containing 50-lbs. of resin.

...ping Classification: Synthetic plastics O/T liquid ...IBN—Rail; Synthetic resin powder—Truck.

...ature: Data Sheet and Technical Information Bulletin.

...ER" VINYL, STYRENE—PLASTICS DIVISION

...dard Forms: "Stymer" LF is vinyl resin, soluble with ...onium hydroxide; "Stymer" S is styrene resin, soluble ...ater.

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

...: Sizes for acetate, rayon and other synthetic fibers.

...ainers: Paper bags; fiber drums.

...ping Classification: Synthetic plastic other than liquid ...; Synthetic resin powder—Truck.

...ature: Technical Bulletins and Data Sheets.

...SSIUM METAPHOSPHATE—INORGANIC DIVISION

...lecular Weight: 118.08

...mula: KPO_3

...dard Form: Powder.

...eral Information—Properties: White powder; M.P. ...rox. 810°C.; practically insoluble in water; insoluble in ...ohol.

...: Suggested for ceramic glazes; phosphate glasses; pol... agent.

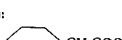
...ainers: 200-lb. net drums.

...ping Classification: Potassium Phosphate.

...ASSIUM PHENYLACETATE 64% SOLUTION

...GANIC DIVISION

...mula:



CH_2COOK

...dard Form: Liquid.

...ifications: Clear, pale yellow liquid with characteristic ...or; assay 64.0% min.; pH range 7.0–8.0; refractive index ...475–1.482 at 25° C.; Sp. Gr. at 25°/25°C. 1.250–1.270.

...eral Information—Properties: Use of the liquid form ... the potassium salt facilitates the handling of phenylacetic ...id and reduces the odor problem. Two pounds of the ...ution are equivalent to one pound of phenylacetic acid.

...: As a precursor in the manufacture of Penicillin G.

...ainers: 540-lb. drums; tank cars.

...ping Classification: Chemicals NOIBN.

...ASSIUM PHOSPHATE, DI—INORGANIC DIVISION

...lecular Weight: 174.18

...mula: K_2HPO_4

...dard Form: White hygroscopic powder.

...eral Information—Properties: Anhydrous; white hy...scopic powder, highly soluble, 100 gms. water will dis... 233 gms. K_2HPO_4 at 25°C.; insoluble in alcohol; con...trated aqueous solutions are miscible with glycerin; pH ...% solution 9.2, very hygroscopic; at 25°C. and 35% ...ive humidity, K_2HPO_4 absorbs water to form a 70% ...tion.

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)

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TOWOLDMON0043437

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

General Information—Properties: An anhydrous monocalcium phosphate used as an acid component for leavening agents in self-rising flours and corn meal, also baking powders and prepared mixes. 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 [illegible]

"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 sanding; easy, economical and durable finishes with paint, enamel or stain. One gallon covers approx. 600 sq. ft.

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

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

ing Classification: Wood Filler Liquid.

ure: Rez Color Card Folder.

" CLEAR EXTERIOR FINISH

IC DIVISION

al Information—Properties: A synthetic resin base lated with a mildewcide to control mildew formation terior wood.

r, gloss exterior wood finish developed through exten- ractical application in the field. New and different in d of exterior finishes Rezite builds a *clear gloss* film protects wood against the weathering effects of sun and ture . . . preserving the *natural color* and grain pattern wood. Rezite may also be applied over Rez color-tones ve a gloss finish if desired. One gallon covers approx. 00 sq. ft. depending upon porosity of wood and er of coats applied.

iners: 5-gal.; 1-gal. (4/case); quarts (12/case).

ing Classification: Wood Filler Liquid.

ture: Leaflet, "New Monsanto Rezite."

ARIN, U.S.P.

own as *saccharin insoluble, and ortho-sulfoben-*

—ORGANIC DIVISION

ular Weight: 183.18

ula:



dard Form: Powder and coarse powder.

ifications: White crystalline powder; assay 98% min.; 227.0 C. min.; loss on drying 0.50% max.; solubility 0% Na_2CO_3 complete.

: Sweetener for tooth pastes, mouth washes and phar- utical preparations. Approximately 500 times the tening power of sugar.

iners: 100-lb. fiber drums.

ping Classification: Chemicals NOIBN.

ature: "Saccharin, the Perfect Sweetener," r; "Recipes enjoy the sweet things of life with Sac- in," booklet of saccharin-sweetened food recipes.

ARIN, SODIUM, U.S.P. — ORGANIC DIVISION

own as *soluble saccharin and sodium* ulfobenzimide)

ular Weight: 241.21

ula:



dard Form: Powder, granules, crystals.

ifications: 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.

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"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.

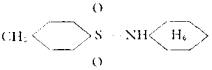
Shipping Classification: Salt Cake.

"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. leverpaks.

Shipping Classification: Resin Plasticizer.

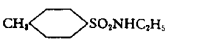
Literature: "Monsanto Plasticizers", 64-page booklet.

"SANTICIZER" 3 PLASTICIZER — ORGANIC DIVISION

(N-Ethyl para-Toluene Sulfonamide)

Molecular Weight: 199.27

Formula:



Standard Form: Crystalline solid.

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

Uses: "Santicizer" 3 is a solid, sulfonamide type plastici Its compatibility with commonly used resins is limited is widely used in combination with other plasticizers. Bl in combination or alone it imparts high gloss, toughness hardness. It sharpens the softening point of some ther plastics, especially the cellulose esters. Its use makes p sible such products as heat sealing lacquer coatings and hesives. It is compatible with cellulose acetate to the ex of 50 parts per 100 parts of resin. In addition to its ef on toughness and gloss, it improves the flow of mold compositions and lowers moisture permeability. Its co patibility with polyvinyl formal is approximately the sa as with cellulose acetate and its use improves flow and parts excellent gloss.

Containers: 430-lb. steel drums.

Shipping Classification: Resin Plasticizer.

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

"SANTICIZER" 8 PLASTICIZER — ORGANIC DIVISION

(Mixture of N-Ethyl-ortho- and para-Toluenesulfonamid

Molecular Weight: 199.27

Formula:



Standard Form: Liquid.

Specifications: Light yellow, viscous liquid; odor sli characteristic; unsubstituted amide 9–13%; acidity (as ac acid) 0.05% max.

General Information—Properties: Readily miscible w all common organic solvents except the petroleum hyd carbons in which it is only very slightly soluble. In wa soluble to approx. 0.13% at 23°C., 0.21% at 48 C.; solub ity in water decreased by presence of ammonia but increas by other alkalies; soluble in castor oil, slightly soluble china wood oil; insoluble in linseed oil; retentivity in ce lose acetate approx. 90 parts by weight to 100 of acet imparts a high degree of plasticity. A solvent for both nit cellulose and cellulose acetate.

Uses: An excellent plasticizer for cellulose acetate, giv brilliance and polish not obtainable with other plastici Being practically insoluble in petroleum hydrocarbons, valuable plasticizer for coatings designed to withstand g line and related products. Has some plasticizing action such protein compounds as casein, glue, soybean pro and corn protein. May be used alone or in conjunction w other materials such as glycerin or similar compou greatly increases the flexibility of shellac with consider softening effect; also very useful with polyvinyl-ace adhesives. "Santicizer" 8 is one of the best plastici known for synthetic polyamides such as nylon and re 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," Tech Data Sheets.

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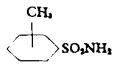
...TICIZER" 9 PLASTICIZER — ORGANIC DIVISION
...ure of ortho- and para-Toluenesulfonamides)

...olecular Weight: 171.21

...rmula:



...ndard Form: *Fine granules.*

...neral Information—Properties: Solubility quite low in ...al-tar hydrocarbons and negligible in petroleum hydro-...rbons; readily soluble in most other solvents, and in hot ...ced, china wood and castor oils; soluble in water only ...out 1.0% at 34°C., but this is increased by the presence ... alkali; least soluble of Monsanto plasticizers in ethylene ...chloride and benzene; solubility in ethylene dichloride ...prox. 4%, in benzene approx. 1.5%, each at 30°C.

...s: "Santicizer" 9 differs greatly from other plasticizers ...its action. Relatively small amounts impart a gloss to ...shed articles, give smooth working and uniform curing ...molded thermosetting products. Blends readily with most ...thetic resins, does not impart the softening action of ...id plasticizers. *Particularly valuable to the makers of* ...lding compositions. In some phenolaldehyde resins it ...pears to act not only as a lubricant but also as a promoter, ...ing more uniform and thorough curing. In amounts of ...out 20 parts per 100, has a temporary plasticizing action ... protein compounds such as corn protein and soybean ...tein. In melamine coating and laminating resins, ...nticizer" 9 promotes solution stability and compatibil-..., improves flowout during baking or curing, and in-...eases impact strength and abrasion resistance.

...ntainers: 250-lb. fiber drums.

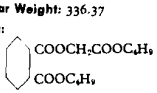
...pping Classification: Resin Plasticizer.

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

...TICIZER" B-16 PLASTICIZER — ORGANIC DIVISION
...l Phthalyl Butyl Glycolate)

...olecular Weight: 336.37

...rmula:



...ndard Form: Liquid.

...cifications: Color APHA 45 max.; Sp. Gr. 1.098 ±0.005 ...°/25°C.; refractive index 1.490 ±0.002 at 25°C.; acidity ...(acetic acid) 0.02% max.; essentially odorless; sulfur (cop-...strip test) negative.

...eral Information—Properties: A practically colorless ...id plasticizer; B.P. 219°C. at 5 mm.; does not crystallize ...peratures as low as —35°C.; water solubility 0.0012% ...°C.; extremely light-stable; darkens on heating above ...°C.

... A widely used polyvinyl-chloride plasticizer where a ...ess and nontoxic composition is required; has re-...d Bureau of Animal Industry approval for use in vinyl ... wrappings. Imparts good heat and light stability. ...cially useful in beverage tubing, food packaging, hospi-...ering and anatomical restorations. Solvent for nitro-...ose; compatible with most resins, imparting good flex-...y. Miscible with castor, linseed and china wood oils; ...what retards gel formation in the latter on heating. ...e crepe rubber but appears to have no effect on vul-...ed rubber; an excellent plasticizer for chlorinated ..., 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.

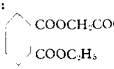
Shipping Classification: Resin Plasticizer.

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.

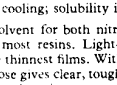
Shipping Classification: Resin Plasticizer.

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

(Continued on next page

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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 100 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.

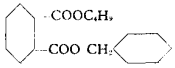
Shipping Classification: Resin Plasticizers.

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. 1.113-1.1 at 25°/25°C.; acidity (as phthalic acid) 0.02% max.

General Information—Properties: A clear, oily, b plasticizer having a slight characteristic odor. Shows g low temperature performance; possesses good heat light stability and low volatility.

Uses: A relatively non-volatile plasticizer for polyv chloride, polyvinyl chloride-acetate, polyvinyl buty ethyl cellulose and nitrocellulose. In addition, compa with cellulose triacetate, polyvinyl formal, cellulose ace butyrate, cellulose-propionate, polyvinyl acetate and ac ics. Superior to many of the commonly used plasticizers its permanence, oil resistance, flexibility and stability.

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

Very effective in cellulosic lacquers, imparting tough flexibility, low-moisture vapor transfer; has good per nence and heat and light stability. An excellent plastic for polyvinyl butyral and for low molecular weight p styrene which is further polymerized later for coating 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 D

Standard Form: Liquid.

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

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

Containers: Tank cars; 55-gallon drums.

Shipping Classification: Resin Plasticizer.

"SANTICIZER" 602 PLASTICIZER *(Iso Octyl Iso Phthalate)* — ORGANIC DIVISION

Standard Form: Liquid.

Specifications: Clear oily liquid; color APHA odor mild; acidity (as phthalic acid) 0.01% max. 0.972 ±0.005 at 25°/25°C.

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...es: A primary plasticizer for polyvinyl chloride with ...wer volatility than dioctyl phthalate (DOP). Has excellent ...istance to soapy water extraction and alkali. Used in ...yl floor tile, plastisols and film and sheeting.

...ntainers: Tank cars.

...pping Classification: Resin Plasticizer.

...erature: Technical Data Sheet.

...TICIZER" 603 PLASTICIZER

...yl Decyl Phthalate) — ORGANIC DIVISION

...ndard Form: Liquid.

...Specifications: Clear oily liquid free of sediment or tur...dity; color APHA 100 max.; acidity 0.01% max. as ...thalic acid; odor, characteristically mild: Sp. Gr. 0.977 ...0.987 at 25° 25°C.

...neral Information—Properties: A low cost primary ...sticizer that offers an attractive pound volume cost. ...good color and low odor enable the film, sheeting, ...trusion and plastisol compounder to effect cost saving ...h minimum loss of quality.

...es: "Santicizer" 603 is a low cost primary plasticizer for ...yvinyl chloride and copolymer type resins. "Santicizer" ...imparts good low temperature flexibility and has per...nence good enough for most applications. This plasti...er is useful in calendered vinyl products such as film and ...ering for shower curtains, drapes and upholstery. "San...izer" 603 imparts good viscosity characteristics to vinyl ...tisols and organosols and is useful in the formulation of ...al molding compounds for dolls and formulations for ...ted fabrics.

...ntainers: Bulk shipments only, 1,000-gal. min.

...pping Classification: Resin Plasticizer.

...erature: "Santicizer 603, Primary Plasticizer for Poly...yl Chloride," Technical Data Sheet.

...TICIZER" 606 PLASTICIZER — ORGANIC DIVISION

...ndard Form: Liquid.

...Specifications: Clear oily liquid free of sediment and ...rbidity, odor is characteristically mild; color, APHA ...no maximum; Specific Gravity, 1.004 to 1.014 at 25° 25° C.

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

...ntainers: Tank cars; tank trucks.

...pping Classification: Resin Plasticizer.

...erature: Technical Data Sheet "SANTICIZER" 606.

...TICIZER" 611 PLASTICIZER — ORGANIC DIVISION

...ndard Form: Liquid.

...duct Description: Clear oily liquid free of sediment and ...bidity; acidity, 0.02%, maximum (as phthalic acid); ...r is characteristically mild; color, APHA 75 maximum; ...ific Gravity 1.029 to 1.039 at 25° 25° C.

...es: A low cost premium quality plasticizer for vinyl-...bestos and flexible vinyl floor tile formulations. ...Santicizer" 611 imparts high resistance to staining, oil, ...se and kerosene extraction. "Santicizer" 611 is recom...ded for plastisols, extrusions, and sheeting for its good ...ity, rapid fusion, and excellent resistance to grease, ...s 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: ONa

Cl_5

Standard Form: Neutral powder, pellets or briquettes.

Specifications: Light tan powder, pellets or briquettes. Assay 88.0% m... Free alkali (as NaOH 0.5–2.0%.

General Information—Properties: Comparatively odorless; stable under ordinary atmospheric conditions when stored in dry place; bulking value: briquettes 45–50 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; 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. 34 (approx. rice-size granules)—A combination of uniformly sized crystals. For shaker top cans and 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 Borers 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.; 1.9%; barium 7.5%.

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Uses: Sludge inhibitor for fuel oils to prevent burner screen clogging and reduce rusting. Concentrations as low as 0.02% have been used satisfactorily.

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

Shipping Classification: Petroleum Oil NOIBN.

"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 100°/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.) 30 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 100°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.

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 1 and 1-G formulations.

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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 I and I-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-

"SANTOLUBE" 395-X OIL ADDITIVE
— ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: An amber liquid with the following typical characteristics: viscocity 12 to 18 cs 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-

"SANTOMASK" II ODOR-MASKING AGENT
— ORGANIC DIVISION

Standard Form: Liquid.

General Information—Properties: Clear, light yellow liquid; pleasant characteristic odor; flash point approx. 210° (Cleveland open cup method); flow point below 0°C; 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 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- 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 NOI

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

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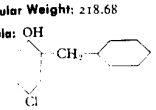
NTOPHEN" I GERMICIDE
o-benzyl-parachlorophenol, Technical)

GANIC DIVISION

olecular Weight: 218.68

rmula:



tandard Form: Flaked solid.

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

General Information—Properties: "Santophen" I posses high bactericidal and fungicidal activity, but low toxity to higher animals. When properly formulated for disfectant use, it is considered nonirritating in use dilutions. soluble in water, but highly soluble in alcohol and other rganic solvents; dispersible in aqueous media with the aid f soaps or synthetic dispersing agents. Noncorrosive to ost metals or other engineering materials.

ses: Used as the active principle, or as an enhancing agent r disinfectants.

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

hipping Classification: Disinfectant Other Than Medicinal NOIBN.

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

NTOPHEN" I SOLUTION
% Santophen I, 25% Isopropanol)

RGANIC DIVISION

tandard Form: Liquid.

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

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

ontainers: 55 and 15-gal. drums.

hipping Classification: Disinfectant other than medicinal NOIBN.

NTOPOID 22" GEAR OIL ADDITIVE

RGANIC DIVISION

tandard Form: Liquid.

eneral Information—Properties: A liquid with the following typical properties: Viscosity 435 SUS at 100°F.; ash Point 300 F.; sp. gr. 1.129 at 60° 60°F. Typical nalysis: Sulfur 12.0%, Chlorine 16.5%, Phosphorous 3% Zinc 3.5%.

ses: An outstanding multipurpose gear oil additive. IL-L-2105 gear oils may be compounded using 5–6%. ear oils which pass the L-37 high torque test and the uick 10-A high speed shock test may be formulated using 5%.

ontainers: 55 gallon black iron drums.

hipping Classification: Petroleum Oil NOIBN.

iterature: "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.

TOWOLDMON0043447

"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 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 (12 case).

Shipping Classification: Wood Filler Liquid.

Literature: Rez Color Card Folder.

"SKYDROL" FUNCTIONAL FLUID — ORGANIC DIVISION

Standard Form: Liquid.

Typical Analysis: Cloud point below 0° F.; moisture 0.25% max.; neutralization number 0.2 max.; specific gravity 1.080 to 1.086 at 25° 25°C.; pour point max. 70°F. or lower.

General Information—Properties: A clear, green, mobile, fire-resistant hydraulic fluid with outstanding lubricity, stability, noncorrosiveness, excellent viscosity-temperature characteristics, and resistance to oxidation.

Uses: Hydraulic fluid in cabin superchargers, 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 ODI 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.

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

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

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

Shipping Classification: Sodium Phosphate.

ODIUM BENZO

Molecular Weig

Formula: $COON$

Standard Form:

Specifications: powder; solubili bility in 90° 0.30 ml N 10 N moisture 0.50 chlorides (as N 0.05%; max. *Technical Grade* 99.0% min. (dry complete but sli (as NaCl: 0.6%

Uses: *U.S.P.* (medicinal prepa *Technical Grade* inhibitor.

Grades: U.S.P.

Containers: 100

Shipping Classi

Literature: "Pre folder; "Benzoic

ODIUM BISULF

INORGANIC DIVIS

Molecular Weig

Formula: $NaHS$

Standard Form

Typical Analys

Uses: Used to r sulfuric acid and is approximately 147 lbs. Glaube

Used principall wooden goods; r pulp; in tanneri bath tan solutio agriculture for s trade.

Containers: 10 kegs; 330 and bulk carloads.

Shipping Class

ODIUM BISULF

Molecular Weig

Formula: $NaHS$

Standard Form SO_2; wt. per gal fite): 66% SO_2 (

Typical Analys

SO_2
Na_2SO
Fe

Uses: In dye m

0685363

TOWOLDMON0043448

...UM BENZOATE — ORGANIC DIVISION

...lecular Weight: 144.11

...mula: COONa

...ndard Form: Powder.

...cifications: *U.S.P. Grade*: Thin white flakes or white ...der; solubility in water (10:18 at 25°C.) complete; solu...ty in 90% ethyl alcohol (1:50 at 25°C.) complete; ...g ml N 10 NaOH to 0.20 ml N. 10 HCl per 2.0 grams; ...isture 0.50% max.; assay 99.0% min. (dry basis); ...lorides (as NaCl) 0.05% max.; sulfates (as Na_2SO_4) ...% max.

...*hnical Grade*: White or slightly tinted powder: assay ...% min. (dry basis); solution in water (10:18) essentially ...plete but slightly inferior to U.S.P. quality; chlorides ...s NaCl) 0.6% max.; sulfates (as Na_2SO_4) 0.6% max.

...: *U.S.P. Grade*: For preserving foods, tobacco and ...icinal preparations.

...*hnical Grade*: As an industrial preservative and rust ...bitor.

...des: U.S.P. and Technical.

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

...pping Classification: Sodium Benzoate.

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

...UM BISULFATE *(Nitre Cake)*

...RGANIC DIVISION

...lecular Weight: 120.07

...mula: $NaHSO_4$

...ndard Form: Globular.

...ical Analysis: 37% H_2SO_4 available.

...e: Used to replace either sulfuric acid or combination of ...ric acid and Glauber's salt. One hundred lbs. nitre cake ...pproximately equivalent to 39.8 lbs. 66° sulfuric acid and ...0 lbs. Glauber's salt.

...d principally in viscose rayon spinning baths; dyeing ...ton goods; refining nickel ores; manufacture of sulfate ...s in tanneries for pickling, deliming and making one-...h tan solutions; as an acid scour for household use; in ...culture for disinfecting soil; as a bowl cleaner in sanitary

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

...ping Classification: Sodium Bisulfate (Nitre Cake).

...M BISULFITE — INORGANIC DIVISION

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

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

...rd Form: Solution: 33°Bé. containing approx. 21% ...t. per gal. 10.78 lbs. Anhydrous (sodium metabisul-...% SO_2 (approx.).

...l Analysis:

	SOLUTION	ANHYDROUS
SO_2	21.5%	66%
Na_2SO_4	3.00	1.5
Fe	0.006	0.002

...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: $Na_3Fe_4(P_2O_7)_5 \cdot xH_2O$

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 $Na_2P_2O_7$.

Standard Forms: Glass platelets, granules and powder.

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

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

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

Containers: 100-lb. net multiwall paper bags; 100-lb. net burlap bags.

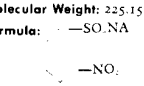
Shipping Classification: Sodium Phosphate, NOIBN.

Literature: "Sodium Phosphates for Industry," booklet.

SODIUM *meta*-NITROBENZENE SULFONATE, TECHNICAL — ORGANIC DIVISION

Molecular Weight: 225.15

Formula:



Standard Form: Wet powder.

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)

TOWOLDMON0043449

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 c lation during condensation of milk and as an emu agent in processing cheese.

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

Containers: 100-lb. bags.

Shipping Classification: Disodium Phosphate.

SODIUM PHOSPHATE, MONO — INORGANIC DIVISION

(Also known as sodium phosphate, monobasic; sod dihydrogen phosphate; sodium biphosphate; monoso orthophosphate and acid sodium phosphate)

Molecular Weight: 119.99

Formula: NaH_2PO_4

Standard Form: Powder.

General Information—Properties: Contains not less th 58% P_2O_5; pH value of 1% solution 4.6.

Uses: For conditioning boiler water and in electropla

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 ph phate, 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 s quickly soluble in water giving an alkaline reaction; pH 1% solution 11.8.

Uses: Principally in cleaners and detergents for both ho hold and industrial use; in fruit cleaning to remove inse cide sprays and inhibit growth of fruit mold; in water tr ment 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 soda, normal pyrosodium phosphate, alkaline so pyrophosphate and TSPP) — INORGANIC DIVISION

Molecular Weight: 265.95

Formula: $Na_4P_2O_7$

Standard Form: Crystals or granules.

General Information—Properties: White crystalline p rial or white granular powder; pH of 1% solution Solubility: 6 parts in 100 parts of water at 15° C., 40 par 100 parts of water at 100°C.

Uses: As a soap builder; conditioning oil drilling w bleaching, especially for straw, and as an ink eradicator manufacture of iron pyrophosphate and other pyro phates; household and industrial cleaner and deterge dye bath for putting certain types of dye in complex tion; electroplating; metal cleaning; electrolytic sepa various metals; as emulsifier in process cheese manu degumming textiles; stabilizing hydrogen peroxide reagent for de-inking newsprint.

Grades: Anhyd

Containers: Re lb. drums; Powe lb. drums.

Shipping Class

Literature: "T Bulletin I-24.

ODIUM TRIPOL

Molecular Weig

Formula: Na_5P

Standard Form

General Inform rial or white p softening and c A calcium sequ power for most

Uses: Soap buil ing oil drilling hard water.

Containers: 100

Shipping Classi

"SOPANOX" ort

— ORGANIC DIVISIO

Molecular Weig

Formula: C

Standard Form:

Specifications: min.; loss on dry

General Informa effective in minut soap and the re adverse qualities, a product of high

Uses: Our exper exacting demand animal or vegetal able in preventin

Containers: 140-l

Shipping Classifi

Literature: "Sopa

"SQ" PHOSPHAT

Standard Form: I

Typical Analysis 7.9.

General Informa glassy poly phos properties. It is compounds such a

Containers: 100-l

Shipping Classifi

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TOWOLDMON0043450

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.

...DIUM 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.

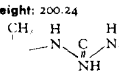
Shipping Classification: Phosphate of Soda.

"SOPANOX" ortho-TOLYL BIGUANIDE

...GANIC 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

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TOWOLDMON0043451

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"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.

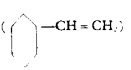
Shipping Classification: Washing Compound Liquid.

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 Sc... over 15 units; free from suspended matter and sed... assay 99.2–99.6% min.; viscosity 0.87 cps. max. at ... Sp. Gr. 0.9038–0.9057 at 25°/25°C.; refractive ind... less n_D 25°C. 1.5434; tertiary butyl catechol 10 ppm. ... 15 ppm. max.; aldehydes (benzaldehyde) 0.02% ... peroxide (diethyl peroxide) 0.01% max.; chlorine o.... sulfur 0.01% max.; polymer content not greater than 0.1...

General Information—Properties: An aromatic hydr... bon with an aliphatic side chain containing a double ... which permits polymerization, copolymerization and ... reactions. A colorless material that polymerizes and co... merizes with other light-colored materials to yield cle... light-colored products.

Uses: Production of styrene molding compounds; G... type synthetic rubber; styrenated oils for surface co... resins; styrene-modified alkyds for air drying and ba... finishes; low-pressure laminating resins; dispersions of ... rene polymers and copolymers for modifying properti... paper and textiles; ion exchange resins.

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

Shipping Classification: Styrene Liquid.

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

SUCCINIC ANHYDRIDE — ORGANIC DIVISION

Molecular Weight: 100.07

Formula:



Standard Form: Flakes.

Specifications: White to off-white flakes, cryst... point 118.0°C. min.; assay 99.0% min.; color (mol... Barrett #5 max.

Uses: In the manufacture of pharmaceuticals and ... 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% ... moisture 0.5% max.; M.P. 122°C. min.; sulfur 26–... Sp. Gr. 1.29; flash point 250°F. min.

Uses: "Sulfasan" R is a sulfur bearing material. It ... at ordinary processing temperatures is good, but at ... temperatures it probably breaks down and liberates ... morpholine and perhaps other compounds. It gives ... freedom from scorch in compounds such as natural ... treads loaded with HAF black. Usually it is used alone ... some regular sulfur, but the total dosage must be ... to keep modulus and hardness in line. Stocks co... "Sulfasan" R give excellent aging. It does not ... white compounds. Some acidic materials such as ... reverse the anti-scorch property.

Containers: 150-lb. fiber drums.

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Shipping Classification: Chemicals NOIBN.

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

PHATE 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.

LFUR 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.

LFURIC 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 concentration 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.

URIC 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.

TOWOLDMON0043453

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: CH_3



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: CH_3



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: CH_3



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 2.0% max.; toluene 0.2% max.

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

Uses: In the manufacture of dyestuff intermediates 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: Cl



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.

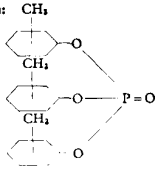
Containers: 55-gal. steel drums.

Shipping Classification: Trichlorobenzene.

TRICRESYL PHOSPHATE — ORGANIC DIVISION

Molecular Weight: 368.36

Formula: CH_3



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 5 hours at 100°C. Refractive index is approx. 1.556 at 25°. Viscosity increases rapidly at temperatures below normal; 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 high retentivity and can be used in large proportions without danger of sweating or separation. Widely used in resins, particularly in electrical applications; has good

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ical properties and imparts flame resistance to the com-
sition. Compatible with most lacquer resins and gives
ns, 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.

ETHYLAMMONIUM PHOSPHATE (TEAP)

— ORGANIC 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.

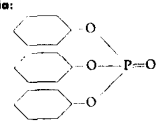
Shipping Classification: Chemicals NOIBN. (Flammable —red label required.)

Literature: "TEAP," leaflet.

PHENYL 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.

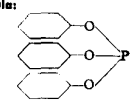
Shipping Classification: Resin Plasticizer.

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

PHENYL 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: CHO



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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TESTING LIQUIDS WITH THE BAUMÉ HYDROMETER

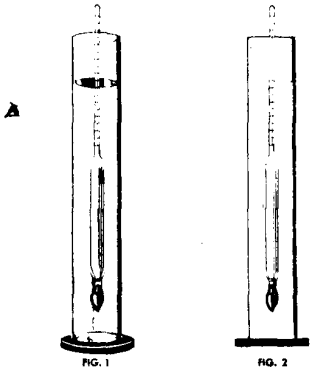
MONSANTO PRODUCTS, when made to a Baumé specification, may vary 0.2 Bé. above but never below the specified strength. The hydrometer used should be of limited range, not more than 10° Bé., and should be at least 10" in length. Its accuracy should be certified by the manufacturer. Our own hydrometers 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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In case the liquid is not sufficiently clear to allow the reading to be made as above described, it will be necessary to read from above the liquid surface and to estimate as accurately as possible the point to which the liquid rises on the hydrometer stem. It should be remembered, however, that the instrument is calibrated to give correct indications when read at the principal surface of the liquid. It will be necessary, therefore, to correct the reading at the upper meniscus by an amount equal to the height to which the liquid creeps up on the stem of the hydrometer. The amount of this correction may be determined with sufficient accuracy for most purposes by taking a few readings on the upper and the lower meniscus in a sample of the clear liquid and noting the difference.

The magnitude of the correction will obviously depend upon the length and value of the subdivisions of the hydrometer scale and must be determined in each case for the particular hydrometer in question.

Correcting for Temperature

The thermometer must be used along with the hydrometer in testing any liquid.

Hydrometers do not indicate the correct strength of a liquid unless read at the exact temperature indicated on the spindle, that is, at 60° F. Accurate readings may be obtained by bringing the liquid to this temperature by cooling or warming, but in most instances a correction can be applied with sufficient accuracy by reference to the following tables. For all liquids listed in this booklet, except ammonia, the correction is added when the test is made above 60°F. and subtracted when made below 60°F. For ammonia the reverse is true.

Conversion Formulae for Density Scales

Heavy Liquids

$$\text{Degrees Twaddell} = (\text{Sp. Gr.} - 1)200$$

$$\text{Sp. Gr.} = \frac{\text{Deg. Tw.} + 200}{200}$$

$$\text{Degrees Baumé} = 145 - \frac{145}{\text{Sp. Gr.}}$$

$$\text{Sp. Gr.} = \frac{145}{145 - \text{Deg. Bé.}}$$

Light Liquids

$$\text{Degrees Baumé} = \frac{140}{\text{Sp. Gr.}} - 130$$

$$\text{Sp. Gr.} = \frac{140}{130 + \text{Deg. Bé.}}$$

THE DILUTION AND CONCENTRATION OF LIQUIDS AND MIXTURES

Rectangle Method

THE FIGURES expressing the percentage concentration of two solutions (or those of one solution, and the figure 0 *for water*, where dilution with water is desired) are written in the two left hand corners of a rectangle, and the figure expressing the desired concentration is placed on the intersection of the two diagonals of this rectangle.

Now subtract the figures on the diagonals, and write the result at the other end of the respective diagonal. These figures then indicate what quantities of the solutions whose concentration is given on the other end of the respective *horizontal* line, must be taken to obtain a solution of the desired concentration. For example, to make a 12% solution, by mixing an 8% and a 15% solution we prepare Fig. 1, which indicates that we have to take 3 parts by weight of the 8% solution, and 4 parts by weight of the 15% solution to obtain 7 parts by weight of the 12% solution.

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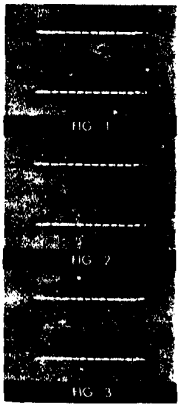
Again, if we wish to dilute a 25% solution so as to obtain a 9% solution, we place the figure 25 in, for example, the upper left corner of a rectangle and place figure 0 (concentration of the solution in pure water) in the lower left corner, and then place the figure 9 (desired concentration) at the 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 [illegible]

	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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...SION TABLES FOR ... OF VOLUME AND ...

TO CONVERT FROM	To Cu. Ft.	To Cu. Yd.	To Fl. Oz.	To Pint	To Gallon	To Cc. (Ml.)	To Liter
Cu. In.	1	0 0,5787	0 0,2143	0 5541	0 03463	0 01732	0 004329	16 39	0 01639
Cu. Ft.	1728	1	0 03704	957 5	59 84	29 92	7 481	28320	28 32
Cu. Yd.	46656	27	1	25850	1616	807 9	202 0	764600	764 6
Fl. Oz.	1 805	0 001044	0 0,3868	1	0 0625	0 03125	0 007813	29 57	0 02957
Pint	28 88	0 01671	0 0,6189	16	1	0 5	0 125	473 2	0 4732
Quart	57 75	0 03342	0 001238	32	2	1	0 25	946 4	0 9464
Gallon	231	0 1337	0 004951	128	8	4	1	3785	3 785
Cc. (Ml.)	0 06102	0 0,3531	0 0,1308	0 03381	0 002113	0 001057	0 0,2642	1	0 001
Liter	61 02	0 03531	0 001308	33 81	2 113	1 057	0 2642	1000	1
Cu. Meter	61020	35 31	1 308	33810	2113	1057	264 2	1000000	1000

Per Cent Equivalent Sodium Oxide (Na_2O)
0 77
1 55
2 32
3 10
3 87
4 65
5 42
6 20
6 97
7 75
8 52
9 30
10 07
10 85
11 62
12 40
13 17
13 95
14 72
15 50
16 27
17 05
17 82
18 60
19 37
20 14
20 92

TO CONVERT FROM	MULTIPLY BY					
	To Grain	To Oz. Troy	To Lb. Troy	To Oz. Av.	To Lb. Av.	To Gram
Gram	1	0 002083	0 0,1736	0 002286	0 0,1429	0 06480
Oz. Troy	480	1	0 08333	1 097	0 06857	31 10
Lb. Troy	5760	12	1	13 17	0 8229	373 2
Oz. Av.	437 5	0 9115	0 07596	1	0 0625	28 35
Lb. Av.	7000	14 58	1 215	16	1	453 6
Gram	15 43	0 03215	0 002679	0 03527	0 002205	1
Kilogram	15432	32 15	2 679	35 27	2 205	1000

NOTE: The small subnumeral following a zero indicates that the zero is to be taken that number of times, thus 0.0 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:

$$\text{gallons} \times \frac{100}{12} = \text{pounds of water}$$

$$\text{pounds of water} \times \frac{12}{100} = \text{gallons}$$

DA

Per Cent Equivalent Sodium Oxide (Na_2O)
52.59
53.02
53.44
53.86
54.30
54.71
55.14

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

DATA FOR SODIUM HYDROXIDE SOLUTIONS AT 176°F

Per Cent Equivalent Sodium Oxide (Na_2O)	Degrees Baume at 60°F. (Am. Std.)	Specific Gravity at 60°/60°F.	Lbs. Caustic Per Gal. of Liquid at 60°F.	Grams NaOH per Liter at 60°F.	Per Cent Caustic Soda (NaOH)	Per Cent Equivalent Sodium Oxide (Na_2O)	Degrees Baume at 60°F. (Am. Std.)	Specific Gravity at 60°/60°F.	Lbs. Caustic Per Gal. of Liquid at 60°F.	Grams NaOH per Liter at 60°F.
52.59	56.9	1.645	9.32	1116.6	71.70	55.55	58.6	1.680	10.05	1204.6
53.02	57.1	1.650	9.42	1129.1	72.25	55.98	58.9	1.685	10.16	1217.4
53.44	57.3	1.655	9.52	1141.5	72.79	56.40	59.2	1.690	10.26	1230.2
53.86	57.6	1.660	9.63	1154.0	73.35	56.83	59.4	1.695	10.37	1243.3
54.30	57.9	1.665	9.74	1166.8	73.90	57.26	59.7	1.700	10.48	1256.3
54.71	58.1	1.670	9.84	1179.2	74.43	57.67	60.0	1.705	10.59	1269.0
55.14	58.3	1.675	9.95	1192.1						

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Temp. °F.	Pressure Lbs. per Sq. in Abs.	Specific Volume of Liquid Cu. Ft. per Lb.	Specific Volume of Sat. Vapor, Cu. Ft. per Lb.	Heat of Vaporization, B.T.U.
−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.

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...MUM SULFATE 60°/60°F.



					...Gal Basic Sulfate Alumina (17.4% Al_2O_3)
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

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[illegible]MINUM SULFATE [illegible]—Continued

[illegible] Baumé	Specific Gravity	[illegible]	Basic Alumina (27% Al_2O_3)	Per Cent Basic Sulfate Alumina (17.4% Al_2O_3)	[illegible]
20.0	1.1600	24.38	2.35	25.7	
20.5	1.1647	24.99	2.42	26.4	
21.0	1.1694	25.60	2.49	27.1	
21.5	1.1741	26.22	2.56	27.7	
22.0	1.1789	26.87	2.64	28.4	
22.5	1.1837	27.50	2.71	29.1	
23.0	1.1885	28.16	2.78	29.8	
23.5	1.1934	28.85	2.86	30.3	
24.0	1.1983	29.50	2.94	31.1	
24.5	1.2033	30.18	3.02	31.7	
25.0	1.2083	30.85	3.10	32.4	
25.5	1.2134	31.54	3.18	33.1	
26.0	1.2185	32.24	3.27	33.8	
26.5	1.2236	32.95	3.35	34.5	
27.0	1.2288	33.63	3.44	35.2	
27.5	1.2340	34.35	3.52	35.9	
28.0	1.2393	35.03	3.61	36.7	
28.5	1.2446	35.75	3.70	37.3	
29.0	1.2500	36.46	3.79	38.1	
29.5	1.2554	37.20	3.88	38.8	
30.0	1.2609	37.90	3.98	39.7	
30.5	1.2664	38.58	4.06	40.3	
31.0	1.2719	39.30	4.16	41.0	
31.5	1.2775	40.02	4.25	41.8	
32.0	1.2832	40.73	4.35	42.5	
32.5	1.2889	41.49	4.45	43.3	
33.0	1.2946	42.20	4.54	44.1	
33.5	1.3004	42.96	4.64	44.9	
34.0	1.3063	43.71	4.75	45.7	
34.5	1.3122	44.48	4.86	46.5	
35.0	1.3182	45.20	4.95	47.4	
35.5	1.3242	46.00	5.07	48.3	
36.0	1.3303	46.80	5.18	49.2	
36.5	1.3364	47.58	5.29	50.1	

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

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ALUMINUM CHLORIDE 60°/60°F.

0.00	1.0000	0.00	0.00	17.50	1.1373	14.73	2.53
0.50	1.0035	0.35	0.038	18.00	1.1417	15.16	2.60
1.00	1.0069	0.75	0.113	18.50	1.1462	15.60	2.69
1.50	1.0105	1.17	0.178	19.00	1.1508	16.05	2.78
2.00	1.0140	1.58	0.242	19.50	1.1554	16.53	2.88
2.50	1.0175	2.00	0.307	20.00	1.1600	16.94	2.96
3.00	1.0211	2.40	0.370	20.50	1.1647	17.43	3.06
3.50	1.0247	2.78	0.430	21.00	1.1694	17.88	3.15
4.00	1.0284	3.16	0.490	21.50	1.1741	18.33	3.25
4.50	1.0320	3.58	0.557	22.00	1.1789	18.78	3.34
5.00	1.0357	4.00	0.625	22.50	1.1837	19.22	3.43
5.50	1.0394	4.38	0.686	23.00	1.1885	19.68	3.53
6.00	1.0432	4.81	0.756	23.50	1.1934	20.13	3.62
6.50	1.0469	5.20	0.820	24.00	1.1983	20.57	3.72
7.00	1.0507	5.63	0.890	24.50	1.2033	21.03	3.81
7.50	1.0545	6.05	0.962	25.00	1.2083	21.50	3.90
8.00	1.0584	6.50	1.04	25.50	1.2134	21.98	4.02
8.50	1.0623	6.92	1.11	26.00	1.2185	22.38	4.12
9.00	1.0662	7.32	1.18	26.50	1.2236	22.82	4.21
9.50	1.0701	7.75	1.25	27.00	1.2288	23.20	4.30
10.00	1.0741	8.13	1.32	27.50	1.2340	23.70	4.41
10.50	1.0781	8.57	1.39	28.00	1.2393	24.13	4.50
11.00	1.0821	9.00	1.47	28.50	1.2446	24.58	4.61
11.50	1.0861	9.46	1.55	29.00	1.2500	25.02	4.72
12.00	1.0902	9.90	1.63	29.50	1.2554	25.53	4.83
12.50	1.0943	10.28	1.70	30.00	1.2609	25.99	4.94
13.00	1.0985	10.70	1.77	30.50	1.2664	26.45	5.04
13.50	1.1027	11.15	1.85	31.00	1.2719	26.92	5.16
14.00	1.1069	11.60	1.93	31.50	1.2775	27.38	5.27
14.50	1.1111	12.05	2.02	32.00	1.2832	27.88	5.40
15.00	1.1154	12.50	2.10	32.50	1.2889	28.33	5.50
15.50	1.1197	12.95	2.19	33.00	1.2946	28.78	5.62
16.00	1.1240	13.37	2.27	33.50	1.3004	29.24	5.73
16.50	1.1284	13.83	2.35	34.00	1.3063	29.68	5.85
17.00	1.1328	14.30	2.44	34.50	1.3100	30.00	5.92

*$Al_2Cl_6+12H_2O$, chloride of alumina crystal. For chloride of alumina 32° Bé. twice the above pounds per gallon of solution.

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Specific Gravity	Per Cent $C_2H_4O_2$	Specific Gravity	Per Cent $C_2H_4O_2$	Specific Gravity	Per Cent $C_2H_4O_2$
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		

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TOWOLDMON0043466

HYDROCHLORIC ACID (Muriatic Acid)*

1.00	1.0069	1.40	15.25	1.1176	23.33
2.00	1.0140	2.82	15.50	1.1197	23.75
3.00	1.0211	4.25	15.75	1.1219	24.16
4.00	1.0284	5.69	16.0	1.1240	24.57
5.00	1.0357	7.15	16.1	1.1248	24.73
5.25	1.0375	7.52	16.2	1.1256	24.90
5.50	1.0394	7.89	16.3	1.1265	25.06
5.75	1.0413	8.26	16.4	1.1274	25.23
6.00	1.0432	8.64	16.5	1.1283	25.39
6.25	1.0450	9.02	16.6	1.1292	25.56
6.50	1.0469	9.40	16.7	1.1301	25.72
6.75	1.0488	9.78	16.8	1.1310	25.89
7.00	1.0507	10.17	16.9	1.1319	26.05
7.25	1.0526	10.55	17.0	1.1328	26.22
7.50	1.0545	10.94	17.1	1.1336	26.39
7.75	1.0564	11.32	17.2	1.1345	26.56
8.00	1.0584	11.71	17.3	1.1354	26.73
8.25	1.0603	12.09	17.4	1.1363	26.90
8.50	1.0623	12.48	17.5	1.1372	27.07
8.75	1.0642	12.87	17.6	1.1381	27.24
9.00	1.0662	13.26	17.7	1.1390	27.41
9.25	1.0681	13.65	17.8	1.1399	27.58
9.50	1.0701	14.04	17.9	1.1408	27.75
9.75	1.0721	14.43	18.0	1.1417	27.92
10.00	1.0741	14.83	18.1	1.1426	28.09
10.25	1.0761	15.22	18.2	1.1435	28.26
10.50	1.0781	15.62	18.3	1.1444	28.44
10.75	1.0801	16.01	18.4	1.1453	28.61
11.00	1.0821	16.41	18.5	1.1462	28.78
11.25	1.0841	16.81	18.6	1.1471	28.95
11.50	1.0861	17.21	18.7	1.1480	29.13
11.75	1.0881	17.61	18.8	1.1489	29.30
12.00	1.0902	18.01	18.9	1.1498	29.48
12.25	1.0922	18.41	19.0	1.1508	29.65
12.50	1.0943	18.82	19.1	1.1517	29.83
12.75	1.0964	19.22	19.2	1.1526	30.00
13.00	1.0985	19.63	19.3	1.1535	30.18
13.25	1.1006	20.04	19.4	1.1544	30.35
13.50	1.1027	20.45	19.5	1.1554	30.53
13.75	1.1048	20.86	19.6	1.1563	30.71
14.00	1.1069	21.27	19.7	1.1572	30.90
14.25	1.1090	21.68	19.8	1.1581	31.08
14.50	1.1111	22.09	19.9	1.1590	31.27
14.75	1.1132	22.50	20.0	1.1600	31.45
15.00	1.1154	22.92	20.1	1.1609	31.64

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20.2	1.1619	31.82	23.2	1.1904	37.58
20.3	1.1628	32.01	23.3	1.1914	37.80
20.4	1.1637	32.19	23.4	1.1924	38.03
20.5	1.1647	32.38	23.5	1.1934	38.26
20.6	1.1656	32.56	23.6	1.1944	38.49
20.7	1.1666	32.75	23.7	1.1953	38.72
20.8	1.1675	32.93	23.8	1.1963	38.95
20.9	1.1684	33.12	23.9	1.1973	39.18
21.0	1.1694	33.31	24.0	1.1983	39.41
21.1	1.1703	33.50	24.1	1.1993	39.64
21.2	1.1713	33.69	24.2	1.2003	39.86
21.3	1.1722	33.88	24.3	1.2013	40.09
21.4	1.1732	34.07	24.4	1.2023	40.32
21.5	1.1741	34.26	24.5	1.2033	40.55
21.6	1.1751	34.45	24.6	1.2043	40.78
21.7	1.1760	34.64	24.7	1.2053	41.01
21.8	1.1770	34.83	24.8	1.2063	41.24
21.9	1.1779	35.02	24.9	1.2073	41.48
22.0	1.1789	35.21	25.0	1.2083	41.72
22.1	1.1798	35.40	25.1	1.2093	41.99
22.2	1.1808	35.59	25.2	1.2103	42.30
22.3	1.1817	35.78	25.3	1.2114	42.64
22.4	1.1827	35.97	25.4	1.2124	43.01
22.5	1.1836	36.16	25.5	1.2134	43.40
22.6	1.1846	36.35			
22.7	1.1856	36.54			
22.8	1.1866	36.73			
22.9	1.1875	36.93			
23.0	1.1885	37.14			
23.1	1.1895	37.36			

*This table has been approved and adopted as a standard by the Manufacturing Chemists' Association of the United States.

Specific gravity determinations were made at 60°F. compared with water at 60°F.

From the specific gravities, the corresponding degrees Baumé were calculated by the following formula:

$$\text{Baumé} = 145 - \frac{145}{\text{Sp. Gr.}}$$

Allowance for Temperature

At 10° to 15° Bé. correction of 1/40° Bé. or 0.0002 Sp. Gr. for every 1°F.
At 15° to 22° Bé. correction of 1/30° Bé. or 0.0003 Sp. Gr. for every 1°F.
At 22° to 25° Bé. correction of 1/28° Bé. or 0.00035 Sp. Gr. for every 1°F.

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TOWOLDMON0043468

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

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32.50	1.2889	45.68	41.25	1.3976	64.93
32.75	1.2918	46.14	41.50	1.4010	65.67
33.00	1.2946	46.58	41.75	1.4044	66.42
33.25	1.2975	47.04	42.00	1.4078	67.18
33.50	1.3004	47.49	42.25	1.4112	67.95
33.75	1.3034	47.95	42.50	1.4146	68.73
34.00	1.3063	48.42	42.75	1.4181	69.52
34.25	1.3093	48.90	43.00	1.4216	70.33
34.50	1.3122	49.35	43.25	1.4251	71.15
34.75	1.3152	49.83	43.50	1.4286	71.98
35.00	1.3182	50.32	43.75	1.4321	72.82
35.25	1.3212	50.81	44.00	1.4356	73.67
35.50	1.3242	51.30	44.25	1.4392	74.53
35.75	1.3273	51.80	44.50	1.4428	75.40
36.00	1.3303	52.30	44.75	1.4464	76.28
36.25	1.3334	52.81	45.00	1.4500	77.17
36.50	1.3364	53.32	45.25	1.4536	78.07
36.75	1.3395	53.84	45.50	1.4573	79.03
37.00	1.3426	54.36	45.75	1.4610	80.04
37.25	1.3457	54.89	46.00	1.4646	81.08
37.50	1.3488	55.43	46.25	1.4684	82.18
37.75	1.3520	55.97	46.50	1.4721	83.33
38.00	1.3551	56.52	46.75	1.4758	84.48
38.25	1.3583	57.08	47.00	1.4796	85.70
38.50	1.3615	57.65	47.25	1.4834	86.98
38.75	1.3647	58.23	47.50	1.4872	88.32
39.00	1.3679	58.82	47.75	1.4910	89.76
39.25	1.3712	59.43	48.00	1.4948	91.35
39.50	1.3744	60.06	48.25	1.4987	93.13
39.75	1.3777	60.71	48.50	1.5026	95.11
40.00	1.3810	61.38			
40.25	1.3843	62.07			
40.50	1.3876	62.77			
40.75	1.3909	63.48			
41.00	1.3942	64.20			

*This table has been approved and adopted as a standard by the Manufacturing Chemists' Association of the United States.

Specific gravity determinations were made at 60°F. compared with water at 60°F.

From the specific gravities, the corresponding degrees Baumé were calculated by the following formula:

$$\text{Baumé} = 145 - \frac{145}{\text{Sp. Gr.}}$$

Allowance for Temperature

At from 10° to 20° Bé. correction of 1.30° Bé. or .00029 Sp. Gr. for every 1°F.
At from 20° to 30° Bé. correction of 1.23° Bé. or .00044 Sp. Gr. for every 1°F.
At from 30° to 40° Bé. correction of 1.20° Bé. or .00060 Sp. Gr. for every 1°F.
At from 40° to 48.5° Bé. correction of 1.17° Bé. or .00084 Sp. Gr. for every 1°F.

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SULPHURIC ACID*

Degrees Bé	Specific Gravity 60°/60° F.	Per Cent H_2SO_4	Freezing (Melting) Point Deg. F.	Degrees Bé	Specific Gravity 60°/60° F.	Per Cent H_2SO_4	Freezing (Melting) Point Deg. F.
0	1.0000	0.00	32.0	36	1.3303	42.63	−70
				37	1.3426	43.99	−60
1	1.0069	1.02	31.2	38	1.3551	45.35	−53
2	1.0140	2.08	30.5	39	1.3679	46.72	−47
3	1.0211	3.13	29.8	40	1.3810	48.10	−41
4	1.0284	4.21	28.9				
5	1.0357	5.28	28.1	41	1.3942	49.47	−35
				42	1.4078	50.87	−31
6	1.0432	6.37	27.2	43	1.4216	52.26	−27
7	1.0507	7.45	26.3	44	1.4356	53.66	−23
8	1.0584	8.55	25.1	45	1.4500	55.07	−20
9	1.0662	9.66	24.0				
10	1.0741	10.77	22.8	46	1.4646	56.48	−14
				47	1.4796	57.90	−15
11	1.0821	11.89	21.5	48	1.4948	59.32	−18
12	1.0902	13.01	20.0	49	1.5104	60.75	−22
13	1.0985	14.13	18.3	50	1.5263	62.18	−27
14	1.1069	15.25	16.6				
15	1.1154	16.38	14.7	51	1.5426	63.66	−33
				52	1.5591	65.13	−39
16	1.1240	17.53	12.6	53	1.5761	66.63	−49
17	1.1328	18.71	10.2	54	1.5934	68.13	−59
18	1.1417	19.89	7.7	55	1.6111	69.65	†
19	1.1508	21.07	4.8				
20	1.1600	22.25	+ 1.6	56	1.6292	71.17	†
				57	1.6477	72.75	†
21	1.1694	23.43	− 1.8	58	1.6667	74.36	†
22	1.1789	24.61	− 6.0	59	1.6860	75.99	− 7
23	1.1885	25.81	−11	60	1.7059	77.67	+12.6
24	1.1983	27.03	−16				
25	1.2083	28.28	−23	61	1.7262	79.43	27.3
				62	1.7470	81.30	39.1
26	1.2185	29.53	−30	63	1.7683	83.34	46.1
27	1.2288	30.79	−39	64	1.7901	85.66	46.4
28	1.2393	32.05	−49	64¼	1.7957	86.33	43.6
29	1.2500	33.33	−61	64½	1.8012	87.04	41.1
30	1.2609	34.63	−74	64¾	1.8068	87.81	37.9
				65	1.8125	88.65	33.1
31	1.2719	35.93	−82	65¼	1.8182	89.55	24.6
32	1.2832	37.26	−96	65½	1.8239	90.60	13.4
33	1.2946	38.58	−97	65¾	1.8297	91.80	− 1
34	1.3063	39.92	−91				
35	1.3182	41.27	−81	66	1.8354	93.19	29

*This table has been approved and adopted as a standard by the Manufacturing Chemists' Association of the United States.

†Below −40°.

Specific gravity determinations were made at 60°F., compared with water at 60°F.

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TOWOLDMON0043471

...RIC ACID*—Continued

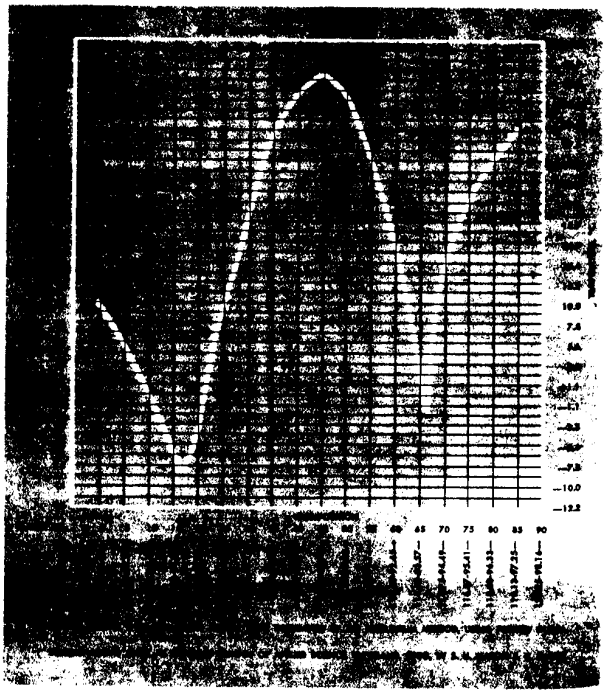
Allowance for Temperature

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



Flash Points

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TOWOLDMON0043472



470°F. (243°C.)	Tricresyl Phosphate
450°F. (232°C.)	Santicizer 140 Diisodecyl Phthalate
437°F. (225°C.)	Triphenyl Phosphate
435°F. (224°C.)	Diphenyl Phthalate Santicizer 141
430°F. (221°C.)	Diisooctyl Phthalate
425°F. (218°C.)	Dioctyl Phthalate Diisodecyl Adipate Di(n-Octyl,n-Decyl) Phthalate
420°F. (215°C.)	Santicizer 9
390°F. (199°C.)	Santicizer 160 Santicizer B-16
386°F. (196°C.)	Santicizer E-15
380°F. (193°C.)	Santicizer M-17
377°F. (192°C.)	Dioctyl Adipate
371°F. (188°C.)	Santicizer 3
345°F. (174°C.)	Santicizer 8
340°F. (171°C.)	Dibutyl Phthalate
295°F. (172°C.)	Diethyl Phthalate
290°F. (149°C.)	Dimethyl Phthalate
289°F. (143°C.)	Ortho-nitrobiphenyl

420°C.	Tricresyl Phosphate
405°C.	Diphenyl Phthalate
390°C. (approx.)	Santicizer 140
386°C.	Dioctyl Phthalate
375°C. (approx.)	Santicizer 141
370°C.	Santicizer 160
370°C. (approx.)	Triphenyl Phosphate
360°C.	Santicizer 9
350°C.	Santicizer 1-H
345°C.	Santicizer B-16
340°C.	Dibutyl Phthalate Santicizer 3 Santicizer 8
330°C. (approx.)	Ortho-Nitrobiphenyl
320 C.	Santicizer E-15
310°C.	Santicizer M-17
298°C.	Diethyl Phthalate
282°C.	Dimethyl Phthalate

*From vapor pressure curves.

446.3	Diisodecyl Phthalate
426.6	Dissodecyl Adipate
418.3	Di(n-Octyl,n-Decyl) Phthalate
390.5	Dioctyl Phthalate
370.6	Dioctyl Adipate
368.4	Tricresyl Phosphate
362.4	Santicizer 141
340.3	Santicizer 140
336.4	Santicizer B-16
326.3	Triphenyl Phosphate
318.3	Diphenyl Phthalate
312.4	Santicizer 160
280.3	Santicizer E-15
278.3	Dibutyl Phthalate
266.3	Santicizer M-17
253.0	Santicizer 1-H
222.2	Diethyl Phthalate
199.3	Santicizer 3 Santicizer 8
199.2	Ortho-Nitrobiphenyl
194.2	Dimethyl Phthalate
171.2	Santicizer 9

83.5°C.	Santicizer 1-H
69°C.	Diphenyl Phthalate
58.0°C.	Santicizer 3
49°C.	Triphenyl Phosphate
34.5°C.*	Ortho Nitrobiphenyl
20°C.*	Santicizer E-15
0°C.	Dimethyl Phthalate
0°C.	Santicizer 8
−0.3°C.*	Diethyl Phthalate
−30°C.	Di(n-Octyl,n-Decyl) Phthalate Dibutyl Phthalate Santicizer 160 Santicizer B-16 Santicizer M-17 Tricresyl Phosphate
Less than −35°C.	Santicizer 140 Dioctyl Phthalate Diisooctyl Phthalate Diisodecyl Phthalate Diisooctyl Adipate Dioctyl Adipate

*Supercools readily.

TOWOLDMON0043473

LE OF COMPARATIVE PROPERTIES OF MONSANTO PLASTICIZERS—Continued

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

*Distilled Water APHA 0
"Listerine" APHA 550

*Distilled Water APHA 0
"Listerine" APHA 550

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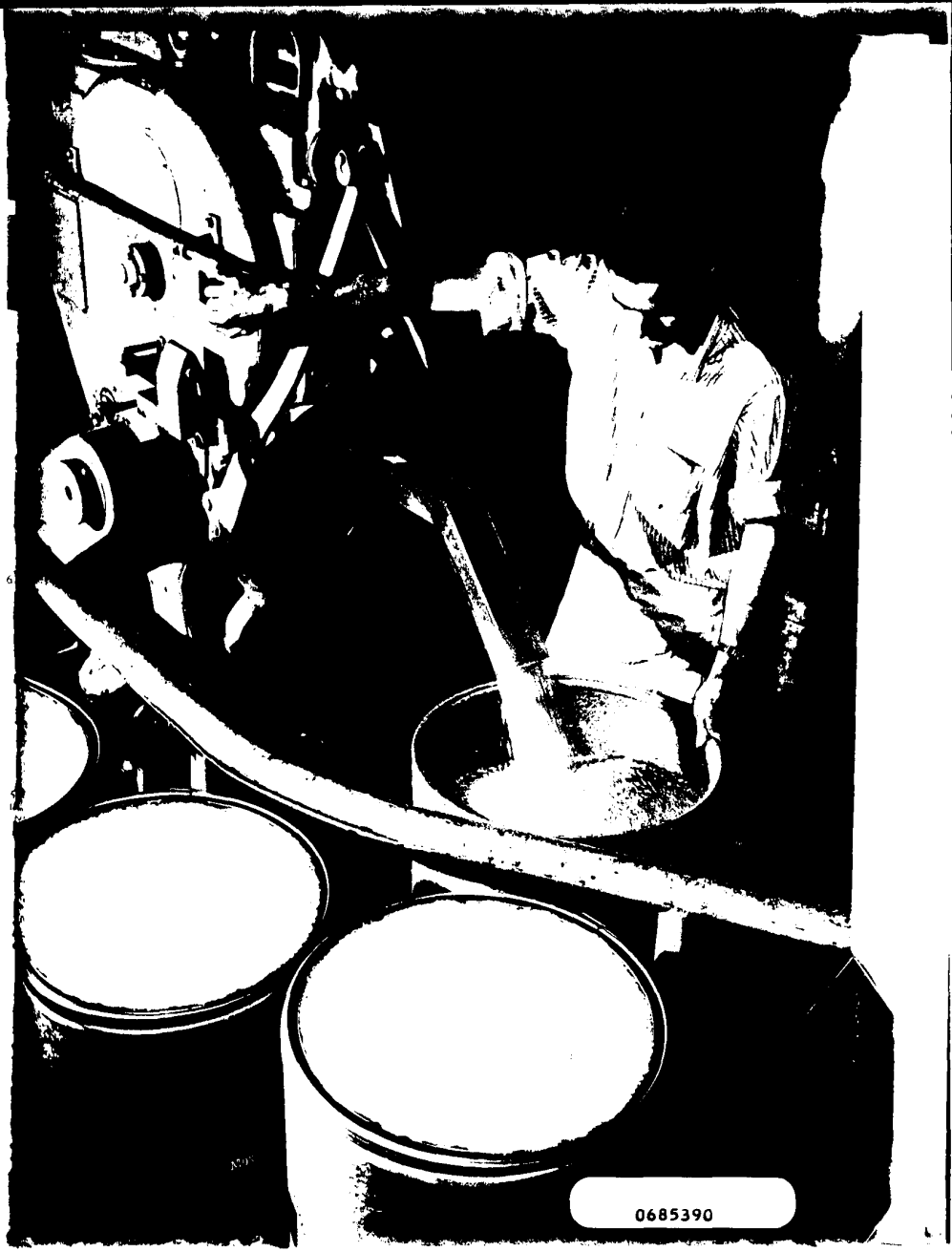
TOWOLDMON0043474



TOWOLDMON0043475

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.

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ACETYLSALICYLIC ACID, STARCH GRANULATIONS	Organic	22
ACETYLSALICYLIC ACID, U.S.P.	Organic	22
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ALUMINUM CHLORIDE SOLUTION 32° Be	Inorganic	
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ALUMINUM SULFATE, COMMERCIAL (DRY, LIQUID)	Inorganic	
ortho-AMINOANISOLE	Organic	
para-AMINOANISOLE	Organic	
meta-AMINOCHLOROBENZENE	Organic	
ortho-AMINOCHLOROBENZENE	Organic	
para-AMINOCHLOROBENZENE	Organic	
2-AMINOETHOXYBENZENE	Organic	
4-AMINOETHOXYBENZENE	Organic	
8-AMINO-1-NAPHTHOL-3,6-SODIUM ACID DISULFONATE	Organic	
ortho-AMINONITROBENZENE	Organic	
para-AMINOPHENETOLE	Organic	
ortho-AMINOPHENYLETHYL ETHER	Organic	
para-AMINOPHENYLETHYL ETHER	Organic	
AMMONIA, ANHYDROUS	Inorganic	
AMMONIUM BIPHOSPHATE	Inorganic	
AMMONIUM DIHYDROGEN PHOSPHATE	Inorganic	
AMMONIUM ETHYL PHOSPHATE	Inorganic	
AMMONIUM NITRATE PELLETED FERTILIZER	Inorganic	
AMMONIUM PHOSPHATE, DI	Inorganic	
AMMONIUM PHOSPHATE, MONO	Inorganic	

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"ARESKAP" SODIUM BUTYL-ortho-PHENYLPHENOLSULFONATE	Inorganic	27
"ARESKET" SODIUM BUTYL BIPHENYL-SULFONATE	Inorganic	27
"ARESKLENE" DISODIUM DIBUTYL-ortho-PHENYLPHENOLDISULFONATE	Inorganic	27
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ASPHALT PLASTIC CEMENT	Lion Oil	28
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BENZYL CHLORIDE, STABILIZED	Organic	33
Bis-Benzyl-para-CHLOROPHENOL, TECHNICAL	Organic	73
BUTYL CYCLOHEXYL PHENYL	Organic	33
BUTYL: Bis (2-BENZOTHIAZOLYL MERCAPTOMETHYL) UREA	Organic	19
BUTYL PHENOL A	Organic	33
BUTYL [illegible] ACID	Lion Oil	43
CALKING AND NAILING CEMENT	Lion Oil	29
CANE ASH	Inorganic	33
CARBON PHOSPHATE	Inorganic	34
CASH CEMENT	Lion Oil	53
CASTER OIL	Lion Oil	45
CHARGE-PROPANE MIXTURE	Lion Oil	46
"BUTASAN"	Organic	19
N-tert-BUTYL-2-BENZOTHIAZOLESULFENAMIDE	Organic	21
BUTYL [illegible]	[illegible]	68
BUTYL [illegible]	[illegible]	69
4,4-BUTYLIDENE-(6-tert-[illegible])	[illegible]	27
BUTYL [illegible]	[illegible]	67
[illegible]	[illegible]	34
[illegible]	[illegible]	35
[illegible]	[illegible]	36
[illegible]	[illegible]	35
[illegible]	[illegible]	36
[illegible]	[illegible]	36
[illegible]	[illegible]	40
[illegible]	[illegible]	36
[illegible]	[illegible]	36
meta-CHLOROANILINE	Organic	35
ortho-CHLOROANILINE	Organic	36
para-CHLOROANILINE	Organic	36
2-(para-tert-Butylphenoxy)-1,4-BENZENEDIOL	Organic	40
[illegible]	[illegible]	36
[illegible]	[illegible]	36

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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-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

Product	Division	Page No.
ortho-Dichlorobenzene, Tech.	Organic	
para-Dichlorobenzene	Organic	
Dichloro-Diphenyl-Trichloroethane (Monsanto DDT)	Organic	
2,4-Dichlorohydroxybenzene (2,4-Dichlorophenol Tech.)	Organic	
2,4-Dichlorophenoxyacetic Acid Isopropyl Ester	Organic	
Dicyclohexyl	Organic	
Dicyclohexylamine	Organic	
DIDA	Organic	
DIDP	Organic	
Diesel Fuel	Lion Oil	
Di-2-Ethyl Hexyl Adipate	Organic	
Di(2-Ethyl Hexyl) Phthalate	Organic	
Diethyl Phthalate	Organic	
1,2-Dihydro-2,2,4-Trimethyl-6-Phenylquinoline	Organic	
1,2-Dihydro-2,2,4-Trimethyl-Quinoline, Polymerized	Organic	
Dihydroxy Diphenyl Sulfone	Organic	
Diisodecyl Adipate	Organic	
Diisodecyl Phthalate	Organic	
Diisooctyl Phthalate	Organic	
N,N-Dimethylcyclohexyl-amine Salt of Dibutyldithio-carbamic Acid	Organic	
Dimethyl Phthalate	Organic	
N,N-Dimethyl-N'-2'Pyridyl-N'2-Thenyl Thylenediamine (Methapyrilene Hydrochloride)	Organic	
2,4-Dinitrochlorobenzene, Technical	Organic	
Dioctyl Adipate	Organic	
Dioctyl Phthalate	Organic	
DIOP	Organic	
Diphenyl	Organic	
Diphenylguanidine	Organic	
Diphenylguanidine Phthalate	Organic	
N,N-Diphenyl-para-Phenylenediamine	Organic	
Diphenyl Phthalate	Organic	
N-N'-Diphenyl Thiourea	Organic	
Disodium Dibutyl-ortho-Phenyl-Phenoldisulfonate	Inorganic	
Disodium Dihydrogen Pyrophosphate	Inorganic	
2,4-Di-tert-Amylhydroquinone	Organic	
2-2'-Dithiobis (Benzothiazole) (MBTS)	Organic	
4,4'-Dithiodimorpholine	Organic	
DOA	Organic	

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Product	Division	Page No.
.....	Organic	38
.....	Organic	19
, Solution".....	Inorganic	40
Kiln Mastic.....	Lion Oil	30
o Coating.....	Lion Oil	30
ute.....	Lion Oil	54
Sixty".....	Organic	19
ne Oil.....	Lion Oil	43
asan".....	Organic	19
avan".....	Organic	40
hoxy-1,2-Dihydro-2,2,4-imethylquinoline.....	Organic	26
hoxy-1,2-Dihydro-2,2,4-imethylquinoline, ified.....	Organic	74
l Acetate.....	Organic	40
l Ammonium Phosphate..	Inorganic	24
l Benzene.....	Plastics	41
lene Dichloride.....	Organic	41
l Phthalyl Ethyl ycolate.....	Organic	67
yl Thiurad".....	Organic	19
hyl para-Toluene lfonamide.....	Organic	66
l Vanillin.....	Organic	40
c Orthophosphate.....	Inorganic	41
phosphorus on Phosphide).....	Inorganic	41
Retardant A ("Monsanto e Retardant A").....	Inorganic	48
ctol" H.....	Organic	25
Oils.....	Lion Oil	30
aldehyde.....	Inorganic	41
ic Acid.....	Organic	41
A.....	Lion Oil	54
lines.....	Lion Oil	42
ine Pump Grease.....	Lion Oil	43

Product	Division	Page No.
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-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
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

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Product	Division	Page No.
2,4-D Isopropyl Ester (2,4-Dichlorophenoxyacetic Acid)	Organic	38

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Product	Division	Page No.
Kerosene	Lion Oil	46
K Kote	Lion Oil	52

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Product	Division	Page No.
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

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Product	Division	Page No.
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	30
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	21
para-Methoxyaniline	Organic	21
Methyl Parathion (80% Solution)	Organic	47
Methyl Phthalyl Ethyl Glycolate	Organic	67
Methyl Salicylate, U.S.P.	Organic	48, 67
Methyl Toluenesulfonate	Organic	48
MHA (Methionine Hydroxy Analogue)	Organic	47
Mixed Acid (Nitrating Acid)	Inorganic	5
mono-Basic Calcium Phosphate	Inorganic	3
mono-Basic Sodium Phosphate	Inorganic	3
Monochlorophthalic Anhydride	Organic	44
"Mono Thiurad"	Organic	21
"Monsanto Detergent MXP"	Inorganic	44
"Monsanto Fire Retardant A"	Inorganic	44
"Monsanto Penta" (Pentachlorphenol, Tech.)	Organic	44
Monsanto Polyethylene	Plastics	44
"Montar" Synthetic Resins	Organic	44
Motor Oils	Lion Oil	44
Multi-Purpose Ultra-White Grease	Lion Oil	44
Muriatic Acid	Inorganic	44

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Product	Division	Page No.
Naturalube DHD Super Duty Oil	Lion Oil	46
Naturalube Reinforced Motor Oil	Lion Oil	46
"Niran" Insecticide (Monsanto Parathion)	Organic	5
Nitrating Acid (Mixed Acid)	Inorganic	5

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Page No.	Product	Division	Page No.
	...E CAKE	Inorganic	75
47	...IC ACID	Inorganic	50
3	...-NITROANILINE		
47	...tho-AMINONITROBENZENE)	Organic	50
	...-NITROCHLOROBENZENE		
47	...eta-CHLORONITROBENZENE)	Organic	50
	...-NITROCHLOROBENZENE		
	...tho-CHLORONITROBENZENE)	Organic	50
47	...-NITROCHLOROBENZENE		
20	...ara-CHLORONITROBENZENE)	Organic	51
	...OGEN FERTILIZER SOLUTIONS	Inorganic	51
	...TRON" CELLULOSE NITRATE	Plastics	60
	...-NITROPHENOL	Organic	51
	...ORODE PRODUCTS	Lion Oil	51
47			
2			
2			
47			
	...LFOS" GLASSY SODIUM		
6	...OSPHATE	Inorganic	55
48, 6	...ALON" VINYL CHLORIDE	Plastics	59, 61
4	...ALON" VINYL CHLORIDE AND		
	...NYL CHLORIDE COPOLYMERS	Plastics	59
4	...IZON" POLYETHYLENE	Plastics	59, 60
5	...HOPHOSPHORIC ACID	Inorganic	56
3	...45 COOLANT FOR ELECTRONIC		
7	...QUIPMENT	Organic	55
4			
2			
4			
4			
4	...R LAMINANT	Lion Oil	31
6	...ATHION ("NIRAN"		
4	...SECTICIDE)	Organic	50
4	...NG ASPHALTS	Lion Oil	31
	...TACHLOROPHENOL, TECH.		
4	...MONSANTO PENTA")	Organic	48
4	...ACETIN	Organic	22
	...-PHENETIDINE	Organic	55
	...-PHENETIDINE	Organic	55
	...OL	Organic	55
	...NOLSULFONIC ACID	Organic	56
	...NOLPHTHALEIN, U.S.P.	Organic	56
	...NOLPHTHALEIN, YELLOW,		
	...T U.S.P.	Organic	56
4	...YLBENZENE	Organic	33
	...PHATIC FERTILIZER SOLUTION	Inorganic	56
4	...PHORIC ACID	Inorganic	56
	...PHORIC ANHYDRIDE	Inorganic	57
5	...PHORIC OXIDE AND		
5	...LID P_2O_5	Inorganic	57
	...PHOROUS ACID	Inorganic	57

Product	Division	Page No.
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 [illegible]	Organic	27
POLYOXYETHYLENE [illegible] THIOETHER [illegible]	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	35
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	[illegible]
REGULAR GASOLINE (UNBRANDED)	Lion Oil	[illegible]

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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

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Product	Division	Page No.
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" 1 Germicide	Organic	73
"Santophen" 1 Solution	Organic	73
"Santopoid" S Oil Additive	Organic	73
"Santopoid 22" Gear Oil Additive	Organic	73
"Santopoid 22-RI" 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	60
"Scriptite" 40 Urea-Formaldehyde	Plastics	60
"Scriptite" Series 50-59 Styrene Copolymers	Plastics	60
Seal Kote	Lion Oil	54
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	24
Sign Kote	Lion Oil	53
Silica Aerogel for Industrial Applications	Inorganic	4
Silica Aerogel for Thermal Insulation	Inorganic	4
"Skydrol" Functional Fluid	Organic	4
"Skydrol 500" Functional Fluid	Organic	4
Sodium Acid Pyrophosphate	Inorganic	4
Sodium Benzoate	Organic	4
Sodium Benzoate, Technical	Organic	4
Sodium Biphosphate	Inorganic	4
Sodium Bisulfate	Inorganic	4
Sodium Bisulfite	Inorganic	4
Sodium Butylbiphenylsulfonate	Inorganic	4

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Page No.	Product	Division	Page No.
72	...DIUM BUTYL-ortho-PHENYLPHENOSULFONATE	Inorganic	27
72	SODIUM-N-CHLORO-para-TOLUENESULFONAMIDE	Organic	35
72	...DIUM DIHYDROGEN PHOSPHATE	Inorganic	76
73	...DIUM FERRIC PYROPHOSPHATE	Inorganic	75
73	...DIUM HEXAMETAPHOSPHATE	Inorganic	75
73	...DIUM META BISULFITE (SILAGE GRADE)		
73	"META GREEN")	Inorganic	47
	...DIUM METAPHOSPHATE	Inorganic	76
73	...DIUM METAPHOSPHATE, LOW PH	Inorganic	76
73	...DIUM meta-NITROBENZENE SULFONATE	Organic	75
74	...DIUM PENTACHLOROPHENATE, TECH	Organic	69
74	...DIUM PHOSPHATE, DI (ANHYDROUS, DUOHYDRATE)	Inorganic	76
2	...DIUM PHOSPHATE, MONO	Inorganic	76
2	...DIUM PYROPHOSPHATE (TETRA)	Inorganic	76
2	...DIUM PHOSPHATE, TRI (ANHYDROUS, CRYSTALLINE)	Inorganic	76
2	...DIUM SALICYLATE, U.S.P.	Organic	65
6	...DIUM SULFATE, ANHYDROUS, TECH	Inorganic	66
6	...DIUM SULFIDE PLANTS	Eng. Sales	35
6	...DIUM ORTHO-SULFOBENZIMIDE	Organic	65
6	...DIUM TRIPOLYPHOSPHATE	Inorganic	77
6	...LD ROOFING ASPHALT	Lion Oil	31
5	...PANOX" ortho-TOLYL BIGUANIDE	Organic	77
5	...P" PHOSPHATE	Inorganic	77
5	...AM CYLINDER OIL (MINERAL AND COMPOUNDED)	Lion Oil	44
2	...EROX" POLYOXYETHYLENE ESTERS, ETHERS AND THIOETHERS	Inorganic	65
7	...EROX" No. 5 POLYOXY-ETHYLENE THIOETHER	Inorganic	77
7	...EROX" No. 6 POLYOXY-ETHYLENE THIOETHER	Inorganic	77
7	...EROX" AJ POLYOXYETHYLENE ETHER	Inorganic	77
7	...EROX" AJ-100 POLYOXY-ETHYLENE ETHER	Inorganic	77
7	...EROX" CD POLYOXYETHYLENE ESTER	Inorganic	78
7	...EROX" SE POLYOXYETHYLENE THIOETHER	Inorganic	78
7	...EROX" SK POLYOXYETHYLENE THIOETHER	Inorganic	78
2	...YMER" VINYL, STYRENE	Plastics	63
2	...YRENE MONOMER	Plastics	78

Product	Division	Page No.
SUCCINIC ANHYDRIDE	Organic	78
"SULFASAN" R	Organic	78
ortho-SULFOBENZIMIDE	Organic	65
para-SULFONAMIDOTOLUENE	Organic	80
SULPONYL 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[illegible] SOL	Inorganic	79
"SYTON" W-20 [illegible] 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
THEORIS (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 SULPONAMIDE	Organic	80
TOLUENESULFONAMIDES N-ETHYL, ortho, para MIXTURES	Organic	66, 67
para-TOLUENE SULPONCHLORIDE	Organic	80
TOLUENESULPONIC ACID, TECHNICAL	Organic	80
para-TOLUENESULPONIC ACID AMIDE	Organic	80
ortho-TOLYL BIGUANIDE	Organic	77
TRACTOR DISTILLATE	Lion Oil	46

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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

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Product	Division	Page No.
"ULTRON" VINYL CHLORIDE (FLEXIBLE FILM AND SHEETING)	Plastics	60
"ULTRON" VINYL CHLORIDE (RIGID SHEETS)	Plastics	71
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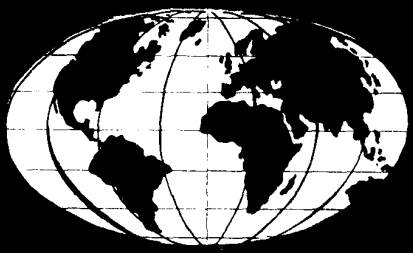

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Suite 301
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Telephone Executive 3-4224

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
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VANCOUVER, CANADA
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CABLE ADDRESS
"Monsanto" St. Louis Codes:
ABC, 6th & 7th Acme,
Bentley's and Bentley's Second

0685409

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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
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MONSANTO, IDAHO
MONSANTO, ILLINOIS
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MONZON, SPAIN
NAGOYA, JAPAN
NEWPORT, ENGLAND
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PORTO MARGHERA, ITALY
RUABON, NORTH WALES
SAINT LOUIS, MISSOURI
SANTA CLARA, CALIFORNIA
SEATTLE, WASHINGTON
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VILLE LA SALLE (MONTREAL), CANADA
WINGLES, FRANCE
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