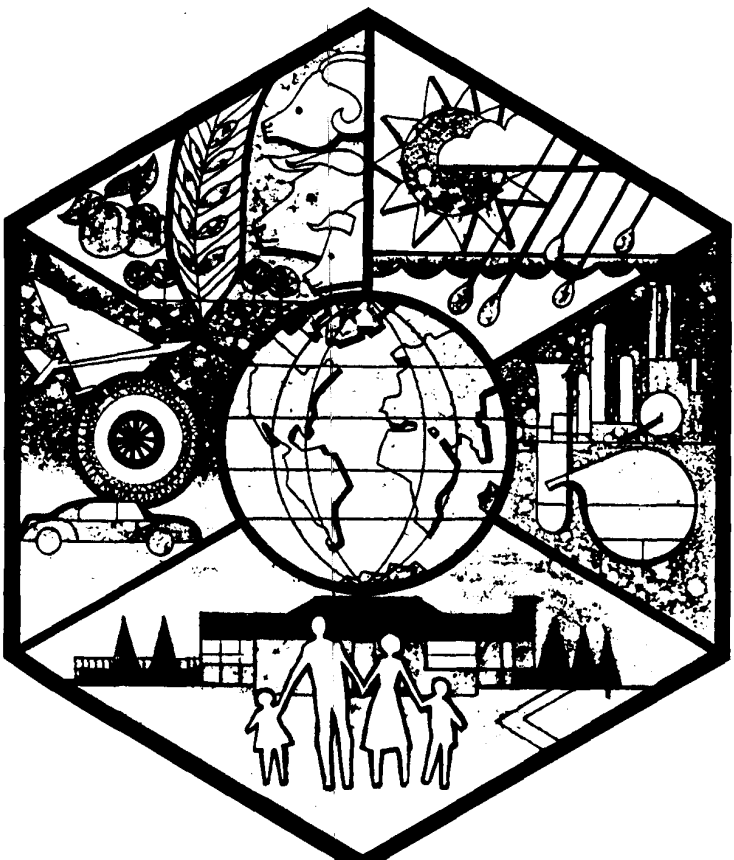
41st EDITION

PRODUCT CATALOG



Monsanto

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THIS catalog lists many of the more than 1000 products or services produced or provided by Monsanto and its major subsidiaries.

For additional information on these products and services, contact a Customer Inquiry Representative at any of the marketing offices listed on page 72. Or call the Customer Inquiry Center in St. Louis, Missouri (314) 694-3404.

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MONSANTO COMPANY is a diversified producer of chemicals, plastics, agricultural products, man-made fibers, and specialized electronic and process control systems. The company has investments, either directly or through affiliated companies, in 150 manufacturing plants and 31 laboratories or technical centers in 20 nations.

MONSANTO AGRICULTURAL PRODUCTS CO.

This operating unit serves agricultural markets through six major business areas: herbicides, insecticides, plant growth regulators, fertilizer materials, blasting products and hybrid breeding animals. Monsanto crop chemicals, used to control many annual and perennial weeds in major crops such as rice, wheat, corn and soybeans, include *Lasso*®, Ramrod®, Roundup®, Avadex®, Far-Go® and *Machete*® herbicides. Insecticides based on parathion manufactured by Monsanto also protect feed and fiber crops around the world from destructive pests, such as the boll worm and boll weevil in cotton. *Polaris*®, which assists cane producers in maximizing yields by increasing the sucrose content of sugar cane, is the first of a family of plant growth regulators under extensive investigation by the company. Monsanto is also one of the world's largest suppliers of ammonium nitrate. While its high nitrogen availability and ease of use make it attractive as a fertilizer, ammonium nitrate also goes into efficient low-cost blasting agents used extensively as mining and construction explosives. The company's work in the animal genetics field is conducted by Farmers Hybrid Companies, Inc. of Des Moines, Iowa, a wholly-owned subsidiary, which is a world leader in developing and marketing improved strains of meat producing animals with its Boar Power® boars.

MONSANTO CHEMICAL INTERMEDIATES CO.

This operating unit of Monsanto covers three basic business areas: petrochemicals, process chemicals, and textile intermediates. Major products include styrene, acrylonitrile, phenol, chlorobenzenes, dibasic acids, chloralkali, phosphorus intermediates, elemental phosphorus and industrial acids. These chemicals are used as key raw materials in the manufacture of plastics, fibers, synthetic rubber, agricultural chemicals and thousands of other consumer and industrial products. The company also maintains an extensive research and development program directed at increasing its eminent position in manufacturing technology. As a result of its successful R & D program, the company's technology is licensed around the world.

MONSANTO INDUSTRIAL CHEMICALS CO.

This operating unit serves a broad range of markets through six business areas: detergents and phosphates, electronics, environmental products, plasticizers, rubber chemicals and specialty chemicals. Detergents and phosphates include products used in cleaners, foods and dentifrices, while electronic products are supplied to the semiconductor industry. Monsanto Enviro-Chem Systems, Inc., a subsidiary, develops, markets and installs systems to control air pollution and is a world leader in the design and construction of sulfuric acid plants. Plasticizers add flexibility and other desirable properties for vinyl packaging film and sheeting. Through its rubber chemicals business the company is one of the world's leading suppliers of chemicals used in the manufacture of rubber products. Specialty chemicals include pharmaceuticals, intermediates, food ingredients, functional fluids and water treatment chemicals.

MONSANTO PLASTICS & RESINS CO.

This operating unit is composed of three divisions—Plastics, Resin Products and Fabricated Products. Products within the Plastics Division include *Lustran*® ABS, *Lustran*® SAN and *Lustrex*® polystyrene, three styrene-based plastics used in a variety of household, construction and appliance applications. *Vydyne*® nylon and *Vydyne*® R reinforced nylon are used in the electrical, appliance and transportation industries. *Fome-Cor*® board is used as sheathing in manufactured housing, for headliners in automobiles and in the graphic arts industry. The Resin Products Division produces *Saflex*® polyvinyl butyral film, the plastic interlayer used in automotive windshields and laminated architectural glass, and specialty resins for paints, coatings, adhesives and paper. Included in the Fabricated Products Division are custom designed and stock blow-molded containers, polyethylene film for greenhouses, *AstroTurf*® recreational surfaces and *Spray Guard*™ rain flaps for controlling splash and spray from large vehicles on wet pavement.

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MONSANTO TEXTILES COMPANY

Nylon, *Acrilan*® acrylic, modacrylic and polyester fibers are manufactured by this operating unit. These man-made fibers serve appatel, hosiery, home furnishings, carpet, and tire markets. Increasing quantities of Monsanto fibers are sold to the apparel and home furnishings markets under the *Wear-Dated*® warranty. *Acrilan*® acrylic, a recognized leader in the field of carpet fibers, and *Ultron*® nylon with antistatic and soil-hiding properties, are preferred by quality mills. In many fabric constructions, *SEF*® modacrylic fiber meets the rigid flammability standard for children's sleepwear. *Cerex*® spunbonded nylon fabric is used as a durable scrim for carpeting and in quilted fabric liners air and liquid filters, and disposable hospital garments. *Bidim*® polyester nonwoven fabric, a civil engineering material, is used extensively for soil stabilization and drainage for road building, rail track beds, heavy work sites and soil drainage.

INTERNATIONAL DIVISION

Monsanto's International operations serve world markets through sales offices or sales representatives in 68 countries selling to customers in 123 nations. Monsanto International coordinates operations outside the United States in conjunction with the five operating companies. Ex-U.S. operations have been divided into three world areas: Europe-Africa, with headquarters in Brussels, Belgium; Canada-Latin America; and Asia-Pacific.

FISHER CONTROLS CORPORATION OF DELAWARE

This self-contained company, jointly owned by Monsanto Company and The General Electric Company Limited (GEC) of the United Kingdom, manufactures automatic control equipment and valves and markets to the worldwide process control market. Fisher Controls' products include a wide range of control valves and regulators and a line of electronic and pneumatic field instrumentation, control room instrumentation, and digital control systems. These products are applied throughout a broad spectrum of energy and processing industries, including chemical, petrochemical, pulp and paper, power, metal processing, oil and gas production, and refining.

MONSANTO RESEARCH CORPORATION

Monsanto Research Corporation is a wholly owned subsidiary engaged principally in government contract work. It operates Mound Facility, in Miamisburg, Ohio, for the United States Department of Energy. Its Dayton Laboratory at Dayton, Ohio provides environmental research and services, and custom synthesis and interim chemical manufacture for government agencies and commercial organizations. It also manufactures radioactive sources for worldwide sale.

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The products manufactured and sold by Monsanto's operating companies, its International Division and its major subsidiaries are listed on the following pages. In order to help you locate products, the catalog is divided into the following sections.

COMPANY ORGANIZATION (See page 1)

A brief resume of Monsanto's organization, describing the broad areas of company interests and the specific interests of the operating companies, International Division and subsidiaries

ALPHABETIC PRODUCT INDEX (See page 4)

Includes products and their uses, refers to the page where specific product descriptions may be found, and to the Locator Key which tells where you may place an order or obtain additional product information.

PRODUCT USE INDEX (See page 12)

Specific uses to which Monsanto products may be put; for example, as Agricultural and Farm Products or as Paint/Coating Ingredients. This index also refers to the Locator Key and to the page where the product description may be found.

LOCATOR KEY (See page 69)

Shown at the lower right of each product description. It works like this: If you need additional information on acetylsalicylic acid (aspirin), Locator Key 36a refers to the marketing offices that handle this product. Thus, if you are located in Milwaukee, Wisconsin, our Chicago office would be most convenient for you.

MAJOR OFFICES (See page 72)

Major offices of the company, both in the United States and abroad. This includes the location, address and telephone number of corporate organizations, operating companies, the International Division and subsidiaries. Marketing offices outside the United States, multicompany marketing offices, and those maintained by operating companies are also listed.

TRADEMARKS (See page 19)

The word Monsanto and the *Monsanto Block M* are Monsanto's most important trademarks. They are registered in the U.S. Patent Office and in most countries throughout the world. Indices used in this catalog also contain other trademarks owned by Monsanto and its subsidiaries. Trademarks which are registered in the U.S. Patent Office are followed by the ®. Unregistered trademarks and those for which registration is pending are followed by an asterisk.

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TRADEMARKS

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ADHESIVES and ADHESIVES COMPONENTS

ADHESIVES

PHENOLIC and RESORCINOL RESINS

Supplied as liquids, various grades of phenolic and resorcinol resins are available for bonding applications demanding an extremely high degree of water resistance. Bonds can withstand continuous boiling. The resins are used as glues for plywood, hardboard, particle board bonding and general woodworking. They can be cured by hot and cold press laminating or radio frequency.

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PHOSPHORIC ACID *75, 80 and 85%*
See Page 46

SANTOQUIN® *preservative (technical ethoxyquin)*
See Page 24

FERTILIZERS

AMMONIA, ANHYDROUS

Compressed gases that are stored, transported and handled as clear liquids. *Monsanto* anhydrous ammonia fertilizer grade contains 0.25-0.50% water. *commercial and industrial grade contains* 5 ppm maximum oil and only trace amounts of iron and chlorine and 0.25-0.50% water. Refrigeration grade contains only 100 ppm maximum water, 3 ppm maximum oil, and 0.1 ml/gm of nonbasic gas in the vapor above the liquid.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **11a**

AMMONIUM NITRATE 83% SOLUTION

Supplied as a clear, aqueous solution of ammonium nitrate.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **11a**

DIAMMONIUM PHOSPHATE (DAP)
See Page 45

E-2® AMMONIUM NITRATE FERTILIZER PRILLS

Supplied as a dense, free-flowing, spherical prill material especially sized for fertilizer blending.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **11a**

MONOAMMONIUM PHOSPHATE (MAP)
See Page 45

MONOPOTASSIUM PHOSPHATE
See Page 46

PHOSPHORIC ACID *75, 80 and 85%*
See Page 46

0684240

TOWOLDMON0042324

HERBICIDES

AVADEX® *diallate*

A proprietary herbicide supplied in liquid and granular form for controlling infestations of wild oat in sugarbeet, flax and certain other crops. Liquid contains 4 lbs./gallon; granules, 10% active (2,3-dichloroallyl) diisopropylthiocarbamate. Applied as ground or aerial spray.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **12a**

AVADEX® BW and FAR-GO® *triallate*

A proprietary herbicide supplied in liquid and granular form for control of wild oat infestations in barley, spring wheat, Durum wheat and certain other crops. Liquid contains 4 lbs./gallon; granules, 10% active 2,3,3-trichloroallyl diisopropylthiocarbamate.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **12a**

LASSO® *alachlor*

A proprietary herbicide available as a 4 lb per gallon (active ingredient) emulsifiable concentrate and a 15% (active ingredient) granule. The active ingredient is 2-chloro-2', 6'-diethyl-N-(methoxy methyl) acetanilide. *Lasso* is used for selective weed control in corn, soybeans, peanuts, cotton, potatoes, dry beans, green peas and ornamentals. Available in 5 gallon cans, 55 gallon drums and bulk quantities of greater than 1000 gallons.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **12a**

MACHETE® *butachlor*

A proprietary herbicide supplied in liquid and granular form for control of a wide range of weeds in rice and barley. The formulation varies from country to country. *Machete* is not sold in the United States.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **12a**

RAMROD® *propachlor*

Ramrod herbicide is available as 20% active granule and as 65% active wettable powder. The active ingredient is 2-chloro-N-isopropylacetanilide. *Ramrod* is used for selective weed control in corn, grain sorghum (milo) and seed soybeans. The wettable powder is also cleared for use on processed green peas.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **12a**

RAMROD® */atrazine (propachlor/atrazine)*

A preblended herbicide mixture available as wettable powder. The active ingredients are 2-chloro-N-isopropylacetanilide (48.1%) and 2-chloro-4-ethylamino-6-isopropylamino-s-triazine (20.9%). *Ramrod* /atrazine is used for selective weed control in corn and grain sorghum (milo). Also available as a flowable formulation with a 3:1 ratio of propachlor to atrazine for use on grain sorghum (milo) only.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **12a**

RANDOX® *CDAA*

A proprietary herbicide supplied in liquid and granular form for controlling infestations of many annual grasses in onion and certain other crops. Liquid contains 4 lbs./gallon; granules, 20% active 2-chloro-N,N-diallylacetamide.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **12a**

ROUNDUP® *glyphosate*

A proprietary herbicide, available as a liquid formulation, containing 4 lbs./gallon isopropyl-amine salt of glyphosate. Offers effective postemergent control of many emerged annual and perennial broadleaves and grasses.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **12a**

VEGADEX® *CDEC*

A proprietary herbicide supplied in liquid or granular form to control certain annual grasses and broadleaf weeds in a variety of vegetable crops. Liquid contains 4 lbs./gallon; granules, 20% active 2-chloroallyl diethyldithiocarbamate.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **12a**

INSECTICIDES

ETHYL PARATHION

A technical grade material supplied to formulators who manufacture their own trademarked ethyl parathion products. Ethyl formulations are registered for use in controlling a wide spectrum of insect pests in all the major commercial agricultural crops. Poison emblem and antidote are required on labels. Ethyl parathion is a restricted use herbicide.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **12a**

TOWOLDMON0042325

METHYL PARATHION

A technical grade material supplied to formulators who manufacture their own trademarked (methyl parathion products. Methyl is typically combined in formulations with other insecticidal materials such as EPN and toxaphene. Methyl parathion formulations are widely used for broad-spectrum insect control in cotton, soybeans and many other fruit crops. Poison emblem and antidote are required on labels. Methyl parathion is a restricted use herbicide.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **12a**

PLANT GROWTH REGULATOR

POLARIS®

A proprietary plant growth regulator for ripening sugarcane. It has been effective in hastening maturity early in the harvest season when sucrose levels are low and natural ripening conditions are adverse. A water soluble product, containing 85% active ingredient.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **12b**

RELATED PRODUCTS/ SERVICES

GELVATOL® RESINS
See Page 52

POLYETHYLENE PROTECTIVE SHEETING and TAPE
See Page 29

ANIMAL and ANIMAL NUTRITION PRODUCTS

AMINO ACIDS

MHA® METHIONINE HYDROXY ANALOG *calcium*

An amino acid (methionine) supplement for poultry and other animal feeds. *MHA* is nutritionally equivalent to DL-methionine and metabolizes *in vivo* to serve as a supplemental source of the essential amino acid.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

ANIMAL PRODUCTS

SWINE BREEDING STOCK

BOARS: 7 months of age, 250-275 lbs. Six Farmers Hybrid breeds of boars for use in a systematic rotational cross breeding program for commercial swine production. *GILTS:* 6 months of age, 220-240 lbs.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **11c**

PRESERVATIVES

AFLABAN® *mold inhibitor*

A selective inhibitor for the control of certain molds, yeasts and bacteria in animal feeds.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

SANTOQUIN® *preservative (technical ethoxyquin)*

A feed grade antioxidant added to animal feed and feed ingredients to prevent oxidative destruction of fat soluble nutrients including Vitamins "A" and "E", carotene, and xanthophyll. *Santoquin* is supplied as liquid; as *Santoquin* Mixture 6 (66.6%) and as *Santoquin* Emulsion (70%).

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

ANTICAKING FLOW CONDITIONERS

TRICALCIUM PHOSPHATE
See Page 46

ANTIFOAMING AGENTS

LIMIT® 33 *defoamer*
See Page 42

PC-1244® *defoamer*

PC-1244 is an additive used in low [illegible] to suppress foaming tendencies in [illegible] formulations. It is an oil-dispersable [illegible] nonmetallic compound in petroleum [illegible]

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21d**

0684242

TOWOLDMON0042326

PC-1344* *defoamer*

Used as a defoamer in nonaqueous hydrocarbon and solvent systems.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

ANTIFOULANTS

DEQUEST* 2000 *phosphonate*
See Page 67

DEQUEST* 2006 *phosphonate*
See Page 67

DEQUEST* 2010 *phosphonate*
See Page 67

DEQUEST* 2041 *phosphonate*
See Page 68

DEQUEST* 2051 *phosphonate*
See Page 68

DEQUEST* 2054 *phosphonate*
See Page 68

DEQUEST* 2060 *phosphonate*
See Page 68

DEQUEST* XK *phosphonate*
See Page 68

ANTIOXIDANTS

SANTONOX* and SANTONOX* R *4,4'-thiobis (6-tert-butyl-m-cresol)*

Santonox and *Santonox* R are used as antioxidants for polyethylene and other plastic resins.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

SANTOQUIN* *preservative (technical ethoxyquin)*
See Page 24

SANTOWHITE* POWDER *antioxidant, 4,4'-butylidenebis (6-tert-butyl-m-cresol)*

Santowhite Powder is an antioxidant for polypropylene, polyethylene, nylon molding powders and other polymer resins.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

BACTERIOSTATS/ DISINFECTANTS/ FUNGICIDES/FUNGISTATS/ GERMICIDES

ACL* 56, 59, 60, 66, 85 SANITIZER and BLEACHING COMPOUNDS
See Page 65

2,4-DICHLOROPHENOL
See Page 40

SANTOPHEN* 1 GERMICIDE *ortho-benzyl-parachorophenol*

Santophen 1 is an off-white solid used as a broad spectrum germicidal active for formulating disinfectant and disinfectant-cleaner products intended for use on inanimate objects. *Santophen* 1 possesses high bactericidal and fungicidal activity, low odor when formulated, and low toxicity to higher animals.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

SANTOPHEN* 1 SOLUTION *75% Santophen 1, 25% isopropanol*

Santophen 1 solution is used as a broad spectrum germicidal active for disinfectant and disinfectant-cleaner products intended for use on inanimate objects.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

TCC* BACTERIOSTATIC AGENT *3,4,4' trichlorocarbanilide*

TCC is a bacteriostatic agent that is supplied to the bar soap industry for use in antimicrobial soaps and deodorant bars.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

BLASTING MATERIALS

BLASTING SUPPLIES

Detonating cord, cast primers and other explosive materials.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **11b**

TOWOLDMON0042327

MONSANTO* HX-30 (REGULAR) AMMONIUM NITRATE FERTILIZER *industrial grade*

HX-30 ammonium nitrate fertilizer is a spherical, white prill containing 1.0% to 1.5% kaolin coating, 0.3% moisture and 0.07% organic matter. Its bulk density is 48 lbs./cu. ft. and the prills are treated to resist caking. HX-30 prills exhibit a controlled internal porosity for maximum oil absorbency which, upon mixture with fuel oil or other carbonaceous fuels to make ANFO, produces a blasting agent well suited for use in open pit mining, quarrying and construction.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **11b**

M•PAK* 100 BLASTING AGENT

M•Pak blasting agents are medium energy explosives designed to meet specific blasting needs in conditions requiring limited water resistance. Available in durable poly textile packages for use in surface coal and metal mining.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **11b**

M•PEL* 000, 600, 650 BLASTING AGENTS

M•Pel blasting agents are free flowing ammonium nitrate based explosives providing the mining industry with reliable, low cost blasting agents where blasthole conditions are dry. They are available in a variety of densities and energies to meet specific blasting requirements.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **11b**

M•POWR* 1100, 1500, 1600, 1650 BLASTING AGENTS

M•Powr blasting agents are packaged explosives in rugged waterproof containers in a variety of densities and energies. The unique, waterproof package feature of *M•Powr* products combined with a wide choice of energies is the proven solution to wet, severe blasting conditions.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **11b**

M•PULZ* 1240, 1260, 1666 BLASTING AGENTS

M•Pulz blasting agents are specific high energy formulations designed for ANFO boostering and as column loads for severe blasting conditions. *M•Pulz* cartridges perform well as column loads in specialized situations such as hole instability, severe toe conditions and thin seams where vibrations limitations demand close control of amount of powder per charge.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **11b**

NITRO CARBO NITRATE (NCN)

Bulk and packaged ammonium nitrate based blasting agents for use in mining, quarrying and construction. Products are sold under the trademarks *M•Pel*, *M•Pak*, *M•Powr*, and *M•Pulz*.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **11b**

CHEMICAL PROCESSES

SULFURIC ACID PLANTS *process and construction*

Custom-engineered to convert various sources of SO_2 to sulfuric acid. The plants are constructed to use either the single or interpass absorption contact process.

MONSANTO ENVIRO-CHEM SYSTEMS INC. Locator Key **33a**

CHEMICAL SPECIALTY CATALYSTS

Monsanto Enviro-Chem supplies the following catalysts for converting sulfur dioxide to sulfur trioxide. These are highly efficient, poison-resistant catalysts designed for durability under the operating conditions in the service designated.

SULFURIC CONTACT CATALYST

Supplied as yellow to orange pellets in 50 liter drums for use in contact sulfuric acid plants.

MONSANTO ENVIRO-CHEM SYSTEMS INC. Locator Key **33a**

VANADIUM PENTOXIDE CATALYST

Supplied in most durable physical form and highest conversion efficiency for contact sulfuric acid plants.

MONSANTO ENVIRO-CHEM SYSTEMS INC. Locator Key **33a**

CONSUMER PRODUCTS

ASTROTURF* DOOR MATS

A line of integrally-made, one piece polyethylene door mats in various sizes and colors, some with decorative plastic flowers available at retail stores throughout the United States.

MONSANTO PLASTICS & RESINS CO. Locator Key **41d**

0684244

TOWOLDMON0042328

CONTAINERS

PLASTIC BOTTLES and CONTAINERS-BLOWNWARE

Monsanto offers custom-designed blow-molded packaging containers in a variety of shapes and sizes, rigid or flexible, to meet specific product market requirements. A large range of stock sizes and shapes of blow-molded plastic bottles are supplied direct and through a nationwide distributor network. Decorating services for both custom and stock containers are provided at three strategically-located facilities.

MONSANTO PLASTICS & RESINS CO. Locator Key **41b**

CORROSION INHIBITORS

CYCLO- and DICYCLOHEXYLAMINE
See Page 39

DEQUEST® 2000 *phosphonate*
See Page 67

DEQUEST® 2006 *phosphonate*
See Page 67

DEQUEST® 2010 *phosphonate*
See Page 67

DEQUEST® 2041 *phosphonate*
See Page 68

DEQUEST® 2051 *phosphonate*
See Page 68

DEQUEST® 2054 *phosphonate*
See Page 68

DEQUEST® 2060 *phosphonate*
See Page 68

DEQUEST® XK *phosphonate*
See Page 68

DENTIFRICE ABRASIVES

CALCIUM PYROPHOSPHATE
See Page 46

DICALCIUM PHOSPHATE, ANHYDROUS
See Page 46

DICALCIUM PHOSPHATE, DIHYDRATE
See Page 46

INSOLUBLE SODIUM METAPHOSPHATE
See Page 47

LUSTRE-PHOS® *dentifrice abrasive*
See Page 46

DISPERSANTS

DEQUEST® 2000 *phosphonate*
See Page 67

DEQUEST® 2006 *phosphonate*
See Page 67

DEQUEST® 2010 *phosphonate*
See Page 67

DEQUEST® 2041 *phosphonate*
See Page 68

DEQUEST® 2051 *phosphonate*
See Page 68

DEQUEST® 2054 *phosphonate*
See Page 68

DEQUEST® 2060 *phosphonate*
See Page 68

DEQUEST® XK *phosphonate*
See Page 68

ELECTRONIC MATERIALS

COOLANOL® 20, 25, 35, 45 *dielectric coolants and heat transfer media*
See Page 34

LAMPBLACK
See Page 42

OS-59® *dielectric heat transfer fluid*
See Page 34

SILICON *semiconductor grade*

Czochralski rod and slices which are (111) or (100) oriented are available in standard diameter and thickness sizes. MON-X® silicon rods and slices which are (111) or (100) oriented, are available in standard and customer sizes. Slices are available with as-cut, lapped, etched or polished surfaces on either or both sides.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **32a**

TOWOLDMON0042329

ENVIRONMENTAL CONTROL

AMMSOX® SYSTEM

System to remove sulfur oxides from gas streams; applicable to SO_2 emitting sources.

MONSANTO ENVIRO-CHEM SYSTEMS INC. Locator Key **33a**

ENVIRONMENTAL SERVICES

Stack, ambient, or occupational exposure testing for air pollutant levels; water and wastewater sampling; complete supporting services which include instrumental and wet method analysis, data evaluation and report preparation.

MONSANTO RESEARCH CORPORATION Locator Key **71a**

Enviro-Chem® equipment, developed by Monsanto Enviro-Chem Systems, Inc., is supplied to the chemical processing and other industries through an engineering sales service that custom-designs, engineers and constructs a variety of units for special tasks as follows:

MONSANTO® ASPHALT VENT PACKAGE

Collects condensed hydrocarbon vapors from vent streams from various asphalt handling and storage systems with efficiencies of 99.5% and higher. Package is pre-engineered and contains a mist elimination section and air motive section. Capacities range from 100 ACFM up to 1500 ACFM.

MONSANTO ENVIRO-CHEM SYSTEMS INC. Locator Key **33a**

MONSANTO® MIST ELIMINATOR/FILTER

Custom-engineered fiber beds in several types of required support materials and configurations for removing very fine liquid mists and soluble solids from gas streams at efficiencies up to 99.9+% depending on design at low initial pressure drop. Recommended for removal and/or collection of liquid mists or soluble solids that may be valuable, toxic, or contaminating.

MONSANTO ENVIRO-CHEM SYSTEMS INC. Locator Key **33a**

MONSANTO® OLEUM VENT PACKAGE

Converts sulfur trioxide vapor into sulfuric acid mists which are removed in a high efficiency *Monsanto* mist eliminator. Package is pre-engineered, contains an optional hydrolysis system, mist elimination section and air motive section. Capacities range from 100 up to 1500 ACFM.

MONSANTO ENVIRO-CHEM SYSTEMS INC. Locator Key **33a**

MONSANTO® ORGANIC PACKAGE

Collects organic emissions from plastics, textile, and other process exhaust stacks. Package is pre-engineered and contains heat exchange section, mist elimination section, and air motive section. Capacities range from 6,000 to 27,000 ACFM.

MONSANTO ENVIRO-CHEM SYSTEMS INC. Locator Key **33a**

EXTRUDED PRODUCTS

EMBOSSED POLYETHYLENE FILM *diaper film*

White, low density polyethylene film designed for economical and efficient convertibility for use as disposable diaper backing.

MONSANTO PLASTICS & RESINS CO. Locator Key **41c**

FOME-COR® BOARDS

Manufactured Housing *Fome-Cor* Sheathing Board: A light-weight, rigid board made of extruded polystyrene foam securely bonded between two layers of tough kraft linerboard. *Fome-Cor* sheathing board reduces heat, sound, water and air infiltration. It is supplied in ¼" thickness in widths of 6', 7', 7½' and 8', accordian folded in a length of 420'.

Home Improvement *Fome-Cor* Board: Similar construction as above; is used as an underlayment board prior to the residing of an existing residential dwelling. It is supplied in ¼" thickness in a width of 4', accordian folded in a length of 50'.

Automotive *Fome-Cor* Board: A similar sandwich construction as described above, supplied in required densities and sizes for insulation, sound-deadening, and water barrier when used primarily as a substrate for headliners, but also suitable for door panels, quarter panels and package trays.

Graphic Arts *Fome-Cor* Board: Supplied with clay coated bleached and natural brown kraft facings in thicknesses of 1/8" to 3/16" for die-cutting, embossing, silk screening or printing. May be scored and folded for exhibits and point-of-purchase displays.

MONSANTO PLASTICS & RESINS CO. Locator Key **42b**

MONSANTO® POLYETHYLENE SHEETING

Supplied as moisture vapor barrier material in gauges .001" to .010", 1' to 40' width, in 60' to 100' length rolls in natural or black. Used under concrete slabs, over studding, concealed flashing for weather-protecting materials, closing in unfinished construction, lining crawl spaces, and covering fresh concrete.

MONSANTO PLASTICS & RESINS CO. Locator Key **41c**

0684246

TOWOLDMON0042330

POLYETHYLENE PROTECTIVE SHEETING and TAPE

Supplied in gauges ranging from .001" to .010", 3' to 40' widths, 100' to 4000' rolls of natural or black polyethylene. Tape is supplied in 2" x 100' rolls. Used for strip mulching, greenhouse covers, irrigation covers, row covers, pond liners, and protective tarpaulins.

MONSANTO PLASTICS & RESINS CO. Locator Key **41c**

FABRICS, MAN-MADE

BIDIM® *polyester nonwoven fabrics*

Bidim engineering fabrics are made of continuous filament polyester fibers needled to form a highly-permeable fabric. This mechanical interlocking of the polyester fibers makes a geotechnic fabric with the durability and toughness required for a wide variety of end uses. Applications are primarily in civil engineering, with special emphasis on bed stabilization for railroads built over poor loadbearing soils, stabilization and crack-reflection reduction of asphalt roads, particularly under severe freeze-thaw conditions, and bed stabilization for access roads built over poor loadbearing soils. They are also used for constructing low maintenance drainage systems, for establishing erosion control along waterways and shorelines, for earth reinforcement, and in the construction of silt fences.

MONSANTO TEXTILES COMPANY Locator Key **51b**

CEREX® *spunbonded nylon fabrics*

Cerex spunbonded nylon is an extraordinarily tough and durable nonwoven fabric. In the spunbonded process, nylon fibers are self-bonded (no adhesive used) to give a stable fabric that is 100% nylon 6/6, and therefore, mildew and rot resistant. The fiber bonding is permanent. The dimensional stability, tensile strength, stitch strength and tear resistance are extremely high. The fabric has the high-heat resistance of the nylon polymer. Cerex nylon can be used in interlining applications, as a quilting medium, as a reinforcing agent, a substrate for coating thermoplastic resins, a strength-giving web for tissue laminates, and a filtration media. It can be readily bonded to itself or to other materials with standard adhesives, dyed to any shade with nylon dyes or printed with multi-color designs.

MONSANTO TEXTILES COMPANY Locator Key **51b**

FIBERS, MAN-MADE

ACRILAN® *acrylic fibers*

Available in 1.2-15 denier in a variety of staple lengths and tow suitable for a full range of woven, knit, and tufted textile and industrial applications. The standard product has excellent whiteness and high resilience, and is available in types designed for the cotton, woolen, and modified-worsted spinning systems. Types especially tailored to excel in certain end uses include: bicomponent fibers (for sweaters and carpets), producer-colored fibers (for deep-pile apparel and carpets).

MONSANTO TEXTILES COMPANY Locator Key **51a**

BI-LOFT® *acrylic fibers*

Acrilan yarn with a content of 35% or more high bulk component. Developed specifically for use in sweaters and half hose where bulk is a desirable property. Comes in a range of deniers from 2 to 5 to achieve products offering unique hand and exceptional consumer appeal.

MONSANTO TEXTILES COMPANY Locator Key **51a**

FILAMENT NYLON YARNS

Available in 3-18 denier per filament products in a full range of weaving, knitting, and tufting multifilament yarns for apparel, carpet, home furnishings, industrial, military, and tire applications, as well as monofils for hosiery. Types specially engineered for high performance in certain end uses include: *Actionwear®* stretch nylon hosiery yarns, and *Ultron®* static-resist, low soiling, advanced-generation carpet yarns in bright and wool-like classic lusters, and *Blue "C"®* nylon for home furnishings and other textile uses. High tenacity nylon filament yarns are available in yarn deniers from 30 to 1890 for use in applications requiring high strength and durability such as tire reinforcement, conveyer belt fabrics, high pressure hose, broad and narrow woven industrial fabrics, rope and cordage, and industrial sewing threads.

MONSANTO TEXTILES COMPANY Locator Key **51a**

NYLON STAPLE

Available in 6, 10, 15 and 18 denier per filament products as regular and advanced generation [illegible] static-resist and low-soiling carpet yarns in bright and wool-like classic luster.

MONSANTO TEXTILES COMPANY Locator Key **51a**

TOWOLDMON0042331

POLYESTER FILAMENT YARNS

Available in popular multifilament textile deniers as partially drawn yarns specially tailored for draw texturing and as producer-textured yarns. The textured product is used in warp-knit, circular-knit, or broadwoven equipment, principally for apparel outerwear.

MONSANTO TEXTILES COMPANY — Locator Key **51a**

POLYESTER STAPLE FIBERS

Available in 1.5-6 denier fiber in staple lengths suitable for a wide variety of apparel, home furnishings, and industrial applications. The standard *Blue "C"* polyester staple fiber has excellent whiteness and is crimped for high resilience in woven, knit, and fiber filled products. *Spectran*® polyester staple is engineered to provide the excellent performance properties of regular polyester with superior dyeing properties and exceptional *hand, drape, stain and soil release performance.*

MONSANTO TEXTILES COMPANY — Locator Key **51a**

SEF® *modacrylic fibers*

Available in 3, 5, or 8 denier fiber in popular staple lengths for use in children's sleepwear, draperies, and area rugs. In proper constructions, such items will meet federal and other applicable flammability standards. Also available in 3 denier, uncrimped tow for use in battery separators. This fiber combines the excellent aesthetic and processing characteristics of acrylics with the flame-retardant qualities of conventional modacrylics to yield an acrylic-like modacrylic of broad utility in apparel and home furnishings applications.

MONSANTO TEXTILES COMPANY — Locator Key **51a**

WEAR-DATED® *textile products*

The Monsanto licensing program for consumer products made from its *Acrilan* acrylic, nylon, polyester and modacrylic yarns and fibers was launched in 1962. Manufacturers of apparel and home furnishings whose merchandise meets Monsanto quality standards are licensed to use the *Wear-Dated* tag. This is the consumer's warranty that if the item does not give normal wear for the specified period of time (one year for apparel and certain home furnishings fabrics, and two to five years for other home furnishings fabrics, depending on the product and its intended use) Monsanto will refund the purchase price or replace the item when returned with the *Wear-Dated* tag and sales slip. In the case of *Wear-Dated* upholstered fabrics, only the sales slip and the filled-out *Wear-Dated* tag is returned and the upholstery fabric is repaired or replaced after home inspection verified failure to give normal wear within two years from date of purchase.

Textile products submitted for licensing under the *Wear-Dated* program are tested for fiber content, colorfastness, construction and various other criteria before the license and tags are issued. Merchandise carrying the *Wear-Dated* warranty can, therefore, be depended upon to offer good value and dependable performance. In the United States more than 300 categories of textile products carry the *Wear-Dated* warranty. Increasingly international in scope, the program now operates in about 20 countries.

MONSANTO TEXTILES COMPANY — Locator Key **51a**

FIRE SAFETY, PRODUCTS TO IMPROVE

NOTE: Materials designated in this Product Catalog as "fire resistant" or "flame retardant" generally are more difficult to ignite, or once ignited burn at a slower rate than corresponding conventional materials. These terms do not mean that fire resistant or flame retardant materials will not burn. However, when properly used, Monsanto's fire resistant or flame retardant products are useful in helping customers meet their fire safety requirements.

DIAMMONIUM PHOSPHATE (DAP)

See Page 45

MONOAMMONIUM PHOSPHATE (MAP)

See Page 45

PHOS-CHEK® *fire retardant*

A group of ammonium phosphate formulations containing corrosion inhibitors, thickeners and flow conditioners for use by fire services in retarding forest, brush and wildfires, from aircraft and ground tankers.

MONSANTO INDUSTRIAL CHEMICALS CO. — Locator Key **36b**

PHOS-CHEK® P/30 *fire retardant*

Phos-Chek P/30 is a catalyst used in intumescent coatings including mastics and latex and alkyd paints. Other applications include use to help meet flammability requirements for rigid and flexible polyurethane foams.

MONSANTO INDUSTRIAL CHEMICALS CO. — Locator Key **36a**

PHOSGARD® C-22-R *organophosphorus compound*

Phosgard C-22-R is an effective fire retardant additive. It is useful in urethane foams, phenolics, polymethylmethacrylates, polyester resins and epoxies to help meet some flammability regulations.

MONSANTO INDUSTRIAL CHEMICALS CO. — Locator Key **34a**

0684248

TOWOLDMON0042332

PHOSGARD® 2XC-20 *organophosphorus compound*

Like *Phosgard* C-22-R, this product is an effective flame retardant additive. It is useful in urethane foams, phenolics, acrylics and epoxies and helps meet flammability requirements. It finds particular utility in the flexible urethane foam area where there is a greater need for thermal stability and hydrolytic stability.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

PYDRAUL® 230C, 312C, 685 *hydraulic fluids*
See Page 34

PYDRAUL® 10E, 29E LT, 50E, 65E, 90E, 115E *hydraulic fluids*
See Page 35

SANTICIZER® 141 *plasticizer*
See Page 49

SANTICIZER® 143 *modified triaryl phosphate*
See Page 49

SANTICIZER® 148 *plasticizer*
See Page 49

SANTICIZER® 154 *triaryl phosphate*
See Page 49

SEF® *modacrylic fibers*
See Page 30

SKYDROL® *fire resistant hydraulic fluids*
See Page 34

TETRATHAL® *tetrachlorophthalic anhydride*

A versatile, low-cost flame retardant for polyester resins used in building construction, transportation, chemical and food preparation equipment manufacture. In addition, polyols based on *Tetrathal* are useful in urethane foams, alkyd and epoxy surface coatings to help these products meet fire retardancy specifications.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

TRIPHENYL PHOSPHATE (TPPA)
See Page 50

FOAM INGREDIENTS — RESINOUS POLYOL

STYRENE-ALLYL ALCOHOL RESINS
See Page 55

TRICALCIUM PHOSPHATE
See Page 46

FOOD INGREDIENTS

ACIDULANTS

ADIPIC ACID, FOOD (F.C.C.) GRADE

Adipic acid is a white crystalline powder which has been declared GRAS (generally recognized as safe) for use in foods by the F.D.A. It can be used in any nonstandardized food as an acidulant replacing citric and tartaric acid or potassium bitartrate.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

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

CWS fumaric acid is a rapidly soluble form of the regular grade of fumaric acid widely used in dry beverage bases, fruit juice drinks, applications where a rapidly soluble acid is a must.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

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

A white odorless crystalline organic food acid which occurs widely in nature. It is used in such products as pie fillings, fruit juice drinks, gelatin desserts, wine, refrigerated biscuit doughs, jelling aids, and sour rye bread.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

H.T.® MONOCALCIUM PHOSPHATE *monohydrate*
See Page 33

LACTIC ACID, U.S.P., FOOD GRADE and TECHNICAL GRADE

Supplied as food grade and technical grade, lactic acid is a colorless, odorless liquid supplied in 50% and 88% minimum assay concentrations. Food grade lactic acid is used as a food acidulant in green olives, process cheese, jams, jellies, frozen desserts, and as an ingredient in food emulsifiers.

0684249

TOWOLDMON0042333

Technical grade material is used to adjust pH in leather tanning and textile finishing processes and as an intermediate for making the acid's esters and salts.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator key **36a**

MONOAMMONIUM PHOSPHATE (MAP)
See Page 45

MONOSODIUM PHOSPHATE (MSP)
See Page 47

PHOSPHORIC ACID *75, 80 and 85%*
See Page 46

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

ADIPIC ACID, FOOD (F.C.C.) GRADE
See Page 31

BENZOIC ACID, U.S.P., F.C.C.
See Page 33

DIAMMONIUM PHOSPHATE (DAP)
See Page 45

DICALCIUM PHOSPHATE, ANHYDROUS
See Page 46

DICALCIUM PHOSPHATE, DIHYDRATE
See Page 46

DISODIUM PHOSPHATE, ANHYDROUS
See Page 47

DISODIUM PHOSPHATE, DUOHYDRATE
See Page 47

EMULSI-PHOS® *cheese emulsifier*
See Page 47

FUMARIC ACID, FOOD (F.C.C.) GRADE
See Page 31

H.T.® MONOCALCIUM PHOSPHATE *monohydrate*
See Page 33

LACTIC ACID, U.S.P., FOOD GRADE and TECHNICAL GRADE
See Page 31

MONOAMMONIUM PHOSPHATE (MAP)
See Page 45

MONOSODIUM PHOSPHATE (MSP)
See Page 47

PHOSPHORIC ACID *75, 80 and 85%*
See Page 46

SODIUM ACID PYROPHOSPHATE (SAPP)
See Page 33

SODIUM HEXAMETAPHOSPHATE
See Page 47

SODIUM TRIPOLYPHOSPHATE (STP)
See Page 47

TETRASODIUM PYROPHOSPHATE
See Page 47

TRICALCIUM PHOSPHATE
See Page 46

TRIPOTASSIUM PHOSPHATE
See Page 46

TRISODIUM PHOSPHATE, ANHYDROUS (TSP/A)
See Page 48

TRISODIUM PHOSPHATE, CRYSTALLINE
See Page 48

FLAVORINGS

ETHAVAN® *ethyl vanillin*

Ethavan is a rich vanilla-like flavor. It has approximately three times the flavoring power of vanillin. It is commonly used by flavor manufacturers to replace part of the vanillin to give bouquet to the finished flavor. Because of its higher volatilizing point it is ideally suited for baked goods.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator key **36a**

METHYL SALICYLATE, U.S.P.

Synthetic oil of wintergreen. A man-made product of uniform purity, free of the often erratic fluctuations in odor and flavor of the natural product. It is used in food and beverages as a flavoring. In pharmaceuticals as a medicant, and masking agent for disagreeable tasting drugs. Additional uses include, as a flavor in mouth washes, cough syrups, and dentifrices.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator key **36a**

0684250

TOWOLDMON0042334

VANILLIN MONSANTO*

Vanillin is a white crystalline powder used as a synthetic vanilla flavoring in flavor extracts, baked goods, confections, soft drinks and ice cream.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

LEAVENING AGENTS

H.T.* MONOCALCIUM PHOSPHATE *monohydrate*

H.T. is a leavening agent for cookies and used also as the fast reacting component of double acting leavening systems in baking powders and prepared mixes. It is useful in acidic products requiring calcium enrichment and as an ingredient in yeast food and dough improvers.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

LEVN-LITE* *sodium aluminum phosphate*

A special leavening agent used in cake, pancake and biscuit mixes. *Levn-Lite* promotes the formation of unusually white and resilient crumb in white cakes.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

PAN-O-LITE* *sodium aluminum phosphate*

Pan-O-Lite is a two-stage leavening agent specially formulated for cake mixes, pancake and waffle mixes. It imparts lightness and resiliency to baked products by means of a delayed leavening action which promotes stability and extends the shelf life of cake batters.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

PY-RAN* *anhydrous monocalcium phosphate*

Py-Ran is a stabilized anhydrous monocalcium phosphate used as an acid component in leavening agents for self-rising flours, corn meal, cake mixes and baking powders.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

SODIUM ACID PYROPHOSPHATE (SAPP)

A food grade phosphate used as a leavening agent in prepared cake and doughnut mixes, refrigerated doughs, as an antidarkening agent for potatoes. SAPP prevents struvite crystals in canned tuna and crab meat.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

STABIL-9* *sodium aluminum phosphate*

Supplied as an all-purpose, high stability leavening agent for self-rising flour, corn meal and prepared mixes.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

PRESERVATIVES

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

Benzoic acid is supplied in powder or fine crystal form for use as a preservative in acid foods, fruit juices, syrups, margarine, and medicinal preparations.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

MONOSODIUM PHOSPHATE (MSP)
See Page 47

PHOSPHORIC ACID *75, 80 and 85%*
See Page 46

SORBIC ACID and POTASSIUM SORBATE, F.C.C.

Sorbic acid is a naturally-occurring compound, originally obtained from the oil of the rowanberry. Sorbic acid, or its water-soluble potassium salt, is a broad spectrum preservative for human and animal food, and to a lesser extent, for drugs and cosmetics.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

TETRASODIUM PYROPHOSPHATE
See Page 47

FRAGRANCES

AMYL SALICYLATE

Amyl salicylate (a balanced mixture of isomeric amyl esters) is supplied for use in floral perfumes.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

BENZYL ACETATE

Benzyl acetate is a natural constituent of jasmine and is used in soap perfumes.

MONSANTO INDUSTRIAL CHEMICALS CO Locator Key **36a**

TOWOLDMON0042335

BENZYL SALICYLATE

Benzyl salicylate occurs naturally in essential oils of carnation and ylang-ylang. It is used as a fixative in floral perfumes, as a solvent for artificial musks, and in soap fragrances. Since it absorbs ultraviolet light it can be used as a sunscreen in creams and lotions.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

COUMARIN
See Page 38

ETHAVAN® *ethyl vanillin*
See Page 32

METHYL SALICYLATE, U.S.P.
See Page 32

VANILLIN MONSANTO*
See Page 33

FUNCTIONAL FLUIDS

AIRBORNE and SPECIALTY

SKYDROL® *fire resistant hydraulic fluids*

Skydrol fluids are engineered from a series of fire resistant, highly stable phosphate ester base stocks specially-processed under rigorous quality control standards. The operating temperatures, viscosity characteristics, pumpability of each are designed for varying types of service. These include: *Skydrol* "500B", "500B-4", "LD" and "LD-4" grades for jet aircraft. *Skydrol* fluids require compatible construction materials in seals, packings, paints, and wiring. Monsanto's technical service support assists customers in designing these items. *Skydrol* fluids are distributed worldwide to commercial airlines.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

DIELECTRIC HEAT TRANSFER FLUIDS

COOLANOL® 20, 25, 35, 45 *dielectric coolants and heat transfer media*

A series of formulated silicate ester fluids used for a wide range of heat transfer, dielectric and hydraulic fluid applications. The four *Coolanol* fluids span an operating-temperature range of -90°F to 700°F and are used primarily in aerospace and advanced electronic hardware as a coolant/dielectric.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

OS-59* *dielectric heat transfer fluid*

OS-59 is a silicate ester fluid used in electronic equipment as a coolant/dielectric.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

HEAT TRANSFER FLUIDS

THERMINOL® 44, 55, 60, 66, 88 *heat transfer fluids*
See Page 35

THERMINOL® VP-1 *heat transfer fluid*
See Page 35

HYDRAULIC FLUIDS

PYDRAUL® 230C, 312C, 68S *hydraulic fluids*
See Page 34 (Industrial)

PYDRAUL® 10E, 29E LT, 50E, 65E, 90E, 115E *hydraulic fluids*
See Page 35 (Industrial)

SKYDROL® *fire resistant hydraulic fluids*
See Page 34 (Airborne and Specialty)

INDUSTRIAL

OS-124* *polyphenyl ether*

OS-124 is a mixed isomeric five-ring polyphenyl ether fluid developed for use in high temperature hydraulic, heat transfer, lubricant and other fluid applications.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

PYDRAUL® 230C, 312C, 68S *hydraulic fluids*

Pydraul C-series (phosphate ester hydrocarbon/synthetic blends) are low cost, fire-resistant fluids for industrial hydraulic applications. *Pydraul* 230C, *Pydraul* 312C and *Pydraul* 68S offer a broad viscosity range for diecast machines, continuous casters, rolling mill systems, etc.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

0684252

TOWOLDMON0042336

PYDRAUL® 10E, 29E LT, 50E, 65E, 90E, 115E *hydraulic fluids*

Pydraul E-series (straight phosphate ester) fluids offer a combination of fire resistance and lubrication in industrial hydraulic and air compressor applications. These fluids allow users to select from a wide viscosity range for diecast machines, continuous casters, rolling mill systems, offshore drilling operations, etc.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

SANTOTRAC® LUBRICANTS *synthetic hydrocarbons*
See Page 38

PROCESS

BIPHENYL *also known as diphenyl and phenylbenzene*

Biphenyl is widely used as a raw material for dye carriers in the textile industry, as a deodorant and mildew preventative, and as a chemical intermediate.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

DIPHENYL OXIDE

Diphenyl oxide is intended for use as a chemical intermediate or functional product. Typical uses as an intermediate include the manufacture of brominated fire retardants, alkylated surfactants, and hydrazide foam blowing agents. Other uses include dye carrier, fragrance, and as a process aid.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

SANTOSOL® 200, 300, 340 *dye solvents*

Santosol 200, 300, and 340 are used as the microencapsulation dye solvent portion of the specialized coating used in the manufacture of carbonless copy paper.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

THERMINOL® 44, 55, 60, 66, 88 *heat transfer fluids*

Therminol fluids in this series are liquid phase, low pressure heat transfer media with an operating temperature range spanning -60° to 750°F. Diverse applications for *Therminol* 44, *Therminol* 55, *Therminol* 60, *Therminol* 66, and *Therminol* 88 include indirect heating and cooling in chemical processing, tanker and barge construction, offshore oil and gas platforms, petroleum refining, synthetic fiber manufacturing and finishing, etc.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

THERMINOL® VP-1 *heat transfer fluid*

Therminol VP-1 is a high temperature heat transfer medium used in vapor phase or liquid phase systems in the range of 60° to 750°F.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

VACUUM PUMP FLUID

SANTOVAC® 5 *vacuum diffusion pump fluid, polyphenyl ether*

Santovac 5 is a specially refined vacuum diffusion pump fluid supplied to pump manufacturers and laboratory and industrial users.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

FURNACE LINER EROSION MONITOR

NUCLEAR INSTRUMENTATION

A nuclear instrument system incorporating electronics and radioactive sources monitors liner erosion in commercial phosphorus furnaces. The system is adaptable to other furnaces. Complete design, engineering, and licensing assistance is provided with the system.

MONSANTO RESEARCH CORPORATION Locator Key **71a**

HEAVY CHEMICALS

CAUSTIC POTASH

Used in formulating liquid soaps and detergents, in the manufacture of many organic and inorganic potassium salts, petroleum refining and in the fertilizer industry.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

CHLOROSULFONIC ACID

Colorless, corrosive liquid used as a sulfonating agent in the production of synthetic detergents, pharmaceuticals, dyes, ion exchange resins and a variety of specialty chemicals.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

TOWOLDMON0042337

MURIATIC ACID *hydrochloric acid*

Supplied as 20° Be., 22° Be. and 23° Be. acid assaying 31.5%, 35.2% and 37.1% HCl. It is widely used in the manufacture of starch, glucose, gelatin, paper, leather, and in the steel industry and for pH control.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

NITRIC ACID 55.0-56.5% (37.5-38.0 Be.)

Supplied as a water-white to slightly yellow solution with the odor of nitrogen dioxide.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **11a**

NITRIC ACID *concentrated*

Supplied as a light yellow to reddish brown fuming liquid minimum 97.5% (HNO_3).

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **11a**

PHOSPHORIC ACID *75, 80 and 85%*
See Page 46

SULFURIC ACID and OLEUM

Monsanto supplies sulfuric acid, and oleum, in numerous specification ranges. Sulfuric acid and oleum are essential industrial acids used in chemical, paint, metals, and fertilizer manufacturing, and for dehydration, sulfonation and petroleum refining processes.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

HERBICIDES

AVADEX® *diallate*
See Page 23

AVADEX® BW *triallate*
See Page 23

FAR-GO® *triallate*
See Page 23

LASSO® *alachlor*
See Page 23

MACHETE® *butachlor*
See Page 23

RAMROD® *propachlor*
See Page 23

RAMROD®/atrazine *propachlor/atrazine*
See Page 23

RANDOX® *CDAA*
See Page 23

ROUNDUP® *glyphosate*
See Page 23

VEGADEX® *CDEC*
See Page 23

INSTRUMENTS

ELECTRONIC INSTRUMENTS

NUCLEAR INSTRUMENTATION
See Page 35

PROCESS CONTROL EQUIPMENT

INSTRUMENTATION, ANALOG PROCESS CONTROL
See Page 55

INSTRUMENTATION, ANALOG PROCESS MEASUREMENT
See Page 55

INSTRUMENTATION, DIGITAL PROCESS CONTROL
See Page 55

INSTRUMENTATION, PNEUMATIC and ELECTRONIC
See Page 56

REGULATOR, GAS
See Page 56

VALVE ACTUATORS and ACCESSORIES
See Page 56

VALVES
See Page 56

VALVES, NOISE ABATEMENT
See Page 56

RUBBER TESTING INSTRUMENTS

CAPILLARY RHEOMETER, AUTOMATIC
See Page 62

MELT INDEXER
See Page 62

MONSANTO® CONE-RHEOMETER
See Page 62

0684254

TOWOLDMON0042338

MONSANTO* CURE-SIMULATOR *module unit*
See Page 62

MONSANTO CURETRON* *data acquisition unit*
See Page 62

MONSANTO* DIE SWELL DETECTOR, AUTOMATIC
See Page 62

MONSANTO* DISK RHEOMETER, MODELS R-100 and R-900/750
See Page 62

MONSANTO* FATIGUE-TO-FAILURE TESTER *flex tester*
See Page 62

MONSANTO* MOONEY COMPUTER
See Page 62

MONSANTO* MOONEY VISCOMETER
See Page 62

MONSANTO* POWER INTEGRATOR
See Page 63

MONSANTO* PROCESSABILITY TESTER
See Page 63

MONSANTO* RHEOMETER COMPUTER
See Page 63

MONSANTO* TENSOMETER, MODEL T-500 *tensile tester*
See Page 63

MONSANTO* TENSOMETER, MODEL W *tensile tester*
See Page 63

MONSANTO* X-RAY UNIT *(three different units available)*
See Page 63

TEST and MEASUREMENT

CAPILLARY RHEOMETER, AUTOMATIC
See Page 62

MELT INDEXER
See Page 62

METAL PROCESSING COMPOUNDS

BONE ASH (NATURAL)

Supplied as finely divided powder [$Ca_5OH(PO_4)_3$] for use as a mold coating for casting copper wire bars and for coating cast iron molds, trays, and tools used to produce stainless steel, bronze, and aluminum and for use in chinaware products.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator key **36a**

FERROPHOSPHORUS *iron phosphide*

This phosphorus by-product from Columbia, Tennessee contains 22 to 23% phosphorus and 69 to 70% iron. It is used in the manufacture of steel, in foundries and as a dense aggregate.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator key **21a**

LoSilPhos* *ferrophosphorus briquettes*

Ferrophosphorus briquettes used in steelmaking for their phosphorus content. *LoSilPhos* briquettes assist in minimizing silicon contamination. All active ingredients are in prepackaged briquettes. *LoSilPhos* briquettes are used in producing low-silicon rephosphorized steel.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator key **21a**

MONOSODIUM PHOSPHATE (MSP)
See Page 47

MOULD COAT *synthetic bone ash*

A synthetic bone ash used as a mold coating for casting copper bars and for coating cast iron molds, trays and tools used in the processing of stainless steel, bronze, brass, and aluminum and for use in chinaware products.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator key **36a**

PHOSPHORIC ACID *75, 80 & 85%*
See Page 46

VANILLIN TECHNICAL
See Page 40

0684255

TOWOLDMON0042339

ODORANTS

COUMARIN

Coumarin is used by soap and perfume manufacturers as a fixative and amplifier for the delicate perfume oils used in their products. It is also used as an odorant or deodorant in industrial products and in printing inks. Tobacco manufacturers use it to enhance the natural taste and aroma of tobacco. Used in nickel plating.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

ETHAVAN® *ethyl vanillin*
See Page 32

METHYL SALICYLATE, U.S.P.
See Page 32

VANILLIN MONSANTO®
See Page 33

OILS-LUBRICATING

SANTOTRAC® LUBRICANTS *synthetic hydrocarbons*

Santotrac 30, 40, 50 and 70 lubricating oils and *Santotrac* EP-2 and HT-2 lubricating greases. *Santotrac* is a series of unique, synthetic hydrocarbon lubricants for use in traction drives, ball bearings, roller clutches and other varied industrial, automotive and aircraft applications. It is similar chemically to mineral oils and is, therefore, generally compatible with the same seals and paints. *Santotrac* offers uniquely high traction, extended bearing life and long operating life at high temperatures.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

ORGANIC CHEMICALS

ACIDS and ANHYDRIDES

ADIPIC ACID, FOOD (F.C.C.) GRADE
See Page 31

ADIPIC ACID, TECHNICAL GRADE
See Page 53

BENZOIC ACID, U.S.P., F.C.C.
See Page 33

EMA® RESINS *ethylene-maleic anhydride copolymers*
See Page 53

FUMARIC ACID, FOOD (F.C.C.) GRADE
See Page 31

FUMARIC ACID, TECHNICAL GRADE
See Page 53

LACTIC ACID, U.S.P., FOOD GRADE and TECHNICAL GRADE
See Page 31

MALEIC ANHYDRIDE

Supplied as white briquettes or fused mass, assay 99.5% minimum, to chemical and paint manufacturers as a polybasic acid resin former used in the production of alkyd and polyester resins and a versatile intermediate in chemical synthesis.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

PHTHALIC ANHYDRIDE

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

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

SALICYLIC ACID, INDUSTRIAL

Monsanto produces salicylic acid, industrial, which is used as a raw material for the production of pharmaceutical salicylates; in the textile industry as a coupling agent in dye intermediates; in the foundry industry as a curing agent in the production of shell molding compounds; and in the rubber industry as a retarder in the vulcanization process.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

SORBIC ACID and POTASSIUM SORBATE, F.C.C.
See Page 33

TETRATHAL® *tetrachlorophthalic anhydride*
See Page 31

AMINES

BISHEXAMETHYLENETRIAMINE (BHMT)

Inexpensive material used in polyamide resin manufacture. Also used as an oil well drilling additive.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

0684256

TOWOLDMON0042340

CYCLO-and DICYCLOHEXYLAMINE

Supplied as clear liquids to chemical manufacturers as an amine intermediate which is used for the manufacture of dyes and as an anticorrosion additive for formulating oils, dry cleaning soaps, and nonaqueous specialty products.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

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

Organic intermediate used in the manufacture of agricultural chemicals and biologically active compounds.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

DODECYLANILINE
See Page 39 *(Intermediates)*

MIXED AMINES

A stream containing hexamethylenediamine, hexamethylenetriamine, hexamethylenimine and diaminocyclohexane. Used as an economical substitute for other pure amines.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

ortho- and para-NITROANILINE
See Page 39 *(Intermediates)*

ortho-NITROANISOLE
See Page 39 *(Intermediates)*

para-PHENETIDINE
See Page 39 *(Intermediates)*

HALOGEN-CONTAINING COMPOUNDS

ACL® 56, 59, 60, 66, 85 SANITIZER and BLEACHING COMPOUNDS
See Page 65

BENZYL CHLORIDE *alpha-chlorotoluene*

A colorless liquid used in the production of benzyl alcohol, dibenzyl disulfide, perfume intermediates, dyestuffs, pharmaceuticals, plasticizers and quaternary ammonium compounds.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

ortho- and para-DICHLOROBENZENE
See Page 39 *(Intermediates)*

ortho- and para-NITROCHLOROBENZENE
See Page 39 *(Intermediates)*

SANTOPHEN® 1 GERMICIDE
See Page 25

SANTOPHEN® 1 SOLUTION
See Page 25

TCC® BACTERIOSTATIC AGENT
3,4,4'-trichlorocarbanilide
See Page 25

TETRATHAL® *tetrachlorophthalic anhydride*
See Page 31

INTERMEDIATES

AROMATIC CHEMICAL INTERMEDIATES

Monsanto supplies a wide variety of benzene derivatives to chemical manufacturers as raw materials which are used in the manufacture of dyes, pharmaceuticals, agricultural chemicals, pesticides, photographic chemicals, leather tanning compounds and others. These chemical building blocks include:

ortho- and para-DICHLOROBENZENE
DODECYLANILINE
ortho- and para-NITROANILINE
ortho-NITROANISOLE
ortho- and para-NITROCHLOROBENZENE
para-PHENETIDINE

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

para-CHLOROPHENOL
See Page 40

3,4-DICHLOROANILINE (3,4-DCA)
See Page 39 *(above)*

2,4-DICHLOROPHENOL
See Page 40

para-TOLUENESULFONAMIDE
para-TOLUENESULFONYL CHLORIDE

These basic building blocks are used by a variety of manufacturers for the final conversion into such end uses as dyes, photographic materials, synthetic tanning aids, plating products and others.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

TOLUENESULFONYL CHLORIDE, MIXED

Mixed TSCl is used in the treatment of crude oil and kerosene to help in purification. It is also used as a chemical intermediate in a variety of specialty end uses.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

TOWOLDMON0042341

PHARMACEUTICALS

ACETAMINOPHEN (APAP)

Acetaminophen (APAP) is a nonaspirin analgesic. It has the benefits of being an effective antipyretic and pain reliever. It is used singularly and in combination with other pharmaceutical and proprietary formulations in tablet, powder, capsule and other special forms.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

ACETYLSALICYLIC ACID *aspirin*

Aspirin is the largest selling analgesic in the world with added benefits of being an effective antipyretic and anti-inflammatory. It is used singly and in combination with other ingredients in pharmaceutical and proprietary formulations in tablet, powder, capsule and other special forms.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

BENZYL BENZOATE, U.S.P.

Benzyl benzoate U.S.P. is used primarily as a fixative and as a diluent in perfume formulations. It is also used in the treatment of scabies. Additionally, benzyl benzoate is used in textile dye intermediate formulations.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

L-DOPA *L-dihydroxyphenylaline*

L-Dopa is a white powder, effective in the treatment of the symptoms of Parkinson's disease.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

METHOTREXATE, U.S.P.

This potent folic acid antagonist is supplied as high purity yellow crystals, suitable for parenteral applications. It is used in treatment of neoplasms and psoriasis, and as an immunosuppressant and antimetabolite.

MONSANTO RESEARCH CORPORATION Locator Key **71a**

3,4,5-TRIMETHOXYBENZALDEHYDE (TMB)

A white powder, TMB is a raw material in the production of an antibacterial drug.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

VANILLIN TECHNICAL

Vanillin technical is a white crystalline powder used as a pharmaceutical intermediate and in some metal plating applications.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

PHENOLS

para-CHLOROPHENOL

Organic intermediate used in the manufacture of dyestuffs, primarily hydroquinone and anthraquinone vat dyes. Other potential applications are for the manufacture of specific germicides, coccidiostats and miticides.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

para-CUMYL PHENOL

Organic intermediate for the production of phosphate esters and as a dye carrier.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

2,4-DICHLOROPHENOL

Organic intermediate used in the manufacture of agricultural chemicals, bacteriostats, fungistats, germicides, and dyestuffs.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

DIDODECYL PHENOL *crude*

A coproduct of the manufacture of dodecylphenol, didodecyl phenol shows promise as a specialty surfactant in oil treating.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

DINONYL PHENOL *crude*

A coproduct of the manufacture of nonylphenol, dinonyl phenol is commonly ethoxylated for use as a specialty chemical in oil treating and agricultural emulsifiers.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

DODECYLPHENOL *alkyl phenol*

Reactive dodecylphenol is specifically designed for use in the manufacture of chemical intermediates. Typical reactions with dodecylphenol are ethoxylation, condensations with aldehydes, etherification, esterification, halogenation, mercuration, nitration, polymerization, and sulfonation.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

para-NITROPHENOL

Supplied in tan to greenish brown flake or granular form, assay 99.0% minimum, molecular weight 139.11. The compound is highly toxic. It is used by chemical manufacturers as an intermediate for making dyestuffs, insecticides, photographic chemicals, leather tanning compounds and pharmaceuticals.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **13a**

0684258

TOWOLDMON0042342

NONYLPHENOL *alkyl phenol*

Reactive nonylphenol is specifically designed for use in the manufacture of chemical intermediates. Typical reactions with nonylphenol are ethoxylation, condensations with aldehydes, etherification, esterification, halogenation, mercuration, nitration, polymerization, and sulfonation.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

PHENOL
See Page 43

SULFONIC ACIDS

CHLOROSULFONIC ACID
See Page 35

DDBSA 99-B *alkylbenzene sulfonic acid-biodegradable*
See Page 65

para-TOLUENESULFONAMIDE
See Page 39

para-TOLUENESULFONYL CHLORIDE
See Page 39

TOLUENESULFONYL CHLORIDE, MIXED
See Page 39

SULFUR-CONTAINING COMPOUNDS

ETHYL PCT *0,0-diethyl phosphorochloridothioate*
METHYL PCT *0,0-dimethyl phosphorochloridothioate*

Intermediate chemicals used in the manufacture of biological toxicants. Supplied as light yellow liquids, ethyl or methyl PCT will add the dialkyl thiophosphoryl group into any other intermediate compound with a suitable reactive site.

MONSANTO AGRICULTURAL PRODUCTS CO. Locator Key **12a**

SANTOLITE® MHP RESIN
See Page 55

SANTONOX® and SANTONOX® R *antioxidant*
See Page 25

SANTOWHITE® POWDER *antioxidant*
See Page 25

OTHER ORGANIC CHEMICALS

CYANURIC ACID

Cyanuric acid stabilizes chlorine against loss from ultraviolet light degradation. Its primary use is in swimming pools.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

CYCLOHEXANOL

An intermediate used in making plasticizers; dry cleaning, dyebath and textile finishing formulations; and for the manufacture of cyclohexanone and adipic acid.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

ETHYL ACETATE

Monsanto® ethyl acetate is available at ester assays of 99.5%, 95-98%, and 85-88%. All grades are clear, sediment-free and the color does not exceed 5 (APHA). The water content is 0.05% max. and the characteristic odor is nonresidual. The products are suitable for coating resin-solvents, cellophane lacquers, and miscellaneous solvent uses in the paint and plastic industries.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

PROPIONITRILE

Converted into propionic acid and di-*n*-propylamine. Also finds application as an organic solvent.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

PAINT/COATING INGREDIENTS

BUTVAR® RESINS
See Page 53

FILTROS® *gum rosin*

Naturally-occurring gum rosin produced by distillation of pine tree pitch for use in paints, varnishes and lacquers.

® Trademark of ERP Company

MONSANTO PLASTICS & RESINS CO. Locator Key **43c**

FORMVAR® RESINS
See Page 53

GELVA® MULTIPOLYMER RESIN SOLUTIONS
See Page 52

0684259

TOWOLDMON0042343

GELVA® RESIN EMULSIONS
See Page 52

GELVATOL® RESINS
See Page 52

LAMPBLACK

Lampblack is a finely divided amorphous carbon produced by burning petroleum oils in a limited air supply. A variety of grades are available exhibiting a range of physical, chemical and electrical properties. Major uses are in tire mold release and antiblemish paints, carbon brushes and inks.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

LYTRON® LATICES
See Page 54

MALEIC ANHYDRIDE
See Page 38

MODAFLOW® *resin modifier*

Modaflow is an additive for improving flow, leveling and adhesion properties of surface coating formulations — especially enamels, vinyls, epoxies and polyesters.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

MODAFLOW® POWDER II *resin modifier*

Modaflow Powder II is the first commercial additive specifically designed to reduce surface imperfections for powder coatings. Because of its fine, uniform particle size, it is easily incorporated into powder coatings.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

MULTIFLOW® *resin modifier*

Multiflow resin modifier is a unique additive for nonaqueous industrial coatings. It improves flow, reduces pinholes and craters, and improves substrate wetting.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

PHOS-CHEK® P/30 *fire retardant*
See Page 30

PHTHALIC ANHYDRIDE
See Page 38

RESIMENE® MELAMINE-FORMALDEHYDE
RESIMENE® UREA-FORMALDEHYDE RESINS *coatings*
See Page 51

SANTICIZER® 160 *plasticizer*
See Page 49

SANTOLITE® MHP RESIN
See Page 55

SANTOLITE® MS RESIN
See Page 55

STYRENE-ALLYL ALCOHOL RESINS
See Page 55

TETRAPOTASSIUM PYROPHOSPHATE
See Page 46

TETRATHAL® *tetrachlorophthalic anhydride*
See Page 31

PAPER CHEMICALS

BUTVAR® RESINS
See Page 53

GELVA® MULTIPOLYMER RESIN SOLUTIONS
See Page 52

GELVA® RESIN EMULSIONS
See Page 52

GELVA® RESIN SOLUTION
See Page 52

GELVATOL® RESINS
See Page 52

LIMIT® 33 *defoamer*

Limit 33 is a specially formulated defoamer for the paper industry to be used at the size press to defoam starch and mixtures of starch and *Scripset®* resins.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

LYTRON® LATICES
See Page 54

0684260

TOWOLDMON0042344

MERSIZE® *paper sizing agent*

Mersize TFL, *Mersize* ExCL and *Mersize* RM Dry are forms of chemically fortified rosin-based sizes that are ready to use in a paper mill to reduce sizing costs, improve resistance to ink, water and other aqueous solutions, give better feathering resistance and more uniform dependable sizing.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

MONSIZE® *paper sizing agent*

A highly efficient wet-end sizing agent supplied as a liquid. It is approximately twice as efficient as paste rosin size which allows maximum sizing with minimum sizing solids in the sheet. *Monsize* sizing agent functions well over a pH range of 4.0 to 6.8.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

RPC-1600 *cationic resin*

A water solution of a highly cationic nonthermosetting resin, used as a retention aid.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

SANTO-RES® 21, 30 & 31 SERIES *paper chemicals*

Santo-Res 21 is a cationic retention aid, useful for retaining dispersed rosin sizes, improving drainage and retaining fines. It is also used to impart a high degree of strength to unbleached paper and board when wet, and to extend life of paper products exposed to weather.

Santo-Res 30 & 31 are caustic activatable polymer solutions designed to impart high levels of wet strength to paper products made from bleached or reclaimed pulp. They also are effective as a Yankee drier coating aid.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

SCRIPSET® 500, 700 SERIES *paper coating and specialty coating resins*

Scripset resins are supplied in a variety of grades convenient for the papermaker's process and handling. The *Scripset* 500 resins are film-formers for surface treating paper and paperboard to improve printability, create good surface qualities and impart water resistance. The *Scripset* 700 series resins are new improved liquid variations of the dry 500 series resins.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

STEROX® DF SURFACTANT
See Page 66

STEROX® DJ SURFACTANT
See Page 66

STEROX® NJ SURFACTANT
See Page 66

PETROCHEMICALS

MONOMERS

ACETIC ACID *glacial and commercial*

Supplied in commercial grades and as glacial acetic, assay minimum 99.8% acetic acid. Shipped with color less than 15 Pt-Co units. Used as a chemical intermediate, in the manufacture of cellulose and vinyl acetate resins and in the textile industry.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

ACRYLONITRILE

A monomer used in the manufacture of acrylic textile fibers, ABS plastics, nitrile rubber, copolymer latices, and as a chemical intermediate.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

BUTADIENE

Supplied, inhibited with tertiary butylcatechol, in liquified gas form with 99.3% minimum assay. A highly reactive hydrocarbon, it is used in the manufacture of styrene, acrylonitrile, and polybutadiene synthetic rubbers and various types of latices used in paints and binders for nonwoven fabrics. It is an intermediate for manufacturing adiponitrile, tetrahydrophthalic anhydride and ABS plastics.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

FORMALDEHYDE

Supplied in grades with a choice of assay: 37%, 44%, 50%, and 52% (methanol-free) and 37% and 44% inhibited with 7% and 15% methanol. Used as a preservative, disinfectant and an intermediate in the manufacture of melamine and phenolic resins.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

PHENOL

A major basic chemical intermediate, phenol is used in the manufacture of phenolic resins for molding and laminating; for lacquers and varnishes; in the manufacture of germicides, antiseptics, preservatives, insecticides, photographic chemicals, dyestuffs; and as a selective solvent in petroleum refining. Supplied in crystalline form.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

0684261

TOWOLDMON0042345

STYRENE MONOMER

An aromatic hydrocarbon with an aliphatic side chain supplied as a colorless liquid inhibited with TBC. Styrene monomer is used to make polystyrene plastics, copolymer resins, SBR synthetic rubber and latices, ion exchange resins, polyesters, and styrene-modified oils and alkyds for surface coatings.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

OTHER PETROCHEMICALS

ACETONE

Supplied as a liquid, APHA color 5 maximum and 0.5% moisture maximum. It is used widely as a commercial solvent and as an intermediate in chemical manufacturing.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

ACETOPHENONE

A commercial grade organic intermediate chemical supplied as a liquid assaying typically 40-60% by weight.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

AROMATIC CONCENTRATE C_9 *mixed isomers*

Supplied as a liquid concentrate containing mixed isomers of trimethylbenzene. It is used for gasoline blending and by chemical manufacturers for making intermediates and as a specialty solvent.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

BUTENE-2 CONCENTRATE

Supplied in liquid form (under pressure), the concentrate is a colorless olefinic hydrocarbon, predominantly *cis*- and *trans*- butene used by chemical manufacturers as a butadiene feed stock, a cross-linking agent in the manufacture of intermediates and as a specialty solvent.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

BUTYLENES *mixed isomers*

Supplied as mixed isomers in liquid form under pressure, the principal constituents are *iso*-butylene and *n*-butene-1. The material is used by chemical manufacturers for making chemical intermediates, polymers and gasoline components.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

CUMENE CONCENTRATE

A hydrocarbon containing typically 60% cumene, 15% ethylbenzene and 10% acetone. It is supplied to blenders as an aromatic gasoline blend stock.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

DICYCLOPENTADIENE CONCENTRATE

A liquid concentrate containing a minimum of 70% $C_5H_6C_5H_6$. It is used by chemical manufacturers to make hydrocarbon resins, insecticides, surface coatings and intermediates.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

DIISOPROPYLBENZENE

An industrial grade hydrocarbon that typically assays 60-65% mixed isomers. It is used as an aromatic gasoline blend stock.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

ETHYLBENZENE

A liquid organic compound supplied to chemical manufacturers for conversion to styrene monomer. It is also used as a resin solvent.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

ETHYLENE

An industrial gas with a typical analysis of 99.8% minimum C_2H_4 *supplied by pipeline to chemical* manufacturers and used in making polyethylene plastics, ethyl alcohol, ethylene glycol, styrene and other intermediates.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

ISOPRENE CONCENTRATE

An aliphatic liquid typically containing 50-53% weight isoprene. Supplied to chemical manufacturers and used in making isoprene monomers, for *cis*-polyisoprene rubber and as a resin raw material.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

METHANOL *methyl alcohol*

Commercial methyl alcohol supplied to the chemical processing industries and used as an intermediate, for making formaldehyde, antifreeze, a solvent, and a denaturant.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

0684262

TOWOLDMON0042346

METHYLACETYLENE/ALLENE CONCENTRATE

An aliphatic concentrate of $CH \equiv C—CH_3$ and $CH_2 = C = CH_2$ supplied to chemical manufacturers in liquid form under pressure as a reactive hydrocarbon for chemical synthesis and as fuel in metal cutting and brazing. It has reaction properties and burning characteristics similar to acetylene.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Ke. **21a**

alpha-METHYLSTYRENE *crude*

A commercial chemical raw material typically containing 70-75% *alpha*-methylstyrene, 14-17% cumene; used by chemical manufacturers in making plastics, surface coatings and synthetic rubber.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Ke. **21a**

PHENOLIC TARS

A heavy petroleum residue from phenol manufacture supplied to blenders and used in low sulfur fuel oil.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Ke. **21a**

PIPERYLENE CONCENTRATE

An aliphatic liquid containing approximately 30% minimum assay of *trans*- and *cis*-piperylenes ($CH_2=CH\text{-}CH=CH\text{-}CH_3$). The concentrate is supplied to chemical manufacturers for making hydrocarbon resins and intermediates.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Ke. **21a**

PROPANE

An industrial gas used as a chemical intermediate or fuel.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Ke. **21a**

PROPYLENE

An olefinic hydrocarbon raw material shipped as a liquid under pressure with 92% minimum of $CH_3CH = CH_2$, the balance principally propane. It is used in the manufacture of intermediates

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Ke. **21a**

RESIN OIL

A highly unsaturated alkyl-aromatic hydrocarbon mixture in liquid form supplied to chemical manufacturers and used in making high grade hydrocarbon resins.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Ke. **21a**

RESIN PR

Supplied as a heavy liquid aromatic petroleum residue which is used in the production of petroleum coke, electrode binder, and miscellaneous industrial pitch products.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Ke. **21a**

XYLENES *para/meta*

Supplied as para-meta xylenes as commercial grade $(CH_3)_2C_6H_4$ to chemical manufacturers for use in the manufacture of intermediates such as terephthalic and isophthalic acids and their esters.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Ke. **21a**

PHOSPHORUS and PHOSPHORUS DERIVATIVES

AMMONIUM PHOSPHATES

DIAMMONIUM PHOSPHATE (DAP)

Technical grade diammonium phosphate (DAP) is used as a fire retardant for cellulosic materials such as wood, paper, cotton; as a source of nitrogen and phosphorus in soluble specialty fertilizers, and in the production of phosphors.

Food grade is used in making yeast and in dough conditioners or yeast foods to promote yeast leavening. Its nutrient value is also used for antibiotic production, bacterial starters and metabolic processes in general.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Ke. **31a**

MONOAMMONIUM PHOSPHATE (MAP)

Technical grade monoammonium phosphate (MAP) is a fire retardant useful in paper, wood, textiles and other cellulose based products; is the major ingredient in ABC type fire extinguishers; is used as an acidulant in dye baths and as a source of nitrogen and phosphorus in soluble specialty fertilizer products.

Food grade monoammonium phosphate (MAP) is used in making yeast and in dough conditioners or yeast foods to promote yeast leavening. Its nutrient value is also used for antibiotic production, bacterial starters and metabolic processes in general.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Ke. **31a**

TOWOLDMON0042347

CALCIUM PHOSPHATES

BONE ASH (NATURAL)
See Page 37

CALCIUM PYROPHOSPHATE

Food grade phosphate salt for use as a dentifrice polishing agent; for food enrichment; and as an ingredient in pharmaceutical preparations. It is also used in manufacture of bone white china.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

DICALCIUM PHOSPHATE, ANHYDROUS

A food grade phosphate salt used as a high abrasive polishing agent in toothpastes and powders; as a mineral supplement in prepared foods and cereals, and in pharmaceutical preparations.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

DICALCIUM PHOSPHATE, DIHYDRATE

A food grade phosphate used primarily as a polishing agent in toothpastes and powders; as a mineral supplement; and in pharmaceutical preparations.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

H.T.* MONOCALCIUM PHOSPHATE *monohydrate*
See Page 33

LUSTRE-PHOS* *dentifrice abrasive*

Lustre-Phos is a white tasteless crystalline powder used in dentifrices as a controlled abrasive to impart optimum cleaning and polishing of the teeth.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

MOULD COAT *synthetic bone ash*
See Page 37

PY-RAN* *anhydrous monocalcium phosphate*
See Page 33

TRICALCIUM PHOSPHATE

A food grade phosphate used as a flow conditioner and anticaking agent in granular and powdered products; as a mineral supplement in food and pharmaceutical preparations; and as a suspending agent in the manufacture of polystyrene.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

PHOSPHORIC ACIDS

PHOSPHORIC ACID *75, 80 and 85%*

Technical grade phosphoric acid is used in the manufacture of phosphate salts; for metal cleaning and treating; as a binder in refractory products; as a clarifying agent in sugar processing; in the electropolishing and pickling of steel; as a catalyst in various processes; in industrial and institutional cleaning products; in liquid fertilizer compositions; as a nutrient in industrial waste treatment; as the major component of aluminum bright-dip baths; as a corrosion inhibitor in antifreeze; and in rustproofing and phosphatizing compositions.

Food grade phosphoric acid is used as an acidulant for soft drinks, particularly colas. It is used in the manufacture of gelatin, cottage cheese, some processed cheeses, fats, shortenings, sugar cane refining, jellies and preserves, soya protein processing, nutrient in yeast production, control of bacterial growth in selected processed foods, and in the manufacture of food grade phosphate salts.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

POTASSIUM PHOSPHATES

MONOPOTASSIUM PHOSPHATE

Technical, food and NF grade phosphate salt used to control pH of culture media in penicillin manufacture; for special medicinal purposes; and soluble fertilizers.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

TETRAPOTASSIUM PYROPHOSPHATE

A technical grade phosphate salt used in detergent formulations; as a processing aid in synthetic (cold) rubber manufacture and as an ingredient for synthetic resin emulsion paints.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

TRIPOTASSIUM PHOSPHATE

A technical grade phosphate salt used as a processing aid in synthetic (cold) rubber manufacture and as a hydrogen sulfide scavenger in petroleum processes.

A food grade is supplied for use as a buffering agent in several food products.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

0684264

TOWOLDMON0042348

SODIUM PHOSPHATES

DISODIUM PHOSPHATE, ANHYDROUS

A technical grade phosphate salt used for boiler water treatment; in making glazes for potteries, porcelains and chinaware; in various chemical processes; in the preparation of enamels; in tinning; 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.

A food grade is supplied for use in process cheese, quick cooking cereal products, evaporated milk and pharmaceutical applications.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

DISODIUM PHOSPHATE, DUOHYDRATE

A food grade phosphate used for preventing coagulation during processing of condensed milk and as an emulsifying agent in processing cheese.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

EMULSI-PHOS[3] *cheese emulsifier*

A food grade phosphate specially designed for use in process cheese, cheese food and cheese spreads.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

INSOLUBLE SODIUM METAPHOSPHATE

An insoluble food grade phosphate salt that is used primarily as a polishing ingredient in toothpaste and powders.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

LEVN-LITE[3] *sodium aluminum phosphate*

See Page 33

MONOSODIUM PHOSPHATE (MSP)

A technical grade phosphate salt used in metal cleaners, water conditioning, as an electroplating solution buffer, and as a textile dyeing aid.

A food grade is supplied for use as a mineral supplement, a pharmaceutical ingredient, as an acidulant in powdered beverages, processed meat products and frozen egg preservation.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

OILFOS[3] *glassy sodium phosphate*

Oilfos is a glassy polyphosphate used exclusively for controlling viscosity of oil well drilling muds.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

PAN-O-LITE[3] *sodium aluminum phosphate*

See Page 33

SODIUM ACID PYROPHOSPHATE (SAPP)

See Page 33

SODIUM HEXAMETAPHOSPHATE

A technical grade phosphate salt used in water softeners, in boiler water treatment, as an ingredient in dishwashing compounds and detergents, and as a deflocculating agent.

The food grade is supplied for use in dietary supplements and in curing meat products.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

SODIUM TRIPOLYPHOSPHATE (STP)

The technical grade of STP is used as a detergent builder; for water softening; in conditioning oil well drilling muds; and as an additive in a variety of products and processes to eliminate scum and soap curds in hard water; to clean metal, deflocculate clays, to improve textile processing.

The food grade STP, sold under the trademark Nutrifos[4], is used in curing hams and related meat products.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

SQ PHOSPHATE *sequestrant*

Supplied as a glassy polyphosphate of high sequestering power for use in formulating industrial cleaning compounds, dishwashing formulations, and dairy cleaners.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

STABIL-9[3] *sodium aluminum phosphate*

See Page 33

TETRASODIUM PYROPHOSPHATE

A technical grade phosphate salt used as a detergent builder; for conditioning oil drilling muds; to formulate household and industrial cleaners and detergents; as a dye bath additive and for metal cleaning; and as a deflocculant in clay processing.

A food grade is supplied for use in meat curing compounds, in instant puddings, as a stabilizer for protein foams, and an antidarkening agent for potatoes.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

TOWOLDMON0042349

TRISODIUM PHOSPHATE, ANHYDROUS (TSP/A)

A technical grade phosphate salt used in heavy duty industrial metal cleaning; water treatment for softening and conditioning; and in abrasive hard surface cleaners.

A food grade is supplied for use as a basic emulsifier in process cheese and as cooking-speed promoter in quick-cook cereals.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

TRISODIUM PHOSPHATE, CRYSTALLINE

A technical grade phosphate salt used principally in heavy duty metal cleaners and in water treatment for softening and conditioning.

A food grade is supplied for use in process cheese, cheese food and cheese spreads as a potent emulsifier.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

OTHER PHOSPHORUS and PHOSPHORUS DERIVATIVES

FERROPHOSPHORUS *iron phosphide*
See Page 37

LoSilPhos* *ferrophosphorus briquettes*
See Page 37

PHOSPHORUS, ELEMENTAL

A pale yellow to deep straw colored waxy solid used as an intermediate in the production of phosphoric acid and organophosphorus compounds, and as an alloying agent in copper alloys.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

PHOSPHORUS OXYCHLORIDE

Used by chemical manufacturers as a chlorinating agent and catalyst in making various intermediates, medicinals, dyestuffs and a reagent for making acetic anhydride and organic phosphates.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

PHOSPHORUS PENTASULFIDE

Supplied as a distillation-purified light greenish-yellow powder in both high and low reactive grades. It is used in the manufacture of lubricating oil additives, thiophosphate insecticidal compounds, salts for ore flotation; as an intermediate for organic synthesis.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

PHOSPHORUS TRICHLORIDE

Supplied as a liquid, it is used by chemical manufacturers variously as a chlorinating agent, catalyst, and reagent in making acid and alkyd chlorides, organic phosphates, germicides, medicinals and in producing iridescent metallic deposits.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

PLASTICIZERS

DI(2-ETHYLHEXYL)ADIPATE (DOA) *dioctyl adipate*

Dioctyl adipate is a high quality plasticizer for imparting low-temperature flexibility to polyvinyl chloride and synthetic rubber compositions.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

DIUNDECYL PHTHALATE (DUP)

DUP is a high molecular weight phthalate plasticizer for PVC resin, offering the best low temperature properties and lowest volatility among the phthalate plasticizers. DUP finds use in PVC wire insulation and PVC automotive interior components because of its excellent performance.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

HB-40® *partially hydrogenated terphenyl*

HB-40 is a plasticizer for vinyl sheeting, films and fabric or paper coatings, and for vinyl protective coatings and adhesives. Used to plasticize vinyl profile extrusions, tubing, wire coating and injection- and slush-molding compounds. Plasticizer for styrene-water dispersion paints, paper coatings, adhesives, styrene casting resins, and polysulfide sealants.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

SANTICIZER® 8 *mixture of N-ethyl-ortho- and para-toluenesulfonamides*

Santicizer 8 is one of the best plasticizers known for synthetic polyamides such as nylon and related resins. It is an excellent plasticizer for cellulose acetate, giving a brilliance and polish not obtainable with other plasticizers. Being practically insoluble in petroleum hydrocarbons, it is a valuable plasticizer for coatings designed to withstand gasoline and related products.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

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TOWOLDMON0042350

SANTICIZER® 9 *mixture of ortho- and para-toluenesulfonamides*

Santicizer 9 differs greatly from other plasticizers in its action. Relatively small amounts impart a gloss to polished articles, give smooth working and uniform curing of molded thermosetting products. Blends readily with most synthetic resins, does not impart the softening action of liquid plasticizers. Particularly valuable to the makers of molding compositions.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

SANTICIZER® 79-TM

Santicizer 79-TM is a trimellitate ester recommended for its permanent qualities in film and sheeting as well as wire and cable.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

SANTICIZER® 97 *ditn-heptyl, n-nonyl)adipate*

Santicizer 97 is an adipate plasticizer designed to give polyvinyl chloride film, sheet, and coatings extreme low temperature flexibility. In all three applications, *Santicizer* 97 imparts good hand and drape. *Santicizer* 97 is FDA regulated for use in food contact applications.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

SANTICIZER® 141 *alkylaryl phosphate*

Excellent for use in polyvinyl chloride films, sheets, extrusions, moldings, organosols and plastisols. Also, *Santicizer* 141 is a fire retardant and may help meet flammability requirements. *Santicizer* 141 is regulated by the Food & Drug Administration (FDA) for use in food packaging films, protective coatings and adhesives.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

SANTICIZER® 143 *modified triaryl phosphate*

Santicizer 143 exhibits the plasticizing efficiency of the alkyl diaryl phosphates while retaining the flame-retardant efficiency of the triaryl phosphates. *Santicizer* 143 is compatible with polyvinyl chloride, vinyl nitrile elastomers, latex emulsions and cellulosic materials.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

SANTICIZER® 148 *alkyl diaryl phosphate*

Santicizer 148 is a flexibilizing, flame-retarding phosphate particularly useful as a plasticizer for polyvinyl chloride resins for use in wall coverings, film and sheeting and drapery backings which must meet specific fire performance specifications. It imparts excellent low temperature flexibility and provides lower smoke generation characteristics in several formulations. *Santicizer* 148 is also excellent as a plasticizer for rubber, particularly the vinyl nitriles.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

SANTICIZER® 154 *triaryl phosphate*

Santicizer 154 is a flame-retardant triaryl phosphate plasticizer suitable for use in a variety of polymer systems. It is compatible with a number of resins including polyvinyl chloride and vinyl nitrile rubber, vinyl acetate emulsions and cellulosics. *Santicizer* 154 is an ideal replacement for tricresyl phosphate and cresyl diphenyl phosphate.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

SANTICIZER® 160 *butyl benzyl phthalate*

Santicizer 160 is a general purpose plasticizer for polyvinyl chloride and is widely used in the flooring industry for its high degree of plasticizing efficiency, stain resistance and adhesive migration resistance. *Santicizer* 160 is also compatible with a wide range of other resin systems including acrylics, urethanes, polyvinyl acetate, cellulose (ethyl and nitro), etc.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

SANTICIZER® 261

Santicizer 261 is a fast fusing monomeric plasticizer that offers high performance, comparable to low molecular weight polymerics, yet still retains the easy processing features of monomeric plasticizers. It finds application in film and sheeting, coated fabrics, plastisols, organisols, vinyl foams, acrylic coatings and polysulfide systems.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

SANTICIZER® 278

Santicizer 278 is a fast fusing, extremely low volatile monomeric plasticizer that offers a high degree of permanence, comparable to polymerics yet retains the excellent processing characteristics of monomerics in vinyl systems. The extremely low volatility and permanence of *Santicizer* 278 makes it one of the products of choice for polysulfide systems.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

TOWOLDMON0042351

SANTICIZER® 409

Santicizer 409 is a permanent plasticizer used in wire coatings and tapes. It is also widely used in high-quality film and sheeting (adhesive backed), organosol fabric coatings, refrigerator gasketing and in other applications requiring a high degree of permanence and resistance to extraction.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

SANTICIZER® 411

Santicizer 411 is a permanent polymeric plasticizer used in outerwear, baby pants, coated cloth (for automobile and furniture upholstery, etc.), wall covering, wire coatings, modified plastisols and organosols, vinyl-metal laminates, and high density foam vinyl.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

SANTICIZER® 412

Santicizer 412 is a permanent plasticizer used in wire and cable compounds, and vinyl plastisols.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

SANTICIZER® 429

Santicizer 429 is a highly efficient permanent plasticizer which provides a good over-all balance of permanent properties.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

SANTICIZER® 546

Santicizer 546 is a fast fusing primary plasticizer for polyvinyl chloride. *Santicizer* 546 also has the unique ability to provide a dry feel and "slip" to the surface of plastisol prepared plastic films.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

SANTICIZER® 711 *ditheptyl, nonyl, undecylphthalate*

Santicizer 711 is a general purpose plasticizer for PVC resin which outperforms DOP (dioctyl phthalate) in the critical areas of low temperature flexibility, volatility and plastisol viscosity stability. Often, *Santicizer* 711 is used to replace DOP and adipate plasticizer blends.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

SANTICIZER® 712-TM

Santicizer 712-TM is a trimellitate ester recommended where excellent retention of physical properties is desired for 125°C insulation and automotive applications.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

SANTONOX® and SANTONOX® R *antioxidant*
See Page 25

SANTOWHITE® POWDER *antioxidant*
See Page 25

TRIBUTYL PHOSPHATE (TBP)

Tributyl phosphate is a practically colorless liquid of low viscosity. It is a primary plasticizer and solvent for nitrocellulose, cellulose acetate and chlorinated rubbers. It is recommended as an antifoaming agent and high boiling solvent used in 2,4-D concentrates and uranium recovery.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

TRIPHENYL PHOSPHATE (TPPA)

Triphenyl phosphate is primarily used as a flame-retardant plasticizer for cellulosics. It also is of interest in heat sealing coatings and adhesives. Triphenyl phosphate is compatible with and acts as a flame retardant for high resilient flexible urethane foams.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

PLASTICS and RESINS

FORMALDEHYDE RESINS

RESIMENE® MELAMINE-FORMALDEHYDE
RESIMENE® UREA-FORMALDEHYDE RESINS *coatings*
See Page 51

SALICYLIC ACID, INDUSTRIAL
See Page 38

MELAMINE and UREA RESINS

RESIMENE® MELAMINE and UREA POWDERS

Resimene melamine-formaldehyde spray-dried powders are used in either solution or dry form for a variety of applications including paper based decorative laminates, glass cloth based industrial laminates, molded products such as school furniture and wood adhesives. *Resimene* spray-dried urea-formaldehyde powders are used as binders in adhesives, molded products and foundry cores. *Resimene* powders provide many useful properties including hard, durable surfaces, color stability, heat resistance, high arc resistance and chemical resistance.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

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TOWOLDMON0042352

RESIMENE® MELAMINE-FORMALDEHYDE
RESIMENE® UREA-FORMALDEHYDE RESINS *coatings*

Supplied in solution form in organic solvents, *Resimene* resins are used to formulate baked on surface coatings. Available as high solids content solutions, *Resimene* resins impart improved surface hardness, weather resistance, and resistance to alkali and chalking. They promote fast cure and excellent color retention. Water soluble grades are also available. The formulated coatings are used on appliances, automotive products, and fabricated industrial parts.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

NYLON RESINS

VYDYNE® *nylon and nylon copolymer resins*

Vydyne nylon and nylon copolymer resins are a family of 66, 66/6 copolymers, 69, and specialty nylon resins designed for a wide variety of molding and extrusion applications. Grades include general purpose, nucleated, heat stabilized, color stabilized, and high viscosity types. They are supplied in natural pellets and salt and pepper pellet blends. Typical applications include fasteners, connectors, insulators, electrical systems and fuel system parts, gears, bearings, films, and filaments in such industries as appliances, automotive and transportation, electrical/electronic, industrial and machinery, packaging, hardware, and textile.

MONSANTO PLASTICS & RESINS CO. Locator Key **42a**

VYDYNE® R *reinforced nylon resins*

A family of mineral-reinforced and glass/mineral-reinforced polyamide engineering thermoplastics designed primarily for molding applications. *Vydyne R offers high rigidity and tensile strength, resistance* to creep under load, and high heat distortion temperature. Processing features include fast cycling (high productivity) and minimum sink mark development. Grades include general engineering and heat stabilized types. They are supplied in natural and black pellets. Used for performance parts including replacement of die cast metals, complex metal assemblies, and more expensive engineering plastics. Suggested applications include appliance, electrical/electronic, industrial, textile, and transportation industry parts.

MONSANTO PLASTICS & RESINS CO. Locator Key **42a**

PHENOLIC RESINS

PHENOLIC and RESORCINOL RESINS
See Page 22

RESINOX® PHENOLIC LIQUID

Resinox liquids are water solutions of phenolic resin. They provide excellent bond strength, heat resistance, chemical resistance and water resistance when cured. They are used for impregnating and bonding a variety of materials such as glass fibers, rock wool, organic fibers, paper, cloth, wood and inorganic fillers. End uses include thermal and acoustical insulation, battery separators, industrial filters, laminated products, abrasive products and foundry sand molds.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

RESINOX® PHENOLIC RESIN COMPOUND

Supplied in powder form, *Resinox* resin compounds provide excellent bond strength, heat resistance and chemical resistance when cured. They are compounded with fillers such as wood flour, glass fibers and fabric for molding applications. Other uses include the manufacture of bonded fiber pads, grinding wheels, brake linings and foundry sand molds.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

RESINOX® PHENOLIC VARNISH

Resinox varnishes are alcohol solutions of phenolic resin. They are used for impregnating, laminating and coating various substrates and filler materials. End uses include electrical and mechanical grade industrial laminates, decorative laminates and automotive filters. Special heat resistant varnishes are available for use in aerospace components and other high performance systems. Varnishes designed for use in surface coatings impart chemical and solvent resistance in baking finishes for metal surfaces.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

POLYIMIDE RESINS

SKYBOND®

Skybond polyimide varnishes are designed for structural, electrical and specialty applications where extended exposure to high temperature is required. They provide heat resistance, high mechanical strength, excellent electrical properties, fire resistance and low smoke. They are used with reinforcements such as glass cloth or graphite fiber for aircraft components, radome construction and filament winding. *Skybond* also is used in high heat resistant adhesives and foams.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

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POLYVINYL ACETATES

GELVA* MULTIPOLYMER RESIN SOLUTIONS

Supplied as water-white or slightly yellow solvent solutions, the amounts of *Gelva* resin solids range from 40 to 55% in solvents consisting of ester-aliphatic hydrocarbon blends or alcohol. The resins in *Gelva* multipolymer resin solutions are based on vinyl acetate, acrylic, and other comonomers. Solution viscosities range from 500 to 40,000 cps @ 25°C. The acrylic-containing grades dry to permanently tacky films. The films from all grades are water resistant. *Gelva* multipolymer resin solutions are used to make pressure sensitive coatings and laminating adhesives for difficult-to-bond surfaces. They are also used in formulating surface coatings and for specialty paper coatings.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

GELVA* RESIN EMULSIONS

Supplied as milk-white aqueous dispersions of a full range of PVAc homopolymers and copolymers that provide a choice of viscosity, particle size, molecular weight, emulsifying system, and film forming properties. Emulsions are available that are borax stable, dextrine compatible and with a range of solvent tolerance. They are widely compatible with plasticizers, other film formers, fillers, and colorants. Films and coatings produced by *Gelva* resin emulsions offer a range of useful properties including excellent adhesion, high tensile strength, hardness, range of heat-sealing temperatures, water resistance and others. They are used broadly as film formers for paints, coatings, binders, adhesives, impregnants.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

GELVA* RESIN SOLUTION

Viscous solvent solution of polyvinyl acetate. *Gelva* V-7-M50 in methyl alcohol. Viscosity 2,500 cps. Total solids 50%. Films and coatings produced from the solution have excellent gloss, clarity and water resistance. It is also noncorrosive and neutral. Used for bonding paper, wood, glass, leather, textiles, ceramics, metal foil and many plastic materials; in shoe cements; in laminating metal foil to cellophane; for preparing plastic wall tile adhesives; and in the paper industry to produce transparent, light and oxygen stable high gloss coatings. Also used as overprint varnishes, greaseproof coatings and pigment binders.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

POLYVINYL ALCOHOL RESINS

GELVATOL* RESINS

White high bulk density powdered resins supplied in a large number of grades in varying degrees of polymerization, per cent hydrolysis and residual acetate content. Resins are water soluble. Viscosities of 4% aqueous solutions range from approximately 2 cps for *Gelvatol* 40-10 to 45 cps for *Gelvatol* 20-90. The resins are nondusting, make clear solutions in water, and cast films are extremely tough with excellent solvent, oil and grease resistance, high tensile strength, and a high degree of impermeability to most gases. Typical applications include dry mix adhesives and building products; textile sizing and finishing; paper coating and sizing; as protective colloids for emulsion polymerization; as binders for china, ceramics, etc.; photosensitive coatings on stencil screens and printing plates; and as water soluble films for packaging soaps, detergents, chemicals, seed, etc.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

POLYVINYL BUTYRALS

BUTVAR* RESIN DISPERSION BR

A milk-white aqueous dispersion of plasticized polyvinyl butyral resin, *Butvar* Dispersion BR has a viscosity of 1500 cps and contains 40 parts plasticizer per 100 parts resin. Air-dried films cast from it are tough, colorless, transparent, dry at room temperature and are unaffected by boiling water. The films are strong and adhere well to a range of surfaces; they resist degradation by water, heat and sunlight. *Butvar* Dispersion BR is used in the textile industry to impart abrasion resistance, durability, strength, slippage control and reduced color crocking to a variety of materials; as abrasion resistant finishes for automobile seat belts and parachute harnesses; as a soft, full-bodied finish for rayon, cotton, or nylon; as a durable, nonraveling finish for filament yarns; and as a finish for curtain and drapery fabrics, glass fabrics, upholstery goods, webbing, awnings, canvas and duck. The resin is also suitable for rug backing, and as greaseproof, washable coatings for wallpaper, window shades and packaging materials. It can be formulated for strippable coatings on metal and other substrates.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

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BUTVAR® RESINS

Butvar polyvinyl butyral resins are white, free-flowing powders supplied in seven resin types or grade forms with various hydroxyl content whose solutions provide a range of viscosities. (Viscosity of a 10% ethanol solution of Butvar B-79 is 55 cps; of "B-72", is 1570 cps). *Butvar* resins are generally soluble in alcohols, glycol esters, and certain mixtures of polar and nonpolar solvents. They are compatible with phthalate and phosphate plasticizers, castor oil, and other flexibilizers. The films are colorless and transparent. *Butvar* resins offer a variety of outstanding performance properties: film clarity, adhesion, flexibility, abrasion and water resistance. They are recommended for formulating metal and wood primers; structural and hot melt adhesives; printing inks; and waterproof textile coatings. In surface coatings, *Butvar* resins improve intercoat adhesion, flexibility, impact and abrasion resistance and flow properties. They are recommended for upgrading the coating performance of thermosetting phenolics, ureas, melamines, epoxies, alkyds, polyurethanes, and polyesters.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

SAFLEX® VINYL BUTYRAL FILM

Saflex polyvinyl butyral is a continuous adhesive film — supplied in clear, translucent, tinted or gradated color — for the plastic interlayer in laminated safety glass. It is a tough and resilient laminating material with excellent optics and adhesion to glass. The functional properties provided by *Saflex* include energy absorption, heat insulation, glare control and sound reduction. *Saflex* is used as the interlayer in the manufacture of high-penetration resistant windshields. Other applications include glazings for aircraft, and for architectural security and decorative glass.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

POLYVINYL FORMAL RESINS

FORMVAR® RESINS

Formvar polyvinyl formal resins are white, free-flowing powders supplied in several grades that offer a range of solubility characteristics and solution viscosities. A 5% ethylene chloride solution of *Formvar* 5/95E ranges from 5-11 cps; "15/95E" from 50-80 cps. *Formvar* resins are soluble in phenols, alcohol mixtures, aromatic hydrocarbons and some chlorinated hydrocarbons. They can be plasticized with phthalate, phosphate, glycolate, and many other plasticizers. Each grade has particularly useful properties. *Formvar* 15/95E, for example, is excellent for making tough, heat-resistant enamels for wire used in hermetic systems. The enamels are solderable, bondable, and have high resistance to burn-out and cut-through and excellent solvent resistance to common refrigerants. *Formvar* resins are also suitable for formulating structural adhesives, wash primers, can and drum linings, and wood and knot sealers.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

RESIN MATERIALS

ADIPIC ACID, TECHNICAL GRADE

Technical grade adipic acid is used by chemical manufacturers as an intermediate in making nylon, plasticizers, surfactants, detergents, waxes, paper finishes and polyester resins.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

EMA® RESINS *ethylene-maleic anhydride copolymers*

EMA linear grade resins function as dispersing agents, film formers and chemical intermediates for use in capsule walls, liquid detergents and drilling muds. Cross-linked resins are used as thickening agents in textile print pastes and cosmetics.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

FUMARIC ACID, TECHNICAL GRADE

Technical grade fumaric acid, assay 99.6% minimum, is a polybasic acid used for the manufacture of alkyd, polyester and paper resins.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

MALEIC ANHYDRIDE

See Page 38

MODAFLOW® *resin modifier*

See Page 42

MODAFLOW® POWDER II *resin modifier*

See Page 42

MULTIFLOW® *resin modifier*

See Page 42

PHOSGARD® C-22-R *organophosphorus compound*

See Page 30

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PHOSGARD® 2XC-20 *organophosphorus compound*
See Page 31

PHTHALIC ANHYDRIDE
See Page 38

STYRENE MONOMER
See Page 44

TETRATHAL® *tetrachlorophthalic anhydride*
See Page 31

STYRENE PLASTICS/RESINS

LUSTRAN® ABS *molding and extrusion resins*

Lustran ABS acrylonitrile-butadiene-styrene thermoplastics are supplied in a full range of molding and extrusion grades that offer optimum processing characteristics and a range of physical property values in the finished product. *Lustran* plastics are high impact materials with special values for quality applications such as refrigerator inner liners, appliance housings, automotive parts and industrial components.

MOLDING MATERIALS: Supplied in a wide range of balanced rigidity and resilience, grades are available in medium to high impact strength with commensurate rigidity, good gloss, high tensile strength, and abuse resistance. Special grades with unique surface characteristics are available to make "platable" products; the materials provide adhesion of the metal plating and good resistance to thermal cycles.

EXTRUSION COMPOUNDS: Supplied in a series of grades that provide a range of flexibility, resilience, tensile strength, elongation, and abrasion resistance. A special grade is available for extruding low gloss sheet with equivalent other physical properties. In addition a grade which meets UL 94 V-O rating is offered.

MONSANTO PLASTICS & RESINS CO. Locator Key **42a**

LUSTRAN® SAN *molding resins*

Lustran SAN styrene-acrylonitrile molding resins are clear rigid thermoplastics for molding high quality articles requiring transparency, brilliant surface, chemical resistance and stiffness. Supplied as Grade 31 general purpose SAN copolymer offering excellent processability and clarity; and Grades 31-7000 and 31-7042, which are UV stabilized grades.

MONSANTO PLASTICS & RESINS CO. Locator Key **42a**

LUSTREX® POLYSTYRENE *extrusion materials*

Supplied in pellet form for extruding into sheet, film, or profile shapes. Available in several commercial grades ranging from crystal polystyrene through rubber-modified medium and high impact materials. A typical use of the extruded products is thermoformed containers, trays, cups and lids.

MONSANTO PLASTICS & RESINS CO. Locator Key **42a**

LUSTREX® POLYSTYRENE *molding materials*

A broad range of products suitable for molding into articles requiring sharp design detail, high surface luster, good color, dimensional stability, hardness, rigidity and toughness. Supplied in pellet form ranging from transparent crystal polystyrene through rubber-modified materials. The molded articles are widely used in packaging, toy, appliance, photographic, furniture, audio cassette, medical and houseware markets.

MONSANTO PLASTICS & RESINS CO. Locator Key **42a**

LYTRON® LATICES

Lytron emulsion latices are aqueous dispersion of polystyrene and styrene-acrylate copolymers that are used as pigments, binders, saturants or coatings. They are used as opacifiers for liquid detergent systems, bowl cleaners, pharmaceutical products and related items; in textile saturating for making shoe components such as box toes and shoe counters; for stiffening foam rubber; and in water-based paints, specialty paper coatings, pigment vehicles and adhesives. They are also used as plastic pigments in paper coating.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

SCRIPSET® RESINS

Styrene-maleic anhydride copolymer resins in powder and liquid form used as protective colloids and film formers. *Scripset* resins promote dispersion and stabilize, harden and thicken aqueous systems. They are alkali-soluble or solvent-soluble for use in adhesives, coatings, and as stabilizers, cross-linking agents, protective colloids and pigment dispersants. *Scripset* resins are used by adhesives manufacturers, textile processors, surface coating manufacturers, and producers of emulsion floor waxes and polishes.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

STYMER® COPOLYMER RESINS
See Page 67

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STYRENE-ALLYL ALCOHOL RESINS

These resins supplied in flake form are low molecular weight copolymers of styrene-allyl alcohol. *RJ-100** and *RJ*101* resins can be used directly as hard resin additives or converted to esters, ester-adducts, ester emulsions. They impart excellent chemical and corrosion resistance to both organic solvent and aqueous coatings. The resin's derivatives are used as latex modifiers for exterior paints, in industrial primer vehicles, in printing inks, and in alkyd and polyester resin manufacture. As a resinous polyol component of polyurethane coatings and rigid foams, SAA offers excellent cost/performance values.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

TRICALCIUM PHOSPHATE

See Page 46

SULFONAMIDE RESINS

SANTOLITE* MHP RESIN

An aryl sulfonamide-formaldehyde resin 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.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

SANTOLITE* MS RESIN *80% industrial resin*

Soft, colorless resin made by the condensation of formaldehyde's aromatic sulfonamides. *Santolite* MS like *Santolite* MHP, is compatible with both nitrocellulose and cellulose acetate; as a solvent for both, it can be used in any proportion. Forms brittle compositions with both resins but the addition of a plasticizer makes such combinations permanently flexible.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **34a**

PRINTING INK PRODUCTS

BUTVAR* RESINS

See Page 53

FILTREZ* RESINS

Modified rosin resins designed for use in printing inks, coatings and adhesives. *Filtrez* resins offer a wide range of properties for the various printing ink applications.

*Trademark of ERP Company

MONSANTO PLASTICS & RESINS CO. Locator Key **43c**

RESIMENE* MELAMINE-FORMALDEHYDE RESIMENE* UREA-FORMALDEHYDE RESINS *coatings*

See Page 51

STYRENE-ALLYL ALCOHOL RESINS

See Page 55 (Styrene Plastics-Resins)

PROCESS CONTROL EQUIPMENT

INSTRUMENTATION, ANALOG PROCESS CONTROL

The ac²* analog instrumentation includes a complete line of controllers, computing elements, computer-compatible instruments, signal converters, decision instruments, accessory stations, annunciators, recorders and power supplies with cases, cabinets and field junction boxes. Instrumentation is available for both integral architecture and split architecture configurations. The system features high reliability and compact displays with control-by-exception indication. Unique color-coded field and control room wiring simplifies installation. The complete line of maintenance equipment includes a portable, simple to use go/no-go tester. Single-unit signal converters and alarms for surface and rack-mounting are also available.

FISHER CONTROLS CORPORATION Locator Key **61a**

INSTRUMENTATION, ANALOG PROCESS MEASUREMENT

A broad line of over 16 types of transmitters for measuring pressure, differential pressure, square root differential pressure, liquid level, solids level, density, temperature, and differential temperature are available. Features include rugged construction, easy range change and calibration, 2-wire output, and intrinsically safe ratings when used with a series of intrinsic safety barriers that are also available.

FISHER CONTROLS CORPORATION Locator Key **61a**

INSTRUMENTATION, DIGITAL PROCESS CONTROL

The dc²* digital control center performs supervisory control, direct digital control, data reduction, batch sequencing, and data logging and

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alarming in real-time, process control applications. The PROVOX® family of prewritten software programs virtually eliminates special user programming. This program family, featuring color CRT and dynamic graphics, includes data acquisition, continuous control, and batch and batch sequencing control programs. The *dc*² features a 16-bit minicomputer with fixed-point and floating-point multiply and divide logic, plus a full line of peripheral devices.

FISHER CONTROLS CORPORATION — Locator Key **61a**

INSTRUMENTATION, PNEUMATIC and ELECTRONIC

Wizard® pneumatic, field-mounted controllers and transmitters are suited to the control of positive, temperature, compound differential and vacuum pressures. On-off, proportional only, or proportional-plus-reset controller action available. Pressure sensing to 20,000 psig depending upon construction. Standard 3 to 15 psig or 6 to 30 psig output signal range.

Level-Trol® pneumatic controllers and transmitters utilize the displacement sensing principle to control the level of a liquid in a vessel. Produces a standard 3 to 15 psig or 6 to 30 psig output signal range. Suited to liquid level, liquid-to-liquid interface level, and density measurement applications.

Temperature transmitters in the PM500 series, offer high resistance to vibration, in-place calibration, proportional mA output, high accuracy, choice of thermocouples and resistance elements.

FISHER CONTROLS CORPORATION — Locator Key **61a**

REGULATOR, GAS

Gas regulators for distribution systems, residential and commercial.

FISHER CONTROLS CORPORATION — Locator Key **61a**

VALVE ACTUATORS and ACCESSORIES

Valve actuators (pneumatic diaphragm or piston; electro-hydraulic), positioners (pneumatic; electro-pneumatic), controllers, transducers.

FISHER CONTROLS CORPORATION — Locator Key **61a**

VALVES

Pressure relief valves (all ranges) and pressure control valves (globe, angle, 3-way, ball and butterfly styles; ratings to ANSI class 2500).

FISHER CONTROLS CORPORATION — Locator Key **61a**

VALVES, NOISE ABATEMENT

Control valve noise abatement products and technology. Field-proven control valve noise prediction techniques. Control valves with Whisper Trim® flow control cages reduce aerodynamic noise levels as much as 30 decibels. Cavitrol® valves to effectively control hydrodynamic noise and cavitation. Also available are diffusers, in-line and vent silencers.

FISHER CONTROLS CORPORATION — Locator Key **61a**

RADIOISOTOPE SOURCES

NUCLEAR INSTRUMENTATION

See Page 35

NUCLEAR SERVICES

Design, analysis, and technical support service covering designing, specifying, and building radiation devices, equipment, and facilities, including health physics in support of operations safety.

MONSANTO RESEARCH CORPORATION — Locator Key **71a**

RADIOACTIVE SOURCES

Radioactive sources, including alpha, beta, gamma, neutron and heat sources, are available for use in reactor start-up, oil well logging, nuclear gauging, medical applications and research, and many other applications. Both standard and custom-designed nuclear sources are supplied.

MONSANTO RESEARCH CORPORATION — Locator Key **71a**

SHIPPING CONTAINERS

A complete range of containers for rental or sale for shipping radioisotope materials. Containers conform to DOT requirements for Type A and Type B packaging. Type B casks, specially-designed for atomic power plant start-up source rods, are available.

MONSANTO RESEARCH CORPORATION — Locator Key **71a**

RAIN FLAPS

SPRAY GUARD® RAIN FLAPS

Monsanto manufactures a line of rain flaps for heavy duty vehicles. Made with a low density polyethylene grass-like surface on a stiff high density polyethylene backing, the rain flaps are designed to significantly reduce the splash and spray thrown from the tires of large vehicles operating on wet pavement.

MONSANTO PLASTICS & RESINS CO. — Locator Key **41a**

0684274

TOWOLDMON0042358

RECREATIONAL SURFACES

ASTROTURF* STADIUM SURFACE

An all-weather, synthetic grass-like recreational surface consisting of nylon facing ribbon with weather resistant backing bonded to a shock-absorbing underpad. This system, installed by Monsanto, is ideal for football, baseball, soccer, lacrosse, and other field sports. Material is available in rolls 15 feet wide by up to 700 feet long.

Handling and Maintenance Equipment Machines for handling and maintaining *AstroTurf* surfaces may be special-ordered: line striper, Grasshopper*, Astro Zamboni* water removal machine, water brush, and tote-a-roll.

MONSANTO PLASTICS & RESINS CO. Locator Key **41d**

RUBBER PROCESSING CHEMICALS

ACCELERATORS FOR NATURAL and SYNTHETIC RUBBERS

A-1* THIOCARBANILIDE VULCANIZATION ACCELERATOR *1,3-diphenyl-2-thiourea or N,N'-diphenylthiourea*

Accelerator for fast-curing repair stocks. Accelerator for neoprene latex, natural rubber latex, and cements and an activator for thiazole accelerators. Can be used as accelerator for neoprene. Relatively nondiscoloring and may be used in light colored goods.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

DPG VULCANIZATION ACCELERATOR *diphenylguanidine*

Secondary accelerator in natural and synthetic rubbers with *Santocure*, *Thiofide* and *Thiotax* accelerators. Slow curing primary accelerator for natural rubber.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

METHASAN* VULCANIZATION ACCELERATOR *zinc dimethyldithiocarbamate*

Used as a secondary accelerator for *Thiofide* and *Santocure* accelerators. Gives strong cure activation.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

MONO THIURAD* VULCANIZATION ACCELERATOR *tetramethylthiuram monosulfide*

Primarily a secondary accelerator for *Thiofide*, *Thiotax* and *Santocure* accelerators. Frequently used in camelback stocks, or in other applications where extended storage of uncured stock is required.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

RZ-100* VULCANIZATION ACCELERATOR *N,N-dimethylcyclohexylamine salt of dibutyldithiocarbamic acid*

An accelerator for very fast room or low temperature cures such as required for latex, cements and proofings. Offers good aging performance and practically no staining and discoloration.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

SANTOCURE* VULCANIZATION ACCELERATOR *N-cyclohexyl-2-benzothiazolesulfenamide*

A delayed action accelerator used alone or with a small quantity of secondary accelerator in natural and synthetic tire treads, sidewalls, etc. *Santocure* gives a shorter scorch delay than *Santocure* NS. Slight discoloration in light or white articles at high concentrations. Nonstaining.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

SANTOCURE* MOR VULCANIZATION ACCELERATOR *2-(morpholinothio)benzothiazole*

An excellent accelerator where extended processing safety is required. Used in thick treads and extrusions, stocks with high loadings of furnace blacks such as ISAF or SAF; stocks which are to be stored for long periods such as camelback. Slight discoloration in light or white articles at high concentrations. Nonstaining.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

TOWOLDMON0042359

SANTOCURE® NS VULCANIZATION ACCELERATOR *N-tert-butyl-2-benzothiazolesulfenamide*

A delayed action fast curing accelerator used alone or with a small quantity of secondary accelerator in natural and synthetic tire treads, sidewalls, etc. *Santocure* NS gives processing safety intermediate between *Santocure* and *Santocure* MOR accelerators. Slight discoloration in light or white articles at higher concentrations. Nonstaining.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

THIOFIDE® MBTS VULCANIZATION ACCELERATOR *2,2'-dithiobis (benzothiazole); benzothiazyl disulfide*

Thiofide gives flat, moderately fast cures in both natural rubber and synthetics. It is particularly useful in white or very bright colored stocks. Secondary acceleration is usually required for synthetic rubbers. Nondiscoloring and nonstaining.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

THIOTAX® MBT VULCANIZATION ACCELERATOR *2-mercaptobenzothiazole*

Thiotax gives flat, fast cures over a wide range of curing temperatures in both natural and synthetic rubbers. *Thiotax* is a good secondary accelerator for butyl and EPDM compounds. Nondiscoloring and nonstaining.

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MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

THIURAD® VULCANIZATION ACCELERATOR *bisdimethylthiocarbamyldisulfide; tetramethylthiuram disulfide*

Sulfur bearing accelerator used as a secondary accelerator with *Santocure* or *Thiofide* accelerators in a wide range of products. It is used in sulfurless cures with *Sulfasan* R vulcanizing agent to obtain heat resistant compounds with nitrile stocks. Will cause surface bloom at high use levels.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

VOCOL® VULCANIZATION ACCELERATOR *zinc-o,o-di-n-butylphosphorodithioate*

Low-cost, nonblooming, fast-curing accelerator for EPDM elastomers. Can be used in combination with *Thiofide* accelerator in natural rubber to improve reversion and aging resistance. Nondiscoloring and nonstaining.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

VOCOL® S VULCANIZATION ACCELERATOR *62% Vocol on 38% inert carrier*

A solid form of *Vocol*, 62% active.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

ANTIOXIDANTS, ANTIOZONANTS and ANTIDEGRADANTS

FLECTOL® H ANTIOXIDANT *polymerized 1,2-dihydro-2,2,4-trimethylquinoline*

One of the best all-purpose antioxidants, where a slight buff discoloration of the product can be tolerated. Powerful and nonblooming; resists effect of heat deterioration and normal aging. Combats product degradation promoted by copper and other heavy metals. Suitable for dry rubber and latex.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

FLECTOL® FLAKES ANTIOXIDANT *polymerized 1,2-dihydro-2,2,4-trimethylquinoline*

Has a lower softening point than *Flectol* H. Used in tires, belts, hose, camelback and general mechanicals.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

FLECTOL® ODP ANTIOXIDANT *an octylated diphenylamine*

For protection of rubber against heat deterioration and normal aging. It causes less discoloration than most other full-power antioxidants. It is a good antioxidant for neoprene.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

SANTOFLEX® AW ANTIOXIDANT *6-ethoxy-1,2-dihydro-2,2,4-trimethylquinoline*

Moderate activity antiozonant/antioxidant for both natural and synthetic rubber. Used as a flex-cracking inhibitor, particularly in tire and belting compounds. Strong staining and discoloration.

MONSANTO INDUSTRIAL CHEMICALS CO Locator Key **35a**

SANTOFLEX® DD ANTIOXIDANT *6-dodecyl-1,2-dihydro-2,2,4-trimethylquinoline*

An excellent antioxidant and flex-cracking inhibitor especially for dynamic applications in tire compounds, belting, camelback, hose, mechanicals, and footwear. Also an efficient stabilizer and gel suppressant for SBR stocks during mixing and storage.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

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TOWOLDMON0042360

SANTOFLEX® IP ANTIOZONANT *N-isopropyl-N'-phenyl-p-phenylenediamine*

An efficient antiozonant, antioxidant, flex-cracking and fatigue inhibitor. Used in tires, sidewalls, cushion gums, carcass stocks, camelback, belting, hose, cables, mountings, buffers and mechanical products exposed to static, dynamic and intermittent-dynamic operating conditions.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

SANTOFLEX® LC ANTIDEGRADANT *an antidegradant blend*

An antiozonant blend used in retread rubber to provide excellent low cost protection against oxygen, heat, ozone, and fatigue or flex-cracking.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

SANTOFLEX® 13 ANTIOZONANT *N-(1,3-dimethylbutyl)-N'-phenyl-p-phenylenediamine*

Outstanding antidegradant for all commonly used elastomers. In both natural and synthetic rubber it is a highly effective antioxidant/antiozonant, and flex-cracking inhibitor. Serves as an excellent polymer stabilizer while retaining carryover activity as an antiozonant/antioxidant.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

SANTOFLEX® 77 ANTIOZONANT *N,N'-bis(1,4-dimethylpentyl)-p-phenylenediamine*

An antiozonant for all commonly used elastomers and particularly effective for static applications where it can replace undesirably high loadings of wax. Gives good short-term dynamic protection.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

SANTOFLEX® 134 ANTIOZONANT an *alkylaryl-p-phenylenediamine* mixture

For stabilizing SBR in emulsion polymers and particularly oil extended and oil/black masterbatches where the stabilizer is added with the oil. Effective general purpose antidegradant for tire stocks.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

SANTOFLEX® 134-D ANTIDEGRADANT *a mixture of Santoflex 134 and Santoflex DD*

A low cost antidegradant blend used to give effective oxygen/ozone protection in tire stocks and general mechanicals. Efficient stabilizer for synthetic elastomers. Staining and discoloring.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

SANTOFLEX® 715 ANTIOZONANT *a blend of Santoflex 13 and Santoflex 77 class antidegradants*

A blended antiozonant used in natural and synthetic rubber to achieve effective resistance to ozone fatigue and aging in products submitted to static, dynamic and intermittent-dynamic service conditions.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

SANTOFLEX® 734 ANTIDEGRADANT *a blend of alkyl-aryl and dialkyl p-phenylenediamines*

Combines protective action of *Santoflex* 13 and *Santoflex* 77 in a single blend. Used in tires and general mechanicals.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

SANTOVAR® A ANTIOXIDANT *2,5-ditert-amyl hydroquinone*

For the protection of uncured rubber against oxidation; retains tack in uncured films and tapes.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

SANTOWHITE® 54 ANTIOXIDANT *modified hindered phenol*

Santowhite 54 is a nonstaining, nondiscoloring antioxidant of moderate strength. It is easily emulsified for use in latex and is easily incorporated in dry rubbers.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

SANTOWHITE® 54-S ANTIOXIDANT *solid form of Santowhite 54*

Santowhite 54-S is two parts *Santowhite* 54 and 1 part inert filler used where a solid form of *Santowhite* 54 is preferred.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

SANTOWHITE® MK ANTIOXIDANT reaction product of 6-tert-butyl-m-cresol and SCl_2

A nonstaining, nondiscoloring antioxidant used in general purpose protection. A viscous liquid somewhat less active than *Santowhite* Crystals.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

TOWOLDMON0042361

SANTOWHITE® CRYSTALS ANTIOXIDANT
4,4'-thiobis (6-tert-butyl-m-cresol)

For the protection of light colored rubber from oxidation. It is also useful in any rubber product used in contact with surfaces such as lacquer or enamel which are subject to staining by ordinary antioxidants. *Santowhite* Crystals provide excellent protection against normal aging.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

SANTOWHITE® POWDER ANTIOXIDANT *4,4'-butylidenebis (6-tert-butyl-m-cresol)*

High activity antioxidant suitable for all white or light colored products where color is critical; also suitable for latex compounding.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

PLASTICIZERS

DI(2-ETHYLHEXYL)ADIPATE (DOA) *dioctyl adipate*
See Page 48

DIUNDECYL PHTHALATE (DUP)
See Page 48

SANTICIZER® 79-TM
See Page 49

SANTICIZER® 97 *di(n-heptyl,n-nonyl) adipate*
See Page 49

SANTICIZER® 141 *alkylaryl phosphate*
See Page 49

SANTICIZER® 143 *modified triaryl phosphate*
See Page 49

SANTICIZER® 148 *alkyl diaryl phosphate*
See Page 49

SANTICIZER® 154 *triaryl phosphate*
See Page 49

SANTICIZER® 160 *butyl benzyl phthalate*
See Page 49

SANTICIZER® 261
See Page 49

SANTICIZER® 278
See Page 49

SANTICIZER® 429
See Page 50

SANTICIZER® 711 *di(heptyl, nonyl, undecyl) phthalate*
See Page 50

SANTICIZER® 712-TM
See Page 50

RETARDERS

SALICYLIC ACID, INDUSTRIAL
See Page 38

SANTOGARD® PVI PREVULCANIZATION INHIBITOR *N-(cyclohexylthio)phthalimide*

Santogard PVI is a prevulcanization inhibitor for natural and synthetic rubber. It is used with all sulfenamide or thiazole accelerators to control processing safety with minimal changes in curing characteristics or vulcanizate properties. *Santogard* PVI improves green stock storage stability and can be used to recover scorchy stocks. Useful in a wide variety of applications otherwise temperature limited, such as faster extrusion, hotter processing and single-stage mixing.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

SPECIAL MATERIALS

ACRYLONITRILE
See Page 43

BUTADIENE
See Page 43

BUTENE-2 CONCENTRATE
See Page 44

INSOLUBLE SULFUR 60

Used to retard sulfur bloom on all in-process articles awaiting further processing - e.g., camelback, tire carcass plies, tire repair materials. Can replace all or part of normal sulfur depending on degree of blooming experienced.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

LAMPBLACK
See Page 42

SANTOWEB® D TREATED FIBER

A treated cellulosic short fiber for use in unsaturated elastomers as a reinforcing material. Used in combination with conventional rubber reinforcing fillers to increase stiffness and engineering properties of rubber compounds.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

0684278

TOWOLDMON0042362

SANTOWEB® H TREATED FIBER

A treated cellulosic short fiber for use in low unsaturated elastomers, specifically EPDM. Used in combination with conventional rubber reinforcing fillers to increase stiffness and engineering properties of rubber compounds.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

SANTOWEB® K TREATED FIBER

A treated cellulosic short fiber for use in nitrile rubbers. Used in conjunction with conventional rubber reinforcing fillers to increase stiffness and engineering properties of rubber compounds.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

STYRENE MONOMER

See Page 44

SULFASAN® R VULCANIZING AGENT

4,4'-dithiodimorpholine

Vulcanizing agent for natural and synthetic rubbers. Stable at processing temperatures but liberates sulfur at curing temperatures. *Sulfasan* R is used as either a total or partial sulfur replacement to produce compounds with excellent heat aging properties and freedom from bloom.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35a**

TRIPOTASSIUM PHOSPHATE

See Page 46

RUBBER PROCESSING EQUIPMENT

MONSANTO® COLD FEED EXTRUDER

Monsanto cold feed extruders produce extrusions of rubber hose, sponge, tire components and profiles. Feed stock is in strip or pellet form. Screw diameters between 1.8 and 10 inches are available. Screw speed ranges between 2 and 72 rmp are achieved. Various screw types and extruder L/D ratios are available. Swing dual head design permits ease of die changing with minimal down time.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO® COLD FEED VACUUM EXTRUDER

A line of cold feed vacuum extruders produce porosity free extrusions of rubber hose, sponge and profiles. Feed stock is in strip or pellet form. Screw diameters between 1.8 and 8 inches are available. screw speed ranges between 2 and 72 rpm are achieved. Various screw types and extruder L D ratios are available. Swing dual head design permits ease of die changing with minimal down time.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO® HOT AIR VULCANIZING TUNNEL

This unit holds microwave-heated extrusions at uniform vulcanizing temperature for desired level of cure. Operating temperatures as high as 500°F can be employed. Twenty air changes per minute prevent hot spots.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO® HOT FEED EXTRUDER

A line of hot feed extruders are available from 2.5 to 10 inch diameters. Dual swing head design permits ease of product change.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO® LCM (LIQUID CURING MEDIUM) UNIT

In this Monsanto LCM unit, the extrusion is submerged in a constant-temperature bath of molten salt for curing. Multiple zoned electric heaters hold the entire bath at uniform curing temperature and eliminate temperature gradients that can cause poor cures.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO® MICROWAVE CONTINUOUS RUBBER VULCANIZER

This unit is placed at the extruder end and quickly and uniformly raises the extrusion temperature to vulcanizing temperatures. Units available in 10 kw increments. The use of 0.8 kw power packs provide flexibility and ease of service. Power packs are compact and low in weight. Easily removed for servicing or replacement by your maintenance personnel; this avoids line stoppages required to service a heavier, in-place power pack. Accommodates single extrusions up to 6 inch diameter or 1¾ x 14".

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO® SPRAY COOLING UNIT

Used in Monsanto's rubber extrusion systems, it has multiple cold water nozzles to chill extrusion. Blow-off ring at exit removes all water from extrusion.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

TOWOLDMON0042363

RUBBER TESTING INSTRUMENTS

CAPILLARY RHEOMETER, AUTOMATIC

Monsanto® Automatic Capillary Rheometer (ACR) is a low cost precision instrument for measuring the flow properties of any viscous material. Test time takes approximately 10 minutes, and is completely automatic. Data is reported directly by display. The ACR gives accurate, reproducible results showing the flow characteristics under typical processing conditions. The unit is designed for quality control as well as research applications. The ACR will provide flow data on thermoplastics, thermosets, textile fiber resins, adhesives, and elastomers over a shear rate range of 10^{-1} to 10^{6} $sec.^{-1}$.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MELT INDEXER

A quality control instrument for the rapid, accurate measurement of the melt indexer of thermoplastics according to the ASTM D-1238 method.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO® CONE-RHEOMETER

The *Monsanto Cone-Rheometer* is a table model rheometer which follows the course of the vulcanization reaction and simultaneously records pressure development associated with the curing and cell development of sponge products. Data are presented on a two-pen strip chart recorder as continuous plots of 1) the stiffness (shear modulus) of the rubber versus time and 2) sample cavity pressure versus time.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO® CURE-SIMULATOR *module unit*

A module unit that gives the Oscillating-Disk Rheometer the capability to cure an elastomeric sample under programmed temperature conditions identical with those of the factory. Particularly useful in curing studies of large cross-section or irregular cross-section rubber articles.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO CURETRON® *data acquisition unit*

Module data acquisition unit that gives the Oscillating-Disk Rheometer the capability to produce numerical quality control data in addition to conventional graphical data. Used for in-process quality control applications in the rubber industry.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO® DIE SWELL DETECTOR, AUTOMATIC

The Automatic Die Swell Detector precisely measures the swell (or memory) character of an extrusion as it exists from the orifice of a capillary rheometer. This measurement indicates the materials' elastic response at conditions similar to processing shear rates and temperatures. The instrument is particularly useful in controlling blow molding, film and profile extrusion and other processes where drawdown character or dimensional stability is critical.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO® DISK RHEOMETER, MODELS R-100 and R-900/750

Floor model or table model rheometers which indicate rubber or rubber-like compound properties such as thermoplasticity, processing safety, cure rate, optimum cure time, and ultimate state of cure. Data are presented as a continuous plot of compound physical properties vs. cure time in accordance with ASTM D-2084-73P.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO® FATIGUE-TO-FAILURE TESTER *flex tester*

Bench model fatigue tester which measures the ultimate fatigue life of cured rubber compounds at selected strain amplitude ratios. Data are presented as the number of cycles to failure.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO® MOONEY COMPUTER

The Mooney Computer is an add-on data processing unit used with the Monsanto custom and standard Mooney Viscometers. Mooney data is automatically displayed on a teletype printer.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO® MOONEY VISCOMETER

Three basic models of shearing disk viscometers designed for operation in accordance with ASTM D 1646, BS 1673 and ISO R 289. All measure plasticity of unvulcanized elastomers and processing performance of compounded elastomers.

The Compact Mooney Viscometer offers simplicity of operation, minimum of floor space. Equipped with direct digital readout for viscosity measurements. Strip chart recorder with 12 speeds available.

The Standard Mooney Viscometer has flat bed recorder, push-button temperature selector, and solid state components.

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Custom Mooney Viscometers are tailored to customer's individual laboratory or factory needs and offers compatibility with existing computers.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO* POWER INTEGRATOR

The power integrator is an instrument that continuously measures and displays the total power used by an energy consuming process such as Banbury, mill or other mixing system. Power integration can be used to standardize and control the work input to a batch of rubber. This technique produces more uniform mixing and consequently greater homogeneity in the finished rubber products.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO* PROCESSABILITY TESTER

The Processability Tester combines an advanced design constant rate capillary rheometer with laser die swell and stress relaxation measurement capability. The instrument modular package includes a microprocessor, servohydraulic drive and precision temperature control. The instrument defines and predicts material characteristics important to the total production process. Tests are conducted at conditions of temperature and shear rate equivalent to those experienced in the actual production process.

Typical uses include viscosity and shear stress characterization, correlative studies of mixing and extruder operation, dimensional stability, homogeneity, carbon black loading analysis, stress relaxation characterization, and scorch determination.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO® RHEOMETER COMPUTER

The Rheometer Computer can be attached to Monsanto Oscillating-Disk Rheometers (MP-V, TM-100 and R-100 models) to automatically print out curemeter data. Data, including sample identification, are printed on a page printer in accordance with international standard methods.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO* TENSOMETER, MODEL T-500
tensile tester

A floor model universal tester with variable crosshead drive and comprehensive stress/strain electronic recording system giving results in real engineering terms on a strip chart recorder. Designed to meet the requirements of BS 903, Part A2, 1971; ASTM D 412, ASTM 638, DIN 53504, ISO/R37, etc.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO® TENSOMETER, MODEL W *tensile tester*

A table model, horizontal, motor driven tensile tester with load capacity of 4,000 lbs. (1814.4 kg). Seven calibrated spring beams are provided for various ranges. A drum type autographic recorder automatically plots stress/strain. A second recorder allows modulus testing.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

MONSANTO* X-RAY UNIT *(three different units available)*

The Monsanto Air-Inflated X-ray System is designed to inspect passenger and light truck tires, bead-to-bead, for all cord materials. The unit employes tire automatic conveyance and sequencing.

The Universal Tire X-ray System is a manual laboratory system to inspect cured and green tire construction. The Monsanto patented lighthouse x-ray tube enables the operator to inspect the complete tire from bead-to-bead with consistent geometric presentation.

The 10/27/750 tire x-ray is designed for automated production line x-ray inspection of passenger, truck, bus, and aircraft tires. The solid state process controller is programmed to automatically optimize tread, bead, and sidewall x-ray geometry viewing for each individual tire size and construction.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **35b**

SCALE INHIBITORS

DEQUEST® 2000 *phosphonate*
See Page 67

DEQUEST® 2006 *phosphonate*
See Page 67

DEQUEST® 2010 *phosphonate*
See Page 67

DEQUEST® 2041 *phosphonate*
See Page 68

DEQUEST® 2051 *phosphonate*
See Page 68

DEQUEST® 2054 *phosphonate*
See Page 68

DEQUEST® 2060 *phosphonate*
See Page 68

DEQUEST® XK *phosphonate*
See Page 68

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TOWOLDMON0042365

SEQUESTRANTS

DEQUEST® 2000 *phosphonate*
See Page 67

DEQUEST® 2006 *phosphonate*
See Page 67

DEQUEST® 2010 *phosphonate*
See Page 67

DEQUEST® 2041 *phosphonate*
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DEQUEST® 2051 *phosphonate*
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DEQUEST® 2054 *phosphonate*
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DEQUEST® 2060 *phosphonate*
See Page 68

DEQUEST® XK *phosphonate*
See Page 68

SQ PHOSPHATE *sequestrant*
See Page 47

SOLVENTS

ACETONE
See Page 44

AROMATIC CONCENTRATE C_9 *mixed isomers*
See Page 44

BUTENE-2 CONCENTRATE
See Page 44

ortho- and para-DICHLOROBENZENE
See Page 39

ETHYL ACETATE
See Page 41

ETHYLBENZENE
See Page 44

METHANOL *methyl alcohol*
See Page 44

STABLE ISOTOPES

Monsanto supplies stable isotopes of the noble gases, carbon, sulfur, nitrogen, bromine, chlorine, and oxygen. Stable carbon isotopes are available in five forms. All of these products are nonradioactive, i.e., stable. They are of controlled purity with various enrichment levels. For each isotope the degree of enrichment is specified as well as minimum purity. The gaseous products are supplied in glass ampoules and steel cylinders, liquids in glass bottles and solids in plastic bottles.

The following stable isotopes are available for physical, chemical, biological research; for industrial uses in nuclear technology; in medical research and diagnostics; for cryogenics and physics studies; in various nuclear physics devices; and in tracer studies of chemical and biological process, where a radioactive isotope would be undesirable. Further information may be obtained upon request.

Stable ARGON Isotopes (gas purity 99.5%)

Stable Isotope:	Ar-36	Ar-38	Ar-40
Isotopic Enrichment	99.5%	95%	99.95%
Purity:	99.5%	99.5%	99.5%

Stable CARBON-12 and Compounds (depleted C-13)

Form:	CO	CO_2	$BaCO_3$
Isotopic Enrichment	99.95%	99.9%	99.9%
Purity:	95%	99%	Reag Grade

Stable CARBON-13 and Compounds (available at two levels of isotope enrichment)

90% Isotopic Enrichment					
Form:	C	CO	CO_2	CH_4	$BaCO_3$
Purity:	99.8%	98%	98%	97%	Reag Grade

99% Isotopic Enrichment				
Form:	C	CO_2	CH_4	$BaCO_3$
Purity:	≥99%	≥99%	97%	Reag Grade

Stable CHLORINE-35 Isotope and Compounds (purity [illegible])

Form:	C_6H_5Cl	NaCl
Isotopic Enrichment	≥90%	≥90%

Stable CHLORINE-37 Isotope and Compounds (purity [illegible])

Form:	C_6H_5Cl	NaCl
Isotopic Enrichment	≥90%	≥90%

Stable HELIUM-3 (gas purity 99.9%)

Isotopic Enrichment	99.9%	99.98%	99.9995%

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Stable KRYPTON Isotopes (gas purity 99.5%)

Stable Isotope	Kr-78	Kr-78	Kr-78	Kr-78	Kr-80	Kr-80
Isotopic Enrichment	8%	50%	90%	99%	70%	90%

Stable KRYPTON Isotopes (gas purity 99.5%) (cont'd.)

Stable Isotope	Kr-82	Kr-82	Kr-83	Kr-84	Kr-86
Isotopic Enrichment	70%	90%	70%	90%	99%

Stable NEON Isotopes (gas purity 99.5%)

Stable Isotope	Ne-20	Ne-21	Ne-22	Ne-22
Isotopic Enrichment	99.95%	90%	70%	99.9%

Stable NITROGEN-14 Compound

Form	$(NH_4)_2SO_4$ in 40% aqueous solution	NH_4NO_3
Isotopic Enrichment	99.99%	99.99%

Stable NITROGEN-15 and Compound

Form	NH_3	$(NH_4)_2SO_4$	HNO_3	KNO_3	N_2	Urea
Isotopic Enrichment	>98%	38-99%	>98%	38-99%	>98%	38-90%

Stable NITROGEN-15 and Compound (cont'd.)

Form	NH_4NO_3
Isotopic Enrichment	38-99%

Stable OXYGEN-16 Isotope and Compounds (purity 99.5%)

Form	O_2	H_2O
Isotopic Enrichment	99.98%	99.98%

Stable OXYGEN-17 Isotope and Compounds (purity 99.5%)

Form	O_2	H_2O
Isotopic Enrichment	20-60%	20-60%

Stable OXYGEN-18 Isotope and Compounds (purity 99.5%)

Form	O_2	H_2O	H_2O
Isotopic Enrichment	90-99%	90-99%	20%

Stable SULFUR-34 Isotope and Compounds (purity ≥98%)

Form	CS_2	S
Isotopic Enrichment	≥90%	≥90%

Stable XENON Isotopes (gas purity 99.5%)

Stable Isotope	Xe-124	Xe-126	Xe-129	Xe-131	Xe-134	Xe-136
Isotopic Enrichment	1-40%	2%	60%	60%	50%	80-99%

MONSANTO RESEARCH CORPORATION — Locator Key **72a**

SURFACE ACTIVE AGENTS, DETERGENTS and BLEACHES

BLEACHING COMPOUNDS

ACL® 56, 59, 60, 66, 85 SANITIZER and BLEACHING COMPOUNDS

ACL 56 sodium dichloroisocyanurate dihydrate is a 56% available chlorine product. It is used in detergent applications, bleaches, and pool disinfection.

ACL 59 potassium dichloroisocyanurate is a 59% available chlorine product that is used for swimming pool disinfection and sanitizing. It is also used as an oxidizer in mechanical dishwashing compounds and other detergent applications.

ACL 60 sodium dichloroisocyanurate is a 62% available chlorine product. It is used in detergent applications, bleaches and pool disinfection.

ACL 66 (monotrichloro) tetra-(monopotassium dichloro)-penta-isocyanurate is a 66% available chlorine product used in sanitizers and detergent applications.

ACL 85 trichloroisocyanuric acid is a 90% available chlorine product. It is used for pool disinfection in compacted forms, commercial bleaches and scouring powders.

MONSANTO INDUSTRIAL CHEMICALS CO. — Locator Key **36a**

DETERGENT INTERMEDIATES

ALKYLATE 215, 225 and 230 *alkylbenzene-biodegradable*

These alkylates are supplied as intermediates for the manufacture of anionic liquid and solid detergents. The three grades are monoalkylbenzene mixtures of different molecular weights.

MONSANTO INDUSTRIAL CHEMICALS CO. — Locator Key **31a**

SURFACE ACTIVE AGENTS-ANIONIC

DDBSA 99-B *alkylbenzene sulfonic acid-biodegradable*

DDBSA 99-B is produced by the sulfonation of refined linear alkylbenzene with SO_3 and contains a minimum amount of free sulfuric acid. It can be neutralized with various bases and is used as an intermediate for the preparation of neutral alkylaryl sulfonates. Primary use is in liquid detergents.

MONSANTO INDUSTRIAL CHEMICALS CO. — Locator Key **31a**

MONSANTO® H-230 AROMATIC NAPHTHA

A coproduct of the manufacture of linear alkylbenzene, *Monsanto* H-230 is a mixture of alkylated benzenes. Available in commercial quantities, the product may be sulfonated and is commonly used for the manufacture of surfactants, oil additives, and other specialty chemicals.

MONSANTO INDUSTRIAL CHEMICALS CO. — Locator Key **31a**

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SURFACE ACTIVE AGENTS-NONIONIC

STEROX® DF SURFACTANT *dodecylphenol-ethylene oxide condensate (alkylaryl polyoxyethylene ether)*

Sterox DF is a liquid nonionic surface active agent. It is primarily designed as an intermediate for sulfation to produce a high foaming active ingredient for liquid detergents. It also shows considerable potential as a paper rewetting agent.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

STEROX® DJ SURFACTANT *dodecylphenol-ethylene oxide condensate (alkylaryl polyoxyethylene ether)*

Sterox DJ is a liquid nonionic surface active agent based on dodecylphenol and 9-10 moles of ethylene oxide. It is a general purpose surfactant with a much lower degree of foaming in comparison to other alkylphenol based nonionics. It is an extremely effective detergent and can be compounded with phosphates and the usual detergent builders for a wide range of applications including textile, paper, leather processing; metal cleaning; emulsifiable toxicant concentrates; latex formulations; and in chemical processing.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

STEROX® ND SURFACTANT *nonylphenol-ethylene oxide condensate*

Sterox ND is a liquid nonionic surface active agent which contains an average of four moles of ethylene oxide. It exhibits excellent oil soluble surfactant properties, and it is highly soluble in nonpolar solvents. *Sterox* ND can be used as an intermediate in the production of sulfated surfactants.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

STEROX® NE SURFACTANT *nonylphenol-ethylene oxide condensate*

Sterox NE is a liquid nonionic surface active agent with an average of five moles of ethylene oxide. It has excellent oil soluble surfactant properties and is used as an active ingredient in gasoline deicer additives. In addition, it is used as a wetting agent and as an intermediate in the production of sulfated surfactants.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

STEROX® NJ SURFACTANT *nonylphenol-ethylene oxide condensate (alkylaryl polyoxyethylene ether)*

Sterox NJ is a general purpose nonionic surfactant. It has proven effective in a wide range of applications including dry and liquid detergents in textile, paper, and leather processing; for metal cleaning; and in latex formulations.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

STEROX® NK SURFACTANT *nonylphenol-ethylene oxide condensate (alkylaryl polyoxyethylene ether)*

Sterox NK is a nonionic, general purpose surface active agent containing an average of 10.5 moles of ethylene oxide. *Sterox* NK is an excellent water-soluble wetting agent and finds wide application in textile processing. It is also used to formulate general purpose dry and liquid detergents, household cleaners and industrial cleaners.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

STEROX® NM SURFACTANT *nonylphenol-ethylene oxide condensate*

Sterox NM is a nonionic surface active agent with an average of 12.5 moles of ethylene oxide. It is especially well suited for modern liquid detergent formulations because of its superior high foaming characteristics and an odor level which is significantly lower than that of competitive surfactants. *Sterox* NM exhibits excellent detersive properties when compared to a lauryl sulfate standard, and it is an effective wetting agent.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **31a**

SYNTHETIC PLAYING SURFACES

ASTROTURF® STADIUM SURFACE
See Page 57

TEXTILE CHEMICALS

BIPHENYL *also known as diphenyl and phenylbenzene*
See Page 35

BUTVAR® RESIN DISPERSION BR
See Page 52

BUTVAR® RESINS
See Page 53

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GELVA® RESIN EMULSIONS
See Page 52

GELVATOL® RESINS
See Page 52

LACTIC ACID, U.S.P., FOOD GRADE and TECHNICAL GRADE
See Page 31

LYTRON® LATICES
See Page 54

SALICYLIC ACID, INDUSTRIAL
See Page 38

SCRIPTSET® RESINS
See Page 54

STYMER® COPOLYMER RESINS

Stymer S is a water-soluble removable size used in sizing filament acetates by the textile industry. *Stymer* S is a styrene maleic anhydride copolymer resin.

MONSANTO PLASTICS & RESINS CO. Locator Key **43a**

TEXTILE INTERMEDIATES

ADIPIC ACID, TECHNICAL GRADE
See Page 53

ADIPONITRILE

Adiponitrile is supplied to nylon 6,6 fiber manufacturers as an intermediate which is used in the production of hexamethylenediamine.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

CYCLOHEXANOL/CYCLOHEXANONE MIXTURE

Used in conversion to adipic acid or separation into cyclohexanol and cyclohexanone.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

HEXAMETHYLENEDIAMINE (HMD)

Supplied to fiber and plastics manufacturers as a basic intermediate used in nylon 6,6 production. Other uses for HMD include manufacture of nylon 6,9, 6,10 and 6,12 resins, polyurethanes via hexamethylenediisocyanate, wet strength resins, boiler feedwater additives and polyamide adhesives.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

HEXAMETHYLENEDIAMMONIUM ADIPATE

Nylon 6,6 salt supplied to fiber and plastics manufacturers as a 50% aqueous solution and used in polymerization to nylon 6,6 polymer.

MONSANTO CHEMICAL INTERMEDIATES CO. Locator Key **21a**

THICKENING AGENTS

EMA® RESINS *ethylene-maleic anhydride copolymers*
See Page 53

GELVATOL® RESINS
See Page 52

WATER TREATING CHEMICALS

DEQUEST® 2000 *phosphonate*

Used in any aqueous system for the prevention of scale formation or to inhibit precipitation in water treating applications. A particularly effective additive in industrial cleaner formulations for the control of extraneous metal ions and to improve soil or scale removal. Used as a scale control agent in oil production.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

DEQUEST® 2006 *phosphonate*

Used in neutral or alkaline systems for the prevention of scale or to prevent mineral precipitation. Agent for deflocculating clays, cements, resins, pigments and the like. Effective additive for alkaline cleaners (such as bottle washing formulas or dairy cleaners) or in general-purpose detergents.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

DEQUEST® 2010 *phosphonate*

Used in scale prevention and corrosion inhibition for industrial water treatment, and to control metal ions in aqueous systems.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key **36a**

TOWOLDMON0042369

DEQUEST® 2041 *phosphonate*

Used in scale prevention and corrosion inhibition for industrial water treatment where a solid product is required. Also used for electroplating and peroxide stabilization for the control of extraneous metal ions.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator key **36a**

DEQUEST® 2051 *phosphonate*

Used in scale prevention and corrosion inhibition for industrial water treatment where a solid product is required.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator key **36a**

DEQUEST® 2054 *phosphonate*

Used in any aqueous system for the prevention of scale formation or to inhibit precipitation in water treating applications, and to control metal ions in aqueous systems.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator key **36a**

DEQUEST® 2060 *phosphonate*

Used in any aqueous system for the prevention of scale formation or to inhibit precipitation in water treating applications. A particularly effective additive in industrial cleaner formulations for the control of extraneous metal ions and to improve soil or scale removal. Used as a scale control agent in oil production.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator key **36a**

DEQUEST® XK *phosphonate*

Used for the control of extraneous metal ions in textile bleaching and scouring.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator key **36a**

SODIUM HEXAMETAPHOSPHATE
See Page 47

WILDFIRE CONTROL CHEMICALS

PHOS-CHEK® *fire retardant*
See Page 30

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THE LOCATOR KEYS listed below serve as a reference to the sales offices which can provide additional information on products listed in the catalog. For example, if you are interested in obtaining additional information about *Vydyne®* nylon and nylon copolymer resins, you may call or write any of the offices listed under Locator Key 42a. These are: Birmingham, MI, Chicago, Cincinnati, Newport Beach, CA, New York, St. Louis or Springfield, MA.

MONSANTO AGRICULTURAL PRODUCTS CO.

11a PLANT FOOD PRODUCTS

St. Louis, MO 63166
800 North Lindbergh Blvd. (314) 694-3767
or
Customer Service Center
St. Louis, MO 63166 (800) 325-4330
800 North Lindbergh Blvd. Ext. 5872/1

11b BLASTING PRODUCTS

St. Louis, MO 63166
800 North Lindbergh Blvd. (314) 694-3858

11c FARMERS HYBRID COMPANIES, INC.

Des Moines, IA 50309
Employer's Mutual Bldg.
717 Mulberry Street (515) 244-1557

12a HERBICIDES & INSECTICIDES

Arlington, TX 76011
2225 East Randol Mill Road
Suite 408 (817) 461-2223
Atlanta, GA 30339
320 Interstate North Parkway (404) 955-4000
Aurora, CO 80011
14211 East Fourth Avenue (303) 341-2511
Bowling Green, OH 43402
735 Haskins Road (419) 352-8478
Carmel, IN 46032
11550 N. Meridian Street
Suite 450 (317) 844-7283
Decatur, IL 62521
1900 East Eldorado
Suite 110 (217) 428-5515
East Lansing, MI 48823
5000 Northwind Drive
Suite 142 (517) 317-1748
Evansville, IN 47715
101 Plaza East Boulevard
Suite 303 (812) 479-8951
Fresno, CA 93710
1520 East Shaw Avenue
Suite 115 (209) 226-2953
Janesville, WI 53545
101 East Milwaukee Street
Suite 509 (608) 756-3691
Luling, LA 70070
River Road
P.O. Box 174 (504) 785-8211
Mankato, MN 56001
209 South Second Street
Suite 311 (507) 387-3406
Memphis, TN 38117
Eastgate Office Building
5118 Park Avenue, Suite 420 (901) 767-2131
Omaha, NE 68137
11128 John Galt Boulevard
Suite 375 (402) 331-3460
Overland Park, KS 66211
Professional Services Building (East) (913) 648-6420
4801 W. 110th St., Suite 220 (West) (913) 642-7043
Raleigh, NC 27612
Wake Building, Suite 115
3203 Woman's Club Drive (919) 781-5270
Sioux Falls, SD 57103
2804 East 26th Street (605) 334-6022
Spokane, WA 99216
East 12929 Sprague Avenue
Suite 3 (509) 928-9001
West Des Moines, IA 50265
1025 Ashworth Road, Suite 535 (515) 225-0412
West Fargo, ND 58078
Midway Office Building Association
623 East Main Street, Suite 201 (701) 282-6122
Wilmington, DE 19810
204 Bancroft Building
3411 Silverside Road (302) 478-4600
or
Customer Service Center
St. Louis, MO 63166 (800) 325-4330
800 North Lindbergh Blvd. Ext. 5868

12b PLANT GROWTH REGULATOR

Atlanta, GA 30339
320 Interstate North Parkway (404) 955-4000
Aurora, CO 80011
14211 East Fourth Avenue (303) 341-2511
Luling, LA 70070
River Road
Box 174 (504) 785-8211
St. Louis, MO 63166
800 North Lindbergh Blvd. (314) 694-1577

13a OTHER PRODUCTS

St. Louis, MO 63166
800 North Lindbergh Blvd. (314) 694-0294

MONSANTO CHEMICAL INTERMEDIATES CO.

21a PROCESS CHEMICALS, TEXTILE INTERMEDIATES & PETROCHEMICALS

Akron, OH 44313
260 Springside Drive [illegible]
Chicago, IL 60018
3158 Des Plaines Avenue [illegible]
Houston, TX 77056
5051 Westheimer Road [illegible]
New York, NY 10036
1114 Avenue of the Americas [illegible]
Santa Clara, CA 95052
2710 Lafayette Street [illegible]
or
Central Order Operations (CO-OP)
Process Chemicals & Textile Intermediates
St. Louis, MO 63166 [illegible]
800 North Lindbergh Blvd. Ext. [illegible]
or
Central Order Operations (CO-OP)
Petrochemicals
Texas City, TX 77590
Box 1311 [illegible]

TOWOLDMON0042371

MONSANTO INDUSTRIAL CHEMICALS CO.

31a DETERGENTS & PHOSPHATES

Akron, OH 44313
260 Springside Drive (216) 668-4111
Chicago, IL 60018
3158 Des Plaines Avenue (312) 296-6688
Cincinnati, OH 45236
8041 Hosbrook Road (513) 984-1100
Newport Beach, CA 92663
Box 2690 (714) 833-9150
New York, NY 10036
1114 Avenue of the Americas (212) 764-5000
St. Louis, MO 63166
800 North Lindbergh Blvd. (314) 694-5464
or
Customer Order Processing Group
St. Louis, MO 63166 (800) 325-4330
800 North Lindbergh Blvd. Ext. 5813

32a ELECTRONIC MATERIALS

Dedham, MA 02026
990 Washington Street (617) 329-2530
Garland, TX 75042
3318 Russwood Lane (214) 494-5300
Palo Alto, CA 94304
755 Page Mill Road (415) 493-3300
St. Peters, MO 63376
Box 8 (314) 272-6281

33a MONSANTO ENVIRO-CHEM SYSTEMS, INC.

St. Louis, MO 63178
Box 14547
Corporate Square Office Park (314) 694-1000

34a PLASTICIZERS

Akron, OH 44313
260 Springside Drive (216) 666-4111
Boston, MA 02149
Everett Station (617) 387-5010
Chicago, IL 60018
3158 Des Plaines Avenue (312) 296-6688
Newport Beach, CA 92663
Box 2690 (714) 833-9150
St. Louis, MO 63166
800 North Lindbergh Blvd. (314) 694-5468
Wilmington, DE 19810
3411 Silverside Road (302) 478-4600
or
Customer Order Processing Group
St. Louis, MO 63166 (800) 325-4330
800 North Lindbergh Blvd. Ext. 5802

35a RUBBER CHEMICALS

Akron, OH 44313
260 Springside Drive (216) 867-5461

35b RUBBER INSTRUMENTS & EQUIPMENT

Akron, OH 44314
947 West Waterloo Road (216) 745-1641

36a SPECIALTY CHEMICALS

Akron, OH 44313
260 Springside Drive (216) 666-4111
Atlanta, GA 30339
320 Interstate North Parkway (404) 955-4000
Chicago, IL 60018
3158 Des Plaines Avenue (312) 296-6688
Cincinnati, OH 45236
8041 Hosbrook Road (513) 984-1100
Houston, TX 77056
5051 Westheimer Road (713) 621-9550
Newport Beach, CA 92663
Box 2690 (714) 833-9150
New York, NY 10036
1114 Avenue of the Americas (212) 764-5000
St. Louis, MO 63166
800 North Lindbergh Blvd. (314) 694-5441
Santa Clara, CA 95052
2710 Lafayette Street (408) 243-0414
Wilmington, DE 19810
3411 Silverside Road (302) 478-4600
or
Customer Order Processing Group
St. Louis, MO 63166 (800) 325-4330
800 North Lindbergh Blvd. Ext. 5804

36b WILDFIRE CONTROL

Ontario, CA 91761
810 East Main Street (714) 983-0772

MONSANTO PLASTICS & RESINS CO.

41a CONSUMER PRODUCTS

Atlanta, GA 30339
320 Interstate North Parkway (404) 955-4000
Chicago, IL 60018
3158 Des Plaines Avenue (312) 296-6688
Dallas, TX 75229
2550 Walnut Hill Lane (214) 358-5577
Kenilworth, NJ 07033
North 8th Street & Monroe Avenue (201) 276-2900
or
Customer Order Entry Division
St. Louis, MO 63166 (800) 325-4330
800 North Lindbergh Blvd. Ext. 5845

41b CONTAINERS - BLOWNWARE

Anaheim, CA 92803
611 East Cerritos Avenue (714) 772-2190
Chicago, IL 60018
3158 Des Plaines Avenue (312) 296-6688
Kenilworth, NJ 07033
North 8th Street & Monroe Avenue (201) 276-2900
Sharonville, OH 45241
3574 East Kemper Road (513) 769-4040
Trenton, NJ 08691
584 Route 130 (609) 585-4650
or
Customer Order Entry Division
St. Louis, MO 63166 (800) 325-4330
800 North Lindbergh Blvd. Ext. 4066

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41c EXTRUDED PRODUCTS - POLYETHYLENE FILM

Anaheim, CA 92803
611 East Cerritos Avenue (714) 772-3610
Kenilworth, NJ 07033
North 8th Street & Monroe Avenue (201) 276-2900
Santa Clara, CA 95052
2710 Lafayette Street (408) 243-0414

41d RECREATIONAL PRODUCTS

St. Louis, MO 63166
800 North Lindbergh Blvd. (314) 694-5335 (314) 694-5338

42a PLASTICS

Birmingham, MI 48010
30100 Telegraph Road (313) 645-5420
Chicago, IL 60018
3158 Des Plaines Avenue (312) 296-6688
Cincinnati, OH 45236
8041 Hosbrook Road (513) 984-1100
Newport Beach, CA 92663
Box 2690 (714) 833-9130
New York, NY 10036
1114 Avenue of the Americas (212) 764-5000
St. Louis, MO 63166
800 North Lindbergh Blvd. (314) 694-5411
Springfield, MA 01151
730 Worcester Street (413) 788-6911
or
Centralized Customer Service Center
Springfield, MA 01151
730 Worcester Street (800) 628-4045

42b PLASTICS-FOME-COR® BOARD

Elkhart, IN 46514
700 East Beardsley Avenue (219) 262-3531
Newport Beach, CA 92663
Box 2690 (714) 833-9150
or
Customer Order Entry Division
St. Louis, MO 63166
800 North Lindbergh Blvd. (800) 325-4330 Ext. 5847

43a RESIN PRODUCTS

Atlanta, GA 30339
320 Interstate North Parkway (404) 955-4000
Birmingham, MI 48010
30100 Telegraph Road (313) 645-5420
Chicago, IL 60018
3158 Des Plaines Avenue (312) 296-6688
Houston, TX 77056
5051 Westheimer Road (713) 621-9550
Indian Orchard, MA 01051
190 Grochmal Avenue (413) 788-6911
Newport Beach, CA 92663
Box 2690 (714) 833-9150
New York, NY 10036
1114 Avenue of the Americas (212) 764-5000
or
Centralized Customer Service Center
St. Louis, MO 63166
800 North Lindbergh Blvd. (800) 325-4330 Ext. 5825

43b RESINS FOR WOOD PRODUCTS INDUSTRY

Eugene, OR 97402
855 Seneca Road (503) 342-7201
Houston, TX 77056
5051 Westheimer Road (713) 621-9550

43c FRP COMPANY

Baxley, GA 31513
Box 349 (912) 367-3616

MONSANTO TEXTILES COMPANY

51a *Depending on end use, one of the following locations should be contacted.*

APPAREL
Charlotte, NC 28210
6230 Fairview Road (704) 364-0110
Los Angeles, CA 90015
110 East 9th Street (213) 628-6312
New York, NY 10036
1114 Avenue of the Americas (212) 764-5000

CARPETS
Atlanta, GA 30339
320 Interstate North Parkway (404) 955-4000
Newport Beach, CA 92663
Box 2690 (714) 833-9150

HOME FURNISHINGS
Charlotte, NC 28210
6230 Fairview Road (704) 364-0110
New York, NY 10036
1114 Avenue of the Americas (212) 764-5000

INDUSTRIAL
Charlotte, NC 28210
6230 Fairview Road (704) 364-0110

TIRE
Akron, OH 44313
260 Springside Drive (216) 867-5460

51b NONWOVENS

St. Louis, MO 63166
800 North Lindbergh Blvd.
Cerex® *spunbonded nylon fabrics* (314) 694-8311
Bidim® *engineering fabrics* (314) 694-8102 or (800) 325-1480

FISHER CONTROLS CORPORATION OF DELAWARE

61a FISHER CONTROLS CORPORATION

Marshalltown, IA 50158
205 South Center Street (515) 754-3536

MONSANTO RESEARCH CORPORATION

71a DAYTON LABORATORY

Dayton, OH 45407
Box 8, Station B
1515 Nicholas Road

ENVIRONMENTAL SERVICES/RESEARCH (513) 268-3411

CUSTOM SYNTHESIS/INTERIM CHEMICAL MANUFACTURE (513) 268-3411

NUCLEAR PRODUCTS/SERVICES (513) 268-[illegible]

72a UNITED STATES DEPARTMENT OF ENERGY FACILITY

Mound Facility, Miamisburg, OH 45342
Box 32 (513) [illegible]

TOWOLDMON0042373

MAJOR COMPANY OFFICES

CORPORATE

WORLD HEADQUARTERS
800 North Lindbergh Blvd.
St. Louis, Missouri 63166
(314) 694-1000

Corporate Administration
and Staff Departments
Monsanto Agricultural Products Co.
Monsanto Chemical Intermediates Co.
Monsanto Industrial Chemicals Co.
Monsanto Plastics & Resins Co.
Monsanto Textiles Company
International Division
Monsanto Research Corporation

MARKETING OFFICES

Multicompany

Akron, OH 44313
260 Springside Drive
(216) 666-4111

Atlanta, GA 30339
320 Interstate North Parkway
(404) 955-4000

Chicago, IL 60018
3158 Des Plaines Avenue
(312) 296-6688

Cincinnati, OH 45236
8041 Hosbrook Road
(513) 984-1100

Detroit, MI
Birmingham, MI 48010
30100 Telegraph Road
(313) 645-5420

Houston, TX 77036
5051 Westheimer Road
(713) 621-9550

Los Angeles, CA
Newport Beach, CA 92663
Box 2690
(714) 833-9150

New York, NY 10036
1114 Avenue of the Americas
(212) 764-5000

St. Louis, MO 63166
800 North Lindbergh Boulevard
(314) 694-1000

San Francisco Bay Area
Santa Clara, CA 95052
2710 Lafayette Street
(408) 243-0414

Wilmington, DE 19810
3411 Silverside Road
(302) 478-4600

Additional Marketing Offices

MONSANTO AGRICULTURAL PRODUCTS CO.

Arlington, TX 76011
2225 East Randol Mill Road
Suite 408
(817) 461-2223

Aurora, CO 80011
14211 East Fourth Avenue
(303) 341-2511

Bowling Green, OH 43402
735 Haskins Road
(419) 352-8478

Carmel, IN 46032
11550 N. Meridian Street
Suite 450
(317) 844-7283

Decatur, IL 62521
1900 E. Eldorado
Suite 110
(217) 428-5515

Des Moines, IA 50309
Farmers Hybrid Companies, Inc.
Employer's Mutual Bldg.
717 Mulberry Street
(515) 244-1557

East Lansing, MI 48823
5000 Northwind Drive
Suite 142
(517) 337-1748

Evansville, IN 47715
101 Plaza East Blvd.
(812) 479-8951

Fresno, CA 93710
1520 East Shaw Avenue
(209) 226-2953

Janesville, WI 53545
101 East Milwaukee Street
Suite 509
(608) 756-3691

Luling, LA 70070
River Road
P. O. Box 174
(504) 785-8211

Mankato, MN 56001
309 South Second Street
Suite 311
(507) 387-3406

Memphis, TN 38117
Eastgate Office Building
5118 Park Avenue, Suite 420
(901) 767-2131

Omaha, NE 68137
11128 John Galt Boulevard
Suite 375
(402) 331-3460

Overland Park, KS 66211
Professional Services Building
4801 W. 110th St., Suite 220
(913) 648-6420 (East)
(913) 642-7043 (West)

Raleigh, NC 27612
Wake Building, Suite 115
3203 Woman's Club Drive
(919) 781-5270

Sioux Falls, SD 57103
2804 East 26th Street
(605) 334-6022

Spokane, WA 99216
East 12929 Sprague Avenue
Suite 3
(509) 928-9001

West Des Moines, IA 50265
1025 Ashworth Road, Suite 535
(515) 225-0412

West Fargo, ND 58078
Midway Office Building Association
623 East Main Street, Suite 201
(701) 282-6122

MONSANTO INDUSTRIAL CHEMICALS CO.

Akron, OH 44314 (Instruments/Equipment)
947 West Waterloo Road
(216) 745-1641

Boston, MA 02149
Everett Station
(617) 387-5010

Ontario, CA 91761
810 East Main Street
(714) 983-0772

Electronic Materials

Dedham, MA 02026
990 Washington Street
(617) 329-2530

Garland, TX 75042
3318 Russwood Lane
(214) 494-5300

Palo Alto, CA 94304
755 Page Mill Road
(415) 493-3300

St. Peters, MO 63376
Box 8
(314) 272-6281

Monsanto Enviro-Chem Systems, Inc.

St. Louis, MO 63178
Box 14547
Corporate Square Office Park
(314) 694-1000

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MONSANTO PLASTICS & RESINS CO.

Consumer Products

Dallas, TX 75229
2550 Walnut Hill Lane
(214) 358-5577

Kenilworth, NJ 07033
North 8th Street & Monroe Avenue
(201) 276-2900

Containers-Blownware

Anaheim, CA 92803
611 East Cerritos Avenue
(714) 772-2190

Kenilworth, NJ 07033
North 8th Street & Monroe Avenue
(201) 276-2900

Sharonville, OH 45241
3574 East Kemper Road
(513) 769-4040

Trenton, NJ 08691
584 Route 130
(609) 585-4650

Extruded Products-Polyethylene Film

Anaheim, CA 92803
611 East Cerritos Avenue
(714) 772-3016

Kenilworth, NJ 07033
North 8th Street & Monroe Avenue
(201) 276-2900

Plastics

Springfield, MA 01151
730 Worcester Street
(413) 788-6911

Plastics-Fome-Cor®

Elkhart, IN 46514
700 East Beardsley Avenue
(219) 262-3531

Resin Products

Eugene, OR 97402
855 Seneca Road
(503) 342-7201

Springfield, MA
Indian Orchard, MA 01051
190 Grochmal Avenue
(413) 788-6911

FRP Company

Baxley, GA 31514
Box 349
(912) 367-3616

MONSANTO TEXTILES COMPANY

Charlotte, NC 28210
6230 Fairview Road
(704) 364-0110

Greenville Customer Service Center
Greenville, SC 29606
Box 5364 Station B
(803) 242-6700

Los Angeles, CA 90015
110 East 9th Street
(213) 628-6312

FISHER CONTROLS CORPORATION OF DELAWARE

Clayton, MO 63105
7711 Bonhomme Avenue
(314) 694-9900

Fisher Controls Company

Marshalltown, IA 50158
205 South Center Street
(515) 754-3556

MONSANTO RESEARCH CORPORATION

Dayton, OH 45407
Box B, Station B
1515 Nicholas Road
(513) 268-3411

Miamisburg, OH 45342
Box 32
(513) 865-4020

OTHER OFFICES

Monsanto Company
1101 17th Street NW
Washington, DC 20036
(202) 452-8880

Monsanto Company
Walt Disney World Exhibit
Box 40
Lake Buena Vista, FL 32830
(305) 824-4333

MARKETING OFFICES OUTSIDE THE UNITED STATES

Argentina
Monsanto Argentina S.A.I.C.
Avda Madero 1020
Buenos Aires, Argentina

Australia
Monsanto Australia Limited
151 Flinders Street
Melbourne, Victoria 3000
Australia

Monsanto Australia Limited
35 Terry Street
Rozelle, Sydney, NSW
Australia 2039

Monsanto Australia Limited
Post Office Box 1111K, Adelaide
South Australia 5001

Monsanto Australia Limited
P.O. Box 63, Hamilton Central
Brisbane, Queensland,
Australia 400[illegible]

Monsanto Australia Limited
P.O. Box 77
Doubleview, Perth
West Australia 6018

Austria
Monsanto GmbH
Am Stadtpark
Hilton Center
A-1030 Vienna, Austria

Belgium
Monsanto Europe S.A.
270-272 Avenue de Tervuren
B-1150 Brussels, Belgium

Monsanto Europe N.V.
Scheldelaan
B-2040 Antwerp, Belgium

Brazil
Industrias Monsanto S.A.
Caixa Postal 8341
Sao Paulo, Brazil

Canada
Monsanto Canada Inc.
2000 Argentia Road
Mississauga, Ontario, Canada
L5N 1V8

Monsanto Canada Inc.
425 St. Patrick Street West
LaSalle, Quebec, Canada

Monsanto Canada Inc.
100 Park Royale Suite 701
West Vancouver, B.C., Canada

Chile
Monsanto Chile Comercial e Industrial Limitada
Casilla 863
Santiago de Chile

Colombia
Monsanto Colombiana Inc.
Apartado Aereo 90[illegible]
Bogota, Colombia

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Denmark
Monsanto A/S
6 Rosenstensgade
DK-1664 Copenhagen V.
Denmark

Monsanto Scandinavia A/B (Textiles only)
Fyllasvej 20
DK-8600 Silkeborg, Denmark

El Salvador
Monsanto Centroamerica (El Salvador) S.A.
Apartado Postal (01) 65
San Salvador, El Salvador

Federal Republic of Germany
Monsanto (Deutschland) GmbH
Immermannstrasse 3
D-4 Dusseldorf,
Federal Republic of Germany

Finland
Monsanto Oy
Arkadiankatu 8 C20
SF-00100 Helsinki 10, Finland

France
Societe Monsanto S.A.
9 rue d'Argenson
F-75008 Paris, France

Guatemala
Monsanto Guatemala Inc.
Apartado Postal 2360
Guatemala City, Guatemala

Hong Kong
Monsanto Far East Ltd.
Hang Lung Bank Bldg., 7th Floor
6-8 Hysan Avenue
Hong Kong

India
Monsanto Chemicals of India Ltd.
Wakefield House
13, Sprott Rd.-Ballard Estate
Bombay 400 038, India

Mindia Chemicals Ltd.
Caithness Hall
310-311 Linghi Chetty Street
Madras 600 001, India

Monsanto Chemicals of India Ltd.
18 Asaf Ali Road
New Delhi 110 001, India

Indonesia
Monsanto Company Representative Office
11th Floor, Wisma Kosgoro Bldg.
53 Jalan M.H. Thamrin
Jakarta, Indonesia

Israel
Mr. F. Gadiesh
23 Ehud Street
Zahala 69936, Israel

Italy
Monsanto Italiana S.p.A.
Via Melchiorre Gioia 8
I-20124 Milan, Italy

Japan
Monsanto Japan Ltd.
320, Kokusai Bldg.
1-1, Marunouchi 3-chome
Chiyoda-ku, Tokyo 100, Japan

Kenya
Monsanto Central Africa, Inc.
Kampus Towers-4th Floor
Corner Moi and University Way
P. O. Box 47686
Nairobi, Kenya

Korea
Chemstrand, Inc. (Korea Branch)
Anglican Church Bldg., 3rd Fl.
3-7, Jeong Dong, Joong-ku
Seoul, Korea

Malaysia
Monsanto Far East Ltd.
(Malaysia Branch)
116, Jalan Semangat
Petaling Jaya, Selangor, Malaysia

Mexico
Monsanto Comercial S.A. de C.V.
Calle Thiers No. 248
Mexico 5, D.F., Mexico

Netherlands
Monsanto B.V.
Jan van Nassaustraat 53-55
NL-2596BP The Hague, The Netherlands

New Zealand
Monsanto New Zealand, Ltd.
19 Great South Road
Remuera, Auckland 5,
New Zealand

Monsanto New Zealand, Ltd.
P.O. Box 11-117
Sockburn,
Christchurch, New Zealand

Monsanto New Zealand, Ltd.
Corner Frankmore Ave. & Trafalgar Rd.
Johnsonville, Wellington, 4
New Zealand

Nicaragua
Monsanto Agricola de Nicaragua S.A.
P.O. Box 288
Managua, Nicaragua

Norway
Monsanto Norge A/S
Fred Olsensgate 11
N-Oslo 1, Norway

Philippines
Monsanto Philippines Inc.
Room II-A, APMC Building
136 Amorsolo Street, corners
Gamboa & Adelantado Streets
Legaspi Village, Makati
Metro Manila, Philippines

Poland
Monsanto Poland Inc.
Hotel Forum, Room 827
Ul. Nowogrodzka 24-26
00-511 Warsaw, Poland

Puerto Rico
Monsanto Puerto Rico Company
P. O. Box 837
Hato Rey, Puerto Rico

Romania
Monsanto Europe S.A.
Bucharest Branch
Hotel Bucharest Capsa
Edgar Quinet 1
Bucharest, Romania

Singapore
Monsanto Singapore Company Pte.
2601-2606, 26th floor
Clifford Centre
Raffles Place
Singapore 0104

South Africa
Monsanto South Africa (Pty.) Ltd.
Sandton City, 4th Floor
P. O. Box 78025
2146 Sandton, Transvaal, South Af

Spain
Monsanto Iberica S.A.
Capitan Haya 56
Madrid 20 Spain

Monsanto Iberica S.A.
Lepanto 350
Barcelona 25 Spain

Sri Lanka
Mr. J. L. Amaratunga
(Marketing Development Manager-S
116 Steuart Place
Galle Road
Colombo 3, Sri Lanka

Sweden
Monsanto (Scandinavia) A/B
Yxhammarsgatan 27
P. O. Box 486
S-50107 Boras, Sweden

Switzerland
Monsanto (Suisse) S.A. Textiles only
Tiefenhole 10
CH-8022 Zurich
Switzerland

Taiwan
Monsanto Far East Ltd. - Taiwan Bra
3rd Floor, 50, Shih-Shen S. Road
Section 1
Taipei, Taiwan R.O.C.

Thailand
Monsanto Tha
Kasemkij Bldg.
120 Silom Road
Bangkok, Thai

United Kingdom
Monsanto Ltd.
2nd Floor,
Burleys Way,
Leicester LE
England

Monsanto Ltd.
Monsanto
10-18
London SW
England

Monsanto
Park House
Bradford
W. York

Venezuela
Monsanto
Apartado
Caracas

0684292

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MONSANTO
800 N. LINDBERGH BLVD.
ST. LOUIS, MISSOURI 63166

0684293

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