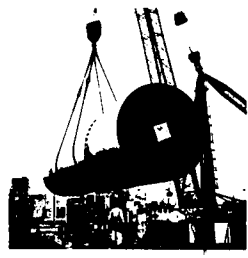
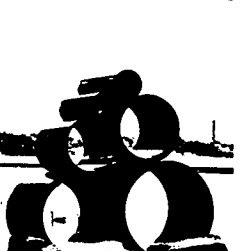
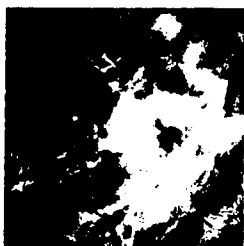
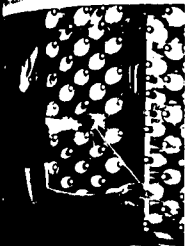


Monsanto

PRODUCT CATALOG

166

October 1975



0684060

FRONT COVER

First Row Left to Right VYDYNE® R Nylon for Automobile Parts and Trim • Chemicals for Paints • LASSO® Herbicide for Increased Corn Crop Yields • LUSTREX® Polystyrene for Egg Cartons shown in Door Liner Made of LUSTRAN® ABS *Second Row Left to Right* Spools of Nylon Fibers • ACL® Chlorine for Swimming Pools • PHOS-CHEK® Fire Retardant for Forest Fire Control • Plasticizers for Vinyl Purses and Shoes *Third Row Left to Right* Man-Made Fibers for Draperies • Fashions of ACRILAN® Acrylic Fibers • LUSTRAN® ABS for Plastic Pipe • PYDRAUL® Fire Resistant Hydraulic Fluid for Offshore Oil Rigs *Fourth Row Left to Right* SKYDROL® Fire Resistant Hydraulic Fluid for Jet Liners • Monsanto Enviro-Chem Systems, Inc., LANDGARD® Solid Waste Disposal System • VYDYNE® Nylon for TV Parts • Aspirin for Pain Relief

*Proprietary term and trademark of Monsanto

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THIS catalog lists many of the more than 1000 products produced by Monsanto's operating companies and major subsidiaries. It also lists marketing offices which can provide information on these products.

If you would like additional information regarding products, services or which location can best serve your needs, contact a Customer Inquiry Representative at any of the marketing offices listed on page 71. 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 139 manufacturing plants and 26 laboratories or technical centers in 21 nations.

MONSANTO AGRICULTURAL PRODUCTS COMPANY

This operating unit of the company produces herbicides, a plant growth regulator, parathions, fertilizer, blasting agents, animal and poultry feed additives, and hybrid swine for the agricultural market. All of the company's herbicides break down rapidly in the soil and are used in major crop producing areas around the world.

MONSANTO COMMERCIAL PRODUCTS COMPANY

This operating unit consists of six business areas: consumer and recreational products, containers, electronics, extruded products, process technology and systems for pollution control, and control valves and systems. Consumer and recreational products include a variety of *AstroTurf*[®] surfaces and consumer goods, while containers cover a range of blow and injection molded plastic bottles. Electronic products include semiconductor materials, light-emitting diodes and instruments. Extruded products cover film, plastic packaging and *Fome-Cor*[®] insulation board. Through its Fisher Controls Company, the operating unit markets automatic control equipment and valves. Monsanto Enviro-Chem Systems, Inc., a subsidiary, develops, markets and installs systems to control air pollution and solid waste disposal. Enviro-Chem also is a world leader in the design and construction of sulfuric acid plants.

MONSANTO INDUSTRIAL CHEMICALS COMPANY

This operating unit serves a broad range of markets through four business areas: detergents and phosphates, plasticizers, rubber chemicals, and specialty and process chemicals. Detergents and phosphates include products used in food additives and dentifrices, while plasticizers add flexibility and other desirable properties to plastics for 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 and process chemicals include functional fluids and specialty chemical systems, such as those used for water, paper and wood conditioning.

MONSANTO POLYMERS & PETROCHEMICALS COMPANY

This operating unit covers four basic business areas: petrochemicals, plastics, specialty resin products, and oil and gas exploration and production. Its worldwide crude oil and natural gas activities help provide the basic resources for a variety of petrochemicals which serve as the building-block raw materials for plastics, resins and hundreds of other Monsanto products. *Lustrex*[®] polystyrene and *Lustran*[®] ABS, two styrene-based plastics, are used widely in a variety of household, industrial and automotive applications. *Saiflex*[®] polyvinyl butyral sheet is the plastic interlayer used in automotive windshields and laminated architectural glass. Specialty resins are used in paints, coatings and adhesives.

MONSANTO TEXTILES COMPANY

Nylon, *Acrlan*[®] acrylic, modacrylic and polyester fibers are manufactured by this operating unit. These man-made fibers serve apparel, hosiery, home furnishings, carpet, tire and wig markets. Increasing quantities of Monsanto fibers are sold to the apparel market under the *Wear-Dated*[®] warranty. *Acrlan* acrylic, a recognized leader in the field of carpet fibers, is 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.

INTERNATIONAL DIVISION

Monsanto's International Division serves world markets through sales offices and sales representatives in 86 nations. It also coordinates operations outside the United States in conjunction with the five operating companies, which have worldwide responsibility for their individual product lines.

MONSANTO RESEARCH CORPORATION

Monsanto Research Corporation is a wholly-owned subsidiary engaged principally in government contract work. It operates Mound Laboratory, in Miamisburg, Ohio, for the U.S. Energy Research and Development Administration (formerly the U.S. Atomic Energy Commission). It also maintains a contract research laboratory in Dayton, Ohio, where scientific research is conducted for many government agencies.

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

COMPANY ORGANIZATION (See page 1)

A brief resume of Monsanto's organization is included, briefly describing the broad areas of company interests and the specific interests of the operating companies, corporate divisions and subsidiaries.

ALPHABETIC PRODUCT INDEX (See page 3)

This index, which includes products and product uses, refers to the page where specific product descriptions may be found; and to the Locator Key which gives the locations where additional information on each product may be obtained, or an order placed.

PRODUCT USE INDEX (See page 9)

This index lists specific uses to which products manufactured by Monsanto may be put; for example, as Agricultural and Farm Products or as Paint/Coating Ingredients. This index, like the Alphabetic Product Index, refers to the page where the product description may be found and also to the Locator Key.

LOCATOR KEY (See page 67)

So that you may determine quickly the Monsanto marketing offices where additional information may be obtained or an order placed, a Locator Key is shown at the lower right of each product

description. It works like this: if you need additional information on acetylsalicylic acid (aspirin), Locator Key 34a refers to the marketing offices that handle this product. Thus, if you are located in Milwaukee, Wisconsin, it would be most convenient for you to call our Chicago office (312) 296-6688.

MAJOR OFFICES (See page 71)

Major offices of the company, both in the United States and abroad, are listed. This includes the location, address and telephone number of corporate organizations, operating companies, corporate divisions and subsidiaries; multi-company marketing offices and additional marketing offices maintained by operating companies and subsidiaries; and marketing offices outside the United States.

TRADEMARKS

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

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material especially sized for fertilizer blending. It is also a good industrial material.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 11b

MONOAMMONIUM PHOSPHATE (MAP)

See Page 42

MONOPOTASSIUM PHOSPHATE

See Page 43

HERBICIDES

AVADEX®

A proprietary "diallate" 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®

A proprietary "triallate" 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-tri-chloroallyl diisopropylthiocarbamate.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12a

LASO®

A proprietary "alachlor" herbicide available as 15% active granule and as 4 lb. (active) per gallon emulsifiable concentrate. The active ingredient is 2-chloro-2', 6'-diethyl-N-(methoxymethyl) acetanilide. Lasso is used for selective weed control in corn, soybeans, peanuts and cotton.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12a

MACHETE®

A proprietary "butachlor" 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®

A proprietary "propachlor" herbicide 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

A preblended herbicide 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).

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12a

RANDOX®

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12a

ROUNDUP®

A proprietary "glyphosate" herbicide available as a 4 lb. (active) per gallon liquid formulation. Containing 4 lbs./gallon isopropyl-amine salt of glyphosate. Offers effective postemergent control of most annual and perennial broadleaves and grasses.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12a

VEGADEX®

A proprietary "CDEC" 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 highly toxic commercial insecticide supplied only to professional formulators for the control of a variety of insects and mites. Ethyl parathion has a residual effect that is an advantage over other organic insecticides making it a standard for certain applications. Poison emblem and antidote required on labels.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12a

METHYL PARATHION

A highly toxic commercial insecticide supplied as 80% active solution (in xylene) only to professional formulators for controlling boll weevil in cotton and a wide spectrum of insects that attack

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fruit, vegetable and forage crops. Poison emblem and antidote required on labels.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12a

NIRAN® 6-3

Supplied only to professional formulators and distributors, *Niran* 6-3 is a liquid blend of ethyl and methyl parathions containing the equivalent of 6 lbs. ethyl and 3 lbs. methyl parathions per gallon. It is highly toxic and used commercially for the control of bollworms and boll weevils in cotton and certain other regulated uses. Poison emblem and antidote required on labels.

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 ripening period when sucrose levels are increasing and weather conditions are adverse for ripening cane. A water soluble product, containing 85% water soluble powder.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12b

PRESERVATIVE

STOP SCALD® fruit spray

Supplied as a 70% active (ethoxyquin) solution that is mixed with water for use as a spray or dip to protect stored scald susceptible apples and pears against common scald during storage.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12a

RELATED PRODUCTS/ SERVICES

GELVATOL® RESINS

See Page 50

POLYETHYLENE PROTECTIVE SHEETING and TAPE

See Page 24

SWINE BREEDING STOCK

BOARS: 7 months of age, 250-275 lbs. Five 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 11d

ANTICAKING FLOW CONDITIONERS

SANTOCEL® silica aerogel

Santocel 62LV, 62, 68, C, FRC and 54 are highly efficient flattening agents for a variety of surface coatings such as lacquers, varnishes, urethanes, alkyd-urea and other coatings. *Santocel* Z is a highly efficient thickening and thixotropic agent for epoxy resins and bodying agent for printing ink vehicles. Other grades include *Santocel* A for thermal insulation and *Santocel* CS as reinforcing agent for silicone rubber.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34e

TRICALCIUM PHOSPHATE

See Page 43

ANTIFOAMING AGENTS

LIMIT® 33 defoamer

See Page 39

PC-1244® defoamer

PC-1244 is an additive whose presence in low concentration suppresses foaming tendencies in lubricating oil formulations. It is an oil-dispersible solution of a nonmetallic compound in petroleum distillate.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34d

PC-1344® defoamer

Used as a defoamer in nonaqueous hydrocarbon and solvent systems.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34d

ANTIOXIDANTS

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 32a

SANTOQUIN® ethoxyquin

A feed grade antioxidant added to animal and poultry feeds and dried forage crops as a protectant for the feedstuffs' Vitamins "A" and "E" and carotenes, and xanthophyll content. *Santoquin* is supplied

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as liquid: as Santoquin Mixture 6 (66.6%) and as Santoquin Emulsion (70%).

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 11a

SANTOWHITE® POWDER 4,4'-butyidenebis (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 32a

SOPANOX® ortho-tolyl biguanide

Sopanax is an amino compound that is effective in minute quantities for inhibiting the oxidation of soaps produced from animal or vegetable fatty acids. Its use controls rancidity, discoloration and other adverse aging effects. Sopanax is particularly valuable in preventing the discoloration of refined toilet soaps.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 31a

**ANTISLIP and
ANTISOIL AGENTS**

SYTON® 200, 240, 250 colloidal silica

Syton 200, 240, and 250 are efficient surface modifying agents for imparting soil and scrub resistance. They also increase bond strength of rubber latex adhesives. Other applications include use as compression resistance agents in latex foam rubber and antiblocking agents in water finishes.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34e

SYTON® DS, DS-40, DS-50, DS-200, DS-240 and DS-250 colloidal silica

Syton DS, DS-40, DS-50, DS-200, DS-240 and DS-250 are used as textile spinning and finishing aids to increase drag between fibers, to deluster surfaces and to alter hand. They also are effective antisoilants for wool/ rayon blends, cotton and synthetic carpets. Antisoiling properties can be built into rug and fabric shampoos by incorporating Syton into the formulation.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34e

SYTON® P, P-40, P-50, P-200 and P-250 colloidal silica

Syton P, P-40, P-50, P-200 and P-250 are excellent antislip agents for the surface treatment of multiwall bags and paperboard containers to control sliding. All grades are compatible with nonionic and anionic surfactants and are efficient antislip

agents used for formulating industrial water emulsion floor waxes and polishes.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34e

**BACTERIOSTATS/
DISINFECTANTS/
FUNGICIDES/ FUNGISTATS/
GERMICIDES**

**ACL® 56, 59, 60, 66, 85 SANITIZER and
BLEACHING COMPOUNDS**

See Page 63

2,4-DICHLOROPHENOL

See Page 36

**MONSANTO® PENTA pentachlorophenol,
technical**

An industrial biocide and preservative soluble in mineral oils and many commercial solvents. Monsanto Penta is formulated into a variety of products for wood treatment to preserve utility poles, building lumber, fence posts and cellulose building materials against termites, boring insects, and wood rot. It is an effective mildew control agent for oil-based paints.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 31a

**SANTOPHEN® 1 GERMICIDE ortho-benzyl-
parachlorophenol**

Santophen 1 is a 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

0684081

TCC® BACTERIOSTATIC AGENT 3,4,4' trichloro-carbanilide

TCC is a bacteriostatic agent that is supplied to the bar soap industry for use in antibacterial medicated 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 **11c**

E-2® AMMONIUM NITRATE FERTILIZER *industrial grade*

E-2 ammonium nitrate fertilizer is a uniform, pearly white, spherical, hard, dense, free-flowing prill containing no coating or organic matter. In its whole prill form E-2 will not absorb fuel oil and is, therefore, unsuitable for use in Ammonium Nitrate-Fuel Oil (ANFO) mixtures unless ground. It is an inexpensive ingredient for fixed explosives when reduced to small particles by grinding. E-2 has a bulk density of 60 lbs./cu. ft. and contains a nominal 0.5% moisture.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key **11c**

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 ideally suited for use in open pit mining, quarrying and construction.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key **11c**

M•PAK® 100, 500, 600, 650 BLASTING AGENTS

M•Pak blasting agents are medium and high energy nitro carbo nitrate (NCN) explosives supplied for use in coal and metal mining. Available in bulk, paper shot-hole bags and poly-lined wet-hole cartridges.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key **11c**

M•PEL® BLASTING AGENT

M•Pel is a nitro carbo nitrate (NCN) blasting agent supplied for use in mining, quarrying and construction. Available in bulk and 50-lb. multi-wall paper bags. Commonly known as ANFO.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key **11c**

M•POWR® 100, 400, 500, 600, 650 BLASTING AGENTS

M•Powr blasting agents are medium and high energy nitro carbo nitrate (NCN) explosives supplied for use in quarrying and construction. Available in paper shot-hole bags and poly-lined wet-hole cartridges.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key **11c**

M•PULZ® 204, 206, 666 BLASTING AGENTS

M•Pulz blasting agents are high energy nitro carbo nitrate (NCN) explosives suitable for boosting Ammonium Nitrate-Fuel Oil (ANFO) column loads. M•Pulz 204 and 206 are slurry blasting agents supplied in poly and poly-lined cartridges. M•Pulz 666 is available in paper shot-hole bags and poly-lined wet-hole cartridges. M•Pulz 206 is also suitable for use as a column load in severe conditions.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key **11c**

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 of M•Pel, M•Pak, M•Powr, and M•Pulz.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key **11c**

CHEMICAL PROCESSES

SULFURIC ACID PLANTS *process and construction*

Custom-engineered to convert various sources of SO₂ to sulfuric acid. The plants are high efficiency converters constructed to use either the single or interpass absorption contact process.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key **27a**

CHEMICAL SPECIALTY CATALYSTS

Monsanto Enviro-Chem supplies the following catalysts for converting sulfur dioxide to sulfur

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trioxide. These are highly efficient, poisoning-resistant catalysts designed for durability under the operating conditions in the service designated.

CAT-OX A® CATALYST

Supplied as specially designed pelleted catalyst for converting sulphur dioxide in the flue gas of coal burning power plants to usable acid-forming SO₃ in the Cat-Ox® SO₃ removal system.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key 27a

RESLOOM® MELAMINE RESINS

See Page 48

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 27a

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 27a

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 COMMERCIAL PRODUCTS CO.

Locator Key 21a

SCAMPER® OUTDOOR SWEEPERS

A line of lightweight rugged outdoor sweepers. Bristles are made from polyethylene. Unique round bristle head allows for sweeping at many angles. Available at many retail stores in the United States.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 21a

CONTAINERS

CYCLE-SAFE® polymeric bottles

High nitrile polymeric containers (known as LOPAC® during development) to be used for beverages where high barrier properties are required in large volume, single product, pressurized applications, such as for soft drinks.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 22b

PLASTIC BOTTLES and CONTAINERS - BLOWNWARE

Monsanto supplies a large variety of stock sizes and shapes of blow-molded polyolefin containers of high and low density polyethylene and of polypropylene. Custom-designed polyolefin packaging containers in unlimited shapes and sizes, rigid or flexible, can be supplied to meet specific product market requirements.

Stock and custom bottles of rubber modified barrier polymers can be supplied for foods, pharmaceuticals and cosmetics where high barrier properties are required for nonpressurized containers.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 22a

PLASTIC CLOSURES and FITMENTS

Injection molded closures and fitments are supplied in a variety of sizes as companion pieces for polyolefin or nonpressurized rubber modified barrier containers. These are suitable for simply closing the container or for dispensing liquids or powders in drop, spray, squirt, shake or pour form.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 22a

DECORATIVE and INDUSTRIAL LAMINATES

RESIMENE® MELAMINE RESINS laminating

See Page 47

RESINOX® PHENOLIC RESINS varnishes

See Page 48

DEFLOCCULATING AGENT

DEQUEST® deflocculating and sequestering agents

See Page 65

DENTIFRICE ABRASIVES

CALCIUM PYROPHOSPHATE

See Page 42

DICALCIUM PHOSPHATE, ANHYDROUS

See Page 42

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DICALCIUM PHOSPHATE, DIHYDRATE

See Page 42

INSOLUBLE SODIUM METAPHOSPHATE

See Page 43

LUSTRE-PHOS[®] dentifrice abrasive

See Page 42

ELECTRONIC PRODUCTS

INSTRUMENTS

AUXILIARY DIGITAL INSTRUMENTS

Instruments offered as peripheral equipment usually used with data collection systems are a data scanner, 21 column printer and deviation calculator.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 23a

COUNTER-TIMERS

Small half-rack frequency counters which read inputs from DC to 1 GHz (GHz = 1×10^9 cycles/second) have preset, reversible, automatic and dual limit features.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 23a

COUNTER-TIMERS, UNIVERSAL

These programmable high performance frequency counters can operate up to 150 MHz or 512 MHz (MHz = 1 million cycles/second). They also possess an autoranging feature.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 23a

DIGITAL CLOCKS

These instruments, usually used in conjunction with a data system may display hours, minutes and seconds for a continuous 24 hours in digital readout form. They also have a BCD output for computer use.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 23a

DIGITEC[®] DATA ACQUISITION COMPONENTS and SYSTEMS

See Page 32

DIGITEC[®] DIGITAL MULTIMETERS

See Page 32

DIGITEC[®] DIGITAL PANEL METERS

See Page 32

DIGITEC[®] DIGITAL THERMOMETERS

See Page 32

DIGITEC[®] DIGITAL VOLTMETERS

See Page 32

DIGITEC[®] FACTORING COUNTERS, SERIES 8100

See Page 32

HIGH RESOLUTION TIME INTERVAL METER, MODEL 8330

This instrument will perform single event time interval measurements at a resolution of 100 picoseconds (pico = 1×10^{-12}); will average time intervals up to 1000 intervals with resolution to 100 femtoseconds (femto = 1×10^{-15}). Accuracy is better than 1 nanosecond (nano = 1×10^{-9}) for single intervals increasing by the square root of the number of intervals averaged.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 23a

PLUG-IN COUNTER, MAINFRAME, MODEL 1505A

This versatile counter operates in conjunction with a variety of plug-in components. Frequencies as high as 12.5 GHz (GHz = 1×10^9 cycles/second) can be counted.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 23a

PLUG-IN SERIES FOR MODEL 1505A PLUG-IN COUNTER

These plug-in units provide the following features and capabilities for the 1505A Counter: 100 nanosecond time interval, video amplifier, 3 GHz frequency converter, 12.5 GHz frequency converter.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 23a

LIGHT-EMITTING DIODES and ARRAYS

DISPLAYS

Light-emitting diode numeric and alpha-numeric characters.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 24a

GaAsLITE[®] light-emitting diodes

Single semiconductor light-emitting diodes, available in a large number of packages and colors — red, yellow, green and orange.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 24a

LIGHT-EMITTING DIODES, INFRARED

Light-emitting diode products emitting infrared energy at 9000[°] angstroms; available in a variety of package and power ranges.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 24a

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OPTO-ISOLATOR

Optical coupler using infrared light-emitting diode as emitter and photosensitive cell as output stage; in a variety of packages and configurations, used as switches, relays, digital signal components, etc.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **24a**

PHOTO DETECTOR

Photo detectors for sensing light energy: MD1, MD2 — photodiode
MT1, MT2 — phototransistor

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **24a**

SOLID STATE RELAYS. MSR 100 SERIES

All solid state relay component; 10 amp, 115 V.A.C. switching capability.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **24a**

MATERIALS

COOLANOL® 15, 20, 25, 35, 40, 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 six Coolanol fluids span an operating-temperature range of -90°F to 700°F and are used primarily in aerospace and advanced electronic hardware.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **34g**

GALLIUM ARSENIDE

Gallium arsenide is supplied in single-crystal, polished-slice form for use in the manufacture of infrared light emitters. It is also available in single and polycrystalline ingot forms.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **24a**

GALLIUM ARSENIDE PHOSPHIDE ALLOY

Gallium arsenide phosphide is supplied in epitaxial wafer form that consists of a gallium arsenide phosphide epitaxial layer grown on a gallium arsenide polished substrate. The wafers are used for the manufacture of red light-emitting diodes.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **24a**

GALLIUM PHOSPHIDE

Gallium phosphide is supplied in three basic forms: (1) poly porous chunk, (2) single crystal ingots, and (3) epitaxial wafers. The poly porous chunk form is used as starting material in the

manufacture of single crystal ingots, and also as a source material in liquid phase epitaxy. The single crystal form is available both as ingots and in polished slices.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **24a**

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 **34g**

SILICON semiconductor grade

Czochralski rod and slices which are (111) or (100) oriented are available in standard diameter and thickness sizes. MON-X® rod 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 COMMERCIAL PRODUCTS CO.

Locator Key **24a**

ENVIRONMENTAL CONTROL

Enviro-Chem* equipment, developed by Monsanto Enviro-Chem Systems, Inc., is supplied to the chemical processing and power generation industries and to pollution control agencies through an engineering sales service that custom-designs, engineers, and constructs a variety of units for special tasks.

AMMSOX*, CALSOX*, and CAT-OX* SYSTEMS

Systems to remove sulfur oxides from flue gas stream; applicable to utility power generation, industrial boilers, and many other SO₂ emitting sources.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key **27a**

BRINK* ASPHALT VENT SYSTEM

Collects condensed hydrocarbon vapors from vent streams from various asphalt handling and storage systems with efficiencies of 99.5% and higher. System 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 **27a**

BRINK* CASCADE IMPACTOR, MODEL B

Device used to measure particle size distribution of mists and dusts suspended in industrial

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process gas streams at temperatures up to 300°F.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key **27a**

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BRINK® COALESCER

Custom-designed units in circular or cylindrical forms comprising a special fiber bed packed between metal or polyester screens that separate and coalesce finely divided or emulsified liquid organic or aqueous materials from the process stream under a variety of environmental conditions.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key **27a**

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BRINK® FILTER

Custom-engineered fiber beds in several types of required support materials and configurations for removing very fine solids in low concentrations from liquid or gas streams. Collection efficiencies exceed 99%.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key **27a**

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BRINK® MIST ELIMINATOR

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.

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BRINK® MIST SAMPLER, MODEL BMS-10

BMS-10 consists of a glass cyclone and glass fiber filter in a temperature controlled cabinet. Liquid mists or solid particles are collected from gas streams at pressures up to 1 psig and temperatures up to 300°F. A calibrated orifice is included. Model BMS-10 is available as a complete sampling kit with all accessories required for stack sampling. A vacuum pump is available as a separate accessory.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key **27a**

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BRINK® MIST SAMPLER, MODEL BMS-11

BMS-11 includes a Brink Model B cascade impactor in a temperature controlled cabinet. Calibrated orifice is not required since the impactor is used to measure flow. BMS-11 collects mists and dust particles in 7 fractions down to less than 0.25 microns in diameter. The cascade impactor measures particle size distribution in industrial process gas streams. Available as a complete sampling kit with all accessories required for

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stack sampling. A vacuum pump is available as a separate accessory. Accessory deep dish collection cups are available for use in the cascade impactor where increased volume capacity is desired.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key **27a**

BRINK® OLEUM VENT SYSTEM

Converts sulfur trioxide vapor into sulfuric acid mists which are removed in a high efficiency Brink mist eliminator. System 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 **27a**

ENVIRONMENTAL SERVICES

Stack, ambient, or in-plant 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 **61a**

LANDGARD® SYSTEM

A custom-engineered pyrolysis system that reduces solid waste by 94% to 96% (by volume) with emission and discharge effluents within pollution codes. The system can recover resources and generate energy. Systems offered have process capacities of 250, 500, 1,000 tons/day and larger.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key **27a**

EXTRUDED PRODUCTS

EMBOSSSED POLYETHYLENE FILM diaper film

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

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **25b**

FOME-COR® BOARDS

Mobile Home Fome-Cor Sheathing Board: A lightweight, rigid board made of expanded 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 1/4" thickness in widths of 6', 7', 7 1/2' and 8', accordian folded in a length of 420'.

Automotive Fome-Cor Board: A similar sandwich construction as described above, supplied in required

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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 $\frac{1}{8}$ " to $\frac{3}{8}$ " for die-cutting, embossing, silk screening or printing. May be scored and folded for exhibits and point-of-purchase displays.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 25a

GER-PAK® POLYETHYLENE SHEETING and TAPE

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. Ger-Pak tape supplied in 2" x 100' rolls. Used under concrete slabs, over studding, concealed flashing, for weather-protecting materials, closing in unfinished construction, lining crawl spaces, and covering fresh concrete.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 25b

PLASTIC MEAT TRAYS

Clear, see-through, freezer-ready trays for pre-cut meat packaging supplied in eleven different sizes ranging from 5" x 5" x $\frac{1}{8}$ " to 14 $\frac{1}{2}$ " x 5 $\frac{1}{2}$ " x $\frac{1}{8}$ ". Trays are sturdy, thermoformed Polyflex and fit most automatic meat wrapping equipment.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 25c

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, fumigation covers, row covers, pond liners, and protective tarpaulins.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 25b

POLYFLEX® FILM

Supplied in rolls in four gauges from .001" to .002" thickness, Polyflex is a top quality packaging film made of crystal clear biaxially oriented polystyrene. It is heat sealable and shrinkable; possesses excellent dimensional stability and water resistance; and "breathes" vapors making it an outstanding wrap for fresh produce, flowers, and is widely used in window envelopes.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 25c

POLYFLEX® SHEET

Supplied in rolls, Polyflex biaxially oriented polystyrene sheet is supplied in .00275" and .00475" gauges (Clear-Flex) for thermofolding document

protectors, wallet inserts, etc. Thermoforming grades (monomer-controlled) in clear or color heavier gauge sheet (.005" to .020") are supplied for heat forming meat, vegetable and cookie trays and inner packages for highly sensitive foods.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 25c

FABRICS, SYNTHETIC

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 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: bi-component fibers (for sweaters and carpets), differential dyeing companion fibers (for apparel, carpets and home furnishings), producer-colored fibers (for deep-pile and apparel), and solution-dyed fibers (for awnings and indoor-outdoor carpet).

MONSANTO TEXTILES COMPANY

Locator Key 51a

ACTIONWEAR®, BLUE "C"®, CADON®, CUMULOFF®, ULTRON® filament nylon yarns

Available in 1-18 denier per filament products in

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a full range of weaving, knitting, and tufting multifilament yarns for apparel, carpet, home furnishings, industrial, military, and tire applications, as well as monofilaments for hosiery. Tow is also available in regular and higher (30, 45, and 60 dpf) deniers for flocking or other special applications. Types specially engineered for high performance in certain end uses include: *Actionwear* stretch nylon hosiery yarns, *Cadon* static-and-soil-resist carpet yarns, and *Ultron* static-resist apparel yarns. *Cumuloft* bulked, continuous filament nylon for carpets and *Blue "C"* nylon for home furnishings and many other textile uses have long been standards in the industry.

MONSANTO TEXTILES COMPANY

Locator Key 51a

BLUE "C"® and SPECTRAN® polyester fibers

Available in 1.5-15 denier fiber in staple lengths suitable for a wide variety of apparel, carpet, home furnishings, and industrial applications. The standard *Blue "C"* product has excellent whiteness and is crimped for high resilience in woven, knit, and tufted products. *Spectran* 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

CADON® nylon staple

Cadon nylon fiber is available in 18-denier 6-inch staple to produce carpets with superior static-and-soil-resist properties plus a unique rich luster. Two differential-dyeing companion fibers are also available for three-color piece-dyed styles which also meet upholstery and other home furnishings styling requirements.

MONSANTO TEXTILES COMPANY

Locator Key 51a

MONVELLE® biconstituent fiber

Monvelle is a biconstituent fiber (50% nylon and 50% spandex) available in both multifilament yarns and monofilaments. Currently, usage is in men's and women's hosiery of exceptional quality and performance.

MONSANTO TEXTILES COMPANY

Locator Key 51a

POLYESTER FILAMENT YARNS

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

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 flammability standards. This new 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, home furnishings and wigs 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 table linens, two years for area rugs, three years for blankets) Monsanto will refund the purchase price or replace the item when returned with the *Wear-Dated* tag and sales slip. The *Wear-Dated* wig warranty is for six months, replacement only.

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

WIG FIBERS, modacrylic S-32 for ELURA® quality hairgoods

Available in 40 or 50 dpf tow in about 20 basic colors. Specifically developed for hairgoods, it is superior to conventional wig fibers in heat resistance, fiber strength, and restyling capabilities. Can be washed, color-rinsed, and yet retain its original factory-set curl. Used for approved hairgoods (wigs, wiglets, hairpieces and falls), meeting *Elura* quality standards, by organizations licensed by Monsanto to use applicable trademarks for such hairgoods.

MONSANTO TEXTILES COMPANY

Locator Key 51a

0684088

45

FIRE SAFETY, PRODUCTS TO IMPROVE

DIAMMONIUM PHOSPHATE (DAP)

See Page 42

MONOAMMONIUM PHOSPHATE (MAP)

See Page 42

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 **34f**

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 **34e**

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 **32a**

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 **32a**

PYDRAUL® 230C, 312C, 540C, MC hydraulic fluids

See Page 30

PYDRAUL® 10E, 29E LT, 30E, 50E, 65E, 90E, 115E hydraulic fluids

See Page 30

SANTICIZER® 140 plasticizer

See Page 46

SANTICIZER® 141 plasticizer

See Page 46

SANTICIZER® 148 plasticizer

See Page 46

SANTOSAFE® 15, 20, 30 water/glycol hydraulic fluids

See Page 31

SEF® modacrylic fibers

See Page 25

SKYDROL® fire resistant hydraulic fluids

See Page 30

TETRATHAL® tetrachlorophthalic anhydride

A versatile, effective, 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 INDUSTRIAL CHEMICALS CO.

Locator Key **34d**

TRIPHENYL PHOSPHATE (TPP)

See Page 47

FOAM INGREDIENTS — RESINOUS POLYOL

STYRENE-ALLYL ALCOHOL RESINS

See Page 52

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 **34a**

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 **34a**

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 **34a**

H.T.[®] MONOCALCIUM PHOSPHATE *monohydrate*

See Page 28

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.

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 **34a**

MONOAMMONIUM PHOSPHATE (MAP)

See Page 42

MONOSODIUM PHOSPHATE (MSP)

See Page 44

PHOSPHORIC ACID 75, 80 and 85%

See Page 43

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

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

See Page 26

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

See Page 29

DIAMMONIUM PHOSPHATE (DAP)

See Page 42

DICALCIUM PHOSPHATE, ANHYDROUS

See Page 42

DICALCIUM PHOSPHATE, DIHYDRATE

See Page 42

DISODIUM PHOSPHATE, ANHYDROUS

See Page 43

DISODIUM PHOSPHATE, DUOHYDRATE

See Page 43

EMULSI-PHOS[®] *cheese emulsifier*

See Page 43

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

See Page 27

H.T.[®] MONOCALCIUM PHOSPHATE *monohydrate*

See Page 28

MONOAMMONIUM PHOSPHATE (MAP)

See Page 42

MONOSODIUM PHOSPHATE (MSP)

See Page 44

PHOSPHORIC ACID 75, 80 and 85%

See Page 43

SODIUM ACID PYROPHOSPHATE (SAPP)

See Page 29

SODIUM HEXAMETAPHOSPHATE

See Page 44

SODIUM TRIPOLYPHOSPHATE (STP)

See Page 44

TETRASODIUM PYROPHOSPHATE

See Page 44

TRICALCIUM PHOSPHATE

See Page 43

TRISODIUM PHOSPHATE, ANHYDROUS (TSP/A)

See Page 44

TRISODIUM PHOSPHATE, CRYSTALLINE

See Page 44

0684090

FLAVORINGS

CAFFEINE ANHYDROUS U.S.P.

Caffeine U.S.P. is used as a mild stimulant in pharmaceutical and soft drink beverages. It is found naturally in tea, coffee, kola, mate, etc., and is also produced synthetically.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34a

COUMARIN

See Page 34

ESSENTIAL OILS

Monsanto Flavor/Essence is a basic manufacturer of essential oils and oleoresins. It also sells aromatic chemicals. Products are used extensively in the food, beverage and cosmetic industries. Products of our own manufacture are:

Oil of Cardamom	Geraniol
Oil of Cassia	Linalool
Oil of Celery	Rhodinol
Oil of Clove	Resin Peru Balsam
Oil of Coriander	Resin Benzoin
Oil of Cubebs	Resin Celery
Oil of Ginger	Resin Ginger
Oil of Nutmeg	Resin Labdanum
Oil of Olibanum	Resin Olibanum
Oil of Opoponax	Resin Opoponax
Oil of Patchouli	Resin Orris
Oil of Black Pepper	Resin Pepper
Oil of Peppermint	Resin Styrax
Oil of Pimento	Resin Tolu Balsam
Oil of Sandalwood	Resin Tonka
Citral	Vanilla Concentrate
Eugenol	

MONSANTO FLAVOR/ESSENCE INC.

Locator Key 34c

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 34a

FLAVORINGS

Monsanto Flavor/Essence supplies an extensive line of natural and imitation flavors in both liquid and spray dried form, as well as offering a customized flavor service to meet individual requirements for use in the food, beverage, confectionary, tobacco, liquor, pet food, baking, dairy, dessert and pharmaceutical industries.

MONSANTO FLAVOR/ESSENCE INC.

Locator Key 34c

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 34a

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 34a

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 34a

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 34a

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 34a

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 34a

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.

The industrial grade is supplied for use in oil well drilling muds and acid metal cleaners.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34a

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 34a

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 34a

MONOSODIUM PHOSPHATE (MSP)

See Page 44

PHOSPHORIC ACID 75, 80 and 85%

See Page 43

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

Sodium benzoate is available in powder, flake and densified form and is used in preserving such products as fruit juices, soft drinks, margarine and medicinal preparations.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34a

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 major preservative for food, and to a lesser extent, for drugs and cosmetics.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34a

TETRASODIUM PYROPHOSPHATE

See Page 44

FRAGRANCES

AMYL SALICYLATE

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

MONSANTO FLAVOR/ESSENCE INC.

Locator Key 34c

BENZYL ACETATE

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

MONSANTO FLAVOR/ESSENCE INC.

Locator Key 34c

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 FLAVOR/ESSENCE INC.

Locator Key 34c

ESSENTIAL OILS

See Page 28

FRAGRANCES

Monsanto Flavor/Essence creates custom-made fragrances for all types of perfume, cosmetic, household and industrial applications. Included are: fine fragrances, colognes, after shave lotions, toiletry and personal care products; household products such as room deodorizers, detergents, polishes and cleaning preparations; for industrial products such as paints, inks, and adhesives. Fragrances are created to give a distinctive, appealing quality, characterizing the individual product concept. Special formulations are also available for deodorizing or masking of unpleasant odors for home and industrial applications.

MONSANTO FLAVOR/ESSENCE INC.

Locator Key 34c

ISOBUTYL SALICYLATE

A clear aromatic ester with a strong characteristic odor supplied to formulators of perfumes and industrial odorants.

MONSANTO FLAVOR/ESSENCE INC.

Locator Key 34c

0684092

29

FUNCTIONAL FLUIDS

AIRBORNE and SPECIALTY

OS-45* TYPE IV high temperature hydraulic fluid

OS-45 Type IV is a silicate-ester based fluid especially suited for high temperature hydraulic applications.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34g

SKYDROL* fire resistant hydraulic fluids

Skydrol fluids are engineered from a series of fire resistant, highly stable phosphate ester base stocks specially-processed to be clean and particle-free and formulated for a particular type of aircraft service. The operating temperatures, viscosity characteristics, pumpability of each are designed for their recommended service. These include: Skydrol "500B" and "LD" grades for jet aircraft. Skydrol fluids require compatible construction materials in seals, packings, paints, and wiring. They are "designed-in" to the specific aircraft with the collaboration of Monsanto's technical service support. They are distributed world-wide to commercial airlines.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34g

SKYLUBE* 450 jet engine hydraulic fluid

Skylube 450 is a chemically-made lubricant specially engineered for Type II+ jet engines. It is designed to provide better thermal stability and greater cleanliness of operation than existing products. Supplied to commercial airlines and to utilities for use in turbine engines.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34g

DIELECTRIC

AROCLOR* 1016 capacitor dielectric

Aroclor is a fire resistant liquid with high dielectric strength and volume resistivity supplied exclusively for impregnating ballast and for motor run and power factor correction type capacitors.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34g

ASKAREL dielectric fluids

Fire resistant dielectric coolants supplied exclusively for askarel-type, sealed-liquid transformers. Trademarked fluids include Pyranol (General Electric) and Inerteen (Westinghouse).

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34g

COOLANOL* 15, 20, 25, 35, 40, 45 dielectric coolants and heat transfer media

See Page 22

OS-59* dielectric heat transfer fluid

See Page 22

INDUSTRIAL

OS-84* reactor grade, partially hydrogenated terphenyl

Supplied as a clear, stable high boiling point liquid. OS-84 is partially hydrogenated terphenyl. It is supplied for use as a coolant in nuclear reactors.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34g

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 34g

PYDRATEK* 100 protective coating preservative, phosphate ester

A phosphate ester fire resistant preservative fluid for rust and corrosion protection (during storage) of industrial hydraulic systems to be operated on phosphate ester fluid.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34g

PYDRAUL* 230C, 312C, 540C, MC hydraulic fluids

Pydraul C-series (phosphate ester/hydrocarbon blends) are low cost, fire-resistant fluids for industrial hydraulic applications. Pydraul 230C, Pydraul 312C and Pydraul 540C offer a broad viscosity range for diecast machines, continuous casters, rolling mill systems, automatic mining equipment, etc.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34g

PYDRAUL* 10E, 29E LT, 30E, 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 34g

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SANTOSAFE® 15, 20, 30 water/glycol hydraulic fluids

Santosafe water/glycol fluids offer fire resistance in general purpose industrial hydraulic applications. The viscosity properties of Santosafe 15, Santosafe 20 and Santosafe 30 allow users to select the desired operating temperature range for their equipment.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **34g**

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SANTOTRAC® LUBRICANTS synthetic hydrocarbons See Page 34

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Locator Key **34g**

TURBINOL® 1122 and 1223 turbine lubricants

Turbinol 1122 and 1223 are two viscosity grades of fire resistant turbine lubricants designed for use in industrial gas and steam turbines and other rotating machinery.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **34g**

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Locator Key **34g**

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 **34g**

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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 800°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 **34g**

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 **34g**

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 **34g**

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 **61a**

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 INDUSTRIAL CHEMICALS CO.

Locator Key **34d**

MURIATIC ACID hydrochloric acid

Supplied as 18° Be., 20° Be., and 22° Be. acid assaying 27.9%, 31.5%, and 35.2% HCl. It is widely used in the manufacture of starch, glucose, gelatin, galvanizing, paper, leather and in the steel industry.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **34d**

NITRIC ACID 38° - 42°

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key **13a**

NITRIC ACID concentrated

Supplied as a light yellow to reddish brown fuming liquid.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key **13a**

0684094

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SANTOSITE® sodium sulfite anhydrous, technical

Supplied as technical grade anhydrous salt, in the form of tan crystalline powder, assay (Na_2SO_3) 97.5% minimum. It is used as a reducing agent for removing oxygen from boiler feed water, as a depressant in ore flotation, for straw and wood pulping, and in the manufacture of rubber and cordage.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34d

SULFURIC ACID and OLEUM

Monsanto supplies commercial sulfuric acid, oleum, and storage battery acid in the specification ranges commercially required. 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 INDUSTRIAL CHEMICALS CO.

Locator Key 34d

INSTRUMENTS

ELECTRONIC INSTRUMENTS

AUXILIARY DIGITAL INSTRUMENTS

See Page 21

COUNTER-TIMERS

See Page 21

COUNTER-TIMERS, UNIVERSAL

See Page 21

DIGITAL CLOCKS

See Page 21

HIGH RESOLUTION TIME INTERVAL METER, MODEL 8330

See Page 21

NUCLEAR INSTRUMENTATION

See Page 21

PLUG-IN COUNTER, MAINFRAME, MODEL 1505A

See Page 21

PLUG-IN SERIES FOR MODEL 1505A PLUG-IN COUNTER

See Page 21

PROCESS CONTROL EQUIPMENT

See Page 53

RUBBER TESTING INSTRUMENTS

See Page 60

TEST and MEASUREMENT

CAPILLARY RHEOMETER, AUTOMATIC

See Page 60

DIGITEC® DATA ACQUISITION COMPONENTS and SYSTEMS

Systems that log data in digital form. Components may include clock, printer, controller, tape punch, comparator and other peripheral instruments. Complete integrated packaged systems are also available.

*Trademark of United Systems Corporation

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 23a

DIGITEC® DIGITAL MULTIMETERS

Instruments that measure AC/DC voltage, current, DB and resistance and display data with light-emitting numerics.

*Trademark of United Systems Corporation

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 23a

DIGITEC® DIGITAL PANEL METERS

Meters that give electronic digital display of amperes, volts or millivolts to 3, 3½ or 4½ digits.

*Trademark of United Systems Corporation

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 23a

DIGITEC® DIGITAL THERMOMETERS

Temperature measuring instruments that provide a digital readout of temperature in °C or °F. Platinum, Thermistor and Thermocouple models.

*Trademark of United Systems Corporation

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 23a

DIGITEC® DIGITAL VOLTMETERS

Meters that measure DC voltage from 0 - 1000 volts and display the data in a digital readout with light-emitting numerics. Autoranging, BCD outputs available.

*Trademark of United Systems Corporation

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 23a

DIGITEC® FACTORING COUNTERS, SERIES 8100

These instruments accept inputs from 5 Hz to 100 KHz (KHz = 1000 cycles/second) and provide multiple time base programming for display in many engineering units utilizing light-emitting numerals.

*Trademark of United Systems Corporation

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 23a

ELT EXTRUSION
See Page 60

ELT INDEXER
See Page 60

INVESTMENT
PRODUCT

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IsolPhos®

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MELT EXTRUSION STRENGTH APPARATUS

See Page 60

MELT INDEXER

See Page 60

INVESTMENT CASTING PRODUCTS

SILESTER[®] ethyl silicate

Silester OS (unhydrolyzed) and Silester A-1 (pre-hydrolyzed) are ideally suitable binders for various metal casting processes such as precision investment casting, ceramic shell molds and precision piece molds. Other applications include use as a binder for refractory materials and for zinc silicate coatings.

Trademark of Monsanto Limited

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34e

SYTON[®] FM and 200-IC colloidal silica

Syton 200-IC and Syton FM are versatile binders for ceramic shell molds used in precision investment metal casting.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34e

METAL PROCESSING COMPOUNDS

BONE ASH (NATURAL)

Supplied as finely divided powder [$\text{Ca}_3(\text{OH})(\text{PO}_3)_2$] for use as a mold-wash for coating molds used for copper castings and for iron molds, trays, and tools used to produce stainless steel, bronze, aluminum, and chinaware products.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34e

FERROPHOSPHORUS iron phosphide

Phosphorus by-product used for vanadium recovery. Soda Springs, Idaho material runs about 13.5% V_2O_5 . Columbia, Tenn. material is 23% phosphorus, 70% iron and is used in the manufacture of steel, in foundries and as a dense aggregate.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 35a

LoSilPhos[®] ferrophosphorus briquettes

High grade ferrophosphorus briquettes used in steelmaking for its phosphorus content. LoSilPhos

is designed to minimize silicon contamination, improve steel machinability, reduce silica occlusions, and improve plant handling. All active ingredients are in prepackaged briquettes. LoSilPhos offers a unique method for producing low-silicon rephosphorized steel.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 35a

MONOSODIUM PHOSPHATE (MSP)

See Page 44

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, aluminum and chinaware.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34e

PHOSPHORIC ACID 75, 80 & 85%

See Page 43

VANILLIN TECHNICAL

See Page 36

NUCLEAR SOURCES

NUCLEAR INSTRUMENTATION

See Page 31

NUCLEAR SERVICES

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

MONSANTO RESEARCH CORPORATION

Locator Key 61a

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 61a

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 61a

0684096

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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 **34a**

METHYL SALICYLATE U.S.P.

See Page 28

SANTOMASK® II odor-masking agent

Santomask II is an odor-control agent for paint, ink, plastics, and other odorous products.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **32a**

VANILLIN MONSANTO®

See Page 28

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 **34g**

ORGANIC CHEMICALS

ACIDS and ANHYDRIDES

ACETIC ACID 95%

Used as pH adjuster and acid wash in numerous textile and other industrial applications.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **34a**

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

See Page 26

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

See Page 29

EMA® RESINS ethylene-maleic anhydride copolymers

See Page 51

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

See Page 27

FUMARIC ACID, TECHNICAL GRADE

See Page 51

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

See Page 27

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 INDUSTRIAL CHEMICALS CO.

Locator Key **34d**

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 INDUSTRIAL CHEMICALS CO.

Locator Key **34d**

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 **34a**

TETRATHAL® tetrachlorophthalic anhydride

See Page 26

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MONSANTO

3,4-DICHL

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MONSANTO

DODECYL

See Page

ortho- and
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ortho-NIT
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para-PHE
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BLEACH
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BENZY

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MONSANTO

ortho-
See Page

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ortho-
See Page

AMINES

CYCLO- and DICYCLOHEXYLAMINE

Supplied as clear liquids to chemical manufacturers as an amine intermediate for the manufacture of dyes and as an anticorrosion additive for formulating oils, dry cleaning soaps, and non-aqueous specialty products.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **34d**

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 35

ortho- and para-NITROANILINE

See Page 35

ortho-NITROANISOLE

See Page 35

para-PHENETIDINE

See Page 35

HALOGEN-CONTAINING COMPOUNDS

ACL[®] 56, 59, 60, 66, 85 SANITIZER and BLEACHING COMPOUNDS

See Page 63

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 INDUSTRIAL CHEMICALS CO.

Locator Key **34d**

ortho and para-DICHLOROBENZENE

See Page 35

MONSANTO[®] PENTA *pentachlorophenol, technical*

See Page 18

ortho- and para-NITROCHLOROBENZENE

See Page 35

PHTHALYL CHLORIDE *phthaloyl chloride*

Used by chemical manufacturers as an intermediate in the manufacture of plasticizers, resins, and for general organic synthesis.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **34d**

SANTOPHEN[®] 1 GERMICIDE

See Page 18

SANTOPHEN[®] 1 SOLUTION

See Page 18

TCC[®] 3,4,4'-trichlorocarbanilide

See Page 19

TETRATHAL[®] *tetrachlorophthalic anhydride*

See Page 26

INTERMEDIATES

AROMATIC CHEMICAL INTERMEDIATES

Monsanto supplies a wide variety of benzene derivatives to chemical manufacturers as raw materials for further conversion into 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 INDUSTRIAL CHEMICALS CO.

Locator Key **34d**

para-CHLOROPHENOL

See Page 36

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

See Page 35

2,4-DICHLOROPHENOL

See Page 36

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 **32a**

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TOLUENESULFONYL CHLORIDE, MIXED

Mixed TSCI 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 32a

PHARMACEUTICALS

ACETYSALICYLIC 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 34a

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 as a miticide and in the treatment of scabies. Additionally, benzyl benzoate is used in textile dye intermediate formulations.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34a

CAFFEINE ANHYDROUS U.S.P.

See Page 28

METHAPYRILENE FUMARATE

Methapyriline salts are used in the formulation of antihistamine preparations and over-the-counter sleep inducers.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34a

METHAPYRILENE HYDROCHLORIDE

Supplied as white or yellow-white crystals, assay 99.2%, methapyriline (thenylpyramine) hydrochloride is an alternate antihistaminic compound for the same uses as fumarate salt.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34a

PHENACETIN U.S.P. *acetophenetidin*

Phenacetin is used as a major antipyretic ingredient in A-P-C tablets, marketed over-the-counter and in prescription combination with other drug actives. It is also used in the textile industry as a dye intermediate.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34a

SALICYLAMIDE N.F.

Salicylamide N.F. is a mild analgesic with improved stability and solubility for use in liquid and solid dosage combination drug formulations such as elixirs, solutions, lozenges and tablets. It also has antipyretic and antirheumatic properties.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34a

SODIUM LACTATE

A 60% aqueous solution of the sodium salt of lactic acid used as a pharmaceutical raw material and buffering solution.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34a

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 34a

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. Other potential applications are as dye carrier, or as other PCP ethoxylates.

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**

ortho- and para-NITROPHENOL

Supplied in tan to greenish brown flake or granular form, assay 99.0% minimum, molecular weight 139.11. Both compounds are highly toxic. They are used by chemical manufacturers as intermediates for making dyestuffs, insecticides, photographic chemicals, leather tanning compounds and pharmaceuticals.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key **13a**

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 40

SULFONIC ACIDS

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 INDUSTRIAL CHEMICALS CO.

Locator Key **34d**

DBSA 99-B *alkylbenzene sulfonic acid-biodegradable*

See Page 63

para-TOLUENESULFONAMIDE

See Page 35

TOLUENESULFONIC ACID, TECHNICAL

Supplied as a liquid or semi-crystalline solid, assay 95% minimum, toluenesulfonic acid is used as an acid catalyst in the production of alkyl and phenol-formaldehyde resins; for the manufacture of phthalate ester plasticizers; as an intermediate for the synthesis of cresols, herbicides, dyes and other organics; for the refining of toluene; and in the production of acid resistant cements, tung oil coatings, and epoxy varnishes.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **34d**

para-TOLUENESULFONYL CHLORIDE

See Page 35

TOLUENESULFONYL CHLORIDE, MIXED

See Page 36

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 **13a**

SANTOLITE® MHP RESIN

See Page 53

SANTONOX® and SANTONOX® R antioxidant

See Page 17

SANTOWHITE® POWDER antioxidant

See Page 18

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 **34e**

CYCLOHEXANOL

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **34d**

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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 POLYMERS & PETROCHEMICALS CO.

Locator Key **43a**

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

See Page 29

PAINT/COATING INGREDIENTS

BUTVAR® RESINS

See Page 50

FILTROS® gum rosin

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **34b**

FORMVAR® RESINS

See Page 51

GELVA® COPOLYMER RESINS

See Page 49

GELVA® MULTIPOLYMER RESIN SOLUTIONS

See Page 49

GELVA® RESIN EMULSIONS

See Page 49

GELVATOL® RESINS

See Page 50

LAMPBLACK

Lampblack is derived from the slow burning (destructive distillation) of petroleum oils in furnaces. A variety of grades are available exhibiting a range of physical, chemical and electrical properties. Major uses are in antibleemish tire paints, carbon brushes and electrodes, paints and inks.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **34e**

LYTRON® LATICES

See Page 52

MALEIC ANHYDRIDE

See Page 34

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 **32a**

MODAFLOW® POWDER resin modifier

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **32a**

MOD-EPOX® epoxy resin modifier

See Page 51

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 **32a**

PHTHALIC ANHYDRIDE

See Page 34

PHOS-CHEK P/30 fire retardant

See Page 26

RESIMENE® MELAMINE-FORMALDEHYDE

RESIMENE® UREA-FORMALDEHYDE RESINS coatings

See Page 47

RESINOX® PHENOLIC RESINS liquid solutions

See Page 48

SANTICIZER® 160 plasticizer

See Page 46

SANTOCEL® silica aerogel

See Page 17

SANTOLITE® MHP RESIN

See Page 53

SANTOLITE® MS RESIN

See Page 53

SANTOMASK® II odor-masking agent

See Page 34

STYRENE

See Pa

TETRAPC

See Pa

TETRATH

anhydride

See Pa

PAPE

BUTVAR

See Pa

GELVA®

See Pa

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STYRENE-ALLYL ALCOHOL RESINS

See Page 52

TETRAPOTASSIUM PYROPHOSPHATE

See Page 43

TETRATHAL® tetrachlorophthalic anhydride

See Page 26

PAPER CHEMICALS

BUTVAR® RESINS

See Page 50

GELVA® COPOLYMER RESINS

See Page 49

GELVA® COPOLYMER RESIN SOLUTIONS

See Page 49

GELVA® MULTIPOLYMER RESIN SOLUTIONS

See Page 49

GELVA® RESIN EMULSIONS

See Page 49

GELVA® RESIN POWDERS

See Page 49

GELVA® RESIN SOLUTION

See Page 50

GELVATOL® RESINS

See Page 50

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 starch *Scripset* mixtures.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34g

LYTRON® LATICES

See Page 52

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 INDUSTRIAL CHEMICALS CO.

Locator Key 34g

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* functions well over a pH range of 4.0 to 6.8.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34g

RPC-1600 cationic resin

A water solution of a highly cationic nonthermo-setting resin, used as a retention aid.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34g

SANTO-RES® 21, 23, 30 SERIES paper chemicals

Santo-Res 21 is a cationic retention aid, useful for retaining dispersed rosin sizes, improving drainage, and retaining fines.

Santo-Res 23 is a polymer solution added to unbleached paper pulp. It is 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 is a caustic activatable polymer solution designed to impart high levels of wet strength to paper products made from bleached or reclaimed pulp. It is also effective as a Yankee drier coating aid.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34g

SANTOSIZE® paper sizing agent

Santosize paste rosin sizes are partially-neutralized rosin sizing agents for specific paper and paperboard grades where the higher efficiency of fortified size is not required. The Santosize pastes emulsify readily.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34g

SCRIPSET® 100, 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* 100 series are based on melamine-formaldehyde and are used to formulate water-insoluble coatings applied at the size press. 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 INDUSTRIAL CHEMICALS CO.

Locator Key 34g

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STEROX[®] DF SURFACTANT
See Page 64

STEROX[®] DJ SURFACTANT
See Page 64

STEROX[®] NJ SURFACTANT
See Page 64

SYTON[®] P, P-40, P-50, P-200 and P-250
colloidal silica
See Page 18

PETROCHEMICALS

MONOMERS

ACETIC ACID *glacial and commercial*

Supplied in commercial grades and as glacial acetic, assay minimum 99.8% acetic acid. Shipped clear and sediment free 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 POLYMERS & PETROCHEMICALS CO. Locator Key **41a**

ACRYLONITRILE

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

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key **41a**

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 POLYMERS & PETROCHEMICALS CO. Locator Key **41a**

FORMALDEHYDE

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

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key **41a**

PHENOL

Supplied as a solid or liquid solution in commercial or U.S.P. grades. 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.

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key **41a**

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 alkyls for surface coatings.

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key **41a**

VINYL ACETATE MONOMER

HQ grade (uninhibited) and DPA grade inhibited with diphenylamine are supplied in liquid form. Vinyl acetate is a reactive monomer used in the manufacture of polyvinyl acetate resins; PVAc latices used in adhesives and surface coatings; and for making copolymer resins for molding and extruding.

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key **41a**

OTHER PETROCHEMICALS

ACETONE

Supplied as a clear, water-white 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 POLYMERS & PETROCHEMICALS CO. Locator Key **41a**

ACETOPHENONE

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

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key **41a**

AROMATIC CONCENTRATE C₉ 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 POLYMERS & PETROCHEMICALS CO. Locator Key **41a**

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BUTENE-2 CONCENTRATE

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

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

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 POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

CUMENE

An aromatic organic compound supplied in liquid form to chemical manufacturers for making intermediates.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

CUMENE CONCENTRATE

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

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

DICYCLOPENTADIENE CONCENTRATE

A liquid concentrate containing a minimum of 80% C_5H_6 supplied to chemical manufacturers for making hydrocarbon resins, insecticides, surface coatings and intermediates.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

DIISOPROPYLBENZENE

An industrial grade hydrocarbon that assays 60-65% mixed isomers supplied as a chemical intermediate and as an aromatic gasoline blend stock.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

ETHYLBENZENE

A liquid organic compound supplied to chemical manufacturers for conversion to styrene monomer and for use as a resin solvent.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

ETHYLENE

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

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

ISOPRENE CONCENTRATE

An aliphatic liquid rich in isoprene, that is supplied to chemical manufacturers for making isoprene monomers, for *cis*-polyisoprene rubber and as a resin raw material.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

METHANOL *methyl alcohol*

Commercial methyl alcohol supplied to the chemical processing industries for use as an intermediate, for making formaldehyde, as an anti-freeze, a solvent, and a denaturant.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

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. It has reaction properties similar to acetylene.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

alpha-METHYLSTYRENE *crude*

A commercial chemical raw material containing 70-75% *alpha*-methylstyrene, 14-17% cumene—supplied as a chemical intermediate to chemical manufacturers for making plastics, surface coatings and synthetic rubber.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

PHENOLIC TARS

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

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

PIPERYLENE CONCENTRATE

An aliphatic liquid containing approximately 30% minimum assay of *trans*- and *cis*-piperlylenes ($CH_2 = CHCH=CHCH_3$). The concentrate is supplied to chemical manufacturers for making hydrocarbon resins and intermediates.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

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PROPANE

An industrial gas meeting NGPA Propane HD-5 specifications used as a chemical intermediate or fuel.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

PROPYLENE

An olefinic hydrocarbon raw material shipped as a liquid under pressure with 92% minimum of $\text{CH}_3\text{CH}=\text{CH}_2$, the balance principally propane. Supplied to chemical manufacturers for manufacture of intermediates.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

RESIN OIL

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

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

RESIN PR

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

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

TOLUENE

An aromatic liquid hydrocarbon supplied as the commercial grade of $\text{CH}_3\text{C}_6\text{H}_5$ to chemical manufacturers for making organic intermediates and to a variety of industries for use as a solvent.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

XYLENES para/meta

Supplied as para/meta xylenes as commercial grade $(\text{CH}_3)_2\text{C}_6\text{H}_4$ to chemical manufacturers to be used in the manufacture of intermediates such as terephthalic and isophthalic acids and their esters.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 41a

PHOSPHORUS and PHOSPHORUS DERIVATIVES AMMONIUM PHOSPHATES

DIAMMONIUM PHOSPHATE (DAP)

Industrial grade diammonium phosphate is used as a fire retardant additive, as a dry source of

nitrogen and phosphorus in soluble specialty type fertilizers, and as a builder in hard surface detergent formulations.

Food grade is used in food processing, vinegar, and as a nutrient in yeast and antibiotic manufacturing.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 31a

MONOAMMONIUM PHOSPHATE (MAP)

Technical grade MAP is a fire retardant that may be useful in paper, wood, textiles; helps reduce afterglow in matches; acidulant in dye bath and is the major ingredient in ABC type fire extinguishers.

Food grade MAP is used for special medicinal purposes; nutrient solutions; manufacture of yeast, vinegar, yeast foods, bread improvers.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 31a

CALCIUM PHOSPHATES

BONE ASH (NATURAL)

See Page 33

CALCIUM PYROPHOSPHATE

Food grade phosphate salt supplied in regular and improved grades 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 28

LUSTRE-PHOS* dentifrice abrasive

Lustre-Phos is a white tasteless crystalline powder used in dentifrices as a controlled abrasive to im-

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MONSANTO INDUSTRIAL CHEMICALS CO.

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MOULD COAT *synthetic bone ash*
See Page 33

Key **31a**

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PY-RAN® *anhydrous monocalcium phosphate*
See Page 28

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 **34a**

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Key **31a**

PHOSPHORIC ACIDS

PHOSPHORIC ACID 75, 80 and 85%

Technical grade phosphoric acid is used in the manufacture of phosphate salts; as a drying agent in intermediate chemicals and dye manufacture; process ingredient in engraving and lithography; an opacifier in glass manufacture; in the manufacture of certain pharmaceutical chemicals, dental cements, rustproofing compounds; for silage preservation; a clarifying agent in sugar; for brightening silk, dyeing of cotton, and printing; for water softening and correction of alkalinity; in the electropolishing and pickling of steel; in the manufacture of special bricks; as petroleum processing catalyst; and as a component in bright dip aluminum baths.

Food grade phosphoric acid is used in the manufacture of gelatin; substitute for tartaric and citric acids in jelly, preserves and soft drinks.

MONSANTO INDUSTRIAL CHEMICALS CO.

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POTASSIUM PHOSPHATES

MONOPOTASSIUM PHOSPHATE

Technical and food 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**

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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 manufacturing and as a hydrogen sulfide scavenger in petroleum processes.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **31a**

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 **34a**

EMULSI-PHOS® cheese emulsifier

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **34a**

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® *sodium aluminum phosphate*
See Page 28

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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 meal products and frozen egg preservation.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **31a**

OILFOS® 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® sodium aluminum phosphate

See Page 28

SODIUM ACID PYROPHOSPHATE (SAPP)

See Page 29

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 is used in curing hams and related meat products.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **31a**

SQ PHOSPHATE sequestant

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® sodium aluminum phosphate

See Page 29

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**

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 33

LoSilPhos® ferrophosphorus briquettes

See Page 33

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 INDUSTRIAL CHEMICALS CO.

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PHOSPHORUS OXYCHLORIDE

Supplied as a water white liquid, assay 99.75%, to chemical manufacturers for use as a chlorinating agent and catalyst in making various intermediates, medicinals, dyestuffs and a reagent for making acetic anhydride and organic phosphates.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34d

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; as a catalyst in production of blown asphalt.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34d

PHOSPHORUS TRICHLORIDE

Supplied as a water white liquid, assay 99.75%. It is used by chemical manufacturers variously as a chlorinating agent, catalyst, and reagent for making acetic anhydride, organic phosphates, germicides, medicinals and in producing iridescent metallic deposits.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34d

SANTICIZER® 140 plasticizer

See Page 46

PLASTICIZERS

DICYCLOHEXYL PHTHALATE (DCHP)

Dicyclohexyl phthalate is widely used as a plasticizer for nitrocellulose. It contributes adhesion, oil resistance, heat sealability and hardness. DCHP is also used in combination with liquid plasticizers in polyvinyl acetate, and is used in acrylic lacquers and heat activated adhesives.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 32a

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 32a

DIETHYL PHTHALATE (DEP)

Diethyl phthalate is a widely used plasticizer for cellulose acetate due to its high degree of compatibility, excellent light stability and over-all properties. DEP is also used in polyvinyl acetate

adhesives and for plasticizing other resin systems, i.e., polystyrene, acrylics, alkyds, ethylcellulose, neoprene and nitrile rubbers, phenolics and polyvinyl butyral.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 32a

DIMETHYL PHTHALATE (DMP)

Dimethyl phthalate is widely used in cellulose acetate, particularly molding compounds; additionally, DMP is widely used as a dispersant for organic and inorganic peroxides. It is also compatible with nitrocellulose, ethylcellulose, alkyds, phenolics, acrylics, polystyrene and nitrile rubber.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 32a

DIPHENYL PHTHALATE

Diphenyl phthalate is a fused solid with a slight yellow or brown cast. It is compatible with a wide variety of cellulosic, vinyl, phenolic, polystyrene and other resins. Diphenyl phthalate is an ideal plasticizer for use in making heat-sealing and delayed-tack adhesives. It is also useful in lacquers, molding compounds, and films, and as a rigid vinyl processing aid.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 32a

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 32a

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 32a

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 gloss not obtainable with other plasticizers. Being plastic-

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cally insoluble in petroleum hydrocabons, it is a valuable plasticizer for coatings designed to withstand gasoline and related products.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 32a

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 32a

SANTICIZER® B-16 butyl phthalylbutyl glycolate

A versatile and high quality plasticizer particularly suited for extrusions and coatings in contact with foods. It is useful in formulating for end products which will be used with foods sensitive to foreign taste and odor, particularly in such applications as cap liners and dispensing tubing for carbonated beverages.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 32a

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 32a

SANTICIZER® 97 di(n-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 32a

SANTICIZER® 140 mixed cresyl phenyl phosphate

Santicizer 140 is a flame retardant plasticizer and resin modifier. It imparts excellent permanence, and chemical stability and equal heat and light stability; gives better low-temperature flexibility and abrasion resistance; is a stronger solvent and slightly more efficient than tricresyl phosphate. Can be used wherever tricresyl phosphate is used. Improved flexibility imparted by *Santicizer 140* makes it preferable to tricresyl phosphate in many applications such as vinyl sheeting, lacquers and paper coating.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 32a

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.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 32a

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 low 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 32a

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 32a

SANTICIZER® 261

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 32a

SANTICIZER® 278

Santicizer 278 is a fast fusing, extremely low volatile monomeric plasticizer that offers a high degree of permanence, comparable to polymeric, yet retains the excellent processing characteristics of monomers 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 32a

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 32a

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 32a

SANTICIZER® 412

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 32a

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 32a

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 32a

SANTICIZER® 711 *diheptyl, 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 32a

SANTONOX® and SANTONOX® R antioxidant See Page 17

SANTOWHITE® POWDER antioxidant See Page 18

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 anti-foaming agent and high boiling solvent used in 2,4-D concentrates and uranium recovery.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 32a

TRIPHENYL PHOSPHATE (TPP)

Triphenyl phosphate is primarily used as a flame-retardant plasticizer for cellulose. It also is of interest in heat sealing coatings and adhesives.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 32a

PLASTICS and RESINS

FORMALDEHYDE RESINS

RESIMENE® MELAMINE-FORMALDEHYDE

RESIMENE® UREA-FORMALDEHYDE RESINS *coatings*

See Page 47

RESINOX® PHENOLIC RESINS *liquid solutions*

See Page 48

MELAMINE and UREA RESINS

RESIMENE® MELAMINE RESINS *laminating*

Melamine-formaldehyde resins in syrup, liquid and spray-dried powder form, *Resimene* industrial resins are used for making impregnating solutions. These thermosetting resins are used to bond glass fibers, thin wood plies, cloth or paper to make heat, flame, and chemically resistant laminates. The decorative laminates are used for furniture, kitchen cabinets and sink counter tops. The industrial laminates are used for electrical panels, machinery components, and appliances. *Resimene* resins produce durable surfaces, extremely hard, color stable and with high arc resistance.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 43a

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 POLYMERS & PETROCHEMICALS CO.

Locator Key 43a

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RESLOOM® MELAMINE

Supplied in powder or liquid form, Resloom resins are a series of essentially monomeric melamine textile finishes permanently effective on fabrics made from a wide range of textile fibers. They are used to impart shrinkage control, wrinkle resistance and textural effects to cotton, rayons, synthetics and wools.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 43a

NYLON RESINS

VYDYNE® nylon and nylon copolymer resins

A family of 66, 69 and specialty nylon copolymers designed for molding and extrusion applications. Certifiable specification grade products are available. Product family includes Vydyn M-340, a fire retardant nylon. Grades include general purpose and color and heat stabilized types. They are supplied in natural pellets and salt and pepper pellet blends. Typical applications include fasteners, insulation, electrical systems and fuel system parts, gears, bearings, films, and filaments in such industries as appliances, electrical/electronic, industrial, packaging, textile and transportation.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 42a

VYDYNE® R mineral-reinforced nylon resins

A family of mineral-reinforced polyamide engineering thermoplastics designed primarily for molding applications. Vydyn 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 POLYMERS & PETROCHEMICALS CO.

Locator Key 42a

PHENOLIC RESINS

PHENOLIC and RESORCINOL RESINS

See Page 15

RESINOX® PHENOLIC liquids

Supplied as water solutions, Resinox industrial

resins possess excellent resistance to high heat, maximum bond strength and good chemical resistance. They are used for impregnating and coating filler materials such as paper, cloth and wood for use in filters, battery separators, pads, scrim, and formed veneers; as the bonding agent for abrasive grits in friction elements and grinding wheels; to bond glass and rock wool for thermal and acoustical insulation; and as foundry sand core binders.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 43a

RESINOX® PHENOLIC liquid solutions

Supplied as liquid phenolic solutions for use as surface coating resins. Resinox solutions impart high heat resistance and promote good chemical resistance in baked enamel and industrial finishes for can, drum and tank car linings; special primers and coatings; and wire enamels. They are used by the paint, varnish and lacquer, automotive, chemical, machinery and appliance industries.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 43a

RESINOX® PHENOLIC flake and resin compound

Supplied in powder or flake form, Resinox industrial resins possess excellent resistance to high heat, maximum bond strength and good chemical resistance. They are used in the manufacture of resinoid grinding wheels, friction elements, brake linings, wood flour, bonded fiber mat and foundry sand shell molds and cores.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 43a

RESINOX® PHENOLIC varnishes

Supplied in alcohol solutions, Resinox varnishes are used for laminating or impregnating filler materials, such as paper, cloth, wood, glass or asbestos. Used in decorative laminate core stock; to make electrical and mechanical grade laminates for radio, TV and home electrical appliances; for composition gears, ball-bearing races, pulleys and bushings; for making oil, chemical and paper filters; and as sand binders for shell molding. Special high heat resistant formulations are available for use with glass, asbestos and similar fillers for aircraft components and high performance systems. The resins provide tough, durable, heat resistant bonds that also resist acids and weak alkalis.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 43a

SKYBOND®

Skybond resistant teristics. smoke r range of processi ties in th compon windings formulati

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POLYIMIDE RESINS

SKYBOND®

Skybond polyimide resins are high temperature resistant resins with excellent electrical characteristics. They are fire resistant and give low smoke relative to many other resins. A wide range of Skybond formulations offer preferred processing characteristics and optimum properties in the cured polyimide. Uses include aircraft components, radome construction, filament windings, graphite fiber reinforcements, adhesive formulations, printed circuit boards and foams.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key **43a**

POLYVINYL ACETATES

GELVA® COPOLYMER RESINS

Carboxylated polyvinyl acetate resins in the form of fine white beads supplied in a choice of grades and physical properties. Gelva copolymer resins have all the properties of PVAc but are also soluble in dilute alkalis as well as organic solvents. Films produced from solvent solutions are water resistant yet may be removed with dilute alkali. Resins are supplied with softening points that range from 250° to 300°F; with solution viscosities (86 gm/1,000 ml ethanol) that range from 9 cps to 22 cps. Gelva copolymer resins have outstanding adhesion to metals, leather and cellulosics. They are used to formulate hot melt and solvent adhesives; for clear, heat-sealable coatings for paper and plastic films; for sizing rayon, cotton and acetate yarns; to make antitarnish lacquers for silver and brass; and as the resin base for temporary protective coatings that are easily removed with mild alkali stripping. Paper and plastic coatings made with Gelva copolymer resins have excellent gloss, printability wet-rub and abrasion resistance and are greaseproof.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key **43a**

GELVA® COPOLYMER RESIN SOLUTIONS

Supplied as a 35% solid, slightly yellow, solution of polyvinyl acetate copolymer — Gelva C-254H in a hexane-heptane mixture (viscosity, 500 cps). Gelva solution is used to make an effective release coating for pressure-sensitive tapes. Used in combination with common back-sizing agents that have been applied to paper from organic solutions, Gelva film gives a controlled release.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key **43a**

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 solutions are PVAc-acrylic copolymers and PVAc-maleate-acetate copolymers. 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 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 POLYMERS & PETROCHEMICALS 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 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 POLYMERS & PETROCHEMICALS CO.

Locator Key **43a**

GELVA® RESIN POWDERS

Supplied as two free-flowing powders, white and cream colored, both grades of Gelva powders (grade 700 and 702) are spray-dried PVAc resin. Both grades are used to formulate dry mix adhesives and cementitious products. The applications include joint compounds, building and industrial adhesives and cement patching compounds. Grade 700 offers excellent stability, promotes cohesive and adhesive strength, and imparts toughness, flexibility and resiliency to the bond. Grade 702 is used where the formulation requires borax or dextrine stability.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key **43a**

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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. They are 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, grease-proof coatings and pigment binders.

MONSANTO POLYMERS & PETROCHEMICALS 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 POLYMERS & PETROCHEMICALS 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, nontraveling 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 POLYMERS & PETROCHEMICALS CO.

Locator Key 43a

BUTVAR® RESINS

Butvar polyvinyl butyral resins are white, free-flowing powders supplied in seven resin type 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-72A," 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 POLYMERS & PETROCHEMICALS CO.

Locator Key 43a

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SAFLEX® VINYL BUTYRAL FILM

Saflex polyvinyl butyral is a continuous adhesive film — supplied in clear, translucent, tinted or graded 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 POLYMERS & PETROCHEMICALS 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, hot melt bonding agents, wash primers, can and drum linings, and wood and knot sealers.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key **43a**

RESIN MATERIALS

ADIPIC ACID, TECHNICAL GRADE

Technical grade adipic acid is supplied to chemical manufacturers as an intermediate for making nylon, plasticizers, surfactants, detergents, waxes, paper finishes and polyester resins.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **34d**

EMA® RESINS *ethylene-maleic anhydride copolymers*

EMA resins are used in oil well drilling muds; stabilizers and thickeners in liquid detergent and cosmetic formulations; thickeners for water-

based latex paints, textile sizes, textile print pastes and binders; suspending agents for ink pigments, thickener for aqueous resin systems, adhesives, binder for foundry cores, etc.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **34e**

FUMARIC ACID, TECHNICAL GRADE

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **34d**

MALEIC ANHYDRIDE

See Page 34

MODAFLOW® *resin modifier*

See Page 38

MODAFLOW® POWDER *resin modifier*

See Page 38

MOD-EPOX® *epoxy resin modifier*

A reactive diluent for epoxy resins that lowers the viscosity, reduces bubble entrapment and acts as a curing booster.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **32a**

MULTIFLOW® *resin modifier*

See Page 38

PHOSGARD® C-22-R *organophosphorus compound*

See Page 26

PHOSGARD® 2XC-20 *organophosphorus compound*

See Page 26

PHTHALIC ANHYDRIDE

See Page 34

STYRENE MONOMER

See Page 40

TETRATHAL® *tetrachlorophthalic anhydride*

See Page 26

STYRENE PLASTICS/RESINS

LUSTRAN® ABS *molding and extrusion materials*

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

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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. Special grades are available for extruding high gloss sheet with equivalent other physical properties.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key **42a**

LUSTRAN® SAN molding materials

Lustran SAN styrene-acrylonitrile molding materials 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 Grade 29, a higher strength material with greater chemical resistance.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key **42a**

LUSTREX® EXPANDABLE POLYSTYRENE molding materials

Small, dense beads supplied in several particle size ranges. Available in natural only in both regular and modified grades. Refer to product literature for explanation of grades. Widely used for low temperature insulation, construction, packaging, flotation, refrigeration and cups and containers.

MONSANTO POLYMERS & PETROCHEMICALS 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 POLYMERS & PETROCHEMICALS CO.

Locator Key **42a**

LUSTREX® POLYSTYRENE molding materials

A broad range of products suitable for molding into articles requiring sharp design detail, brilliant 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, houseware and industrial markets.

MONSANTO POLYMERS & PETROCHEMICALS 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 POLYMERS & PETROCHEMICALS CO.

Locator Key **43a**

LYTRON® RESINS

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

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key **43a**

STYMER® COPOLYMER RESINS

See Page 65

STYRENE-ALLYL ALCOHOL RESINS

These resins supplied in flake form are low molecular weight copolymers of styrene-allyl alcohol. RJ-100® and RJ-101 grades 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 POLYMERS & PETROCHEMICALS CO.

Locator Key **43a**

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 **32a**

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 **32a**

POLISHING AGENTS

SYTON® HT-30, HT-40 and HT-50 colloidal silica

Syton HT-30, HT-40 and HT-50 are highly efficient polishing agents used in the manufacture of silicon wafers.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **34e**

PRINTING INK PRODUCTS

BUTVAR® RESINS

See Page 50

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 FRP Company

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **34b**

RESIMENE® MELAMINE-FORMALDEHYDE

RESIMENE® UREA-FORMALDEHYDE RESINS coatings

See Page 47

SANTOCEL® silica aerogel

See Page 17

STYRENE-ALLYL ALCOHOL RESINS

See Page 52

PROCESS CONTROL EQUIPMENT

INSTRUMENTATION, ANALOG PROCESS CONTROL

The ac²® analog control center is supplied as a complete line of analog instrumentation that includes controllers, computing elements, computer-compatible instruments, accessory stations, annunciators, recorders and power supplies with cases, cabinets and field junction boxes. The system features process indication by deviation. Operating and tuning controls are accessible from the front. 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.

FISHER CONTROLS CO.

Locator Key **26a**

INSTRUMENTATION, DIGITAL PROCESS CONTROL

The dc²® digital control center performs supervisory control, direct digital control, data reduction, batch sequencing, and data logging and alarming in real-time, process control applications. The pc² language allows the process engineer to routinely write, maintain and expand process control programs. The dc² features a 16-bit minicomputer with fixed-point and floating-point multiply and divide logic, plus a full line of peripheral devices.

FISHER CONTROLS CO.

Locator Key **26a**

INSTRUMENTATION, PNEUMATIC and ELECTRONIC

The Wizard® III series of field-mounted instruments include three sensors plus a transmitter and two controllers. In combination, these units give nine complete instruments to control pressure (positive, compound, differential, vacuum), liquid level, flow rate, media density or specific gravity. Standard pneumatic and mA outputs, pressure sensing to 20,000 psig, extreme accuracy.

Temperature transmitter 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 CO.

Locator Key **26a**

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REGULATOR, GAS

Gas regulators for distribution systems, residential and commercial.

FISHER CONTROLS CO.

Locator Key **26a**

VALVE ACTUATORS and ACCESSORIES

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

FISHER CONTROLS CO.

Locator Key **26a**

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 CO.

Locator Key **26a**

RECREATIONAL SURFACES

ASTROTURF® ACTION SURFACE *commercial*

A synthetic all-weather grass-like green surface consisting of facing material of nylon ribbon, a woven polypropylene backing with an all-weather back especially suited for outdoor applications on patios, poolsides, porches, decks, balconies, etc. Professionally installed over hard-surfaced base of asphalt, concrete or wood. Recommended for medium-traffic commercial applications.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **21b**

ASTROTURF® FIELDHOUSE SURFACE

Seamless resilient surface composed of polyurethane and filler poured-in-place by Monsanto installation crews and finished with smooth, silica granule, or chip finish. Ideal for basketball, gymnasiums, fieldhouses, dressing rooms, exercise rooms, etc.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **21b**

ASTROTURF® GOLF TEE

A unique synthetic golf tee system consisting of facing material of nylon ribbon and a polyester tire cord backing. This fabric is stretched on an all-weather frame and installed over an energy-absorbing underpad. The tee surface and pad are easily removed for cleaning and repair. The system is sold in kit form and is available in two tee sizes.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **21b**

ASTROTURF® OUTDOOR CARPETING *residential*

A synthetic all-weather grass-like green surface consisting of facing material of nylon ribbon, polypropylene backing with an embossed all-weather back suitable for do-it-yourself installation on patios, poolsides, porches, decks, balconies, and other residential applications.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **21b**

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 available in rolls 15 feet wide by up to 200 feet long.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **21b**

ASTROTURF® TRACK SURFACE

All-weather, seamless, resilient surface consisting of polyurethane and filler topped with polyurethane chips or silica granules as a traction surface. Ideal for use outdoors or indoors as running tracks, track event runways, tennis courts, warning tracks, etc.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **21b**

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 in accelerator systems for EPDM and neoprene. Relatively nondiscoloring and may be used in light colored goods.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33a

A-32* VULCANIZATION ACCELERATOR reaction product of butyraldehyde and butylidene aniline

Accelerator used alone or in combination with thiazoles and Santocure accelerators in natural and synthetic rubber stocks. Provides good processing safety and flat curing properties with high modulus above 250°F. Excellent for hard rubber (ebonite).

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33a

A-100* VULCANIZATION ACCELERATOR reaction product of butyraldehyde, acetaldehyde and butylidene aniline

Accelerator used in natural and synthetic stock, particularly hard rubber, to produce tough products with little tendency to brittleness.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33a

DPG VULCANIZATION ACCELERATOR diphenylguanidine

Secondary accelerator in natural and synthetic rubbers with Santocure, Thiofide, and Thiotax accelerators. Slow curing primary accelerator for natural rubber; generally too slow for synthetics.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33a

METHASAN* VULCANIZATION ACCELERATOR zinc dimethyldithiocarbamate

Used as a secondary accelerator for Thiofide and Santocure accelerators.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33a

MONO THIURAD* VULCANIZATION

ACCELERATOR bis(dimethylthiocarbamyl)sulfide;
tetramethylthiuram monosulfide

Primarily a secondary accelerator for Thiofide, Thiotax and Santocure accelerators. One of the safest activators; frequently used in camelback stocks, or in other applications where extended storage of uncured stock is required.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33a

R-2* CRYSTALS VULCANIZATION ACCELERATOR

reaction product of carbon disulfide and
1,1'-methylene dipiperidine

Ultra accelerator for latex and fast-curing cements. Gives fast cure and excellent properties. Nondiscoloring and nonstaining.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33a

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 33a

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 33a

SANTOCURE* MOR VULCANIZATION

ACCELERATOR 2-(morpholiniothio)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 33a

SANTOCURE* NS VULCANIZATION

ACCELERATOR N-tert-butyl-2-
benzothiazolesulfenamide

A delayed action fast curing accelerator used alone or with a small quantity of secondary accel-

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erator in natural and synthetic tire treads, sidewalls, etc. Santocure NS gives processing safety intermediate between Santocure and Santocure MOR accelerators. The higher modulus of Santocure NS stock frequently permits a 10% reduction in usage level. Slight discoloration in light or white articles at higher concentrations. Non-staining.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **33a**

THIOFIDE® MBTS VULCANIZATION ACCELERATOR 2,2'-dithiobis (benzothiazole); benzothiazyl disulfide; 2,2'-dibenzothiazyl 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. Thiofide also acts as a plasticizer/retarder in polychloroprene. Nondiscoloring and nonstaining.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **33a**

THIOTAX® MBT VULCANIZATION ACCELERATOR 2-mercaptobenzothiazole

Vulcanization accelerator that 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 EDPM compounds. Available in an oiled and unoled powder form. Nondiscoloring and nonstaining.

*Trademark of Monsanto Limited

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **33a**

THIURAD® VULCANIZATION ACCELERATOR bis(dimethylthiocarbamyl)disulfide; 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 NR/SBR and nitrile stocks. Available in oiled and unoled powder form and pellet form.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **33a**

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 **33a**

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 an accelerator for neoprene vulcanization.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **33a**

MONTACLERE® ANTIOXIDANT styrenated phenol

Low cost, medium activity liquid antioxidant for general purpose use. Nonstaining and non-discoloring.

*Trademark of Monsanto Limited

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **33a**

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

An 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 **33a**

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 **33a**

SANTOFLEX® IP ANTIOXONANT 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 **33a**

SANTOFLEX® LC ANTIDEGRADANT an antidegradant blend

An antiozonant 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 **33a**

SANTOFLEX® dimethylb

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SANTOFLEX® 13 ANTIOXONANT *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 33a

SANTOFLEX® 17 ANTIOXONANT *N,N'*-bis(1-ethyl-3-methylpentyl)-*p*-phenylenediamine

An antiozonant to protect against degradation in polyunsaturated elastomers.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33a

SANTOFLEX® 77 ANTIOXONANT *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 33a

SANTOFLEX® 134 ANTIOXONANT 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. Also used in solution polymers, with or without oil, where staining can be tolerated.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33a

SANTOFLEX® 134-D ANTIDEGRADANT a mixture of Santoflex 13 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 33a

SANTOFLEX® 217 ANTIOXONANT *N,N'*-bis(1-methylheptyl)-*p*-phenylenediamine

An antiozonant to protect against degradation in polyunsaturated elastomers.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33a

SANTOFLEX® 347 ANTIOXONANT a blend of Santoflex 13 and Santoflex 77 class antidegradants

A blended antiozonant used in natural and synthetic rubbers to achieve effective resistance to ozone, fatigue and aging in products submitted

to static, dynamic and intermittent-dynamic conditions in service - e.g., tire treads and sidewalls, belts, etc.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33a

SANTOFLEX® 734 ANTIOXONANT 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 33a

SANTOVAR® A ANTIOXIDANT 2,5-di(tert-amyl)hydroquinone

For the protection of uncured rubber against oxidation; retains tack in uncured films and tapes. It also inhibits oxygen attack on unsaturated resins and oils. Potential short-stop for nitrile production.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33a

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 33a

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 33a

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

A nonstaining, nondiscoloring antioxidant used for general purpose protection. A liquid product, slightly less active than Santowhite Crystals.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33a

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 33a

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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 and also suitable for latex compounding.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33a

PLASTICIZERS

DI(2-ETHYLHEXYL)ADIPATE (DOA)

See Page 45

DIUNDECYL PHTHALATE (DUP)

See Page 45

SANTICIZER® 79-TM

See Page 46

SANTICIZER® 97

See Page 46

SANTICIZER® 140

See Page 46

SANTICIZER® 141

See Page 46

SANTICIZER® 148

See Page 46

SANTICIZER® 160

See Page 46

SANTICIZER® 261

See Page 46

SANTICIZER® 278

See Page 46

SANTICIZER® 429

See Page 47

SANTICIZER® 711

See Page 47

RETARDERS

SANTOGARD® PVI PREVULCANIZATION INHIBITOR N-(cyclohexylthio)phthalimide

Santogard PVI is a prevulcanization inhibitor for synthetic and NR. It is used with all sulfenamide or thiazole accelerators to control processing safety with no resultant 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 33a

SPECIAL MATERIALS

ACRYLONITRILE

See Page 40

BUTADIENE

See Page 40

BUTENE-2 CONCENTRATE

See Page 41

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 (ground) sulfur depending on degree of blooming experienced.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33a

LAMPBLACK

See Page 38

NITROL® ELASTOMER MODIFIER 1 part

N-(2-methyl-2-nitropropyl)-4-nitrosoaniline 2 parts
inert diluent

A modifier to reduce heat build-up of rubber under dynamic conditions by producing better filler/polymer interaction. Used in butyl rubber to improve processing and extruding properties and electrical resistivity characteristics and in polyisoprene to improve green strength and hence better processing properties.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33a

SANTOGUM® ELASTOMERS copolymer of ethylene and vinyl acetate

The gum rubber is vulcanized with a peroxide, and reinforced with conventional fillers for use in mechanical rubber goods applications requiring excellent resistance to hot air, ozone and compression set.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33a

SANTOWE® 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.

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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 33a

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 33a

STYRENE MONOMER

See Page 40

SULFASAN® R VULCANIZING AGENT

4,4'-dithiodimorpholine

Vulcanizing agent for natural and synthetic rubbers. Stable at processing temperatures but liberates sulfur (27.1%) 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 33a

TRIPOTASSIUM PHOSPHATE

See Page 43

VOCOL® RUBBER 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 33a

VOCOL® S RUBBER ACCELERATOR 62% Vocol on 38% inert carrier

A solid form of Vocol, 62% active.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33a

RUBBER PROCESSING EQUIPMENT

MONSANTO® CABLE BEAD MACHINE

This tire bead producing machine has the ability to spiral wrap bead wire around a rotating wire core to produce an "endless" cable bead. The

number of wires around the core, the number of spirals around the circumference, and the number of layers of wrapped wire can be varied to produce a wide range of bead constructions. The cable bead machine produces cable beads for passenger and truck tires. The cable bead design permits uniform distribution of stresses resulting in high strength beads especially suitable for use in tires of radial construction.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33b

MONSANTO® COLD FEED VENTED EXTRUDER

A line of cold feed vented extruders produce porosity free extrusions of rubber hose, sponge, and profiles. Feed stock is in strip or pellet form. Screw diameters between 1½ and 8 inches are available, screw speed ranges between 2 and 61 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 33b

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 33b

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 33b

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. Unit is designed with special attention to personnel safety and environmental compliance.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33b

MONSANTO® MICROWAVE CONTINUOUS RUBBER VULCANIZER

This unit is placed at the extruder end and quickly and uniformly raises the extrusion temperature to vulcanizing temperatures. The patented roller conveyor provides more efficient heating and prevents

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costly maintenance problems encountered with conveyor systems. The use of 2.5 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 5" diameter . . . larger diameter for special applications.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33b

MONSANTO* MICROWAVE PREHEATER

The microwave preheater raises the temperature of a contained stock quickly and efficiently by utilizing an adjustable source of microwave energy. The microwave preheater is designed to reduce production time by decreasing the time to vulcanize a stock. Microwave heating is particularly well suited for uniformly heating stocks with long vulcanization times by conventional techniques. Stocks up to 6 inches thick can be preheated by this unit.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33b

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 33b

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 33b

MONSANTO* TIRE UNIFORMITY GRADER

This machine measures the radial composite and fundamental tire forces, the lateral composite and side pull (conicity) tire forces, and has an optional runout package. A grinding system is employed to remove rubber from the tire shoulder area, thus reducing undesirable radial force variations. Tires may be processed through the machine automatically or manually, to be measured and graded, or if necessary, grind corrected. Automatic operations, once initiated, do not require operator attendance.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33b

MONSANTO* TOGGLE-ACTION STOCK CUTTER

A component in Monsanto's rubber extrusion systems, this unit has air-powered single stroke cutting blade. Electronic digital counter for measurements accurate to 0.01" intervals. Assured separation of stock between cuts.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33b

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 10^4 sec.⁻¹.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33b

MELT EXTRUSION STRENGTH APPARATUS

A research and quality control instrument designed to measure the melt strength of thermoplastics, elastomers and textile fiber resins. The unit is used in conjunction with a capillary rheometer. The measurement of melt strength is particularly useful for controlling blow molding, melt spinning and film blowing operations and characterizing the materials useful for such operations.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 33b

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 33b

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

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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 **33b**

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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.

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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 **33b**

33b

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 **33b**

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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 **33b**

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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.

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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.

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 **33b**

MONSANTO® TENSOMETER, MODELS F-20, F-30 tensile tester

Monsanto F-20 and F-30 are free standing, pendulum type tensile testers with variable cross-head drive and an automatically-recording extensometer.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **33b**

MONSANTO® TENSOMETER, MODEL T-500 tensile tester

A floor model universal tester with variable cross-head drive and comprehensive stress/strain electronic recording system giving results in real engineering terms on a flat-bed 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 **33b**

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 **33b**

TEL-TAK® tack meter

Portable tack tester that precisely measures tack and stickiness of rubber compounds and tapes. Used in laboratory compound development or in-process quality control of compounds where tack and stickiness are significant, i.e., impregnated fabric, rubber-to-metal bonding, etc.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **33b**

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SOLVENTS

ACETONE

See Page 40

AROMATIC CONCENTRATE C_8 mixed isomers

See Page 40

BUTENE-2 CONCENTRATE

See Page 41

ortho- and para-DICHLOROBENZENE

See Page 35

ETHYL ACETATE

See Page 38

ETHYLBENZENE

See Page 41

METHANOL methyl alcohol

See Page 41

TOLUENE

See Page 42

STABLE ISOTOPES

Monsanto supplies stable isotopes of the noble gases, carbon, sulfur, nitrogen, 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. Mound Laboratory is conducting Research and Development activities on methods for the production of the stable isotopes of bromine, chlorine, and calcium. Further information may be obtained upon request.

Stable ARGON Isotopes (gas purity 99.5%)				
Stable Isotope:	Ar-36	Ar-38	Ar-38	Ar-40
Isotopic Enrichment	99.5%	25%	95%	99.5%
Purity:	99.5%	99.5%	99.5%	99.5%

Stable CARBON-12 and Compounds (depleted C-13)				
Form:	C	CO	CO ₂	BaCO ₃
Isotopic Enrichment	99.9%	99.95%	99.9%	99.9%
Purity:	99.8%	99.9%	99%	Reag. Grade

Stable CARBON-13 and Compounds (available at three levels of isotope enrichment)				
20% Isotopic Enrichment				
Form:	CO	CO ₂		
Purity:	≥99%	≥99%		

90% Isotopic Enrichment				
Form:	C	CO	CO ₂	CH ₄ BaCO ₃
Purity:	99.8%	98%	98%	97% Reag. Grade

97% Isotopic Enrichment				
Form:	C	CO ₂	CH ₄	BaCO ₃
Purity:	99.8%	≥99%	≥97%	Reag. Grade

Stable HELIUM-3 (gas purity 99.9%)				
Isotopic Enrichment	99.9%	99.98%	99.9995%	

Stable KRYPTON Isotopes (gas purity 99.5%)						
Stable Isotope:	Kr-78	Kr-78	Kr-80	Kr-82	Kr-83	Kr-84 Kr-86
Isotopic Enrichment	90%	99%	70%	70%	70%	90% 99%

Stable NEON Isotopes (gas purity 99.5%)				
Stable Isotope:	Ne-20	Ne-21	Ne-21	Ne-22
Isotopic Enrichment	99.95%	70%	90%	99.9%

Stable NITROGEN-14 Compound				
Form:	(NH ₄) ₂ SO ₄ in 40% aqueous solution			
Isotopic Enrichment	99.99%			

Stable NITROGEN-15 and Compounds				
Form:	NH ₃	(NH ₄) ₂ SO ₄	HNO ₃	KNO ₃ N ₂
Isotopic Enrichment	95+%	95+%	95+%	95+%

Stable OXYGEN-16 Isotope and Compounds (purity 99.5%)				
Form:	O ₂	H ₂ O		
Isotopic Enrichment	99.98%	99.98%		

Stable OXYGEN-17 Isotope and Compounds (purity 99.5%)				
Form:	O ₂	H ₂ O		
Isotopic Enrichment	20-40%	20-40%		

Stable OXYGEN-18 Isotope and Compounds (purity 99.5%)				
Form:	O ₂	H ₂ O		
Isotopic Enrichment	90-99%	90-99%		

Stable SULFUR-34 Isotope and Compounds (purity ≥ 98%)				
Form:	CS ₂	SO ₂		
Isotopic Enrichment	≥90%	≥90%		

Stable XENON Isotopes (gas purity 99.5%)				
Stable Isotope:	Xe-124	Xe-129	Xe-131	Xe-136
Isotopic Enrichment	1-40%	60%	60%	80-99%

MONSANTO RESEARCH CORPORATION

Locator Key 62a

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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 63% available chlorine product. It is used in detergent applications, bleaches and pool disinfection.

ACL 66, (monotrichloro) tetra-(monopotassium dichloro)-penta-isocyanurate, is a 66.5% 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 and used in detergent applications.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34e

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

DBSA 99-B alkylbenzene sulfonic acid- biodegradable

DBSA 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

SURFACE ACTIVE AGENTS- NONIONIC

STEROX® AJ SURFACTANT tridecanoethylene oxide condensates (polyoxyethylene ether)

Sterox AJ is an 85% active nonionic surface active agent in solution form. Sterox AJ (85% active, 15% H_2O) was developed for use where a liquid product is more desirable. Sterox AJ's outstanding property is its stability under the most adverse conditions. It is used in combination with phosphate, carbonate and silicate builders to formulate laundering products; in the paper industry as a rewetting agent for paper toweling; for heavy duty cleaning compounds, and in textile processing.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 31a

STEROX® AJ-100 SURFACTANT polyoxyethylene ether

Sterox AJ-100 is a 100% active nonionic surface active agent which is a soft waxy material at room temperature. Sterox AJ-100 is used in household detergents and detergent sanitizer formulations, but it is particularly suited for agricultural emulsions and detergent formulations where added water is detrimental.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 31a

STEROX® CD SURFACTANT tall oil ethylene oxide condensate (polyoxyethylene ester)

Sterox CD is a 99% active nonionic surface active agent based on tall oil. It is designed to give very little suds, a valuable property for laundry detergents where minimum or controlled sudsing is required. It has a high detergency efficiency over a wide range of concentrations and temperatures in soft or hard water. Sterox CD is used for industrial laundering; for formulating detergent products, paint and wall cleaners; for wettable powders; for metal cleaning; and as a wetting agent in the textile and paper industries.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 31a

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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 is used primarily as an intermediate in the production of anionic 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 nonionic detergents.

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 detergent ingredient; in textile, paper, and leather process-

ing; 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 detergency properties when compared to a lauryl sulfate standard, and it is an effective wetting agent.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **31a**

TEXTILE CHEMICALS

BIPHENYL

See Page 31

BUTVAR® RESIN DISPERSION BR

See Page 50

BUTVAR® RESINS

See Page 50

GELVA® COPOLYMER RESINS

See Page 49

GELVA® RESIN EMULSIONS

See Page 49

GELVATOL® RESINS

See Page 50

LYTRON® LATICES

See Page 52

LYTRON® RESINS

See Page 52

RESLOOM® MELAMINE RESINS

See Page 48

STYMER® COPOLYMER RESINS

Stymer LF is a vinyl resin, soluble in ammonium hydroxide; Stymer S is a styrene copolymer resin, soluble in water. These textile resins are outstanding as sizing agents for acetate. Stymer LF-25 is designed as a durable size. Stymer S is a water-soluble removable size. They are used as sizes for filament acetates by the textile industry.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 43a

SYTON® DS, DS-40, DS-50, DS-200, DS-240, and DS-250 colloidal silica
See Page 18

THICKENING AGENTS

EMA® RESINS ethylene-maleic anhydride copolymers
See Page 51

GELVATOL® RESINS
See Page 50

SANTOCOL® silica aerogel
See Page 17

WATER TREATING CHEMICALS

DEQUEST® 2000 deflocculating and sequestering agent

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 34e

DEQUEST® 2006 deflocculating and sequestering agent

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 34e

DEQUEST® 2010 organophosphorus product

Used in scale prevention and corrosion inhibition for industrial water treatment.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34e

DEQUEST® 2015 organophosphorus product

Used in scale prevention and corrosion inhibition for industrial water treatment where a solid product is required.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34e

DEQUEST® 2041 organophosphorus product

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 34e

DEQUEST® 2042 organophosphorus product

Used in scale prevention and corrosion inhibition for industrial water treatment.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34e

DEQUEST® 2044 organophosphorus product

Used in scale prevention and corrosion inhibition for industrial water treatment.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34e

DEQUEST® 2052 organophosphorus product

Used primarily as a scale and corrosion inhibitor in water treatment applications. Also used as a scale inhibitor in secondary flooding of oil fields.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34e

DEQUEST® 2054 organophosphorus product

Used in any aqueous system for the prevention of scale formation or to inhibit precipitation in water treating applications.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34e

DEQUEST® XK organophosphorus product

Used for the control of extraneous metal ions in textile bleaching and scouring.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 34e

SODIUM HEXAMETAPHOSPHATE

See Page 44

WOOD PRESERVATIVE

MONSANTO® PENTA pentachlorophenol, technical

See Page 18

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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: Atlanta, Chicago, Cincinnati, Detroit, Indian Orchard, Mass., Newport Beach, Calif., New York or St. Louis.

MONSANTO AGRICULTURAL PRODUCTS CO.

11a ANIMAL NUTRITION PRODUCTS

Santa Clara, Calif. 95052
2710 Lafayette Street
St. Louis, Mo. 63166
800 North Lindbergh Blvd.
(408) 243-0414
(314) 694-2761

11b PLANT FOOD PRODUCTS

Atlanta, Ga. 30339
320 Interstate North Parkway
Luling, La. 70070
Box 174
Memphis, Tenn. 38117
5118 Park Avenue
Santa Clara, Calif. 95052
2710 Lafayette Street
St. Louis, Mo. 63166
800 North Lindbergh Blvd.
(404) 434-4949
(504) 785-8211
(901) 767-2131
(408) 243-0414
(314) 694-3294

11c BLASTING PRODUCTS

St. Louis, Mo. 63166
800 North Lindbergh Blvd.
(314) 694-3891

11d FARMERS HYBRID COMPANIES, INC.

Hampton, Iowa 50441
Box 420
(515) 456-2596

12a HERBICIDES & INSECTICIDES

Atlanta, Ga. 30339
320 Interstate North Parkway
Bowling Green, Ohio 43402
735 Haskins Road
Decatur, Ill. 62523
363 South Main Street
Des Moines, Iowa 50310
312 Merle Hay Tower
Fargo, N.D. 58078
301 27th Street, South
Indianapolis, Ind. 46032
25 Jefferson Square
Jamestown, Wis. 53545
100 East Building
Kansas City, Mo. 64133
4240 Blue Ridge Blvd.
Luling, La. 70070
Box 174
Mankato, Minn. 56001
111 Madison East Plaza
Memphis, Tenn. 38117
5118 Park Avenue
Omaha, Neb. 68114
10225 Regency Circle
Santa Clara, Calif. 95052
2710 Lafayette Street
St. Louis, Mo. 63166
800 North Lindbergh Blvd.
Wilmington, Dela. 19810
3411 Silverside Road
(404) 434-4949
(419) 352-8478
(217) 423-6011
(515) 225-0412
(701) 293-9865
(317) 844-7283
(608) 756-3691
(816) 353-8060
(504) 785-8211
(507) 387-3406
(901) 767-2131
(402) 393-2521
(408) 243-0414
(314) 694-3753
(302) 478-4600

12b PLANT GROWTH REGULATOR

Atlanta, Ga. 30339
320 Interstate North Parkway
Luling, La. 70070
Box 174
Santa Clara, Calif. 95052
2710 Lafayette Street
St. Louis, Mo. 63166
800 North Lindbergh Blvd.
(404) 434-4949
(504) 785-8211
(408) 243-0414
(314) 694-3530

13a OTHER PRODUCTS

St. Louis, Mo. 63166
800 North Lindbergh Blvd.
(314) 694-3759

MONSANTO COMMERCIAL PRODUCTS CO.

21a CONSUMER PRODUCTS

Chicago, Ill. 60018
3158 Des Plaines Avenue
Dallas, Texas 75229
2550 Walnut Hill Lane
New York, N.Y. 10036
1114 Avenue of the Americas
St. Louis, Mo. 63166
800 North Lindbergh Blvd.
(312) 296-6688
(214) 358-5377
(212) 764-5000
(314) 694-1000

21b RECREATIONAL PRODUCTS

St. Louis, Mo. 63166
800 North Lindbergh Blvd.
(314) 694-1000

22a CONTAINERS - BLOWNWARE

Anaheim, Calif. 92803
611 East Cerritos Avenue
Chicago, Ill. 60018
3158 Des Plaines Avenue
Kenilworth, N.J. 07033
North 8th Street & Monroe Avenue
St. Louis, Mo. 63166
800 North Lindbergh Blvd.
Sharonsville, Ohio 45241
1574 East Kemper Road
Yardville, N.J. 08620
584 Route 130, Box 23
(214) 772-2190
(312) 296-6688
(201) 276-2900
(314) 694-4152
(513) 769-4040
(609) 585-4650

22b CONTAINERS - CYCLE-SAFE®

St. Louis, Mo. 63166
800 North Lindbergh Blvd.
(314) 694-4121

23a UNITED SYSTEMS CORPORATION

Dayton, Ohio 45403
918 Woodley Road
(513) 254-6251

24a ELECTRONIC MATERIALS & OPTOELECTRONIC COMPONENTS

Boston, Mass. 02149
Everett Station
Chicago, Ill. 60018
3158 Des Plaines Avenue
East Brunswick, N.J. 08816
735 Highway 18
Garland, Texas 75042
3318 Ruswood Lane
Mission Viejo, Calif. 92675
24631 Via San Fernando
Palo Alto, Calif. 94304
3400 Hillview Avenue
St. Peters, Mo. 63376
Box 8
Westwood, Mass. 02090
555 High Street
(617) 387-5010
(312) 296-6688
(201) 254-1588
(214) 272-9974
(714) 581-5811
(415) 493-1300
(314) 272-6261
(617) 329-2510

25a EXTRUDED PRODUCTS - FOME-COR® BOARD

Anaheim, Calif. 92803
611 East Cerritos Avenue
Atlanta, Ga. 30339
320 Interstate North Parkway
Elkhart, Indiana 46514
700 East Birdsey Avenue
St. Louis, Mo. 63166
800 North Lindbergh Blvd.
(214) 772-2190
(404) 434-4949
(219) 262-3531
(314) 694-4141

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**MONSANTO COMMERCIAL
PRODUCTS CO. (Continued)**

25b EXTRUDED PRODUCTS - POLYETHYLENE FILM

Anaheim, Calif. 92801 (714) 772-1010
611 East Cerritos Avenue
Kenilworth, N.J. 07033 (201) 276-1900
North 8th St. & Monroe Avenue
Santa Clara, Calif. 95052 (408) 243-0414
2710 Lafayette Street

**25c EXTRUDED PRODUCTS - POLYFLEX® &
PLASTIC MEAT TRAYS**

St. Louis, Mo. 63166 (314) 694-8081
800 North Lindbergh Blvd.

26a FISHER CONTROLS COMPANY

Marshalltown, Iowa 50158 (515) 754-1556
205 South Central Street

27a MONSANTO ENVIRO-CHEM SYSTEMS, INC.

Chicago, Ill. 60606 (312) 782-6372
10 South Riverside Plaza
St. Louis, Mo. 63166 (314) 694-1000
800 North Lindbergh Blvd.

**MONSANTO INDUSTRIAL
CHEMICALS CO.**

31a DETERGENTS & PHOSPHATES

Akron, Ohio 44313 (216) 666-4111
260 Springside Drive
Chicago, Ill. 60018 (312) 296-6688
3158 Des Plaines Avenue
Cincinnati, Ohio 45236 (513) 984-1100
8041 Hosbrook Road
Newport Beach, Calif. 92660 (714) 833-9150
1401 Dove Street
New York, N.Y. 10036 (212) 764-5000
1114 Avenue of the Americas
St. Louis, Mo. 63166 (314) 694-7107
800 North Lindbergh Blvd.
or
Customer Order Processing Group
St. Louis, Mo. 63166 (314) 694-3801
800 North Lindbergh Blvd.

32a PLASTICIZERS

Akron, Ohio 44313 (216) 666-4111
260 Springside Drive
Boston, Mass. 02149 (617) 387-5010
Fleet Station
Chicago, Ill. 60018 (312) 296-6688
3158 Des Plaines Avenue
Newport Beach, Calif. 92660 (714) 833-9150
1401 Dove Street
New York, N.Y. 10036 (212) 764-5000
1114 Avenue of the Americas
Wilmington, Dela. 19810 (302) 478-4600
3411 Silverside Road
or
Customer Order Processing Group
St. Louis, Mo. 63166 (314) 694-3354
800 North Lindbergh Blvd.

33a RUBBER CHEMICALS

Akron, Ohio 44313 (216) 867-5465
260 Springside Drive

33b RUBBER INSTRUMENTS & EQUIPMENT

Akron, Ohio 44314 (216) 745-1641
947 West Waterloo Road

34a FOOD & FINE CHEMICALS

Atlanta, Ga. 30339 (404) 434-4949
320 Interstate North Parkway
Chicago, Ill. 60018 (312) 296-6688
3158 Des Plaines Avenue
Cincinnati, Ohio 45236 (513) 984-1100
8041 Hosbrook Road
Newport Beach, Calif. 92660 (714) 833-9150
1401 Dove Street
New York, N.Y. 10036 (212) 764-5000
1114 Avenue of the Americas
St. Louis, Mo. 63166 (314) 694-7264
800 North Lindbergh Blvd.
Wilmington, Dela. 19810 (302) 478-4600
3411 Silverside Road
or
Customer Order Processing Group
St. Louis, Mo. 63166 (314) 694-2600
800 North Lindbergh Blvd.

34b FRP COMPANY

Baxley, Ga. 31513 (912) 367-1616
Box 349

34c MONSANTO FLAVOR/ESSENCE INC.

Chicago, Ill. 60018 (312) 296-6688
3158 Des Plaines Avenue
Newport Beach, Calif. 92660 (714) 833-9150
1401 Dove Street
New York, N.Y. 10013 (212) 966-5566
427 Washington Street

34d PROCESS CHEMICALS

Akron, Ohio 44313 (216) 666-4111
260 Springside Drive
Atlanta, Ga. 30339 (404) 434-4949
320 Interstate North Parkway
Chicago, Ill. 60018 (312) 296-6688
3158 Des Plaines Avenue
Houston, Texas 77027 (713) 621-9510
5051 Westheimer Road
New York, N.Y. 10036 (212) 764-5000
1114 Avenue of the Americas
Santa Clara, Calif. 95052 (408) 243-0414
2710 Lafayette Street
St. Louis, Mo. 63166 (314) 694-7267
800 North Lindbergh Blvd.
Wilmington, Dela. 19810 (302) 478-4600
3411 Silverside Road
or
Customer Order Processing Group
St. Louis, Mo. 63166 (314) 694-2600
800 North Lindbergh Blvd.

MONSANTO INDUSTRIAL CHEMICALS CO. (Continued)

34e SPECIAL CHEMICAL SYSTEMS

Akron, Ohio 44313
260 Springside Drive (216) 666-4111
Atlanta, Ga. 30339
320 Interstate North Parkway (404) 434-4949
Chicago, Ill. 60018
3158 Des Plaines Avenue (312) 296-6688
Houston, Texas 77027
5051 Westheimer Road (713) 621-9550
Newport Beach, Calif. 92660
1401 Dove Street (714) 833-9150
New York, N.Y. 10036
1114 Avenue of the Americas (212) 764-5000
St. Louis, Mo. 63166
800 North Lindbergh Blvd. (314) 694-7101
or
Customer Order Processing Group
St. Louis, Mo. 63166
800 North Lindbergh Blvd. (314) 694-3024

34f WILDFIRE CONTROL

Oxnard, Calif. 91361
810 East Main Street (714) 983-0772

34g SPECIALTY PRODUCTS

Akron, Ohio 44313
260 Springside Drive (216) 666-4111
Atlanta, Ga. 30339
320 Interstate North Parkway (404) 434-4949
Boston, Mass. 02149
Everett Station (617) 387-5010
Chicago, Ill. 60018
3158 Des Plaines Avenue (312) 296-6688
Houston, Texas 77027
5051 Westheimer Road (713) 621-9550
Newport Beach, Calif. 92660
1401 Dove Street (714) 833-9150
New York, N.Y. 10036
1114 Avenue of the Americas (212) 764-5000
Santa Clara, Calif. 95052
2710 Lafayette Street (408) 243-0414
St. Louis, Mo. 63166
800 North Lindbergh Blvd. (314) 694-7266
or
Customer Order Processing Group
St. Louis, Mo. 63166
800 North Lindbergh Blvd. (314) 694-3024

35a OTHER PRODUCTS

St. Louis, Mo. 63166
800 North Lindbergh Blvd. (314) 694-2126

MONSANTO POLYMERS & PETROCHEMICALS CO.

41a PETROCHEMICALS

Akron, Ohio 44313
260 Springside Drive (216) 666-4111
Chicago, Ill. 60018
3158 Des Plaines Avenue (312) 296-6688
Houston, Texas 77027
5051 Westheimer Road (713) 621-9550
New York, N.Y. 10036
1114 Avenue of the Americas (212) 764-5000
Wilmington, Dela. 19810
3411 Silverside Road (302) 478-4600
or
Centralized Customer Service Center
Texas City, Texas 77590
Box 1311 (800) 231-6570

42a PLASTICS

Atlanta, Ga. 30339
320 Interstate North Parkway (404) 434-4949
Chicago, Ill. 60018
3158 Des Plaines Avenue (312) 296-6688
Cincinnati, Ohio 45216
8041 Holbrook Road (513) 984-1100
Indian Orchard, Mass. 01051
730 Worcester Street (413) 788-6911
Newport Beach, Calif. 92660
1401 Dove Street (714) 833-9150
New York, N.Y. 10036
1114 Avenue of the Americas (212) 764-5000
St. Louis, Mo. 63166
800 North Lindbergh Blvd. (314) 694-1901
Southfield, Mich. 48075
500 Northland Towers West (313) 357-0910
or
Centralized Customer Service Center
Indian Orchard, Mass. 01051
730 Worcester Street (800) 628-4045

43a RESIN PRODUCTS

Atlanta, Ga. 30339
320 Interstate North Parkway (404) 434-4949
Chicago, Ill. 60018
3158 Des Plaines Avenue (312) 296-6688
Houston, Texas 77027
5051 Westheimer Road (713) 621-9550
Indian Orchard, Mass. 01051
190 Grochmal Avenue (413) 788-6911
Newport Beach, Calif. 92660
1401 Dove Street (714) 833-9150
New York, N.Y. 10036
1114 Avenue of the Americas (212) 764-5000
Southfield, Mich. 48075
500 Northland Towers West (313) 357-0910
or
Centralized Customer Service Center
St. Louis, Mo. 63166
800 North Lindbergh Blvd. (800) 325-4162

43b RESINS FOR WOOD PRODUCTS INDUSTRY

Eugene, Oregon 97402
855 Seneca Road (503) 342-7201
Houston, Texas 77027
5051 Westheimer Road (713) 621-9550

44a CRUDE OIL & NATURAL GAS

Houston, Texas 77027
5051 Westheimer Road (713) 621-9550

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MONSANTO TEXTILES COMPANY

51a *Depending on end use, one of the following locations should be contacted.*

APPAREL

Charlotte, N.C. 28210	(704) 364-0110
6230 Fairview Road	
Chicago, Ill. 60654	(312) 467-0141
222 North Bank Drive	
Los Angeles, Calif. 90015	(213) 628-6312
110 East 9th Street	
New York, N.Y. 10036	(212) 764-5000
1114 Avenue of the Americas	

CARPETS

Atlanta, Ga. 30339	(404) 434-4949
320 Interstate North Parkway	
New York, N.Y. 10036	(212) 764-5000
1114 Avenue of the Americas	
San Francisco, Calif. 94111	(415) 781-4531
151 Union Street	

HOME FURNISHINGS

Atlanta, Ga. 30339	(404) 434-4949
320 Interstate North Parkway	
Charlotte, N.C. 28210	(704) 364-0110
6230 Fairview Road	
New York, N.Y. 10036	(212) 764-5000
1114 Avenue of the Americas	

INDUSTRIAL

Charlotte, N.C. 28210	(704) 364-0110
6230 Fairview Road	
New York, N.Y. 10036	(212) 764-5000
1114 Avenue of the Americas	

TIRE

Akron, Ohio 44313	(216) 867-5460
260 Springside Drive	

WIGS

New York, N.Y. 10036	(212) 764-5000
1114 Avenue of the Americas	

51b NONWOVENS

St. Louis, Mo. 63166	(314) 694-8332
800 North Lindbergh Blvd.	

MONSANTO RESEARCH CORPORATION**61a EXPLORATORY & LONG RANGE RESEARCH**

Dayton, Ohio 45407	(513) 268-3411
1515 Nicholas Road	

62a UNITED STATES ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION FACILITY

Mound Laboratory, Miamisburg, Ohio 45342	(513) 866-7444
Box 32	

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CORPORATE

WORLD HEADQUARTERS
800 North Lindbergh Blvd
St. Louis, Missouri 63166
(314) 694-1000

Corporate Administration
and Staff Departments
Monsanto Agricultural Products Co.
Monsanto Commercial Products Co.
Monsanto Industrial Chemicals Co.
Monsanto Polymers & Petrochemicals Co.
Monsanto Textiles Company
International Division
New Enterprise Division
Monsanto Research Corporation

MARKETING OFFICES

Multi-Company

Alton, Ohio 44313
260 Spangrude Drive
(216) 846-4111

Atlanta, Georgia 30339
310 Inverdale North Parkway
(404) 434-4949

Chicago, Illinois 60618
3158 Des Plaines Avenue
(312) 296-6686

Cincinnati, Ohio 45236
8041 Houbrook Road
(513) 984-1100

Detroit Area
Southfield, Michigan 48075
500 Northland Towers West
(313) 357-0910

Houston, Texas 77027
5051 Westheimer Road
(713) 621-9550

Los Angeles Area
Newport Beach, California 92660
1401 Dove Street
(714) 833-9150

New York, New York 10036
1114 Avenue of the Americas
(212) 764-5000

St. Louis, Missouri 63166
800 North Lindbergh Boulevard
(314) 694-1000

San Francisco Bay Area
Santa Clara, California 95052
2710 LaVette Street
(408) 243-0414

Wilmington, Delaware 19810
3411 Silverside Road
(302) 478-4600

Additional Marketing Offices

MONSANTO AGRICULTURAL PRODUCTS CO.

Bowling Green, Ohio 43402
735 Perkins Road
(419) 352-8478

Decatur, Illinois 62523
363 South Main Street
(217) 423-6031

Des Moines, Iowa 50310
312 Merle Hay Tower
(515) 225-0412

Fargo, North Dakota 58078
101-1 7th Street, South
(701) 293-9855

Hampden, Iowa 50441
Farmers Hybrid Companies, Inc.
Box 420
(515) 436-2596

Indianapolis, Indiana 46032
25 Jefferson Square
(317) 844-7283

Janesville, Wisconsin 53545
100 East Building
(608) 756-1691

Kansas City, Missouri 64133
4240 Blue Ridge Boulevard
(816) 353-8060

Luling, Louisiana 70070
Box 174
(504) 785-8211

Mankato, Minnesota 56001
111 Madison East Plaza
(507) 487-3406

Memphis, Tennessee 38117
5118 Park Avenue
(901) 167-2131

Omaha, Nebraska 68114
10215 Regency Circle
(402) 393-2521

MONSANTO COMMERCIAL PRODUCTS CO.

Consumer Products

Dallas, Texas 75229
2550 Walnut Hill Lane
(214) 358-5577

Containers-Blownware

Anaheim, California 92803
611 East Cerritos Avenue
(714) 772-2190

Kenilworth, New Jersey 07033
North 6th Street & Monroe Avenue
(201) 216-2900

Sharonville, Ohio 45241
3574 Egan Kemper Road
(513) 749-4040

Yardville, New Jersey 08620
584 Route 130, Box 23
(609) 585-4650

United Systems Corporation

Dayton, Ohio 45403
918 Woodley Road
(513) 254-6251

Electronic Materials & Optoelectronic Components

Boston, Massachusetts 02149
Everett Station
(617) 387-5010

East Brunswick, New Jersey 08816
735 Highway 18
(201) 254-1588

Garland, Texas 75042
3318 Russwood Lane
(214) 272-6974

Mission Viejo, California 92675
24631 Via San Fernando
(714) 581-5817

Palo Alto, California 94304
3400 Hillview Avenue
(415) 493-1300

St. Peters, Missouri 63376
Box 8
(314) 272-6281

Westwood, Massachusetts 02090
555 High Street
(617) 329-2530

Extruded Products - Fome-Cor® Board

Anaheim, California 92803
611 East Cerritos Avenue
(714) 772-2190

Elkhart, Indiana 46514
700 East Beardsley Avenue
(219) 262-3531

Extruded Products - Polyethylene Film

Anaheim, California 92803
611 East Cerritos Avenue
(714) 772-1010

Kenilworth, New Jersey 07033
North 6th Street & Monroe Avenue
(201) 216-2900

Fisher Controls Company

Marshalltown, Iowa 50158
205 South Central Street
(515) 754-3556

Monsanto Enviro-Chem Systems, Inc.

Chicago, Illinois 60606
10 South Riverside Plaza
(312) 782-0372

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MONSANTO INDUSTRIAL CHEMICALS CO.

Akron, Ohio 44314 (Instruments/Equipment)
947 West Waterloo Road
(216) 745-1641

Boston, Massachusetts 02149
Everett Station
(617) 387-5010

Ontario, California 91761
810 East Main Street
(714) 983-0772

FRP Company

Baxley, Georgia 31513
Box 349
(912) 367-3616

Monsanto Flavor/Essence, Inc.

New York, New York 10013
427 Washington Street
(212) 966-5566

MONSANTO POLYMERS & PETROCHEMICALS CO.

Eugene, Oregon 97402
855 Seneca Road
(503) 342-7201

Plastics

Springfield, Massachusetts
Indian Orchard, Massachusetts 01051
730 Worcester Street
(413) 788-6511

Resin Products

Springfield, Massachusetts
Indian Orchard, Massachusetts 01051
190 Gitchinal Avenue
(413) 788-6911

MONSANTO TEXTILES COMPANY

Charlotte, North Carolina 28210
5230 Fairview Road
(704) 364-0110

Chicago, Illinois 60654
232 North Bank Drive
(312) 467-0441

Greenville Customer Service Center
Greenville, South Carolina 29606
Box 5564 Station B
(803) 242-6700

Los Angeles, California 90015
110 East 9th Street
(213) 628-6312

San Francisco, California 94111
151 Union Street
(415) 781-4531

MONSANTO RESEARCH CORPORATION

Dayton, Ohio 45407
1515 Nicholas Road
(513) 268-3411

Miamisburg, Ohio 45342
Box 32
(513) 866-7444

OTHER MARKETING OFFICES:

Government Marketing

Monsanto Company
1101 17th Street NW
Washington, D.C. 20036
(202) 452-8880

Special Attractions

Monsanto Company
Dowland Exhibit
1313 Harbor Blvd.
Anaheim, California 92803
(714) 533-1334

Monsanto Company
Walt Disney World Exhibit
Box 40
Lake Buena Vista, Florida 32830
(305) 824-4333

MARKETING OFFICES OUTSIDE THE UNITED STATES

Argentina

Monsanto Argentina S.A.I.C.
Avenida Madero 1020, Floors 17th & 18th
Buenos Aires, Argentina

Dima-Fisher, S.R.L.
535 Belgrano
Buenos Aires, Argentina

Australia

Monsanto Australia Limited
East Tower, Princes Gate Bldg.
131 Flinders Street
Melbourne, Victoria 3001
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Monsanto Australia Limited
35 Terry Street
Rozelle, Sydney, NSW
Australia 2039

Monsanto Australia Limited
Post Office Box 1111K, Adelaide
South Australia 5031

Monsanto Australia Limited
Brisbane
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Queensland, Australia 4007

Monsanto Australia Limited
Perth
P.O. Box 77
Doubleview
West Australia 6018

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Monsanto GmbH Austria
Rydolfsplatz 12
A-1010 Wien 1, Austria

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Monsanto Europe S.A.
1, Place Madoou
1630 Brussels, Belgium
Monsanto Europe NV/SA
(Chemicals and Plastics only)
163 Mechelsesteenweg
2000 Antwerp, Belgium

Brazil

Industrias Monsanto Ltda.
Rua Araujo 216, 6 Andar
Sao Paulo, Brazil 01220

Fisher Controls Company
Rua Araujo 216, 6 Andar
Sao Paulo, Brazil 01220

Canada

Monsanto Canada Ltd.
415 Patrick Street
L3S1E6, Quebec, Canada

Monsanto Canada Ltd.
115 Rendale Blvd.
Rivdale, Ontario, Canada

Monsanto Canada Ltd.
100 Park Royale, Suite 701
West Vancouver, B.C., Canada

Monsanto Canada Ltd.

666 St. James, Suite 200
Winnipeg, Manitoba, Canada

Fisher Controls Co. of Canada, Ltd.
P.O. Box 578
Woodstock, Ontario, Canada
Monsanto Flavor/Essence, Ltd.
9130 Salley
LaSalle, Quebec, Canada

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Monsanto Chile Comercial e Industrial
Limada
Edificio Espana Oficina 502
Calle Estado 337
Santiago de Chile

Colombia

Monsanto Colombiana Inc.
Carrera 14, No. 77 - 59
Bogota, Colombia

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11 Sprout Rd., Ballard Estate
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Mindia Chemicals Ltd.
19 Rajendranath Mukherjee Rd.
Calcutta 700 001, India

Mindia Chemicals Ltd.
310-311 Lingshi Chetty Street
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Indonesia
P. T. Monsanto Pan Electronics
191 D, Dr Sahardjo
Jakarta, Indonesia

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Israel Chemical Fibres Ltd.
(Textiles only)
Ashdod Industrial Zone
Ashdod 77100, Israel

Israel Chemical Fibres Ltd.
(Textiles only)
19th Floor Shalom Tower
Tel Aviv 65251, Israel

Israel Styrene Polymers Ltd.
P.O. Box 99
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Chiyoda-ku, Tokyo, Japan

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Monsanto Echernach
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Echernach
Grand Duchy of Luxembourg

Monsanto Cie S.A.
Echernach
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116, Jalan Semangat
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Mexico
Monsanto Comercial S.A. de C.V.
Thiers No. 248
Mexico S. D.F., Mexico

Cia Industrial de Plasticos S.A.
Thiers No. 248
Mexico S. D.F., Mexico

Cia Industrial de Plasticos S.A.
Keramos y Framboyanes
Colonia del Prado
Monterrey NL, Mexico

Fisher Governor of Mexico, S.A.
Calle 1, Avenida 12
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Jan van Nassaustraat 53-55
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Monsanto South Africa (Pty.) Ltd.
11th Floor, Sandton City Bldg.
Sandton, Transvaal, South Africa

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Monsanto (Scandinavia) AB
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Ulvsundavagen 108
Bromma, Sweden

Monsanto (Scandinavia) AB
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Xshammatsgatan 27
Boras, Sweden

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(Textiles only)
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Monsanto (Suisse) S.A.
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(Electronic Instrumentation only)
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United Kingdom

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Plaza Venezuela
Caracas 101, Venezuela

West Germany
Monsanto (Deutschland) GmbH
Immermannstrasse 3
D-4000 Dusseldorf, West Germany

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BACK COVER

First Row Left to Right CEREX® Spunbonded Nylon Fabric for Cargo Parachutes • Light-Emitting Diodes • Appli-
 cation of AVADEX® BW Herbicide *Second Row Left to Right* CYCLE-SAFE® Bottle (Left) • Acetic Acid Unit at
 Texas City • ELURA® Wig of Modacrylic Fiber • ACRILAN® Acrylic and CADON® Nylon Fibers for Carpeting *Third*
Row Left to Right MACHETE® Herbicide Protects Rice Crops • SEF® Fire-Retardant Fiber for Children's Sleepwear •
 Rubber Chemicals, Instruments and Nylon Cord for Tires • POLARIS® Plant Growth Regulator Improves Per-Acre
 Yield of Sugar Crops *Fourth Row Left to Right* SAFLEX® Plastic Interlayer in Architectural Glass • Blow-Molded
 Plastic Bottles • ASTROTURF® Surfaces for Sports • SAFLEX® Plastic Interlayer for Automobile Windshields *Fifth*
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