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PRODUCT CATALOG

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TOWOLDMON0042071
WATER_PCB-00033117

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

If you are not sure of the location which can best serve you, or if you are interested in a product or service which is not listed or have some other question you wish answered, a Customer Inquiry Representative at any of the marketing offices will help put you in touch with the person most qualified to answer your inquiry.

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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 subdivided into various sections.

ALPHABETIC PRODUCT INDEX (See page 2)

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

PRODUCT USE INDEX (See page 7)

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 65)

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 21b 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.

COMPANY ORGANIZATION (See page 68)

A brief resumé 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.

MAJOR OFFICES (See page 69)

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.

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RZ-100 [®] ultra type accelerator	23c
Santocure [®] Vulcanization Accelerator	23c
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Santowhite [®] Powder antioxidant	23c

ADHESIVES and ADHESIVES COMPONENTS

ADHESIVES

PHENOLIC AND RESORCINOL RESINS

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

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key **33b**

ADHESIVES COMPONENTS

BUTVAR® RESINS

See Page 51

FORMVAR® RESINS

See Page 52

GELVA® COPOLYMER RESINS

See Page 49

GELVA® COPOLYMER RESIN SOLUTIONS

See Page 50

GELVA® MULTIPOLYMER RESIN SOLUTIONS

See Page 50

GELVA® RESIN EMULSIONS

See Page 50

GELVA® RESIN POWDERS

See Page 50

GELVA® RESINS

See Page 50

GELVA® RESIN SOLUTIONS

See Page 50

GELVATOL® RESINS

See Page 51

LYTRON® LATICES

See Page 53

LYTRON® RESINS

See Page 53

MONFLEX® BARRIER COATING *ethylene vinyl chloride latices*

Latex polymers have either 14°C Tg or 0°C Tg and have either carboxyl or amide functional group along polymer chain. Suggested for adhesives, barrier coatings, paints, pigment binder, heat seal

coatings and caulking. *Monflex* is useful as a flame-retardant component in textile finishes and carpet backing.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

AGRICULTURAL and FARM PRODUCTS

FEED ADDITIVES

MHA® METHIONINE HYDROXY ANALOG

An amino acid (methionine) supplement for poultry and animal feeds. *MHA* is nutritionally equivalent to DL-methionine on a 1.09:1.00 gravimetric basis and metabolizes *in vivo* to serve as a supplemental source of the essential amino acid.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **11a**

SANTOQUIN® *ethoxyquin antioxidant*

See Page 15

FERTILIZERS

AMMONIA, ANHYDROUS

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

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **11c**

AMMONIA, AQUA

Supplied as very faintly turbid, water-white solution containing 26-30% ammonia. Except for the haze, this material meets all NF XIII requirements. The very slight haziness or turbidity is due to 3-5 ppm lubricating oil from anhydrous ammonia which is dissolved in steam condensate or deionized water to make the aqua ammonia.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **11c**

AMMONIUM NITRATE 83% SOLUTION

Supplied as a clear, aqueous solution of ammonium nitrate.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **11c**

DIAMMONIUM PHOSPHATE (DAP)

See Page 41

E-2® AMMONIUM NITRATE FERTILIZER pellets

Supplied as a dense, free-flowing, spherical pelleted material especially sized for fertilizer blending. It is also a good industrial material.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 11c

MONOPOTASSIUM PHOSPHATE

See Page 42

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 COMMERCIAL PRODUCTS CO.

Locator Key 11b

AVADEX® BW

A proprietary "triallate" herbicide that is supplied in liquid form to control infestations of wild oat in barley, spring wheat, Durum wheat, peas and lentils. Each gallon contains 4 lbs./gallon active 2,3,3-trichloroallyl diisopropylthiocarbamate. Applied as ground or aerial spray.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 11b

FAR-GO®

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

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 11b

LASO®

A proprietary "alachlor" herbicide available as 10% 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 COMMERCIAL PRODUCTS CO.

Locator Key 11b

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 COMMERCIAL PRODUCTS CO.

Locator Key 11b

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 COMMERCIAL PRODUCTS CO.

Locator Key 11b

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 COMMERCIAL PRODUCTS CO.

Locator Key 11b

RANDOX® T

A proprietary herbicide available as a granule. The active ingredients are a-chloro-N,N-diallylacetamide (11.7%) and trichlorobenzyl chloride (23.3%). Randox T is supplied for use in the corn belt states for selective weed control in corn.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 11b

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 COMMERCIAL PRODUCTS CO.

Locator Key 11b

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 COMMERCIAL PRODUCTS CO.

Locator Key 11b

METHYL PARATHION

A highly toxic commercial insecticide supplied as 80% active solution (in xylene) only to profes-

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Key **11b**

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sional formulators for controlling boll weevil in cotton and a wide spectrum of insects that attack fruit, vegetable and forage crops. Poison emblem and antidote required on labels.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **11b**

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 COMMERCIAL PRODUCTS CO.

Locator Key **11b**

SANTOCHLOR® para-dichlorobenzene
See Page 34

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 COMMERCIAL PRODUCTS CO.

Locator Key **11b**

RELATED PRODUCTS/SERVICES

POLYETHYLENE PROTECTIVE SHEETING AND TAPE
See Page 22

SEED CORN

High yielding, disease resistant hybrid seed corn. Available in single cross, three-way cross and double cross. All types of field corn available in maturity range (90 day to 130 day) to cover the entire central corn belt. Special silage blends are also available.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **11e**

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 COMMERCIAL PRODUCTS CO.

Locator Key **11e**

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 **22b**

TRICALCIUM PHOSPHATE
See Page 42

ANTIFOAMING AGENTS

LIMIT® 33 defoamer
See Page 38

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 **23b**

PC-1344® defoamer

Used as defoamer in nonaqueous hydrocarbon and solvent systems.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23b**

ANTIOXIDANTS

SANTONOX® and SANTONOX® R
See Page 36

SANTOQUIN® ethoxyquin

A feed grade antioxidant added to animal and poultry feeds and dried forage crops as a protectant for the feedstuffs' Vitamin "A" and "E", carotenes, and xanthophyll content. *Santoquin* is regulated by the FDA for use in complete feeds at a level of 0.015%. It is supplied as the liquid 100% biologically active; as *Santoquin Mixture 6* (66.6% active) and as *Santoquin Emulsion* (70% active).

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **11a**

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 **21a**

ANTISLIP and ANTISOIL AGENTS

SYTON® AS-200, AS-240 and AS-250 colloidal silica

Syton AS-200, AS-240 and AS-250 are efficient antisoilants for wool/rayon blends, cotton and synthetic carpets. Antisoiling properties can be built into rug and fabric shampoos by incorporating *Syton* in the formulation. *Syton* AS-200, AS-240 and AS-250 have excellent compatibility with nonionic and anionic surfactants.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22b**

SYTON® C-30, C-40, C-50, 200, 240 and 250 colloidal silica

Syton 200, 240, 250, C-30, C-40 and C-50 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 **22b**

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.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22b**

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.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22b**

SYTON® W-200, W-240 and W-250 colloidal silica

Syton W-200, W-240 and W-250 are efficient antislip agents used for formulating industrial water emulsion floor waxes and polishes.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22b**

BACTERIOSTATS/ DISINFECTANTS/ FUNGICIDES/ FUNGISTATS/ GERMICIDES

ACL®59 sanitizer and bleaching compound *See Page 61*

ACL®60 sanitizer and bleaching compound *See Page 62*

ACL®66 sanitizer and bleaching compound *See Page 62*

ACL®85 sanitizer and bleaching compound *See Page 62*

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 cellulosic 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 **22c**

SANTOBRITE® sodium pentachlorophenate, technical

An industrial biocide and preservative soluble in water. *Santobrite* is used directly as a fungicide and contact herbicide. In low concentrations it is an excellent medium for control of microorganisms that cause mold, mildew, or "souring" in adhesives, insulation board, water-base paints, leather, and for slime and algae control of paper plant processing water and cooling water in circulating systems.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

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

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possesses high bactericidal and fungicidal activity, low odor when formulated, and low toxicity to higher animals.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **21a**

22b

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 **21a**

FS/

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 **21a**

BLASTING MATERIALS

BLASTING SUPPLIES

Detonating cord, cast primers and other explosive materials.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **11d**

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 COMMERCIAL PRODUCTS CO.

Locator Key **11d**

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 COMMERCIAL PRODUCTS CO.

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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 COMMERCIAL PRODUCTS CO.

Locator Key **11d**

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. multiwall paper bags. Commonly known as ANFO.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **11d**

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 COMMERCIAL PRODUCTS CO.

Locator Key **11d**

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 COMMERCIAL PRODUCTS CO.

Locator Key **11d**

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 COMMERCIAL PRODUCTS CO.

Locator Key **11d**

CHEMICAL PROCESSES

DeNORA® CHLORINE MERCURY CELLS

Monsanto Enviro-Chem engineers and installs this type production unit for the manufacture of chlorine and sodium hydroxide. The process electrolytically separates brine solution, collecting the sodium in the mercury cathode from which it is stripped by water.

Marketing agent for Oronzio DeNora Impianti Elettrochimici, Sp.A., owner of the trademark DeNora.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key **15d**

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17

ELECTROLYTIC PROCESS PLANTS *design and construction*

Custom-designed for the process, all detail engineering, procurement, expediting, field erection and start-up is handled by Monsanto Enviro-Chem.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key **15a**

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 contact or interpass absorption process.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key **15a**

CHEMICAL SPECIALTY CATALYSTS

Monsanto Enviro-Chem supplies the following catalysts for converting sulfur dioxide to sulfur 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® SO₂ removal system.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key **15a**

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 **15a**

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 **15a**

CONSUMER PRODUCTS

ASTROTURF® AUTO FLOOR MATS

Universal twin front auto floor mats, small car twin front floor mats and universal twin rear mats made of polyethylene and available at retail stores in four colors—green, blue, black and ginger.

NEW ENTERPRISE DIVISION

Locator Key **61a**

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.

NEW ENTERPRISE DIVISION

Locator Key **61a**

CURING AGENTS

CATALYST AC SERIES

Catalyst AC is a light yellow liquid for catalyzing melamine-formaldehyde resin textile finishes. It is compatible with most cationic, anionic, and nonionic softeners and penetrants used in resin finishing baths. Catalysts "AC-4" and "AC-6" are clear, compatible liquid catalysts for high speed curing of cyclic-urea and melamine resin fabric treatments. They promote rapid, uniform resin cure and good retention of the resin in the fabric, including rayons, cottons, and synthetics.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key **33a**

DECORATIVE AND INDUSTRIAL LAMINATES

RESIMENE® MELAMINE RESINS

See Page 48

RESINOX® PHENOLIC RESINS *varnishes*

See Page 49

DEFLOCCULATING AGENT

DEQUEST® deflocculating and sequestering agents

See Page 64

DENTIFRICE ABRASIVES

CALCIUM PYROPHOSPHATE

See Page 41

DICALCIUM PHOSPHATE, ANHYDROUS

See Page 42

DICALCIUM PHOSPHATE, DIHYDRATE

See Page 42

INSOLUBLE SODIUM METAPHOSPHATE

See Page 43

LUSTRE-PHOS®

See Page 42

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oil stores

Key 61a

ELECTRONIC PRODUCTS INSTRUMENTS

AUXILIARY DIGITAL INSTRUMENTS

Instruments offered as peripheral equipment usually used with data collection systems are a comparator, data scanner, 21 column printer, D/A converter, deviation calculator.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 12a

COUNTER-TIMERS, 100 SERIES

Small half-rack frequency counters which operate from DC to 512 MHz (MHz = 1 million cycles/second) have preset, reversible, automatic and dual limit features.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 12a

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 12a

DIGITAL CLOCK, MODEL 505B

This instrument usually used in conjunction with a data system, displays hours, minutes, seconds, for a continuous 24 hours in digital readout form. It also has a BCD digital output for computer use.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 12a

DIGITEC⁺ DATA ACQUISITION COMPONENTS AND SYSTEMS

See Page 31

DIGITEC⁺ DIGITAL MULTIMETERS

See Page 31

DIGITEC⁺ DIGITAL PANEL METERS

See Page 31

DIGITEC⁺ DIGITAL THERMOMETERS

See Page 31

DIGITEC⁺ DIGITAL VOLTMETERS

See Page 32

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 12a

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

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

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 12a

PROGRAMMABLE FREQUENCY SYNTHESIZER, MODEL 3100B

This instrument generates a precise electrical signal in the frequency range of 0 to 1.3 MHz.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 12a

LIGHT-EMITTING DIODES AND ARRAYS

DISPLAYS AND DISPLAY MODULES

Light-emitting diode numeric and alpha-numeric characters with associated electronic circuitry for operation.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 12c

LIGHT-EMITTING DIODES, GaAsLITE⁺

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

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 12c

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 12c

MONTEMA⁺ SOLID STATE DIGITAL CLOCK

Executive digital clock with six light-emitting diode displays for hours, minutes, and seconds plus four light-emitting diode displays for elapsed time, to time meetings or calls for the busy executive.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 12c

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 12c

0684007

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PHOTO DETECTOR

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

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 12c

SOLID STATE RELAYS, MSR 100 SERIES

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

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 12c

MATERIALS

COOLANOL® 15 dielectric coolant and heat transfer medium

Coolanol 15 is a silicate ester fluid for use in heat transfer and dielectric applications at very low temperatures.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 22c

COOLANOL® 20 dielectric heat transfer fluid

Coolanol 20 is a formulated silicate ester fluid intended for use as a heat transfer, dielectric and hydraulic fluid over wide temperature ranges.

COOLANOL® 25 dielectric coolant for electronic equipment

Coolanol 25 is a formulated silicate ester fluid for use as a heat transfer, dielectric and hydraulic fluid, especially in electronic apparatus.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 22c

COOLANOL® 35 dielectric coolant for electronic equipment

Coolanol 35 is a formulated silicate ester fluid for use as a heat transfer, dielectric and hydraulic fluid, especially in electronic apparatus.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 22c

COOLANOL® 40 dielectric heat transfer fluid

Coolanol 40 is a formulated silicate ester fluid intended for use as a heat transfer, dielectric and hydraulic fluid over wide temperature ranges.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 22c

COOLANOL® 45 dielectric coolant for electronic equipment

Coolanol 45 is a formulated silicate ester fluid for use as a heat transfer, dielectric and hydraulic fluid, especially in electronic apparatus.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 22c

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 12b

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 12b

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 12b

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 22c

OS-80* silicate ester protectant fluid

OS-80 is a preservative fluid for filling *Coolanol* (only) dielectric cooling systems during equipment storage. It is designed as a protectant, not as a working fluid.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 22c

SILICON electronic grade

High purity silicon that is grown by either the Czochralski or float zone techniques is supplied in the form of ingots and slices. Both "n" and "p" conductivity types are produced in resistivities ranging from 0.001 to 1000 ohm centimeters. Slices cut from such ingots are supplied with thickness of 5 mils or greater in diameters of 0.5 to 3.0 inches. Slices can be ordered in as-cut, lapped, etched, polished or polished-&-oxidized forms. Used in the semiconductor industry for both power and signal devices.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 12b

ENVIRONMENTAL CONTROL

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*Enviro-Chem** equipment, developed by Mon-
santo 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 cus-
tom-designs, engineers, and constructs a variety
of units for special tasks.

AIR SAMPLING SERVICE

Stack, ambient, or in-plant testing for air pollu-
tant levels; complete supporting services which
include analytical, data analysis and report
preparation.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key 15b

AMMSOX*, CALSOX*, CAT-OX* AND NOSOX* 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 15a

BRINK* CASCADE IMPACTOR, MODEL B

Device used to measure particle size distribution
of mists and dusts suspended in industrial
process gas streams at temperatures of 250-300°F.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key 15a

BRINK* COALESCER

Custom-designed units in circular or cylindrical
forms comprising a special fiber bed packed be-
tween 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 condi-
tions.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key 15a

BRINK* FILTER

Custom-engineered filter 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 valu-
able, toxic, or contaminating.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key 15a

BRINK* MIST ELIMINATOR

Custom-engineered installations to remove liq-
uid mists or soluble solids from a plant's effluent
gas stream. The collection efficiencies exceed
99%. Eliminator systems are designed around the
Brink filter bed.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key 15a

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 tempera-
tures of 250 to 300°F. A calibrated orifice is in-
cluded. 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 15a

BRINK* MIST SAMPLER, MODEL BMS-11

BMS-11 includes a *Brink* Model B cascade impac-
tor in a temperature controlled cabinet. Calibra-
ted 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 mea-
sures particle size distribution in industrial
process gas streams. Available as a complete
sampling kit with all accessories required for
stack sampling. A vacuum pump is available as a
separate accessory. Accessory deep dish collec-
tion cups are available for use in the cascade im-
pactor where increased volume capacity is de-
sired.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key 15a

LANDGARD* SYSTEM

A custom-engineered pyrolysis system that re-
duces solid waste by 94% to 96% (by volume)
with emission and discharge effluents within pol-
lution codes. Systems offered have process capa-
cities of 250, 500, 1,000 tons/day and larger.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key 15a

OLEUM VENTING 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 eli-
mination section and air motive section. Capacities
range from 100 up to 1500 ACFM.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key 15a

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PURASIV[†] S PROCESS

Molecular sieve process to control sulfur dioxide emissions designed for use by the sulfuric acid industry in sulfur burning plants, sludge acid plants and smelter operations. Sulfur oxides are adsorbed selectively and returned to the acid plant to increase acid production.

[†]Trademark of Union Carbide Corp., used under license.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key 15a

VENTRI ROD[†] SCRUBBER

Installations to remove very fine dust particles from industrial off-gases for air pollution control in a wide range of industries. The scrubber system can be used for removing both solid particulates and gases.

[†]Trademark of Enviroengineering, Inc., used under license.

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key 15a

FABRICATED PRODUCTS

CUSTOM VINYL EXTRUSIONS

Supplied to customer's order in profiled shapes of high quality vinyl compound for use as weather stripping, water stop in concrete foundations, or other construction uses.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 13d

EMBOSSED 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 13b

FOME-COR[®] BOARDS

A light-weight, rigid, sheathing board made of expanded polystyrene foam securely bonded between two layers of tough kraft linerboard. *Fome-Cor* is a barrier for heat, sound, and moisture. It is supplied in a range of foam densities, a choice of facings, and 1/8" to 1/2" sandwich thickness; in widths of 48", 60", and 72"; in 96" and 140" lengths; and in seven different dimensional packages of sheets. Grades are supplied for the following uses:

Automotive *Fome-Cor* Board: supplied in required densities and sizes for insulation, sound-deadening, and moisture barrier when used as automotive door panels, quarter panels, head liners, package trays; and as weather and sound sheathing for mobile homes.

Graphic Arts *Fome-Cor* Board: supplied with clay coated bleached kraft facings in two thicknesses 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 13b

GER-PAK[®] POLYETHYLENE SHEETING AND TAPE

Supplied as moisture vapor barrier material in gauges .001" to .010", 1' to 40' width, in 50' to 100' length rolls in natural color 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 13b

POLYETHYLENE PROTECTIVE SHEETING AND TAPE

Supplied in gauges ranging from .001 to .010", 1' to 40' widths, 40' to 100' rolls of natural color 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 13b

SILENT-COR[®] *sound deadening board*

Supplied as a flat sheet laminate of closed cell polystyrene foam 1/4" thick with paper facings, engineered to reduce the level of sound transmitted through walls, ceilings, and floors. Shipped in bundles of 20 sheets, 4' wide and in lengths of 8', 10' or 12'.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 13b

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.

NEW ENTERPRISE DIVISION

Locator Key 62a

hibits

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DURETTE® fire-resistant fabrics

Durette materials are a family of fire-resistant woven, knit and nonwoven fabrics and constructions designed to provide fire protection in hazardous environments. Durette fabrics exhibit outstanding resistance to ignition, flame penetration and propagation, and shrinkage in a fire situation. Durette fabrics exhibit good over-all textile properties.

MONSANTO RESEARCH CORPORATION

Locator Key 51a

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 41a

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

Available in 1-18 denier per filament products in a full range of weaving, knitting, and tufting multifilament yarns for apparel, carpet, home furnishings, industrial, military, and tire applications, as well as 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 41a

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 41a

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 41a

MONVELLE® biconstituent fiber

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

MONSANTO TEXTILES COMPANY

Locator Key 41a

PNW® nylon staple

PNW nylon fiber is available in 3, 6, or 15 deniers in suitable staple lengths for use in wet-laid nonwovens and specialty papers from light-weight disposable textiles to heavy duty industrial products. A special grade with high dispersibility permits the use of finer or longer fibers without loss of manufacturing efficiency.

MONSANTO TEXTILES COMPANY

Locator Key 42a

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 41a

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 con-

ventional modacrylics to yield an acrylic-like modacrylic of broad utility in apparel and home furnishings applications.

MONSANTO TEXTILES COMPANY

Locator Key **41a**

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 guarantee 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 guarantee 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* guarantee 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* guarantee. Increasingly international in scope, the program now operates in about 20 countries.

MONSANTO TEXTILES COMPANY

Locator Key **41a**

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 **41a**

FIRE SAFETY, PRODUCTS TO IMPROVE

DIAMMONIUM PHOSPHATE (DAP)

See Page 41

DURETTE® fire resistant fabrics

See Page 23

MONFLEX® BARRIER COATING

See Page 13

MONOAMMONIUM PHOSPHATE (MAP)

See Page 41

PHOS-CHEK® fire retardant

A series of ammonium phosphate compounds containing corrosion inhibitors, thickeners, and flow conditioners for use by fire services in retarding forest, brush and wildfires.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22b**

PHOS-CHEK® P/30 fire retardant

An effective fire retardant, it is useful in intumescent latex and alkyd paints. May also help meet flammability requirements for rigid polyurethane foam.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22b**

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 **23a**

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 **23a**

PYDRAUL® fire resistant hydraulic fluids

See Page 29

SANTICIZER® 140 plasticizer

See Page 46

SANTICIZER® 141 plasticizer

See Page 46

SANTICIZER® 145 plasticizer

See Page 46

SANTICIZER® 148 plasticizer

See Page 46

SANTOSAFE® WATER GLYCOL hydraulic fluids

See Page 29

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SEF® modacrylic fiber
See Page 23

SKYDROL® fire resistant hydraulic fluids
See Page 28

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 23b

TRIBUTYOXYETHYL PHOSPHATE (TBEP)
See Page 47

TRICRESYL PHOSPHATE (TCP)
See Page 48

TRIPHENYL PHOSPHATE (TPP)
See Page 48

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 21b

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 21b

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, jellings aids, and sour rye bread.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 21b

H.T.* MONOCALCIUM PHOSPHATE monohydrate
See Page 26

LACTIC ACID, FOOD (F.C.C.) 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 21b

MONOAMMONIUM PHOSPHATE (MAP)
See Page 41

MONOSODIUM PHOSPHATE (MSP)
See Page 43

PHOSPHORIC ACID 75, 80 and 85%
See Page 42

BUFFERING

AGENTS/COAGULANTS/DISPERSING

AGENTS/EMULSIFIERS/NUTRITION

SUPPLEMENTS/PROTEIN

INTERACTANTS/SEQUESTRANTS

ADIPIC ACID, FOOD (F.C.C.) GRADE
See Page 25

BENZOIC ACID, U.S.P., F.C.C.
See Page 27

DIAMMONIUM PHOSPHATE (DAP)
See Page 41

DICALCIUM PHOSPHATE, ANHYDROUS
See Page 42

DICALCIUM PHOSPHATE, DIHYDRATE
See Page 42

DISODIUM PHOSPHATE, ANHYDROUS
See Page 42

DISODIUM PHOSPHATE, DUOHYDRATE
See Page 42

EMULSI-PHOS® cheese emulsifiers
See Page 43

FUMARIC ACID, FOOD (F.C.C.) GRADE
See Page 25

H.T.* MONOCALCIUM PHOSPHATE monohydrate
See Page 26

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MONOAMMONIUM PHOSPHATE (MAP)

See Page 41

MONOSODIUM PHOSPHATE (MSP)

See Page 43

PHOSPHORIC ACID 75, 80 and 85%

See Page 42

SODIUM ACID PYROPHOSPHATE (SAPP)

See Page 27

SODIUM HEXAMETAPHOSPHATE

See Page 43

SODIUM TRIPOLYPHOSPHATE (STP)

See Page 43

TETRASODIUM PYROPHOSPHATE

See Page 43

TRICALCIUM PHOSPHATE

See Page 42

TRISODIUM PHOSPHATE, ANHYDROUS (TSP/A)

See Page 43

TRISODIUM PHOSPHATE, CRYSTALLINE

See Page 43

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 **21b****COUMARIN**

See Page 33

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. The complete line of essential oils is contained in a product catalog issued by the Monsanto Flavor/Essence New York office. Products of our own manufacture are:

Oil of Cardamom
Oil of Cassia
Oil of Celery
Oil of Clove
Oil of Coriander
Oil of Cubeb
Oil of Ginger
Oil of Nutmeg
Oil of Olibanum

Oil of Opoponax
Oil of Patchouli
Oil of Black Pepper
Oil of Peppermint
Oil of Pimento
Oil of Sandalwood
Citral
Eugenol
Geraniol

Linalool
Rhodinol
Resin Peru Balsam
Resin Benzoin
Resin Celery
Resin Ginger
Resin Labdanum
Resin Olibanum

Resin Opoponax
Resin Orris
Resin Pepper
Resin Styrax
Resin Tolu Balsam
Resin Tonka
Vanilla Concentrate

MONSANTO FLAVOR/ESSENCE INC.

Locator Key **21c****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 volatility, it is ideally suited for baked goods.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **21h****FLAVORINGS**

Monsanto Flavor/Essence supplies a complete line of natural and imitation flavors in both liquid and spray-dried form for use in the food, beverage, tobacco and pharmaceutical industries. Custom flavors are also developed to meet specific needs of customers.

MONSANTO FLAVOR/ESSENCE INC.

Locator Key **21c****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 **21b****VANILLIN MONSANTO®**

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **21b****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 re-

12X

quiring calcium enrichment and as an ingredient in yeast food and dough improvers.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **21b**

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21c**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 **21b**

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21b**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 **21b**

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21c**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 **21b**

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21b**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 **21b****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 **21b**

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21b**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 **21b**

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MONOSODIUM PHOSPHATE (MSP)

See Page 43

PHOSPHORIC ACID 75, 80 and 85%

See Page 42

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **21b****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 **21b****TETRASODIUM PYROPHOSPHATE**

See Page 43

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 **21c****BENZYL ACETATE**

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

MONSANTO FLAVOR/ESSENCE INC.

Locator Key **21c****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 **21c****ESSENTIAL OILS**

See Page 26

FRAGRANCES

Monsanto Flavor/Essence supplies "custom-made" fragrances and re-odorants for all types of cosmetic and industrial products. Special charac-

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ter fragrances are developed for toilet soaps, cosmetics, and externally applied medicants; for household products such as detergents, polishes, cleaning preparations; for industrial products such as paints and adhesives. Fragrances are designed to give a distinctive, pleasant odor that is in character with the product and appealing to the senses of the ultimate user. Special formulation for re-odorizing or masking unpleasant odors are also supplied.

MONSANTO FLAVOR/ESSENCE INC.

Locator Key **21c**

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 **21c**

FUNCTIONAL FLUIDS

AIRBORNE AND SPECIALTY

MCS® 293 jet engine lubricant

MCS 293 is an advanced Type III jet engine lubricant. This experimental product is being tested primarily for the next generation of jet engines. Provides an excellent design tool for the engine designer in that he can take advantage of the improved thermal stability and reduced flammability characteristics of the fluid.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **24a**

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 **22c**

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", "500C", and "LD" grades for jet aircraft; Skydrol 7000 for specified propeller-type 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 **22c**

SKYLUBE® 450 jet engine hydraulic fluid

Skydrol 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 **24a**

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 **22c**

ASKAREL dielectric fluids

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

COOLANOL® 15 dielectric coolant and heat transfer medium

See Page 20

COOLANOL® 20 dielectric heat transfer fluid

See Page 20

COOLANOL® 25 dielectric coolant for electronic equipment

See Page 20

COOLANOL® 35 dielectric coolant for electronic equipment

See Page 20

COOLANOL® 40 dielectric heat transfer fluid

See Page 20

COOLANOL® 45 dielectric coolant for electronic equipment

See Page 20

OS-59® dielectric heat transfer fluid

See Page 20

OS-80® silicate ester protectant fluid

See Page 20

INDUSTRIAL

HB-40® reactor grade, partially hydrogenated terphenyl

Supplied as a clear, stable high boiling point liquid. HB-40 is partially hydrogenated terphenyl. It

is superior.

MONSANTO

OS-124®

OS-124 is a high boiling liquid with a low vapor pressure.

MONSANTO

PYDRATE phosphoric acid

A phosphoric acid derivative of industrial phosphoric acid.

MONSANTO

PYDRAU

Ultra high viscosity hydraulic fluid for start-up and regular operation.

MONSANTO

PYDRAU

Low viscosity hydraulic fluid for quiring.

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PYDRAU

Low viscosity hydraulic fluid for application in winches.

MONSANTO

PYDRAU

A mechanical hydraulic fluid for use in hydraulic systems.

MONSANTO

PYDRAU

A high boiling point hydraulic fluid.

MONSANTO

is supplied for use as a coolant in nuclear reactors.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

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 **22c**

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 **22c**

PYDRAUL* 10E hydraulic fluid

Ultra low viscosity straight phosphate ester fire resistant fluid for industrial hydraulic systems operating in low ambient temperature or low start-up temperature applications such as Askania Regulators.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

PYDRAUL* 29E LT hydraulic fluid

Low viscosity straight phosphate ester fire resistant fluid for industrial hydraulic applications requiring good low temperature properties.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

PYDRAUL* 30E hydraulic fluid

Low viscosity, highly stable straight phosphate ester fire resistant fluid for industrial hydraulic applications requiring a 150 SSU (@ 100°F) fluid. Also used as a low viscosity air compressor fluid for winter time application.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

PYDRAUL* 50E hydraulic fluid

A medium viscosity, highly stable straight phosphate ester fire resistant fluid for industrial hydraulic applications requiring a 200-250 SSU (@ 100°F) fluid. Used in diecast machines, continuous casters, rolling mill systems, etc.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

PYDRAUL* 65E hydraulic fluid

A 300 SSU (@ 100°F) highly stable straight phosphate ester fire resistant fluid for industrial hy-

draulic applications. Used in diecast machines, continuous casters, rolling mills, etc.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

PYDRAUL* 90E hydraulic fluid

A highly stable straight phosphate ester fire resistant air compressor fluid used as cylinder and bearing lubricant.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

PYDRAUL* 115E hydraulic fluid

A highly stable straight phosphate ester fire resistant fluid for industrial hydraulic applications requiring a high viscosity fluid, or for heavy duty air compressor use.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

PYDRAUL* 230C hydraulic fluid

A low cost phosphate ester/hydrocarbon blend fire resistant fluid for industrial hydraulic applications requiring good low temperature pumpability.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

PYDRAUL* 312C hydraulic fluid

A low cost, medium viscosity phosphate ester/hydrocarbon blend fire resistant fluid for industrial hydraulic applications such as diecast machines, steel mill equipment or any application requiring a 300 SSU (@ 100°F) fluid. Meets many customer requirements for fire retardancy.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

PYDRAUL* 540C hydraulic fluid

A low cost high viscosity phosphate ester/hydrocarbon blend fire resistant fluid for heavy duty industrial hydraulic applications such as forging and extrusion presses. Meets many customer requirements for fire retardancy.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

SANTOSAFE* WATER GLYCOL 15 hydraulic fluid

A low viscosity (150 SSU @ 100°F) water glycol fire resistant fluid for industrial hydraulic applications requiring good low temperature properties. Primarily used in mobile equipment.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

SANTOSAFE* WATER GLYCOL 20 hydraulic fluid

A medium viscosity (200 SSU @ 100°F) fluid for general purpose industrial hydraulic applications such as diecast machines, steel mill equipment, etc.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

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SANTOSAFE® WATER GLYCOL 30 hydraulic fluid

A high viscosity (275 SSU @ 100°F) water glycol fire resistant fluid for heavy duty industrial hydraulic applications.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

SANTOTRAC® LUBRICANTS synthetic hydrocarbons

See Page 33

SANTOWAX® OMP organic coolant for nuclear reactors, mixed polyphenyls

Supplied as a stable waxy solid consisting of mixed isomers of polyphenyls. It is used as a chemical intermediate, as a wax extender, and in specialty formulations.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

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 **22c**

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 **22c**

SANTOSOL® 200 monoisopropylbiphenyl (MIPB)

Santosol 200 is used as the microencapsulation dye solvent portion of the specialized coating used in the manufacture of carbonless copy paper. MIPB may also find application as a chemical intermediate.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

SANTOSOL® 300 polyphenyl derivative

Santosol 300 is used as the microencapsulation dye solvent portion of the specialized coating used in the manufacture of carbonless copy paper.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

SANTOSOL® 340 polyphenyl derivative

Santosol 340 is used as the microencapsulation

dye solvent portion of the specialized coating used in the manufacture of carbonless copy paper.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

THERMINOL® 55 heat transfer fluid

Therminol 55 is a low cost liquid phase heat transfer fluid for use in the 0°F - 575°F temperature range.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

THERMINOL® 66 heat transfer fluid

Therminol 66 is a wide range liquid phase heat transfer fluid for use in the 0°F - 650°F temperature range.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

THERMINOL® 88 heat transfer fluid

Therminol 88 is a high temperature liquid phase heat transfer fluid for use in the 300°F-800°F temperature range.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

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 **22c**

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 detergents.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23b**

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 glass industries.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23b**

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NITRIC ACID 38° - 42°

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

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 16a

NITRIC ACID concentrated

Supplied as a light yellow to reddish brown fuming liquid.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 16a

SANTOSITE® sodium sulfite anhydrous, technical

Supplied as technical grade anhydrous salt, in the form of tan crystalline powder, assay (Na_2SO_3) 97.7% 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 23b

SODIUM BISULFATE nitre cake

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 23b

SODIUM BISULFITE, ANHYDROUS

Used in dye manufacture; as source for reducing sodium bichromate to basic chrome sulfate in tanning; bleaching of vegetable tan extracts; production of hydrosulfite for vat dyeing; antichlor in bleaching ground wood, etc.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 23b

SODIUM CHLORIDE rock salt

Supplied as mine run lump or screened grades in 98.5% to 99.1% purity depending on grade. It is used in the chemical industry as a raw material source of sodium and chlorine.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 23b

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 23b

INSTRUMENTS

ELECTRONIC INSTRUMENTS

See Page 19

PROCESS CONTROL EQUIPMENT

See Page 54

RUBBER PROCESSING TESTING INSTRUMENTS

See Page 60

TEST AND MEASUREMENT

CAPILLARY RHEOMETER, AUTOMATIC

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

MONSANTO RESEARCH CORPORATION

Locator Key 51a

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.

†Registered trademark of United Systems Corporation

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 12a

DIGITEC† DIGITAL MULTIMETERS

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

†Registered trademark of United Systems Corporation

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 12a

DIGITEC† DIGITAL PANEL METERS

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

†Registered trademark of United Systems Corporation

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 12a

DIGITEC† DIGITAL THERMOMETERS

Temperature measuring instruments that provide

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a digital readout of temperature in °C or °F. Platinum, Thermistor and Thermocouple models.

[†]Registered trademark of United Systems Corporation

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **12a**

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.

[†]Registered trademark of United Systems Corporation

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **12a**

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 and film blowing operations and characterizing the materials useful for such operations.

MONSANTO RESEARCH CORPORATION

Locator Key **51a**

MELT INDEXER

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

MONSANTO RESEARCH CORPORATION

Locator Key **51a**

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.

[†]Registered trademark of Monsanto Chemicals Limited

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22b**

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 **22b**

METAL PROCESSING COMPOUNDS

BONE ASH (NATURAL)

Supplied as finely divided powder [$\text{Ca}_3(\text{PO}_4)_2$] 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 **22b**

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 **22b**

PHOSPHORIC ACID 75, 80, & 85%

See Page 42

NUCLEAR SOURCES

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 **51a**

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 **51a**

SHIPPING CONTAINERS

A complete range of containers for rental or sale for shipping radioisotope materials. Containers conform to DOT requirement 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 **51a**

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ODORANTS

COUMARIN

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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 21b

METHYL SALICYLATE U.S.P.

See Page 26

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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 23a

VANILLIN MONSANTO®

See Page 26

OILS—LUBRICATING

SANTOTRAC® LUBRICANTS synthetic hydrocarbons

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safety.

or Key 51a

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 22c

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 21b

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

See Page 25

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

See Page 27

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or Key 51a

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

See Page 25

FUMARIC ACID, TECHNICAL GRADE

See Page 52

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 23b

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 23b

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 21b

TPSA® tetrapropenylsuccinic anhydride

Supplied as a clear light yellow liquid to chemical manufacturers, TPSA is used as a corrosion inhibitor, an epoxy resin curing agent, and as a chemical intermediate.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 23b

AMINES

ortho- and para-ANISIDINE

See Page 34

ortho- and para-CHLOROANILINE

See Page 34

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 23b

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

3,4-DCA is a chemical intermediate used in the synthesis of biologically active compounds and dyestuffs.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **24a**

DODECYLANILINE

See Page 34

ortho- and para-NITROANILINE

See Page 34

ortho-NITROANISOLE

See Page 34

ortho- and para-PHENETIDINE

See Page 34

HALOGEN-CONTAINING COMPOUNDS (MISC.)

ACL®59 sanitizer and bleaching compound

See Page 61

ACL®60 sanitizer and bleaching compound

See Page 62

ACL®66 sanitizer and bleaching compound

See Page 62

ACL®85 sanitizer and bleaching compound

See Page 62

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 **23b**

CHLOROBENZENE

See Page 34

ortho-DICHLOROBENZENE

See Page 34

MONSANTO® PENTA *pentachlorophenol*, technical

See Page 16

ortho- and para-NITROCHLOROBENZENE

See Page 34

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 **23b**

SANTOCHLOR® INSECTICIDE *para*-dichloro-benzene

Moth and mildew control, deodorant blocks, chemical intermediate.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23b**

SANTOPHEN® 1 GERMICIDE *ortho*-benzyl-parachlorophenol

See Page 16

SANTOPHEN® 1 SOLUTION

See Page 17

TCC® 3,4,4' trichlorocarbaniide

See Page 17

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-ANISIDINE

CHLOROBENZENE

ortho- and para-CHLOROANILINE

ortho- and para-CHLOROPHENOL

ortho- and para-DICHLOROBENZENE

2,4-DICHLOROPHENOL

DODECYLANILINE

ortho- and para-NITROANILINE

ortho-NITROANISOLE

ortho- and para-NITROCHLOROBENZENE

ortho- and para-PHENETIDINE

para-TOLUENESULFONAMIDE

para-TOLUENESULFONYL CHLORIDE

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23b**

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 **21b**

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

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of scabies. Additionally, benzyl benzoate is used in textile dye intermediate formulations.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **21b**

CAFFEINE ANHYDROUS, U.S.P.

See Page 26

METHAPYRILENE FUMARATE

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **21b**

METHAPYRILENE HYDROCHLORIDE

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **21b**

PHENACETIN U.S.P. *acetophenetidin*

Phenacetin (acetophenetidin) is supplied as a fine white crystalline powder (5% max. retained on 100 mesh) for the antipyretic ingredient in the formulation of aspirin, A-P-C tablets, and specialty pharmaceuticals.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **21b**

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 antipneumatic properties.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **21b**

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 **21b**

PHENOLS

BISPHENOL A

See Page 39

ortho- and para-CHLOROPHENOL

See Page 34

para-CUMYL PHENOL

Organic intermediate for the production of phos-

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **21a**

2,4-DICHLOROPHENOL *2,4-dichloro-hydroxybenzene*

See Page 34

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 **21a**

DIHYDROXYDIPHENYL SULFONE

Additive for electrolytic tin plating and for chemical synthesis.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23b**

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 **21a**

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 **21a**

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 COMMERCIAL PRODUCTS CO.

Locator Key **16a**

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 **21a**

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PHENOL

See Page 39

SULFONIC ACIDS

CHLOROSULFONIC ACID

Colorless, corrosive liquid used in the production of synthetic detergents, pharmaceuticals, dyes, and ion exchange resins.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23b**

DDBSA 99-B alkylbenzene sulfonic acid-biodegradable

See Page 62

para-TOLUENESULFONAMIDE

See Page 34

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 alkyd 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 **23b**

para-TOLUENESULFONYL CHLORIDE

See Page 34

SULFUR-CONTAINING COMPOUNDS (MISC.)

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 COMMERCIAL PRODUCTS CO.

Locator Key **16a**

SANTOLITE® MHP RESIN

See Page 54

SANTONOX® AND SANTONOX® R antioxidant

Santonox is used as an antioxidant for polyethylene.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

SODIUM meta-NITROBENZENE SULFONATE

Intermediate for chemical synthesis and in textile applications.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23b**

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 **22b**

CYCLOHEXANOL

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23b**

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 **33a**

ETHYL CHLOROACETATE

Supplied as a clear light straw-colored liquid, acidity (as monochloroacetic) 0.6% maximum, to chemical manufacturers for use as a chemical intermediate.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23b**

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

See Page 27

TETRATHAL® tetrachlorophthalic anhydride

See Page 25

PACKAGING MATERIALS

ALL-PURPOSE PLASTIC TAPE

Supplied in rolls of .008" gauge, 2" wide, 100' long, black, polyethylene tape with pre-slit paper backing packaged in a cutter edge dispenser. Used for repair patching, edge sealing, and closing plastic or paper bags or liners.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **13b**

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g, and clos-scator Key **13b****PLASTIC BOTTLES and CONTAINERS**

Monsanto supplies a large variety of stock sizes and shapes of blow molded bottles and containers thermoformed of high and low density polyethylene or polyvinyl chloride.

Custom-designed packaging containers are developed to meet specific product and market requirements. Customized containers in unlimited shapes and in sizes from 5 cc to 15 gallons, rigid or flexible, can be supplied in the thermoplastic suited to the need, including polyethylene, polyvinyl chloride, polypropylene.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **13a****PLASTIC CLOSURES and FITMENTS**

Injection molded closures and fitments are supplied in a variety of sizes as companion pieces for packaging 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 **13a****PLASTIC MEAT TRAYS**

Clear, see-through, freezer-ready trays for pre-cut meat packaging supplied in fifteen different sizes ranging from 5" x 5" x 1/2" to 14 1/2" x 5 1/2" x 1/2". Trays are sturdy, thermoformed *Polyflex* plastic and fit most wrapping equipment. Also available in clear yellow, blue, and in opaque white.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **13c****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 and flowers.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key **13c****POLYFLEX® SHEET**

Supplied in rolls, *Polyflex* biaxially oriented polystyrene sheet is supplied in two thin gauges (.00275" and .00475") 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 **13c****PAINT/COATING
INGREDIENTS****BENTHAL® alkyd resin intermediate**

A resin intermediate supplied in the form of white flakes to paint and alkyd resin makers for use as a gloss, hardness and durability improver in short oil alkyds for baking enamels.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23b****BISPHENOL A**

See Page 39

BUTVAR® RESINS

See Page 51

BUTVAR® RESIN DISPERSION BR

See Page 51

DIBUTYL FUMARATE

See Page 52

DIBUTYL MALEATE

See Page 52

DIOCTYL MALEATE

See Page 52

D.P. SOLUTION® dibutylamine pyrophosphate

An anticorrosion agent in lacquers and cotton solutions; an agent to prevent the settling of *Santocel* flattening agent in flat lacquer formulations; for light and heat stabilization of vinyl chloride and vinyl copolymer resins.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22b****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 **22a****FORMVAR® RESINS**

See Page 52

GELVA® COPOLYMER RESINS

See Page 49

GELVA® MULTIPOLYMER RESIN SOLUTIONS

See Page 50

GELVA® RESIN EMULSIONS

See Page 50

GELVATOL® RESINS

See Page 51

LAMPBLACK

Lampblack is derived from the slow burning (destructive distillation) of petroleum oils in furnaces. A variety of grades are available exhibiting

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a range of physical, chemical and electrical properties. Major uses are in antiblemish tire paints, carbon brushes and electrodes, paints and inks.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22b**

LYTRON® LATICES

See Page 53

LYTRON® RESINS

See Page 53

MALEIC ANHYDRIDE

See Page 33

MODAFLOW® resin modifier

See Page 52

PHOS-CHEK® P/30 fire retardant

See Page 24

PHTHALIC ANHYDRIDE

See Page 33

RESIMENE® MELAMINE-FORMALDEHYDE RESINS

RESIMENE® UREA-FORMALDEHYDE RESINS

See Page 48

RESINOX® PHENOLIC RESINS

liquid solutions

See Page 49

SANTOCEL® silica aerogel

See Page 15

SANTOMASK® II odor-masking agent

See Page 33

STYRENE-ALLYL ALCOHOL RESINS

See Page 53

TETRATHAL® tetrachlorophthalic anhydride

See Page 25

PAPER CHEMICALS

GELVA® COPOLYMER RESINS

See Page 49

GELVA® MULTIPOLYMER RESIN SOLUTIONS

See Page 50

GELVA® RESIN EMULSIONS

See Page 50

GELVA® RESINS

See Page 50

GELVA® RESIN SOLUTIONS

See Page 50

GELVATOL® RESINS

See Page 51

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 **22c**

LYTRON® LATICES

See Page 53

MERSIZE® paper sizing agent

Mersize TFL 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 **22c**

RPC 1115 wet strength resin

A thermosetting, cationic polymer for papermaking use as a neutral curing wet strength resin.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

SANTOBRITE® sodium pentachlorophenate, technical (paper mill slimicide)

See Page 16

SANTO-RES® 23 wet strength paper resin

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. Can also be used as a drainage aid and as a starch additive to impart dry strength.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22c**

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 **22c**

SCRIPSET® 100, 500 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

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surface treating paper and paperboard to improve printability, create good surface qualities and impart water resistance.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 22c

SCRIPTITE® 435 wet strength paper resin

Scriptite 435 is a urea-formaldehyde resin supplied to paper mills for addition to the pulp furnish that imparts exceptional wet strength to the finished paper and paperboard.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 22c

STEROX® DF surfactant

See Page 63

STEROX® DJ surfactant

See Page 63

STEROX® NJ surfactant

See Page 63

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

See Page 16

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 31a

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 31a

BISPHENOL A

Supplied as white flakes with a maximum of 0.10% free phenol and 0.15% moisture. Bisphenol A is used as a chemical intermediate for the manufacture of epoxy, polycarbonate and oil soluble phenolic resins, surface coatings, adhesives, rigid foams and in compounding oils, greases, and vinyl compositions.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 31a

BUTADIENE

Supplied, inhibited with tertiary butylcatechol, in liquified gas form with 99% 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 31a

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 31a

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 31a

STYRENE MONOMER

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

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 31a

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 31a

OTHER PETROCHEMICALS

ACETONE

Supplied as a clear, water-white liquid. APHA color 5 maximum and 0.5% moisture maximum.

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It is used widely as a commercial solvent and as an intermediate in chemical manufacturing.

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key **31a**

ACETOPHENONE

A commercial grade organic intermediate chemical supplied as a clear light to dark amber liquid assaying 40-60% by weight.

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key **31a**

AROMATIC CONCENTRATE C_8 mixed isomers

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

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key **31a**

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 cross-linking agent in the manufacture of intermediates and as a specialty solvent.

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key **31a**

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 **31a**

CUMENE

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

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key **31a**

CUMENE CONCENTRATE

An industrial grade hydrocarbon concentrate containing 58% cumene, 17% ethylbenzene, 6% isopropyl cyclohexane that has a flash point of 75°F (C.O.C.). It is supplied to blenders as an aromatic gasoline blend stock.

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key **31a**

DICYCLOPENTADIENE CONCENTRATE

A liquid concentrate containing approximately 85% C_5H_6 supplied to chemical manufacturers for making hydrocarbon resins, insecticides, surface coatings and intermediates.

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key **31a**

DIISOPROPYL BENZENE

An industrial grade hydrocarbon shipped as a medium brown liquid that assays 60.5 to 64.6% mixed isomers supplied to blenders for use as an aromatic gasoline blend stock.

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key **31a**

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 **31a**

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 **31a**

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 **31a**

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 **31a**

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 **31a**

alpha-METHYLSTYRENE crude

A commercial chemical raw material containing 73-77% 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 **31a**

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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 31a

PIPERYLENE CONCENTRATE

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An aliphatic liquid containing approximately 50% *trans*- and *cis*-piperylenes ($\text{CH}_2=\text{CHCH}=\text{CHCH}_3$). The concentrate is supplied to chemical manufacturers for making hydrocarbon resins and intermediates.

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key 31a

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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 31a

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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 31a

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RESIN PR

Supplied as a heavy liquid aromatic petroleum residue for use in the production of petroleum coke, carbon black, and miscellaneous industrial asphaltic products.

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key 31a

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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 31a

XYLENES *para/meta*

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Supplied as *para/meta* xylenes as commercial grade (CH_3)₂C₆H₄ 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 31a

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 fertilizers, as builder in hard surface detergent formulations, and as a nutrient in yeast and antibiotic manufacturing.

Food grade is used in food processing, vinegar, and as a toothpaste ingredient.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key 21a

ETHYL AMMONIUM PHOSPHATE 65% solution

Supplied as a clear liquid (33% P_2O_5) that is useful in helping meet fire retardancy specifications for textiles.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key 22b

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. 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 21a

TRIETHYLAMMONIUM PHOSPHATE 40% solution

Used as an additive for nonaqueous materials for stabilizing corrosive and iron-sensitive liquids in metal containers.

MONSANTO INDUSTRIAL CHEMICALS CO. Locator Key 22b

CALCIUM PHOSPHATES

BONE ASH (NATURAL)

See Page 32

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 21a

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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 **21a**

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 **21a**

H.T.[®] MONOCALCIUM PHOSPHATE *monohydrate* See Page 26

LUSTRE-PHOS[®] *dentifrice abrasive*

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **21a**

MOULD COAT *synthetic bone ash* See Page 32

PY-RAN[®] *anhydrous monocalcium phosphate* See Page 27

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 **21b**

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, calico 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 acid in jelly, preserves and soft drinks.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **21a**

POTASSIUM PHOSPHATES

MONOPOTASSIUM PHOSPHATE

A 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 **21a**

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 **21a**

TRIPOTASSIUM PHOSPHATE

A 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 **21a**

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 **21a**

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 **21b**

EMULSI-PI

A food grade phosphate salt used in the manufacture of emulsions.

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INSOLUBL

An insoluble phosphate salt used in the manufacture of emulsions.

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LEVN-LITE

See Page

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A technical grade phosphate salt used in the manufacture of emulsions. A food grade phosphate salt used in the manufacture of emulsions.

MONSANTO

OILFOS[®]

Oilfos is a food grade phosphate salt used in the manufacture of emulsions.

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SODIUM

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EMULSI-PHOS® cheese emulsifier

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 21b

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 21a

LEVN-LITE® sodium aluminum phosphate See Page 27

MONOSODIUM PHOSPHATE (MSP)

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 21a

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 21a

PAN-O-LITE® sodium aluminum phosphate See Page 27

SODIUM ACID PYROPHOSPHATE (SAPP) See Page 27

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 21a

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 21a

SQ PHOSPHATE® sequesterant

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 21a

STABIL-9® sodium aluminum phosphate See Page 27

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.

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 21a

TRISODIUM PHOSPHATE, ANHYDROUS (TSP/A)

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

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 21a

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 21a

OTHER PHOSPHORUS AND PHOSPHORUS DERIVATIVES

ALKOPHOS® aluminum acid phosphates

Coating for electrical steel transformer and motor laminations; binder for high temperature insulation brick and other refractories; high temperature water insoluble binder or adhesive.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 22b

ALKYL ACID PHOSPHATES

Supplied as the liquid amyl, n-butyl, ethyl, and n-propyl esters of phosphoric acid. Used as metal

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adhesion improving additives in paints and varnishes; as a catalyst for making urea resins; and as polymerizing agents for oils and resins.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22b**

ETHYL ACID PHOSPHATE

Supplied as a clear, colorless liquid of mixed $(C_2H_5)HPO_4$ and $(C_2H_5)_2HPO_4$ esters for use in formulating flame retardant compounds for textiles, for the manufacture of paint driers, and an acid catalyst for making urea-formaldehyde resins.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22b**

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 **24a**

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.

Locator Key **21a**

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 **23b**

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 **23b**

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 **23b**

SANTICIZER® 140 *plasticizer*

See Page 46

TRICRESYL PHOSPHATE (TCP)

See Page 48

TRIPHENYL PHOSPHITE

Triphenyl phosphite—a specialty for improving the processing and arresting color deterioration and cloudiness development in alkyl and polyester resins during manufacture.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

PLASTICIZERS

DIBUTYL PHTHALATE (DBP)

Dibutyl phthalate is a widely used plasticizer for nitrocellulose; it is also useful in polyvinyl acetate, phenolics and in nitrile and chlorinated rubbers. It is also compatible with a wide variety of other resins.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

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.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

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 **23a**

DI(2-ETHYLHEXYL)PHTHALATE (DOP) *dioctyl phthalate*

DOP is a general purpose plasticizer for PVC resin. It does a satisfactory job in imparting most desirable properties to vinyl products.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

DIETHYL PHTHALATE (DEP)

Diethyl phthalate is a widely used plasticizer for cellulose acetate due to its high degree of com-

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patibility, 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 **23a**

DIISODECYL PHTHALATE (DIDP)

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Key **23a**

DIDP is a general purpose plasticizer for PVC resin. It is used most often in wire insulation compounds where lower volatility and better electrical properties, compared to dioctyl phthalate (DOP), are desired.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

DIMETHYL PHTHALATE (DMP)

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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 **23a**

DIPHENYL PHTHALATE

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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 **23a**

DIUNDECYL PHTHALATE (DUP)

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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 **23a**

DYTROL® paint brush preserver

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Key **23a**

Dytrol is a low volatility, fire resistant, pleasant smelling liquid that possesses a strong softening action on paints, lacquers, varnishes, etc. Dytrol is supplied for formulating paint brush dips that keep brushes soft between uses; as a reconditioner for dried, hardened paint brushes; and for

formulations to remove paint from the skin after a paint job.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

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 **23a**

SANTICIZER® 1-H N-cyclohexyl para-toluenesulfonamide

Santicizer 1-H plasticizer is used in special crystallizing finishes, paper coatings, textile coatings and adhesives. It is a useful plasticizer in nitrocellulose lacquers, imparting a relatively sharp softening point. It is also used to incorporate incompatible components such as paraffin wax for producing special coating effects such as crystallizing lacquers.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

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 **23a**

SANTICIZER® B-16 butyl phthalylbutyl glycolate

A versatile and high quality plasticizer particularly suited for extrusions and coatings in contact with

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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 **23a**

SANTICIZER® M-17 methyl phthalylethyl glycolate

Santicizer M-17 is used in cellulose acetate sheet and lacquers where grease resistance and moisture resistance is sought. It is also compatible with alkyds, polystyrene, chlorinated rubber and many phenolic resins.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

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 **23a**

SANTICIZER® 97 di(n-octyl, n-decyl)adipate (DNODA)

Santicizer 97 is a 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.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

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 **23a**

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 **23a**

SANTICIZER® 145 alkylaryl phosphate ester

A flame-retardant plasticizer which offers an unusual combination of volatility and low tempera-

ture flexibility to both vinyl and nonvinyl formulators. Some *Santicizer 145* formulations generate less smoke than many other formulations in laboratory tests.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

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. It imparts excellent low temperature flexibility and provides good low smoke generation characteristics in several formulations. It can also be used per se or in a gelled form as an air filter, dirt pick-up media which meets UL requirements for flame retardance and Bureau of Standards requirements for dirt pick-up.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

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 **23a**

SANTICIZER® 213

Santicizer 213 is a fast fusing primary plasticizer for polyvinyl chloride. In plastisol prepared sheet flooring *Santicizer 213* contributes a high degree of stain resistance in the end product while maintaining good plastisol properties during processing. *Santicizer 213* 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 **23a**

SANTICIZER® 218A

Santicizer 218A is an excellent general purpose plasticizer for polyvinyl acetate adhesives. It offers the emulsion adhesive formulator the advantages of excellent wet tack, high heat delamination temperatures and outstanding plasticizing efficiency.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

SANTICIZER® 261

Santicizer 261 is a monomeric plasticizer that offers high performance, comparable to low mo-

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lecular weight polymeric, yet still retains the
easy processing features of monomeric plasti-
cizers. It finds application in film and sheeting,
coated fabrics, plastisols, organosols, vinyl foams,
acrylic coatings and polysulfide systems.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

SANTICIZER® 267

Santicizer 267 performance properties contribute
a high degree of stain resistance and abrasion re-
sistance in a variety of vinyl plastisol applications.
This performance is particularly important in
plastisol-prepared vinyl sheet flooring and plasti-
sol-prepared vinyl top coats. It is also a good
choice in a plastisol operation where nonlacquer
marring properties are required.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

SANTICIZER® 278

Santicizer 278 is a fast fusing, extremely low vol-
atile monomeric plasticizer that offers a high de-
gree of permanence, comparable to polymeric,
yet retains the excellent processing charac-
teristics of monomers in vinyl systems. The ex-
tremely low volatility and permanence of
Santicizer 278 makes it one of the products of
choice for polysulfide systems.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

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 **23a**

SANTICIZER® 411

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

SANTICIZER® 412

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

SANTICIZER® 429

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

SANTICIZER® 679

Santicizer 679 is a modified phthalate plasticizer
for polyvinyl chloride. Properly formulated, it is
one of the very best low-cost plasticizers for for-
mulating plastisol adhesives.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

SANTICIZER® 885

Santicizer 885 is an excellent general purpose
plasticizer for polyvinyl acetate adhesives. It
offers the emulsion adhesive formulator the ad-
vantages of slightly longer open time, better
water resistance and high initial viscosities in
polyvinyl acetate emulsions.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

SANTONOX® and SANTONOX® R *antioxidant* *See Page 36*

SANTOSET® I

Santoset I is a reactive plasticizer for use in vinyl
dispersions to produce rigid and/or flexible,
tough, durable plastic products.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

TRIBUTOXYETHYL PHOSPHATE (TBEP)

Plasticizer for leveling agent for self-polishing
floor waxes. Offers flame retardance, but not as
good as TCP (tricresyl phosphate). Imparts good
low temperature flexibility to resins.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23a**

TRIBUTYL PHOSPHATE (TBP)

Tributyl phosphate is a practically colorless liquid
of low viscosity. It is a primary plasticizer and sol-
vent for nitrocellulose, cellulose acetate and
chlorinated rubbers. It is recommended as an an-

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 23a

TRICRESYL PHOSPHATE (TCP)

A standard fire-retarding plasticizer for vinyls, nitrocellulose and styrene-butadiene rubber. It finds utility particularly where very low volatility is important.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 23a

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 23a

PLASTICS AND RESINS

FORMALDEHYDE RESINS

RESIMENE® MELAMINE-FORMALDEHYDE

RESIMENE® UREA-FORMALDEHYDE

See Page 48

RESINOX® PHENOLIC liquid solutions

See Page 49

MELAMINE AND UREA RESINS

RESIMENE® MELAMINE

Melamine resins in syrup and spray-dried powder form, *Resimene* industrial resins are used for making powder solutions or syrup laminating agents. The thermosetting laminating agents 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 33a

RESIMENE® MELAMINE-FORMALDEHYDE

RESIMENE® UREA-FORMALDEHYDE

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 33a

RESLOOM® MELAMINE

Supplied in powder (*Resloom* HP) or liquid form (*Resloom* M-75, M-80), *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 33a

NYLON RESINS

VYDYNE® nylon and nylon copolymer resins

A family of 6/6, 6/10, and specialty nylon copolymers designed for molding and extrusion applications. Certifiable specification grade products are available. Product family includes *Vydyne* M-340-FR, a U.L. SE-O rated flame retardant nylon, and *Vydyne* M-18, a nylon copolymer offering improved toughness, reduced water absorption, and higher melting point compared to nylon 6/6. Grades include general purpose and color and heat stabilized types. They are supplied in natural and black pellets; salt and pepper pellet blends. Typical applications include fasteners, insulation, electrical systems and fuel systems parts, gears, bearings, films, and filaments in such industries as appliances, electrical/electronic, industrial, packaging, textile and transportation.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 32a

VYDYNE® R mineral-reinforced nylon resins

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

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 32a

coatings
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PHENOLIC RESINS

PHENOLIC and RESORCINOL RESINS See Page 13

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 **33a**

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 **33a**

RESINOX® PHENOLIC lump, flake and resin compound

Supplied in powder, lump or flake, *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 and pulp moldings and for bonding foundry sand to make shell molds and cores.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key **33a**

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 per-

formance systems. The resins provide tough, durable, heat resistant bonds that also resist acids and weak alkalis.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key **33a**

POLYETHYLENE

HIGH DENSITY POLYETHYLENE

Monsanto® high density polyethylene is supplied in pelleted form, in grades designed with particular advantages for the major conversion processes and the products made thereby. These are formulated to process efficiently under a broad range of conditions and to perform satisfactorily in the final product's intended service.

BLOW-MOLDING RESINS: The blow-molded products made from these grades are tough with high impact resistance, good gloss and color and suitable for packaging a wide variety of industrial chemicals, foods and toiletries.

EXTRUSION RESINS: The extrusion grades include a high molecular weight material suitable for primary insulation in REA cables, a general purpose grade for sheet extrusion, and a grade for high quality, premium performance sheet.

INJECTION MOLDING RESINS: The narrow molecular weight distribution of these materials assures good impact resistance, low warpage with minimal sacrifice of molding cycle time. The injection molding grades include a material specially suited to high speed molding of thin-wall parts, a homopolymer offering good toughness and rigidity with moderate flow for large parts, copolymers with great toughness and stress crack resistance and a choice of flow characteristics.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key **32a**

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 **33a**

POLYVINYL ACETATES

GELVA® COPOLYMER RESINS

Carboxylated polyvinyl acetate resins in the form of fine white beads supplied in a choice of grades

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and physical properties. *Gelva* copolymer resins have all the properties of PVAc but are also soluble in dilute alkalies 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 cellulose. 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 33a

GELVA® COPOLYMER RESIN SOLUTIONS

Supplied as two 35% solids, water-white or slightly yellow, solutions of polyvinyl acetate copolymer — *Gelva* C-254B in benzene (viscosity, 1,200 cps); *Gelva* C-254H in a hexane-heptane mixture (viscosity, 500 cps). *Gelva* solutions are used to make effective release coatings for pressure sensitive tapes. Used in combination with common back-sizing agents that have been applied to paper from organic solutions, *Gelva* films give a controlled release.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 33a

GELVA® MULTIPOLYMER RESIN SOLUTIONS

Supplied as water-white or slightly yellow solvent solutions, the amounts of dissolved *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 33a

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.

ymers 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 33a

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 33a

GELVA® RESINS

Gelva PVAc resins are supplied in six grades, granules or lumps that offer a range in physical property values such as tensile strength, flexibility and softening point; and solution viscosities from 1.35 cps to 800 cps (86 gm resin/1,000 ml benzene). All grades are thermoplastic, transparent, colorless, odorless and tasteless and develop excellent adhesion to a wide variety of surfaces. The resins are soluble in ketones, esters, chlorinated and aromatic hydrocarbons and compatible with many plasticizers including phthalates and phosphates. *Gelva* resins are used for a variety of PVAc applications, including hot melt and solvent-based adhesives, paper and textile coatings, printing inks and as a base for chewing gum.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 33a

GELVA® RESIN SOLUTIONS

Viscous solvent solutions of polyvinyl acetate available in two types, *Gelva* V-55-E34 in ethyl alcohol and *Gelva* V-7-M50 in methyl alcohol. Viscosity ranges from approximately 2,500 cps for V-7-M50 to approximately 50,000 cps for V-55-E34. Total solids range from 34% to 50%. Films and

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coatings produced from the solutions 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, greaseproof coatings and pigment binders.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 33a

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 *Gelvato* 40-10 to 60 cps for *Gelvato* 1-90. 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, etc.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 33a

POLYVINYL BUTYRALS

BUTVAR® RESIN DISPERSION BR

A milk-white aqueous dispersion of plasticized polyvinyl butyral resin, *Butvar* Dispersion BR has a viscosity of 1500 cps and contains 40 parts plasticizer per 100 parts resin. Air-dried films cast from it are tough, colorless, transparent, dry at room temperature and are unaffected by boiling water. The films are strong and adhere well to a range of surfaces; they resist degradation by water, heat and sunlight. *Butvar* Dispersion BR is used in the textile industry to impart abrasion resistance, durability, strength, slippage control and reduced color crocking to a variety of materials; as abrasion resistant finishes for automobile seat belts and parachute harnesses; as a soft, full-

bodied finish for rayon, cotton, or nylon; as a durable, nonraveling finish for filament yarns; and as a finish for curtain and drapery fabrics, glass fabrics, upholstery goods, webbing, awnings, canvas and duck. The resin is also suitable for rug backing, and as greaseproof, washable coatings for wallpaper, window shades and packaging materials. It can be formulated for strippable coatings on metal and other substrates.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 33a

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 33a

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. *Saflex* is used as the laminating medium for automotive, aircraft and architectural applications. The functional properties provided by *Saflex* include energy absorption, heat insulation, glare control and sound reduction. *Saflex* is used to make bullet and burglar resisting safety glass and to laminate reflective coatings, painted designs and embeddings between layers of glass for sundry exterior and interior applications such as mirrors, room dividers, shower stalls and table tops. Standard 15 ga. and 30 ga. film is supplied in 750 ft. and 1500 ft. rolls.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key 33a

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POLYVINYL FORMAL RESINS

FORMVAR® RESINS

Formvar polyvinyl formal resins are white, free-flowing powders supplied in six 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; "5/95S" 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 **33a**

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 **23b**

DIBUTYL FUMARATE

Used as an internal plasticizing resin former for copolymerizing with vinyl acetate and vinyl chloride for adhesives, textile, paint and paper coatings. Intermediate for chemical synthesis.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23b**

DIBUTYL MALEATE

Supplied as a clear liquid, color APHA 10 maximum, to chemical manufacturers for use as an internal plasticizing resin former for copolymerizing with vinyl resins to make adhesives; textile and paper coatings, paints; and as an intermediate for chemical synthesis.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23b**

DIOCTYL MALEATE (DOM)

Supplied as a clear mobile liquid monomer for polymerization and copolymerization. DOM

combines with a variety of other monomers to form resins ranging from hard brittle materials to internally-plasticized elastomers.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23b**

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 primers, 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 **22b**

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 **23b**

MALEIC ANHYDRIDE

See Page 33

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 **23a**

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 **23a**

PHOSGARD® C-22-R *organophosphorus compound*

See Page 24

PHOSGARD® 2XC-20 *organophosphorus compound*

See Page 24

PHTHALIC ANHYDRIDE

See Page 33

STYRENE MONOMER

See Page 39

TETRATHAL® *tetrachlorophthalic anhydride*

See Page 25

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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 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 **32a**

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 21 general purpose SAN copolymer offering excellent processability; Grade 27, an improved heat resistant SAN plastic; and Grade 29, a higher strength material.

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key **32a**

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 **32a**

Lustrex® POLYSTYRENE extrusion materials

Lustrex extrusion compounds are supplied for extruding sheeting, film, or profile shapes

Grades are available in the full range of styrene plastics — from pure polystyrene through rubber-modified copolymers to provide general purpose, medium- or high impact materials, including high heat resistant grades.

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key **32a**

LUSTREX® POLYSTYRENE molding materials

A complete range of styrene plastics suitable for molding articles requiring sharp design detail, brilliant surface luster, good color, dimensional stability, hardness, rigidity, toughness. *Lustrex* is supplied in all commercial grades ranging from pure polystyrene through rubber-modified medium- to high impact materials — including high heat resistant grades — in crystal clear, transparent and opaque colors.

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key **32a**

LYTRON® LATICES

Lytron emulsion latices are aqueous dispersion of polystyrene and styrene-acrylate copolymers that are used as a binder, saturant or coating. 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.

MONSANTO POLYMERS & PETROCHEMICALS CO. Locator Key **33a**

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 **33a**

STYMER® COPOLYMER RESINS

See Page 64

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.

0684041

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, in alkyd and polyester resin manufacture and in urethane coatings.

MONSANTO POLYMERS & PETROCHEMICALS CO.

Locator Key **33a**

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 **23a**

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 **23a**

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 **22b**

POLYELECTROLYTES

MONSANTO® PE-52

PE-52, a dry solid powder, is the imidized form of *EMA* (ethylene maleic anhydride) 91 which has been lightly crosslinked with an amine. It removes bacterial material from water, blood and other systems. It is being investigated in the drug, water, food and other industries.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **24a**

MONSANTO® PE-60

PE-60 is the imidized form of isobutylene/maleic anhydride lightly crosslinked with an amine. It is an outstanding scavenger of viral and bacterial matter from proteinaceous material such as blood, sewage, fecal matter. Under investigation in drug, water, food and related industries. Supplied in dry powder form.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **24a**

PRINTING INK PRODUCTS

BUTVAR® RESINS

See Page 51

GELVA® RESINS

See Page 50

SANTOCEL® silica aerogel

See Page 15

STYRENE-ALLYL ALCOHOL RESINS

See Page 53

PROCESS CONTROL EQUIPMENT

INSTRUMENTATION, ANALOG PROCESS CONTROL

The dc^{2+} 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.

†Trademark of Fisher Controls Co.

FISHER CONTROLS CO.

Locator Key **14a**

INSTRUMENTATION, DIGITAL PROCESS CONTROL

The dc^{2+} , digital control center, performs supervisory control, direct digital control, data reduction, batch sequencing, and data logging and alarming in solving real-time, process control problems. The pc^2 language allows the process engineer to routinely write, maintain and expand process control programs. The dc^2 features a 16-bit minicomputer with fixed-point and floating-

point multi-peripheral
†Trademark of Fisher
FISHER CONTROL

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ICTS

point multiply and divide logic, plus a full line of peripheral devices.

Trademark of Fisher Controls Co.
FISHER CONTROLS CO.

Locator Key 14a

INSTRUMENTATION, PNEUMATIC and ELECTRONIC

The Wizard[†] III series of field-mounted instruments includes 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.

The temperature transmitter series, pt², offers high resistance to vibration, in-place calibration, proportional mA output, high accuracy, choice of thermocouples and resistance elements.

Registered trademark of Fisher Controls Co.

FISHER CONTROLS CO.

Locator Key 14a

REGULATOR, GAS

Gas regulators for distribution systems, residential and commercial.

FISHER CONTROLS CO.

Locator Key 14a

VALVE ACTUATORS and ACCESSORIES

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

FISHER CONTROLS CO.

Locator Key 14a

VALVES

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

FISHER CONTROLS CO.

Locator Key 14a

RECREATIONAL SURFACES

ASTROTURF® ACTION SURFACE

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.

NEW ENTERPRISE DIVISION

Locator Key 61a

ASTROTURF® FIELDHOUSE SURFACE

Smooth, seamless, resilient surface consisting of polyurethane and filler, poured-in-place by Monsanto installation crews. Ideal for basketball, gymnasiums, fieldhouses, dressing rooms, exercise rooms, etc.

NEW ENTERPRISE DIVISION

Locator Key 61a

ASTROTURF® GOLF PRACTICE PUTTING GREEN SURFACE

A synthetic golf practice putting green surface consisting of facing material of nylon ribbon, a polyester and nylon backing with a synthetic latex coating. Requires professional installation per Monsanto specifications over a hard-surfaced base such as asphalt or concrete.

NEW ENTERPRISE DIVISION

Locator Key 61a

ASTROTURF® GOLF TEE SURFACE

A synthetic golf tee surface consisting of facing material of nylon ribbon, a polyester and nylon backing with a synthetic latex coating, and a polyvinyl chloride foam pad attached—installed per Monsanto specifications over a fiber pad.

NEW ENTERPRISE DIVISION

Locator Key 61a

ASTROTURF® LANDSCAPE SURFACE *polyethylene*

One piece, continuous polyethylene surface—grass-like in color and texture, supplied in rolls nominally 3 feet wide by 50 feet long. Material requires professional installation. Ideal for installation on highway medians, industrial, commercial and residential landscape areas.

NEW ENTERPRISE DIVISION

Locator Key 61a

ASTROTURF® LANDSCAPE SURFACE *nylon*

An all-weather, synthetic grass-like cover consisting of facing material of nylon ribbon and polypropylene tufting media with an all-weather back. Should be professionally installed. Ideal for industrial, commercial and residential landscaping.

NEW ENTERPRISE DIVISION

Locator Key 61a

ASTROTURF® 'ROUND-THE-HOME' SURFACE

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, practice putting areas, etc.

NEW ENTERPRISE DIVISION

Locator Key 61a

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ASTROTURF® STADIUM SURFACE

An all-weather, synthetic grass-like recreational surface system consisting of facing material of nylon ribbon and a waterproof backing of polyester fiber and nylon tire cord bonded to a shock-absorbing under pad. This system, installed by Monsanto, is ideal for football, baseball, soccer and other field sports. Material available in rolls 15' wide by up to 200 feet long.

NEW ENTERPRISE DIVISION

Locator Key **61A**

ASTROTURF® TRACK SURFACE

All-weather seamless, resilient surface consisting of polyurethane and filler, with silica granule traction finish coat added, poured-in-place by Monsanto installation crews. Ideal for outdoor or indoor running tracks, tennis courts, broad jump runways, warning track, etc.

NEW ENTERPRISE DIVISION

Locator Key **61A**

RUBBER PROCESSING CHEMICALS

ACCELERATORS FOR NATURAL AND SYNTHETIC RUBBERS

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

Accelerator in fast-curing repair stocks. Accelerator for neoprene latex, natural rubber latex, and cements and an activator for thiazole accelerators.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23C**

A-32* 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.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23C**

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

Vulcanization accelerator for natural and synthetic rubbers. Used mostly for hard rubber.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23C**

DPG diphenylguanidine

Vulcanization accelerator for natural and synthetic rubbers. Used mostly as a secondary for thiazoles. DPG is treated to reduce dusting and dispersion.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23C**

EL-SIXTY* VULCANIZATION ACCELERATOR 1,3-bis (2-benzothiazolylmercaptomethyl)urea

Vulcanization accelerator for natural and synthetic rubbers. May be used alone but, for best results, an activator is usually desirable. Gives excellent processing and curing characteristics in many types of compounds. Effective in compounds containing high loads of retarding pigments such as clay.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23C**

METHASAN* VULCANIZATION ACCELERATOR zinc dimethyldithiocarbamate

Used as a secondary accelerator for Thiofide and Santocure accelerators.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23C**

MONO THIURAD* VULCANIZATION ACCELERATOR bis(dimethylthiocarbamyl)sulfide; tetramethylthiuram monosulfide

Primarily a secondary accelerator for Thiofide, Thiotax and Santocure accelerators. One of the safest activators and is frequently used in camel-back stocks. Used to some extent as a primary accelerator in white and colored goods.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23C**

R-2* CRYSTALS reaction product of carbon disulfide and 1,1'-methylene dipiperidine

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23C**

RZ-100* *N,N*-dimethylcyclohexamine salt of dibutyldithiocarbamic acid

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23C**

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

A delayed action accelerator used alone or with a small quantity of activator in natural and synthetic tire treads, sidewalls, etc. Used with high

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levels of activators in nontire applications to re-
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shorter scorch delay than *Santocure* NS.

MONSANTO INDUSTRIAL CHEMICALS CO.

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**SANTOCURE® 26 VULCANIZATION
ACCELERATOR 2-(2,6-dimethyl-4-
morpholiniothio)benzothiazole**

A delayed action accelerator for natural and syn-
thetic rubbers. Used in the same way as other
Santocure accelerators to achieve maximum pro-
cessing safety with furnace blacks, particularly
during the extrusion of tire treads and camel-
back.

MONSANTO INDUSTRIAL CHEMICALS CO.

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**SANTOCURE® MOR VULCANIZATION
ACCELERATOR 2-(morpholiniothio)benzothiazole**

An excellent accelerator where extended pro-
cessing safety is required. Used in thick treads
and extrusions, stocks with high loadings of fur-
nace blacks such as ISAF or SAF; stocks which
are to be stored for long periods such as camel-
back.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

**SANTOCURE® MOR-90 VULCANIZATION
ACCELERATOR blend of Santocure MOR and
Thiofide**

A delayed action accelerator with processing
safety between *Santocure* MOR and *Santocure*
NS. Used in the same way as other *Santocure* ac-
celerators - e.g., for the extrusion of tire treads
and camelback.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

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

A delayed action accelerator used alone or with
a small quantity of activator in natural and syn-
thetic tire treads, sidewalls, etc. Used with higher
levels of activators in nontire applications to re-
place MBTS/DPG systems.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

**SANTOCURE® NS-50 VULCANIZATION
ACCELERATOR 50-50 blend of Santocure NS and
Santogard PVI**

Santocure NS-50 is used to control processing
safety without significant influences on curing
characteristics and physical properties of the re-
sulting vulcanizate. It is used to replace conven-
tional retarders with no undesirable side effects

such as porosity and staining. *Santocure* NS-50 is
effective with the full range of conventional ac-
celerators, elastomers, and other compounding
ingredients.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

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

Vulcanization accelerator for natural and synthe-
tic rubbers. An activator is usually desirable. Safe
handling when properly activated. Can be used
successfully in a wide variety of stocks. *Thiofide*
is treated to reduce dusting and aid dispersion.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

THIOTAX† MBT 2-mercaptobenzothiazole

Vulcanization accelerator for natural and synthe-
tic rubbers. An activator is not needed but is often
desirable. Activator must be adjusted carefully to
avoid scorch difficulties. *Thiotax* is treated to re-
duce dusting and dispersion.

†Registered trademark of Monsanto Chemicals Limited

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

**THIURAD® VULCANIZATION ACCELERATOR
bis(dimethylthiocarbamyl)disulfide;
tetramethylthiuram disulfide**

Sulfur bearing vulcanization accelerator for natu-
ral and synthetic rubbers. Available in oiled and
unoiiled powder form and pellet form.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

**ANTIOXIDANTS AND
ANTIOXONANTS**

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

A powerful, nonblooming antioxidant to resist ef-
fect of heat deterioration and normal aging.
Combats catalytic degradation caused by copper,
etc. Suitable for both dry rubber and latex.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

FLECTOL® ODP an octylated diphenylamine

For protection of rubber against heat deterio-
ration and normal aging. It causes less discolor-
ation than most other full-power antioxidants. It
is an accelerator for neoprene vulcanization.
Flectol ODP is excellent for reducing frosting on
dry heat cured compounds.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

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SANTOFLEX® AW 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.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

SANTOFLEX® DD 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 **23c**

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

Outstanding and complete antidegradant for all commonly used elastomers. An efficient antiozonant, antioxidant, copper and manganese inhibitor, 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 **23c**

SANTOFLEX® LC *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 **23c**

SANTOFLEX® 13 *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, copper and manganese inhibitor, and flex-cracking inhibitor. Serves as an excellent polymer stabilizer while retaining carryover activity as an antiozonant/antioxidant.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

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

An antiozonant to protect against degradation in polyunsaturated elastomers.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

SANTOFLEX® 77 *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 **23c**

SANTOFLEX® 134 *an alkylaryl-p-phenylenediamine*

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, e.g., polybutadiene for tires.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

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

An antiozonant to protect against degradation in polyunsaturated elastomers.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

SANTOFLEX® 347 *a 1:1 blend of Santoflex 13 and Santoflex 77*

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 **23c**

SANTOFLEX® 734 *a 2:1 blend of Santoflex 13 and Santoflex 77*

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 **23c**

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

For the protection of uncured rubber against oxidation. It also inhibits oxygen attack on unsaturated resins and oils. Cold flow of uncured compositions is reduced by a stiffening effect of Santovar A.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

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SANTOWHITE® 54 modified hindered phenol

Santowhite 54 is an outstanding antioxidant from the standpoints of discoloration and staining. It is easily emulsified for use in latex and incorporates readily in dry rubbers.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

SANTOWHITE® 54-S solid form of Santowhite 54

Santowhite 54-S is an outstanding antioxidant from the standpoints of discoloration and staining. It is easily emulsified for use in latex and incorporates readily in dry rubbers.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

SANTOWHITE® MK reaction product of 6-tert-butyl-m-cresol and SCI_2

For protection of rubber from oxidation. It is excellent from the standpoints of staining and discoloration. Gives good protection to uncured SBR latex compounds.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

SANTOWHITE® CRYSTALS 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 provides excellent protection against normal aging.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

SANTOWHITE® POWDER 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 **23c**

RETARDERS

SANTOGARD® PVI RUBBER ADDITIVE 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 vulcanize properties. Santogard PVI gives significant improvements in green stock storage stability to minimize stock wastage.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

SPECIAL MATERIALS

INSOLUBLE SULFUR 60

Used to retard "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 **23c**

LAMPBLACK

See Page 37

MONOMERS for synthetic rubber

See Page 39

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 **23c**

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.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

TRIPOTASSIUM PHOSPHATE

See Page 42

VOCOL® RUBBER ACCELERATOR

zinc-o,o-di-n-butylphosphorodithioate

Low-cost, nonblooming, fast-curing activator for EPDM elastomers.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

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

Low-cost, nonblooming, fast-curing activator for EPDM elastomers.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23c**

0684047

59

RUBBER PROCESSING TESTING INSTRUMENTS

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 process. Data are presented on a two-pen strip chart recorder as continuous plots of 1) the stiffness (shear modulus) of the rubber versus time and 2) sample cavity pressure versus time.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23d**

MONSANTO® CURE-SIMULATOR *module unit*

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23d**

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 **23d**

MONSANTO® DISK RHEOMETER, MODELS 100 and MP-V

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-2084-71T Tentative Method.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23d**

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23d**

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, 1963. All measure plasticity of unvulcanized elastomers and processing performance of compounded elastomers. The Compact Mooney Viscometer offers simplicity of operation, minimum of floor space. Equipped with direct digital readout for viscosity measurements. Strip chart recorder with 12 speeds available.

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

The Custom Mooney Viscometer is tailored to customer's individual laboratory or factory needs, and offers compatibility with existing computers.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23d**

MONSANTO® TENSOMETER, MODELS F-10, F-20, F-30 *tensile tester*

Monsanto F-10, 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 **23d**

MONSANTO® TENSOMETER, MODEL T-500 *tensile tester*

A floor model electronic tensile tester with variable crosshead drive and comprehensive stress/strain electronics 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, DIN 53504, ISO/R37, etc.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **23d**

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 **23d**

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 **23d**

SOLVI

ACETONE
See Pag

AROMATI
See Pag

BUTENE-2
See Pag

CHLOROB
See Pag

ortho-DIC
See Pag

ETHYL AC
See Pag

ETHYLBEN
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METHAN
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TOLUENE
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SOLVENTS

ACETONE

See Page 39

AROMATIC CONCENTRATE C_9 mixed isomers

See Page 40

BUTENE-2 CONCENTRATE

See Page 40

CHLORO BENZENE

See Page 34

ortho-DICHLOROBENZENE

See Page 34

ETHYL ACETATE

See Page 36

ETHYLBENZENE

See Page 40

METHANOL methyl alcohol

See Page 40

TOLUENE

See Page 41

STABLE ISOTOPES

Monsanto supplies stable isotopes of the noble gases, carbon, and oxygen-16. 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 major and minor contaminants in the carbon isotopes are indicated. The gaseous products are supplied in glass ampoules and steel cylinders, the solid 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:

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

Stable BROMINE Isotopes
Stable Isotope: Br-79 Br-81
Isotopic
Enrichment 90% 90%
Form: NaBr NaBr
Purity: $\geq 98\%$ $\geq 98\%$

Stable CARBON-12 and Compounds (depleted $C-13$)
Form: C CO CO₂ CH₄ BaCO₃
Isotopic
Enrichment 99.9% 99.95% 99.9% 99.9% 99.9%
Purity: 99.8% 99.9% 99% 97% Reag. Grade

Stable CARBON-13 and Compounds (available at three levels of isotope enrichment)
20% Isotopic Enrichment
Form: CO CO₂
Purity: $\geq 99\%$ $\geq 99\%$

90% Isotopic Enrichment
Form: C CO CO₂ CH₄ BaCO₃
Purity: 99.8% 98% 98% 97% Reag. Grade

97% Isotopic Enrichment
Form: C CO₂ CH₄ BaCO₃
Purity: 99.8% $\geq 99\%$ $\geq 97\%$ Reag. Grade

Stable CHLORINE Isotopes
Stable Isotope: Cl-35 Cl-37
Isotopic
Enrichment 90% 90%
Form: NaCl NaCl
Purity: $\geq 98\%$ $\geq 98\%$

Stable HELIUM-3 (gas purity 99.5%)
Isotopic
Enrichment 90% 99.5% 99.98%

Stable KRYPTON Isotopes (gas purity 99.5%)
Stable Isotope: Kr-78 Kr-80 Kr-82 Kr-83 Kr-84 Kr-86
Isotopic
Enrichment 50% 50% 70% 70% 90% 99%

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

Stable OXYGEN Isotope (gas purity 99.5%)
Stable Isotope: O-16
Isotopic
Enrichment 99.98%

Stable SULFUR Isotope
Stable Isotope: S-34
Isotopic
Enrichment 90%
Form: S
Purity: $\geq 98\%$

Stable XENON Isotopes (gas purity 99.5%)
Stable Isotope: Xe-124 Xe-129 Xe-131 Xe-136
Isotopic
Enrichment 20-60% 60-90% 60% 99%

Monsanto Research Corporation

Locator Key 52a

SURFACE ACTIVE AGENTS, DETERGENTS and BLEACHES

BLEACHING COMPOUNDS

ACL®59 SANITIZER and BLEACHING COMPOUND potassium dichloroisocyanurate

ACL 59 is a 59% available chlorine product that is used for swimming pool disinfection and sanitizing. It is also used as an oxidizer in mechanical

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dishwashing compounds and other detergent applications.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22b**

ACL®60 SANITIZER and BLEACHING COMPOUND
sodium dichloroisocyanurate

ACL 60 is a 63% available chlorine product. It is used in detergent applications, bleaches and pool disinfection.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22b**

ACL®66 SANITIZER and BLEACHING COMPOUND
[(monotrichloro) tetra-(monopotassium dichloro)]-penta-isocyanurate

ACL 66 is a 66.5% available chlorine product used in sanitizers and detergent applications.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22b**

ACL®85 SANITIZER and BLEACHING COMPOUND
trichloroisocyanuric acid

ACL 85 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 **22b**

DETERGENT INTERMEDIATES

ALKYLATE 215 and 230 alkylbenzene-
biodegradable

These alkylates are supplied as intermediates for the manufacture of anionic liquid and solid detergents. The two grades are monoalkylbenzene mixtures of different molecular weights.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **21a**

SURFACE ACTIVE AGENTS -
ANIONIC

DBSA 99-B alkylbenzene sulfonic acid-
biodegradable

DBSA 99-B is produced by the sulfonation of refined linear alkylbenzene with SO₃ 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 **21a**

MONSANTO® H-230 AROMATIC NAPHTHA

A coproduct of the manufacture of linear alkylbenzene, *Monsanto H-230* is a mixture of alkylat-

ed 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 **21;**

SANTOMERSE® ME-B SLURRY sodium
alkylbenzene sulfonate-biodegradable

Santomerse ME-B Slurry is a special high solid, high active linear alkylbenzene sulfonate developed for detergent formulations. It is used in spray or drum dried products as well as liquid detergents. Light color gives flexibility in finishing products color.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **21;**

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% H₂O) 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 **21a**

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 **21a**

STEROX® AWS SURFACTANT built nonionic
detergent

Sterox AWS is a controlled sudsing, built, biodegradable, nonionic detergent designed for use in automatic home laundry machines.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **21a**

STEROX®
condensates

Sterox agent built little surfactants require a wide range of surfactants. In soft water, the product is a powder agent in solution.

STEROX®
ethylene polyoxye

Sterox agent built for sulfonated greasier siderab

STEROX®
ethylene polyoxye

Sterox based on ethylene oxide a much better extremely powdered agent including cleaning latex fo

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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 deterative 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 **21a**

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 **21a**

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 **21a**

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 **21a**

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 **21a**

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 processing; for metal cleaning; and in latex formulations.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **21a**

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 **21a**

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **21a**

TEXTILE CHEMICALS

BUTVAR® RESIN DISPERSION BR

See Page 51

BUTVAR® RESINS

See Page 51

CATALYST AC SERIES

See Page 18

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GELVA® COPOLYMER RESINS

See Page 49

GELVA® RESIN EMULSIONS

See Page 50

GELVA® RESINS

See Page 50

GELVATOL® RESINS

See Page 51

LYTRON® LATICES

See Page 53

LYTRON® RESINS

See Page 53

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 **33a**

SYTON® AS-200, AS-240, and AS-250 colloidal silica

See Page 16

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

See Page 16

THICKENING AGENTS

EMA® RESINS ethylene maleic anhydride copolymers

See Page 52

SANTOCEL® silica aerogel

See Page 15

WATER TREATING CHEMICALS

DEQUEST® 2000 deflocculating and sequestering agent

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

particularly effective additive in acid cleaner formulations for the control of extraneous metal ions and to improve soil or scale removal.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22**

DEQUEST® 2006 deflocculating and sequestering agent

Used in neutral or alkaline systems for the removal or 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 both washing formulas or dairy cleaners) or in general purpose detergents.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22**

DEQUEST® 2010 organophosphorus product

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22**

DEQUEST® 2042 organophosphorus product

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22**

DEQUEST® 2044 organophosphorus product

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22**

DEQUEST® 2052 organophosphorus product

Used primarily as a scale inhibitor in secondary flooding of oil fields.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22**

DEQUEST® 2054 organophosphorus product

Used primarily as a scale inhibitor in secondary flooding of oil fields.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **22**

WOOD PRESERVATIVE

MONSANTO® PENTA pentachlorophenol, technical

See Page 16

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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 MHA® Methionine Hydroxy Analog, you may call or write any of the offices listed under Locator Key 11a. These are: Atlanta, Santa Clara and St. Louis.

MONSANTO COMMERCIAL PRODUCTS CO.

11a ANIMAL PRODUCTS

Atlanta, Ga. 30339	(404) 432-7111
320 Interstate North Parkway	
Santa Clara, Calif. 95052	(408) 243-0414
2710 Lafayette Street	
St. Louis, Mo. 63166	(314) 694-2761
800 North Lindbergh Blvd.	

11b HERBICIDES

Atlanta, Ga. 30339	(404) 432-7111
320 Interstate North Parkway	
Decatur, Ill. 62523	(217) 423-6031
363 South Main Street	
Des Moines, Iowa 50310	(515) 276-8503
312 Marie Hay Tower	
Fargo, N.D. 58078	(701) 293-9855
Box 622	
Indianapolis, Ind. 46205	(317) 844-1838
4002 Meadows Drive	
Kansas City, Mo. 64133	(816) 353-8060
4240 Blue Ridge Blvd.	
Luling, La. 70070	(504) 784-6263
Box 174	
Mankato, Minn. 56001	(507) 387-3406
111 Madison East Plaza	
Memphis, Tenn. 38117	(901) 767-2131
5118 Park Avenue	
Santa Clara, Calif. 95052	(408) 243-0414
2710 Lafayette Street	
Wilmington, Dela. 19810	(302) 478-4600
3411 Silverside Road	

11c PLANT FOOD PRODUCTS

Atlanta, Ga. 30339	(404) 432-7111
320 Interstate North Parkway	
Fargo, N.D. 58078	(701) 293-9855
Box 622	
Luling, La. 70070	(504) 784-6263
Box 174	
Memphis, Tenn. 38117	(901) 767-2131
5118 Park Avenue	
Santa Clara, Calif. 95052	(408) 243-0414
2710 Lafayette Street	
St. Louis, Mo. 63166	(314) 694-2086
800 North Lindbergh Blvd.	

11d BLASTING PRODUCTS

St. Louis, Mo. 63166	(314) 694-3109
800 North Lindbergh Blvd.	

11e FARMERS HYBRID COMPANIES, INC.

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

12a UNITED SYSTEMS CORPORATION

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

12b ELECTRONIC MATERIALS

Garland, Texas 75042	(214) 272-6974
3318 Russwood Lane	
St. Peters, Mo. 63376	(314) 272-6281
Box 8	
Santa Clara, Calif. 95052	(408) 243-0414
2710 Lafayette Street	
Westwood, Mass. 02090	(617) 329-2530
555 High Street	

12c ELECTRONIC SPECIAL PRODUCTS

Cupertino, Calif. 95014	(408) 257-2140
10131 Bubbs Road	

13a BLOWNWARE

Anaheim, Calif. 92803	(714) 772-2190
611 E. Cerritos Avenue	
Chicago, Ill. 60018	(312) 296-6688
3158 Des Plaines Avenue	
Kenilworth, N.J. 07033	(201) 276-2900
North 8th St. & Monroe Avenue	
Sharonville, Ohio 45241	(513) 769-4040
3574 East Kemper Road	
Yardville, N.J. 08620	(609) 585-4630
584 Route 130, Box 23	

13b PLASTIC PRODUCTS

Atlanta, Ga. 30339	(404) 432-7111
320 Interstate North Parkway	
Chicago, Ill. 60018	(312) 296-6688
3158 Des Plaines Avenue	
Kenilworth, N.J. 07033	(201) 276-2900
North 8th St. & Monroe Avenue	
Santa Clara, Calif. 95052	(408) 243-0414
2710 Lafayette Street	

13c FOOD PACKAGING MATERIALS

Los Angeles, Calif. 90040	(213) 723-2492
6670 East Flotilla Street	
Yardville, N.J. 08620	(609) 585-4630
584 Route 130, Box 23	

13d EXTRUDED PRODUCTS

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

14a FISHER CONTROLS COMPANY

Marshalltown, Iowa 50158	(515) 754-5556
205 South Center Street	

15a MONSANTO ENVIRO-CHEM SYSTEMS, INC.

Chicago, Ill. 60606	(312) 782-0172
10 South Riverside Plaza	
St. Louis, Mo. 63166	(314) 694-2086
800 North Lindbergh Blvd.	

15b AIR SAMPLING SERVICES

Dayton, Ohio 45407	(513) 254-6251
1515 Nicholas Road	
St. Louis, Mo. 63166	(314) 694-2086
800 North Lindbergh Blvd.	

16a OTHER PRODUCTS

St. Louis, Mo. 63166	(314) 694-2086
800 North Lindbergh Blvd.	

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MONSANTO INDUSTRIAL CHEMICALS CO.

21a DETERGENTS AND PHOSPHATES

Akron, Ohio 44313
260 Springside Drive (216) 666-4111
Chicago, Ill. 60018
3158 Des Plaines Avenue (312) 296-6688
Cincinnati, Ohio 45206
1501 Madison (513) 751-6707
Los Angeles, Calif. 90040
6670 East Flotilla Street (213) 723-2492
New York, N.Y. 10036
1114 Avenue of the Americas (212) 764-5000
St. Louis, Mo. 63166
800 North Lindbergh Blvd. (314) 694-7107

21b FOOD AND FINE CHEMICALS

Atlanta, Ga. 30339
320 Interstate North Parkway (404) 432-7111
Chicago, Ill. 60018
3158 Des Plaines Avenue (312) 296-6688
Cincinnati, Ohio 45206
1501 Madison (513) 751-6707
Los Angeles, Calif. 90040
6670 East Flotilla Street (213) 723-2492
New York, N.Y. 10036
1114 Avenue of the Americas (212) 764-5000
St. Louis, Mo. 63166
800 North Lindbergh Blvd. (314) 694-7264
or
Central Order Processing Group
St. Louis, Mo. 63166
800 North Lindbergh Blvd. (314) 694-3354

21c MONSANTO FLAVOR/ESSENCE INC.

Chicago, Ill. 60018
3158 Des Plaines Avenue (312) 296-6688
New York, N.Y. 10013
427 Washington Street (212) 966-5566
Santa Clara, Calif. 95052
P.O. Box 120 (408) 243-0414

22a FRP COMPANY

Baxley, Ga. 31513
Box 349 (912) 367-3616

22b SPECIAL CHEMICAL SYSTEMS

Akron, Ohio 44313
260 Springside Drive (216) 666-4111
Atlanta, Ga. 30339
320 Interstate North Parkway (404) 432-7111
Chicago, Ill. 60018
3158 Des Plaines Avenue (312) 296-6688
Houston, Texas 77027
5051 Westheimer Road (713) 621-9550
Los Angeles, Calif. 90040
6670 East Flotilla Street (213) 723-2492
New York, N.Y. 10036
1114 Avenue of the Americas (212) 764-5000
St. Louis, Mo. 63166
800 North Lindbergh Blvd. (314) 694-7103

22c SPECIALTY PRODUCTS

Akron, Ohio 44313
260 Springside Drive (216) 666-4111
Atlanta, Ga. 30339
320 Interstate North Parkway (404) 432-7111
Boston, Mass. 02149
Everett Station (617) 387-5019
Chicago, Ill. 60018
3158 Des Plaines Avenue (312) 296-6688
Detroit, Mich. 48235
Box 5255 (313) 357-0911
Houston, Texas 77027
5051 Westheimer Road (713) 621-9550
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) 694-7107
Wilmington, Dela. 19810
3411 Silverside Road (302) 478-4608
or
Central Order Processing Group
St. Louis, Mo. 63166
800 North Lindbergh Blvd. (314) 694-3354

23a PLASTICIZERS

Akron, Ohio 44313
260 Springside Drive (216) 666-4111
Boston, Mass. 02149
Everett Station (617) 387-5019
Chicago, Ill. 60018
3158 Des Plaines Avenue (312) 296-6688
Los Angeles, Calif. 90040
6670 East Flotilla Street (213) 723-2492
New York, N.Y. 10036
1114 Avenue of the Americas (212) 764-5000
Wilmington, Dela. 19810
3411 Silverside Road (302) 478-4608
or
Central Order Processing Group
St. Louis, Mo. 63166
800 North Lindbergh Blvd. (314) 694-3354

23b PROCESS CHEMICALS

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
Santa Clara, Calif. 95052
2710 Lafayette Street (408) 243-0414
or
Central Order Processing Group
St. Louis, Mo. 63166
800 North Lindbergh Blvd. (314) 694-3354

23c RUBBER CHEMICALS

Akron, Ohio 44313
260 Springside Drive (216) 666-4111

23d RUBBER INSTRUMENTS

Akron, Ohio 44311
920 Brown Street (216) 434-1111

23e RELIABLE MANUFACTURING COMPANY

Akron, Ohio 44314
2689 Wingate Avenue (216) 753-6411

24a OTHER PRODUCTS

St. Louis, Mo. 63166
800 North Lindbergh Blvd. (314) 694-7107

MON!
PETRO

31a PET

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33a RE

Atla

Chic

Detr

Hou

Indi

Los

New

33b RE

Eug

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Hou

0684054

216) 666-4111
 404) 432-7111
 17) 387-5010
 12) 296-6688
 13) 357-0910
 13) 621-9550
 12) 764-5000
 08) 243-0414
 14) 694-7109
 02) 478-4600
 14) 694-3354
 16) 666-4111
 17) 387-5010
 12) 296-6688
 13) 723-2492
 12) 764-5000
 02) 478-4600
 14) 694-3024
 16) 666-4111
 12) 296-6688
 13) 621-9550
 12) 764-5000
 08) 243-0414
 4) 694-3354
 5) 867-5461
 7) 434-1962
 4) 753-8451
 6) 694-1000

MONSANTO POLYMERS & PETROCHEMICALS CO.

31a PETROCHEMICALS

Akron, Ohio 44313
 260 Springside Drive
 Chicago, Ill. 60618
 3158 Des Plaines Avenue
 Houston, Texas 77027
 5051 Westheimer Road
 New York, N.Y. 10036
 1114 Avenue of the Americas
 Seattle, Wash. 98121
 2112 Third Avenue
 Wilmington, Dela. 19810
 3411 Silverside Road

32a PLASTICS

Atlanta, Ga. 30339
 320 Interstate North Parkway
 Chicago, Ill. 60618
 3158 Des Plaines Avenue
 Cincinnati, Ohio 45206
 1501 Madison
 Detroit, Mich. 48235
 Box 5155
 Indian Orchard, Mass. 01051
 730 Worcester Street
 Los Angeles, Calif. 90040
 6670 East Flotilla Street
 New York, N.Y. 10036
 1114 Avenue of the Americas
 St. Louis, Mo. 63166
 800 North Lindbergh Blvd.

33a RESIN PRODUCTS

Atlanta, Ga. 30339
 320 Interstate North Parkway
 Chicago, Ill. 60618
 3158 Des Plaines Avenue
 Detroit, Mich. 48235
 Box 5253
 Houston, Texas 77027
 5051 Westheimer Road
 Indian Orchard, Mass. 01051
 190 Grochmal Avenue
 Los Angeles, Calif. 90040
 6670 East Flotilla Street
 New York, N.Y. 10013
 1114 Avenue of the Americas

33b RESINS FOR WOOD PRODUCTS INDUSTRY

Eugene, Oregon 97402
 855 Seneca Road

34a CRUDE OIL & NATURAL GAS

Houston, Texas 77027
 5051 Westheimer Road

(216) 666-4111
 (312) 296-6688
 (713) 621-9550
 (212) 764-5000
 (206) 622-4203
 (302) 478-4600

(404) 432-7111
 (312) 296-6688
 (513) 751-6707
 (313) 357-0910
 (413) 788-6911
 (213) 723-2492
 (212) 764-5000
 (314) 694-3964

(404) 432-7111
 (312) 296-6688
 (313) 357-0910
 (713) 621-9550
 (413) 788-6911
 (213) 723-2492
 (212) 764-5000

(503) 342-7201

(713) 621-9550

MONSANTO TEXTILES COMPANY

41a Depending on end use, one of the following locations should be contacted.

APPAREL

Charlotte, N.C. 28210
 6230 Fairview Road
 Chicago, Ill. 60654
 222 North Bank Drive
 Los Angeles, Calif. 90015
 110 East 9th Street
 New York, N.Y. 10036
 1114 Avenue of the Americas

CARPETS

Atlanta, Ga. 30339
 320 Interstate North Parkway
 Chicago, Ill. 60654
 222 North Bank Drive
 New York, N.Y. 10036
 1114 Avenue of the Americas
 San Francisco, Calif. 94111
 151 Union Street

HOME FURNISHINGS

Atlanta, Ga. 30339
 320 Interstate North Parkway
 Charlotte, N.C. 28210
 6230 Fairview Road
 New York, N.Y. 10036
 1114 Avenue of the Americas

INDUSTRIAL

Akron, Ohio 44313
 260 Springside Drive
 Charlotte, N.C. 28210
 6230 Fairview Road
 New York, N.Y. 10036
 1114 Avenue of the Americas

TIRE

Akron, Ohio 44313
 260 Springside Drive

WIGS

New York, N.Y. 10036
 1114 Avenue of the Americas

42a FIBERS FOR NONWOVENS

St. Louis, Mo. 63166
 800 North Lindbergh Blvd.

MONSANTO RESEARCH CORPORATION

51a EXPLORATORY & LONG RANGE RESEARCH BUSINESS EXPERIMENTS

Dayton, Ohio 45407
 1515 Nicholas Road

52a UNITED STATES ATOMIC ENERGY FACILITY

Mound Laboratory, Miamisburg, Ohio 45342
 Box 32

NEW ENTERPRISE DIVISION

61a RECREATIONAL SURFACES

St. Louis, Mo. 63166
 800 North Lindbergh Blvd.

62a SPUNBONDED FABRIC

St. Louis, Mo. 63166
 800 North Lindbergh Blvd.

MONSANTO Company is a diversified producer of chemicals, plastics, man-made fibers, petroleum and electronics. The company manufactures more than 1,000 products at its 45 plants in the United States and in manufacturing operations in 19 other countries. Monsanto has research facilities in 11 United States locations and at four overseas sites. In addition, the company's subsidiaries operate other laboratories and manufacturing plants. Monsanto Company is organized into four semiautonomous operating companies, plus an International and a New Enterprise Division.

MONSANTO COMMERCIAL PRODUCTS CO.

This operating unit of the company includes five basic business areas: agricultural, electronic products, control valves and systems, environmental and chemical systems and fabricated products. Agricultural products include herbicides, feed additives, fertilizer materials, insecticides and hybrid breeding swine. Electronic products include semiconductor materials, light-emitting diodes and instruments. Through its Fisher Controls Company, the company markets automatic control equipment and valves. Monsanto Enviro-Chem Systems, Inc., a subsidiary, develops, markets and installs systems to control air and solid waste pollution. Fabricated products include plastic packaging, blow-molded plastic bottles and *Fome-Cor*® insulation board.

MONSANTO INDUSTRIAL CHEMICALS CO.

This operating unit of the company includes three basic business areas: rubber and process chemicals, detergent and fine chemicals and functional products. The first business area includes rubber chemicals, plasticizers and general process chemicals. Detergents and phosphates, phosphorus manufacturing and food and fine chemicals form the second area. The third entity consists of specialty products such as functional fluids, and special chemical systems, including chemicals used for water, paper and wood conditioning.

MONSANTO POLYMERS & PETROCHEMICALS CO.

This operating unit of the company includes four basic business areas: plastics, resin products, petrochemicals, and petroleum. The plastics are polystyrene, ABS, polyethylene, and nylon resins. Resin products include plastic interlayer for laminated glass; polyvinyl acetates, alcohols, butyral and formals; and phenolic, urea and melamine resins. Petrochemicals include monomers and petrochemicals. The fourth area covers the exploration for and production of crude oil and natural gas.

MONSANTO TEXTILES COMPANY

This operating unit of the company manufactures four man-made fibers: nylon, acrylic, modacryl, and polyester. Increasing quantities of Monsanto fibers are sold under the *Wear-Dated*® guarantee. Carpeting in the *A-Acrilan*® program has long been a standard of quality. *Monsanto*® nylon tire yarns enjoy widespread acceptance. Industrial and home furnishings applications are growing rapidly. *Elura*® modacrylic wigs occupy position of leadership worldwide. In many fabric constructions, *SEF*® modacrylic fiber meets the rigid flammability standard for children's sleepwear (DOC FF 3-71). *SEF* also performs well in home furnishings fabrics where flammability standards must be met. New *Monvella*® biconstituted nylon and spandex hosiery yarn offers a unique combination of sheerness and support.

INTERNATIONAL DIVISION

Monsanto serves world markets through its International Division, with sales offices in approximately 100 countries. This corporate division coordinates operations outside the United States in conjunction with the four operating companies which have worldwide responsibility for their individual product lines.

NEW ENTERPRISE DIVISION

This corporate division searches out and creates new business ideas in areas of interest to the company. Currently there are two major business groups: *AstroTurf*® recreational surfaces and *Cerex*® spunbonded nylon fabric.

MONSANTO RESEARCH CORPORATION

Monsanto Research Corporation is a wholly-owned subsidiary of the company which serves as its vehicle for doing business with the government. It operates Mound Laboratory, in Miamisburg, Ohio, for the Atomic Energy Commission. It also maintains a contract research laboratory in Dayton, Ohio, which does a variety of scientific research for many government agencies, and also markets radioisotope sources and certain specialized instruments.

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Akron, 1
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Atlanta,
320 Int
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Chicago,
3158 D
(312) 2

Cincinnati,
1501 M
(513) 7

Detroit, 1
500 No
Southfi
(313) 3

Houston,
3051 W
(713) 6

Los Ange
6670 Ea
(213) 7

New Yor
1114 A
(212) 7

St. Louis
800 No
(314) 6

San Fran
2710 L
Santa F
(408) 2

Wilmington,
3411 S
(302) 4

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Agric

Decatur
363 So
(217)

Des Mo
112 W
(515)

CORPORATE

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

Corporate Administration
and Staff Departments
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

Akron, Ohio 44313
260 Springside Drive
(216) 666-4111

Atlanta, Georgia 30339
320 Interstate North Parkway
(404) 432-7111

Chicago, Illinois 60618
3158 Des Plaines Avenue
(312) 296-6688

Cincinnati, Ohio 45206
1501 Madison
(513) 751-6707

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

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

Los Angeles, California 90040
6670 East Flotilla Street
(213) 723-2492

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
2710 Lafayette Street
Santa Clara, California 95052
(408) 243-0414

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

**Additional marketing offices
maintained by:**

**MONSANTO COMMERCIAL
PRODUCTS CO.**

Agricultural Division

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

Des Moines, Iowa 50310
312 Merle Hay Tower
(515) 276-8503

Hampton, Iowa 50441
Headquarters:
Farmers Hybrid Companies, Inc.
Box 420
(515) 456-2596

Indianapolis, Indiana 46205
4002 Meadows Drive
(317) 844-1838

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

Luling, Louisiana 70070
Box 174
(504) 784-6263

Minneapolis, Minnesota 55601
111 Madison East Plaza
(507) 387-3406

Memphis, Tennessee 38117
5118 Park Avenue
(901) 767-2131

Electronics Group

Cupertino, California 95014
10131 Bybb Road
(408) 257-2140

Dayton, Ohio 45403
Headquarters:
United Systems Corporation
918 Woodley Road
(513) 254-6251

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

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

Fabricated Products Division

Anaheim, California 92803
611 E. Cerritos Avenue
(714) 722-2190

Kenilworth, New Jersey 07033
North 8th Street and Monroe Avenue
(201) 276-2900

Sharonville, Ohio 45241
3574 East Kemper Road
(513) 769-4040

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

Fisher Controls Company

Marshalltown, Iowa 50158
Headquarters:
205 South Center Street
(515) 756-3011

Monsanto Enviro-Chem Systems, Inc.

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Akron, Ohio 44311
920 Brown Street
(216) 434-1962

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

FRP Company

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

Monsanto Flavor/Essence, Inc.

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

Reliable Manufacturing Company

Akron, Ohio 44314
Headquarters:
2689 Wingate Avenue
(216) 753-8451

MONSANTO POLYMERS & PETROCHEMICALS CO.

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

Seattle, Washington 98121
2112 Third Avenue
(206) 622-4203

Springfield, Massachusetts

Resin Products

Indian Orchard, Mass. 01051
190 Grochmal Avenue
(413) 788-6911

Plastics

Indian Orchard, Mass. 01051
730 Worcester Street
(413) 788-6911

MONSANTO TEXTILES COMPANY

Charlotte, North Carolina 28210
6230 Fairview Road
(704) 364-0110

Chicago, Illinois 60654
222 North Bank Drive
(312) 467-0141

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

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Government Marketing

Monsanto Company
1101 17th Street NW
Washington, D.C. 20036
(202) 296-0050

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

Special Attractions

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.
Tucuman 117
Buenos Aires, Argentina

Australia

Monsanto Australia Limited
East Tower, Princes Gate
151 Flinders St
Melbourne, Victoria 3001
Australia

Monsanto Australia Limited
35 Terry Street
Rozelle, Sydney, NSW,
Australia 2039

Austria

Monsanto GmbH Austria
Rudolfplatz 12
Vienna 1, Austria

Belgium

Monsanto Europe S.A.
1, Place Madou
1030 Brussels, Belgium
Monsanto Europe NV/SA
163 Mechelsesteenweg
2000 Antwerp, Belgium

Brazil

Monsanto Comercio e Industria Ltda.
Rua Araujo 216 6° Andar
Sao Paulo, Brazil 01220

Canada

Monsanto Canada Ltd.
425 S. Patrick St.
LaSalle, Quebec, Canada
Monsanto Canada Ltd.
175 Rexdale Blvd.
Rexdale, Ontario, Canada
Monsanto Canada Ltd.
1004 Hamilton St.
Vancouver 3, B.C., Canada

Chile

Servicios Tecnicos Pacifico Ltda "Sertepal"
Edificio Espana Oficina 502
Calle Estado 337
Santiago de Chile

Colombia

Monsanto Colombiana Inc.
Carrera 15 No. 77-50
Bogota, Colombia

Dominican Republic

Monsanto Dominicana Inc.
Josefa Perdomo 17
Esquina Pasteur
Santo Domingo, Republica Dominicana

El Salvador

Monsanto Centroamerica (El Salvador) S.A.
Edificio Plaza
67 Avenida sury Calle a Santa Tecla
San Salvador, El Salvador

Finland

Monsanto (Scandinavia) AB
Arkadiankatu 8 C 20
001000 Helsinki 10, Finland

France

Societe Monsanto S.A.
9, rue d'Argenson
75 Paris (8) France

Guatemala

Monsanto Guatemala Inc.
Edificio Casa
7a Avenida 711 Zona 9
Guatemala City, Guatemala

Holland

Monsanto NV
Jan van Nassaustraat 53/55
Den Haag, Holland

Hong Kong

Monsanto Far East Ltd.
Management House
26 Canal Road West
Hong Kong

India

Monsanto Chemicals of India Pvt. Ltd.
Wakefield House, 11 Sprott Road
Ballard Estates
Bombay 1, India
Monsanto Chemicals of India Pvt. Ltd.
19 Rajendranath Mukherjee Road
Calcutta 1, India

Monsanto Chemicals of India Pvt. Ltd.
310-311 Linghi Chetty Street
Madras 1, India
Monsanto Chemicals of India Pvt. Ltd.
3/8 Asaf Ali Road
New Turkian Gate
New Delhi, India

Israel

Israel Chemical Fibres Ltd.
Industrial Zone
Ashdod, Israel

Italy

Monsanto Italiana S.p.A.
Via Melchiorre Gioia 8
20124 Milan, Italy

Japan

Monsanto Japan Ltd.
Room 628 Chiyoda Building
1-2 Marunouchi 2-chome, Chiyoda-ku
Tokyo 100, Japan

Malaysia

Monsanto Far East Ltd. Malaysia Branch
116, Jalan Semangat
Petaling Jaya, Selangor, Malaysia

Mexico

Monsanto Comercial S.A. de C.V.
Calle Thiers No. 248
Mexico 5, D.F., Mexico

Nicaragua

Monsanto Nicaragua S.A.
P. O. Box 288
Managua, Nicaragua

Norway

Monsanto Norge A.S.
Fred Olsensgt 11
Oslo 1, Norway

Philippines

Monsanto Philippines Inc.
Suite 314 Rufino Bldg.
6784 Ayala Avenue
Makati, Rizal D-708 Philippines

Puerto Rico

Monsanto Puerto Rico Company
P.O. Box 837 Hato Rey Sta.
Hato Rey, Puerto Rico 00919

Singapore

Monsanto Singapore Company (Pte.)
(Off Jalan Jurong Kechil, 8 M.S.)
Singapore 21

South Africa

Monsanto South Africa (Pty.) Ltd.
151 Guildhall 25-31 Cardiner Street
Durban, South Africa
Monsanto South Africa (Pty.) Ltd.
85 Rissik Street
Johannesburg, South Africa

Spain

Monsanto Iberica SA
Lepanto 350
Barcelona 13, Spain

Sweden

Monsanto (Scandinavia) AB
Ulysundavagen 108
16111 Bromma 11, Sweden

Switzerland

Monsanto (Suisse) SA
Tiefenhofe 10
8001 Zurich, Switzerland

Taiwan

Monsanto Far East Ltd. - Taiwan Branch
6th Floor, Section 1
36 Chang An East Road
Taipei, Taiwan

Thailand

Monsanto Thailand Ltd.
5th Floor, Kasemkij Building
120 Silom Road
Bangkok, Thailand

United Kingdom

Monsanto Chemicals Ltd.
Monsanto House
10-18 Victoria Street
London S.W.1, England
Monsanto Textiles Ltd.
Monsanto House
10-18 Victoria Street
London, S.W.1, England
Monsanto Textiles Ltd.
90 Thornton Road
Bradford & BDI 2DX
Yorkshire, England
Monsanto Textiles Ltd.
2nd Floor Thames Tower
Burleys Way
Leicester Le1 3 TP Leicestershire
England

Venezuela

Monsanto (Venezuela) CA
Torre Phelps - Piso 24
Plaza Venezuela
Caracas, Venezuela

West Germany

Monsanto (Deutschland) GmbH
Chemiewerke Lingen
D-4450 Lingen (Ems)
West Germany

MONSANTO / 800 N. LINDBERGH BLVD. / ST. LOUIS, MISSOURI 63166

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