

PRODUCT CATALOG

40th
Edition

Blowing Com
Blue "C" (Plas
Blue "C" filame
Blue "C" polyest
Bone Ash (Natur
Bone Ash, Synthet
Bottles and Contain
Bromine-79, 81 stab
Buffering Agents
Butadiene
Butene-2 Conce
Butvar

Coumarin
Counter, F
Counter-T
Counter/7
Counter-T



oxyquin
yl Acet
nylbene
ethylene



Hexameta
Hexameth
Hexamethy
High Bo



Krypt
KR-



Monsanto

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TOWOLDMON0042223

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

If you would like additional information regarding products, services or which location can best serve your needs, contact a Customer Inquiry Representative at any of the marketing offices listed on page 72. Or call the Customer Inquiry Center in St. Louis, Missouri (314) 694-3404.

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MONSANTO COMPANY is a diversified producer of chemicals, plastics, agricultural products, man-made fibers, and specialized electronic and process control systems. The company has investments, either directly or through affiliated companies, in 167 manufacturing plants and 35 laboratories or technical centers in 22 nations.

MONSANTO AGRICULTURAL PRODUCTS CO.

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

MONSANTO CHEMICAL INTERMEDIATES CO.

This operating unit of Monsanto covers four basic business areas: petrochemicals, process chemicals, textile intermediates and oil and gas production and exploration. Major products include styrene, acrylonitrile, phenol, chlorobenzenes, dibasic acids, chloralkali, phosphorus intermediates and industrial acids. These chemicals are used as key raw materials in the manufacture of plastics, fibers, synthetic rubber, agricultural chemicals and thousands of other consumer and industrial products. Through its production and exploration activities, the company finds and develops crude oil and natural gas reserves. While the majority of its operations are in the United States, the group also is actively involved in exploration efforts in Canada, the United Kingdom North Sea, and other parts of the world. The company also maintains an extensive research and development program directed at increasing its eminent position in manufacturing technology. As a result of its successful R & D program, the company's technology is licensed around the world.

MONSANTO COMMERCIAL PRODUCTS CO.

This operating unit consists of three business areas: electronics, process technology and systems for pollution control, and control valves and systems. Electronic products include semiconductor materials, light-emitting diodes and instruments. Through its Fisher Controls Company, the operating unit

markets automatic control equipment and valves. Monsanto Enviro-Chem Systems, Inc., a subsidiary, develops, markets and installs systems to control air pollution. Enviro-Chem also is a world leader in the design and construction of sulfuric acid plants.

MONSANTO INDUSTRIAL CHEMICALS CO.

This operating unit serves a broad range of markets through four business areas: detergents and phosphates, plasticizers, rubber chemicals, and specialty chemicals. Detergents and phosphates include products used in food and dentifrices, while plasticizers add flexibility and other desirable properties for packaging, film and sheeting. Through its rubber chemicals business the company is one of the world's leading suppliers of chemicals used in the manufacture of rubber products. Specialty chemicals include pharmaceuticals, food ingredients, functional fluids, water treatment chemicals and food additives.

MONSANTO PLASTICS & RESINS CO.

This operating unit is composed of three divisions—plastics, resin products and fabricated products. Monsanto plastics include Lustran® ABS, Lustran® SAN and Lustrex® polystyrene, three styrene-based plastics used in a variety of household, construction and appliance applications. Vydene® nylon and Vydne® R mineral-reinforced nylon are used in the electrical, appliance and transportation industries. Resin products encompass Sallux® polyvinyl butyral film, the plastic interlayer used in automotive windshields and laminated architectural glass, and specialty resins for paints, coatings, adhesives and paper. Included in fabricated products are custom designed and stock polyolefin containers, Fome-Cor® sheathing board for manufactured homes and automobile headliners, polyethylene film and Astroturf® stadium and resilient surfaces.

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MONSANTO TEXTILES COMPANY

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

INTERNATIONAL DIVISION

Monsanto's International operations serve world markets through sales offices and sales representatives in 74 nations. Monsanto International also coordinates operations outside the United States in conjunction with the six operating companies, which have worldwide responsibility for their individual product lines.

MONSANTO RESEARCH CORPORATION

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

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

COMPANY ORGANIZATION (See page 1)

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

ALPHABETIC PRODUCT INDEX (See page 4)

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

PRODUCT USE INDEX (See page 12)

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

LOCATOR KEY (See page 68)

Shown at the lower right of each product description. It works like this: If you need additional information on acetylsalicylic acid

(aspirin), Locator Key 44a refers to the marketing offices that handle this product. Thus, if you are located in Milwaukee, Wisconsin, our Chicago office would be closer to you.

MAJOR OFFICES (See page 72)

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

TRADEMARKS

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TOWOLDMON0042227

ALPHABETICAL PRODUCT INDEX

	Locator Key	Page No.
A		
A-1* Thiocarbonyl Vulcanization Accelerator.....	43a	57
Accelerators for Natural and Synthetic Rubbers.....		57
Acetaminophen (APAP).....	44a	39
Acetate, Ethyl.....	53a	41
Acetates, Polyvinyl.....		52
Acetic Acid 95%.....	44a	37
Acetic Acid glacial and commercial.....	44a	43
Acetone.....	22a	43
Acetophenetidin (Phenacetin U.S.P.).....	44a	39
Acetophenone.....	22a	43
Acetylsalicylic acid aspirin.....	44a	39
Acid, Acetic 95%.....	44a	37
Acid, Acetic glacial and commercial.....	44a	43
Acid, Acetylsalicylic aspirin.....	44a	39
Acid, Adipic, Food (F.C.C.) Grade.....	44a	30
Acid, Adipic, Technical Grade.....	21a	53
Acid, Alkylbenzene Sulfonic-Biodegradable (DDBSA 99-B).....	41a	65
Acid, Amino.....		21
Acid, Benzoic, U.S.P., F.C.C.....	44a	32
Acid, Carboic phenol.....	22a	43
Acid, Chlorosulfonic.....	21a	34
Acid, Cyanuric.....	44a	41
Acid, Fumaric, Food (F.C.C.) Grade.....	44a	30
Acid, Fumaric, Food (F.C.C.) Grade (CWS*).....	44a	30
Acid, Fumaric, Technical Grade.....	21a	53
Acid, Hydrochloric muriatic acid.....	21a	34
Acid, Lactic, U.S.P., Food Grade and Technical Grade.....	44a	30
Acid, Muriatic hydrochloric acid.....	21a	34
Acid, Nitric 37.5% - 38.0% Be.....	13a	34
Acid, Nitric concentrated.....	13a	35
Acid, Phosphoric 75, 80 and 85%.....	41a	46
Acid, Salicylic industrial.....	44a	38
Acid, Sorbic, F.C.C. (Monitor*).....	44a	32
Acid, Sulfuric.....	21a	35
Acids and Anhydrides.....		37
Acidulants.....		30
ACL* 56, 59, 60, 66, 85 Sanitizer and Bleaching Compounds.....	44a	65
Acrilan* acrylic fibers.....	61a	28
Acrylic Fibers (Acrilan*, Fina*).....	61a	28
Acrylonitrile.....	22a	43
Acrylonitrile-Butadiene-Styrene (Lustran* ABS).....	52a	54
Actionwear* filament nylon yarn.....	61a	28
Adhesives.....		19
ADHESIVE and ADHESIVES COMPONENTS		19
Adhesives Components.....		19
Adipic Acid, Food (F.C.C.) Grade.....	44a	30
Adipic Acid, Technical Grade.....	21a	53
Adiponitrile.....	21a	27
Allban* mold inhibitor.....	44a	21
AGRICULTURAL and FARM PRODUCTS....		19
Airborne and Specialty Fluids.....		33
Alachlor Herbicide (Lasso*).....	12a	20
Alcohol, Methyl (Methanol).....	22a	44
Alcohol Resins, Polyvinyl.....		52
Alkylaryl Phosphate (Santicizer* 141).....	42a	49

	Locator Key	Page No.
Alkylaryl Polyoxyethylene Ether (Sterox* DF, DJ, NJ, NK).....	41a	66
Alkylate 215, 225 and 230 alkylbenzene-biodegradable.....	41a	65
Alkylbenzene-Biodegradable (Alkylate 215, 225 and 230).....	41a	65
Alkylbenzene Sulfonic Acid-Biodegradable (DDBSA 99-B).....	41a	65
Alkyl Diaryl Phosphate (Santicizer* 148).....	42a	49
Alkyl Phenol (dodecylphenol, nonylphenol).....	41a	40
Aluminum Phosphate, Sodium (Levn-Lite*, Pan-O-Lite*, Stabil-9*).....	44a	31, 32
Amines.....		38
Amines, Mixed.....	21a	38
Amino Acids.....		21
Aminoplasts - see Melamine & Urea Resins.....	53a	50
Ammonia, Anhydrous.....	11a	19
Ammonium Nitrate 83% Solution.....	11a	19
Ammonium Nitrate Fertilizer, industrial grade (E-2*, Monsanto* HX-30).....	11b	22
Ammonium Nitrate Fertilizer Prills (E-2*).....	11a	19
Ammonium Phosphates.....		45
Ammox* environmental control system.....	34a	26
Amyl Salicylate.....	44c	32
Analog Process Control, Instrumentation.....	33a	55
Analog Process Measurement, Instrumentation.....	33a	55
Anhydrides and Acids.....		37
Anhydrous Ammonia.....	11a	19
ANIMAL NUTRITION PRODUCTS.....		21
Anionic Surface Active Agents.....	65	
ANTICAKING FLOW CONDITIONERS.....		21
ANTIFOAMING AGENTS.....		21
ANTIOXIDANTS.....		21
Antioxidants, Antiozonants and Antidegradants.....		58
APAP (Acetaminophen).....	44a	39
Argon AR-36, AR-38, AR-40 stable isotopes.....	72a	64
Aromatic Chemical Intermediates.....	21a	38
Aromatic Concentrate Cs mixed isomers.....	22a	43
Aromatic Naphtha (Monsanto* H-230).....	41a	65
Asphalt Vent System (Brink*).....	34a	26
Aspirin acetylsalicylic acid.....	44a	39
AstroTurf* Door Mats.....	51a	23
AstroTurf* Fieldhouse Surface.....	51e	56
AstroTurf* Stadium Surface.....	51e	56
AstroTurf* Track Surface.....	51e	57
Automatic Capillary Rheometer.....	43b	62
Auxiliary Digital Instruments.....	35a	24
Avadex* herbicide.....	12a	19
Avadex* BW herbicide.....	12a	20
B		
BACTERIOSTATS.....		22
Benzoate, Benzyl U.S.P.....	44a	39
Benzoate, Sodium, U.S.P., F.C.C.....	44a	32
Benzoic Acid, U.S.P., F.C.C.....	44a	32
Benzoin, Resin essential oil.....	44c	31
Benzothiazyl Disulfide (Thiolide* MBTS).....	43a	58
Benzyl Acetate.....	44c	32

	Locator Key	Page No.
Benzyl Benzoate, U.S.P.	44a	39
Benzyl Chloride <i>alpha-chlorotoluene</i>	21a	38
ortho-Benzyl-Parachlorophenol (Santophen® I Germicide)	41a	22
Benzyl Salicylate	44c	32
Bidim® spunbonded polyester fabrics	61b	27
Biphenyl	44a	34
N-N'-Bis(1,4-Dimethylpentyl)-p-Phenylenediamine (Santoflex® 77)	43a	59
Bis(Dimethylthiocarbamyl) Disulfide (Thiurad®)	43a	58
Bis(Dimethylthiocarbamyl) Sulfide (Mono Thiurad®)	43a	57
Bishexamethylenetriamine (BHMT)	21a	38
Blasting Agents (M-Pak®, M-Pel®, M-Pow®, M-Pulz®)	11b	22, 23
BLASTING MATERIALS	22	22
Blasting Supplies	11b	22
Bleaching Compounds	65	23
Blownware (Plastic Bottles & Containers)	61b	23
Blue "C"® filament nylon yarn	61a	28
Blue "C"® polyester fiber	61a	28
Bone Ash (Natural)	44a	36
Bone Ash, Synthetic (Mould Coat)	44a	36
Bottles and Containers, Plastic, Blownware	61b	23
Brink® Asphalt Vent System	34a	26
Brink® Filter	34a	26
Brink® Mist Eliminator	34a	26
Brink® Oleum Vent System	34a	26
Bromine-79, 81 stable isotopes	72a	60
Buffering Agents	34	30
Butadiene	22a	43
Butene-2 Concentrate	22a	44
Butvar® Resin Dispersion BR polyvinyl butyral	53a	52
Butvar® Resins polyvinyl butyral	53a	53
N-tert-Butyl-2-Benzothiazolesulfenamide (Santocure® NS)	43a	57
Butyl Benzyl Phthalate (Santizicer® 160)	42a	49
Butylenes mixed isomers	22a	44
4,4'-Butylenedibis(6-tert-butyl-m-cresol) (Santowhite® Powder)	42a	21
Butyrls, Polyvinyl	52	52

C

Calcium Orthophosphate (Lustre-Phos®)	41a	46
Calcium Phosphates	45	45
Calcium Pyrophosphate	41a	45
Capillary Rheometer, Automatic	43b	62
Carbolic Acid phenol	22a	43
Carbon-12, -13 and Compounds stable isotopes	72a	64
Cardamom Oil essential oil	44c	31
Cassia Oil essential oil	44c	31
Cast Primers (Blasting Supplies)	11b	22
Catalysts (Sulfuric Contact, Vanadium Pentoxide)	34a	23
CATALYSTS, CHEMICAL SPECIALTY	23	23
Caustic Potash	21a	34
CDA® Herbicide (Randox®)	12a	20
CDEC Herbicide (Vegadex®)	12a	20
Celery Oil and Resin essential oil	44c	31
Cellulosic Short Fiber, Treated (Santoweb®)	43a	60, 61
Cere® spunbonded nylon fabrics	61b	27
Cheese Emulsifier (Emulsi-Phos®)	44a	46
Chemical Intermediates, Aromatic	21a	38
CHEMICAL PROCESSES	23	23
CHEMICAL SPECIALTY CATALYSTS	23	23
Chlorine-35, 37 stable isotopes	72a	64
2-Chloroallyl Diethyldithiocarbamate (Vegadex®)	12a	20
alpha-Chloro-N,N-Diallylacetamide (Randox®)	12a	20
2-Chloro-2',6'-diethyl-N-(methoxymethyl) Acetanilide (Lasso®)	12a	20

2-Chloro-N-Isopropylacetanilide (Ramrod®)	12a	20
para-Chlorophenol	41a	40
Chlorosulfonic Acid	21a	34
alpha-Chlorotoluene benzyl chloride	21a	38
Citral essential oil	44c	31
Clocks, Digital	35a	24
Clove Oil essential oil	44a	37
Coagulants	60	60
Cold Feed Vacuum Extruder (Monsanto®)	41b	61
Cone-Rheometer (Monsanto®)	41b	62
CONSUMER PRODUCTS	23	23
CONTAINERS	23	23
Containers and Bottles, Plastic, Blownware	61b	23
Coolanol® 20, 25, 35, 45 dielectric coolants and heat transfer media	44a	33
Cooling Unit, Spray (Monsanto®)	41b	62
Coriander Oil essential oil	44c	31
CORROSION INHIBITORS	24	24
Coumarin	44a	37
Counter, Plug-In, Mainframe, Model 1505A	35a	25
Counter-Timers	35a	24
Counter-Timers, Programmable Factoring, Series 8150 (Digitec®)	35a	36
Counter-Timers, Universal	35a	24
Cubeb Oil essential oil	44c	31
Cumene	22a	44
Cumene Concentrate	22a	44
Cumuloff® filament nylon yarn	61a	28
para-Cumyl Phenol	41a	40
Cure-Simulator (Monsanto®)	41b	62
Curetron® data acquisition unit (Monsanto)	41b	62
CWS® Fumaric Acid, Food (F.C.C.) Grade	44a	30
Cyanuric Acid	44a	41
Cyclohexanol	21a	41
Cyclohexanol/Cyclohexanone Mixture	21a	27
Cyclohexylamine	21a	38
N-Cyclohexyl-2-Benzothiazolesulfenamide (Santocure®)	43a	57
N-(Cyclohexylthio)phthalimide (Santogard® PVH)	41a	60

D

Data Acquisition Components and Systems (Digitec®)	35a	36
Data Acquisition Unit (Monsanto Curetron®)	41b	62
DBSA 99-8 alkylbenzene sulfonic acid-biodegradable	41a	65
DECORATIVE AND INDUSTRIAL LAMINATES	24	24
Defoamer (Limit® 33)	43a	42
Defoamers (PC-1244®, PC-1344®)	21a	21
DENTIFRICE ABRASIVES	24	24
Dequest® 2000, 2006, 2010, 2041, 2054, 2060	44a	67
XX phosphonates	44a	67
Detector, Photo	32a	25
Detergent Intermediates	65	65
Detonating Cord (Blasting Supplies)	11b	22
Diallate Herbicide (Avadex®)	12a	19
Diammonium Phosphate (DAP)	41a	45
2,5-di(tert-Amyl) Hydroquinone (Santovar® A)	43a	59
2,2'-Dibenzothiazyl Disulfide (Thiodex® MBTS)	43a	58
Dicalcium Phosphate, Anhydrous and Dihydrate	41a	45
2,3-Dichloroallyl Diisopropylthiocarbamate (Avadex®)	12a	19
3,4-Dichloroaniline (3,4-DCA)	21a	38
ortho- and para-Dichlorobenzene	21a	39
2,4-Dichlorophenol	41a	40
Dicyclohexylamine	21a	38
Dicyclohexyl Phthalate (DCHP)	42a	48
Dicyclopentadiene Concentrate	22a	44

ALPHABETICAL PRODUCT INDEX Continued

	Locator Key	Page No.
Didodecyl Phenol crude.....	41a	40
Dielectric Coolants (Coolanol® 20, 25, 35, 45).....	44a	33
Dielectric Fluids		33
Dielectric Heat Transfer Fluid (DS-59®).....	44a	33
Di(2-Ethylhexyl) Adipate (DOA) dioctyl adipate.....	42a	48
0,0-Diethyl Phosphorochloridothioate (Ethyl PCT).....	13a	40
Digital Clocks.....	35a	24
Digital Instruments, Auxiliary.....	35a	24
Digital Multimeters (Digitec®).....	35a	36
Digital Panel Meters (Digitec®).....	35a	36
Digital Process Control, Instrumentation.....	33a	55
Digital Thermometers (Digitec®).....	35a	36
Digital Voltmeters (Digitec®).....	35a	36
Digitec® Data Acquisition Components and Systems.....	35a	36
Digitec® Digital Multimeters.....	35a	36
Digitec® Digital Panel Meters.....	35a	36
Digitec® Digital Thermometers.....	35a	36
Digitec® Digital Voltmeters.....	35a	36
Digitec® Programmable Factoring Counter/Timers, Series 8150.....	35a	36
Di(Heptyl, Nonyl, Undecyl)Phthalate (Santicizer® 711).....	42a	50
1,2-Dihydro-2,2,4-Trimethylquinoline, Polymerized (Flectol® H).....	43a	58
L-Dihydroxyphenylalanine (L-Dopa).....	44a	39
Diisopropylbenzene.....	22a	44
N-(1,3-Dimethylbutyl)-N'-Phenyl-p-Phenylenediamine (Santoflex® 13).....	43a	59
0,0-Dimethyl Phosphorochloridothioate (Methyl PCT).....	13a	40
Di(n-heptyl, n-nonyl)Adipate (Santicizer® 97).....	42a	48
Dinonyl Phenol crude.....	41a	40
Dioctyl Adipate (DOA) di(2-ethylhexyl)adipate.....	42a	48
Diodes, Light-Emitting (Infrared, Lamps).....	32a	25
Diphenyl biphenyl.....	44a	34
Diphenyl Oxide.....	44a	34
Diphenylamine, Octylated (Flectol® ODP).....	43a	58
Diphenylguanidine (DPC).....	43a	57
1,3-Diphenyl-2-Thiourea (A-1*).....	43a	57
N,N'-Diphenylthiourea (A-1*).....	43a	57
Di-n-Propylamine.....	21a	38
DISINFECTANTS		22
Disk-Rheometer, Models R-100 and R-900/750 (Monsanto®).....	43b	62
Disodium Phosphate, Anhydrous.....	41a	46
Disodium Phosphate, Dihydrate.....	44a	46
DISPERANTS		24
Displays.....	32a	25
2,2'-Dithiobis(benzothiazole) (Thiofide® MBTS).....	43a	58
4,4'-Dithiodimorpholine (Sulfasan® R).....	43a	61
Diundecyl Phthalate (DUP).....	42a	48
Dodecylaniline.....	21a	39
6-Dodecyl-1,2-Dihydro-2,2,4-Trimethylquinoline (Santoflex® DD).....	43a	58
Dodecylphenol alkyl phenol.....	41a	40
Dodecylphenol-Ethylene Oxide Condensate (Sterox® DF, DJ).....	41a	66
Door Mats (AstroTurf®).....	51a	23
L-DOPA L-dihydroxyphenylalanine.....	44a	39
DPG Vulcanization Accelerator diphenylguanidine.....	43a	57
E		
E-2® Ammonium Nitrate Fertilizer industrial grade.....	11b	22
E-2® Ammonium Nitrate Fertilizer Pills.....	11a	19
Electronic Instruments		24
Electronic Materials		25
ELECTRONIC PRODUCTS		24
EMA® Resins ethylene-maleic anhydride copolymers.....	44a	53
Embossed Polyethylene Film diaper film.....	51d	26
Emulsifier, Cheese (Emulsi-Phos®).....	44a	46

Emulsifiers	30	Fu
Emulsi-Phos® cheese emulsifier.....	44a	46
ENVIRONMENTAL CONTROL		26
Environmental Services.....	71a	26
Epoxy Resin Modifier (Mod-Epoxy®).....	42a	53
Essential Oils.....	44c	31
Ethavan® ethyl vanillin.....	44a	31
6-Ethoxy-1,2-Dihydro-2,2,4-Trimethylquinoline (Santoflex® AW).....	43a	58
Ethoxyquin (Santoquin®).....	44a	21
Ethyl Acetate.....	53a	41
Ethylbenzene.....	22a	44
Ethylene.....	22a	44
Ethylene-Maleic Anhydride Copolymers (EMA® Resins).....	44a	53
Ethyl Parathion insecticide.....	12a	20
Ethyl PCT 0,0-diethyl phosphorochloridothioate.....	13a	40
Ethyl Vanillin (Ethavan®).....	44a	31
Eugenol essential oil.....	44c	31
EXTRUDED PRODUCTS		26
Extruder, Cold Feed Vacuum (Monsanto®).....	43b	61
Extruder, Hot Feed (Monsanto®).....	43b	61
F		
Fabrics, Spunbonded Nylon (Ceretex®).....	61b	27
FABRICS, SYNTHETIC		27
Factoring Counter/Timers, Programmable, Series 8150 (Digitec®).....	35a	36
Far-Co® herbicide.....	12a	20
FARM PRODUCTS		19
Fatigue-to-Failure Tester iflex tester (Monsanto®).....	43b	62
Feed Additives		19
Ferrophosphorus Briquettes (LoSilPhos®).....	45a	36
Ferrophosphorus iron phosphide.....	45a	36
Fertilizers		19
FIBER INTERMEDIATES		27
Fibers, Acrylic (Acilan®, Fina®).....	61a	28
FIBERS, MAN-MADE		28
Fibers, Modacrylic (SEF®).....	61a	28
Fibers, Polyester (Blue "C"® and Spectran®).....	61a	28
Fieldhouse Surface (AstroTurf®).....	51e	56
Filament Nylon Yarns (Actionwear®, Blue "C"®, Cumulot®, Ultron®).....	61a	28
Filament Yarns, Polyester.....	61a	28
Film, Embossed Polyethylene diaper film.....	51d	26
Filter (Brink®).....	34a	26
Filterex® Resins.....	53c	55
Filteros® gum rosin.....	53c	41
Fina® acrylic fiber.....	61a	28
FIRE SAFETY, PRODUCTS TO IMPROVE		29
Fire Retardants		29
Flame Retardants		29
Flavorings		44c
Flectol® Flakes Antioxidant.....	43a	58
Flectol® H, ODP Antioxidants.....	43a	58
Flex Tester (Monsanto® Fatigue-to-Failure Tester).....	43b	62
FOAM INGREDIENTS - RESINOUS POLYOL		30
Fome-Cor® Boards.....	51c	26
FOOD INGREDIENTS		30
Formal Resins, Polyvinyl.....	53a	53
Formaldehyde.....	53a	43
Formaldehyde Resins.....		50
Formvar® Resins polyvinyl formal.....	53a	53
FRAGRANCES		44c
Frequency Counters (Counter-Timers).....	35a	24
Fumaric Acid, Food (F.C.C.) Grade.....	44a	30
Fumaric Acid, Food (F.C.C.) Grade (CWS®).....	44a	30

	Locator Key	Page No.
Fumaric Acid, Technical Grade.....	21a	53
FUNCTIONAL FLUIDS	33	
FUNGICIDES	22	
FUNGISTATS	22	
FURNACE LINER EROSION MONITOR	34	
G		
Gallium Arsenide electronic grade.....	32a	25
Gallium Arsenide Phosphide Alloy electronic grade.....	32a	25
Gallium Phosphide electronic grade.....	32a	25
Gas Regulators.....	33a	56
Gelva® Multipolymer Resin Solutions polyvinyl acetate.....	53a	52
Gelva® Resin Emulsions polyvinyl acetate.....	53a	52
Gelva® Resin Solutions polyvinyl acetate.....	53a	52
Gelvatol® Resins polyvinyl alcohol.....	53a	52
Geraniol essential oil.....	44c	31
GERMICIDES	22	
Ger-Pak® Polyethylene Sheeting and Tape.....	51d	27
Ginger Oil and Resin essential oil.....	44c	31
Glacial Acetic Acid.....	22a	43
Glyss Sodium Phosphate (Oilfos®).....	41a	47
Glyphosate Herbicide (Roundup®).....	12a	20
Gum Rosin (Filtros®).....	53c	41
H		
H-230 Aromatic Naphtha (Monsanto®).....	41a	65
Halogen-Containing Compounds	38	
H8-40® partially hydrogenated terphenyl.....	42a	48
Heat Transfer Fluids (Coolanol®, Therminol®).....	44a	33, 34
HEAVY CHEMICALS	34	
Helium-3 stable isotope.....	72a	64
Herbicides	19	
Hexametaphosphate, Sodium.....	41a	47
Hexamethylenediamine (HMD).....	21a	28
Hexamethylenediammonium Adipate.....	21a	28
High Resolution Time Interval Meter, Model 8320.....	35a	25
Hot Air Vulcanizing Tunnel (Monsanto®).....	43b	61
Hot Feed Extruder (Monsanto®).....	43b	61
H.T.® Monocalcium Phosphate monohydrate.....	44a	31
HX-30 (Regular) Ammonium Nitrate Fertilizer industrial grade.....	11b	22
Hydraulic Fluids	33	
Hydraulic Fluids (OS-45® Type IV, Skydrol®, Pydraul®).....	44a	33
Hydrochloric Acid muriatic acid.....	21a	34
I		
Industrial Fluids	33	
Infrared, Light-Emitting Diodes.....	32a	25
Insecticides	20	
Insoluble Sodium Metaphosphate.....	41a	47
Insoluble Sulfur 60.....	43a	60
INSTRUMENTS	35	
Instruments, Auxiliary Digital.....	35a	24
Instruments, Electronic	24	
INSTRUMENTS, RUBBER TESTING	62	
Instrumentation, Analog Process Control.....	33a	55
Instrumentation, Analog Process Measurement.....	33a	55
Instrumentation, Digital Process Control.....	33a	55
Instrumentation, Nuclear.....	71a	34
Instrumentation, Pneumatic and Electronic.....	33a	56
Intermediates	38	
Iron Phosphide (ferrophosphorus).....	45a	36
Isobutyl Salicylate.....	44c	33
Isoprene Concentrate.....	22a	44
N-Isopropyl-N'-Phenyl-p-Phenylenediamine (Santoflex® IP).....	43a	58
Isotopes, Stable.....	72a	64

K		
Krypton KR-78, KR-80, KR-82, KR-83, KR-84, KR-86 stable isotopes.....	72a	64
L		
Labdanum, Resin essential oil.....	44c	31
Lactic Acid, U.S.P., Food Grade and Technical Grade.....	44a	30
Lampblack.....	44a	41
Lamps, Light-Emitting Diode.....	32a	25
Lasso® herbicide.....	12a	20
Leavening Agents	31	
Levin-Lite® sodium aluminum phosphate.....	44a	31
Light-Emitting Diode Lamps.....	32a	25
Light-Emitting Diodes and Arrays	25	
Light-Emitting Diodes, Infrared.....	32a	25
Limit® 33 defoamer.....	53a	42
Linalool essential oil.....	44c	31
Liquid Curing Medium Unit (LCMU) (Monsanto®).....	43b	61
LoSilPhos® ferrophosphorus briquettes.....	45a	36
Lubricants (Santotrac®).....	44a	17
Lustran® ABS molding and extrusion resins.....	52a	54
Lustran® SAN molding resins.....	52a	54
Lustre-Phos® dentifrice abrasive.....	41a	46
Lustrex® polystyrene extrusion materials and molding materials.....	52a	54
Lytrol® Latices.....	53a	54
Lytrol® Resins.....	53a	54
M		
Machete® herbicide.....	12a	20
Maleic Anhydride.....	21a	37
MAN-MADE FIBERS	28	
Materials, Electronic	25	
Mats, Door (AstroTurf®).....	51a	23
Melamine and Urea Resins	50	
Melt Indexer.....	43b	62
2-Mercaptobenzothiazole (Thiotax® MBT).....	43a	58
Mersize® paper sizing agent.....	53a	42
METAL PROCESSING COMPOUNDS	36	
Metaphosphate, Insoluble Sodium.....	41a	47
Methanol methyl alcohol.....	22a	44
Methacrylene Fumarate.....	44a	39
Methacrylene Hydrochloride.....	44a	39
Methasan® Vulcanization Accelerator.....	43a	57
Methionine Hydroxy Analog calcium (MHA®).....	44a	21
Methylacetylene/Allene Concentrate.....	22a	44
Methyl Alcohol methanol.....	22a	44
Methyl Parathion insecticide.....	12a	20
Methyl PCT 0.0-dimethyl phosphorochloridathioate.....	13a	40
Methyl Salicylate, U.S.P.....	44a	31
alpha-Methylstyrene crude.....	22a	44
MHA® Methionine Hydroxy Analog calcium.....	44a	21
Microwave Continuous Rubber Vulcanizer (Monsanto®).....	43b	61
Mineral-Reinforced Nylon Resins (Vydyne®).....	52a	51
Mist Eliminator (Brink®).....	34a	26
Mixed Amines.....	21a	38
Modacrylic Fibers (SEF).....	61a	28
Modaflow® resin modifier.....	42a	41
Modaflow® Powder II resin modifier.....	42a	41
Mod-Epoxy® epoxy resin modifier.....	42a	53
Monitor® Sorbic Acid and Potassium Sorbate, F.C.C.....	44a	32
Monom ammonium Phosphate (MAP).....	41a	45
Monocalcium Phosphate, Anhydrous (Py-Ran®).....	44a	32
Monocalcium Phosphate monohydrate (H.T.®).....	44a	31
Monomers	41	
Monopotassium Phosphate.....	41a	46

8

* Nylon Resins, Mineral-Reinforced (Vydyne® R).....	52a	28
Nylon Staple.....	61a	28
Nylon Yarns, Filament (Actionwear®, Blue "C"®, Cumuloft®, Ultron®).....	61a	28
O		
ODORANTS		
Odor-Masking Agent (Santomask® II).....	42a	37
Oilflos® glassy sodium phosphate.....	41a	47
Oils, Essential.....	44c	31
OILS-LUBRICATING		
Oilum and Sulfuric Acid.....	21a	35
Oilum Vent System (Brink®).....	31a	26
Oilbanum Oil and Resin essential oil.....	44c	31
Opponax Oil and Resin essential oil.....	44c	31
Opto-Isolator.....	32a	25
ORGANIC CHEMICALS		
Orris, Resin essential oil.....	44c	31
OS-45® Type IV high temperature hydraulic fluid.....	44a	33
OS-59® dielectric heat transfer fluid.....	44a	33
OS-124® polyphenyl ether.....	44a	33
Outdoor Sweepers (Scamper®).....	51a	23
Oxygen-16, -17, -18 and Compounds stable isotopes.....	72a	64
P		
PAINT/COATING INGREDIENTS		
Panel Meters, Digital (Digitec®).....	35a	36
Pan-O-Lite® sodium aluminum phosphate.....	44a	32
Paper Coating and Specialty Coating Resins (Iscrisp®).....	53a	42
PAPER CHEMICALS		
Paper Sizing Agents (Merisize®, Monisize®, Santosize®).....	53a	42
Parathion-Ethyl and Methyl insecticide.....	12a	20
Patchouli Oil essential oil.....	44c	31
PC-1244®, PC-1344® defoamer.....	21a	21
Pentachlorophenol, Technical (Monsanto® Penta).....	41a	22
Pepper Oil and Resin essential oil.....	44c	31
Peppermint Oil essential oil.....	44c	31
Peru Balsam, Resin essential oil.....	44c	31
PETROCHEMICALS		
Pharmaceuticals		
Phenacetin, U.S.P. acetophenetidin.....	44a	39
para-Phenetidine.....	21a	39
Phenol.....	22a	43
Phenolic Resins liquid solutions (Resinox®).....	53a	51
Phenolic Resins		
Phenolic Resins liquids (Resinox®).....	53a	51
Phenolic Resins resin compound (Resinox®).....	53a	51
Phenolic Resins varnishes (Resinox®).....	53a	51
Phenolic and Resorcinol Resins.....	53b	49
Phenolic Tars.....	22a	44
Phenols		
Phenylbenzene biphenyl.....	44a	14
Phos-Chek® fire retardant.....	44b	24
Phos-Chek® P/30 fire retardant.....	44a	24
Phosgard® C-22-R, 2XC-20 organophosphorus compounds.....	42a	24
Phosphate Ester, Hydraulic Fluids (Pydraul®, Skydrol®).....	44a	14
Phosphonates (Dequest®).....	44a	14
Phosphoric Acid 75, 80 and 85%.....	41a	14
Phosphoric Acids		
Phosphorus, Elemental.....	41a	14
Phosphorus Oxychloride.....	21a	14
Phosphorus Pentasulfide.....	21a	14
PHOSPHORUS AND PHOSPHORUS DERIVATIVES		
Phosphorus Trichloride.....	21a	14

Photo C
Phthalic
Phthalol
Phthalyl
Pimelic
Piperyle
Plant
Plastic 1
Plastic 2
PLAST
PLAST
Plastic
Plug-In
Plug-In
Pneum.
Polaris
Polyam
Polyest
Polyest
Polyest
Polyeth
Polyeth
Polyeth
Polyir
Polyim
Polyox
Polypyr
Polyst
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Polyvin
-Gel
Polyvin
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Potas
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PRIN
PRO
Proc
Propa
Propa
Propie
Propy
Protec
Prot
Pydra
Pydra
11
Py-Ri

R-2*
Rad-2
RAC
Ramu

Locator Key	Page No.	Locator Key	Page No.
.....52a	51	32a	25
.....61a	28	21a	37
.....61a	28	21a	38
.....37		21a	38
.....42a	37	44c	31
.....41a	47	22a	44
.....44c	31	21	21
.....37		51b	23
.....21a	35	35a	23
.....34a	26	51b	50
.....44c	31	48	50
.....44c	31	60	60
.....32a	25	25	25
.....37		56	56
.....44c	31	12b	21
.....44a	33	52a	51
.....44a	33	61b	28
.....44a	33	61a	28
.....44a	33	61a	28
.....51a	23	51d	26
.....72a	64, 65	51d	27
.....41		51d	27
.....35a	36	51	51
.....44a	32	53a	51
.....53a	42	41a	65
.....42		44a	33
.....53a	42	54	54
.....12a	20	52	52
.....44c	31	52	52
.....21a	21	52	52
.....41a	22	52	52
.....44c	31	52	52
.....44c	31	52	52
.....44c	31	52	52
.....43		52	52
.....44a	39	52	52
.....21a	39	53a	52
.....22a	43	53a	53
.....53a	51	53a	52
.....51		53a	53
.....53a	51	53a	53
.....53a	51	53a	53
.....53b	19	53a	53
.....22a	44	53a	53
.....44a	34	53a	53
.....44b	29	53a	53
.....44a	29	53a	53
.....42a	29	53a	53
.....44a	33	53a	53
.....44a	67	53a	53
.....41a	46	53a	53
.....46		53a	53
.....41a	48	53a	53
.....21a	48	53a	53
.....21a	48	53a	53
.....45		53a	53
.....21a	48	53a	53

Ramrod® atrazine herbicide	12a	20
Randox® herbicide	12a	20
RECREATIONAL SURFACES		76
Reducing Agent (Santosit®)	21a	15
Regulator, Gas	33a	50
Related Products/Services		
agricultural & farm products		21
Resimene® Melamine Resins laminating	33a	50
Resimene® Melamine-Formaldehyde		
Resimene® Urea-Formaldehyde Resins coatings	33a	50
Resin Materials		51
Resin Modifiers (Modallow®, Modallow® Powder II, Multiflow®)	42a	41
Resin Oil	22a	45
Resin PR	22a	45
Resinous Polyol (Styrene-Allyl Alcohol Resins)	33a	55
Resinox® Phenolic Resins liquid solutions	33a	51
Resinox® Phenolic Resins liquids	33a	51
Resinox® Phenolic Resins resin compound	33a	51
Resinox® Phenolic Resins varnishes	33a	51
RESINS AND PLASTICS		50
Resloom® Melamine Resins	33a	50
Resorcinol and Phenolic Resins	53b	19
Retarders (Rubber)		60
Rheometer, Automatic Capillary	43b	62
Rheometer, Cone (Monsanto®)	43b	62
Rheometer, Disk, Models R-100 and R-900/750 (Monsanto®)	43b	62
Rhodinol essential oils	44c	31
RJ-100® and R® 101 styrene-allyl alcohol resins	33a	55
Rosin, Gum (Filtros®)	53c	41
Roundup® herbicide	12a	20
RPC-1600 cationic resin	53a	42
RUBBER PROCESSING CHEMICALS		57
RUBBER PROCESSING EQUIPMENT		61
RUBBER TESTING INSTRUMENTS		62
RZ-100® Vulcanization Accelerator	43a	57
S		
Saflex® Vinyl Butyral Film	53a	53
Salicylamide N.F.	44a	39
Salicylate, Amyl	44c	32
Salicylate, Benzyl	44c	32
Salicylate, Isobutyl	44c	33
Salicylate, Methyl, U.S.P.	44a	31
Salicylic Acid, Industrial	44a	38
Sandalwood Oil essential oil	44c	31
Sanitizer and Bleaching Compounds (ACL® 56, 59, 60, 66, 85)	44a	65
Santicizer® 8, 9, 79-TM, 97 plasticizer	42a	48
Santicizer® 141, 143, 148, 154, 160, 261, 278, 409	42a	49
411, 412, 429 plasticizers	42a	50
Santicizer® 546, 711, 712-TM plasticizers	42a	50
Santocure® Vulcanization Accelerator	43a	57
Santocure® MOR, NS Vulcanization Accelerators	43a	57
Santoflex® AW, DD Antioxidants	43a	58
Santoflex® IP Antiozonant	43a	58
Santoflex® LC Antidegradant	43a	59
Santoflex® 13, 77, 134 Antiozonants	43a	59
Santoflex® 134-D Antidegradant	43a	59
Santoflex® 715 Antiozonant	43a	59
Santoflex® 734 Antidegradant	43a	59
Santogard® PVI Prevulcanization Inhibitor	43a	60
Santolite® MHP Resin	42a	53
Santolite® MS Resin 80% industrial resin	42a	53
Santomask® II odor-masking agent	42a	57
Santonox® and Santonox® R antioxidant	42a	21
Santophen® I Germicide	42a	22
Santophen® I Solution	42a	22

ALPHABETICAL PRODUCT INDEX Continued

	Locator Key	Page No.
Santoquin® ethoxyquin antioxidant.....	44a	21
Santo-Res® 21, 30 Series paper chemicals.....	53a	42
Santosite® sodium sulfite anhydrous technical.....	21a	35
Santosize® paper sizing agent.....	53a	42
Santosol® 200, 300, 340 dye solvents.....	44a	34
Santotrac® Lubricants synthetic hydrocarbons.....	44a	37
Santovac® 5 vacuum diffusion pump fluid, polyphenyl ether.....	44a	34
Santovar® A Antioxidant.....	43a	59
Santoweb® D, H treated fibers.....	43a	60
Santoweb® K treated fiber.....	43a	61
Santoweb® 54, 54S, MK, Crystals Antioxidants.....	43a	59
Santowhite® Powder Antioxidant for plastic resins.....	42a	21
Santowhite® Powder Antioxidant for rubber elastomers.....	43a	59
Scamper® Outdoor Sweepers.....	51a	23
Scrispel® 500, 700 Series paper coating and specialty coating resins.....	53a	42
SEF® modacrylic fibers.....	61a	28
Sequestering Agents (Dequest®).....	44a	67
Sequestant (SQ Phosphate).....	41a	47
SEQUESTRANTS	63	
Sheeting, Polyethylene (Ger-Pak®).....	51d	27
Sheeting, Polyethylene Protective.....	51d	27
Shipping Containers for radioisotope materials.....	71a	56
Silicate Ester Fluids (Coolanol® OS-45® Type IV, OS-59®).....	44a	33
Silicon semiconductor grade.....	32a	26
Skybond® polyimide resins.....	53a	51
Skydrol® fire resistant hydraulic fluids.....	44a	33
Sodium Acid Pyrophosphate (SAPP).....	44a	32
Sodium Aluminum Phosphate (Levin-Lite®, Pan-O-Lite®, Stabil-9®).....	44a	31, 32
Sodium Benzoate, U.S.P., F.C.C.....	44a	32
Sodium Dichloroisocyanurate (ACL® 60).....	44a	65
Sodium Dichloroisocyanurate Dihydrate (ACL® 56).....	44a	65
Sodium Hexametaphosphate.....	41a	47
Sodium Metaphosphate, Insoluble.....	41a	47
Sodium Phosphate, Glassy (Oilfos®).....	41a	47
Sodium Phosphates	46	
Sodium Sulfite Anhydrous, Technical (Santosite®).....	21a	35
Sodium Tripolyphosphate (STP).....	41a	47
SOLVENTS	64	
Sopanox® ortho-tolyl biguanide.....	41a	22
Sorbate, Potassium, F.C.C. (Monitor®).....	44a	32
Sorbic Acid and Potassium Sorbate, F.C.C. (Monitor®).....	44a	32
Special Materials (Rubber)	60	
Spectran® polyester fiber.....	61a	28
Spray Cooling Unit (Monsanto®).....	43b	62
Spunbonded Nylon Fabrics (Ceretex®).....	61b	27
Spunbonded Polyester Fabrics (Bidim®).....	61b	27
SQ Phosphate sequestant.....	41a	47
Stabil-9® sodium aluminum phosphate.....	44a	32
STABLE ISOTOPES	72a	64
Stadium Surface (AstroTurf®).....	51e	56
Sterox® AJ, AJ-100, Surfactants.....	41a	65
Sterox® DF, DJ, ND, NE, NJ, NK, NM Surfactants.....	41a	66
Stymer® Copolymer Resins.....	53a	67
Styrex, Resin essential oil.....	44c	31
Styrenated Phenol (Montaclore®).....	43a	58
Styrene-Acrylonitrile Resins (Lustran® SAN).....	52a	54
Styrene-Allyl Alcohol Resins.....	53a	55
Styrene-Maleic Anhydride Copolymer Resins (Lyttron®).....	52a	54
Styrene Molding and Extrusion Materials (Lustrex®).....	53a	54
Styrene Monomer.....	22a	43
Styrene Plastics/Resins	54	
Sulfasane® R Vulcanizing Agent.....	43a	61
Sulfate, Sodium (Santosite®).....	21a	35

Sulfonamide Resins	55
Sulfonic Acids	40
Sulfur S-34 stable isotope.....	72a
Sulfur-Containing Compounds	64
Sulfuric Acid and Oleum.....	21a
Sulfuric Acid Plants process and construction.....	34a
Sulfuric Contact Catalyst.....	34a
SURFACE ACTIVE AGENTS, DETERGENTS and BLEACHES	65
Surface Active Agents - Anionic	65
Surface Active Agents - Nonionic	65
Sweepers, Outdoor (Scamper®).....	51a
Swine Breeding Stock.....	11c
SYNTHETIC FABRICS	27

T

Tape, Polyethylene (Ger-Pak®).....	51d	27
Tape, Polyethylene (Ger-Pak®).....	51d	27
TCC® 3,4,4'-trichlorocarbonyl.....	41a	22
Tensile Testers (Monsanto® Tensometers).....	43b	63
Tensometer, Model T-500 tensile tester (Monsanto®).....	43b	63
Tensometer, Model W tensile tester (Monsanto®).....	43b	63
Terphenyl, Partially Hydrogenated (HB-40®).....	42a	48
Test and Measurement Instruments	36	
Tetrachlorophthalic Anhydride (Tetrathal®).....	21a	29
Tetramethylthiuram Disulfide (Thiurad®).....	43a	58
Tetramethylthiuram Monosulfide (Mono Thiurad®).....	43a	57
Tetrapotassium Pyrophosphate.....	41a	46
Tetrasodium Pyrophosphate.....	41a	47
Tetrathal® tetrachlorophthalic anhydride.....	21a	29
TEXTILE CHEMICALS	66	
Therminol® 44, 55, 60, 66, 88, VP-1 heat transfer fluids.....	44a	34
Thermometers, Digital (Digitec®).....	35a	36
THICKENING AGENTS	67	
4,4'-Thiobis (6-tert-butyl-m-cresol) (Santonox® and Santonox® R).....	42a	21
4,4'-Thiobis (6-tert-butyl-m-cresol) (Santowhite® Crystals).....	43a	59
Thiocarbonyl (A-1®).....	43a	57
Thiodex® MBTS Vulcanization Accelerator.....	43a	58
Thiotax® MBT Vulcanization Accelerator.....	43a	58
Thiurad® Vulcanization Accelerator.....	43a	58
Time Interval Meter, High Resolution, Model 8320.....	35a	25
Tolu Balsam, Resin essential oil.....	44c	31
Toluene.....	22a	45
para-Toluenesulfonamide.....	42a	39
para-Toluenesulfonyl Chloride.....	42a	39
Toluenesulfonyl Chloride, Mixed.....	42a	39
ortho-Tolyl Biguanide (Sopanox®).....	41a	22
Tonka, Resin essential oil.....	44c	31
Track Surface (AstroTurf®).....	51e	56
Triallate Herbicide (Avadex® BW, Far-Co®).....	12a	20
Triaryl Phosphate (Santicizer® 154).....	42a	49
Triaryl Phosphate Modified (Santicizer® 143).....	42a	49
Tributyl Phosphate (TBP).....	42a	50
Tricalcium Phosphate.....	44a	46
2,3,3-Trichloroallyl Diisopropylthiocarbamate (Avadex® BW, Far-Co®).....	12a	20
3,4,4'-Trichlorocarbonyl (TCC®).....	41a	22
Trichloroisocyanuric Acid (ACL® 85).....	44a	65
Tridecanoethylene Oxide Condensate (Serox® AJ).....	41a	65
3,4,5-Trimethoxybenzaldehyde (TMB).....	44a	39
Triphenyl Phosphate (TPPA).....	42a	50
Tripolyphosphate, Sodium (STP).....	41a	47
Tripotassium Phosphate.....	41a	46

Trisodium P
Trisodium P
Tunnel, Hot

Ultron® nia
Urea and

Vacuum
Valve Actu
Valves
Valves, No
Vanadium
Vanilla Coi
Vanillin, El
Vanillin M
Vanillin Te
Vegadex®
Vent Syste
Vent Syste
Vinyl Acet
Vinyl But
Viscomete

PRODUCT USE INDEX

ADHESIVES and ADHESIVES COMPONENTS

Adhesives

Phenolic and Resorcinol Resins.....53b 19

Adhesives Components

Butvar[®] Resins.....53a 53
Dicyclohexyl Phthalate (DCHP).....42a 48
Formvar[®] Resins.....53a 53
Gelva[®] Multipolymer Resin Solutions.....53a 52
Gelva[®] Resin Emulsions.....53a 52
Gelva[®] Resin Solutions.....53a 52
Gelvatol[®] Resins.....53a 52
Lytron[®] Latexes.....53a 54
Lytron[®] Resins.....53a 54
Mod-Epoxy[®] epoxy resin modifier.....42a 53
Resloom[®] Melamine Resins.....53a 50
Santocizer[®] 141 plasticizer.....42a 49
Santocizer[®] 160 plasticizer.....42a 49
Santocizer[®] 261 plasticizer.....42a 49
Santocizer[®] 711 plasticizer.....42a 50

AGRICULTURAL and FARM PRODUCTS

Feed Additives

MHA[®] Methionine Hydroxy Analog calcium.....44a 21

Fertilizers

Ammonia, Anhydrous.....11a 19
Ammonium Nitrate 83% Solution.....11a 19
Diammonium Phosphate (DAP).....41a 45
E-2[®] Ammonium Nitrate Fertilizer Prills.....11a 19
Monopotassium Phosphate (MAP).....41a 45
Monopotassium Phosphate.....41a 46

Herbicides

Avadex[®].....12a 19
Avadex[®] BW.....12a 20
Far-Co[®].....12a 20
Lasso[®].....12a 20
Machete[®].....12a 20
Ramrod[®].....12a 20
Ramrod[®]/atrazine.....12a 20
Randox[®].....12a 20
Roundup[®].....12a 20
Vegadex[®].....12a 20

Insecticides

Ethyl Parathion.....12a 20
Methyl Parathion.....12a 20
Niran[®] 6-3.....12a 20

Plant Growth Regulator

Polaris[®].....12b 21

Related Products/Services

Gelvatol[®] Resins.....53a 52
Polyethylene Protective Sheeting and Tape.....51d 27
Swine Breeding Stock.....11c 21

ANIMAL NUTRITION PRODUCTS

Amino Acids

MHA[®] Methionine Hydroxy Analog calcium.....44a 21

Preservatives

Allaban[®] mold inhibitor.....44a 21
Santocin[®] ethoxyquin.....44a 21

ANTICAKING FLOW CONDITIONERS

Tricalcium Phosphate.....44a 46

ANTIFOAMING AGENTS

Limit[®] 33 defoamer.....53a 42
PC-1244[®] defoamer.....21a 21
PC-1344[®] defoamer.....21a 21

ANTIOXIDANTS

Santonox[®] and Santonox[®] R.....42a 21
Santoquin[®] ethoxyquin.....44a 21
Santowhite[®] Powder antioxidant.....42a 21
Sopanox[®] ortho-tolyl biguanide.....41a 22

BACTERIOSTATS/DISINFECTANTS/

FUNGICIDES/FUNGISTATS/GERMICIDES

ACL[®] 56, 59, 60, 66, 85 Sanitizer and Bleaching Compounds.....44a 65
2,4-Dichlorophenol.....41a 40
Monsanto[®] Penta pentachlorophenol, technical.....41a 22
Santophen[®] I Germicide.....41a 22
Santophen[®] I Solution.....41a 22
TCC[®] 3,4,4'-trichlorocarbaniide.....41a 22

BLASTING MATERIALS

Blasting Supplies.....11b 22
E-2[®] Ammonium Nitrate Fertilizer industrial grade.....11b 22
Monsanto[®] HX-30 (Regular) Ammonium Nitrate Fertilizer industrial grade.....11b 22
M-Pak[®] 100, 500, 600, 650 Blasting Agents.....11b 23
M-Pel[®] Blasting Agent.....11b 23
M-Pow[®] 100, 400, 500, 600, 650 Blasting Agents.....11b 23
M-Pulz[®] 204, 206, 666 Blasting Agents.....11b 23
Nitro Carbo Nitrate (NCN).....11b 23

CHEMICAL PROCESSES

Sulfuric Acid Plants process and construction.....34a 23

CHEMICAL SPECIALTY CATALYSTS

Sulfuric Contact Catalyst.....34a 23
Vanadium Pentoxide Catalyst.....34a 23

CONSUMER PRODUCTS

AstroTurf[®] Door Mats.....51a 23
Scamper[®] Outdoor Sweepers.....51a 23

CONTAINERS

Plastic Bottles & Containers - Blowware.....51b 23

CORROSION INHIBITORS

Cyclo- and Dicyclohexylamine.....21a 38
Santosite[®] sodium sulfite anhydrous, technical.....21a 35

DECORATIVE and INDUSTRIAL LAMINATES

Resimene[®] Melamine Resins laminating.....53a 50
Resinox[®] Phenolic Resins varnishes.....53a 51

DENTIFRICE ABRASIVES

Calcium Pyrophosphate.....41a 45
Dicalcium Phosphate, Anhydrous.....41a 45
Dicalcium Phosphate, Dihydrate.....41a 45
Insoluble Sodium Metaphosphate.....41a 47
Lustre-Phos[®] dentifrice abrasive.....41a 46

DISPERSANTS

Dequest[®] 2000 phosphonate.....44a 67
Dequest[®] 2006 phosphonate.....44a 67

Dequest[®]
Dequest[®]
Dequest[®]
Dequest[®]

ELECTRIC

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Auxiliar

Counter

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	Page No.	Location Key	Page No.
Dequest® 2010 phosphonate.....	44a	67	
Dequest® 2041 phosphonate.....	44a	67	
Dequest® 2054 phosphonate.....	44a	67	
Dequest® 2060 phosphonate.....	44a	67	
Dequest® XK phosphonate.....	44a	67	
ELECTRONIC PRODUCTS			
Instruments			
Auxiliary Digital Instruments.....	35a	24	
Counter-Timers.....	35a	24	
Counter-Timers, Universal.....	35a	24	
Digital Clocks.....	35a	24	
Digitec® Data Acquisition Components and Systems.....	35a	36	
Digitec® Digital Multimeters.....	35a	36	
Digitec® Digital Panel Meters.....	35a	36	
Digitec® Digital Thermometers.....	35a	36	
Digitec® Digital Voltmeters.....	35a	36	
Digitec® Programmable Factoring Counter/Timers, Series 8150.....	35a	36	
High Resolution Time Interval Meter, Model 8320.....	35a	25	
Plug-In Counter, Mainframe, Model 1505A.....	35a	25	
Plug-In Series for Model 1505A Plug-In Counter.....	35a	25	
Light-Emitting Diodes and Arrays			
Displays.....	32a	25	
Light-Emitting Diode Lamps.....	32a	25	
Light-Emitting Diodes, Infrared.....	32a	25	
Opto-Isolator.....	32a	25	
Photo Detector.....	32a	25	
Materials			
Coolanol® 20, 25, 35, 45 dielectric coolants and heat transfer media.....	44a	33	
Gallium Arsenide.....	32a	25	
Gallium Arsenide Phosphide Alloy.....	32a	25	
Gallium Phosphide.....	32a	25	
OS-59® dielectric heat transfer fluid.....	44a	33	
Silicon semiconductor grade.....	32a	26	
ENVIRONMENTAL CONTROL			
Ammox® System.....	34a	26	
Brink® Asphalt Vent System.....	34a	26	
Brink® Filter.....	34a	26	
Brink® Mist Eliminator.....	34a	26	
Brink® Oleum Vent System.....	34a	26	
Environmental Services.....	71a	26	
EXTRUDED PRODUCTS			
Embossed Polyethylene Film Diaper Film.....	51d	26	
Fome-Cor® Boards.....	51c	26	
Ger-Pak® polyethylene sheeting and tape.....	51d	27	
Polyethylene Protective Sheeting and Tape.....	51d	27	
FABRICS, SYNTHETIC			
Bidim® spunbonded polyester fabrics.....	61b	27	
Cerex® spunbonded nylon fabrics.....	61b	27	
FIBER INTERMEDIATES			
Adipic Acid, Technical Grade.....	21a	53	
Adiponitrile.....	21a	27	
Cyclohexanol/Cyclohexanone Mixture.....	21a	27	
Hexamethylenediamine (HMD).....	21a	27	
Hexamethylenediammonium Adipate.....	21a	28	
FIBERS, MAN-MADE			
Acrlan® acrylic fibers.....	61a	28	
Actionwear®, Blue "C"®, Cumulot®, Ultron® filament nylon yarns.....	61a	28	

	Page No.	Location Key	Page No.
Blue "C"® and Spectran® polyester fibers.....	61a	28	
Fina® acrylic fiber.....	61a	28	
Nylon Staple.....	61a	28	
Polyester Filament Yarns.....	61a	28	
SEF® modacrylic fibers.....	61a	28	
Wear-Dated® textile products.....	61a	28	
FIRE SAFETY, PRODUCTS TO IMPROVE			
Diammonium Phosphate (DAP).....	41a	45	
Monoammonium Phosphate (MAP).....	41a	45	
Phos-Chek® fire retardant.....	44b	29	
Phos-Chek® P30 fire retardant.....	44a	29	
Phosgard® C-22-R organophosphorus compound.....	42a	29	
Phosgard® 2XC-20 organophosphorus compound.....	42a	29	
Pydraul® 230C, 312C, 540C, MC hydraulic fluids.....	44a	33	
Pydraul® 10E, 29E LT, 30E, 50E, 65E, 90E, 115E hydraulic fluids.....	44a	33	
Santicizer® 141 plasticizer.....	42a	49	
Santicizer® 143 modified triaryl phosphate.....	42a	49	
Santicizer® 148 plasticizer.....	42a	49	
Santicizer® 154 triaryl phosphate.....	42a	49	
SEF® modacrylic fibers.....	61a	28	
Skydrol® fire resistant hydraulic fluids.....	44a	33	
Tetrathal® tetrachlorophthalic anhydride.....	21a	29	
Triphenyl Phosphate (TPPA).....	42a	50	
FOAM INGREDIENTS-RESINOUS POLYOL			
Styrene-Allyl Alcohol Resins.....	53a	55	
Tricalcium Phosphate.....	44a	46	
FOOD INGREDIENTS			
Acidulants			
Adipic Acid, Food (F.C.C.) Grade.....	44a	30	
CWS® Fumaric Acid, Food (F.C.C.) Grade.....	44a	30	
Fumaric Acid, Food (F.C.C.) Grade.....	44a	30	
H.T.® Monocalcium Phosphate monohydrate.....	44a	31	
Lactic Acid, U.S.P., Food Grade and Technical Grade.....	44a	30	
Monoammonium Phosphate (MAP).....	41a	45	
Monosodium Phosphate (MSP).....	41a	47	
Phosphoric Acid 75, 80 and 85%.....	41a	46	
Buffering Agents/Coagulants/Emulsifiers/Nutrition Supplements/Protein Interactants			
Adipic Acid, Food (F.C.C.) Grade.....	44a	30	
Benzoic Acid, U.S.P., F.C.C. Grade.....	44a	32	
Diammonium Phosphate (DAP).....	41a	45	
Dicalcium Phosphate, Anhydrous.....	41a	45	
Dicalcium Phosphate, Dihydrate.....	41a	45	
Disodium Phosphate, Anhydrous.....	41a	46	
Disodium Phosphate, Dihydrate.....	44a	46	
Emulsi-Phos® cheese emulsifier.....	44a	49	
Fumaric Acid, Food (F.C.C.) Grade.....	44a	30	
H.T.® Monocalcium Phosphate monohydrate.....	44a	31	
Monoammonium Phosphate (MAP).....	41a	45	
Monosodium Phosphate (MSP).....	41a	47	
Phosphoric Acid 75, 80 and 85%.....	41a	46	
Sodium Acid Pyrophosphate (SAPP).....	44a	2	
Sodium Hexametaphosphate.....	41a	27	
Sodium Tripolyphosphate (STP).....	41a	27	
Tetrasodium Pyrophosphate.....	41a	27	
Tricalcium Phosphate.....	44a	30	
Trisodium Phosphate, Anhydrous (TSP/A).....	41a	27	
Trisodium Phosphate, Crystalline.....	41a	27	
Flavorings			
Essential Oils.....	44a	3	
Ethavan® ethyl vanillin.....	44a	3	

PRODUCT USE INDEX Continued

	Locator Key	Page No.
Flavorings.....	44C	31
Methyl Salicylate, U.S.P.....	44A	31
Vanillin Monsanto*.....	44A	31
Leavening Agents		
H.T.* Monocalcium Phosphate monohydrate.....	44A	31
Levin-Lite* sodium aluminum phosphate.....	44A	31
Pan-O-Lite* sodium aluminum phosphate.....	44A	32
Py-Ran* anhydrous monocalcium phosphate.....	44A	32
Sodium Acid Pyrophosphate (SAPP).....	44A	32
Stabil-9* sodium aluminum phosphate.....	44A	32
Preservatives		
Benzoic Acid, U.S.P., F.C.C.....	44A	32
Monitor* Sorbic Acid and Potassium Sorbate, F.C.C.....	44A	32
Monosodium Phosphate (MSP).....	41A	47
Phosphoric Acid 75, 80 and 85%.....	41A	46
Sodium Benzoate, U.S.P., F.C.C.....	44A	32
Tetrasodium Pyrophosphate.....	41A	47
FRAGRANCES		
Amyl Salicylate.....	44C	32
Benzyl Acetate.....	44C	32
Benzyl Salicylate.....	44C	32
Coumarin.....	44A	37
Essential Oils.....	44C	31
Ethavan* ethyl vanillin.....	44A	31
Fragrances.....	44C	32
Isobutyl Salicylate.....	44C	33
Methyl Salicylate, U.S.P.....	44A	31
Vanillin Monsanto*.....	44A	31
FUNCTIONAL FLUIDS		
Airborne and Specialty		
Skydrol* fire resistant hydraulic fluids.....	44A	33
Dielectric		
Coolanol* 20, 25, 35, 45 dielectric coolants and heat transfer media.....	44A	33
OS-45* Type IV high temperature hydraulic fluid.....	44A	33
OS-59* dielectric heat transfer fluid.....	44A	33
Hydraulic Fluids		
Skydrol* fire resistant hydraulic fluids.....	44A	33
Pydraul* 230C, 312C, 540C, MC hydraulic fluids.....	44A	33
Pydraul* 10E, 29E LT, 30E, 50E, 65E, 90E, 115E hydraulic fluids.....	44A	33
Industrial		
OS-124* polyphenyl ether.....	44A	33
Pydraul* 230C, 312C, 540C, MC hydraulic fluids.....	44A	33
Pydraul* 10E, 29E LT, 30E, 50E, 65E, 90E, 115E hydraulic fluids.....	44A	33
Santotrac* Lubricants synthetic hydrocarbons.....	44A	37
Process		
Biphenyl also known as diphenyl and phenylbenzene.....	44A	34
Diphenyl Oxide.....	44A	34
Santosol* 200, 300, 340 dye solvents.....	44A	34
Therminol* 44, 55, 60, 66, 88 heat transfer fluids.....	44A	34
Therminol* VP-1 heat transfer fluid.....	44A	34
Vacuum Pump Fluid		
Santovac* 5 vacuum diffusion pump fluid, polyphenyl ether.....	44A	34
FURNACE LINER EROSION MONITOR		
Nuclear Instrumentation.....	71A	34
HEAVY CHEMICALS		
Caustic Potash.....	21A	34
Chlorosulfonic Acid.....	21A	34
Muriatic Acid hydrochloric acid.....	21A	34

* Nitric Acid 37.5% - 38.0% Be.....	13A	34
Nitric Acid Concentrated.....	13A	35
Santosite* sodium sulfate anhydrous, technical.....	21A	35
Sulfuric Acid and Oleum.....	21A	35

INSTRUMENTS

Electronic Instruments		
Auxiliary Digital Instruments.....	35A	24
Counter-Timers.....	35A	24
Counter-Timers, Universal.....	35A	24
Digital Clocks.....	35A	24
High Resolution Time Interval Meter, Model 8320.....	35A	25
Nuclear Instrumentation.....	71A	34
Plug-In Counter, Mainframe, Model 1505A.....	35A	25
Plug-In Series for Model 1505A Plug-In Counter.....	35A	25

Process Control Equipment

Instrumentation, Analog Process Control.....	33A	55
Instrumentation, Analog Process Measurement.....	33A	55
Instrumentation, Digital Process Control.....	33A	55
Instrumentation, Pneumatic and Electronic.....	33A	56
Regulator, Gas.....	33A	56
Valve Actuators and Accessories.....	33A	56
Valves.....	33A	56
Valves, Noise Abatement.....	33A	56

Rubber Testing Instruments

Capillary Rheometer, Automatic.....	43B	62
Melt Indexer.....	43B	62
Monsanto* Cone-Rheometer.....	43B	62
Monsanto* Cure-Simulator module unit.....	43B	62
Monsanto* Curetron* data acquisition unit.....	43B	62
Monsanto* Disk Rheometer, Models R-100 and R-900/750.....	43B	62
Monsanto* Fatigue-to-Failure Tester flex tester.....	43B	62
Monsanto* Mooney Viscometer.....	43B	62
Monsanto* Tensometer, Model T-500 tensile tester.....	43B	63
Monsanto* Tensometer, Model W tensile tester.....	43B	63

Test and Measurement

Capillary Rheometer, Automatic.....	43B	62
Digitec* Data Acquisition Components and Systems.....	35A	36
Digitec* Digital Multimeters.....	35A	36
Digitec* Digital Panel Meters.....	35A	36
Digitec* Digital Thermometers.....	35A	36
Digitec* Digital Voltmeters.....	35A	36
Digitec* Programmable Factoring Counter/Timers, Series 8150.....	35A	36
Melt Indexer.....	43B	62

METAL PROCESSING COMPOUNDS

Bone Ash (Natural).....	44A	36
Ferrophosphorus iron phosphide.....	45A	36
LoSilPhos* ferrophosphorus briquettes.....	45A	36
Monosodium Phosphate (MSP).....	41A	47
Mould Coat synthetic bone ash.....	44A	36
Phosphoric Acid 75, 80 & 85%.....	41A	46
Vanillin Technical.....	44A	39

ODORANTS

Coumarin.....	44A	37
Methyl Salicylate, U.S.P.....	44A	31
Santomask* II odor-masking agent.....	42A	37
Vanillin Monsanto*.....	44A	31

OILS-LUBRICATING

Santotrac* Lubricants synthetic hydrocarbons.....	44A	37
---	-----	----

ORGANIC CHEMICALS

Acids and Anhydrides		
Acetic Acid 95%.....	44A	37
Adipic Acid, Food (F.C.C.) Grade.....	44A	10

Page No.	Locator Key	Page No.
34	Adipic Acid, Technical Grade.....	21a
35	Benzoic Acid, U.S.P., F.C.C.....	44a
35	EMA® Resins ethylene-maleic anhydride copolymers.....	44a
35	Fumaric Acid, Food (F.C.C.) Grade.....	44a
	Fumaric Acid, Technical Grade.....	21a
	Lactic Acid, U.S.P., Food Grade and Technical Grade.....	44a
24	Maleic Anhydride.....	21a
24	Monitor® Sorbic Acid and Potassium Sorbate, F.C.C.....	44a
24	Phthalic Anhydride.....	21a
35	Salicylic Acid, Industrial.....	44a
25	Tetrathal® tetrachlorophthalic anhydride.....	21a
	Amines	
55	Bishexamethylenetriamine (BHMT).....	21a
55	Cyclo- and Dicyclohexylamine.....	21a
55	3,4-Dichloroaniline (3,4-DCA).....	41a
55	Di-n-Propylamine.....	21a
56	Dodecylaniline.....	21a
56	Mixed Amines.....	21a
56	ortho- and para-Nitroaniline.....	21a
56	ortho-Nitroanisole.....	21a
56	para-Phenetidine.....	21a
	Halogen-Containing Compounds	
62	ACL® 56, 59, 60, 66, 85 Sanitizer and Bleaching Compounds.....	44a
62	Benzyl Chloride alpha-chlorotoluene.....	21a
62	ortho- and para-Dichlorobenzene.....	21a
62	Monsanto® Penta pentachlorophenol, technical.....	41a
62	ortho- and para-Nitrochlorobenzene.....	21a
62	Phthalyl Chloride phthaloyl chloride.....	21a
62	Santophen® I Germicide.....	41a
62	Santophen® I Solution.....	41a
63	TCC® 3,4,4'-trichlorocarbanilide.....	41a
63	Tetrathal® tetrachlorophthalic anhydride.....	21a
	Intermediates	
62	Aromatic Chemical Intermediates.....	21a
36	ortho- and para-Dichlorobenzene.....	
36	Dodecylaniline.....	
36	ortho- and para-Nitroaniline.....	
36	ortho-Nitroanisole.....	
36	ortho- and para-Nitrochlorobenzene.....	
36	para-Phenetidine.....	
36	para-Chlorophenol.....	41a
62	3,4-Dichloroaniline (3,4-DCA).....	41a
	2,4-Dichlorophenol.....	41a
36	para-Toluenesulfonamide.....	42a
36	para-Toluenesulfonyl Chloride.....	42a
36	Toluenesulfonyl Chloride, Mixed.....	42a
	Pharmaceuticals	
36	Acetaminophen (APAP).....	44a
46	Acetylsalicylic Acid aspirin.....	44a
39	Benzyl Benzoate, U.S.P.....	44a
	L-Dopa L-dihydroxyphenylalanine.....	44a
	Methapyrilene Fumarate.....	44a
37	Methapyrilene Hydrochloride.....	44a
31	Phenacetin, U.S.P. acetophenetidin.....	44a
37	Salicylamide N.F.....	44a
31	3,4,5-Trimethoxybenzaldehyde (TMB).....	44a
	Vanillin Technical.....	44a
	Phenols	
37	para-Chlorophenol.....	41a
	para-Cumyl Phenol.....	41a
37	2,4-Dichlorophenol.....	41a
30	Didodecyl Phenol crude.....	41a

41a	Dinonyl Phenol crude.....	41a
41a	Dodecylphenol alkyl phenol.....	41a
41a	para-Nitrophenol.....	41a
41a	Nonylphenol alkyl phenol.....	41a
41	Phenol.....	22a
	Sulfonic Acids	
21a	Chlorosulfonic Acid.....	21a
14	DBSA 99-B alkylbenzene sulfonic acid - biodegradable.....	41a
42a	para-Toluenesulfonamide.....	42a
42a	para-Toluenesulfonyl Chloride.....	42a
42a	Toluenesulfonyl Chloride, Mixed.....	42a
	Sulfur-Containing Compounds	
41a	Ethyl PCT O,O-diethyl phosphorochlorodithioate.....	41a
41a	Methyl PCT O,O-dimethyl phosphorochlorodithioate.....	41a
42a	Santolite® MHP Resin.....	42a
42a	Santonox® and Santonox® R antioxidant.....	42a
42a	Santowhite® Powder antioxidant.....	42a
	Other Organic Chemicals	
44a	Cyanuric Acid.....	44a
41a	Cyclohexanol.....	41a
41a	Ethyl Acetate.....	41a
41a	Propionitrile.....	41a
42a	Sodium Benzoate, U.S.P., F.C.C.....	42a
	PAINT/COATING INGREDIENTS	
53a	Butvar® Resins.....	53a
53a	Filtros® gum rosin.....	53a
53a	Formvar® Resins.....	53a
53a	Gelva® Multipolymer Resin Solutions.....	53a
52	Gelva® Resin Emulsions.....	53a
52	Gelvatol® Resins.....	53a
41a	Lampblack.....	41a
53a	Lyttron® Latexes.....	53a
21a	Maleic Anhydride.....	21a
42a	Modalflow® resin modifier.....	42a
42a	Modalflow® Powder II resin modifier.....	42a
42a	Mod-Epoxy® epoxy resin modifier.....	42a
42a	Multiflow® resin modifier.....	42a
21a	Phthalic Anhydride.....	21a
42a	Phos-Chek® P/30 fire retardant.....	42a
53a	Resimene® Melamine-Formaldehyde Resins coatings.....	53a
53a	Resinox® Phenolic Resins liquid solutions.....	53a
42a	Santicizer® 160 plasticizer.....	42a
42a	Santolite® MHP Resin.....	42a
42a	Santolite® MS Resin.....	42a
42a	Santomask® II odor-masking agent.....	42a
53a	Styrene-Allyl Alcohol Resins.....	53a
41a	Tetrapotassium Pyrophosphate.....	41a
21a	Tetrathal® tetrachlorophthalic anhydride.....	21a
	PAPER CHEMICALS	
53a	Butvar® Resins.....	53a
53a	Gelva® Multipolymer Resin Solutions.....	53a
53a	Gelva® Resin Emulsions.....	53a
53a	Gelva® Resin Solutions.....	53a
53a	Gelvatol® Resins.....	53a
53a	Limit® 33 defoamer.....	53a
53a	Lyttron® Latexes.....	53a
53a	Mersize® paper sizing agent.....	53a
53a	Monsize® paper sizing agent.....	53a
53a	RPC-1600 cationic resin.....	53a
53a	Santo-Res® 21, 30 Series paper chemicals.....	53a
53a	Santosize® paper sizing agent.....	53a
53a	Scriptel® 500, 700 Series paper coating and special coating resins.....	53a
41a	Sterox® DF Surfactant.....	41a

PRODUCT USE INDEX Continued

	Locator Key	Page No.
Sterox® DJ Surfactant.....	41a	66
Sterox® NJ Surfactant.....	41a	66

PETROCHEMICALS

Monomers		
Acetic Acid glacial and commercial.....	22a	43
Acrylonitrile.....	22a	43
Butadiene.....	22a	43
Formaldehyde.....	53a	43
Phenol.....	22a	43
Styrene Monomer.....	22a	43
Vinyl Acetate Monomer.....	22a	43
Other Petrochemicals		
Acetone.....	22a	43
Acetophenone.....	22a	43
Aromatic Concentrate C _x mixed isomers.....	22a	43
Butene-2 Concentrate.....	22a	44
Butylenes mixed isomers.....	22a	44
Cumene.....	22a	44
Cumene Concentrate.....	22a	44
Dicyclopentadiene Concentrate.....	22a	44
Diisopropylbenzene.....	22a	44
Ethylbenzene.....	22a	44
Ethylene.....	22a	44
Isoprene Concentrate.....	22a	44
Methanol methyl alcohol.....	22a	44
Methylacetylene/Allene Concentrate.....	22a	44
alpha-Methylstyrene crude.....	22a	44
Phenolic Tars.....	22a	44
Piperylene Concentrate.....	22a	44
Propane.....	22a	45
Propylene.....	22a	45
Resin Oil.....	22a	45
Resin PR.....	22a	45
Toluene.....	22a	45
Xylenes, para/meta.....	22a	45

PHOSPHORUS and PHOSPHORUS DERIVATIVES

Ammonium Phosphates		
Diammonium Phosphate (DAP).....	41a	45
Monoammonium Phosphate (MAP).....	41a	45
Calcium Phosphates		
Bone Ash (Natural).....	44a	36
Calcium Pyrophosphate.....	41a	45
Dicalcium Phosphate, Anhydrous.....	41a	45
Dicalcium Phosphate, Dihydrate.....	41a	45
H.T.* Monocalcium Phosphate monohydrate.....	44a	31
Lustre-Phos® dentifrice abrasive.....	41a	46
Mould Coat synthetic bone ash.....	44a	36
Py-Ran® anhydrous monocalcium phosphate.....	44a	32
Tricalcium Phosphate.....	44a	46
Phosphoric Acids		
Phosphoric Acid 75, 80 and 85%.....	41a	46
Potassium Phosphates		
Monopotassium Phosphate.....	41a	46
Tetrapotassium Pyrophosphate.....	41a	46
Tripotassium Phosphate.....	41a	46
Sodium Phosphates		
Disodium Phosphate, Anhydrous.....	41a	46
Disodium Phosphate, Dihydrate.....	44a	46
Emulsi-Phos® cheese emulsifier.....	44a	46
Insoluble Sodium Metaphosphate.....	41a	47
Levn-Lite® sodium aluminum phosphate.....	44a	31
Monosodium Phosphate (MSP).....	41a	47
Oilfos® glassy sodium phosphate.....	41a	47

	Locator Key	Page No.
Pan-O-Lite® sodium aluminum phosphate.....	44a	32
Sodium Acid Pyrophosphate (SAPP).....	44a	32
Sodium Hexametaphosphate.....	41a	47
Sodium Tripolyphosphate (STP).....	41a	47
SQ Phosphate sequestant.....	41a	47
Stabil-9® sodium aluminum phosphate.....	44a	32
Tetrasodium Pyrophosphate.....	41a	47
Trisodium Phosphate, Anhydrous (TSPA).....	41a	47
Trisodium Phosphate, Crystalline.....	41a	47

Other Phosphorus and Phosphorus Derivatives

Ferrophosphorus iron phosphide.....	45a	36
LoSilPhos® ferrophosphorus briquettes.....	45a	36
Phosphorus, Elemental.....	41a	48
Phosphorus Oxichloride.....	21a	48
Phosphorus Pentasulfide.....	21a	48
Phosphorus Trichloride.....	21a	48

PLASTICISERS

Dicyclohexyl Phthalate (DCHP).....	42a	48
Di(2-Ethylhexyl)Adipate (DOA) dioctyl adipate.....	42a	48
Diundecyl Phthalate (DUP).....	42a	48
HB-40® partially hydrogenated terphenyl.....	42a	48
Santicizer® 8.....	42a	48
Santicizer® 9.....	42a	48
Santicizer® 79-TM.....	42a	48
Santicizer® 97.....	42a	48
Santicizer® 141.....	42a	49
Santicizer® 143 modified triaryl phosphate.....	42a	49
Santicizer® 148.....	42a	49
Santicizer® 154 triaryl phosphate.....	42a	49
Santicizer® 160.....	42a	49
Santicizer® 261.....	42a	49
Santicizer® 278.....	42a	49
Santicizer® 409.....	42a	49
Santicizer® 411.....	42a	49
Santicizer® 412.....	42a	49
Santicizer® 429.....	42a	49
Santicizer® 546.....	42a	50
Santicizer® 711.....	42a	50
Santicizer® 712-TM.....	42a	50
Santonox® and Santonox® R antioxidant.....	42a	21
Santowhite® Powder antioxidant.....	42a	21
Tributyl Phosphate (TBP).....	42a	50
Triphenyl Phosphate (TPPA).....	42a	50

PLASTICS and RESINS

Formaldehyde Resins		
Resimene® Melamine-Formaldehyde.....		
Resimene® Urea-Formaldehyde Resins coatings.....	53a	50
Resinox® Phenolic Resins liquid solutions.....	53a	51
Salicylic Acid, Industrial.....	44a	18
Melamine and Urea Resins		
Resimene® Melamine Resins laminating.....	53a	50
Resimene® Melamine-Formaldehyde.....		
Resimene® Urea-Formaldehyde Resins coatings.....	53a	50
Resloom® Melamine Resins.....	53a	50
Nylon Resins		
Vydyne® nylon and nylon copolymer resins.....	52a	51
Vydyne® R mineral-reinforced nylon resins.....	52a	51
Phenolic Resins		
Phenolic and Resorcinol Resins.....	53a	19
Resinox® Phenolic Resins liquids.....	53a	51
Resinox® Phenolic Resins liquid solutions.....	53a	51
Resinox® Phenolic Resins resin compound.....	53a	51
Resinox® Phenolic Resins varnishes.....	53a	51

Page No.		Locator Key	Page No.
32	Polyimide Resins		
32	Skybond®.....	53a	51
47	Polyvinyl Acetates		
47	Gelva® Multipolymer Resin Solutions.....	53a	52
32	Gelva® Resin Emulsions.....	53a	52
47	Gelva® Resin Solutions.....	53a	52
47	Polyvinyl Alcohol Resins		
47	Gelvitol® Resins.....	53a	52
	Polyvinyl Butyrals		
	Butvar® Resin Dispersion BR.....	53a	52
36	Butvar® Resins.....	53a	53
36	Sailflex® Vinyl Butyral Film.....	53a	53
48	Polyvinyl Formal Resins		
48	Formvar® Resins.....	53a	53
48	Resin Materials		
48	Adipic Acid, Technical Grade.....	21a	53
	EMA® Resins ethylene-maleic anhydride copolymers.....	44a	53
48	Fumaric Acid, Technical Grade.....	21a	53
48	Maleic Anhydride.....	21a	37
48	Modalflow® resin modifier.....	42a	41
48	Modalflow® Powder II resin modifier.....	42a	41
48	Mod-Epoxy® epoxy resin modifier.....	42a	53
48	Multiflow® resin modifier.....	42a	41
48	Phosgard® C-22-R organophosphorus compound.....	42a	29
48	Phosgard® 2XC-20 organophosphorus compound.....	42a	29
49	Phthalic Anhydride.....	21a	37
49	Styrene Monomer.....	22a	43
49	Tetrathal® tetrachlorophthalic anhydride.....	21a	29
49	Styrene Plastics/Resins		
49	Lustran® ABS molding and extrusion resins.....	52a	54
49	Lustran® SAN molding resins.....	52a	54
49	Lustrex® Polystyrene extrusion materials.....	52a	54
49	Lustrex® Polystyrene molding materials.....	52a	54
49	Lytron® Latex.....	53a	54
49	Lytron® Resins.....	53a	54
50	Stymer® Copolymer Resins.....	53a	67
50	Styrene-Allyl Alcohol Resins.....	53a	55
50	Tricalcium Phosphate.....	44a	46
21	Sulfonamide Resins		
21	Santolite® MHP Resin.....	42a	55
50	Santolite® MS Resin 80% industrial resin.....	42a	55
	PRINTING INK PRODUCTS		
	Butvar® Resins.....	53a	53
	Filterez® Resins.....	53c	55
	Resimene® Melamine-Formaldehyde.....		
	Resimene® Urea-Formaldehyde Resins coatings.....	53a	50
0	Styrene-Allyl Alcohol Resins.....	53a	55
1			
8	PROCESS CONTROL EQUIPMENT		
	Instrumentation, Analog Process Control.....	33a	55
0	Instrumentation, Analog Process Measurement.....	33a	55
0	Instrumentation, Digital Process Control.....	33a	55
0	Instrumentation, Pneumatic and Electronic.....	33a	56
	Regulator, Gas.....	33a	56
-1	Valve Actuators and Accessories.....	33a	56
1	Valves.....	33a	56
	Valves, Noise Abatement.....	33a	56
9	RADIOISOTOPE SOURCES		
	Nuclear Instrumentation.....	71a	34
1	Nuclear Services.....	71a	56
1	Radioactive Sources.....	71a	56
1	Shipping Containers.....	71a	56

RECREATIONAL SURFACES

AstroTurf® Fieldhouse Surface.....	51e	5n
AstroTurf® Stadium Surface.....	51e	5n
AstroTurf® Track Surface.....	51e	5n

RUBBER PROCESSING CHEMICALS

Accelerators for Natural and Synthetic Rubbers

A-1® Thiocarbonyl Disulfide Accelerator.....	43a	57
DPG Vulcanization Accelerator.....		
diphenylguanidine.....	43a	57
Methasan® Vulcanization Accelerator.....	43a	57
Mono Thiurad® Vulcanization Accelerator.....	43a	57
R-2® Crystals Vulcanization Accelerator.....	43a	57
RZ-100® Vulcanization Accelerator.....	43a	57
Santocure® Vulcanization Accelerator.....	43a	57
Santocure® MOR Vulcanization Accelerator.....	43a	57
Santocure® NS Vulcanization Accelerator.....	43a	57
Thiodiol® MBTS Vulcanization Accelerator.....	43a	58
Thiotax® MBT Vulcanization Accelerator.....	43a	58
Thiurad® Vulcanization Accelerator.....	43a	58

Antioxidants, Antiozonants and Antidegradants

Di-n-Propylamine.....	21a	48
Flectol® H Antioxidant.....	43a	58
Flectol® Flakes Antioxidant.....	43a	58
Flectol® ODP Antioxidant.....	43a	58
Montaclore® Antioxidant.....	43a	58
Santoflex® AW Antioxidant.....	43a	58
Santoflex® DD Antioxidant.....	43a	58
Santoflex® IP Antiozonant.....	43a	58
Santoflex® LC Antidegradant.....	43a	59
Santoflex® 13 Antiozonant.....	43a	59
Santoflex® 77 Antiozonant.....	43a	59
Santoflex® 134 Antiozonant.....	43a	59
Santoflex® 134-D Antidegradant.....	43a	59
Santoflex® 715 Antiozonant.....	43a	59
Santoflex® 734 Antidegradant.....	43a	59
Santovar® A Antioxidant.....	43a	59
Santowhite® 54 Antioxidant.....	43a	59
Santowhite® 54-S Antioxidant.....	43a	59
Santowhite® MK Antioxidant.....	43a	59
Santowhite® Crystals Antioxidant.....	43a	59
Santowhite® Powder Antioxidant.....	43a	59

Plasticizers

Di(2-Ethylhexyl)Adipate (DOA) dioctyl adipate.....	42a	48
Diundecyl Phthalate (DUP).....	42a	48
Santicizer® 79-TM.....	42a	48
Santicizer® 97.....	42a	48
Santicizer® 141.....	42a	49
Santicizer® 143.....	42a	49
Santicizer® 148.....	42a	49
Santicizer® 154.....	42a	49
Santicizer® 160.....	42a	49
Santicizer® 261.....	42a	49
Santicizer® 278.....	42a	49
Santicizer® 429.....	42a	49
Santicizer® 711.....	42a	50
Santicizer® 712-TM.....	42a	50

Retarders

Salicylic Acid, Industrial.....	44a	48
Santogard® PVI Pre-vulcanization Inhibitor.....	43a	60

Special Materials

Acrylonitrile.....	22a	43
Butadiene.....	22a	43
Butene-2 Concentrate.....	22a	44
Insoluble Sulfur 60.....	43a	60
Lampblack.....	44a	41
Nirol® Elastomer Modifier.....	43a	60

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17

TOWOLDMON0042241

	Locator Key	Page No.
Santoweb® D treated fiber.....	43a	60
Santoweb® H treated fiber.....	43a	60
Santoweb® K treated fiber.....	43a	61
Styrene Monomer.....	22a	43
Sulfasol® R Vulcanizing Agent.....	43a	61
Tripositum Phosphate.....	41a	46
Vocol® Rubber Accelerator.....	43a	61
Vocol® S Rubber Accelerator.....	43a	61
RUBBER PROCESSING EQUIPMENT		
Monsanto® Cold Feed Extruder.....	43b	61
Monsanto® Cold Feed Vacuum Extruder.....	43b	61
Monsanto® Hot Air Vulcanizing Tunnel.....	43b	61
Monsanto® Hot Feed Extruder.....	43b	61
Monsanto® LCM (Liquid Curing Medium) Unit.....	43b	61
Monsanto® Microwave Continuous Rubber Vulcanizer.....	43b	61
Monsanto® Spray Cooling Unit.....	43b	62
RUBBER TESTING INSTRUMENTS		
Capillary Rheometer, Automatic.....	43b	62
Melt Indexer.....	43b	62
Monsanto® Cone-Rheometer.....	43b	62
Monsanto® Cure-Simulator module unit.....	43b	62
Monsanto Curetron® data acquisition unit.....	43b	62
Monsanto® Die Swell Detector, Automatic.....	43b	62
Monsanto® Disk Rheometer, Models R-100 and R-900/750.....	43b	62
Monsanto® Fatigue-to-Failure Tester flex tester.....	43b	62
Monsanto® Mooney Computer.....	43b	62
Monsanto® Mooney Viscometer.....	43b	62
Monsanto® Power Integrator.....	43b	63
Monsanto® Processability Tester.....	43b	63
Monsanto® Rheometer Computer.....	43b	63
Monsanto® Tensometer, Model T-500 tensile tester.....	43b	63
Monsanto® Tensometer, Model W tensile tester.....	43b	63
Monsanto® X-ray Unit.....	43b	63
SEQUESTRANTS		
Dequest® 2000 phosphonate.....	44a	67
Dequest® 2006 phosphonate.....	44a	67
Dequest® 2010 phosphonate.....	44a	67
Dequest® 2041 phosphonate.....	44a	67
Dequest® 2054 phosphonate.....	44a	67
Dequest® 2060 phosphonate.....	44a	67
Dequest® XK phosphonate.....	44a	67
SOLVENTS		
Acetone.....	22a	43
Aromatic Concentrate C, mixed isomers.....	22a	43
Butene-2 Concentrate.....	22a	44
ortho- and para-Dichlorobenzene.....	21a	39
Ethyl Acetate.....	53a	41
Ethylbenzene.....	22a	44
Methanol methyl alcohol.....	22a	44
Toluene.....	22a	45
STABLE ISOTOPES	72a	64

SURFACE ACTIVE AGENTS, DETERGENTS and BLEACHES

Bleaching Compounds

ACL® 56, 59, 60, 66, 85 Sanitizer and

Bleaching Compounds.....44a 65

Detergent Intermediates

Alkylate 215, 225 and 230 alkylbenzene -
biodegradable.....41a 65

Surface Active Agents-Anionic

DBSA 99-B alkylbenzene sulfonic acid -
biodegradable.....41a 65

Monsanto® H-230 Aromatic Naphtha.....41a 65

Surface Active Agents-Nonionic

Sterox® AJ Surfactant.....41a 65

Sterox® AJ-100 Surfactant.....41a 65

Sterox® DF Surfactant.....41a 66

Sterox® DI Surfactant.....41a 66

Sterox® ND Surfactant.....41a 66

Sterox® NE Surfactant.....41a 66

Sterox® NJ Surfactant.....41a 66

Sterox® NK Surfactant.....41a 66

Sterox® NM Surfactant.....41a 66

TEXTILE CHEMICALS

Acetic Acid 95%.....44a 37

Biphenyl.....44a 34

Butvar® Resin Dispersion BR.....53a 52

Butvar® Resins.....53a 53

Gelva® Resin Emulsions.....53a 52

Gelvato® Resins.....53a 52

Lactic Acid, U.S.P., Food Grade and
Technical Grade.....44a 30

Lytron® Latexes.....53a 54

Lytron® Resins.....53a 54

Resloom® Melamine Resins.....53a 50

Salicylic Acid, Industrial.....44a 38

Stymer® Copolymer Resins.....53a 67

THICKENING AGENTS

EMA® Resins ethylene-maleic
anhydride copolymers.....44a 53

Gelvato® Resins.....53a 52

WATER TREATING CHEMICALS

Dequest® 2000 phosphonate.....44a 67

Dequest® 2006 phosphonate.....44a 67

Dequest® 2010 phosphonate.....44a 67

Dequest® 2041 phosphonate.....44a 67

Dequest® 2054 phosphonate.....44a 67

Dequest® 2060 phosphonate.....44a 67

Dequest® XK phosphonate.....44a 67

Sodium Hexametaphosphate.....41a 47

WILDFIRE CONTROL CHEMICALS

Phos-Chek® fire retardant.....44b 29

WOOD PRESERVATIVE

Monsanto® Penta pentachlorophenol, technical.....41a 22

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ADHESIVES and ADHESIVES COMPONENTS

ADHESIVES

PHENOLIC and RESORCINOL RESINS

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

MONSANTO PLASTICS & RESINS CO.

Locator Key **53b**

ADHESIVES COMPONENTS

BUTVAR® RESINS

See Page 53

DICYCLOHEXYL PHTHALATE (DCHP)

See Page 48

FORMVAR® RESINS

See Page 53

GELVA® MULTIPOLYMER RESIN SOLUTIONS

See Page 52

GELVA® RESIN EMULSIONS

See Page 52

GELVA® RESIN SOLUTIONS

See Page 52

GELVATOL® RESINS

See Page 52

LYTRON® LATICES

See Page 54

LYTRON® RESINS

See Page 54

MOD-EPOX® epoxy resin modifier

See Page 53

RESLOOM® MELAMINE RESINS

See Page 50

SANTICIZER® 141 plasticizer

See Page 49

SANTICIZER® 160 plasticizer

See Page 49

SANTICIZER® 261 plasticizer

See Page 49

SANTICIZER® 711 plasticizer

See Page 50

AGRICULTURAL and FARM PRODUCTS

FEED ADDITIVES

MHA® METHIONINE HYDROXY ANALOG calcium

See Page 21

FERTILIZERS

AMMONIA, ANHYDROUS

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key **11a**

AMMONIUM NITRATE 83% SOLUTION

Supplied as a clear, aqueous solution of ammonium nitrate.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key **11a**

DIAMMONIUM PHOSPHATE (DAP)

See Page 45

E-2® AMMONIUM NITRATE FERTILIZER PRILLS

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key **11a**

MONOAMMONIUM PHOSPHATE (MAP)

See Page 45

MONOPOTASSIUM PHOSPHATE

See Page 46

HERBICIDES

AVADEX®

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key **12a**

AVADEX® BW and FAR-GO®

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12a

LASO®

A proprietary herbicide available as a 4 lb. per gallon (active ingredient) emulsifiable concentrate and a 15% (active ingredient) granule. The active ingredient is 2-chloro-2', 6'-diethyl-N-(methoxy methyl) acetanilide, common name, "alachlor". Laso is used for selective weed control in corn, soybeans, peanuts, cotton, and certain other crops.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12a

MACHETE®

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12a

RAMROD®

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12a

RAMROD®/atrazine

A preblended herbicide mixture available as wettable powder. The active ingredients are 2-chloro-N-isopropylacetanilide (48.1%) (common name, "propachlor") and 2-chloro-4-ethylamino-6-isopropylamino-s-triazine (20.9%) (common name, "atrazine"). Ramrod/atrazine is used for selective weed control in corn and grain sorghum (milo).

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12a

RANDEX®

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12a

ROUNDUP®

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12a

VEGADEX®

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12a

INSECTICIDES

ETHYL PARATHION

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12a

METHYL PARATHION

A highly toxic commercial insecticide supplied as 80% active solution (in xylene) only to professional formulators for controlling boll weevil and other insects in cotton and a wide spectrum of insects that attack fruit, vegetable and forage crops. Poison emblem and antidote required on labels.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12a

NIRAN® 6-3

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12a

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PLANT GROWTH REGULATOR

POLARIS®

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 12b

RELATED PRODUCTS/ SERVICES

GELVATOL® RESINS

See Page 52

POLYETHYLENE PROTECTIVE SHEETING and TAPE

See Page 27

SWINE BREEDING STOCK

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 11c

ANIMAL NUTRITION PRODUCTS

AMINO ACIDS

MHA® METHIONINE HYDROXY ANALOG *calcium*

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

PRESERVATIVES

AFLABAN® mold inhibitor

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

SANTOQUIN® ethoxyquin

A feed grade antioxidant added to animal and poultry feeds and dried forage crops as a protectant for the feedstuffs' Vitamins "A" and "E", carotenes, and xanthophyll content. Santoquin is supplied as liquid; as Santoquin Mixture 6 (66.6%) and as Santoquin Emulsion (70%).

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

ANTICAKING FLOW CONDITIONERS

TRICALCIUM PHOSPHATE

See Page 46

ANTIFOAMING AGENTS

LIMIT® 33 defoamer

See Page 42

PC-1244® defoamer

PC-1244 is an additive used in low concentrations to suppress foaming tendencies in lubricating oil formulations. It is an oil-dispersable solution of a nonmetallic compound in petroleum distillate.

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 21a

PC-1344® defoamer

Used as a defoamer in nonaqueous hydrocarbon and solvent systems.

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 21a

ANTIOXIDANTS

SANTONOX® and SANTONOX® R 4,4'-thiodis (6-tert-butyl-m-cresol)

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

SANTOQUIN® ethoxyquin

See Page 21 (Animal Nutrition Products)

SANTOWHITE® POWDER antioxidant, 4,4'-thiodis (6-tert-butyl-m-cresol)

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

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SOPANOX® *ortho*-tolyl biguanide

Sopanox 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. Sopanox is particularly valuable in preventing the discoloration of refined toilet soaps.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 41a

BACTERIOSTATS/ DISINFECTANTS/ FUNGICIDES/FUNGISTATS/ GERMICIDES

ACL® 56, 59, 60, 66, 85 SANITIZER and BLEACHING COMPOUND

See Page 65

2,4-DICHLOROPHENOL

See Page 40

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.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 41a

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 41a

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 41a

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

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 41a

BLASTING MATERIALS

BLASTING SUPPLIES

Detonating cord, cast primers and other explosive materials.

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 11b

E-2® AMMONIUM NITRATE FERTILIZER *industrial* *grade*

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 11b

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

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 11b

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

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 11b

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 AGRICULTURAL PRODUCTS CO.

Locator Key 11b

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

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 11b

M-PULZ® 204, 206, 666 BLASTING AGENTS

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 11b

NITRO CARBO NITRATE (NCN)

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 11b

CHEMICAL PROCESSES

SULFURIC ACID PLANTS *process and construction*

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

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key 34a

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.

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 34a

VANADIUM PENTOXIDE CATALYST

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

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key 34a

CONSUMER PRODUCTS

ASTROTURF® DOOR MATS

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 51a

SCAMPER® OUTDOOR SWEEPERS

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 51a

CONTAINERS

PLASTIC BOTTLES and CONTAINERS-BLOWNWARE

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 51b

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CORROSION INHIBITORS

CYCLO- and DICYCLOHEXYLAMINE

See Page 38

SANTOSITE® sodium sulfite anhydrous, technical

See Page 35

DECORATIVE and INDUSTRIAL LAMINATES

RESIMENE® MELAMINE RESINS laminating

See Page 50

RESINOX® PHENOLIC RESINS varnishes

See Page 51

DENTIFRICE ABRASIVES

CALCIUM PYROPHOSPHATE

See Page 45

DICALCIUM PHOSPHATE, ANHYDROUS

See Page 45

DICALCIUM PHOSPHATE, DIHYDRATE

See Page 45

INSOLUBLE SODIUM METAPHOSPHATE

See Page 47

LUSTRE-PHOS® dentifrice abrasive

See Page 46

DISPERSANTS

DEQUEST® 2000 phosphonate

See Page 67

DEQUEST® 2006 phosphonate

See Page 67

DEQUEST® 2010 phosphonate

See Page 67

DEQUEST® 2041 phosphonate

See Page 67

DEQUEST® 2054 phosphonate

See Page 67

DEQUEST® 2060 phosphonate

See Page 67

DEQUEST® XK phosphonate

See Page 67

ELECTRONIC PRODUCTS

INSTRUMENTS

AUXILIARY DIGITAL INSTRUMENTS

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

UNITED SYSTEMS CORPORATION

Locator Key 35a

COUNTER-TIMERS

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

UNITED SYSTEMS CORPORATION

Locator Key 35a

COUNTER-TIMERS, UNIVERSAL

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

UNITED SYSTEMS CORPORATION

Locator Key 35a

DIGITAL CLOCKS

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

UNITED SYSTEMS CORPORATION

Locator Key 35a

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DIGITEC® DATA ACQUISITION COMPONENTS and SYSTEMS

See Page 36

DIGITEC® DIGITAL MULTIMETERS

See Page 36

DIGITEC® DIGITAL PANEL METERS

See Page 36

DIGITEC® DIGITAL THERMOMETERS

See Page 36

DIGITEC® DIGITAL VOLTMETERS

See Page 36

DIGITEC® PROGRAMMABLE FACTORING COUNTER/TIMERS, SERIES 8150

See Page 36

HIGH RESOLUTION TIME INTERVAL METER, MODEL 8320

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

UNITED SYSTEMS CORPORATION

Locator Key 35a

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 ($\text{GHz} = 1 \times 10^9$ cycles/second) can be counted.

UNITED SYSTEMS CORPORATION

Locator Key 35a

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

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

UNITED SYSTEMS CORPORATION

Locator Key 35a

LIGHT-EMITTING DIODES and ARRAYS

DISPLAYS

Light-emitting diode numeric and alpha-numeric characters.

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 32a

LIGHT-EMITTING DIODE LAMPS

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

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 32a

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 32a

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 32a

PHOTO DETECTOR

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

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 32a

MATERIALS

COOLANOL® 20, 25, 35, 45 dielectric coolants and heat transfer media
See Page 33

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 32a

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 32a

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 32a

OS-59* dielectric heat transfer fluid See Page 33

SILICON semiconductor grade

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

MONSANTO COMMERCIAL PRODUCTS CO.

Locator Key 32a

ENVIRONMENTAL CONTROL

AMMSOX* SYSTEM

System 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 34a

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

BRINK* ASPHALT VENT SYSTEM

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

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key 34a

BRINK* FILTER

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

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key 34a

BRINK* MIST ELIMINATOR

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

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key 34a

BRINK* OLEUM VENT SYSTEM

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

MONSANTO ENVIRO-CHEM SYSTEMS INC.

Locator Key 34a

ENVIRONMENTAL SERVICES

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

MONSANTO RESEARCH CORPORATION

Locator Key 71a

EXTRUDED PRODUCTS

EMBOSSED POLYETHYLENE FILM diaper film

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 51d

FOME-COR* BOARDS

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

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

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

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 51C

GER-PAK® POLYETHYLENE SHEETING and TAPE

Supplied as moisture vapor barrier material in gauges .001" to .010", 1' to 40' width, in 60' to 100' length rolls in natural or black. Ger-Pak tape supplied in 2" x 100' rolls. Used under concrete slabs, over studding, concealed flashing, for weather-protecting materials, closing in unfinished construction, lining crawl spaces, and covering fresh concrete.

MONSANTO PLASTICS & RESINS CO.

Locator Key 51d

POLYETHYLENE PROTECTIVE SHEETING and TAPE

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 51d

FABRICS, SYNTHETIC

BIDIM® spunbonded polyester fabrics

Bidim engineering fabrics are made of continuous filament polyester fibers needled to form a highly-permeable fabric. This mechanical interlocking of the polyester fibers makes a formed fabric with the durability and toughness required for a wide variety of end uses now being methodically explored. Initial applications have been primarily in civil engineering, with special emphasis on bed stabilization for access roads built over poor loadbearing soils, bed stabilization for railroads built over poor loadbearing soils, low-maintenance drainage systems, and stabilization and contamination-prevention of asphalt roads, particularly under severe freeze-thaw conditions. They are also used for constructing low maintenance drainage systems, for establishing erosion control along

waterways and shorelines, for earth reinforcement, and in the construction of silt fences.

MONSANTO TEXTILES COMPANY

Locator Key 61b

CEREX® spunbonded nylon fabrics

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

MONSANTO TEXTILES COMPANY

Locator Key 61b

FIBER INTERMEDIATES

ADIPIC ACID, TECHNICAL GRADE

See Page 53

ADIPONITRILE

Adiponitrile is supplied to nylon 6.6 fiber manufacturers as an intermediate for the production of hexamethylenediamine.

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 21a

CYCLOHEXANOL/CYCLOHEXANONE MIXTURE

Used for conversion to adipic acid or separation into cyclohexanol and cyclohexanone.

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 21a

HEXAMETHYLENEDIAMINE (HMD)

Supplied to fiber and plastics manufacturers as a basic intermediate for nylon 6,6 production. Other uses for HMD include manufacture of nylon 6,9, 6,10 and 6,12 resins, polyurethanes via hexamethylenediisocyanate, wet strength resins, boiler feed-water additives and polyamide adhesives.

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 21a

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27

HEXAMETHYLENEDIAMMONIUM ADIPATE

Nylon 6,6 salt supplied to fiber and plastics manufacturers as a 50% aqueous solution for polymerization to nylon 6,6 polymer.

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 21a

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 61a

ACTIONWEAR®, BLUE "C"®, 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. Types specially engineered for high performance in certain end uses include: Actionwear stretch nylon hosiery yarns, and Ultron static-resist, soil-hiding, advanced-generation carpet yarns. Cumuloft first-generation 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 61a

BLUE "C"® and SPECTRAN® polyester fibers

Available in 1.5-6 denier fiber in staple lengths suitable for a wide variety of apparel, home furnishings, and industrial applications. The standard Blue "C" product has excellent whiteness and is crimped for high resilience in woven, knit, and fiber filled 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 61a

FINA® acrylic fiber

Available in 1.2 denier, Fina—a Type 16 Acrilan variant—is the finest and brightest acrylic produced in the United States. Developed specifically for use in fine cut knits and lightweight broadwovens, the new fiber facilitates production of fabrics offering unique and exceptional consumer appeal.

MONSANTO TEXTILES COMPANY

Locator Key 61a

NYLON STAPLE

Available in 6, 10, and 18 denier per filament products in several dye levels and lusters for spinning into yarns and tufting into carpets.

MONSANTO TEXTILES COMPANY

Locator Key 61a

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 61a

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. Also available in 3 denier, uncrimped tow for use in battery separators. This new fiber combines the excellent aesthetic and processing characteristics of acrylics with the flame-retardant qualities of conventional modacrylics to yield an acrylic-like modacrylic of broad utility in apparel and home furnishings applications.

MONSANTO TEXTILES COMPANY

Locator Key 61a

WEAR-DATED® textile products

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

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of *Wear-Dated* upholstered products, only the sales slip and the filled-out *Wear-Dated* tag is returned and the upholstery is repaired or replaced after home inspection verified failure to give normal wear within two years from date of purchase.

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

MONSANTO TEXTILES COMPANY

Locator Key 61a

FIRE SAFETY, PRODUCTS TO IMPROVE

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

DIAMMONIUM PHOSPHATE (DAP)

See Page 45

MONOAMMONIUM PHOSPHATE (MAP)

See Page 45

PHOS-CHEK® fire retardant

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44b

PHOS-CHEK® P/30 fire retardant

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

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 42a

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 42a

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

See Page 33

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

See Page 33

SANTICIZER® 141 plasticizer

See Page 49

SANTICIZER® 143 modified triaryl phosphate

See Page 49

SANTICIZER® 148 plasticizer

See Page 49

SANTICIZER® 154 triaryl phosphate

See Page 49

SEF® modacrylic fibers

See Page 28

SKYDROL® fire resistant hydraulic fluids

See Page 33

TETRATHAL® tetrachlorophthalic anhydride

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 21a

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29

TRIPHENYL PHOSPHATE (TPPA)

See Page 50

FOAM INGREDIENTS — RESINOUS POLYOL

STYRENE-ALLYL ALCOHOL RESINS

See Page 55

TRICALCIUM PHOSPHATE

See Page 46

FOOD INGREDIENTS

ACIDULANTS

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

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 44a

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

H.T.* MONOCALCIUM PHOSPHATE monohydrate

See Page 31

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

Supplied as food grade and technical grade, lactic acid is a colorless, odorless liquid supplied in 50% and 88% minimum assay concentrations. Food grade lactic acid is used as a food acidulant

in green olives, process cheese, jams, jellies, frozen desserts, and as an ingredient in food emulsifiers.

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

MONOAMMONIUM PHOSPHATE (MAP)

See Page 45

MONOSODIUM PHOSPHATE (MSP)

See Page 47

PHOSPHORIC ACID 75, 80 and 85%

See Page 46

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

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

See Page 30 (Acidulants)

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

See Page 32

DIAMMONIUM PHOSPHATE (DAP)

See Page 45

DICALCIUM PHOSPHATE, ANHYDROUS

See Page 45

DICALCIUM PHOSPHATE, DIHYDRATE

See Page 45

DISODIUM PHOSPHATE, ANHYDROUS

See Page 46

DISODIUM PHOSPHATE, DUOHYDRATE

See Page 46

EMULSI-PHOS® cheese emulsifier

See Page 46

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

See Page 30 (Acidulants)

H.T.* MONOCALCIUM PHOSPHATE monohydrate

See Page 31

MONOAMMONIUM PHOSPHATE (MAP)

See Page 45

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MONOSODIUM PHOSPHATE (MSP)

See Page 47

PHOSPHORIC ACID 75, 80 and 85%

See Page 46

SODIUM ACID PYROPHOSPHATE (SAPP)

See Page 32

SODIUM HEXAMETAPHOSPHATE

See Page 47

SODIUM TRIPOLYPHOSPHATE (STP)

See Page 47

TETRASODIUM PYROPHOSPHATE

See Page 47

TRICALCIUM PHOSPHATE

See Page 46

TRISODIUM PHOSPHATE, ANHYDROUS (TSP/A)

See Page 47

TRISODIUM PHOSPHATE, CRYSTALLINE

See Page 47

FLAVORINGS

ESSENTIAL OILS

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

Oil of Cardamom
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 44C

ETHAVAN® ethyl vanillin

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

FLAVORINGS

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

MONSANTO FLAVOR ESSENCE INC.

Locator Key 44C

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 44a

VANILLIN MONSANTO®

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

LEAVENING AGENTS

H.T.® MONOCALCIUM PHOSPHATE monohydrate

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

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 44a

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TOWOLDMON0042255

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 44a

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 44a

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 44a

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 44a

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 44a

MONITOR® 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 44a

MONOSODIUM PHOSPHATE (MSP)

See Page 47

PHOSPHORIC ACID 75, 80 and 85%

See Page 46

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

TETRASODIUM PYROPHOSPHATE

See Page 47

FRAGRANCES

AMYL SALICYLATE

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

MONSANTO FLAVOR/ESSENCE INC.

Locator Key 44c

BENZYL ACETATE

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

MONSANTO FLAVOR/ESSENCE INC.

Locator Key 44c

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 44c

COUMARIN

See Page 37

ESSENTIAL OILS

See Page 31

ETHAVAN® ethyl vanillin

See Page 31

FRAGRANCES

Monsanto Flavor/Essence creates custom-made fragrances for all types of perfume, cosmetic, household and industrial applications. Included are: fine fragrances, colognes, after-shave lotions, toiletry and personal care products; household products such as room deodorizers, detergents, polishes and cleaning preparations; for industrial products such as paints, inks, and adhesives. Fragrances are created to give a distinctive, appealing

quality, characterizing the individual product concept. Special formulations are also available for deodorizing or masking of unpleasant odors for home and industrial applications.

MONSANTO FLAVOR/ESSENCE INC.

Locator Key **44c**

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 **44c**

METHYL SALICYLATE, U.S.P.

See Page 31

VANILLIN MONSANTO*

See Page 31

FUNCTIONAL FLUIDS

AIRBORNE and SPECIALTY

SKYDROL® fire resistant hydraulic fluids

Skydrol fluids are engineered from a series of fire resistant, highly stable phosphate ester base stocks specially-processed 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", "500B-4", "LD" and "LD-4" grades for jet aircraft. Skydrol fluids require compatible construction materials in seals, packings, paints, and wiring. They are "designed-in" to the specific aircraft with the collaboration of Monsanto's technical service support. They are distributed worldwide to commercial airlines.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **44a**

DIELECTRIC

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **44a**

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 **44a**

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 **44a**

HYDRAULIC FLUIDS

SKYDROL® fire resistant hydraulic fluids

See Page 33 (Airborne and Specialty)

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

See Page 33 (Industrial)

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

See Page 33 (Industrial)

INDUSTRIAL

OS-124® polyphenyl ether

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **44a**

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **44a**

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **44a**

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33

SANTOTRAC[®] LUBRICANTS *synthetic hydrocarbons*
See Page 37

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 **44a**

DIPHENYL OXIDE

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **44a**

SANTOSOL[®] 200, 300, 340 dye solvents

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **44a**

THERMINOL[®] 44, 55, 60, 66, 88 heat transfer fluids

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **44a**

THERMINOL[®] VP-1 heat transfer fluid

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **44a**

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 **44a**

FURNACE LINER EROSION MONITOR

NUCLEAR INSTRUMENTATION

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

MONSANTO RESEARCH CORPORATION

Locator Key **71a**

HEAVY CHEMICALS

CAUSTIC POTASH

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key **21a**

CHLOROSULFONIC ACID

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key **21a**

MURIATIC ACID *hydrochloric acid*

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key **21a**

NITRIC ACID 37.5°-38.0° Be.

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key **13a**

NITRIC ACID *concentrated*

Supplied as a light yellow to reddish brown fuming liquid minimum 97.5% (HNO₃).

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key **13a**

SANTOSITE® *sodium sulfite anhydrous, technical*

Supplied as technical grade anhydrous salt, in the form of tan crystalline powder, assay (Na₂SO₃) 97.5% minimum. It is used as a reducing agent for removing oxygen from boiler feed water, as a depressant in ore flotation, for straw and wood pulping, and in the manufacture of rubber and cordage.

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key **21a**

SULFURIC ACID and OLEUM

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key **21a**

INSTRUMENTS

ELECTRONIC INSTRUMENTS

AUXILIARY DIGITAL INSTRUMENTS

See Page 24

COUNTER-TIMERS

See Page 24

COUNTER-TIMERS, UNIVERSAL

See Page 24

DIGITAL CLOCKS

See Page 24

HIGH RESOLUTION TIME INTERVAL METER,

MODEL 8320

See Page 25

NUCLEAR INSTRUMENTATION

See Page 34

PLUG-IN COUNTER, MAINFRAME, MODEL 1505A

See Page 25

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

See Page 25

PROCESS CONTROL EQUIPMENT

INSTRUMENTATION, ANALOG PROCESS CONTROL

See Page 55

INSTRUMENTATION, ANALOG PROCESS MEASUREMENT

See Page 55

INSTRUMENTATION, DIGITAL PROCESS CONTROL

See Page 55

INSTRUMENTATION, PNEUMATIC and ELECTRONIC

See Page 56

REGULATOR, GAS

See Page 56

VALVE ACTUATORS and ACCESSORIES

See Page 56

VALVES

See Page 56

VALVES, NOISE ABATEMENT

See Page 56

RUBBER TESTING INSTRUMENTS

CAPILLARY RHEOMETER, AUTOMATIC

See Page 62

MELT INDEXER

See Page 62

MONSANTO® CONE-RHEOMETER

See Page 62

MONSANTO® CURE-SIMULATOR *module unit*

See Page 62

MONSANTO® CURETRON® *data acquisition unit*

See Page 62

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

See Page 62

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

See Page 62

MONSANTO® MOONEY VISCOMETER

See Page 62

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

See Page 63

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35

TOWOLDMON0042259

MONSANTO® TENSOMETER, MODEL W tensile tester

See Page 63

TEST and MEASUREMENT

CAPILLARY RHEOMETER, AUTOMATIC

See Page 62

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.

UNITED SYSTEMS CORPORATION

Locator Key 35a

DIGITEC® DIGITAL MULTIMETERS

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

UNITED SYSTEMS CORPORATION

Locator Key 35a

DIGITEC® DIGITAL PANEL METERS

Meters that give electronic digital display of amperes, volts or millivolts to 3½ or 4½ digits. Displays can be offset and/or scaled to provide direct readout in desired units.

UNITED SYSTEMS CORPORATION

Locator Key 35a

DIGITEC® DIGITAL THERMOMETERS

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

UNITED SYSTEMS CORPORATION

Locator Key 35a

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.

UNITED SYSTEMS CORPORATION

Locator Key 35a

DIGITEC® PROGRAMMABLE FACTORING COUNTER/TIMERS, SERIES 8150

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

numerals. Programming is simplified by front panel thumbwheel switches or orderly decimal jumpers. Available options include an internal comparator alarm, BCD output and two input multipliers.

UNITED SYSTEMS CORPORATION

Locator Key 35a

MELT INDEXER

See Page 62

METAL PROCESSING COMPOUNDS

BONE ASH (NATURAL)

Supplied as finely divided powder [$\text{Ca}_2\text{OH}(\text{PO}_4)_2$] 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 44a

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 45a

LoSilPhos® ferrophosphorus briquettes

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 45a

MONOSODIUM PHOSPHATE (MSP)

See Page 47

MOULD COAT synthetic bone ash

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

PHOSPHORIC ACID 75, 80 & 85 %

See Page 46

VANILLIN TECHNICAL

See Page 39

ODORANTS

COUMARIN

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

METHYL SALICYLATE, U.S.P.

See Page 31

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 42a

VANILLIN MONSANTO®

See Page 31

OILS-LUBRICATING

SANTOTRAC® LUBRICANTS synthetic hydrocarbons

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

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 44a

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

See Page 30

ADIPIC ACID, TECHNICAL GRADE

See Page 53

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

See Page 32

EMA® RESINS ethylene-maleic anhydride copolymers

See Page 53

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

See Page 30

FUMARIC ACID, TECHNICAL GRADE

See Page 53

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

See Page 30

MALEIC ANHYDRIDE

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 21a

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

See Page 32

PHTHALIC ANHYDRIDE

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 21a

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37

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 **44a**

TETRATHAL* *tetrachlorophthalic anhydride*

See Page 29

AMINES

BISHEXAMETHYLENTRIAMINE (BHMT)

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key **21a**

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 CHEMICAL INTERMEDIATES CO.

Locator Key **21a**

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **41a**

DI-*n*-PROPYLAMINE

Finds applications in agricultural chemicals and in rubber chemicals as an antioxidant, accelerator or antiozonant.

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key **21a**

DODECYLANILINE

See Page 38 (*Intermediates*)

MIXED AMINES

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key **21a**

ortho- and para-NITROANILINE

See Page 38 (*Intermediates*)

ortho-NITROANISOLE

See Page 38 (*Intermediates*)

para-PHENETIDINE

See Page 38 (*Intermediates*)

HALOGEN-CONTAINING COMPOUNDS

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

See Page 65

BENZYL CHLORIDE *alpha-chlorotoluene*

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key **21a**

ortho- and para-DICHLOROBENZENE

See Page 38 (*Intermediates*)

MONSANTO® PENTA *pentachlorophenol, technical*

See Page 22

ortho- and para-NITROCHLOROBENZENE

See Page 38 (*Intermediates*)

PHTHALYL CHLORIDE *phthaloyl chloride*

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key **21a**

SANTOPHEN® 1 GERMICIDE

See Page 22

SANTOPHEN® 1 SOLUTION

See Page 22

TCC® 3,4,4'-trichlorocarbanilide

See Page 22

TETRATHAL® *tetrachlorophthalic anhydride*

See Page 29

INTERMEDIATES

AROMATIC CHEMICAL INTERMEDIATES

Monsanto supplies a wide variety of benzene derivatives to chemical manufacturers as raw materials for further conversion into dyes, pharmaceuticals, agricultural chemicals, pesticides, photographic chemicals, leather tanning compounds.

and others. These chemical building blocks include:

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 21a

para-CHLOROPHENOL

See Page 40

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

See Page 38

2,4-DICHLOROPHENOL

See Page 40

para-TOLUENESULFONAMIDE

para-TOLUENESULFONYL CHLORIDE

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

TOLUENESULFONYL CHLORIDE, MIXED

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

PHARMACEUTICALS

ACETAMINOPHEN (APAP)

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

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 44a

BENZYL BENZOATE, U.S.P.

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

L-DOPA *L-dihydroxyphenylalanine*

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

METHAPYRILENE FUMARATE

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

METHAPYRILENE HYDROCHLORIDE

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

PHENACETIN, U.S.P. *acetophenetidin*

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

SALICYLAMIDE N.F.

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

3,4,5-TRIMETHOXYBENZALDEHYDE (TMB)

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

VANILLIN TECHNICAL

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

0684179

PHENOLS

para-CHLOROPHENOL

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 41a

para-CUMYL PHENOL

Organic intermediate for the production of phosphate esters. Other potential applications are as dye carrier, or as other PCP ethoxylates.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 41a

2,4-DICHLOROPHENOL

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 41a

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 41a

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 41a

DODECYPHENOL *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 41a

para-NITROPHENOL

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 13a

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 41a

PHENOL

See Page 43

SULFONIC ACIDS

CHLOROSULFONIC ACID

See Page 34

DBBSA 99-B *alkylbenzene sulfonic acid-biodegradable*

See Page 65

para-TOLUENESULFONAMIDE

See Page 39

para-TOLUENESULFONYL CHLORIDE

See Page 39

TOLUENESULFONYL CHLORIDE, MIXED

See Page 39

SULFUR-CONTAINING COMPOUNDS

ETHYL PCT 0,0-diethyl phosphorochloridothioate

METHYL PCT 0,0-dimethyl phosphorochloridothioate

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

MONSANTO AGRICULTURAL PRODUCTS CO.

Locator Key 13a

SANTOLITE® MHP RESIN

See Page 55

SANTONOX® and SANTONOX® R antioxidant

See Page 21

SANTOWHITE® POWDER antioxidant

See Page 21

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 **44a**

CYCLOHEXANOL

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key **21a**

ETHYL ACETATE

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

MONSANTO PLASTICS & RESINS CO.

Locator Key **53a**

PROPIONITRILE

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key **21a**

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

See Page 32

PAINT/COATING INGREDIENTS

BUTVAR® RESINS

See Page 53

FILTROS® gum rosin

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

*Trademark of FRP Company

MONSANTO PLASTICS & RESINS CO.

Locator Key **53c**

FORMVAR® RESINS

See Page 53

GELVA® MULTIPOLYMER RESIN SOLUTIONS

See Page 52

GELVA® RESIN EMULSIONS

See Page 52

GELVATOL® RESINS

See Page 52

LAMPBLACK

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **44a**

LYTRON® LATICES

See Page 54

MALEIC ANHYDRIDE

See Page 37

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 **42a**

MODAFLOW® POWDER II resin modifier

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **42a**

MOD-EPOX® epoxy resin modifier

See Page 53

MULTIFLOW® resin modifier

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **42a**

PHTHALIC ANHYDRIDE

See Page 37

PHOS-CHEK® P/30 fire retardant

See Page 29

RESIMENE® MELAMINE-FORMALDEHYDE

RESIMENE® UREA-FORMALDEHYDE RESINS coatings

See Page 50

RESINOX® PHENOLIC RESINS liquid solutions

See Page 51

SANTICIZER® 160 plasticizer

See Page 49

SANTOLITE® MHP RESIN

See Page 55

SANTOLITE® MS RESIN

See Page 55

SANTOMASK® II odor-masking agent

See Page 37

STYRENE-ALLYL ALCOHOL RESINS

See Page 55

TETRAPOTASSIUM PYROPHOSPHATE

See Page 46

TETRATHAL® tetrachlorophthalic anhydride

See Page 29

PAPER CHEMICALS

BUTVAR® RESINS

See Page 53

GELVA® MULTIPOLYMER RESIN SOLUTIONS

See Page 52

GELVA® RESIN EMULSIONS

See Page 52

GELVA® RESIN SOLUTIONS

See Page 52

GELVATOL® RESINS

See Page 52

LIMIT® 33 defoamer

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 53a

LYTRON® LATICES

See Page 54

MERSIZE® paper sizing agent

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 53a

MONSIZE® paper sizing agent

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 53a

RPC-1600 cationic resin

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 53a

SANTO-RES® 21, 30 SERIES paper chemicals

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

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 53a

SANTOSIZE® paper sizing agent

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 53a

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

Scripset resins are supplied in a variety of grades convenient for the papermaker's process and handling. The Scripset 500 resins are film-formers.

for surface treating paper and paperboard to improve printability, create good surface qualities and impart water resistance. The Scripset 700 series resins are new improved liquid variations of the dry 500 series resins.

MONSANTO PLASTICS & RESINS CO.

Locator Key 53a

STEROX® DF SURFACTANT

See Page 66

STEROX® DJ SURFACTANT

See Page 66

STEROX® NJ SURFACTANT

See Page 66

PETROCHEMICALS

MONOMERS

ACETIC ACID *glacial and commercial*

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 22a

ACRYLONITRILE

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 22a

BUTADIENE

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 22a

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 PLASTICS & RESINS CO.

Locator Key 53a

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 CHEMICAL INTERMEDIATES CO.

Locator Key 22a

STYRENE MONOMER

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 22a

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 CHEMICAL INTERMEDIATES CO.

Locator Key 22a

OTHER PETROCHEMICALS

ACETONE

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 22a

ACETOPHENONE

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 22a

AROMATIC CONCENTRATE *C₈ mixed isomers*

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 22a

0684183

BUTENE-2 CONCENTRATE

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 22a

BUTYLENES mixed isomers

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 22a

CUMENE

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 22a

CUMENE CONCENTRATE

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 22a

DICYCLOPENTADIENE CONCENTRATE

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 22a

DIISOPROPYLBENZENE

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 22a

ETHYLBENZENE

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 22a

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 CHEMICAL INTERMEDIATES CO.

Locator Key 22a

ISOPRENE CONCENTRATE

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 22a

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 CHEMICAL INTERMEDIATES CO.

Locator Key 22a

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 CHEMICAL INTERMEDIATES CO.

Locator Key 22a

alpha-METHYLSTYRENE crude

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 22a

PHENOLIC TARS

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 22a

PIPERYLENE CONCENTRATE

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key 22a

PROPANE

An industrial gas used as a chemical intermediate or fuel.

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key **22a**

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 CHEMICAL INTERMEDIATES CO.

Locator Key **22a**

RESIN OIL

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key **22a**

RESIN PR

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key **22a**

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 CHEMICAL INTERMEDIATES CO.

Locator Key **22a**

XYLENES *para/meta*

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key **22a**

PHOSPHORUS and PHOSPHORUS DERIVATIVES

AMMONIUM PHOSPHATES

DIAMMONIUM PHOSPHATE (DAP)

Technical grade diammonium phosphate (DAP) is

used as a fire retardant for cellulosic materials such as wood, paper, cotton; as a source of nitrogen and phosphorus in soluble specialty fertilizers, and in the production of phosphors.

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **41a**

MONOAMMONIUM PHOSPHATE (MAP)

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **41a**

CALCIUM PHOSPHATES

BONE ASH (NATURAL)

See Page 36

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 **41a**

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 **41a**

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 **41a**

0684185

45

TOWOLDMON0042269

H.T.¹ MONOCALCIUM PHOSPHATE *monohydrate*

See Page 31

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 41a

MOULD COAT *synthetic bone ash*

See Page 36

PY-RAN[®] *anhydrous monocalcium phosphate*

See Page 32

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 44a

PHOSPHORIC ACIDS

PHOSPHORIC ACID 75, 80 and 85%

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 41a

POTASSIUM PHOSPHATES

MONOPOTASSIUM PHOSPHATE

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 41a

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 41a

TRIPOTASSIUM PHOSPHATE

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 41a

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 41a

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 44a

EMULSI-PHOS[®] *cheese emulsifier*

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

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 41a

LEVN-LITE® sodium aluminum phosphate

See Page 31

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 41a

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 41a

PAN-O-LITE® sodium aluminum phosphate

See Page 32

SODIUM ACID PYROPHOSPHATE (SAPP)

See Page 32

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 41a

SODIUM TRIPOLYPHOSPHATE (STP)

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 41a

SQ PHOSPHATE sequestrant

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 41a

STABIL-9® sodium aluminum phosphate

See Page 32

TETRASODIUM PYROPHOSPHATE

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 41a

TRISODIUM PHOSPHATE, ANHYDROUS (TSP/A)

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 41a

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 41a

OTHER PHOSPHORUS and PHOSPHORUS DERIVATIVES

FERROPHOSPHORUS iron phosphide

See Page 36

LoSilPhos® ferrophosphorus briquettes

See Page 36

0684187

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 **41a**

PHOSPHORUS OXYCHLORIDE

Supplied 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 CHEMICAL INTERMEDIATES CO.

Locator Key **21a**

PHOSPHORUS PENTASULFIDE

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key **21a**

PHOSPHORUS TRICHLORIDE

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

MONSANTO CHEMICAL INTERMEDIATES CO.

Locator Key **21a**

PLASTICIZERS

DICYCLOHEXYL PHTHALATE (DCHP)

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **42a**

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 **42a**

DIUNDECYL PHTHALATE (DUP)

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **42a**

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 **42a**

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 **42a**

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 **42a**

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 **42a**

SANTICIZER® 97 di(n-heptyl, n-nonyl)adipate

Santicizer 97 is an adipate plasticizer designed to give polyvinyl chloride film, sheet, and coatings

extreme low temperature flexibility. In all three applications, Santicizer 97 imparts good hand and drape. Santicizer 97 is FDA regulated for use in food contact applications.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

SANTICIZER® 141 alkylaryl phosphate

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

SANTICIZER® 143 modified triaryl phosphate

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

SANTICIZER® 148 alkyl diaryl phosphate

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

SANTICIZER® 154 triaryl phosphate

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

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 42a

SANTICIZER® 261

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

SANTICIZER® 278

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

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 42a

SANTICIZER® 411

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

SANTICIZER® 412

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

SANTICIZER® 429

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

SANTICIZER® 546

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

SANTICIZER® 711 diheptyl, nonyl, undecylphthalate

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

SANTICIZER® 712-TM

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

SANTONOX® and SANTONOX® R antioxidant

See Page 21

SANTOWHITE® POWDER antioxidant

See Page 21

TRIBUTYL PHOSPHATE (TBP)

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

TRIPHENYL PHOSPHATE (TPPA)

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

PLASTICS and RESINS

FORMALDEHYDE RESINS

RESIMENE® MELAMINE-FORMALDEHYDE

RESIMENE® UREA-FORMALDEHYDE RESINS coatings
See Page 50 (Melamine & Urea Resins)

RESINOX® PHENOLIC RESINS liquid solutions

See Page 51

SALICYLIC ACID, INDUSTRIAL

See Page 38

MELAMINE and UREA RESINS

RESIMENE® MELAMINE RESINS laminating

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 53a

RESIMENE® MELAMINE-FORMALDEHYDE

RESIMENE® UREA-FORMALDEHYDE RESINS coatings

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 53a

RESLOOM® MELAMINE

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 53a

NYLON RESINS

VDYDNE® nylon and nylon copolymer resins

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

MONSANTO PLASTICS & RESINS CO.

Locator Key **52a**

VDYDNE® R mineral-reinforced nylon resins

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

MONSANTO PLASTICS & RESINS CO.

Locator Key **52a**

PHENOLIC RESINS

PHENOLIC and RESORCINOL RESINS

See Page 19

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 PLASTICS & RESINS CO.

Locator Key **53a**

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 PLASTICS & RESINS CO.

Locator Key **53a**

RESINOX® PHENOLIC resin compound

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

MONSANTO PLASTICS & RESINS CO.

Locator Key **53a**

RESINOX® PHENOLIC varnishes

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

MONSANTO PLASTICS & RESINS CO.

Locator Key **53a**

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 formulations of *Skybond* 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 PLASTICS & RESINS CO.

Locator Key **53a**

POLYVINYL ACETATES

GELVA® MULTIPOLYMER RESIN SOLUTIONS

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

MONSANTO PLASTICS & RESINS CO.

Locator Key **53a**

GELVA® RESIN EMULSIONS

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

MONSANTO PLASTICS & RESINS CO.

Locator Key **53a**

GELVA® RESIN SOLUTIONS

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

MONSANTO PLASTICS & RESINS CO.

Locator Key **53a**

POLYVINYL ALCOHOL RESINS

GELVATOL® RESINS

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

MONSANTO PLASTICS & RESINS CO.

Locator Key **53a**

POLYVINYL BUTYRALS

BUTVAR® RESIN DISPERSION BR

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

MONSANTO PLASTICS & RESINS CO.

Locator Key **53a**

BUTVAR® RESINS

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 53a

SAFLEX® VINYL BUTYRAL FILM

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 53a

POLYVINYL FORMAL RESINS

FORMVAR® RESINS

Formvar polyvinyl formal resins are white, free-flowing powders supplied in several grades that offer a range of solubility characteristics and solution viscosities. A 5% ethylene chloride solution of Formvar 5/95E ranges from 5-11 cps; "15/95E" from 50-80 cps. Formvar resins are soluble in phenols, alcohol mixtures, aromatic hydrocarbons and some chlorinated hydrocarbons. They can be plasticized with phthalate, phosphate, glycolate, and many other plasticizers. Each grade has particularly useful properties. Formvar 15/95E, for example, is excellent for making tough, heat-resist-

ant 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 PLASTICS & RESINS CO.

Locator Key 53a

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 CHEMICAL INTERMEDIATES CO.

Locator Key 21a

EMA® RESINS ethylene-maleic anhydride copolymers

EMA resins are used in oil well drilling muds; stabilizers and thickeners in liquid detergent and cosmetic formulations; thickeners for water-based latex paints, textile sizes, textile print pastes and binders; suspending agents for ink pigments, thickener for aqueous resin systems, adhesives, binder for foundry cores, etc.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

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 CHEMICAL INTERMEDIATES CO.

Locator Key 21a

MALEIC ANHYDRIDE

See Page 37

MODAFLOW® resin modifier

See Page 41

MODAFLOW® POWDER II resin modifier

See Page 41

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 42a

MULTIFLOW® resin modifier

See Page 41

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PHOSGARD® C-22-R organophosphorus compound
See Page 29

PHOSGARD® 2XC-20 organophosphorus compound
See Page 29

PHTHALIC ANHYDRIDE
See Page 37

STYRENE MONOMER
See Page 43

TETRATHAL® tetrachlorophthalic anhydride
See Page 29

STYRENE PLASTICS/RESINS

LUSTRAN® ABS molding and extrusion resins

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

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

EXTRUSION COMPOUNDS: Supplied in a series of grades that provide a range of flexibility, resilience, tensile strength, elongation, and abrasion resistance. Special grades are available for extruding low gloss sheet with equivalent other physical properties.

MONSANTO PLASTICS & RESINS CO.

Locator Key 52a

LUSTRAN® SAN molding resins

Lustran SAN styrene-acrylonitrile molding resins are clear rigid thermoplastics for molding high quality articles requiring transparency, brilliant surface, chemical resistance and stiffness. Supplied as Grade 31 general purpose SAN copolymer offering excellent processability and clarity; and Grade 29, a higher strength material with greater chemical resistance.

MONSANTO PLASTICS & RESINS CO.

Locator Key 52a

LUSTREX® POLYSTYRENE extrusion materials

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 52a

LUSTREX® POLYSTYRENE molding materials

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 52a

LYTRON® LATICES

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 53a

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 PLASTICS & RESINS CO.

Locator Key 53a

STYMER® COPOLYMER RESINS

See Page 67

0684194

STYRENE-ALLYL ALCOHOL RESINS

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 53a

TRICALCIUM PHOSPHATE

See Page 46

SULFONAMIDE RESINS

SANTOLITE® MHP RESIN

An aryl sulfonamide-formaldehyde resin used in spraying, dipping or brushing lacquers to make clear, colorless, odorless coatings of good gloss and adhesion. It does not materially increase the viscosity of the solution and permits the building up of a high-solids content in the lacquer. Compatible with all the common plasticizers.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

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. For brittle compositions with both resins but the addition of a plasticizer makes such combinations permanently flexible.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 42a

PRINTING INK PRODUCTS

BUTVAR® RESINS

See Page 53

FILTREZ® RESINS

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

*Trademark of FRP Company

MONSANTO PLASTICS & RESINS CO.

Locator Key 53c

RESIMENE® MELAMINE-FORMALDEHYDE

RESIMENE® UREA-FORMALDEHYDE RESINS coatings

See Page 50

STYRENE-ALLYL ALCOHOL RESINS

See Page 55 (Styrene Plastics/Resins)

PROCESS CONTROL EQUIPMENT

INSTRUMENTATION, ANALOG PROCESS CONTROL

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

FISHER CONTROLS CO.

Locator Key 33a

INSTRUMENTATION, ANALOG PROCESS MEASUREMENT

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

FISHER CONTROLS CO.

Locator Key 33a

INSTRUMENTATION, DIGITAL PROCESS CONTROL

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

FISHER CONTROL CO.

Locator Key 33a

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TOWOLDMON0042279

INSTRUMENTATION, PNEUMATIC and ELECTRONIC

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

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

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

FISHER CONTROL CO.

Locator Key 33a

REGULATOR, GAS

Gas regulators for distribution systems, residential and commercial.

FISHER CONTROLS CO.

Locator Key 33a

VALVE ACTUATORS and ACCESSORIES

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

FISHER CONTROLS CO.

Locator Key 33a

VALVES

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

FISHER CONTROLS CO.

Locator Key 33a

VALVES, NOISE ABATEMENT

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

FISHER CONTROLS CO.

Locator Key 33a

RADIOISOTOPE SOURCES

NUCLEAR INSTRUMENTATION

See Page 34

NUCLEAR SERVICES

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

MONSANTO RESEARCH CORPORATION

Locator Key 71a

RADIOACTIVE SOURCES

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

MONSANTO RESEARCH CORPORATION

Locator Key 71a

SHIPPING CONTAINERS

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

MONSANTO RESEARCH CORPORATION

Locator Key 71a

RECREATIONAL SURFACES

ASTROTURF® FIELDHOUSE SURFACE

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 51e

ASTROTURF® STADIUM SURFACE

An all-weather, synthetic grass-like recreational surface consisting of nylon facing ribbon with weather resistant backing bonded to a shock-absorbing underpad. This system, installed by Monsanto, is ideal for football, baseball, soccer, lacrosse, and other field sports. Material is available in rolls 15 feet wide by up to 200 feet long.

MONSANTO PLASTICS & RESINS CO.

Locator Key 51e

ASTROTURF® TRACK SURFACE

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

MONSANTO PLASTICS & RESINS CO.

Locator Key 51e

RUBBER PROCESSING CHEMICALS

ACCELERATORS FOR NATURAL and SYNTHETIC RUBBERS

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

DPG VULCANIZATION ACCELERATOR diphenylguanidine

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

METHASAN® VULCANIZATION ACCELERATOR zinc dimethyldithiocarbamate

Used as a secondary accelerator for Thiofide and Santocure accelerators.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

R-2* CRYSTALS VULCANIZATION ACCELERATOR reaction product of carbon disulfide and 1,1'-methylenebis(piperidine)

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

SANTOCURE® VULCANIZATION ACCELERATOR N-cyclohexyl-2-benzothiazolesulfenamide

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

SANTOCURE® MOR VULCANIZATION ACCELERATOR 2-(morpholiniothio)benzothiazole

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

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

A delayed action fast curing accelerator used alone or with a small quantity of secondary accelerator in natural and synthetic tire treads, sidewalls, etc. Santocure NS gives processing safety intermediate between Santocure and Santocure MOR accelerators. The higher modulus of Santocure NS stock frequently permits a 10% reduction in usage level. Slight discoloration in light or white articles at high concentrations. Nonstaining.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

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TOWOLDMON0042281

THIOFIDE® MBTS VULCANIZATION

ACCELERATOR 2,2'-dithiobis (benzothiazole); benzothiazyl disulfide; 2,2'-dibenzothiazyl disulfide

Thiofide gives flat, moderately fast cures in both natural rubber and synthetics. It is particularly useful in white or very bright colored stocks. Secondary acceleration is usually required for synthetic rubbers. Thiofide also acts as a plasticizer/retarder in poly-chloroprene. Nondiscoloring and nonstaining.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

THIOTAX® MBT VULCANIZATION ACCELERATOR

2-mercaptobenzothiazole

Vulcanization accelerator that gives flat, fast cures over a wide range of curing temperatures in both natural and synthetic rubbers. Thiotax is a good secondary accelerator for butyl and EDPM compounds. Available in an oiled and unoled powder form. Nondiscoloring and nonstaining.

*Trademark of Monsanto Limited

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

THIURAD® VULCANIZATION ACCELERATOR

bis(dimethylthiocarbamyl)disulfide;
tetramethylthiuram disulfide

Sulfur bearing accelerator used as a secondary accelerator with Santocure or Thiofide accelerators in a wide range of products. It is used in sulfurless cures with Sulfasan R vulcanizing agent to obtain heat resistant compounds with NR/SBR and nitrile stocks. Available in oiled and unoled powder form and pellet form.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

ANTIOXIDANTS, ANTIOZONANTS and ANTIDEGRADANTS

DI-n-PROPYLAMINE

See Page 38

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

FLECTOL® ODP ANTIOXIDANT an octylated diphenylamine

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

MONTACLERE® ANTIOXIDANT styrenated phenol

Low cost, medium activity liquid antioxidant for general purpose use. Nonstaining and nondiscoloring.

*Trademark of Monsanto Limited

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

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SANTOFLEX® LC ANTIDEGRADANT *an antidegradant blend*

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

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

For stabilizing SBR in emulsion polymers and particularly oil extended and oil/black masterbatches where the stabilizer is added with the oil. Also used in solution polymers, with or without oil, where staining can be tolerated.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

SANTOFLEX® 134-D ANTIDEGRADANT *a mixture of Santoflex 13 and Santoflex DD*

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

SANTOWHITE® 54 ANTIOXIDANT *modified hindered phenol*

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

SANTOWHITE® MK ANTIOXIDANT *reaction product of 6-tert-butyl-m-cresol and SCl₂*

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

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59

PLASTICIZERS

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

DIUNDECYL PHTHALATE (DUP)
See Page 48

SANTICIZER® 79-TM
See Page 48

SANTICIZER® 97 di(n-heptyl,n-nonyl) adipate
See Page 48

SANTICIZER® 141 alkylaryl phosphate
See Page 49

SANTICIZER® 143 modified triaryl phosphate
See Page 49

SANTICIZER® 148 alkyl diaryl phosphate
See Page 49

SANTICIZER® 154 triaryl phosphate
See Page 49

SANTICIZER® 160 butyl benzyl phthalate
See Page 49

SANTICIZER® 261
See Page 49

SANTICIZER® 278
See Page 49

SANTICIZER® 429
See Page 49

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

SANTICIZER® 712-TM
See Page 50

RETARDERS

SALICYLIC ACID, INDUSTRIAL
See Page 38

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

Santogard PVI is a prevulcanization inhibitor for synthetic and NR. It is used with all sulfenamide or thiazole accelerators to control processing safety with no resultant changes in curing characteristics or vulcanizate properties. Santogard PVI improves green stock storage stability and can be used to

recover scorchy stocks. Useful in a wide variety of applications otherwise temperature limited, such as faster extrusion, hotter processing and single-stage mixing.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

SPECIAL MATERIALS

ACRYLONITRILE
See Page 43

BUTADIENE
See Page 43

BUTENE-2 CONCENTRATE
See Page 44

INSOLUBLE SULFUR 60

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

LAMPBLACK
See Page 41

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 43a

SANTOWEB® D TREATED FIBER

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

SANTOWEB® H TREATED FIBER

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

MONSANTO INDUSTRIAL CHEMICALS CO.

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SANTOWEB® K TREATED FIBER

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

STYRENE MONOMER

See Page 43

SULFASAN® R VULCANIZING AGENT

4,4'-dithiodimorpholine

Vulcanizing agent for natural and synthetic rubbers. Stable at processing temperatures but liberates sulfur (27.1%) at curing temperatures. Sulfasan R is used as either a total or partial sulfur replacement to produce compounds with excellent heat aging properties and freedom from bloom.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

TRIPOTASSIUM PHOSPHATE

See Page 46

VOCOL® RUBBER ACCELERATOR

zinc-o,o-di-n-butylphosphorodithioate

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

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

A solid form of Vocol, 62% active.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43a

RUBBER PROCESSING EQUIPMENT

MONSANTO® COLD FEED EXTRUDER

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43b

MONSANTO® COLD FEED VACUUM EXTRUDER

A line of cold feed vacuum extruders produce porosity free extrusions of rubber hose, sponge and profiles. Feed stock is in strip or pellet form. Screw diameters between 1 1/4 and 8 inches are available. screw speed ranges between 2 and 72 rpm are achieved. Various screw types and extruder L/D ratios are available. Swing dual head design permits ease of die changing with minimal down time.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43b

MONSANTO® HOT AIR VULCANIZING TUNNEL

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43b

MONSANTO® HOT FEED EXTRUDER

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43b

MONSANTO® LCM (LIQUID CURING MEDIUM) UNIT

In this Monsanto LCM unit, the extrusion is submerged in a constant-temperature bath of molten salt for curing. Multiple zoned electric heaters hold the entire bath at uniform curing temperature and eliminate temperature gradients that can cause poor cures. Unit is designed with special attention to personnel safety and environmental compliance.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43b

MONSANTO® MICROWAVE CONTINUOUS RUBBER VULCANIZER

This unit is placed at the extruder end and quickly and uniformly raises the extrusion temperature to vulcanizing temperatures. The patented roller conveyor provides more efficient heating and prevents costly maintenance problems encountered with conveyor systems. The use of 2.5 kw power packs provide flexibility and ease of service. Power packs are compact and low in weight. Easily removed for servicing or replacement by your maintenance personnel; this avoids line stoppages required to service a heavier, in-place power pack. Accommodates single extrusions up to 5" diameter...larger diameter for special applications.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 43b

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61

MONSANTO* SPRAY COOLING UNIT

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **43b**

RUBBER TESTING INSTRUMENTS

CAPILLARY RHEOMETER, AUTOMATIC

Monsanto* Automatic Capillary Rheometer (ACR) is a low cost precision instrument for measuring the flow properties of any viscous material. Test time takes approximately 10 minutes, and is completely automatic. Data is reported directly by display. The ACR gives accurate, reproducible results showing the flow characteristics under typical processing conditions. The unit is designed for quality control as well as research applications. The ACR will provide flow data on thermoplastics, thermosets, textile fiber resins, adhesives, and elastomers over a shear rate range of 10^{-1} to 10^4 sec.⁻¹.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **43b**

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 INDUSTRIAL CHEMICALS CO.

Locator Key **43b**

MONSANTO* CONE-RHEOMETER

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **43b**

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 **43b**

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 **43b**

MONSANTO* DIE SWELL DETECTOR, AUTOMATIC

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **43b**

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **43b**

MONSANTO* FATIGUE-TO-FAILURE TESTER flex tester

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **43b**

MONSANTO* MOONEY COMPUTER

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **43b**

MONSANTO* MOONEY VISCOMETER

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

The Compact Mooney Viscometer offers simplicity

0684202

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.

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **43b**

MONSANTO® POWER INTEGRATOR

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **43b**

MONSANTO® PROCESSABILITY TESTER

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

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **43b**

MONSANTO® RHEOMETER COMPUTER

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **43b**

MONSANTO® TENSOMETER, MODEL T-500 tensile tester

A floor model universal tester with variable cross-

head drive and comprehensive stress/strain electronic recording system giving results in real engineering terms on a flatbed strip chart recorder. Designed to meet the requirements of BS 903, Part A2, 1971; ASTM D 412, ASTM 638, DIN 53504, ISO/R37, etc.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **43b**

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 **43b**

MONSANTO® X-RAY UNIT (three different units available)

The Monsanto Air-Inflated X-ray System is designed to inspect passenger and light truck tires, bead-to-bead, for all cord materials. The unit employs tire automatic conveyance and sequencing.

The Universal Tire X-ray System is a manual laboratory system to inspect cured and green tire construction. The Monsanto patented lighthouse x-ray tube enables the operator to inspect the complete tire from bead-to-bead with consistent geometric presentation.

The Off-The-Road Tire Inspection System is designed to accomplish dynamic or static x-ray inspection of tires of the off-the-road class. This system makes it possible for a single operator to x-ray inspect the complete tire from bead-to-bead through 360°.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **43b**

SEQUESTRANTS

DEQUEST® 2000 phosphonate
See Page 67

DEQUEST® 2006 phosphonate
See Page 67

DEQUEST® 2010 phosphonate
See Page 67

DEQUEST® 2041 phosphonate
See Page 67

0684203

DEQUEST® 2054 phosphonate
See Page 67

DEQUEST® 2060 phosphonate
See Page 67

DEQUEST® XK phosphonate
See Page 67

SOLVENTS

ACETONE

See Page 43

AROMATIC CONCENTRATE C₆ mixed isomers
See Page 43

BUTENE-2 CONCENTRATE
See Page 44

ortho- and para-DICHLOROBENZENE
See Page 39

ETHYL ACETATE
See Page 41

ETHYLBENZENE
See Page 44

METHANOL methyl alcohol
See Page 44

TOLUENE
See Page 45

STABLE ISOTOPES

Monsanto supplies stable isotopes of the noble gases, carbon, sulfur, nitrogen, bromine, chlorine, and oxygen. Stable carbon isotopes are available in five forms. All of these products are nonradioactive, i.e., stable. They are of controlled purity with various enrichment levels. For each isotope the degree of enrichment is specified as well as minimum purity. The gaseous products are supplied in glass ampoules and steel cylinders, liquids in glass bottles and solids in plastic bottles.

The following stable isotopes are available for physical, chemical, biological research; for industrial uses in nuclear technology; in medical research and diagnostics; for cryogenics and physics studies; in various nuclear physics devices; and in tracer studies of chemical and biological process, where a radioactive isotope would be undesirable. Further information may be obtained upon request.

Stable ARGON Isotopes (gas purity 99.5%+)
Stable Isotope: Ar-36 Ar-38 Ar-38 Ar-40
Isotopic Enrichment 99.5% 25% 95% 99.95%
Purity: 99.5% 99.5% 99.5% 99.5%

Stable BROMINE-79
Form: C₂H₅Br
Isotopic Enrichment ≥ 90%

Stable BROMINE-81
Form: C₂H₅Br
Isotopic Enrichment ≥ 90%

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

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

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

99% Isotopic Enrichment
Form: C CO₂ CH₄ BaCO₃
Purity: ≥ 99% ≥ 99% ≥ 99% Reag. Grade

Stable CHLORINE-35 Isotope and Compounds (purity ≥ 98%)
Form: C₂H₅Cl CL₂ HCl NaCl
Isotopic Enrichment ≥ 90% ≥ 90% ≥ 90% ≥ 90%

Stable CHLORINE-37 Isotope and Compounds (purity ≥ 98%)
Form: C₂H₅Cl CL₂ HCl NaCl
Isotopic Enrichment ≥ 90% ≥ 90% ≥ 90% ≥ 90%

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

Stable KRYPTON Isotopes (gas purity 99.5%)
Stable Isotope: Kr-78 Kr-78 Kr-78 Kr-78 Kr-80 Kr-80
Isotopic Enrichment 8% 50% 90% 99% 70% 90%

Stable KRYPTON Isotopes (gas purity 99.5%) (cont'd.)
Stable Isotope: Kr-82 Kr-82 Kr-83 Kr-84 Kr-86
Isotopic Enrichment 70% 90% 70% 90% 99%

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

Stable NITROGEN-14 Compound
Form: (NH₄)₂SO₄ in 40% aqueous solution N₂H₄NO₂
Isotopic Enrichment 99.99% 99.99%

Stable NITROGEN-15 and Compound
Form: NH₃ (NH₄)₂SO₄ HNO₃ KNO₃ N₂ Urea
Isotopic Enrichment 90-99% 38-99% 90-99% 38-99% 90-99% 38-89%

Stable OXYGEN-16 Isotope and Compounds (purity 99.5%)
Form: O₂ H₂O
Isotopic Enrichment 99.98% 99.98%

Stable OXYGEN-17 Isotope and Compounds (purity 99.5%)
Form: O₂ H₂O
Isotopic Enrichment 20-40% 20-40%

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Stable OXYGEN-18 Isotope and Compounds (purity 99.5%)

Form: O_2 H_2O H_2O

Isotopic

Enrichment 90-99% 90-99% 20%

Stable SULFUR-34 Isotope and Compounds (purity $\geq 98\%$)

Form: CS_2 H_2S H_2SO_4 SO_2 S

Isotopic

Enrichment $\geq 90\%$ $\geq 90\%$ $\geq 90\%$ $\geq 90\%$ $\geq 90\%$

Stable XENON Isotopes (gas purity 99.5%)

Stable Isotope: Xe-124 Xe-126 Xe-129 Xe-131 Xe-134 Xe-136

Isotopic

Enrichment 1-40% 2% 60% 60% 50% 80-99%

MONSANTO RESEARCH CORPORATION

Locator Key 72a

SURFACE ACTIVE AGENTS, DETERGENTS and BLEACHES

BLEACHING COMPOUNDS

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

ACL 56, sodium dichloroisocyanurate dihydrate, is a 56% available chlorine product. It is used in detergent applications, bleaches, and pool disinfection.

ACL 59, potassium dichloroisocyanurate, is a 59% available chlorine product that is used for swimming pool disinfection and sanitizing. It is also used as an oxidizer in mechanical dishwashing compounds and other detergent applications.

ACL 60, sodium dichloroisocyanurate, is a 62% available chlorine product. It is used in detergent applications, bleaches and pool disinfection.

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

ACL 85, trichloroisocyanuric acid, is a 90% available chlorine product. It is used for pool disinfection in compacted forms and used in detergent applications.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

DETERGENT INTERMEDIATES

ALKYLATE 215, 225 and 230 alkylbenzene-biodegradable

These alkylates are supplied as intermediates for the manufacture of anionic liquid and solid detergents. The three grades are monoalkylbenzene

mixtures of different molecular weights.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 41a

SURFACE ACTIVE AGENTS- ANIONIC

DBSA 99-B alkylbenzene sulfonic acid-biodegradable

DBSA 99-B is produced by the sulfonation of refined linear alkylbenzene with SO_3 and contains a minimum amount of free sulfuric acid. It can be neutralized with various bases and is used as an intermediate for the preparation of neutral alkylaryl sulfonates. Primary use is in liquid detergents.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 41a

MONSANTO® H-230 AROMATIC NAPHTHA

A coproduct of the manufacture of linear alkylbenzene, Monsanto H-230 is a mixture of alkylated benzenes. Available in commercial quantities, the product may be sulfonated and is commonly used for the manufacture of surfactants, oil additives, and other specialty chemicals.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 41a

SURFACE ACTIVE AGENTS- NONIONIC

STEROX® AJ SURFACTANT tridecanoethylene oxide condensates (polyoxyethylene ether)

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 41a

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 41a

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65

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STEROX® DF SURFACTANT *dodecylphenol-ethylene oxide condensate (alkylaryl polyoxyethylene ether)*

Sterox DF is a liquid nonionic surface active agent. It is primarily designed as an intermediate for sulfation to produce a high foaming active ingredient for liquid detergents. It also shows considerable potential as a paper rewetting agent.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **41a**

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 **41a**

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 **41a**

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 **41a**

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 **41a**

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 **41a**

STEROX® NM SURFACTANT *nonylphenol-ethylene oxide condensate*

Sterox NM is a nonionic surface active agent with an average of 12.5 moles of ethylene oxide. It is especially well suited for modern liquid detergent formulations because of its superior high foaming characteristics and an odor level which is significantly lower than that of competitive surfactants. Sterox NM exhibits excellent detergency properties when compared to a lauryl sulfate standard, and it is an effective wetting agent.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key **41a**

TEXTILE CHEMICALS

ACETIC ACID 95%

See Page 37

BIPHENYL *also known as diphenyl and phenylbenzene*

See Page 34

BUTVAR® RESIN DISPERSION BR

See Page 52

BUTVAR® RESINS

See Page 53

GELVA® RESIN EMULSIONS

See Page 52

GELVATOL® RESINS

See Page 52

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

See Page 30

LYTRON® LATICES

See Page 54

0684206

LYTRON® RESINS

See Page 54

RESLOOM® MELAMINE RESINS

See Page 50

SALICYLIC ACID, INDUSTRIAL

See Page 38

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 PLASTICS & RESINS CO.

Locator Key 53a

THICKENING AGENTS

EMA® RESINS ethylene-maleic anhydride copolymers

See Page 53

GELVATOL® RESINS

See Page 52

WATER TREATING CHEMICALS

DEQUEST® 2000 phosphonate

Used in any aqueous system for the prevention of scale formation or to inhibit precipitation in water treating applications. A particularly effective additive in industrial cleaner formulations for the control of extraneous metal ions and to improve soil or scale removal. Used as a scale control agent in oil production.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

DEQUEST® 2006 phosphonate

Used in neutral or alkaline systems for the prevention of scale or to prevent mineral precipitation. Agent for deflocculating clays, cements, resins, pigments and the like. Effective additive for alkaline cleaners (such as bottle washing formulas or dairy cleaners) or in general-purpose detergents.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

DEQUEST® 2010 phosphonate

Used in scale prevention and corrosion inhibition for industrial water treatment, and to control metal ions in aqueous systems.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

DEQUEST® 2041 phosphonate

Used in scale prevention and corrosion inhibition for industrial water treatment where a solid product is required. Also used for electroplating and peroxide stabilization for the control of extraneous metal ions.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

DEQUEST® 2054 phosphonate

Used in any aqueous system for the prevention of scale formation or to inhibit precipitation in water treating applications, and to control metal ions in aqueous systems.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

DEQUEST® 2060 phosphonate

Used in any aqueous system for the prevention of scale formation or to inhibit precipitation in water treating applications. A particularly effective additive in industrial cleaner formulations for the control of extraneous metal ions and to improve soil or scale removal. Used as a scale control agent in oil production.

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

DEQUEST® XK phosphonate

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

MONSANTO INDUSTRIAL CHEMICALS CO.

Locator Key 44a

SODIUM HEXAMETAPHOSPHATE

See Page 47

WILDFIRE CONTROL CHEMICALS

PHOS-CHEK® fire retardant

See Page 29

WOOD PRESERVATIVE

MONSANTO® PENTA pentachlorophenol, technical

See Page 22

0684207

LOCATOR KEY

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 Vydne® nylon and nylon copolymer resins, you may call or write any of the offices listed under Locator Key 52a. These are: Atlanta, Chicago, Cincinnati, Indian Orchard, MA, Newport Beach, CA, New York, St. Louis or Southfield, MI.

MONSANTO AGRICULTURAL PRODUCTS CO.

11a PLANT FOOD PRODUCTS

St. Louis, MO 63166
800 North Lindbergh Blvd. (314) 694-3767

11b BLASTING PRODUCTS

St. Louis, MO 63166
800 North Lindbergh Blvd. (314) 694-3861

11c FARMERS HYBRID COMPANIES, INC.

Des Moines, IA 50309
Employee's Mutual Bldg.
717 Mulberry Street (515) 244-1557

12a HERBICIDES & INSECTICIDES

Atlanta, GA 30339
320 Interstate North Parkway (404) 955-4000

Bowling Green, OH 43402
735 Haskins Road (419) 352-8478

Carmel, IN 46032
1717 East 116th Street (317) 844-7283

Decatur, IL 62526
2490 N. Water Street (217) 875-1880

W. Des Moines, IA 50265
1501 42nd Street (515) 225-0412

Evansville, IN 47715
101 Plaza East Blvd. (812) 479-8951

Fargo, ND 58078
301 27th Street, South (701) 293-9555

Fresno, CA 93710
1520 East Shaw Avenue (209) 226-2953

Janesville, WI 53545
100 East Building (608) 756-3691

Kansas City, MO
Independence, MO 64055 (816) 373-1700

12401 East 43rd
Luling, LA 70070 (504) 785-8211

Box 174
Mankato, MN 56001 (507) 387-3406

111 Madison East Plaza
Memphis, TN 38117 (901) 767-2131

5118 Park Avenue
Omaha, NE 68144 (402) 330-4545

11414 W. Center Road
St. Louis, MO 63166 (314) 694-3753

800 North Lindbergh Blvd.
Wilmington, DE 19810 (302) 478-4600

3411 Silverside Road

12b PLANT GROWTH REGULATOR

Atlanta, GA 30339
320 Interstate North Parkway (404) 955-4000

Fresno, CA 93710
1520 East Shaw Avenue (209) 226-2953

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

St. Louis, MO 63166
800 North Lindbergh Blvd. (314) 694-3530

13a OTHER PRODUCTS

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

MONSANTO CHEMICAL INTERMEDIATES CO.

21a PROCESS CHEMICALS & FIBER INTERMEDIATES

Akron, OH 44313 (216) 666-4111

260 Springdale Drive (312) 296-6688

Chicago, IL 60018 (713) 621-4156

3158 Des Plaines Avenue

Houston, TX 77056

5051 Westheimer Road

New York, NY 10036 (212) 764-5000

1114 Avenue of the Americas

Santa Clara, CA 95052 (408) 243-0434

2710 Lafayette Street

Wilmington, DE 19810 (302) 478-4600

3411 Silverside Road

or

Central Order Operations (CO-OP)

St. Louis, MO 63166 (800) 125-4111

800 North Lindbergh Blvd.

22a PETROCHEMICALS

Akron, OH 44313 (216) 666-4111

260 Springdale Drive (312) 296-6688

Chicago, IL 60018 (713) 621-4156

3158 Des Plaines Avenue

Houston, TX 77056

5051 Westheimer Road

New York, NY 10036 (212) 764-5000

1114 Avenue of the Americas

Santa Clara, CA 95052 (408) 243-0434

2710 Lafayette Street

Wilmington, DE 19810 (302) 478-4600

3411 Silverside Road

or

Central Order Operations (CO-OP)

Texas City, TX 77590 (800) 125-4111

Box 1311

23a CRUDE OIL & NATURAL GAS

Houston, TX 77056
5051 Westheimer Road 0684208

MONSANTO COMMERCIAL PRODUCTS CO.

32a ELECTRONIC MATERIALS & OPTOELECTRONIC COMPONENTS

Chicago, IL 60018
3158 Des Plaines Avenue (312) 296-6688
Dedham, MA 02026 (617) 329-2530
990 Washington Street (617) 329-1150
Garland, TX 75042
3318 Russwood Lane (214) 272-6974
Palo Alto, CA 94304
3400 Hillview Avenue (415) 493-3300
St. Peters, MO 63376
Box 8 (314) 272-6281

33a FISHER CONTROLS COMPANY

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

34a MONSANTO ENVIRO-CHEM SYSTEMS, INC.

St. Louis, Mo. 63178
Box 14547 (314) 694-1000
Corporate Square Office Park

35a UNITED SYSTEMS CORPORATION

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

MONSANTO INDUSTRIAL CHEMICALS CO.

41a DETERGENTS & PHOSPHATES

Akron, OH 44313
260 Springside Drive (216) 666-4111
Atlanta, GA 30339 (404) 955-4000
320 Interstate North Parkway
Chicago, IL 60018 (312) 296-6688
3158 Des Plaines Avenue
Cincinnati, OH 45236 (513) 984-1100
8041 Hosbrook Road
Newport Beach, CA 92660 (714) 833-9150
1401 Dove Street
New York, NY 10036 (212) 764-5000
1114 Avenue of the Americas
St. Louis, MO 63166 (314) 694-7107
800 North Lindbergh Blvd.
or
Customer Order Processing Group
St. Louis, MO 63166 (800) 325-4330
800 North Lindbergh Blvd.

42a PLASTICIZERS

Akron, OH 44313
260 Springside Drive (216) 666-4111
Boston, MA 02149 (617) 387-5010
Everett Station
Chicago, IL 60018 (312) 296-6688
3158 Des Plaines Avenue
Newport Beach, CA 92660 (714) 833-9150
1401 Dove Street
New York, NY 10036 (212) 764-5000
1114 Avenue of the Americas
St. Louis, MO 63166 (314) 694-7265
800 North Lindbergh Blvd.
Wilmington, DE 19810 (302) 478-4600
3411 Silverside Road
or
Customer Order Processing Group
St. Louis, MO 63166 (800) 325-4330
800 North Lindbergh Blvd.

43a RUBBER CHEMICALS

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

43b RUBBER INSTRUMENTS & EQUIPMENT

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

44a SPECIALTY CHEMICALS

Akron, OH 44313
260 Springside Drive (216) 666-4111
Atlanta, GA 30339 (404) 955-4000
320 Interstate North Parkway
Boston, MA 02149 (617) 387-5010
Everett Station
Chicago, IL 60018 (312) 296-6688
3158 Des Plaines Avenue
Cincinnati, OH 45236 (513) 984-1100
8041 Hosbrook Road
Houston, TX 77056 (713) 621-9550
5051 Westheimer Road
Newport Beach, CA 92660 (714) 833-9150
1401 Dove Street
New York, NY 10036 (212) 764-5000
1114 Avenue of the Americas
St. Louis, MO 63166 (314) 694-7105
800 North Lindbergh Blvd.
Santa Clara, CA 95052 (408) 243-0414
2710 Lafayette Street
Wilmington, DE 19810 (302) 478-4600
3411 Silverside Road
or
Customer Order Processing Group
St. Louis, MO 63166 (800) 325-4330
800 North Lindbergh Blvd.

44b WILDFIRE CONTROL

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

44c MONSANTO FLAVOR/ESSENCE INC.

Chicago, IL 60018
3158 Des Plaines Avenue (312) 296-6688
Montvale, NJ 07645 (201) 391-9870
7 Mercedes Drive
Newport Beach, CA 92660 (714) 833-9150
1401 Dove Street

45a OTHER PRODUCTS

St. Louis, MO 63166 (314) 694-2210
800 North Lindbergh Blvd.

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LOCATOR KEY

MONSANTO PLASTICS & RESINS CO.

51a CONSUMER PRODUCTS

Atlanta, CA 30339
320 Interstate North Parkway (404) 955-4000
Chicago, IL 60018 (312) 296-6688
3158 Des Plaines Avenue
Dallas, TX 75229 (214) 358-5577
2550 Walnut Hill Lane
or
Customer Order Entry Division
St. Louis, MO 63166
800 North Lindbergh Blvd. (800) 325-4330

51b CONTAINERS - BLOWNWARE

Anaheim, CA 92803
611 East Cerritos Avenue (714) 772-2190
Chicago, IL 60018 (312) 296-6688
3158 Des Plaines Avenue
Kenilworth, NJ 07033 (201) 276-2900
North 8th Street & Monroe Avenue
Sharonville, OH 45241 (513) 769-4040
3374 East Kemper Road
Yardville, NJ 08620 (609) 585-4650
584 Route 130, Box 23
or
Customer Order Entry Division
St. Louis, MO 63166
800 North Lindbergh Blvd. (800) 325-4330

51c EXTRUDED PRODUCTS - FOME-COR® BOARD

Anaheim, CA 92803
611 East Cerritos Avenue (714) 772-2190
Atlanta, CA 30339 (404) 955-4000
320 Interstate North Parkway
Elkhart, IN 46514 (219) 262-3531
700 East Beardsley Avenue
or
Customer Order Entry Division
St. Louis, MO 63166
800 North Lindbergh Blvd. (800) 325-4330

51d EXTRUDED PRODUCTS - POLYETHYLENE FILM

Anaheim, CA 92803
611 East Cerritos Avenue (714) 772-3010
Kenilworth, NJ 07033 (201) 276-2900
North 8th Street & Monroe Avenue
Santa Clara, CA 95052 (408) 243-0414
2710 Lafayette Street

51e RECREATIONAL PRODUCTS

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

52a PLASTICS

Atlanta, CA 30339 (404) 955-4000
320 Interstate North Parkway
Chicago, IL 60018 (312) 296-6688
3158 Des Plaines Avenue
Cincinnati, OH 45236 (513) 984-1100
8041 Hosbrook Road
Indian Orchard, MA 01051 (413) 788-6911
730 Worcester Street
Newport Beach, CA 92660 (714) 833-9150
1401 Dove Street
New York, NY 10036 (212) 764-5000
1114 Avenue of the Americas
St. Louis, MO 63166 (314) 694-8301
800 North Lindbergh Blvd.
Southfield, MI 48075 (313) 569-0330
500 Northland Towers West
or
Centralized Customer Service Center
Indian Orchard, MA 01051 (800) 628-4045
730 Worcester Street

53a RESIN PRODUCTS

Atlanta, CA 30339 (404) 955-4000
320 Interstate North Parkway
Chicago, IL 60018 (312) 296-6688
3158 Des Plaines Avenue
Houston, TX 77056 (713) 621-4551
5051 Westheimer Road
Indian Orchard, MA 01051 (413) 788-6911
190 Grochmal Avenue
Newport Beach, CA 92660 (714) 833-9150
1401 Dove Street
New York, NY 10036 (212) 764-5000
1114 Avenue of the Americas
Southfield, MI 48075 (313) 569-0330
500 Northland Towers West
or
Centralized Customer Service Center
St. Louis, MO 63166 (800) 325-4330
800 North Lindbergh Blvd.

53b RESINS FOR WOOD PRODUCTS INDUSTRY

Eugene, OR 97402 (503) 342-1201
855 Seneca Road
Houston, TX 77056 (713) 621-4551
5051 Westheimer Road

53c FRP COMPANY

Baxley, GA 31513 (912) 361-1677
Box 349

MONSANTO TEXTILES COMPANY

61a Depending on end use, one of the following locations should be contacted.

APPAREL

Charlotte, NC 28210	(704) 364-0110
6230 Fairview Road	
Los Angeles, CA 90015	(213) 628-6312
110 East 9th Street	
New York, NY 10036	(212) 764-5000
1114 Avenue of the Americas	

CARPETS

Atlanta, GA 30339	(404) 955-4000
320 Interstate North Parkway	
San Francisco, CA 94111	(415) 781-4511
151 Union Street	

HOME FURNISHINGS

Charlotte, NC 28210	(704) 364-0110
6230 Fairview Road	
New York, NY 10036	(212) 764-5000
1114 Avenue of the Americas	

INDUSTRIAL

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

TIRE

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

61b NONWOVENS

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

MONSANTO RESEARCH CORPORATION

71a EXPLORATORY & LONG RANGE RESEARCH

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

72a UNITED STATES ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION FACILITY

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

0684211

MAJOR COMPANY OFFICES

CORPORATE

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

Corporate Administration
and Staff Departments
Monsanto Agricultural Products Co.
Monsanto Chemical Intermediates Co.
Monsanto Commercial Products Co.
Monsanto Industrial Chemicals Co.
Monsanto Plastics & Resins Co.
Monsanto Textiles Company
International Division
Monsanto Research Corporation

MARKETING OFFICES

Multicompany

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

Atlanta, GA 30339
320 Interstate North Parkway
(404) 955-4000

Chicago, IL 60018
3158 Des Plaines Avenue
(312) 296-6688

Cincinnati, OH 45236
8041 Hosbrook Road
(513) 984-1100

Detroit, MI 48075
500 Northland Towers West
(313) 569-0330

Houston, TX 77056
5051 Westheimer Road
(713) 621-9550

Los Angeles, CA 92660
1401 Dove Street
(714) 833-9150

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

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

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

Wilmington, DE 19810
3411 Silverside Road
(302) 478-6600

Additional Marketing Offices

MONSANTO AGRICULTURAL PRODUCTS CO.

Bowling Green, OH 43402
735 Haskins Road
(419) 352-8478

Camel, IN 46032
1717 East 116th Street
(317) 844-7283

Decatur, IL 62526
2490 N. Water Street
(217) 875-1880

W. Des Moines, IA 50265
1501 42nd Street
(515) 225-0412

Des Moines, IA 50309
Farmers Hybrid Companies, Inc.
Employee's Mutual Bldg.
717 Mulberry Street
(515) 244-1557

Evansville, IN 47715
101 Plaza East Blvd.
(812) 479-8951

Fargo, ND 58078
301 27th Street, South
(701) 293-9855

Fresno, CA 93710
1520 East Shaw Avenue
(209) 226-2953

Janesville, WI 53545
100 East Building
(608) 756-3691

Kansas City, MO
Independence, MO 64055
12401 East 43rd
(816) 373-1700

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

Mankato, MN 56001
111 Madison East Plaza
(507) 387-3406

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

Omaha, NE 68144
11414 W. Center Road
(402) 330-4545

MONSANTO COMMERCIAL PRODUCTS CO.

Electronic Materials & Optoelectronic Components

Dedham, MA 02026
990 Washington Street
(617) 329-2530
(617) 329-1150

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

Palo Alto, CA 94304
3400 Hillview Avenue
(415) 493-3300

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

Fisher Controls Company

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

Monsanto Enviro-Chem Systems, Inc.

St. Louis, MO 63178
Box 14547
Corporate Square Office Park
(314) 694-1000

United Systems Corporation

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

MONSANTO INDUSTRIAL CHEMICALS CO.

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

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

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

Monsanto Flavor/Essence, Inc.

Montvale, NJ 07645
7 Mercedes Drive
(201) 391-9870

MONSANTO PLASTICS & RESINS CO.

Consumer Products

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

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Extruded Products - Polyethylene Film

Anaheim, CA 92803
611 East Cerritos Avenue
(714) 772-2010

Kenilworth, NJ 07033
North 8th Street & Monroe Avenue
(201) 276-2900

Plastics

Springfield, MA
Indian Orchard, MA 01051
730 Worcester Street
(413) 788-8911

Resin Products

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

Springfield, MA
Indian Orchard, MA 01051
190 Grochmal Avenue
(413) 788-8911

FRP Company

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

MONSANTO TEXTILES COMPANY

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

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

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

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

MONSANTO RESEARCH CORPORATION

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

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

Containers - Blowware

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

Kenilworth, NJ 07033
North 8th Street & Monroe Avenue
(201) 276-2900

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

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

Extruded Products - Fome-Cor®

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

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

OTHER MARKETING OFFICES

Government Marketing

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

Special Attraction

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

MARKETING OFFICES OUTSIDE THE UNITED STATES

Argentina
Monsanto Argentina S.A.I.C.
Avenida Madero 1020
Buenos Aires, Argentina

Australia
Monsanto Australia Limited
151 Flinders Street
Melbourne, Victoria 3001
Australia

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

Monsanto Australia Limited
Post Office Box 1111K, Adelaide
South Australia 5001

Monsanto Australia Limited
P.O. Box 63, Hamilton Central
Brisbane, Queensland,
Australia 4007

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

Austria
Monsanto GmbH
Am Stadtpark
Hilton Center
A-1030 Vienna, Austria

Belgium
Monsanto Europe S.A.
270-272 Avenue de Tervuren
1150 Brussels, Belgium

Monsanto Europe S.A.
163 Mechelsesteenweg
2000 Antwerp, Belgium

Brazil
Industrias Monsanto S.A.
Rua da Consolacao 881
Sao Paulo, Brazil 01220

Canada
Monsanto Canada Ltd
2000 Argenta Road
Plaza Two, Third Floor
Mississauga, Ontario, Canada
L5N 1V8

Monsanto Canada Ltd
425 Patrick Street
LaSalle, Quebec, Canada

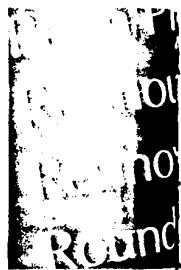
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Monsanto Canada Ltd. 175 Rexdale Blvd. Rexdale, Ontario, Canada			
Monsanto Canada Ltd. 100 Park Royale West Vancouver, B.C., Canada			
Chile Monsanto Chile Comercial e Industrial Limitada Calle Estado 337 Santiago de Chile	Italy Monsanto Italiana S.p.A. Via Melchiorre Gioia 8 20124 Milano, Italy	Poland Monsanto Poland Inc. Hotel Forum, Room 827 Nowogrodzka 24-26 0051 Warsaw, Poland	
Colombia Monsanto Colombiana Inc. Carrera 14, No. 77 - 59 Bogota, Colombia	Ivory Coast Monsanto Central Africa, Inc. B. P. 2802 Abidjan, Ivory Coast	Puerto Rico Monsanto Puerto Rico Company P. O. Box 837 Hato Rey, Puerto Rico	
Denmark Monsanto A/S 6 Rysensteensgade DK 1564 Copenhagen Denmark	Japan Monsanto Japan Ltd. 217, Shin Kokusai Bldg. 4-1, Marunouchi 3, Chome Chiyoda-ku, Tokyo, Japan	Singapore Monsanto Singapore Company (Pte.) Ltd. Colden Mile Tower, Beach Road Singapore 7	
El Salvador Monsanto Centroamerica (El Salvador) S.A. 67 Avenida Sur y Calle a Santa Tecla San Salvador, El Salvador	Kenya Monsanto Central Africa, Inc. P.O. Box 25274 Nairobi, Kenya	South Africa Monsanto South Africa (Pty.) Ltd. P. O. Box 78025 Sandton, Transvaal, South Africa	
Federal Republic of Germany Monsanto (Deutschland) GmbH Immermannstrasse 3 D-4000 Dusseldorf, Federal Republic of Germany	Korea Chemstrand, Inc. (Korea Branch) 3-7, Jeong Dong, Joong-Ku Seoul, Korea	Sri Lanka Monsanto Far East, Ltd. (Agricultural Products) First Floor, 56 Galle Road Colombo 3, Sri Lanka	
Finland Monsanto Oy Arkadiankatu 8 C 20 00100 Helsinki 10, Finland	Malaysia Monsanto Far East Ltd. (Malaysia Branch) 116, Jalan Semangat Petaling Jaya, Selangor, Malaysia	Sweden Monsanto (Scandinavia) A.B. Xshammarsgatan 27 Boras, Sweden	
France Societe Monsanto S.A. 9 rue d'Argenson 7500 Paris, France	Mexico Fisher Governor of Mexico, S.A. Calle I, Avenida 12 Toluca, Edo de Mexico, Mexico	Monsanto (Scandinavia) A.B. Ulfvundavagen 108 Bromma, Sweden	
Guatemala Monsanto Guatemala Inc. 3a Calle 8-49 Zona 15 Guatemala City, Guatemala	Monsanto Comercial S.A. de C.V. Calle Thiers No. 248 Mexico S. D.F., Mexico	Switzerland Monsanto (Suisse) S.A. Postfach CH 5600 Lenzburg, 1 Switzerland	
Hong Kong Monsanto Far East Ltd. 26 Canal Road West Hong Kong, B.C.C.	Netherlands Monsanto B.V. Jan van Nassaustraet 53-55 Den Haag, Holland	Taiwan Monsanto Far East Ltd. - (Taiwan Branch) Shin Shen South Road P. O. Box 3949 Taipei, Taiwan R.O.C.	
India Monsanto Chemicals of India Pvt. Ltd. Wakefield House 11, Spott Rd. - Ballard Estate Bombay 400 038, India	New Zealand Monsanto New Zealand, Ltd. 19 Great South Road Remuera, Auckland 5, New Zealand	Thailand Monsanto Thailand Ltd. 120 Silom Road Bangkok, Thailand	
Monsanto Chemicals of India Pvt. Ltd. 310-311 Linghi Chetty Street Madras 600 001, India	Monsanto New Zealand, Ltd. P. O. Box 11-117 Sockburn, Christchurch, New Zealand	United Kingdom Monsanto Ltd. 14 Tothill Street London SW1H 9LH England	
Monsanto Chemicals of India Pvt. Ltd. 3/8 Asaf Ali Road New Delhi 110 001, India	Monsanto New Zealand, Ltd. P. O. Box 38359 Petone Wellington, New Zealand	Monsanto Ltd. 90 Thornton Road Bradford BD1 2DX W. Yorkshire, England	
Indonesia Monsanto Far East Ltd. (Indonesia Branch) 44 Senen Raya Jakarta, Pusat, Indonesia	Nicaragua Monsanto Agricolade (Nicaragua) S.A. P.O. Box 288 Managua, Nicaragua	Monsanto Ltd. 11 King Richards Road Leicester LE1 50B Leicestershire England	
Israel Israel Chemical Fibres Ltd. (Textiles only) 19th Floor Shalom Tower Tel Aviv 65251, Israel	Norway Monsanto Norge A/S Fred Olsengate 11 Oslo 1, Norway	Monsanto Ltd. Dundonald (Nr Kilmarnock) Ayrshire KA2 9 BU Scotland, Great Britain	
	Philippines Monsanto Philippines Inc. 6778 Ayala Ave. Makati Rizal D-708, Philippines	Venezuela Monsanto (Venezuela) C.A. Torre Phelps Piso 24 Caracas 101, Venezuela	

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

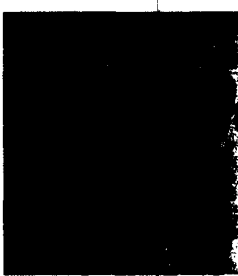
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Niran® 6-3



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Tridecanoethyle
Triphenyl Phosph
Tripolyphosphate
Tripotassium Pho
Trisodium Phosph
Trisodium Phosph



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