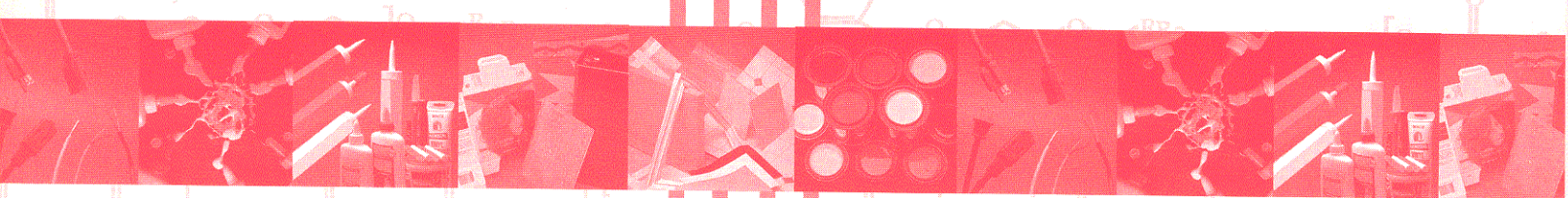
VELSICOL CHEMICAL CORPORATION

ADMEX® POLYMERIC PLASTICIZERS

IMPROVED PERMANENCE ● SUPERIOR MIGRATION RESISTANCE ● EXTENDED LIFE OF FLEXIBLE ARTICLES ● EXPANDED PRODUCT APPLICABILITY ● SUPERIOR OUTDOOR WEATHERING PERFORMANCE ● SUPERIOR EXTRACTION RESISTANCE ● EXTREMELY LOW VOLATILITY ● IMPROVED PERMANENCE ● SUPERIOR MIGRATION RESISTANCE ● EXTENDED LIFE OF FLEXIBLE ARTICLES ● EXPANDED PRODUCT APPLICABILITY ● SUPERIOR OUTDOOR WEATHERING PERFORMANCE ● SUPERIOR EXTRACTION RESISTANCE



MARKETED BY

HARWICK STANDARD
DISTRIBUTION CORPORATION
60 S. Seiberling Street • Akron, Ohio 44305

VELSICOL CHEMICAL CORPORATION

Velsicol is a growing, global corporation focused on producing high performance specialty chemicals based on benzoic acid and cyclopentadiene that serve a variety of niche markets.

Top-selling products include a full line of specialty plasticizers ranging from innovative benzoate esters to high performance polymerics and monomerics. With such a broad line, we are able to serve the adhesives, caulks, sealants, coatings and PVC resins markets.

Velsicol also is proud to be the world's largest marketer of refined benzoic acid and derivatives. Our investments in this area ensure that you can expect only the highest quality derivatives and continual development of new products from Velsicol.

Cyclopentadiene is the basis for the third line of chemicals we manufacture. These derivatives are used in the production of flame retardants and agricultural pesticides.

Admex® Polymeric Plasticizers

Admex® Polymeric Plasticizers

Velsicol's Admex® polymeric plasticizers offer permanence and migration resistance to PVC compound applications. Admex polymerics extend the life of flexible articles and expand product applicability into high performance environments. Because of their excellent migration resistance, Admex products are well-suited for applications such as vinyl electrical tape, appliance gaskets, labels, decals, vinyl foam and electrical wire insulation. Superior outdoor weathering performance is demonstrated by their wide use in automotive decorative decals. Admex polymerics' resistance to solvent extraction is employed in fuel lines, industrial mats and clothes, and printing rollers.

Chemically, Admex products range from aromatic to aliphatic and from branched to linear. In addition to their chemically varied performance attributes, the high molecular weight attained through polymerization dramatically increases their permanence. Admex polymeric plasticizers provide superior resistance to migration, volatilization and extraction and are available in molecular weights from 900 to 6,400.

Admex® 334F

Admex® 334F is a polyester-type permanent plasticizer well-suited for critical uses where the PVC compound must be approved for food and food contact applications. It has been qualified and regulated by the Food and Drug Administration (FDA) under the indirect food additive section 21CFR 178.3740, 21CFR 175.300 and 21CFR 175.320.

Admex 334F is recommended for food packaging uses such as film, closures and cap liners. Admex 334F has extraction and migration resistance superior to monomeric plasticizers suitable for these applications.

Admex® Polymeric Plasticizers

Admex® 409

Admex® 409 is a medium molecular weight polymeric plasticizer widely used in polyvinyl chloride and rubber formulations. It offers a good balance of plasticizing properties suitable for many applications and maintains excellent permanence of these properties in the finished goods. Admex 409 is an excellent plasticizer for wire and cable coatings offering good electrical properties, low odor, easy processing and good humidity stability. For film, tape and coated fabrics, Admex 409 offers compatibility, migration resistance to rubber, excellent oil and hexane resistance, and low volatility.

Admex® 429

Admex® 429 is a medium-to-high molecular weight polyester plasticizer. The product has low odor, processes easily and offers permanence; good low-temperature flexibility; excellent electrical properties; and outstanding migration resistance, humidity stability and resistance to oil and solvent extraction. Admex 429 fuses readily, even at temperatures below other polymerics.

Admex 429 shows excellent resistance to migration from PVC compositions to various rubbers and polystyrene copolymers, a property valuable in electrical insulation and refrigerator gasketing. This product also is an excellent plasticizer for making oil resistant, high temperature PVC wire and cable compounds. Admex 429 also is useful for plasticizing ethyl cellulose, nitrocellulose, acrylic caulking compounds, and adhesive systems based on polyvinyl acetate, styrene-butadiene and acrylic lattices.

Admex® 523

Admex® 523 is a low molecular weight polymeric plasticizer that is characterized by a mild ester odor and very light color. It imparts excellent processability to PVC compositions and is compatible with a wide variety of other polymers. Admex 523 provides good adhesion in metal coatings and imparts processability to engineering thermoplastics. It also has high gel strength in plastisols and low fusion temperatures.

Admex® 760

Admex® 760 is an ultra-high molecular weight, polymeric adipate. It is characterized by a mild ester odor and light color. It possesses maximum resistance to extraction, migration and volatility. Admex 760's high molecular weight makes it well-suited for solvent resistance in print rollers.

Admex® Polymeric Plasticizers

Admex® 770

Admex® 770 is a medium-to-high molecular weight polymeric based on a blend of adipic and phthalic acid. It is characterized by a mild ester odor and light color. It possesses excellent extraction resistance and weatherability which make it well-suited for exterior graphics. Its low migration into adhesives and extremely low volatility make it a superior product for decorative decals and for use in automotive instrument panels. Admex 770 also is compatible with nitrile rubber.

Admex® 910-001

Admex® 910-001 is a medium molecular weight polymeric adipate that is characterized by a mild ester odor and light color. It possesses high permanence and low contribution to odor and taste in vinyl compounds. Combined with low migration to appliance coatings, resistance to hydrolysis and soapy water extraction, these properties make it a perfect candidate for refrigerator and dishwasher gaskets.

Admex® 1723

Admex® 1723 is a medium-to-low molecular weight polymeric adipate. It is characterized by a mild ester odor and light color. It possesses outstanding processability in calendering operations, allowing the production of high gloss sheeting. With its excellent permanence and printability, it is suitable for use in decorative graphics. It gives high permanence in single-ply roofing and is flexible in vehicle and furniture upholstery.

Admex® 2632

Admex® 2632 is a medium-to-low molecular weight polymeric adipate that is characterized by a mild ester odor and light color. Additionally, Admex 2632 is non-extractable by lipids and is washable in plastics sheeting. It is highly permanent in tubing and equipment coatings.

Admex 2632 has been qualified and regulated by the FDA under the indirect food additive sections 21CFR 178.3740, 21CFR 175.300 and 21CFR 175.320.

Admex® 6187

Admex® 6187 is a high molecular weight polymeric adipate characterized by a mild ester odor and very light color. It possesses excellent permanence, particularly to oil extraction, and is capable of producing vinyl compounds competitive with nitrile rubber for oil resistance. Admex 6187 has excellent extraction, oil and solvent resistance that make it ideal for applications such as gasoline hose and tubing, oil resistant electrical cable insulation, industrial boots, gloves and aprons. It is highly permanent and washable in wall and shelf coverings.

Admex® Polymeric Plasticizers

Admex® 6985

Admex® 6985 is the standard against which all other polymeric plasticizers are compared. It is a high molecular weight polymeric adipate characterized by a mild ester odor and light color. It offers very low extractability, volatility and migration. Admex 6985 is chemically stable and extraction resistant in tank liners, highly permanent and printable in decorative decals; non-extractable from floor coverings; and non-volatile in automotive headrests.

Admex® 6996

Admex® 6996 is a low molecular weight polymeric adipate that is characterized by a mild ester odor and light color. It features excellent processability, low migration to pressure sensitive adhesives, printability and outstanding low temperature flexibility for a polymeric plasticizer. Admex 6996 also is non-volatile, flexible and non-migratory in electrical tape. Additionally, it is highly permanent in high temperature electrical environments. Its low viscosity makes it suitable for paper coatings and its high plasticizing efficiency gives soft, flexible fabric coatings.

Admex® P-27

Admex® P-27 is an intermediate molecular weight polymeric plasticizer intended for use in PVC compounds requiring excellent performance and durability. It is a high purity product intended for applications that require its excellent resistance to migration, high humidity compatibility, high dielectric properties, and non-fogging characteristics.

ADMEX® POLYMERIC PLASTICIZERS

Admex® Polymeric Plasticizer Application Guide

	Admex 334F	Admex 409	Admex 429*	Admex 523	Admex 760	Admex 770	Admex 910-001	Admex 1723	Admex 2632	Admex 6187	Admex 6985	Admex 6996	Admex P-27
Flexible PVC													
Electrical Tape					◆						◆	◆	◆
Plastisols	◆	◆	◆	◆						◆		◆	
Sealants						◆		◆		◆	◆		
Inks												◆	
Film & Sheeting	◆	◆	◆			◆		◆	◆	◆	◆		◆
Wire & Cable		◆			◆						◆	◆	
Foam				◆	◆								
Decals						◆		◆			◆		
Tubing & Hoses	◆	◆			◆				◆	◆			◆
FDA Approvals	◆								◆				
Molding & Extrusions							◆	◆		◆	◆		
Non-PVC													
Rubber		◆				◆						◆	

*Admex 429 is useful in other non-PVC applications including plasticizing ethyl cellulose, nitrocellulose, acrylic caulking compounds, and adhesive systems based on polyvinyl acetate, styrenebutadiene and acrylic lattices.

FDA Status

Admex® 334F and Admex 2632 have been qualified and regulated by the FDA under the indirect food additive sections 21CFR 178.3740, 21CFR 175.300 and 21CFR 175.320.

Additional regulatory information can be found in the Product Information Bulletin available for each Velsicol product.

rev. 09.98

Velsicol has developed guidelines to help ensure the safe handling, storage and transportation of its products. Information is available through Storage and Handling guidelines and Material Safety Data Sheets. Should there be any questions or concerns about the use or handling of Velsicol products, contact the worldwide headquarters at (800) 843-7759 or fax to (847) 298-9014.

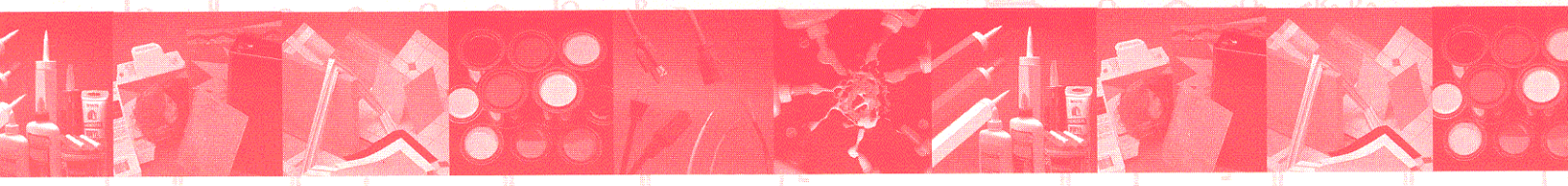
MARKETED BY

HARWICK STANDARD DISTRIBUTION CORPORATION

60 S. Seiberling Street • Akron, Ohio 44305

VELSICOL
CHEMICAL CORPORATION

10400 W. Higgins Road, Suite 600
Rosemont, Illinois 60018-3713 USA
www.velsicol.com



Harwick Standard Distribution Corporation

Plasticizers

Harwick Standard offers a broad line of plasticizers to meet the needs of both rubber compounders and flexible PVC formulators. By offering a large range of products, we provide our customers the versatility of identifying a plasticizer family that is effective with various polymers, and gives several product options from which to choose for optimum performance characteristics - from general use to most demanding requirements.

Harwick Standard's experienced technical and sales staff can assist in selecting the best plasticizer to meet your requirements. Please contact us for assistance with your compounding needs.

Non-Phthalate C-9

Tradename(s)	Chemical Name	Polymer Usage	General Purpose	Low Temperature/ Flexibility	Low Volatitity	Low Extraction	Heat Aging Resistance	High Solvating	Miscellaneous
Polycizer® DHIN	1-2 cylcohexane dicarboxylic acid diisononyl ester	R-1,2/P-1	√						Performance similar to DOP in NBR compounds

Adipates

Tradename(s)	Chemical Name	Polymer Usage	General Purpose	Low Temperature/ Flexibility	Low Volatitity	Low Extraction	Heat Aging Resistance	High Solvating	Miscellaneous
Polycizer® DOA	Di-2 ethylhexyl adipate	R-1,2/P-1,2	√	√					FDA, low water extraction, UV stability
Merrol® 4206 (DBEA)	Dibutoxyethyl adipate	R-1,2,3/P-2		√					
Polycizer DBEEA Merrol 4226	Dibutoxyethoxyethyl adipate	R-1,2,3		√	√	√	√		

Azelates

Tradename(s)	Chemical Name	Polymer Usage	General Purpose	Low Temperature/ Flexibility	Low Volatitity	Low Extraction	Heat Aging Resistance	High Solvating	Miscellaneous
Merrol DOZ-E	Di-2 ethylhexyl azelate	R-1,2/P-1,2	√	√	√				Excellent low temp

Polymer Usage Key	
R-1	NBR, NBR/PVC
R-2	CR, CPE, CSM
R-3	ECO, Fluoroelastomers, Polyacrylates

Polymer Usage Key	
P-1	PVC
P-2	PVAC, PS, ABS, Cellulosics
P-3	Eng, Resins, Polyester, Alloys

Benzoates

Tradename(s)	Chemical Name	Polymer Usage	General Purpose	Low Temperature/ Flexibility	Low Volatitity	Low Extraction	Heat Aging Resistance	High Solvating	Miscellaneous
Benzoflex® 9-88	Dipropylene glycol dibenzoate	R-1/P-1,2			√			√	Polyurethanes
Benzoflex 50	Diethylene/ dipropylene glycol dibenzoate	R-1/P-1,2			√			√	Water-based adhesives
Benzoflex 2088	Diethylene glycol dibenzoate, triethylene glycol dibenzoate, dipropylene glycol dibenzoate	R-1/P-1,2			√	√		√	High solvator, low VOC's, FDA

Chlorinated Paraffins

Tradename(s)	Chemical Name	Polymer Usage	General Purpose	Low Temperature/ Flexibility	Low Volatitity	Low Extraction	Flame Resistance	High Solvating	Miscellaneous
Chloro Flo/ Paroil Series	Liquid chlorinated paraffins	R-2/P-1	√		√		√		

Mono-Esters

Tradename(s)	Chemical Name	Polymer Usage	General Purpose	Low Temperature/ Flexibility	Low Volatitity	Low Extraction	Heat Aging Resistance	High Solvating	Miscellaneous
Polycizer Butyl Oleate	N-butyl oleate	R-2/P-2		√					Primary light color plasticizer for polychloroprene
Polycizer MO	Vegetable Oil	R-2		√	√		√	√	Low & high temp for polychloroprene
Plasticizer OLN	Oleyl nitrile	R-1				√		√	Low & high temp for polychloroprene
Natroflex® IOT	Isooctyl tallate	R-1,2	√	√					
Merrol 818T	Alkyl tallate	R-1/P-2	√	√					

Polymer Usage Key	
R-1	NBR, NBR/PVC
R-2	CR, CPE, CSM
R-3	ECO, Fluoroelastomers, Polyacrylates
P-1	PVC
P-2	PVAC, PS, ABS, Cellulosics
P-3	Eng, Resins, Polyester, Alloys

Petroleum Process Oils

Tradename(s)	Chemical Name	Polymer Usage	General Purpose	Low Temperature/ Flexibility	Low Volatitity	Low Extraction	Heat Aging Resistance	High Solvating	Miscellaneous
Stan-Lube Series	Paraffinic oils	Non-polar	√						Light color, good for EPRs
Stan-Plas Series	Naphthenic oils	R-1	√						General Processability
Duoprime® Series	White oils	Non-polar	√						FDA

Phosphate Esters

Tradename(s)	Chemical Name	Polymer Usage	General Purpose	Low Temperature/ Flexibility	Low Volatitity	Low Extraction	Flame Resistance	High Solvating	Miscellaneous
Lindol®	Tricresyl phosphate	P-1,2	√		√		√	√	
Phosflex® 41L Merrol 521	Isopropylated triaryl phosphate	R-1,2/P-1					√		
Phosflex T-BEP	Tributoxylethyl phosphate	R-1,2,3/P-1,2		√			√	√	
Phosflex 71-B	Butylated triphenyl phosphate	R-1,2/P-1					√		
Phosflex 362	2-ethyhexyl diphenyl phosphate	R-1,2/P-1,2					√		
Phosflex 390	Isodecyl diphenyl phosphate	R-1,2/P-1,2					√		

Polymer Usage Key	
R-1	NBR, NBR/PVC
R-2	CR, CPE, CSM
R-3	ECO, Fluoroelastomers, Polyacrylates
P-1	PVC
P-2	PVAC, PS, ABS, Cellulosics
P-3	Eng, Resins, Polyester, Alloys

Phthalates

Tradename(s)	Chemical Name	Polymer Usage	General Purpose	Low Temperature/ Flexibility	Low Volatitity	Low Extraction	Heat Aging Resistance	High Solvating	Miscellaneous
Merrol DAP	Diallyl phthalate	R-1,2/P-3						√	Co-curing
Polycizer DBP Merrol DBP	Di-n-butyl phthalate	R-1,2/P-1,2	√					√	Good emollient for cosmetics
Polycizer DIDP	Diisodecyl phthalate	R-1,2/P-1,2			√	√			Also E grade
Polycizer DINP Merrol DINP	Dissononyl phthalate	R-1,2/P-1,2			√				
Polycizer DOP Merrol DOP	Di-2-ethylhexyl phthalate	R-1,2/P-1,2	√						
Polycizer DUP	Diundecyl phthalate	R-1,2/P-1,2		√	√		√		Low fogging Also CA grade

Polymerics

Tradename(s)	Chemical Name	Polymer Usage	General Purpose	Low Temperature/ Flexibility	Perme-ability	Migration Resistance	Low Extraction	Heat Aging	Miscellaneous
Admex® P-27	Polyester adipate	R-1/P-1,2				√			High purity, good electrical properties
Admex 409	Polyester adipate	R-1/P-1,2	√			√		√	Good electrical properties
Admex 412	Polyester adipate	R-1/P-1		√	√				Low viscosity, easy processing
Amdex 429	Polyester adipate	R-1,2/P-1,2				√			Non-fogging, humidity resistance
Admex 523	Mixed polyester	R-1/P-1,2	√			√	√		Low viscosity
Admex 760	Polyester adipate	R-1,2/P-1,2			√	√			Excellent permanence, low water extractability
Admex 761	Polyester adipate	R-1/P-1,2					√		
Admex 770	Mixed polyester	R-1,2/P-1,2			√	√			Excellent weatherability (decals)
Admex 775	Mixed polyester	R-1/P-1,2							Excellent resistance to aqueous & organic solvents
Admex 910-001	Mixed polyester	R-1/P-1,2					√		Low water extraction
Admex 1723	Mixed polyester	R-1/P-1,2			√				Printability
Admex 2632	Mixed polyester	R-1/P-1,2	√						FDA

Polymerics (continued)

Tradename(s)	Chemical Name	Polymer Usage	General Purpose	Low Temperature/ Flexibility	Perme-ability	Migration Resistance	Low Extraction	Heat Aging	Miscellaneous
Admex 6187	Polyester adipate	R-1/P-1,2				√	√		Solvent & oil resistance
Admex 6985	Polyester adipate	R-1/P-1,2				√	√	√	Very low volatility
Admex 6994	Mixed polyester	R-1/P-1,2				√			Mar resistance, low fogging
Admex 6995	Polyester adipate	R-1/P-1,2			√				UV weatherability
Admex 6996	Polyester adipate	R-1/P-1,2		√					Printability

Tradename(s)	Chemical Name	Polymer Usage	General Purpose	Low Temperature/ Flexibility	Low Volatility	Low Extraction	Heat Aging Resistance	High Solvating	Miscellaneous
Merrol P-6320	Polyester adipate	R-1,2/P-1		√		√			Solvent & oil resistance, low temp flexibility
Merrol P-6412	Polyester adipate	R-1,2/P-1,2				√			Medium viscosity, FDA
Merrol P-6410	Polyester adipate	P-1,2			√	√			
Merrol P-6420	Polyester adipate	P-1				√			Good color

Sebacates

Tradename(s)	Chemical Name	Polymer Usage	General Purpose	Low Temperature/ Flexibility	Low Volatitity	Low Extraction	Heat Aging Resistance	High Solvating	Miscellaneous
Polycizer DBS	Di-n-butyl sebacate	R-1,2/P-1,2		√				√	FDA
Polycizer DOS Merrol DOS	Di-2-ethylhexyl sebacate	R-2/P-1,2	√	√		√			Low temp greases & caulks

Harwick Standard Distribution Corporation

www.harwickstandard.com

330-798-9300

Polymer Usage Key	
R-1	NBR, NBR/PVC
R-2	CR, CPE, CSM
R-3	ECO, Fluoroelastomers, Polyacrylates
P-1	PVC
P-2	PVAC, PS, ABS, Cellulosics
P-3	Eng, Resins, Polyester, Alloys

Specialty

Tradename(s)	Chemical Name	Polymer Usage	General Purpose	Low Temperature/ Flexibility	Perme-ability	Migration Resistance	Low Extraction	Heat Aging	Miscellaneous
Plasticizer SC-B	Triethyleneglycol dicaprate/caprylate	R-1,2,3		√				√	FDA
Plasticizer SC-E	Triethyleneglycol di 2-ethylhexanoate	R-1,2,3		√					Flexibilitity over a wide temp range
Hercoflex® 600	Pentaerythritol ester of fatty acids	R-1,2		√	√	√	√	√	Excellent low and high temp
Hercoflex 707, 707A	Pentaerythritol ester of fatty acids	R-1,2		√	√	√	√	√	Excellent low and high temp
Polycizer ESO Merrol E-68	Epoxidized soybean oil	R-1/P-1,2,3			√	√		√	Good heat stabilizer

Trimellitates

Tradename(s)	Chemical Name	Polymer Usage	General Purpose	Low Temperature/ Flexibility	Perme-ability	Migration Resistance	Low Extraction	Heat Aging	Miscellaneous
Polycizer TOTM	Tri-2-ethylhexyl trimelliatate	R-1,2/P-1,2			√		√	√	Also E&CA grades, excellent water resistance
Merrol 810TM-E	Tri(n-octyl/n-decyl) trimellitate	R-2		√	√		√	√	Oxidation resistance, excellent water resistance
Polycizer TINTM	Triisononyltrimellitate	R-1,2/P-1,2			√	√	√	√	

Polymer Usage Key	
R-1	NBR, NBR/PVC
R-2	CR, CPE, CSM
R-3	ECO, Fluoroelastomers, Polyacrylates
P-1	PVC
P-2	PVAC, PS, ABS, Cellulosics
P-3	Eng, Resins, Polyester, Alloys

Harwick Standard Distribution Corporation

60 South Seiberling Street

P.O. Box 9360

Akron, OH 44305-0360

Phone: 330-798-9300

Fax: 330-798-0214

Technical Fax: 330-798-9328

Sales Fax: 330-798-4089

www.harwickstandard.com