

CHLOREZ® RESIN GRADES (TYPICAL PROPERTIES)

Property	Chlorez 700	Chlorez 700-S	Chlorez 760	Chlorez 700-DD	Chlorez 700-DF	Chlorez 700-SS	Chlorez 700-SSNP
Physical Form	White Powder	White Powder	White Powder	White Powder	White Flake	White Powder	White Powder
Color, APHA (15g in 100 ml Toluene)	150	100	100	100	100	100	60
Chlorine Content % By Weight ASTM E 442	71.5	71.5	74	71.5	71.5	71.5	71.5
Specific Gravity, Solids, 25°C	1.6	1.6	1.7	1.6	1.6	1.6	1.6
Bulk Density, Pounds/Gallon	13.5	13.5	14.0	13.5		13.5	13.5
Particle Size, % Thru 50 Mesh	95%	95%	95%	95%	Flake	95%	95%
Volatiles	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%
Softening Point (Ball and Ring Method, °C ASTM D-36)	103	103	160	103	103	115	120
Stability JQD Method - % HCl 4 Hrs @ 175°C	0.1	0.05	0.05	0.1	0.1	0.01	0.01

Chlorez products are tasteless and odorless chlorinated paraffin resins especially soluble in aromatic and chlorinated solvents. They have limited or no solubility in lower alcohols, glycols, glycerins, and water.

Chlorez is compatible with most commonly used resins, rubbers, plasticizers, waxes, and drying oils. Because of their very high active halogen content and low cost, Chlorez products find wide usage as flame retardant additives in coatings, inks, plastics, foams, adhesives, paper and fabrics.

Chlorez 760 has a softening point of 160°C minimum. It has wide applications in olefins, styrenes, adhesives, wire and cable and many other flame retardant areas.

Chlorez 700-DD was developed for use in white coatings. It gives superior color stability compared to other chloroparaffins.

Chlorez 700-DF has the same properties as Chlorez 700, but in flake form. These flakes reduce house-keeping problems associated with handling powders.

Chlorez 700-SS was developed by using the best raw materials and the best chlorination technique and stabilization system. It has considerably improved thermal stability over other chlorinated paraffins. Applications include flame retarding polyethylene, polypropylene, polystyrene and other material needing good stability.

Chlorez 700-SSNP is an improved version of Chlorez 700-SS and is produced in Dover's state-of-the-art new facility. It has the best color and thermal stability of any Chlorez grade, and is recommended for use in polyolefins, unsaturated polyesters, polystyrenes and materials requiring thermal stability.

DOVERSPERSE® GRADES (TYPICAL PROPERTIES)

Property	DOVERSPERSE A-1	DOVERSPERSE 3
Physical Form	Water Dispersion of Chlorez 700	Water Emulsion of Paroil 170HV
Color	Cream White	Cream White
Solids, % By Weight	65	66.5
Chlorine content % By Weight of Disp. or Emul.	45	45
Specific Gravity of Solids @ 25°C	1.600	1.540
Density, Wet Pounds/Gallon	11.0	11.3
Viscosity #6 Spindle, 10 RPM 25°C Poise	—	225
#6 Spindle, 100 RPM 25°C Poise	—	37.5
#4 Spindle, 10 RPM 25°C Poise	63	—
NS Hegman Units	4	—
pH	8.4	7

Both Doversperse A-1 and Doversperse 3 typically contain 45% available chlorine for maximum flame retardant efficiency.

Because of their non-ionic base they find application in both cationic and anionic emulsion systems.

In addition to their flame retardant contribution they improve adhesion, increase chemical and water resistance, and allow the user to formulate aqueous systems rather than solvent systems.

Doversperse A-1 is recommended if increased hardness is required. Use Doversperse 3 for plasticizing and to increase tackiness.

Application areas include adhesives, rubber coatings, inks, carpet backings, paper and fabric coatings.

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MARKETED BY
**HARWICK STANDARD
DISTRIBUTION CORPORATION**
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SPECIALTY GRADES OF

CHLORINATED PARAFFINS

PAROIL® LIQUID GRADES

PAROIL® NON-REPORTABLE* FORMULAS

**PAROIL® CORROSION-INHIBITED
FORMULAS**

CHLOREZ® RESIN GRADES

**DOVERSPERSE® WATER DISPERSED
AND EMULSIFIED GRADES**



ISO
9001
Certified



Responsible Care
A Public Commitment



QSR-130



CHLORINATED PARAFFINS TYPICAL ANALYSIS

PROPERTY	PAROIL 10	CHLORO-FLO 40	CHLORO-FLO 42	PAROIL 140	PAROIL 45	PAROIL 142A	PAROIL 145A	PAROIL 50	PAROIL 152	PAROIL 150A	PAROIL 150LVA	PAROIL 1057	PAROIL 1061	PAROIL 57/61	PAROIL 1650	PAROIL 170T	PAROIL 170LV	PAROIL 170HV	
Distinguishing Characteristics	Stable, lowest vis., high solubility	Stable, low vis., excellent solubility	Stable, low vis., excellent solubility	Stable, low volatility, good solubility	Good color, low vis., ex. stability	Stable, med. vis., good solubility	Stable, med. vis., good solubility	Low vis., high chlorine	Very stable, very low volatility, good solubility	Stable, very high vis., med. solubility		Med. to high vis.	Low vis., ex. solubility	High chlorine, ex. stability	Blend of 1057 and 1061	Med. vis., ex. stability	High chlorine, lower vis. than LV.	High vis., high chlorine	Very high vis., high chlorine
Color, Typical, Gardner 1933 Std.	1	2	2	1	1	1	3	1	1	1	2	1	1	1	1	3	2	2	
Chlorine Content % by Weight	40	39	40	42	45	45	46	50	51	50	48	57	61 min	59	62	70	67	70	
Specific Gravity @ 50°/25°C @ 25°/25°C	1.060 1.080	1.085 1.100	1.100 1.120	1.150 1.170	1.160 1.180	1.195 1.215	1.200 1.220	1.250 1.270	1.250 1.270	1.250 1.270	1.220 1.240	1.300 1.320	1.370 1.390	1.335 1.355	1.390 1.410	1.510 1.530	1.500 1.520	1.520 1.540	
Pounds Per Gallon	8.9	9.0	9.3	9.6	9.6	10.0	10.0	10.3	10.3	10.3	10.3	10.9	11.4	11.1	11.8	12.5	12.5	12.7	
Viscosity: SUS @ 210°F	33	63	90	150	50	200	230	40	70	450	250	55	72	63	90	75	350	530	
SUS @ 100°F	55	560	1300	3900	390	8000	10500	190	1750	30000	14000	1100	4000	1700	7000	5000	>10 ⁷	>10 ⁹	
Poises @ 77°F	0.2	3.0	8	29	2-3	70	95	1.1	15	375	130	13	60	20	130	70	>10 ⁷	>10 ⁷	
Volatility, % Loss 4 hrs @ 150°C 24 hrs @ 100°C	60 40	5.0 3.0	2.0 0.5	1.5 0.8	7.0 1.5	1.5 0.8	1.5 0.8	25.0 15.0	3.5 0.9	1.5 0.7	1.4 1.0	18 6.0	11 3.0	14 4.0	6.0 2.0	15 9	5.2 0.6	1.0 0.1	
Stability: JQD Method % HCl, 4 Hrs @ 175°C	0.2	0.3	0.3	0.3	0.2	0.3	0.4	0.3	0.2	0.3	0.25	0.25	0.25	0.25	0.25	0.4	0.25	0.25	
Flash Point °F (Cleveland Open Cup)	155	>450	>450	>450	>400	>450	>450	>400	>450	>450	>450	>450	>450	>450	>450	>450	>450	>450	
300 SERIES CORROSION-INHIBITED FORMULAS	310	CF340	CF342	340	3045	342A	345A	3050	352	350A	350LVA	3057	3061	357/61	3650	370T	370LV	370HV	

NON-REPORTABLE (NR) FORMULAS AVAILABLE IN MOST GRADES.

SPECIAL EMULSIFIABLE, WATER DISPERSED AND WATER EMULSIFIED GRADES ALSO AVAILABLE.

UPON REQUEST, MATERIAL SAFETY DATA SHEETS, PREPARED IN COMPLIANCE WITH CFR 29-1910.1200 HAZARD COMMUNICATION, ARE AVAILABLE.

PLEASE SEE REVERSE SIDE FOR:

- CHLOREZ - 70% RESINOUS GRADES.
- DOVERPERSE - RESINOUS WATER DISPERSION AND LIQUID EMULSION GRADES.

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60 S. Seiberling Street • Akron, Ohio 44305

Please Note: These typical analyses are representative of current production. They are subject to change without notice.

Non-reportable refers to the Toxic Release Inventory (TRI), Section 313, Form R.



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 Volatility	Low Extraction	Heat Aging Resistance	High Solvating	Miscellaneous
Polycizer® DHIN	1-2 cyclohexane 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 Volatility	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 Volatility	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 Volatility	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 Volatility	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 Volatility	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
Natoflex® 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 Volatility	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 Volatility	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	Tributoxyethyl 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					✓		

Disclaimer of Liability

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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 Volatility	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	Disisononyl 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

Polymeric

Tradename(s)	Chemical Name	Polymer Usage	General Purpose	Low Temperature/Flexibility	Permeability	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

Polymeric (continued)

Tradename(s)	Chemical Name	Polymer Usage	General Purpose	Low Temperature/ Flexibility	Permeability	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 Volatility	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	Permeability	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		✓					Flexibility 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	Permeability	Migration Resistance	Low Extraction	Heat Aging	Miscellaneous
Polycizer TOTM	Tri-2-ethylhexyl trimellitate	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	Trisononyltrimellitate	R-1,2/P-1,2			✓	✓	✓	✓	



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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

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