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Chemistry



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***POLYMERIC PLASTICIZERS FOR
FLEXIBLE PVC***

 **HallStar**

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POLYMERIC PLASTICIZER PERFORMANCE SUMMARY

Recipe: Resin - 100 pphr; Plasticizer - as indicated; Stabilizer - 1.0 pphr
Plasticizer shown is at 67 pphr (40%) of total compound

Plasticizer	PARAPLEX								PLASTHALL							
	G-25	G-30	G-31	G-40	G-41	G-50	G-54	G-57	P-550	P-643	P-650	P-670	P-7046	P-7092	UVC	DOP

Original Physical Properties

Hardness Duro A, pts.	75	79	81	87	82	79	77	78	75	74	73	70	79	84	72	72
100% Modulus, psi	1200	1350	1500	1550	1500	1100	1250	1300	1300	1050	1150	850	1450	1550	1265	850
Elongation @ Break, %	420	430	430	420	380	470	430	470	370	430	450	450	430	420	365	440
Tensile Strength, MPa	15.2	17.6	17.2	16.9	17.6	17.6	16.9	17.6	16.9	16.2	16.9	16.2	18.3	17.6	18.4	14.5
psi	2200	2550	2500	2450	2550	2550	2450	2550	2450	2350	2450	2300	2650	2550	2665	2100
Specific Gravity	1.253	1.267	1.281	1.297	1.289	1.273	1.271	1.278	1.253	1.264	1.252	1.259	1.277	1.280	1.281	1.209

Low Temperature

Brittle Point, °C	-18	-7	+5	-12	-13	-8	-15	-19	-11	-15	-15	-24	-5	-3	-10	-34
T-45,000 psi, °C	-12	-14	-4	-10	-10	-16	-16	-17	-14	-18	-14	-25	-6	-3	NT	-37
T-135,000 psi, °C	-20	-24	-13	-18	-19	-25	-25	-26	-21	-27	-20	-34	-13	-10	NT	-46

Air Oven Aging, 3 days @ 136°C or (121°C)

Tensile Change, %	-11	0	+5	-6	-1	-10	-4	-2	0	-13	0	-7	24	-6	5	rigid
Elongation Change, %	-10	-12	-14	-6	-2	-2	-12	-9	+3	-9	-4	-4	-9	-19	0	rigid
Weight Change, %	-9.7	-8.4	-4.3	-2	-4.0	-1.9	-1.4	-1.5	-2.2	-2.1	-2.4	-2.3	-2.0	-1.6	-3.6	-28

Immersion/Extraction, Percent Weight Change After:

n-Hexane, 24hrs @23°C, DO	-39	-4.8	-1.7	-5.8	+1.4	-2.9	-2.8	-1.5	-1.9	-3.9	-2.6	-5.4	-7.4	-3.8	-2.4	-31
1% Soapy Water, 7d @90°C, DO	-5.3	-16	-8.3	-17	-11	-20	-15	-16	-11	-21	-9.0	-6.5	-12	-8.4	-12.2	-19
Cottonseed Oil, 24hrs @ 60°C	-.08	-5.1	-1.8	-1.9	-4.1	-5.1	-3.6	-4.6	-3.8	-5.0	-3.6	-6.8	-2.8	-1.9	-5.8	-16
Distilled Water, 24hrs. @ 60°C, DO	-.28	-.77	-.51	-2.4	-.69	-2.5	-1.1	-1.3	-1.0	-2.2	-.55	-.87	-1.0	-.89	-2.2	-.79
High Humidity, 9d @ 90°C, DO	-.09	-.29	-.37	-8.4	-5.0	-7.7	-3.0	-4.6	-4.8	-4.5	-.39	-.28	-.31	-.22	-0.9	-4.3

Compatibility and Permanence

Roll Spew	E	E	E	E	E	P	P	E	E	P	E	E	E	E	E	E
ABS Migration	G	P	F	P	G	P	F	E	G	F	G	P	E	E	F	P
Polystyrene Migration	E	P	F	G	G	E	F	G	E	F	G	P	E	G	E	P
Nitrocellulose Migration	E	P	G	G	P	P	F	F	G	F	G	F	G	G	NT	P

KEYS: E = Excellent, G = Good; F = Fair, P = Poor; DO = Dry Out, NT = not tested

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PLASTICIZER PHYSICAL PROPERTIES

Trade Name	Generic Name	Acid Number	Color, Gardner or (APHA)	Molecular Weight	Refractive Index	Specific Gravity @ 25°C	Viscosity @ 25°C, cps
Paraplex® G-25	Polyester Sebacate	1.4	2	8,000	1.467	1.06	160,000
Paraplex G-30	Mixed Dibasic Acid Polyester	0.8	(100)	800	1.499	1.085	1,400
Paraplex G-31	Mixed Dibasic Acid Polyester	0.7	(140)	1,000	1.503	1.10	6,200
Paraplex G-40	Polyester Adipate	1.5	(150)	6,000	1.470	1.15	150,000
Paraplex G-41	Polyester Adipate	1.5	(125)	5,000	1.470	1.12	100,000
Paraplex G-50	Polyester Adipate	1.4	4	2,200	1.466	1.08	2,700
Paraplex G-54	Polyester Adipate	1.1	(100)	3,300	1.466	1.092	5,600
Paraplex G-57	Polyester Adipate	1.0	(100)	3,400	1.466	1.10	6,800
Plasthall® P-550	Polyester Glutarate	0.8	(125)	2,500	1.464	1.063	3,900
Plasthall P-643	Polyester Adipate	1.0	(100)	2,000	1.465	1.08	2,650
Plasthall P-650	Polyester Adipate	1.0	1	1,200	1.464	1.050	3,300
Plasthall P-670	Polyester Adipate	1.0	(100)	800	1.464	1.08	1,200
Plasthall P-7046	Polyester Glutarate	1.0	5	4,200	1.466	1.11	12,000
Plasthall P-7092	Polyester Glutarate	0.8	9	5,000	1.467	1.11	24,000
Plasthall UVC	Polyester Adipate	1.0	(100)	N/A	1.488	1.134	2,600
Plasthall DOP	Diocetyl Phthalate		(25)	390		0.983	57

PLASTICIZED PVC COMPOUND APPLICATIONS INCLUDE:

by INDUSTRY

Automotive
 Aerospace
 Appliances
 Adhesives
 Caulks
 Coatings

Packaging
 Medical
 Construction
 Transportation
 Hydrocarbon and Chemical
 Transmission and Storage

by END USE

Hose and Tubing
 Rollers
 Belting
 Tank Linings
 Gloves and Boots
 Refrigerator Gaskets

Upholstery
 Instrument Panels
 Wall Covering
 Rainwear
 Food Wrap
 Wire & Cable

Automotive
 (interior and exterior)
 Roofing Membrane
 Decals
 Pond and tank liners
 Decorative Film & Tape

SUGGESTED APPLICATIONS

Polymeric plasticizers are used in PVC applications to provide flexibility, softness and lower modulus values and to maintain these characteristics after exposure of the PVC compound to severe use conditions or harsh environments. Polymeric are more permanent (stable) under extended, high heat conditions and less likely to volatilize out of the PVC compound than are monomeric plasticizers. Polymeric plasticizers are resistant to extraction (leeching) by solvents, oils and fluids, and they resist migration to other polymer compounds in contact with the PVC material. In short, polymeric plasticizers provide greater permanence than monomerics in PVC applications.



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