

Lindol

Phosflex[®] Flame Retardant Plasticizers

Application Data Sheet

Tricresyl phosphate was one of the earliest plasticizers used for commercial flexible vinyl products in the late 1930's. Its use today continues as a flame-retardant plasticizer for vinyl and cellulosic plastic composites and in vinyl, cellulose nitrate and ethyl cellulose coatings for photographic films. LINDOL plasticizer, a triaryl phosphate, demonstrates low volatility and good resistance to extraction by oil.

Typical properties of LINDOL plasticizer :

Physical appearance	Clear, transparent liquid
Phosphorus content, wt. %	8.4
Specific gravity, 20°C,	1.170
Density: @ 20°C lbs/gal	9.8
Kg/m ³	1170
Viscosity @ 25°C, mPa.s	65
Acidity, mg KOH/g	0.10
Water content, wt. %	<0.10
Color, APHA	<75

Formulations for Flexible Suspension PVC at 50phr Plasticizer

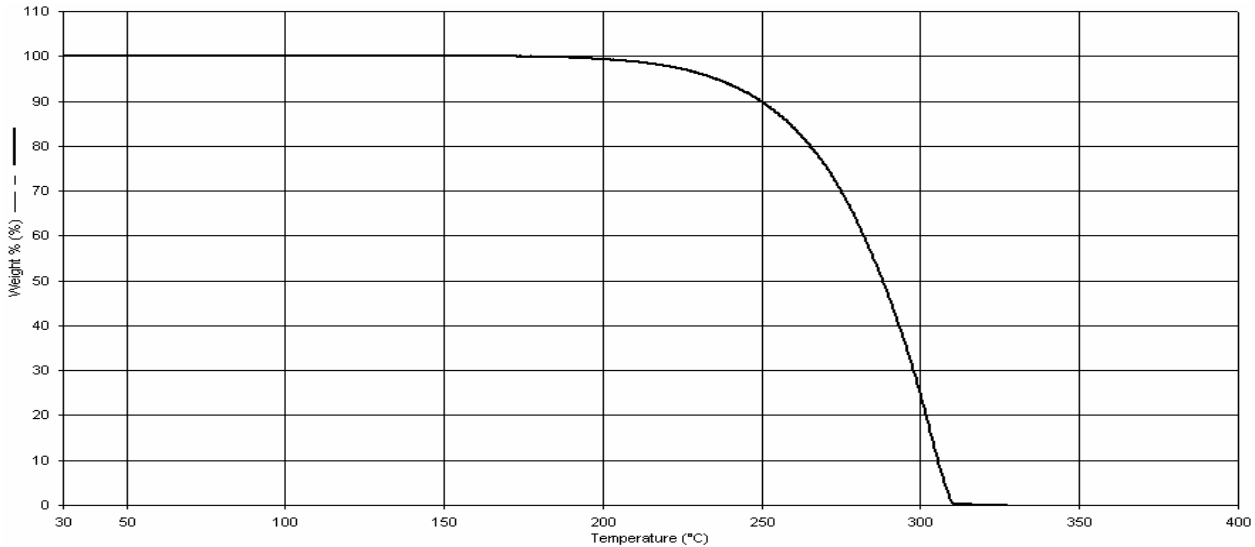
	1	2	3	4	5
PVC (Geon 103 EP)	100	100	100	100	100
CaCO ₃	50	50	50	50	50
Zinc Borate (Firebrake ZB)		3	6	3	6
ATH (Hydral 710)				20	40
Plasticizers	50	50	50	50	50
ESO (Plastoflex 2307)	5	5	5	5	5
Stabilizers (Ba/Zn mixed metals)	5	5	5	5	5
Totals:	210	213	216	233	256

These five formulations represent basic formulation and component variations typically seen for FR-PVC. The resultant flammability and physical properties are shown in the following tables with comparisons to similar flame retarded vinyl systems.

Lindol (TCP in PVC Suspension Resin (GEON-103EP))

Component	Additive Phr	Tensile Properties			Hardness Shore "A"		LOI 100mils	UL-94 1.6mm
		Strength psi (MPa)	E Mod. psi (MPa)	Elong. %	Initial	Creep (15 sec)		
DIDP	50	1844(12.7)	858(5.9)	426	88	85	23.0	FAIL
ZB	3	2018(13.9)	907(6.2)	461	88	84	23.2	FAIL
ZB	6	1824(12.6)	906(6.2)	417	90	86	23.2	FAIL
ZB/ATH	3/20	1635(11.3)	945(6.5)	359	91	86	23.6	FAIL
ZB/ATH	6/40	1715(11.8)	1081(7.4)	374	93	89	25.0	FAIL
Lindol (neat)	50	2200(15.2)	980(6.7)	420	93	89	31.2	V-0
ZB	3	2200(15.2)	1000(6.9)	420	94	90	32.2	V-0
ZB	6	2200(15.2)	1040(7.2)	383	94	89	32.6	V-0
ZB/ATH	3/20	1900(13.1)	1100(7.6)	337	94	90	33.4	V-0
ZB/ATH	6/40	1900(13.1)	1190(8.2)	335	96	92	36.0	V-0

Thermogravimetric Analysis: LINDOL
(10° rise/minute in nitrogen)



218°C	2% wt. Loss
235°C	5% wt. Loss
250°C	10% wt. Loss

Safety & Handling:

Consult the Material Safety Data Sheet for this product.

For further advice and assistance, contact our representatives in your area:

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