

Phosflex® 362



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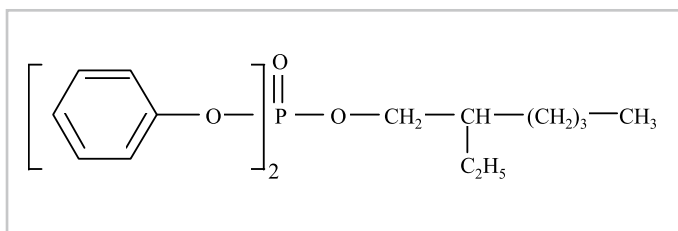
Phosflex®
Flame Retardant Plasticizers

Chemical Name: 2-Ethylhexyl Diphenyl Phosphate

CAS#

2-ethylhexyl diphenyl phosphate 1241-94-7

Triphenyl phosphate 115-86-6



Overview

Phosflex® 362 is a highly efficient plasticizer for PVC, with very good low temperature flexibility and excellent solvating properties for fast fusion.

One of the unique characteristics of Phosflex® 362 is its ability to reduce flammability while also reducing smoke. Typically when flame retardants are used, the combustion efficiency of the compound is decreased, and as a result, smoke (incomplete combustion particles and gases) increase. Phosflex® 362 can deliver low smoke properties and effective levels of flame retardancy in many types of polymer systems, especially flexible vinyl and vinyl alloys.

Phosflex® 362 has excellent compatibility in PVC and other plastics. Formulated correctly, it performs well in vinyl composites for outdoor applications where exposure to UV irradiation and weathering is critical. Phosflex® 362 has been found useful in flame retardant foamed vinyl and vinyl alloys (PVC/nitrile rubber), calendared sheet goods, and outdoor PVC applications. In certain rubbers, it can be useful as a solvating material to improve the tactile feel and flexibility of elastomeric composites. Phosflex® 362 also has the advantage of FDA approvals for certain food packaging applications.

Phosflex® Product Selector

	Key applications	Key characteristics
4	<ul style="list-style-type: none">• Primary plasticizer for nitrocellulose, chlorinated rubber• Anti-foam agent	<ul style="list-style-type: none">• Low viscosity• Low density
31L	<ul style="list-style-type: none">• PVC film and sheet compounds• Dispersant for plastisols	<ul style="list-style-type: none">• Low color• Blendable with non-FR plasticizers
41L	<ul style="list-style-type: none">• PVC film and sheet compounds• Dispersant for plastisols	<ul style="list-style-type: none">• Low color• Blendable with non-FR plasticizers
71B	<ul style="list-style-type: none">• Flame retardant plasticizer for PVC	<ul style="list-style-type: none">• Excellent flame retardant properties• Low volatility
362	<ul style="list-style-type: none">• Flame retardant plasticizer for PVC alloys	<ul style="list-style-type: none">• Low temperature and low smoke• Excellent vinyl solvating properties• Approved for packaging materials in food contact
390	<ul style="list-style-type: none">• Flame retardant plasticizer for PVC sheets and coatings	<ul style="list-style-type: none">• Excellent low temperature flexibility• Low smoke, good weathering properties
314, 318, 321, 327	<ul style="list-style-type: none">• Blended plasticizer for film and sheet vinyl goods	<ul style="list-style-type: none">• High efficiency• High solvating

Key Applications

Formulations for Flexible Suspension PVC at 50 phr Plasticizer

	1	2	3	4	5
PVC Geon (103EP)	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 (parts)	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.

Phosflex® 362 in PVC Suspension Resin (GEON 103EP)

Component	Additive phr	Tensile Properties			Hardness		LOI 100 Mils	UL-94 1.6mm
		Strength psi (MPa)	E Mod. psi (MPa)	Elong. %	Shore "A" Initial	Creep (15 sec.)		
DIDP	50	1844(12.7)	858(5.9)	426	88	85	23	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	FAIL
Phosflex® 362	50	1389(9.6)	602(4.1)	394	82	78	27	V-0
ZB	3	1365(9.4)	610(4.2)	387	82	78	27.6	V-0
ZB	6	1284(8.8)	629(4.3)	359	82	78	27.6	V-0
ZB/ATH	3/20	1319(9.1)	706(4.9)	366	83	80	28.2	V-0
ZB/ATH	6/40	1227(8.5)	784(5.4)	345	87	84	30.4	V-0

Typical Properties



Physical appearance	Clear, transparent liquid
Phosphorus content, wt. %	8.5
Specific gravity, 20°C/20°C	1.090
Density @ 20°C, lbs/gal	9.1
kg/m ³	1090
Viscosity @ 25°C, mPa.s	18
Acidity, as phosphoric acid, %	0.01
Water content, wt. %	0.10
Color, APHA	40

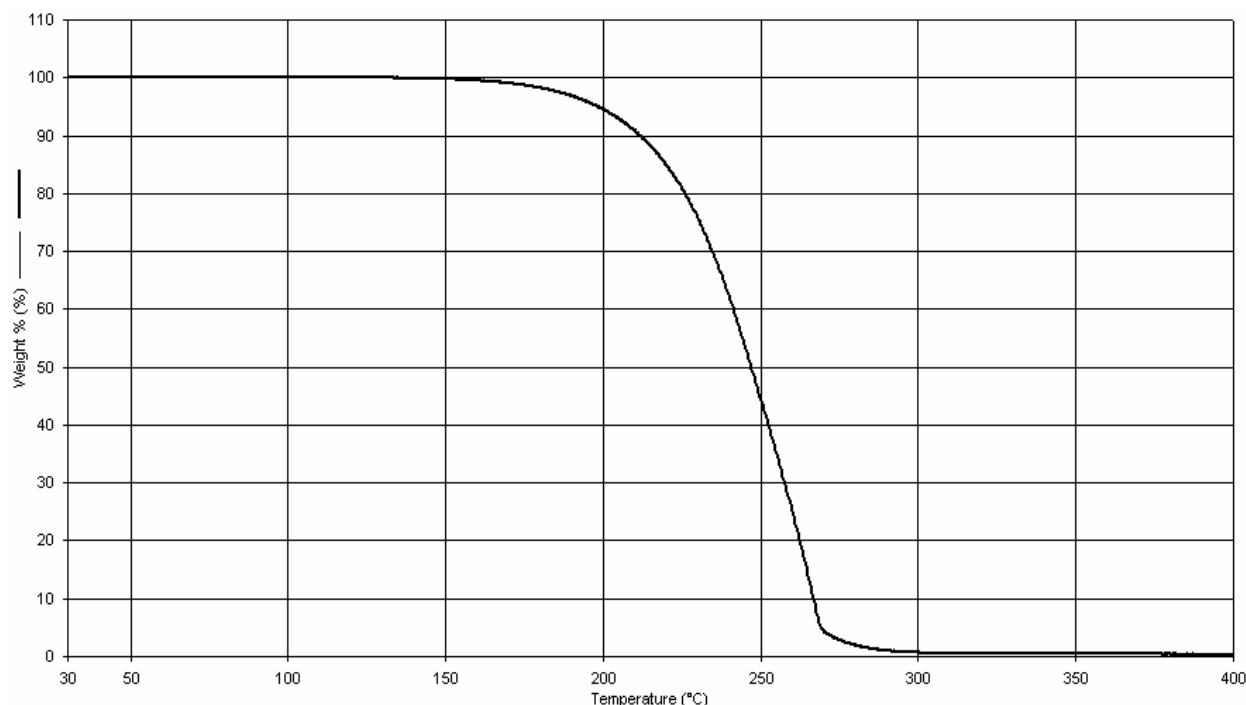
Safety & Handling

Consult the Material Safety Data Sheet for this product.

Shipping Information

Available in bulk tank trucks, isocontainers, 2,200 lb totes, and 480 lb drums.

Thermogravimetric Analysis: Phosflex® 362 (10°C rise/minute in nitrogen)



2% wt. Loss	182°C
5% wt. Loss	198°C
10% wt. Loss	211°C

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