

# Product Bulletin

**supresta**<sup>™</sup>  
BUILT-IN DEFENSE

**Phosflex<sup>®</sup> 41L**

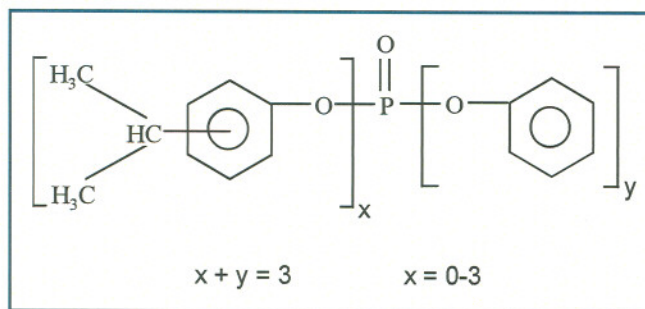
MARKETED BY  
**HARWICK STANDARD**  
DISTRIBUTION CORPORATION  
80 S. Seiberling Street • Akron, Ohio 44305

**Phosflex<sup>®</sup>**  
Flame Retardant Plasticizers

**Chemical Name:** Isopropylated triphenyl phosphate ester

## CAS #

Triphenyl phosphate 115-86-6  
Propylated triphenyl phosphate 68937-41-7



## Overview

Phosflex<sup>®</sup> 41L is a substituted triaryl phosphate ester made exclusively from synthetic feedstocks. It has excellent flame-retarding characteristics, which are typical of the triaryls. This flame retarding efficiency permits back-blending with non-flame retarding plasticizers, resulting in favorable economics and wide flexibility to formulators.

While used primarily in PVC formulations, Phosflex<sup>®</sup> 41L finds compatibility and utility in other resin systems as well.

## Key Applications

### PVC Applications:

#### Formulations for Flexible Suspension PVC at 50 phr Plasticizer

	1	2	3	4	5
PVC Geon (103EP)	100	100	100	100	100
CaCO <sub>3</sub>	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 on the next page with comparisons to similar flame-retarded vinyl systems.

## Phosflex<sup>®</sup> Product Selector

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

### Phosflex® 41L 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(6.3)	461	88	84	23.2	FAIL
ZB	6	1824(12.6)	906(6.3)	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® 41L	50	2230(15.4)	1102(7.6)	383	92	86	30.7	V-0
ZB	3	2146(14.8)	1118(7.7)	350	93	87	31	V-0
ZB	6	1934(13.3)	1099(7.6)	305	92	87	31.6	V-0
ZB/ATH	3/20	2008(13.8)	1190(8.2)	334	93	88	32.8	V-0
ZB/ATH	6/40	1832(12.6)	1273(8.8)	290	93	90	35.5	V-0

### Typical Properties

Physical appearance	Clear, transparent liquid
Phosphorus content, wt. %	8.3
Specific gravity, 20°C/20°C	1.160
Density @ 20°C, lbs/gal	9.7
kg/m <sup>3</sup>	1160
Viscosity @ 25°C, mPa.s	100
Acidity, as phosphoric acid, %	0.10
Water content, wt. %	0.10
Color, APHA	<75

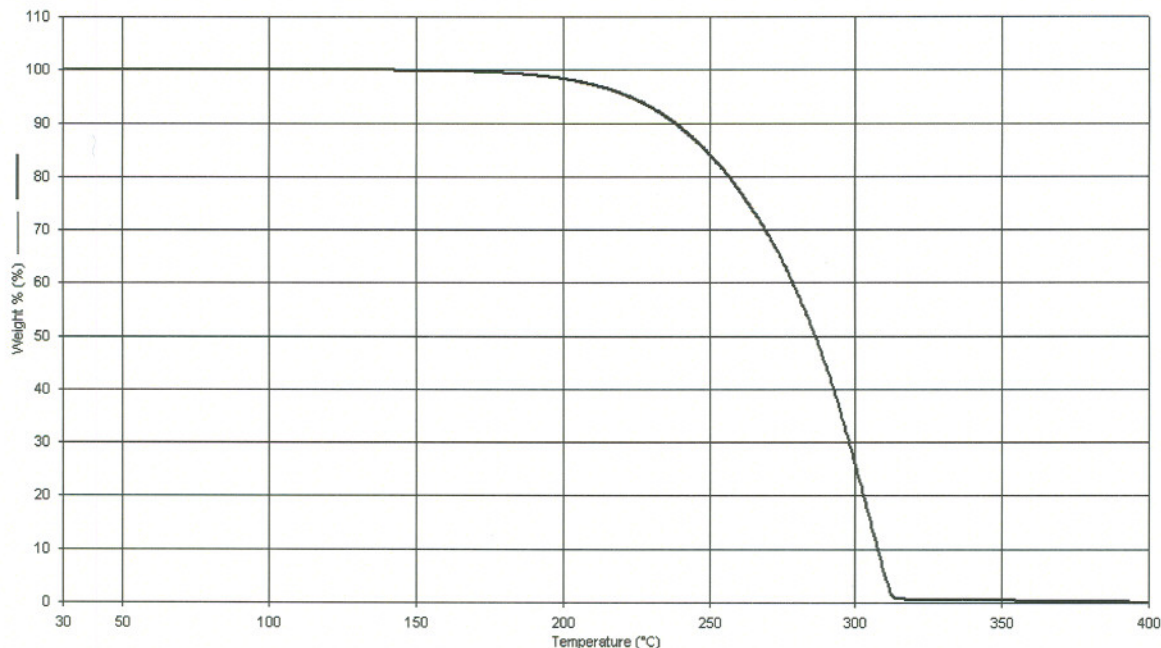
### Safety & Handling

Consult the Material Safety Data Sheet for this product.

### Shipping Information

Available in bulk tank trucks, isocontainers, 2,500 lb totes, and 534 lb drums.

**Thermogravimetric Analysis: Phosflex® 41L**  
(10°C rise/minute in nitrogen)



2% wt. Loss	203°C
5% wt. Loss	222°C
10% wt. Loss	238°C

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AMERICAS REGIONAL SALES OFFICE  
Ardsley Park at 420 Saw Mill River Road  
Ardsley, New York 10502 USA  
914.269.5900, 800.666.1200  
fax 914.674.9735

ASIA PACIFIC REGIONAL SALES OFFICE  
12/B, Sun Tong Plaza, No.55 Huai Hai Road West  
Shanghai 200030 China  
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fax 86 21 5298 9352

EUROPEAN REGIONAL SALES OFFICE  
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3800 GB Amersfoort, The Netherlands  
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fax 31 33 4534578

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