

# PHOSFLEX®



## FLAME RETARDANT PLASTICIZERS

Phosphorus Chemicals

### PHOSFLEX 4

**Tributyl Phosphate**  
**Phosphoric Acid, Tributyl Ester**

#### Typical properties:

Physical appearance		Clear transparent liquid
Phosphorus content	(%)	11.7
Colour	(apha)	<50
Acidity	(mg KOH/g)	0.1
Density at 20°C	(kg/m <sup>3</sup> )	980
Viscosity at 25°C	(mPa.s, approx.)	5
Melting point	(°C)	below -80
Water content	(wt%)	0.2

#### Applications:

PHOSFLEX 4, Tributyl Phosphate, is a clear, water-white, high boiling liquid. It is an effective solvent, and is used in blending of material which are difficult to dissolve. This characteristic makes PHOSFLEX 4 an excellent solvent for use in graphic inks and in the preparation of concentrates for use as agricultural herbicides and fungicides. It can also be used as a solvent for material gums and synthetic resins. PHOSFLEX 4 is also used for solvent extraction, sometimes called liquid-liquid extraction, of numerous rare earth metals. It is used as a sole agent or in combination with other chemicals for the extraction of uranium from its ores.

As an efficient antifoam agent, PHOSFLEX 4 has no residual odour, which makes it ideal for use in paper and protective coatings. Tributyl phosphate is utilized, for example, as a defoamer in vinyl latex emulsions, rubber-based paints, casein, inks, protein- or resin-based adhesives, and textile sizings. Normally, less than 1% by weight addition is sufficient to prevent undesirable foaming. Used with a small amount of isopropanol or similar material, tributyl phosphate will destroy or prevent foam in most detergent solutions. In anti-freeze solutions of the ethylene glycol-borax type, tributyl phosphate sharply reduces foaming. It is similarly useful in the manufacture and packaging of latex paints and some floor polishes. In other applications, it is an antifoaming agent for concrete, and a defoamer and corrosion inhibitor in chromium plating.

PHOSFLEX 4 has been used to improve the wetting ability of mercerizing liquids and the film strength of lubricating oils. Its relatively high phosphorous content, along with good solvency, permits use in adhesives for veneer plywood applications.

Sept. 1998

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# PHOSFLEX®



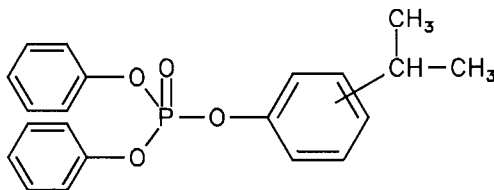
## FLAME RETARDANT PLASTICIZERS

Phosphorus Chemicals

### PHOSFLEX 41L

Isopropylated Triphenyl Phosphate Ester

Structural formula



#### **Typical chemical and physical properties:**

Appearance		Clear transparent liquid
Colour	(apha)	40
Phosphorus content	(%)	8.1
Viscosity at 25°C	(mPa.s)	100
Density at 25°C	(kg/m <sup>3</sup> )	1160
Acidity	(mg KOH/g)	0.1
Water content	(%, max.)	0.1

#### **Applications**

Phosflex 41L is a substituted triphenyl 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 favourable economics and wide flexibility to formulators.

While use primarily in PVC formulations, PHOSFLEX 41L finds compatibility and utility in other resin systems as well.

June 2000

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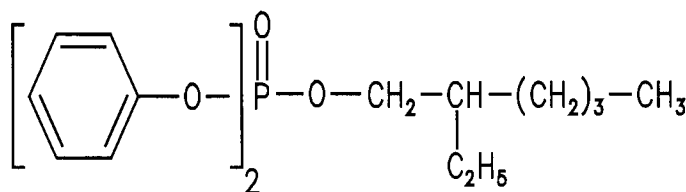
## FLAME RETARDANT PLASTICIZERS

Phosphorus Chemicals

### PHOSFLEX 362

2-Ethylhexyl Diphenyl Phosphate

Structural formula



#### Typical properties:

Physical appearance		Clear transparent liquid
Colour	(apha)	40
Phosphorus content	(%)	8.5
Viscosity at 25°C	(mPa.s)	18
Density at 20°C	(kg/m <sup>3</sup> )	1090
Water content	(%, max.)	0.1
Acidity, as phosphoric acid, %		0.01

#### Applications:

PHOSFLEX 362 is 2-ethylhexyl diphenyl phosphate. It is a low smoke generating flame retardant plasticizer with good compatibility in PVC and other plastics. PHOSFLEX 362 has excellent low temperature properties, and improves processing because of its excellent resin solvating power.

Nov. 1998

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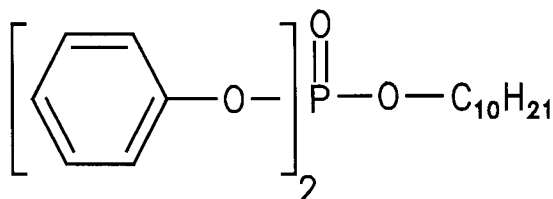
## FLAME RETARDANT PLASTICIZERS

Phosphorus Chemicals

### PHOSFLEX 390

Isodecyl Diphenyl Phosphate

Structural formula



#### Typical properties:

Physical appearance		Clear transparent liquid
Colour	(apha, max.)	<100
Phosphorus content	(%)	7.9
Acidity	(mg KOH/g)	0.1
Viscosity at 25°C	(mPa.s)	26
Density at 20°C	(kg/m <sup>3</sup> )	1070
Water content	(%, max.)	0.1

#### Applications:

PHOSFLEX 390 is isodecyl diphenyl phosphate made from synthetic feedstocks. It is a low smoke generating flame retardant plasticizer with good compatibility in PVC and other plastics.

PHOSFLEX 390 has excellent low temperature properties because of its high solvency.

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