supresTA™

Material Safety Data Sheet
acc. to ISO/DIS 11014

Printing date 02/15/2006 Revision number: 3 Reviewed on 02/15/2006

1 Identification of substance

· **Product details**

· **Trade name: PHOSFLEX 321**
· **Application of the substance / the preparation** Flame retardant plasticizer

· **Manufacturer/Supplier:**
Supresta
420 Saw Mill River Road
Ardsley, NY 10502
USA

· **Information department:**
Product safety department.
1-914-269-5900 (9:00 am - 5:00 pm EDT)
· **Emergency information:**
Medical: PROSAR 1-888-875-1685 (24HRS)
Transportation: CHEMTREC 1-800-424-1685 (24 HRS)

2 Composition/Data on components

· **Chemical characterization**
· **Description:** Substance is a compound and/or mixture.

· **Chemical Components:**		
	Proprietary Alkyl Phosphate Ester	20 - 25%
220352-35-2	Phenol, tert-Bu derivs., phosphates (3:1)	20 - 25%
115-86-6	Triphenyl phosphate	15 - 20%
	Proprietary Alkyl Aryl Phosphates	30 - 40%

· **Carcinogenicity status (IARC, NTP, OSHA)**
This product does not contain a listed carcinogen at a concentration of 0.1% or greater.

3 Hazards identification

· **NFPA ratings (0=minimal, 1=slight, 2=moderate, 3=severe, 4=extreme)**

Health = 1
Fire = 1
Reactivity = 0

· **HMIS ratings (0=minimal, 1=slight, 2=moderate, 3=serious, 4=severe)**

HEALTH	*1
FIRE	1
REACTIVITY	0

Health = *1
Fire = 1
Reactivity = 0

· **Additional information:**
Caution!
May cause mild eye irritation.
May cause skin and respiratory irritation.
May cause kidney, liver, testicular and adrenal effects based on animal data.
May release harmful vapors at elevated temperatures.

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4 First aid measures

· **After inhalation:**
If inhaled, remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
· **After skin contact:**
Immediately remove contaminated clothing and equipment. Thoroughly wash all affected areas with soap and plenty of water. Get medical attention if irritation persists. Wash contaminated clothing before reuse. Thoroughly clean or destroy contaminated shoes.
· **After eye contact:**
Immediately flush eyes with plenty of running water. Hold the eyelids apart during the flushing to ensure rinsing of the entire surface of the eye and lids with water. Get medical attention if irritation persists.
· **After swallowing:**
Get medical attention by calling a physician or a poison control center immediately. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, keep head below hips to reduce the risk of aspiration. Never give anything by mouth to an unconscious person.
· **Information for doctor:**
Repeated exposure to very high levels of this product may result in cholinesterase inhibition. Additional symptoms resulting from the repeated exposure could include salivation, sweating, headache, nausea, diarrhea and tremors. Should cholinesterase inhibition occur, atropine may be used as an antidote.

5 Fire fighting measures

· **Suitable extinguishing agents:**
Use water fog or spray, dry chemical, foam or carbon dioxide extinguishing agents.
· **Special hazards caused by the material, its products of combustion or resulting gases:**
Decomposition of this product under fire conditions can produce carbon monoxide, carbon dioxide, phosphorus oxides, hydrogen chloride gas and organic decomposition products.
· **Protective equipment:**
As in any fire, prevent human exposure to fire, smoke, fumes or products of combustion. Evacuate non-essential personnel from the fire area. Firefighters should wear full-face, self contained breathing apparatus and impervious protective clothing. If possible, move containers from the fire area. If not leaking, keep fire exposed containers cool with a water fog or spray to prevent rupture due to excessive heat. High pressure water may spread product from broken containers increasing contamination or fire hazard. Dike fire control water for later disposal. Do not allow contaminated water to enter waterways.
· **Additional information**
This product is not defined as flammable or combustible. It is self-extinguishing once the source of ignition is removed. The material is not sensitive to static discharge or physical impact. It may decompose under fire conditions.

6 Accidental release measures

· **Personnel-related safety precautions:**
Isolate spill area and restrict nonessential personnel. All personnel involved in spill cleanup should follow appropriate industrial hygiene practices (see Section 8).
Particular danger of slipping on leaked/spilled product.
· **Measures for environmental protection:**
Stop source of spill if possible. Dike area to prevent spill from spreading.

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· **Measures for cleaning/collecting:**
Soak up liquid with a suitable absorbent such as clay, sawdust, or kitty litter. Sweep up absorbed material and place in a chemical waste container for disposal. Cover spill area with a slurry of powdered household detergent and water. Use stiff brush to work slurry into cracks and crevices. Allow to stand for 2-3 minutes, then flush with water. Dike water for later disposal. Do not allow contaminated water to enter waterways or sewers.

7 Handling and storage

· **Handling:**
· **Information for safe handling:**
Wear protective clothing including chemical goggles and rubber gloves when handling this product to avoid eye and skin contact. Handle in a well ventilated area. Avoid inhalation of vapor or mist. Wash thoroughly after handling.
Containers should be located in an area where they can be rotated regularly (first in, first out) and visually inspected for dents and bulging on a weekly basis.
Empty containers may retain product residues. Follow all warnings and precautions even after container is empty.
· **Information about protection against explosions and fires:** The product is not flammable.

· **Storage:**
· **Suggested Storage Conditions:**
Store away from foodstuffs and animal feed. Containers should be stored in a cool, dry, well-ventilated area away from flammable or oxidizing materials and sources of heat or flame.
This material is noncorrosive to glass or metals. However, because the material has plasticizing properties, it may soften or deteriorate certain plastics and elastomers (particularly vinyl-based resins, neoprene and natural rubbers).
· **Information about storage in one common storage facility:**
Prolonged storage at elevated temperatures under wet alkaline or acidic conditions should be avoided to assure product integrity. Care should be taken to prevent moisture condensation in the container. Carbon steel is the preferred material of construction for storage containers. The product is normally shipped in unlined tank cars, trucks and drums.
· **Further information about storage conditions:** Containers should not be opened until ready for use.

8 Exposure controls and personal protection

· **Additional information about design of technical systems:**
At elevated processing temperatures or in the event that use conditions generate airborne vapor, aerosol or mist, the material should be handled in a well-ventilated area.
Where adequate ventilation is not available, respiratory protection should be used.

· **Additional Occupational Exposure Limit Values for possible hazards during processing:**

115-86-6 Triphenyl phosphate (15 - 20%)

PEL	3 mg/m³ (OSHA)
TLV	3 mg/m³ (ACGIH)
TWA	3 mg/m³ (NIOSH)

· **Personal protective equipment:**
· **General protective and hygienic measures:**
The primary routes of exposure to this product are skin contact and inhalation of mists or vapors.
· **Breathing equipment:**
Use a NIOSH-approved organic vapor/acid gas respirator (OVAG) with dust, mist and fume filters to reduce potential for inhalation exposure if use conditions generate vapor, mist or aerosol and adequate ventilation (e.g., outdoor or well ventilated area) is not available. Where exposure necessitates a higher level of protection use a NIOSH-approved, positive pressure, pressure demand, air-supplied respirator.

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· **Protection of hands:**
Skin contact with liquid or its aerosol should be prevented through the use of suitable protective clothing, gloves and footware selected with regard for use condition exposure potential.
· **Material of gloves** Neoprene gloves
· **Eye protection:**
Eye contact with liquid or aerosol should be prevented through the use of chemical safety goggles and/or a face shield selected with regard for use condition exposure potential.
· **Body protection:**
Safety showers, with quick opening valves which stay open and eye wash fountains or other means of washing the eyes with a gentle flow of cool to tepid tap water should be readily available in all areas where this material is handled or stored. Water should be supplied through insulated and heat-traced lines to prevent freezeups in cold weather. Long sleeved clothing may be used to minimize skin contact.

9 Physical and chemical properties

· **General Information**	
Form:	Liquid
Color:	Clear, transparent
Odor:	Odorless
Melting point/Melting range:	Not determined
Boiling point/Boiling range:	> 238°C (> 460°F)
· **Flash point:**	> 234°C (> 453°F) (Cleveland cc)
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Vapor pressure at 25°C (77°F):**	< 250 Pa
· **Density at 25°C (77°F):**	1.183
· **Solubility in / Miscibility with Water:**	< 1 g/l
· **Viscosity:**	
Dynamic at 25°C (77°F):	100 mPas
· **Additional information:**	Soluble-most organic solvents.

10 Stability and reactivity

· **Thermal decomposition / conditions to be avoided:**
This product is stable at ambient temperatures and atmospheric pressure. It is not self-reactive and is not sensitive to static discharge or physical impact.
Prolonged storage at elevated temperatures should be avoided.
· **Materials to be avoided:**
This product is incompatible with strong oxidizers, strong acids and strong alkalis. It hydrolyzes slowly at ambient temperatures in acidic or alkaline aqueous solutions.
· **Dangerous reactions** Hazardous polymerization is not expected to occur.
· **Dangerous products of decomposition:**
Under wet alkaline or acidic conditions, this product hydrolyzes slowly and nonviolently.

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11 Toxicological information

· **Acute toxicity:**

· LD/LC50 values that are relevant for classification:		
Oral	LD50	2830 mg/kg (rat) Component: slightly toxic.
Dermal	LD50	> 2000 mg/kg (rabbit) Practically non-toxic (components).
Inhalation	LC50	3 mg/l (rat) Component: 6-hrs exposure to heated vapor (163C). No deaths at heated (125C) concentration of 4.8 mg/l for 4-hrs.

· **Primary irritant effect:**
· **on the skin:**
A component in this product did produce primary skin irritation in human volunteers.
This material was found to be a mild irritant in rabbits following a 24-hour exposure (components).
· **on the eye:** This product is expected to be a mild irritant based on component and similar product data.
· **Sensitization:** A component in this product did not cause allergic skin reactions in tests with human volunteers.
· **Subchronic to chronic toxicity:**
Daily ingestion by rats of 100, 400 or 1600 ppm of a Triphenyl Phosphate/Butylated Triphenyl Phosphate Mixture in the diet for three months produced increases in the liver and adrenal gland weights in females and increases in the liver weights of males at the high-dose level. Since no histopathological changes were seen in these organs, the organ weight increases were considered adaptive responses and not a sign of target organ toxicity.
Rats and dogs fed Alkyl Aryl Phosphates in their diets for two years showed a decreased growth rate.
· **Subchronic - Repeated dose effects:**
For Alkyl Phosphate Ester:
In a subchronic study, dermal application of 1450 mg/kg to rabbits for 90 days produced an increase in kidney weight, but no histological changes were observed in any tissue.
In a subchronic study, daily oral doses of 25 or 250 mg/kg fed to rats for 90 days produced mortality and increased organ weights and organ to body weight ratios for liver and kidney, but no histological changes were noted in any tissues.
No target organ toxicity was observed in either study.
· **Chronic Toxicity:**
For Alkyl Phosphate Ester:
A chronic rodent toxicity test found target organ toxicity associated with the liver, kidney and testes in a dose-related manner, with the low dose of 5 mg/kg/day being the no-effect level for the study. Certain of the high dose female rats showed plasma cholinesterase inhibition of up to 30 percent.
· **Mutagenicity:**
Triphenyl Phosphate/Butylated Triphenyl Phosphate Mixture was examined for mutagenic and clastogenic activity in a series of in vitro assays. The assays included: Ames tests, the mouse lymphoma and chromosome abberration tests. No evidence of genotoxic or mutagenic activity was noted in any of these assays.
For Alkyl Phosphate Ester:
In most of the large number of standard microbial mutagenicity tests conducted, the product showed no mutagenic acivity. In a few microbial assays, weak activity was reported. Two mammalian hepatocyte UDS assays showed no mutagenic activity. Two gene mutation tests utilizing mouse lymphoma cells and Chinese hamster V79 cells showed no mutagenic activity. An early mouse lymphoma test provided equivocal results for chromosomal aberrations but a very recently conducted Chinese Hamster Ovary Cell Test measuring the same endpoint, conducted twice, showed no chromosomal aberrations. Two in vivo mutagenicity tests, the Drosophia melanogaster test and a mouse bone marrow cytogenetics test, showed no muatgenic activity. Almost all of the many mutagenicity tests conducted show the product is not a mutagen and does not express genotoxic activity.
No genetic changes occurred in standard animal tests or in tests with bacterial and yeast cells for Alkyl Aryl Phosphates.

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· **Carcinogenicity:**
Triphenyl Phosphate/Butylated Triphenyl Phosphate Mixture was tested in an in vitro malignant transformation assay using BALB/3T3 cells. It did not induce morphological transformations and thus did not exhibit carcinogenic potential in this assay.
For Alkyl Phosphate Ester:
Daily ingestion of 20 mg/kg or 80 mg/kg for two years was oncogenic to rats. No significant effects were observed at 5 mg/kg/day. Microscopic examination of the tissues and organs of the mid and high dose animals revealed significant increases in the incidence of liver nodules, benign renal cortical tumors and interstitial cell tumors or the testes. Females receiving the high dose showed an increase in adrenal cortical adenomas. No significant increase in tumor incidence was observed in the low dose animals. The substantial decrease in body weights seen in the high dose animals confirmed that the Maximum Tolerated Dose was achieved, and possibly exceeded.
Although there was a significant increase in the incidence of benign tumors in mid and high dose animals, the lack of a significant incidence of malignant tumors in any treatment group confirms that the product did not demonstrate carcinogenic activity. This is consistent with the results of the mutagenicity tests which show the product is not a genotoxin and thus not a genotoxic carcinogen.

· **Neurotoxicity:**
When Triphenyl Phosphate/Butylated Triphenyl Phosphate Mixture was administered orally to hens at a cumulative oral dose of 23 g/kg, no signs of acute delayed neurotoxicity were noted.
When this material was administered orally to hens at a cumulative oral dose of 23 g/kg, no signs of acute delayed neurotoxicity were noted.
Oral administration of 600, 1200, 2400 or 4800 mg/kg of Alkyl Phosphate Ester to hens for five days resulted in leg and wing weakness at 1200 mg/kg and above and 100% mortality at 4800 mg/kg. Surviving hens appeared to fully recover within a few days of cessation of dosing.
Daily administration of 4, 20 or 100 mg/kg to hens for 90 days produced no evidence of delayed neurotoxicity by clinical observation or microscopic evaluation. Fifty percent mortality was observed in hens receiving 200 mg/kg/day for 21 days.
The product, when administered orally in a single dose (10 g/kg) to hens, did not significantly inhibit hen brain neurotoxic esterase and produced no mortality. The results of this predictive test indicate that the product does not have the potential to cause neurotoxicity.
All of these neurotoxicity tests conducted consistently showed the product lacked neurotoxic activity.
For Alkyl Aryl Phosphates:
Neurotoxicity tests with chickens showed no neurotoxic effects.

· **Reproductive effects:**
In a developmental toxicity test, daily administration of Butylated triphenyl phosphate at 100, 400 or 1000 mg/kg to rats on days 6 through 20 of gestation demonstarted maternal toxicity (increased liver weights and reduced food consumption at the high-dose) but no indications of teratogenicity were observed.
In a rat reproduction study, male and female animals received either 50, 250 or 1000 mg/kg/day for several weeks after which they mated. There was no reproductive toxicity observed at any dose level. Diagnostic pathology confirmed no alterations to the reproductive organs. There was no effect on mating index, litter size, survival of the offspring or on any other measured parameter. This product did not demonstrate reproductive toxicity.
For Alkyl Phosphate Ester:
Daily oral administration of 2, 20 or 200 mg/kg to male rabbits for 12 weeks did not affect male rabbits fertility or sperm quantity or quality. At 200 mg/kg there was an increase in liver and kidney weight but no histological changes were observed.
The administration of 25, 100 or 400 mg/kg/day of Alkyl Phosphate Ester to pregnant rats from day 6 through day 15 of gestation did not cause developmental anomalies (birth defects) in the offspring. The high dose caused maternal toxicity which was seen as reduced food consumption and decreased body weight gain. This maternal toxicity affected the developing fetuses, resulting in lower fetal weights and decreased fetal size. Maternal toxicity was not evident in the mid dose animals and subsequently there was no affect on the fetuses in that treatment group. Although the high dose caused maternal toxicity, it did not result in fetal anomalies. This product did not demonstrate teratogenic activity.

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For Alkyl Aryl Phosphates:
No birth defects were noted in rats born to mothers fed doses that produced maternal toxicity. When pregnant rats were fed this component at high doses, offspring had lower body weight.

12 Ecological information

· **Behavior in environmental systems:**
· **Components:**
Hydrolysis rates for triphenyl phosphate, a product component, are:
at pH 9.5: half-life: 0.23 days
at pH 8.2: half-life: 7.5 days
· **Ecotoxical effects:**

· **Aquatic toxicity:**	
220352-35-2 Phenol, tert-Bu derivs., phosphates (3:1)	
LC50 (96-hr)	> 2 mg/l (Rainbow trout)
Proprietary Alkyl Phosphate Ester	
EC50	>10000 mg/l (Activated Sludge) 12 mg/l (Algae) (biomass)
LC50 (96-hr)	1.4 mg/l (Rainbow trout)
Proprietary Alkyl Aryl Phosphates	
LC50	0.5 mg/L (Midge larvae) 48-hour 0.15 mg/L (daphnia) (48-hour)
LC50 (96-hr)	0.2 mg/l (Algae) (chlorophyll) 32 mg/l (Bluegill) 14 mg/l (Fathead minnow) 15 mg/l (Rainbow trout)

13 Disposal considerations

· **Product:**
· **Recommendation:**
Material that cannot be used or chemically reprocessed should be disposed of in accordance with all applicable federal, state and local regulations.
This product, if unused, does not meet the EPA's criteria as either a listed or characteristic hazardous waste under the Resource Conservations and Recovery Act (RCRA) as published in 40 CFR 261.

· **Uncleaned packagings:**
· **Recommendation:**
Product containers designed for single use should be thoroughly emptied before disposal. Containers should be drained of residual product before disposal. Empty containers should be disposed of in accordance with all applicable laws and regulations.

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14 Transport information

· **DOT regulations:**

· **Hazard class:**	9
· **Identification number:**	UN3082
· **Packing group:**	III
· **Proper shipping name (technical name):**	ENVIRONMENTALLY HAZARDOUS SUNSTANCE, LIQUID, N.O.S. (contains Triaryl Phosphates)
· **Label**	9, Marine Pollutant
· **Remarks:**	Not regulated for surface and air transport in non-bulk (< 119 gallons) packagings. This product contains triphenyl phosphate which is a Marine Pollutant per 49 CFR 172.101, Appendix B.

· **Maritime transport IMDG:**

· **Marine pollutant:** Yes (PP)

15 Regulations:

· **Sara**

· **Section 355 (extremely hazardous substances):**	
Proprietary Substituted Propane	.008%

· **Section 313 (Specific toxic chemical listings):**
This product does not contain a toxic chemical subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372 (annual Toxic Chemical Release Reporting).

· **SARA Title III: Section 304 - CERCLA:**
This product does not contain a hazardous substance regulated under Section 304 for emergency release notification (CERCLA List).

· **TSCA (Toxic Substances Control Act):** Substance is listed.

· **TSCA Section 12(b) - Export Notification:**
This product contains the following chemical subject to Section 12(b) export notification:
1,2-dichloropropane (CAS No. 78-87-5)

· **Proposition 65**

· **Chemicals known to cause cancer:**
Warning! This product contains chemicals known to the State of California to cause cancer.

Proprietary Substituted Propane	.008%
Proprietary Tetrahaloalkene	.005%
Proprietary Dihaloalkane	0.001%
Proprietary trihaloalkane	.008%

· **Chemicals known to cause reproductive toxicity for females:**
None of the ingredients are listed.

· **Chemicals known to cause reproductive toxicity for males:**
Warning! This product contains a substance known to the State of California to cause reproductive toxicity.

Proprietary Substituted Propane	.008%

· **Chemicals known to cause developmental toxicity:**
None of the ingredients are listed.

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· **OSHA status:**
This product is considered to be a hazardous chemical under the OSHA Hazard Communication Standard (29 CFR 1910.1200)
· **Resource Conservation and Recovery Act (RCRA):**
This product is not considered to be a hazardous waste under RCRA (40 CFR 261).
· **Canadian WHMIS Symbol(s):**

· **Canadian WHMIS Classification(s):** D2B
· **State Regulations:**

· **State Right-To-Know**		
	Proprietary Alkyl Phosphate Ester	20 - 25%
220352-35-2	Phenol, tert-Bu derivs., phosphates (3:1)	20 - 25%
	Proprietary Alkyl Aryl Phosphates	30 - 40%
115-86-6	Triphenyl phosphate	15 - 20%
	Proprietary trihaloalkane	0.008%
	Proprietary Dihaloalkane	0.001%
	Proprietary Tetrahaloalkene	0.005%
	Proprietary Substituted Propane	0.008%

16 Other information

This information in this material safety data sheet should be provided to all who will use, handle, store, transport or otherwise be exposed to this product. All information concerning this product and/or suggestions for handling and use contained herein are offered in good faith and are believed to be reliable as of the date of publication. However, no warranty is made as to the accuracy of and/or sufficiency of such information and/or suggestions as to the merchantability or fitness of the product for any particular purpose, or that any suggested use will not infringe any patent. Nothing in here shall be construed as granting or extending any license under any patent. Buyer must determine for himself, by preliminary tests or otherwise, the suitability of this product for his purposes, including mixing with other products. The information contained herein supersedes all previously issued bulletins on the subject matter covered. If the date of this document is more than three years old, call to make certain that this sheet is current.

· **Department issuing MSDS:** Product safety department (Tel.: 914 269-5900)