ICL Industrial PRODUCTS

MATERIAL SAFETY DATA SHEET

Product Name	**PHOSFLEX 321**	
Product id	7024	
Revision date	22/03/2009	**Revision:** 1

1. Identification of the substance & the company

Chemical name Proprietary blend of phosphate esters

Type of product and use Flame-retardant plasticizer

Supplier

ICL Supresta, Inc.
622 Emerson Road - Suite 500
St Louis, Missouri 63141, USA
Tel:(314)983-7884 Fax:(314)983-7607

Emergency Telephone Chemtrec (800)424-9300

2. Hazards identification

Emergency overview *May cause mild irritation to the eyes. May cause skin and respiratory tract irritation. May cause liver, kidney, adrenal and testicular toxicity after repeated exposures May release harmful vapors at elevated temperatures.*

NFPA Ratings (Scale 0-4) Health = 1, Fire = 1, Reactivity = 0
HMIS Ratings (Scale 0-4) Health = 1*, Fire =1, Reactivity = 0.

3. Composition / information on ingredients

Components	CAS No.	Weight %
Phenol, tert-Bu derv, phosphates (3:1)	220352-35-2	20 - 25
Proprietary Alkyl Aryl Phosphate	Confidential	30 - 40
Proprietary Alkyl Phosphate Ester	Confidential	20 - 25
Triphenyl phosphate	115-86-6	15 - 20

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4. First-aid measures

Eye contact

Holding the eyelids apart, flush eyes promptly with copious flowing water for at least 20 minutes.Get medical attention immediately.

Skin contact

Remove contaminated clothing. Wash skin thoroughly with mild soap and plenty of water for at least 15 minutes. Wash clothing before re-use.
Get medical attention if irritation occurs.

Inhalation

In case of inhalation, remove person to fresh air.
Keep him quiet and warm. Apply artificial respiration if necessary and get medical attention immediately.

Ingestion

If swallowed, wash mouth thoroughly with plenty of water. Get medical attention immediately.
****
NOTE: Never give an unconscious person anything to drink.
****

Notes to the physician

Repeated exposure to very high doses 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 media

Material is not combustible
Water, water fog, carbon dioxide (CO2), dry chemical, foam

Fire fighting procedure

Fire fighters should wear full protective clothing and self-contained breathing apparatus (SCBA). Contain runoff to prevent entry into water or drainage systems.

Unusual fire and explosion hazards

When heated to decomposition, may release poisonous and corrosive fumes of Carbon Dioxide, Carbon Monoxide, Hydrogen Chloride and Phosphorus Oxides.

6. Accidental release measures

Personal precautions

Wear appropriate safety clothing and eye/face protection (see Section 8)
Slipping hazard due to spilled product

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Methods for cleaning up

Soak up with sand or other suitable absorbant and dispose of as solid waste.
Collect in suitable and properly labeled containers.
Ventilate area and wash spill site after material pickup is complete.

Environmental precautions

Prevent product from entering drains, ditches and rivers.

7. Handling and storage

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 breathing vapors.
Avoid bodily contact. Keep containers tightly closed.
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.

Storage

Store in a dry, cool, well-ventilated area away from incompatible materials (see "materials to avoid").
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). 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.

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8. Exposure controls / personal protection

Exposure Limits :

Components	ACGIH-TLV Data	OSHA (PEL) Data
Phenol, tert-Bu derv, phosphates (3:1) 220352-35-2	Not determined	Not determined
Proprietary Alkyl Aryl Phosphate	Not determined	Not determined
Proprietary Alkyl Phosphate Ester	Not determined	Not determined
Triphenyl phosphate 115-86-6	3 mg/m³	3 mg/m³

Ventilation requirements Ventilation must be sufficient to maintain atmospheric concentration below recommended exposure limit.

Personal protective equipment:

- **Respiratory protection** 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.
- **Hand protection** Neoprene gloves
- **Eye protection** Chemical safety goggles
- **Skin and body protection** Body covering clothes and boots

Hygiene measures Safety shower and eye bath should be provided. Do not eat, smoke or drink where material is handled, processed or stored. Wash hands carefully before eating or smoking.

9. Physical and chemical properties

Appearance Clear, transparent liquid
Odor None

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Melting point/range	Not determined
Boiling point/range	> 238°C (> 460 °F)
Flash point	> 234°C (> 460°F) (closed cup)
Flammable/Explosion limits	Not explosive/Not flammable
Auto-ignition temperature	Not self-ignitable
Vapour pressure	< 250Pa (25°C)
Viscosity	100mPas (25°C)
Solubility:	
- Solubility in water	< 1g/l
- Solubility in other solvents	Soluble in most organic solvents
Specific gravity	1.183(25°C)

10. Stability and reactivity

Stability	Stable under normal conditions
Materials to avoid	Strong oxidizers, strong acids and strong alkalis. It hydrolyzes slowly at normal temperatures in acidic or alkaline aqueous solutions.
Conditions to avoid	Prolonged storage at elevated temperatures
Hazardous decomposition products	Carbon dioxide and carbon monoxide Hydrogen Chloride Phosphorus oxides
Hazardous polymerization	Not expected to occur

11. Toxicological information

Acute toxicity:	
- Rat oral LD50	2830 mg/kg (component)
- Rabbit dermal LD50	> 2000 mg/kg (components)
- Rat inhalation LC50	> 5 mg/l (heated aerosol)
- Eye irritation (rabbit)	Mild irritant (similar product)
- Dermal irritation (rabbit)	A component in this product did produce primary skin irritation in human volunteers Was found to be a mild irritant in rabbits
Dermal sensitization	A component in this product did not cause allergic skin reactions in tests with human volunteers.
Target organ effects	Based on animal studies, may cause liver, kidney, adrenal and testicular toxicity after repeated exposure.

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Sub-chronic toxicity:

A 90-day study (rabbit, dermal application of 1450 mg/kg) produced an increase in kidney weight, but no histological changes in any tissue.
A 90-day study (rat, oral doses of 25 or 250 mg/kg/day) produced mortality and an increase in liver and kidney organ weights, but no histological changes in any tissue.

Chronic toxicity

NOEL: 5 mg/kg/day (rat)
Certain high dose female rats showed plasma cholinesterase inhibition of up to 30 percent

Mutagenicity

Mutagenic by the Ames Test
Unscheduled DNA synthesis (rat liver) - not mutagenic
Not mutagenic in the mouse lymphoma L5178Y test system.
Negative in the Chromosomal aberrations test (hamster's V79 cells)
Not clastogenic in chromosome aberration test with Chinese hamster cells.
In vivo mouse bone marrow cytogenicity: not mutagenic
In vivo Drosophia melanogaster test: not mutagenic

Carcinogenicity

Not classified by IARC
Not included in NTP 11th Report on Carcinogens
Not classified as a carcinogen by USA OSHA
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 proprietary phosphate ester 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.

Reproductive toxicity

Reproductive studies showed that oral administration of this product to male rabbits for 12 weeks did not adversely affect fertility or sperm quantity.

Teratogenicity

Not teratogenic

Neurotoxicity

Not neurotoxic

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12. Ecological information

Aquatic toxicity :

- 96 Hour-LC50, Fish

[220352-35-2] Butylated triphenyl phosphate mixture
> 2 mg/l (Rainbow trout)

Proprietary Alkyl Phosphate Ester
1.4 mg/l (Oncorhynchus mykiss)

Proprietary Alkyl Aryl Phosphates
14 mg/l (Fathead minnow)

- 48 Hour-EC50, Daphnia magna
0.15 mg/l (Proprietary Alkyl Aryl Phosphates)

- 96 Hour- IC50, Algae
0.2 mg/l (chlorophyll) Proprietary Alkyl Aryl Phosphates

- Hydrolysis
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

13. Disposal considerations

Waste disposal
Observe all federal, state and local environmental regulations when disposing of this material

Disposal of Packaging
Dispose of in a safe manner in accordance with local/national regulations.

14. Transportation information

UN No.
3082

DOT
Proper shipping name: Environmentally hazardous substance, liquid , n.o.s
(contains Triaryl Phosphates)
Class: 9 - Miscellaneous Hazardous Material
Label: 9
Packing Group: III

Not regulated for surface and air transport in non-bulk (<119 gallons) packagings.
(contains triphenyl phosphate which is a Marine Pollutant per 49CFR 172.101 Appendix B)

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IMO	Proper shipping name: Environmentally hazardous substance, liquid, n.o.s (contains Triaryl Phosphate) Class: 9 - Miscellaneous Dangerous Substances and articles Label: 9 Packing Group: III Marking: MARINE POLLUTANT (PP)
ICAO/IATA	Proper shipping name: Environmentally hazardous substance, liquid , n.o.s (contains Triaryl Phosphate) Class: 9 Hazard label(s): Miscellaneous Packing group: III

15. Regulatory information

USA	Reported in the EPA TSCA Inventory
- SARA 313	This product does not contain a chemical listed at or above de minimis concentrations.
- California-Prop 65	WARNING: This product contains a chemical(s) known to the State of California to cause cancer, or birth defects or other reproductive harm (concentration < 0.1%)
- Waste Classifications	This material does not meet RCRA`s characteristic definition of ignitability, corrosivity, or reactivity, and is not listed in 40CFR 261.33.
- Workplace Classification	This product is considered hazardous under the OSHA Hazard Communication Standard (29CFR 1910.1200).
Canada	Listed in DSL
-WHMIS hazard class	D2B toxic materials
EU	Reported in EINECS
Japan	Listed in ENCS
Australia	Listed in AICS
New Zealand Inventory	Listed in NZIoC

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China inventory	Listed
Korea	Listed
Philippines	Listed in PICCS

16. Other information

Health, Safety & Environment Policy
We will strive to ensure that our operations and products meet the needs of the present global community without compromising the ability of future generations to meet their needs
We accept that the success of our business is dependent on the supply of products and services that will benefit society whilst ensuring human safety and protection of the environment and natural resources
Within the framework of our commitment to the Responsible Care program, we will provide a healthy and safe work environment for employees and will responsibly manage our products at all stages of their life cycle in order to protect human health and the environment whilst maintaining high production standards of operation

TO MEET THIS COMMITMENT WE WILL:
Comply with or exceed applicable national and international regulatory requirements and other requirements to which we subscribe
Communicate openly and actively encourage dialogue with employees, customers and community concerning our products and operations
Implement documented management systems consistent with and for promotion of the Responsible Care ethics
Develop and supply products that can be manufactured, transported, used and disposed of safely whilst best meeting the needs of our customers
Regularly assess, continually improve and responsibly manage health, safety and environmental risks associated with products and processes throughout their life-cycles
Share knowledge and expertise with others and seek to learn from and incorporate improved practices into our own operations
Educate and train employees, contractors and customers to improve their HSE performance
Communicate up-to-date information to enable our workers, customers and other interested parties to handle our products in a safe and environmentally responsible manner
Endeavor to work with customers, suppliers, distributors and contractors to foster the safe use, transport and disposal of our chemicals
Support Product Stewardship programs in cooperation with customers, distributors and transporters

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End of safety data sheet