

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard 29 CFR 1910.1200 (GHS)
According to Canada WHMIS 2015

Product name	PHOSFLEX 4	
Product id	7020	
Revision date	28/05/2017	Revision: 4
Supersedes	26/11/2013	

1. Identification of the substance & the company

Chemical name	Tributyl phosphate
Synonym(s)	TBP; Tri-n-butyl phosphate.
Chemical formula	C ₁₂ H ₂₇ O ₄ P
Chemical family	Trialkyl phosphate
Molecular weight	266.32
Type of product and use	Flame-retardant plasticizer Heat exchange medium
Supplier	ICL-IP America Inc. 622 Emerson Road - Suite 500 St Louis, Missouri 63141, USA Tel:(314)983-7884 Fax:(314)983-7607 e-mail:msdsinfo@icl-group.com
Emergency Telephone	Chemtrec: (800) 424-9300 Medical: PROSAR 1-888-875-1685 (24HRS)

2. Hazards identification

GHS classification	Carc. Cat. 2, H351 Suspected of causing cancer Skin Irrit. 2, H315 Causes skin irritation Acute Tox. 4, H302 Harmful if swallowed Aquatic Chronic 3, H412 Harmful to aquatic life with long lasting effects
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Signal Word	WARNING
Hazard statements	H351 - Suspected of causing cancer H315 - Causes skin irritation H302 - Harmful if swallowed H412 - Harmful to aquatic life with long lasting effects

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Precautionary statements

P202 - Do not handle until all safety precautions have been read and understood
P264 - Wash hands thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P273 - Avoid release to the environment
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
P330 - Rinse mouth
P332 + P313 - If skin irritation occurs: Get medical advice/attention
P362 + P364 - Take off all contaminated clothing and wash it before reuse
P308 + P313 - IF exposed or concerned: Get medical advice/attention
P405 - Store locked up
P501 - Dispose of contents/container in accordance with national and international regulations

NFPA Ratings (Scale 0-4) Health = 3, Fire = 1, Reactivity = 0
HMIS Ratings (Scale 0-4) Health = 3, Fire = 1, Reactivity = 0.

3. Composition / information on ingredients

Components	CAS No.	Weight %
Tributyl Phosphate	126-73-8	100

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 reuse. Get medical attention if irritation persists.

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

Most important symptoms and effects, acute or delayed

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Causes skin irritation
Harmful if swallowed

Notes to the physician Treat symptomatically and supportively.

5. Fire - fighting measures

Suitable extinguishing media	Carbon dioxide, dry chemicals, foam, water spray (fog).
Unusual fire and explosion hazards	When heated to decomposition, may release poisonous and corrosive fumes of carbon dioxide, carbon monoxide and phosphorus oxides.
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.

6. Accidental release measures

Personal precautions	Wear appropriate safety clothing and eye/face protection (see Section 8).
Methods for cleaning up	Absorb on sand or vermiculite and place in closed container for disposal. 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	Keep containers tightly closed. Avoid bodily contact.
Storage	Store in a dry, cool, well-ventilated area away from incompatible materials (see "materials to avoid"). Maximum recommended storage temperature of 65°C (149°F)

8. Exposure controls / personal protection

Exposure Limits :

Components	ACGIH-TLV Data	Korea OEL	OSHA (PEL) Data
Tributyl Phosphate 126-73-8	5 mg/m ³ , A3	Not determined	5 mg/m ³

Ventilation requirements	Ventilation must be sufficient to maintain atmospheric concentration below exposure limit.
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Personal protective equipment:

- Respiratory protection In case of insufficient ventilation wear suitable respiratory equipment.
- Hand protection Neoprene gloves
or gloves from Viton A and ethylene propylene elastomers
- Eye protection Chemical safety goggles
- Skin and body protection Use protective clothing impervious to this material.

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

9. Physical and chemical properties

Appearance	Colorless to pale yellow liquid
Odor	None.
Melting point/range	-80°C (-112°F)
Boiling point/range	~ 180°C
Flash point	165°C (329°F) (closed cup)
Flammable/Explosion limits	Not flammable/Not explosive
Vapor pressure	0.014 mmHg (20°C)
Density	0.987 g/mL (20°C)
Solubility:	
- Solubility in water	1 g/l @ 20°C
Auto-ignition temperature	Not self-ignitable
Viscosity	4.5 cP (25°C)

10. Stability and reactivity

Reactivity	No reactive hazards known/expected.
Stability	Stable under normal conditions
Possibility of hazardous reactions	Not expected to occur
Conditions to avoid	High temperatures.
Materials to avoid	Strong oxidizers, strong acids and strong alkalis. It hydrolyzes slowly at normal temperatures in acidic or alkaline aqueous solutions.
Hazardous decomposition products	Phosphorus oxides. Carbon dioxide and carbon monoxide.

11. Toxicological information

Acute toxicity:	
- Rat oral LD50	1,6 ml/kg bw
- Rabbit dermal LD50	> 3100 mg/kg
Skin corrosion/irritation	Slightly irritating to skin but not sufficient for classification.

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Serious eye damage/ irritation Slightly irritating to skin but not sufficient for classification.

Respiratory or skin sensitisation Not a skin sensitizer

Mutagenicity Not mutagenic by the Ames Test.
In vivo Drosophila melanogaster test: not mutagenic
The product did not demonstrate mutagenic or genotoxic effects in various tests using mammalian cells.

Carcinogenicity Not included in NTP 14th Report on Carcinogens
IARC Group 3 (animal inadequate evidence, human no data available).
Not classified as a carcinogen by USA OSHA
Data from a lifetime study in rats has shown an increased incidence of urinary bladder tumors at a very high dose level. These tumors developed in response to long-term irritation of the bladder wall by cytotoxic metabolites which caused chronic irritation with subsequent abnormal growth during repair of the bladder wall. A recent risk assessment has shown no risk to human health from occupational exposure to tributyl phosphate.

Tributyl phosphate was administered in the diet of mice for 18 months at concentrations of 100, 1000, and 3500 ppm. The only treatment related change other than an increase in liver weight at 1000 and 3500 ppm was an increase in the incidence of benign liver tumors in the high dose males.

Reproductive toxicity In a two generation reproductive toxicity study, rats were dosed with tributyl phosphate at concentrations of 200, 700 or 3000 ppm (approximately 15, 53 or 225 mg/kg/day). There were no adverse effect on fertility or reproduction at any dose. The NOEL was greater than 3000 ppm.

Developmental toxicity In a developmental toxicity test, the product was not teratogenic or embryotoxic when administered orally to pregnant rats at levels up to 750 mg/kg/day. A decrease in fetal body weight was observed at the maternally toxic dose of 750 mg/kg/day. It was not maternally toxic, embryotoxic, fetotoxic or teratogenic when administered to pregnant rabbits at levels up to 150 mg/kg/day.

Neurotoxicity There was no evidence that this material affected nervous system function and structure of rats following both acute (single dose) and subchronic (repeated dose over a 90 day period) exposure. This material is not considered neurotoxic based on these tests.

Other This product is a weak cholinesterase inhibitor.

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12. Ecological information

Aquatic toxicity :

- | | |
|-------------------------------|-------------------------------|
| - 96 Hour-LC50, Fish | 13 mg/l (Rainbow Trout) |
| - LC50, Crustacea | 2.4 mg/l (Amphipod, 96-hours) |
| - 48 Hour-EC50, Daphnia magna | 2.6 mg/l |
| - 96 Hour- IC50, Algae | 4.4 mg/l |

Biodegradation Readily biodegradable

Bioaccumulative potential Not bioaccumulative
BCF=21-35

Note: Does not meet the criteria for PBT or vPvB assessment

13. Disposal considerations

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

14. Transportation information

DOT Not regulated

IMDG Not regulated

ICAO/IATA Not regulated

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 This product does not contain any ingredient known to the State of California to cause cancer or reproductive toxicity as listed under the State drinking Water and Toxic Enforcement Act of 1986.

Canada Listed in DSL

Australia Listed in AICS

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China	
- China inventory	Listed in IECSC
Japan	Listed in ENCS
Korea	Listed in ECL
Mexico	Listed in the National Inventory of Chemical Substances (INSQ).
New Zealand Inventory	Listed in NZIoC
Philippines	Listed in PICCS
Taiwan	Listed (TCSI)
Vietnam	Listed
Thailand	Listed

16. Other information

This data sheet contains changes from the previous version in section(s)
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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