1. Identification of the substance & the company

Chemical name: Propylated triphenyl phosphate
Chemical family: Aryl phosphate
Molecular weight: 452.52
Type of product and use: Flame-retardant plasticizer
Supplier: ICL-IP America 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 reproductive toxicity.
   May cause mild skin irritation.
   Inhalation of vapors, mists or aerosols may cause respiratory tract irritation
   May cause neurotoxicity.

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

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylated triphenyl</td>
<td>68937-41-7</td>
<td>81-87</td>
</tr>
<tr>
<td>phosphate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triphenyl phosphate</td>
<td>115-86-6</td>
<td>13-19</td>
</tr>
</tbody>
</table>
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**
Keep him quiet and warm. Apply artificial respiration if necessary and get medical attention immediately.
In case of inhalation, remove person to fresh air

**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**
Treat symptomatically and supportively.

5. Fire - fighting measures

**Suitable extinguishing media**
Material is not combustible.
Use extinguishing media appropriate to surrounding fire conditions.

**Fire fighting procedure**
Fire fighters should wear full protective clothing and self-contained breathing apparatus (SCBA). Contain fire fighting water 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 and Phosphorus Oxides.

6. Accidental release measures

**Personal precautions**
Wear appropriate safety clothing and eye/face protection (see Section 8)

**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
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)
Crystallizes at temperatures below 4.4°C (40°F).

8. Exposure controls / personal protection

Exposure Limits:

<table>
<thead>
<tr>
<th>Components</th>
<th>ACGIH-TLV Data</th>
<th>OSHA (PEL) Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylated triphenyl phosphate 68937-41-7</td>
<td>Not determined</td>
<td>Not determined</td>
</tr>
<tr>
<td>Triphenyl phosphate 115-86-6</td>
<td>3 mg/m³</td>
<td>3 mg/m³</td>
</tr>
</tbody>
</table>

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

Personal protective equipment:
- **Respiratory protection**
  In case of insufficient ventilation wear suitable respiratory equipment.
- **Hand protection**
  Neoprene gloves
- **Eye protection**
  Chemical safety goggles
- **Skin and body protection**
  Body covering clothes and boots

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

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear colorless liquid</td>
</tr>
<tr>
<td>Odour</td>
<td>None</td>
</tr>
<tr>
<td>Boiling point/range</td>
<td>410°C (770 °F)</td>
</tr>
<tr>
<td>Melting point/range</td>
<td>&lt; -20°C</td>
</tr>
<tr>
<td>Pour point</td>
<td>-20.55°C (-5 °F)</td>
</tr>
<tr>
<td>Flash point</td>
<td>&gt;225°C (&gt;437°F) (open cup)</td>
</tr>
<tr>
<td>Flammable/Explosion limits</td>
<td>Not explosive/Not flammable</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not self-ignitable</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>0.45 kPa (20°C)</td>
</tr>
<tr>
<td>Viscosity</td>
<td>96.3 mPa*sec (dynamic) (20°C)</td>
</tr>
<tr>
<td>Solubility:</td>
<td></td>
</tr>
<tr>
<td>- Solubility in water</td>
<td>0.330-0.367mg/l at 20°C</td>
</tr>
<tr>
<td>Density</td>
<td>1.168 (20°C)</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>Log Pow = 4.92-5.17</td>
</tr>
<tr>
<td>(n-octanol/water)</td>
<td></td>
</tr>
<tr>
<td>Explosive properties</td>
<td>There are no chemical groups associated with explosive properties present in the molecule</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>The structure indicates non oxidizing properties</td>
</tr>
</tbody>
</table>

10. Stability and reactivity

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability</td>
<td>Stable under normal conditions.</td>
</tr>
<tr>
<td>Materials to avoid</td>
<td>Strong oxidizers, strong acids and strong alkalis.</td>
</tr>
<tr>
<td>Conditions to avoid</td>
<td>It hydrolyzes slowly at normal temperatures in acidic or alkaline aqueous solutions.</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>Carbon dioxide and carbon monoxide</td>
</tr>
<tr>
<td>Hazardous polymerization</td>
<td>Phosphorus oxides,</td>
</tr>
</tbody>
</table>

11. Toxicological information

| Acute toxicity:                | Value                                                                 |
|                                |                                                                      |
| - Rat oral LD50               | 2530 - 5000 mg/kg                                                    |
| - Rabbit dermal LD50          | > 2000 mg/kg                                                         |
| - Rat inhalation LC50         | 200 mg/m³ air                                                        |
| - Eye irritation (rabbit)     | Not irritant                                                         |
| - Dermal irritation (rabbit)  | Mild irritant                                                        |
MATERIAL SAFETY DATA SHEET

Product Name: PHOSFLEX 41L
Product id: 7018
Revision date: 22/11/2010
Supersedes: 22/01/2009

Chronic toxicity: No data available

Mutagenicity: Weak mutagenic activity in cell forward mutagen assay in mouse lymphoma with metabolic activation. Not mutagenic by the Ames Test. Tests on mammalian cell cultures with and without metabolic activation did not show mutagenic effects.

Carcinogenicity: Not classified by IARC. Not included in NTP 11th Report on Carcinogens. Not classified as a carcinogen by USA OSHA.

Reproductive toxicity: In a reproductive toxicity study, rats received daily oral doses of 25, 100 or 400 mg/kg/day for two weeks. The animals were mated and their reproductive organs were microscopically examined. Decreased fertility was observed in the mid and high dose animals. Adverse effects on the reproductive organs were observed at all dose levels. The results of this study indicated that isopropylated triphenylphosphate is a reproductive toxin.

Neurotoxicity: May cause neurotoxicity after acute and repeated exposure.

12. Ecological information

Aquatic toxicity:
- 96 Hour-LC50, Fish: 0.36 mg/l (Rainbow Trout); > 1.3 mg/l (Sheepshead minnow)
- LC50, Crustacea: > 1 mg/l (Mysid shrimp)
- 48 Hour-LC50, Daphnia magna: 1.0 mg/l

Bioaccumulative potential: Triaryl phosphate esters, including triphenyl phosphate, exhibit low aqueous solubility, have moderate potential for bioconcentration and readily undergo biodegradation.

Germany, water endangering classes (WGK): 2

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.
MATERIAL SAFETY DATA SHEET

Product Name: PHOSFLEX 41L
Product id: 7018
Supersedes: 22/01/2009

14. Transportation information

UN No.: 3082

DOT
Proper shipping name: Environmentally hazardous substances, liquid, n.o.s (contains triphenyl phosphate & triaryl phosphates, isopropylated)
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 & isopropylated triaryl phosphates which are Marine Pollutants per 49CFR 172.101 Appendix B)

IMO
Proper shipping name: Environmentally hazardous substance, liquid, n.o.s (contains triphenyl phosphate & triaryl phosphates, isopropylated)
Class: 9 - Miscellaneous Dangerous Substances and articles
Label: 9
Packing Group: III
Mark: MARINE POLLUTANT

ICAO/IATA
Proper shipping name: Environmentally hazardous substance, liquid, n.o.s (contains triphenyl phosphate & triaryl phosphates, isopropylated)
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
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.

- Waste Classifications
This material does not meet RCRA’s characteristic definition of ignitability, corrosivity, or reactivity, and is not listed in 40CFR 261.33.
# MATERIAL SAFETY DATA SHEET

<table>
<thead>
<tr>
<th>Product Name</th>
<th>PHOSFLEX 41L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product id</td>
<td>7018</td>
</tr>
<tr>
<td>Revision date</td>
<td>22/11/2010</td>
</tr>
<tr>
<td>Supersedes</td>
<td>22/01/2009</td>
</tr>
<tr>
<td></td>
<td>Revision: 2</td>
</tr>
</tbody>
</table>

- Workplace Classification

This product is considered hazardous under the OSHA Hazard Communication Standard (29CFR 1910.1200).

- **Canada**
  - Listed in DSL

- **WHMIS hazard class**
  - D2A very toxic materials

- **EU**
  - Reported in EINECS

- **Japan**
  - Listed in ENCS

- **Australia**
  - Listed in AICS

- **New Zealand Inventory**
  - Listed in NZIoC

- **China inventory**
  - Listed

- **Korea**
  - Listed in ECL

- **Philippines**
  - Listed in PICCS

## 16. Other information

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

2 & 3 (not ANSI), 9

**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