SAFETY DATA SHEET

Product name: PHOSFLEX 71B
Product id: 7019
Revision date: 07/05/2017
Revision: 4
Supersedes: 21/01/2014

1. Identification of the substance & the company

Product identifier: PHOSFLEX 71B
Chemical name: Reaction mass of 4-tert-butylphenyl diphenyl phosphate and bis(4-tert-butylphenyl) phenyl phosphate and triphenyl phosphate
Synonym(s): Phenol, isobutylated, phosphate (3:1).
Chemical family: Aryl phosphate
Type of product and use: Flame-retardant plasticizer
Company: ICL-IP America Inc.
622 Emerson Road - Suite 500
St Louis, Missouri 63141, USA
Phone - 1 800 666 1200

Emergency telephone number:
- For Europe +32 (0) 3 575 5555  SGS
- For USA Chemtrec (800) 424-9300
- For Asia - Pacific ALERT-SGS
24 hr Toll Free Number : +800 ALERTSGS (+800-2537-8747)
24 hr Singapore Exchange Number : +65 6542-9595

2. Hazards identification

GHS classification
- Aquatic Acute 1, H400 - Very toxic to aquatic life
- Aquatic Chronic 1, H410 - Very toxic to aquatic life with long lasting effects

Labels and other form of warning

Signal Word: WARNING
Hazard statements: H410 - Very toxic to aquatic life with long lasting effects
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Precautionary statements:
P273 - Avoid release to the environment
P391 - Collect spillage
P501 - Dispose of contents/container in accordance with national and international regulations

3. Composition / information on ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>Weight %</th>
<th>Index No.</th>
<th>EC No.</th>
<th>EU Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>t-Butylphenyl diphenyl phosphate</td>
<td>40 - 46</td>
<td>56803-37-3</td>
<td>260-391-0</td>
<td>-</td>
</tr>
<tr>
<td>Bis(t-butylphenyl)phenyl phosphate</td>
<td>12 - 18</td>
<td>65652-41-7</td>
<td>265-859-8</td>
<td>-</td>
</tr>
<tr>
<td>Tri(t-butylphenyl) phosphate</td>
<td>1 - 3</td>
<td>78-33-1</td>
<td>201-106-1</td>
<td>None</td>
</tr>
<tr>
<td>Triphenyl phosphate</td>
<td>30-45</td>
<td>115-86-6</td>
<td>204-112-2</td>
<td>Aquatic Acute 1, H400, Aquatic Chronic 2, H411</td>
</tr>
</tbody>
</table>

Butylated triphenyl phosphate is multi constituent substance can also be described as: (CAS No. 68937-40-6)
Phenol, isobutylated, phosphate (3:1)

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.

Most important symptoms and effects, acute or delayed

None known
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Notes to the physician:
Treat symptomatically and supportively.
No specific antidote.

5. Fire - fighting measures

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

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:
Soak up with sand or other suitable absorbent 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:
Avoid bodily contact. Keep containers tightly closed.

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>Korea OEL</th>
<th>OSHA (PEL) Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>t-Butylphenyl diphenyl phosphate 56803-37-3</td>
<td>Not determined</td>
<td>Not determined</td>
<td>Not determined</td>
</tr>
<tr>
<td>Bis(t-butylphenyl)phenyl phosphate 65652-41-7</td>
<td>Not determined</td>
<td>Not determined</td>
<td>Not determined</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Substance</th>
<th>Limit value</th>
<th>Limit value</th>
<th>Limit value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tri(t-butylphenyl) phosphate</td>
<td>Not determined</td>
<td>Not determined</td>
<td>Not determined</td>
</tr>
<tr>
<td>78-33-1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triphenyl phosphate</td>
<td>3 mg/m³</td>
<td>Not determined</td>
<td>3 mg/m³</td>
</tr>
<tr>
<td>115-86-6</td>
<td></td>
<td></td>
<td></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: Chemical safety gloves
- Eye protection: Chemical splash goggles and/or face shield if splash hazard exists
- 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 thoroughly after handling and 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, transparent liquid</td>
</tr>
<tr>
<td>Odor</td>
<td>None</td>
</tr>
<tr>
<td>Melting point/range</td>
<td>-21°C</td>
</tr>
<tr>
<td>Boiling point/range</td>
<td>&gt;400°C (762mmHg)</td>
</tr>
<tr>
<td>Pour point</td>
<td>-26.11°C (-15 °F)</td>
</tr>
<tr>
<td>Flash point</td>
<td>&gt;80°C (closed cup)</td>
</tr>
<tr>
<td>Flammable/Explosion limits</td>
<td>Not flammable/Not explosive</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>1.08x10(-3)Pa (20°C)</td>
</tr>
<tr>
<td>Density</td>
<td>1.176 g/mL (25°C)</td>
</tr>
<tr>
<td>Solubility:</td>
<td>Analysis not determined</td>
</tr>
<tr>
<td>- Solubility in water</td>
<td>3.2 mg/l at 20°C</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not self-ignitable</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>&gt;234°C</td>
</tr>
<tr>
<td>Viscosity</td>
<td>63.6 cP (25°C)</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>Reactivity</td>
<td>No reactive hazards known/expected. It hydrolyzes slowly at normal temperatures in acidic or alkaline aqueous solutions.</td>
</tr>
<tr>
<td>Stability</td>
<td>Stable under normal conditions</td>
</tr>
<tr>
<td>Possibility of hazardous reactions</td>
<td>Not expected to occur</td>
</tr>
<tr>
<td>Conditions to avoid</td>
<td>Heating above decomposition temperature.</td>
</tr>
</tbody>
</table>
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<td>Revision date</td>
<td>07/05/2017</td>
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<td>Revision:</td>
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</tr>
<tr>
<td>Supersedes</td>
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</tr>
</tbody>
</table>

**Materials to avoid**
- Strong oxidizers, strong acids and strong alkalis.
- Phosphorus oxides. Carbon dioxide and carbon monoxide.

**11. Toxicological information**

**Acute toxicity:**
- Rat oral LD50: > 5000 mg/kg
- Rabbit dermal LD50: > 2000 mg/kg
- Rat inhalation LC50: > 0.4 mg/l
- Dermal irritation (rabbit): Not irritant
- Eye irritation (rabbit): Not irritant

**Dermal sensitization**
Sensitiser (Local lymph node assay in the mouse).
Based on the favourable outcome of the Human Patch test and the epidemiological
information that no incidences of sensitization are known at the production facility
for many years related to the use and production of the substance, it was decided
not to classify for sensitization.

**Mutagenicity**
No evidence of genotoxic or mutagenic activity was noted in Ames tests, the
mouse lymphoma and chromosome aberration tests.

**Carcinogenicity**
Not included in NTP 14th Report on Carcinogens
Not classified by IARC

**Reproductive toxicity**
Butylated triphenyl phosphate did not demonstrate reproductive toxicity.
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.

**Teratogenicity**
Not teratogenic when administered orally up to 1000 mg/kg

**Specific Target Organ Toxicity (STOT) - Single exposure**
No effects on specific target organs have been identified

**Specific Target Organ Toxicity (STOT) - Repeat exposure**
NOAEL 107.5 mg/kg bw/day (90 days oral, male rat) NOAEL 124.8 mg/kg bw/day (90 days oral, female rat)

**Aspiration hazard**
Not expected to occur

**Neurotoxicity**
No signs of acute delayed neurotoxicity when administered orally to hens at 23 g/kg

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12. Ecological information

Aquatic toxicity:
- 96 Hour-LC50, Fish 0.8 mg/l (Ictalurus punctatus)
- 48 Hour-EC50, Daphnia magna 202 µg/L

Biodegradation Readily biodegradable

Bioaccumulative potential The wholefish BCF was found to be 1850.

Note: Not considered to be PBT or vPvB

13. Disposal considerations

Waste disposal Dispose of in a safe manner in accordance with local/national regulations.

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

14. Transportation information

UN No. 3082

IMDG Proper shipping name: Environmentally hazardous substance, liquid, n.o.s (triphenyl phosphate, tert-butylated triphenyl phosphate mixtures containing 10% to 48% triphenyl phosphates)
Class: 9 - Miscellaneous Dangerous Substances and Articles
Packing Group: III
Labels: 9
Mark: MARINE POLLUTANT

ADR/RID Proper shipping name: Environmentally hazardous substance, liquid, n.o.s (triphenyl phosphate, tert-butylated triphenyl phosphate mixtures containing 10% to 48% triphenyl phosphate)
Class: 9 - Miscellaneous Dangerous Substances and Articles
Packing group: III
Classification Code: M6
Hazard identification No: 90
Labels: 9
Marking: Environmentally hazardous substance
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ICAO/IATA
Proper shipping name: Environmentally hazardous substance, liquid, n.o.s (triphenyl phosphate, tert-butylated triphenyl phosphate mixtures containing 10% to 48% triphenyl phosphates)
Class: 9
Packing group: III
Hazard label(s): Miscellaneous
Marking: Environmentally hazardous substance

DOT
Proper shipping name: Environmentally hazardous substances, liquid, n.o.s (triphenyl phosphate, tert-butylated triphenyl phosphate mixtures containing 10% to 48% triphenyl phosphates)
Class: 9 - Miscellaneous Hazardous Materials
Labels: 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)

15. Regulatory information

EC No. 700-990-0
USA Reported in the EPA TSCA Inventory.
Australia Listed in AICS
Canada Listed in DSL
China - China inventory Listed in IECSC
Japan Listed in ENCS
ISHL No. 4-(9)-167, 4-(9)-168, 4-(9)-208, 4-(9)-250, 4-(9)-262
Korea Listed in KECI
- Toxic Chemical Control Act CAS 115-86-6 - toxic chemicals
CAS 68937-40-63 - non toxic chemicals
New Zealand Inventory Listed in NZIoC
Philippines Listed in PICCS
Taiwan Listed (TCSI)
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16. Other information

This data sheet contains changes from the previous version in section(s)
1, 15

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.

Although the information and recommendations set forth herein (hereinafter "information") are presented in good faith and believed to be correct as of the date hereof, ICL-IP America Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its safety and suitability for their purposes prior to use. In no event will ICL-IP America Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE, ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH THE INFORMATION REFERS.

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telephone: +/972-8-6297835

End of safety data sheet