1. Identification of the substance & the company

Chemical name: Tris(2-chloroisopropyl) phosphate
Chemical formula: C9H18Cl3O4P
Chemical family: Alkyl phosphate
Molecular weight: ca.327.57
Type of product and use: Flame retardant
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
Medical: PROSAR 1-888-875-1685 (24HRS)

2. Hazards identification

Emergency overview: 
May be harmful if swallowed
May cause mild irritation to the eyes. May cause skin and respiratory tract irritation.

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

Signal word: Warning
Hazard statements: H302 - Harmful if swallowed
Precautionary statements

P264 - Wash hands thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P330- Rinse mouth.
P501 - Dispose of contents/container in accordance with national and international regulations.

3. Composition / information on ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tris(2-chloro-1-methylethyl) phosphate</td>
<td>13674-84-5</td>
<td>99.5</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

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

Treat symptomatically and supportively.
5. Fire - fighting measures

Suitable extinguishing media
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 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)

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 50°C (122°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>Tris(2-chloro-1-methylethyl) phosphate 13674-84-5</td>
<td>Not determined</td>
<td>Not determined</td>
</tr>
</tbody>
</table>

Ventilation requirements: Provide adequate ventilation.

Personal protective equipment:
- Respiratory protection: In case of insufficient ventilation wear suitable respiratory equipment.
- Hand protection: Rubber gloves
- Eye protection: Chemical safety goggles
- Skin and body protection: Use protective clothing impervious to this material.

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 colorless liquid
Odour: Slightly sweetish
Boiling point/range: 288°C (decomposes)
Melting point/range: -20°C
Flash point: >245°C (closed cup)
Flammable/Explosion limits: Not explosive/Not flammable
Auto-ignition temperature: > 400°C
Vapour pressure: 1.4x10(-3)Pa (25°C)
Viscosity: 71mPas (25°C)

Solubility:
- Solubility in water: 1.08g/l at 20°C
Density: 1.290 (20°C)
Decomposition temperature: 245°C
9. Physical and chemical properties

- **Partition coefficient**
  - Log Pow = 2.68

- **Explosive properties**
  - There are no chemical groups associated with explosive properties present in the molecule

- **Oxidising properties**
  - The structure indicates non oxidizing properties

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**
  - Exposure to air and moisture
  - Heating above decomposition temperature

- **Hazardous decomposition products**
  - Hydrogen Chloride
  - Halogenated hydrocarbons

- **Hazardous polymerization**
  - Not expected to occur

11. Toxicological information

- **Acute toxicity:**
  - Rat oral LD50 < 2000 mg/kg
  - Rabbit dermal LD50 > 5000 mg/kg
  - Rat dermal LD50 > 2000 mg/kg
  - Rat inhalation LC50 > 7 mg/l (4-hr)
  - Eye irritation (rabbit) Not irritant
  - Dermal irritation (rabbit) Not irritant
  - Dermal sensitization Not a sensitizer

- **Sub-chronic toxicity:**
  - NOEL > 20,000 ppm (13 weeks oral rat)

- **Chronic toxicity**
  - No data available

- **Mutagenicity**
  - Not mutagenic by the Ames Test
  - Mutagenic in the mouse lymphoma L5178Y test system.
  - Non genotoxic in an in-vivo micronucleus test in mice
# MATERIAL SAFETY DATA SHEET

<table>
<thead>
<tr>
<th>Product Name</th>
<th>FYROL PCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product id</td>
<td>7002</td>
</tr>
<tr>
<td>Revision date</td>
<td>17/01/2011</td>
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<tr>
<td>Supersedes</td>
<td>21/11/2010</td>
</tr>
<tr>
<td></td>
<td>Revision: 4</td>
</tr>
</tbody>
</table>

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

### Reproductive toxicity
- In a two-generation oral reproductive toxicity study a LOAEL of 99 mg/kg/day is derived for effects on fertility and for developmental toxicity.

### Neurotoxicity
- Not neurotoxic

### 12. Ecological information

<table>
<thead>
<tr>
<th>Aquatic toxicity:</th>
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</thead>
<tbody>
<tr>
<td>- 96 Hour-LC50, Fish</td>
</tr>
<tr>
<td>- 48 Hour-EC50, Daphnia magna</td>
</tr>
<tr>
<td>- 72 Hour-EC50, Freshwater algae</td>
</tr>
</tbody>
</table>

### Chronic toxicity
- The No Observed Effect Concentration (NOEC) in Daphnia magna is 32 mg/l.

### Biodegradation
- Not readily biodegradable
- Inherently biodegradable

### Bioaccumulative potential
- Not bioaccumulative

### Germany, water endangering classes (WGK)
- 1

### 13. Disposal considerations

<table>
<thead>
<tr>
<th>Waste disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observe all federal, state and local environmental regulations when disposing of this material</td>
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</table>

### 14. Transportation information

<table>
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<table>
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<table>
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MATERIAL SAFETY DATA SHEET

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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.

Canada
- Listed in DSL
- WHMIS hazard class
  Non-controlled

EU
- Reported in EINECS

EC No.
- 911-815-4

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)
1 (REACH only), 2 (ANSI only), 11, 12
MATERIAL SAFETY DATA SHEET

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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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<tr>
<td>Prepared by</td>
<td>HERA Division in ISRAEL</td>
</tr>
<tr>
<td></td>
<td>telephone: +/-972-8-6297835</td>
</tr>
<tr>
<td></td>
<td>telefax: +/-972-8-6297832</td>
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<tr>
<td></td>
<td><a href="http://www.icl-ip.com">www.icl-ip.com</a></td>
</tr>
<tr>
<td></td>
<td>e-mail:<a href="mailto:msdsinfo@icl-ip.com">msdsinfo@icl-ip.com</a></td>
</tr>
</tbody>
</table>

End of safety data sheet