

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard 29 CFR 1910.1200 (HAZCOM 2012 - GHS)

Product name	FYROL 6	
Product id	7040	
Revision date	01/03/2018	Revision: 4
Supersedes	16/12/2014	

1. Identification of the substance & the company

Chemical name	Diethyl bis(2-hydroxyethyl) aminomethyl phosphonate
Chemical family	Alkyl phosphonate
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 e-mail:msdsinfo@icl-group.com
Emergency Telephone	Chemtrec: (800) 424-9300 Medical: PROSAR 1-888-875-1685 (24HRS)

2. Hazards identification

GHS classification	Flam. Liq. 3, H226 Flammable liquid and vapour
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Signal Word	WARNING
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Hazard statements	H226 - Flammable liquid and vapor
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Precautionary statements	<p>P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking</p> <p>P233 - Keep container tightly closed</p> <p>P240 - Ground/bond container and receiving equipment</p> <p>P241 - Use explosion-proof electrical/ ventilating/ lighting/ equipment</p> <p>P242 - Use only non-sparking tools</p> <p>P243 - Take precautionary measures against static discharge</p> <p>P280 - Wear protective gloves/protective clothing/eye protection/face protection</p> <p>P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower</p> <p>P370 + P378 - In case of fire: Use dry chemical powder, carbon dioxide, water spray (fog) or foam for extinction</p> <p>P403 + P235 - Store in a well-ventilated place. Keep cool</p> <p>P501 - Dispose of contents/container in accordance with national and international regulations</p>
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HMIS Ratings (Scale 0-4) Health = 1, Fire = 2, Reactivity = 0.

3. Composition / information on ingredients

Components	CAS No.	Weight %
Phosphonic acid, [[bis(2-hydroxyethyl)amino]methyl]-, diethyl ester	2781-11-5	85 - 95

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 occurs.

Inhalation In case of mist inhalation or breathing fumes released from heated material, 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

None known

Notes to the physician Treat symptomatically and supportively.

5. Fire - fighting measures

Suitable extinguishing media Water, water fog, carbon dioxide (CO₂), dry chemical, foam.

Unusual fire and explosion hazards Flammable liquid. When heated to decomposition, may release poisonous fumes of Carbon Monoxide, Carbon Dioxide, Phosphorus Oxides and Nitrogen Oxides.

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

6. Accidental release measures

Personal precautions Avoid heat, flames, sparks and other sources of ignition.
Wear appropriate safety clothing and eye/face protection (see Section 8).

Methods for cleaning up Collect in suitable and properly labeled containers. Absorb on sand or vermiculite and place in closed container for disposal. 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"). Noncorrosive to glass or metals. May soften or deteriorate certain plastics and elastomers (vinyl-based resins, neoprene and natural rubbers).
Maximum recommended storage temperature of 50°C (122°F).

8. Exposure controls / personal protection

Exposure Limits :

Components	ACGIH-TLV Data	Korea OEL	OSHA (PEL) Data
Phosphonic acid, [[bis(2-hydroxyethyl)amino]methyl] -, diethyl ester 2781-11-5	Not determined	Not determined	Not determined

Ventilation requirements Adequate ventilation is recommended to control potential employee exposure.

Personal protective equipment:

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

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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.
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9. Physical and chemical properties

Appearance	Clear liquid
Color	Amber
pH	6.0 mg KOH/g (Acid Number)
Melting point/range	Not determined
Boiling point/range	196°C (385°F)
Flash point	51-62°C (125-145°F)
Flammable/Explosion limits	Not explosive.
Vapor pressure	25 Pa (20°C)
Density	1.16 g/ml (20°C)
Solubility:	
- Solubility in water	Soluble
- Solubility in other solvents	Alcohol, Ketones
Auto-ignition temperature	Not self-ignitable
Decomposition temperature	172°C
Viscosity	185 cP (25°C)
Ignition temperature	388°C
Bulk density	9.6 lbs/gal @ 20°C

10. Stability and reactivity

Reactivity	It hydrolyzes slowly at normal temperatures in acidic or alkaline aqueous solutions.
Stability	Stable under normal conditions The product will decompose and release ethanol upon heating. Acids may form if heated above 275°F (125°C)
Possibility of hazardous reactions	Not expected to occur
Conditions to avoid	Ignition sources and extreme temperatures. Exposure to moisture. Heating above decomposition temperature.
Materials to avoid	Strong oxidizers and strong bases
Hazardous decomposition products	Phosphorus oxides. Carbon monoxide, carbon dioxide and nitrogen oxides.

11. Toxicological information

Acute toxicity:

- Rat oral LD50	> 5000 mg/kg
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- Rabbit dermal LD50	> 2000 mg/kg	
Skin corrosion/irritation	Not irritant	
Serious eye damage/ irritation	Minimal irritant.	
Mutagenicity	<p>Not mutagenic by the Ames Test.</p> <p>Mutagenic in the mouse lymphoma forward mutation assay</p> <p>Mutagenic in cytogenetic analysis</p> <p>In vitro transformation of BALB/3T3 cells assay: negative</p>	
Carcinogenicity	<p>Not included in NTP 14th Report on Carcinogens</p> <p>Not classified by IARC</p> <p>Not classified as a carcinogen by USA OSHA</p>	
Reproductive toxicity	<p>Repeated exposure to Fyrol 6 did not adversely affect reproductive performance, fertility, litter size, pup size, pup weights, or the male or female organs. This study confirms the product is not a reproductive toxin.</p> <p>NOAEL: 750 mg/kg/day</p>	
Neurotoxicity	<p>This product, when administered once orally (12.3 g/kg) to hens, produced slight unsteadiness, non-vocal behavior, diarrhea and no mortality. Two doses (1 or 10 g/kg) orally administered twice to hens 21 days apart did not produce any evidence of delayed neurotoxicity.</p>	
Specific Target Organ Toxicity (STOT) - Single exposure	No effects on specific target organs have been identified	
Specific Target Organ Toxicity (STOT) - Repeat exposure	<p>Daily oral administration of 20, 100 or 500 mg/kg to rats for three months produced increased relative liver and kidney weights in the high dose males and in the mid and high dose females. Hepatocellular hypertrophy was observed in the mid and high dose males and females. No evidence of toxicity was observed in the males and females administered 20 mg/kg/day.</p>	

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12. Ecological information

Aquatic toxicity :

- 96 Hour-LC50, Fish > 10,000 mg/L (Rainbow Trout)

- 48 hour-LC50, Daphnia magna > 1000 mg/L

Toxicity to micro-organisms Activated sludge respiration inhibition test: EC50 > 10,000 mg/l

- **Hydrolysis** Stable under acidic conditions (half-life: > 100 days). Moderately stable under neutral conditions (half-life: < 100 days). Unstable under alkaline conditions with degradation increasing with increasing temperature.

Biodegradation Not readily biodegradable.

Bioaccumulative potential No data available

Note: Not expected to be PBT or vPvB

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.

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14. Transportation information

UN No.	1993
DOT	Proper shipping name: Flammable Liquid, n.o.s. (Diethyl bis(hydroxyethyl) aminomethyl phosphonate) Class: 3 - Flammable liquids Packing Group: III Label: FLAMMABLE LIQUIDS (3)
IMDG	Proper shipping name: Flammable liquid, n.o.s (Diethyl bis(hydroxyethyl) aminomethyl phosphonate) Class: 3 - Flammable liquids Packing Group: III Label: FLAMMABLE LIQUIDS (3)
ICAO/IATA	Proper shipping name: Flammable liquid, n.o.s (Diethyl bis(hydroxyethyl) aminomethyl phosphonate) Class: 3 Packing group: III Hazard label(s): Flammable liquid

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
EU	Reported in EINECS
Australia	Listed in AICS
China	
- China inventory	Listed in IECSC
Japan	Listed in ENCS

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Korea	Listed in KECI
New Zealand Inventory	Listed in NZIoC
Philippines	Listed in PICCS
Taiwan	Listed (TCSI)

16. Other information

This data sheet contains changes from the previous version in section(s)
11, 13, 15

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Prepared by	HERA Division telephone: +/972-8-6297835 telefax: +/972-8-6297832 www.icl-ip.com e-mail:msdsinfo@icl-group.com
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End of safety data sheet