SAFETY DATA SHEET

This safety data sheet was created pursuant to the requirements of:
US OSHA

Revision date 16-Jun-2024 **Supersedes Date:** 26-Jun-2022 **Revision Number** 10

1. Identification

Product identifier

Product Name FYROL PCF

Other means of identification

Product Code(s) 7002

Synonyms 2-Propanol, 1-chloro-, phosphate (3:1)
Tris(2-chloroisopropyl) phosphate
2-Propanol, 1-chloro-, 2,2',2''-phosphate
Reaction products of phosphoryl trichloride and methyloxirane

Recommended use of the chemical and restrictions on use

Recommended use Flame retardant

Restrictions on use No information available

Details of the supplier of the safety data sheet

Supplier Address
ICL-IP America Inc. ICL
622 Emerson Road - Suite 500
St. Louis, Missouri 63141, USA
Tel:(314)983-7884
e-mail:msdsinfo@icl-group.com

Emergency telephone number

Emergency Telephone Chemtrec 1-800-424-9300

2. Hazard(s) identification

Classification

Acute toxicity - Oral	Category 4
Carcinogenicity	Category 2
Chronic aquatic toxicity	Category 3

Hazards not otherwise classified (HNOC)
Not applicable

Label elements

Warning

Hazard statements
Harmful if swallowed
Suspected of causing cancer
Harmful to aquatic life with long lasting effects

Appearance Clear colorless liquid **Physical state** Liquid **Odor** Slightly sweetish

Precautionary Statements - Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Wear protective gloves/clothing and eye/face protection
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product

Precautionary Statements - Response
IF exposed or concerned: Get medical advice/attention
IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell
Rinse mouth

Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Other information
Harmful to aquatic life

3. Composition/information on ingredients

Substance

Not applicable.

Mixture

Synonyms
2-Propanol, 1-chloro-, phosphate (3:1)
Tris(2-chloroisopropyl) phosphate
2-Propanol, 1-chloro-, 2,2',2''-phosphate
Reaction products of phosphoryl trichloride and methyloxirane

Chemical Family Alkyl phosphate.

Chemical name	CAS No.	Weight-%	Trade secret
Tris(2-chloro-1-methylethyl) phosphate	13674-84-5	99.5	Sk*

Additional information
This product can also be described as:
Reaction mass of tris(2-chloropropyl) phosphate and tris(2-chloro-1-methylethyl) phosphate and Phosphoric acid, bis(2-chloro-1-methylethyl) 2-chloropropyl ester and Phosphoric acid, 2-chloro-1-methylethyl bis(2-chloropropyl) ester

4. First-aid measures

Description of first aid measures

General advice Show this safety data sheet to the doctor in attendance. IF exposed or concerned: Get medical advice/attention.

Inhalation Remove to fresh air.

Eye contact Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician.

Skin contact Wash skin with soap and water. In the case of skin irritation or allergic reactions see a physician.

Ingestion Do NOT induce vomiting
Rinse mouth
Never give anything by mouth to an unconscious person
Call a physician

Most important symptoms and effects, both acute and delayed

Symptoms Harmful if swallowed.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically and supportively.

5. Fire-fighting measures

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Specific hazards arising from the chemical May emit toxic and irritating fumes under fire conditions.

Explosion data

Sensitivity to mechanical impact None.

Sensitivity to static discharge None.

Special protective equipment and precautions for fire-fighters Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Cool containers with water spray. Contain runoff to prevent entry into water or drainage systems.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions Ensure adequate ventilation. Avoid contact with skin, eyes, and clothing.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. Handling and storage

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with eyes, skin and clothing. Use personal protection equipment. Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Keep out of the reach of children. Keep container tightly closed in a dry and well-ventilated place. Maximum recommended storage temperature of 50°C (122°F).

8. Exposure controls/personal protection

Control parameters

Exposure Limits This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Chemical name	ACGIH TLV	OSHA PEL	NIOSH
Tris(2-chloro-1-methylethyl) phosphate 13674-84-5	-	-	-

Appropriate engineering controls

Engineering controls Showers
Eyewash stations
Ventilation systems

Individual protection measures, such as personal protective equipment

Eye/face protection Chemical safety goggles.

Hand protection Wear suitable gloves

Skin and body protection Wear suitable protective clothing.

Respiratory protection No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required

General hygiene considerations Do not eat, drink or smoke when using this product. Wash hands before breaks and immediately after handling the product.

9. Physical and chemical properties

Information on basic physical and chemical properties

Physical state Liquid
Appearance Clear colorless liquid
Color Colourless

Odor	Slightly sweetish

Property	Values	Remarks • Method
pH	No data available	None known
Melting point / freezing point	-20 °C / -4 °F	
Initial boiling point and boiling range	288 °C / 550.4 °F	
Flash point	> 245 °C / 473 °F	CC (closed cup)
Evaporation rate	No data available	None known
Flammability	No data available	None known
Flammability Limit in Air		None known
Upper flammability or explosive limits	No data available	
Lower flammability or explosive limits	No data available	
Vapor pressure	1.4x10(-5)hPa (25°C)	
Relative vapor density	No data available	None known
Relative density	1.290 (20°C)	
Water solubility	1.08 g/l at 20°C	
Solubility(ies)	No data available	
Partition coefficient	No data available	
Autoignition temperature	> 400	
Decomposition temperature		
Kinematic viscosity	No data available	None known
Dynamic viscosity	68.5 cP (20°C)	

Other information	
Explosive properties	No information available
Oxidizing properties	No information available
Softening point	No information available
Molecular weight	ca.328
VOC content	No information available
Liquid Density	No information available
Bulk density	No information available

10. Stability and reactivity

Reactivity It hydrolyzes slowly at normal temperatures in acidic or alkaline aqueous solutions.

Chemical stability Stable under normal conditions.

Possibility of hazardous reactions None under normal processing.

Conditions to avoid Heating above decomposition temperature.

Incompatible materials Strong oxidizing agents. Strong acids. Strong bases.

Hazardous decomposition products Carbon dioxide and carbon monoxide. Phosphorus oxides. Hydrogen chloride.

11. Toxicological information

Information on likely routes of exposure

Product Information

Ingestion Harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms See section 4.

Acute toxicity

Numerical measures of toxicity

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Tris(2-chloro-1-methylethyl) phosphate 13674-84-5	632 - 4200 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	> 4.6 mg/l (4-hr) (Rat)

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation non-irritant.

Serious eye damage/eye irritation non-irritant.

Respiratory or skin sensitization Not a skin sensitizer

Germ cell mutagenicity Not mutagenic in AMES Test
Non genotoxic in an in-vivo micronucleus test in mice
Mutagenic in the mouse lymphoma L5178Y test system.

Carcinogenicity Contains a known or suspected carcinogen
Suspected of causing cancer

Chemical name	ACGIH	IARC	NTP	OSHA
Tris(2-chloro-1-methylethyl) phosphate 13674-84-5	-	-	-	-

Reproductive toxicity No significant adverse effects on the reproductive parameters evaluated.

Developmental toxicity NOAEL 650 mg/kg bw/day (rat, oral). Does not meet classification criteria.

STOT - single exposure Based on available data, the classification criteria are not met.

STOT - repeated exposure Based on available data, the classification criteria are not met

Chronic toxicity No data available

Neurological effects Not neurotoxic.

Aspiration hazard Not expected.

Other adverse effects No information available.

12. Ecological information

Ecotoxicity Harmful to aquatic life with long lasting effects.

Chemical name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Tris(2-chloro-1-methylethyl) phosphate 13674-84-5	EC50: 82 mg/L (72h, Pseudokirchnerella subcapitata) NOEC: 13 mg/L	LC50: 51 mg/L (96h, Pimephales promelas)	EC50: 784 mg/L (3h, Activated Sludge)	EC50: 131 mg/L (Daphnia magna, 48h) NOEC: 32 mg/L (Daphnia magna)

Persistence and degradability Not readily biodegradable. Inherently biodegradable.

Bioaccumulation The bioaccumulation potential is expected to be low.

Bioconcentration factor (BCF) 0.8- <14

Component Information

Chemical name	Partition coefficient
Tris(2-chloro-1-methylethyl) phosphate 13674-84-5	2.68

Mobility in soil Based on measured results the adsorption coefficient for TCPP is derived to be 174, indicating a moderate adsorption potential.

Other adverse effects No information available

13. Disposal considerations

Waste treatment methods

Waste from residues/unused products Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

Contaminated packaging Dispose of in a safe manner in accordance with local/national regulations.

14. Transport information

DOT Not regulated

TDG Not regulated

MEX Not regulated

IATA Not regulated

IMDG Not regulated

15. Regulatory information

International Inventories

GHS hazardous component CAS registry numbers appearing in section 3 may differ from substances appearing in section 15 due to country or regional chemical inventory coverage requirements, however, remain in compliance with the inventory
Products that are used as food additives are exempt from listing in international chemical inventories

For further details on the regulatory status for this product in a specific country, please send your inquiry to the following email address: msdsinfo@icl-group.com

Chemical name	TSCA Inventory List Active/Inactive
Tris(2-chloro-1-methylethyl) phosphate 13674-84-5 (99.5)	Present (ACTIVE)

TSCA	Listed or exempted
DSL	Listed or exempted
ENCS	Listed or exempted
IECSC	Listed or exempted
KECI	Listed or exempted
PICCS	Listed or exempted
AIIC	Listed or exempted
NZIoC	Not Listed
TCSI	Listed or exempted
NCI	Listed or exempted
TECI	Listed or exempted
NSQ	Listed or exempted

Legend:
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AIIC - Australian Inventory of Industrial Chemicals
NZIoC - New Zealand Inventory of Chemicals
TCSI - Taiwan Chemical Substance Inventory
NCI - Vietnam National Chemicals Inventory
TECI - Thailand Inventory FDA Existing Chemicals
NSQ - Mexico National Inventory of Chemical Substances

US Federal Regulations

Chemical name	U.S. - TSCA (Toxic Substances Control Act) - Section 5(a)(2) - Chemicals with Significant New Use Rules (SNURs)
Tris(2-chloro-1-methylethyl) phosphate - 13674-84-5	-

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

Chemical name	SARA 313 - Threshold Values %
Tris(2-chloro-1-methylethyl) phosphate - 13674-84-5	-

SARA 311/312 Hazard Categories
Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications.

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Tris(2-chloro-1-methylethyl) phosphate 13674-84-5	-	-	-	-

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

Chemical name	Hazardous Substances RQs	Extremely Hazardous Substances RQs	Reportable Quantity (RQ)
Tris(2-chloro-1-methylethyl) phosphate 13674-84-5	-	-	

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

This product does not contain any substances regulated under applicable state right-to-know regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Reaction products of phosphoryl trichloride and methyloxirane 1244733-77-4	-	-	-
Tris(2-chloro-1-methylethyl) phosphate 13674-84-5	-	-	-

U.S. EPA Label Information

EPA Pesticide Registration Number Not applicable

16. Other information

NFPA **Health hazards** 2 **Flammability** 1 **Instability** 0 **Special hazards** -

HMIS **Health hazards** 2 Sk* **Flammability** 1 **Physical hazards** 0 **Personal protection** X

Chronic Hazard Star Legend ** = Chronic Health Hazard*

Key or legend to abbreviations and acronyms used in the safety data sheet

Legend Section 8: Exposure controls/personal protection

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value	*	Skin designation

Key literature references and sources for data used to compile the SDS

Agency for Toxic Substances and Disease Registry (ATSDR)
U.S. Environmental Protection Agency ChemView Database
European Food Safety Authority (EFSA)
Environmental Protection Agency
Acute Exposure Guideline Level(s) (AEGL(s))
U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act

U.S. Environmental Protection Agency High Production Volume Chemicals
Food Research Journal
Hazardous Substance Database
International Uniform Chemical Information Database (IUCLID)
National Institute of Technology and Evaluation (NITE)
Australia National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
NIOSH (National Institute for Occupational Safety and Health)
National Library of Medicine's ChemID Plus (NLM CIP)
National Library of Medicine's PubMed database (NLM PUBMED)
U.S. National Toxicology Program (NTP)
New Zealand's Chemical Classification and Information Database (CCID)
Organization for Economic Co-operation and Development Environment, Health, and Safety Publications
Organization for Economic Co-operation and Development High Production Volume Chemicals Program
Organization for Economic Co-operation and Development Screening Information Data Set
World Health Organization

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End of Safety Data Sheet