



SAFETY DATA SHEET

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

Revision date 31-May-2021

Supersedes Date: 09-Aug-2017

Revision Number 8

1. Identification

Product identifier

Product Name FYROL FR-2

Other means of identification

Product Code(s) 7007

UN/ID no UN3082

Chemical name Tris(1,3-dichloro-2-propyl) phosphate

Synonyms Tri(B,B'-dichloroisopropyl) phosphate; 2-Propanol,1,3-dichloro- phosphate (3:1), TDCP

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
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 number

Emergency Telephone Chemtrec 1-800-424-9300

2. Hazard(s) identification

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Carcinogenicity	Category 2
Chronic aquatic toxicity	Category 1

Hazards not otherwise classified (HNOC)

Not Applicable

Label elements



Signal word
Warning

Hazard statements
Suspected of causing cancer
Very toxic to aquatic life with long lasting effects

Precautionary Statements - Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response IF exposed or concerned: Get medical advice/attention

Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container in accordance with local, regional, national, and international regulations as applicable
Other information
Toxic to aquatic life

3. Composition/information on ingredients

Substance

Chemical name	CAS No	Weight-%
tris[2-chloro-1-(chloromethyl)ethyl] phosphate	13674-87-8	93 - 97

4. First-aid measures

Description of first aid measures

General advice	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	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, both acute and delayed
Symptoms No information available.

Indication of any immediate medical attention and special treatment needed

Note to physicians

Repeated exposure to very high doses of this product may result in cholinesterase inhibition. Additional symptoms resulting from the repeated exposure could include salivation, sweating, headache, nausea, diarrhea and tremors. Should cholinesterase inhibition occur, atropine may be used as an antidote.

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 fumes under fire conditions.

Hazardous combustion products

Carbon monoxide. Carbon dioxide (CO₂). Phosphorus oxides. Hydrogen chloride.

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.

6. Accidental release measures**Personal precautions, protective equipment and emergency procedures****Personal precautions**

Ensure adequate ventilation.

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.

Environmental precautions

See Section 12 for additional Ecological Information. Should not be released into the environment.

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 skin, eyes or clothing.

Conditions for safe storage, including any incompatibilities**Storage Conditions**

Keep container tightly closed in a dry and well-ventilated place. Maximum recommended storage temperature of 54.4°C (130°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 IDLH
tris[2-chloro-1-(chloromethyl)ethyl] phosphate 13674-87-8	-	-	-

Appropriate engineering controls

Engineering controls
Eyewash stations
Showers
Ventilation systems

Individual protection measures, such as personal protective equipment

Eye/face protection Chemical safety goggles.

Hand protection Wear suitable gloves. Neoprene gloves. Nitrile rubber.

Skin and body protection Wear suitable protective clothing.

Respiratory protection Gas mask with a new organic vapour canister.

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 colorless
Odor Mild

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
pH	No data available	None known
Melting point / freezing point	(-20)°C (1013 hPa) / (-4) °F	
Boiling point / boiling range	326 °C / 618.8 °F	
Flash point	200 °C / 392 °F	
Evaporation rate	No data available	None known
Flammability (solid, gas)	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	0.0000056Pa (25°C)	
Vapor density	No data available	None known
Relative density	1.51 g/ml (20°C)	
Water solubility	18.1mg/l at 20°C	
Solubility in other solvents	No data available	
Partition coefficient	No data available	
Autoignition temperature	513°C (955°F)	Not self-ignitable
Hyphen	326°C	
Kinematic viscosity	No data available	None known
Dynamic viscosity	1715mPa.s (20°C)	
<u>Other information</u>		
Oxidizing properties	No data available	
Explosive properties	No data available	
Molecular weight	430.9	

10. Stability and reactivity

Reactivity	No reactive hazards known/expected.
Stability	Stable under normal conditions.
Explosion data	
Sensitivity to mechanical impact	None.
Sensitivity to static discharge	None.
Possibility of hazardous reactions	None under normal processing.
Conditions to avoid	Heating above 50 °C.
Incompatible materials	Strong oxidizers, strong acids and strong alkalis.
Hazardous decomposition products	Carbon dioxide and carbon monoxide. Phosphorus oxides. Hydrogen chloride.

11. Toxicological information

Information on likely routes of exposure

Product Information

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms No information available.

Acute toxicity

Numerical measures of toxicity

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
tris[2-chloro-1-(chloromethyl)ethyl] phosphate 13674-87-8	>2000 mg/kg (Rat)	>2000 mg/kg (Rat)	> 5220 mg/m ³ (Rat) 4 h

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

Skin corrosion/irritation	Slightly irritant. Does not meet classification criteria.
Serious eye damage/eye irritation	Slightly irritant. Does not meet classification criteria.
Respiratory or skin sensitization	Not a skin sensitizer.
Germ cell mutagenicity	Mutagenic by the Ames Test. Unscheduled DNA synthesis (rat liver) - not mutagenic. Not mutagenic in the mouse lymphoma L5178Y test system. Negative in the Chromosomal aberrations test (hamster's V79 cells). Not clastogenic in chromosome aberration test with Chinese hamster cells. In vivo mouse bone marrow cytogenicity: not mutagenic. Live mutagenicity test with Drosophila melanogaster: non-mutagenic.

Carcinogenicity

Suspected of causing cancer.

Chemical name	ACGIH	IARC	NTP	US OSHA
tris[2-chloro-1-(chloromet	-	-	-	-

hyl)ethyl] phosphate 13674-87-8				
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Reproductive toxicity	Reproductive studies showed that oral administration of this product to male rabbits for 12 weeks did not adversely affect fertility or sperm quantity (1,3-dichloro - 2-propanol phosphate).
Teratogenicity	Not teratogenic.
STOT - single exposure	No information available.
STOT - repeated exposure	Based on available data, the classification criteria are not met.
Neurological effects	All of neurotoxicity tests conducted consistently showed the product lacked neurotoxic activity.
Aspiration hazard	Not expected.

12. Ecological information

Yes.

Ecotoxicity	Very toxic to aquatic life with long lasting effects. Toxic to aquatic life.
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Component information

Chemical name	Algae/aquatic plants	Fish	Crustacea	Toxicity to microorganisms
tris[2-chloro-1-(chloromethyl)ethyl] phosphate 13674-87-8	EC50: 4.6 mg/L (72h, Pseudokirchneriella subcapitata) NOEC: 2.3 mg/L	LC50: 1.1 mg/L (96h, Oncorhynchus mykiss) NOEC: 2 µg/L (Danio rerio)	EC50: 3.8 mg/L (48h, Daphnia magna) NOEC: 0.5 mg/L	-

Persistence and degradability	Not readily biodegradable.
Bioaccumulation	Measured fish BCF of 31-59. Not bioaccumulative.

Component information

Chemical name	Partition coefficient
tris[2-chloro-1-(chloromethyl)ethyl] phosphate 13674-87-8	3.69

Mobility	The compound is considered to be very strongly adsorbed onto soil particles.
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 contents/containers in accordance with local regulations.

14. Transport information

DOT

UN/ID no UN3082
 UN proper shipping name Environmentally hazardous substance, liquid, n.o.s. (tris[2-chloro-1-(chloromethyl)ethyl] phosphate)
 Hazard class 9
 Packing group III
 Marine pollutant Yes.
 Description: UN3082, Environmentally hazardous substance, liquid, n.o.s. (tris[2-chloro-1-(chloromethyl)ethyl] phosphate), 9, III, Marine pollutant
 Emergency Response Guide Number 171

TDG

UN/ID no UN3082
 UN proper shipping name Environmentally hazardous substance, liquid, n.o.s. (tris[2-chloro-1-(chloromethyl)ethyl] phosphate)
 Hazard class 9
 Packing group III
 Marine pollutant Yes.
 Description: UN3082, Environmentally hazardous substance, liquid, n.o.s. (tris[2-chloro-1-(chloromethyl)ethyl] phosphate), 9, III

MEX

UN/ID no UN3082
 UN proper shipping name Environmentally hazardous substance, liquid, n.o.s. (tris[2-chloro-1-(chloromethyl)ethyl] phosphate)
 Hazard class 9
 Packing group III
 Environmental hazards Yes
 Description: UN3082, Environmentally hazardous substance, liquid, n.o.s. (tris[2-chloro-1-(chloromethyl)ethyl] phosphate), 9, III

IATA

UN number or ID number UN3082
 UN proper shipping name Environmentally hazardous substance, liquid, n.o.s. (tris[2-chloro-1-(chloromethyl)ethyl] phosphate)
 Transport hazard class(es) 9
 Packing group III
 Environmental hazards Yes
 ERG Code 9L
 Special precautions None
 Description: UN3082, Environmentally hazardous substance, liquid, n.o.s. (tris[2-chloro-1-(chloromethyl)ethyl] phosphate), 9, III

IMDG

UN number or ID number UN3082
 UN proper shipping name Environmentally hazardous substance, liquid, n.o.s. (tris[2-chloro-1-(chloromethyl)ethyl] phosphate)
 Transport hazard class(es) 9
 Packing group III
 EmS-No F-A, S-F
 Special precautions None
 Marine pollutant Yes
 Description: UN3082, Environmentally hazardous substance, liquid, n.o.s. (tris[2-chloro-1-(chloromethyl)ethyl] phosphate), 9, III, Marine pollutant

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-(chloromethyl)ethyl] phosphate 13674-87-8 (93 - 97)	Present (ACTIVE)
TSCA	Listed or exempted
DSL	Listed or exempted
ENCS	Listed or exempted
IECSC	Listed or exempted
KECL	Listed or exempted
PICCS	Listed or exempted
AIIC	Listed or exempted
NZIoC	Not Listed
TCSI	Listed or exempted
NCI	Listed or exempted
TECI	Not Listed
NSQ	Listed or exempted

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
 DSL/NDL - 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-(chloromethyl)ethyl] phosphate - 13674-87-8	-

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.

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. Under the amended regulations at 40 CFR 370, EPCRA 311/312 Tier II reporting for the 2017 calendar year will need to be consistent with updated hazard 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-(chloromet	-	-	-	-

hyl)ethyl] phosphate 13674-87-8				
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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
tris[2-chloro-1-(chloromethyl)ethyl] phosphate 13674-87-8	-	-

US State Regulations**California Proposition 65**

This product contains the following Proposition 65 chemicals:.

U.S. State Right-to-Know Regulations**US State Regulations**

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

Chemical name	New Jersey	Massachusetts	Pennsylvania
tris[2-chloro-1-(chloromethyl)ethyl] yl] phosphate - 13674-87-8	-	-	-

U.S. EPA Label Information

EPA Pesticide Registration Number Not Applicable

16. Other information

NFPA	Health hazards 0	Flammability 1	Instability 0	Special hazards -
HMIS	Health hazards 1*	Flammability 1	Physical hazards 0	Personal protection X
<i>Chronic Hazard Star Legend</i>		* = 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)
 European Chemicals Agency
 EPA (Environmental Protection Agency)
 Acute Exposure Guideline Level(s) (AELG(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)
 Japan GHS Classification
 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)
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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Revision date 31-May-2021

Revision Note The symbol (***) in the margin of this SDS indicates that this line has been revised.
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, we make no representations as to the completeness or accuracy thereof. Information is supplied to you upon the condition that the persons receiving the information will make their own determination as to its safety and suitability for their purposes prior to use. In no event will we be responsible for damages of any nature whatsoever resulting from the use of or reliance upon the information. In addition, we shall not be liable for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices or from any hazards inherent in the nature of the product.

End of Safety Data Sheet