



SAFETY DATA SHEET

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

Revision date 06-Mar-2022

Supersedes Date: 22-Feb-2022

Revision Number 7

1. Identification

Product identifier

Product Name Fyrol HF-9

Other means of identification

Product Code(s) 7019-9

UN/ID no UN3082

Recommended use of the chemical and restrictions on use

Recommended use Flame retardant additive

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
e-mail:msdsinfo@icl-group.com

Emergency telephone number

Emergency Telephone Chemtrec 1-800-424-9300

2. Hazard(s) identification

Classification

Skin sensitization	Category 1
Acute aquatic toxicity	Category 1
Chronic aquatic toxicity	Category 2

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Warning

Hazard statements

May cause an allergic skin reaction
Very toxic to aquatic life with long lasting effects

**Appearance** Clear, transparent liquid**Physical state** Liquid**Odor** No information available**Precautionary Statements - Prevention**

Avoid breathing dust/fume/gas/mist/vapors/spray
 Contaminated work clothing must not be allowed out of the workplace
 Wear protective gloves/protective clothing/eye protection/face protection
 Avoid release to the environment

Precautionary Statements - Response

IF ON SKIN: Wash with plenty of water and soap
 If skin irritation or rash occurs: Get medical advice/attention
 Take off contaminated clothing and wash it before reuse
 Collect spillage

Precautionary Statements - Disposal

Dispose of contents/container in accordance with local, regional, national, and international regulations as applicable

Other information

No information available.

3. Composition/information on ingredients

Substance

Not applicable.

Mixture

Chemical name	CAS No	Weight-%	Trade secret
Reaction mass of 4-tert-butylphenyl diphenyl phosphate and bis(4-tert-butylphenyl) phenyl phosphate and triphenyl phosphate	---	75-85	*
7-Oxabicyclo[4.1.0] heptane-3-carboxylic acid	2386-87-0	0.1	*

*The exact percentage (concentration) of composition has been withheld as a trade secret.

4. First-aid measures

Description of first aid measures**General advice**

Show this safety data sheet to the doctor in attendance.

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 with soap and water. May cause an allergic skin reaction. In the case of skin irritation or allergic reactions see a physician.

Ingestion Rinse mouth
Get medical attention if symptoms occur
NOTE: Never give an unconscious person anything to drink

Most important symptoms and effects, both acute and delayed

Symptoms Itching. Rashes. Hives.

Indication of any immediate medical attention and special treatment needed

Note to physicians May cause sensitization in susceptible persons. Treat symptomatically.

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 Product is or contains a sensitizer. May cause sensitization by skin contact. May emit toxic 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 or clothing. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

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 skin, eyes or clothing. Ensure adequate ventilation. In case of insufficient ventilation wear suitable respiratory equipment. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash it before reuse.

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 50°C (122°F).

8. Exposure controls/personal protection

Control parameters**Exposure Limits**

Chemical name	ACGIH TLV	OSHA PEL	NIOSH
Reaction mass of 4-tert-butylphenyl diphenyl phosphate and bis(4-tert-butylphenyl) phenyl phosphate and triphenyl phosphate ---	-	-	-
7-Oxabicyclo[4.1.0] heptane-3-carboxylic acid 2386-87-0	-	-	-

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 Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Information on basic physical and chemical properties

Physical state Liquid
Appearance Clear, transparent liquid
Color Colorless to yellowish
Odor No information available
Odor threshold No information available

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
pH	No data available	None known
Melting point / freezing point	-21 °C / -5.8 °F	
Boiling point / boiling range	No data available	None known
Flash point	107 °C / 224.6 °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	No data available	
Vapor density	No data available	None known
Relative density	1.20	
Water solubility	Not available	
Solubility(ies)	No data available	None known
Partition coefficient	No data available	None known
Autoignition temperature	No data available	None known
Decomposition temperature		
Kinematic viscosity	No data available	None known
Dynamic viscosity	350 mPas	
Other information		
Explosive properties	No information available	
Oxidizing properties	No information available	
Softening point	No information available	
Molecular weight	No information available	
VOC Content (%)	No information available	
Liquid Density	No information available	
Bulk density	No information available	

10. Stability and reactivity

Reactivity	No reactive hazards known/expected.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	None under normal processing.
Conditions to avoid	None known based on information supplied.
Incompatible materials	Strong oxidizers, strong acids and strong alkalis.
Hazardous decomposition products	Carbon dioxide and carbon monoxide. Phosphorus oxides.

11. Toxicological information

Information on likely routes of exposure

Product Information	The toxicological data refer to the main ingredient.
Skin contact	May cause sensitization by skin contact. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons.
Ingestion	Abdominal pain, nausea and vomiting.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms	Itching. Rashes. Hives.
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Acute toxicity

Numerical measures of toxicity

The following values are calculated based on chapter 3.1 of the GHS document

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Reaction mass of 4-tert-butylphenyl diphenyl phosphate and bis(4-tert-butylphenyl) phenyl phosphate and triphenyl phosphate ---	> 5000 mg/kg	> 2000 mg/kg	> 0.4 mg/l
7-Oxabicyclo[4.1.0] heptane-3-carboxylic acid 2386-87-0	= 5000 mg/kg (Rat)	= 23600 mg/kg (Rabbit)	-

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

Skin corrosion/irritation Not irritant.

Serious eye damage/eye irritation Not irritant.

Respiratory or skin sensitization May cause sensitization by skin contact. Classification based on data available for ingredients.

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

Carcinogenicity

The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical name	ACGIH	IARC	NTP	OSHA
Reaction mass of 4-tert-butylphenyl diphenyl phosphate and bis(4-tert-butylphenyl) phenyl phosphate and triphenyl phosphate ---	-	-	-	-
7-Oxabicyclo[4.1.0] heptane-3-carboxylic acid 2386-87-0	-	-	-	-

Reproductive toxicity The product did not demonstrate reproductive toxicity.

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

STOT - single exposure No information available.

STOT - repeated 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)

Neurological effects No signs of acute delayed neurotoxicity when administered orally to hens at 23 g/kg.

Aspiration hazard Not expected.

Other adverse effects No information available.

12. Ecological information

Note The toxicological data refer to the main ingredient

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

Chemical name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Reaction mass of 4-tert-butylphenyl diphenyl phosphate and bis(4-tert-butylphenyl) phenyl phosphate and triphenyl phosphate ---	EC50: 1.4 mg/L NOEC: 0.05 mg/L (Pseudokirchneriella subcapitata, 72 h)	LC50: 0.8 mg/l (Ictalurus punctatus, 96 h) NOEC: 0.093 mg/L (90 days)	-	EC50: 202 µg/L (48 h, Daphnia magna) NOEC: 0.0399 mg/L(21 days, Daphnia magna)
7-Oxabicyclo[4.1.0] heptane-3-carboxylic acid 2386-87-0	-	LC50: =24mg/L (96h, Oncorhynchus mykiss)	-	-

Persistence and degradability READILY BIODEGRADABLE.

Bioaccumulation The wholefish BCF was found to be 1850.

Component Information

Chemical name	Partition coefficient
Reaction mass of 4-tert-butylphenyl diphenyl phosphate and bis(4-tert-butylphenyl) phenyl phosphate and triphenyl phosphate ---	4.85
7-Oxabicyclo[4.1.0] heptane-3-carboxylic acid 2386-87-0	-

Mobility in soil Not applicable,. READILY BIODEGRADABLE.

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

UN/ID no UN3082
 Proper shipping name Environmentally hazardous substance, liquid, n.o.s.
 Transport hazard class(es) 9
 Packing group III
 Special Provisions 8, 146, 173, 335, IB3, T4, TP1, TP29

DOT Marine Pollutant	P
Marine pollutant	Yes
Description:	UN3082, Environmentally hazardous substance, liquid, n.o.s.(triphenyl phosphate, tert-butylated triphenyl phosphate mixtures containing 10% to 48% of triphenyl phosphate), 9, III, Marine pollutant
Emergency Response Guide Number	171

TDG

UN/ID no	UN3082
Proper shipping name	Environmentally hazardous substance, liquid, n.o.s.
Transport hazard class(es)	9
Packing group	III
Special Provisions	16, 99
Marine pollutant name	Yes.
Description:	UN3082, Environmentally hazardous substance, liquid, n.o.s.(triphenyl phosphate, tert-butylated triphenyl phosphate mixtures containing 10% to 48% of triphenyl phosphate), 9, III

MEX

UN/ID no	UN3082
Proper shipping name	Environmentally hazardous substance, liquid, n.o.s.
Transport hazard class(es)	9
Packing group	III
MEX Technical Name	triphenyl phosphate, tert-butylated triphenyl phosphate mixtures containing 10% to 48% of triphenyl phosphate
Description:	UN3082, Environmentally hazardous substance, liquid, n.o.s.(triphenyl phosphate, tert-butylated triphenyl phosphate mixtures containing 10% to 48% of triphenyl phosphate), 9, III
Special Provisions	274, 331, 335

IATA

UN number or ID number	UN3082
UN proper shipping name	Environmentally hazardous substance, liquid, n.o.s.
Transport hazard class(es)	9
Packing group	III
IATA Technical Name	triphenyl phosphate, tert-butylated triphenyl phosphate mixtures containing 10% to 48% of triphenyl phosphate
Description:	UN3082, Environmentally hazardous substance, liquid, n.o.s.(triphenyl phosphate, tert-butylated triphenyl phosphate mixtures containing 10% to 48% of triphenyl phosphate), 9, III
Special Provisions	A97, A158, A197

IMDG

UN number or ID number	UN3082
UN proper shipping name	Environmentally hazardous substance, liquid, n.o.s.
Transport hazard class(es)	9
Packing group	III
EmS-No	F-A, S-F
Special Provisions	274, 335, 969
Marine pollutant	P
Marine Pollutant	triphenyl phosphate, tert-butylated triphenyl phosphate mixtures containing 10% to 48% of triphenyl phosphate
Description:	UN3082, Environmentally hazardous substance, liquid, n.o.s.(triphenyl phosphate, tert-butylated triphenyl phosphate mixtures containing 10% to 48% of triphenyl 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
7-Oxabicyclo[4.1.0] heptane-3-carboxylic acid 2386-87-0 (0.1)	Present (ACTIVE)
TSCA	Listed or exempted
DSL	Listed or exempted
ENCS	Not Listed
IECSC	Not Listed
KECL	Not Listed
PICCS	Not Listed
AIIC	Not Listed
NZIoC	Not Listed
TCSI	Not Listed
NCI	Not Listed
TECI	Not Listed
NSQ	Not Listed

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL - Canadian 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)
Reaction mass of 4-tert-butylphenyl diphenyl phosphate and bis(4-tert-butylphenyl) phenyl phosphate and triphenyl phosphate - ---	-
7-Oxabicyclo[4.1.0] heptane-3-carboxylic acid - 2386-87-0	-

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 %
Reaction mass of 4-tert-butylphenyl diphenyl phosphate and bis(4-tert-butylphenyl) phenyl phosphate and triphenyl phosphate - ---	-
7-Oxabicyclo[4.1.0] heptane-3-carboxylic acid - 2386-87-0	-

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
Reaction mass of 4-tert-butylphenyl diphenyl phosphate and bis(4-tert-butylphenyl) phenyl phosphate and triphenyl phosphate ---	-	-	-	-
7-Oxabicyclo[4.1.0] heptane-3-carboxylic acid 2386-87-0	-	-	-	-

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)
Reaction mass of 4-tert-butylphenyl diphenyl phosphate and bis(4-tert-butylphenyl) phenyl phosphate and triphenyl phosphate ---	-	-	
7-Oxabicyclo[4.1.0] heptane-3-carboxylic acid 2386-87-0	-	-	

US State Regulations**California Proposition 65**

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Reaction mass of 4-tert-butylphenyl diphenyl phosphate and bis(4-tert-butylphenyl) phenyl phosphate and triphenyl phosphate ---	Listed (Triphenyl phosphate)	Listed (Triphenyl phosphate)	Listed (Triphenyl phosphate)
7-Oxabicyclo[4.1.0] heptane-3-carboxylic acid 2386-87-0	-	-	-
Cyclic Phosphonate (668) NOCAS	-	-	-

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	Flammability 1	Physical hazards 0	Personal protection X

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)
 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)
 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)
 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 Note

The symbol (***) in the margin of this SDS indicates that this line has been revised.

Disclaimer

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.

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End of Safety Data Sheet