

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

EASTMAN

Skydrol® LD4 Fire Resistant Hydraulic Fluid

Version	Revision Date:	SDS Number:	Date of last issue: 13.03.2019
2.5	06.08.2020	150000093409	Date of first issue: 18.09.2013
PRD		SDSGB / EN / 0001	

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name	:	Skydrol® LD4 Fire Resistant Hydraulic Fluid
Product code	:	34102-00, P3410207, P3410200, P3410206, P3410204, P3410202, P3410205, P3410203, E3410201, P3410208, P3410209
Unique Formula Identifier (UFI)	:	TXKG-8WHJ-VU0W-FPHJ

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture	:	Hydraulic fluids
Recommended restrictions on use	:	None known.

1.3 Details of the supplier of the safety data sheet

Company	:	Eastman Chemical Company 200 South Wilcox Drive 37660-5280 Kingsport
Telephone	:	+14232292000
E-mail address of person responsible for the SDS	:	Visit our website at www.EASTMAN.com or email emnmsds@eastman.com

1.4 Emergency telephone

Tel. 111 NCEC +44 (0)1235 239 670

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Skin irritation, Category 2	H315: Causes skin irritation.
Carcinogenicity, Category 2	H351: Suspected of causing cancer.
Long-term (chronic) aquatic hazard, Category 3	H412: Harmful to aquatic life with long lasting effects.

2.2 Label elements

Labeling (REGULATION (EC) No 1272/2008)

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Hazard pictograms

:



Signal Word

:

Warning

Hazard Statements

:

H315 Causes skin irritation.
H351 Suspected of causing cancer.
H412 Harmful to aquatic life with long lasting effects.

Precautionary Statements

:

Prevention:

P201 Obtain special instructions before use.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.

Disposal:

P501 Dispose of contents/ container to an approved facility in accordance with local, regional, national and international regulations.

Additional Labeling

EUH208 Contains 7-Oxabicyclo[4.1.0]heptane-3-carboxylic acid, 2-ethylhexyl ester. May produce an allergic reaction.

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Components

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
Tributyl phosphate	126-73-8 204-800-2 015-014-00-2	Acute Tox. 4; H302 Skin Irrit. 2; H315 Carc. 2; H351 Aquatic Chronic 3; H412	55 - 65

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	01-2119492859-14-0002		
Reaction mass of butyl diphenyl phosphate and dibutyl phenyl phosphate and tributyl phosphate	907-672-2 01-2119967407-27-0000	Carc. 2; H351 Aquatic Chronic 3; H412	20 - 40
2-ethylhexyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate	62256-00-2	Skin Sens. 1; H317	< 10
butylated hydroxytoluene	128-37-0 204-881-4 01-2119565113-46-xxxx	Aquatic Acute 1; H400 Aquatic Chronic 1; H410 M-Factor (Chronic aquatic toxicity): 1	1

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

- If inhaled : Move to fresh air.
If breathing is difficult, give oxygen.
Consult a physician if necessary.
- In case of skin contact : Wash off immediately with plenty of water for at least 15 minutes.
Get medical attention if symptoms occur.
Wash contaminated clothing before reuse.
- In case of eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes.
Get medical attention if symptoms occur.
- If swallowed : Call a physician or poison control center immediately.
Do not induce vomiting without medical advice.
Rinse mouth.
Never give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed

- Risks : Causes skin irritation.
Suspected of causing cancer.

4.3 Indication of any immediate medical attention and special treatment needed

- Treatment : Treat symptomatically.

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SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Water spray
Carbon dioxide (CO₂)
Dry chemical
Foam

Unsuitable extinguishing media : Do not use a solid water stream as it may scatter and spread fire.

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products : Carbon monoxide
Carbon dioxide (CO₂)
oxides of phosphorus

5.3 Advice for firefighters

Special protective equipment for fire-fighters : Wear an approved positive pressure self-contained breathing apparatus in addition to standard fire fighting gear.

Further information : Use a water spray to cool fully closed containers.
Do not allow run-off from fire fighting to enter drains or water courses.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Ventilate the area.
Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
Avoid contact with skin and eyes.
Material can create slippery conditions.
Wear appropriate personal protective equipment.
Local authorities should be advised if significant spillages cannot be contained.

6.2 Environmental precautions

Environmental precautions : Clear up spills immediately and dispose of waste safely.
Avoid release to the environment.
Collect spillage.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).

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6.4 Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Do not breathe vapors or spray mist.
Handle product only in closed system or provide appropriate exhaust ventilation at machinery.
In case of insufficient ventilation, wear suitable respiratory equipment.
Wear appropriate personal protective equipment.
Avoid contact with skin, eyes and clothing.
Wash thoroughly after handling.
Wash contaminated clothing before reuse.
Drain or remove substance from equipment prior to break-in or maintenance.
Handle in accordance with good industrial hygiene and safety practice.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Store locked up. Keep container tightly closed in a dry and well-ventilated place. Keep in a cool place away from oxidizing agents.

7.3 Specific end use(s)

Specific use(s) : www.EastmanAviationSolutions.com

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
Tributyl phosphate	126-73-8	TWA	5 mg/m3	GB EH40
		STEL	5 mg/m3	GB EH40
butylated hydroxy-toluene	128-37-0	TWA	10 mg/m3	GB EH40
Further information: Where no specific short-term exposure limit is listed, a figure three times the long-term exposure limit should be used.				

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Routes of exposure	Potential health effects	Value
Tributyl phosphate	Workers	Skin contact	Short-term exposure, Local effects	1.78 mg/cm2
	Workers	Skin contact	Long-term exposure, Local effects	0.44 mg/cm2

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	Workers	Skin contact	Short-term exposure, Systemic effects	1.78 mg/kg bw/day
	Workers	Skin contact	Long-term exposure, Systemic effects	0.44 mg/kg bw/day
	Workers	Inhalation	Short-term exposure, Local effects	12.52 mg/m3
	Workers	Inhalation	Long-term exposure, Local effects	3.13 mg/m3
	Workers	Inhalation	Short-term exposure, Systemic effects	12.52 mg/m3
	Workers	Inhalation	Long-term exposure, Systemic effects	3.13 mg/m3
	General Population	Oral	Short-term exposure, Systemic effects	0.88 mg/kg bw/day
	General Population	Oral	Long-term exposure, Systemic effects	0.22 mg/kg bw/day
	General Population	Skin contact	Short-term exposure, Local effects	0.88 mg/cm2
	General Population	Skin contact	Long-term exposure, Local effects	0.22 mg/cm2
	General Population	Skin contact	Short-term exposure, Systemic effects	0.88 mg/kg bw/day
	General Population	Skin contact	Long-term exposure, Systemic effects	0.22 mg/kg bw/day
	General Population	Inhalation	Short-term exposure, Local effects	3.08 mg/m3
	General Population	Inhalation	Long-term exposure, Local effects	0.77 mg/m3
	General Population	Inhalation	Short-term exposure, Systemic effects	3.08 mg/m3
	General Population	Inhalation	Long-term exposure, Systemic effects	0.77 mg/m3
Reaction mass of butyl diphenyl phosphate and dibutyl phenyl phosphate and tributyl phosphate	Workers	Skin contact	Long-term exposure, Local effects	0.48 mg/cm2
	Workers	Skin contact	Long-term exposure, Systemic effects	1.39 mg/kg bw/day
	Workers	Inhalation	Long-term exposure, Local effects	0.67 mg/m3
	Workers	Inhalation	Long-term exposure, Systemic effects	0.67 mg/m3
	General Population	Oral	Long-term exposure, Systemic effects	0.025 mg/kg bw/day
	General Population	Skin contact	Long-term exposure, Local effects	0.24 mg/cm2
	General Population	Skin contact	Long-term exposure, Systemic effects	0.69 mg/kg bw/day
	General Population	Inhalation	Long-term exposure, Local effects	0.167 mg/m3
	General Population	Inhalation	Long-term exposure, Systemic effects	0.167 mg/m3

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	lation		Systemic effects	
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Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	Environmental Compartment	Value
Tributyl phosphate	Water	0.082 mg/l
	Fresh water sediment	1.84 mg/kg
Remarks:	dry	
	Marine water	0.0082 mg/l
	Marine sediment	0.184 mg/kg
	dry	
	Sewage treatment plant	1 mg/l
	Soil	3.63 mg/kg
	dry	
Reaction mass of butyl diphenyl phosphate and dibutyl phenyl phosphate and tributyl phosphate	Water	0.0106 mg/l
	Marine water	0.00106 mg/l
	Aqua Intermittent	0.014 mg/l
	Fresh water sediment	1.02 mg/kg
Remarks:	dry	
	Marine sediment	0.102 mg/kg
	dry	
	Sewage treatment plant	10 mg/l
	Soil	0.199 mg/kg
	dry	

8.2 Exposure controls

Engineering measures

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal protective equipment

Eye protection : Wear safety glasses with side shields (or goggles).

Hand protection

Remarks : Wear suitable gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. After contamination with product change the gloves immediately and dispose of them according to relevant national and local regulations.

Skin and body protection : Wear suitable protective clothing.

Respiratory protection : Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary.

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Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn.

Protective measures : Ensure that eye flushing systems and safety showers are located close to the working place.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	: oily
Color	: purple
Odor	: odourless
Odor Threshold	: not determined
pH	: No data available
Melting point/range	: < -62 °C
Boiling point/boiling range	: not determined
Flash point	: 174 °C Method: Cleveland open cup
Evaporation rate	: not determined
Upper explosion limit / Upper flammability limit	: not determined
Lower explosion limit / Lower flammability limit	: not determined
Vapor pressure	: 0.27 hPa (25 °C)
Relative vapor density	: not determined
Relative density	: 1.0111 (25 °C)
Partition coefficient: n-octanol/water	: No data available
Autoignition temperature	: 469 °C Method: ASTM D2155

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Decomposition temperature	:	not determined
Viscosity		
Viscosity, dynamic	:	not determined
Viscosity, kinematic	:	< 2000 mm ² /s (-54 °C)
		11.15 mm ² /s (38 °C)
		3.83 mm ² /s (99 °C)
Explosive properties	:	No data available
Oxidizing properties	:	No data available

9.2 Other information

No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

None reasonably foreseeable.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions : None known.

10.4 Conditions to avoid

Conditions to avoid : None known.

10.5 Incompatible materials

Materials to avoid : Strong oxidizing agents

10.6 Hazardous decomposition products

Emits acid smoke and fumes when heated to decomposition.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Not classified based on available information.

Product:

Acute oral toxicity : LD50 (Rat, male and female): 2,100 mg/kg

Acute inhalation toxicity : LC50 (Rat, male): > 5.8 mg/l

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Exposure time: 4 h
Test atmosphere: dust/mist
Assessment: The substance or mixture has no acute inhalation toxicity
Remarks: (highest concentration tested)

Acute dermal toxicity : LD50 Dermal (Rabbit, male and female): > 3,160 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

Components:

Tributyl phosphate:

Acute oral toxicity : LD50 Oral (Rat, male and female): 1,553 mg/kg
Assessment: Harmful if swallowed.

LD50 Oral (Rat, male and female): 1,400 mg/kg

Acute inhalation toxicity : LC50 (Rat, male and female): > 4.242 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 Dermal (Rabbit, male and female): > 3,100 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

Reaction mass of butyl diphenyl phosphate and dibutyl phenyl phosphate and tributyl phosphate:

Acute oral toxicity : Acute toxicity estimate (Rat, male and female): 2,400 - 3,000 mg/kg
Assessment: Not classified

Acute inhalation toxicity : LCLo (Rat, male and female): > 5 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Assessment: The substance or mixture has no acute inhalation toxicity

LC50 (Rat, male and female): > 5 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Assessment: Not classified

Acute dermal toxicity : LD50 Dermal (Rabbit, male and female): > 5,000 mg/kg
Assessment: Not classified

2-ethylhexyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:

Acute oral toxicity : LD50 Oral (Rat, male and female): 4,470 mg/kg

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Acute dermal toxicity : LD50 Dermal (Rabbit, male and female): > 7,940 mg/kg

butylated hydroxytoluene:

Acute oral toxicity : LD50 Oral (Rat): > 6,000 mg/kg

Acute dermal toxicity : LD50 Dermal (Guinea pig): > 20,000 mg/kg

Skin corrosion/irritation

Causes skin irritation.

Product:

Species	: Rabbit
Exposure time	: 24 h
Assessment	: irritating
Result	: moderate irritation

Components:

Tributyl phosphate:

Species	: Rabbit
Exposure time	: 4 h
Assessment	: Causes skin irritation.
Result	: irritating

Reaction mass of butyl diphenyl phosphate and dibutyl phenyl phosphate and tributyl phosphate:

Species	: Rabbit
Assessment	: Not classified
Result	: none

Species	: Humans
Exposure time	: 24 h
Assessment	: Not classified
Result	: none

2-ethylhexyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:

Species	: Rabbit
Exposure time	: 24 h
Assessment	: Not classified as hazardous.
Result	: slight to moderate irritation

butylated hydroxytoluene:

Species	: Rabbit
Exposure time	: 24 h
Result	: very slight

Serious eye damage/eye irritation

Not classified based on available information.

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Product:

Species	:	Rabbit
Exposure time	:	24 h
Assessment	:	Not classified
Result	:	slight

Components:

Tributyl phosphate:

Species	:	Rabbit
Exposure time	:	24 h
Assessment	:	Not classified
Result	:	slight irritation

Reaction mass of butyl diphenyl phosphate and dibutyl phenyl phosphate and tributyl phosphate:

Species	:	Rabbit
Assessment	:	Not classified
Result	:	slight

2-ethylhexyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:

Species	:	Rabbit
Exposure time	:	24 h
Assessment	:	Not classified
Result	:	slight irritation

butylated hydroxytoluene:

Species	:	Rabbit
Result	:	none

Respiratory or skin sensitization

Skin sensitization

Not classified based on available information.

Respiratory sensitization

Not classified based on available information.

Product:

Test Type	:	Human experience
Assessment	:	Not classified
Method	:	Human Repeat Insult Patch Test
Result	:	Does not cause skin sensitisation.

Components:

Tributyl phosphate:

Test Type	:	Skin Sensitization
Species	:	Guinea pig

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Assessment : Not classified
Result : Does not cause skin sensitisation.

Test Type : Skin Sensitization
Species : Humans
Assessment : Not classified
Result : Does not cause skin sensitisation.

Reaction mass of butyl diphenyl phosphate and dibutyl phenyl phosphate and tributyl phosphate:

Test Type : Human experience
Species : Humans
Assessment : Not classified
Result : non-sensitizing

2-ethylhexyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:

Test Type : Skin Sensitization
Species : Guinea pig
Result : May cause sensitization by skin contact.

butylated hydroxytoluene:

Test Type : Skin sensitization
Species : Guinea pig
Result : non-sensitizing

Germ cell mutagenicity

Not classified based on available information.

Product:

Genotoxicity in vitro : Test Type: Salmonella typhimurium assay (Ames test)
Metabolic activation: +/- activation
Result: negative

Test Type: Mutagenicity - Mammalian
Metabolic activation: +/- activation
Method: In vitro Mammalian Chromosome Aberration Test
Result: negative

Components:

Tributyl phosphate:

Genotoxicity in vitro : Test Type: Mutagenicity - Bacterial
Metabolic activation: +/- activation
Method: Bacterial Reverse Mutation Assay
Result: negative

Test Type: Mutagenicity - Mammalian
Metabolic activation: +/- activation
Method: In vitro Mammalian Chromosome Aberration Test
Result: equivocal

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Genotoxicity in vivo : Species: Rat (male and female)
Application Route: oral: gavage
Method: Mammalian Bone Marrow Chromosome Aberration Test
Result: negative

Reaction mass of butyl diphenyl phosphate and dibutyl phenyl phosphate and tributyl phosphate:

Genotoxicity in vitro : Test Type: Salmonella typhimurium assay (Ames test)
Metabolic activation: +/- activation
Method: Bacterial Reverse Mutation Assay
Result: negative

Test Type: Mutagenicity - Mammalian
Metabolic activation: +/- activation
Method: In vitro Mammalian Cell Gene Mutation Test
Result: negative

Metabolic activation: +/- activation
Method: In vitro Mammalian Chromosome Aberration Test
Result: negative

Test Type: Mutagenicity - Mammalian
Metabolic activation: - activation
Method: Genetic Toxicology: DNA Damage and Repair, Un-scheduled DNA Synthesis in Mammalian Cells In Vitro
Result: negative

Genotoxicity in vivo : Species: Rat (male and female)
Application Route: Intraperitoneal injection
Result: negative

2-ethylhexyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:

Genotoxicity in vitro : Test Type: Salmonella typhimurium assay (Ames test)
Metabolic activation: +/- activation
Method: Bacterial Reverse Mutation Assay
Result: negative

Test Type: Mutagenicity - Mammalian
Metabolic activation: +/- activation
Method: In vitro Mammalian Chromosome Aberration Test
Result: equivocal

Test Type: Mutagenicity - Mammalian
Metabolic activation: +/- activation
Method: In vitro Mammalian Cell Gene Mutation Test
Result: negative

Genotoxicity in vivo : Species: Rat (male and female)
Application Route: intraperitoneal injection
Method: Mammalian Bone Marrow Chromosome Aberration

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Test
Result: equivocal

Carcinogenicity

Suspected of causing cancer.

Product:

Remarks : This information is not available.

Components:

Tributyl phosphate:

Species : Rat, male and female
Application Route : Ingestion
Method : EPA OTS 798.3300
Remarks : Limited evidence of a carcinogenic effect.
May cause cancer.

Reaction mass of butyl diphenyl phosphate and dibutyl phenyl phosphate and tributyl phosphate:

Carcinogenicity - Assessment : Limited evidence of a carcinogenic effect.

Reproductive toxicity

Not classified based on available information.

Product:

Effects on fertility : Remarks: No data available

STOT-single exposure

Not classified based on available information.

Product:

Remarks : No data available

Components:

Tributyl phosphate:

Assessment : Based on available data, the classification criteria are not met.

Reaction mass of butyl diphenyl phosphate and dibutyl phenyl phosphate and tributyl phosphate:

Assessment : Not classified

STOT-repeated exposure

Not classified based on available information.

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Product:

Remarks : No data available

Components:

Tributyl phosphate:

Assessment : Based on available data, the classification criteria are not met.

Reaction mass of butyl diphenyl phosphate and dibutyl phenyl phosphate and tributyl phosphate:

Routes of exposure : inhalation (dust/mist/fume)
Target Organs : Respiratory system
Assessment : Not classified

Repeated dose toxicity

Product:

Species : Rat, male and female
NOAEL : 40 mg/m³
Application Route : Inhalation
Exposure time : 28 days
Target Organs : Blood, Respiratory system
Remarks : Irritating to eyes and respiratory system.

Components:

Tributyl phosphate:

Species : Mouse, male and female
NOAEL : 75 mg/kg
Application Route : in feed
Exposure time : 90 days

Reaction mass of butyl diphenyl phosphate and dibutyl phenyl phosphate and tributyl phosphate:

Species : Rat, male and female
NOAEL : 5 mg/kg
LOAEL : 50 mg/kg
Application Route : in feed
Exposure time : 90 days

Species : Rat, male and female
NOAEL : 5 mg/m³
Application Route : Inhalation
Exposure time : 90 days

Species : Rabbit, male and female
NOAEL : 100 mg/kg bw/day
Application Route : Dermal Study
Exposure time : 21 d

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Aspiration toxicity

Not classified based on available information.

Product:

Not applicable

Components:

2-ethylhexyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:

Not applicable

Information on likely routes of exposure

Product:

Inhalation	:	Remarks: None known.
Skin contact	:	Remarks: Causes skin irritation.
Eye contact	:	Remarks: Contact with the eyes may be very painful but does not cause damage.
Ingestion	:	Remarks: None known.

Further information

Product:

Remarks : None known.

SECTION 12: Ecological information

12.1 Toxicity

Product:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 5.2 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	LC50 (Daphnia magna (Water flea)): 5.8 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	EC50 (Selenastrum capricornutum (green algae)): 8.2 mg/l Exposure time: 96 h

Components:

Tributyl phosphate:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 4.2 mg/l Exposure time: 96 h
Toxicity to daphnia and other	:	EC50 (Daphnia magna (Water flea)): 1.8 mg/l

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aquatic invertebrates	Exposure time: 48 h
Toxicity to algae/aquatic plants	: EC50 (Desmodesmus subspicatus (green algae)): 1.1 mg/l Exposure time: 72 h
Toxicity to fish (Chronic toxicity)	: NOEC: 0.82 mg/l Exposure time: 95 d Species: Oncorhynchus mykiss (rainbow trout) 1.7 mg/l
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: NOEC: 1.3 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea)

Reaction mass of butyl diphenyl phosphate and dibutyl phenyl phosphate and tributyl phosphate:

Toxicity to fish	: LL50 (Cyprinus carpio (Carp)): 1.8 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): 1.4 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	: EL50 (Selenastrum capricornutum (green algae)): 9.6 mg/l Exposure time: 72 h Remarks: EL50 method of the water accommodated fraction (W.A.F.) NOELR (Selenastrum capricornutum (green algae)): 3.5 mg/l Exposure time: 72 h Remarks: EL50 method of the water accommodated fraction (W.A.F.)
Toxicity to fish (Chronic toxicity)	: NOEC: > 0.11 mg/l Exposure time: 60 d Species: Oncorhynchus mykiss (rainbow trout)
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: NOEC: 0.106 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea)

Ecotoxicology Assessment

Acute aquatic toxicity	: This product has no known ecotoxicological effects.
Chronic aquatic toxicity	: Harmful to aquatic life with long lasting effects.

12.2 Persistence and degradability

Product:

Biochemical Oxygen Demand (BOD)	: Remarks: not determined
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Chemical Oxygen Demand (COD) : Remarks: not determined

Components:

Tributyl phosphate:

Biodegradability : Result: Readily biodegradable.

Reaction mass of butyl diphenyl phosphate and dibutyl phenyl phosphate and tributyl phosphate:

Biodegradability : Method: Ready Biodegradability: Manometric Respirometry Test
Remarks: Readily biodegradable

Method: Ready Biodegradability: Modified MITI Test (I)
Remarks: Not readily biodegradable.

2-ethylhexyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:

Biodegradability : Concentration: 100 mg/l
Method: Ready Biodegradability: Modified MITI Test (I)
Remarks: Readily biodegradable

12.3 Bioaccumulative potential

Components:

Tributyl phosphate:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Exposure time: 56 d
Bioconcentration factor (BCF): 20
Method: OECD Test Guideline 305

Exposure time: 38 d
Bioconcentration factor (BCF): 35

Partition coefficient: n-octanol/water : Pow: 10,100

Reaction mass of butyl diphenyl phosphate and dibutyl phenyl phosphate and tributyl phosphate:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 35
Method: OECD Test Guideline 305

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12.4 Mobility in soil

Components:

Reaction mass of butyl diphenyl phosphate and dibutyl phenyl phosphate and tributyl phosphate:

Distribution among environmental compartments : Koc: 933, log Koc: 2.97
Method: QSAR model

12.5 Results of PBT and vPvB assessment

Product:

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher..

12.6 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : Dispose of in accordance with local regulations.

SECTION 14: Transport information

14.1 UN number

Not regulated as a dangerous good

14.2 UN proper shipping name

Not regulated as a dangerous good

14.3 Transport hazard class(es)

Not regulated as a dangerous good

14.4 Packing group

Not regulated as a dangerous good

14.5 Environmental hazards

Not regulated as a dangerous good

14.6 Special precautions for user

Not applicable

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable for product as supplied.

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SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals : Not applicable

REACH - Candidate List of Substances of Very High Concern for Authorization (Article 59). : Not applicable

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer : Not applicable

Regulation (EC) No 850/2004 on persistent organic pollutants : Not applicable

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.
Not applicable

Other regulations:

Take note of Directive 92/85/EEC regarding maternity protection or stricter national regulations, where applicable.

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

The ingredients of this product are reported in the following inventories:

TCSI	: On the inventory, or in compliance with the inventory
TSCA	: All substances listed as active on the TSCA inventory
AICS	: On the inventory, or in compliance with the inventory
DSL	: All components of this product are on the Canadian DSL
NZIoC	: On the inventory, or in compliance with the inventory
ENCS	: On the inventory, or in compliance with the inventory
IECSC	: On the inventory, or in compliance with the inventory
PICCS	: On the inventory, or in compliance with the inventory

15.2 Chemical Safety Assessment

For the following substances of this mixture a chemical safety assessment has been carried out:
tributyl phosphate

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Reaction mass of dibutyl phenyl phosphate, butyl diphenyl phosphate and tributyl phosphate

SECTION 16: Other information

Full text of H-Statements

H302	: Harmful if swallowed.
H315	: Causes skin irritation.
H317	: May cause an allergic skin reaction.
H351	: Suspected of causing cancer.
H400	: Very toxic to aquatic life.
H410	: Very toxic to aquatic life with long lasting effects.
H412	: Harmful to aquatic life with long lasting effects.

Full text of other abbreviations

Acute Tox.	: Acute toxicity
Aquatic Acute	: Short-term (acute) aquatic hazard
Aquatic Chronic	: Long-term (chronic) aquatic hazard
Carc.	: Carcinogenicity
Skin Irrit.	: Skin irritation
Skin Sens.	: Skin sensitization
GB EH40	: UK. EH40 WEL - Workplace Exposure Limits
GB EH40 / TWA	: Long-term exposure limit (8-hour TWA reference period)
GB EH40 / STEL	: Short-term exposure limit (15-minute reference period)

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature;

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SDS - Safety Data Sheet; SVHC - substance of very high concern; TCSI - Taiwan Chemical Substance Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Sources of key data used to : www.EastmanAviationSolutions.com
compile the Material Safety
Data Sheet

Classification of the mixture:

Skin Irrit. 2	H315
Carc. 2	H351
Aquatic Chronic 3	H412

Classification procedure:

Calculation method
Calculation method
Calculation method

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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