

SAFETY DATA SHEET (SDS)

PRODUCT NAME: MECHANICAL PUMP OIL - KRYTOX PFPE AND VPF 1500 SERIES

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/ UNDERTAKING

1.1 Product identifier

Product name: Krytox PFPE Oils, Krytox VPF 1500 Series Oils.
Other means of identification: None known.
Item numbers: Krytox 1506: H11307018, H11307020.
Krytox 1514: H11308018, H11308020.
Krytox 1525: H11309018, H11309020.

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

Identified use: Lubricant.
Uses advised against: No data available.

1.3 Details of the supplier of the safety data sheet.

UK contact details

Edwards, Innovation Drive, Burgess Hill, West Sussex,
RH15 9TW, United Kingdom

General enquiries

Tel: +44 (0)8459 212223
Email: info@edwardsvacuum.com

US contact details

Edwards, 6416 Inducon Drive West, Sanborn,
New York, 14132, USA

General enquiries

Toll Free: 1-800-848-9800

1.4 Emergency telephone number

Chemtrec: 1-800-424-9300.

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS classification: Substance.
Classification according to
Regulation (EC) No. 1272/2008: Not classified as hazardous.
Classification according to
Directive 1999/45/EC: Not classified as hazardous.

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2.2 Label elements

Hazard pictograms: Not applicable.
Signal words: Not applicable.
Hazard statements: Not applicable.
Precautionary statements: Not applicable.

2.3 Other hazards

PBT criteria: No data available.
vPvB criteria: No data available.
Other hazards which do not result in a classification: Breathing high concentrations of vapour may cause shortness of breath and irritation.
Thermal decomposition can lead to the liberation of Fluorinated compounds.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Ingredient	CAS No	Hazard class*	Risk phrase / Hazard Statements*
Perfluoroalkylether	60164-51-4	Not applicable	Not applicable

* Hazard class, Risk phrase and Hazard Statements. These columns are only completed for ingredients which are classified as hazardous under EU Directive No 1272/2008 (as amended) and are present in sufficient concentration to make the overall substance hazardous. In all other situations, the column will be completed as "Not applicable".

Full text for the declared risk phrases and hazards statements is given in Section 16.

3.2 Mixtures

Not applicable.

SECTION 4. FIRST AID MEASURES

4.1 Description of first aid measures

Eyes: Rinse thoroughly with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Remove contact lenses, if present and easy to do so. Seek medical attention if symptoms persist.

Skin: Wash contaminated skin with plenty of soap and water. Seek medical attention if symptoms occur.

Ingestion/Oral: Never give anything by mouth to an unconscious person. Do not induce vomiting unless instructed to do so by a physician or poison control centre.

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Inhalation: Remove affected person to fresh air. If breathing problems occur, a qualified individual should administer Oxygen or artificial respiration as indicated. Seek immediate medical attention.

General advice: When symptoms persist or in all cases of doubt seek medical advice.

4.2 Most important symptoms and effect, both acute and delayed

Potential acute health effects:

Eyes: No data available.
Skin: No data available.
Ingestion / Oral: No data available.
Inhalation: Effects of breathing high concentrations of vapour may include irritation and shortness of breath.

Over-exposure symptoms:

Eyes: No data available.
Skin: No data available.
Ingestion / Oral: No data available.
Inhalation: No data available.

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media: The product itself does not burn. Select extinguishing media to suit other material(s) involved.

Unsuitable extinguishing media: No data available.

5.2 Special hazards arising from the substance or mixture

Fire and explosion hazard: No data available.

Hazardous combustion products Thermal decomposition may occur at temperatures above 350 °C / 662 °F liberating fluorinated compounds.

5.3 Advice for fire-fighters

Special precautions for fire-fighters: Not applicable.

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Special protective equipment for fire-fighters:

Fire-fighters should wear Self-Contained Breathing Apparatus (SCBA) with full face-piece operated in positive pressure mode. Skin protection should be worn to protect from thermal decomposition products. Follow the standard procedure for chemical fires.

For Flammability Properties - refer to Section 9.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel:

No action shall be taken involving any personal risk or without suitable training. Evacuate non-essential staff, or those not equipped with individual personal protective equipment. Turn leaking containers leaktight up to prevent the escape of the product. Do not touch or walk through spilled material; spilt product constitutes a slip hazard. Avoid contact with skin and eyes. Put on appropriate personal protective equipment (refer to Section 8).

For emergency responders:

No data available.

6.2 Environmental precautions:

Contain spill before washing area to prevent slip hazard. Prevent product from entering drains, sewers and watercourses.

6.3 Methods and material for containment and cleaning up

Put on the necessary personal protective equipment; refer to Section 8. Exercise caution; the area of the spill may be slippery. Absorb material onto vermiculite, dry sand, earth or similar inert absorbent. Place spilled material into covered container for disposal. Use a suitable cleaning solution to clean up any remaining product. Dispose of according to applicable local, state and federal regulations. Do not flush into surface water or sanitary sewer system.

6.4 Reference to other sections

Refer to Section 8 for information on personal protective equipment.

Refer to Section 13 for information on disposal considerations.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Ensure personal protective equipment is used whenever handling the product, refer to Section 8. Avoid eating and drinking in areas where the product is used. Practice good hygiene. Wash hands after use and prior to consuming food and drink. Use in a well ventilated area and avoid breathing vapours from overheated product.

7.2 Conditions for safe storage, including any incompatibilities

Store in sealed containers, in a cool well-ventilated area. Do not store in areas that may reach high temperatures (350 °C / 662 °F).

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7.3 Specific end use(s)

No data available.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Substance	ACGIH - TLV	OSHA - PEL	Occupational Exposure Limits EH40 (UK)
None	Not applicable	Not applicable	Not applicable

8.2 Exposure controls

Appropriate engineering controls: None required under normal conditions of use. If heated above 350 °C / 662 °F local ventilation should be provided to avoid exposure to decomposition products.

Individual protection measures:

Eye/Face Protection: Wear suitable eye protection complying with EN 166.

Hand/Skin Protection: Wear suitable protective clothing such as nitrile impermeable gloves (chemical, oil and solvent resistant) and long-sleeved overalls/coveralls and safety shoes appropriate to the risk at the specific workplace.

Respiratory Protection: Use a personal respirator and approved filter that conforms to local and national standards when potentially exposed to hazardous decomposition products.

Hygiene Measures: Practice good hygiene. Wash face, hands and any exposed skin thoroughly after handling. Remove all soiled and contaminated clothing. Do not eat or drink while handling the product.

Other/General Protection: None.

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SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Colourless viscous liquid	Melting point / freezing point	No data available	°C / °F
Odour	Odourless	Initial boiling point and boiling range	No data available	°C / °F
Odour threshold	No data available	Flash point	Does not flash (Pensky-Martens Closed Cup)	°C / °F
pH	Neutral	Upper/lower flammability or explosive limits	No data available	°C / °F
Evaporation rate	No data available	Vapour pressure	No data available	hPa
Flammability (solid, gas)	No data available	Vapour density	No data available	g/cm ³
Solubility(ies)	Insoluble in water	Relative density	1.86 - 1.91 @ 24 °C / 75.2 °F	g/cm ³
Partition coefficient: n-octanol/water	No data available	Auto-ignition temperature	No data available	°C / °F
Explosive properties	No data available	Decomposition temperature	> 350 / 662	°C / °F
Oxidising properties	No data available	Viscosity	No data available	mPa.s

9.2 Other information

None.

SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity

Stable under normal conditions of use.

10.2 Chemical stability

Stable under normal conditions of use.

10.3 Possibility of hazardous reactions

Decomposes on heating.

10.4 Conditions to avoid

To avoid thermal decomposition, avoid heating above 350 °C / 662 °F.

10.5 Incompatible materials

No data available.

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10.6 Hazardous decomposition products

Fluorinated compounds.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity:	LD50 Oral: > 37,400 mg/kg (Rat) - Based on data from Great Britain LD50 Oral: > 11,000 mg/kg (Rat) - Based on data from the European Community Approximate Lethal Dose (ALD) Dermal: > 17,000 mg/kg (Rabbit) Approximate Lethal Concentration (ALC) Inhalation: > 19.54 mg/l (4 hr, Rat)
Irritation:	Not classified as an irritant to the eye or skin (Rabbit).
Corrosivity:	No data available.
Sensitisation:	Not classified as a sensitiser (human patch test).
Repeat dose toxicity:	No data available.
Carcinogenicity:	No data available.
Mutagenicity:	Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
Specific Target Organ Toxicity (STOT) - single exposure	No data available.
STOT - repeated exposure	No data available.
Aspiration hazard	No data available.
Toxicity for reproduction:	No toxicity to reproduction.

Information on likely routes of exposure

No data available.

Symptoms related to the physical, chemical and toxicological characteristics

Eye Effects:	No data available.
Skin Effects:	No data available.
Ingestion/Oral Effects:	No data available.
Inhalation Effects:	Effects of breathing high concentrations of vapour may include irritation and shortness of breath.

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

No data available.

Other information

No data available.

SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity

The substance is a polymer and is not expected to produce toxic effects.

LC50, 96 h > 1000 mg/l, *Oncorhynchus mykiss* (Rainbow Trout).

EC50, 48 h > 1000 mg/l, *Daphnia magna* (Water Flea) - Based on data from Great Britain.

EC50, 48 h > 100 mg/l, *Daphnia magna* (Water Flea) - Based on data from the European Community.

ErC50, 72 h > 1000 mg/l *Pseudokirchneriella subcapitata* (Green Algae).

NOEC, 72 h > 1000 mg/l *Pseudokirchneriella subcapitata* (Green Algae).

12.2 Persistence and degradability

This product is not readily biodegradable.

12.3 Bioaccumulative potential

No data available.

12.4 Mobility in soil

No data available.

12.5 Results of PBT and vPvB assessment

PBT: No data available.

vPvB: No data available.

12.6 Other adverse effects

No data available.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product: Dispose of the product in compliance with all applicable local and national regulations. This product is not suitable for disposal via municipal sewers, drains natural streams or rivers.

Packaging: If recycling is not practical, dispose of the packaging in compliance with all applicable local and national regulations.

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SECTION 14. TRANSPORT INFORMATION

14.1 UN number

ADR/RID	IMDG	IATA	United States DOT
Not applicable	Not applicable	Not applicable	Not applicable

14.2 UN proper shipping name

ADR/RID	IMDG	IATA	United States DOT
Not applicable	Not applicable	Not applicable	Not applicable

14.3 Transport hazard class

ADR/RID	IMDG	IATA	United States DOT
Not applicable	Not applicable	Not applicable	Not applicable

14.4 Packing group

ADR/RID	IMDG	IATA	United States DOT
Not applicable	Not applicable	Not applicable	Not applicable

14.5 Environmental hazards

ADR/RID	IMDG	IATA	United States DOT
Not applicable	Not applicable	Not applicable	Not applicable

14.6 Special precautions for user

ADR/RID	IMDG	IATA	United States DOT
Not applicable	Not applicable	Not applicable	Not applicable

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code

Not applicable.

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SECTION 15. REGULATORY INFORMATION

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

European

This product has been classified in accordance with EU Regulation No 1907/2006 (REACH) on the Classification, Labelling and Packaging of Substances and Mixtures.

Classified as dangerous to supply: No.

German Federal Water Management Act: WGK 1.

United States

Materials contained in this product are not listed on the U.S. Toxic Substances Control Act (TSCA).

SARA TITLE III - SECTION 313 SUPPLIER NOTIFICATION:

This product does not contain toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 and 40 CFR Part 372.

California Proposition 65: This product does not contain chemicals known to the State of California to cause cancer or reproductive toxicity.

Canadian

WHMIS Classification: Not WHMIS controlled.

Ingredients in this product are included in the Canadian DSL.

15.2 Chemical safety assessment

No data available.

SECTION 16. OTHER INFORMATION

This SDS is compiled in accordance with ANSI Z400.1, Regulation (EC) No 1907/2006 (as amended by Regulation No 453/2010) concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

16.1 Full text of abbreviated statements and phrases

Not applicable.

16.2 NFPA / HMIS hazard codes

NFPA Hazard codes		HMIS Hazard codes		Rating System
Health	No data available	Health	No data available	0 = No Hazard
Flammability	No data available	Flammability	No data available	1 = Slight Hazard
Instability	No data available	Reactivity	No data available	2 = Moderate Hazard
				3 = Serious Hazard
				4 = Severe Hazard

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16.3 Sources of information for this data sheet

- DuPont Safety Data Sheet for "Krytox PFPE Oils" (Great Britain). Reference 150000000934. Version 3.7, Revision Date 22nd October 2013.
- DuPont Safety Data Sheet for "Krytox PFPE Oils" (European Union). Reference 150000000934. Version 2.0, Revision Date 27th June 2014.
- DuPont Safety Data Sheet for "Krytox PFPE Oils" (Canada). Reference 150000000934. Version 2.0, Revision Date 22nd February 2011.

16.4 Glossary

ACGIH - American Conference of Governmental Industrial Hygienists; **ADR** - European Agreement concerning the International Carriage of Dangerous Goods by Road; **ALC** - Approximate Lethal Concentration; **ALD** - Approximate Lethal Dose; **ANSI** - American National Standards Institute; **CAS No.** - Chemical Abstracts Service number; **Chemtrec** - Chemical Transportation Emergency Centre (US); **CLV** - Ceiling Limit Value; **DSL** - Domestic Substances List; **EH40 (UK)** - HSE Guidance Note EH40 Occupational Exposure Limits; **EPCRA** - Emergency Planning and Community Right-to-Know Act; **EU** European Union; **GHS** - Globally Harmonized System of Classification and Labelling of Chemicals; **HMIS** - Hazardous Material Information Service; **IATA** - International carriage of dangerous goods by air; **IBC** - International Bulk Chemical; **IMDG** - International carriage of dangerous goods by sea; **LC** - Lethal Concentration; **LD** - Lethal Dose; **MARPOL 73/78** - International Convention for the Prevention of Pollution from Ships, 1973 as modified by the protocol of 1978; **NFPA** - National Fire Protection Association; **NOEL** - No Observed Effect Level; **OEL** - Occupational Exposure Limit; **OSHA** - Occupational Safety and Health Administration; **PBT** - Persistent, Bioaccumulative, Toxic chemical; **PEL** - Permissible Exposure Limit; **REACH** - Registration, Evaluation, Authorisation and Restriction of Chemicals; **RID** - International carriage of dangerous goods by rail; **SARA (Title III)** - Superfund Amendments and Reauthorization Act; **SARA 313** - Superfund Amendments and Reauthorization Act, Section 313; **SDS** - Safety Data Sheet; **STEL** - Short Term Exposure Limit, 15 minute reference period; **STOT** - Specific Target Organ Toxicity; **SCBA** - Self-Contained Breathing Apparatus; **TLV** - Threshold Limit Value; **TSCA** - Toxic Substances Control Act Public Law 94-469; **TWA** - Time Weighted Average, 8 hour reference period; **US DOT** - US Department of Transportation; **vPvB** - Very Persistent, Very Bioaccumulative chemical; **WHMIS** - Workplace Hazardous Materials Information System.

16.5 Revisions:

April 2015 - Initial release.

January 2016 - Contact details updated. Revision date not changed to preserve 2-yearly SDS review date.

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