

Trade name: Therminol VP-1**Product no.:** 5008056**Current version :** 3.0.0, issued: 28.10.2021**Replaced version:** 2.1.0, issued: 23.07.2021**Region:** GB**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier****Trade name****Therminol VP-1****UFI:**

66FX-XWNF-AU0A-VK54

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

heat transfer fluids

Uses advised against

No data available.

1.3 Details of the supplier of the safety data sheet**Address**

Krahn Chemie Deutschland GmbH

Grimm 10

20457 Hamburg

Deutschland

Telephone no. +49 40 320 92-0

Fax no. +49 40 320 92-322

Information provided by / telephone

+49 40 320 92-0

Advice on Safety Data Sheet

msds@krahn.eu

1.4 Emergency telephone number

For medical advice (in German and English):

+49 551 192 40 (Giftinformationszentrum Nord)

In case of transport incidents and other emergencies:

+44 (0)1235 239 670 (NCEC, National Chemical Emergency Centre)

SECTION 2: Hazards identification**2.1 Classification of the substance or mixture****Classification in accordance with Regulation (EC) No 1272/2008 (CLP)**

Acute Tox. 4; H332

Aquatic Chronic 1; H410

Skin Irrit. 2; H315

STOT SE 3; H335

Classification information

Classification and labelling are based on toxicological studies performed on the product (mixture).

Classification and labelling with respect to water pollution risks are based on ecotoxicological studies performed on the product (mixture).

This product is assessed and classified using the methods and criteria below referred to in Article 9 of Regulation (EC) n° 1272/2008:

Physical hazards: determined through assessment data based on the methods or standards referred to in part 2 of Annex I to CLP

Health hazards and environmental hazards: determined through toxicological and ecotoxicological assessment data based on the methods or standards referred to in Part 3, 4 and 5 of Annex I to CLP.

2.2 Label elements**Labelling according to Regulation (EC) No 1272/2008 (CLP Regulation)****Hazard pictograms**

GHS07



GHS09

Signal word

Warning

Hazardous component(s) to be indicated on label:

biphenyl

Hazard statement(s)

H315

Causes skin irritation.

H332

Harmful if inhaled.

H335

May cause respiratory irritation.

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H410	Very toxic to aquatic life with long lasting effects.
Precautionary statement(s)	
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P273	Avoid release to the environment.
P280	Wear protective gloves.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312	Call a POISON CENTER/doctor if you feel unwell.
P391	Collect spillage.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
UFI:	
66FX-XWNF-AU0A-VK54	

2.3 Other hazards

PBT assessment
The components of this product are not considered to be a PBT.

vPvB assessment
The components of this product are not considered to be a vPvB.

SECTION 3: Composition/information on ingredients**3.1 Substances**

Not applicable. The product is not a substance.

3.2 Mixtures**Hazardous ingredients**

No	Substance name	Classification (EC) 1272/2008 (CLP)	Additional information	
	CAS / EC / Index / REACH no		Concentration	%
1	Diphenyl ether			
	101-84-8 202-981-2 - 01-2119472545-33	Eye Irrit. 2; H319 Aquatic Acute 1; H400 Aquatic Chronic 3; H412	73.50	wt%
2	biphenyl			
	92-52-4 202-163-5 601-042-00-8 01-2119480408-33	Aquatic Acute 1; H400 Aquatic Chronic 1; H410 Eye Irrit. 2; H319 Skin Irrit. 2; H315 STOT SE 3; H335	26.50	wt%

Full Text for all H-phrases and EUH-phrases: pls. see section 16

SECTION 4: First aid measures**4.1 Description of first aid measures****General information**

In case of persisting adverse effects, consult a physician. Remove contaminated clothing and shoes immediately, and launder thoroughly before reusing. If the patient is likely to become unconscious, place and transport in stable sideways position.

After inhalation

Ensure supply of fresh air. Remove affected person from the immediate area. Irregular breathing/no breathing: artificial respiration. In case of breathing difficulties give oxygen.

After skin contact

In case of contact with skin wash off immediately with soap and water.

After eye contact

Remove contact lenses. Rinse eye thoroughly under running water keeping eyelids wide open and protecting the unaffected eye (at least 10 to 15 minutes).

After ingestion

Rinse the mouth thoroughly with water. Do not induce vomiting. Call a doctor immediately. Never give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed

No data available.

4.3 Indication of any immediate medical attention and special treatment needed

No data available.

SECTION 5: Firefighting measures**5.1 Extinguishing media**

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Carbon dioxide; Dry chemical extinguisher; Water mist; Foam

Unsuitable extinguishing media

High power water jet

5.2 Special hazards arising from the substance or mixtureIn the event of fire, the following can be released: Carbon monoxide (CO); Carbon dioxide (CO₂)**5.3 Advice for firefighters**

Use self-contained breathing apparatus. Wear protective clothing. Cool endangered containers with water spray jet. Run-off water from fire fighting must not be discharged into drains or enter surface water. Fire residues and contaminated firefighting water must be disposed of in accordance with the local regulations.

SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures****For non-emergency personnel**

Refer to protective measures listed in sections 7 and 8. Ensure adequate ventilation. Do not inhale vapours. High risk of slipping due to leakage/spillage of product.

For emergency responders

No data available. Personal protective equipment (PPE) - see Section 8.

6.2 Environmental precautions

Do not discharge into the drains/surface waters/groundwater. Do not discharge into the subsoil/soil. In case of entry into waterways, soil or drains, inform the responsible authorities.

6.3 Methods and material for containment and cleaning up

Prevent spread over a wide area. Take up with absorbent material (e.g., sand, kieselguhr, universal binder). Send in suitable containers for recovery or disposal.

6.4 Reference to other sections

No data available.

SECTION 7: Handling and storage**7.1 Precautions for safe handling****Advice on safe handling**

Provide good ventilation at the work area (local exhaust ventilation, if necessary). If workplace exposure limits are exceeded, respiratory protection approved for this particular job must be worn. Risks inherent to handling the product must be minimised by applying the appropriate protective and preventive measures. Working processes should - so far as possible, according to the state of the art - be designed to rule out bodily contact or the release of hazardous substances. Observe information on personal protection equipment (see section 8). Transfer and handle only in enclosed systems. Provide suitable exhaust ventilation at the processing machines.

General protective and hygiene measures

Do not eat, drink or smoke during work time. Keep away from food, drink and animal feeding stuffs. Wash hands before breaks and after work. Avoid contact with eyes and skin. Provide eye wash fountain in work area. Do not inhale vapours. Remove soiled or soaked clothing immediately.

Advice on protection against fire and explosion

Keep away from sources of heat and ignition.

7.2 Conditions for safe storage, including any incompatibilities**Technical measures and storage conditions**

Keep container tightly closed and dry in a cool, well-ventilated place. Protect from heat and direct sunlight.

Requirements for storage rooms and vessels

Containers which are opened must be carefully closed and kept upright to prevent leakage. Keep only in the original container.

Incompatible products

Do not store together with: oxidizing agents

7.3 Specific end use(s)

No data available.

SECTION 8: Exposure controls/personal protection**8.1 Control parameters****Occupational exposure limit values**

No	Substance name	CAS no.	EC no.
1	Diphenyl ether	101-84-8	202-981-2
	2017/164/EU		
	Diphenyl ether		

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WEL short-term (15 min reference period)	14	mg/m ³	2	ppm
WEL long-term (8-hr TWA reference period)	7	mg/m ³	1	ppm
List of approved workplace exposure limits (WELs) / EH40				
Diphenyl ether				
WEL short-term (15 min reference period)	14	mg/m ³	2	ppm
WEL long-term (8-hr TWA reference period)	7	mg/m ³	1	ppm

DNEL, DMEL and PNEC values**DNEL values (worker)**

No	Substance name			CAS / EC no	
	Route of exposure	Exposure time	Effect	Value	
1	Diphenyl ether			101-84-8 202-981-2	
	dermal	Long term (chronic)	systemic	25.00	mg/kg/day
	inhalative	Long term (chronic)	systemic	59.00	mg/m ³
	inhalative	Long term (chronic)	local	7.00	mg/m ³
	inhalative	Short term (acute)	local	14.00	mg/m ³
2	biphenyl			92-52-4 202-163-5	
	dermal	Long term (chronic)	systemic	63.00	mg/kg/day
	inhalative	Long term (chronic)	systemic	11.17	mg/m ³

DNEL value (consumer)

No	Substance name			CAS / EC no	
	Route of exposure	Exposure time	Effect	Value	
1	biphenyl			92-52-4 202-163-5	
	oral	Long term (chronic)	systemic	1.90	mg/kg/day
	dermal	Long term (chronic)	systemic	38.00	mg/kg/day
	inhalative	Long term (chronic)	systemic	3.30	mg/m ³

PNEC values

No	Substance name		CAS / EC no	
	ecological compartment	Type	Value	
1	Diphenyl ether		101-84-8 202-981-2	
	water	fresh water sediment	0.093	mg/kg dry weight
	water	marine water sediment	0.009	mg/kg dry weight
	soil	-	0.018	mg/kg
	with reference to: dry weight			
	sewage treatment plant	-	10.00	mg/L
2	biphenyl		92-52-4 202-163-5	
	water	fresh water	0.017	mg/L
	water	marine water	0.002	mg/L
	water	fresh water sediment	2.69	mg/kg
	with reference to: dry weight			
	water	marine water sediment	0.269	mg/kg
	with reference to: dry weight			
	soil	-	0.528	mg/kg
	with reference to: dry weight			
	sewage treatment plant	-	10.00	mg/L
	secondary poisoning	-	16.70	mg/kg
	with reference to: food			

8.2 Exposure controls**Appropriate engineering controls**

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**Respiratory protection**

If workplace exposure limits are exceeded, a respiration protection approved for this particular job must be worn. In case of aerosol and mist formation, take appropriate measures for breathing protection in the event workplace threshold values are not specified.

Eye / face protection

Safety glasses with side protection shield (EN 166)

Hand protection

Sufficient protection is given wearing suitable protective gloves checked according to i.e. EN 374, in the event of risk of skin contact with

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the product. Before use, the protective gloves should be tested in any case for its specific work-station suitability (i.e. mechanical resistance, product compatibility and antistatic properties). Adhere to the manufacturer's instructions and information relating to the use, storage, care and replacement of protective gloves. Protective gloves shall be replaced immediately when physically damaged or worn. Design operations thus to avoid permanent use of protective gloves. Heat-resistant gloves when using hot material (EN 407).

Appropriate Material	PVC		
Material thickness		1.26	mm
Breakthrough time		85	min
Appropriate Material	neoprene		
Material thickness		0.9	mm
Breakthrough time		45	min

Other

Chemical-resistant work clothes. Make sure when selecting personal protective equipment (PPE), that it is suitable for the activity, workplace conditions in which it will be used according to the applying European CEN standards and upon consultation with the PPE supplier.

Environmental exposure controls

No data available.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

State of aggregation			
liquid			
Form/Colour			
liquid			
colourless			
Odour			
characteristic			
pH value			
No data available			
Boiling point / boiling range			
Value		257	°C
Reference pressure		1013	hPa
Melting point/freezing point			
Value		12	°C
Decomposition temperature			
No data available			
Flash point			
Value		110	°C
Method		Pensky-Martens closed cup	
Value		124	°C
Method		Cleveland open cup	
Ignition temperature			
No data available			
Auto-ignition temperature			
Value		621	°C
Method		ASTM D 2155	
Flammability			
Not applicable			
Lower explosion limit			
No data available			
Upper explosion limit			
No data available			
Vapour pressure			
No data available			
Relative vapour density			
No data available			
Relative density			
Value		1.06	
Reference temperature		25	°C
Density			
Value		1.06	g/cm ³

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Reference temperature	25	°C
Solubility in water		
Value	0.025	g/l
Solubility		
No data available		
Partition coefficient n-octanol/water (log value)		
No data available		
Viscosity		
Value	2.48	mm²/s
Reference temperature	40	°C
Type	kinematic	
Value	0.99	mm²/s
Reference temperature	100	°C
Type	kinematic	
Particle characteristics		
No data available		

9.2 Other information

Other information
No data available.

SECTION 10: Stability and reactivity**10.1 Reactivity**

Dangerous reactions are not expected if the product is handled according to its intended use.

10.2 Chemical stability

Stable under recommended storage and handling conditions (See section 7).

10.3 Possibility of hazardous reactions

Dangerous reactions are not to be expected when handling product according to its intended use.

10.4 Conditions to avoid

Heat, naked flames and other ignition sources.

10.5 Incompatible materials

Oxidizing agents

10.6 Hazardous decomposition products

No hazardous decomposition products known.

SECTION 11: Toxicological information**11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008**

Acute oral toxicity			
No	Product Name		
1	Therminol VP-1		
LD50		2050	mg/kg
Species	rat		
Acute dermal toxicity			
No	Product Name		
1	Therminol VP-1		
LD50		5010	mg/kg
Species	rabbit		
Acute inhalational toxicity			
No	Product Name		
1	Therminol VP-1		
LC50		2.66	mg/m ³
Duration of exposure		4	h
State of aggregation	Dust/mist		
Species	rat		
Skin corrosion/irritation			
No	Product Name		
1	Therminol VP-1		
Duration of exposure		24	h
Species	rabbit		

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Evaluation	low-irritant		
Serious eye damage/irritation			
No	Product Name		
1	Therminol VP-1		
Duration of exposure	24	h	
Species	rabbit		
Evaluation	non-irritant		
Respiratory or skin sensitisation			
No	Substance name	CAS no.	EC no.
1	Diphenyl ether	101-84-8	202-981-2
Route of exposure	Skin		
Method	maximization test		
Source	ECHA		
Evaluation	non-sensitizing		
2	biphenyl	92-52-4	202-163-5
Route of exposure	Skin		
Species	guinea pig		
Method	OECD 406		
Source	ECHA		
Evaluation	non-sensitizing		
Germ cell mutagenicity			
No	Product Name		
1	Therminol VP-1		
Type of examination	Chromosome aberration test		
Evaluation	negative		
Type of examination	Ames-Test		
Evaluation	negative		
Type of examination	Mammalian Erythrocyte Micronucleus Test, In vivo		
Evaluation	negative		
Reproduction toxicity			
No	Product Name		
1	Therminol VP-1		
NOAEL	500	mg/kg	
Species	rat		
Evaluation/classification	Based on available data, the classification criteria are not met.		
NOAEL	< 50	mg/l	
Species	rat		
Method	OECD 414		
Evaluation/classification	Based on available data, the classification criteria are not met.		
Carcinogenicity			
No	Substance name	CAS no.	EC no.
1	biphenyl	92-52-4	202-163-5
Route of exposure	oral		
Species	rat		
Method	OECD 453		
Evaluation/classification	Based on available data, the classification criteria are not met.		
STOT - single exposure			
No data available			
STOT - repeated exposure			
No	Product Name		
1	Therminol VP-1		
Route of exposure	inhalative		
NOAEC	0.051	mg/l	
Species	rats (male/female)		
Route of exposure	oral		
LOAEL	500	mg/l	
Species	rat		
Aspiration hazard			
No data available			
Delayed and immediate effects as well as chronic effects from short and long-term exposure			
Contact with hot material may cause thermal burns. Contact of the product with skin or eyes may cause irritation. Inhalation of vapours in higher concentration may lead to irritation of eyes, nose and respiratory tract.			

11.2 Information on other hazards**Endocrine disrupting properties**

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No data available.

Other information

No data available.

SECTION 12: Ecological information**12.1 Toxicity**

Toxicity to fish (acute)			
No	Product Name		
1	Therminol VP-1		
LC50		7.6	mg/l
Duration of exposure		96	h
Species	Oncorhynchus mykiss		
Toxicity to fish (chronic)			
No data available			
Toxicity to Daphnia (acute)			
No	Product Name		
1	Therminol VP-1		
LC50		2.4	mg/l
Duration of exposure		48	h
Species	Daphnia magna		
Toxicity to Daphnia (chronic)			
No data available			
Toxicity to algae (acute)			
No	Product Name		
1	Therminol VP-1		
EC50		1.3	mg/l
Duration of exposure		72	h
Species	Selenastrum capricornutum		
Toxicity to algae (chronic)			
No data available			
Bacteria toxicity			
No data available			

12.2 Persistence and degradability

Biodegradability			
No	Substance name	CAS no.	EC no.
1	Diphenyl ether	101-84-8	202-981-2
Type	aerobic biodegradation		
Source	ECHA		
Evaluation	readily biodegradable		

12.3 Bioaccumulative potential

Bioconcentration factor (BCF)			
No	Substance name	CAS no.	EC no.
1	Diphenyl ether	101-84-8	202-981-2
BCF		196	
Species	Oncorhynchus mykiss		
Source	ECHA		
2	biphenyl	92-52-4	202-163-5
BCF		1900	
Species	Oncorhynchus mykiss		
Source	ECHA		

12.4 Mobility in soil

Mobility in soil			
No	Substance name	CAS no.	EC no.
1	biphenyl	92-52-4	202-163-5
log K _{oc}		3.19	
Method	OECD 106		

12.5 Results of PBT and vPvB assessment

Results of PBT and vPvB assessment	
PBT assessment	The components of this product are not considered to be a PBT.
vPvB assessment	The components of this product are not considered to be a vPvB.

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No data available.

12.7 Other adverse effects

No data available.

12.8 Other information**Other information**

Do not discharge product unmonitored into the environment.

SECTION 13: Disposal considerations**13.1 Waste treatment methods****Product**

Disposal of the product should be carried out in accordance with all applicable regulations following consultation with the responsible local authority and the disposal company in an authorised and suitable disposal facility.

Allocation of a waste code number, according to the European Waste Catalogue, should be carried out in agreement with the regional waste disposal company.

Packaging

Residues must be removed from packaging and when emptied completely disposed of in accordance with the regulations for waste removal. Incompletely emptied packaging must be disposed of in the form of disposal specified by the regional disposer.

SECTION 14: Transport information**14.1 Transport ADR/RID/ADN**

Class	9
Classification code	M6
Packing group	III
Hazard identification no.	90
UN number	UN3082
Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Technical name	Diphenyl ether biphenyl
Tunnel restriction code	-
Label	9
Environmentally hazardous substance mark	Symbol "fish and tree"

14.2 Transport IMDG

Class	9
Packing group	III
UN number	UN3082
Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Technical name	Diphenyl ether biphenyl
EmS	F-A, S-F
Label	9
Marine pollutant mark	Symbol "fish and tree"

14.3 Transport ICAO-TI / IATA

Class	9
Packing group	III
UN number	UN3082
Proper shipping name	Environmentally hazardous substance, liquid, n.o.s.
Technical name	Diphenyl ether biphenyl
Label	9
Environmentally hazardous substance mark	Symbol "fish and tree"

14.4 Other information

No data available.

14.5 Environmental hazards

Information on environmental hazards, if relevant, please see 14.1 - 14.3.

14.6 Special precautions for user

No data available.

14.7 Maritime transport in bulk according to IMO instruments

Not relevant

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According to the data available and/or specifications supplied by upstream suppliers, this product does not contain any substances considered as substances requiring authorisation as listed on Annex XIV of the REACH regulation (EC) 1907/2006.

REACH candidate list of substances of very high concern (SVHC) for authorisation

According to available data and the information provided by preliminary suppliers, the product does not contain substances that are considered substances meeting the criteria for inclusion in annex XIV (List of Substances Subject to Authorisation) as laid down in Article 57 and article 59 of REACH (EC) 1907/2006.

Regulation (EC) No 1907/2006 (REACH) Annex XVII: RESTRICTIONS ON THE MANUFACTURE, PLACING ON THE MARKET AND USE OF CERTAIN DANGEROUS SUBSTANCES, MIXTURES AND ARTICLES

The product is considered being subject to REACH regulation (EC) 1907/2006 annex XVII.

No 3

Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances

This product is subject to Part I of Annex I, risk category:

E1

Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control)

Comments not applicable

National regulations**National chemical inventories**

USA (TSCA)	listed
DSL/NDL (Canada)	DSL listed
ENCS (Japan)	ENCS/ISHL listed
ECL (Korea)	listed
AICS (Australia)	listed
IECSC / NEPA (China)	listed
PICCS (Philippines)	listed
NZIoC (New Zealand)	listed
CSNN (Taiwan)	listed

15.2 Chemical safety assessment

A chemical safety assessment has been carried out for the following substance/s in this mixture:

CAS no.	101-84-8 / 92-52-4
EC no.	202-981-2 / 202-163-5

SECTION 16: Other information**Sources of key data used to compile the data sheet:**

Regulation (EC) No 1907/2006 (REACH), 1272/2008 (CLP) as amended in each case.

Directives 2000/39/EC, 2006/15/EC, 2009/161/EU, (EU) 2017/164.

National Threshold Limit Values of the corresponding countries as amended in each case.

Transport regulations according to ADR, RID, IMDG, IATA as amended in each case.

The data sources used to determine physical, toxic and ecotoxic data, are indicated directly in the corresponding section.

Full text of the H- and EUH- phrases drawn up in sections 2 and 3 (provided not already drawn up in these sections)

H319	Causes serious eye irritation.
H400	Very toxic to aquatic life.
H412	Harmful to aquatic life with long lasting effects.

Creation of the safety data sheet

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This information is based on our present knowledge and experience.

The safety data sheet describes products with a view to safety requirements.

It does not however, constitute a guarantee for any specific product properties and shall not establish a legally valid contractual relationship.

Alterations/supplements:

Alterations to the previous edition are marked in the left-hand margin.

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