

SAFETY DATA SHEET

According to Regulation (EC) N° 1907/2006 (REACH); 453/2010/EC

1. Substance/preparation and company name

Trade Name Liquid Sun -20°C

Typical Applications Coolant – Antifreeze for Solar Thermal Energy.

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2. Hazard identification

2.1. Classification of the substance or mixture

No particular hazards known.

Classification according to Regulation (EC) No. 1272/2008 [CLP]:
The product is not subject to classification

2.2. Label elements

Label according to Regulation (CE)N° 1272/2008 [CLP]:
The product is not subject to labeling

3. Composition/Information on ingredients

Propylene Glycol with corrosion inhibitors.

Chemical name	CAS-No	CEE number	%
1,2-Propanediol	57-55-6	200-338-0	30-50

4. First aid measures

General advice Remove contaminated clothing.

On contact with eyes	Wash affected eyes for at least 15 minutes under running water with eyelids held open.
On skin contact	Wash thoroughly with soap and water.
If inhaled	If difficulties occur after vapour/aerosol has been inhaled remove to fresh air and seek medical attention.
On Ingestion	Rinse mouth and then drink water (two glasses at the most). Consult doctor if feeling unwell.
Note to physician	Symptomatic treatment (decontamination, vital functions), no known specific antidote.

5. Fire fighting measures

Suitable extinguishing media:	Water spray, alcohol resistant foam, dry extinguishers, carbon dioxide (CO ₂)
Specific hazards	Evolution of fumes/fog. The substances/group of substances mentioned can be released in case of fire. Vapours heavier than air.
Special protective equipment	In case of fire, wear a self contained breathing apparatus.
Further Information	The degree of risk is governed by the burning substance and the fire conditions. Contaminated extinguishing water must be disposed according to official regulations.

6. Accidental release measures

Personal precautions:	Use personal protective clothing. Do not inhale vapors/aerosol.
Environmental precautions:	Do not discharge into drains, surface waters, ground water.
Methods for cleaning up/taking up:	<u>Large amount:</u> Pump off products. <u>Residues/spills:</u> Bind the liquid by using a suitable absorbent material and dispose it according to the regulations.

7. Handling and storage

Handling	Ensure thorough ventilation of stores and working areas.
Protection against fire and explosion.	Take precautionary measures against static discharges. If exposed to fire, keep containers cool by spraying with water.
Storage	Product is hygroscopic. Containers should be stored tightly sealed in dry place. Since zinc is not compatible with propylene glycol, storage in galvanized containers is not recommended.

8. Exposure controls and personal protection

General safety and hygiene measures: Wash hands and forearms after handling.
Do not smoke, eat or drink during manipulations.

Personal protective equipment:

Respiratory protection: Only in case of release of fumes/fog. Well ventilated areas are recommended for manipulation.
Required when vapors/aerosols are generated. Filter A-(P2)

Hands: Chemical resistant protective gloves are recommended.

Eyes: Safety glasses with side-shields.

DNEL (Workers):

<i>Substance</i>		<i>Acute</i>		<i>Long Term</i>	
		Systemic	Local	Systemic	Local
1,2 Propanediol	Ingestion	Not relevant	Not relevant	Not relevant	Not relevant
CAS 57-55-6	Skin Contact	Not relevant	Not relevant	Not relevant	Not relevant
CE: 200-338-0	Inhalation	Not relevant	Not relevant	186 mg/m ³	10 mg/m ³

DNEL (Consumers):

<i>Substance</i>		<i>Acute</i>		<i>Long Term</i>	
		Systemic	Local	Systemic	Local
1,2 Propanediol	Ingestion	Not relevant	Not relevant	Not relevant	Not relevant
CAS 57-55-6	Skin Contact	Not relevant	Not relevant	Not relevant	Not relevant
CE: 200-338-0	Inhalation	Not relevant	Not relevant	50 mg/m ³	10 mg/m ³

PNEC Values

<i>Substance</i>	<i>Fresh Water</i>	<i>Sea Water</i>	<i>Water (Intermittent Releases)</i>	<i>Fresh Water Sediment</i>	<i>Sea Sediment</i>	<i>Soil</i>	<i>Sewage Treatment Plant</i>
1,2 Propanediol	260 mg/l	26 mg/l	183 mg/l	572 mg/Kg dry	57,2 mg/Kg dry	50 mg/Kg dry	20.000 mg/l

9. Physical and Chemical properties

Physical state	Liquid
Color	Orange
Odour	Weak, characteristic.
pH	8-9
Boiling point/range	aprox.100°C
Solidification temperature	-20°C
Vapour pressure at 20°C	0.1 mbar a 20°C
Flash point	>100°C
Lower explosion limit	2,6% V/V
Upper explosion limit	12,6% V/V
Ignition temperature	>200°C
Density	1.03-1.04 g/cc at 20°C
Solubility in water	Unlimited.
Solubility in other solvents	Soluble in polar solvents.

10. Stability and reactivity

Hazardous reactions	No hazardous reactions if stored and handle as prescribed.
Substances to avoid	Powerful oxidizing agents and strong acids.
Hazardous decomposition products	No hazardous decomposition products if stored and handle as prescribed.

11. Toxicological data

1,2 Propanediol data:

Acute Toxicity:

<i>Exposure</i>	<i>Parameter</i>	<i>Test</i>	<i>Value</i>	<i>Exposure time</i>	<i>Specie</i>	<i>Value</i>
Ingestion	DL50	OCDE 401	22.000 mg/Kg	-	Rat	Experimental
Skin Contact	DL50	OCDE 402	>2000 mg/Kg.	24 h	Rabbit	Experimental
Inhalation	CL50	OCDE 403	317042 mg/l	2 h	Rabbit	Experimental

Conclusion:

Acute Oral toxicity: Low

Acute Dermal toxicity: Low

Acute Inhalation toxicity: Low

Corrosion o irritation:

<i>Exposure</i>	<i>Result</i>	<i>Test</i>	<i>Exposure time</i>	<i>Specie</i>	<i>Value</i>
Ingestion	No irritating	OCDE 405	24, 48, 72 h	Rabbit	Experimental
Skin Contact	No irritating	OCDE 404	24, 48, 72 h	Rabbit	Experimental
Skin Contact	Slightly irritating	Patch	24 h	Human	Experimental

Conclusion:

Not classified as irritating to the skin.

Not classified as irritating to eyes.

Respiratory or Skin sensitization:

<i>Exposure</i>	<i>Result</i>	<i>Test</i>	<i>Exposure time</i>	<i>Specie</i>	<i>Value</i>
Skin Contact	not sensitizing	OCDE 429		Rat	Experimental
Skin Contact	not sensitizing	Patch	24 h	Human	Experimental
Inhalation	No relevant				

Conclusion:

No skin sensitizer.

Not available data for respiratory sensitization.

Specific Target Organ Toxicity.

<i>Exposure</i>	<i>Test</i>	<i>Value</i>	<i>Effect</i>	<i>Exposure time</i>	<i>Specie</i>	<i>Value</i>
Ingestion	OCDE 429	1700 mg/Kg day	No effect	>102 weeks(daily, 5 days/week)	Rat	Experimental
Skin Contact	Patch	0,02 ml (twice a week)	No effect	10 weeks (daily, 5 days/week)	Mouse	Experimental
Inhalation	LOAEC	160 mg/m ³	No effect	90 days	Rat	Experimental

Conclusion:

Subchronic dermal toxicity: Low.

Subchronic oral toxicity: Low

Subchronic inhalation toxicity: Low

Germ cell mutagenicity (in vitro)

<i>Result</i>	<i>Test</i>	<i>Test substrate</i>	<i>Effect</i>	<i>Value</i>
Negative	Others	Bacteria (S.typhimurium)		Experimental
Negative	OCDE 473	Human lymphocytes		Experimental

Carcinogenicity

<i>Exposure</i>	<i>Test</i>	<i>Value</i>	<i>Exposure time</i>	<i>Specie</i>	<i>Valor</i>	<i>Effect</i>
Inhalation	NOAEC	>350 mg/m ³ air	18 months	Rat	Experimental	No effect
Skin Contact	NOAEL	0,02 ml (twice per week)		Mouse	Experimental	No effect
Ingestion	NOAEL	1700 mg/Kg.	2 years	Rat	Experimental	No effect
Ingestion	NOAEL	3040 mg/Kg.	105 weeks	Rat	Experimental	No effect
Ingestion	NOAEL	2390 mg/Kg.day	105 weeks	Mouse	Experimental	No effect

Reproductive toxicity

<i>Study</i>	<i>Test</i>	<i>Valor</i>	<i>Exposure time</i>	<i>Specie</i>	<i>Effect</i>
Effect on fertility	OCDE 416	10100 mg/Kg day		Mouse	No Effect
Developmental Toxicity	OCDE 414	10400 mg/Kg day	9 days	Mouse	No Effect

Conclusion CMR

Not classified for carcinogenicity.

Not classified for mutagenic or genotoxic toxicity.

Not classified for reproductive toxicity or developmental toxicity.

12. Ecological data

Data for 1,2 Propanediol

Toxicity

<i>Study</i>	<i>Parameter</i>	<i>Test</i>	<i>Value</i>	<i>Test Time</i>	<i>Specie</i>	<i>Environment</i>
Acute Toxicity fishes	CL50		40613 mg/l	96 h	Oncorhynchus Mykiss	Fresh Water
Acute Toxicity invertebrates	CL50	EPA 600/4-90/027	18340 mg/l	48 h	Ceriodaphnia Dubia	Fresh Water
Acute Toxicity invertebrates	CL50	FIFRA 72-3	18800 mg/l	96 h	Americamysis bahía	Sea Water
Threshold limit algae	CE50	OCDE 201	19000 mg/l	96 h	Pseudokircheneriella subcapita	Fresh Water
Threshold limit algae	CE50	OCDE 201	19100 mg/l	96 h	Skeletonema Costatum	Sea Water
Acute Toxicity fishes	ChV	ECOSAR	2500 mg/l	30 days		Fresh Water
Acute Toxicity aquatic invertebrates	NOEC	EPA 600/4-89/001	13020 mg/l	7 days	Ceriodaphnia Sp.	Fresh Water
Toxicity aquatic microorganisms	NOEC		20000 mg/l	18 days	Pseudomonas Putida	Fresh Water
Toxicity sedimentary organisms	CL50		69836 mg/Kg sediment	10 days	Corophium volutator	Fresh Water

Conclusion

Harmless to fish (CL50 (96h) > 1000 mg/l)

Not harmful to invertebrates (CE50 (48) >1000 mg/l)

Harmless to algae (CE50 (72h) >1000 mg/l)

Harmless to bacteria (CE50 >1000 mg/l)

Persistence and degradability

Biodegradation in water:

<i>Test</i>	<i>Value</i>	<i>Test Duration</i>	<i>Value</i>
OCDE 301F	81,7%	28 days	Experimental

Biodegradation in soil:

<i>Test</i>	<i>Value</i>	<i>Duration</i>	<i>Value</i>
Others	98%	105 days	Experimental

Phototransformation aire (DT50 water)

<i>Test</i>	<i>Value</i>	<i>Conc. Radicals OH</i>	<i>Value</i>
AOPWIN v1.92	0,83 days	$1.5 \times 10^6 / \text{cm}^3$	QSAR

Phototransformation water (DT50 water)

<i>Test</i>	<i>Value</i>	<i>Conc. Radicals OH</i>	<i>Value</i>
Others	2,3 years	$1.5 \times 10^6 / \text{cm}^3$	Calculate

Conclusion:

Readily biodegradable in water

Biodegradable in soil under anaerobic conditions.

Photodegradation in water occurs slowly.

Bioaccumulation potential

Log Pow

<i>Test</i>	<i>Value</i>	<i>Temperature</i>	<i>Value</i>
OCDE 107	-1,07	20,5°C	Experimental

Percentage distribution

<i>Test</i>	<i>Air Fraction</i>	<i>Biota Fraction</i>	<i>Sediment Fraction</i>	<i>Soil Fraction</i>	<i>Water Fraction</i>	<i>Value</i>
Level of Mackay III	2,98%		0,07%	48,1%	48,8%	Calculate

Additional information Do not release into natural waters.

13. Disposal considerations

Contaminated packaging

Uncontaminated canisters can be re-used. Canisters that cannot be cleaned should be disposed of in the same manner as the contents.

Packaging that cannot be cleaned should be disposed according to the applicable law in the same way that content.

Waste code: (91/689 / EEC Commission Decision 2001/118 / EC, O.D. L47 of 16/2/2001):

07 01 0* (other organic solvents, washing liquids and mother liquors);

16 01 14* (antifreeze containing dangerous substances)

LWCA (Netherlands): KGA category 03

Hazardous waste (91/689 / EEC)

Disposal methods:

Recycling by distillation

Delete incinerator for solvents prior authorization of pollution control agency to discharge water treatment station

No discharge into surface water

Packaging / Container:

Waste material code packaging (91/689 / EEC Commission Decision 2001/118 / EC, O.D. L47 of 16/2/2001): 15 01 10 * (packaging containing residues of hazardous substances or contaminated by them)

Disposal of contaminated packaging: Completely empty containers

Disposal in an authorized waste collection point

Recommended cleaning method: cleaned by recycling center or specialized company

14. Transport information

Not classified as hazardous under transport regulations.

(ADR / RID / ADNR / IMDG/GGVSee ICIAO/IATA)

15. Regulatory information

Regulations of the European Union (labeling) / National legislation / Regulations:

Hazard symbol

H-phrases:

P-phrases:

16. Further information

Abbreviations and acronyms:

PNEC: Predicted No Effect Concentration.

Intermittent Release: Intermittent but only recurring infrequently i.e. less than once per month and for no more than 24 hours.

This safety data sheet is intended to provide information and recommendations as to: 1. how to handle chemical substances and preparations in accordance with the essential requirements of safety precautions and physical, toxicological and ecological data. 2. How to handle, store, use and transport them safely.

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