MATERIAL SAFETY DATA SHEET

S-OIL GEAR OIL 320

Date of the previous version: 2020-01-14 **Revision Date:** 2023-09-08 **Version** 2

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

1.1. Product identifier

Product name	**S-OIL GEAR OIL 320**
Pure substance/mixture	Mixture

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

Recommended Use	Industrial gear oil

1.3. Details of the supplier of the safety data sheet

Supplier	S-OIL CORPORATION 192, Baekbeom-ro, Mapo-gu, Seoul 04196, Korea

For further information, please contact:

Contact Point	HSSEQ
E-mail Address	dolyoo@stlc.co.kr

1.4. Emergency telephone number

Korea	**+ 82 2 6320-2000**

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

GHS Classification

Not classified

2.2. Label elements

GHS label elements, including precautionary statements

Symbol(s)	Not Classified
Signal Words	Not Classified

2.3. GHS Hazard Statements

Not classified

2.4. GHS Precautionary Statements

Prevention	Not Classified
Response	Not Classified
Storage	Not Classified
Disposal	Not Classified

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2.5. Other hazards

Physical-Chemical Properties Contaminated surfaces will be extremely slippery.

Environmental properties Should not be released into the environment

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Mixture

Chemical Name	CAS-No	EC-No	Weight %
Distillates (petroleum), hydrotreated heavy paraffinic	64742-54-7	265-157-1	15.0 ~ 25.0
Residual oils (petroleum), hydrotreated	64742-57-0	265-160-8	70.0 ~ 80.0
Industrial gear oil additive	Mixture	-	1.0 ~ 3.0
Polymerized dimethyl silicone fluid	Mixture	-	< 0.1
Oil solution of acrylic polymer	Mixture	-	< 1.0

Additional information Product containing mineral oil with less than 3% DMSO extract as measured by IP 346

4. FIRST AID MEASURES

4.1. Description of first-aid measures

General advice IN CASE OF SERIOUS OR PERSISTENT CONDITIONS, CALL A DOCTOR OR EMERGENCY MEDICAL CARE.

Eye contact Immediately flush with plenty of water. After initial flushing, remove any contact Lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing.

Skin contact Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Wash contaminated clothing before reuse. High pressure jets may cause skin damage. In this case, the casualty should be sent immediately to hospital.

Inhalation Remove casualty to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration.

Ingestion Clean mouth with water. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Call a physician or Poison Control Center immediately.

Protection of First-aiders First aider needs to protect himself. See Section 8 for more detail. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

4.2. Most important symptoms and effects, both acute and delayed

Eye contact Not classified.

Skin contact Not classified. High pressure injection of the products under the skin may have very serious consequences even though no symptom or injury may be

apparent.

Inhalation Not classified. Inhalation of vapors in high concentration may cause irritation of respiratory system.

Ingestion Not classified. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

4.3. Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media Carbon dioxide (CO_2), ABC powder. Foam. Water spray or fog.

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

Special Hazard Incomplete combustion and thermolysis may produce gases of varying toxicity such as carbon monoxide, carbon dioxide, various hydrocarbons, aldehydes and soot. These maybe highly dangerous if inhaled in confined spaces or at high concentration.

5.3. Advice for fire-fighters

Special protective equipment for fire-fighters Wear self-contained breathing apparatus and protective suit.

Other information Cool containers / tanks with water spray. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

General Information Do not touch or walk through spilled material. Contaminated surfaces will be extremely slippery.
Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition.

6.2. Environmental precautions

General Information Do not allow material to contaminate ground water system. Try to prevent the material from entering drains or water courses.
Local authorities should be advised if significant spillages cannot be contained.

6.3. Methods and material for containment and cleaning up

Methods for containment Dike to collect large liquid spills. If necessary dike the product with dry earth, sand or similar non-combustible materials.

Methods for cleaning up Dispose of contents/container in accordance with local regulation. In case of soil contamination, remove contaminated soil for remediation or disposal, in

accordance with local regulations.

6.4. Reference to other sections

Personal Protective Equipment	See Section 8 for more detail.
Waste treatment	See section 13.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Advice on safe handling	For personal protection see section 8. Use only in well-ventilated areas. Do not breathe vapors or spray mist. Avoid contact with skin, eyes and clothing.
Prevention of fire and explosion	Take precautionary measures against static discharges.
Hygiene measures	Ensure the application of strict rules of hygiene by the personnel exposed to the risk of contact with the product. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product. Do not use abrasives, solvents or fuels. Do not dry hands with rags that have been contaminated with product. Do not put product contaminated rags into workwear pockets.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures/Storage conditions	Keep away from food, drink and animal feeding stuffs. Keep in a bunded area. Keep container tightly closed. Keep preferably in the original container. Otherwise reproduce all indication of the regulation label on the new container. Do not remove the hazard labels of the containers (even if they are empty). Design the installations in order to avoid accidental emissions of product (due to seal breakage, for example) onto hot casings or electrical contacts. Protect from frost, heat and sunlight. Protect from moisture.
Materials to Avoid	Strong oxidizing agents.

7.3. Specific end uses

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Exposure limits	Mineral oil mist : USA: OSHA (PEL) TWA 5 mg/m^3, NIOSH (REL) TWA 5 mg/m^3, STEL 10 mg/m^3, ACGIH (TLV) TWA 5 mg/m^3 (highly refined)
Legend	See section 16.

8.2. Exposure controls

Occupational Exposure Controls

Engineering Measures	Apply technical measures to comply with the occupational exposure limits. When working in confined spaces (tanks, containers, etc.), ensure that there is a supply of air suitable for breathing and wear the recommended equipment.

Personal Protective Equipment

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General Information	Protective engineering solutions should be implemented and in use before personal protective equipment is considered. The personal protective equipment (PPE2) recommendations apply to the product ITSELF. In case of mixtures or formulations, it is suggested that you contact the relevant PPE suppliers.
Respiratory protection	None under normal use conditions. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Respirator with combination filter for vapour/particulate (EN 14387): Type A/P1. Warning ! filters have a limited use duration. The use of breathing apparatus must comply strictly with the manufacturer's instructions and the regulations governing their choices and uses.
Eye Protection	If splashes are likely to occur, wear:. Safety glasses with side-shields. EN 166.
Skin and body protection	Long sleeved clothing. Wear suitable protective clothing. Protective shoes or boots. Type 4/6.
Hand Protection	Hydrocarbon-proof gloves. Fluorinated rubber. Nitrile rubber. In case of prolonged contact with the product, it is recommended to wear gloves complying with EN 420 and EN 374 standards, protecting at least for 480 minutes and having a thickness of 0.38 mm at least. These values are indicative only. The level of protection is provided by the material of the glove, its technical characteristics, its resistance to the chemicals to be handled, the appropriateness of its use and its replacement frequency. 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.

Environmental exposure controls

General Information	The product should not be allowed to enter drains, water courses or the soil.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Color	Yellow
Physical State @20°C	liquid
Odor	Characteristic

Property	**Values**	**Remarks**	**Method**
pH		Not applicable	
Boiling point/boiling range		Not applicable	
Flash point	**252 °C**		Cleveland Open Cup (COC)
Evaporation rate		No information available	
Flammability Limits in Air		No information available	
Vapor Pressure		No information available	
Vapor density		No information available	
Density	890 kg/m^3	@ 15 °C	
Water solubility	Negligible	Insoluble	
Solubility in other solvents		No information available	
logPow		No information available	
Autoignition temperature		No information available	
Viscosity, kinematic	307.4 mm^2/s	@ 40 °C	
	24.0 mm^2/s	@ 100 °C	
Explosive properties	Not explosive		
Oxidizing Properties	Not applicable		
Possibility of hazardous reactions	Not applicable		

9.2. Other information

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10. STABILITY AND REACTIVITY

10.1. Reactivity

General Information None under normal processing.

10.2. Chemical stability

Stability. Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

Hazardous Reactions No dangerous reaction known under conditions of normal use.

10.4. Conditions to Avoid

Conditions to Avoid Keep away from open flames, hot surfaces and sources of ignition. Keep away from heat and sparks.

10.5. Incompatible Materials

Materials to Avoid Strong oxidizing agents.

10.6. Hazardous Decomposition Products

Hazardous Decomposition Product Incomplete combustion and thermolysis may produce gases of varying toxicity such as carbon monoxide, carbon dioxide, various hydrocarbons, aldehydes and soot. Combustion products include sulphur oxide (SO_2 and SO_3) and Hydrogen sulphide H_2S, Mercaptans, Phosphorous oxides, nitrogen oxides (NO_x), Silicon dioxide, Zinc oxdies.

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity Local effects Product Information

Skin contact . Not classified. High pressure injection of the products under the skin may have very serious consequences even though no symptom or injury may be apparent.

Eye contact . Not classified.

Inhalation . Not classified. Inhalation of vapors in high concentration may cause irritation of respiratory system.

Ingestion . Not classified. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Acute toxicity - Component Information

Chemical name	Oral	Dermal	Inhalation
Distillates (petroleum), hydrotreated heavy paraffinic	LD50 > 5000 mg/kg bw (rat – OECD 420)	LD50 > 5000 mg/kg bw (rabbit – OECD 402)	LC50 (4h) > 5 mg/l (aerosol) (rat – OECD 403)
Industrial gear oil additive	ATEmix > 10000 mg/kg	-	-
Polymerized dimethyl silicone fluid	LD50 > 5000 mg/kg (rat)	LD50 > 2000 mg/kg (rat)	LC50 > 71 mg/kg (rat – dust/mist)
Oil solution of acrylic	LC50 > 2000 mg/kg	LD50 > 2000 mg/kg	-

polymer	(Rat)	(Rabbit)	

Sensitization

Sensitization Not classified as a sensitizer.

Specific effects

Carcinogenicity This product is not classified carcinogenic.
Mutagenicity This product is not classified as mutagenic.
Reproductive toxicity This product does not present any known or suspected reproductive hazards.

Repeated Dose Toxicity

Subchronic toxicity No information available.

Target Organ Effects (STOT)

Target Organ Effects (STOT) No information available.

Other information

Other adverse effects Characteristic skin lesions (pimples) may develop following prolonged and repeated exposures (contact with contaminated clothing).

12. ECOLOGICAL INFORMATION

12.1. Toxicity

1) Acute toxicity

Chemical name	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates	Toxicity to fish
Distillates (petroleum), hydrotreated heavy paraffinic	EL50 > 100 mg/l (48h, Pseudokirchnerella subcapitata – OECD 201)	EL50 > 10000 mg/l (48h, Daphnia magna – OECD 202)	LL50 > 100 mg/l (96h, Oncorhynchus mykiss – OECD 203)

2) Chronic Toxicity

Chemical name	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates	Toxicity to fish
Distillates (petroleum), hydrotreated heavy paraffinic		NOEL > 10 mg/l (21d, Daphnia magna – QSAR Petrotox)	NOEL > 100 mg/l (14/28d, Oncorhynchus mykiss – QSAR Petrotox)

Effects on terrestrial organisms No information available.

12.2. Persistence and degradability

General Information No information available.

12.3. Bioaccumulative potential

Product Information No information available.

logPow No information available

Component Information No information available.

12.4. Mobility in soil

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Soil	Given its physical and chemical characteristics, the product generally shows low soil mobility.
Air	Loss by evaporation is limited.
Water	Insoluble. The product spreads on the surface of the water.

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment	No information available.

12.6. Other adverse effects

General Information	No information available

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste from Residues / Unused Products	Should not be released into the environment. Do not empty into drains. Dispose of in accordance with all applicable national environment laws and regulations. Where possible recycling is preferred to disposal or incineration
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal.
Other information	Refer to section 8 for safety and protective measures for disposal personnel.

14. TRANSPORT INFORMATION

ADR/RID	Not regulated
IMDG/IMO	Not regulated
ICAO/IATA	Not regulated
ADN	Not regulated

15. REGULATORY INFORMATION

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

International Inventories

TSCA
KECL

Legend
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
KECL - Korean Existing and Evaluated Chemical Substances

Further information

15.2. Chemical Safety Assessment

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Chemical Safety Assessment No information available

16. OTHER INFORMATION

Abbreviations, acronyms

Legend Section 8

+	Sensitizer	*	Skin designation
**	Hazard Designation	C:	Carcinogen
M:	Mutagen	R:	Toxic to reproduction

Revision Date: 2023-09-08
Revision Note *** Indicates updated section.

This safety data sheet serves to complete but not to replace the technical product sheets. The information contained herein is given in good faith and is accurate to the best of knowledge at the date indicated above. It is understood by the user that any use of the product for purposes other than those for which it was designed entails potential risk. The information given herein in no way dispenses the user from knowing and applying all provisions regulating his activity. The user bears sole liability for the precautions required when using the product. The regulatory texts indicated herein are intended to aid the user to fulfil his obligations. This list is not to be considered complete and exhaustive. It is the user's responsibility to ensure that he is subject to no other obligations than those mentioned.

End of the safety data sheet