SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name : **MOLYGREEN PERFECT 10W-60 SN**
Product Code : 50-E-118
Recommended Use : Engine oil
Identification of the supplier : CHUGAI YUKAGAKU KOGYO Co., Ltd.
Address : 790 Nisibukuro, Yasio-City, Saitama Pref. JAPAN
Phone number : +81-48-924-5211
Facsimile number : +81-48-924-5212
Emergency telephone number : +81-48-929-0051

2. Hazards identification

GHS CLASSIFICATION
PHYSICAL/CHEMICAL HAZARDS : Not classified
HEALTH HAZARDS : Not classified
ENVIRONMENTAL HAZARDS : Not classified
GHS LABELING
Precautionary pictograms : Not applicable
Signal word : Not applicable
Hazard Statement : Not applicable
Precautionary Statements
Prevention : Not applicable
Response : Not applicable
Storage : Not applicable
Disposal : Not applicable

※ Even when there is no mentioning in the above instructions by GHS classification, please consider sufficiently to prevention /response/storage/disposal by making reference to after information.

3. Composition/information on ingredients

Substance/Mixture : Mixture
The name of a chemical substance : Mixture of lubricant base oils and Additives
Ingredients and Concentration :

Ingredients	Cas No.	Concentration (mass%)
Polyalphaolefin	151006-63-2	65-75
Polymer Ester	non-disclosure	3-13
Fatty acid Ester	non-disclosure	2-8
Additives	(Mixture)	12-22

Chemical formula : nonidentifiable
Hazardous substances
Poisonous and Deleterious Substances Control Act : Not Regulated
Pollutant Release and Transfer Register (PRTR) : Not Regulated
Japan Industrial Safety and Health Act :

Ingredients	Cabinet Order No.	Concentration (mass%)
Mineral oil	Article 18, 1, Attached table 9-168 of Cabinet order(Labeling, etc)	3-8
Molybdenum and its compounds	Article 18, 1, Attached table 9-603 of Cabinet order(Labeling, etc)	0.4-0.8 (as Molybdenum :0.018-0.036)

4. First-aid measures

Inhalation
1 Remove victim to fresh air and keep at rest in a position comfortable for breathing.
2 Cover the body with blankets to keep warm and quiet. If you feel unwell,seek medical advice.

Skin Contact
1 Immediately take off the polluted clothes and flush skin with large amounts of water and soapy water.
2 Wash contaminated clothing before reuse.

Eye Contact
1 Rinse with clean water carefully for several minutes.
2 Remove contact lenses if present and if removal is easy, then continue rinsing.
3 Rinse for 15 minutes at a minimum and seek medical attention.

Ingestion
1 Do not induce vomiting. Call a physician or poison control center immediately.
2 When the inside of the mouth is polluted, it's washed with water enough.

5. Fire-fighting measures

Extinguishing Media : Mist of loaded liquid, dry chemicals, carbon dioxide, fire foam, and dry sand are effective.
Extinguishing Media to Avoid : Use of straight steam of water can cause a risk of spreading fire.
Specific hazards arising : In some cases of fire, may release irritant gases.
Peculiar fire extinguishing method
1 Remove combustion source in fire.
2 Spray water to the surrounding facilities for cooling.
3 Keep unauthorized persons off the site of occurrence of fire and the surroundings.
Precautions for fire fighters
1 Fight fire from windward direction while wearing protective equipment. If contact with skin is expected, wear impervious protective equipment and gloves.
2 Use air-breathing apparatus and protective clothing whenever necessary.

6. Accidental release measures

Personal precautions : Wear protective equipment when working.
Environmental precautions
1 Prevent spreading of oil spill with earth and sand, sandbags, or other proper materials and use care not to allow the oil spill to flow to street drains, sewer systems, and rivers.

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	2 At sea, install oil spill containment booms to prevent spreading of spills and absorb with absorption mat or other proper materials.
Methods and materials for containment and cleaning up	1 Make a person evacuate from a dangerous area. 2 Stretch a rope and prohibit person's entering around the dangerous area. 3 In case of spillage in small quantity, collect spillage by absorbing with earth, sand, sawdust, waste, or other proper materials. 4 In case of spillage in large quantity, enclose with embankment to prevent spreading of spillage and collect spillage in empty containers to the extent possible.
Prevention of second accident	1 In case of spillage, immediately inform the organizations concerned of the spillage to prevent possible accidents and spreading of spillage. 2 Remove nearby potential ignition sources immediately and make fire-extinguishing agents available. 3 Remove spillage completely, and ventilate and clean the site and the surroundings.

7. Handling and storage

Handling

Technical measures	1 Keep away from any possible contact with sparks, open flames, and high-temperature materials, and do not allow release of vapor without justification. 2 Use personal protective equipment as required. 3 Use pumps or other proper equipment for taking out from containers. Do not siphon with your mouth using a tube. Do not drink. 4 When mist is generated, use respiratory equipment to prevent inhalation of mist.
Ventilation/Exhaust measure	1 Maintain adequate ventilation when handling indoors. 2 In case of vapor/mist dispersion, install a closed system, local ventilation system, and/or other proper equipment for the sources of vapor/mist generation.
Precautions	1 Wash hands and face thoroughly after handling. 2 Wear protective gloves when opening containers to eliminate a risk of hand injury. 3 Avoid rough handling of containers such as falling, dropping, exposing to shock, and dragging.

Storage

Storage Conditions	1 Store in a well ventilated, cool, dry, dark place, protecting from direct sunlight. 2 Avoid every kind of potential ignition sources and high-temperature materials. 3 Keep containers tightly closed after use to prevent possible contamination with dust and moisture.
Precautions	1 Avoid contact and storage in the same place with Halogens, Strong acids, Alkalies and Oxidizers. 2 Enpty containers may contain combustible product residues. Do not weld,solder, drill,cut or perform similar operations unless they have been properly cleaned.

8. Exposure controls and personal protection

Engineering controls	1 In case of mist generation, enclose the source of mist generation, or install a ventilation system. 2 Install eye cleaning and body cleaning equipment near the handling site.
Control parameters	: None established Assessment Criteria of Working Environment (Ministry of Labor, Notification No.79 in 27-Mar-95)
Threshould Limit Values	1 Time Weighted Average 3mg/m^3 (Mineral Oil Mist) (Japan Society for Occupational Health /2010 year editions) 2 Time Weighted Average 5mg/m^3 (Mineral Oil Mist) (ACGIH /2010 year editions)

Protective Equipment

Respiratory Protection	: Not needed under normal conditions, but wear a gas mask (against organic gases) whenever required.
Hand protection	: In case of prolonged or repeated exposure, wear oil-resistant hand protection.
Eye protection	: In case of exposure to splashes, wear ordinary type goggles.
Skin Protection	: In case of handling over a prolonged period of time or in case of exposure to oil, wear oil-resistant, long-sleeved work clothing.
Hygiene Measures	1 Take off contaminated clothing and wash thoroughly before reuse. 2 Wash hands thoroughly after handling.

9. Physical and chemical properties

Appearances

Physical state	: Liquid		
Form	: Viscous fluid		
Color	: Clear brown		
Odor	: Slight odor		
Density (at 15 C)	: 0.86	g/cm^3	JIS K 2249
Flash Point	: 264	℃	JIS K 2265-4 (ＣＯＣ)
Viscosity (at 40℃)	: 154	mm^2/s	JIS K 2283
(at 100℃)	: 22	mm^2/s	JIS K 2283
Pour Point:	: <-35.0	℃	JIS K 2269

Upper/lower flammability or explosive limits (Estimated value)
: Explosion Limit (1-7%)

Solubility : Water/insoluble

10. Stability and reactivity

Chemical stability	: Stable when stored or preserved in a dark place at room temperature.
Possibility of hazardous reactions	: Keep away from any possible contact with strong oxidizing agents.
Conditions to avoid	1 Contact with incompatible hazard substances.

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2 Prolonged heating, open flames, and ignition sources
Incompatible materials : Use care to keep away from any possible contact with halogens, strong acids, alkalis, and Oxidizers.
Hazardous decomposition products : When burnt, may release carbon monoxide and other gases.

11. Toxicological information

(The obtained information is based on a safety data sheet of each ingredient)
Product
For mixtures, hazard category was identified based on the classification criteria for mixtures.
Ingredients(Polyalphaolefin)
Acute toxicity(oral) : LD50:≧ 2000 mg/kg[rat] The toxicity is very low.
This data is based on data of a similar chemical structure.
Acute toxicity(dermal) : LD50:≧ 2000 mg/kg[rat] The toxicity is very low.
This data is based on data of a similar chemical structure.
Acute toxicity(Inhalation) : LC50(4h) >5000 mg/m3 (Oil mist) The toxicity is very low.
This data is based on data of a similar chemical structure.
Aspiration hazard : The toxicity is very low. (In room temperature)
This data is based on data of a similar chemical structure.
Skin corrosion/irritation : The toxicity is very low. (In room temperature)
This data is based on data of a similar chemical structure.
Serious eye damage/irritation : There is a fear that the unpleasant feeling which is short time's slightness is exerted on eyes.
This data is based on data of a similar chemical structure.
Sensitization : Practically None
Chronic toxicity : The important influence to health is identical or is estimated not to cause it under
Long-term toxicity the usual conditions for use according to a study at a laboratory by a substance of resemblance.
Mutagenicity : Not determined
Carcinogenicity : Not applicable (IARC,NTP,Japan Society for Occupational Health)
Reproductive toxicity : Not determined
Teratogenesis : Not determined
Ingredients(Polymer Ester)
Acute toxicity (Oral) : Not classified for acute toxicity based on available data.
Acute toxicity (Dermal) : Not classified for acute toxicity based on available data.
Acute toxicity(Inhalation) : Not classified for acute toxicity based on available data.
Skin Corrosion/Irritation : When being long or touching repeatedly, a stimulus sometimes forms.
: Remarks: Not classified as a primary skin irritant.
Serious Eye Damage/Eye Irritation : Remarks: Not classified as a primary eye irritant.
Respiratory sensitization : No data available
Skin sensitization : No data available
Germ cell mutagenicity : No data available
Carcinogenicity : No data available
Reproductive toxicity : No data available
Specific target organ toxicity (Single exposure)
: No data available
Specific target organ toxicity (Repeated exposure)
: No data available
Aspiration hazard : No data available
Ingredients(Fatty acid ester)
Acute toxicity(oral) : LD50 >2000mg/kg bw(rat) (OECD 401;Polyesuter)
Acute toxicity(dermal) : Not determined
Acute toxicity(Inhalation) : LC50(4h) >5.1mg/l(rat) (OECD 403;Reed accros from Supporting substance)
Skin corrosion/irritation : None
Serious eye damage/irritation : None

Respiratory sensitization : Not determined
Skin sensitization : Not determined
Mutagenicity : Not determined
Carcinogenicity : Not determined
Reproductive toxicity : Not determined
Specific target organ toxicity (Single exposure)
: Not determined
Specific target organ toxicity (Repeated exposure)
: Not determined
Aspiration hazard : Not determined
Ingredient (Additives)
(Long-chain arcarylamine/The content in the product : 0.1- <1.2 %)
Acute oral toxicity : LD50 Rat: > 5,000 mg/kg
Method: OECD Test Guideline 401
Test substance: Read-across (Analogy)
Remarks: Based on available data, the classification criteria are not met.
Acute dermal toxicity : LD50 Rat: > 2,000 mg/kg
Method: OECD Test Guideline 402
Test substance: Read-across (Analogy)
Remarks: Based on available data, the classification criteria are not met.
Acute inhalation toxicity : study scientifically unjustified
Skin corrosion/irritation : Species: Rabbit
Result: No skin irritation

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Method: OECD Test Guideline 404
Test substance:yes
Serious eye damage/eye irritation : Species: Rabbit
Result: No eye irritation
Method: OECD Test Guideline 405
Test substance: yes
Based on available data, the classification criteria are not met.
Respiratory or skin sensitisation : Test Method: Maximisation Test
Species: Guinea pig
Result: Does not cause skin sensitisation.
Method: OECD Test Guideline 406
Test substance: Read-across (Analogy)
Based on available data, the classification criteria are not met.
Germ cell mutagenicity
Genotoxicity in vitro : Result: negative
Test substance: Read-across (Analogy)
Based on available data, the classification criteria are not met.
Genotoxicity in vivo : Test species: MouseTest substance: Read-across (Analogy)
Result: negativeBased on available data, the classification criteria are not met.
Carcinogenicity : study scientifically unjustified
Reproductive toxicity : Test substance: Read-across (Analogy)
Based on available data, the classification criteria are not met.

(Zinc alkyl dithiophosphateate)/The content in the product : 0.1- <1.2 %)
Acute oral toxicity : LD50 Rat, male: 2,600 mg/kg
Method: Tested according to Annex V of Directive 67/548/EEC.
Test substance: yes
GLP: yes
Remarks: May be harmful if swallowed.
Acute dermal toxicity : LD50 Rabbit, male and female: > 3,160 mg/kg
Method: OECD Test Guideline 402
Test substance: yes
Remarks: Based on available data, the classification criteria are not met.
Acute inhalation toxicity : LC50 Rat, male: > 2 mg/l
Exposure time: 1 h
Method: OECD Test Guideline 403
Test substance: Read-across (Analogy)
GLP: no
Remarks: Based on available data, the classification criteria are not met.
Skin corrosion/irritation : Species: Guinea pig
Exposure time: 4 h
Result: Causes skin irritation.
Method: OECD Test Guideline 404
Test substance:Read-across (Analogy)
Specific concentration limits : Skin Irrit. 2 H315 >= 6.25 -100%.
Serious eye damage/eye irritation : Species: Rabbit
Exposure time: 504 h
Result: Causes serious eye damage.
Method: 16 CFR 1500.42
Test substance: Read-across (Analogy)
Carcinogenicity : No data available

(Molybdenum polysulphide long chain alkyl dithiocarbamate complex/The content in the product : <0.13 %)
Skin corrosion/irritation : Exposure time: 4 h
Result: Skin irritation
Method: OECD Test Guideline 404
Test substance:yes
Causes skin irritation.
Respiratory or skin sensitisation : Test Method: Maximisation Test (GPMT)
Classification: May cause sensitisation by skin contact.
Result: Causes sensitisation.
Method: Maximisation Test (GPMT)
Test substance: yes
May cause an allergic skin reaction.

12. Ecological information

(The obtained information is based on a safety data sheet of each ingredient)

Product

For mixtures, hazard category was identified based on the classification criteria for mixtures.

Ingredients(Polyalphaolefin)

Ecotoxicity : It isn't estimated by hydrobios to be harmful.
Bioaccumulative potential : It's predicted that there is biodegradablility essentially.
Mobility : There is no useful information.
Other adverse effect : Important influence and toxicity aren't reported.

Ingredients(Polymer Ester)

Ecotoxicity : No data available
Biodegradation : No data available
Bioaccumulative potential : No data available
Mobility : No data available
Other adverse effect : No data available

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Ingredients(Fatty acid ester)
Ecotoxicity : EL(50) >100mg/L (daphnia) (OECD 202)
LL50(96h) >10,000mg/L(fish) (OECD 203)
Biodegradation : 72% (OECD 301B,degradation;28days)
Bioaccumulative potential : There is no useful information.
Mobility : There is no useful information.
Other adverse effect : There is no useful information.
: There is no useful information.

Ingredient (Additives)
(Long-chain arcarylamine/The content in the product : 0.1- <1.2 %)
Ecotoxicity
Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 100 mg/l
Exposure time: 96 h
Test Method: static test
Test substance: Read-across (Analogy)
Method: OECD Test Guideline 203
Based on available data, the classification criteria are not met.
Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Test Method: static test
Test substance: yes
Method: OECD Test Guideline 202
Based on available data, the classification criteria are not met.
Toxicity to algae : EC50 (Desmodesmus subspicatus (green algae)): > 100 mg/l
Exposure time: 72 h
Test Method: static test
Test substance: Read-across (Analogy)
Method: OECD Test Guideline 201
Based on available data, the classification criteria are not met.
Persistence and degradability
Biodegradability : aerobic
activated sludge
Result: Not biodegradable
Biodegradation: 1 %
Exposure time: 28 d
Test substance: Read-across (Analogy)
According to the results of tests of biodegradability this product is not readily biodegradable.
Bioaccumulative potential : Accumulation in aquatic organisms is expected.
Partition coefficient: noctanol/water log Pow: > 7.6
Mobility in soil : After release, adsorbs onto soil.
Results of PBT and vPvB assessment : This substance is not considered to be persistent,bioaccumulating and toxic (PBT).,
This substance is not considered to be very persistent and very bioaccumulating (vPvB).

(Zinc alkyl dithiophosphateate)/The content in the product : 0.1- <1.2 %)
Ecotoxicity
Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 4.5 mg/l
Exposure time: 96 h
Test Method: semi-static test
Analytical monitoring: no
Test substance: Read-across (Analogy)
Method: OECD Test Guideline 203
GLP: yes
Toxic to aquatic life.
Toxicity to daphnia and other aquatic invertebrates : EL50 (Daphnia magna (Water flea)): 5.4 mg/l
Exposure time: 48 h
Test Method: static test
Analytical monitoring: yes
Test substance: Read-across (Analogy)
Method: OECD Test Guideline 202
GLP: yes
Toxic to aquatic life.
Toxicity to algae : EbC50 (Selenastrum capricornutum (green algae)): 2.1 mg/l
Exposure time: 96 h
Test Method: static test
Analytical monitoring: yes
Test substance: Read-across (Analogy)
Method: OECD Test Guideline 201
GLP: yes
Toxic to aquatic life.
Persistence and degradability
Biodegradability : aerobic
activated sludge
Concentration: 10 mg/l
Result: Not readily biodegradable.
Biodegradation: 1.5 %
Exposure time: 28 d
Method: OECD Test Guideline 301B
Test substance: yes
GLP: yes

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According to the results of tests of biodegradability this product is not readily biodegradable.
Bioaccumulative potential : Due to the distribution coefficient n-octanol/water,accumulation in organisms is not expected.
Partition coefficient: noctanol/water log Pow: 0.9 at 23 ° C
Mobility in soil : After release, adsorbs onto soil.
Results of PBT and vPvB assessment : This substance is not considered to be persistent,bioaccumulating and toxic (PBT)., This substance is not considered to be very persistent and very bioaccumulating (vPvB).

(Molybdenum polysulphide long chain alkyl dithiocarbamate complex/The content in the product : <0.13 %)
Ecotoxicity
Toxicity to fish : NOEC (Oncorhynchus mykiss (rainbow trout)): 94.8 mg/l
Exposure time: 96 h
Test Method: semi-static test
Test substance: Read-across (Analogy)
Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates : EL50 (Daphnia magna (Water flea)): 50 mg/l
Exposure time: 48 h
Test Method: static test
Test substance: yes
Method: OECD Test Guideline 202
Harmful to aquatic life.
Toxicity to algae : EbC50 (Pseudokirchneriella subcapitata (green algae)): 9.62 mg/l
Exposure time: 72 h
Test Method: Growth inhibition
Test substance: Read-across (Analogy)
Method: OECD Test Guideline 201
Toxicity to bacteria : IC50 : > 100 mg/l
Exposure time: 3 h
Test Method: Respiration inhibition
Test substance: Read-across (Analogy)
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 100 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Test substance: yes
Persistence and degradability
Biodegradability : aerobic
activated sludge
Result: Not readily biodegradable.
Biodegradation: 22.75 %
Exposure time: 29 d
Method: OECD Test Guideline 301
Test substance: Read-across (Analogy)
According to the results of tests of biodegradability this product is not readily biodegradable.
Bioaccumulative potential : Species: Cyprinus carpio (Carp)
Temperature: 25 ° C
Concentration: 0.05 mg/l
Bioconcentration factor (BCF): 88
Test substance: Read-across (Analogy)
Method: OECD Test Guideline 305
Accumulation in aquatic organisms is unlikely.
Mobility in soil : After release, adsorbs onto soil.
Results of PBT and vPvB assessment : This substance is not considered to be persistent,bioaccumulating and toxic (PBT)., This substance is not considered to be very persistent and very bioaccumulating (vPvB).

13. Disposal considerations

Disposal methods
1 Dispose of contents/container in accordance with local/regional/national/international regulations.
2 Don't throw away.
3 Every customer/user of the product should dispose of industrial waste on its own responsibility, otherwise it must rely on a company authorized by prefectural governor for treating industrial waste or a local public body involved in the disposal of industrial waste for proper disposal.
4 Before disposal of used container, remove contents completely.

14. Transport information

UN classification : Not applicable
LAND - Precautionary Transportation Measures & Conditions : Do not co-load together with dangerous substances categorized in Fire Cat. 1 and/or 6, and/or High Pressure Gases.
NOTE: Comply with applicable laws and regulations.
SEA (IMDG) Not Regulated for Sea Transport according to IMDG-Code
Marine Pollutant : No
AIR (IATA) : Not Regulated for Air Transport
Specific security precaution and condition of transportation : Transport containers without causing any significant friction or shaking.

15. Regulatory information

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National Laws and Regulations
Fire Service Law : Category 4, Flammable Liquids, Class III (#4 Petroleum)
Industrial Safety and Health Act : Notified Substances
Pollutant Release and Transfer Register (PRTR) : Not Regulated
Water Pollution Contro Act : Regulations on emissions
Sewerage Act : Regulations on emissions
Marine Pollution Prevention Low : Regulations on emissions
Waste Management and Pablic Cleaning Law : Industrial waste treatment regulation

16. Other information

(references)
Globally Harmonized System of Classification and Labelling of Chemicals(GHS) (2013 year editions)
The National Institute of Technology and Evaluation (NITE) /GHS relevant information
Japan Personnel management & Safety information /GHS relevant information
The others; Additionally the information a literature search gave.

We would like every customer/user of the product to refer to the information and understand the necessity of taking appropriate measures for the actual handling conditions on their own responsibilities for optimum practical application of the product of interest.
Consequently, the Safety Data Sheet is not intended to guarantee the safety of the product referenced to herein.