SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name : MOLYGREEN HYBRID 0W-20 SN・GF-5
Product Code : 29-E-27
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%)
Petroleum hydrocarbons	64742-54-7	70-80
Polyalphaolefin	100172-11-1	2-8
Fatty acid Ester	27178-16-1	2-8
Additives	(Mixture)	10-20

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)	80-90
Molybdenum and its compounds	Article 18, 1, Attached table 9-603 of Cabinet order(Labeling, etc)	0.1-1.0 (as Molybdenum : <0.05)

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

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materials and use care not to allow the oil spill to flow to street drains, sewer systems, and rivers.
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)	: 0.85	g/cm^3	JIS K 2249
Flash Point	: >200	℃	JIS K 2265-4 (ＣＯＣ)
Viscosity (at 40℃)	: 44	mm^2/s	JIS K 2283
(at 100℃)	: 8.5	mm^2/s	JIS K 2283
Pour Point:	: <-20.0	℃	JIS K 2269

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

Solubility : Water/insoluble

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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.
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.
Acute toxicity : No data available
Skin Corrosion/Irritation : No data available
Serious Eye Damage /Eye Irritation : No data available
Respiratory sensitizer : No data available
Skin sensitizer : No data available
Germ Cell Mutagenicity : No data available
Carcinogenicity : No data available
Toxic to reproduction : No data available
Specific Target Organ Toxicity (Single Exposure) : No data available
Specific Target Organ Toxicity (Repeated Exposure) : No data available
Aspiration Hazard : As Kinematic viscosity at 40℃ is 20.5 mm^2/s and more ,not applicable.
Ingredients(Petroleum hydrocarbons)
Acute toxicity(oral) : LD50:≧ 5000 mg/kg[rat]
Acute toxicity(dermal) : LD50:≧ 5000 mg/kg[rat]
Acute toxicity(Inhalation) : LC50(4h) >5.0 mg/L[rat] (Oil mist)
Serious eye damage : Practically None [rabbit]
Respiratory sensitization : Not applicable
Skin sensitization : None Buehler method [guinea pig]
Mutagenicity : None AMES method [guinea pig]
Carcinogenicity : EU:Category 2 : R45 need not apply.(NOTE L is Applicable), IARC:3
Reproductive toxicity : Negative
Specific target organ toxicity (Single exposure) : Toxicity isn't admitted.
Specific target organ toxicity (Repeated exposure) : Toxicity isn't admitted.
Aspiration hazard : Not applicable
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 / Long-term toxicity : The important influence to health is identical or is estimated not to cause it under 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 (Adipic acid diisodesyl ester)
Acute toxicity(oral) : Rat LD50=20,500mg/kg [1,2)]
Rat LD50>5,000mg/kg [2)]
Guinea pig LD50>5,000mg/kg [2)]
Acute toxicity(dermal) : Rat LD50>5,000mg/kg [2)]
Acute toxicity(Inhalation) : Not determined
Skin corrosion/irritation : Rat None [2)]
Serious eye damage/irritation : Rabbit None [2)]

Respiratory sensitization : Not determined Adipic acid diisodesyl ester
Skin sensitization : None [2)]
Mutagenicity : Not determined
Carcinogenicity : Not determined

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Reproductive toxicity : Not determined
Specific target organ toxicity (Single exposure)
: Not determined
Specific target organ toxicity (Repeated exposure)
: Not determined
Aspiration hazard : Not determined

1) Registry of Toxic Effects of Chemical substances 1997
2) International Uniform Chemical Information Database data Set 2000

Ingredient (Additive)
Lubricant additive package(The content in the product ; 6-10 mass %)
Acute toxicity(Oral) : Ingestion may cause gastrointestinal irritation and diarrhea.
(Information on the ingredient included in an additive package)
Mineral oil (The content in the product ; 2.4-4.9 mass %)
LD50 Oral Rat >5000 mg/kg
Zinc dialkyl dithiophosphatel (The content in the product ; 0.8-1.6 mass %)
LD50 Oral Rat 3100 mg/kg
Calcium long-chain alkylphenate sulfide (The content in the product ; 0.1-1.4 mass %)
LD50 Oral Rat >5000 mg/kg
Alkaryl aminel (The content in the product ; 0.1-1.4 mass %)
LD50 Oral Rat >5000 mg/kg
Polyolefin
LD50 Oral Rat >10000 mg/kg
Acute toxicity(Dermal) : Repeated or prolonged contact with the mixture may cause removal of natural fat from the skin, resulting in nonallergic contact dermatitis and absorption through the skin.
(Information on the ingredient included in an additive package)
Mineral oil (The content in the product ; 2.4-4.9 mass %)
LD50 Dermal Rabbit >5000 mg/kg
Zinc dialkyl dithiophosphatel (The content in the product ; 0.8-1.6 mass %)
LD50 Dermal Rat >2000 mg/kg
Calcium long-chain alkylphenate sulfide (The content in the product ; 0.1-1.4 mass %)
LD50 Dermal Rabbit >2000 mg/kg
Polyolefin
LD50 Dermal Rabbit >2000 mg/kg
Acute toxicity(nhalation) : Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.
(Information on the ingredient included in an additive package)
Mineral oil (The content in the product ; 2.4-4.9 mass %)
LC50 Inhalation Rat >5000 mg/m^3 4 hours Vapor
Polyolefin
LC50 Inhalation Rat >19171 mg/m^3 4 hours Vapor
Eye contact : Non-irritating to the eyes.
Other information : Not available.

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.
Ecotoxicity : No data available
Bioaccumulative potential : No data available

Mobility : No data available
Other adverse effect : No data available
Ingredients(Petroleum hydrocarbons)
Ecotoxicity
Acute toxicity : Hydrobios is polluted because dissolve in no water.
LC 50 (Fathead Minnow, 4 d): > 100 mg/l
EC 50 (Water flea (Daphnia magna), 2 d): > 10,000 mg/l
NOEL (Green algae (selenastrum capricomutum)): >100mg
Since putting it in the above test for water-insolubility, adjusted WAF (for water applicability picture) is being used as a sample.
From the above test outcome, without aquatic environment acute harmful effects.
Chronic toxicity : Hydrobios is polluted because dissolve in no water.
NOEL (Fathead Minnow, 14 d): > 100 mg/l
NOEL (Water flea (Daphnia magna), 21 d): > 10 mg/l
Since putting it in the above test for water-insolubility, adjusted WAF (for water applicability picture) is being used as a sample.
From the above test outcome, without aquatic environment acute harmful effects.
Biological decomposition test outcome is 31% (28 days). There is biodegradablility basically, but it isn't biodegradablility easily.
Bioaccumulative potential : There is no useful information.
Mobility : Log KOC of resemblance group oil is guessed at with more than 3. It's difficult to think that the oil which leaked at the surface of the earth flows to groundwater by being absorbed in ground.
Other adverse effect : There is no useful information.
Ingredients(Polyalphaolefin)
Ecotoxicity : It isn't estimated by hydrobios to be harmful.

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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 (Adipic acid diisodesyl ester)
Ecotoxicity(Acute toxicity) : Not determined
Ecotoxicity(Chronic toxicity) : Not determined
Biodegradation : Microbial degradation /Initial concentration 8.4ppm /Decomposition rate 7days 100%
Bioaccumulative potential : Not determined
Mobility : Not determined
Harmful to the ozone layer : Not determined

Ingredient (Additive)
Lubricant additive package(The content in the product ; 6-10 mass %)
Environmental hazards : Harmful to aquatic organisms.
May cause long-term adverse effects in the aquatic environment. Based on calculation.
Environmental fate : This product contains components which may be persistent in the environment.

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

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.