SAFETY DATA SHEET

SECTION 1 - IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Dynamic Green Products Inc.
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Emergency telephone number: (800) 222-1222 or 911

Product identifier	DGP 2-Cycle Oil
Synonyms	Proprietary
Trade names	DGP High Performance Bio-based 2 Cycle Oil
Chemical family	Branched and linear olefinic hydrocarbons
Relevant identified uses of the substance or mixture and uses advised against	Not for human or animal consumption.
Issue Date	February 2020

SECTION 2 - HAZARDS IDENTIFICATION

GHS Classification of the substance or mixture Regulation (EC) 1272/2008 [GHS]

Aspiration hazard - Category 1. H304

Label elements

CLP/GHS hazard pictogram

CLP/GHS signal word	Danger
CLP/GHS hazard statements	H304 - May be fatal if swallowed and enters airways.
CLP/GHS precautionary statements	P301+P310 - If swallowed: Immediately contact a poison control center or physician. P331- Do NOT induce vomiting. P405 - Store locked up. P501 - Dispose of contents/container to location in accordance with local/regional/ national/international regulations.
Other hazards	See Section 11.

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	CAS #	Percent	Classification
1,6,10-Dodecatriene, 7,11-dimethyl-3-methylene-, (6E)-, hydrogenated	1581740-29-5	<10%	H304
Farnesane	3891-98-3	<12%	H304
Tetradec-1-ene	1120-36-1	<7%	H304
Hexadec-1-ene	629-73-2	<7%	H304
Alkenes, C10-16 -, mixed with (6E)-7,11-dimethyl-3-methylene-1,6,10- dodecatriene, dimers and trimers hydrogenated	1472005-85-8	<2%	H304
Alkenes, C10-16 a-, mixed with (6E)-7,11-dimethyl-3-methylene-1,6,10- dodecatriene, dimers, tetramers and trimers, hydrogenated	1472010-43-7	<40%	Not classified
Butene, homopolymer	(CAS No) 9003-29-6	<30%	Not Classified
Proprietary polyol ester		<20%	Not Classified
Proprietary antiwear and detergent		<5%	Not classified

SECTION 4 - FIRST AID MEASURES

Description of first aid measures

Immediate Medical Attention Needed	Yes
Eye Contact	If easy to do, remove contact lenses, if worn. Immediately flush eyes with copious quantities of water for at least 15 minutes. If irritation occurs or persists, notify medical personnel and supervisor.
Skin Contact	Wash exposed area with soap and water and remove contaminated clothing/shoes. If irritation occurs or persists, notify medical personnel and supervisor.
Inhalation	Immediately move exposed subject to fresh air. If not breathing, give artificial respiration. If breathing is labored, administer oxygen. Immediately notify medical personnel and supervisor.
Ingestion	If swallowed, call a physician immediately. Do not induce vomiting unless directed by medical personnel. Do not give anything to drink unless directed by medical personnel. Never give anything by mouth to an unconscious person. Notify medical personnel and supervisor.
Protection of first aid responders	See Section 8 for Exposure Controls/Personal Protection recommendations.
Most important symptoms and effects, both acute and delayed	See Sections 2 and 11
Indication of immediate medical attention and special treatment needed, if necessary	Treat symptomatically and supportively. If accidental exposure occurs to an individual who is also taking one or more concomitant medications, consult the respective package or prescribing information for potential drug interactions.

SECTION 5 - FIREFIGHTING MEASURES

Extinguishing media	Use water spray (fog), foam, dry powder, or carbon dioxide, as appropriate for surrounding fire and materials.

Specific hazards arising from the substance or mixture	No information identified. May emit toxic fumes of carbon monoxide and carbon dioxide. Vapors may form explosive mixtures with air.
Flammability/Explosivity	No explosivity or flammability data identified. High airborne concentrations of finely divided organic particles can potentially explode if ignited. In a fire or if heated, a pressure increase will occur and the container may burst.
Advice for firefighters	Wear full protective clothing and a self-contained breathing apparatus with a full facepiece operated in the pressure demand or other positive pressure mode. Decontaminate all equipment after use.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	If product is released or spilled, take proper precautions to minimize exposure by using appropriate personal protective equipment (see Section 8). Area should be adequately ventilated.
Environmental precautions	Do not empty into drains. Avoid release to the environment.
Methods and material for containment and cleaning up	For small spills (such as in a laboratory), soak up material with absorbent, e.g., damp paper towel, and wash spill area thoroughly with soap and water. For large spills in manufacturing, use an industrial vacuum cleaner equipped with a high efficiency particulate (HEPA) filter if available. Alternatively if in solid or dried form, do not raise dust. Surround spill or powder with absorbents and place a damp cloth or towel over the area to minimize powder from entering the air. Use care in the choice of absorbents as some may react and generate excess heat and create a risk of fire. Review safety data sheets of absorbents prior to use. Add excess liquid to allow for the material to enter solution. Capture remaining liquid onto spill absorbents. Place spill materials into a leak-proof container suitable for disposal. Decontaminate area a second time. Dispose of material in a manner that is compliant with federal, state and local laws.
Reference to other sections	See Sections 8 and 13 for more information.

SECTION 7 - HANDLING AND STORAGE

Precautions for safe handling	Avoid contact with eyes, skin and other mucous membranes. Wash thoroughly after handling. Use personal protective equipment. Avoid breathing vapor. Do not eat, drink or smoke while handling this product. Avoid prolonged or repeated exposure. Provide sufficient air exchange and/or exhaust in workrooms. Take precautionary measures against static discharges. Use normal preventative fire protection measures.
Conditions for safe storage including any incompatibilities	Keep container tightly closed. Keep in a cool and well-ventilated area away from any ignition source. To maintain product quality, do not store in heat or direct sunlight.
Specific end use(s)	No information identified.

Max. Handling Temperature:	70°C (158°F)
Safe Handling Precautions:	Avoid contact with eyes and skin. Wash thoroughly after handling. Avoid breathing vapor or mist. Use personal protection measures as recommended in Section 8.
Max. Storage Temperature:	45°C (113°F)
Safe Storage Conditions:	Keep containers tightly closed, in a cool, well-ventilated and dry area. Store away from incompatible materials. Do not store in unlabeled containers.
Incompatible Materials:	Strong oxidizing agents.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure/Engineering controls	Selection and use of containment devices and personal protective equipment should be based on a risk assessment of exposure potential. Use local exhaust and/ or enclosure at mist/aerosol/spray-generating points. High-energy operations such as spraying should be done within an approved emission control or containment system.
Respiratory protection	Choice of respiratory protection should be appropriate to the task and the level of existing engineering controls. An approved and properly fitted air-purifying respirator with HEPA filters should provide ancillary protection based on the known or foreseeable limitations of existing engineering controls. Use a powered air-purifying respirator equipped with HEPA filters or combination filters or a positive-pressure air-supplied respirator if there is any potential for an uncontrolled release, when exposure levels are not known, or in any other circumstances where a lower level of respiratory protection may not provide adequate protection.
Hand protection	Wear nitrile or other impervious gloves if skin contact is possible. When the material is dissolved or suspended in an organic solvent, wear gloves that provide protection against the solvent.
Skin protection	Wear appropriate gloves, lab coat, or other protective overgarment if skin contact is likely. Base the choice of skin protection on the job activity, potential for skin contact and solvents and reagents in use.
Eye/face protection	Wear safety glasses with side shields, chemical splash goggles, or full face shield, if necessary. Base the choice of protection on the job activity and potential for contact with eyes or face. An emergency eye wash station should be available.
Environmental Exposure Controls	Avoid release to the environment and operate within closed systems wherever practicable. Air and liquid emissions should be directed to appropriate pollution control devices. In case of spill, do not release to drains. Implement appropriate and effective emergency response procedures to prevent release or spread of contamination and to prevent inadvertent contact by personnel.
Other protective measures	Wash hands in the event of contact with this mixture, especially before eating, drinking or smoking. Protective equipment is not to be worn outside the work area (e.g., in common areas or out-of-doors). Decontaminate all protective equipment following use.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Liquid
Color	Green
Odor	Mild Wheat
Odor threshold	No information identified.
pH	No information identified.
Melting point/freezing point	No information identified.
Initial boiling point and boiling range	230°C (396 °F) at 1 atm (760 mm Hg)
Flash point	138 °C (280 °F) Cleveland Open Cup
Evaporation rate	No information identified.
Flammability (solid, gas)	No information identified.
Upper/lower flammability or explosive limits	No information identified.
Vapor pressure	No information identified.
Vapor density	No information identified.
Relative density	0.86-.88 g/mL @ 20°C.
Water solubility	Insoluble.
Solvent solubility	No information identified.
Partition coefficient (*n-octanol/water*)	No information identified.
Auto-ignition temperature	No information identified.
Decomposition temperature	No information identified.
Viscosity	52-59 cSt at 40°C, 8.8-9.6 cSt @ 100*C
Explosive properties	No information identified.
Oxidizing properties	No information identified.

Other information

Molecular weight	Proprietary
Molecular formula	Proprietary

SECTION 10 - STABILITY AND REACTIVITY

Reactivity	No information identified.
Chemical stability	Stable under normal handling and storage conditions
Possibility of hazardous reactions	Not expected to occur.
Conditions to avoid	Keep away from heat and open flames.
Incompatible materials	Avoid strong oxidizers, strong acids and strong bases.
Hazardous decomposition products	Carbon oxides (CO, CO2)

SECTION 11 - TOXICOLOGICAL INFORMATION

Information on toxicological effects

Route of entry May be absorbed by inhalation, skin contact and ingestion.

Acute toxicity

Compound	Type	Route	Species	Dose
1,6,10-Dodecatriene, 7,11-dimethyl-3-methylene-, (6E)-, hydrogenated	--	--	--	--
Farnesane	LC_{50}	Inhalation	Rat	>2.19 mg/L
	LD_{50}	Oral	Rat	> 5000 mg/kg
	LD_{50}	Dermal	Rabbit	> 5000 mg/kg
Tetradec-1-ene	--	--	--	--
Hexadec-1-ene	--	--	--	--
Alkenes, C10-16 -, reaction products with (6E)-7,11-dimethyl-3-methylene-1,6,10-dodecatriene, dimers and trimers hydrogenated	None	None	None	None

Irritation/Corrosion
Sensitization

In rabbits, farnesane was not considered an irritant under GHS or CLP. In *in vitro* eye and skin tests (MatTek Epiocular™ MTT viability assay, MatTek Epiderm™ skin irritation test) farnesane was non-irritating. In human 48 hour patch testing, farnesane was considered non-irritating. In HRIPT, irritation was noted as the pure substance under highly localized and occluded conditions. At lower concentrations or with open application, mild to no irritation was observed; no irritation was observed at concentrations of up to 60%.

In three human repeated patch studies, farnesane was not considered to be a sensitizer ranging from concentrations of 20% to 80%.

STOT-single exposure No studies identified.

STOT-repeated exposure No studies identified.

Reproductive toxicity No studies identified.

Developmental toxicity No studies identified.

Genotoxicity Negative in an Ames bacterial cell mutagenicity assay. Not clastogenic at non-precipitating doses with or without metabolic activation in Chromosome aberration study.

Carcinogenicity	No studies identified. This mixture is not listed by NTP, IARC, ACGIH or OSHA as a carcinogen.
Aspiration hazard	Considered an aspiration hazard based on kinematic viscosity.
Human health data	See Irritation and Sensitization sections.
Additional information	Substance not fully tested.

SECTION 12 - ECOLOGICAL INFORMATION

Toxicity Farnesane is not classified for acute or chronic toxicity to aquatic species. Farnesane is essentially insoluble in water (0.25 µg/L) and is not expected to hydrolyze. It was tested in chronic fish and daphnia studies and no toxicity occurred at the limit of water solubility (0.25 µg/L)

Compound	Type	Species	Concentration
1,6,10-Dodecatriene, 7,11-dimethyl-3-methylene-, (6E)-, hydrogenated	--	--	--
Farnesane	96hEC50	*Pseudokirchneriella subcapitata*	>86 ug/L
	NOEC (21 day)	*Pimephales promelas*	66 ug/L
	NOEC (21 day)	*Daphnia magna*	54 ug/L
Tetradec-1-ene	72hEL50	Aquatic plants	>1000 mg/L
	48hEL50	Daphnia	>1000 mg/L
	96hLL50	Fish	>1000 mg/L
	28NOEC	Microorganism	2 mg/L
Hexadec-1-ene	72hEL50	Aquatic plants	>1000 mg/L
	48hEL50	Daphnia	<1000 mg/L
	96hLL50	Fish	>1000 mg/L
	28dEC20	Microorganism	>4 mg/L
Alkenes, C10-16 -, reaction products with (6E)-7,11-dimethyl-3-methylene-1,6,10-dodecatriene, dimers and trimers, hydrogenated	48hEL50	Daphnia	>100 mg/L WAF

Additional toxicity information Based on the results from similar substances, farnesane is not expected to inhibit the activity of sewage sludge micro-organisms.

Persistence and Degradability In CO_2-evolution ready biodegradability tests (OECD301B), farnesane degradation was between 12-44% by 28 days. In addition, modelled data (EpiSiuite v 4.11, BIOWIN v4.10 and BioHCWin v1.01), predict that farnesane will not be readily biodegradable, that it will be ultimately biodegradable in a period of weeks to months and that its half-life is 22 days. The measured half-life in a seawater biodegradation study was 3.5 days (CONCAWE). Tetradec-1-ene and hexadec-1-ene are readily biodegradable and show a low bioaccumulation potential.

Bioaccumulative potential	Farnesane predicted range 1074 to 1944 L/kg wet-wt by modelling (EpiSuite v4.11 and BCFBAF v3.01). Based on predicted values of less than 2000 L/kg wet-wt farnesane is not expected to bioaccumulate.
Mobility in soil	Not expected to be mobile in soil. Predicted log Koc: 5.8-6.6 (Kowwin method)
Results of PBT and vPvB assessment	Based on the chemical safety assessment and the results described herein, farnesane is not a PBT / vPvB substance.
Other adverse effects	No data available.
Note	The environmental characteristics of this mixture have not been fully investigated. Releases to the environment should be avoided.

SECTION 13 - DISPOSAL CONSIDERATIONS

Waste treatment methods	Used product should be disposed of according to local, state, and federal regulations. Do not send down the drain or flush down the toilet. All wastes containing the material should be properly labeled. Dispose of wastes in accordance to prescribed federal, state, and local guidelines, e.g., appropriately permitted chemical waste incinerator. Rinse waters resulting from spill cleanups should be discharged in an environmentally safe manner, e.g., appropriately permitted municipal or on-site wastewater treatment facility.

SECTION 14 - TRANSPORT INFORMATION

Transport	Based on the available data, this mixture is not regulated as a hazardous material/ dangerous good under EU ADR/RID, US DOT, Canada TDG, IATA, or IMDG.
UN number	None assigned.
UN proper shipping name	None assigned.
Environmental hazards	Based on the available data, this product/mixture is not regulated as an environmental hazard or a marine pollutant.
Special precautions for users	Avoid exposure and releases to the environment.
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.

SECTION 15 - REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture	This SDS complies with the requirements under US, EU and GHS (EU CLP - Regulation EC No 1272/2008 and UN ST/SG/AC 10/30 rev 3) guidelines.
Chemical safety assessment	Conducted.
OSHA Hazardous	Yes. Harmful or fatal if swallowed. Can enter lungs and cause damage. Mixture not fully tested.

WHMIS classification	This substance does not meet any of the hazard criteria of the Controlled Products Regulations and the SDS contains all of the information required by those regulations.
TSCA status	All components are listed on the TSCA inventory.
SARA section 312/313	Acute health hazard (aspiration)
California proposition 65	Not listed.

SECTION 16 - OTHER INFORMATION

Full text of H phrases, P phrases and GHS classification	AH1- Aspiration Hazard - Category 1 H304 - May be fatal if swallowed and enters airways
NFPA Classification:	Health Hazard: 1; Fire Hazard: 1; Reactivity Hazard; 0
Sources of data	Information from published literature and internal company data.
Abbreviations	ACGIH - American Conference of Governmental Industrial Hygienists ADR/RID - European Agreement Concerning the International Carriage of Dangerous Goods by Road/Rail AIHA - American Industrial Hygiene Association CAS# - Chemical Abstract Services Number DNEL - Derived No Effect Level DOT - Department of Transportation EINECS - European Inventory of New and Existing Chemical Substances ELINCS - European List of Notified Chemical Substances EU - European Union GHS - Globally Harmonized System of Classification and Labelling of Chemicals IARC - International Agency for Research on Cancer IDLH - Immediately Dangerous to Life or Health IATA - International Air Transport Association IMDG - International Maritime Dangerous Goods LOEL - Lowest Observed Effect Level LOAEL - Lowest Observed Adverse Effect Level NIOSH - The National Institute for Occupational Safety and Health NOEL - No Observed Effect Level NOAEL - No Observed Adverse Effect Level NTP - National Toxicology Program OEL - Occupational Exposure Limit OSHA - Occupational Safety and Health Administration PBT - Persistent, Bioaccumulative and Toxic PNEC - Predicted No Effect Concentration SARA - Superfund Amendments and Reauthorization Act STEL - Short Term Exposure Limit TDG - Transport Dangerous Goods TSCA - Toxic Substances Control Act TWA - Time Weighted Average WHMIS - Workplace Hazardous Materials Information System

Disclaimer

The above information is based on data available to us and is believed to be correct. Since the information may be applied under conditions beyond our control and with which we may be unfamiliar, we do not assume any responsibility for the results of its use and all persons receiving it must make their own determination of the effects, properties and protections which pertain to their particular conditions. No representation, warranty, or guarantee, express or implied (including a warranty of fitness or merchantability for a particular purpose), is made with respect to the materials, the accuracy of this information, the results to be obtained from the use thereof, or the hazards connected with the use of the material. Caution should be used in the handling and use of the material because it is a pharmaceutical product. The above information is offered in good faith and with the belief that it is accurate. As of the date of issuance, we are providing all information relevant to the foreseeable handling of the material. However, in the event of an adverse incident associated with this product, this Safety Data Sheet is not, and is not intended to be, a substitute for consultation with appropriately trained personnel.