



RADCOLUBE® 500M

SAFETY DATA SHEET

MIL-PRF-87252E COOLANT FLUID, HYDROLYTICALLY STABLE, DIELECTRIC

Issue Date: 22 July 2019

Revision Date: 20 April 2020

Revision Number: 1.1

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

1.1 Product Identifier

Product Name: RADCOLUBE® 500M

Specifications: MIL-PRF-87252E
Qualification Number: AFPET/PTPT 19-014
Qualification Date: 25 September 2019

ISO 9001:2015 Certification Number: C2018-00035

NATO Code: S-1748

National Stock Numbers (NSN):
9150-01-306-2475 Quart
9150-01-336-7174 1-gallon oblong
9150-01-304-0885 1-gallon round
9160-01-380-2175 1-gallon oblong
9150-01-306-2470 55-Gallon drum

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

This product is a synthetic hydrocarbon coolant fluid for use in the -54°C to 200°C (-65.2°F to 392°F) temperature range for use in electronic applications.

1.3 Details of the supplier of the safety data sheet

Headquarters	Manufacturing Facility
Radco Industries, Inc.	Radco Industries, Inc.
700 Kingsland Drive	39W930 Midan Drive
Batavia, IL 60510	LaFox, IL 60147
CAGE Code 6ZS16	CAGE Code 1RVC4

Customer information number: 1-630-232-7966

1.4 Emergency Telephone Number

Advisory Office in case of poisoning: Chemtrec
Chemtrec (North America): 1-800-424-9300

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture:

Aspiration hazard Category 1

2.2 Label elements



Hazard pictograms: Health Hazard

Signal word: DANGER

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Classification of mixture is in accordance with United Nations (UN) Globally Harmonized System of Classification and Labelling of Chemicals (GHS), sixth revised edition (2015), and United States Standard 29 CFR 1910 Occupational Safety and Health Standards.

Hazard statements

H304:	May be fatal if swallowed and enters airways.
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Precaution statements

P101:	If medical advice is needed, have product container or label at hand.
P202:	Do not handle until all safety precautions have been read and understood.
P270:	Do not eat, drink or smoke when using this product.
P273:	Avoid release to the environment.
P280:	Wear protective gloves/protective clothing/eye protection/face protection.
P301 + P331 + P315:	IF SWALLOWED: Do NOT induce vomiting. Rinse mouth. Get immediate medical advice/attention.
P303 + P353:	IF ON SKIN (or hair): Rinse skin with water/shower.
P304 + P340 + P342 + P315:	IF INHALED: Remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms, get immediate medical advice/attention.
P305 + P351 + P338 + P310:	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.
P306 + P363:	IF ON CLOTHING: Wash contaminated clothing before reuse.
P404:	Store in a closed container.
P501:	Dispose of contents/container to in accordance with local/regional/national/international regulation.

2.3 Other hazards**PBT and vPvB**

This product is not expected to be PBT and vPvB based on components.

NFPA Hazard ID

Health: 1
Flammability: 1
Reactivity: 0

HMIS Hazard ID

Health: 1
Flammability: 1
Reactivity: 0

SECTION 3. Composition/information on ingredients**3.1 Substances**Dec-1-ene, dimers, hydrogenated

Index number: Not available
CAS number: 68649-11-6
EC number: 500-228-5
REACH number: 01-2119493069-28
Synonyms: 1-Decene, dimer, hydrogenated; Polyalphaolefin

Non-classifiable components

Index number: Not available
CAS number: Trade Secret
EC number: Trade Secret
REACH number: Not available

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Synonyms: Trade Secret

3.2 Mixtures**Description of mixture:**

Multicomponent mixture of synthetic base oils and additives.

Component	CAS Number	EC Number	%Content	Classification of Labeling	M-Factor
Dec-1-ene, dimers, hydrogenated	68649-11-6	500-183-1	> 95%	Acute Tox. 4 – H332 Asp. Tox. 1 – H304	0
Non-classifiable components	Trade secret	Trade secret	Trade secret	Not classified	0

M-Factor determinations are in accordance with UN GHS, sixth revised edition (2015).

See SECTION 16 for full text of the toxicity categories and H-statements listed in this section.

Indicative occupational exposure limit values

None established

SECTION 4. FIRST AID MEASURES**4.1 Description of first aid measures****Eye contact**

Upon accidental eye exposure, wash the eyes promptly with water for at least 20 minutes. If wearing contact lenses, remove them if safe to do so, and continue washing. Get medical attention immediately.

Ingestion

If swallowed, do not induce vomiting. Rinse mouth out with water. Get medical attention immediately.

Inhalation

If respiratory irritation, dizziness, or nausea occurs, move to fresh air and keep at rest in a comfortable position for breathing. If symptoms persist or unconsciousness occurs, seek immediate medical assistance.

Skin contact

Wash skin thoroughly with mild soap and plenty of water for at least 20 minutes. If irritation develops, seek medical advice.

Note to physicians

Treat symptomatically.

4.2 Most important symptoms and effects, both acute and delayed**Acute symptoms****Eye exposure symptoms**

Direct eye exposure may lead to redness and lacrimation (crying tears).

Ingestion symptoms

Small amounts may cause nausea. Large amounts may lead to abdominal obstruction (cramps), constipation or diarrhea.

Inhalation symptoms

May cause irritation of the nose, throat, and lungs.

Skin exposure symptoms

Short-term exposure is not expected to cause irritation.

Delayed symptoms**Eye exposure symptoms**

None expected, however seek medical attention if irritation persists.

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Ingestion symptoms

None expected, however seek medical attention if abdominal obstruction, constipation or diarrhea persists.

Inhalation symptoms

None expected, however seek medical attention if respiratory irritation persists.

Skin exposure symptoms

Repeated exposure may lead to irritation. If rash develops, seek medical attention.

4.3 Indication of any immediate medical attention and special treatment needed

Suggestions for clinical testing and medical monitoring for delayed effects are not known. Use first aid when applicable, and seek guidance from a medical physician for specific treatment.

SECTION 5. FIREFIGHTING MEASURES**5.1 Extinguishing media**

Suitable extinguishing media includes alcohol-resistant foam, carbon dioxide, dry chemical or water fog.

5.2 Special hazards arising from the substance or mixture

No data is available.

5.3 Advice for firefighters**Fire-Fighting Equipment**

Firefighter should wear normal protective equipment (full bunker gear) and positive-pressure contained breathing apparatus. Water can be used to cool fire-exposed containers, to protect personnel and to disperse vapors and spills. Water runoff can cause environmental damage. Dike and collect water used to fight fires.

Special Fire-Fighting Procedures

Use water spray to cool fire-exposed containers and structures. If a rail or tank truck is involved in a fire, isolate for 800 meters (0.5 mile) in all directions. Shut off fuel to fire if it is possible to do so without hazard. If this is impossible, withdraw from the area and let the fire burn out under controlled conditions. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.

SECTION 6. ACCIDENTAL RELEASE MEASURES**6.1 Personal precautions, protective equipment and emergency procedures****For non-emergency personnel**

Wear personal protective equipment (PPE). Eliminate sources of ignition, if safe to do so. Avoid breathing vapors or mist. Evacuate to designated safe areas.

For emergency responders

If possible, move individual to safe area, and treat symptomatically.

6.2 Environmental precautions

Contain spill, if safe to do so. Prevent from entering sewers or drains.

6.3 Methods and material for containment and cleaning up

Use oil absorbent material to soak up product on the ground. Should this product enter sewers or drains, it should be pumped out into an open vessel. The recovered material should be discarded as hazardous waste.

6.4 Reference to other sections

If appropriate, refer to SECTION 8 and SECTION 13 for additional information.

SECTION 7. HANDLING AND STORAGE

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7.1 Precautions for safe handling

Use personal protective equipment (PPE) when handling this product. Smoking, eating and drinking should be prohibited in the application area.

7.2 Conditions for safe storage, including any incompatibilities

Do not store in open or unlabeled containers. Keep container tightly closed in a dry and well-ventilated place.

7.3 Specific end use(s)

For use in -54°C to 200°C (-65.2°F to 392°F) temperature range.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**8.1 Control parameters****Occupational exposure limits**

No exposure limits have been established for any of the disclosed components.

Biological exposure limits

None established for any of the disclosed components.

8.2 Exposure controls**Appropriate engineering controls**

Practice general industrial hygiene. Do not eat, drink or smoke near product. Wash hands after handling. Remove clothing and wash separate from other laundry.

Personal protective equipment (PPE)**Eye/face protection**

Safety glasses, chemical safety goggles and/or face shields are recommended when handling this product.

Skin protection

For extended handling, wear oil resistant gloves such as neoprene. Nitrile gloves may be appropriate for short handling periods use. Contact a government approved or accredited manufacturer for specific recommendations.

Other protections

Wear protective clothing ensuring minimal skin exposure. Protective clothing should be chemically impervious to oils and other solvents.

Respiratory protection

Use with adequate ventilation. Avoid breathing vapor. If heated and ventilation is inadequate, use NIOSH certified respirator, which will protect against organic vapor.

Environmental exposure controls

Do not allow product to reach ground water, water course, or sewage systems. Stop leaks, if safe to do so. Contain spills with absorbent or adsorbent materials.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**9.1 Information on basic physical and chemical properties**

Appearance:	Colorless liquid
Odor:	Faint
Odor threshold:	Not determined
Auto-ignition temperature:	329°C (625°F)
Decomposition temperature:	Not determined
Evaporation Rate (ASTM D972):	Not determined
Explosive properties:	None

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Flammability (solid, gas): Lower flammability limit: Upper flammability limit:	Non-flammable No data available No data available
Flash point Cleveland Open Cup (ASTM D92):	> 157°C (315°F)
Flash point Pensky-Martens Closed Cup (ASTM D93):	> 142°C (288°F)
Normal boiling point:	> 305°C (599°F), 10% fraction
Melting point/freezing point:	< -70°C (-94°F)
Oxidizing properties:	None
Partition coefficient (n-octanol/water), Log P _{ow} :	No data available
pH:	Not applicable
Relative density (ASTM D1298) 15.6°C/15.6°C (60°F/60°F):	0.798
Solubility in water:	< 200 ppm
Vapor density:	No data available
Vapor pressure:	< 0.01 mmHg at 25°C
Viscosity (ASTM D445):	< 1300 mm ² /s (cSt) at -54°C (-65.2°F) < 300 mm ² /s (cSt) at -40°C (-40°F) > 5.0 mm ² /s (cSt) at 40°C (104°F) > 1.65 mm ² /s (cSt) at 100°C (212°F)

9.2 Other information

No further information is available.

SECTION 10. STABILITY AND REACTIVITY**10.1 Reactivity**

Non-reactive in its original state.

10.2 Chemical stability

Stable in its original state.

10.3 Possibility of hazardous reactions

Does not occur.

10.4 Conditions to avoid

Oxidizing materials

10.5 Incompatible materials

Keep away from strong oxidizing or reducing agents, including acids, caustics, chlorites (bleach), halogens and peroxides.

10.6 Hazardous decomposition products

Decomposition of this product under fire conditions may produce carbon oxides, phenols, and other decomposition products.

SECTION 11. TOXICOLOGICAL INFORMATION**11.1 Information on toxicological effects**

Acute toxicity	Method	Species	Result
Dec-1-ene, dimers, hydrogenated	Dermal	Rat	LD ₅₀ > 2000 mg/kg
	Inhalation	Rat	LC ₅₀ ≥ 0.9 mg/L after 1 hour
	Oral	Rat	LD ₅₀ > 5000 mg/kg
Non-classifiable components	--	--	Not classified

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Aspiration hazard	Test Method	Species	Result
Dec-1-ene, dimers, hydrogenated	OECD 403	Rat	Aspiration hazard, Category 1
Non-classifiable components	--	--	Not classified

Carcinogenicity

No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by ACGIH, IARC, NTP or OSHA.

Eye damage / irritation	Test Method	Species	Results
Dec-1-ene, dimers, hydrogenated	OECD 405	Rabbit	Not irritating
Non-classifiable components	--	--	Not classified

Germ cell mutagenicity	Test Method	Species	Results
Dec-1-ene, dimers, hydrogenated	OECD 471	<i>S. typhimurium</i>	Not mutagenic
Non-classifiable components	--	--	No data available

Reproductive toxicity	Test Method	Species	Results
Dec-1-ene, dimers, hydrogenated	OECD 415	Rat	No reproductive harm
Non-classifiable components	--	--	No data available

Respiratory sensitization

No data available

Skin sensitization	Test Method	Species	Results
Dec-1-ene, dimers, hydrogenated	OECD 406	Guinea pig	Not sensitizing
Non-classifiable components	--	--	Not classified

Skin corrosion/irritation	Test Method	Species	Results
Dec-1-ene, dimers, hydrogenated	OECD 404	Rabbit	Not irritating
Non-classifiable components	--	--	Not classified

Specific target organ toxicity (STOT)-repeated exposure	Test Method	Species	Results
Dec-1-ene, dimers, hydrogenated	OECD 407	Rat	NOAEL = 1000 mg/kg/day
Non-classifiable components	--	--	No data available

Specific target organ toxicity (STOT)-single exposure

No data available

11.2 Other information

See SECTION 16 for toxicity references.

SECTION 12. ECOLOGICAL INFORMATION**12.1 Toxicity**

Aquatic Toxicity	Test Method	Species	Results
Dec-1-ene, dimers, hydrogenated	EPA - 660/3-75-009	<i>O. mykiss</i>	LL ₅₀ > 1000g/L after 96 hours
	OECD 201	<i>S. capricornutum</i>	NOEC = 1000mg/L WAF after 72 hours
	OECD 202	<i>Americamysis bahia</i>	LL ₅₀ > 5002 ppm after 96 hours
	OECD 211	<i>Daphnia magna</i>	NOELR = 125 mg/L WAF after 21 days
Non-classifiable components	--	--	Not classified

Terrestrial Toxicity	Test Method	Species	Results
Dec-1-ene, dimers, hydrogenated	OECD 222	<i>Eisenia foetida</i>	NOEC = 500 mg/kg after 56 days
Non-classifiable components	--	--	Not classified

12.2 Persistence and degradability

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Biodegradation	Test Method	Results
Dec-1-ene, dimers, hydrogenated	OECD 301B	Not readily biodegradable
Non-classifiable components	--	No data available

12.3 Bioaccumulative potential**Bioconcentration Factor (BCF)**

No data available

Partition Coefficient n-octanol / water	Results
Dec-1-ene, dimers, hydrogenated	Log P _{ow} > 6.5
Non-classifiable components	No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Chemical	Results
Dec-1-ene, dimers, hydrogenated	The substance is not PBT / vPvB.
Non-classifiable components	These substances are not PBT / vPvB.

12.6 Other adverse effects

No data available

SECTION 13. DISPOSAL CONSIDERATIONS**13.1 Waste treatment methods**

This unused material, when discarded or disposed of, is not specifically listed as a hazardous waste in Federal regulations; however, it could be considered hazardous if it meets U.S. EPA (40 CFR Subpart C) criteria for being toxic, corrosive, ignitable, or reactive. This material could also become hazardous waste if it is mixed with or meets a listed hazardous waste. If it is a hazardous waste, regulations in 40 CFR 262-266, 268, 270, and 279 may apply.

SECTION 14. TRANSPORTATION INFORMATION**United States Department of Transportation (DOT)**

Not regulated

Canada Transport - Transportation of Dangerous Goods (TDG)

Not regulated

International Air Transport Association (IATA)

Not regulated

International Carriage of Dangerous Goods by Inland Waterways (AND)

Not regulated

International Carriage of Dangerous Goods by Rail (RID)

Not regulated

International Carriage of Dangerous Goods by Road (ADR)

Not regulated

International Civil Aviation Organization (ICAO)

Not regulated

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International Maritime Dangerous Goods Code (IMDG Code)

Not regulated

SECTION 15. REGULATORY INFORMATION**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture****Australia Inventory (AICS)**

All the ingredients are listed.

California Proposition 65

This product does not contain any chemicals known to the State of California to cause cancer and/or to cause birth defects or other reproductive harm.

Canadian Domestic Substances List/Non-Domestic Substances List (DSL/NDSL)

All the ingredients are listed.

China Inventory of Existing Chemical Substances (IECSC)

All the ingredients are listed.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Reportable Quantity

This product is not reportable under 40 CFR Part 302.4.

International Agency for Research on Cancer (IARC)

None of the ingredients are listed.

Japan Existing and New Chemical Substances (ENCS)

All the ingredients are listed.

Korean Existing and Evaluated Chemical Substances (KECL)

All the ingredients are listed.

Philippines Inventory of Chemicals and Chemical Substances (PICCS)

All the ingredients are listed.

SARA Title III Section 302 Extremely Hazardous Substances (40 CFR Part 355)

This product is not regulated under Section 302 of SARA and 40 CFR Part 355.

SARA Title III Section 313 (40 CFR Part 372)

This product is not regulated under Section 313 of SARA and 40 CFR Part 372.

SARA Title III Sections 311/312 Hazardous Categorization (40 CFR Part 370)

Hazardous categories for this product are:

Acute = No Chronic = No Fire = No Pressure = No Reactive = No

United States Toxic Substances Control Act (TSCA)

All the ingredients are listed.

15.2 Chemical safety assessment

A Chemical Safety Assessment has not been conducted.

SECTION 16. OTHER INFORMATION

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RADCOLUBE® is a registered trademark of Radco Industries, Inc.

Toxicological References

"Dec-1-ene, homopolymer, hydrogenated." *Registration Dossier - ECHA*. European Chemicals Agency, [no date]. Web. 11 Apr. 2017.
Globally Harmonized System of Classification and Labelling of Chemicals: (GHS). 6th ed. New York: United Nations, 2015. Print.

Definitions

Asp. Tox. 1	See <i>Aspiration hazard, category 1 definition</i> .
Aspiration hazard, category 1	Hydrocarbons with kinematic viscosity ≤ 20.5 mm ² /s.
DIN 38412-8	German Standards for the Examination of Water, Waste Water and Sludge ...
EC number	European Community number
EC50	Concentration that effects 50% of the test population.
EPA	United States Environmental Protection Agency
EPA - 660/3-75-009	United States Environmental Protection Agency Test Guideline for Acute Toxicity Tests With Fish
EU	European Union
Eye Irrit. 2	See <i>Eye irritation, category 2 definition</i> .
Eye irritation, category 2	Potential for reversible eye irritation within 21 days in animal studies.
H304	May be fatal if swallowed and enters airways.
HMIS	Hazardous Materials Identification System
IARC	International Agency for Research on Cancer
LC50	Lethal concentration that causes 50% death in test population.
LD50	Lethal dose that causes 50% death in test population.
LL50	Loading test rate that causes 50% death in test population.
M-Factor	Multiplying factor for substances that are toxic to aquatic environment.
NFPA	National Fire Protection Association
NOEC	No observable effect concentration
NOEL	No observable effect level
NOELR	No observed effect loading rate
NTP	National Toxicology Program, United States Department of Health and Human Services
OECD	Organisation for Economic Co-operation and Development
OECD 201	OECD Guideline 201: Freshwater Alga and Cyanobacteria, Growth Inhibition Test
OECD 202	OECD Guideline 202: Daphnia sp. Acute Immobilisation Test
OECD 203	OECD Guideline 203: Fish, Acute Toxicity Test
OECD 211	OECD Guideline 211: Daphnia magna Reproduction Test
OECD 301B	OECD Guideline 301 B: (Ready Biodegradability: CO2 Evolution Test)
OECD 403	OECD Guideline 403: Acute Inhalation Toxicity
OECD 404	OECD Guideline 404: Acute Dermal Irritation/Corrosion Test
OECD 405	OECD Guideline 405: Acute Eye Irritation/Corrosion Test
OECD 406	OECD Guideline 406: Skin Sensitization Test
OECD 415	OECD Guideline 415: One-Generation Reproduction Toxicity Study
OECD 471	OECD Guideline 471: Bacterial Reverse Mutation Test
OSHA	United States Department of Labor Occupational Safety and Health Administration
PBT	Persistence Bioaccumulation and Toxicity
Skin Irrit. 2	See <i>Skin corrosion/irritation, Category 2 for definition</i> .
Skin irritation, Category 2	Inflammation, alopecia (limited area), hyperkeratosis, hyperplasia, and scaling that fully reverses after 14 day in animal studies.
UN	United Nations
US	United States of America
vPvB	Very persistent and very bioaccumulative