



RADCOLUBE® FR257

SAFETY DATA SHEET

MIL-PRF-87257C HYDRAULIC FLUID, FIRE RESISTANT, LOW TEMPERATURE, SYNTHETIC HYDROCARBON BASE, AIRCRAFT AND MISSILE

Issue Date: 2 February 2010

Revision Date: 13 August 2020

Revision Number: 4.1

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

1.1 Product Identifier

| | | |
|-------------------------------------|-------------------|----------------|
| Product Name: | RADCOLUBE® FR257 | |
| Specifications: | MIL-PRF-87257C | |
| Qualification Number: | AFPET/PTPS 19-011 | |
| Qualification Date: | 18 July 2019 | |
| ISO 9001:2008 Certification Number: | C2018-00035 | |
| NATO Code: | H-538 | |
| National Stock Numbers (NSN): | 9150-01-388-7769 | Quart |
| | 9150-01-386-6687 | Gallon |
| | 9150-01-391-2087 | 5 Gallon Pail |
| | 9150-01-387-4577 | 55 Gallon Drum |

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

Synthetic hydrocarbon base hydraulic fluid for use in the -54°C to +200°C (-65°F to 392°F) temperature range in aircraft and missile hydraulic systems.

1.3 Details of the supplier of the safety data sheet

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

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.

2.2 Label elements

Hazard pictograms:



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Signal word: DANGER**Hazard statements**

| | |
|-------|---|
| H304: | May be fatal if swallowed and enters airways. |
|-------|---|

Precaution statements

| | |
|--------------------|---|
| P243: | Take precautionary measures against static discharge |
| P273: | Avoid release to the environment. |
| P301 + P315 +P331: | IF SWALLOWED: Do NOT induce vomiting. Get immediate medical advice/attention. |
| P305 + P351: | IF IN EYES: Rinse cautiously with water for several minutes. |
| P350: | Gently wash with soap and water. |
| P362: | Take off contaminated clothing and wash before reuse. |
| P405: | Store locked up. |
| P501: | Dispose of contents/container to an approved waste disposal plant. |

2.3 Other hazards**PBT and vPvB**

PBT and vPvB assessment is not available as chemical safety assessment has not been conducted.

| NFPA Hazard ID | | HMIS Hazard ID | |
|----------------|---|----------------|---|
| Health: | 1 | Health: | 1 |
| Flammability: | 1 | Flammability: | 1 |
| Reactivity: | 0 | Reactivity: | 0 |

SECTION 3. Composition/information on ingredients**3.1 Substances**1-Decene, homopolymer, hydrogenated

Index number: Not available
CAS number: 68037-01-4
EC number: 500-183-1
REACH number: 01-2119486452-34
Synonyms: 1-Decene, dimer, hydrogenated; Polyalphaolefin; Dec-1-ene, homopolymer, hydrogenated Dec-1-ene, oligomers, hydrogenated

Proprietary components

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

3.2 Mixtures

| Component | CAS Number | EC Number | %Content | Classification of Labeling | M-Factor |
|-------------------------------------|-------------|-------------|--------------|----------------------------|----------|
| 1-Decene, homopolymer, hydrogenated | 68037-01-4 | 500-183-1 | Trade secret | Asp. Tox. 1 – H304 | 0 |
| Proprietary components | Proprietary | Proprietary | Proprietary | Proprietary | 0 |

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

Indicative occupational exposure limit values



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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.

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

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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**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)

Designed for use in applications requiring MIL-PRF-87257C type hydraulic fluid.

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

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Occupational exposure limits

None established

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: | Transparent, red liquid |
| Odor: | Odorless |
| Odor threshold: | Not determined |
| Auto-ignition temperature: | 340°C (644°F) |
| Decomposition temperature: | Not determined |
| Evaporation Rate (ASTM D972): | 14% after 6.5 hours at 135°C (275°F) |
| Explosive properties: | Not determined |
| Flammability (solid, gas): | Non-flammable |
| Lower flammability limit: | Not determined |
| Upper flammability limit: | Not determined |
| Flash point Cleveland Open Cup (ASTM D92): | 172°C (341.6°F) |
| Flash point Pensky-Martens (ASTM D93): | Not determined |
| Initial boiling point and boiling range: | Not determined |
| Melting point/freezing point: | < -60°C (-76°F) |
| Oxidizing properties: | Not determined |
| Partition coefficient (n-octanol/water), Log P _{ow} : | Not determined |
| pH: | Not applicable |
| Relative density (ASTM D1298) 15.6°C/15.6°C (60°F/60°F): | 0.84 |
| Solubility in water: | Insoluble |

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| | |
|------------------------|---|
| Vapor density: | Not determined |
| Vapor pressure: | <0.1 mmHg at 20°C (68°F) |
| Viscosity (ASTM D445): | 2.1 mm ² /s (cSt) at 100°C (212°F) 6.8 mm ² /s (cSt) at 40°C(104°F) 470 mm ² /s (cSt) at -40°C (-40°F) 2,350 mm ² /s (cSt) at -54°C (65.2°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 |
|-------------------------------------|------------|---------|--|
| 1-Decene, homopolymer, hydrogenated | Dermal | Rat | LD ₅₀ > 2000 mg/kg |
| | Inhalation | Rat | LC ₅₀ = 5.0 mg/L after 1 hour |
| | Oral | Rat | LD ₅₀ > 2000 mg/kg |
| Proprietary components | -- | -- | Not classified |

| Aspiration hazard | Test Method | Species | Result |
|-------------------------------------|-------------|---------|-------------------------------|
| 1-Decene, homopolymer, hydrogenated | OECD 403 | Rat | Aspiration hazard, Category 1 |
| Proprietary components | -- | -- | No data available |

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 |
|-------------------------------------|-------------|---------|----------------|
| 1-Decene, homopolymer, hydrogenated | OECD 405 | Rabbit | Not irritating |
| Proprietary components | -- | -- | Not classified |

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| Germ cell mutagenicity | Test Method | Species | Results |
|-------------------------------------|-------------|-----------------------|-------------------|
| 1-Decene, homopolymer, hydrogenated | OECD 471 | <i>S. typhimurium</i> | Not mutagenic |
| Proprietary components | -- | -- | No data available |

| Reproductive toxicity | Test Method | Species | Results |
|-------------------------------------|-------------|---------|----------------------|
| 1-Decene, homopolymer, hydrogenated | OECD 415 | Rat | No reproductive harm |
| Proprietary components | -- | -- | No data available |

Respiratory sensitization

No data available

| Skin sensitization | Test Method | Species | Results |
|-------------------------------------|-------------|------------|-----------------|
| 1-Decene, homopolymer, hydrogenated | OECD 406 | Guinea pig | Not sensitizing |
| Proprietary components | -- | -- | Not classified |

| Skin corrosion/irritation | Test Method | Species | Results |
|-------------------------------------|-------------|---------|----------------|
| 1-Decene, homopolymer, hydrogenated | OECD 404 | Rabbit | Not irritating |
| Proprietary components | -- | -- | Not classified |

Specific target organ toxicity – repeated exposure (STOT-RE)

No data available

Specific target organ toxicity – single exposure (STOT-SE)

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 |
|-------------------------------------|-------------------------------------|---|---|
| 1-Decene, homopolymer, hydrogenated | OECD 203 OECD 211 DIN 38412-8 | <i>D. magna</i> <i>O. mykiss</i> <i>P. putida</i> | NOEL = 125 mg/L after 21 days LL ₅₀ > 1000g/L after 96 hours EC ₅₀ > 10g/L after 16 hours |
| Proprietary components | -- | -- | Not classified |

| Terrestrial Toxicity | Test Method | Species | Results |
|-------------------------------------|-------------|-----------|---------------------------------|
| 1-Decene, homopolymer, hydrogenated | OECD 222 | Earthworm | LC50 > 1000 mg/kg after 56 days |
| Proprietary components | -- | -- | No data available |

12.2 Persistence and degradability

| Biodegradation | Test Method | Results |
|-------------------------------------|-------------|---------------------------|
| 1-Decene, homopolymer, hydrogenated | OECD 301B | Not readily biodegradable |
| Proprietary components | -- | No data available |

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

No data available

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| Partition Coefficient n-octanol / water (Log K _{ow}) | Results |
|--|-----------------------------|
| 1-Decene, homopolymer, hydrogenated | Log K _{ow} = 10.09 |
| Proprietary components | No data available |

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

| Chemical | Results |
|-------------------------------------|--|
| 1-Decene, homopolymer, hydrogenated | This substance is not PBT and vPvB. |
| Proprietary components | These substances are not PBT and vPvB. |

12.6 Other adverse effects

No further information is 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

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**



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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

Safety Data Sheet Creation Date: 2 February 2010

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THIS INFORMATION RELATES TO THE SPECIFIC MATERIAL DESIGNATED AND MAY NOT BE VALID FOR SUCH MATERIAL USED IN COMBINATION WITH ANY OTHER MATERIALS OR IN ANY PARTICULAR PROCESS OR FOR ANY PARTICULAR PURPOSE. SUCH INFORMATION STATED IS TO THE BEST OF RADCO'S KNOWLEDGE AND BELIEF, ACCURATE AND RELIABLE AS OF THE DATE COMPILED.

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

Toxicological References

"Dec-1-ene, homopolymer, hydrogenated Dec-1-ene, oligomers, 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.