1. Identification

Product identifier: R-1234yf Refrigerant PAG Oil

Other means of identification

FIR No.: 195623

Recommended use: A/C refrigerant compressor oil

Recommended restrictions: None known.

Manufacturer/Importer/Supplier/Distributor information

Supplier

Company Name: Ford Motor Company
Address: Attention: MSDS Information, P.O. Box 1899
Dearborn, Michigan 48121 USA

Telephone: 1-800-392-3673
MSDS Information: 1-800-448-2063
msds@brownart.com

Emergency telephone numbers

Poison Control Center: USA and Canada: 1-800-959-3673
INFOTRAC (Transportation): USA and Canada 1-800-535-5053

2. Hazard(s) identification

Physical hazards: Not classified.

Health hazards: Sensitization, skin Category 1

Environmental hazards: Hazardous to the aquatic environment, acute hazard Category 3
Hazardous to the aquatic environment, long-term hazard Category 3

OSHA defined hazards: Not classified.

Label elements

Signal word: Warning

Hazard statement: May cause an allergic skin reaction. Harmful to aquatic life. Harmful to aquatic life with long lasting effects.

Precautionary statement

Prevention: Avoid breathing mist or vapor. Contaminated work clothing must not be allowed out of the workplace. Avoid release to the environment. Wear protective gloves.

Response: If on skin: Wash with plenty of water. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Storage: Store away from incompatible materials.

Disposal: Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC): May irritate eyes and skin. May cause irritation of respiratory tract. May be harmful if swallowed.

Supplemental information: None.

3. Composition/information on ingredients

Mixtures

FIR No.: 195623
Version: 01
Issue Date: 10-19-2015
Specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

4. First-aid measures

Inhalation
Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact
Remove contaminated clothing immediately and wash skin with soap and water. In case of eczema or other skin disorders: Seek medical attention and take along these instructions.

Eye contact
Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation develops and persists.

Ingestion
Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. If ingestion of a large amount does occur, call a poison control center immediately. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed
May cause an allergic skin reaction. Dermatitis. Rash.

Indication of immediate medical attention and special treatment needed
Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

General information
Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Wash contaminated clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media

Unsuitable extinguishing media
Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical
During fire, gases hazardous to health may be formed. Upon decomposition, this product emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

Special protective equipment and precautions for firefighters
Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions
Move containers from fire area if you can do so without risk.

Specific methods
Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards
No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Avoid contact with eyes, skin, and clothing. Avoid breathing mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up
Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Prevent product from entering drains. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Environmental precautions
Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground. Inform appropriate managerial or supervisory personnel of all environmental releases.
7. Handling and storage

Precautions for safe handling: Avoid breathing mist or vapor. Avoid contact with eyes, skin, and clothing. Provide adequate ventilation. Wear appropriate personal protective equipment. Avoid release to the environment. Observe good industrial hygiene practices. See Section 8 of the SDS for Personal Protective Equipment.

Conditions for safe storage, including any incompatibilities: Store in original tightly closed container. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits: No exposure limits noted for ingredient(s).

Biological limit values: No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls: Use adequate ventilation to control airborne concentrations below the exposure limits/guidelines. If user operations generate a vapor, dust and/or mist, use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits/guidelines.

Individual protection measures, such as personal protective equipment:

Eye/face protection: Wear safety glasses with side shields (or goggles).

Skin protection: The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Suitable chemical protective gloves should be worn when the potential exists for prolonged or repeated skin exposure. Nitrile gloves are recommended. Neoprene gloves are recommended.

Hand protection: The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Suitable chemical protective gloves should be worn when the potential exists for prolonged or repeated skin exposure. Nitrile gloves are recommended. Neoprene gloves are recommended.

Other: Wear appropriate chemical resistant clothing. Wear appropriate chemical resistant clothing if applicable.

Respiratory protection: If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, an approved respirator must be worn. Respirator selection, use and maintenance should be in accordance with the requirements of OSHA Respiratory Protection Standard 29 CFR 1910.134 and/or Canadian Standard CSA Z94.4.

Thermal hazards: Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace.

9. Physical and chemical properties

Appearance:

Physical state: Liquid.

Form: Lubricant.

Color: Clear colorless or nearly colorless

Odor: Mild.

Odor threshold: Not available.

pH: Not available.

Melting point/freezing point: -40 °F (-40 °C)

Initial boiling point and boiling range: Not available.

Flash point: 359.6 °F (182.0 °C)

Evaporation rate: Not available.

Flammability (solid, gas): Not applicable.

Upper/lower flammability or explosive limits:

Flammability limit - lower (%): Not available.

Flammability limit - upper (%): Not available.

Explosive limit - lower (%): Not available.

Explosive limit - upper (%): Not available.

Vapor pressure: Not available.
Vapor density < 1
Relative density Not available.
Solubility(ies)
  Solubility (water) Not available.
Partition coefficient (n-octanol/water) Not available.
Auto-ignition temperature Not available.
Decomposition temperature Not available.
Viscosity 40 - 50 mm²/s
Viscosity temperature 104 °F (40 °C)

10. Stability and reactivity
Reactivity The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability Material is stable under normal conditions.
Possibility of hazardous reactions No dangerous reaction known under conditions of normal use.
Conditions to avoid Contact with incompatible materials.
Incompatible materials Strong oxidizing agents. Strong acids.

11. Toxicological information
Information on likely routes of exposure
  Inhalation May cause irritation to the respiratory system.
  Skin contact May cause an allergic skin reaction. May be irritating to the skin.
  Eye contact Direct contact with eyes may cause temporary irritation.
  Ingestion May be harmful if swallowed.
Symptoms related to the physical, chemical and toxicological characteristics May cause an allergic skin reaction. Dermatitis. Rash.
Information on toxicological effects
Acute toxicity May cause an allergic skin reaction. May irritate eyes and skin. May cause respiratory irritation. May be harmful if swallowed.
Skin corrosion/irritation Prolonged skin contact may cause temporary irritation.
Serious eye damage/eye irritation Direct contact with eyes may cause temporary irritation.
Respiratory or skin sensitization
  Respiratory sensitization Not a respiratory sensitizer.
  Skin sensitization May cause an allergic skin reaction.
Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
  Not listed.
Reproductive toxicity This product is not expected to cause reproductive or developmental effects.
Specific target organ toxicity - single exposure Not classified.
Specific target organ toxicity - repeated exposure Not classified.
Aspiration hazard Not an aspiration hazard.

12. Ecological information
Ecotoxicity Harmful to aquatic life with long lasting effects.
Ecotoxicity

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Calculated/Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tris(methylphenyl) phosphate (CAS 1330-78-5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aquatic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crustacea</td>
<td>EC50 Water flea (Daphnia magna)</td>
<td>2.3 - 4.5 mg/l, 48 hours</td>
</tr>
<tr>
<td>Fish</td>
<td>LC50 Rainbow trout, donaldson trout (Oncorhynchus mykiss)</td>
<td>0.21 - 0.32 mg/l, 96 hours</td>
</tr>
</tbody>
</table>

Persistence and degradability

No data is available on the degradability of this product.

Bioaccumulative potential

<table>
<thead>
<tr>
<th>Partition coefficient n-octanol / water (log Kow)</th>
<th>Tris(methylphenyl) phosphate</th>
<th>5.11</th>
</tr>
</thead>
</table>

Mobility in soil

No data available.

Other adverse effects

No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions

Don't pollute. Conserve resources. Return used oil to collection centers. Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations

Dispose in accordance with all applicable regulations.

Hazardous waste code

The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products

Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging

Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not established.

15. Regulatory information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.
Superfund Amendments and Reauthorization Act of 1986 (SARA)

**Hazard categories**
- Immediate Hazard - Yes
- Delayed Hazard - No
- Fire Hazard - No
- Pressure Hazard - No
- Reactivity Hazard - No

**SARA 302 Extremely hazardous substance**
- Not listed.

**SARA 311/312 Hazardous chemical**
- No

**SARA 313 (TRI reporting)**
- Not regulated.

**Other federal regulations**
- Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List
  - Not regulated.
- Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)
  - Not regulated.
- Safe Drinking Water Act (SDWA)
  - Not regulated.

**US state regulations**
- US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)
  - Not listed.
- US. Massachusetts RTK - Substance List
  - Not regulated.
- US. New Jersey Worker and Community Right-to-Know Act
  - Tris(methylphenyl) phosphate (CAS 1330-78-5)
- US. Pennsylvania Worker and Community Right-to-Know Law
  - Not listed.
- US. Rhode Island RTK
  - Not regulated.
- US. California Proposition 65
  - California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

**International Inventories**
- All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.

16. **Other information, including date of preparation or last revision**

- Issue date: 10-19-2015
- Version #: 01
- **HMIS® ratings**
  - Health: 1
  - Flammability: 1
  - Physical hazard: 0
- **NFPA ratings**
  - Health: 1
  - Flammability: 1
  - Instability: 0

**Preparation Information and Disclaimer**

This document was prepared by FCSD-Toxicology, Ford Motor Company, Diagnostic Service Center II, 1800 Fairlane Drive, Allen Park, MI 48101, USA, based in part on information provided by the manufacturer. The information on this data sheet represents our current data and is accurate to the best of our knowledge as to the proper handling of this product under normal conditions and in accordance with the application specified on the packaging and/or technical guidance literature. Any other use of the product which involves using the product in combination with any other product or any other process is the responsibility of the user. To the extent that there are any differences between this product’s Safety Data Sheet (SDS) and the consumer packaged product labels, the SDS should be followed.

**Part number(s)**
- YN-35