Ritchie High Vacuum Pump Oil

Material Safety Data Sheet

Ritchie Engineering Company, Inc.
10950 Hampshire Avenue South
Bloomington, MN 664362623

MSDS No. 143057
Revision Date 04/24/2001

IMPORTANT: Read this MSDS before handling or disposing of this product and pass this information on to employees, customers and users of this product.

Emergency Overview

Physical State
Liquid.

Color
Light Amber

Odor
Mild petroleum odor

This product can cause mild eye and skin irritation.
Protect eyes from misting or spraying material.
Protect exposed skin from repeated or prolonged exposure.
This product can burn when preheated but will not ignite readily.
Do not store material in open or unmarked containers.
Spills may create a slipping hazard!

SECTION 1: IDENTIFICATION

Trade Name
Ritchie High Vacuum Pump Oil

Product Number
143057

CAS Number
Mixture.

Product Family
Lubricating Oil

Synonyms
Lubricating Oil; Vacuum Pump

Technical Contact
(952) 943-1333

Medical Emergency
(952) 943-1333

CHEMTREC Emergency
(United States Only)
(800) 424-9300

SECTION 2: COMPOSITION

Component Name(s)
1) Highly-Refined Petroleum Lubricant Oils

CAS Registry No.
64741-88-4;
64742-65-0

Concentration (%)
100

SECTION 3: HAZARDS IDENTIFICATION

Also see Emergency Overview and Hazard Ratings on the top of Page 1 of this MSDS.

Major Route(s) of Entry
Skin contact.

Signs and Symptoms of Acute Exposure

Inhalation
No significant adverse health effects are expected to occur upon short-term exposure to this product.

Eye Contact
Minimal eye irritation may result from short-term contact with liquid, mist, and/or vapor.

Hazard Rankings

<table>
<thead>
<tr>
<th>HMIS</th>
<th>NFPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Hazard</td>
<td>0 0</td>
</tr>
<tr>
<td>Fire Hazard</td>
<td>1 1</td>
</tr>
<tr>
<td>Reactivity</td>
<td>0 0</td>
</tr>
</tbody>
</table>

Chronic Health Hazard

Protective Equipment

Minimum Requirements
See Section 6 for Details

- Eye Protection
- Respiratory Protection
- Skin Protection

MSDS No. 143057
Revision Date 04/24/2001
Continued on Next Page
Page Number: 1
Ritchie High Vacuum Pump Oil

Skin Contact
This material can cause mild skin irritation from prolonged or repeated skin contact. Injection under the skin, in muscle, or into the blood stream can cause irritation, inflammation, swelling, fever, and systemic effects and mild central nervous system depression. Injection of pressurized hydrocarbons can cause severe, permanent tissue damage. Initial symptoms may be minor. Injection of petroleum hydrocarbons requires immediate medical attention.

Ingestion
If swallowed in quantities greater than one teaspoon, this material can cause a laxative effect.

Chronic Health Effects
Contains a petroleum-based mineral oil. Prolonged or repeated skin contact can cause mild irritation and inflammation characterized by drying, cracking, (dermatitis) or oil acne. Repeated or prolonged inhalation of petroleum-based mineral oil mists at concentrations above applicable workplace exposure levels can cause respiratory irritation or other pulmonary effects.

Conditions Aggravated by Exposure
Personnel with pre-existing skin disorders should avoid repeated or prolonged contact with this product.

Target Organs
Skin.

Carcinogenic Potential
This product does not contain any components at concentrations above 0.1% which are considered carcinogenic by OSHA, IARC, or NTP.

<table>
<thead>
<tr>
<th>OSHA Health Hazard Classification</th>
<th>OSHA Physical Hazard Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irritant c l Toxic</td>
<td>Combustible c l</td>
</tr>
<tr>
<td>Sensitizer</td>
<td>Flammable c l</td>
</tr>
<tr>
<td>Corrosive Carcinogenic</td>
<td>Explosive</td>
</tr>
<tr>
<td></td>
<td>Oxidizer c l</td>
</tr>
<tr>
<td></td>
<td>Compressed Gas</td>
</tr>
<tr>
<td></td>
<td>Organic Peroxide</td>
</tr>
<tr>
<td></td>
<td>Pyrophoric c l</td>
</tr>
<tr>
<td></td>
<td>Water-reactive</td>
</tr>
<tr>
<td></td>
<td>Unstable</td>
</tr>
</tbody>
</table>

OSHA Hazard Classification is indicated by an “X” in the box adjacent to the hazard title. If no “X” is present, the product does not exhibit the hazard as defined in the OSHA Hazard Communication Standard (29 CFR 1910.1200).

SECTION 4: FIRST AID MEASURES
Take proper precautions to ensure your own health and safety before attempting rescue or providing first aid. For more specific information, refer to Exposure Controls and Personal Protection in Section 8 of this MSDS.

inhalation
Vaporization is not expected at ambient temperatures. This material is not expected to cause inhalation-related disorders under anticipated conditions of use. In case of overexposure, move the person to fresh air.

Eye Contact
Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water while occasionally lifting and lowering eyelids. Seek medical attention if excessive tearing, redness, or pain persists.

Skin Contact
Remove contaminated shoes and clothing. Wipe off excess material. Wash exposed skin with soap and water. Seek medical attention if tissue appears damaged or if irritation persists. Thoroughly clean contaminated clothing before reuse. Discard contaminated leather goods. If material is injected under the skin, into muscle, or into the bloodstream, seek medical attention immediately.

ingestion
Do not induce vomiting unless directed to by a physician. Do not give anything to drink unless directed to by a physician. Never give anything by mouth to a person who is not fully conscious. If large amounts are swallowed or irritation or discomfort occurs, seek medical attention immediately.

Notes to Physician
The viscosity range of the product represented by this MSDS is 100 to 400 SUS at 100° F. Accordingly, upon ingestion there is a low to moderate risk of aspiration. Careful gastric lavage may be considered to evacuate large quantities of material. Subcutaneous or intramuscular injection requires prompt surgical debridement.
SECTION 5: FIRE FIGHTING MEASURES

NFPA Flammability Classification
NFPA Class-IIIB combustible material. Slightly combustible!

Flash Point Method
CLOSED CUP: 208°C (406°F). (Pensky-Martens (ASTM D-93)) OPEN CUP: 215°C (419°F)

Lower Flammable Limit
No data. Upper Flammable Limit No data.

Autoignition Temperature
Not available.

Hazardous Combustion Products
Combustion gases may contain carbon monoxide, carbon dioxide, and irritating or acrid combustion products.

Special Properties
This material can burn but will not readily ignite. This material will release vapors when heated above the flash point temperature that can ignite when exposed to a source of ignition. In enclosed spaces, heated vapor can ignite with explosive force. Mists or sprays may burn at temperatures below the flash point.

Extinguishing Media
Use dry chemical, foam, Carbon Dioxide or water fog.

Fire Fighting Protective Clothing
Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Take proper precautions to ensure your own health and safety before attempting spill control or clean-up. For more specific information, refer to the Emergency Overview on Page 1, Exposure Controls and Personal Protection in Section 8 and Disposal Considerations in Section 13 of this MSDS.

Do not touch damaged containers or spilled material unless wearing appropriate protective equipment. Slipping hazard; do not walk through spilled material. Stop leak if you can do so without risk. For small spills, absorb or cover with dry earth, sand, or other inert non-combustible absorbent material and place into waste containers for later disposal. Contain large spills to maximize product recovery or disposal. Prevent entry into waterways or sewers. In urban area, cleanup spill as soon as possible. In natural environments, seek cleanup advice from specialists to minimize physical habitat damage. This material will float on water. Absorbent pads and similar materials can be used. Comply with all laws and regulations.

SECTION 7: HANDLING AND STORAGE

Handling
Avoid water contamination and extreme temperatures to minimize product degradation. Empty containers may contain product residues that can ignite with explosive force. Do not pressurize, cut, weld, braze solder, drill, grind or expose containers to flames, sparks, heat or other potential ignition sources. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers and/or waste residues of this product.

Storage
Keep container closed. Do not store with strong oxidizing agents. Do not store at temperatures above 120° F or in direct sunlight for extended periods of time. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers or waste residues of this product.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of mists and/or vapors below the recommended exposure limits (see below). An eye wash station and safety shower should be located near the work-station.

Personal Protective Equipment
Personal protective equipment should be selected based upon the conditions under which this material is used. A hazard assessment of the work area for PPE requirements should be conducted by a qualified professional pursuant to OSHA regulations. The following pictograms represent the minimum requirements for personal protective equipment. For certain operations, additional PPE may be required.
Ritchie High Vacuum Pump Oil

Eye Protection
Safety glasses equipped with side shields should be adequate protection under most conditions of use. Wear goggles and/or face shield if splashing or spraying is anticipated. Wear goggles and face shield if material is heated above 125°F (51 °C). Have suitable eye wash water available.

Hand Protection
Use gloves constructed of chemical resistant materials such as neoprene or heavy nitrile rubber if frequent or prolonged contact is expected. Use heat-protective gloves when handling product at elevated temperatures.

Body Protection
Use clean and impervious protective clothing (e.g., neoprene or Tyvek®) if splashing or spraying conditions are present. Protective clothing may include long-sleeve outer garment, apron, or lab coat. If significant contact occurs, remove oil-contaminated clothing as soon as possible and promptly shower. Launder contaminated before reuse or discard. Wear heat protective boots and protective clothing when handling material at elevated temperatures.

Respiratory Protection
Vaporization or misting is not expected at ambient temperatures. Therefore, the need for respiratory protection is not anticipated under normal use conditions and with adequate ventilation. If elevated airborne concentrations above applicable workplace exposure levels are anticipated, a NIOSH-approved organic vapor respirator equipped with a dust/mist prefilter should be used. Protection factors vary depending upon the type of respirator used. Respirators should be used in accordance with OSHA requirements (29 CFR 1910.134).

General Comments
Use good personal hygiene practices. Wash hands and other exposed skin areas with plenty of mild soap and water before eating, drinking, smoking, use of toilet facilities, or leaving work. DO NOT use gasoline, kerosene, solvents or harsh abrasives as skin cleaners. Since specific exposure standards/control limits have not been established for this product, the “Oil Mist, Mineral” exposure limits shown below are suggested as minimum control guidelines.

Occupational Exposure Guidelines

<table>
<thead>
<tr>
<th>Substance</th>
<th>Applicable Workplace Exposure Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Highly-Refined Petroleum Lubricant Oils</td>
<td>TWA: 5 STEL: 10 (mg/M³) from ACGIH (TLV)</td>
</tr>
<tr>
<td></td>
<td>TWA: 5 (mg/M³) from OSHA (PEL)</td>
</tr>
<tr>
<td></td>
<td>TWA: 5 STEL: 10 (mg/M³) from NIOSH</td>
</tr>
</tbody>
</table>

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Physical State</th>
<th>Color</th>
<th>Odor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid</td>
<td>Light Amber</td>
<td>Mild petroleum odor</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specific Gravity</th>
<th>pH</th>
<th>Vapor Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.87 (Water = 1)</td>
<td>Not Applicable.</td>
<td>&gt;1 (Air = 1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Boiling Point/Range</th>
<th>Melting/Freezing Point</th>
<th>Viscosity (cSt @ 40°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available.</td>
<td>Not available.</td>
<td>31</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Solubility in Water</th>
<th>Volatile Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insoluble in cold water.</td>
<td>Negligible volatility</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Additional Properties</th>
<th>Gravity, *API (ASTM D287) = 31.1 @ 60° F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density = 7.25 Lbs/gal.</td>
<td>Viscosity (ASTM D2161) = AP 150 SUS @ 100° F</td>
</tr>
</tbody>
</table>

SECTION 10: STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Chemical Stability</th>
<th>Hazardous Polymerization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable.</td>
<td>Not expected to occur.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conditions to Avoid</th>
<th>Materials Incompatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keep away from extreme heat, sparks, open flame, and strongly oxidizing conditions.</td>
<td>Strong oxidizers.</td>
</tr>
</tbody>
</table>

| Hazardous Decomposition Products | No additional hazardous decomposition products were identified other than the combustion products identified in Section 5 of this MSDS. |
SECTION 11: TOXICOLOGICAL INFORMATION

For other health-related information, refer to the Emergency Overview on Page 1 and the Hazards Identification in Section 3 of this MSDS.

Toxicity Data

Highly-Refined Petroleum Lubricant Oils:

- **ORAL (LD50):** Acute: >5000 mg/kg [Rat].
- **DERMAL (LD50):** Acute: >2000 mg/kg [Rabbit].

Highly-Refined Petroleum Lubricant Oils:

Mineral oil mists derived from highly refined oils are reported to have low acute and sub-acute toxicities in animals. Effects from single and short-term repeated exposures to high concentrations of mineral oil mists well above applicable workplace exposure levels include lung inflammatory reaction, lipoid granuloma formation and lipoid pneumonia. In acute and sub-acute studies involving exposures to lower concentrations of mineral oil mists at or near current workplace exposure levels produced no significant toxicological effects. In long term studies (up to two years) no carcinogenic effects have been reported in any animal species tested.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Analysis for ecological effects has not been conducted on this product. However, if spilled, this product and any contaminated soil or water may be harmful to human, animal, and aquatic life. Also, the coating action associated with petroleum and petroleum products can be harmful or fatal to aquatic life and waterfowl.

Environmental Fate

An environmental fate analysis has not been conducted on this specific product. However, plants and animals may experience harmful or fatal effects when coated with petroleum-based products. Petroleum-based (mineral) lube oils will normally float on water. In stagnant or slow-flowing waterways, an oil layer can cover a large surface area. As a result, this oil layer might limit or eliminate natural atmospheric oxygen transport into the water. With time, if not removed, oxygen depletion in the waterway might be enough to cause a fish kill or create an anaerobic environment.

SECTION 13: DISPOSAL CONSIDERATIONS

Hazard characteristic and regulatory waste stream classification can change with product use. Accordingly, it is the responsibility of the user to determine the proper storage, transportation, treatment and/or disposal methodologies for spent materials and residues at the time of disposition.

Conditions of use may cause this material to become a hazardous waste, as defined by Federal or State regulations. It is the responsibility of the user to determine if the material is a hazardous waste at the time of disposal. Transportation, treatment, storage and disposal of waste material must be conducted in accordance with RCRA regulations (see 40 CFR 260 through 40 CFR 271). State and/or local regulations may be more restrictive. Contact the RCRA/Superfund Hotline at (800) 424-9346 or your regional US EPA office for guidance concerning case specific disposal issues.

SECTION 14: TRANSPORT INFORMATION

**DOT Status**
Not a U.S. Department of Transportation regulated material.

**Proper Shipping Name**
Petroleum Oil, N.O.I.B.N.

**Hazard Class**
Not a DOT controlled material (United States).

**Packaging Group(s)**
Not applicable.

**UN/NA ID**
Not applicable.

**Reportable Quantity**
A Reportable Quantity (RQ) has not been established for any components of this material.
Ritchie High Vacuum Pump Oil

Placards

Emergency Response Guide No.
HAZMAT STCC No. Not available.
MARPOL III status Not a DOT “Marine Pollutant” per 49 CFR 171.8.

SECTION 15: REGULATORY INFORMATION

TSCA inventory
This product and/or its components are listed on the Toxic Substance Control Act (TSCA) inventory.

SARA 302/304
The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to Subparts 302 and 304 to submit emergency planning and notification information based on Threshold Planning Quantities (TPQs) and Reportable Quantities (RQs) for “Extremely Hazardous Substances” listed in 40 CFR 302.4 and 40 CFR 355. No components were identified.

SARA 311/312
The Superfund Amendments and Reauthorization Act of 1988 (SARA) Title III requires facilities subject to this subpart to submit aggregate information on chemicals by “Hazard Category” as defined in 40 CFR 370.2. This material would be classified under the following hazard categories:
No SARA 3111312 hazard categories identified.

SARA 313
This product contains the following components in concentrations above de minimis levels that are listed as toxic chemicals in 40 CFR Part 372 pursuant to the requirements of Section 313 of SARA: No components were identified.

CERCLA
The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center concerning release of quantities of “hazardous substances” equal to or greater than the reportable quantities (RQs) listed in 40 CFR 302.4. As defined by CERCLA, the term “hazardous substance” does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically designated in 40 CFR 302.4. This product or refinery stream is not known to contain chemical substances subject to this statute. However, it is recommended that you contact state and local authorities to determine if there are any other reporting requirements in the event of a spill.

CWA
This material is classified as an oil under Section 311 of the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters must be reported to the EPA’s National Response Center at (800) 424-8802.

California Proposition 65
This product is not known to contain the any components for which the State of California has found to cause cancer, birth defects or other reproductive harm.

New Jersey Right-to-Know Label
Petroleum Oil

Additional Regulatory Remarks
No additional regulatory remarks.

SECTION 16: OTHER INFORMATION

Refer to the top of Page 1 for the HMIS and NFPA Hazard Ratings for this product.

REVISION INFORMATION
Version Number 1.0
Revision Date 04/24/2001
Print Date Printed on 04/24/2001.

ABBREVIATIONS
AP = Approximately Established
EQ = Equal
= Greater Than
< = Less Than
NA = Not Applicable
ND = No Data
NE = Not

ACGIH = American Conference of Governmental Industrial Hygienists
AIHA = American Industrial Hygiene Association
Ritchie High Vacuum Pump Oil

IARC = International Agency for Research on Cancer
NIOSH = National Institute of Occupational Safety and Health
NPCA = National Paint and Coating Manufacturers Association
NFPA = National Fire Protection Association

NTP = National Toxicology Program
OSHA = Occupational Safety and Health Administration
HMIS = Hazardous Materials Information System
EPA = Environmental Protection Agency

DISCLAIMER OF LIABILITY

THE INFORMATION IN THIS MSDS WAS OBTAINED FROM SOURCES WHICH WE BELIEVE ARE RELIABLE. HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY WARRANTY, EXPRESSED OR IMPLIED REGARDING ITS CORRECTNESS. SOME INFORMATION PRESENTED AND CONCLUSIONS DRAWN HEREIN ARE FROM SOURCES OTHER THAN DIRECT TEST DATA ON THE SUBSTANCE ITSELF. THIS MSDS WAS PREPARED AND IS TO BE USED ONLY FOR THIS PRODUCT. IF THE PRODUCT IS USED AS A COMPONENT IN ANOTHER PRODUCT, THIS MSDS INFORMATION MAY NOT BE APPLICABLE. USERS SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE INFORMATION OR PRODUCTS FOR THEIR PARTICULAR PURPOSE.

THE CONDITIONS OR METHODS OF HANDLING, STORAGE, USE, AND DISPOSAL OF THE PRODUCT ARE BEYOND OUR CONTROL AND MAY BE BEYOND OUR KNOWLEDGE. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH HANDLING, STORAGE, USE OR DISPOSAL OF THE PRODUCT.

END OF MSDS