MATERIAL SAFETY DATA SHEET

ADDITIN RC 3045  440D/1760S  MTO

RHEIN CHEMIE CORPORATION
145 Parker Court
Chardon, OH   44024

TRANSPORTATION EMERGENCY
CALL CHEMTREC......... : (800) 424-9300
INTERNATIONAL ......... : (703) 527-3887

NON-TRANSPORTATION
RCC EMERGENCY PHONE   : (440) 285-3547
RCC INFORMATION PHONE: (800) 289-2436

Section 1: Product and Company Identification

Product Name: ADDITIN RC 3045  440D/1760S  MTO
Article Number: 2294914
Chemical Family: Metal Salt in Mineral Oil
Chemical Name: Solution of Zinc Dialkyldithiophosphate with Primary and Secondary Alkyl Groups in Mineral Oil

Section 2: Composition/Information on Ingredients

HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient Name/ CAS Number</th>
<th>Exposure Limits</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc Alkyl Dithiophosphate</td>
<td>OSHA (PEL):</td>
<td>60% 100%</td>
</tr>
<tr>
<td>CAS# is a trade secret</td>
<td>Not Established</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACGIH (TLV):</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not Established</td>
<td></td>
</tr>
<tr>
<td>Hydrotreated Light Paraffinic Distillates</td>
<td>OSHA (PEL):</td>
<td>7% 13%</td>
</tr>
<tr>
<td>CAS# is a trade secret</td>
<td>5.00 mg/m3 TWA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACGIH (TLV):</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10.00 mg/m3 STEL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.00 mg/m3 TWA</td>
<td></td>
</tr>
</tbody>
</table>

Exposure limit for: Oil mist, mineral

Section 3: Hazards Identification

EMERGENCY OVERVIEW
WARNING! No Physical Hazards  Color: Yellow  Form: Liquid  Odor: Characteristic
Harmful if inhaled or ingested. Causes respiratory tract irritation. Inhalation may cause nausea or dizziness. Causes skin irritation. Causes eye irritation. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. Use water as fog or mist; solid streams may spread fire. Toxic gases/fumes are given off during burning or thermal decomposition.

POTENTIAL HEALTH EFFECTS

Route(s) of Entry: Inhalation, Skin Contact, Skin Absorption, Eye Contact

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

Inhalation Hazards
Acute Inhalation Hazards: This material, if misted or vapors are generated from heating, may cause irritation of the mucous membranes and the upper respiratory tract and may cause lipoid pneumonia (inflammation of the lungs), headache, dizziness and/or drowsiness if exposure is excessive.

Chronic Inhalation Hazards: Other symptoms include nausea, vomiting, coughing and difficulty breathing. Repeated and prolonged contact with oils may cause fibrotic nodules, lipid pneumonia and lipid granuloma.

Skin Hazards
Acute Skin Hazards: This product may cause skin irritation. May cause some redness of the affected area, with itching and swelling possible. The usual skin response to oil based materials is an oil folliculitis (inflammation of the hair follicles) and oil acnethat arises as a result of chemical irritation and mechanical plugging of the hair follicles.

Chronic Skin Hazards: None reported for this product as a whole. Repeated or prolonged exposure may cause mild irritation. Repeated and prolonged contact with mineral oils may cause defatting of the skin which may result in dermatitis.

Eye Hazards
Acute Eye Hazards: According to reports by various suppliers of oil based products containing zinc dialkyldithiophosphates there is the risk of irreversible damage to the eyes when using products from this chemical family. Causes eye irritation. Eyes will become red and irritated with tearing and possible blistering.

Chronic Eye Hazards: None reported for this product as a whole. Effects are expected to be similar to those listed above for acute eye exposure. Excessive exposure may cause impaired vision.

Ingestion Hazards
Acute Ingestion Hazards: However, if ingested this product can cause gastrointestinal distress, accompanied by a burning sensation in the mouth, nausea, vomiting and diarrhea. If vomiting occurs, aspiration of mineral oil into the lungs can cause "oil mist pneumonitis".

Chronic Ingestion Hazards: None reported for this product as a whole, expected to be similar to those listed for acute ingestion. May cause liver damage.
Carcinogenic Effects: The International Agency for Research on Cancer (IARC - Monographs Vol. 33, 1984) has reported that there is no evidence that severely solvent-refined mineral oils are carcinogenic to experimental animals and the available data on severely hydrotreated mineral oils are inadequate to permit an evaluation of their carcinogenicity to experimental animals.

Carcinogenic Components:
NTP: None
IARC: None
OSHA: None

Medical Conditions Aggravated by Exposure: May aggravate existing eye, skin or respiratory conditions.

Section 4: First Aid Measures

First Aid for Eye: In case of contact, flush eyes with large quantities of water for at least 15 minutes. The eyelids should be held apart during irrigation to ensure thorough flushing of all eye tissue. Get medical attention.

First Aid for Skin: Immediately remove contaminated clothing and shoes. In case of skin contact, wash affected areas with soap and water. Get medical attention if irritation develops or persists. Wash clothing and clean shoes before reuse.

First Aid for Inhalation: If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

First Aid for Ingestion: If material is ingested, do not induce vomiting unless directed to do so by medical personnel. Give victim one or two glasses of water or milk. Never give anything by mouth to an unconscious person. Call a physician immediately. Should vomiting occur, keep patients head below hip level to prevent aspiration of fluid into the lungs.

Note to Physician: Treat symptomatically.

Section 5: Fire Fighting Measures

Flash Point: > 302 °F (> 150 °C) ISO 2592

Flammable Limits:
- Upper Explosion Limit (UEL %): Not Established
- Lower Explosion Limit (LEL %): Not Established

Auto-ignition Temperature: Not Established

Extinguishing Media: Suitable: Water, Carbon Dioxide, Dry Chemical, Foam
**Special Fire Fighting Procedures:**

During a fire, irritating and toxic gases may be generated by thermal decomposition or combustion. Evacuate non-emergency personnel to a safe area. Full emergency equipment with self-contained breathing apparatus and full protective clothing should be worn by firefighters. Use cold water spray to cool fire exposed containers. A solid stream of water directed into the burning material could spread the fire. Hydrogen sulfide (H2S) formation is possible after prolonged heating.

**Unusual Fire/Explosion Hazards:**

None known.

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**Section 6: Accidental Release Measures**

**Spill or Leak Procedures:**

Do not allow spilled or released material to enter ground water, waste water or soil. Extinguish all ignition sources. Keep unnecessary personnel out of spill area. Emergency clean-up personnel should wear appropriate protection when entering the spill area for clean-up. Notify local health authorities and other appropriate agencies if such contamination should occur. Cover the spill with absorbent material such as sand, sweeping compound or diatomaceous earth. Scoop up solid absorbent for waste disposal. Spill area can be washed with water. Ventilate area to remove vapors. Major Spill: If transportation spill, call CHEMTREC 800/424-9300.

**Other Accidental Release Notes:**

Rhein Chemie requires that CHEMTREC be immediately notified (800-424-9300) when this product is unintentionally released from its container during its course of distribution, regardless of the amount released. Distribution includes transportation, storage incidental to transportation, loading and unloading. Such notification must be immediate and made by the person having knowledge of the release.

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**Section 7: Handling and Storage**

**Storage Temperature:**

Not Established

**Shelf Life:**

Not Established

**Special Sensitivity:**

Heat and sources of ignition.

**Handling/Storage Precautions:**

Keep away from heat, sparks and flames. Store in a dry place away from excessive heat. Keep container tightly closed when not in use. Avoid contact with skin or clothing. Avoid breathing dusts, vapors or mists. All handling equipment should be properly grounded to prevent the build-up of electrostatic charges. Handle in accordance with good industrial hygiene and safety practices.
Section 8: Exposure Controls/Personal Protection

**Personal Protection Equipment**

**Eye Protection Requirements:** Chemical safety goggles, full-face shield. Vapor resistant goggles should be worn when contact lenses are in use. In a splash hazard environment chemical goggles should be used in combination with a full face-shield.

**Skin Protection Requirements:** Permeation resistant gloves (neoprene, nitrile, or PVC) and impervious clothing (long sleeve shirts) are recommended. Avoid repeated or prolonged contact.

**Ventilation Requirements:** Use local exhaust ventilation if dusting or misting is a problem, to maintain air levels below the recommended exposure limit. Ventilation equipment should be explosion-proof if explosive concentrations of dust, vapor or fume are present.

**Respirator Requirements:** Under conditions of frequent use or heavy exposure, A NIOSH/MSHA respirator is recommended. Air purifying respirator equipped with a dust and mist filter cartridge if fumes or dust are near or exceed the exposure limits listed in Section 2. An organic vapor cartridge should be used if ventilation is not sufficient to control fumes released during thermal processing. Observe OSHA regulations for respirator use (29 CFR 1910.134.)

**Additional Protective Measures:** Emergency showers and eye wash stations should be available. Employees should wash their hands and face before eating, drinking, or using tobacco products. Educate and train employees on the safe use and handling of this product.

Section 9: Physical and Chemical Properties

**Physical Form:** Liquid
**Color:** Yellow
**Odor:** Characteristic
**Odor Threshold:** Not Established
**pH:** Approximately 5 - 6.5 in 2% in TBN-solvent
**Boiling Point:** Not Established
**Melting/Freezing Point:** Not Established
**Viscosity:** Approximately 150 cm²/s (kinematic value) @ 104 °F (40 °C)
**Solubility in Water:** Insoluble
**Solubility (non Aqueous):** Soluble in mineral oils and synthetic base oils
**Specific Gravity:** 1.12 @ 68 °F (20 °C)
**Vapor Pressure:** Not Established
**Vapor Density:** Not Established
**VOC by Weight:** None

Section 10: Stability and Reactivity

**Stability:** Stable, Material may gradually release hydrogen sulfide (H2S) if heated at 185 °F (85 °C) for more than two days.
Hazardous Polymerization: Will not occur

Substances to Avoid: Strong acids or strong oxidizing agents such as chlorates, nitrates, peroxides, etc.

Conditions to Avoid: Avoid heat, flames, sparks and other sources of ignition.

Decomposition Temperature: Begins at 176 °F (80 °C)

Decomposition Products: By fire and/or thermal decomposition: hydrogen sulfide, oxides of sulfur, oxides of phosphorus, oxides of carbon, water vapor, and other undetermined aliphatic fragments, Alkylmercaptans, Dialkysulphides

Section 11: Toxicological Information

Toxicity Data for ADDITIN RC 3045 440D/1760S MTO
Acute oral toxicity: LD₅₀ = 2,000 mg/kg (Rat)
Eye Irritation: Severely irritating (Rabbit)
Skin Irritation: Slightly irritating (Rabbit)
Sensitization: No sensitization. (Guinea pig) OECD Guideline No. 406 (Skin Sensitization)

Toxicity Data for Zinc Alkyl Dithiophosphate
Toxicity Note: No data available for this component.

Toxicity Data for Hydrotreated Light Paraffinic Distillates
Toxicity Note: No data available for this component.

Section 12: Ecological Information

Ecological Data for ADDITIN RC 3045 440D/1760S MTO
Ecological Note: Water Pollution Class WGK 2 - impairment of water quality (German Water Resources Act), This product is considered toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.

Ecological Data for Zinc Alkyl Dithiophosphate
Fish Toxicity: > 0.01 mg/kg, 96 hrs. Fish Source: US EPA ECOSAR
Invertebrate Toxicity: > 0.01 mg/kg, 48 hrs. Daphnid Source: US EPA ECOSAR
Plant Toxicity: > 0.01 mg/kg, 96 hrs. Green algae Source: US EPA ECOSAR

Ecological Data for Hydrotreated Light Paraffinic Distillates
Ecological Note: No data available for this component.
Section 13: Disposal Considerations

Waste Disposal Method: Disposal must be in compliance with federal, state and local environmental control regulations. If incinerated, toxic and corrosive combustion gases must be properly handled.

Empty Container Precautions: Empty container retains product residue and can be hazardous. Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat, flame, sparks, static electricity, or other sources of ignition. Recondition or dispose of empty container in accordance with government regulations.

Section 14: Transportation Information

Technical shipping name: Solution of Zinc Dialkyldithiophosphate in Mineral Oil

Product Label: Product Label Established

Domestic Surface Transportation (DOT)
Proper Shipping Name: Environmentally Hazardous Substance, Liquid, N.O.S.
Hazard Class or Division: 9
UN/NA Number: UN3082
Packing Group: III
Hazard Label(s): Class 9, Marine Pollutant
Hazard Placard(s): Class 9, Marine Pollutant
DOT Postnote: * If the quantity per package is 119 gallons or less, this material ships as non-regulated.

Marine Transportation (IMO / IMDG)
Proper Shipping Name: Environmentally Hazardous Substance, Liquid, N.O.S.
Hazard Class Division Number: 9
UN Number: UN3082
Packing Group: III
Hazard Label(s): Miscellaneous, Marine Pollutant (Mark)
Hazard Placard(s): Miscellaneous, Marine Pollutant

Air Transportation (ICAO / IATA)
Proper Shipping Name: Environmentally Hazardous Substance, Liquid, N.O.S.
Hazard Class Division Number: 9
UN Number: UN3082
Packing Group: III
Hazard Label(s): Miscellaneous, Marine Pollutant
Radioactive?: Non-Radioactive
Passenger Air - Max. Qty.: 450 L
Passenger Packing Instruction: 914
Cargo Air - Max. Qty.: 450 L
Cargo Air Packing Instruction: 914
Section 15: Regulatory Information

United States Federal Regulations

OSHA Hazcom Standard: Hazardous

TSCA Inventory List: On TSCA Inventory

CERCLA Hazardous Substance:
Component(s) Reportable Quantity
Zinc Alkyl Dithiophosphate (Regulated as: Zinc and Compounds (No RQ established for this general class.))

SARA Title III
SARA Section 302 Extremely Hazardous Substances:
Component(s)/ CAS Number Concentration
None

SARA Section 311/312 Hazard Categories:

SARA Section 313 Toxic Chemicals:
Component(s)/ CAS Number Reporting Threshold Concentration
Zinc Alkyl Dithiophosphate (Regulated as: Zinc Compounds) NJTSRN:000001255
Min. 1.0 % 60% Max. 100%

RCRA Status: Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product, should be classified as a hazardous waste. (40 CFR 261.20-24)

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

State Right-to-Know Information

Component(s)/ CAS Number State Code Concentration
Zinc Alkyl Dithiophosphate NJTSRN:000001259 PA-E, NJ-H, NJ-E Min. 60% Max. 100%
Hydrotreated Light Paraffinic Distillates NJTSRN:00000955 PA-H, NJ-H, MA-H 7% 13%

The following component(s) are listed under Massachusetts Extra-ordinary Hazards:
Hydrotreated Light Paraffinic Distillates NJTSRN:00000955 MA-X 7% 13%

State Code Translation Table
PA-H = Pennsylvania Hazardous Substance List
PA-E = Pennsylvania Environmental Hazardous Substance List
NJ-H = New Jersey Hazardous Substance List
NJ-E = New Jersey Environmental Hazardous Substance List
MA-H = Massachusetts Hazardous Substance List
MA-X = Massachusetts Extra-ordinary Hazardous Substance List

Foreign Chemical Inventory List(s)

EINECS (Europe): Listed
DSL (Canada): Listed
AICS (Australia): Listed
MOE (Korea): Listed
PICCS (Philippines): Listed

Section 16: Other Information

HMIS Rating

<table>
<thead>
<tr>
<th>Health</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability</td>
<td>1</td>
</tr>
<tr>
<td>Reactivity</td>
<td>1</td>
</tr>
</tbody>
</table>

0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe
* = Chronic Health Hazard

RHEIN CHEMIE CORPORATION’s method of hazard communication is comprised of Product Labels and Material Safety Data Sheets. HMIS and NFPA ratings are provided by RHEIN CHEMIE CORPORATION as a customer service.

Contact: HES Dept.
Phone: (440) 285-3547
MSDS Number: 000000004597
Version Date: 02/02/2010
MSDS Version: 2.2

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