SAFETY DATA SHEET

1. Identification

Identification
Product name: PARATHERM™ SC
Additional identification
Chemical name: Polyalkylene polyamine

Recommended use and restriction on use
Recommended use: Heat Transfer Fluid
Restrictions on use: Lubricating oils; Hydraulic fluid additive

Details of the supplier of the safety data sheet
Supplier
Company Name: PARATHERM
A DIV. OF THE LUBRIZOL CORPORATION
Address: 2009 Renaissance Boulevard
King of Prussia, PA 19406
US
Telephone: 610-941-4900

Emergency telephone number:
FOR TRANSPORT EMERGENCY CALL CHEMTREC (+1)703 527 3887, OR WITHIN USA 800 424 9300

2. Hazard(s) identification

Hazard Classification
Physical Hazards
Flammable liquids Category 3

Health Hazards
Skin Corrosion/Irritation Category 2
Serious Eye Damage/Eye Irritation Category 1
Skin sensitizer Category 1
Aspiration Hazard Category 1

Label Elements:

Hazard Symbol:

Signal Word: Danger
Hazard Statement: Flammable liquid and vapor. Causes skin irritation. Causes serious eye damage. May cause an allergic skin reaction. May be fatal if swallowed and enters airways.

Precautionary Statement:


Response: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation or rash occurs: Get medical advice/attention. IF SWALLOWED: Immediately call a POISON CENTER/doctor. Do NOT induce vomiting. Immediately call a POISON CENTER/doctor. Specific treatment (see this label). Wash contaminated clothing before reuse. In case of fire: Use CO2, dry chemical or foam for extinction. Water can be used to cool and protect exposed material. Collect spillage.

Storage: Store in well-ventilated place. Keep cool. Store locked up.

Disposal: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in GHS classification: None identified.

3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS number</th>
<th>Percent by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral oil</td>
<td>8042-47-5</td>
<td>60 - 70%</td>
</tr>
<tr>
<td>Turpentine</td>
<td>8006-64-2</td>
<td>10 - 20%</td>
</tr>
<tr>
<td>Turpentine</td>
<td>9005-90-7</td>
<td>10 - 20%</td>
</tr>
<tr>
<td>Polymeric amide</td>
<td>Not determined.</td>
<td>1 - 5%</td>
</tr>
<tr>
<td>++ Pinene</td>
<td>80-56-8</td>
<td>20 - 30%</td>
</tr>
<tr>
<td>++ Beta-pinene</td>
<td>127-91-3</td>
<td>1 - 5%</td>
</tr>
</tbody>
</table>

++ The listed components are subcomponents of the hazardous ingredients listed above.

4. First-aid measures
Ingestion: Do NOT induce vomiting. Aspiration of material due to vomiting can cause chemical pneumonitis which can be fatal. If vomiting occurs naturally, the casualty should lean forward to reduce the risk of aspiration. Rinse mouth. Immediately call a POISON CENTER/doctor/…

Inhalation: Remove to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER/doctor/…/if you feel unwell.

Skin Contact: Take off immediately all contaminated clothing. Take off contaminated clothing and wash before re-use. Wash skin thoroughly with soap and water. Call a POISON CENTER/doctor/…/if you feel unwell. Launder contaminated clothing before reuse.

Eye contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor/…

Most important symptoms/effects, acute and delayed

Symptoms: See section 11.

Indication of immediate medical attention and special treatment needed

Treatment: Treat symptomatically.

5. Fire-fighting measures

General Fire Hazards: Use water spray to keep fire-exposed containers cool. Water may be ineffective in fighting the fire. Fight fire from a protected location. Move containers from fire area if you can do so without risk.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: CO2, Dry chemical or Foam. Water can be used to cool and protect exposed material.

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

Specific hazards arising from the chemical: Vapors may cause a flash fire or ignite explosively. Prevent buildup of vapors or gases to explosive concentrations. Vapors may travel considerable distance to a source of ignition and flash back. Water may cause splattering. Container may rupture on heating. A solid stream of water will spread the burning material. Material creates a special hazard because it floats on water. See section 10 for additional information. Toxic fumes, gases or vapors may evolve on burning or exposure to heat.

Special protective equipment and precautions for firefighters

Special fire fighting procedures: No data available.

Special protective equipment for fire-fighters: Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.
6. Accidental release measures

| Personal precautions, protective equipment and emergency procedures: | Ventilate closed spaces before entering them. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Keep upwind. Keep unauthorized personnel away. See Section 8 of the SDS for Personal Protective Equipment. |
| Methods and material for containment and cleaning up: | Eliminate all ignition sources if safe to do so. Dike far ahead of larger spill for later recovery and disposal. Pick up free liquid for recycle and/or disposal. Residual liquid can be absorbed on inert material. Stop the flow of material, if this is without risk. Prevent entry into waterways, sewer, basements or confined areas. |
| Environmental Precautions: | Avoid release to the environment. Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so. |

7. Handling and storage

| Precautions for safe handling: | Material can accumulate static charges which may cause an electrical spark (ignition source). Use proper bonding and/or grounding procedures. Use grounding and bonding connection when transferring material. In case of spills, beware of slippery floors and surfaces. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharges. Ground and bond container and receiving equipment. Use only non-sparking tools. Do not get in eyes. Avoid breathing dust/fume/gas/mist/vapors/spray. Avoid contact with eyes, skin, and clothing. Avoid contact with skin. Observe good industrial hygiene practices. Use only in well-ventilated areas. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Launder contaminated clothing before reuse. Avoid environmental contamination. |
| Maximum Handling Temperature: | Not determined. |
| Conditions for safe storage, including any incompatibilities: | Keep container tightly closed. Keep cool. Store in a well-ventilated place. Store away from incompatible materials. See section 10 for incompatible materials. Do not store near potential sources of ignition. |
| Maximum Storage Temperature: | Not determined. |
8. Exposure controls/personal protection

Control Parameters:

Occupational Exposure Limits

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>type</th>
<th>Exposure Limit Values</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral oil - Inhalable fraction.</td>
<td>TWA</td>
<td>5 mg/m³</td>
<td>US. ACGIH Threshold Limit Values (02 2012)</td>
</tr>
<tr>
<td>Mineral oil - Mist.</td>
<td>REL</td>
<td>5 mg/m³</td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards (2010)</td>
</tr>
<tr>
<td>Mineral oil - Mist.</td>
<td>STEL</td>
<td>10 mg/m³</td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards (2010)</td>
</tr>
<tr>
<td>Mineral oil - Mist.</td>
<td>PEL</td>
<td>5 mg/m³</td>
<td>US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)</td>
</tr>
<tr>
<td>++ Pinene</td>
<td>TWA</td>
<td>20 ppm</td>
<td>US. ACGIH Threshold Limit Values (02 2012)</td>
</tr>
<tr>
<td>++ Pinene</td>
<td>TWA</td>
<td>20 ppm</td>
<td>US. ACGIH Notice of Intended Changes (NIC) to Threshold Limit Values (02 2013)</td>
</tr>
<tr>
<td>Turpentine</td>
<td>PEL</td>
<td>100 ppm 560 mg/m³</td>
<td>US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)</td>
</tr>
<tr>
<td>Turpentine</td>
<td>TWA</td>
<td>100 ppm 560 mg/m³</td>
<td>US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)</td>
</tr>
<tr>
<td>Turpentine</td>
<td>TWA</td>
<td>20 ppm</td>
<td>US. ACGIH Threshold Limit Values (02 2012)</td>
</tr>
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<td>TWA</td>
<td>20 ppm</td>
<td>US. ACGIH Threshold Limit Values (02 2012)</td>
</tr>
<tr>
<td>++ Beta-pinene</td>
<td>TWA</td>
<td>20 ppm</td>
<td>US. ACGIH Notice of Intended Changes (NIC) to Threshold Limit Values (02 2013)</td>
</tr>
</tbody>
</table>

Appropriate engineering controls:
Use explosion-proof ventilation equipment to stay below exposure limits. Adequate ventilation should be provided so that exposure limits are not exceeded. Mechanical ventilation or local exhaust ventilation may be required.

Individual protection measures, such as personal protective equipment

General information:
Use explosion-proof ventilation equipment. Provide easy access to water supply and eye wash facilities. Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Eye/face protection:
Wear tight-fitting goggles or face shield.

Skin Protection

Hand Protection:
Use nitrile or neoprene gloves. Use good industrial hygiene practices. In case of skin contact, wash hands and arms with soap and water. Nitrile Gloves should always be inspected before each use and discarded if they show tears, pinholes, or signs of wear. Consult clothing/glove manufacturer to determine appropriate type of glove for given situation. Gloves should always be inspected before each use and discarded if they show tears, pinholes, or signs of wear. Consult clothing/glove manufacturer to determine appropriate type of glove for given situation.
Other: Wear apron or protective clothing in case of contact. Do not wear rings, watches or similar apparel that could entrap the material. Long sleeve shirt is recommended.

Respiratory Protection: Use disposable dust/mist mask if the recommended exposure limit is exceeded. Use respirator with a combination organic vapor and dust/mist cartridge. A respiratory protection program compliant with all applicable regulations must be followed whenever workplace conditions require the use of a respirator. Under normal use conditions, respirator is not usually required. Use appropriate respiratory protection if exposure to dust particles, mist or vapors is likely. Use self-contained breathing apparatus for entry into confined space, for other poorly ventilated areas and for large spill clean-up sites.

Hygiene measures: Observe good industrial hygiene practices. Do not eat, drink or smoke when using the product. Do not get in eyes. Avoid contact with skin. Wash contaminated clothing before reuse. When using do not smoke. Wash hands before breaks and immediately after handling the product. Wash hands after handling. Contaminated work clothing should not be allowed out of the workplace.

9. Physical and chemical properties

Appearance
Physical state: liquid
Form: liquid
Color: Yellow
Odor: Pine
Odor threshold: No data available.
PH: No data available.
Freezing point: No data available.
Boiling Point: > 309 °F (> 154 °C)
Flash Point: 109 °F (43 °C) (ASTM D93 (Pensky-Martens (A and B Closed Cup)))
Evaporation rate: No data available.
Flammability (solid, gas): No data available.
Upper/lower limit on flammability or explosive limits
Flammability limit - upper (%): No data available.
Flammability limit - lower (%): No data available.
Explosive limit - upper (%): No data available.
Explosive limit - lower (%): No data available.
Vapor pressure: > 1 hPa
Vapor density: No data available.
Relative density: 0.83 - 0.88 60.1 °F (15.6 °C)
Solubility(ies)
Solubility in water: Insoluble in water
Solubility (other): No data available.
Partition coefficient (n-octanol/water): No data available.
Auto-ignition temperature: No data available.
Decomposition temperature: No data available.
Viscosity: No data available.
10. Stability and reactivity

Reactivity: No data available.

Chemical Stability: Material is stable under normal conditions.

Possibility of hazardous reactions: Will not occur.

Conditions to avoid: Do not expose to excessive heat, ignition sources, or oxidizing materials.

Incompatible Materials: Oxidizing agents.

Hazardous Decomposition Products: Thermal decomposition or combustion may generate smoke, carbon monoxide, carbon dioxide, and other products of incomplete combustion.

11. Toxicological information

Information on likely routes of exposure

Inhalation: No data available.

Ingestion: May be harmful if swallowed.

Skin Contact: Causes skin irritation.

Eye contact: Causes serious eye damage.

Information on toxicological effects

Acute toxicity

Oral
Product: Material can be aspirated into the lungs during the act of swallowing or vomiting. This could result in severe injury to the lungs and death. Ingestion can cause central nervous system effects such as headache, dizziness, drowsiness, and generalized weakness. LD 50 (Unknown): > 2,000.1 mg/kg (Supplier information)

Dermal
Product: LD 50 > 5,000.1 mg/kg Not classified

Inhalation
Product: High concentrations may cause headaches, dizziness, nausea, behavioral changes, weakness, drowsiness and stupor. Dusts, mists and fumes: LC 50 Not classified Dusts, mists and fumes Vapour: LC 50 Not classified Vapour

Skin Corrosion/Irritation:
Product: Prolonged or repeated skin contact as from clothing wet with material may cause dermatitis. Symptoms may include redness, edema, drying, and cracking of the skin. Classification: Severely irritating to skin. Rabbit. Remarks: Causes skin irritation.

Serious Eye Damage/Eye Irritation:
Respiratory sensitization: No data available

Skin sensitization: Mineral oil Classification: Not a skin sensitizer. (Literature) Not a skin sensitizer.

Specific Target Organ Toxicity - Single Exposure:
Mineral oil If material is misted or if vapors are generated from heating, exposure may cause irritation of mucous membranes and the upper respiratory tract.
++ Pinene May cause irritation to the mucous membranes and upper respiratory tract.

Aspiration Hazard:
Product: May be fatal if swallowed and enters airways.

Other effects:
++ Pinene Lung
Turpentine Lung
++ Beta-pinene Lung

Chronic Effects
Carcinogenicity: No data available

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans: No carcinogenic components identified

US. National Toxicology Program (NTP) Report on Carcinogens: No carcinogenic components identified


Germ Cell Mutagenicity: No data available

Reproductive toxicity: No data available

Specific Target Organ Toxicity - Repeated Exposure: No data available

12. Ecological information

Ecotoxicity
Fish
Mineral oil LC 50 (Not reported, 96 h): > 10,000 mg/l
NOEC (Not reported, 96 h): > 10,000 mg/l
Aquatic Invertebrates
Mineral oil
EC 50 (Water flea (Daphnia magna), 2 d): > 100 mg/l
NOEC (Water flea (Daphnia magna), 2 d): >= 100 mg/l
EC 50 (Water flea (Daphnia magna), 21 d): > 10 mg/l
NOEC (Water flea (Daphnia magna), 21 d): 10 mg/l

Toxicity to Aquatic Plants
Mineral oil
LC 50 (Algae (Pseudokirchneriella subcapitata), 3 d): > 100 mg/l
NOEC (Algae (Pseudokirchneriella subcapitata), 3 d): > 100 mg/l

Toxicity to soil dwelling organisms
No data available

Sediment Toxicity
No data available

Toxicity to Terrestrial Plants
No data available

Toxicity to Above-Ground Organisms
No data available

Toxicity to microorganisms
No data available

Persistence and Degradability
Biodegradation
Mineral oil
OECD TG 301 F, 31.13 %, 28 d, Not readily degradable.

Bioaccumulative Potential
Bioconcentration Factor (BCF)
No data available

Partition Coefficient n-octanol / water (log Kow)
No data available

Mobility:
No data available

Other Adverse Effects:
No data available.

13. Disposal considerations

Disposal instructions:
Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations. Dispose of packaging or containers in accordance with local, regional, national and international regulations. Empty containers retain material residue. Do not cut, weld, braze, solder, drill, grind or expose containers to heat, flame, spark or other sources of ignition.

Contaminated Packaging:
Container packaging may exhibit hazards.
14. Transport information

**DOT**
- UN Number: UN 1299
- UN Proper Shipping Name: Turpentine solution
- Transport Hazard Class(es): Class 3, Label(s): 3
- Packing Group: III
- Marine Pollutant: Yes
- Special precautions for user: None established
- Reportable quantity: Pinene 100 lbs

**IMDG**
- UN Number: UN 1299
- UN Proper Shipping Name: TURPENTINE SOLUTION
- Transport Hazard Class(es): Class 3, Label(s): 3
- EmS No.: F-E, S-E
- Packing Group: III
- Marine Pollutant: Yes
- Limited quantity: 5.00L
- Excepted quantity: E1
- Special precautions for user: None established

**IATA**
- UN Number: UN 1299
- Proper Shipping Name: Turpentine solution
- Transport Hazard Class(es): Class 3, Label(s): 3
- Marine Pollutant: Yes
- Packing Group: III
- Limited quantity: 10.00L
- Excepted quantity: E1
- Environmental Hazards: Marine Pollutant
- Special precautions for user: None established
- Other information:
  - Passenger and cargo aircraft: Allowed.
  - Cargo aircraft only: Allowed.

**Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**
None known.

The DOT shipping information in this section is based on a bulk container. Please review the accompanying shipping papers for the correct shipping descriptions based on the size of the package. Shipping descriptions may vary based on mode of transport, quantities, temperature of the material, package size, and/or origin and destination. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material. During transportation, steps must be taken to prevent load shifting or materials falling, and all relating legal statutes should be obeyed. Review classification requirements before shipping materials at elevated temperatures.

15. Regulatory information
US Federal Regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4)

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>CAS number</th>
<th>Reportable quantity</th>
<th>Calculated¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pinene</td>
<td>80-56-8</td>
<td>100 lbs</td>
<td>417 lbs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>189 kgs</td>
</tr>
</tbody>
</table>

¹This is the amount product/material required to be released before CERCLA reporting is required.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 311 Classifications
Fire Hazard
Immediate (Acute) Health Hazards

SARA 302 Extremely Hazardous Substance
None present or none present in regulated quantities.

SARA 304 Emergency Release Notification

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>CAS number</th>
<th>Percent by Weight</th>
<th>Reportable quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pinene</td>
<td>80-56-8</td>
<td>24.0 %</td>
<td>100 lbs</td>
</tr>
</tbody>
</table>

SARA 313 (TRI Reporting)
None present or none present in regulated quantities.

US State Regulations

US. California Proposition 65
No ingredient regulated by CA Prop 65 present.

Inventory Status

Australia (AICS)
This product contains a substance that is not listed on the Australia Inventory of Chemical Substances.

Canada (DSL/NDSL)
This product contains a substance that is not listed on the Canadian Domestic Substances List (DSL).

China (IECSC)
This product contains a substance that is not listed on the Chinese Inventory of Existing Chemical Substances (IECSC).

European Union (REACH)
To obtain information on the REACH compliance status of this product, please e-mail REACH@SDSInquiries.com.

Japan (ENCS)
This product contains a substance that is not listed on the Japanese Existing and New Chemical Substances (ENCS) list.

Korea (ECL)
This product requires notification before sale in Korea.

New Zealand (NZIoC)
This product requires notification before sale in New Zealand.

Philippines (PICCS)
This product requires notification before sale in the Philippines.
Switzerland (SWISS)
May require notification before sale in Switzerland.

Taiwan (TCSCA)
This product requires notification before sale in Taiwan.

United States (TSCA)
All components of this material are on the US TSCA Inventory.

The information that was used to confirm the compliance status of this product may deviate from the chemical information shown in Section 3.

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

**HMIS Hazard ID**

<table>
<thead>
<tr>
<th>Health</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability</td>
<td>2</td>
</tr>
<tr>
<td>Physical Hazards</td>
<td>0</td>
</tr>
</tbody>
</table>

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe; RNP - Rating not possible; *Chronic health effect

**NFPA Hazard ID**

| Flammability | 2 |
| Health | 3 |
| Reactivity | 0 |
| Special hazard. |

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe; RNP - Rating not possible

**Issue Date:** 03/24/2016

**Version #:** 2.0

**Source of information:** Internal company data and other publically available resources.

**Further Information:** Contact supplier (see Section 1)

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