SAFETY DATA SHEET

1. Identification

Product identifier: Carbon disulfide

Other means of identification
Product No.: 9172, 8831, E350

Recommended use and restriction on use
Recommended use: Not available.
Restrictions on use: Not known.

Manufacturer/Importer/Supplier/Distributor Information

Manufacturer
Company Name: Avantor Performance Materials, Inc.
Address: 3477 Corporate Parkway, Suite 200
          Center Valley, PA 18034
Telephone: Customer Service: 855-282-6867
Fax: Contact Person: Environmental Health & Safety
e-mail: info@avantormaterials.com

Emergency telephone number:
24 Hour Emergency: 908-859-2151
Chemtrec: 800-424-9300

2. Hazard(s) identification

Hazard Classification

Physical Hazards
Flammable liquids Category 2

Health Hazards
Acute toxicity (Inhalation - vapor) Category 4
Serious Eye Damage/Eye Irritation Category 2A
Toxic to reproduction Category 2
Specific Target Organ Toxicity - Repeated Exposure Category 1

Unknown toxicity
Acute toxicity, dermal 100 %
Acute toxicity, inhalation, vapor 100 %
Acute toxicity, inhalation, dust or mist 100 %

Environmental Hazards
Acute hazards to the aquatic environment Category 2

Label Elements
Hazard Symbol:
Signal Word: Danger

Hazard Statement: Highly flammable liquid and vapor. Harmful if inhaled. Causes serious eye irritation. Suspected of damaging fertility or the unborn child. Causes damage to organs through prolonged or repeated exposure. Toxic to aquatic life.

Precautionary Statement

Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat/sparks/open flames/hot surfaces. No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting/equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Do not breathe dust/fume/gas/mist/vapors/spray. Do not eat, drink or smoke when using this product. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.

Response: In case of fire: Use water spray, foam, dry powder or carbon dioxide for extinction. IF exposed or concerned: Get medical advice/attention. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Storage: Store in a 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: Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment. Sparks may ignite liquid and vapor. May cause flash fire or explosion.

3. Composition/information on ingredients

Substances

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>Content in percent (%)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARBON DISULFIDE</td>
<td></td>
<td>75-15-0</td>
<td>90 - 100%</td>
</tr>
</tbody>
</table>

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures
General information: Get medical advice/attention if you feel unwell. Show this safety data sheet to the doctor in attendance.

Ingestion: Rinse mouth. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Get medical attention.

Inhalation: Move to fresh air. If breathing is difficult, give oxygen. If breathing stops, provide artificial respiration. Get medical attention immediately.

Skin Contact: Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if irritation persists after washing. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.

Eye contact: Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention.

Most important symptoms/effects, acute and delayed

Symptoms: Mist or vapor extremely irritating to eyes and respiratory tract. Vapors have a narcotic effect and may cause headache, fatigue, dizziness and nausea.

Indication of immediate medical attention and special treatment needed

Treatment: Treat symptomatically. Symptoms may be delayed.

5. Fire-fighting measures

General Fire Hazards: Highly flammable liquid and vapour.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: Water spray, foam, dry powder or carbon dioxide.

Unsuitable extinguishing media: Avoid water in straight hose stream; will scatter and spread fire.

Specific hazards arising from the chemical: Vapors may cause a flash fire or ignite explosively. Vapors may travel considerable distance to a source of ignition and flash back. Prevent buildup of vapors or gases to explosive concentrations. Heat may cause the containers to explode.

Special protective equipment and precautions for firefighters

Special fire fighting procedures: 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.

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:
ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Keep unauthorized personnel away. Keep upwind. Use personal protective equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. See Section 8 of the MSDS for Personal Protective Equipment.

### Methods and material for containment and cleaning up:
Eliminate all ignition sources if safe to do so. Take precautionary measures against static discharges. Stop leak if possible without any risk. Use only non-sparking tools. Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination. Dike far ahead of larger spill for later recovery and disposal.

### Notification Procedures:
Stop the flow of material, if this is without risk. Dike for later disposal. Prevent entry into waterways, sewer, basements or confined areas.

### Environmental Precautions:
Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so. Avoid release to the environment.

### 7. Handling and storage

#### Precautions for safe handling:
DO NOT handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Take precautionary measures against static discharges. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting/equipment. Use only non-sparking tools. Wear protective gloves/protective clothing/eye protection/face protection. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Wash hands thoroughly after handling.

#### Conditions for safe storage, including any incompatibilities:
Keep away from food, drink and animal feeding stuffs. Keep container tightly closed in a cool, well-ventilated place. Ground container and transfer equipment to eliminate static electric sparks. Comply with all national, state, and local codes pertaining to the storage, handling, dispensing, and disposal of flammable liquids.
8. Exposure controls/personal protection

Control Parameters

Occupational Exposure Limits

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Type</th>
<th>Exposure Limit Values</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARBON DISULFIDE</td>
<td>TWA</td>
<td>1 ppm</td>
<td>US. ACGIH Threshold Limit Values (2011)</td>
</tr>
<tr>
<td></td>
<td>REL</td>
<td>1 ppm</td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards (2010)</td>
</tr>
<tr>
<td></td>
<td>STEL</td>
<td>10 ppm</td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards (2010)</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>20 ppm</td>
<td>US. OSHA Table Z-2 (29 CFR 1910.1000) (02 2006)</td>
</tr>
<tr>
<td>Ceiling</td>
<td></td>
<td>30 ppm</td>
<td>US. OSHA Table Z-2 (29 CFR 1910.1000) (02 2006)</td>
</tr>
<tr>
<td>MAX. CONC</td>
<td></td>
<td>100 ppm</td>
<td>US. OSHA Table Z-2 (29 CFR 1910.1000) (02 2006)</td>
</tr>
</tbody>
</table>

Biological Limit Values

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Exposure Limit Values</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARBON DISULFIDE (2-Thiothiazolidine-4-carboxylic acid (TTCA): Sampling time: End of shift.)</td>
<td>0.5 mg/g (Creatinine in urine)</td>
<td>ACGIH BEL (2011)</td>
</tr>
</tbody>
</table>

Appropriate Engineering Controls

No data available.

Individual protection measures, such as personal protective equipment

General information: 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. An eye wash and safety shower must be available in the immediate work area. If exposure limits have not been established, maintain airborne levels to an acceptable level. Use explosion-proof ventilation equipment.

Eye/face protection: Wear safety glasses with side shields (or goggles). Wear a full-face respirator, if needed.

Skin Protection Hand Protection: Chemical resistant gloves

Other: Wear suitable protective clothing and gloves.

Respiratory Protection: In case of inadequate ventilation use suitable respirator. Use air-supplied respirator.

Hygiene measures: Provide eyewash station and safety shower. Observe good industrial hygiene practices. Wash hands before breaks and immediately after handling the product. Do not eat, drink or smoke when using the product. Wash contaminated clothing before reuse.

9. Physical and chemical properties
**Appearance**

<table>
<thead>
<tr>
<th>Physical state:</th>
<th>Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form:</td>
<td>Mobile liquid</td>
</tr>
<tr>
<td>Color:</td>
<td>Clear colorless or faintly yellow</td>
</tr>
<tr>
<td>Odor:</td>
<td>No data available.</td>
</tr>
<tr>
<td>Odor threshold:</td>
<td>No data available.</td>
</tr>
<tr>
<td>pH:</td>
<td>No data available.</td>
</tr>
<tr>
<td>Melting point/freezing point:</td>
<td>-112.1 °C</td>
</tr>
<tr>
<td>Initial boiling point and boiling range:</td>
<td>46 °C (101.325 kPa)</td>
</tr>
<tr>
<td>Flash Point:</td>
<td>-30 °C (Closed Cup)</td>
</tr>
<tr>
<td>Evaporation rate:</td>
<td>22.6 (butyl acetate=1)</td>
</tr>
<tr>
<td>Flammability (solid, gas):</td>
<td>Class IB Flammable Liquid</td>
</tr>
</tbody>
</table>

**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:                | 47.86 kPa (25 °C)   |
| Vapor density:                 | 2.67 AIR=1          |
| Relative density:              | 1.26 (20 °C)        |

**Solubility(ies)**

- Solubility in water: No data available.
- Solubility (other): No data available.

**Partition coefficient (n-octanol/water):** 1.94

**Auto-ignition temperature:** 90 °C

**Decomposition temperature:** No data available.

**Viscosity:** No data available.

**Other information**

- Molecular weight: 76.14 g/mol (CS2)

### 10. Stability and reactivity

- **Reactivity:** No dangerous reaction known under conditions of normal use.
- **Chemical Stability:** Material is stable under normal conditions. Risk of explosion if heated.
- **Possibility of Hazardous Reactions:** Hazardous polymerization does not occur.
- **Conditions to Avoid:** Heat, sparks, flames. Contact with incompatible materials.
- **Incompatible Materials:** Strong oxidizing agents. Chemically active metals. Amines.
- **Hazardous Decomposition Products:** Thermal decomposition may produce oxides of sulfur. Carbon monoxide. Carbon dioxide.

### 11. Toxicological information

**Information on likely routes of exposure**

- **Ingestion:** May be harmful if swallowed.
- **Inhalation:** Harmful if inhaled. May cause irritation to the respiratory system.
Skin Contact: May cause irritation. Prolonged skin contact may cause redness, irritation and dry skin.

Eye contact: Causes serious eye irritation.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral
Product: LD 50 (Rat): 3,188 mg/kg

Dermal
Product: No data available.

Inhalation
Product: LC 50 (Rat, 2 h): 25 mg/l
   LC 50 (Rabbit, 6 h): 16 mg/l

Repeated Dose Toxicity
Product: No data available.

Skin Corrosion/Irritation
Product: May cause skin irritation.

Serious Eye Damage/Eye Irritation
Product: Causes serious eye irritation.

Respiratory or Skin Sensitization
Product: Not a skin sensitizer.

Carcinogenicity
Product: 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

No carcinogenic components identified

Germ Cell Mutagenicity

In vitro
Product: No data available.

In vivo
Product: No data available.

Reproductive Toxicity
Product: May damage fertility or the unborn child.

Specific Target Organ Toxicity - Single Exposure
Product: No data available.

Specific Target Organ Toxicity - Repeated Exposure
Product: Nervous System, Cardiovascular system, Eyes. - Causes damage to organs through prolonged or repeated exposure.

Aspiration Hazard
Product: Not classified
Other Effects: No data available.

12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish
Product: No data available.

Specified substance(s):
CARBON DISULFIDE
LC 50 (Western mosquitofish (Gambusia affinis), 96 h): 135 mg/l Mortality
LC 50 (Guppy (Poecilia reticulata), 96 h): 3 - 5.8 mg/l Mortality

Aquatic Invertebrates
Product: No data available.

Specified substance(s):
CARBON DISULFIDE
LC 50 (Water flea (Daphnia magna), 48 h): 1.9 - 2.2 mg/l Mortality

Chronic hazards to the aquatic environment:

Fish
Product: No data available.

Aquatic Invertebrates
Product: No data available.

Toxicity to Aquatic Plants
Product: No data available.

Persistence and Degradability

Biodegradation
Product: The product is moderately biodegradable.

BOD/COD Ratio
Product: No data available.

Bioaccumulative Potential

Bioconcentration Factor (BCF)
Product: No data available on bioaccumulation.

Partition Coefficient n-octanol / water (log Kow)
Product: Log Kow: 1.94

Mobility in Soil:
No data available.

Known or predicted distribution to environmental compartments

CARBON DISULFIDE
No data available.

Other Adverse Effects: Toxic to aquatic organisms.

13. Disposal considerations

Disposal instructions: Discharge, treatment, or disposal may be subject to national, state, or local laws. 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.
Contaminated Packaging: Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

- UN Number: UN 1131
- UN Proper Shipping Name: Carbon disulfide
- Transport Hazard Class(es): 3, 6.1
- Label(s): 3, 6.1
- Packing Group: I
- Marine Pollutant: No

IMDG

- UN Number: UN 1131
- UN Proper Shipping Name: CARBON DISULPHIDE
- Transport Hazard Class(es): 3, 6.1
- Label(s): 3, 6.1
- EmS No.: F-E, S-D
- Packing Group: I
- Marine Pollutant: No

IATA

- UN Number: UN 1131
- Proper Shipping Name: Carbon disulphide
- Transport Hazard Class(es): 3, 6.1
- Label(s): 3, 6.1
- Marine Pollutant: No
- Packing Group: –

15. Regulatory information

US Federal Regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):
CARBON DISULFIDE Reportable quantity: 100 lbs.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

<table>
<thead>
<tr>
<th>Hazard categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ Acute (Immediate)</td>
</tr>
<tr>
<td>☐ Chronic (Delayed)</td>
</tr>
<tr>
<td>☑ Fire</td>
</tr>
<tr>
<td>☐ Reactive</td>
</tr>
<tr>
<td>☐ Pressure Generating</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SARA 302 Extremely Hazardous Substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Identity</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>CARBON DISULFIDE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SARA 304 Emergency Release Notification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Identity</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>CARBON DISULFIDE</td>
</tr>
</tbody>
</table>
SARA 311/312 Hazardous Chemical
Chemical Identity    Threshold Planning Quantity
CARBON DISULFIDE    500lbs

SARA 313 (TRI Reporting)
Chemical Identity Reporting threshold for Reporting threshold for
other users manufacturing and processing
CARBON DISULFIDE 10000 lbs 25000 lbs.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)
CARBON DISULFIDE Reportable quantity: 100 lbs.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):
CARBON DISULFIDE Threshold quantity: 20000 lbs

US State Regulations

US. California Proposition 65
CARBON DISULFIDE Developmental toxin.
CARBON DISULFIDE Male reproductive toxin.
CARBON DISULFIDE Female reproductive toxin.

US. New Jersey Worker and Community Right-to-Know Act
CARBON DISULFIDE Listed

US. Massachusetts RTK - Substance List
CARBON DISULFIDE Listed

US. Pennsylvania RTK - Hazardous Substances
CARBON DISULFIDE Listed

US. Rhode Island RTK
CARBON DISULFIDE Listed

Inventory Status:
Australia AICS: On or in compliance with the inventory
Canada DSL Inventory List: On or in compliance with the inventory
EU EINECS List: On or in compliance with the inventory
EU ELINCS List: Not in compliance with the inventory.
Japan (ENCS) List: Not in compliance with the inventory.
EU No Longer Polymers List: Not in compliance with the inventory.
China Inv. Existing Chemical Substances: Not in compliance with the inventory.
Korea Existing Chemicals Inv. (KECI): On or in compliance with the inventory
Canada NDSL Inventory: Not in compliance with the inventory.
Philippines PICCS: On or in compliance with the inventory
US TSCA Inventory: On or in compliance with the inventory
New Zealand Inventory of Chemicals: On or in compliance with the inventory
Japan ISHL Listing: On or in compliance with the inventory
Japan Pharmacopoeia Listing: Not in compliance with the inventory.

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

NFPA Hazard ID

SDS_US - SDS0000001473

10/11
Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe

Issue Date: 10-16-2014
Revision Date: No data available.
Version #: 1.1
Further Information: No data available.

Disclaimer:
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