1. IDENTIFICATION

Product Identifier
Product Name Dibutyl Maleate

Other means of identification
SDS # NC-007

Other Information Trade Name: DBM.

Recommended use of the chemical and restrictions on use
Recommended Use Maleate Plasticizers.

Details of the supplier of the safety data sheet
Supplier Address Neuchem Inc.
2062 Union Street, Suite 300
San Francisco, CA 94123 USA
www.neuchem.com

Emergency Telephone Number
Company Phone Number Phone: 415-345-9353
Fax: 415-345-9350
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America) Account No. 100534

2. HAZARDS IDENTIFICATION

Classification

<table>
<thead>
<tr>
<th>Skin corrosion/irritation</th>
<th>Category 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>Category 2A</td>
</tr>
<tr>
<td>Specific target organ toxicity (single exposure)</td>
<td>Category 3</td>
</tr>
</tbody>
</table>

Signal Word
Warning

Hazard Statements
Causes skin irritation
Causes serious eye irritation
May cause respiratory irritation

Appearance Clear liquid
Physical State Liquid
Odor Characteristic
4. FIRST-AID MEASURES

First Aid Measures

General Advice Provide this SDS to medical personnel for treatment.

Eye Contact In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. If irritation persists, seek medical attention.

Inhalation Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion Do not induce vomiting without medical advice. Call a physician or poison control center immediately.
**Most important symptoms and effects**

**Symptoms**
See Section 11: Toxicological Information of this SDS for more detailed symptoms.

**Indication of any immediate medical attention and special treatment needed**

**Notes to Physician**
Treat symptomatically.

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**5. FIRE-FIGHTING MEASURES**

**Suitable Extinguishing Media**
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

- **Large Fire**
  - Foam, chemical powder, CO2, water spray or fog.

- **Unsuitable Extinguishing Media**
  - Not determined.

**Specific Hazards Arising from the Chemical**
Combustible product. Risk of fire if exposed to flame or heat. The heating can cause expansion or decomposition, leading to violent burst of the containers. Mists with combustible products can be explosive. Avoid reactions with oxidizing agents.

**Hazardous Combustion Products**
Toxic fumes of carbon monoxide or irritant smoke.

**Protective equipment and precautions for firefighters**
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Wear protective gloves. Prevent, by any means, spillage from entering drains or waterways. Use water delivered as a fine spray to control fire and cool adjacent area. Avoid spraying water onto liquid pools. Do not approach containers suspected to be hot. Cool fire-exposed containers with water spray from a protect location. If safe to do so, remove containers from path of fire.

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**6. ACCIDENTAL RELEASE MEASURES**

**Personal precautions, protective equipment and emergency procedures**

- **Personal Precautions**
  - Wear protective clothing as described in Section 8 of this safety data sheet. Small Spills: Clean up spills immediately. Wear impervious gloves and safety glasses.
  - Large spills: clear area of personnel. Wear protective clothing, impervious gloves and safety glasses. Shut off all possible sources of ignition and increase ventilation.

- **For Emergency Responders**
  - Follow applicable OSHA regulations (29 CFR 1910.120).

**Methods and material for containment and cleaning up**

- **Methods for Containment**
  - Prevent further leakage or spillage if safe to do so. In case of small spills, wipe up and absorb small quantities with vermiculite or other absorbent material. Large spills, absorb or cover spill with sand, earth, inert material or vermiculite.

- **Methods for Clean-Up**
  - Sweep up absorbed material and shovel into suitable containers for disposal. Discard any product, residue, disposable container or liner in full compliance with federal, state, and local regulations. For waste disposal, see section 13 of the SDS.

- **Prevention of Secondary Hazards**
  - Spills may present a slipping hazard.

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**7. HANDLING AND STORAGE**
Precautions for safe handling

Advice on Safe Handling
Handle in accordance with good industrial hygiene and safety practice. Use personal protection recommended in Section 8. Avoid breathing mist and vapor, especially at high temperature. Use in a well-ventilated area. Avoid prolonged and repeated skin contact. Avoid contact with eyes. Keep containers securely sealed when not in use. Wash hands with soap and water after handling. Use only in well-ventilated areas.

Conditions for safe storage, including any incompatibilities

Storage Conditions
Keep container tightly closed and store in a cool, dry and well-ventilated place. Store locked up.

Packaging Materials
In bulk, stainless steel or carbon steel, aluminum or reinforced plastic tanks with vent. Check if the containers are clearly labeled.

Incompatible Materials
Strong oxidizing agents; Strong bases.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines
The following information is given as general guidance

Appropriate engineering controls

Engineering Controls
General exhaustion is adequate under normal operating conditions. Local exhaust ventilation may be required in specific circumstances. Provide adequate ventilation in warehouse or closed storage areas. In the area where product is handled, keep an emergency shower and eyewash unit.

Individual protection measures, such as personal protective equipment

Eye/Face Protection
No special equipment when handling small quantities. Otherwise, wear safety glasses with side shields. Contact lenses pose a special hazard. Soft lenses can absorb irritants and all lenses concentrate them.

Skin and Body Protection
Wear chemical protective gloves, i.e. PVC gloves with polyethylene liner or latex. Safety shoes. Apron made of PVC, trevira or equivalent.

Respiratory Protection
If risk of overexposure exists, use semi-facial respirator with filter for organic vapors.

General Hygiene Considerations
Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks • Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Liquid</td>
<td></td>
</tr>
<tr>
<td>Appearance</td>
<td>Clear liquid</td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>Clear</td>
<td></td>
</tr>
<tr>
<td>Odor</td>
<td>Characteristic</td>
<td></td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not determined</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>Not determined</td>
<td></td>
</tr>
<tr>
<td>Melting Point/Freezing Point</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Boiling Point/Boiling Range</td>
<td>280.6 °C / 537.08 °F</td>
<td></td>
</tr>
<tr>
<td>Flash Point</td>
<td>140.5 °C / 284.9 °F</td>
<td></td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not determined</td>
<td></td>
</tr>
<tr>
<td>Flammability (Solid, Gas)</td>
<td>Not determined</td>
<td></td>
</tr>
</tbody>
</table>
NC-007 - Dibutyl Maleate

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under normal temperatures and pressures.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization
Hazardous polymerization does not occur.

Conditions to Avoid
Incompatible Materials.

Incompatible Materials
Strong oxidizing agents; Strong bases.

Hazardous Decomposition Products
Carbon monoxide.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact
Causes serious eye irritation.

Skin Contact
Causes skin irritation.

Inhalation
May cause respiratory irritation.

Ingestion
May be harmful if swallowed.

Component Information

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
<th>Inhalation LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dibutyl maleate</td>
<td>3700 mg/kg (Rat)</td>
<td>10 g/kg (Rabbit)</td>
<td>-</td>
</tr>
<tr>
<td>105-76-0</td>
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</tbody>
</table>

Information on physical, chemical and toxicological effects
Symptoms

Please see below for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation

Product can be slightly uncomfortable to the skin. Sensitization can result as a response of allergic dermatitis including eruptions, itching, urticaria or ends swelling. Material can produce skin irritation after prolonged or repeated exposure and can produce contact dermatitis (non-allergic). This form of dermatitis is often characterized by redness and skin swelling, and then can evolve to vesicles formation, scale and epidermis swelling. Histologically, it can produce intercellular edema of the spongy layer and intracellular edema of epidermis.

Serious eye damage/eye irritation

Material can be slightly uncomfortable to eyes and is capable of causing slight, temporary conjunctiva redness (similar to windburn), temporary damage to vision and/or other transient ulcerations/damages. It can be irritating to eyes, prolonged contact can cause inflammation. Repeated or prolonged exposure to irritants can produce conjunctivitis.

Irritation

Inhalation: Normally, it does not pose a risk due to the non-volatile nature of the product. Vapors inhalation is more probable at elevated temperatures than at normal ones. The vapor is slightly uncomfortable to the upper respiratory tract and to the lungs. The main effects of aliphatic esters are narcosis, irritation and anesthesia at more elevated concentrations. These effects are aggravated as the molecular weights and boiling points increase. Central nervous system depression, headaches, sleepiness, dizziness, coma and neurobehavioral changes can also be symptoms of overexposure. The involvement of the respiratory tract can produce irritation of mucous membranes, dyspnea and tachypnea, pharyngitis, bronchitis, pneumonitis and under massive exposure, pulmonary edema. Gastrointestinal effects include nausea, vomit, diarrhea and abdominal cramps. Damage to liver and kidneys can result from massive exposure.

Ingestion: Material can be uncomfortable to gastrointestinal tract and can be harmful if swallowed in large amounts. Considered as an improbable entry route in commercial/industrial environments.

Carcinogenicity

This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

STOT - single exposure

May cause respiratory irritation.

Chronic toxicity

There are no available data about human exposure. For this reason, the health effects are based on experience with chemically similar materials.

Target organ effects

Skin, eyes, respiratory tract, central nervous system (CNS).

Numerical measures of toxicity

Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity

Toxic to aquatic organisms. Toxic to aquatic life with long lasting effects.

Component Information

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Algae/aquatic plants</th>
<th>Fish</th>
<th>Toxicity to microorganisms</th>
<th>Crustacea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dibutyl maleate</td>
<td>6.2: 72 h Scenedesmus subspicatus mg/L EC50</td>
<td>6.2: 48 h Leuciscus idus mg/L LC50 static</td>
<td>21: 48 h Daphnia magna mg/L EC50</td>
<td></td>
</tr>
</tbody>
</table>
Persistence/Degradability
Not determined

Bioaccumulation
Not determined

Mobility

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Partition Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dibutyl maleate</td>
<td>3.38</td>
</tr>
</tbody>
</table>

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes
Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging
Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

Note
Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT
Not regulated

IATA
Not regulated

IMDG
Not regulated

15. REGULATORY INFORMATION

International Inventories
Not determined

Legend:
- TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
- DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
- EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
- ENCS - Japan Existing and New Chemical Substances
- IECSC - China Inventory of Existing Chemical Substances
- KECL - Korean Existing and Evaluated Chemical Substances
- PICCS - Philippines Inventory of Chemicals and Chemical Substances

US Federal Regulations
SARA 313
Not determined

US State Regulations

U.S. State Right-to-Know Regulations
Not determined

16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>NFPA</th>
<th>Health Hazards</th>
<th>Flammability</th>
<th>Instability</th>
<th>Special Hazards</th>
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<td>Not determined</td>
<td>Not determined</td>
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</table>

<table>
<thead>
<tr>
<th>HMIS</th>
<th>Health Hazards</th>
<th>Flammability</th>
<th>Physical Hazards</th>
<th>Personal Protection</th>
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<tbody>
<tr>
<td></td>
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<td>Not determined</td>
<td>Not determined</td>
<td>Not determined</td>
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Issue Date 13-Jun-2013
Revision Date: 30-Jun-2013
Revision Note New format

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet