SAFETY DATA SHEET

1. Identification

Product identifier
PARMAVERT

Other means of identification
BRI Product Code
310
CAS number
13257-44-8
Synonyms
2-Nonynal dimethyl acetal * 2-Nonynal DMA * 2-Nonyne, 1,1-dimethoxy-
fragrance

Recommended use
For Manufacturing Use Only

Recommended restrictions
Not for use in Tobacco or Nicotine delivery device applications and/or products.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer
Company name
Bedoukian Research
Address
6 Commerce Drive
Danbury, CT 06810
United States

Telephone
1-203-830-4000

Website
www.bedoukian.com

E-mail
customerservice@bedoukian.com

Contact person
Joseph Bania

Emergency phone number
Chemtrec (North America) 1-800-424-9300
Chemtrec (International) 1-703-527-3887

2. Hazard(s) identification

Physical hazards
Flammable liquids
Category 4

Health hazards
Sensitization, skin
Category 1B

Environmental hazards
Not classified.

OSHA defined hazards
Not classified.

Label elements

Signal word
Warning

Hazard statement
Combustible liquid. May cause an allergic skin reaction.

Precautionary statement

Prevention
Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Avoid breathing mist or vapor. Contaminated work clothing must not be allowed out of the workplace. Wear protective gloves/eye protection/face protection.

Response
If on skin: Wash with plenty of water. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse. In case of fire: Use appropriate media to extinguish.

Storage
Store in a well-ventilated place. Keep cool.

Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC)
None known.

Supplemental information
None.

3. Composition/information on ingredients

Substances
### Chemical Name and Synonyms

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Common Name and Synonyms</th>
</tr>
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<tbody>
<tr>
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<tr>
<td>synthetic alpha tocopherol</td>
<td>10191-41-0</td>
</tr>
</tbody>
</table>

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

### Stabilizers

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>%</th>
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<td>10191-41-0</td>
<td>0.1</td>
<td></td>
</tr>
</tbody>
</table>

### Composition Comments

Occupational Exposure Limits for stabilizers are listed in Section 8.

### 4. First-aid Measures

#### Inhalation
Move to fresh air. Call a physician if symptoms develop or persist.

#### Skin Contact
Remove contaminated clothing immediately and wash skin with soap and water. In case of eczema or other skin disorders: Seek medical attention and take along these instructions.

#### Eye Contact
Rinse with water. Get medical attention if irritation develops and persists.

#### Ingestion
Direct contact with eyes may cause temporary irritation. May cause an allergic skin reaction. Dermatitis. Rash.

#### Most Important Symptoms/Effects, Acute and Delayed
Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

#### Indication of Immediate Medical Attention and Special Treatment Needed
Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Wash contaminated clothing before reuse.

### 5. Fire-fighting Measures

#### Suitable Extinguishing Media
Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

#### Unsuitable Extinguishing Media
Do not use water jet as an extinguisher, as this will spread the fire.

#### Specific Hazards Arising from the Chemical
The product is combustible, and heating may generate vapors which may form explosive vapor/air mixtures. During fire, gases hazardous to health may be formed.

#### Special Protective Equipment and Precautions for Firefighters
Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

#### Fire-fighting equipment/instructions
In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk.

#### General Fire Hazards
Combustible liquid.

### 6. Accidental Release Measures

#### Personal Precautions, Protective Equipment and Emergency Procedures
Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment and clothing during clean-up. Avoid breathing mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

#### Methods and Materials for Containment and Cleaning up
Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water.

Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Environmental Precautions
Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
7. Handling and storage

Precautions for safe handling

Keep away from open flames, hot surfaces and sources of ignition. When using do not smoke.
Avoid breathing mist or vapor. Avoid contact with eyes, skin, and clothing. Provide adequate
ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene
practices.

Conditions for safe storage, including any incompatibilities

Keep away from heat, sparks and open flame. Store in a cool, dry place out of direct sunlight.
Store in original tightly closed container. Store in a well-ventilated place. Keep in an area equipped
with sprinklers. Store away from incompatible materials (see Section 10 of the SDS).
Recommended Packaging: Glass, Plastic, Aluminum or Phenolic Lined Steel. Store tightly sealed
under inert gas in a cool, well-ventilated area.

8. Exposure controls/personal protection

Occupational exposure limits

This substance has no PEL, TLV, or other recommended exposure limit.

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

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.

Individual protection measures, such as personal protective equipment

Eye/face protection

Face shield is recommended. Wear safety glasses with side shields (or goggles).

Skin protection

Hand protection

Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove
supplier.

Other

Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

Respiratory protection

If engineering controls do not maintain airborne concentrations below recommended exposure
limits (where applicable) or to an acceptable level (in countries where exposure limits have not
been established), an approved respirator must be worn.

Thermal hazards

Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations

When using do not smoke. Always observe good personal hygiene measures, such as washing
after handling the material and before eating, drinking, and/or smoking. Routinely wash work
clothing and protective equipment to remove contaminants. Contaminated work clothing should not
be allowed out of the workplace.

9. Physical and chemical properties

Appearance

Physical state

Liquid.

Color

Pale yellow

Odor

powerful green, floral violet-leaf odor.

Odor threshold

Not available.

pH

Not available.

Melting point/freezing point

Not available.

Initial boiling point and boiling range

443.52 °F (228.62 °C) US EPA. 2014. Estimation Programs Interface Suite™ for Microsoft®
Windows, v 4.11. US EPA, Washington, DC, USA.

Flash point

205 °F (96 °C) Closed Cup

Evaporation rate

Not available.

Flammability (solid, gas)

Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower (%)

Not available.

Flammability limit - upper (%)

Not available.

Explosive limit - lower (%) Not available.

Explosive limit - upper (%) Not available.

Vapor pressure

0.06 mmHg at 20°C; US EPA. 2014. Estimation Programs Interface Suite™ for Microsoft®
Windows, v 4.11. US EPA, Washington, DC, USA.

Vapor density

6.4 Relative to air; air = 1
Relative density Not available.
Solubility(ies)
   Solubility (water) Not available.
   (n-octanol/water) EPA, Washington, DC, USA.
Auto-ignition temperature Not available.
Decomposition temperature Not available.
Viscosity Not available.
Other information
   Density 0.881 - 0.889 g/cm3
   Flammability class Combustible III B estimated
   Molecular formula C11H20O2
   Molecular weight 184.27
   Specific gravity 0.881 - 0.889 at 25°C

10. Stability and reactivity
Reactivity The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability Material is stable under normal conditions.
Possibility of hazardous reactions No dangerous reaction known under conditions of normal use.
Conditions to avoid Avoid heat, sparks, open flames and other ignition sources. Avoid temperatures exceeding the 
   flash point. Contact with incompatible materials.
Incompatible materials Strong oxidizing agents.
Hazardous decomposition products No hazardous decomposition products are known.

11. Toxicological information
Information on likely routes of exposure
   Inhalation No adverse effects due to inhalation are expected.
   Skin contact May cause an allergic skin reaction.
   Eye contact Direct contact with eyes may cause temporary irritation.
   Ingestion Expected to be a low ingestion hazard.
Symptoms related to the physical, chemical and toxicological characteristics May cause an allergic skin reaction. Dermatitis. Rash.
Information on toxicological effects
Acute toxicity May cause an allergic skin reaction.
   Product Species Test Results
   PARMAVERT (CAS 13257-44-8)
      Acute
         Dermal
         Liquid
         LD50 Rabbit > 5000 mg/kg
      Oral
         Liquid
         LD50 Rat > 5000 mg/kg
* Estimates for product may be based on additional component data not shown.
Skin corrosion/irritation Prolonged skin contact may cause temporary irritation.
Irritation Corrosion - Skin

PARMAVERT

20 % OECD 429, Considered not irritating at test concentrations of 5%, 10%, and 20% during a preliminary dermal irritation screen.
Result: No irritation observed.
Species: Mouse
Organ: Skin
Notes: BRI study

4 % Patch test, Vehicle Petrolatum.
Result: No irritation observed.
Species: Human
Organ: Skin
Notes: RIFM

Serious eye damage/eye irritation

Direct contact with eyes may cause temporary irritation.

Respiratory or skin sensitization

Respiratory sensitization
Not a respiratory sensitizer.

Skin sensitization
May cause an allergic skin reaction.

20 % OECD 429, Concentrations of 1%, 10% and 20% in vehicle diethyl phthalate:ethanol (3:1) resulted in SI values less than 3. Therefore, the test material is not considered a dermal sensitizer in the Local Lymph Node Assay.
Result: Not sensitizing.
Species: Mouse
Organ: Skin
Notes: BRI study

20 % Patch test, Vehicle 3:1 diethyl phthalate:ethanol.
Result: Not sensitizing.
Species: Human
Organ: Skin
Notes: BRI study

5 % Maximization test
Result: Sensitization noted.
Species: Guinea pig
Organ: Multiple Routes

Germ cell mutagenicity
No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity
This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

IARC Monographs. Overall Evaluation of Carcinogenicity
Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens
Not listed.

Reproductive toxicity
This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure
Not classified.

Specific target organ toxicity - repeated exposure
Not classified.

Aspiration hazard
Not an aspiration hazard.

12. Ecological information

Ecotoxicity
The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Persistence and degradability
No data is available on the degradability of this product.

Bioaccumulative potential

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

Other adverse effects
No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions
Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations
Dispose in accordance with all applicable regulations.

Hazardous waste code
The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products
Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging
Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT
Not regulated as dangerous goods.

IATA
Not regulated as dangerous goods.

IMDG
Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not established.

15. Regulatory information

US federal regulations
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)
Not listed.

SARA 304 Emergency release notification
Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)
Hazard categories
Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - Yes
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance
Not listed.

SARA 311/312 Hazardous chemical
Yes

SARA 313 (TRI reporting)
Not regulated.

Other federal regulations
Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List
Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)
Not regulated.

Safe Drinking Water Act (SDWA)
Not regulated.
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<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
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</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
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<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
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<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
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<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
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<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
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<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
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<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
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<td>New Zealand</td>
<td>New Zealand Inventory</td>
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<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
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<tr>
<td>Taiwan</td>
<td>Taiwan Toxic Chemical Substances (TCS)</td>
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<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

IFRA restriction

There is an IFRA guideline regarding this product. Please visit www.ifraorg.org for the full text of the guideline, or contact Bedoukian Research, Inc. for more information.

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

Issue date: 26-May-2015
Revision date: 05-October-2018
Version #: 04

Disclaimer

Bedoukian Research cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user’s responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.

Revision information
Toxicological Information: Toxicological Property Data