# SECTION 1: Identification

## 1.1. Product identifier

Identification of the substance/preparation: **n-Nonanal**

**CAS-No**: 124-19-6

## 1.2. Relevant identified uses of the substance or mixture and uses advised against

<table>
<thead>
<tr>
<th>Use of the Substance / Preparation</th>
<th>Intermediate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uses advised against</td>
<td>None</td>
</tr>
</tbody>
</table>

## 1.3. Details of the supplier of the safety data sheet

<table>
<thead>
<tr>
<th>Supplier</th>
<th>OQ Chemicals Corporation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15375 Memorial Drive</td>
</tr>
<tr>
<td></td>
<td>West Memorial Place I</td>
</tr>
<tr>
<td></td>
<td>Suite 300</td>
</tr>
<tr>
<td></td>
<td>Houston, TX 77079</td>
</tr>
<tr>
<td></td>
<td>USA</td>
</tr>
<tr>
<td></td>
<td>Phone +1 346 378 7300</td>
</tr>
</tbody>
</table>

**Product Information**

- Product Stewardship
- FAX: +49 (0)208 693 2053
- email: sc.psq@oq.com

## 1.4. Emergency telephone number

**Emergency telephone number**: NCEC +1 202 464 2554

Available 24/7

# SECTION 2: Hazards identification

## 2.1. Classification of the substance or mixture

This substance is classified in accordance with paragraph (d) of §1910.1200 (GHS-US classification).

- Flammable liquid  Category 4, H227
- Environmental hazard  Aquatic Acute 2; H401; Aquatic Chronic 3; H412

**OSHA Specified Hazards**: Not applicable.
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2.2. Label elements
Labeling according to §1910.1200 (GHS-US labeling).

Signal word

Warning

Hazard statements
H227: Combustible liquid
H401: Toxic to aquatic life
H412: Harmful to aquatic life with long lasting effects.

Precautionary statements

Prevention
P210: Keep away from flames and hot surfaces. - No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/eye protection/face protection.

Storage
P403 + P235: Store in a well ventilated place. Keep cool.

Disposal
P501: Dispose of contents/container in accordance with local regulation.

2.3. Other hazards
Vapour/air-mixtures are explosive at intense warming

SECTION 3: Composition / information on ingredients

3.1. Substances

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonanal</td>
<td>124-19-6</td>
<td>&gt; 88,0</td>
</tr>
</tbody>
</table>

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation
Keep at rest. Aerate with fresh air. When symptoms persist or in all cases of doubt seek medical advice.

Skin
Wash off immediately with soap and plenty of water. When symptoms persist or in all cases of doubt seek medical advice.

Eyes
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses. Obtain medical attention.

Emergency telephone number
NCEC +1 202 464 2554

USA (A-US)
Do not induce vomiting without medical advice. Call a physician immediately.

4.2. Most important symptoms and effects, both acute and delayed

Main symptoms
nausea, shortness of breath, dizziness.

Special hazard
Lung oedema, Lung irritation.

4.3. Indication of any immediate medical attention and special treatment needed

General advice
Remove contaminated, soaked clothing immediately and dispose of safely. First aider needs to protect himself.

Treat symptomatically. In case of lung irritation, first treatment with cortisone spray.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media
alcohol-resistant foam, dry chemical, carbon dioxide (CO2), water spray

Unsuitable Extinguishing Media
Do not use a solid water stream as it may scatter and spread fire.

5.2. Special hazards arising from the substance or mixture

Under conditions giving incomplete combustion, hazardous gases produced may consist of:
carbon monoxide (CO)
carbon dioxide (CO2)
Combustion gases of organic materials must in principle be graded as inhalation poisons
Vapours are heavier than air and may spread along floors
Vapour/air-mixtures are explosive at intense warming

5.3. Advice for firefighters

Special protective equipment for firefighters
Fire fighter protection should include a self-contained breathing apparatus (NIOSH-approved or EN 133) and full fire-fighting turn out gear.

Precautions for firefighting
Keep people away from and upwind of fire. Cool containers / tanks with water spray. Dike and collect water used to fight fire. Water run-off can cause environmental damage.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
For non-emergency personnel: For personal protective equipment see section 8. Avoid contact with skin and eyes. Avoid breathing vapors or mists. Keep people away from and upwind of spill/leak. Ensure adequate ventilation, especially in confined areas. Keep away from heat and sources of ignition.
For emergency responders: Personal protection see section 8.

6.2. Environmental precautions

Prevent further leakage or spillage. Do not discharge product into the aquatic environment without pretreatment (biological treatment plant). Water runoff can cause environmental damage.

6.3. Methods and material for containment and cleaning up

Methods for containment
Stop the flow of material, if possible without risk. Dike spilled material, where this is possible.

Methods for cleaning up
Soak up with inert absorbent material. DO NOT use combustible materials such as sawdust. Keep in suitable, closed containers for disposal. If liquid has been spilt in large quantities clean up promptly by scoop or vacuum. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours).

6.4. Reference to other sections

For personal protective equipment see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling
Avoid contact with skin, eyes and clothing. Do not breathe vapours or spray mist. Wash hands before breaks and immediately after handling the product. Provide sufficient air exchange and/or exhaust in work rooms. Refill and handle product only in closed system.

Hygiene measures
When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Advice on the protection of the environment
See Section 8: Environmental exposure controls.

Incompatible products
acids and bases
amines
oxidizing agents

7.2. Conditions for safe storage, including any incompatibilities

Advice on protection against fire and explosion
Keep away from sources of ignition - No smoking. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). In case of fire, emergency cooling with water spray should be available. Ground and bond containers when transferring material. Vapour/air-mixtures are explosive at intense warming.

Technical measures/Storage conditions
Keep containers tightly closed in a cool, well-ventilated place. Handle and open container with care. Handle under nitrogen, protect from moisture. Keep at temperatures between 0 and 49 °C (32 and 120 °F).

SECTION 8: Exposure controls / personal protection

8.1. Control parameters

Exposure limits United States of America
No exposure limits established regarding ACGIH, OSHA Z-1 and OSHA Z-2.

8.2. Exposure controls

Appropriate Engineering controls
General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred. Explosion-proof equipment (for example fans, switches, and grounded ducts) should be used in mechanical ventilation systems.

Individual protection measures, such as personal protective equipment

General industrial hygiene practice
Avoid contact with skin, eyes and clothing. Do not breathe vapours or spray mist. Ensure that eyewash stations and safety showers are close to the workstation location.

Hygiene measures
When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Eye protection
Tightly fitting safety goggles. In addition to goggles, wear a face shield if there is a reasonable chance for splash to the face.

Hand protection
Wear protective gloves. Recommendations are listed below. Other protective material may be used, depending on the situation, if adequate degradation and permeation data is available. If other chemicals are used in conjunction with this chemical, material selection should be based on protection for all chemicals present.

| Suitable material | nitrile rubber |
| Evaluation        | according to EN 374: level 4 |
| Glove thickness   | approx 0,55 mm |
| Break through time| approx 90 min |
| Suitable material | butyl-rubber |
| Evaluation        | according to EN 374: level 3 |
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Glove thickness approx 0,3 mm
Break through time approx 50 min

Skin and body protection
Impervious clothing. Wear face-shield and protective suit for abnormal processing problems.

Respiratory protection
Respirator with filter for organic vapour. Use the indicated respiratory protection if the occupational exposure limit is exceeded and/or in case of product release (dust). Equipment should conform to NIOSH.

Environmental exposure controls
If possible use in closed systems. If leakage can not be prevented, the substance needs to be suck off at the emersion point, if possible without danger. Observe the exposure limits, clean exhaust air if needed. If recycling is not practicable, dispose of in compliance with local regulations. Inform the responsible authorities in case of leakage into the atmosphere, or of entry into waterways, soil or drains.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance liquid @ 20 °C (68 °F)
Colour colourless
Odour fruity
Odour threshold No data available
pH No data available
Melting point/range -2,2 °F (-19 °C) (Pour point)
Method DIN ISO 3016
Boiling point/range 361 °F (183 °C) @ 1 atm (101,3 kPa)
Method OECD 103
Flash point 167 °F (75 °C) @ 1013 hPa
Method ISO 2719
Evaporation rate No data available
Flammability (solid, gas) Does not apply, the substance is a liquid
Lower explosion limit 0,59 Vol %
Upper explosion limit 6,54 Vol %

Vapour pressure

<table>
<thead>
<tr>
<th>Values [hPa]</th>
<th>Values [kPa]</th>
<th>Values [atm]</th>
<th>°C</th>
<th>°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0,2</td>
<td>&lt; 0,001</td>
<td>20</td>
<td>68</td>
</tr>
<tr>
<td>8,1</td>
<td>0,81</td>
<td>0,008</td>
<td>50</td>
<td>122</td>
</tr>
</tbody>
</table>

Method DIN EN 13016-2

Vapour density 4,9 (Air = 1) @ 20 °C (68 °F)

Relative density

<table>
<thead>
<tr>
<th>Values</th>
<th>°C</th>
<th>°F</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,8230</td>
<td>20</td>
<td>68</td>
<td>DIN 51757</td>
</tr>
</tbody>
</table>

Solubility 101 mg/l @ 68 °F (20 °C), in water, OECD 105

log Pow 4,1 (measured) OECD 117

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6 / 13 USA (A-US)
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Autoignition temperature
383 °F (195 °C)
Method
DIN 51794

Decomposition temperature
No data available

Viscosity
1,40 mPa*s @ 68 °F (20 °C)
Method
ASTM D445, dynamic

9.2. Other information

Molecular weight
142,24
Molecular formula
C9 H18 O

log Koc
2.84 @ 35 °C OECD 121

Dissociation constant
No data available

Oxidizing properties
Does not apply, substance is not oxidising. There are no chemical groups associated with oxidizing properties

Refractive Index
1,424 @ 68 °F (20 °C)
Explosive properties
Does not apply, substance is not explosive. There are no chemical groups associated with explosive properties

Surface tension
48.1 mN/m (20 mg/l @ 20°C), OECD 115

SECTION 10: Stability and Reactivity

10.1. Reactivity
The reactivity of the product corresponds to the typical reactivity shown by the substance group as described in any text book on organic chemistry.

10.2. Chemical stability
Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions
When finely distributed, self-ignition is possible. May form explosive peroxides. Hazardous polymerisation may occur. Polymerization is a highly exothermic reaction and may generate sufficient heat to cause thermal decomposition and/or rupture containers.

10.4. Conditions to avoid
Avoid contact with heat, sparks, open flame and static discharge. Avoid any source of ignition.

10.5. Incompatible materials
bases, amines, acids, oxidizing agents.

10.6. Hazardous decomposition products
No decomposition if stored and applied as directed.
SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure  
Ingestion, Inhalation, Eye contact, Skin contact

Nonanal, CAS: 124-19-6
Main symptoms  
nausea, shortness of breath, dizziness.

Target Organ Systemic Toxicant - Single exposure
Due to lack of data, a classification is not possible for: STOT SE

Target Organ Systemic Toxicant - Repeated exposure
Based on available data, the classification criteria are not met for: STOT RE

Acute toxicity
Nonanal (124-19-6)

<table>
<thead>
<tr>
<th>Routes of Exposure</th>
<th>Endpoint</th>
<th>Values</th>
<th>Species</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>LD50</td>
<td>5000 mg/kg</td>
<td>rat</td>
<td></td>
</tr>
<tr>
<td>Inhalative</td>
<td>LC0</td>
<td>0.95 mg/l</td>
<td>rat</td>
<td></td>
</tr>
<tr>
<td>Dermal</td>
<td>LD50</td>
<td>5000 mg/kg</td>
<td>rabbit</td>
<td></td>
</tr>
</tbody>
</table>

Nonanal, CAS: 124-19-6
Assessment
Based on available data, the classification criteria are not met for:
Acute oral toxicity
Acute dermal toxicity
Acute inhalation toxicity

Irritation and corrosion
Nonanal (124-19-6)

<table>
<thead>
<tr>
<th>Target Organ Effects</th>
<th>Species</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eyes</td>
<td>rabbit</td>
<td>No eye irritation</td>
<td>EPA OPP 81-4</td>
</tr>
<tr>
<td>Skin</td>
<td>rabbit</td>
<td>irritating</td>
<td>EC Directive L251</td>
</tr>
</tbody>
</table>

Nonanal, CAS: 124-19-6
Assessment
Based on available data, the classification criteria are not met for:
skin irritation/corrosion
eye irritation/corrosion

Sensitization
Nonanal (124-19-6)

<table>
<thead>
<tr>
<th>Target Organ Effects</th>
<th>Species</th>
<th>Evaluation</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin</td>
<td>Human experience</td>
<td>not sensitizing</td>
<td>Human repeat insult patch test (HRIPT) read across</td>
</tr>
</tbody>
</table>
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Nonanal, CAS: 124-19-6
Assessment
Based on available data, the classification criteria are not met for:
Skin sensitization
For respiratory sensitization, no data are available

Subacute, subchronic and prolonged toxicity
Nonanal (124-19-6)

<table>
<thead>
<tr>
<th>Type</th>
<th>Dose</th>
<th>Species</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subacute toxicity</td>
<td>LOAEL: 500 mg/kg/d (2 weeks)</td>
<td>rabbit</td>
<td>Dermal</td>
</tr>
<tr>
<td>Subchronic toxicity 90-day</td>
<td>NOAEL: 20000 ppm</td>
<td>rat</td>
<td>OECD 408 Oral read across</td>
</tr>
</tbody>
</table>

Nonanal, CAS: 124-19-6
Assessment
Based on available data, the classification criteria are not met for:
STOT RE

Carcinogenicity, Mutagenicity, Reproductive toxicity
Nonanal (124-19-6)

<table>
<thead>
<tr>
<th>Type</th>
<th>Dose</th>
<th>Species</th>
<th>Evaluation</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mutagenicity</td>
<td>rat, hepatocytes human hepatocytes</td>
<td>negative</td>
<td>UDS test</td>
<td>In vitro study</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>Salmonella typhimurium</td>
<td>negative</td>
<td>OECD 471 (Ames)</td>
<td>In vitro study</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>rat, hepatocytes</td>
<td>positive</td>
<td>SCE</td>
<td>In vitro study</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>rat, hepatocytes</td>
<td>negative</td>
<td>Chromosomal Aberration</td>
<td>In vitro study</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>mouse lymphoma cells</td>
<td>negative</td>
<td>Mouse lymphoma assay</td>
<td>In vitro study</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>mouse</td>
<td>negative</td>
<td>OECD 474</td>
<td>In vivo read across</td>
</tr>
<tr>
<td>Reproductive toxicity</td>
<td>LOAEL 1500 mg/kg/d</td>
<td>rat</td>
<td>Weight of evidence</td>
<td>read across</td>
</tr>
<tr>
<td>Reproductive toxicity</td>
<td>NOAEL 200 mg/kg/d</td>
<td>rat, parental</td>
<td>Weight of evidence</td>
<td>read across</td>
</tr>
<tr>
<td>Developmental Toxicity</td>
<td>No data available</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nonanal, CAS: 124-19-6
CMR Classification
The available data on CMR properties are summarized in the table above. They do not indicate a classification into categories 1A or 1B
Evaluation
In vitro tests did not show mutagenic effects
In the absence of specific alerts no cancer testing is required

Emergency telephone number
NCEC +1 202 464 2554
USA (A-US)
Note
Handle in accordance with good industrial hygiene and safety practice. Further details on substance data can be found in the registration dossier under the following link:

SECTION 12: Ecological information

12.1. Toxicity

Acute aquatic toxicity

<table>
<thead>
<tr>
<th>Nonanal (124-19-6)</th>
<th>Species</th>
<th>Exposure time</th>
<th>Dose</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daphnia magna (Water flea)</td>
<td>48h</td>
<td>EC50: 1,54 mg/l</td>
<td>OECD 202</td>
</tr>
<tr>
<td></td>
<td>Selenastrum capricornutum (green algae)</td>
<td>72h</td>
<td>EC50: 4,50 mg/l (Growth rate)</td>
<td>OECD 201</td>
</tr>
<tr>
<td></td>
<td>Selenastrum capricornutum (green algae)</td>
<td>72h</td>
<td>EC50: 2,60 mg/l (Biomass)</td>
<td>OECD 201</td>
</tr>
<tr>
<td></td>
<td>Oncorhynchus mykiss (rainbow trout)</td>
<td>96h</td>
<td>EC50: 2,1 mg/l</td>
<td>OECD 203</td>
</tr>
<tr>
<td></td>
<td>Activated sludge (domestic)</td>
<td>3 h</td>
<td>LC50: ca 70 mg/l</td>
<td>OECD 209</td>
</tr>
</tbody>
</table>

Long term toxicity

<table>
<thead>
<tr>
<th>Nonanal (124-19-6)</th>
<th>Type</th>
<th>Species</th>
<th>Dose</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aquatic toxicity</td>
<td>Selenastrum capricornutum (green algae)</td>
<td>NOEC: 0,759 mg/l (3d)</td>
<td>OECD 201</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

Nonanal, CAS: 124-19-6

Biodegradation
83 % (28 d), activated sludge, inoculum, OECD 301 F.

Abiotic Degradation

<table>
<thead>
<tr>
<th>Nonanal (124-19-6)</th>
<th>Type</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hydrolysis</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Photolysis</td>
<td>No data available</td>
<td></td>
</tr>
</tbody>
</table>

12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>Nonanal (124-19-6)</th>
<th>Type</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>log Pow</td>
<td>4,1</td>
<td>measured, OECD 117</td>
</tr>
</tbody>
</table>
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BCF 94 l/kg calculated

12.4. Mobility in soil

<table>
<thead>
<tr>
<th>Nonanal (124-19-6)</th>
<th>Type</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface tension</td>
<td>48.1 mN/m @ 20 °C (68 °F) @ 20 mg/l</td>
<td>OECD 115</td>
<td></td>
</tr>
<tr>
<td>Adsorption/Desorption</td>
<td>log Koc: 2.84 @ 35 °C</td>
<td>OECD 121</td>
<td></td>
</tr>
<tr>
<td>Distribution to environmental compartments</td>
<td>no data available</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12.5. Results of PBT and vPvB assessment

Nonanal, CAS: 124-19-6
PBT and vPvB assessment
This substance is not considered to be persistent, bioaccumulating nor toxic (PBT), nor very persistent nor very bioaccumulating (vPvB)

12.6. Other adverse effects

Nonanal, CAS: 124-19-6
No data available

Note
Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product Information
Disposal required in compliance with all waste management related state and local regulations. The choice of the appropriate method of disposal depends on the product composition by the time of disposal as well as the local statutes and possibilities for disposal.

Uncleaned empty packaging
Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse.

SECTION 14: Transport information

Section 14.1 - 14.6

D.O.T. (49CFR)
## SECTION 15: Regulatory information

### Federal and State Regulations
Components of the product are listed in the quoted regulations. For details please refer to the regulations directly. This list is not exhaustive, please check for other applicable regulations.

#### Federal Regulations
This product is listed on the TSCA inventory

### International Inventories

**Nonanal, CAS: 124-19-6**
- AICS (AU)
- DSL (CA)
- IECSC (CN)
- EC-No. 2046885 (EU)
- ENCS (2)-494 (JP)
- ISHL (2)-494 (JP)
-KECI KE-26088 (KR)
- PICCS (PH)
- TSCA (US)
- NZIoC (NZ)
- TCSI (TW)
SECTION 16: Other information

Revision Date 05-May-2020
Issuing date 15-May-2020

Hazard Rating Systems

NFPA (National Fire Protection Association)
- Health Hazard 1
- Fire Hazard 2
- Reactivity 1

HMIS (Hazardous Material Information System)
- Health Hazard 1
- Flammability 2
- Physical Hazard 1

Training advice
For effective first-aid, special training / education is needed.

Sources of key data used to compile the datasheet
Information contained in this safety data sheet is based on OQ owned data and public sources deemed valid or acceptable. The absence of data elements required by OSHA, ANSI or Annex II, Regulation 1907/2006/EC indicates, that no data meeting these requirements is available.

Further information for the safety data sheet
Changes against the previous version are marked by ***. Observe national and local legal requirements. For more information, other material safety data sheets or technical data sheets please consult the OQ homepage (www.chemicals.oq.com).

The use of a comma in section 3 and section 7 to 12 is the same as a period.

Disclaimer
For industrial use only. The information contained herein is accurate to the best of our knowledge. We do not suggest or guarantee that any hazards listed herein are the only ones which exist. OQ makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances. User has the sole responsibility to determine the suitability of the materials for any use and the manner of use contemplated. User must meet all applicable safety and health standards.

End of Safety Data Sheet