SAFETY DATA SHEET

Isononanal
10300
Version / Revision 4
Supersedes Version 3.01
Revision Date 04-May-2020
Issuing date 15-May-2020

SECTION 1: Identification

1.1. Product identifier

Identification of the substance/preparation Isononanal
Chemical Name 3,5,5-Trimethylhexanal
CAS-No 5435-64-3

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

Use of the Substance / Preparation Intermediate
Uses advised against None

1.3. Details of the supplier of the safety data sheet

Supplier OQ Chemicals Corporation
15375 Memorial Drive
West Memorial Place I
Suite 300
Houston, TX 77079
USA
Phone +1 346 378 7300

Product Information Product Stewardship
FAX: +49 (0)208 693 2053
e-mail: sc.ps@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).

Skin corrosion/irritation Category 2, H315
Serious eye damage/eye irritation Category 2B, H320
Skin sensitization Category 1, H317
Flammable liquid Category 3, H226
SAFETY DATA SHEET

Isononanal
10300

Environmental hazard  Aquatic Chronic 3; H412; Aquatic Acute 3; H402

OSHA Specified Hazards  Not applicable.

2.2. Label elements

Labeling according to §1910.1200 (GHS-US labeling).

Hazard symbol(s)

Signal word  Warning

Hazard statements  H226: Flammable liquid and vapor.
                  H315: Causes skin irritation.
                  H320: Causes eye irritation
                  H317: May cause an allergic skin reaction.
                  H402: Harmful to aquatic life
                  H412: Harmful to aquatic life with long lasting effects.

Precautionary statements

Prevention  P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
            P233: Keep container tightly closed.
            P240: Ground and bond container and receiving equipment.
            P241: Use explosion-proof electrical/ ventilating/ lighting equipment.
            P242: Use non-sparking tools.
            P243: Take action to prevent static discharges.
            P280: Wear protective gloves/eye protection/face protection.
            P264: Wash hands thoroughly after handling.
            P261: Avoid breathing gas/mist/vapours.
            P272: Contaminated work clothing must not be allowed out of the workplace.
            P273: Avoid release to the environment.

Response  P302 + P352: IF ON SKIN: Wash with plenty of soap and water.
          P333 + P313: If skin irritation or rash occurs: Get medical advice/attention.
          P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
          P337 + P313: If eye irritation persists: Get medical advice/ attention.
          P361: Take off immediately all contaminated clothing and wash it before reuse.

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

Emergency telephone number  NCEC +1 202 464 2554
2 / 13
USA (A-US)
Disposal

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

2.3. Other hazards

Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback

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>3,5,5-Trimethylhexanal</td>
<td>5435-64-3</td>
<td>&gt; 90</td>
</tr>
</tbody>
</table>

Remarks
Mixture of isomeric Nonanals with > 90% 3,5,5-Trimethylhexanal.

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.

Ingestion
Do not induce vomiting without medical advice. Call a physician immediately.

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

Main symptoms
shortness of breath.

Special hazard
Lung oedema.

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
Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback

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
Cool containers / tanks with water spray. Dike and collect water used to fight fire. Keep people away from and upwind of fire. Water run-off can cause environmental damage. Water run-off and vapor cloud may be corrosive.

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).

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. 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 is heavier than air and can travel considerable distance to a source of ignition and flashback.

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 15 and 30 °C (59 and 86 °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.

<table>
<thead>
<tr>
<th>Suitable material</th>
<th>nitrile rubber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation</td>
<td>according to EN 374: level 4</td>
</tr>
<tr>
<td>Glove thickness</td>
<td>approx 0.55 mm</td>
</tr>
<tr>
<td>Break through time</td>
<td>approx 90 min</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Suitable material</th>
<th>polyvinylchloride</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation</td>
<td>Information derived from practical experience</td>
</tr>
<tr>
<td>Glove thickness</td>
<td>approx 0.8 mm</td>
</tr>
</tbody>
</table>

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. 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

**Colour**
- colourless

**Odour**
- slight

**Odour threshold**
- No data available

**pH**
- 3.8 - 4.3 (0.3 % in water @ 20 °C (68 °F))

**Melting point/range**
- < -148 °F (< -100 °C)

**Boiling point/range**
- 336 °F (169 °C) @ 1 atm (101.3 kPa)

**Flash point**
- 93 °F (34 °C)

**Method**
- EU A.9

**Evaporation rate**
- No data available

**Flammability (solid, gas)**
- Does not apply, the substance is a liquid

**Lower explosion limit**
- 0.7 Vol %

**Upper explosion limit**
- No data available

**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>9</td>
<td>0.9</td>
<td>0.009</td>
<td>20</td>
<td>68</td>
</tr>
</tbody>
</table>

**Method**
- OECD 109

**Vapour density**
- No data available

**Relative density**

<table>
<thead>
<tr>
<th>Values</th>
<th>@ °C</th>
<th>@ °F</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.82</td>
<td>20</td>
<td>68</td>
<td>OECD 109</td>
</tr>
</tbody>
</table>

**Solubility**
- ~ 0.3 g/l @ 20 °C (68 °F), in water, OECD 105

**log Pow**
- ~ 3.3 (measured) OECD 117

**Autoignition temperature**
- 401 °F (205 °C)

**Method**
- EU A.15

**Decomposition temperature**
- No data available

**Viscosity**
- 1.72 mm²/s @ 68 °F (20 °C)

**Method**
- OECD 114, kinematic

9.2. Other information

**Molecular weight**
- 142.23

**Molecular formula**
- C9 H18 O

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

**Refractive Index**
- 1.419 - 1.423 @ 68 °F (20 °C)

**Explosive properties**
- Does not apply, substance is not explosive. There are no chemical groups associated with explosive properties

**Surface tension**
- 45.6 mN/m (0.265 g/l @ 20°C (68°F)), 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
Hazardous polymerisation may occur. Polymerization is a highly exothermic reaction and may generate sufficient heat to cause thermal decomposition and/or rupture containers. May form explosive peroxides. When finely distributed, self-ignition is possible.

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  Inhalation, Eye contact, Skin contact, Ingestion

3,5,5-Trimethylhexanal, CAS: 5435-64-3
Main symptoms  shortness of breath.

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

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

Acute toxicity

<table>
<thead>
<tr>
<th>3,5,5-Trimethylhexanal (5435-64-3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routes of Exposure</td>
</tr>
<tr>
<td>Oral</td>
</tr>
<tr>
<td>Dermal</td>
</tr>
</tbody>
</table>

3,5,5-Trimethylhexanal, CAS: 5435-64-3
Assessment
Based on available data, the classification criteria are not met for:
Acute oral toxicity
Acute dermal toxicity
For acute inhalation toxicity, no data are available

### Irritation and corrosion

**3,5,5-Trimethylhexanal (5435-64-3)**

<table>
<thead>
<tr>
<th>Target Organ Effects</th>
<th>Species</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin</td>
<td>rabbit</td>
<td>irritating</td>
<td>OECD 404</td>
</tr>
<tr>
<td>Eyes</td>
<td>rabbit</td>
<td>Mild eye irritation</td>
<td>OECD 405</td>
</tr>
</tbody>
</table>

**3,5,5-Trimethylhexanal, CAS: 5435-64-3**

**Assessment**
The available data lead to the classification given in section 2

### Sensitization

**3,5,5-Trimethylhexanal (5435-64-3)**

<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>guinea pig</td>
<td>sensitizing</td>
<td>OECD 406</td>
</tr>
</tbody>
</table>

**3,5,5-Trimethylhexanal, CAS: 5435-64-3**

**Assessment**
The available data lead to a classification as skin sensitizer (see section 2)
For respiratory sensitization, no data are available

### Subacute, subchronic and prolonged toxicity

**3,5,5-Trimethylhexanal (5435-64-3)**

<table>
<thead>
<tr>
<th>Type</th>
<th>Dose</th>
<th>Species</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subacute toxicity</td>
<td>NOAEL: ~ 250 mg/kg/d (28d)</td>
<td>rat, male/female</td>
<td>OECD 407</td>
</tr>
</tbody>
</table>

**3,5,5-Trimethylhexanal, CAS: 5435-64-3**

**Assessment**
Based on available data, the classification criteria are not met for:
STOT RE

### Carcinogenicity, Mutagenicity, Reproductive toxicity

**3,5,5-Trimethylhexanal (5435-64-3)**

<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></td>
<td>Salmonella typhimurium</td>
<td>negative</td>
<td>OECD 471 (Ames)</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td></td>
<td>mouse</td>
<td>negative</td>
<td>EU B12, Oral</td>
</tr>
</tbody>
</table>

**3,5,5-Trimethylhexanal, CAS: 5435-64-3**

**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

**3,5,5-Trimethylhexanal, CAS: 5435-64-3**

---

Emergency telephone number
NCEC +1 202 464 2554
USA (A-US)
SAFETY DATA SHEET

Isononanal
10300

Aspiration toxicity
Due to the viscosity, this product does not present an aspiration hazard

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
3,5,5-Trimethylhexanal (5435-64-3)

<table>
<thead>
<tr>
<th>Species</th>
<th>Exposure time</th>
<th>Dose</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyprinus carpio (Carp)</td>
<td>96h</td>
<td>LC50: 45 mg/l</td>
<td>OECD 203</td>
</tr>
<tr>
<td>Daphnia magna (Water flea)</td>
<td>48h</td>
<td>LC50: ~ 10,1 mg/l</td>
<td>OECD 202</td>
</tr>
<tr>
<td>Desmodesmus subspicatus</td>
<td>72h</td>
<td>EC50: ~ 33 mg/l</td>
<td>OECD 201</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

3,5,5-Trimethylhexanal, CAS: 5435-64-3
Biodegradation
~ 33 % (28 d), activated sludge, non-adapted, aerobic, OECD 301 B.

12.3. Bioaccumulative potential

3,5,5-Trimethylhexanal (5435-64-3)

<table>
<thead>
<tr>
<th>Type</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>log Pow</td>
<td>~ 3,3</td>
<td>measured, OECD 117</td>
</tr>
</tbody>
</table>

12.4. Mobility in soil

3,5,5-Trimethylhexanal (5435-64-3)

<table>
<thead>
<tr>
<th>Type</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface tension</td>
<td>45,6 mN/m (0,265 g/l @ 20°C (68°F))</td>
<td>OECD 115</td>
</tr>
</tbody>
</table>

12.5. Results of PBT and vPvB assessment

3,5,5-Trimethylhexanal, CAS: 5435-64-3
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

3,5,5-Trimethylhexanal, CAS: 5435-64-3
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

D.O.T. (49CFR)

14.1. UN number
UN 1989
14.2. UN proper shipping name
Aldehydes, n.o.s. (3,5,5-Trimethylhexanal)
14.3. Transport hazard class(es)
3
14.4. Packing group
III
14.5. Environmental hazards
no
14.6. Special precautions for user
Emergency Response Guide 129

ICAO-TI / IATA-DGR

14.1. UN number
UN 1989
14.2. UN proper shipping name
Aldehydes, n.o.s. (3,5,5-Trimethylhexanal)
14.3. Transport hazard class(es)
3
14.4. Packing group
III
14.5. Environmental hazards
no
14.6. Special precautions for user
no data available

Emergency telephone number
NCEC +1 202 464 2554
USA (A-US)
SAFETY DATA SHEET

Isononanal
10300

IMDG

14.1. UN number
14.2. UN proper shipping name
14.3. Transport hazard class(es)
14.4. Packing group
14.5. Environmental hazards
14.6. Special precautions for user
14.7. Transport in bulk according to Annex II

UN 1989
Aldehydes, n.o.s. (3,5,5-Trimethylhexanal)
III
no
F-E, S-D
not applicable

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

3,5,5-Trimethylhexanal, CAS: 5435-64-3
AICS (AU)
DSL (CA)
IECSC (CN)
EC-No. 2266030 (EU)
ENCS (2)-494 (JP)
ISHL (2)-494 (JP)
INSQ (MX)
PICCS (PH)
TSCA (US)
NZIoC (NZ)
TCSI (TW)

SECTION 16: Other information

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

Hazard Rating Systems

Emergency telephone number
NCEC +1 202 464 2554
USA (A-US)
SAFETY DATA SHEET

Isononanal
10300

Version / Revision 4

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

HMIS (Hazardous Material Information System)
Health Hazard 2
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