SECTION 1: Identification of the substance / mixture and of the company / undertaking

1.1. Product identifier
Identification of the substance/preparation n/i-C13/C15 Aldehyde
Chemical Name Reaction mass of pentadecanal and tridecanal and 2-methyldodecanal and 2-methyltetradecanal
CAS-No 93821-14-8
EC No. 931-038-4 / 298-699-2
Registration number (REACH) 01-2119441590-45

1.2. Relevant identified uses of the substance or mixture and uses advised against
Identified uses Formulation
Uses advised against None

1.3. Details of the supplier of the safety data sheet
Company/Undertaking OQ Chemicals GmbH
Identification Rheinpromenade 4A
D-40789 Monheim
Germany
Product Information Product Stewardship
FAX: +49 (0)208 693 2053
email: sc.psq@oq.com

1.4. Emergency telephone number
Emergency telephone number +44 (0) 1235 239 670 (UK)
available 24/7

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture
This substance is classified based on Directive 1272/2008/EC and its amendments (CLP Regulation)

Skin corrosion/irritation  Category 2, H315
Skin sensitization  Category 1, H317
Environmental hazard  Aquatic Acute 1; H400
Aquatic Chronic 1; H410

Additional information
For full text of Hazard- and EU Hazard-statements see SECTION 16.

2.2. Label elements
Hazard pictograms

Signal word  Warning

Hazard statements  H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H400: Very toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects.

Precautionary statements  P261: Avoid breathing gas/mist/vapours.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P302 + P352: IF ON SKIN: Wash with plenty of soap and water.
P333 + P313: If skin irritation or rash occurs: Get medical advice/attention.
P391: Collect spillage.
P501: Dispose of contents/container in accordance with local regulation.

2.3. Other hazards

PBT and vPvB assessment  This substance is not considered to be persistent, bioaccumulating nor toxic (PBT), nor very persistent nor very bioaccumulating (vPvB)

SECTION 3: Composition / information on ingredients

3.1. Substances

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>REACH-No</th>
<th>1272/2008/EC</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkenes, C12-14, hydroformylation products, distn. lights</td>
<td>93821-14-8</td>
<td>01-2119441590-45</td>
<td>Skin Irrit. 2; H315 Skin Sens. 1; H317 Aquatic Acute 1; H400 Aquatic Chronic 1; H410</td>
<td>&gt; 96,5</td>
</tr>
</tbody>
</table>

For full text of Hazard- and EU Hazard-statements see SECTION 16.

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, 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

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.

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

Further info may be available in the appropriate Exposure scenarios in the annex to this SDS.

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.

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.

Temperature class
T3

7.3. Specific end use(s)

Formulation
For specific end use information see the annex of this safety data sheet

SECTION 8: Exposure controls / personal protection

8.1. Control parameters

Exposure limits European Union
No exposure limits established

Exposure limits UK
No exposure limits established.

DNEL & PNEC

Alkenes, C12-14, hydroformylation products, distn. lights, CAS: 93821-14-8

Workers

DN(M)EL - long-term exposure - systemic effects - Inhalation 24 mg/m³
DN(M)EL - acute / short-term exposure - systemic effects - Inhalation No hazard identified
DN(M)EL - long-term exposure - local effects - Inhalation Hazard unknown (no further information necessary)
DN(M)EL - acute / short-term exposure - local effects - Inhalation Hazard unknown (no further information necessary)
DN(M)EL - long-term exposure - systemic effects - Dermal 3,33 mg/kg bw/day
DN(M)EL - acute / short-term exposure - systemic effects - Dermal No hazard identified
DN(M)EL - long-term exposure - local effects - Dermal Medium hazard (no threshold derived)
DN(M)EL - acute / short-term exposure - local effects - Dermal Medium hazard (no threshold derived)
DN(M)EL - local effects - eyes No hazard identified

General population

DN(M)EL - long-term exposure - systemic effects - Inhalation 5,8 mg/m³
DN(M)EL - acute / short-term exposure - systemic effects - Inhalation No hazard identified
DN(M)EL - long-term exposure - local effects - Inhalation Hazard unknown (no further information necessary)
DN(M)EL - acute / short-term exposure - local effects - Inhalation Hazard unknown (no further information necessary)
DN(M)EL - long-term exposure - systemic effects - Dermal 1,67 mg/kg bw/day
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**Version / Revision** 4

### DN(M)EL - acute / short-term exposure - systemic effects - Dermal

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Hazard</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dermal</td>
<td>No hazard identified</td>
<td></td>
</tr>
</tbody>
</table>

### DN(M)EL - long-term exposure - local effects - Dermal

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Hazard</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dermal</td>
<td>Medium hazard (no threshold derived)</td>
<td></td>
</tr>
</tbody>
</table>

### DN(M)EL - acute / short-term exposure - local effects - Dermal

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Hazard</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dermal</td>
<td>Medium hazard (no threshold derived)</td>
<td></td>
</tr>
</tbody>
</table>

### DN(M)EL - long-term exposure - systemic effects - Oral

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Hazard</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>1,67 mg/kg bw/day</td>
<td></td>
</tr>
</tbody>
</table>

### DN(M)EL - acute / short-term exposure - systemic effects - Oral

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Hazard</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>No hazard identified</td>
<td></td>
</tr>
</tbody>
</table>

### DN(M)EL - local effects - eyes

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Hazard</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eyes</td>
<td>No hazard identified</td>
<td></td>
</tr>
</tbody>
</table>

### Environment

<table>
<thead>
<tr>
<th>Environment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNEC aqua - freshwater</td>
<td>0,8 µg/l</td>
</tr>
<tr>
<td>PNEC aqua - marine water</td>
<td>0,08 µg/l</td>
</tr>
<tr>
<td>PNEC aqua - intermittent releases</td>
<td>8 µg/l</td>
</tr>
<tr>
<td>PNEC STP</td>
<td>2,36 mg/l</td>
</tr>
<tr>
<td>PNEC sediment - freshwater</td>
<td>0,109 mg/kg</td>
</tr>
<tr>
<td>PNEC sediment - marine water</td>
<td>0,0109 mg/kg</td>
</tr>
<tr>
<td>PNEC Air</td>
<td>No hazard identified</td>
</tr>
<tr>
<td>PNEC soil</td>
<td>0,0212 mg/kg</td>
</tr>
</tbody>
</table>

### Secondary poisoning

<table>
<thead>
<tr>
<th>Secondary poisoning</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No potential for bioaccumulation</td>
<td></td>
</tr>
</tbody>
</table>

### 8.2. Exposure controls

**Special adaptations (REACH)**

Not applicable.

**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.

**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. Equipment should conform to EN 166

**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**

<table>
<thead>
<tr>
<th>Material</th>
<th>Evaluation</th>
<th>Glove thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>nitrile rubber</td>
<td>according to EN 374: level 6</td>
<td>approx 0,55 mm</td>
</tr>
</tbody>
</table>
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Break through time > 480 min

Suitable material polyvinylchloride
Evaluation Information derived from practical experience
Glove thickness approx 0.8 mm

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

Respiratory protection
Respirator with A filter. Full mask with above mentioned filter according to producers using requirements or self-contained breathing apparatus. Equipment should conform to EN 136 or EN 140 and EN 143.

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.

Additional advice
Further details on substance data can be found in the registration dossier under the following link: http://echa.europa.eu/information-on-chemicals/registered-substances.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance liquid
Colour colourless
Odour fruity
Odour threshold No data available
pH 4.4 (0.002 g/l in water @ 20 °C (68 °F)) OECD 105
Melting point/range -9 °C (Pour point) @ 1013 hPa
Method DIN ISO 3016
Boiling point/range 263 - 286 °C @ 1013 hPa
Method OECD 103
Flash point 122 °C
Method ISO 2719
Evaporation rate No data available
Flammability (solid, gas) Does not apply, the substance is a liquid
Lower explosion limit No data available
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>~ 3</td>
<td>~ 0,3</td>
<td>~ 0,003</td>
<td>20</td>
<td>68</td>
</tr>
</tbody>
</table>
Method DIN EN 13016-2

Vapour density No data available

Relative density

<table>
<thead>
<tr>
<th>Values</th>
<th>@ °C</th>
<th>@ °F</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.830</td>
<td>20</td>
<td>68</td>
</tr>
</tbody>
</table>
Method DIN 51757

Solubility 0.002 g/l @ 20 °C, in water, OECD 105

log Pow 6.1 - 7.1 (measured), OECD 117

Autoignition temperature 215 °C @ 1001 hPa
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Method
Decomposition temperature
Viscosity
Method
Explosive properties
Oxidizing properties

9.2. Other information
Surface tension

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
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

Acute toxicity

<table>
<thead>
<tr>
<th>Alkenes, C12-14, hydroformylation products, distn. lights (93821-14-8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routes of Exposure</td>
</tr>
<tr>
<td>Oral</td>
</tr>
<tr>
<td>Dermal</td>
</tr>
</tbody>
</table>

Alkenes, C12-14, hydroformylation products, distn. lights, CAS: 93821-14-8
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**

<table>
<thead>
<tr>
<th>Alkenes, C12-14, hydroformylation products, distn. lights (93821-14-8)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target Organ Effects</strong></td>
</tr>
<tr>
<td>Skin</td>
</tr>
<tr>
<td>Eyes</td>
</tr>
</tbody>
</table>

**Assessment**
The available data lead to the classification given in section 2
For respiratory irritation, no data are available

**Sensitization**

<table>
<thead>
<tr>
<th>Alkenes, C12-14, hydroformylation products, distn. lights (93821-14-8)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target Organ Effects</strong></td>
</tr>
<tr>
<td>Skin</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Alkenes, C12-14, hydroformylation products, distn. lights (93821-14-8)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
</tr>
<tr>
<td>Subacute toxicity</td>
</tr>
</tbody>
</table>

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

**Carcinogenicity, Mutagenicity, Reproductive toxicity**

<table>
<thead>
<tr>
<th>Alkenes, C12-14, hydroformylation products, distn. lights (93821-14-8)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
</tr>
<tr>
<td>Mutagenicity</td>
</tr>
<tr>
<td>Mutagenicity</td>
</tr>
<tr>
<td>Mutagenicity</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET

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<table>
<thead>
<tr>
<th>Reproductive toxicity</th>
<th>NOAEL 1000 mg/kg/d</th>
<th>rat</th>
<th>OECD 422, Oral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developmental Toxicity</td>
<td>NOAEL 1000 mg/kg/d</td>
<td>rat</td>
<td>OECD 422, Oral</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>No data available</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Alkenes, C12-14, hydroformylation products, distn. lights, CAS: 93821-14-8

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
Animal testing did not show any effects on fertility
No cancer study was conducted

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

Aspiration toxicity
no data available

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
Alkenes, C12-14, hydroformylation products, distn. lights (93821-14-8)

<table>
<thead>
<tr>
<th>Species</th>
<th>Exposure time</th>
<th>Dose</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Danio rerio (Zebra fish)</td>
<td>96h</td>
<td>LC50: &gt; 0.4 - &lt; 0.9 mg/l</td>
<td>OECD 203</td>
</tr>
<tr>
<td>Activated sludge (domestic)</td>
<td>28 d</td>
<td>NOEC: 23.6 mg/l</td>
<td>OECD 310</td>
</tr>
<tr>
<td>Daphnia magna (Water flea)</td>
<td>48h</td>
<td>EC50: 1.54 mg/l</td>
<td>OECD 202 read across</td>
</tr>
<tr>
<td>Pseudokirchneriella subcapitata</td>
<td>72h</td>
<td>EC50: 4.5 mg/l (Growth rate)</td>
<td>OECD 201 read across</td>
</tr>
</tbody>
</table>

Long term toxicity
Alkenes, C12-14, hydroformylation products, distn. lights (93821-14-8)

<table>
<thead>
<tr>
<th>Type</th>
<th>Species</th>
<th>Dose</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquatic toxicity</td>
<td>Pseudokirchneriella subcapitata</td>
<td>NOEC: 4.5 mg/l (3d) Growth rate</td>
<td>OECD 201 read across</td>
</tr>
</tbody>
</table>
12.2. Persistence and degradability

**Alkenes, C12-14, hydroformylation products, distn. lights, CAS: 93821-14-8**

**Biodegradation**
65.4 % (21 d), activated sludge (domestic), non-adapted, aerobic, OECD 310.

<table>
<thead>
<tr>
<th>Type</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photolysis</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Hydrolysis</td>
<td>not expected</td>
<td></td>
</tr>
</tbody>
</table>

**Abiotic Degradation**

<table>
<thead>
<tr>
<th>Type</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkenes, C12-14, hydroformylation products, distn. lights (93821-14-8)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>Type</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>log Pow</td>
<td>6.1 - 7.1</td>
<td>measured, OECD 117</td>
</tr>
<tr>
<td>BCF</td>
<td>No data available</td>
<td></td>
</tr>
</tbody>
</table>

12.4. Mobility in soil

<table>
<thead>
<tr>
<th>Type</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkenes, C12-14, hydroformylation products, distn. lights (93821-14-8)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface tension</td>
<td>42.3 mN/m @ 20 °C (68 °F)</td>
<td>OECD 115</td>
</tr>
<tr>
<td>Adsorption/Desorption</td>
<td>log Koc: 3.12</td>
<td>calculated read across</td>
</tr>
<tr>
<td>Distribution to environmental compartments</td>
<td>no data available</td>
<td></td>
</tr>
</tbody>
</table>

12.5. Results of PBT and vPvB assessment

**Alkenes, C12-14, hydroformylation products, distn. lights, CAS: 93821-14-8**

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

**Alkenes, C12-14, hydroformylation products, distn. lights, CAS: 93821-14-8**

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.
Hazardous waste according to European Waste Catalogue (EWC)

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

#### ADR/RID

<table>
<thead>
<tr>
<th>14.1. UN number</th>
<th>UN 3082</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.2. UN proper shipping name</td>
<td>Environmentally hazardous substance, liquid, n.o.s. (n/i-C13/C15-Aldehyde)</td>
</tr>
<tr>
<td>14.3. Transport hazard class(es)</td>
<td>9</td>
</tr>
<tr>
<td>14.4. Packing group</td>
<td>III</td>
</tr>
<tr>
<td>14.5. Environmental hazards</td>
<td>Fish and tree</td>
</tr>
<tr>
<td>14.6. Special precautions for user</td>
<td>ADR Tunnel restriction code (E) Classification Code M6 Hazard Number 90</td>
</tr>
</tbody>
</table>

#### ADN

<table>
<thead>
<tr>
<th>14.1. UN number</th>
<th>UN 3082</th>
</tr>
</thead>
<tbody>
<tr>
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<td>14.3. Transport hazard class(es)</td>
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</tr>
<tr>
<td>14.5. Environmental hazards</td>
<td>Fish and tree</td>
</tr>
<tr>
<td>14.6. Special precautions for user</td>
<td>Classification Code M6 Hazard Number 90</td>
</tr>
</tbody>
</table>

#### ICAO-TI / IATA-DGR

<table>
<thead>
<tr>
<th>14.1. UN number</th>
<th>UN 3082</th>
</tr>
</thead>
<tbody>
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<td>III</td>
</tr>
<tr>
<td>14.5. Environmental hazards</td>
<td>Fish and tree</td>
</tr>
<tr>
<td>14.6. Special precautions for user</td>
<td>no data available</td>
</tr>
</tbody>
</table>

#### IMDG

| 14.1. UN number | UN 3082 |
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14.2. UN proper shipping name
Environmentally hazardous substance, liquid, n.o.s.
(n/i-C13/C15-Aldehyde)

14.3. Transport hazard class(es)
9

14.4. Packing group
III

14.5. Environmental hazards
Fish and tree
Marine pollutant
yes

14.6. Special precautions for user
F-A, S-F

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code
not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Regulation 1272/2008, Annex VI
not listed

DI 2012/18/EU (Seveso III)
Category
Annex I, part 1:
E1

DI 1999/13/EC (VOC Guideline)

<table>
<thead>
<tr>
<th>Component</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkenes, C12-14, hydroformylation products, distn. lights, CAS: 93821-14-8</td>
<td>regulated</td>
</tr>
</tbody>
</table>

International Inventories

Alkenes, C12-14, hydroformylation products, distn. lights, CAS: 93821-14-8
EC-No. 2986992 (EU)
KECI KE-00631 (KR)
NZIoC-NZ May be used as single component chemical

National regulatory information Great Britain

Releases to air (Pollution Inventory Substances)
not subject

Releases to water (Pollution Inventory Substances)
not subject

Releases to sewer (Pollution Inventory Substances)
not subject

15.2. Chemical safety assessment
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The Chemical Safety Report (CSR) has been generated. For Exposure Scenarios see the annex.

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3
H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H400: Very toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects.

Abbreviations
A table of terms and abbreviations can be found under the following link:

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 annex is not required because the substance is registered as an intermediate under REACh

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

Annex to the extended Safety Data Sheet (eSDS)

General information
Local Human hazard:
Qualitative approach used to conclude safe use.

Operational conditions and risk management measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Wear protective gloves. Substance/Task appropriate respirator, based on potential exposure to the use. Regular cleaning of equipment and work area. Good standard of personal hygiene. Avoid contact with contaminated tools and objects. Wear protective gloves and eye/face protection. Minimization of manual phases.
**Exposure scenario identification**

Number of the ES 1

<table>
<thead>
<tr>
<th>Formulation &amp; (re)packing of substances and mixtures</th>
</tr>
</thead>
</table>

**List of use descriptors**

**Process categories [PROC]**
- PROC1: Use in closed process, no likelihood of exposure
- PROC2: Use in closed, continuous process with occasional controlled exposure
- PROC3: Use in closed batch process (synthesis or formulation)
- PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
- PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
- PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
- PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
- PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
- PROC14: production of preparations or articles by tabletting, compression, extrusion, pelettisation
- PROC15: Use as laboratory reagent

**Environmental release categories [ERC]**
- ERC2: Formulation of preparations (mixtures)

**Product characteristics**
Refer to attached safety data sheets

**Processes and activities covered by the exposure scenario**
Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities

**Further explanations**
Assumes use at not more than 20°C above ambient temperature (unless stated differently)

Industrial use

**Number of the contributing scenario 1**

**Contributing exposure scenario controlling environmental exposure for ERC 2**

**Further specification**
- assessment tool used: Chesar 2.3
- Amounts used
  - Daily amount per site: 0.333 to 0.616
  - Annual amount per site: 100 to 180
  - Fraction of EU tonnage used in region: 1
- Environment factors not influenced by risk management
  - River flow rate: 18000 m³/d
- Technical conditions and measures at process level (source) to prevent release
  - Release fraction to air from process: 2.5%
  - Release fraction to wastewater from process: 2%
  - Release fraction to soil from process: 0.01%
- Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
  - Onsite treatment wastewater. Apply acclimated biological treatment. Assumed Efficiency: 99.9 %
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Conditions and measures related to municipal sewage treatment plant
Size of municipal sewage system/treatment plant (m³/d): 2000
The minimum grade of elimination in the sewage plant is (%): 20003
Do not apply industrial sludge to natural soils

Conditions and measures related to external treatment of waste for disposal
Dispose of waste product or used containers according to local regulations

<table>
<thead>
<tr>
<th>Number of the contributing scenario</th>
<th>Contributing exposure scenario controlling worker exposure for</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PROC 1</td>
</tr>
<tr>
<td></td>
<td><strong>2</strong></td>
</tr>
<tr>
<td>Further specification</td>
<td>assessment tool used: Chesar 2.3</td>
</tr>
<tr>
<td>Product characteristics</td>
<td>Covers percentage substance in the product up to 100 % (unless stated differently)</td>
</tr>
<tr>
<td></td>
<td>Liquid</td>
</tr>
<tr>
<td>Frequency and duration of use</td>
<td>8 h (full shift)</td>
</tr>
<tr>
<td>Other given operational conditions affecting workers exposure</td>
<td>Indoor and outdoor use</td>
</tr>
<tr>
<td>Technical conditions and measures to control dispersion from source towards the worker</td>
<td>provide a basic standard of general ventilation (1 to 3 air changes per hour).</td>
</tr>
<tr>
<td>Conditions and measures related to personal protection, hygiene and health evaluation</td>
<td>Wear suitable gloves tested to EN374. Substance/task appropriate respirator; based on potential exposure to the use. Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Use suitable eye protection.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of the contributing scenario</th>
<th>Contributing exposure scenario controlling worker exposure for</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PROC 2</td>
</tr>
<tr>
<td></td>
<td><strong>3</strong></td>
</tr>
<tr>
<td>Further specification</td>
<td>assessment tool used: Chesar 2.3</td>
</tr>
<tr>
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</tr>
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<td>Conditions and measures related to personal protection, hygiene and health evaluation</td>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PROC 3</td>
</tr>
<tr>
<td></td>
<td><strong>4</strong></td>
</tr>
<tr>
<td>Further specification</td>
<td>assessment tool used: Chesar 2.3</td>
</tr>
<tr>
<td>Product characteristics</td>
<td>Covers percentage substance in the product up to 100 % (unless stated differently)</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>Frequency and duration of use</td>
<td>8 h (full shift)</td>
</tr>
<tr>
<td>Other given operational conditions affecting workers exposure</td>
<td>Indoor use</td>
</tr>
<tr>
<td>Technical conditions and measures to control dispersion from source towards the worker</td>
<td>provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).</td>
</tr>
</tbody>
</table>
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Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374. Substance/task appropriate respirator; based on potential exposure to the use. Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Use suitable eye protection.

Number of the contributing scenario
Contributing exposure scenario controlling worker exposure for PROC 4

Further specification
assessment tool used: Chesar 2.3

Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Liquid

Frequency and duration of use
8 h (full shift)

Other given operational conditions affecting workers exposure
Indoor use

Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374. Substance/task appropriate respirator; based on potential exposure to the use. Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Use suitable eye protection.

Number of the contributing scenario
Contributing exposure scenario controlling worker exposure for PROC 5

Further specification
assessment tool used: Chesar 2.3

Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Liquid

Frequency and duration of use
8 h (full shift)

Other given operational conditions affecting workers exposure
Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).

Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear respiratory protection (Efficiency: 95 %). Use suitable eye protection. Skin coverage with appropriate barrier material based on potential for contact with the chemicals.

Number of the contributing scenario
Contributing exposure scenario controlling worker exposure for PROC 8a

Further specification
assessment tool used: Chesar 2.3

Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Liquid

Frequency and duration of use
8 h (full shift)

Other given operational conditions affecting workers exposure
Indoor use

Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).

Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection.
### Further specification

**assessment tool used:** Chesar 2.3

### Product characteristics

**Covers percentage substance in the product up to 100 % (unless stated differently)**

**Liquid**

### Frequency and duration of use

8 h (full shift)

### Other given operational conditions affecting workers exposure

Indoor use

### Technical conditions and measures to control dispersion from source towards the worker

Provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 95 % (inhalative); 0 % (dermal).

### Conditions and measures related to personal protection, hygiene and health evaluation

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection. Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Substance/task appropriate respirator; based on potential exposure to the use.

**Number of the contributing scenario**

| 8 |
| Contributing exposure scenario controlling worker exposure for |
| PROC 8b |

---

**Number of the contributing scenario**

| 9 |
| Contributing exposure scenario controlling worker exposure for |
| PROC 9 |

---

**Number of the contributing scenario**

| 10 |
| Contributing exposure scenario controlling worker exposure for |
| PROC 14 |

---

**Conditions and measures related to personal protection, hygiene and health evaluation**

Wear suitable gloves tested to EN374. Use suitable eye protection. Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Substance/task appropriate respirator; based on potential exposure to the use.
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Number of the contributing scenario
11
Contributing exposure scenario controlling worker exposure for
PROC 15

Further specification
assessment tool used: Chesar 2.3

Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Liquid

Frequency and duration of use
8 h (full shift)

Other given operational conditions affecting workers exposure
Indoor use

Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation):
90 % (inhalative); 0 % (dermal).

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374. Use suitable eye protection. Skin coverage with appropriate barrier material based on
potential for contact with the chemicals. Substance/task appropriate respirator; based on potential exposure to the use.

Environment
PEC = predicted environmental concentration (local); RCR = risk characterisation ratio
Fresh Water (Pelagic) PEC: 1.096E-5 mg/l; RCR: 0.014
Fresh Water (Sediment) PEC: 0.001 mg/kg dw; RCR: 0.137
Marine Water (Pelagic) PEC: 1.096E-6 mg/l; RCR: 0.014
Marine Water (Sediment) PEC: 1.487E-4 mg/kg dw; RCR: 0.137
Agricultural Soil PEC: 6.563E-5 mg/kg dw; RCR: 0.031
Sewage Treatment Plant (Effluent) PEC: 1.098E-4 mg/l; RCR: < 0.01

Human exposure prediction (oral, dermal, inhalative)
Oral exposure is not expected to occur. EE(inhal): Estimated inhalative long-term exposure [mg/m³]; EE(derm):
Estimated dermal long-term exposure [mg/kg b.w./d]. Exposure estimates are given for short-term or long-term,
systemic or local exposure depending on which lead to more conservative risk characterization ratios. The RMMs
described above suffice to control risks for both local and systemic effects.

Proc 1 EE(inhal): 0.083; EE(derm): 0.034
Proc 2 EE(inhal): 8.264; EE(derm): 1.37
Proc 3 EE(inhal): 2.479; EE(derm): 0.69
Proc 4 EE(inhal): 4.132; EE(derm): 1.372
Proc 5 EE(inhal): 2.066; EE(derm): 1.371
Proc 8a EE(inhal): 8.264; EE(derm): 1.371
Proc 8b EE(inhal): 2.066; EE(derm): 1.371
Proc 9 EE(inhal): 4.132; EE(derm): 1.372
Proc 14 EE(inhal): 4.132; EE(derm): 0.686
Proc 15 EE(inhal): 4.132; EE(derm): 0.34

Risk characterisation
Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's
given correspond in each case to the most conservative calculated values.

Proc 1 RCR(inhal): 0.01; RCR(derm): 0.01
Proc 2 RCR(inhal): 0.344; RCR(derm): 0.411
Proc 3 RCR(inhal): 0.103; RCR(derm): 0.207
Proc 4 RCR(inhal): 0.172; RCR(derm): 0.412
Proc 5 RCR(inhal): 0.086; RCR(derm): 0.412
Proc 8a RCR(inhal): 0.344; RCR(derm): 0.412
Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES
Usage of release factors allows downstream users to verify in a first approximation, if the combination of local usage and production conditions meets the defined release quantities resulting from this exposure scenario (calculated as M(site) [see amounts used, contributing scenario 1] x release factor [Technical conditions and measures at process level (source) to prevent release; contributing scenario 1])

associated uses:

Other combinations of operational conditions may also be safe. Please contact OQ in case your local operational conditions differ from the ones described above and you are unsure if they are also safe.