2-Butanone ≥99.5 %, for synthesis

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

1.1 Product identifier

Identification of the substance: 2-Butanone
Article number: 8403
Registration number (REACH): 01-2119457290-43-xxxx
Index No: 606-002-00-3
EC number: 201-159-0
CAS number: 78-93-3

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

Identified uses: laboratory chemical, laboratory and analytical use

1.3 Details of the supplier of the safety data sheet

Carl Roth GmbH + Co KG
Schoemperlenstr. 3-5
D-76185 Karlsruhe
Germany

Telephone: +49 (0) 721 - 56 06 0
Telefax: +49 (0) 721 - 56 06 149
e-mail: sicherheit@carlroth.de
Website: www.carlroth.de

Competent person responsible for the safety data sheet: Department Health, Safety and Environment

1.4 Emergency telephone number

Emergency information service: Poison Centre Munich: +49/(0)89 19240

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 (CLP)

<table>
<thead>
<tr>
<th>Classification acc. to GHS</th>
<th>Hazard class</th>
<th>Hazard class and category</th>
<th>Hazard statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.6 flammable liquid</td>
<td>(Flam. Liq. 2)</td>
<td>H225</td>
<td></td>
</tr>
<tr>
<td>3.3 serious eye damage/eye irritation</td>
<td>(Eye Irrit. 2)</td>
<td>H319</td>
<td></td>
</tr>
<tr>
<td>3.8D specific target organ toxicity - single exposure (narcotic effects, drowsiness)</td>
<td>(STOT SE 3)</td>
<td>H336</td>
<td></td>
</tr>
</tbody>
</table>
2-Butanone ≥99,5 %, for synthesis

article number: 8403

### Supplemental hazard information

<table>
<thead>
<tr>
<th>Code</th>
<th>Supplemental hazard information</th>
</tr>
</thead>
<tbody>
<tr>
<td>EUH066</td>
<td>repeated exposure may cause skin dryness or cracking</td>
</tr>
</tbody>
</table>

The most important adverse physicochemical, human health and environmental effects
Narcotic effects.

### 2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 (CLP)

**Signal word** Danger

**Pictograms**

GHS02, GHS07

**Hazard statements**

- H225  Highly flammable liquid and vapour
- H319  Causes serious eye irritation
- H336  May cause drowsiness or dizziness

**Precautionary statements**

**Precautionary statements - prevention**

- P210  Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P280  Wear protective gloves/eye protection.

**Precautionary statements - response**

- P304+P340  IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- P305+P351+P338  IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

**Supplemental hazard information**

EUH066  Repeated exposure may cause skin dryness or cracking.

**Labelling of packages where the contents do not exceed 125 ml**

Signal word: Danger

**Symbol(s)**

EUH066  Repeated exposure may cause skin dryness or cracking.

### 2.3 Other hazards

There is no additional information.
SECTION 3: Composition/information on ingredients

3.1 Substances

<table>
<thead>
<tr>
<th>Name of substance</th>
<th>Methyl ethyl ketone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index No</td>
<td>606-002-00-3</td>
</tr>
<tr>
<td>Registration number (REACH)</td>
<td>01-2119457290-43-xxxx</td>
</tr>
<tr>
<td>EC number</td>
<td>201-159-0</td>
</tr>
<tr>
<td>CAS number</td>
<td>78-93-3</td>
</tr>
<tr>
<td>Molecular formula</td>
<td>C₄H₈O</td>
</tr>
<tr>
<td>Molar mass</td>
<td>72,11 g/mol</td>
</tr>
</tbody>
</table>

SECTION 4: First aid measures

4.1 Description of first aid measures

General notes
Take off contaminated clothing.

Following inhalation
Provide fresh air. In all cases of doubt, or when symptoms persist, seek medical advice.

Following skin contact
Rinse skin with water/shower. In all cases of doubt, or when symptoms persist, seek medical advice.

Following eye contact
Irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart. In case of eye irritation consult an ophthalmologist.

Following ingestion
Rinse mouth. Do not induce vomiting. Aspiration hazard. Call a physician immediately.

4.2 Most important symptoms and effects, both acute and delayed
Irritant effects, Cough, Drowsiness, Dizziness, Vertigo, Dyspnoea, Nausea, Vomiting, Narcosis

4.3 Indication of any immediate medical attention and special treatment needed
none

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Co-ordinate fire-fighting measures to the fire surroundings
water spray, foam, dry extinguishing powder, carbon dioxide (CO2)
**Unsuitable extinguishing media**
- water jet

**5.2 Special hazards arising from the substance or mixture**
- Combustible. Vapours are heavier than air, spread along floors and form explosive mixtures with air. Vapours can form explosive mixtures with air.

**Hazardous combustion products**
- In case of fire may be liberated: carbon monoxide (CO), carbon dioxide (CO2)

**5.3 Advice for firefighters**
- Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus.

---

### SECTION 6: Accidental release measures

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

**For non-emergency personnel**
- Use personal protective equipment as required. Avoid contact with skin, eyes and clothes. Do not breathe vapour/spray. Avoidance of ignition sources.

**6.2 Environmental precautions**
- Keep away from drains, surface and ground water. Explosive properties.

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

**Advises on how to contain a spill**
- Covering of drains.

**Advises on how to clean up a spill**
- Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents).

**Other information relating to spills and releases**
- Place in appropriate containers for disposal. Ventilate affected area.

**6.4 Reference to other sections**

---

### SECTION 7: Handling and storage

**7.1 Precautions for safe handling**
- Provision of sufficient ventilation. Avoid: Aerosol or mist formation.

**• Measures to prevent fire as well as aerosol and dust generation**
- Keep away from sources of ignition - No smoking.

- Take precautionary measures against static discharge. Due to danger of explosion, prevent leakage of vapours into cellars, flues and ditches.
Advice on general occupational hygiene
Wash hands before breaks and after work. Keep away from food, drink and animal feedingstuffs. When using do not smoke.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed. Protect from sunlight. Store in a well-ventilated place.

Incompatible substances or mixtures
Observe hints for combined storage.

Consideration of other advice
Ground/bond container and receiving equipment.

• Ventilation requirements
Use local and general ventilation.

• Specific designs for storage rooms or vessels
Recommended storage temperature: 15 – 25 °C.

7.3 Specific end use(s)
No information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

National limit values

Occupational exposure limit values (Workplace Exposure Limits)

<table>
<thead>
<tr>
<th>Country</th>
<th>Name of agent</th>
<th>CAS No</th>
<th>Notation</th>
<th>Identifier</th>
<th>TWA [ppm]</th>
<th>TWA [mg/m³]</th>
<th>STEL [ppm]</th>
<th>STEL [mg/m³]</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU</td>
<td>ethyl methyl ketone</td>
<td>78-93-3</td>
<td>IOELV</td>
<td>200</td>
<td>600</td>
<td>300</td>
<td>900</td>
<td>2000/39/EC</td>
<td></td>
</tr>
<tr>
<td>GB</td>
<td>butan-2-one (methyl ethyl ketone)</td>
<td>78-93-3</td>
<td>WEL</td>
<td>200</td>
<td>600</td>
<td>300</td>
<td>899</td>
<td>EH40/2005</td>
<td></td>
</tr>
</tbody>
</table>

Notation
STEL: Short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified).
TWA: Time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average (unless otherwise specified).

Biological limit values

<table>
<thead>
<tr>
<th>Country</th>
<th>Name of agent</th>
<th>Parameter</th>
<th>Notation</th>
<th>Identifier</th>
<th>Value</th>
<th>Material</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>GB</td>
<td>butan-2-one</td>
<td>ethyl methyl ketone</td>
<td>BMGV</td>
<td>70 µmol/l</td>
<td>urine</td>
<td>EH40/2005</td>
<td></td>
</tr>
</tbody>
</table>

Relevant DNELs/DMELs/PNECs and other threshold levels

• Human health values

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Threshold level</th>
<th>Protection goal, route of exposure</th>
<th>Used in</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNEL</td>
<td>600 mg/m³</td>
<td>human, inhalatory</td>
<td>worker (industry)</td>
<td>chronic - systemic effects</td>
</tr>
<tr>
<td>DNEL</td>
<td>1.161 mg/kg bw/day</td>
<td>human, dermal</td>
<td>worker (industry)</td>
<td>chronic - systemic effects</td>
</tr>
</tbody>
</table>
2-Butanone ≥99,5 %, for synthesis

article number: 8403

**Environmental values**

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Threshold level</th>
<th>Environmental compartment</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNEC</td>
<td>55,8 mg/l</td>
<td>freshwater</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>PNEC</td>
<td>55,8 mg/l</td>
<td>marine water</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>PNEC</td>
<td>709 mg/l</td>
<td>sewage treatment plant (STP)</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>PNEC</td>
<td>284,7 mg/kg</td>
<td>freshwater sediment</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>PNEC</td>
<td>284,7 mg/kg</td>
<td>marine sediment</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>PNEC</td>
<td>22,5 mg/kg</td>
<td>soil</td>
<td>short-term (single instance)</td>
</tr>
</tbody>
</table>

**Exposure controls**

**Individual protection measures (personal protective equipment)**

**Eye/face protection**

Use safety goggle with side protection.

**Skin protection**

- **hand protection**
  Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

- **type of material**
  Butyl caoutchouc (butyl rubber)

- **material thickness**
  0,7mm.

- **breakthrough times of the glove material**
  >240 minutes (permeation: level 5)

- **other protection measures**
  Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.
  Flame-retardant protective clothing.

**Respiratory protection**

Respiratory protection necessary at: Aerosol or mist formation. Type: A (against organic gases and vapours with a boiling point of > 65 °C, colour code: Brown).

**Environmental exposure controls**

Keep away from drains, surface and ground water.
**SECTION 9: Physical and chemical properties**

9.1 Information on basic physical and chemical properties

**Appearance**
- **Physical state**: liquid (fluid)
- **Colour**: colourless
- **Odour**: like: Acetone
- **Odour threshold**: No data available

**Other physical and chemical parameters**
- **pH (value)**: ~ 7 (20 °C) (neutral)
- **Melting point/freezing point**: -86 °C
- **Initial boiling point and boiling range**: 79 – 80 °C at 1.013 hPa
- **Flash point**: -8 °C (c.c.)
- **Evaporation rate**: no data available
- **Flammability (solid, gas)**: not relevant (fluid)

**Explosive limits**
- **lower explosion limit (LEL)**: 1,5 vol% 
- **upper explosion limit (UEL)**: 11,5 vol%

**Explosion limits of dust clouds**: not relevant

**Vapour pressure**: 105 hPa at 20 °C

**Density**: 0,81 g/cm³ at 20 °C

**Vapour density**: 2,48 (air = 1)

**Bulk density**: Not applicable

**Relative density**: Information on this property is not available.

**Solubility(ies)**
- **Water solubility**: ~ 290 g/l at 20 °C

**Partition coefficient**
- **n-octanol/water (log KOW)**: 0,3 (pH value: 7, 40 °C) (ECHA)

**Auto-ignition temperature**: 514 °C - (DIN 51794)

**Decomposition temperature**: no data available

**Viscosity**
- **kinematic viscosity**: 0,4938 mm²/s
- **dynamic viscosity**: 0,4 mPa s at 20 °C

**Explosive properties**: Shall not be classified as explosive

**Oxidising properties**: none
9.2 Other information

Temperature class (EU, acc. to ATEX) T1 (Maximum permissible surface temperature on the equipment: 450°C)

SECTION 10: Stability and reactivity

10.1 Reactivity

Risk of ignition. Vapours can form explosive mixtures with air. May form explosive peroxides.

10.2 Chemical stability

Reactivity if exposed to light. Reactivity if exposed to air.

10.3 Possibility of hazardous reactions

Exothermic reaction with: Alkali hydroxide (caustic alkali), Chromium(VI) oxide, Oxidisers,

Violent reaction with: Nitric acid, Sulphuric acid, concentrated, Hydrogen peroxide => Explosive properties

10.4 Conditions to avoid

Direct light irradiation. Keep away from heat.

10.5 Incompatible materials

different plastics

10.6 Hazardous decomposition products

Peroxides.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Shall not be classified as acutely toxic.

<table>
<thead>
<tr>
<th>Exposure route</th>
<th>Endpoint</th>
<th>Value</th>
<th>Species</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>dermal</td>
<td>LD50</td>
<td>6.480 mg/kg</td>
<td>rabbit</td>
<td>TOXNET</td>
</tr>
<tr>
<td>oral</td>
<td>LD50</td>
<td>2.054 mg/kg</td>
<td>rat</td>
<td>ECHA</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation

Shall not be classified as corrosive/irritant to skin.

Serious eye damage/eye irritation

Causes serious eye irritation.

Respiratory or skin sensitisation

Shall not be classified as a respiratory or skin sensitiser.

Summary of evaluation of the CMR properties

Shall not be classified as germ cell mutagenic, carcinogenic nor as a reproductive toxicant

• Specific target organ toxicity - single exposure

May cause drowsiness or dizziness.

• Specific target organ toxicity - repeated exposure

Shall not be classified as a specific target organ toxicant (repeated exposure).
Aspiration hazard
Shall not be classified as presenting an aspiration hazard.

Symptoms related to the physical, chemical and toxicological characteristics
• If swallowed
nausea, vomiting, presenting an aspiration hazard
• If in eyes
Causes serious eye irritation
• If inhaled
irritant effects, cough, vertigo, dizziness, Respiratory complaints, narcosis, pulmonary oedema
• If on skin
Frequently or prolonged contact with skin may cause dermal irritation. risk of absorption via the skin

Other information
Other adverse effects: Heart-Liver and kidney damage.

SECTION 12: Ecological information

12.1 Toxicity
acc. to 1272/2008/EC: Shall not be classified as hazardous to the aquatic environment.

Aquatic toxicity (acute)

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Value</th>
<th>Species</th>
<th>Source</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50</td>
<td>2.993 mg/l</td>
<td>fish</td>
<td>ECHA</td>
<td>96 h</td>
</tr>
<tr>
<td>EC50</td>
<td>308 mg/l</td>
<td>aquatic invertebrates</td>
<td>ECHA</td>
<td>48 h</td>
</tr>
<tr>
<td>ErC50</td>
<td>1.972 mg/l</td>
<td>algae</td>
<td>ECHA</td>
<td>72 h</td>
</tr>
</tbody>
</table>

12.2 Process of degradability
The substance is readily biodegradable.
Theoretical Oxygen Demand: 2,441 mg/mg
Theoretical Carbon Dioxide: 2,441 mg/mg

<table>
<thead>
<tr>
<th>Process</th>
<th>Degradation rate</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>oxygen depletion</td>
<td>98 %</td>
<td>28 d</td>
</tr>
</tbody>
</table>

12.3 Bioaccumulative potential
Does not significantly accumulate in organisms.
n-octanol/water (log KOW) 0,3 (pH value: 7, 40 °C)

12.4 Mobility in soil
Data are not available.

12.5 Results of PBT and vPvB assessment
Data are not available.

12.6 Other adverse effects
Data are not available.
SECTION 13: Disposal considerations

13.1 Waste treatment methods

This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

Sewage disposal-relevant information
Do not empty into drains.

Waste treatment of containers/packagings
It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used.

Sewage disposal-relevant information
Do not empty into drains.

Waste treatment of containers/packagings
It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used.

13.2 Relevant provisions relating to waste

The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process.

13.3 Remarks

Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions.

SECTION 14: Transport information

14.1 UN number

1493

14.2 UN proper shipping name

ETHYL METHYL KETONE

14.3 Hazardous ingredients

2-Butanone

14.4 Transport hazard class(es)

Class 3 (flammable liquids)

14.5 Packing group

II (substance presenting medium danger)

14.6 Environmental hazards

none (non-environmentally hazardous acc. to the dangerous goods regulations)

14.7 Special precautions for user

Provisions for dangerous goods (ADR) should be complied within the premises.

14.8 Transport in bulk according to Annex II of MARPOL and the IBC Code

The cargo is not intended to be carried in bulk.

14.9 Information for each of the UN Model Regulations

• Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN)

UN number 1193
### 2-Butanone ≥99,5 %, for synthesis

<table>
<thead>
<tr>
<th><strong>Proper shipping name</strong></th>
<th>ETHYL METHYL KETONE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Particulars in the transport document</strong></td>
<td>UN1193, ETHYL METHYL KETONE, 3, II, (D/E)</td>
</tr>
<tr>
<td><strong>Class</strong></td>
<td>3</td>
</tr>
<tr>
<td><strong>Classification code</strong></td>
<td>F1</td>
</tr>
<tr>
<td><strong>Packing group</strong></td>
<td>II</td>
</tr>
<tr>
<td><strong>Danger label(s)</strong></td>
<td>3</td>
</tr>
</tbody>
</table>

#### Excepted quantities (EQ)

- E2

#### Limited quantities (LQ)

- 1 L

#### Transport category (TC)

- 2

#### Tunnel restriction code (TRC)

- D/E

#### Hazard identification No

- 33

### Emergency Action Code

- 2YE

#### • International Maritime Dangerous Goods Code (IMDG)

<table>
<thead>
<tr>
<th><strong>UN number</strong></th>
<th>1193</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Proper shipping name</strong></td>
<td>ETHYL METHYL KETONE</td>
</tr>
<tr>
<td><strong>Particulars in the shipper's declaration</strong></td>
<td>UN1193, ETHYL METHYL KETONE, 3, II, -8°C c.c.</td>
</tr>
<tr>
<td><strong>Class</strong></td>
<td>3</td>
</tr>
<tr>
<td><strong>Marine pollutant</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Packing group</strong></td>
<td>II</td>
</tr>
<tr>
<td><strong>Danger label(s)</strong></td>
<td>3</td>
</tr>
</tbody>
</table>

#### Special provisions (SP)

- 

#### Excepted quantities (EQ)

- E2

#### Limited quantities (LQ)

- 1 L

#### EmS

- F-E, S-D

#### Stowage category

- B

#### • International Civil Aviation Organization (ICAO-IATA/DGR)

<table>
<thead>
<tr>
<th><strong>UN number</strong></th>
<th>1193</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Proper shipping name</strong></td>
<td>Ethyl methyl ketone</td>
</tr>
<tr>
<td><strong>Particulars in the shipper's declaration</strong></td>
<td>UN1193, Ethyl methyl ketone, 3, II</td>
</tr>
<tr>
<td><strong>Class</strong></td>
<td>3</td>
</tr>
<tr>
<td><strong>Packing group</strong></td>
<td>II</td>
</tr>
</tbody>
</table>
SECTION 15: Regulatory information

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

Relevant provisions of the European Union (EU)

- Regulation 649/2012/EU concerning the export and import of hazardous chemicals (PIC)
  Not listed.

- Regulation 1005/2009/EC on substances that deplete the ozone layer (ODS)
  Not listed.

- Regulation 850/2004/EC on persistent organic pollutants (POP)
  Not listed.

- Restrictions according to REACH, Annex XVII

<table>
<thead>
<tr>
<th>Name of substance</th>
<th>CAS No</th>
<th>Wt%</th>
<th>Type of registration</th>
<th>Conditions of restriction</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Butanone</td>
<td></td>
<td>100</td>
<td>1907/2006/EC annex XVII</td>
<td>R3</td>
<td>3</td>
</tr>
<tr>
<td>2-Butanone</td>
<td></td>
<td>100</td>
<td>1907/2006/EC annex XVII</td>
<td>R40</td>
<td>40</td>
</tr>
</tbody>
</table>

Legend

R3

1. Shall not be used in:
   - ornamental articles intended to produce light or colour effects by means of different phases, for example in ornamental lamps and ashtrays,
   - tricks and jokes,
   - games for one or more participants, or any article intended to be used as such, even with ornamental aspects,
2. Articles not complying with paragraph 1 shall not be placed on the market.
3. Shall not be placed on the market if they contain a colouring agent, unless required for fiscal reasons, or perfume, or both, if they:
   - can be used as fuel in decorative oil lamps for supply to the general public, and,
   - present an aspiration hazard and are labelled with R65 or H304,
4. Decorative oil lamps for supply to the general public shall not be placed on the market unless they conform to the European Standard on Decorative oil lamps (EN 14059) adopted by the European Committee for Standardisation (CEN).
5. Without prejudice to the implementation of other Community provisions relating to the classification, packaging and labelling of dangerous substances and mixtures, suppliers shall ensure, before the placing on the market, that the following requirements are met:
   (a) lamp oils, labelled with R65 or H304, intended for supply to the general public are visibly, legibly and indelibly marked as follows: 'Keep lamps filled with this liquid out of the reach of children'; and, by 1 December 2010, 'Just a sip of lamp oil - or even sucking the wick of lamps - may lead to life-threatening lung damage';
   (b) grill lighter fluids, labelled with R65 or H304, intended for supply to the general public are legibly and indelibly marked by 1 December 2010 as follows: 'Just a sip of grill lighter may lead to life threatening lung damage';
   (c) lamp oils and grill lighters, labelled with R65 or H304, intended for supply to the general public are packaged in black opaque containers not exceeding 1 litre by 1 December 2010.
6. No later than 1 June 2014, the Commission shall request the European Chemicals Agency to prepare a dossier, in accordance with Article 69 of the present Regulation with a view to ban, if appropriate, grill lighter fluids and fuel for decorative lamps, labelled R65 or H304, intended for supply to the general public.
7. Natural or legal persons placing on the market for the first time lamp oils and grill lighter fluids, labelled with R65 or H304, shall by 1 December 2011, and annually thereafter, provide data on alternatives to lamp oils and grill lighter fluids labelled R65 or H304 to the competent authority in the Member State concerned. Member States shall make those data available to the Commission.
2-Butanone ≥99.5%, for synthesis

article number: 8403

**Legend**

R40

1. Shall not be used, as substance or as mixtures in aerosol dispensers where these aerosol dispensers are intended for supply to the general public for entertainment and decorative purposes such as the following:
   - metallic glitter intended mainly for decoration,
   - artificial snow and frost,
   - ‘whoopie’ cushions,
   - silly string aerosols,
   - imitation excrement,
   - horns for parties,
   - decorative flakes and foams,
   - artificial cobwebs,
   - stink bombs.

2. Without prejudice to the application of other Community provisions on the classification, packaging and labelling of substances, suppliers shall ensure before the placing on the market that the packaging of aerosol dispensers referred to above is marked visibly, legibly and indelibly with:
   ‘For professional users only’.

3. By way of derogation, paragraphs 1 and 2 shall not apply to the aerosol dispensers referred to Article 8 (1a) of Council Directive 75/324/EEC (2).

4. The aerosol dispensers referred to in paragraphs 1 and 2 shall not be placed on the market unless they conform to the requirements indicated.

**Restrictions according to REACH, Title VIII**

None.

**List of substances subject to authorisation (REACH, Annex XIV)/SVHC - candidate list**

not listed

**Seveso Directive**

<table>
<thead>
<tr>
<th>2012/18/EU (Seveso III)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>P5c</td>
</tr>
</tbody>
</table>

**Notation**

51) Flammable liquids, categories 2 or 3 not covered by P5a and P5b

**Directive 75/324/EEC relating to aerosol dispensers**

Filling batch


<table>
<thead>
<tr>
<th>VOC content</th>
<th>100 %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>810 g/l</td>
</tr>
</tbody>
</table>

**Directive on industrial emissions (VOCs, 2010/75/EU)**

<table>
<thead>
<tr>
<th>VOC content</th>
<th>100 %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>810 g/l</td>
</tr>
</tbody>
</table>

**Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) - Annex II**

not listed

**Regulation 166/2006/EC concerning the establishment of a European Pollutant Release and Transfer Register (PRTR)**

not listed

**Directive 2000/60/EC establishing a framework for Community action in the field of water policy (WFD)**

not listed
Safety data sheet
according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU

2-Butanone ≥99.5 %, for synthesis

article number: 8403

Regulation 98/2013/EU on the marketing and use of explosives precursors
not listed

Regulation 111/2005/EC laying down rules for the monitoring of trade between the Community and third countries in drug precursors

<table>
<thead>
<tr>
<th>Name of substance</th>
<th>CAS No</th>
<th>Classification</th>
<th>CN Code</th>
<th>Threshold level</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Butanone</td>
<td>78-93-3</td>
<td>Category 3</td>
<td>2914 12 00</td>
<td></td>
</tr>
</tbody>
</table>

National inventories
Substance is listed in the following national inventories:

<table>
<thead>
<tr>
<th>Country</th>
<th>National inventories</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>AU</td>
<td>AICS</td>
<td>substance is listed</td>
</tr>
<tr>
<td>CA</td>
<td>DSL</td>
<td>substance is listed</td>
</tr>
<tr>
<td>CN</td>
<td>IECSC</td>
<td>substance is listed</td>
</tr>
<tr>
<td>EU</td>
<td>ECSI</td>
<td>substance is listed</td>
</tr>
<tr>
<td>EU</td>
<td>REACH Reg.</td>
<td>substance is listed</td>
</tr>
<tr>
<td>JP</td>
<td>CSCL-ENCS</td>
<td>substance is listed</td>
</tr>
<tr>
<td>KR</td>
<td>KECI</td>
<td>substance is listed</td>
</tr>
<tr>
<td>MX</td>
<td>INSQ</td>
<td>substance is listed</td>
</tr>
<tr>
<td>NZ</td>
<td>NZIoC</td>
<td>substance is listed</td>
</tr>
<tr>
<td>PH</td>
<td>PICCS</td>
<td>substance is listed</td>
</tr>
<tr>
<td>TR</td>
<td>CICR</td>
<td>substance is listed</td>
</tr>
<tr>
<td>TW</td>
<td>TCSI</td>
<td>substance is listed</td>
</tr>
<tr>
<td>US</td>
<td>TSCA</td>
<td>substance is listed</td>
</tr>
</tbody>
</table>

Legend
AICS    Australian Inventory of Chemical Substances
CICR    Chemical Inventory and Control Regulation
CSCL-ENCS List of Existing and New Chemical Substances (CSCL-ENCS)
DSL     Domestic Substances List (DSL)
IECS    EC Substance Inventory (EINECS, ELINCS, NLP)
INSQ    National Inventory of Chemical Substances
KECI    Korea Existing Chemicals Inventory
NZIoC   New Zealand Inventory of Chemicals
PICCS   Philippine Inventory of Chemicals and Chemical Substances
REACH Reg. REACH registered substances
TCSI    Taiwan Chemical Substance Inventory
TSCA    Toxic Substance Control Act

15.2 Chemical Safety Assessment
No Chemical Safety Assessment has been carried out for this substance.
### Abbreviations and acronyms

<table>
<thead>
<tr>
<th>Abbr.</th>
<th>Descriptions of used abbreviations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADN</td>
<td>Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)</td>
</tr>
<tr>
<td>ADR</td>
<td>Accord européen relatif au transport international des marchandises dangereuses par route (European Agreement concerning the International Carriage of Dangerous Goods by Road)</td>
</tr>
<tr>
<td>CAS</td>
<td>Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)</td>
</tr>
<tr>
<td>CLP</td>
<td>Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures</td>
</tr>
<tr>
<td>CMR</td>
<td>Carcinogenic, Mutagenic or toxic for Reproduction</td>
</tr>
<tr>
<td>CN Code</td>
<td>Combined Nomenclature</td>
</tr>
<tr>
<td>DGR</td>
<td>Dangerous Goods Regulations (see IATA/DGR)</td>
</tr>
<tr>
<td>DMEL</td>
<td>Derived Minimal Effect Level</td>
</tr>
<tr>
<td>DNEL</td>
<td>Derived No-Effect Level</td>
</tr>
<tr>
<td>EINECS</td>
<td>European Inventory of Existing Commercial Chemical Substances</td>
</tr>
<tr>
<td>ELINCS</td>
<td>European List of Notified Chemical Substances</td>
</tr>
<tr>
<td>EmS</td>
<td>Emergency Schedule</td>
</tr>
<tr>
<td>GHS</td>
<td>&quot;Globally Harmonized System of Classification and Labelling of Chemicals&quot; developed by the United Nations</td>
</tr>
<tr>
<td>IATA</td>
<td>International Air Transport Association</td>
</tr>
<tr>
<td>IATA/DGR</td>
<td>Dangerous Goods Regulations (DGR) for the air transport (IATA)</td>
</tr>
<tr>
<td>ICAO</td>
<td>International Civil Aviation Organization</td>
</tr>
<tr>
<td>IMDG</td>
<td>International Maritime Dangerous Goods Code</td>
</tr>
<tr>
<td>index No</td>
<td>the Index number is the identification code given to the substance in Part 3 of Annex VI to Regulation (EC) No 1272/2008</td>
</tr>
<tr>
<td>IOELV</td>
<td>indicative occupational exposure limit value</td>
</tr>
<tr>
<td>MARPOL</td>
<td>International Convention for the Prevention of Pollution from Ships (abbr. of &quot;Marine Pollutant&quot;)</td>
</tr>
<tr>
<td>NLP</td>
<td>No-Longer Polymer</td>
</tr>
<tr>
<td>PBT</td>
<td>Persistent, Bioaccumulative and Toxic</td>
</tr>
<tr>
<td>PNEC</td>
<td>Predicted No-Effect Concentration</td>
</tr>
<tr>
<td>ppm</td>
<td>parts per million</td>
</tr>
<tr>
<td>REACH</td>
<td>Registration, Evaluation, Authorisation and Restriction of Chemicals</td>
</tr>
<tr>
<td>RID</td>
<td>Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)</td>
</tr>
<tr>
<td>STEL</td>
<td>short-term exposure limit</td>
</tr>
<tr>
<td>SVHC</td>
<td>Substance of Very High Concern</td>
</tr>
<tr>
<td>TWA</td>
<td>time-weighted average</td>
</tr>
<tr>
<td>VOC</td>
<td>Volatile Organic Compounds</td>
</tr>
</tbody>
</table>
Abbr. | Descriptions of used abbreviations
--- | ---
vPvB | very Persistent and very Bioaccumulative
WEL | workplace exposure limit

Key literature references and sources for data
- Regulation (EC) No. 1272/2008 (CLP, EU GHS)
- Dangerous Goods Regulations (DGR) for the air transport (IATA)
- International Maritime Dangerous Goods Code (IMDG)

List of relevant phrases (code and full text as stated in chapter 2 and 3)

<table>
<thead>
<tr>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>H225</td>
<td>highly flammable liquid and vapour</td>
</tr>
<tr>
<td>H319</td>
<td>causes serious eye irritation</td>
</tr>
<tr>
<td>H336</td>
<td>may cause drowsiness or dizziness</td>
</tr>
</tbody>
</table>

Disclaimer
The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.