

Creation Date 13-Apr-2009

Revision Date 19-Oct-2023

Revision Number 11

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

| | |
|----------------------------------|---|
| Product Description: | Ethyl methyl ketone |
| Cat No. : | E/1455/08, E/1455/27, E/1455/25AL, E/1455/25, E/14, E/1455/PB15, E/1455/PB17, E/1455/15, E/1455/17 |
| Synonyms | Methyl ethyl ketone; MEK; Ethyl methyl ketone |
| Index No | 606-002-00-3 |
| CAS No | 78-93-3 |
| EC No | 201-159-0 |
| Molecular Formula | C ₄ H ₈ O |
| REACH registration number | 01-2119457290-43 |

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

| | |
|---------------------------------------|---|
| Recommended Use | Laboratory chemicals. |
| Sector of use | SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites |
| Product category | PC21 - Laboratory chemicals |
| Process categories | PROC15 - Use as a laboratory reagent |
| Environmental release category | ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates) |
| Uses advised against | No Information available |

1.3. Details of the supplier of the safety data sheet

Company

EU entity/business name

Thermo Fisher Scientific
Janssen Pharmaceuticaaan 3a
2440 Geel, Belgium

UK entity/business name

Fisher Scientific UK
Bishop Meadow Road, Loughborough,
Leicestershire LE11 5RG, United Kingdom

Swiss distributor - Fisher Scientific AG

Neuhofstrasse 11, CH 4153 Reinach
Tel: +41 (0) 56 618 41 11
e-mail - infoch@thermofisher.com

E-mail address

begel.sdsdesk@thermofisher.com

1.4. Emergency telephone number

Tel: 01509 231166
Chemtrec US: (800) 424-9300
Chemtrec EU: 001-703-527-3887

For customers in Switzerland:

Tox Info Suisse Emergency Number: **145 (24hr)**
Tox Info Suisse: +41-44 251 51 51 (Emergency number from abroad)
Chemtrec (24h) Toll-Free: 0800 564 402
Chemtrec Local: +41-43 508 20 11 (Zurich)

SAFETY DATA SHEET

Ethyl methyl ketone

Revision Date 19-Oct-2023

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

CLP Classification - Regulation (EC) No 1272/2008

Physical hazards

Flammable liquids

Category 2 (H225)

Health hazards

Serious Eye Damage/Eye Irritation
Specific target organ toxicity - (single exposure)

Category 2 (H319)
Category 3 (H336)

Environmental hazards

Based on available data, the classification criteria are not met

Full text of Hazard Statements: see section 16

2.2. Label elements



Signal Word

Danger

Hazard Statements

H225 - Highly flammable liquid and vapor
H319 - Causes serious eye irritation
H336 - May cause drowsiness or dizziness
EUH066 - Repeated exposure may cause skin dryness or cracking

Precautionary Statements

P280 - Wear protective gloves/protective clothing/eye protection/face protection
P240 - Ground and bond container and receiving equipment
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

2.3. Other hazards

Substance is not considered persistent, bioaccumulative and toxic (PBT) / very persistent and very bioaccumulative (vPvB)

SAFETY DATA SHEET

Ethyl methyl ketone

Revision Date 19-Oct-2023

Contains a substance on the National Authorities Endocrine Disruptor Lists
Contains a known or suspected endocrine disruptor

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

| Component | CAS No | EC No | Weight % | CLP Classification - Regulation (EC) No 1272/2008 |
|---------------------|---------|-------------------|----------|--|
| Methyl ethyl ketone | 78-93-3 | EEC No. 201-159-0 | <=100 | Flam. Liq. 2 (H225) Eye Irrit. 2 (H319) STOT SE 3 (H336) (EUH066) |

| | |
|---------------------------|------------------|
| REACH registration number | 01-2119457290-43 |
|---------------------------|------------------|

Full text of Hazard Statements: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

| | |
|------------------------------------|--|
| Eye Contact | Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention. |
| Skin Contact | Wash off immediately with plenty of water for at least 15 minutes. Get medical attention if symptoms occur. |
| Ingestion | Do NOT induce vomiting. Get medical attention. |
| Inhalation | Remove to fresh air. Get medical attention if symptoms occur. If not breathing, give artificial respiration. |
| Self-Protection of the First Aider | Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. |

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

Difficulty in breathing. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting: Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

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

| | |
|--------------------|---|
| Notes to Physician | Treat symptomatically. Symptoms may be delayed. |
|--------------------|---|

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable Extinguishing Media

CO₂, dry chemical, dry sand, alcohol-resistant foam. Water mist may be used to cool closed containers.

Extinguishing media which must not be used for safety reasons

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

SAFETY DATA SHEET

Ethyl methyl ketone

Revision Date 19-Oct-2023

5.2. Special hazards arising from the substance or mixture

Flammable. Risk of ignition. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Containers may explode when heated. Thermal decomposition can lead to release of irritating gases and vapors. Keep product and empty container away from heat and sources of ignition.

Hazardous Combustion Products

Carbon monoxide (CO), Carbon dioxide (CO₂).

5.3. Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective equipment as required. Remove all sources of ignition. Take precautionary measures against static discharges. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation.

6.2. Environmental precautions

Avoid release to the environment. See Section 12 for additional Ecological Information.

6.3. Methods and material for containment and cleaning up

Remove all sources of ignition. Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Use spark-proof tools and explosion-proof equipment.

6.4. Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Wear personal protective equipment/face protection. Ensure adequate ventilation. Use spark-proof tools and explosion-proof equipment. Avoid contact with skin, eyes or clothing. Avoid ingestion and inhalation. Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharges. Use only non-sparking tools. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash hands before breaks and after work.

7.2. Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks and flame. Flammables area.

Technical Rules for Hazardous Substances (TRGS) 510
Storage Class (LGK) (Germany)

Class 3

Switzerland - Storage of hazardous substances

Storage class - SC 3
<https://www.kvu.ch/de/themen/stoffe-und-produkte>

SAFETY DATA SHEET

Ethyl methyl ketone

Revision Date 19-Oct-2023

<https://www.kvu.ch/fr/themes/substances-et-produits>
<https://www.kvu.ch/it/temi/sostanze-e-prodotti>

7.3. Specific end use(s)

Use in laboratories

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Exposure limits

List source(s): **EU** - Commission Directive (EU) 2019/1831 of 24 October 2019 establishing a fifth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC and amending Commission Directive 2000/39/EC **UK** - EH40/2005 Work Exposure Limits, Forth edition. Published 2020. **IRE** - 2010 Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001. Published by the Health and Safety Authority. **CH** - The Government of Switzerland has set a directive on limit values for working materials (Grenzwerte am Arbeitsplatz) which is based on the Swiss Federal Regulation "Verordnung über die Verhütung von Unfällen und Berufskrankheiten". This directive is administered, periodically revised and enforced by SUVA (Swiss National Accident Insurance Fund).

| Component | European Union | The United Kingdom | France | Belgium | Spain |
|---------------------|--|--|---|--|--|
| Methyl ethyl ketone | TWA: 200 ppm (8h) TWA: 600 mg/m ³ (8h) STEL: 300 ppm (15min) STEL: 900 mg/m ³ (15min) | STEL: 300 ppm 15 min STEL: 899 mg/m ³ 15 min TWA: 200 ppm 8 hr TWA: 600 mg/m ³ 8 hr Skin | TWA / VME: 200 ppm (8 heures). restrictive limit TWA / VME: 600 mg/m ³ (8 heures). restrictive limit STEL / VLCT: 300 ppm. restrictive limit STEL / VLCT: 900 mg/m ³ . restrictive limit Peau | TWA: 200 ppm 8 uren TWA: 600 mg/m ³ 8 uren STEL: 300 ppm 15 minuten STEL: 900 mg/m ³ 15 minuten | STEL / VLA-EC: 300 ppm (15 minutos). STEL / VLA-EC: 900 mg/m ³ (15 minutos). TWA / VLA-ED: 200 ppm (8 horas) TWA / VLA-ED: 600 mg/m ³ (8 horas) |
| Component | Italy | Germany | Portugal | The Netherlands | Finland |
| Methyl ethyl ketone | TWA: 200 ppm 8 ore. Time Weighted Average TWA: 600 mg/m ³ 8 ore. Time Weighted Average STEL: 300 ppm 15 minuti. Short-term STEL: 900 mg/m ³ 15 minuti. Short-term | TWA: 200 ppm (8 Stunden). AGW - exposure factor 1 TWA: 600 mg/m ³ (8 Stunden). AGW - exposure factor 1 TWA: 200 ppm (8 Stunden). MAK TWA: 600 mg/m ³ (8 Stunden). MAK Höhepunkt: 200 ppm Höhepunkt: 600 mg/m ³ Haut | STEL: 300 ppm 15 minutos STEL: 900 mg/m ³ 15 minutos TWA: 200 ppm 8 horas TWA: 600 mg/m ³ 8 horas | huid STEL: 900 mg/m ³ 15 minuten TWA: 590 mg/m ³ 8 uren | TWA: 20 ppm 8 tunteina TWA: 60 mg/m ³ 8 tunteina STEL: 100 ppm 15 minuutteina STEL: 300 mg/m ³ 15 minuutteina Iho |
| Component | Austria | Denmark | Switzerland | Poland | Norway |
| Methyl ethyl ketone | Haut MAK-KZGW: 200 ppm 15 Minuten MAK-KZGW: 590 mg/m ³ 15 Minuten MAK-TMW: 100 ppm 8 Stunden MAK-TMW: 295 mg/m ³ 8 Stunden | TWA: 50 ppm 8 timer TWA: 145 mg/m ³ 8 timer STEL: 900 mg/m ³ 15 minutter STEL: 300 ppm 15 minutter Hud | Haut/Peau STEL: 200 ppm 15 Minuten STEL: 590 mg/m ³ 15 Minuten TWA: 200 ppm 8 Stunden TWA: 590 mg/m ³ 8 Stunden | STEL: 900 mg/m ³ 15 minutach TWA: 450 mg/m ³ 8 godzinach | TWA: 75 ppm 8 timer TWA: 220 mg/m ³ 8 timer STEL: 112.5 ppm 15 minutter. value calculated STEL: 275 mg/m ³ 15 minutter. value calculated |
| Component | Bulgaria | Croatia | Ireland | Cyprus | Czech Republic |
| Methyl ethyl ketone | TWA: 590 mg/m ³ STEL : 885 mg/m ³ | TWA-GVI: 200 ppm 8 satima. TWA-GVI: 600 mg/m ³ 8 satima. STEL-KGVI: 300 ppm 15 minutama. | TWA: 200 ppm 8 hr. TWA: 600 mg/m ³ 8 hr. STEL: 300 ppm 15 min STEL: 900 mg/m ³ 15 min Skin | STEL: 300 ppm STEL: 900 mg/m ³ TWA: 200 ppm TWA: 600 mg/m ³ | TWA: 600 mg/m ³ 8 hodinách. Ceiling: 900 mg/m ³ |

SAFETY DATA SHEET

Ethyl methyl ketone

Revision Date 19-Oct-2023

| | | | | | |
|--|--|--|--|--|--|
| | | STEL-KGVI: 900 mg/m ³ 15 minutama. | | | |
|--|--|--|--|--|--|

| Component | Estonia | Gibraltar | Greece | Hungary | Iceland |
|---------------------|--|---|--|--|--|
| Methyl ethyl ketone | TWA: 200 ppm 8 tundides. TWA: 600 mg/m ³ 8 tundides. STEL: 300 ppm 15 minutites. STEL: 900 mg/m ³ 15 minutites. | TWA: 200 ppm 8 hr TWA: 600 mg/m ³ 8 hr STEL: 300 ppm 15 min STEL: 900 mg/m ³ 15 min | STEL: 300 ppm STEL: 900 mg/m ³ TWA: 200 ppm TWA: 600 mg/m ³ | STEL: 900 mg/m ³ 15 percekben. CK TWA: 600 mg/m ³ 8 óraban. AK lehetőséges borön keresztüli felszívódás | STEL: 300 ppm STEL: 900 mg/m ³ TWA: 50 ppm 8 klukkustundum. TWA: 145 mg/m ³ 8 klukkustundum. Skin notation |

| Component | Latvia | Lithuania | Luxembourg | Malta | Romania |
|---------------------|---|-----------|--|--|--|
| Methyl ethyl ketone | STEL: 300 ppm STEL: 900 mg/m ³ TWA: 67 ppm TWA: 200 mg/m ³ | | TWA: 200 ppm 8 Stunden TWA: 600 mg/m ³ 8 Stunden STEL: 300 ppm 15 Minuten STEL: 900 mg/m ³ 15 Minuten | TWA: 200 ppm TWA: 600 mg/m ³ STEL: 300 ppm 15 minuti STEL: 900 mg/m ³ 15 minuti | TWA: 200 ppm 8 ore TWA: 600 mg/m ³ 8 ore STEL: 300 ppm 15 minute STEL: 900 mg/m ³ 15 minute |

| Component | Russia | Slovak Republic | Slovenia | Sweden | Turkey |
|---------------------|---|--|--|---|--|
| Methyl ethyl ketone | TWA: 200 mg/m ³ 0421 MAC: 400 mg/m ³ | Ceiling: 900 mg/m ³ TWA: 200 ppm TWA: 600 mg/m ³ | TWA: 200 ppm 8 urah TWA: 600 mg/m ³ 8 urah Koža STEL: 300 ppm 15 minutah STEL: 900 mg/m ³ 15 minutah | Binding STEL: 300 ppm 15 minuter Binding STEL: 900 mg/m ³ 15 minuter TLV: 50 ppm 8 timmar. NGV TLV: 150 mg/m ³ 8 timmar. NGV | TWA: 200 ppm 8 saat TWA: 600 mg/m ³ 8 saat STEL: 300 ppm 15 dakika STEL: 900 mg/m ³ 15 dakika |

Biological limit values

List source(s): **UK** - Biological Monitoring Guidance Values provided by the UK's Health and Safety Executive (HSE) Control of Substances Hazardous to Health Regulations (COSHH) 2002 (as amended) and EH40/2005.

| Component | European Union | United Kingdom | France | Spain | Germany |
|---------------------|----------------|--|---|---|---|
| Methyl ethyl ketone | | Butan-2-one: 70 µmol/L urine post shift | Methylethylketone: 2 mg/L urine end of shift | Methyl ethyl ketone: 2 mg/L urine end of shift | 2-Butanone: 2 mg/L urine (end of shift) |

| Component | Italy | Finland | Denmark | Bulgaria | Romania |
|---------------------|-------|---------|---------|----------|---|
| Methyl ethyl ketone | | | | | Methylethylketone: 2 mg/L urine end of shift |

Monitoring methods

BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents.

MDHS70 General methods for sampling airborne gases and vapours

MDHS 88 Volatile organic compounds in air. Laboratory method using diffusive samplers, solvent desorption and gas chromatography

MDHS 96 Volatile organic compounds in air - Laboratory method using pumped solid sorbent tubes, solvent desorption and gas chromatography

Derived No Effect Level (DNEL) / Derived Minimum Effect Level (DMEL)

Workers; See table for values

| Component | Acute effects local (Dermal) | Acute effects systemic (Dermal) | Chronic effects local (Dermal) | Chronic effects systemic (Dermal) |
|--|---------------------------------|------------------------------------|-----------------------------------|--------------------------------------|
| Methyl ethyl ketone 78-93-3 (<=100) | | | | DNEL = 1161mg/kg bw/day |

SAFETY DATA SHEET

Ethyl methyl ketone

Revision Date 19-Oct-2023

| Component | Acute effects local (Inhalation) | Acute effects systemic (Inhalation) | Chronic effects local (Inhalation) | Chronic effects systemic (Inhalation) |
|--|----------------------------------|-------------------------------------|------------------------------------|---------------------------------------|
| Methyl ethyl ketone 78-93-3 (<=100) | | | | DNEL = 600mg/m ³ |

Predicted No Effect Concentration (PNEC)

See values below.

| Component | Fresh water | Fresh water sediment | Water Intermittent | Microorganisms in sewage treatment | Soil (Agriculture) |
|--|-----------------|--------------------------------|--------------------|------------------------------------|--------------------------|
| Methyl ethyl ketone 78-93-3 (<=100) | PNEC = 55.8mg/L | PNEC = 284.74mg/kg sediment dw | PNEC = 55.8mg/L | PNEC = 709mg/L | PNEC = 22.5mg/kg soil dw |

| Component | Marine water | Marine water sediment | Marine water Intermittent | Food chain | Air |
|--|-----------------|-------------------------------|---------------------------|-----------------------|-----|
| Methyl ethyl ketone 78-93-3 (<=100) | PNEC = 55.8mg/L | PNEC = 284.7mg/kg sediment dw | | PNEC = 1000mg/kg food | |

8.2. Exposure controls

Engineering Measures

Ensure adequate ventilation, especially in confined areas. Use explosion-proof electrical/ventilating/lighting/equipment. Ensure that eyewash stations and safety showers are close to the workstation location.

Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

Personal protective equipment

Eye Protection

Goggles (European standard - EN 166)

Hand Protection

Protective gloves

| Glove material | Breakthrough time | Glove thickness | EU standard | Glove comments |
|----------------|-------------------|-----------------|-------------------|--|
| Butyl rubber | < 60 minutes | 0.5 mm | Level 4 EN 374 | Permeation rate 36 µg/cm ² /min As tested under EN374-3 Determination of Resistance to Permeation by Chemicals |

Skin and body protection

Wear appropriate protective gloves and clothing to prevent skin exposure.

Inspect gloves before use. observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information) gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion. gloves with care avoiding skin contamination.

Respiratory Protection

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Large scale/emergency use

Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced

Recommended Filter type: Type A Organic gases and vapours filter Brown conforming to EN14387

Small scale/Laboratory use

Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Recommended half mask:- Valve filtering: EN405; or; Half mask: EN140; plus filter, EN 141

SAFETY DATA SHEET

Ethyl methyl ketone

Revision Date 19-Oct-2023

Environmental exposure controls No information available.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

| | | |
|---|---|---------------------------------|
| Physical State | Liquid | |
| Appearance | Colorless | |
| Odor | Characteristic - sweet | |
| Odor Threshold | No data available | |
| Melting Point/Range | -87 °C / -124.6 °F | |
| Softening Point | No data available | |
| Boiling Point/Range | 80 °C / 176 °F | |
| Flammability (liquid) | Highly flammable | On basis of test data |
| Flammability (solid,gas) | Not applicable | Liquid |
| Explosion Limits | Lower 1.8 Vol% Upper 11.5 Vol% | |
| Flash Point | -7 °C / 19.4 °F | Method - CC (closed cup) |
| Autoignition Temperature | 404 °C / 759.2 °F | |
| Decomposition Temperature | No data available | |
| pH | No information available | |
| Viscosity | 0.42 mPa.s @ 15°C | |
| Water Solubility | 290 g/L (20°C) | |
| Solubility in other solvents | No information available | |
| Partition Coefficient (n-octanol/water) | | |
| Component | log Pow | |
| Methyl ethyl ketone | 0.29 | |
| Vapor Pressure | 105 mbar @ 20 °C | |
| Density / Specific Gravity | 0.806 | |
| Bulk Density | Not applicable | Liquid |
| Vapor Density | 2.41 | (Air = 1.0) |
| Particle characteristics | Not applicable (liquid) | |

9.2. Other information

| | |
|----------------------|---|
| Molecular Formula | C4 H8 O |
| Molecular Weight | 72.11 |
| Explosive Properties | Not explosive Vapors may form explosive mixtures with air |
| Oxidizing Properties | Not oxidising |
| Evaporation Rate | 3.7 - (Butyl Acetate = 1.0) |

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

None known, based on information available

10.2. Chemical stability

Hygroscopic.

10.3. Possibility of hazardous reactions

| | |
|--------------------------|--|
| Hazardous Polymerization | Hazardous polymerization does not occur. |
| Hazardous Reactions | None under normal processing. |

SAFETY DATA SHEET

Ethyl methyl ketone

Revision Date 19-Oct-2023

10.4. Conditions to avoid

Incompatible products. Excess heat. Keep away from open flames, hot surfaces and sources of ignition. Exposure to moist air or water.

10.5. Incompatible materials

Strong oxidizing agents. Strong acids. Strong bases. Strong reducing agents. Ammonia. copper. Amines.

10.6. Hazardous decomposition products

Carbon monoxide (CO). Carbon dioxide (CO₂).

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Product Information

(a) acute toxicity;

Oral

Based on available data, the classification criteria are not met

Dermal

Based on available data, the classification criteria are not met

Inhalation

Based on available data, the classification criteria are not met

| Component | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|---------------------|---------------------------|------------------------------|------------------------------|
| Methyl ethyl ketone | LD50 = 2483 mg/kg (Rat) | LD50 = 5000 mg/kg (Rabbit) | LC50 = 11700 ppm (Rat) 4 h |

(b) skin corrosion/irritation;

Based on available data, the classification criteria are not met

(c) serious eye damage/irritation;

Category 2

(d) respiratory or skin sensitization;

Respiratory

Based on available data, the classification criteria are not met

Skin

Based on available data, the classification criteria are not met

(e) germ cell mutagenicity;

Based on available data, the classification criteria are not met

Not mutagenic in AMES Test

(f) carcinogenicity;

Based on available data, the classification criteria are not met

There are no known carcinogenic chemicals in this product

(g) reproductive toxicity;

Based on available data, the classification criteria are not met

(h) STOT-single exposure;

Category 3

Results / Target organs

Central nervous system (CNS).

(i) STOT-repeated exposure;

Based on available data, the classification criteria are not met

Target Organs

None known.

(j) aspiration hazard;

Based on available data, the classification criteria are not met

SAFETY DATA SHEET

Ethyl methyl ketone

Revision Date 19-Oct-2023

Symptoms / effects, both acute and delayed Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting.

11.2. Information on other hazards

Endocrine Disrupting Properties
Assess endocrine disrupting properties for human health

Contains a substance on the National Authorities Endocrine Disruptor Lists

| Component | EU National Authorities Endocrine Disruptor Lists - Health |
|--|--|
| Methyl ethyl ketone 78-93-3 (<=100) | List II |

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecotoxicity effects

| Component | Freshwater Fish | Water Flea | Freshwater Algae |
|---------------------|--|--|------------------|
| Methyl ethyl ketone | Lepomis macrochirus: LC50=3,22 g/L 96 h | EC50: = 5091 mg/L, 48h (Daphnia magna) EC50: 4025 - 6440 mg/L, 48h Static (Daphnia magna) EC50: > 520 mg/L, 48h (Daphnia magna) | |

| Component | Microtox | M-Factor |
|---------------------|---|----------|
| Methyl ethyl ketone | EC50 = 3403 mg/L 30 min EC50 = 3426 mg/L 5 min | |

12.2. Persistence and degradability

Persistence

Readily biodegradable
Persistence is unlikely, based on information available.

| Component | Degradability |
|--|---------------|
| Methyl ethyl ketone 78-93-3 (<=100) | 98% (28d) |

12.3. Bioaccumulative potential

Bioaccumulation is unlikely

| Component | log Pow | Bioconcentration factor (BCF) |
|---------------------|---------|-------------------------------|
| Methyl ethyl ketone | 0.29 | No data available |

12.4. Mobility in soil

The product contains volatile organic compounds (VOC) which will evaporate easily from all surfaces. Will likely be mobile in the environment due to its volatility. Disperses rapidly in air.

12.5. Results of PBT and vPvB assessment

Substance is not considered persistent, bioaccumulative and toxic (PBT) / very persistent and very bioaccumulative (vPvB).

12.6. Endocrine disrupting properties

Endocrine Disruptor Information

This product does not contain any known or suspected endocrine disruptors

SAFETY DATA SHEET

Ethyl methyl ketone

Revision Date 19-Oct-2023

12.7. Other adverse effects
Persistent Organic Pollutant
Ozone Depletion Potential

This product does not contain any known or suspected substance
This product does not contain any known or suspected substance

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste from Residues/Unused Products

Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

Contaminated Packaging

Dispose of this container to hazardous or special waste collection point. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep product and empty container away from heat and sources of ignition.

European Waste Catalogue (EWC)

According to the European Waste Catalog, Waste Codes are not product specific, but application specific.

Other Information

Waste codes should be assigned by the user based on the application for which the product was used. Do not flush to sewer. Can be landfilled or incinerated, when in compliance with local regulations.

Switzerland - Waste Ordinance

Disposal should be in accordance with applicable regional, national and local laws and regulations. Ordinance on the Avoidance and the Disposal of Waste (Waste Ordinance, ADWO) SR 814.600
<https://www.fedlex.admin.ch/eli/cc/2015/891/en>

SECTION 14: TRANSPORT INFORMATION

IMDG/IMO

14.1. UN number

UN1193

14.2. UN proper shipping name

Ethyl methyl ketone (Methyl ethyl ketone)

14.3. Transport hazard class(es)

3

14.4. Packing group

II

ADR

14.1. UN number

UN1193

14.2. UN proper shipping name

Ethyl methyl ketone (Methyl ethyl ketone)

14.3. Transport hazard class(es)

3

14.4. Packing group

II

IATA

14.1. UN number

UN1193

14.2. UN proper shipping name

Methyl ethyl ketone

14.3. Transport hazard class(es)

3

14.4. Packing group

II

14.5. Environmental hazards

No hazards identified

14.6. Special precautions for user

No special precautions required.

14.7. Maritime transport in bulk according to IMO instruments

Not applicable, packaged goods

SAFETY DATA SHEET

Ethyl methyl ketone

Revision Date 19-Oct-2023

SECTION 15: REGULATORY INFORMATION

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

International Inventories

Europe (EINECS/ELINCS/NLP), China (IECSC), Taiwan (TCSI), Korea (KECL), Japan (ENCS), Japan (ISHL), Canada (DSL/NDSL), Australia (AICS), New Zealand (NZIoC), Philippines (PICCS). US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)

| Component | CAS No | EINECS | ELINCS | NLP | IECSC | TCSI | KECL | ENCS | ISHL |
|---------------------|---------|-----------|--------|-----|-------|------|----------|------|------|
| Methyl ethyl ketone | 78-93-3 | 201-159-0 | - | - | X | X | KE-24094 | X | X |

| Component | CAS No | TSCA | TSCA Inventory notification - Active-Inactive | DSL | NDSL | AICS | NZIoC | PICCS |
|---------------------|---------|------|---|-----|------|------|-------|-------|
| Methyl ethyl ketone | 78-93-3 | X | ACTIVE | X | - | X | X | X |

Legend: X - Listed '-' - Not Listed

KECL - NIER number or KE number (<http://ncis.nier.go.kr/en/main.do>)

Authorisation/Restrictions according to EU REACH

| Component | CAS No | REACH (1907/2006) - Annex XIV - Substances Subject to Authorization | REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances | REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC) |
|---------------------|---------|---|---|---|
| Methyl ethyl ketone | 78-93-3 | - | Use restricted. See item 75. (see link for restriction details) | - |

REACH links

<https://echa.europa.eu/substances-restricted-under-reach>

Seveso III Directive (2012/18/EC)

| Component | CAS No | Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification | Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements |
|---------------------|---------|---|--|
| Methyl ethyl ketone | 78-93-3 | Not applicable | Not applicable |

Regulation (EC) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of dangerous chemicals

Not applicable

Contains component(s) that meet a 'definition' of per & poly fluoroalkyl substance (PFAS)?

Not applicable

Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work .

Take note of Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values

National Regulations

UK - Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment

WGK Classification

See table for values

SAFETY DATA SHEET

Ethyl methyl ketone

Revision Date 19-Oct-2023

| Component | Germany - Water Classification (AwSV) | Germany - TA-Luft Class |
|---------------------|---------------------------------------|-------------------------|
| Methyl ethyl ketone | WGK1 | |

| Component | France - INRS (Tables of occupational diseases) |
|---------------------|--|
| Methyl ethyl ketone | Tableaux des maladies professionnelles (TMP) - RG 84 |

Swiss Regulations

Article 4 para. 4 of the Ordinance on the protection of young people in the workplace (SR 822.115) and Article 1 lit. f of the EAER regulation on hazardous work and young people (SR 822.115.2).

Take note on Article 13 Maternity Ordinance (SR 822.111.52) with regards expectant and nursing mothers.

| Component | Switzerland - Ordinance on the Reduction of Risk from handling of hazardous substances preparation (SR 814.81) | Switzerland - Ordinance on Incentive Taxes on Volatile Organic Compounds (OVOC) | Switzerland - Ordinance of the Rotterdam Convention on the Prior Informed Consent Procedure |
|--|--|---|---|
| Methyl ethyl ketone 78-93-3 (<=100) | | Group I | |

15.2. Chemical safety assessment

A Chemical Safety Assessment/Report (CSA/CSR) has been conducted by the manufacturer/importer

SECTION 16: OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3

H225 - Highly flammable liquid and vapor

H319 - Causes serious eye irritation

H336 - May cause drowsiness or dizziness

EUH066 - Repeated exposure may cause skin dryness or cracking

Legend

CAS - Chemical Abstracts Service

EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

IECSC - Chinese Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDL - Canadian Domestic Substances List/Non-Domestic Substances List

ENCS - Japanese Existing and New Chemical Substances

AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

WEL - Workplace Exposure Limit

ACGIH - American Conference of Governmental Industrial Hygienists

DNEL - Derived No Effect Level

RPE - Respiratory Protective Equipment

LC50 - Lethal Concentration 50%

NOEC - No Observed Effect Concentration

PBT - Persistent, Bioaccumulative, Toxic

TWA - Time Weighted Average

IARC - International Agency for Research on Cancer

Predicted No Effect Concentration (PNEC)

LD50 - Lethal Dose 50%

EC50 - Effective Concentration 50%

POW - Partition coefficient Octanol:Water

vPvB - very Persistent, very Bioaccumulative

ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road

IMO/IMDG - International Maritime Organization/International Maritime Dangerous Goods Code

OECD - Organisation for Economic Co-operation and Development

BCF - Bioconcentration factor

Key literature references and sources for data

<https://echa.europa.eu/information-on-chemicals>

Suppliers safety data sheet, Chemadviser - LOLI, Merck index, RTECS

ICAO/IATA - International Civil Aviation Organization/International Air Transport Association

MARPOL - International Convention for the Prevention of Pollution from Ships

ATE - Acute Toxicity Estimate

VOC - (volatile organic compound)

Training Advice

SAFETY DATA SHEET

Ethyl methyl ketone

Revision Date 19-Oct-2023

Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.

Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.

First aid for chemical exposure, including the use of eye wash and safety showers.

Fire prevention and fighting, identifying hazards and risks, static electricity, explosive atmospheres posed by vapours and dusts.

| | |
|------------------|-----------------|
| Creation Date | 13-Apr-2009 |
| Revision Date | 19-Oct-2023 |
| Revision Summary | Not applicable. |

**This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.
COMMISSION REGULATION (EU) 2020/878 amending Annex II to Regulation (EC) No
1907/2006 .**

**For Switzerland - Compiled in accordance with the technical provisions referred to in Annex 2,
Number 3, Chemo (SR 813.11 - Ordinance on Protection against Dangerous Substances and
Preparations).**

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of Safety Data Sheet