



# SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Date of issue: 04/22/2014

Version 1.0

## SECTION 1. Identification

### Product identifier

Product number	BX1670
Product name	2-Butanone [Methyl ethyl ketone] GR ACS
CAS-No.	78-93-3

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

Identified uses	Reagent for analysis
-----------------	----------------------

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

Company	EMD Millipore Corporation   290 Concord Road, Billerica, MA 01821, United States of America   General Inquiries: +1-978-715-4321   Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5)
---------	--

Emergency telephone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week
---------------------	--

## SECTION 2. Hazards identification

### GHS Classification

Flammable liquid, Category 2, H225  
Eye irritation, Category 2, H319  
Specific target organ systemic toxicity - single exposure, Category 3, H336  
For the full text of the H-Statements mentioned in this Section, see Section 16.

### GHS-Labeling

#### Hazard pictograms



Signal Word  
Danger

#### Hazard Statements

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

# SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number  
Product name

BX1670  
2-Butanone [Methyl ethyl ketone] GR ACS

Version 1.0

## Precautionary Statements

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

## OSHA Hazards

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS and may deviate from the GHS information.

## Other hazards

None known.

---

## SECTION 3. Composition/information on ingredients

Formula	C <sub>2</sub> H <sub>5</sub> COCH <sub>3</sub>	C <sub>4</sub> H <sub>8</sub> O (Hill)
Molar mass	72.11 g/mol	

## Hazardous ingredients

*Chemical Name (Concentration)*

CAS-No.

*ethyl methyl ketone (>= 90 % - <= 100 % )*

78-93-3

Exact percentages are being withheld as a trade secret.

---

## SECTION 4. First aid measures

### Description of first-aid measures

#### *Inhalation*

After inhalation: fresh air. Consult doctor if feeling unwell.

#### *Skin contact*

After skin contact: wash off with plenty of water. Remove contaminated clothing.

#### *Eye contact*

After eye contact: rinse out with plenty of water. Call in ophthalmologist.

#### *Ingestion*

After swallowing: caution if victim vomits. Risk of aspiration! Keep airways free. Pulmonary failure possible after aspiration of vomit. Call a physician immediately.

Subsequently administer: activated charcoal (20 - 40 g in 10% slurry).

Do not give milk. No digestible oils.

Never give anything by mouth to an unconscious person.

### Most important symptoms and effects, both acute and delayed

irritant effects, Cough, Shortness of breath, Drowsiness, Dizziness, narcosis, inebriation,

Nausea, Vomiting, drowsiness, CNS disorders

Drying-out effect resulting in rough and chapped skin.

## SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number BX1670  
Product name 2-Butanone [Methyl ethyl ketone] GR ACS

---

Version 1.0

The following applies to ketones in general: when vapors/aerosols occur, mucosal irritations, coughing, and dyspnoea after inhalation. The absorption of large quantities leads to: CNS depression (narcosis). Repeated skin contact leads to a degreasing effect, with secondary inflammation possible. Toxic effects on the liver and kidneys cannot be excluded after high doses. The inhalation of droplets may result in the formation of oedemas in the respiratory tract.

### Indication of any immediate medical attention and special treatment needed

Laxative: Sodium sulfate (1 tablespoon/1/4 l water).  
After swallowing of large amounts: Gastric lavage.

---

## SECTION 5. Fire-fighting measures

### Extinguishing media

*Suitable extinguishing media*  
Carbon dioxide (CO<sub>2</sub>), Foam, Dry powder

*Unsuitable extinguishing media*  
For this substance/mixture no limitations of extinguishing agents are given.

### Special hazards arising from the substance or mixture

Combustible.  
Vapors are heavier than air and may spread along floors.  
Pay attention to flashback.  
Forms explosive mixtures with air at ambient temperatures.  
Development of hazardous combustion gases or vapors possible in the event of fire.

### Advice for firefighters

*Special protective equipment for fire-fighters*  
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

*Further information*  
Cool closed containers exposed to fire with water spray. Prevent fire extinguishing water from contaminating surface water or the ground water system.

---

## SECTION 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Keep away from open flames, hot surfaces and sources of ignition. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

### Environmental precautions

Do not empty into drains. Risk of explosion.

### Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills.  
Observe possible material restrictions (see sections 7 and 10).  
Take up with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

---

# SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number

BX1670

Version 1.0

Product name

2-Butanone [Methyl ethyl ketone] GR ACS

---

## SECTION 7. Handling and storage

### Precautions for safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapors/aerosols.

Observe label precautions.

### *Advice on protection against fire and explosion*

Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

### Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Store at room temperature.

---

## SECTION 8. Exposure controls/personal protection

### Exposure limit(s)

#### *Ingredients*

Basis	Value	Threshold limits	Remarks
<i>ethyl methyl ketone 78-93-3</i>			
ACGIH	Time Weighted Average (TWA):	200 ppm	
	Short Term Exposure Limit (STEL):	300 ppm	
NIOSH/GUIDE	Recommended exposure limit (REL):	200 ppm	
		590 mg/m <sup>3</sup>	
	Short Term Exposure Limit (STEL):	300 ppm	
		885 mg/m <sup>3</sup>	
OSHA_TRANS	PEL:	200 ppm	
		590 mg/m <sup>3</sup>	
Z1A	Time Weighted Average (TWA):	200 ppm	
		590 mg/m <sup>3</sup>	
	Short Term Exposure Limit (STEL):	300 ppm	
		885 mg/m <sup>3</sup>	

### Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

### Individual protection measures

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

### *Hygiene measures*

Immediately change contaminated clothing. Apply skin- protective barrier cream. Wash hands and face after working with substance.

---

# SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number

BX1670

Version 1.0

Product name

2-Butanone [Methyl ethyl ketone] GR ACS

---

### *Eye/face protection*

Safety glasses

### *Hand protection*

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

### *Other protective equipment:*

Flame retardant antistatic protective clothing

### *Respiratory protection*

required when vapors/aerosols are generated.

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

---

## **SECTION 9. Physical and chemical properties**

Physical state	liquid
Color	colorless
Odor	of solvents
Odor Threshold	No information available.
pH	at 68 °F (20 °C) neutral
Melting point	-86 °C
Boiling point/boiling range	175.3 °F (79.6 °C) at 1,013 hPa
Flash point	25 °F (-4 °C) Method: DIN 51755 Part 1
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	1.8 %(V)
Upper explosion limit	11.5 %(V)
Vapor pressure	105 hPa at 68 °F (20 °C)
Relative vapor density	2.48
Density	0.805 g/cm <sup>3</sup> at 68 °F (20 °C)

---

## SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number	BX1670	Version 1.0
Product name	2-Butanone [Methyl ethyl ketone] GR ACS	

---

Relative density	No information available.
Water solubility	292 g/l at 68 °F (20 °C)
Partition coefficient: n-octanol/water	log Pow: 0.29 (experimental) (Lit.) Bioaccumulation is not expected.
Autoignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	0.40 mPa.s at 68 °F (20 °C)
Explosive properties	Not classified as explosive.
Oxidizing properties	none
Ignition temperature	957 °F (514 °C) Method: DIN 51794
Conductivity	< 0.1 µS/cm

---

### SECTION 10. Stability and reactivity

#### Reactivity

Vapors may form explosive mixture with air.

#### Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

#### Possibility of hazardous reactions

Risk of ignition or formation of inflammable gases or vapors with:, Exothermic reaction with:

Oxidizing agents, alkali hydroxides, chromium(VI) oxide

Risk of explosion with:

hydrogen peroxide, Nitric acid, conc. sulfuric acid

#### Conditions to avoid

Warming.

A range from approx. 15 Kelvin below the flash point is to be rated as critical.

#### Incompatible materials

various plastics

#### Hazardous decomposition products

Peroxides

SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number

BX1670

Version 1.0

Product name

2-Butanone [Methyl ethyl ketone] GR ACS

---

**SECTION 11. Toxicological information**

**Information on toxicological effects**

*Likely route of exposure*

Inhalation, Eye contact, Skin contact

*Target Organs*

Eyes

Skin

Respiratory system

Central nervous system

*Acute oral toxicity*

LD50 rat: 3,400 mg/kg

OECD Test Guideline 401

LD50 rat: > 2,600 mg/kg (IUCLID)

Symptoms: Nausea, Vomiting, Risk of aspiration upon vomiting., Aspiration may cause pulmonary edema and pneumonitis.

*Acute inhalation toxicity*

Symptoms: Possible damages:., mucosal irritations

*Acute dermal toxicity*

LD50 rabbit: > 8,000 mg/kg

(Lit.)

absorption

*Skin irritation*

rabbit

Result: slight irritation

(IUCLID)

Repeated exposure may cause skin dryness or cracking.

*Eye irritation*

rabbit

Result: Severe irritations

(IUCLID)

Causes serious eye irritation.

*Sensitization*

Sensitization test: guinea pig

Result: negative

(IUCLID)

*Genotoxicity in vitro*

Ames test

Result: negative

(IUCLID)

## SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number

BX1670

Version 1.0

Product name

2-Butanone [Methyl ethyl ketone] GR ACS

---

Mutagenicity (mammal cell test): chromosome aberration.

Result: negative

(National Toxicology Program)

*Specific target organ systemic toxicity - single exposure*

May cause drowsiness or dizziness.

*Specific target organ systemic toxicity - repeated exposure*

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

*Aspiration hazard*

Regarding the available data the classification criteria are not fulfilled.

### Carcinogenicity

IARC

No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA

No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

NTP

No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

ACGIH

No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

### Further information

After absorption of large quantities:

CNS disorders, Dizziness, inebriation, drop in blood pressure, narcosis

Causes impaired function of:

respiratory tract, Cardiac

Other information

The following applies to ketones in general: when vapors/aerosols occur, mucosal irritations, coughing, and dyspnoea after inhalation. The absorption of large quantities leads to: CNS depression (narcosis). Repeated skin contact leads to a degreasing effect, with secondary inflammation possible. Toxic effects on the liver and kidneys cannot be excluded after high doses. The inhalation of droplets may result in the formation of oedemas in the respiratory tract.

Further data:

Handle in accordance with good industrial hygiene and safety practice.

---

## SECTION 12. Ecological information

### Ecotoxicity

*Toxicity to fish*

LC50 Pimephales promelas (fathead minnow): 3,220 mg/l; 96 h (IUCLID)

*Toxicity to daphnia and other aquatic invertebrates*

EC50 Daphnia magna (Water flea): 5,091 mg/l; 48 h (IUCLID)



## SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number

BX1670

Version 1.0

Product name

2-Butanone [Methyl ethyl ketone] GR ACS

---

### *Toxicity to algae*

IC50 Scenedesmus quadricauda (Green algae):  $\geq$  4,300 mg/l; 7 d (IUCLID)

### *Toxicity to bacteria*

EC50 Pseudomonas putida: 1,150 mg/l; 16 h (IUCLID)

## **Persistence and degradability**

### *Biodegradability*

Readily biodegradable.

### *Theoretical oxygen demand (ThOD)*

2,440 mg/g

(Lit.)

### *Ratio BOD/ThBOD*

BOD5 76 %

(IUCLID)

### *Ratio COD/ThBOD*

95 %

(IUCLID)

## **Bioaccumulative potential**

### *Partition coefficient: n-octanol/water*

log Pow: 0.29

(experimental)

(Lit.) Bioaccumulation is not expected.

## **Mobility in soil**

No information available.

### *Additional ecological information*

Discharge into the environment must be avoided.

---

## **SECTION 13. Disposal considerations**

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

---

## **SECTION 14. Transport information**

### **Land transport (DOT)**

**UN number**

UN 1193

**Proper shipping name**

ETHYL METHYL KETONE

**Class**

3

**Packing group**

II

**Environmentally hazardous**

--

### **Air transport (IATA)**

# SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number

BX1670

Version 1.0

Product name

2-Butanone [Methyl ethyl ketone] GR ACS

---

**UN number** UN 1193  
**Proper shipping name** ETHYL METHYL KETONE  
**Class** 3  
**Packing group** II  
**Environmentally hazardous** --  
**Special precautions for user** no

#### Sea transport (IMDG)

**UN number** UN 1193  
**Proper shipping name** ETHYL METHYL KETONE  
**Class** 3  
**Packing group** II  
**Environmentally hazardous** --  
**Special precautions for user** yes  
**EmS** F-E S-D

---

## SECTION 15. Regulatory information

### United States of America

#### OSHA Hazards

Flammable Liquid

Eye irritant

Target organ effects

This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS, and may deviate from the GHS information on the label and in section 2.

#### SARA 311/312 Hazards

Fire Hazard

Acute Health Hazard

Chronic Health Hazard

#### SARA 313

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

#### SARA 302

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

# SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number

BX1670

Version 1.0

Product name

2-Butanone [Methyl ethyl ketone] GR ACS

---

## Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

## DEA List I

Not listed

## DEA List II

Listed

### *Ingredients*

ethyl methyl ketone

78-93-3

## US State Regulations

### Massachusetts Right To Know

#### *Ingredients*

ethyl methyl ketone

### Pennsylvania Right To Know

#### *Ingredients*

ethyl methyl ketone

### New Jersey Right To Know

#### *Ingredients*

ethyl methyl ketone

### California Prop 65 Components

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

## Notification status

TSCA: All components of the product are listed in the TSCA-inventory.

DSL: All components of this product are on the Canadian DSL.

---

## SECTION 16. Other information

### Training advice

Provide adequate information, instruction and training for operators.

### 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.

### Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at [www.wikipedia.org](http://www.wikipedia.org).

SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number

BX1670

Version 1.0

Product name

2-Butanone [Methyl ethyl ketone] GR ACS

---

Date of issue: 04/22/2014

---

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

*All rights reserved. Millipore and the "M" Mark are registered trademarks of Merck KGaA, Darmstadt, Germany.*