

2-Methylpropene

Print date 08.08.2024
Revision date 08.08.2024
Version 10.0 (en)
replaces version of 04.08.2021 (9.0)

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

1.1 Product identifier

Trade name/designation 2-Methylpropene
Art-Nr(n). 2420, 70242
Substance name 2-methylpropene
Index No 601-012-00-4
EC No 204-066-3
REACH No. 01-2119456616-32
CAS No 115-11-7

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

Sector of uses [SU]

SU3 Industrial uses
SU9 Manufacture of fine chemicals

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
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
PROC15 Use as laboratory reagent

Environmental release categories [ERC]

ERC1 Manufacture of substances
ERC6a Industrial use resulting in manufacture of another substance (use of intermediates)

Product Categories [PC]

PC19 Intermediate (precursor)

* **Use of the substance/mixture**

Refrigerant
Basic substance

1.3 Details of the supplier of the safety data sheet

Supplier

GHC Gerling, Holz & Co. Handels GmbH
Ruhrstraße 113
D-22761 Hamburg
Telephone +49 40 853 123 0
E-mail hamburg@ghc.de
Website www.ghc.com

Department responsible for information:
GHC Gerling, Holz & Co. Handels GmbH
Telephone +49 40 853 123 0

E-mail (competent person):
msds@ghc.de

* 1.4 Emergency telephone number

EN: Poison Information Center Mainz +49 6131 19240

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*** SECTION 2: Hazards identification***** 2.1 Classification of the substance or mixture**

Classification according to Regulation (EC) No 1272/2008 [CLP]	Classification procedure
--	--------------------------

Flam. Gas 1A, H220

Press. Gas (Liq.), H280

Hazard statements for physical hazards

H220 Extremely flammable gas.

H280 Contains gas under pressure; may explode if heated.

*** 2.2 Label elements***** Labelling according to Regulation (EC) No 1272/2008 [CLP]****Hazard pictograms**

GHS02

Signal word

Danger

Hazard statements

H220 Extremely flammable gas.

H280 Contains gas under pressure; may explode if heated.

Precautionary statements

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

P381 In case of leakage, eliminate all ignition sources.

P403 Store in a well-ventilated place.

*** Supplemental hazard information**

EIGA0357 Asphyxiant in high concentrations.

Please return container with residual pressure.

*** 2.3 Other hazards***** Adverse human health effects and symptoms**

Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

Contact with liquid may cause cold burns/frostbite.

*** Other adverse effects**

The substance/mixture does not contain components identified as having endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated Regulation (EU) 2017/2100 or Commission Delegated Regulation (EU) 2018/605 in quantities of 0.1% or more.

*** Results of PBT and vPvB assessment**

The substance/mixture does not contain components meeting the PBT/vPvB criteria of the Reach Regulation, Annex XIII, at levels of 0.1% or higher.

SECTION 3: Composition / information on ingredients**3.1 Substances**

Substance name	2-methylpropene
Index No	601-012-00-4
EC No	204-066-3
REACH No.	01-2119456616-32
CAS No	115-11-7
ATE	ATE(inhalation gas): > 10000 ppm

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Additional information

Content: >= 99,5 %

3.2 Mixtures

not applicable

* SECTION 4: First aid measures

* 4.1 Description of first aid measures

* General information

Remove contaminated, saturated clothing immediately.
In the event of persistent symptoms obtain medical treatment.
First aider: Pay attention to self-protection!

* Following inhalation

Remove casualty to fresh air and keep warm and at rest.
In case of respiratory standstill give artificial respiration by respiratory bag (Ambu bag) or respirator. Obtain medical assistance.

* Following skin contact

In case of skin contact rinse with warm water.
In case of frostbite, wash with plenty of water; do not remove clothing.
In case of frostbite rinse with lukewarm (not hot) water for at least 15 minutes. Do not remove clothing frozen to the skin.
Thaw with lukewarm water. Apply a sterile dressing. Obtain medical assistance.

* After eye contact

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical assistance.

Following ingestion

Ingestion is not considered a potential route of exposure.

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

* Symptoms

The following symptoms may occur in case of strong exposition:
Unconsciousness
Cardiopulmonary arrest.

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

* Notes for the doctor

Treat symptomatically.
To supervise the blood circulation.

* SECTION 5: Firefighting measures

* 5.1 Extinguishing media

* Suitable extinguishing media

Extinguishing powder
Foam
Water spray jet

* Unsuitable extinguishing media

Carbon dioxide (CO₂)
Full water jet

* 5.2 Special hazards arising from the substance or mixture

* Hazardous combustion products

In case of fire formation of dangerous gases possible.
Carbon monoxide
Carbon dioxide (CO₂)

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* 5.3 Advice for firefighters

- * **Special protective equipment for firefighters**
Wear a self-contained breathing apparatus and chemical protective clothing.

* Additional information

If possible, shut off gas valves and move containers to a safe location.
Use water spray jet to protect personnel and to cool endangered containers.
Exposure to fire may cause rupture / explosion of the containers.
Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire.
Dispose of fire residues and contaminated extinguishing water in accordance with local, official regulations.

* SECTION 6: Accidental release measures

* 6.1 Personal precautions, protective equipment and emergency procedures

- * **For non-emergency personnel**
Use personal protection equipment.
Leave the danger area.
Keep people away and stay on the upwind side.
- * **For emergency responders**
Personal protection by wearing close-fitting protective clothing and breathing apparatus.
Pay attention to extension of gas especially at ground (heavier than air) and in direction of the wind.
Remove persons to safety.
Eliminate all ignition sources if safe to do so.

* 6.2 Environmental precautions

If possible, stop flow of product.
Do not allow to enter into soil/subsoil.
Do not allow to enter into surface water or drains.

* 6.3 Methods and material for containment and cleaning up

- * **For containment**
If necessary, secure leaky pressure receptacles using a salvage container.
Prevent the liquid from spreading over a wide area (set up barriers, cover sewage systems).
Limit expansion of the gas (water spray jet).
- * **For cleaning up**
Leave to vapourize.
Provide adequate ventilation.

6.4 Reference to other sections

Disposal: see section 13
Personal protection equipment: see section 8

* SECTION 7: Handling and storage

* 7.1 Precautions for safe handling

- * **Protective measures**
Use only in well-ventilated areas.
Transfer and handle product only in closed systems.
Usual measures for fire prevention.
Containers' temperature should not be increased above 50 °C.
The working pressure in the receptacle must not exceed the saturation vapour pressure of the pure product resulting at a temperature of 50 °C.
Prevent cylinders from falling over.
Take precautionary measures against static discharges. Ground barrels and installations. Use only antistatically equipped (spark-free) tools.
Use explosion-proof machinery, apparatus, ventilation facilities, tools etc.
Ensure valve protection device is correctly fitted.
Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
Open valve slowly to avoid pressure shock.
Do not allow backflow into the container.
Entering of water into the container must be prevented.
No water to valves, flanges and other fittings.
Purging of pipes and valves with inert gases - to avoid: water, solvents.

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Advices on general occupational hygiene

When using do not eat, drink, smoke, sniff.
 Wash hands before breaks and after work.
 Remove contaminated clothing and protective equipment before entering eating areas.

*** 7.2 Conditions for safe storage, including any incompatibilities**

- * **Requirements for storage rooms and vessels**
 All regulations and local requirements for the storage of containers have to be respected.
 Keep container tightly closed and in a well-ventilated place.
 Containers' temperature should not be increased above 50 °C.
 Prevent cylinders from falling over.
 Only use containers specifically approved for the substance/product.
 Information on suitable materials for receptacles and valves see ISO 11114.

- * **Materials to avoid**
 Do not store together with explosives.
 Do not store together with flammable liquids.
 Do not store together with flammable solids.
 Do not store together with pyrophoric and self-heating substances.
 Do not store together with oxidizing liquids or oxidizing solids.
 Do not store together with toxic liquids or toxic solids.
 Do not store together with infectious substances.
 Do not store together with radioactive material.
 Do not store together with food or feed.

*** 7.3 Specific end use(s)**

- * **Recommendation**
 Exposure scenarios (ES) see annex to this safety data sheet.

*** SECTION 8: Exposure controls/personal protection***** 8.1 Control parameters***** Occupational exposure limit values**

CAS No	EC No	Substance name	occupational exposure limit value
115-11-7	204-066-3	Butene, all isomers	250 [ml/m ³ (ppm)] (IE)

*** 8.2 Exposure controls****Appropriate engineering controls****Technical measures to prevent exposure**

Transfer and handle only in enclosed systems.

*** Personal protection equipment****Eye/face protection**

Protective goggles according to EN 166, in case of increased risk add protective face shield.

*** Hand protection**

Safety gloves according to EN 388:
 Chromate-free leather

Body protection:

Safety shoes with steel toecap.
 Body covering work clothing or chemical resistant suit at increased risk.

*** Respiratory protection**

Keep self contained breathing apparatus readily available for emergency use.

Respiratory protection necessary at:
 high concentrations

Respiratory protection complying with EN 137.

Do not use any filter apparatus.

In case of rescue and maintenance activities in storage containers use environment-independent breathing apparatus because of risk of suffocation due to displacement of oxygen.

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* **Thermal hazards**
 Use cold-resistant protective equipment.

* **Environmental exposure controls**

* **Remark**
 Prevent release to the environment.

* **SECTION 9: Physical and chemical properties*** **9.1 Information on basic physical and chemical properties****Physical state**

Gaseous / liquefied under pressure.

Colour

colourless

* **Odour**
 Gasoline

Safety relevant basis data

	Value	Method	Source, Remark
Odour threshold:			not determined
Melting point/freezing point			not applicable
Boiling point or initial boiling point and boiling range	-7.1 °C		
flammability			flammable
Lower and upper explosion limit	Upper explosion limit 10 Vol-%		
Lower and upper explosion limit	Lower explosion limit 1.6 Vol-%		
Flash point			not applicable
Auto-ignition temperature	465 °C		
Decomposition temperature			No decomposition if used as directed.
pH			not applicable
Viscosity			not applicable
Solubility(ies)	Water solubility 0.263 g/L (25°C)		
Partition coefficient n-octanol/water (log value)	2.35		
Vapour pressure	2590 hPa (20°C)		
Density and/or relative density			not applicable
Relative vapour density	2		Air = 1.
particle characteristics			not applicable

* **9.2 Other information*** **Information with regard to physical hazard classes*** **Gases under pressure****Safety characteristics**

	Value	Method, Result	Source, Remark
Critical temperature	144.7 °C		

* **Other information**
 Vapours are heavier than air.

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*** SECTION 10: Stability and reactivity***** 10.1 Reactivity**

May form an explosive mixture with air.

*** 10.2 Chemical stability**

The substance is chemically stable under recommended conditions of storage, use and temperature.

*** 10.3 Possibility of hazardous reactions**

Must not be mixed with air or oxygen.
 May react violently with oxidants.
 Risk of polymerisation.

*** 10.4 Conditions to avoid**

Heat sources / heat - risk of bursting.
 Ignition sources, open flames, glowing metal surfaces, etc.

10.5 Incompatible materials

Acetylene
 Chlorine
 Hydrochloric gas
 Fluorine
 Nitrogen oxides (NO_x)

10.6 Hazardous decomposition products

When handled and stored appropriately, no dangerous decomposition products are known.

*** SECTION 11: Toxicological information****11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008***** Acute toxicity***** Animal data**

	Effective dose	Method, Evaluation	Source, Remark
Acute oral toxicity			Study technically not feasible.
Acute dermal toxicity			Study technically not feasible.
Acute inhalation toxicity	CAS No115-11-7 2-methylpropene Acute inhalation toxicity (gas) LC50: > 10000 ppm Species Rat Exposure time 4 h	OECD 403	

*** Assessment/classification**

Based on available data, the classification criteria are not met.

*** Skin corrosion/irritation***** Assessment/classification**

Study technically not feasible.

*** Serious eye damage/irritation***** Assessment/classification**

Study technically not feasible.

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*** Sensitisation to the respiratory tract**

*** Assessment/classification**
 No data available

*** Skin sensitisation**

*** Assessment/classification**
 Study technically not feasible.

*** Germ cell mutagenicity**

	Value	Method	Result / Evaluation	Remark
In vitro mutagenicity/genotoxicity		OECD 476	negative	
In vivo mutagenicity/genotoxicity		OECD 474	negative	

*** Assessment/classification**
 Based on available data, the classification criteria are not met.

*** Carcinogenicity****Animal data**

	Value	Method	Result / Evaluation	Remark
Carcinogenicity	inhalative NOAEL(C): 8000 ppm Species Rat Exposure duration 2 a	OECD 453	negative	

*** Assessment/classification**
 Based on available data, the classification criteria are not met.

*** Reproductive toxicity****Animal data**

	Value	Method	Result / Evaluation	Remark
Reproductive toxicity	inhalative NOAEC 18.4 mg/l Species Rat	OECD 422	negative	

*** Assessment/classification**
 Based on available data, the classification criteria are not met.

*** STOT-single exposure***** STOT SE 1 and 2**

*** Assessment/classification**
 Based on available data, the classification criteria are not met.

*** STOT-repeated exposure***** Animal data**

	Effective dose	Method	Specific effects:	Organs affected:	Source, Remark
Oral specific target organ toxicity (repeated exposure)	148.6 mg/kg bw/day Species Rat (male / female) Exposure duration 28 d	OECD 407			NOAEL

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	Effective dose	Method	Specific effects:	Organs affected:	Source, Remark
Inhalative specific target organ toxicity (repeated exposure)	NOAEL(C): 2000 ppm Species Rat (male / female) Exposure duration 2 a	OECD 453			

* **Assessment/classification**
 Based on available data, the classification criteria are not met.

* **Aspiration hazard**

* **Remark**
 Study technically not feasible.

11.2 Information on other hazards

No data available

* **SECTION 12: Ecological information*** **12.1 Toxicity*** **Aquatic toxicity**

	Effective dose	Method, Evaluation	Source, Remark
Acute (short-term) fish toxicity	LC50: 29 mg/L Test duration 96 h	QSAR	
Chronic (long-term) fish toxicity	not determined		
Acute (short-term) toxicity to crustacea	LC50 16.8 mg/L Test duration 48 h	QSAR	
Chronic (long-term) toxicity to aquatic invertebrate	not determined		
Acute (short-term) toxicity to algae and cyanobacteria	EC50 13.6 mg/L Test duration 96 h	QSAR	
Chronic (long-term) toxicity to aquatic algae and cyanobacteria	not determined		
Toxicity to other aquatic plants/organisms	not determined		
Toxicity to microorganisms	not determined		

* **12.2 Persistence and degradability**

* **Assessment/classification**
 Readily biodegradable (according to OECD criteria).

* **12.3 Bioaccumulative potential**

* **Assessment/classification**
 Based on the n-octanol/water partition coefficient accumulation in organisms is not expected.

* **12.4 Mobility in soil**

* **Assessment/classification**
 No data available

* **12.5 Results of PBT and vPvB assessment**

The substance/mixture does not contain components meeting the PBT/vPvB criteria of the Reach Regulation, Annex XIII, at levels of 0.1% or higher.

* **12.6 Endocrine disrupting properties**

No data available

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12.7 Other adverse effects

No data available

*** SECTION 13: Disposal considerations***** 13.1 Waste treatment methods****Waste codes/waste designations according to EWC/AVV**

Waste code product	Waste name
160504 *	gases in pressure containers (including halons) containing hazardous substances

*** Appropriate disposal / Product**
 Waste disposal according to directive 2008/98/EC, covering waste and dangerous waste.
 Prevent release to the environment. No disposal via the sewage.

Appropriate disposal / Package
 Transportable pressure equipment (empty, residual pressure): Return to supplier / manufacturer.

*** SECTION 14: Transport information**

	Land transport (ADR/RID)	Sea transport (IMDG)	Air transport (ICAO-TI / IATA-DGR)
14.1 UN number or ID number	UN 1055	UN 1055	UN 1055
14.2 UN proper shipping name	ISOBUTYLENE (2-methylpropene)	ISOBUTYLENE (2-methylpropene)	Isobutylene (2-methylpropene)
14.3 Transport hazard class(es)	2.1	2.1	2.1
14.4 Packing group	-	-	-
14.5 Environmental hazards	No	No	No

14.6 Special precautions for user

The protective measures listed in Sections 6, 7 and 8 of the Safety Data Sheet have to be considered.

14.7 Maritime transport in bulk according to IMO instruments

No carriage in bulk.

Land transport (ADR/RID)

UN number or ID number	UN 1055
UN proper shipping name	ISOBUTYLENE (2-methylpropene)
Transport hazard class(es)	2.1
Hazard label(s)	2.1
Classification code	2F
Packing group	-
Environmental hazards	No
Limited quantity (LQ)	0
Special provisions	662
Tunnel restriction code	B/D

*** Sea transport (IMDG)**

UN number or ID number	UN 1055
UN proper shipping name	ISOBUTYLENE (2-methylpropene)
Transport hazard class(es)	2.1
Packing group	-
Environmental hazards	No

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Limited quantity (LQ)	0
Marine pollutant	No
EmS	F-D, S-U

*** Air transport (ICAO-TI / IATA-DGR)**

UN number or ID number	UN 1055
UN proper shipping name	Isobutylene (2-methylpropene)
Transport hazard class(es)	2.1
Packing group	-
Environmental hazards	No

*** SECTION 15: Regulatory information***** 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture***** EU legislation***** Restrictions of occupation**

Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.
 Observe restrictions to employment for juvenils according to the 'juvenile work protection guideline' (94/33/EC).

*** Other regulations (EU)***** To follow:**

Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Annex XVII No 40.
 Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances.
 National and local regulations concerning chemicals shall be observed.

15.2 Chemical Safety Assessment*** National regulations**

For this substance a chemical safety assessment has been carried out.

*** SECTION 16: Other information***** Abbreviations and acronyms**

Flam. Gas 1A: Flammable gas, Category 1A
 Press. Gas (Liq.): Liquefied gas (LG)

Key literature references and sources for data

Information from our suppliers and data from the "GESTIS Substances Database" and the "Registered Substances" database of the European Chemicals Agency (ECHA) were used to create this safety data sheet.

*** Additional information**

The information contained herein is based on the state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

Relevant H- and EUH-phrases (Number and full text)

H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.

Indication of changes

* Data changed compared with the previous version

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Annex: Exposure scenarios**1. Short title of exposure scenario**

ERC6a

PROCs

Industrial use, Use as an intermediate

2. Description of activities/process(es) covered in the Exposure Scenario

Process category	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
	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.
	PROC15	Use as laboratory reagent
	Cat. release to the environment	ERC6a
Use/Function	Use of substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	

3. Application conditions**3.1 Duration and frequency****4.1 Physical form****4.2 Concentration of substance in preparation****4.3 Amount used per time or per activity****5. Other operational conditions****6. RISK MANAGEMENT MEASURES****6.1.1 Occupational Measures****6.1.2 Consumer related measures****6.2 Environment related measures****7. Waste related measures****8. Prediction of exposure**

Calculation method	Qualitative approach used to conclude safe use.
Remarks	Risk checked

9. Guidance to downstream user

No additional relevant information available.