

dimethyl ether - isobutane, mixture

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

1.1 Product identifier:

Product name : dimethyl ether - isobutane, mixture
Synonyms :
Registration number REACH : Not applicable (mixture)
Product type REACH : Mixture

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

1.2.1 Relevant identified uses

Industrial use

1.2.2 Uses advised against

No uses advised against known

1.3 Details of the supplier of the safety data sheet:

Supplier of the safety data sheet

BALCHEM NV
 Westvaardijk 85
 B-1850 Grimbergen Belgium
 +32 2 251 60 87
 +32 2 252 17 51
 info.grimbergen@balchem.com

Distributor of the product

BALCHEM NV
 Westvaardijk 85
 B-1850 Grimbergen Belgium
 +32 2 251 60 87
 +32 2 252 17 51
 info.grimbergen@balchem.com

1.4 Emergency telephone number:

24h/24h (Telephone advice: English, French, German, Dutch):
 +32 14 58 45 45 (BIG)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture:

2.1.1 Classification according to Regulation EC No 1272/2008

Classified as dangerous according to the criteria of Regulation (EC) No 1272/2008

Class	Category	Hazard statements
Flam. Gas	category 1	H220: Extremely flammable gas.
Press. Gas	Liquefied gas	H280: Contains gas under pressure; may explode if heated.

2.1.2 Classification according to Directive 67/548/EEC-1999/45/EC

Classified as dangerous in accordance with the criteria of Directives 67/548/EEC and 1999/45/EC
 F+; R12 - Extremely flammable.

2.2 Label elements:

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



Signal word

Danger

H-statements

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

P-statements

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P381 Eliminate all ignition sources if safe to do so.
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P403 Store in a well-ventilated place.
P410 + P403 Protect from sunlight. Store in a well-ventilated place.

2.3 Other hazards:

CLP

May build up electrostatic charges: risk of ignition
May be ignited by sparks
Gas/vapour spreads at floor level: ignition hazard
Heat may cause pressure rise in tanks/drums: explosion risk
May cause frostbites
Slightly irritant to respiratory organs
May be narcotic if inhaled
Slightly irritant to eyes

SECTION 3: Composition/information on ingredients

3.1 Substances:

Not applicable

3.2 Mixtures:

Name REACH Registration No	CAS No EC No	Conc. (C)	Classification according to DSD/DPD	Classification according to CLP	Note	Remark
dimethyl ether 01-2119472128-37	115-10-6 204-065-8	C<100 %	F+; R12	Flam. Gas 1; H220 Press. Gas - Liquefied gas; H280	(1)(2)(10)	Constituent
isobutane 01-2119485395-27	75-28-5 200-857-2	C<100 %	F+; R12	Flam. Gas 1; H220 Press. Gas - Liquefied gas; H280	(1)(2)(10)	Constituent
butane	106-97-8 203-448-7	C<1.5 %	F+; R12	Flam. Gas 1; H220 Press. Gas - Liquefied gas; H280	(1)(2)(10)	Impurity
propane	74-98-6 200-827-9	C<1.5 %	F+; R12	Flam. Gas 1; H220 Press. Gas - Liquefied gas; H280	(1)(2)(10)	Impurity

(1) For R-phrases and H-statements in full: see heading 16

(2) Substance with a Community workplace exposure limit

(10) Subject to restrictions of Annex XVII of Regulation (EC) No. 1907/2006

SECTION 4: First aid measures

4.1 Description of first aid measures:

General:

Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with laboured breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital.

After inhalation:

Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

After skin contact:

Rinse with water for 20 minutes. Rinse with water. Take victim to a doctor if irritation persists. In case of frostbites: Wash immediately with lots of water (15 minutes)/shower. Remove clothing while washing. Do not remove clothing if it sticks to the skin. Cover wounds with sterile bandage. Consult a doctor/medical service. If burned surface > 10%: take victim to hospital.

After eye contact:

Rinse immediately with plenty of water for 15 minutes. Do not apply neutralizing agents. Take victim to an ophthalmologist.

After ingestion:

Not applicable.

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

4.2.1 Acute symptoms

After inhalation:

Feeling of weakness. Central nervous system depression. Headache. Nausea. Dizziness. Narcosis. Coordination disorders. Disturbances of consciousness. EXPOSURE TO HIGH CONCENTRATIONS: Disturbances of heart rate. Respiratory difficulties.

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After skin contact:

Frostbites.

After eye contact:

Redness of the eye tissue. Lacrimation. Frostbites.

After ingestion:

Not applicable.

4.2.2 Delayed symptoms

No effects known.

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

If applicable and available it will be listed below.

SECTION 5: Firefighting measures

5.1 Extinguishing media:**5.1.1 Suitable extinguishing media:**

Water spray. Polyvalent foam. Alcohol-resistant foam. BC powder. Carbon dioxide.

5.1.2 Unsuitable extinguishing media:

Solid water jet ineffective as extinguishing medium.

5.2 Special hazards arising from the substance or mixture:

Upon combustion: CO and CO₂ are formed.

5.3 Advice for firefighters:**5.3.1 Instructions:**

If no hazard for/from the surroundings: controlled burning. If hazardous substances are nearby: consider extinguishment. Extinguish only if gas supply/leak can be shut afterwards. Cool tanks/drums with water spray/remove them into safety. Physical explosion risk: extinguish/cool from behind cover. Do not move the load if exposed to heat. After cooling: persistent risk of physical explosion.

5.3.2 Special protective equipment for fire-fighters:

Insulating gloves. Protective clothing. Compressed air/oxygen apparatus.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures:

Keep upwind. Seal off low-lying areas. Close doors and windows of adjacent premises. Stop engines and no smoking. No naked flames or sparks. Spark- and explosionproof appliances and lighting equipment. Avoid ingress of water in the containers.

6.1.1 Protective equipment for non-emergency personnel

See heading 8.2

6.1.2 Protective equipment for emergency responders

Insulating gloves. Protective clothing.

Suitable protective clothing

See heading 8.2

6.2 Environmental precautions:

Contain released substance, pump into suitable containers. Plug the leak, cut off the supply. Dam up the liquid spill. Tip the container on one side to stop the leakage. Try to reduce evaporation. Prevent spreading in sewers.

6.3 Methods and material for containment and cleaning up:

Prevent evaporation by covering with: foam. Damaged/cooled tanks must be emptied. Do not use compressed air for pumping over spills. Take collected spill to manufacturer/competent authority. Wash clothing and equipment after handling.

6.4 Reference to other sections:

See heading 13.

SECTION 7: Handling and storage

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

7.1 Precautions for safe handling:

Use spark-/explosionproof appliances and lighting system. Take precautions against electrostatic charges. Keep away from naked flames/heat. Keep away from ignition sources/sparks. Gas/vapour heavier than air at 20°C. Observe normal hygiene standards.

7.2 Conditions for safe storage, including any incompatibilities:**7.2.1 Safe storage requirements:**

Store in a cool area. Keep out of direct sunlight. Store in a dry area. Ventilation at floor level. Provide for an automatic sprinkler system. Provide for a tub to collect spills. Provide the tank with earthing. Meet the legal requirements.

7.2.2 Keep away from:

Heat sources, ignition sources, highly flammable materials, oxidizing agents, (strong) acids, halogens.

7.2.3 Suitable packaging material:

Steel, aluminium, iron, copper, bronze.

7.2.4 Non suitable packaging material:

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No data available

7.3 Specific end use(s):

If applicable and available, exposure scenarios are attached in annex. See information supplied by the manufacturer.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters:

8.1.1 Occupational exposure

a) Occupational exposure limit values

If limit values are applicable and available these will be listed below.

The Netherlands

Dimethylether	Time-weighted average exposure limit 8 h (Public occupational exposure limit value)	496 ppm	
	Time-weighted average exposure limit 8 h (Public occupational exposure limit value)	950 mg/m ³	
	Short time value (Public occupational exposure limit value)	783 ppm	
	Short time value (Public occupational exposure limit value)	1500 mg/m ³	
n-Butaan	Time-weighted average exposure limit 8 h (Private occupational exposure limit value)	592 ppm	
	Time-weighted average exposure limit 8 h (Private occupational exposure limit value)	1430 mg/m ³	

EU

Dimethylether	Time-weighted average exposure limit 8 h (Indicative occupational exposure limit value)	1000 ppm	
	Time-weighted average exposure limit 8 h (Indicative occupational exposure limit value)	1920 mg/m ³	

Belgium

Hydrocarbures aliphatiques sous forme gazeuse : (Alcanes C1-C4)	Time-weighted average exposure limit 8 h	1000 ppm	
Oxyde de diméthyle	Time-weighted average exposure limit 8 h	1000 ppm	
	Time-weighted average exposure limit 8 h	1920 mg/m ³	

USA (TLV-ACGIH)

Butane, all isomers	Time-weighted average exposure limit 8 h (TLV - Adopted Value)	1000 ppm	
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Germany

Butan	Time-weighted average exposure limit 8 h (TRGS 900)	1000 ppm	
	Time-weighted average exposure limit 8 h (TRGS 900)	2400 mg/m ³	
Dimethylether	Time-weighted average exposure limit 8 h (TRGS 900)	1000 ppm	
	Time-weighted average exposure limit 8 h (TRGS 900)	1900 mg/m ³	
Isobutan	Time-weighted average exposure limit 8 h (TRGS 900)	1000 ppm	
	Time-weighted average exposure limit 8 h (TRGS 900)	2400 mg/m ³	
Propan	Time-weighted average exposure limit 8 h (TRGS 900)	1000 ppm	
	Time-weighted average exposure limit 8 h (TRGS 900)	1800 mg/m ³	

France

n-Butane	Time-weighted average exposure limit 8 h (VL: Valeur non réglementaire indicative)	800 ppm	
	Time-weighted average exposure limit 8 h (VL: Valeur non réglementaire indicative)	1900 mg/m ³	
Oxyde de diméthyle	Time-weighted average exposure limit 8 h (VRI: Valeur réglementaire indicative)	1000 ppm	
	Time-weighted average exposure limit 8 h (VRI: Valeur réglementaire indicative)	1920 mg/m ³	

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UK

Butane	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	600 ppm	
	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	1450 mg/m ³	
	Short time value (Workplace exposure limit (EH40/2005))	750 ppm	
	Short time value (Workplace exposure limit (EH40/2005))	1810 mg/m ³	
Dimethyl ether	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	400 ppm	
	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	766 mg/m ³	
	Short time value (Workplace exposure limit (EH40/2005))	500 ppm	
	Short time value (Workplace exposure limit (EH40/2005))	958 mg/m ³	

b) National biological limit values

If limit values are applicable and available these will be listed below.

8.1.2 Sampling methods

If applicable and available it will be listed below.

8.1.3 Applicable limit values when using the substance or mixture as intended

If limit values are applicable and available these will be listed below.

8.1.4 DNEL/PNEC values

DNEL - Workers

dimethyl ether

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term systemic effects inhalation	1894 mg/m ³	

DNEL - General population

dimethyl ether

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term systemic effects inhalation	471 mg/m ³	

PNEC

dimethyl ether

Compartments	Value	Remark
Fresh water	0.155 mg/l	
Marine water	0.016 mg/l	
Aqua (intermittent releases)	1.549 mg/l	
Wastewater treatment plant	160 mg/l	
Fresh water sediment	0.681 mg/kg sediment dw	
Marine water sediment	0.069 mg/kg sediment dw	
Soil	0.045 mg/kg soil dw	

8.1.5 Control banding

If applicable and available it will be listed below.

8.2 Exposure controls:

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

8.2.1 Appropriate engineering controls

Use spark-/explosionproof appliances and lighting system. Take precautions against electrostatic charges. Keep away from naked flames/heat. Keep away from ignition sources/sparks. Before use: check for peroxides and eliminate them. Measure the concentration in the air regularly. Work under local exhaust/ventilation.

8.2.2 Individual protection measures, such as personal protective equipment

Observe normal hygiene standards. Do not eat, drink or smoke during work.

a) Respiratory protection:

Gas mask with filter type AX. High vapour/gas concentration: self-contained respirator.

b) Hand protection:

Insulated gloves.

- materials (good resistance)

Leather, chlorinated polyethylene, neoprene, polyethylene.

- materials (less resistance)

PVC.

- materials (poor resistance)

Rubber, viton.

c) Eye protection:

Protective goggles.

d) Skin protection:

Protective clothing.

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8.2.3 Environmental exposure controls:

See headings 6.2, 6.3 and 13

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties:

Physical form	Liquefied gas
Odour	Characteristic odour
Odour threshold	No data available
Colour	Colourless
Particle size	Not applicable (gas)
Explosion limits	2.3 - 13.4 vol %
Flammability	Extremely flammable gas.
Log Kow	Not applicable (mixture)
Dynamic viscosity	No data available
Kinematic viscosity	No data available
Melting point	-150 °C ; 1013 hPa
Boiling point	-21 - -18.3 °C ; 1013 hPa
Flash point	-62 - -55 °C
Evaporation rate	No data available
Relative vapour density	1.73 - 2.21
Vapour pressure	3100 - 3500 hPa ; 20 °C
Solubility	water ; 18 - 24 g/100 ml ; 20 °C methanol ; soluble ethanol ; soluble isopropanol ; soluble chlorinated hydrocarbons ; soluble toluene ; soluble
Relative density	0.613 - 0.635 ; 20 °C
Decomposition temperature	No data available
Auto-ignition temperature	395 °C
Explosive properties	No chemical group associated with explosive properties
Oxidising properties	No chemical group associated with oxidising properties
pH	No data available

9.2 Other information:

Absolute density	613 - 635 kg/m ³ ; 20 °C
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SECTION 10: Stability and reactivity

10.1 Reactivity:

May build up electrostatic charges: risk of ignition. May be ignited by sparks. Gas/vapour spreads at floor level: ignition hazard.

10.2 Chemical stability:

Stable under normal conditions.

10.3 Possibility of hazardous reactions:

Reacts violently with many compounds e.g.: with (strong) oxidizers, with (some) halogens and with (some) acids: (increased) risk of fire/explosion. Prolonged storage: may form peroxides.

10.4 Conditions to avoid:

Use spark-/explosionproof appliances and lighting system. Take precautions against electrostatic charges. Keep away from naked flames/heat. Keep away from ignition sources/sparks.

10.5 Incompatible materials:

Highly flammable materials, oxidizing agents, (strong) acids, halogens.

10.6 Hazardous decomposition products:

Upon combustion: CO and CO₂ are formed.

SECTION 11: Toxicological information

11.1 Information on toxicological effects:

11.1.1 Test results

Acute toxicity

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No (test)data on the mixture available

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dimethyl ether

Route of exposure	Parameter	Method	Value	Exposure time	Species	Value determination	Remark
Oral						Data waiving	
Dermal						Data waiving	
Inhalation (gases)	LC50	Other	309 mg/l	4 h	Rat (male)	Experimental value	
Inhalation (gases)	LC50	Other	164000 ppm	4 h	Rat (male)	Experimental value	

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Route of exposure	Parameter	Method	Value	Exposure time	Species	Value determination	Remark
Oral						Data waiving	
Dermal						Data waiving	
Inhalation (gases)	LC50		1443 mg/l	15 minutes	Rat (male/female)	Experimental value	
Inhalation (gases)	LC50	Other	520400 ppm	2 h	Mouse (male)	Experimental value	
Inhalation (gases)	LC50	Other	1237 mg/l	2 h	Mouse (male)	Experimental value	

Judgement is based on the relevant ingredients

As the substance is a gas, inhalation is the most appropriate route of exposure

Conclusion

Low acute toxicity by the inhalation route

Corrosion/irritation

dimethyl ether - isobutane, mixture

No (test)data on the mixture available

dimethyl ether

Route of exposure	Result	Method	Exposure time	Time point	Species	Value determination	Remark
Eye						Data waiving	
Skin						Data waiving	

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Route of exposure	Result	Method	Exposure time	Time point	Species	Value determination	Remark
Eye						Data waiving	
Skin						Data waiving	

Judgement is based on the relevant ingredients

The liquid form can cause frostbites, typical for all liquified gases

Conclusion

Not classified as irritating to the skin

Not classified as irritating to the eyes

Not classified as irritating to the respiratory system

Respiratory or skin sensitisation

dimethyl ether - isobutane, mixture

No (test)data on the mixture available

dimethyl ether

Route of exposure	Result	Method	Exposure time	Observation time point	Species	Value determination	Remark
Skin						Data waiving	

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Route of exposure	Result	Method	Exposure time	Observation time point	Species	Value determination	Remark
Skin						Data waiving	
Inhalation (gases)						Data waiving	

Judgement is based on the relevant ingredients

The study on skin sensitisation does not need to be conducted as the substance is a gas

Conclusion

Not classified as sensitizing for skin

Not classified as sensitizing for inhalation

Specific target organ toxicity

dimethyl ether - isobutane, mixture

No (test)data on the mixture available

dimethyl ether - isobutane, mixture

dimethyl ether

Route of exposure	Parameter	Method	Value	Organ	Effect	Exposure time	Species	Value determination
Oral								Data waiving
Dermal								Data waiving
Inhalation (vapours)	NOAEC	Equivalent to OECD 452	47106 mg/m ³		No effect	2 year(s) (6h/day, 5 days/week)	Rat (male/female)	Experimental value

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Route of exposure	Parameter	Method	Value	Organ	Effect	Exposure time	Species	Value determination
Oral								Data waiving
Dermal								Data waiving
Inhalation (gases)	NOAEC systemic effects	OECD 422	9000 ppm		No effect	6 weeks (6h/day, 7 days/week)	Rat (male/female)	Experimental value
Inhalation (gases)	NOAEC systemic effects	OECD 422	21394 mg/m ³ air		No effect	6 weeks (6h/day, 7 days/week)	Rat (male/female)	Experimental value

Judgement is based on the relevant ingredients

As the substance is a gas, inhalation is the most appropriate route of exposure

Conclusion

Not classified for subchronic toxicity

Mutagenicity (in vitro)

dimethyl ether - isobutane, mixture

No (test)data on the mixture available

dimethyl ether

Result	Method	Test substrate	Effect	Value determination
Negative with metabolic activation, negative without metabolic activation	OECD 471	Bacteria (S.typhimurium)	No effect	Experimental value
Negative with metabolic activation, negative without metabolic activation	OECD 473	Human lymphocytes	No effect	Experimental value

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Result	Method	Test substrate	Effect	Value determination
Negative with metabolic activation, negative without metabolic activation	OECD 473	Human lymphocytes	No effect	Experimental value
Negative with metabolic activation, negative without metabolic activation	OECD 471	Bacteria (S.typhimurium)	No effect	Experimental value

Mutagenicity (in vivo)

dimethyl ether - isobutane, mixture

No (test)data on the mixture available

dimethyl ether

Result	Method	Exposure time	Test substrate	Organ	Value determination
Negative	Drosophila SLRL test (gene mutation)	3-14 day(s)	Drosophila melanogaster (male)		Experimental value

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Result	Method	Exposure time	Test substrate	Organ	Value determination
Negative	OECD 474	13 weeks (6h/day, 5 days/week)	Rat (male/female)	Bone marrow	Read-across

Carcinogenicity

dimethyl ether - isobutane, mixture

No (test)data on the mixture available

dimethyl ether

Route of exposure	Parameter	Method	Value	Exposure time	Species	Value determination	Organ	Effect
Inhalation (vapours)	NOAEL	Equivalent to OECD 453	2.5 %	2 year(s) (6h/day, 5 days/week)	Rat (male/female)	Experimental value		No carcinogenic effect

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Route of exposure	Parameter	Method	Value	Exposure time	Species	Value determination	Organ	Effect
Inhalation (gases)						Data waiving		
Dermal						Data waiving		
Oral						Data waiving		

Reproductive toxicity

dimethyl ether - isobutane, mixture

No (test)data on the mixture available

dimethyl ether

	Parameter	Method	Value	Exposure time	Species	Effect	Organ	Value determination
Developmental toxicity	NOAEL	Equivalent to OECD 414	40000 ppm		Rat	No effect		Experimental value
Maternal toxicity	NOAEL	Equivalent to OECD 414	5000 ppm		Rat	No effect		Experimental value
Effects on fertility	NOAEL	Investigation reproductive capacity	2.5 %	2 year(s) (6h/day, 5 days/week)	Rat (male/female)	No effect		Experimental value

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	Parameter	Method	Value	Exposure time	Species	Effect	Organ	Value determination
Developmental toxicity	NOAEC	OECD 422	12000 ppm	6 weeks (6h/day, 7 days/week)	Rat (female)	No effect		Experimental value
	NOAEC	OECD 422	21641 mg/m ³ air	6 weeks (6h/day, 7 days/week)	Rat (female)	No effect		Experimental value
Maternal toxicity	NOAEC	OECD 422	12000 ppm	6 weeks (6h/day, 7 days/week)	Rat (female)	No effect		Experimental value
	NOAEC	OECD 422	21641 mg/m ³ air	6 weeks (6h/day, 7 days/week)	Rat (female)	No effect		Experimental value
Effects on fertility	NOAEC (P/F1)	OECD 422	9000 ppm	6 weeks (6h/day, 7 days/week)	Rat (male/female)	No effect		Experimental value
	NOAEC (P/F1)	OECD 422	21394 mg/m ³ air	6 weeks (6h/day, 7 days/week)	Rat (male/female)	No effect		Experimental value

Judgement is based on the relevant ingredients

Conclusion CMR

Not classified for carcinogenicity

Not classified for mutagenic or genotoxic toxicity

Not classified for reprotoxic or developmental toxicity

Toxicity other effects

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No (test)data on the mixture available

Chronic effects from short and long-term exposure

dimethyl ether - isobutane, mixture

No effects known.

SECTION 12: Ecological information

12.1 Toxicity:

dimethyl ether - isobutane, mixture

No (test)data on the mixture available

dimethyl ether - isobutane, mixture

dimethyl ether

	Parameter	Method	Value	Duration	Species	Test design	Fresh/salt water	Value determination
Acute toxicity fishes	LC50	Other	> 4100 mg/l	96 h	Poecilia reticulata	Semi-static system	Fresh water	Experimental value
	NOEC	Other	>=4100 mg/l	96 h	Poecilia reticulata	Semi-static system	Fresh water	Experimental value
Acute toxicity invertebrates	EC50	Other	> 4400 mg/l	48 h	Daphnia magna	Static system	Fresh water	Experimental value
Toxicity algae and other aquatic plants	EC50	ECOSAR v1.00	154.9 mg/l	96 h	Algae			QSAR
Toxicity aquatic micro-organisms	EC10		> 1600 mg/l		Pseudomonas putida	Static system	Fresh water	Literature study

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	Parameter	Method	Value	Duration	Species	Test design	Fresh/salt water	Value determination
Acute toxicity fishes	LC50		9.89 mg/l	96 h	Pimephales promelas			QSAR
	LC50	Other	27.98 mg/l	96 h	Pisces		Fresh water	QSAR
Acute toxicity invertebrates	LC50		10.67 mg/l	48 h	Daphnia magna			QSAR
	LC50		16.33 mg/l	48 h	Daphnia sp.		Fresh water	QSAR
Toxicity algae and other aquatic plants	EC50		7.15 mg/l	72 h	Algae			QSAR
	EC50		8.57 mg/l	96 h	Chlorophyta		Fresh water	QSAR
Long-term toxicity fish	NOEC		1.42 mg/l	768 h	Pimephales promelas			QSAR
Long-term toxicity aquatic invertebrates	NOEC		0.77 mg/l	504 h	Daphnia magna			QSAR

Classification of the mixture is based on the relevant ingredients of the mixture

Conclusion

Classification concerning the environment: not applicable

12.2 Persistence and degradability:

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Half-life soil (t1/2 soil)

Method	Value	Primary degradation/mineralisation	Value determination
Not applicable (gas)			

dimethyl ether

Biodegradation water

Method	Value	Duration	Value determination
OECD 301D: Closed Bottle Test	5 %	28 day(s)	Experimental value

Phototransformation air (DT50 air)

Method	Value	Conc. OH-radicals	Value determination
	<8 day(s)		Experimental value

Half-life soil (t1/2 soil)

Method	Value	Primary degradation/mineralisation	Value determination
Not applicable (gas)			

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Biodegradation water

Method	Value	Duration	Value determination
	72.6 %	35 day(s)	Literature study
	100 %	385.5 h	Experimental value

Phototransformation air (DT50 air)

Method	Value	Conc. OH-radicals	Value determination
Other	1906 day(s)	5.105 molecule/cm ³	Calculated value

Half-life soil (t1/2 soil)

Method	Value	Primary degradation/mineralisation	Value determination
			Not applicable (gas)

Conclusion

Contains non readily biodegradable component(s)

12.3 Bioaccumulative potential:

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Log Kow

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Method	Remark	Value	Temperature	Value determination
	Not applicable (mixture)			

dimethyl ether

Log Kow

Method	Remark	Value	Temperature	Value determination
		0.07		
KOWWIN		0.07	25 °C	QSAR

isobutane

BCF fishes

Parameter	Method	Value	Duration	Species	Value determination
BCF		20 - 52		Pisces	QSAR

BCF other aquatic organisms

Parameter	Method	Value	Duration	Species	Value determination
BCF		20 - 52		Daphnia magna	QSAR

Log Kow

Method	Remark	Value	Temperature	Value determination
		2.8	20 °C	Experimental value

Conclusion

Does not contain bioaccumulative component(s)

12.4 Mobility in soil:

dimethyl ether

Volatility (Henry's Law constant H)

Value	Method	Temperature	Remark	Value determination
518.6 Pa.m ³ /mol	Other			Literature study

Percent distribution

Method	Fraction air	Fraction biota	Fraction sediment	Fraction soil	Fraction water	Value determination
Mackay level III	99.5 %		0 %	0.04 %	0.43 %	Calculated value

Conclusion

Not applicable (gas)

12.5 Results of PBT and vPvB assessment:

Does not contain component(s) that meet(s) the criteria of PBT and/or vPvB as listed in Annex XIII of Regulation (EC) No 1907/2006.

12.6 Other adverse effects:

dimethyl ether - isobutane, mixture

Global warming potential (GWP)

None of the known components is included in the list of fluorinated greenhouse gases (Regulation (EC) No 842/2006)

Ozone-depleting potential (ODP)

Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009)

SECTION 13: Disposal considerations

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

13.1 Waste treatment methods:

13.1.1 Provisions relating to waste

Waste material code (Directive 2008/98/EC, Decision 2000/0532/EC).

16 05 04* (gases in pressure containers and discarded chemicals: gases in pressure containers (including halons) containing dangerous substances).

Hazardous waste according to Directive 2008/98/EC.

13.1.2 Disposal methods

Refer to manufacturer/supplier for information on recovery/ recycling. Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Do not discharge into drains or the environment.

13.1.3 Packaging/Container

Waste material code packaging (Directive 2008/98/EC).

15 01 10* (packaging containing residues of or contaminated by dangerous substances).

SECTION 14: Transport information

Road (ADR)

14.1 UN number:

UN number	3161
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14.2 UN proper shipping name:

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dimethyl ether - isobutane, mixture

Proper shipping name	Liquefied gas, flammable, n.o.s. (dimethyl ether)
14.3 Transport hazard class(es):	
Hazard identification number	23
Class	2
Classification code	2F
14.4 Packing group:	
Packing group	
Labels	2.1
14.5 Environmental hazards:	
Environmentally hazardous substance mark	no
14.6 Special precautions for user:	
Special provisions	274
Limited quantities	none.

Rail (RID)

14.1 UN number:	
UN number	3161
14.2 UN proper shipping name:	
Proper shipping name	Liquefied gas, flammable, n.o.s. (dimethyl ether)
14.3 Transport hazard class(es):	
Hazard identification number	23
Class	2
Classification code	2F
14.4 Packing group:	
Packing group	
Labels	2.1 (+13)
14.5 Environmental hazards:	
Environmentally hazardous substance mark	no
14.6 Special precautions for user:	
Special provisions	274
Limited quantities	none.

Inland waterways (ADN)

14.1 UN number:	
UN number	3161
14.2 UN proper shipping name:	
Proper shipping name	Liquefied gas, flammable, n.o.s. (dimethyl ether)
14.3 Transport hazard class(es):	
Class	2
Classification code	2F
14.4 Packing group:	
Packing group	
Labels	2.1
14.5 Environmental hazards:	
Environmentally hazardous substance mark	no
14.6 Special precautions for user:	
Special provisions	274
Limited quantities	none.

Sea (IMDG/IMSBC)

14.1 UN number:	
UN number	3161
14.2 UN proper shipping name:	
Proper shipping name	Liquefied gas, flammable, n.o.s. (dimethyl ether)
14.3 Transport hazard class(es):	
Class	2.1
14.4 Packing group:	
Packing group	
Labels	2.1
14.5 Environmental hazards:	
Marine pollutant	-
Environmentally hazardous substance mark	no
14.6 Special precautions for user:	
Special provisions	274
Limited quantities	none.
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:	
Annex II of MARPOL 73/78	Not applicable

Air (ICAO-TI/IATA-DGR)

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dimethyl ether - isobutane, mixture

14.1 UN number:	UN number	3161
14.2 UN proper shipping name:	Proper shipping name	Liquefied gas, flammable, n.o.s. (dimethyl ether)
14.3 Transport hazard class(es):	Class	2.1
14.4 Packing group:	Packing group	
	Labels	2.1
14.5 Environmental hazards:	Environmentally hazardous substance mark	no
14.6 Special precautions for user:	Special provisions	A1
	Passenger and cargo transport: limited quantities: maximum net quantity per packaging	

SECTION 15: Regulatory information

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

European legislation:

VOC content Directive 2010/75/EU

VOC content	Remark
100 %	

REACH Annex XVII - Restriction

Contains component(s) subject to restrictions of Annex XVII of Regulation (EC) No 1907/2006: restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles.

	Designation of the substance, of the group of substances or of the mixture	Conditions of restriction
· dimethyl ether · isobutane	Substances classified as flammable gases category 1 or 2, flammable liquids categories 1, 2 or 3, flammable solids category 1 or 2, substances and mixtures which, in contact with water, emit flammable gases, category 1, 2 or 3, pyrophoric liquids category 1 or pyrophoric solids category 1, regardless of whether they appear in Part 3 of Annex VI to that Regulation or not.	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, — “whoopee” 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.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.

National legislation The Netherlands

dimethyl ether - isobutane, mixture

Waste identification (the Netherlands)	LWCA (the Netherlands): KGA category 06
Waterbezwaarlijkheid	11

National legislation Germany

dimethyl ether - isobutane, mixture

WGK	1; Classification water polluting based on the components in compliance with Verwaltungsvorschrift wassergefährdender Stoffe (VwVwS) of 27 July 2005 (Anhang 4)
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dimethyl ether

Schwangerschaft Gruppe	D
MAK 8-Stunden-Mittelwert ppm	Dimethylether; 1000 ppm
MAK 8-Stunden-Mittelwert mg/m ³	Dimethylether; 1900 mg/m ³
TA-Luft	5.2.5

isobutane

Schwangerschaft Gruppe	D
MAK 8-Stunden-Mittelwert ppm	Butan (beide Isomeren); 1000 ppm
MAK 8-Stunden-Mittelwert mg/m ³	Butan (beide Isomeren); 2400 mg/m ³
TA-Luft	5.2.5

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dimethyl ether - isobutane, mixture

butane

Schwangerschaft Gruppe	D
MAK 8-Stunden-Mittelwert ppm	Butan (beide Isomeren); 1000 ppm
MAK 8-Stunden-Mittelwert mg/m ³	Butan (beide Isomeren); 2400 mg/m ³
TA-Luft	5.2.5

propane

Schwangerschaft Gruppe	D
MAK 8-Stunden-Mittelwert ppm	Propan; 1000 ppm
MAK 8-Stunden-Mittelwert mg/m ³	Propan; 1800 mg/m ³
TA-Luft	5.2.5

National legislation France

dimethyl ether - isobutane, mixture

No data available

National legislation Belgium

dimethyl ether - isobutane, mixture

No data available

Other relevant data

dimethyl ether - isobutane, mixture

No data available

15.2 Chemical safety assessment:

No chemical safety assessment is required.

SECTION 16: Other information

Labelling according to Directive 67/548/EEC-1999/45/EC (DSD/DPD)

Labels



Extremely flammable

R-phrases

12 Extremely flammable

S-phrases

(02) (Keep out of the reach of children)
(09) Keep container in a well-ventilated place
(16) Keep away from sources of ignition - No smoking
(33) Take precautionary measures against static discharges
(46) (If swallowed, seek medical advice immediately and show this container or label)

Full text of any R-phrases referred to under headings 2 and 3:

R12 Extremely flammable

Full text of any H-statements referred to under headings 2 and 3:

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

(*) = INTERNAL CLASSIFICATION BY BIG

PBT-substances = persistent, bioaccumulative and toxic substances

DSD Dangerous Substance Directive

DPD Dangerous Preparation Directive

CLP (EU-GHS) Classification, labelling and packaging (Globally Harmonised System in Europe)

The information in this safety data sheet is based on data and samples provided to BIG. The sheet was written to the best of our ability and according to the state of knowledge at that time. The safety data sheet only constitutes a guideline for the safe handling, use, consumption, storage, transport and disposal of the substances/preparations/mixtures mentioned under point 1. New safety data sheets are written from time to time. Only the most recent versions may be used. Old versions must be destroyed. Unless indicated otherwise word for word on the safety data sheet, the information does not apply to substances/preparations/mixtures in purer form, mixed with other substances or in processes. The safety data sheet offers no quality specification for the substances/preparations/mixtures in question. Compliance with the instructions in this safety data sheet does not release the user from the obligation to take all measures dictated by common sense, regulations and recommendations or which are necessary and/or useful based on the real applicable circumstances. BIG does not guarantee the accuracy or exhaustiveness of the information provided and cannot be held liable for any changes by third parties. This safety data sheet is only to be used within the European Union, Switzerland, Iceland, Norway and Liechtenstein. Any use outside of this area is at your own risk. Use of this safety data sheet is subject to the licence and liability limiting conditions as stated in your BIG licence agreement or when this is failing the general conditions of BIG. All intellectual property rights to this sheet are the property of BIG and its distribution and reproduction are limited. Consult the mentioned agreement/conditions for details.

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