

SAFETY DATA SHEET

QUALITATIVE - PEAK ID MIX ASTM-D4815, Part Number 8500-8434

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

1.1 Product identifier

Product name : QUALITATIVE - PEAK ID MIX ASTM-D4815, Part Number 8500-8434
Part no. : 8500-8434

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

Identified uses : Analytical chemistry.
1 x 1 ml.
Uses advised against : None known.

1.3 Details of the supplier of the safety data sheet

Agilent Technologies Deutschland GmbH
Hewlett-Packard-Str. 8
76337 Waldbronn
Germany
0800 603 1000
e-mail address of person responsible for this SDS : pdl-msds_author@agilent.com

1.4 Emergency telephone number

Emergency telephone number (with hours of operation) : CHEMTREC®: +(44)-870-8200418

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

H225	FLAMMABLE LIQUIDS	Category 2
H302	ACUTE TOXICITY (oral)	Category 4
H315	SKIN CORROSION/IRRITATION	Category 2
H318	SERIOUS EYE DAMAGE/EYE IRRITATION	Category 1
H340	GERM CELL MUTAGENICITY	Category 1B
H350	CARCINOGENICITY	Category 1A
H360FD	REPRODUCTIVE TOXICITY	Category 1B
H371	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE	Category 2
H335	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Respiratory tract irritation)	Category 3
H336	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Narcotic effects)	Category 3
H373	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE	Category 2
H304	ASPIRATION HAZARD	Category 1

The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.

Ingredients of unknown toxicity : Percentage of the mixture consisting of ingredient(s) of unknown acute dermal toxicity: 10 - 30%
 Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: 10 - 30%
 Percentage of the mixture consisting of ingredient(s) of unknown acute oral toxicity: 10 - 30%

Ingredients of unknown ecotoxicity : Contains 4% of components with unknown hazards to the aquatic environment

SECTION 2: Hazards identification

See Section 16 for the full text of the H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard pictograms :



Signal word : Danger

Hazard statements :

- H225 - Highly flammable liquid and vapour.
- H302 - Harmful if swallowed.
- H304 - May be fatal if swallowed and enters airways.
- H315 - Causes skin irritation.
- H318 - Causes serious eye damage.
- H335 - May cause respiratory irritation.
- H336 - May cause drowsiness or dizziness.
- H340 - May cause genetic defects.
- H350 - May cause cancer.
- H360FD - May damage fertility. May damage the unborn child.
- H371 - May cause damage to organs.
- H373 - May cause damage to organs through prolonged or repeated exposure.

Precautionary statements

Prevention :

- P201 - Obtain special instructions before use.
- P280 - Wear protective gloves, protective clothing and eye or face protection.
- P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Response : P308 + P313 - IF exposed or concerned: Get medical advice or attention.

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

Disposal : P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazardous ingredients : Propan-2-ol; butan-1-ol; propan-1-ol; butan-2-ol; 2-methylpropan-1-ol; 2-methylbutan-2-ol; methanol; 1,2-dimethoxyethane and benzene

Supplemental label elements : Not applicable.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Restricted to professional users.

Special packaging requirements

Tactile warning of danger : Not applicable.

2.3 Other hazards

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII : This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

Other hazards which do not result in classification : None known.

SECTION 3: Composition/information on ingredients

3.2 Mixtures : Mixture

Product/ingredient name	Identifiers	%	Classification	Specific Conc. Limits, M-factors and ATEs	Type
propan-2-ol	EC: 200-661-7 CAS: 67-63-0 Index: 603-117-00-0	≤10	Flam. Liq. 2, H225 Eye Irrit. 2, H319 STOT SE 3, H336	-	[1] [2]
ethanol	EC: 200-578-6 CAS: 64-17-5 Index: 603-002-00-5	≤10	Flam. Liq. 2, H225 Eye Irrit. 2, H319	Eye Irrit. 2, H319: C ≥ 50%	[1] [2]
butan-1-ol	EC: 200-751-6 CAS: 71-36-3 Index: 603-004-00-6	≤10	Flam. Liq. 3, H226 Acute Tox. 4, H302 Skin Irrit. 2, H315 Eye Dam. 1, H318 STOT SE 3, H335 STOT SE 3, H336	ATE [Oral] = 790 mg/kg	[1] [2]
propan-1-ol	EC: 200-746-9 CAS: 71-23-8 Index: 603-003-00-0	≤10	Flam. Liq. 2, H225 Eye Dam. 1, H318 STOT SE 3, H336	-	[1] [2]
butan-2-ol	EC: 201-158-5 CAS: 78-92-2 Index: 603-127-00-5	≤10	Flam. Liq. 3, H226 Eye Irrit. 2, H319 STOT SE 3, H335 STOT SE 3, H336	-	[1] [2]
2-methylpropan-1-ol	EC: 201-148-0 CAS: 78-83-1 Index: 603-108-00-1	≤10	Flam. Liq. 3, H226 Skin Irrit. 2, H315 Eye Dam. 1, H318 STOT SE 3, H335 STOT SE 3, H336	-	[1] [2]
2-methylbutan-2-ol	EC: 200-908-9 CAS: 75-85-4 Index: 603-007-00-2	≤8.3	Flam. Liq. 2, H225 Acute Tox. 4, H312 Acute Tox. 4, H332 Skin Irrit. 2, H315 Eye Dam. 1, H318 STOT SE 3, H335 STOT SE 3, H336	ATE [Dermal] = 1100 mg/kg ATE [Inhalation (vapours)] = 11 mg/l	[1]
2-methylpropan-2-ol	EC: 200-889-7 CAS: 75-65-0 Index: 603-005-00-1	≤10	Flam. Liq. 2, H225 Acute Tox. 4, H332 Eye Irrit. 2, H319 STOT SE 3, H335 STOT SE 3, H336	ATE [Inhalation (gases)] = 14100 ppm	[1] [2]
methanol	EC: 200-659-6 CAS: 67-56-1	≤8.3	Flam. Liq. 2, H225 Acute Tox. 3, H301 Acute Tox. 3, H311 Acute Tox. 3, H331 STOT SE 1, H370 (central nervous system (CNS), optic nerve)	ATE [Oral] = 100 mg/kg ATE [Dermal] = 300 mg/kg ATE [Inhalation (vapours)] = 3 mg/l STOT SE 1, H370: C ≥ 10% STOT SE 2, H371: 3% ≤ C < 10%	[1] [2]
2-methoxy-2-methylbutane	EC: 213-611-4 CAS: 994-05-8 Index: 603-213-00-2	≤10	Flam. Liq. 2, H225 Acute Tox. 4, H302 STOT SE 3, H336	ATE [Oral] = 1602 mg/kg	[1]
1,2-dimethoxyethane	EC: 203-794-9	≤6.8	Flam. Liq. 2, H225	ATE [Inhalation	[1]

SECTION 3: Composition/information on ingredients

	CAS: 110-71-4 Index: 603-031-00-3		Acute Tox. 4, H332 Repr. 1B, H360FD EUH019	(vapours)] = 11 mg/l	
benzene	EC: 200-753-7 CAS: 71-43-2 Index: 601-020-00-8	<10	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Muta. 1B, H340 Carc. 1A, H350 STOT RE 1, H372 Asp. Tox. 1, H304 Aquatic Chronic 3, H412	-	[1] [2]
tert-butyl methyl ether	EC: 216-653-1 CAS: 1634-04-4 Index: 603-181-00-X	≤5	Flam. Liq. 2, H225 Skin Irrit. 2, H315	-	[1] [2]
methylcyclopentane	EC: 202-503-2 CAS: 96-37-7	≤5	Flam. Liq. 2, H225 Skin Irrit. 2, H315 STOT SE 3, H336 Asp. Tox. 1, H304	-	[1]
2-ethoxy-2-methylpropane	EC: 211-309-7 CAS: 637-92-3	≤5	Flam. Liq. 2, H225 STOT SE 3, H336	-	[1] [2]
diisopropyl ether	EC: 203-560-6 CAS: 108-20-3 Index: 603-045-00-X	≤5	Flam. Liq. 2, H225 STOT SE 3, H336 EUH019 EUH066 See Section 16 for the full text of the H statements declared above.	-	[1] [2]

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment, are PBTs, vPvBs or Substances of equivalent concern, or have been assigned a workplace exposure limit and hence require reporting in this section.

Type

[1] Substance classified with a health or environmental hazard

[2] Substance with a workplace exposure limit

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

4.1 Description of first aid measures

- Eye contact** : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.
- Inhalation** : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

SECTION 4: First aid measures

- Ingestion** : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Aspiration hazard if swallowed. Can enter lungs and cause damage. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

- Eye contact** : Causes serious eye damage.
- Inhalation** : May cause damage to organs following a single exposure if inhaled. Can cause central nervous system (CNS) depression. May cause drowsiness or dizziness. May cause respiratory irritation.
- Skin contact** : May cause damage to organs following a single exposure in contact with skin. Causes skin irritation.
- Ingestion** : Harmful if swallowed. May cause damage to organs following a single exposure if swallowed. Can cause central nervous system (CNS) depression. May be fatal if swallowed and enters airways.

Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:
 pain
 watering
 redness
- Inhalation** : Adverse symptoms may include the following:
 respiratory tract irritation
 coughing
 nausea or vomiting
 headache
 drowsiness/fatigue
 dizziness/vertigo
 unconsciousness
 reduced foetal weight
 increase in foetal deaths
 skeletal malformations
- Skin contact** : Adverse symptoms may include the following:
 pain or irritation
 redness
 blistering may occur
 reduced foetal weight
 increase in foetal deaths
 skeletal malformations
- Ingestion** : Adverse symptoms may include the following:
 stomach pains
 nausea or vomiting
 reduced foetal weight
 increase in foetal deaths
 skeletal malformations

4.3 Indication of any immediate medical attention and special treatment needed

- Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

SECTION 4: First aid measures

Specific treatments : No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use dry chemical, CO₂, water spray (fog) or foam.

Unsuitable extinguishing media : Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture : Highly flammable liquid and vapour. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapour/gas is heavier than air and will spread along the ground. Vapours may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back.

Hazardous combustion products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
Formaldehyde.

5.3 Advice for firefighters

Special precautions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental precautions

: Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

6.4 Reference to other sections

: See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not swallow. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

- Storage** : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidising materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Seveso Directive - Reporting thresholds

Danger criteria

Category	Notification and MAPP threshold	Safety report threshold
P5c	5000 tonne	50000 tonne

7.3 Specific end use(s)

- Recommendations** : Industrial applications, Professional applications.
- Industrial sector specific solutions** : Not available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
propan-2-ol	NAOSH (Ireland, 5/2021). Absorbed through skin. Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV: 200 ppm 8 hours. OELV: 400 ppm 15 minutes.
ethanol	NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV: 1000 ppm 15 minutes.
butan-1-ol	NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV: 20 ppm 8 hours.
propan-1-ol	NAOSH (Ireland, 5/2021). Absorbed through skin. Notes: Advisory Occupational Exposure Limit Values (OELVs)

SECTION 8: Exposure controls/personal protection

butan-2-ol	OELV: 100 ppm 8 hours. NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV: 100 ppm 8 hours. OELV: 300 mg/m ³ 8 hours. OELV: 150 ppm 15 minutes. OELV: 450 mg/m ³ 15 minutes.
2-methylpropan-1-ol	NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV: 50 ppm 8 hours. OELV: 150 mg/m ³ 8 hours. OELV: 75 ppm 15 minutes. OELV: 225 mg/m ³ 15 minutes.
2-methylpropan-2-ol	NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV: 100 ppm 8 hours. OELV: 300 mg/m ³ 8 hours.
Methanol	NAOSH (Ireland, 5/2021). Absorbed through skin. Notes: EU derived Occupational Exposure Limit Values OELV: 200 ppm 8 hours. OELV: 260 mg/m ³ 8 hours.
benzene	NAOSH (Ireland, 5/2021). Absorbed through skin. Notes: EU derived Occupational Exposure Limit Values OELV: 1 ppm 8 hours. OELV: 3.25 mg/m ³ 8 hours.
tert-butyl methyl ether	NAOSH (Ireland, 5/2021). Notes: EU derived Occupational Exposure Limit Values OELV: 367 mg/m ³ 15 minutes. OELV: 100 ppm 15 minutes. OELV: 183.5 mg/m ³ 8 hours. OELV: 50 ppm 8 hours.
2-Ethoxy-2-methylpropane	NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV: 25 ppm 8 hours.
diisopropyl ether	NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV: 250 ppm 8 hours. OELV: 1050 mg/m ³ 8 hours. OELV: 310 ppm 15 minutes. OELV: 1320 mg/m ³ 15 minutes.

Biological exposure indices

Product/ingredient name	Exposure indices
propan-2-ol	NAOSH (Ireland, 1/2011) BMGV: 40 mg/l, acetone [in urine]. Sampling time: end of shift at end of workweek.
Methanol	NAOSH (Ireland, 1/2011) BMGV: 15 mg/l, methanol [in urine]. Sampling time: end of shift - As soon as possible after exposure ceases.
benzene	NAOSH (Ireland, 1/2011) BMGV: 500 µg/g creatinine, t,t-Muconic acid [in urine]. Sampling time: end of shift - As soon as possible after exposure ceases. BMGV: 25 µg/g creatinine, S-phenylmercapturic acid [in urine]. Sampling time: end of shift - As soon as possible after exposure ceases.

SECTION 8: Exposure controls/personal protection

Recommended monitoring procedures

: Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

Product/ingredient name	Type	Exposure	Value	Population	Effects
propan-2-ol	DNEL	Long term Inhalation	500 mg/m ³	Workers	Systemic
	DNEL	Long term Dermal	888 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Oral	26 mg/kg bw/day	General population	Systemic
	DNEL	Short term Oral	51 mg/kg bw/day	General population	Systemic
	DNEL	Long term Inhalation	89 mg/m ³	General population	Systemic
	DNEL	Short term Inhalation	178 mg/m ³	General population	Systemic
	DNEL	Long term Dermal	319 mg/kg bw/day	General population	Systemic
ethanol	DNEL	Short term Inhalation	1000 mg/m ³	Workers	Systemic
	DNEL	Long term Inhalation	380 mg/m ³	Workers	Systemic
	DNEL	Long term Oral	87 mg/kg bw/day	General population	Systemic
	DNEL	Long term Inhalation	114 mg/m ³	General population	Systemic
	DNEL	Long term Dermal	206 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	343 mg/kg bw/day	Workers	Systemic
	DNEL	Short term Inhalation	950 mg/m ³	General population	Local
butan-1-ol	DNEL	Short term Inhalation	1900 mg/m ³	Workers	Local
	DNEL	Long term Oral	1.5625 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	3.125 mg/kg bw/day	General population	Systemic
	DNEL	Long term Inhalation	55.357 mg/m ³	General population	Systemic
	DNEL	Long term Inhalation	155 mg/m ³	General population	Local
propan-1-ol	DNEL	Long term Inhalation	310 mg/m ³	Workers	Local
	DNEL	Short term Inhalation	518 mg/m ³	General population	Systemic
	DNEL	Short term Inhalation	1037 mg/m ³	Workers	Systemic
butan-2-ol	DNEL	Long term Oral	15 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	203 mg/kg bw/day	General population	Systemic
	DNEL	Long term Inhalation	213 mg/m ³	General population	Systemic
	DNEL	Long term Dermal	405 mg/kg bw/day	Workers	Systemic

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2-methylpropan-1-ol	DNEL	Long term Inhalation	600 mg/m ³	Workers	Systemic	
	DNEL	Long term Inhalation	55 mg/m ³	General population	Local	
2-methylbutan-2-ol	DNEL	Long term Inhalation	310 mg/m ³	Workers	Local	
	DNEL	Long term Oral	1.24 mg/kg bw/day	General population	Systemic	
	DNEL	Long term Dermal	1.24 mg/kg bw/day	General population	Systemic	
	DNEL	Long term Dermal	2.5 mg/kg bw/day	Workers	Systemic	
	DNEL	Long term Inhalation	4.3 mg/m ³	General population	Systemic	
	DNEL	Long term Inhalation	17.2 mg/m ³	Workers	Systemic	
	DNEL	Long term Inhalation	66.6 mg/m ³	General population	Local	
2-methylpropan-2-ol	DNEL	Long term Inhalation	267.8 mg/m ³	Workers	Local	
	DNEL	Long term Oral	0.3 mg/kg bw/day	General population	Systemic	
	DNEL	Long term Inhalation	0.5 mg/m ³	General population	Systemic	
	DNEL	Long term Dermal	2.7 mg/kg bw/day	General population	Systemic	
	DNEL	Long term Inhalation	2.7 mg/m ³	Workers	Systemic	
	DNEL	Long term Dermal	5.5 mg/kg bw/day	Workers	Systemic	
	DNEL	Short term Inhalation	159.8 mg/m ³	General population	Systemic	
	DNEL	Short term Inhalation	214 mg/m ³	Workers	Systemic	
	Methanol	DNEL	Short term Oral	4 mg/kg bw/day	General population	Systemic
		DNEL	Long term Oral	4 mg/kg bw/day	General population	Systemic
DNEL		Short term Dermal	4 mg/kg bw/day	General population	Systemic	
DNEL		Long term Dermal	4 mg/kg bw/day	General population	Systemic	
DNEL		Short term Dermal	20 mg/kg bw/day	Workers	Systemic	
DNEL		Long term Dermal	20 mg/kg bw/day	Workers	Systemic	
DNEL		Short term Inhalation	26 mg/m ³	General population	Local	
DNEL		Long term Inhalation	26 mg/m ³	General population	Local	
DNEL		Short term Inhalation	26 mg/m ³	General population	Systemic	
DNEL		Long term Inhalation	26 mg/m ³	General population	Systemic	
DNEL		Short term Inhalation	130 mg/m ³	Workers	Local	
DNEL		Long term Inhalation	130 mg/m ³	Workers	Local	
DNEL		Short term Inhalation	130 mg/m ³	Workers	Systemic	
DNEL		Long term Inhalation	130 mg/m ³	Workers	Systemic	
2-methoxy-2-methylbutane		DNEL	Long term Oral	1 mg/kg bw/day	General population	Systemic

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1,2-dimethoxyethane	DNEL	Long term Inhalation	26.5 mg/m ³	General population	Systemic
	DNEL	Long term Inhalation	88.8 mg/m ³	Workers	Systemic
	DNEL	Short term Inhalation	212 mg/m ³	General population	Systemic
	DNEL	Short term Inhalation	353.3 mg/m ³	Workers	Systemic
	DNEL	Long term Dermal	961 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	1601 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Dermal	0.09 mg/kg bw/day	General population	Systemic
	DNEL	Long term Oral	0.1 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	0.27 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	0.33 mg/m ³	General population	Systemic
benzene	DNEL	Long term Inhalation	1.88 mg/m ³	Workers	Systemic
	DNEL	Long term Inhalation	0.14 mg/m ³	General population	Systemic
tert-butyl methyl ether	DNEL	Long term Oral	7.1 mg/kg bw/day	General population	Systemic
	DNEL	Long term Inhalation	53.6 mg/m ³	General population	Systemic
methylcyclopentane	DNEL	Long term Inhalation	178.5 mg/m ³	Workers	Systemic
	DNEL	Short term Inhalation	214 mg/m ³	General population	Local
	DNEL	Short term Inhalation	357 mg/m ³	Workers	Local
	DNEL	Long term Dermal	3570 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	5100 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	1131 mg/m ³	General population	Systemic
	DNEL	Long term Oral	1301 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	1377 mg/kg bw/day	General population	Systemic
	DNEL	Long term Inhalation	5306 mg/m ³	Workers	Systemic
	DNEL	Long term Dermal	13964 mg/kg bw/day	Workers	Systemic
2-Ethoxy-2-methylpropane	DNEL	Long term Oral	6 mg/kg bw/day	General population	Systemic
	DNEL	Long term Inhalation	63 mg/m ³	General population	Local
	DNEL	Long term Inhalation	105 mg/m ³	General population	Systemic
	DNEL	Long term Inhalation	105 mg/m ³	Workers	Local
	DNEL	Long term Inhalation	352 mg/m ³	Workers	Systemic
	DNEL	Short term Inhalation	1680 mg/m ³	General population	Systemic
	DNEL	Short term Inhalation	2800 mg/m ³	Workers	Systemic
	DNEL	Long term Dermal	4060 mg/kg bw/day	General population	Systemic

SECTION 8: Exposure controls/personal protection

diisopropyl ether	DNEL	Long term Dermal	6767 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Oral	43.1 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	43.1 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	121.4 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	151 mg/m ³	General population	Systemic
	DNEL	Short term Inhalation	302 mg/m ³	General population	Systemic
	DNEL	Long term Inhalation	850 mg/m ³	Workers	Systemic
	DNEL	Short term Inhalation	1700 mg/m ³	Workers	Systemic

PNECs

No PNECs available

8.2 Exposure controls

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

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. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves. Refer to European Standard EN 1149 for further information on material and design requirements and test methods.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

SECTION 8: Exposure controls/personal protection

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

9.1 Information on basic physical and chemical properties**Appearance**

Physical state : Liquid.
Colour : Clear. / Colourless.
Odour : Not available.
Odour threshold : Not available.
Melting point/freezing point : -98°C
Initial boiling point and boiling range : 65°C
Flammability : Not applicable
Upper/lower flammability or explosive limits : Lower: 6%
 Upper: 36.5%
Flash point : Closed cup: 10°C

Auto-ignition temperature

Ingredient name	°C	Method
1,2-dimethoxyethane	202	-
methylcyclopentane	257.85	-

Decomposition temperature : Not available.

pH : Not available.

Viscosity : Not available.

Solubility(ies)

Media	Result
water	Soluble

Miscible with water : Yes.

Partition coefficient: n-octanol/water : Not applicable.

Vapour pressure : 13.3 kPa (100 mm Hg)

Evaporation rate : >1 (butyl acetate = 1)

Relative density : 0.79

Density : 0.79 g/cm³

Vapour density : 1.1 [Air = 1]

Explosive properties : Not available.

Oxidising properties : Not available.

Particle characteristics

Median particle size : Not applicable.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

- 10.1 Reactivity** : No specific test data related to reactivity available for this product or its ingredients.
- 10.2 Chemical stability** : The product is stable.
- 10.3 Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.
- 10.4 Conditions to avoid** : Avoid all possible sources of ignition (spark or flame). Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapour to accumulate in low or confined areas.
- 10.5 Incompatible materials** : Reactive or incompatible with the following materials:
oxidising materials
Reactive or incompatible with the following materials: metals and acids.
- 10.6 Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
propan-2-ol	LD50 Dermal	Rabbit	12800 mg/kg	-
	LD50 Oral	Rat	5000 mg/kg	-
ethanol	LC50 Inhalation Vapour	Rat	124700 mg/m ³	4 hours
	LD50 Oral	Rat	7 g/kg	-
butan-1-ol	LC50 Inhalation Vapour	Rat	24000 mg/m ³	4 hours
	LD50 Dermal	Rabbit	3400 mg/kg	-
propan-1-ol	LD50 Oral	Rat	790 mg/kg	-
	LC50 Inhalation Vapour	Rat - Male, Female	>33.8 mg/l	4 hours
butan-2-ol	LD50 Dermal	Rabbit	5040 mg/kg	-
	LC50 Inhalation Vapour	Rat	48500 mg/m ³	4 hours
	LC50 Inhalation Vapour	Rat	8000 ppm	4 hours
2-methylpropan-1-ol	LD50 Dermal	Rat - Male, Female	>2000 mg/kg	-
	LD50 Oral	Rat	2054 mg/kg	-
2-methylpropan-2-ol	LD50 Dermal	Rabbit	3400 mg/kg	-
	LD50 Oral	Rat	2460 mg/kg	-
Methanol	LC50 Inhalation Gas.	Rat	14100 ppm	4 hours
	LD50 Dermal	Rabbit - Male, Female	>2000 mg/kg	-
2-methoxy-2-methylbutane 1,2-dimethoxyethane	LD50 Oral	Rat	2733 mg/kg	-
	LC50 Inhalation Vapour	Rat	189.95 mg/l	1 hours
	LC50 Inhalation Vapour	Rat	145000 ppm	1 hours
	LC50 Inhalation Vapour	Rat	83.84 mg/l	4 hours
	LC50 Inhalation Vapour	Rat	64000 ppm	4 hours
tert-butyl methyl ether	LD50 Dermal	Rabbit	15800 mg/kg	-
	LD50 Oral	Rat	5600 mg/kg	-
2-Ethoxy-2-methylpropane	LD50 Oral	Rat	1602 mg/kg	-
	LD50 Dermal	Rabbit	2000 mg/kg	-
diisopropyl ether	LD50 Oral	Rat	775 mg/kg	-
	LD50 Oral	Rat	41000 mg/m ³	4 hours
	LC50 Inhalation Vapour	Rat	23576 ppm	4 hours
	LD50 Oral	Rat	4 g/kg	-
	LC50 Inhalation Vapour	Rat	36200 mg/m ³	4 hours
	LD50 Oral	Rat	7150 mg/kg	-
	LD50 Oral	Rat	4.5 g/kg	-

SECTION 11: Toxicological information

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
QUALITATIVE - PEAK ID MIX ASTM-D4815, Part Number 8500-8434	880.2	2809.2	161667.1	23.0	N/A
propan-2-ol	5000	12800	N/A	72.2	N/A
ethanol	7000	N/A	N/A	124.7	N/A
butan-1-ol	790	3400	N/A	24	N/A
propan-1-ol	N/A	5040	N/A	N/A	N/A
butan-2-ol	2054	N/A	N/A	48.5	N/A
2-methylpropan-1-ol	2460	3400	N/A	N/A	N/A
2-methylbutan-2-ol	N/A	1100	N/A	11	N/A
2-methylpropan-2-ol	2733	N/A	14100	N/A	N/A
Methanol	100	300	N/A	3	N/A
2-methoxy-2-methylbutane	1602	N/A	N/A	N/A	N/A
1,2-dimethoxyethane	N/A	N/A	N/A	11	N/A
tert-butyl methyl ether	4000	N/A	N/A	41	N/A
2-Ethoxy-2-methylpropane	7150	N/A	N/A	36.2	N/A
diisopropyl ether	4500	N/A	N/A	N/A	N/A

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
propan-2-ol	Eyes - Moderate irritant	Rabbit	-	10 mg	-
	Eyes - Moderate irritant	Rabbit	-	24 hours 100 mg	-
ethanol	Skin - Mild irritant	Rabbit	-	500 mg	-
	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
butan-1-ol	Eyes - Moderate irritant	Rabbit	-	0.066666667 minutes 100 mg	-
	Eyes - Moderate irritant	Rabbit	-	100 uL	-
	Eyes - Severe irritant	Rabbit	-	0.005 MI	-
	Eyes - Severe irritant	Rabbit	-	24 hours 2 mg	-
propan-1-ol	Skin - Moderate irritant	Rabbit	-	24 hours 20 mg	-
	Eyes - Moderate irritant	Rabbit	-	24 hours 20 mg	-
butan-2-ol	Skin - Mild irritant	Rabbit	-	500 mg	-
	Eyes - Severe irritant	Rabbit	-	0.1 MI	-
	Eyes - Severe irritant	Rabbit	-	24 hours 100 uL	-
2-methylpropan-2-ol	Skin - Mild irritant	Rabbit	-	24 hours 500 uL	-
	Eyes - Moderate irritant	Rabbit	-	24 hours 100 mg	-
Methanol	Eyes - Moderate irritant	Rabbit	-	40 mg	-
	Eyes - Moderate irritant	Rabbit	-	24 hours 20 mg	-
	Skin - Moderate irritant	Rabbit	-	24 hours 20 mg	-
2-methoxy-2-methylbutane	Eyes - Severe irritant	Rabbit	-	24 hours 100 uL	-
	Skin - Severe irritant	Rabbit	-	4 hours 500 uL	-
benzene	Eyes - Moderate irritant	Rabbit	-	88 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 15 mg	-
	Skin - Mild irritant	Rat	-	8 hours 60 uL	-
	Skin - Moderate irritant	Rabbit	-	24 hours 20 mg	-

SECTION 11: Toxicological information

2-Ethoxy-2-methylpropane	Eyes - Moderate irritant	Rabbit	-	24 hours 100 uL	-
	Skin - Moderate irritant	Rabbit	-	4 hours 500 uL	-
diisopropyl ether	Skin - Mild irritant	Rabbit	-	363 mg	-

Skin : Repeated exposure may cause skin dryness or cracking.

Eyes : May cause eye irritation.

Sensitiser

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Repeated or prolonged exposure to the substance can produce reproductive system damage.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
propan-2-ol	Category 3	-	Narcotic effects
butan-1-ol	Category 3	-	Respiratory tract irritation
propan-1-ol	Category 3	-	Narcotic effects
butan-2-ol	Category 3	-	Respiratory tract irritation
2-methylpropan-1-ol	Category 3	-	Narcotic effects
	Category 3	-	Respiratory tract irritation
2-methylbutan-2-ol	Category 3	-	Narcotic effects
	Category 3	-	Respiratory tract irritation
2-methylpropan-2-ol	Category 3	-	Narcotic effects
	Category 3	-	Respiratory tract irritation
Methanol	Category 3	-	Narcotic effects
	Category 1	-	central nervous system (CNS), optic nerve
2-methoxy-2-methylbutane	Category 3	-	Narcotic effects
methylcyclopentane	Category 3	-	Narcotic effects
2-Ethoxy-2-methylpropane	Category 3	-	Narcotic effects
diisopropyl ether	Category 3	-	Narcotic effects

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
benzene	Category 1	-	-

Aspiration hazard

Product/ingredient name	Result
QUALITATIVE - PEAK ID MIX ASTM-D4815, Part Number 8500-8434	ASPIRATION HAZARD - Category 1
benzene	ASPIRATION HAZARD - Category 1
methylcyclopentane	ASPIRATION HAZARD - Category 1

SECTION 11: Toxicological information

Information on likely routes of exposure : Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

Potential acute health effects

- Inhalation** : May cause damage to organs following a single exposure if inhaled. Can cause central nervous system (CNS) depression. May cause drowsiness or dizziness. May cause respiratory irritation.
- Ingestion** : Harmful if swallowed. May cause damage to organs following a single exposure if swallowed. Can cause central nervous system (CNS) depression. May be fatal if swallowed and enters airways.
- Skin contact** : May cause damage to organs following a single exposure in contact with skin. Causes skin irritation.
- Eye contact** : Causes serious eye damage.

Symptoms related to the physical, chemical and toxicological characteristics

- Inhalation** : Adverse symptoms may include the following:
respiratory tract irritation
coughing
nausea or vomiting
headache
drowsiness/fatigue
dizziness/vertigo
unconsciousness
reduced foetal weight
increase in foetal deaths
skeletal malformations
- Ingestion** : Adverse symptoms may include the following:
stomach pains
nausea or vomiting
reduced foetal weight
increase in foetal deaths
skeletal malformations
- Skin contact** : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur
reduced foetal weight
increase in foetal deaths
skeletal malformations
- Eye contact** : Adverse symptoms may include the following:
pain
watering
redness

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

Long term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

Potential chronic health effects

- Conclusion/Summary** : Not available.
- General** : May cause damage to organs through prolonged or repeated exposure.
- Carcinogenicity** : May cause cancer. Risk of cancer depends on duration and level of exposure.

SECTION 11: Toxicological information

- Mutagenicity** : May cause genetic defects.
Reproductive toxicity : May damage fertility. May damage the unborn child.

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties

Not available.

11.2.2 Other information

Adverse symptoms may include the following: blurred or double vision Eye contact can result in corneal damage or blindness. Repeated or prolonged exposure to the substance can produce liver damage. Narcotic effect. May cause nervous system disturbances.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
propan-2-ol	Acute EC50 7550 mg/l Fresh water	Daphnia - <i>Daphnia magna</i> - Neonate	48 hours
ethanol	Acute LC50 1400000 µg/l Marine water	Crustaceans - <i>Crangon crangon</i>	48 hours
	Acute LC50 4200 mg/l Fresh water	Fish - <i>Rasbora heteromorpha</i>	96 hours
	Acute EC50 3306 mg/l Marine water	Algae - <i>Ulva pertusa</i>	96 hours
	Acute EC50 1074 mg/l Fresh water	Crustaceans - <i>Cypris subglobosa</i>	48 hours
butan-1-ol	Acute EC50 2 mg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
	Acute LC50 11000000 µg/l Marine water	Fish - <i>Alburnus alburnus</i>	96 hours
	Chronic NOEC 4.995 mg/l Marine water	Algae - <i>Ulva pertusa</i>	96 hours
	Chronic NOEC 100 µl/L Fresh water	Daphnia - <i>Daphnia magna</i> - Neonate	21 days
propan-1-ol	Acute EC50 225 mg/l Fresh water	Algae - <i>Pseudokirchneriella subcapitata</i>	96 hours
	Acute EC50 1983 mg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
	Acute LC50 1730000 µg/l Fresh water	Fish - <i>Pimephales promelas</i>	96 hours
	Acute NOEC 415 mg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
butan-2-ol	Acute NOEC 519 mg/l Fresh water	Fish - <i>Pimephales promelas</i>	96 hours
	Acute EC50 4480000 µg/l Fresh water	Algae - <i>Selenastrum sp.</i>	96 hours
	Acute LC50 1000000 µg/l Fresh water	Crustaceans - <i>Gammarus pulex</i>	48 hours
	Acute LC50 2950000 µg/l Fresh water	Daphnia - <i>Daphnia pulex</i>	48 hours
2-methylpropan-1-ol	Acute LC50 3800000 µg/l Marine water	Fish - <i>Alburnus alburnus</i>	96 hours
	Acute EC50 4227 mg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
2-methylbutan-2-ol	Acute LC50 3670000 µg/l Fresh water	Fish - <i>Pimephales promelas</i>	96 hours
	Acute LC50 600 mg/l Marine water	Crustaceans - <i>Artemia salina</i>	48 hours
2-methylpropan-2-ol	Acute LC50 1030000 µg/l Fresh water	Daphnia - <i>Daphnia magna</i> - Neonate	48 hours
	Acute LC50 1330000 µg/l Fresh water	Fish - <i>Oncorhynchus mykiss</i>	96 hours
Methanol	Chronic NOEC 4 mg/l Fresh water	Daphnia - <i>Daphnia magna</i>	21 days
	Acute LC50 450 mg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
2-methoxy-2-methylbutane	Acute EC50 >976 mg/l Fresh water	Algae	72 hours
	Acute EC50 5504 mg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
	Acute LC50 6410000 µg/l Fresh water	Fish - <i>Pimephales promelas</i>	96 hours
	Chronic NOEC 100 mg/l Fresh water	Daphnia	21 days
2-methoxy-2-methylbutane	Acute EC50 2736 mg/l Marine water	Algae - <i>Ulva pertusa</i>	96 hours
	Acute LC50 2500000 µg/l Marine water	Crustaceans - <i>Crangon crangon</i> - Adult	48 hours
	Acute LC50 3289 mg/l Fresh water	Daphnia - <i>Daphnia magna</i> - Neonate	48 hours
	Acute LC50 290 mg/l Fresh water	Fish - <i>Danio rerio</i> - Egg	96 hours
2-methoxy-2-methylbutane	Chronic NOEC 9.96 mg/l Marine water	Algae - <i>Ulva pertusa</i>	96 hours
	Acute EC50 230 mg/l Fresh water	Algae	72 hours
	Acute EC50 >100000 µg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
	Acute LC50 >100000 µg/l Fresh water	Fish - <i>Oncorhynchus mykiss</i>	96 hours

SECTION 12: Ecological information

1,2-dimethoxyethane	Acute NOEC 77 mg/l Fresh water Chronic NOEC 3.39 mg/l Acute EC50 9120 mg/l Fresh water	Algae Crustaceans Algae - <i>Pseudokirchneriella subcapitata</i>	72 hours 28 days 72 hours
benzene	Acute EC50 4000 mg/l Fresh water Acute EC50 1600000 µg/l Fresh water Acute EC50 9.23 mg/l Fresh water	Daphnia - <i>Daphnia magna</i> Algae - <i>Selenastrum sp.</i> Daphnia - <i>Daphnia magna</i> - Neonate	48 hours 96 hours 48 hours
tert-butyl methyl ether	Acute LC50 21 mg/l Marine water Acute LC50 5.28 ul/L Fresh water Chronic EC10 >1360 mg/l Fresh water	Crustaceans - <i>Artemia salina</i> Fish - <i>Oncorhynchus gorboscha</i> - Fry Algae - <i>Desmodesmus subspicatus</i>	48 hours 96 hours 96 hours
2-Ethoxy-2-methylpropane	Chronic NOEC 98 mg/l Fresh water Chronic NOEC 1.5 to 5.4 ul/L Marine water	Daphnia - <i>Daphnia magna</i> Fish - <i>Morone saxatilis</i> - Juvenile (Fledgling, Hatchling, Weanling)	21 days 4 weeks
diisopropyl ether	Acute EC50 472 mg/l Fresh water Acute LC50 672000 µg/l Fresh water Chronic NOEC 26 mg/l Marine water Chronic NOEC 3.04 mg/l Fresh water Acute EC50 1100 mg/l Fresh water	Daphnia Fish - <i>Pimephales promelas</i> Daphnia Fish Algae - <i>Pseudokirchneriella subcapitata</i>	48 hours 96 hours 28 days 21 days 72 hours
	Acute NOEC 7.5 mg/l Fresh water	Algae - <i>Pseudokirchneriella subcapitata</i>	72 hours
	Acute EC50 190 mg/l Fresh water Acute LC50 91700 µg/l Fresh water	Daphnia - <i>Daphnia magna</i> Fish - <i>Pimephales promelas</i>	48 hours 96 hours

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
2-methylbutan-2-ol	OECD 310 Ready Biodegradability - CO2 in Sealed Vessels (Headspace Test)	40 to 50 % - Inherent - 28 days	-	-
2-methylpropan-2-ol	OECD 301B Ready Biodegradability - CO2 Evolution Test	2.6 to 5.1 % - Not readily - 29 days	ThCO ₂	-
2-methoxy-2-methylbutane	OECD 301D Ready Biodegradability - Closed Bottle Test	4 % - Readily - 28 days	-	-
1,2-dimethoxyethane	OECD 302B Inherent Biodegradability: Zahn-Wellens/EMPA Test	16 % - Not readily - 28 days	95 mg/l	Activated sludge
tert-butyl methyl ether	OECD 301D Ready Biodegradability - Closed Bottle Test	0 % - Not readily - 28 days	-	Activated sludge
methylcyclopentane	OECD 301C Ready Biodegradability - Modified MITI Test (I)	93 to 94 % - Readily - 28 days	-	-

SECTION 12: Ecological information

diisopropyl ether	OECD 301D Ready Biodegradability - Closed Bottle Test	0 % - Not readily - 28 days	-	-
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Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
propan-2-ol	-	-	Readily
ethanol	-	-	Readily
butan-1-ol	-	-	Readily
propan-1-ol	-	-	Readily
butan-2-ol	-	-	Readily
2-methylpropan-1-ol	-	-	Readily
2-methylbutan-2-ol	-	-	Inherent
Methanol	-	-	Readily
2-methoxy-2-methylbutane	-	-	Not readily
1,2-dimethoxyethane	-	-	Not readily
benzene	-	-	Readily
tert-butyl methyl ether	-	50%; 3.2 day(s)	Not readily
methylcyclopentane	-	-	Readily
diisopropyl ether	-	-	Not readily

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
propan-2-ol	0.05	-	Low
ethanol	-0.35	0.5	Low
butan-1-ol	1	-	Low
propan-1-ol	0.2	-	Low
butan-2-ol	0.61	-	Low
2-methylpropan-1-ol	1	3	Low
2-methylbutan-2-ol	0.89	-	Low
2-methylpropan-2-ol	0.317	5.01	Low
Methanol	-0.77	<10	Low
2-methoxy-2-methylbutane	1.55	-	Low
1,2-dimethoxyethane	-0.21	-	Low
benzene	2.13	11	Low
tert-butyl methyl ether	1.04	1.5	Low
methylcyclopentane	3.37	-	Low
2-Ethoxy-2-methylpropane	1.48	-	Low
diisopropyl ether	2.4	-	Low

12.4 Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

12.6 Endocrine disrupting properties

Not available.

12.7 Other adverse effects

No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.




Hazardous waste : The classification of the product may meet the criteria for a hazardous waste.

Packaging

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions : This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapour from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

	ADR/RID	IMDG	IATA
14.1 UN number or ID number	UN1993	UN1993	UN1993
14.2 UN proper shipping name	FLAMMABLE LIQUID, N.O.S. (Propan-2-ol, Ethanol)	FLAMMABLE LIQUID, N.O.S. (Propan-2-ol, Ethanol)	Flammable liquid, n.o.s. (Propan-2-ol, Ethanol)
14.3 Transport hazard class(es)	3 	3 	3 
14.4 Packing group	II	II	II
14.5 Environmental hazards	No.	No.	No.

Additional information

Remarks: De minimis quantities

ADR/RID : **Hazard identification number** 33
Limited quantity 1 L
Special provisions 601, 274, 640C
Tunnel code (D/E)

IMDG : **Emergency schedules** F-E, _S-E_
Special provisions 274

IATA : **Quantity limitation** Passenger and Cargo Aircraft: 5 L. Packaging instructions: 353.
Cargo Aircraft Only: 60 L. Packaging instructions: 364. Limited Quantities - Passenger Aircraft: 1 L. Packaging instructions: Y341.
Special provisions A3

14.6 Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

QUALITATIVE - PEAK ID MIX ASTM-D4815, Part Number 8500-8434

SECTION 14: Transport information

14.7 Transport in bulk according to IMO instruments : Not available.

SECTION 15: Regulatory information

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

[EU Regulation \(EC\) No. 1907/2006 \(REACH\)](#)

[Annex XIV - List of substances subject to authorisation](#)

[Annex XIV](#)

None of the components are listed.

[Substances of very high concern](#)

Ingredient name	Intrinsic property	Status	Reference number	Date of revision
<input checked="" type="checkbox"/> 1,2-Dimethoxyethane	Toxic to reproduction	Candidate	ED/87/2012	6/18/2012

[Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles](#)

Product / Ingredient name	Identifiers	Designation [Usage]
<input checked="" type="checkbox"/> QUALITATIVE - PEAK ID MIX ASTM-D4815, Part Number 8500-8434		3 28 29 30 69 30 5 28 29 72
Methanol		
1,2-dimethoxyethane		
benzene		

Label : Restricted to professional users.

[Other EU regulations](#)

[Ozone depleting substances \(1005/2009/EU\)](#)

Not listed.

[Prior Informed Consent \(PIC\) \(649/2012/EU\)](#)

Ingredient name	Annex	Status
Benzene	Annex I - Part 1	Listed

[Persistent Organic Pollutants](#)

Not listed.

[Seveso Directive](#)

This product is controlled under the Seveso Directive.

[Danger criteria](#)

Category
P5c

[National regulations](#)

Product/ingredient name	List name	Name on list	Classification	Notes
<input checked="" type="checkbox"/> benzene	Ireland Occupational Exposure Limits	benzene	Carc..1A, Muta..1B	-

[International regulations](#)

[Chemical Weapon Convention List Schedules I, II & III Chemicals](#)

Not listed.

SECTION 15: Regulatory information

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia	: Not determined.
Canada	: At least one component is not listed in DSL but all such components are listed in NDSL.
China	: Not determined.
Eurasian Economic Union	: Russian Federation inventory: All components are listed or exempted.
Japan	: Japan inventory (CSCL): Not determined. Japan inventory (ISHL): Not determined.
New Zealand	: Not determined.
Philippines	: Not determined.
Republic of Korea	: All components are listed or exempted.
Taiwan	: All components are listed or exempted.
Thailand	: Not determined.
Turkey	: Not determined.
United States	: All components are active or exempted.
Viet Nam	: All components are listed or exempted.

15.2 Chemical safety assessment : This product contains substances for which Chemical Safety Assessments might still be required.

SECTION 16: Other information

📌 Indicates information that has changed from previously issued version.

Abbreviations and acronyms	: ATE = Acute Toxicity Estimate CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008] DMEL = Derived Minimal Effect Level DNEL = Derived No Effect Level EUH statement = CLP-specific Hazard statement N/A = Not available PBT = Persistent, Bioaccumulative and Toxic PNEC = Predicted No Effect Concentration RRN = REACH Registration Number vPvB = Very Persistent and Very Bioaccumulative
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Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Flam. Liq. 2, H225	On basis of test data
Acute Tox. 4, H302	Calculation method
Skin Irrit. 2, H315	Calculation method
Eye Dam. 1, H318	Calculation method
Muta. 1B, H340	Calculation method
Carc. 1A, H350	Calculation method
Repr. 1B, H360FD	Calculation method
STOT SE 2, H371	Calculation method
STOT SE 3, H335	Calculation method

SECTION 16: Other information

STOT SE 3, H336	Calculation method
STOT RE 2, H373	Calculation method
Asp. Tox. 1, H304	Expert judgment

Full text of abbreviated H statements

H225	Highly flammable liquid and vapour.
H226	Flammable liquid and vapour.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H311	Toxic in contact with skin.
H312	Harmful in contact with skin.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H340	May cause genetic defects.
H350	May cause cancer.
H360FD	May damage fertility. May damage the unborn child.
H370	Causes damage to organs.
H371	May cause damage to organs.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.
H412	Harmful to aquatic life with long lasting effects.
EUH019	May form explosive peroxides.
EUH066	Repeated exposure may cause skin dryness or cracking.

Full text of classifications [CLP/GHS]

Acute Tox. 3	ACUTE TOXICITY - Category 3
Acute Tox. 4	ACUTE TOXICITY - Category 4
Aquatic Chronic 3	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3
Asp. Tox. 1	ASPIRATION HAZARD - Category 1
Carc. 1A	CARCINOGENICITY - Category 1A
Eye Dam. 1	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
Eye Irrit. 2	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2
Flam. Liq. 2	FLAMMABLE LIQUIDS - Category 2
Flam. Liq. 3	FLAMMABLE LIQUIDS - Category 3
Muta. 1B	GERM CELL MUTAGENICITY - Category 1B
Repr. 1B	REPRODUCTIVE TOXICITY - Category 1B
Skin Irrit. 2	SKIN CORROSION/IRRITATION - Category 2
STOT RE 1	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 1
STOT RE 2	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2
STOT SE 1	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 1
STOT SE 2	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 2
STOT SE 3	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 3

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