SAFETY DATA SHEET

Agilent Technologies

Residual Solvent Revised Method 467 Class 1

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

1.1 Product identifier

Product name : Residual Solvent Revised Method 467 Class 1

Part no. : 5190-0490

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

Identified uses : Reagents and Standards for Analytical Chemistry Laboratory Use
1 x 1 ml

Uses advised against : None known.

1.3 Details of the supplier of the safety data sheet

Agilent Technologies LDA UK Ltd.
5500 Lakeside Cheadle Royal Business Park,
Cheadle, Cheshire, SK8 3GR
United Kingdom
Tel: +44 (0) 345 712 5292

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 20 3807 3798

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]

H332	ACUTE TOXICITY (inhalation)	Category 4
H340	GERM CELL MUTAGENICITY	Category 1B
H350	CARCINOGENICITY	Category 1A
H372	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE	Category 1
H420	HAZARDOUS TO THE OZONE LAYER	Category 1

The product is classified as hazardous according to UK CLP Regulation SI 2019/720 as amended.

Ingredients of unknown toxicity : Percentage of the mixture consisting of ingredient(s) of unknown acute dermal toxicity: 1 - 10%
Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: 1 - 10%

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

SECTION 2: Hazards identification

Hazard statements : H332 - Harmful if inhaled.
H340 - May cause genetic defects.
H350 - May cause cancer.
H372 - Causes damage to organs through prolonged or repeated exposure.
H420 - Harms public health and the environment by destroying ozone in the upper atmosphere.

Precautionary statements

Prevention : P201 - Obtain special instructions before use.
P280 - Wear protective gloves, protective clothing and eye or face protection.
P260 - Do not breathe vapour.
P270 - Do not eat, drink or smoke when using this product.

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

Storage : Not applicable.

Disposal : P502 - Refer to manufacturer or supplier for information on recovery or recycling.

Hazardous ingredients : 1,1-dichloroethylene; carbon tetrachloride 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 : For use in industrial installations only.

Special packaging requirements

Containers to be fitted with child-resistant fastenings : Not applicable.

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	Type
1,1,1-trichloroethane	EC: 200-756-3 CAS: 71-55-6 Index: 602-013-00-2	≤4.3	Acute Tox. 4, H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Ozone 1, H420	[1] [2]
1,1-dichloroethylene	EC: 200-864-0 CAS: 75-35-4 Index: 602-025-00-8	≤3.4	Flam. Liq. 1, H224 Acute Tox. 3, H301 Acute Tox. 1, H330 Eye Irrit. 2, H319 Muta. 2, H341 Carc. 1, H350 STOT RE 1, H372 (nose/sinuses) (inhalation) STOT RE 2, H373	[1] [2]

SECTION 3: Composition/information on ingredients

			(liver) (oral) Aquatic Chronic 3, H412	
1,2-dichloroethane	EC: 203-458-1 CAS: 107-06-2 Index: 602-012-00-7	≤2.1	Flam. Liq. 2, H225 Acute Tox. 4, H302 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Carc. 1B, H350 STOT SE 3, H335	[1] [2] [3]
carbon tetrachloride	EC: 200-262-8 CAS: 56-23-5 Index: 602-008-00-5	≤2.1	Acute Tox. 3, H301 Acute Tox. 3, H311 Acute Tox. 3, H331 Carc. 2, H351 STOT RE 1, H372 (kidneys, liver) Aquatic Chronic 3, H412 Ozone 1, H420	[1] [2]
benzene	EC: 200-753-7 CAS: 71-43-2 Index: 601-020-00-8	<1	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]

Type

[1] Substance classified with a health or environmental hazard
[2] Substance with a workplace exposure limit
[3] Substance with carcinogenic, mutagenic or reproductive toxicity properties

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

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.

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

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact : 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. Get medical attention.

Inhalation : 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. Get medical attention. If necessary, call a poison center or physician. 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. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact : 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. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

SECTION 4: First aid measures

Ingestion : 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. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. 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

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments : No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture : In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous combustion products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
sulfur oxides
halogenated compounds
carbonyl halides

5.3 Advice for firefighters

Special protective actions 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.

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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to British standard BS EN 469 will provide a basic level of protection for chemical incidents.

Additional information : May be combustible at high temperature.

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. Do not breathe vapour. 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). May be harmful to the environment if released in large quantities.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Stop leak if without risk. Move containers from spill area. 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 material(s) and residues under controlled conditions.

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 : Handle material(s) under controlled conditions. Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Avoid breathing vapour or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Avoid release to the environment. Avoid contact with eyes, skin and clothing. Do not ingest. Empty containers retain product residue and can be hazardous. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Do not reuse container. Do not breathe vapour or mist. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Refer to special instructions/safety data sheet.

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 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. 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.

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
1,1,1-trichloroethane	**EH40/2005 WELs (United Kingdom (UK), 1/2020)** STEL 15 minutes: 1110 mg/m³. TWA 8 hours: 100 ppm. TWA 8 hours: 555 mg/m³. STEL 15 minutes: 200 ppm.
1,1-dichloroethylene	**EH40/2005 WELs (United Kingdom (UK), 1/2020)** TWA 8 hours: 2 ppm. TWA 8 hours: 8 mg/m³. STEL 15 minutes: 20 mg/m³. STEL 15 minutes: 5 ppm.
1,2-dichloroethane	**EH40/2005 WELs (United Kingdom (UK), 1/2020)** Carc. Absorbed through skin. TWA 8 hours: 5 ppm. TWA 8 hours: 21 mg/m³.
carbon tetrachloride	**EH40/2005 WELs (United Kingdom (UK), 1/2020)** Absorbed through skin. TWA 8 hours: 1 ppm. TWA 8 hours: 6.4 mg/m³. STEL 15 minutes: 32 mg/m³. STEL 15 minutes: 5 ppm.
benzene	**EH40/2005 WELs (United Kingdom (UK), 1/2020)** Carc. Absorbed through skin. TWA 8 hours: 1 ppm. TWA 8 hours: 3.25 mg/m³.

Biological exposure indices

No exposure indices known.

Recommended monitoring procedures : Reference should be made to monitoring standards, such as the following: British Standard BS EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) British Standard BS EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) British Standard BS 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	Result	
1,1-dichloroethylene	DMEL - General population - Long term - Inhalation	0.032 mg/m³
	DNEL - General population - Long term - Oral	0.09 mg/kg bw/day
	DNEL - Workers - Long term - Dermal	1.5 mg/kg bw/day
	DMEL - Workers - Long term - Inhalation	1.792 mg/m³
	DNEL - Workers - Short term - Inhalation	38 mg/m³
1,2-dichloroethane	DMEL - General population - Long term - Inhalation	2.9 µg/m³
	DMEL - Workers - Long term - Inhalation	6.6 mg/m³
	DMEL - Workers - Long term - Dermal	62.4 mg/kg bw/day
carbon tetrachloride	DNEL - General population - Long term - Inhalation	0.107 mg/m³
	DNEL - Workers - Long term - Dermal	0.91 mg/kg bw/day

SECTION 8: Exposure controls/personal protection

	DNEL - Workers - Long term - Inhalation	1.29 mg/m³
benzene	DNEL - General population - Long term - Inhalation	0.14 mg/m³

PNECs

Not 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.

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: safety glasses with side-shields.

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.

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.

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 : Colourless.

Odour : Not available.

Odour threshold : Not available.

Melting point/freezing point : 18.4°C

Initial boiling point and boiling range : 189°C

SECTION 9: Physical and chemical properties

Flammability : Not applicable.

Lower and upper explosion limit/ flammability limit : Lower: 2.6%
Upper: 28.5%

Flash point : Closed cup: 95°C

Auto-ignition temperature : 215°C

Decomposition temperature : Not available.

pH : Not available.

Viscosity : Dynamic (room temperature): Not available.
Kinematic (room temperature): Not available.
Kinematic (40°C): Not available.

Solubility :

Media	Result
water	Soluble

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

Vapour pressure : 0.049 kPa (0.37 mm Hg)

Relative density : 1.101

Density : 1.101 g/cm³

Vapour density : Not available.

Particle characteristics

Median particle size : Not applicable.

9.2 Other information

9.2.1 Information with regard to physical hazard classes

Explosive properties : Not available.

Oxidising properties : Not available.

9.2.2 Other safety characteristics

Miscible with water : Yes.

Evaporation rate : Not available.

Physical/chemical properties comments : Not available.

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 : No specific data.

10.5 Incompatible materials : May react or be incompatible with oxidising materials.

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	
1,1,1-trichloroethane	Rat - Oral - LD50	9600 mg/kg
	Rat - Inhalation - LC50 Vapour	17000 ppm [4 hours]
1,1-dichloroethylene	Rat - Inhalation - LC50 Gas.	6350 ppm [4 hours]
1,2-dichloroethane	Rat - Oral - LD50	500 mg/kg
	Rabbit - Dermal - LD50	2800 mg/kg
carbon tetrachloride	Rat - Dermal - LD50	5070 mg/kg
	Rabbit - Dermal - LD50	>20 g/kg
	Rat - Inhalation - LC50 Vapour	8000 ppm [4 hours]
benzene	Rat - Oral - LD50	6400 mg/kg

Conclusion/Summary [Product] : Not available.

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)
Residual Solvent Revised Method 467 Class 1	3258.2	18734.8	198276.4	13.7	N/A
1,1,1-trichloroethane	9600	15800	N/A	11	N/A
1,1-dichloroethylene	300	N/A	6350	0.5	N/A
1,2-dichloroethane	500	2800	N/A	N/A	N/A
carbon tetrachloride	100	300	N/A	3	N/A
benzene	6400	N/A	N/A	N/A	N/A

Skin corrosion/irritation

Product/ingredient name	Result	
1,1,1-trichloroethane	Rabbit - Skin - Mild irritant	Duration of treatment/ exposure: 288 hours Amount/concentration applied: 5 gm l
	Rabbit - Skin - Moderate irritant	Duration of treatment/ exposure: 24 hours Amount/concentration applied: 20 mg
1,2-dichloroethane	Rabbit - Skin - Mild irritant	Duration of treatment/ exposure: 24 hours Amount/concentration applied: 500 mg
	Rabbit - Skin - Mild irritant	Amount/concentration applied: 625 mg
carbon tetrachloride	Rabbit - Skin - Mild irritant	Duration of treatment/ exposure: 24 hours Amount/concentration applied: 500 mg
	Rabbit - Skin - Mild irritant	Amount/concentration applied: 4 mg
benzene	Rat - Skin - Mild irritant	Duration of treatment/ exposure: 8 hours Amount/concentration applied: 60 uL
	Rabbit - Skin - Mild irritant	Duration of treatment/ exposure: 24 hours Amount/concentration applied: 15 mg
	Rabbit - Skin - Moderate irritant	Duration of treatment/ exposure: 24 hours Amount/concentration

SECTION 11: Toxicological information

applied: 20 mg

Conclusion/Summary [Product] : Repeated exposure may cause skin dryness or cracking.

Ingredient name	Conclusion/Summary
1,1-dichloroethylene	Repeated exposure may cause skin dryness or cracking.
carbon tetrachloride	May cause skin irritation.

Serious eye damage/eye irritation

Product/ingredient name	Result	
1,1,1-trichloroethane	Rabbit - Eyes - Mild irritant	Amount/concentration applied: 100 mg
	Rabbit - Eyes - Severe irritant	Duration of treatment/ exposure: 24 hours
		Amount/concentration applied: 2 mg
1,2-dichloroethane	Rabbit - Eyes - Mild irritant	Duration of treatment/ exposure: 24 hours
		Amount/concentration applied: 500 mg
	Rabbit - Eyes - Severe irritant	Amount/concentration applied: 63 mg
carbon tetrachloride	Rabbit - Eyes - Mild irritant	Duration of treatment/ exposure: 24 hours
		Amount/concentration applied: 500 mg
	Rabbit - Eyes - Mild irritant	Duration of treatment/ exposure: 0.5 minutes
		Amount/concentration applied: 2200 ug
benzene	Rabbit - Eyes - Moderate irritant	Amount/concentration applied: 88 mg
	Rabbit - Eyes - Severe irritant	Amount/concentration applied: 0.1 Ml

Conclusion/Summary [Product] : Not available.

Ingredient name	Conclusion/Summary
carbon tetrachloride	May cause eye irritation.

Respiratory corrosion/irritation

Conclusion/Summary [Product] : Not available.

Respiratory or skin sensitization

Skin

Conclusion/Summary [Product] : May cause sensitisation by skin contact.

Respiratory

Conclusion/Summary [Product] : Not available.

Germ cell mutagenicity

Conclusion/Summary [Product] : Not available.

Carcinogenicity

SECTION 11: Toxicological information

Conclusion/Summary [Product] : Not available.

Reproductive toxicity

Conclusion/Summary [Product] : Not available.

Specific target organ toxicity (single exposure)

Product/ingredient name	Result
1,2-dichloroethane	STOT SE 3, H335 (Respiratory tract irritation)

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Result
1,1-dichloroethylene	STOT RE 1, H372 (nose/sinuses) (inhalation) STOT RE 2, H373 (liver) (oral)
carbon tetrachloride	STOT RE 1, H372 (kidneys, liver)
benzene	STOT RE 1, H372

Aspiration hazard

Product/ingredient name	Result
benzene	ASPIRATION HAZARD - Category 1

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

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : Harmful if inhaled.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

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 [Product] : Not available.

General : Causes damage to organs through prolonged or repeated exposure.

SECTION 11: Toxicological information

Carcinogenicity : May cause cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity : May cause genetic defects.

Reproductive toxicity : No known significant effects or critical hazards.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result		
1,1,1-trichloroethane	Acute - EC50 - Fresh water OECD Algae - Green algae - *Desmodesmus subspicatus* 813 ppm [72 hours] Population	-	-
1,1-dichloroethylene	Acute - LC50 - Fresh water Daphnia - Water flea - *Daphnia magna* Age: 1 11.6 mg/l [48 hours] Mortality	-	-
	Acute - LC50 - Fresh water Fish - Fathead minnow - *Pimephales promelas* - Adult Size: 35 mm; Weight: 0.8 g 108 mg/l [96 hours] Mortality	-	-
	Acute - NOEC - Fresh water OECD 202 [Daphnia sp. Acute Immobilization Test and Reproduction Test] Daphnia - Daphnia - *Daphnia magna* 29.4 mg/l [48 hours]	-	-
	Chronic - EC10 Algae - Green algae - *Chlamydomonas reinhardtii* - Exponential growth phase Age: 7 days 3.94 mg/l [72 hours] Population	-	-
	Acute - EC50 Algae - Green algae - *Chlamydomonas reinhardtii* - Exponential growth phase Age: 7 days 9.12 mg/l [72 hours] Population	-	-
1,2-dichloroethane	Acute - LC50 - Marine	-	-

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	water Crustaceans - Opossum shrimp - *Americamysis bahia* 110 ppm [48 hours] Mortality		
	Acute - LC50 - Marine water STDMETH Fish - Sheepshead minnow - *Cyprinodon variegatus* Size: 3.5 cm; Weight: 2 g 113 ppm [96 hours] Mortality	-	-
	Acute - EC50 - Fresh water OECD Algae - Green algae - *Desmodesmus subspicatus* 166 ppm [96 hours] Population	-	-
	Chronic - NOEC - Fresh water OECD Daphnia - Water flea - *Daphnia magna* Age: ≤24 hours 100 mg/l [21 days] Mortality	-	-
	Chronic - EC10 - Marine water OECD Algae - Green Flagellate - *Platymonas subcordiformis* - Exponential growth phase 152 mg/l [96 hours] Population	-	-
carbon tetrachloride	Acute - LC50 - Fresh water US EPA Daphnia - Water flea - *Daphnia magna* Age: ≤24 hours 35 mg/l [48 hours] Mortality	-	-
	Acute - LC50 - Fresh water Fish - Fathead minnow - *Pimephales promelas* Age: 30 days; Weight: 0.092 g 10.4 mg/l [96 hours] Mortality	-	-
	Acute - EC50 - Fresh	-	-

SECTION 12: Ecological information

	water OECD Algae - Green algae - *Desmodesmus subspicatus* 21 ppm [72 hours] Population		
	Acute - NOEC - Fresh water OECD [Daphnia Magna Reproduction Test] Daphnia - Daphnia - *Daphnia magna* 3.1 mg/l [21 days]	-	-
	Acute - NOEC - Fresh water OECD [Alga, Growth Inhibition Test] Algae - Algae - *Pseudokirchneriella subcapitata* 2.2 mg/l [72 hours]	-	-
benzene	Acute - LC50 - Fresh water Fish - Pink salmon - *Oncorhynchus gorbuscha* - Fry 5.28 µl/l [96 hours] Mortality	-	-
	Acute - EC50 - Fresh water Daphnia - Water flea - *Daphnia magna* - Neonate Age: ≤24 hours 9.23 mg/l [48 hours] Intoxication	-	-
	Chronic - NOEC - Marine water Fish - Striped bass - *Morone saxatilis* - Juvenile (Fledgling, Hatchling, Weanling) Size: 18.1 cm; Weight: 3.39 g 1.5 to 5.4 µl/l [4 weeks] Growth	-	-
	Chronic - NOEC - Fresh water Daphnia - Water flea - *Daphnia magna* Age: <24 hours 98 mg/l [21 days] Reproduction	-	-
	Chronic - EC10 - Fresh water Algae - Green algae - *Desmodesmus*	-	-

SECTION 12: Ecological information

	subspicatus >1360 mg/l [96 hours] Population		
	Acute - EC50 - Fresh water Algae - Green algae - *Raphidocelis subcapitata* 29 mg/l [72 hours] Growth	-	-

Conclusion/Summary [Product] : Not available.

12.2 Persistence and degradability

Conclusion/Summary [Product] : Not available.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
1,1,1-trichloroethane	-	-	Inherent
1,2-dichloroethane	-	-	Inherent
carbon tetrachloride	-	-	Inherent
benzene	-	-	Readily

12.3 Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
1,1,1-trichloroethane	2.49	9 [Flow through system]	Low
1,1-dichloroethylene	2.13	12.88	Low
1,2-dichloroethane	1.45	2	Low
carbon tetrachloride	2.83	49.9 to 75.1 [OECD 305]	Low
benzene	2.13	11	Low

12.4 Mobility in soil

Soil/water partition coefficient

Product/ingredient name	logKoc	Koc
1,1,1-trichloroethane	1.9	88.9775
1,1-dichloroethylene	1.8	64.503
1,2-dichloroethane	1.5	33.1086
carbon tetrachloride	1.8	70.7792
benzene	1.7	56.1326

Results of PMT and vPvM assessment

Product/ingredient name	PMT	P	M	T	vPvM	vP	vM
1,1,1-trichloroethane	No	N/A	Yes	No	N/A	N/A	Yes
1,1-dichloroethylene	N/A	N/A	Yes	Yes	N/A	N/A	Yes
1,2-dichloroethane	N/A	N/A	Yes	Yes	N/A	N/A	Yes
carbon tetrachloride	N/A	N/A	Yes	Yes	N/A	N/A	Yes
benzene	N/A	N/A	Yes	Yes	N/A	N/A	Yes

Mobility : Not available.

Conclusion/Summary : The product does not meet the criteria to be considered as a PMT or vPvM.

12.5 Results of PBT and vPvB assessment

SECTION 12: Ecological information

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

Product/ingredient name	PBT	P	B	T	vPvB	vP	vB
1,1,1-trichloroethane	No	N/A	No	No	No	N/A	No
1,1-dichloroethylene	No	N/A	No	Yes	No	N/A	No
1,2-dichloroethane	No	N/A	No	Yes	No	N/A	No
carbon tetrachloride	No	N/A	No	Yes	No	N/A	No
benzene	No	N/A	No	Yes	No	N/A	No

Regulation (EC) No. 1272/2008 [CLP]

Product/ingredient name	PBT	P	B	T	vPvB	vP	vB
1,1,1-trichloroethane	No	N/A	No	No	No	N/A	No
1,1-dichloroethylene	No	N/A	No	Yes	No	N/A	No
1,2-dichloroethane	No	N/A	No	Yes	No	N/A	No
carbon tetrachloride	No	N/A	No	Yes	No	N/A	No
benzene	No	N/A	No	Yes	No	N/A	No

Conclusion/Summary Regulation (EC) No. 1272/2008 [CLP] : The product does not meet the criteria to be considered as a PBT or vPvB.

12.6 Endocrine disrupting properties

Not available.

Conclusion/Summary [Product] : The product does not meet the criteria to be considered as having endocrine disrupting properties according to the criteria set out in either Regulation (EC) No. 1907/2006 or Regulation (EC) No 1272/2008.

12.7 Other adverse effects

This product has the potential to cause adverse global warming effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Methods of disposal : 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. The generation of waste should be avoided or minimised wherever possible. 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 : Dispose of material(s) and residues under controlled conditions. 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. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

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SECTION 14: Transport information

	ADR/RID	IMDG	IATA
14.1 UN number	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-
14.3 Transport hazard class(es)	-	-	-
14.4 Packing group	-	-	-
14.5 Environmental hazards	No.	No.	No.

Additional information

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.

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

UK (GB)/REACH

Annex XIV - List of substances subject to authorisation

Annex XIV

Intrinsic property	Ingredient name	Status	Reference number	Date of revision
Carcinogen	1,2-dichloroethane	Listed	26	1/1/2021

Substances of very high concern

Intrinsic property	Ingredient name	Status	Reference number	Date of revision
Carcinogen	1,2-dichloroethane	Candidate	-	12/19/2011

Ozone depleting substances

Ingredient name	Status
1,1,1-Trichloroethane Carbon tetrachloride	Group V Group IV

Prior Informed Consent (PIC)

Part	Ingredient name	Status
Part 1	1,1-dichloroethene carbon tetrachloride benzene	Listed Listed Listed

Persistent Organic Pollutants

Not listed.

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SECTION 15: Regulatory information

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

None of the components are listed / The components are not impacted by a restriction

Labelling : For use in industrial installations only.

Seveso Directive

This product is not controlled under the Seveso Directive.

National regulations

Product/ingredient name	List name	Name on list	Classification	Notes
1,2-dichloroethane	EH40/2005 WELs	-	Carc	-
benzene	EH40/2005 WELs	-	Carc	-

EU regulations

Industrial emissions (integrated pollution prevention and control) - Air : Listed

Industrial emissions (integrated pollution prevention and control) - Water : Not listed

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Ingredient name	Status
1,1,1-trichloroethane	Annex B, Group III
carbon tetrachloride	Annex B, Group II

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

List name	Ingredient name	Status
Pesticide	Ethylene dichloride (ISO); Gaze Olefiant; 1,2-Dichloroethane; sym-(metric)-Dichlorethane; ENT 1656	Listed

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

United States : All components are active 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.

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SECTION 16: Other information

Abbreviations and acronyms : ADN = European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterway
ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE = Acute Toxicity Estimate
GB CLP = UK CLP (EC No 1272/2008) on the Classification, Labelling and Packaging of Substances and Mixtures as amended by (EU Exit) Regulations 2019 No. 720 and amendments
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EUH statement = GB CLP-specific Hazard statement
IATA = International Air Transport Association
IMDG = International Maritime Dangerous Goods
IMO = International Maritime Organization
N/A = Not available
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail
RRN = REACH Registration Number
SGG = Segregation Group
vPvB = Very Persistent and Very Bioaccumulative

Procedure used to derive the classification

Classification	Justification
Acute Tox. 4, H332	Calculation method
Muta. 1B, H340	Calculation method
Carc. 1A, H350	Calculation method
STOT RE 1, H372	Calculation method
Ozone 1, H420	Calculation method

Full text of abbreviated H statements

H224	Extremely flammable liquid and vapour.
H225	Highly 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.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H340	May cause genetic defects.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H351	Suspected of causing cancer.
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.
H420	Harms public health and the environment by destroying ozone in the upper atmosphere.

Full text of classifications

Residual Solvent Revised Method 467 Class 1

SECTION 16: Other information

Acute Tox. 1	ACUTE TOXICITY - Category 1
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. 1	CARCINOGENICITY - Category 1
Carc. 1A	CARCINOGENICITY - Category 1A
Carc. 1B	CARCINOGENICITY - Category 1B
Carc. 2	CARCINOGENICITY - Category 2
Eye Irrit. 2	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2
Flam. Liq. 1	FLAMMABLE LIQUIDS - Category 1
Flam. Liq. 2	FLAMMABLE LIQUIDS - Category 2
Muta. 1B	GERM CELL MUTAGENICITY - Category 1B
Muta. 2	GERM CELL MUTAGENICITY - Category 2
Ozone 1	HAZARDOUS TO THE OZONE LAYER - Category 1
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 3	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 3

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