Conforms to US OSHA Hazard Communication 29CFR1910.1200

SAFETY DATA SHEET

Agilent Technologies

7890GC SP1, Part Number 8500-8855

Section 1. Identification

1.1 Product identifier

Product name : 7890GC SP1, Part Number 8500-8855

Part no. : 8500-8855

Validation date : 8/11/2023

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 x1 ml Amber. ampoule

1.3 Details of the supplier of the safety data sheet

Supplier/Manufacturer : Agilent Technologies, Inc.
5301 Stevens Creek Blvd
Santa Clara, CA 95051, USA
800-227-9770

1.4 Emergency telephone number

In case of emergency : CHEMTREC®: 1-800-424-9300

Section 2. Hazards identification

2.1 Classification of the substance or mixture

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture

H225	FLAMMABLE LIQUIDS - Category 2
H311	ACUTE TOXICITY (dermal) - Category 3
H315	SKIN IRRITATION - Category 2
H319	EYE IRRITATION - Category 2A
H341	GERM CELL MUTAGENICITY - Category 2
H351	CARCINOGENICITY - 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
H412	AQUATIC HAZARD (LONG-TERM) - Category 3

Ingredients of unknown toxicity : Percentage of the mixture consisting of ingredient(s) of unknown acute dermal toxicity: > 60%

Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 2%

2.2 GHS label elements

Hazard pictograms :

Signal word : Danger

Section 2. Hazards identification

Hazard statements : H225 - Highly flammable liquid and vapor.
H311 - Toxic in contact with skin.
H315 - Causes skin irritation.
H319 - Causes serious eye irritation.
H335 - May cause respiratory irritation.
H336 - May cause drowsiness or dizziness.
H341 - Suspected of causing genetic defects.
H351 - Suspected of causing cancer.
H412 - Harmful to aquatic life with long lasting effects.

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.
P241 - Use explosion-proof electrical, ventilating or lighting equipment.
P242 - Use non-sparking tools.
P243 - Take action to prevent static discharges.
P273 - Avoid release to the environment.
P261 - Avoid breathing vapor.
P264 - Wash thoroughly after handling.

Response : P308 + P313 - IF exposed or concerned: Get medical advice or attention.
P304 + P312 - IF INHALED: Call a POISON CENTER or doctor if you feel unwell.
P361 + P364 - Take off immediately all contaminated clothing and wash it before reuse.
P302 + P312, P352 - IF ON SKIN: Call a POISON CENTER or doctor if you feel unwell. Wash with plenty of water.
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 - If eye irritation persists: Get medical advice or attention.

Storage : P403 + P233 - Store in a well-ventilated place. Keep container tightly closed.
P403 + P235 - Keep cool.

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

Supplemental label elements : Avoid contact with skin and clothing. Wash thoroughly after handling.

2.3 Other hazards

Hazards not otherwise classified : Prolonged or repeated contact may dry skin and cause irritation.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	%	CAS number
tert-Butyl methyl ether	≥75 - ≤90	1634-04-4
2-Ethoxy-2-methylpropane	≤3	637-92-3
trans-Pent-2-ene	≤3	646-04-8
(Z)-Pent-2-ene	≤3	627-20-3
2-Methylbut-2-ene	≤1.3	513-35-9
2-methoxy-2-methylbutane	≤1.3	994-05-8
pentane	≤1.3	109-66-0
2-Methylpropan-2-ol	≤1.3	75-65-0

Section 3. Composition/information on ingredients

Isopentane	≤1.3	78-78-4
Methanol	≤1.3	67-56-1
2,4,4-trimethylpent-1-ene	≤3	107-39-1
2,2,4,6,6-pentamethylhept-3-ene	<3	123-48-8

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified 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 necessary 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.

Skin contact : Wash skin thoroughly with soap and water or use recognized skin cleanser. 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. If necessary, call a poison center or physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

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. If necessary, call a poison center or 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.

4.2 Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : Can cause central nervous system (CNS) depression. May cause drowsiness or dizziness. May cause respiratory irritation.

Skin contact : Toxic in contact with skin. Causes skin irritation. Defatting to the skin.

Ingestion : Can cause central nervous system (CNS) depression.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Section 4. First aid measures

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing
nausea or vomiting
headache
drowsiness/fatigue
dizziness/vertigo
unconsciousness

Skin contact : Adverse symptoms may include the following:
irritation
redness
dryness
cracking

Ingestion : No specific data.

4.3 Indication of immediate medical attention and special treatment needed, if necessary

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

Specific treatments : No specific treatment.

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.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use dry chemical, CO_2, water spray (fog) or foam.

Unsuitable extinguishing media : Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Specific hazards arising from the chemical : Highly flammable liquid and vapor. 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 vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

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

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. 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 spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized 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 spilled 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). Water polluting material. May be harmful to the environment if released in large quantities.

6.3 Methods and materials 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.

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. 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 vapor or mist. Do not ingest. Avoid release to the environment. 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 : 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 oxidizing 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 unlabeled 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.

Section 7. Handling and storage

Industrial sector specific solutions : Not available.

Section 8. Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
tert-Butyl methyl ether	**ACGIH TLV (United States, 1/2022).** TWA: 50 ppm 8 hours. **CAL OSHA PEL (United States, 5/2018).** TWA: 144 mg/m³ 8 hours. TWA: 40 ppm 8 hours.
2-Ethoxy-2-methylpropane	**ACGIH TLV (United States, 1/2022).** TWA: 25 ppm 8 hours. **CAL OSHA PEL (United States, 5/2018).** TWA: 21 mg/m³ 8 hours. TWA: 5 ppm 8 hours.
trans-Pent-2-ene	None.
(Z)-Pent-2-ene	None.
2-Methylbut-2-ene	**ACGIH TLV (United States, 1/2022).** TWA: 10 ppm 8 hours.
2-methoxy-2-methylbutane	**ACGIH TLV (United States, 1/2022).** TWA: 20 ppm 8 hours.
pentane	**ACGIH TLV (United States, 1/2022).** **[Pentane all isomers]** TWA: 1000 ppm 8 hours. **OSHA PEL 1989 (United States, 3/1989).** TWA: 600 ppm 8 hours. TWA: 1800 mg/m³ 8 hours. STEL: 750 ppm 15 minutes. STEL: 2250 mg/m³ 15 minutes. **NIOSH REL (United States, 10/2020).** TWA: 120 ppm 10 hours. TWA: 350 mg/m³ 10 hours. CEIL: 610 ppm 15 minutes. CEIL: 1800 mg/m³ 15 minutes. **OSHA PEL (United States, 5/2018).** TWA: 1000 ppm 8 hours. TWA: 2950 mg/m³ 8 hours. **CAL OSHA PEL (United States, 5/2018).** TWA: 1800 mg/m³ 8 hours. TWA: 600 ppm 8 hours.
2-Methylpropan-2-ol	**OSHA PEL 1989 (United States, 3/1989).** TWA: 100 ppm 8 hours. TWA: 300 mg/m³ 8 hours. STEL: 150 ppm 15 minutes. STEL: 450 mg/m³ 15 minutes. **ACGIH TLV (United States, 1/2022).** TWA: 100 ppm 8 hours. TWA: 303 mg/m³ 8 hours. **NIOSH REL (United States, 10/2020).** TWA: 100 ppm 10 hours. TWA: 300 mg/m³ 10 hours. STEL: 150 ppm 15 minutes. STEL: 450 mg/m³ 15 minutes. **OSHA PEL (United States, 5/2018).** TWA: 100 ppm 8 hours.

Section 8. Exposure controls/personal protection

	TWA: 300 mg/m³ 8 hours. **CAL OSHA PEL (United States, 5/2018).** STEL: 450 mg/m³ 15 minutes. STEL: 150 ppm 15 minutes. TWA: 300 mg/m³ 8 hours. TWA: 100 ppm 8 hours.
Isopentane	**ACGIH TLV (United States, 1/2022).** **[Pentane all isomers]** TWA: 1000 ppm 8 hours.
Methanol	**ACGIH TLV (United States, 1/2022).** **Absorbed through skin.** TWA: 200 ppm 8 hours. TWA: 262 mg/m³ 8 hours. STEL: 250 ppm 15 minutes. STEL: 328 mg/m³ 15 minutes. **OSHA PEL 1989 (United States, 3/1989).** **Absorbed through skin.** TWA: 200 ppm 8 hours. TWA: 260 mg/m³ 8 hours. STEL: 250 ppm 15 minutes. STEL: 325 mg/m³ 15 minutes. **NIOSH REL (United States, 10/2020).** **Absorbed through skin.** TWA: 200 ppm 10 hours. TWA: 260 mg/m³ 10 hours. STEL: 250 ppm 15 minutes. STEL: 325 mg/m³ 15 minutes. **OSHA PEL (United States, 5/2018).** TWA: 200 ppm 8 hours. TWA: 260 mg/m³ 8 hours. **CAL OSHA PEL (United States, 5/2018).** **Absorbed through skin.** STEL: 325 mg/m³ 15 minutes. STEL: 250 ppm 15 minutes. C: 1000 ppm TWA: 260 mg/m³ 8 hours. TWA: 200 ppm 8 hours.
2,4,4-trimethylpent-1-ene	None.
2,2,4,6,6-pentamethylhept-3-ene	None.

Biological exposure indices

Ingredient name	Exposure indices
Methanol	**ACGIH BEI (United States, 1/2022)** BEI: 15 mg/l, methanol [in urine]. Sampling time: end of shift.

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, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

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 8. Exposure controls/personal protection

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.

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.

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 9. Physical and chemical properties and safety characteristics

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

Appearance

Physical state : Liquid. [Clear.]

Color : Colorless.

Odor : Not available.

Odor threshold : Not available.

pH : Not available.

Melting point/freezing point : -98°C (-144.4°F)

Boiling point, initial boiling point, and boiling range : 65°C (149°F)

Flash point : Closed cup: 10°C (50°F)

Evaporation rate : >1 (butyl acetate = 1)

Flammability : Not applicable.

Lower and upper explosion limit/flammability limit : Lower: 6%
Upper: 36.5%

Vapor pressure : 13.3 kPa (100 mm Hg)

Relative vapor density : 1.1 [Air = 1]

Relative density : 0.79

Section 9. Physical and chemical properties and safety characteristics

Density : 0.79 g/cm³

Solubility(ies) :

Media	Result
water	Soluble

Miscible with water : Yes.

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

Auto-ignition temperature :

Ingredient name	°C	°F	Method
pentane	260	500	-
2-Methylbut-2-ene	360	680	-

Decomposition temperature : Not available.

Viscosity : Not available.

Particle characteristics

Median particle size : Not applicable.

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 pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.

10.5 Incompatible materials : Reactive or incompatible with the following materials:
oxidizing 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	Species	Dose	Exposure
tert-Butyl methyl ether	LC50 Inhalation Vapor	Rat	41000 mg/m³	4 hours
	LC50 Inhalation Vapor	Rat	23576 ppm	4 hours
	LD50 Oral	Rat	4 g/kg	-
2-Ethoxy-2-methylpropane	LC50 Inhalation Vapor	Rat	36200 mg/m³	4 hours
	LD50 Oral	Rat	7150 mg/kg	-
2-Methylbut-2-ene	LC50 Inhalation Vapor	Rat - Male, Female	>175000 mg/m³	4 hours
	LC50 Inhalation Vapor	Rat	>61000 ppm	4 hours
	LD50 Dermal	Rat	>2000 mg/kg	-
2-methoxy-2-methylbutane	LD50 Oral	Rat	1602 mg/kg	-
pentane	LC50 Inhalation Vapor	Rat	364 g/m³	4 hours
	LD50 Oral	Rat - Male, Female	>2000 mg/kg	-
2-Methylpropan-2-ol	LC50 Inhalation Gas.	Rat	14100 ppm	4 hours

Section 11. Toxicological information

	LD50 Dermal	Rabbit - Male, Female	>2000 mg/kg	-
	LD50 Oral	Rat	2733 mg/kg	-
Isopentane	LC50 Inhalation Vapor	Rat	280000 mg/m³	4 hours
	LD50 Oral	Rat - Male, Female	>2000 mg/kg	-
Methanol	LC50 Inhalation Vapor	Rat	189.95 mg/l	1 hours
	LC50 Inhalation Vapor	Rat	145000 ppm	1 hours
	LC50 Inhalation Vapor	Rat	83.84 mg/l	4 hours
	LC50 Inhalation Vapor	Rat	64000 ppm	4 hours
	LD50 Dermal	Rabbit	15800 mg/kg	-
	LD50 Oral	Rat	5600 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
2-Ethoxy-2-methylpropane	Eyes - Moderate irritant	Rabbit	-	24 hours 100 uL	-
	Skin - Moderate irritant	Rabbit	-	4 hours 500 uL	-
2-methoxy-2-methylbutane	Eyes - Severe irritant	Rabbit	-	24 hours 100 uL	-
	Skin - Severe irritant	Rabbit	-	4 hours 500 uL	-
2-Methylpropan-2-ol	Eyes - Severe irritant	Rabbit	-	24 hours 100 uL	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 uL	-
Methanol	Eyes - Moderate irritant	Rabbit	-	24 hours 100 mg	-
	Eyes - Moderate irritant	Rabbit	-	40 mg	-
	Skin - Moderate irritant	Rabbit	-	24 hours 20 mg	-

Conclusion/Summary

Skin : Repeated exposure may cause skin dryness or cracking.

Eyes : May cause eye irritation.

Sensitization

Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	OSHA	IARC	NTP
tert-Butyl methyl ether	-	3	-

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)

Section 11. Toxicological information

Name	Category	Route of exposure	Target organs
tert-Butyl methyl ether	Category 3	-	Respiratory tract irritation
	Category 3		Narcotic effects
2-Ethoxy-2-methylpropane	Category 3	-	Respiratory tract irritation
	Category 3		Narcotic effects
trans-Pent-2-ene	Category 3	-	Respiratory tract irritation
(Z)-Pent-2-ene	Category 3	-	Respiratory tract irritation
	Category 3		Narcotic effects
2-Methylbut-2-ene	Category 3	-	Respiratory tract irritation
	Category 3		Narcotic effects
2-methoxy-2-methylbutane	Category 3	-	Respiratory tract irritation
	Category 3		Narcotic effects
pentane	Category 3	-	Narcotic effects
2-Methylpropan-2-ol	Category 3	-	Respiratory tract irritation
	Category 3		Narcotic effects
Isopentane	Category 3	-	Narcotic effects
Methanol	Category 1	-	central nervous system (CNS), optic nerve
2,4,4-trimethylpent-1-ene	Category 3	-	Narcotic effects

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Name	Result
trans-Pent-2-ene	ASPIRATION HAZARD - Category 1
(Z)-Pent-2-ene	ASPIRATION HAZARD - Category 1
2-Methylbut-2-ene	ASPIRATION HAZARD - Category 1
pentane	ASPIRATION HAZARD - Category 1
Isopentane	ASPIRATION HAZARD - Category 1
2,4,4-trimethylpent-1-ene	ASPIRATION HAZARD - Category 1

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

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : Can cause central nervous system (CNS) depression. May cause drowsiness or dizziness. May cause respiratory irritation.

Skin contact : Toxic in contact with skin. Causes skin irritation. Defatting to the skin.

Ingestion : Can cause central nervous system (CNS) depression.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Section 11. Toxicological information

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing
nausea or vomiting
headache
drowsiness/fatigue
dizziness/vertigo
unconsciousness

Skin contact : Adverse symptoms may include the following:
irritation
redness
dryness
cracking

Ingestion : No specific data.

Delayed and immediate effects and also 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

General : Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.

Carcinogenicity : Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity : Suspected of causing genetic defects.

Reproductive toxicity : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapors) (mg/l)	Inhalation (dusts and mists) (mg/l)
7890GC SP1, Part Number 8500-8855	2774.7	725.8	1410000.0	300.0	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
2-Methylbut-2-ene	500	2500	N/A	N/A	N/A
2-methoxy-2-methylbutane	1602	N/A	N/A	N/A	N/A
pentane	2500	N/A	N/A	364	N/A
2-Methylpropan-2-ol	2733	2500	14100	N/A	N/A
Isopentane	2500	N/A	N/A	280	N/A
Methanol	100	300	N/A	3	N/A

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
tert-Butyl methyl ether	Acute EC50 472 mg/l Fresh water	Daphnia	48 hours
	Acute LC50 672000 µg/l Fresh water	Fish - *Pimephales promelas*	96 hours
	Chronic NOEC 26 mg/l Marine water	Daphnia	28 days
	Chronic NOEC 3.04 mg/l Fresh water	Fish	21 days
2-Ethoxy-2-methylpropane	Acute EC50 1100 mg/l Fresh water	Algae - *Pseudokircheriella subcapitata*	72 hours
	Acute NOEC 7.5 mg/l Fresh water	Algae - *Pseudokinchneriella subcapitata*	72 hours
2-Methylbut-2-ene	Acute EC50 3.84 mg/l Fresh water	Daphnia - *Daphnia magna*	48 hours
2-methoxy-2-methylbutane	Acute EC50 >100000 µg/l Fresh water	Daphnia - *Daphnia magna*	48 hours
	Acute LC50 >100000 µg/l Fresh water	Fish - *Oncorhynchus mykiss*	96 hours
	Chronic NOEC 3.39 mg/l	Crustaceans	28 days
2-Methylpropan-2-ol	Acute EC50 >976 mg/l Fresh water	Algae	72 hours
	Acute EC50 5504 mg/l Fresh water	Daphnia - *Daphnia magna*	48 hours
	Acute LC50 6410000 µg/l Fresh water	Fish - *Pimephales promelas*	96 hours
	Chronic NOEC 100 mg/l Fresh water	Daphnia	21 days
Methanol	Acute EC50 2736 mg/l Marine water	Algae - *Ulva pertusa*	96 hours
	Acute LC50 2500000 µg/l Marine water	Crustaceans - *Crangon crangon* - Adult	48 hours
	Acute LC50 3289 mg/l Fresh water	Daphnia - *Daphnia magna* - Neonate	48 hours
	Acute LC50 290 mg/l Fresh water	Fish - *Danio rerio* - Egg	96 hours
	Chronic NOEC 9.96 mg/l Marine water	Algae - *Ulva pertusa*	96 hours

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
tert-Butyl methyl ether	OECD 301D Ready Biodegradability - Closed Bottle Test	0 % - Not readily - 28 days	-	Activated sludge
2-Methylbut-2-ene	OECD 301D Ready Biodegradability - Closed Bottle Test	7 % - Not readily - 28 days	-	-
2-methoxy-2-methylbutane	OECD 301D Ready Biodegradability - Closed Bottle Test	4 % - Readily - 28 days	-	-
pentane	OECD 301F Ready Biodegradability - Manometric Respirometry Test	87 % - Readily - 28 days	-	Activated sludge
2-Methylpropan-2-ol	OECD 301B Ready Biodegradability - CO_2 Evolution Test	2.6 to 5.1 % - Not readily - 29 days	$ThCO_2$	-
Isopentane	OECD 301F Ready Biodegradability -	71.43 % - Readily - 28 days	25 to 33 mg/l	-

Section 12. Ecological information

	Manometric Respirometry Test			

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
tert-Butyl methyl ether	-	50%; 3.2 day(s)	Not readily
2-Methylbut-2-ene	-	-	Not readily
2-methoxy-2-methylbutane	-	-	Not readily
pentane	-	-	Readily
Isopentane	-	-	Readily
Methanol	-	-	Readily

12.3 Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
tert-Butyl methyl ether	1.04	1.5	Low
2-Ethoxy-2-methylpropane	1.48	-	Low
2-Methylbut-2-ene	2.67	-	Low
2-methoxy-2-methylbutane	1.55	-	Low
pentane	3.45	171	Low
2-Methylpropan-2-ol	0.317	5.01	Low
Isopentane	3	171	Low
Methanol	-0.77	<10	Low
2,4,4-trimethylpent-1-ene	4.55	602.56	High

12.4 Mobility in soil

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

12.5 Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

13.1 Waste treatment methods

Disposal methods : The generation of waste should be avoided or minimized 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. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. 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. Vapor 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 spilled material and runoff and contact with soil, waterways, drains and sewers.

United States - RCRA Toxic hazardous waste "U" List

Ingredient	CAS #	Status	Reference number
Methanol (I)	67-56-1	Listed	U154

Section 13. Disposal considerations

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

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

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

Section 14. Transport information

DOT / TDG / Mexico / IMDG / IATA : Not regulated.

Additional information

Remarks: De minimis quantities

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.

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

U.S. Federal regulations : **TSCA 8(a) PAIR**: 2-Ethoxy-2-methylpropane; 2-methoxy-2-methylbutane; pentane; 2-Methylpropan-2-ol; 2,4,4-trimethylpent-1-ene

TSCA 8(a) CDR Exempt/Partial exemption: Not determined

Clean Air Act (CAA) 112 regulated flammable substances: trans-Pent-2-ene; (Z)-Pent-2-ene; pentane; Isopentane

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Section 15. Regulatory information

Classification : FLAMMABLE LIQUIDS - Category 2
ACUTE TOXICITY (dermal) - Category 3
SKIN IRRITATION - Category 2
EYE IRRITATION - Category 2A
GERM CELL MUTAGENICITY - Category 2
CARCINOGENICITY - Category 2
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3
HNOC - Defatting irritant

Composition/information on ingredients

Name	%	Classification
tert-Butyl methyl ether	≥75 - ≤90	FLAMMABLE LIQUIDS - Category 2 SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3
2-Ethoxy-2-methylpropane	≤3	FLAMMABLE LIQUIDS - Category 2 SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3 HNOC - Defatting irritant
trans-Pent-2-ene	≤3	FLAMMABLE LIQUIDS - Category 2 SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 ASPIRATION HAZARD - Category 1 HNOC - Static-accumulating flammable liquid
(Z)-Pent-2-ene	≤3	FLAMMABLE LIQUIDS - Category 2 SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3 ASPIRATION HAZARD - Category 1 HNOC - Static-accumulating flammable liquid
2-Methylbut-2-ene	≤1.3	FLAMMABLE LIQUIDS - Category 2 ACUTE TOXICITY (oral) - Category 4 SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A GERM CELL MUTAGENICITY - Category 2 CARCINOGENICITY - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3 ASPIRATION HAZARD - Category 1 HNOC - Static-accumulating flammable liquid
2-methoxy-2-methylbutane	≤1.3	FLAMMABLE LIQUIDS - Category 2 ACUTE TOXICITY (oral) - Category 4 SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3
pentane	≤1.3	FLAMMABLE LIQUIDS - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3 ASPIRATION HAZARD - Category 1 HNOC - Static-accumulating flammable liquid HNOC - Defatting irritant FLAMMABLE LIQUIDS - Category 2

Section 15. Regulatory information

2-Methylpropan-2-ol	≤1.3	ACUTE TOXICITY (inhalation) - Category 4 EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3
Isopentane	≤1.3	FLAMMABLE LIQUIDS - Category 1 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3 ASPIRATION HAZARD - Category 1 HNOC - Static-accumulating flammable liquid HNOC - Defatting irritant
Methanol	≤1.3	FLAMMABLE LIQUIDS - Category 2 ACUTE TOXICITY (oral) - Category 3 ACUTE TOXICITY (dermal) - Category 3 ACUTE TOXICITY (inhalation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) - Category 1
2,4,4-trimethylpent-1-ene	≤3	FLAMMABLE LIQUIDS - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3 ASPIRATION HAZARD - Category 1 HNOC - Static-accumulating flammable liquid HNOC - Defatting irritant
2,2,4,6,6-pentamethylhept-3-ene	<3	SERIOUS EYE DAMAGE - Category 1

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	tert-Butyl methyl ether 2-Methylpropan-2-ol Methanol	1634-04-4 75-65-0 67-56-1	≥75 - ≤90 ≤1.3 ≤1.3
Supplier notification	tert-Butyl methyl ether 2-Methylpropan-2-ol Methanol	1634-04-4 75-65-0 67-56-1	≥75 - ≤90 ≤1.3 ≤1.3

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts : The following components are listed: METHYL TERT-BUTYL ETHER; BETA-AMYLENE-TRANS; BETA-AMYLENE-CIS; 2-METHYL-2-BUTENE; PENTANE; TERT-BUTYL ALCOHOL; ISOPENTANE; METHANOL; 2,4,4-TRIMETHYL-1-PENTENE

New York : The following components are listed: Methyl tert-butyl ether; Methanol

New Jersey : The following components are listed: METHYL-tert-BUTYL ETHER; ETHYL tert-BUTYL ETHER; 2-PENTENE, (E)-; 2-PENTENE-cis; 2-METHYL-2-BUTENE; tert-AMYL METHYL ETHER; PENTANE; tert-BUTYL ALCOHOL; ISOPENTANE; METHYL ALCOHOL

Pennsylvania : The following components are listed: METHYL TERT-BUTYL ETHER; 2-PENTENE, (E)-; 2-PENTENE, (Z)-; 2-BUTENE, 2-METHYL-; PENTANE; 2-PROPANOL, 2-METHYL-; BUTANE, 2-METHYL-; METHANOL; 1-PENTENE, 2,4,4-TRIMETHYL-

California Prop. 65

⚠ **WARNING**: This product can expose you to Methanol, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Ingredient name	No significant risk level	Maximum acceptable dosage level
Methanol	-	Yes.

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.

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.

Section 16. Other information

Procedure used to derive the classification

Classification	Justification
FLAMMABLE LIQUIDS - Category 2	On basis of test data
ACUTE TOXICITY (dermal) - Category 3	Calculation method
SKIN IRRITATION - Category 2	Calculation method
EYE IRRITATION - Category 2A	Calculation method
GERM CELL MUTAGENICITY - Category 2	Calculation method
CARCINOGENICITY - Category 2	Calculation method
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3	Calculation method
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3	Calculation method
AQUATIC HAZARD (LONG-TERM) - Category 3	Calculation method

History

Date of issue/Date of revision : 08/11/2023

Date of previous issue : 04/30/2018

Version : 3

Section 16. Other information

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
N/A = Not available
UN = United Nations

Indicates information that has changed from previously issued version.

Notice to reader

Disclaimer: The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.