1. Product and Company Information

(1) Chemical Product name	Alcohol (synthetic alcohol, 95 / synthetic alcohol, 99).
(2) Application	Intermediate raw materials such as solvents, industrial products, and medical products. This product is not suitable for drinking
(3) Supplier	Japan Synthetic Alcohol Co., Ltd.
(Emergency Contact)	Quality Assurance Department Address : 10-8, Ukishima-cho, Kawasaki-ku, Kawasaki-city, Kanagawa, 210-0862, Japan Tel : +81-44-266-6571 Fax : +81-44-266-6528

2. Summary of Hazards

(1) GHS classification:

Physical hazards

Flammable liquids	Category 2
Pyrophoric liquid	Not classified
Self-heating chemicals	Classification not possible
Metal corrosive chemicals	Classification not possible

Harmful to health

Acute toxicity (Oral)	Not classified
Acute toxicity (Dermal)	Not classified
Acute toxicity (Vapor)	Not classified
Acute toxicity (Dust and mist)	Classification not possible
Skin corrosion and irritation	Not classified
Serious damage to the eye or eye irritation	Category 2B
Respiratory sensitization	Classification not possible
Skin sensitization	Classification not possible
Germ cell mutagenicity	Classification not possible
Carcinogenic	Classification not possible
Reproductive toxicity	Category 1A
Specific target organ toxicity (Single exposure)	Category 3 (respiratory tract irritation, narcotic effect)
Specific target organ toxicity (Repeated exposure)	Category 1 (Liver) Category 2 (Central Nervous System)
Aspiration hazard	Classification not possible

Hazard to environment

Short-term(acute) aquatic hazard	Not classified
Long-term (chronic) aquatic hazard	Not classified
Hazard to the ozone layer	Classification not possible

Note: Hazard classes other than the listed above are "Not applicable" in the before GHS classification.
Hazards mentioned above are not classified in the before GHS classification.

(2) Graphic display

(3) Signal words Danger

(4) Hazard information

Highly flammable liquid and vapor
Strong eye irritation
Risk of adverse effects on fertility or fetus
Risk of respiratory irritation
Risk of drowsiness or dizziness
Damage to organs (liver) due to long-term or repeated exposure
Damage to organs (central nervous system) due to long-term or repeated exposure

(5) Caution:

[Safety measures]

Read the safety data sheet carefully and do not handle until you understand all safety precautions.
Keep away from ignition sources such as heat, sparks, open flames, and hot surfaces. Non-smoking.
Keep the container closed tight.
Ground the container.
Use explosion-proof electrical, ventilation, and lighting equipment.
Use tools that do not generate sparks.
Take precautionary measures against static discharge.
Do not inhale dust, smoke, gas, mist, vapors, or spray.
Wash your hands thoroughly after handling.
Do not eat, drink, or smoke when using this product.
Use only outdoors or in well-ventilated areas.
Wear protective gloves, protective clothing, protective glasses, and face shield.

[First Aid Measures]

If you feel bad, contact your doctor.
If you feel bad, receive medical advice/attention.
If adhered to skin (or hair): Immediately take off all contaminated clothing.
Rinse skin with water / shower.
If inhaled: Go to an area with fresh air and rest in a position comfortable for breathing.
In case of exposure or concern of exposure: Receive medical advice/attention.
In the case of fire, spray a large amount of water or use a fire extinguisher for alcohol.
Next, if you wear contact lenses and they can be removed easily, remove the lenses.
In case of contact with eyes, wash carefully with water for several minutes. Then continue rinsing.
If eye irritation continues, receive medical advice/attention.

[Storage]

Store locked up.
Store in a well-ventilated place. Store in a cool place.
Keep container tightly closed.

[Disposal]
Contents/container must be processed in accordance with the law.

3. Composition and Information on Ingredients

(1) Distinction: Chemical product or Mixture	Chemical product
(2) Chemical name or Common name	Ethanol
(3) Alias	Ethyl alcohol, Ethane-1-ol
(4) Content	95.0 vol% or more, 92.42 wt% or more and 99.5 vol% or more, 99.18 wt% or more
(5) Chemical formula	C_2H_5OH
(6) Molecular weight	46.07
(7) CAS number	64-17-5 (ethanol)
(8) Official Gazette notice reference number	(2)-202 (CSCL), existing chemical substances (Industrial Safety and Health Act)

4. First Aid Measures

(1) If inhaled	Immediately move the victim to an area with fresh air and have them rest. If you feel bad, contact your doctor.
(2) If adhered to skin	Remove/Take off the contaminated clothing immediately. Wash using running water. Wash well using soap. If you feel bad, contact your doctor.
(3) If in eyes	Wash eyes carefully with an abundant amount of clean water for at least 15 minutes. If you wear contact lenses and they can be removed easily, remove the lenses and wash for a few more minutes. Immediately seek medical attention.
(4) If ingested	Rinse the mouth thoroughly with water. Do not induce vomiting without instruction from a physician. Immediately seek medical attention.

5. Measures in Case of Fire

(1) Extinguishing agent	Small fire: carbon dioxide, extinguishing powder, sprinkler, alcohol-resistant foam extinguishing agent Large fire: sprinkler, water spray, alcohol-resistant foam extinguishing agent.
(2) DO NOT use the following extinguishing agents	Straight stream.
(3) Critical hazards	The container may explode if heated.

	Extremely easy to burn, easily ignited from heat, sparks, and flame. May ignite again after being extinguished. Irritating, corrosive, or toxic gases may be generated during a fire.
(4) Fire-fighting measures	If there is a possibility that the fire spread due to sprinklers, please use other appropriate extinguishing agents different from sprinklers, as shown above. If the fire is large and the other fire extinguishing agents have no effect, use sprinklers. If this can be done without risk, move the containers from the fire area. If the containers cannot be moved, cool them and the surrounding area by using sprinklers. After the fire, cool the containers sufficiently by using a large amount of water.
(5) Protection equipment for firefighters	Wear appropriate protective equipment (gloves, glasses, mask, etc.) when fighting fire.

6. Accidental Release Measures

(1) Preventive measures for human body	Prevent the entry of unauthorized personnel.
Protective equipment and emergency measures	Wear protective equipment in accordance with the situation (respiratory protective equipment, chemical protective clothing, gloves, boots, glasses, masks, etc.), and avoid inhalation or direct contact with the product.
(2) Environmental precautions	Do not discharge leaking products into rivers, etc., as this may negatively impact the environment. Be careful not to discharge contaminated waste water into the environment without being properly treated.
(3) Containment and cleanup methods and equipment	In case of slight contamination, immediately wash the spilled location with a large amount of water. In case of large contamination, collect as much of the leakage as possible in empty sealable containers and wash the location that could not be collected with a large amount of water.
(4) Measures for preventing a secondary disaster	The product has permeable and volatile properties, so promptly remove all sources of ignition.

7. Handling and Storage

(1) Handling	
Technical measures	Wear protective equipment and take the measures described in "8. Exposure Prevention and Protection Measures".
Local and general ventilation	Perform local and general ventilation as described in "8. Exposure

	Prevention and Protection Measures".
Safe handling precautions	See "10. Stability and reactivity.
Avoid Contact	See "10. Stability and reactivity.
(2) Storage	
Technical measures	Follow the applicable laws and regulations.
Incompatible materials	See "10. Stability and reactivity.
Safe storage conditions	Store locked up.
Safe packaging materials	Use containers that have been regulated by the Fire Service Act and the UN transport method.

8. Exposure Prevention and Protection Measures

(1) Respiratory protective equipment	If necessary, wear appropriate respiratory protective equipment (such as a protective mask and air breathing apparatus) in places where vapors are generated.
(2) Hand protective equipment	If necessary or if there is risk of adhering to hands, wear impermeable rubber gloves.
(3) Eye protective equipment	If there is a risk of entering eyes, wear appropriate eye protective equipment (protective glasses, goggles, face protection, etc.).
(4) Skin and body protective equipment	If necessary, wear protective clothing, protective apron, protective shoes, etc.

Information as 100% ethanol

Management concentration Not defined

Allowable concentration

Japan Society for Occupational Health		Not defined (Version 2013)
ACGIH	TLV-STEL	1000ppm (Version 2013)

9. Physical and Chemical Properties

Information as 100% ethanol

(1)	Properties	Colorless transparent liquid
(2)	Odor	Pungent odor
(3)	pH	No Information
(4)	Melting Point and Freezing point	-114.14 ℃ : HSDB(2013)
(5)	Boiling point or Initial boiling point and boiling point range	78.5 ℃ : Merck (14th, 2006)
(6)	Flash Point	13 ℃ (closed up) : Merck (14th, 2006)
(7)	Coefficient of dynamic viscosity	No Information
(8)	Explosive range	3.3 - 19vol%: ICSC (2000)
(9)	Vapor pressure	59.3mmHg (25 ℃) : HSDB (2013)
(10)	Relative vapor density:	1.59 (Air=1) : HSDB (2013)
(11)	Density and/or relative density	0.789 (20 ℃ / 4 ℃) : Merck (14th, 2006)
(12)	Solubility	Water-miscible : ICSC (2000) Miscible with most of the organic solvents: HSDB (2013)
(13)	n- Octanol / water partition coefficient	log Kow = -0.31 : HSDB (2013)
(14)	Spontaneous ignition temperature	363 ℃ : ICSC (2000)
(15)	Decomposition temperature	No Information
(16)	Viscosity (Coefficient of viscosity	1.074mPa ・ s at 20 ℃ : HSDB (2013)
(17)	Combustibility	No Information
(18)	Particle characteristics	No Information

10. Stability and reactivity

(1) Chemical Stability	It is considered stable for storage and handling in accordance with laws and regulations.
(2) Possibility of hazardous reactions	It gradually reacts with calcium hypochlorite, silver oxide, and ammonia, and poses a risk of fire or explosion. It reacts violently with oxidizing agents, such as nitric acid, silver nitrate, mercuric nitrate, magnesium perchlorate, and poses a risk of fire or explosion.
(3) Conditions to avoid	No Information
(4) Incompatible materials	Oxidizing agents, such as calcium hypochlorite , silver oxide, ammonia, nitric acid, silver nitrate, mercuric nitrate, magnesium perchlorate
(5) Hazardous decomposition products	No Information
(6) Reactivity	No Information

11. Hazard information

Information as 100% ethanol

Acute toxicity

(1) Oral	Not classified Rats' LD50 value = 6,200mg/kg, 11,500mg/kg, 17,800mg/kg, 13,700mg/kg (PATTY (6th, 2012)), 15,010mg/kg, 7,000-11,000mg/kg (SIDS (2005), all values corresponded to Not applicable.
(2) Dermal	Not classified On the basis of the rabbits' LDLo = 20,000mg/kg (SIDS (2005)), it corresponded to Not applicable.
(3) Inhaled (Vapor)	Not classified Both rat LC50=63,000ppmV (DFGOT vol.12 (1999)) and 66,280ppmV (124.7mg/L) (SIDS (2005)) corresponded to Not applicable. Furthermore, ppmV was used as reference value, as the density of the tested material showed value [70,223ppmv (132.4mg/l)], which is lower than 90% of the saturated vapor pressure concentration 78,026ppmv (147.1mg/l).
(4) Inhaled (Mist)	Classification not possible Due to insufficient data
(5) Skin corrosion and skin irritation	Not classified After the 4-hour exposure test using rabbits (OECD TG 404), erythema average score for 1 and 24 hours after application was 1.0, and for the other points all average scores of erythema and edema were 0.0, and based on evaluation SIDS (2009) was classified as "Not irritant".
(6) Serious damage to the eyes or eye irritation	Category 2B After two Draize tests using rabbits (OECD TG 405), irritation was evaluated as moderate (SIDS (2005)). Corneal opacity, iritis, conjunctival redness, and conjunctival edema were observed in one of the tests, as the average score for corneal opacity on the first day was 1 or more and for conjunctival redness was 2 or more, so they were classified because most of the cases recovered within 7 days (ECETOC TR (2) (1998)).
(7) Respiratory sensitization	Classification not possible Due to insufficient data
(8) Skin sensitization	Classification not possible Due to insufficient data
(9) Germ cell mutagenicity	Classification not possible in vivo and in vitro showed negative results or negative evaluation, and because of the inability to select “Not applicable” due to the revision of the classification guidance, it was marked as "Classification not possible."
(10) Carcinogenic	Classification not possible Since inhalation exposure data is insufficient, the following was marked as "Classification not possible." Ethanol was not included in the "Recommendation of Occupational Exposure Limits (2015)" by the Japan Society for Occupational Health. In ACGIH (2009), based on the data of animal experiments with oral administration of ethanol (carcinogenicity has

	been confirmed in animal experiments, but has not been suggested in humans), it was classified as A3. Furthermore, in the proviso it was indicated as unclear in humans, and in the evaluation by NIOSH (USA) (2015), it was classified as A4 (substances that cannot be evaluated for carcinogenicity to humans due to insufficient data, etc.) (ACGIH (2004)). In addition, in CLP (EU) ethanol is "Not applicable", and in EPA (USA) it is "Not listed". Furthermore, IARC (2010) confirmed the classification of alcohol consumption and of ethanol in alcoholic beverages in Group 1 (Carcinogenic to humans), NTP (US Toxicology Program) (2014)) classified alcohol consumption as "Known" (known as carcinogenic substance to humans), but both are based on the data of alcohol beverage consumption habits in humans.
(11) Reproductive toxicity	Category 1A The following was classified as Category 1A. In humans, ingestion of ethanol before birth is known to cause fetal alcohol syndrome (FAS), referred to as congenital malformations in newborns. These malformations include microcephaly, short palpebral fissures, joint, limb, and cardiac abnormalities, as well as behavioral and cognitive dysfunction in the development stage (PATTY (6th, 2012)). In addition, the fetal alcohol syndrome is associated with women with alcohol addiction who have abused and chronically drunk alcohol during pregnancy. There are no reports of fetal alcohol syndrome due to industrial oral, transdermal, or inhalation exposure.
(12) Specific target organ toxicity (Single exposure)	Category 3 (respiratory tract irritation, narcotic effect) The following was classified as Category 3 (respiratory tract irritation, narcotic effect) Irritation to the eyes and respiratory tract in humans due to inhalation exposure has been reported (PATTY (6th, 2012)). The rise of ethanol concentration in blood may cause mild intoxication (decreased muscle coordination, changes in mood, character, or behavior) to moderate intoxication (visual impairment, sensory paralysis, delayed reaction time, language disorder), and even severe intoxication symptoms (vomiting, lethargy, low body temperature, low blood sugar, respiratory depression, etc.). (PATTY (6th, 2012)). In addition to humans, the suppression of symptoms of the central nervous system in laboratory animals has been observed (SIDS (2005)).
(13) Specific target organ toxicity (Repeated exposure)	Category 1 (liver), Category 2 (central nervous system) In humans, long-term heavy intake of alcohol has negative impact on almost all organs, and the strongest influence is on the liver, which is the target organ. The failure begins with fatty degeneration, and progresses through the stages of necrosis and fibrosis to cirrhosis (DFGOT vol.12 (1999)), so it was classified as Category 1 (liver). In addition, from the fact that the US FDA has approved three types of therapeutic agents as a treatment for patients with alcohol abuse and dependency (HSDB (Access on June 2013), it was classified as Category 2 (central nervous system).

(14) Aspiration hazard	Classification not possible Due to insufficient data

12. Ecological Information

Information as 100% ethanol

(1) Short-term(acute) aquatic hazard	"Not classified" Seaweed (chlorella) 96-hour EC50 = 1000mg/L (SIDS, 2005), shellfish (Daphnia magna) 48-hour EC50 = 5463mg/L (ECETOC TR 91 2003), fish (rainbow trout) 96-hour LC50 = 11200ppm (SIDS, 2005), acute toxicity of 100mg/L in seaweed, shellfish, and fish has not been reported.
(2) Long-term (chronic) aquatic hazard	"Not classified" When using chronic toxicity data, there is a rapid degradation (a degradation rate by BOD: 89% (existing inspection, 1993)), shellfish (kind of Ceriodaphnia dubia) 10-day NOEC = 9.6mg/L (SIDS, 2005), so it was marked as "Not applicable". If acute toxicity data was used for the trophic level without obtaining chronic toxicity data, both seaweed and fish were marked as "Not applicable" for acute toxicity, and are not poorly water-soluble (miscible, ICSC, 2000).
(3) Hazard to the ozone layer	The substance is not listed in the annex to the Montreal Protocol.
(4) Persistence and degradability	No information
(5) Biological concentration	No information
(6) Mobility in soil	No information

13. Disposal Considerations

Information on the safe and environmentally desirable destruction or recycling of chemicals (residual waste), contaminated containers and packaging to which the chemicals are attached.

Comply with all applicable laws and regulations when disposing of as waste, including standards for local municipalities.
Consign disposal to municipal facilities or to other authorized industrial waste disposal facilities.
Inform the operator of all hazards associated with the product before transferring waste for disposal.
The product may be an industrial waste requiring special treatment (waste oil). If so, dispose of waste in accordance with treatment standards for industrial waste requiring special treatment, as defined in the Waste Disposal and Public Cleansing Law.
Containers must be cleaned and recycled or appropriately disposed of in accordance with applicable laws, regulations, and local standards.
Remove all content before disposing of empty containers.
Follow the instructions given in the Section 7. HANDLING AND STORAGE, as well as general precautions for flammable liquids.

14. Precautions for Transportation

(1) UN Number	1170 ETHANOL(ETHYL ALCOHOL) or ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)
(2) UN Classification	3
(3) Packing Group	II
(4) Fire Service Act.	Category IV, Alcohols
(5) Act. on Port Regulations	Inflammable liquids (Enforcement Regulations, Article #194, Notice of dangerous goods, Annex 1)
(6) Ship Safety Act.	Inflammable liquid compounds (Dangerous Goods Regulations, Article #3, Notice of dangerous goods, Annex 1)
(7) Act. on Prevention of Marine Pollution and Maritime Disaster	Substances type Z
(8) Emergency Response Guide book Number	127
(9) Others	When transporting in tank trucks and tank cars, thoroughly check the valve of the discharge port, the flange surface, and the safety valve in advance, so that leakage does not occur during transportation. Before shipping, make sure that the container is sealed and there are no leaks. During transportation and carrying, containers should always be fixed firmly, and a suitable buffer substance should be filled in advance around bottles and cans so as not to be damaged by colliding with each other during shipment. As described in section "7. Handling and Storage".

15. Applicable Laws

(1) Industrial Safety and Health Act.	Hazardous and flammable materials (Enforcement Order, Annex Paragraph 1, Paragraph 4 No. 4, 3); Dangerous goods and hazardous materials, which name should be notified (Article 57, Paragraph 2, Enforcement Order, Article 18, Paragraph 2, No. 1, No. 2, Annex 9, 61); Dangerous goods and hazardous materials, which name should be displayed (Article 57, Paragraph 1, Enforcement Order Article 18, No. 1, No. 2, Annex 9, 61)
(2) Poisonous and Deleterious Substances Control Act.	Not applicable
(3) Act. on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvement to the management thereof	Not applicable

(4) Fire Service Act.	Category IV Inflammable Liquids, Alcohols (Article 2, Paragraph 7, Dangerous Goods (Annex 1, 4).
(5) Civil Aeronautic Act.	Inflammable liquids (Enforcement Regulations, Article #194, Notice of dangerous goods, Annex 1)
(6) Ship Safety Act.	Flammable liquid compounds (Dangerous Goods Regulations, Article #3, Notice of dangerous goods, Annex 1)
(7) Act. on Port Regulations	Other hazardous materials and flammable liquid compounds (Article 21, Paragraph 2; Regulations: Article 12, notice to determine the type of hazardous materials, Annex 2)
(8) Act. on Prevention of Marine Pollution and Maritime Disaster	Hazardous liquid substances (substances type Z) (Enforcement Ordinance Annex 1, 20).
(9) Ethanol Business Act.	Article 2, 90 vol% or more, 85.69 wt% or more alcohol

16. Other Information

(1) References:

1) JIS Z7253: 2019; Hazard Communication of Chemicals Based on GHS - Labelling and Safety Data Sheet (SDS).
2) GHS Classification Guidance for Enterprises (Revised 2019, (Ver. 2.0))
3) Ministry of Health, Labor and Welfare brochure "Targeted Risk Assessment in Order to Prevent Industrial Accidents."
https://www.mhlw.go.jp/file/06-Seisakujouhou-11300000-Roudoukijunkyokuanzeneiseibu/0000099625.pdf

(2) Ethanol information:

1) National Institute of Technology and Evaluation (NITE)
Chemical Risk Information Platform (CHRIP), GHS Classification, Results, Ethanol (2013)
2) Ministry of Health, Labor and Welfare, Workplace Safety Site
Model MSDS, Ethanol (Revised: March 31, 2014)

This safety data sheet is created in compliance with JIS Z7253: 2019 and GHS Classification Guidance for Enterprises (Revised 2019, (Ver. 2.0)).
The contents have been created based on the current documentation, information, and data available. Content, hazardous and harmful physical and chemical properties etc., may have been revised after new findings and tests, so there is no guarantee of the contents. Also, these precautions are intended for normal handling, so in case of special handling, ask for instructions on appropriate safety measures for handling.