Safety Data Sheet (SDS)

1. Chemical product and company identification

Chemical product name	Swasolve ETB
Product code	ETB
Company name	MARUZEN PETROCHEMICAL CO.,LTD.
Address	1-1, Irifune 2-Chome, Chuo-ku, Tokyo, JAPAN
Department in charge	Industrial Chemicals Dept.
Telephone number	+81-3-3552-9372 Fax number +81-3-5566-8395
Emergency telephone number	Industrial Chemicals Dept., +81-3-3552-9372

2. Hazards identification

GHS Classification

Physical hazards

Explosives	Not applicable
Flammable gases (including chemically unstable gases)	Not applicable
Aerosols	Not applicable
Oxidizing gases	Not applicable
Gases under pressure	Not applicable
Flammable liquids	Category 3
Flammable solids	Not applicable
Self-reactive substances and mixtures	Not applicable
Pyrophoric liquids	Not classified
Pyrophoric solids	Not applicable
Self-heating substances and mixtures	Classification not possible
Substances and mixtures which, in contact with water, emit flammable gases	Not applicable
Oxidizing liquids	Not applicable
Oxidizing solids	Not applicable
Organic peroxides	Not applicable
Corrosive to metals	Not classified

Environmental hazards

Aquatic hazard (acute)	Not classified
Aquatic hazard (long-term)	Not classified
Hazardous to the ozone layer	Classification not possible

Health hazards

Acute toxicity (oral)	Category 4
(dermal)	Classification not possible
(inhalation: gas)	Not applicable
(inhalation: vapour)	Category 3
(inhalation: dust)	Classification not possible
(inhalation: mist)	Classification not possible
Skin corrosion/irritation	Not classified
Serious eye damage/eye irritation	Category 1
Respiratory sensitization	Classification not possible
Skin sensitization	Not classified
Germ cell mutagenicity	Classification not possible
Carcinogenicity	Classification not possible
Reproductive toxicity	Classification not possible
Specific target organ toxicity – single exposure	
	Classification not possible
Specific target organ toxicity – repeated exposure	
(Blood)	Category 2
Aspiration hazard	Classification not possible

GHS labeling elements

Pictograms or symbols

Signal words **Danger**

Hazard statements
- [H226] Flammable liquid and vapour.
- [H302] Harmful if swallowed.
- [H331] Toxic if inhaled.
- [H318] Causes serious eye damage.
- [H373] May cause damage to blood through prolonged or repeated exposure.

Precautionary statements

[Prevention]
- [P210] Keep away from heat/sparks/open flames/hot surfaces. -No smoking.
- [P233] Keep container tightly closed.
- [P240] Ground/bond container.
- [P241] Use explosion-proof electrical/ventilating/lighting equipment.
- [P242] Use only non-sparking tools.
- [P243] Take precautionary measures against static discharge.
- [P280] Wear protective gloves/protective clothing/eye protection/face protection.
- [P264] Wash the hands thoroughly after handling.
- [P270] Do not eat, drink or smoke when using this product.
- [P260] Do not breathe mist/vapours/spray.
- [P271] Use only outdoors or in a well-ventilated area.

[Response]
- [P370 + P378] Employ appropriate fire-fighting method in case of fire.
- [P303+P361+P353] IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with running water/shower.
- [P301 + P312] IF SWALLOWED: Call a doctor/physician if you feel unwell.
- [P330] Rinse mouth.
- [P304 + P340] IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- [P305 + P351+ P338] IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- [P310] Immediately call a doctor/physician.
- [P314] Get medical advice/attention if you feel unwell.

[Storage]
- [P403 + P235] Store in a well-ventilated place. Keep cool.
- [P233] Keep container tightly closed.
- [P405] Store locked up.

[Disposal]
- [P501] Dispose of contents/container by contracting an agency for industrial waste disposal licensed by the prefectural governor.

3. Composition/information on ingredients

Chemical/mixture	A chemical
Chemical name	Ethylene glycol mono-tertiary-butyl ether (Other name: tert-butyl cellosolve, 2-tert-butoxyethanol)
Concentration or concentration range	99% and above
Chemical formula	$C_6H_{14}O_2$ (molecular weight 118)
Reference number in gazetted list in Japan	ENCS No. (2)-2424 ISHA Existing chemical substance
CAS No.	7580-85-0

4. First-aid measures

If inhaled
- Remove victims to fresh air and keep at rest in a position comfortable for breathing.
- Keep the victim warm and at rest by covering them with blankets.
- If breathing stops or is weak, loosen clothing, secure airways and give artificial respiration.
- For those who are unconscious but breathing or who are conscious but have breathing difficulty, oxygen inhalation is effective. It is preferable to perform oxygen inhalation under a physician's instructions.
- Do not use any drug other than oxygen or give anything orally without a

physician's instructions. Seek immediate medical advice/attention.

If in eyes	• Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. • Rinse with clean water for at least 15 minutes and seek immediate medical attention from an ophthalmologist. • When washing the eyes, wash so that water can flow all over the eyelid.
If on skin	• Remove / take off immediately all contaminated clothing and shoes. Cut them off if necessary. • Wash thoroughly with running water or lukewarm water. • Wash off thoroughly with soap. • If any change is detected in appearance or pain persists, get medical attention immediately.
If swallowed	• Rinse mouth. Get medical attention immediately. • If the victim is unconscious, do not give water etc. • Keep the victim warm. Get immediate medical advice/attention.
Expected acute and delayed symptoms and the most important symptoms	• Harmful if swallowed. • Toxic if inhaled. • Causes serious eye damage. • Causes damage to blood through prolonged or repeated exposure.
Protection of first-aid responders	• During a first-aid activity, the rescuer should avoid skin and eye contact with the product.

5. Fire-fighting measures

Extinguishing media	• Small fire: Carbon dioxide, dry chemical powder, sprinkling water, alcohol-resistant foam extinguisher. • Large fire: Sprinkling water, water spray, alcohol-resistant foam extinguisher.
Prohibited extinguishing media	• Water jet
Specific hazard	• Heating may induce explosion of containers. • Fire may produce irritant/corrosive/toxic gases. • Flammable liquid and vapour.
Specific fire-fighting procedures	• Do not allow non-authorized personnel to access around the fire. • Use powder extinguisher, carbon monoxide, dry sand and such for the fire in its early stage. • For a large fire, it is effective to shut off air using foam extinguisher. • Sprinkle water to cool down the neighboring facilities. • Move the container away from the fire if safe to do. • Cool unremovable containers and surrounding areas by sprinkling water. • Fully cool containers with plenty of water even after extinction.
Protection of fire-fighting personnel	• Wear protective equipment such as self-contained breathing apparatus during fire-fighting.

6. Accidental release measures

Personal safety precautions, protective equipment and emergency measures	• Evacuate people from downwind. Do not allow non-authorized personnel to access around the leakage area: mark the area using rope, etc. • Wear protective equipment to prevent skin contact with splash or inhalation of the vapour. • Stay upwind. • Keep out of low areas. • Ventilate before entering tightly closed places.
Environmental precautions	• Avoid environmental impacts caused by releasing the product to rivers, etc.
Methods and materials for containment and cleaning up	• Stop leak if safe to do so. • Ground all equipment used to handle the leaked substance. • Use vapour suppression foam to lower the vapour concentration.
Recovery	• Small leakage: Use dry soil, sand or other non-flammable materials to absorb or cover the leaked substance, and collect them in a hermetic empty container.

- Small leakage: Use clean, antistatic tools to collect the materials absorbing the leaked substance.
- Large leakage: Prevent the flow by banking soil. Evacuate the leaked substance to a safe place before collecting it.
- Large leakage: Sprinkling water lowers the vapour concentration. However, in a tightly closed place, this may not prevent combustion.

Preventive measures for secondary hazards
- Remove all fire sources promptly. (Prohibit smoking, sparks and open flames in surrounding areas.)

7. Handling and storage

Handling

Engineering measures (local exhaust / total ventilation)
- Take facility measures including local exhaust/total ventilation as instructed in "8. Exposure controls/personal protection" and wear protective equipment.

Precautions for safe handling
- Do not use high-temperature ignition sources, sparks or fire near the product.
- Never handle the container roughly, such as knocking it over, dropping it, giving it a shock or dragging it.
- Use only outdoors or in a well-ventilated area.
- Avoid contact, inhalation or ingestion.
- Avoid contact with the eye.
- Do not breathe mist.
- Do not breathe vapour.
- Do not breathe spray.
- Wash the hands thoroughly after handling.

Contact avoidance
- See "10. Stability and reactivity."

Hygienic measures
- Wash the hands thoroughly after handling.

Storage

Safe storage conditions
- Keep away from heat/sparks/open flames. -No smoking.
- Store separately from incompatible materials such as oxidizer.
- Store container in a well-ventilated, cool, dark place, protected from sunlight.
- Store locked up.

Appropriate engineering measures
- Apply the fireproof structure to walls, pillars and floors of the storage room. Use noncombustible material for beams.
- Use noncombustible material for roofs of the storage room. Cover the roof with sheet metal plates or other light noncombustible materials. Do not make ceilings.
- For floors of the storage room, apply a structure that prevents water influx/infiltration.
- For floors of the storage room, apply a structure that prevents infiltration of hazardous substances and make appropriate slopes and cesspools.
- In the storage room, install the daylighting, lighting and ventilating equipment needed for storing or handling hazardous substances.

Incompatible materials
- See "10. Stability and reactivity".

Safe container/packaging materials
- Use containers designated by the Fire Defense Law and the U.N. transportation regulations.

8. Exposure controls / personal protection

Allowable exposure limit

Recommendation of The Japan Society for Occupational Health (2012)	Not described.
ACGIH (2012)	Not described.

[Note] Allowable exposure limit of n-butyl cellosolve (2-buthoxy ethanol) in ACGIH (2012) is TWA 20 ppm.

Facility measures	• For indoor handling, install equipment to tightly enclose the vapour-generating source or exhaust ventilation. • Install an eye-washing facility and emergency shower in the storage or work area. Clearly indicate the location of the facility.
Protective equipment	
Breathing equipment	• Gas masks against organic gases, air-supplied masks and air respirator.
Protection of hands	• Oil-proof protective gloves.
Eye protection	• Protective goggles, protective facemask.
Skin and body protection	• Protective boots, protective clothing and protective apron.

9. Physical and chemical properties

Appearance (physical state, shape, colour, etc.)	Colorless transparent liquid
Odour	Ether-like characteristic odour
pH	No data available.
Melting point, freezing point	-120 ^{o}C or below
Boiling point, initial boiling point	Boiling point: 153 ^{o}C, initial boiling point: 150 ^{o}C
Flash point	55 ^{o}C
Upper/lower flammability or explosive limits	Lower limit: 0.6 vol%, upper limit: 10.5 vol%
Vapor pressure	0.21 kPA (20 ^{o}C)
Vapour density	No data available.
Specific gravity (relative density)	0.898 g/cm^3 (20 ^{o}C)
Solubility	Soluble in water, alcohol.
Ignition point	440 ^{o}C
n-Octanol/water partition coefficient	log Pow = 0.36
Decomposition temperature	No data available.
Viscosity (viscosity coefficient)	1.88 cst (55 ^{o}C)

10. Stability and reactivity

Reactivity/chemical stability	• Stable under normal handling conditions. • Ignites by high-temperature surface, spark or open flame. • Decomposes if heated and produces irritant fume and gas. • Pressure increase accompanied by explosion is caused if heated.
Possibility of hazardous reactions	• Reacts with strong oxidizer, strong acid, strong base.
Conditions to avoid	• Heating, high-temperature surface, spark or open flame.
Incompatible materials	• Strong oxidizer, strong acid, strong base.
Hazardous decomposition products	• No information available.

11. Toxicological information

Acute toxicity

• Oral	Rat (male) oral, LD50 = 2000 mg/kg, rat (female) oral, LD50 = 800 mg/kg. Based on this the substance is classified as “Category 4” (in-house data). It is reported in Safety (toxicity) Assessment of Existing Chemical Substances under Chemical Substance Control Law that rat (male and female) LD50 >= 2000 mg/kg.
• Dermal	No data available.
• Inhalation	Gas: The product is liquid under GHS definition. Vapour: Rat inhalation LC50 >= 1914 ppm (the highest concentration in the experiment). Death was noted in a female (20% of the animals) at this concentration (also 2 females (40% of the animals) were dead at 1443 ppm) and 1914 ppm is considered to be the lethal concentration. Therefore the substance is classified as “Category 3” (in-house data).

	Dust, mist: No data available.
Skin corrosion/irritation	Primary skin irritation index (P.I.I.) is 2.2 (in-house data). In EU, R38 is given to this substance.
Serious eye damage/eye irritation	"Extreme irritation" is noted based on the damage degree of conjunctivae, iris and cornea of rabbits (in-house data). In EU, R41 is given to this substance.
Respiratory sensitization or skin sensitization	The substance is classified as "Not classified" based on the report that the sensitization level is considered to be from extremely weak to no sensitization in the study using mouse (Chemicals Evaluation and Research Institute (3th, 2005)).
Germ cell mutagenicity	It is judged that the substance is "not clastogenic (negative)" in chromosome aberration study using Chinese hamster cultured cell (Safety (toxicity) Assessment of Existing Chemical Substances under Chemical Substance Control Law). Also, no mutagenicity was noted in Ames test (in-house data and Safety (toxicity) Assessment of Existing Chemical Substances under Chemical Substance Control Law). No *in vivo* study data is available and the results of *in vitro* studies are negative. Based on these the substance is classified as "Classification not possible" according to the technical guidance.
Carcinogenicity	No data available.
Reproductive toxicity	The result of a repeated oral administration toxicity/reproductive developmental combined study was evaluated. In this study, SD strain rats (12 male and female in each group) were administered orally at the dose levels of 4, 20 and 100 mg/kg/day during 37 days in total from 14 days before mating through mating period for males and for females, during 42-47 days from 14 days before mating through mating period, pregnant and delivery until day 4 of lactation. No change due to the test substance was noted in estrus cycle of the parental animals, copulation index, fertility index, number of corpus luteum, number of implantation, implantation index, parturition index, delivery index, gestational period, delivery and lactation activity. No change due to the test substance was noted in the number of newborn, number of live born, sex ratio, live birth index, viability index of the offsprings on day 4, external appearance, general condition, body weight, body weight gain and necropsy. Based on above results, no-observed effect level of reproductive developmental toxicity is considered to be 100 mg/kg/day for both parental animal and pup (Safety (toxicity) Assessment of Existing Chemical Substances under Chemical Substance Control Law).
Specific target organ toxicity, single exposure	Single oral dose administration was given to male and female rats at the dose levels of 0, 500, 1000 and 2000 mg/kg. As a result chromaturia (red) and anemia-like changes of pale auricle, limb or eyeball were noted in all male and female animals of the test substance treated groups. Abnormal gait was noted in the groups of 1000 mg/kg and above, decrease in locomotor activity, irregular respiration and prone position were noted at 2000 mg/kg group, but no death was noted (Safety (toxicity) Assessment of Existing Chemical Substances under Chemical Substance Control Law).
Specific target organ toxicity, repeated exposure	The result of a repeated oral administration toxicity/reproductive developmental combined study was evaluated. In this study, SD strain rats (12 male and female in each group) were administered orally at the dose levels of 4, 20 and 100 mg/kg/day during 37 days in total from 14 days before mating through mating period for males and for females, during 42-47 days from 14 days before mating through mating period, pregnant and delivery until day 4 of lactation. In haematological test, significant low values of erythrocyte count, haemoglobin and mean corpuscular haemoglobin concentration, significant high values of mean corpuscular volume, mean corpuscular haemoglobin and reticulocyte count were noted in male and female of 100 mg/kg group, and similar changes were noted also in the females of 20 mg/kg group. In addition, significant low values of haematocrit and leukocyte count were noted in males of 100 mg/kg group. In males of 20 mg/kg group, significant low values of mean corpuscular haemoglobin concentration were noted. In blood chemistry test, significant low values of potassium were noted in the females of 100 mg/kg group. In pathological test, effect due to the test substance administration was noted in

	spleen and liver of male and female in the groups of 20 mg/kg and above, bone marrow and kidney of male and female of 100 mg/kg group and increased hematopoiesis in erythrocyte system and increased hemosiderin deposit were noted. In general conditions, chromaturia (recovered after the next day of the administration), significant high values of absolute and relative organ weight of spleen, swelling of spleen were noted in male and female of 100 mg/kg group. Based on these results, no-observed effect level of repeated dose toxicity is considered to be 4 mg/kg/day for both male and female (Safety (toxicity) Assessment of Existing Chemical Substances under Chemical Substance Control Law).
Aspiration hazard	No data available.

12. Ecological information

Ecotoxicity:

Fish	Fish, LC50 (96hr) > 100 mg/L (in-house data) Killifish, LC50 (96hr) = 4000 mg/L and above Kilifish, acute toxicity LC50 (96hr) > 100 mg/L (MOR, 2000)
Crustacea	Water flea, EC50 (48hr) > 100 mg/L (in-house data) Daphnia magna, acute swimming immobilization, EC50 (48hr) > 1000 mg/L (MOR, 2000) Reproductive inhibition, EC50 (21day) > 100 mg/L, NOEC (21day) > 100 mg/L (MOR, 2000)
Algae	Algae, IC50 (72hr) > 100 mg/L (in-house data) Selenastrum [growth rate method] EC50 (48hr) > 890 mg/L, NOEC (48hr) 310 mg/L (MOR, 2000), [yield method] EC50 (72hr) > 890 mg/L, NOEC (72hr) 310 mg/L (MOR, 2000)
Persistence and degradability	No data available.
Bioaccumulative potential	No data available.
Mobility in soil	No data available.
Aquatic hazard (acute)	Based on above results, the substance is classified as “Not classified” because both LC50 and EC50 are 100 or above.
Aquatic hazard (long-term)	The substance is classified as “Not classified” because it is soluble in water, log Kow is 1.3 or below and acute toxicity level is low.
Hazardous to the ozone layer	No data available.

13. Disposal considerations

Residual contents	• When disposing of the substances, follow the related laws/regulations or municipal codes. • Dispose of the substance by contracting an agency for industrial waste disposal licensed by the prefectural governor or a local public organization for industrial waste disposal, if available. • When contracting an agency to dispose of the substance, fully notify the agency of possible danger and harmfulness of the substance.
Contaminated containers and packaging	• Container should be cleaned and recycled or disposed according to regulation and standard of regional government. • Remove the content completely before disposal of empty container.

14. Transport information

International regulations:

Marine regulations	Follow the IMO regulations.
U.N. number	1993
Proper shipping name	Flammable liquids, n.o.s.
U.N. classification	Class 3 (flammable liquids)
Packing group	III
Air regulations	Follow the ICAO/IATA regulations.

Regulations in Japan

Land regulations	Follow the regulations of Fire Defense Law.
Fire Defense Law	Category 4, Second-class petroleum
Container	Specified in the Attached Table 3-2 in the Hazardous Substance Control Regulations.
Container labeling	Category 4, Second-class petroleum, Hazard classification III, quantity, No fire
Loading limitation	Height of stacked containers should be not more than 3 meters for transportation.
Substances prohibited to be loaded with this product	Hazardous substances in Category 1 and Category 6, high pressure gases
Marine regulations	Follow the Ship Safety Law: flammable liquid Precaution: No fire. Chapter 17, IBC Code of IMO (International Maritime Organization) (flammable liquid or hazardous liquid) Substance name: Ethylene glycol monoalkyl ethers (monoalkyl; C1, C3, C4)
Air regulations	Follow the Aviation Law: flammable liquid

Special safety measures

- Confirm that there is no damage to the container or leakage, and load the substance by enforcing preventive measures against load collapse, so as not to cause shock, inversion, fall and damage.
- Upon filling a tank truck (tank lorry), etc. or unloading the containers, use a pump or compressed gas of nor more than the permissible working pressure of the tank truck after parking the truck on flat land using bumping post and grounding.
- Give complete treatment to the detached hose to remove the residues inside.
- The tank lorry and carrying ship must be equipped with the designated tag, firefighting equipment and emergency materials for hazard prevention.

Treatment:

Emergency response guide number: 128

15. Regulatory information

In Japan

Fire Defense Law	Category 4, Second-class petroleum (Hazard Classification III, Water-soluble liquid) (2000 L)
Industrial Safety and Health Act	Enforcement Order, Attached table 1, “Dangerous material/flammable goods”
Pollutant Release and Transfer Register (PRTR) Regulation	Not applicable.
Poisonous and Deleterious Substances Control Law	Not applicable.
Ship Safety Act	Dangerous Goods Regulations, Dangerous Goods Notification, Attached table 1, “Flammable liquids”
Aviation Law	Enforcement Regulations, Article 194, Dangerous Goods Notification, Attached table 1, “Flammable liquids”
Act on Port Regulations	“Dangerous goods/flammable liquids”, Enforcement Ordinance, Article 12
Law on the Prevention of Marine Pollution and Maritime Disaster	Enforcement Ordinance, Attached table 1 “Hazardous liquid (Type Y)”

Follow all local, state and federal laws, regulations and codes.

16. Other information

NITE Classification data were referred and cited for toxicological and environmental information.
GHS classification is conducted according to [JIS Z 7252 (2009)].
The descriptions herein are based on the currently available sources and information but no guarantee is given

for its integrity or accuracy.
Responsibility for use of this information in determining the safety handling procedure lies with the user.

History of revision	1st edition created on	January 11, 1993	
	Revised on	May 1, 2007	
		February 1, 2010	Compliance with GHS, revised PRTR Law
		February 20, 2013	Compliance with JIS Z 7253
		July 16, 2013	Change of address and contact details.