MATERIAL SAFETY DATA SHEETS(MSDS)

1. Identification of the substance/preparation and of the company/undertaking

A. Product name	PERFECT CLEANER CC-303	C. Manufacturer / Supplier / Distributor Information	
		○ Manufacturer	GHI CO.,LTD
PART NUMBER	CC-303	○ Importer	
ITEM NUMBER	00303-01	Address	
General characteristics	Non Flammable cleaning, degreasing agent	○ Supplier	GHI CO.,LTD
Hazard classification	Hazardous substance, irritant substance	Address	16Gil 6, Jinjang, BugKu, Ulsan, South Korea
B. Recommended use of the product and restrictions on use	Washing and degreasing agents.	TEL	+82-52-298-2259, +82-52-294-0250
		E-mail	hq@ghi.cc
		Date of draft	10.01.1997

2. Hazardous Ingredients

A. Hazardous Classification :

Flammable liquids : Category 2, Acute toxicity (oral) : Category 4, Acute toxicity (inhalation) : Category 4, Serious Eye Damage/Eye Irritation : Category 2, Skin sensitizer : Category 1, Toxic to reproduction : Category 2, Specific target organ toxicity-single exposure : Category 1, Specific target organ toxicity-single exposure : Category 3(narcotic effect), Specific target organ toxicity-single exposure : Category 3(respiratory irritation), Specific target organ toxicity-repeated exposure : Category 1, Chronic hazards to the aquatic environment : Category 3

B. Label elements

○ Pictogram :

○ Signal word : Warning

○ Hazard statement

H225 Highly flammable liquid and vapour. H302 Harmful if swallowed
H317 May cause an allergic skin reaction. H319 Causes serious eye irritation.
H332 Harmful if inhaled. H335 May cause respiratory irritation.
H336 May cause drowsiness or dizziness.
H361 Suspected of damaging fertility or the unborn child.
H370 Cause damage to organs.
H372 Causes damage to respiratory organs through prolonged or repeated exposure.
H412 Harmful to aquatic life with long lasting effects.

○ precautionary statements

Prevention/ P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat/sparks/open flames. - No smoking
P233 Keep container tightly closed.
P240 Connect containers and receptacles.
P241 Use explosion-proof electrical / ventilating / lighting / equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P260 Do not breathe dust/mist/spray. P264 Wash hands thoroughly after handling
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing should not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P281 Use personal protective equipment as required.

Response/ P301+P312 IF SWALOWED : Call a POISON CENTER or doctor/physician if you fel unwel.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P303+P361+P353 IF ON SKIN(or hair): Femove/take off immediately all contaminated clothing. Finse skin with water/shower.
P304+P340+P313: IF INHALED: Remove victim to fresh air and keep out 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.
P307+P311 If exposed, seek medical advice.
P308+P313 IF exposed or concerned: Get medical advice/attention
P312 Call a Poison Centre/doctor/... if you feel unwell. P330 Rinse mouth.
P333+P313 If skin irritation or rash occurs: Get medical advice/attention

○ precautionary statements	P337+P313 If eye irritation persists : Get medical advice/attention. P363 Wash contaminated clothing before reuse. P370+P378 In case of fire: Use a fire extinguisher.
	Storage/ P403+P233 Store in a well-ventilated place. Keep container tightly closed. P403+P235 Store in a well-ventilated place. Keep cool. P405 Store locked up.
	Disposal/ P501: Dispose of contents and container in accordance with local and national regulations.
C. Other hazard which do not result in classification	Health-2, Fire-3, Reactivity-0

3. Composition / Information on Ingredients

Ingredients	CAS NO.	Contents(%)
1.2-Dichloropropane	78-87-5	26~33
1.1-dichloro-1-fluoroethane	1717-00-06	65~73
Additive 1	-	1~2

4. First Aid Measures

A. Eye Contact	Wash eyes thoroughly with plenty of water for at least 20 minutes. Get medical attention immediately.
B. Skin Contact	In the case of burns, immediately cool the area with cold water, and do not remove clothing adhering to the skin. Wash skin with soap and water. Remove and isolate contaminated clothing and shoes. Wash skin with water.
C. Inhalation	Move to fresh air. If not breathing, give artificial respiration. Also call your doctor.
D. Ingestion (Swallowed)	Do not induce vomiting unless directed to do so by medical personnel.
E. Indication of immediate medical attention and special treatment needed	Contact, inhaled symptoms may be delayed. Make sure that medical personnel are aware of the material and take protective measures.

5. Fire-fighting Measures

A. Suitable extinguishing media:
- When digesting, use dry sand or earth.
- Use alcohol foam, carbon dioxide or water spray for digestion related to this material.

B. Specific hazards arising from the chemical (ex. Hazardous substances generated during combustion) :
Vapors may be ignited. May form explosive mixture at or above flash point. The container may explode on heating. Highly flammable: Easily ignited by heat, sparks and flames. Leaks are a fire / explosion hazard. Indoors, outdoors, and at the sewer, there is a risk of steam explosion. Vapors may form explosive mixtures with air. Steam can move back to the ignition source and flash back. Violent reaction may cause fire and explosion. Some liquid vapors may cause dizziness and suffocation. May be toxic by inhalation and skin contact. May cause irritation to eyes and skin and burns. May cause irritation, corrosion and toxic gases in case of fire.

C. Special protective equipment and precautions for fire fighters:
Wear appropriate protective equipment. Maintain safety distance and extinguish. Be aware that most of them are lighter than water. Most vapors are heavier than air and can spread along the ground and accumulate in low-lying or confined spaces. In the event of a large fire in a tank fire, use unmanned fire fighting equipment and let fire escape if it is impossible.

6. Accidental Release Measure

A. Personal precautions/ measures and equipments	Remove all ignition sources as very fine particles may cause fire or explosion. Wipe off any spills immediately and follow the precautionary measures. Note the substances and conditions to avoid. Steam suppression foam may be used to reduce steam generation. Stop the leak if it is not dangerous. Remove all sources of ignition and do not touch or walk with exposed material.
B. Environmental precautions	Do not expose this product to the environment as it may cause contamination. Be careful of inflows into waterways, sewers, basements, and confined spaces. Absorb spillage with inert material (dry sand or earth) and place in a chemical waste container.
C. Methods of cleaning up/ removing	When a large amount has leaked, make a trench away from the leak. Absorb liquid and rinse contaminated area with detergent and water. Pile up the embankment and collect the water for digestion. Collect absorbed material using clean explosion-proof tools.

7. Handling and Storage

A. safety handling precaution	Do not expose, cut, expose to welding, soldering, bonding, punching, grinding or heat exposure, flame, sparks, static electricity or other sources of ignition. Follow all MSDS / label precautions as product residues may remain after emptying containers. Take antistatic measures. Measure oxygen concentration in the air and ventilate. Use a non-sparking tool. Wear personal protective equipment.
B. Suitable storage conditions	Keep away from heat / sparks / open flames / hot surfaces. - No smoking. Keep container tightly closed and in a well-ventilated place. Keep it at low temperature.

8. Exposure controls / personal protection

A. Component exposure limits	National standard	TWA - 75ppm 350mg/m3 STEL - 110ppm 510mg/m3.
	ACGH	TWA 10 ppm
	Biological exposure standard	N.E.
B. Engineering controls	N.A.	
C. Persona protective equipments	○ Respiratory protection: Wear a respirator that has been approved by the Korean Occupational Safety and Health Administration in accordance with the physicochemical properties of the substance being exposed.	
	○ Eye protection: Wear protective glasses.	
	○ Hand protection: Wear protective gloves.	
	○ Personal protective equipment: Wear impervious gloves, shoes and masks.	

9. Physical and chemical properties

A. Appearance (physical state, color..)	Clear liquid	K. Vapor pressure	53.3mmHG (25℃)
B. Odor	Sweet smell	L. Solubility	2,800 mg/1,000㎖ (20℃)
C. Odor threshold	50 ppm	M. Vapor density	3.9
D. pH	N.E.	N. Specific gravity	1.2-1.3
E. Melting point/freezing point	-100 ℃	O. Partition coefficient (n-octanol/water)	1.98
F. Initial boiling point and boiling range	96 ℃	P. Auto-ignition temperature	557 ℃
G. Flash point	N.E.	Q Decomposition temperature	N.E.
H. Evaporation rate	(>1 (Butyl acetate=1)	R. Viscosity	N.E.
I. Flammability (solid, gas)	N.E.	S. Molecular Weight	N.E.
J. Upper/lower flammability or explosive limits	14.5 / 3.4 %	T. Percent volatile	N.E.

10. Stability and Reactivity

A. Chemical stability	Violent polymerization may cause fire and explosion (Due to high flammability liquid and vapor). May be toxic by inhalation and skin contact. May form explosive mixture at or above flash point. Containers may explode upon heating. Highly flammable: Easily ignited by heat, sparks and flames. Leaks have a fire / explosion hazard and may present a vapor explosion in the indoor, outdoor and sewage system.
B. Possibility of hazardous polymerization	Vapors may form explosive mixtures with air. Steam can move back to the ignition source and flash back. Vapors may cause dizziness or suffocation. May cause irritating, corrosive and toxic gases in case of fire. May cause eye irritation and skin burns.
C. Avoid condition (discharge of static electricity, shock, vibration)	Keep away from heat / sparks / open flames / hot surfaces. - No smoking.
D. Avoid materials	N.E.
E. Decomposition products	Irritant, corrosive, toxic gas

11. Toxicological Information

A. Information for exposure route	May cause irritation, nausea, vomiting, stomach pain, headache, drowsiness, blood disorders, kidney damage, liver damage, diarrhea. May cause mild irritation.
B. Information for health	○ Acute toxicity Oral : LD50 1900 ㎎/㎏ Rat, Dermal : LD50 10115 ㎎/㎏ Rabbit, Inhaslation : LC50 7600 ppm
	○ Skin corrosion/irritation : Causes mild irritation in rabbits.
	○ Serious eye damage/eye irritation : Causes moderate irritation in rabbits.
	○ Respiratory sensitization ; N.E.
	○ Skin sensitization : Skin sensitization is revealed in humans.
	○ Carcinogenicity : Industrial Safety and Health Act : N.E. Labor Ministry Notice: N.E. IARC: Group 3 OSHA: N.E. ACGIH: A4 NPT: N.E. EU CLP: N.E.
	○ Germ cell mutagenicity : Dominant lethal test using rat - negative
	○ Reproductive toxicity : - Degeneration of spermatogenesis, increased number of denatured spermatozoa were found.
	○ Specific target organ toxicity -single exposure : Hepatotoxicity in humans, hepatic necrosis, hemolytic anemia and thrombosis, acute effects on kidneys, tubulorrhexis, central nervous system depression have been reported.
	○ Specific target organ toxicity -repeated exposure : Severe kidney failure in humans, acute liver failure, hemolytic anemia and thrombosis, tubulorrhexis have been reported.
	○ Aspiration hazard : N.E.

12. Ecological Information

A. Ecotoxicity	○ Fish : LC50 280 ㎎/ℓ 96 hr ○ Persistence : N.E. ○ Degradability : N.E.
B. Persistence / degradability	○ Persistence : N.E. ○ Degradability : N.E.
C. Bioaccumulative potential	○ Bioaccumulation : BCF 6.9 ○ Biodegradable : N.E.
D. Soil mobility	N.E.
E. Other adverse effects	N.E.

13. Disposal Considerations

A. Disposal method	If oil and water separation is possible, pre-treat with oil and water separation method

B. Waste information (including waste method of contaminated container and packaging)
In the case of Aerosol, do not throw it in the fire. You should also make holes and discard them.
Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

A. UN number	1279	
B. UN proper shipping name	1,2-dichloropropane	
C. Transport hazard class	3	
D. Packing group	2	
E. Marine pollution	N.E.	
F. Special precaution which a user to be aware of or needs to comply with in connection with transport or conveyance either within or outside their premises		- Emergence procedure at fire : F-E - Emergency procedure at spill : S-D

15. Regulatory Information

A. According to industrial Safety&health Act	Exposure standard setting substance	
B. According to Chemicals Control Law	N.E.	
C. According to Dangerous Substances Safety Management Act Enforcement Rule	4th class first petroleum(non-water-soluble liquid) 200ℓ	
D. According to Enforcement Decree of The wastes control Act	Designated waste	
E. According to other regulations	Domestic regulation	Persistent organic pollutant control Act : N.A.
	Other countries regulation	○ US Administration Information - OSHA : N.A. - CERCLA : 453.599 kg 1000 lb - EPCRA 302 : N.A. - EPCRA 304 : N.A. - EPCRA 313 : 해당됨. - Rotterdam Convention material : N.A. - Stockholm Convention material : N.A. - Montreal Protocol on Substances : N.A. ○ EU classification information - Confirmed classification result : F; R11Xn; R20/22 - Risk phrases: R11, R20/22 - Precaution phrases: S2, S16, S24

16. Other Information

A. Reference : This MSDS has been supplemented and written by a GHI CO., LTD (supplier) on October 1, 1997 in accordance with GHS (Globally Harmonized System of Classification and Labeling Chemicals). The source of the data is based on materials such as IUCLID Chemical Data Sheet, EC-ECB, ECOTOX Database, EPA (http://cfpub.epa.gov/ecotox), International Chemical Safety Cards(ICSC) (http://www.nihs.go.jp/ICSC), Corporate Solution From Thomson Micromedex(http://csi.micromedex.com), Industrial Addiction Manual, Shin Kwang Publishing Co., TOXNET, U.S. National Library of Medicine(http://toxnet.nlm.nih.gov), The Chemical Database, The Department of Chemistry at the University of Akron (http://ull.chemistry.uakron.edu/erd), ECB-ESIS(European chemical Substances Information System)(http://ecb.jrc.it/esis), Chemical Information System, National Institute of Environmental Research(http://ncis.nier.go.kr), Dangerous Goods Information Management System, National Emergency Management(http://hazmat.nema.go.kr)

B. Date of draft : Oct 1. 1997

C. Revision number and the latest version date : 4 / May 30. 2018

D. This Material Safety Data Sheet(MSDS) may be changed or modified without prior notice due to product performance improvements or new technologies.

This MSDS is based on Article 39 (1) and Article 41 of the Industrial Safety and Health Act, Article 32 (2) of the Enforcement Decree of the same Act, Article 81 (1) of the Enforcement Rule, Article 92 (2) It is based on the classification of chemical substances, warning signs, material safety data to be prepared by the employer, and training for workers in accordance with Paragraph 2 of Schedule 11. A person who has been provided with information on the chemical substance pursuant to Article 20 (3) shall not use it for purposes other than therapeutic purposes or for the protection of workers' health, or disclose it to another person. We do not assume any technical or legal liability as a result of this.

B.S.= Business secrecy

N.A.= Not applicable

N.E.= Not established

Last Update May 30, 2018