Material Safety Data Sheet

PRODUCT	DIC AF COOLANT

1. CHEMICAL PRODUCT /COMPANY IDENTIFICATION

a.. Product : DIC AF COOLANT

b. Restrictions on the Use of purpose and recommendations

○ Advisory purposes : The internal combustion engine corrosion prevention and anti-freeze

○ Restrictions on the Use : No data

c. Manufacturer / supplier / distributors information

○ Supply Company : DASCO CHEMICAL LTD.

Address : 293-14, Gieopdanji-ro, Wongok-Myeon, Anseong-si, Gyeonggi-do, Republic of Korea

Provide emergency contact telephone information service : +82-31-652-1301

2. HEALTH HAZARD IDENTIFICATION

a. Risk category

Acute toxcity (inhalation: dust/mist) : category 4

Serious eye damage / eye irritation : Category 2

Reproductive toxicity substances Category 1B

Target organ systemic toxicity (single exposure) category 1

Target organ systemic toxicity (repeated exposure) category 1

b. Warning phrase to cover topics including prevention measures

○ Symbol



○ Signal Word Danger

○ Hazard Statement:

H302 Harmful if swallowed

H319 Causes serious eye irritation

H332 Harmful if inhaled

H360 May damage fertility or unborn child

H370 Cause damage to organs

H373 May Cause damage to organs through prolonged or repeated exposure

○ Phrases precautions

- Prevention

P201 Obtain special instruction before use.

P202 Don't handle all safety precautions have been read & understood .

P260 Don't breathe dust/fume/mists.vapors/spray.

P264 Wash... thoroughly after handling.

P270 Do not eat, drink, or smoke when using this product.

P271 Use only outdoors or in a well- ventilated area.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P281 Use personal protective equipment as requiredf.

- Response

P304+P340 IF INHALAED: Remove victim to fresh air and keep at rest in a position comfotable 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.

- Response	P307+P311 IF exposed**:** Call a POISON CENTER or doctor/ physician. P312 Call a POISON CENTER or doctor/ physician if you feel unwell P314 Get medical advise/ attention if you feel unwell P337+P313 If eye irritation persists: Get medical advice/attention.
- Storage	P405 Store locked up.
- Obsolete	P501 Dispose of contents/ container to...

c. Hazardous. Risk category does not include other criteria, the risk remains (NFPA)

	Health	Flammability	Reactivity
ETHYLENE GLYCOL	0	1	0
Sodium phosphate tribasic dodecahydrate	3	0	0
METHYL-1H-BENZOTRIAZOLE	1	1	0
BENZOIC ACID, SODIUM SALT	0	1	0
SODIUM MOLYBDATE	1	No data	0
WATER	0	0	0

3. INGREDIENTS

Components	Synonyms	CAS No.	Content(%)
ETHYLENE GLYCOL	1,2-ETHANDIOL	107-21-1	88~92
Sodium phosphate tribasic dodecahydrate	TRISODIUM PHOSPHATE	10101-89-0	0.2~0.4
METHYL-1H-BENZOTRIAZOLE	(1H-Benzotriazole,4(OR 5) methyl	29385-43-1	0.1~0.2
BENZOIC ACID, SODIUM SALT	BENZOIC ACID, SODIUM SALT	532-32-1	2~3
SODIUM MOLYBDATE	SODIUM MOLYBDATE, ANHYDROUS	7631-95-0	0.1~0.3
WATER	DIHYDROGEN OXIDE	7732-18-5	3~5

4. FIRST AID MEASURES

4.1 Description of first aid measures

a. On contacts with eyes	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
b. On skin contact	Remove contaminatwd clothing and clothing and shoes Wash with plenty of soap and water. Get medical advice/attention. Wash affects eyes for at least 20minutes under running water with eyes and skin
c. IF inhaled	If difficulties occur after vapor/aerosol has been inhaled, remove to fresh air and seed medical attention.
d. On digestion	Rinse mouth immediately and then drink plenty of water, seek medical attention.
e. Self-protection of the first aider/ Note for the doctor.	request the medical advice if you feel unwell.

5. FIRE FIGHTING MEASURES

a. Suitable(Unsuitable) extinguishing media

Suitable(Unsuitable) extinguishing media	Dry chemical, Carbon dioxide, water spray, AFFF foam. alcohol-resistant foam

b. Arise from a partcular chemical toxicity

Arise from a partcular chemical toxicity	Highly dependent on combusion condition , a complex mixture airborne solids, liquids, and gases including CO,CO2, and unidentified organic compounds will be evolved when this materials undergoes combusion.

c. Advise for fire-fighters	This material will burn, altthough it is not easily igniteded If you can do without the risk of fire, the courage to move from the area. Spray some substance to the pressurized water leakage, preventing them from scattering. Wear fire /flame resistant/ retardant clothing Fight fire with normal precautions from a reasonable distance Do not fight fire when fire reachs explosive Fight fire remotely due to the risk of expolsion Eliminate all ignition sources if safe to do so.

6. ACCIDENTAL RELEASE MEASURES

a. Personal precautions, protective equipment and emergency procedures	
	keep away from dust, hume, gas, mist, vapor. use personal protective equipment as required Eliminate all ignition sources Stop leak if safe to do Avoid release to the enviroment.
b. Environmental precautions:	Do not abdon your product to rivers
c. Methods and material for containment and cleaning up:	Use appropriate techniques such aas applying non-combustible materials or pumping Clean up spill as soon as possible After absorbing material to absor using the disposal, burning

7. HANDLING AND STORAGE

a. Precautions for safe handling	Do not get in eyes Do not breath vapor or hume Wash throughly after handling Do not taste or swallow antifreeze or solution.
b. Conditions for safe storage, including any incompatibilities	Do not store in open or unlabled containers. Empty containers should be compltely drained , properly closed, and promptly returned to a drum reconditioner or disposed of properly Store in a cool , dry place.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

a. Exposure Limits / Exposed to biological criteria.

Domestic Policy	STEL - C 40ppm C 100mg/m3 Hume or Mist
ACGIH	C 100 mg/m3(aerosol only)
Exposrd to biological criteria	No data
b. Appropriate engineering controls	Use process enclosure, local exhaust ventilation , or other engineering control airborne levels belows the recommended exposure limils.
c. Personal protective equipment	
Eye/face protection	Wear protective equipment to prevent eye contact - safety goggles, face shields, chemical goggles,...
Skin protection	No special protective clothing is normally required .Suggested materials for protective gloves include: Natural rubber, Neoprene, Nitrile Rubber, Polyvinyl Chloride (PVC or Vinyl).
Respiratory protection	Determine if airborne concentrations are below the recommended exposure limits. If not, wear an approved respirator that provides adequate protection from measured concentrations of this material, such as: Air-Purifying Respirator for Organic Vapors, Dusts and Mists. Consider the potential hazards of this material , applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES (Information on basic physical and chemical properties)

Appearance	
- Physical state	**LIQUID,**
- Color	**GREEN,**
Odour	**Faint or Mild**
Odour thershold	**No data**
pH	**7~9 (Vol 50% solution)**
Melting point/freezing point	**No data / <-34℃ (50 VOL% In water)**
Initial boiling point and boiling range	**>163℃ (1 ATM)**
Flash point.	**>110℃**
Evaporation rate	**No data**
Flammability (solid, gas)	**No data**
Upper/lower flammability or explosive	**No data**
Vapour pressure	**0.07 hPa (20℃)**
Vapour density	**2.1 (Air=1)**
Solubility(ies)	**SOLUBLE IN WATER**
Specific gravity	**1.132 (20℃)**
Partition coefficient n-octanol/water (Log Kow)	**No data**
Auto-ignition temperature	**398℃ (ETHYLENE GLYCOL)**
Decomposition temperature	**No data**
Viscosity	**0.016~0.030 Pas (25℃)**
Explosives properties	**No data**
Oxidising properties	**No data**
Molecular weight	**No data**

10. STABILITY AND RELIABILITY

a. Chemical stability : This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

b. Hazardous reactions : No hazardous reactions when stored and handled according to instructions.

c. Condition to avoid (electrostatic discharge, shock, vibration, etc.): heat, lights, fire works .

d. Incompatibility With Other Materials: May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc

e. When hazardous substances produced by decomposition

corrosion, toxic fume, irritation

f. Hazardous Polymerization : Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

a. Information regarding the most likely route of exposure

○ Ingested through the mouth : No data

○ Skin contact : No data

○ Eye contact : No data

b. Delays caused by exposure to short-term and long-term, chronic and acute impact

○ Acute toxic	.- Oral : LD50 7167 ㎎/㎏ Rat
	.- Dermal : LD50 >3500 ㎎/㎏ Mouse
	.- Inhalation : No data
○ Skin Corrosion / Irritation	Not classified- rabbit, Weak stimulus
○ Serious Eye Damage / Eye Irritation	Category 2
○ Respiratory Sensitizer:	No data
○ Skin Sensitizer:	slight irritation at the room temparture

○ Carcinogenicity

IARC	No data
OSHA	No data
ACGIH	A4
NTP	No data
EU CLP	No data
○ Toxicity for reproduction	May cause harmful
○ STOT-Single exposure	May cause drowsiness or dizziness
○ STOT-repeated exposure	May cause drowsiness or dizziness
○ Aspiration hazard No data	No data

12. ECOLOGICAL INFORMATION

a. Toxicity

○ fish	LC50 2278 ㎎/ℓ 96 hr Pimephales promelas
○ Daphnia	EC50 41100 ㎎/ℓ 48 hr Daphnia magna
○ Algae	EC50 7218 ㎎/ℓ 96 hr Selenastrum capricornutum

b. Persistence and degradability

○ Persistence	No data
○ Degradabilit	BOD 0.78 ㎎/ℓ, COD 1.19 ㎎/ℓ, BOD5/COD 0.66

c. Bioaccumulative potential

○ Bioconcentration factor (BCF)	BCF 200
○ Biodegradation	89 (%) 21 day
d. Mobility in soil	No data
e. Other adverse effects	No data

13. DISPOSAL CONSIDERATIONS

a. Waste treatment method

○ Use material for its intended purpose or recycle if possible.

○ This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by dispoal regulations Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, law requires disposal at a licensed hazardous waste disposal facility.

○ Obsolete applied in accordance with regulations

14. TRANSPORT INFORMATION

a. UN number	Not applicable
b. UN proper shipping name	Not applicable
c. Transport hazard class	Not applicable
d. Packing group:	Not applicable
e. Environmental hazard:	No data
f. Special precautions for user:	Not applicable

15. REGULATORY INFORMATION

Domestic regulation	Not applicable
National regulation	
OSHA	Not applicable
CRCLA	2267.995 kg 4999 lb
EPCRA 302	Not applicable
EPCRA 304	Not applicable
EPCRA 313	applicable

Montreal Protocol	Not applicable
EU Classified Information (Classification)	Acute Tox. 4 *
EU Classified Information (Danger pharse)	H302
EU Classified Information (Safety pharse)	Not applicable

16 OTHER INFORMATION

a. Key literature references and sources for data

○ Ethylene Glycol

KOSHA, KISchem, ECHA, ECOTOX, ICSC, Toxnet

○ BENZOIC ACID, SODIUM SALT

OECD Screening Information Data Set, University of Akron, Mdl Information System

ICSC, NLM, Corporate Solution From Thomson Micromedex

○ 4-TERT-BUTYLBENZOIC ACID

IUCLID, NITE, NLM, Corporate Solution From Thomson Micromedex, ECOTOX, University of Akron

○ POTASSIUM PHOSPHATE DIBASIC

IUCLID, ECOSAR

○ METHYL-1H-BENZOTRIAZOLE

ECHA, ChemIDplus, TOMES, ECOSAR, QSAR

○ SODIUM MOLYBDATE

OECD, OECD SIDS, University of Akron, ECHA, ChemIDplus

○ WATER

NLM

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