Material Safety Data Sheet

[This sheet was made by Industrial Safety and Health Act, Article 41, in Korea]

Electrolytic Galvanized Sheet (EGI)

MSDS No. : AA09408-0000000013

1. Chemical Product and Company Identification

A. Product Name : Electrolytic Galvanized Sheet (EGI)

B. Recommended Use of Product and restrictions on use

- Recommended Use of Product : Home appliance, Furniture, Car etc.
- restrictions on use : N/A

C. Manufacturer / Supplier / Distributor Information

- Name: KG Steel
- Address : 1228, Bukbusaneom-ro, Songak-Eup, Dangjin-Si, Chungnam province, 343-823, Korea
- Emergency phone number : +82-41-351-8527 / +82-41-351-8115

2. Hazards Identification

A. Hazard. Risk Classification

Pyrophoric solid : Classification 1

Reproductive toxicity: Classification 1B

Chronic aquatic environment hazard : Classification 2

B. Label elements including precautionary statements

Symbol

Signal Word : Hazards

Hazard-Risk Statement

H360 May damage fertility or the unborn child

H411 Toxic to aquatic life with long lasting effects

Precautionary Statement

Prevention

P201 Obtain special instructions before use

P202 Do not handle untill all safety precautions have been read and understood

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources.

P273 Avoid release to the environment

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

Response

P308+P313 If Exposed or concerned : Get medical advice/attention

P335+P334 Brush off loose particles from skin. Immerse in cool water or wrap in wet bandages

P391 Collect spillage

Storage

P405 Store locked up

Disuse

P501 Dispose of contents/container according to applicable regulations

C. Other Hazard. Risk which are not included in the classification criteria

Manganese

Health : 0 Fire : N/A Reaction : 1

Iron

Health : 2 Fire : N/A Reaction : N/A

Zinc

Health : 0 Fire : N/A Reaction : 1

3. Composition/Information on ingredients

Name	Other name	CAS No	Percentage
Manganese	Mangan	7439-96-5	Max 1%
Iron	Ferrium	7439-89-6	Mqx 97.3%
Zinc	Zink	7440-66-6	Max 1.2%

※ Please refer to the MSDS of iron

※ C, Si, Al and Ti may be added in minor amounts during manufacturing

※ This product is solid finished product. There is no possibility of exposure to chemicals contained in the product. It may be partially exposed in the melting state such as cutting, melting etc.

4. First aid measures

A. Eye contact

Get medical advice/attention

Rinse cautiously with water for several minutes

B. Skin contact

Brush off loose particles from skin. Immerse in cool water or wrap in wet banages

Get medical advice/attention

Remove contaminated clothing and shoes and isolate contaminated areas

Rinse cautiously with water for several minutes

Avoid dispersal of contaminants.

C. Inhalation

If exposed or concerned, call a doctor

Remove person to fresh air

Make it warm and stable

D. Ingestion

If exposed or concerned, call a doctor

Do not use artificial respiration with mouth-to-mouth method and use appropriate respiratory medical equipment

E. Doctor's notes

Contact your health care professional and take special first aid measures such as follow-up investigations

Have the healthcare worker know about the material and take protective measures

5. Fire-Fighting measures

A. Suitable (and unsuitable) extinguishing media

Use alcohol foam, carbon dioxide or water spray

Use dry sand or soil for extinguishment by smothering

B. Specific hazards arising from the chemical

Can generate toxic gas by decomposing at high temperature

Leaks are a fire/explosion hazard

May re-ignite after extinguish the fire

Some substances may burn rapidly with a flash

Some can burn, but not easily ignite

Non-flammable materials do not burn, but can generate corrosive/toxic fumes by decomposing at high temperatures.

C. Special protective equipment and precautions for fire-fighters

Manganese

Rescuers should wear appropriate protectice equipment

Escape the area and extinguish the fire at a safe distance

Move container from fir area if it is not hazardous

If it is impossible to extinguish the fire, protect the surroundings and let the fire extinguish itself

Iron

Move container from fir area if it is not hazardous

If it is impossible to extinguish the fire, protect the surroundings and let the fire extinguish itself

Zinc

Rescuers should wear appropriate protectice equipment

Escape the area and extinguish the fire at a safe distance

6. Accidental release measures

A. Personal precautions, protective equipment and emergency procedures

Remove all ignition sources as very fine particles may cause fire or explosion

Isolate contaminated areas

Do not enter if you do not need to enter or do not have protective equipment

Remove all ignition sources

Stop the leak if it is not dangerous

Do not touch a damaged container or spill without adequate protection

Cover with plastic sheet to prevent spreading

Avoid dust formation

Note the substances and conditions to avoid

B. Environmental precautions and protective procedures

Do not discharge into the environment

Prevent entry into waterways, sewers, basements and confined areas.

C. Methods and materials for containment and cleaning up

In case of powder leakage, cover with plastic sheet to prevent spread and keep dry

7. Handling and storage

A. Precautions for safe handling

Do not handle until all safety precautions have been read and understood

Handle / store carefully

Do not breathe vapors from heated material

Do not go into storage area, if there is no adequate ventilation

Note the substances and conditons to avoid

Be careful of high temperatures

B. Conditions for safe storage

Keep away fron heat, sparks, flames and high temperature

Store in lockable storage area

8. Exposure controls & personal protection

A. Control parameters

Domestic regulations

Manganese: TWA – 1mg/m³ Manganese and inorganic compounds

TWA – 3mg/m³ Manganese(fume)

Iron : TWA – 1mg/m³

Zinc : N/A

ACGIH

Manganese:

TWA 0.02 mg/m³ Manganese and inorganic compounds(Respirable dust)

TWA 0.02 mg/m³ Manganese(fume)(Respirable dust)

TWA 0.1 mg/m³ Manganese and inorganic compounds(Inhalable dust)

TWA 0.1 mg/m³ Manganese(fume)(Inhalable dust)

Iron: N/A

Zinc : N/A

Biological exposure standard : N/A

B. Appropriate engineering controls

Use process isolation, local exhaust, or keep air level below exposure standard

C. Personal protective equipment

Respiratory protection

Manganese and inorganic compounds

Wear respiratory protection which has been approved by the Korean Occupational Safety and Health Administration in accordance with physicochemical properties of the particulate matter to be exposed.

If the exposure level is lower than 10mg/m³, wear a respiratory protective gear of half mask type that have appropriate type filter.

If the exposure concentration is lower than 25mg/m³, wear a dust mask of loose-fitting hood /powered helmet type or continuous-flow type that have appropriate type filter.

If the exposure concentration is lower than 50mg/m³, wear a respiratory protective gear of full type or powered and half type or Air-fed continuous-flow / pressure-demanding type that have appropriate type filter.

If the exposure concentration is lower than 1000mg/m³, wear a ventilation mask of full type or hood/helmet type or Pressure-demanded type that have appropriate type filter.

If the exposure concentration is lower than 10000 mg / m³, wear self-contained breathing apparatus (SCBA) or self-contained breathing apparatus with pressure-demand self-contained breathing apparatus (SCBA) with appropriate filter.

Manganese (fume)

Wear respiratory protection which has been approved by the Korean Occupational Safety and Health Administration in accordance with physicochemical properties of the particulate matter to be exposed.

If the exposure level is lower than 30mg/m³, wear a respiratory protective gear of half mask type that have appropriate type filter.

If the exposure concentration is lower than 75mg/m³, wear a dust mask of loose-fitting hood /powered helmet type or continuous-flow type that have appropriate type filter.

If the exposure concentration is lower than 150mg/m³, wear a respiratory protective gear of full type or powered and half type or Air-fed continuous-flow / pressure-demanding type that have appropriate type filter.

If the exposure concentration is lower than 3000mg/m³, wear a ventilation mask of full type or hood/helmet type or Pressure-demanded type that have appropriate type filter.

If the exposure concentration is lower than 30000 mg / m³, wear self-contained breathing apparatus (SCBA) or self-contained breathing apparatus with pressure-demand self-contained breathing apparatus (SCBA) with appropriate filter.

Iron

Wear respiratory protection which has been approved by the Korean Occupational Safety and Health Administration in accordance with physicochemical properties of the particulate matter to be exposed.

If the exposure level is lower than 10mg/m³, wear a respiratory protective gear of half mask type that have appropriate type filter.

If the exposure concentration is lower than 25mg/m³, wear a dust mask of loose-fitting hood /powered helmet type or continuous-flow type that have appropriate type filter.

If the exposure concentration is lower than 50mg/m³, wear a respiratory protective gear of full type or powered and half type or Air-fed continuous-flow / pressure-demanding type that have appropriate type filter.

If the exposure concentration is lower than 1000mg/m³, wear a ventilation mask of full type or hood/helmet type or Pressure-demanded type that have appropriate type filter.

If the exposure concentration is lower than 10000 mg / m³, wear self-contained breathing apparatus (SCBA) or self-contained breathing apparatus with pressure-demand self-contained breathing apparatus (SCBA) with appropriate filter.

Zinc

Wear respiratory protection which has been approved by the Korean Occupational Safety and Health Administration in accordance with physicochemical properties of the particulate matter to be exposed.

9. Physical and chemical properties

Manganese

A. Appearance

Appearance : Solid(Powder)

Colour : Gray

B. Odour : N/A

C. Odour threshold : N/A

D. pH : N/A

E. Meting point/freezing point : 1244℃

F. Initial boiling point and boiling range : Aluminum : 1962℃

G. Flash point : N/A

H. Evaporation rate : N/A

I. Flammability(solid, gas) : Flammability

J. Upper/lower flammability or explosive limits : N/A

K. Vapour pressure : 1 Pa (955℃)

L. Solubility : (Insoluble)

M. Vapor density : N/A

N. Specific gravity : 7.47

O. N-octanol/water Partition coefficient : N/A

P. Auto-ignition temperature : N/A

Q. Decomposition temperature : N/A

R. Viscosity : N/A

S. Molecular weight : 54.94

Iron

A. Appearance

Appearance : Solid

Colour : White or Gray

B. Odour : N/A

C. Odour threshold : N/A

D. pH : N/A

E. Meting point/freezing point : 1535℃

F. Initial boiling point and boiling range: 2750℃

G. Flash point : None

H. Evaporation rate : None

I. Flammability(solid, gas) : None

J. Upper/lower flammability or explosive limits : None

K. Vapour pressure : 1 mmHg (at 1787℃)

L. Solubility : (Water solubility: Insolubility. Solvent availability : availability : acid.

Insolubility : alkali, Alcohol, ether)

M. Vapor density : None

N. Specific gravity : 7.86 ((water=1))

O. N-octanol/water Partition coefficient : None

P. Auto-ignition temperature : None

Q. Decomposition temperature : None

R. Viscosity : None

S. Molecular weight : 55.85

Zinc

A. Appearance

Appearance : Solid(Powder)

Colour Gray ~ Blue

B. Odour : Odorless

C. Odour threshold : N/A

D. pH : N/A

E. Meting point/freezing point : 419℃

F. Initial boiling point and boiling range : 907℃

G. Flash point : N/A

H. Evaporation rate : N/A

I. Flammability(solid, gas) : Flammabilty

J. Upper/lower flammability or explosive limits : N/A

K. Vapour pressure : 0.1 kPa (487℃)

L. Solubility : (Reaction)

M. Vapor density : N/A`

N. Specific gravity : 7.14 (Water=1)

O. N-octanol/water Partition coefficient : -0.47 (Estimate)

P. Auto-ignition temperature : 460℃ (Fine powder)

Q. Decomposition temperature : N/A

R. Viscosity : N/A

S. Molecular weight : 65.38

10. Stability and reactivity

A. Chemical stability and possibility of hazardous reactions

Manganese

Can decompose at high temperature and generate toxic gas

Can be ignited by heat, sparks and flames

May re-ignite after extinguish the fire

Some materials burn with intense heat

Dust and fumes can form explosive mixtures with air

Inhalation and contact with vapors, substances, and decomposition products may result in serious injury or death

Oxides in metal fires have serious health hazards

Iron

Can be ignited by heat, sparks and flames

May re-ignite after extinguish the fire

Some materials burn with intense heat

Dust and fumes can form explosive mixtures with air

May cause irritating, corrosive and toxic gases in case of fire

Inhalation and contact with vapors, substances, and decomposition products may result in serious injury or death

Oxides in metal fires have serious health hazards

Zinc

Leaks are a fire / explosion hazard

May re-ignite after extinguish the fire

Can be ignited by heat, sparks and flames

May cause irritating, corrosive and toxic gases in case of fire

Inhalation and contact with vapors, substances, and decomposition products may result in serious injury or death

May form corrosive solution in contact with water

B. Conditions to avoid

Manganese: Heat, Spark, Flame etc Ignition source

Iron : Heat, Spark, Flame etc Ignition source

Zinc

Heat, Spark, Flame etc Ignition source

Moisture

C. Incompatible materials

Manganese: Water

Iron : Water

Zinc : Water

D. Hazardous decomposition products

Manganese : Irritant, corrosive, toxic gas

Iron : Irritant, corrosive, toxic gas

Zinc : Irritant, corrosive, toxic gas

11. Toxicological information

A. Information on the likely routes of exposure : N/A

B. Health hazards information

Acute toxic

Oral

Manganese : LC50 > 2000 mg/kg Rat (OECD TG 420, GLP)

Iron : LC50 98600 mg/kg Rat (OECD TG 401, Male)

Zinc : LC50 > 2000 mg/kg Rat (OECD TG 401, GLP)

Dermal

Manganese : N/A

Iron : LC50 20000 mg/kg Guinea pig

Zinc : N/A

Inhalation

Manganese : Dust LC50 > 5.14 mg/ℓ 4 hr Rat (OECD TG 403, GLP)

Iron : Dust LC50 > 100 mg/m³ 6 hr Rat (Not applicable to classification due to lack of reliability of data such as mouse, hamster and guinea pig)

Zinc: Dust LC50 > 5..41 mg/m³ 4 hr Rat (OECD TG 403, GLP)

Skin corrosive/irritant

Manganese : As a result of skin corrosion / irritation test on rabbits, no corrosivity OECD TG 404, GLP

Iron : As a result of skin corrosion / irritation test on rabbits, no corrosivity OECD TG 404

Zinc : Body/No stimulation

Serious eye damage/eye irritation

Manganese : As a result of eye damage / irritation test on rabbits, no stimulation OECD TG 405, GLP

Iron : As a result of eye damage / irritation test on rabbots, no stimulation OECD TG 405

Zinc : : As a result of eye damage / irritation test on rabbots, very slight irritation, but not classified OECD TG 405, GLP

Respiratory sensitization : N/A

Skin sensitization

Manganese : As a result of the skin sensitization LLNA test for female mouse, no sensitization OECD TG 426, GLP

Iron : As a result of the skin sensitization test for guinea pigs, all iron oxide materials are non-irritant

Similar materials : 1309-37-1, 1317-61-9, 1310-14-1

Zinc : No skin sensitization

Carcinogenicity

Industrial Safety and Health Act : N/A

Ministry of Labor examination : N/A

IARC : N/A

OSHA : N/A

ACGIH

Manganese : A4

Iron : N/A

Zinc : N/A

NTP : N/A

EU CLP : N/A

Germ cell Mutagenicity

Manganese : As a result of chromosomal aberration test using in vitro cultured mammalian cells, no chromosomal animalies

Similar materials : 7773-01-5 OECD TG 473, GLP

Iron : As a result of gene mutation test using in vitro cultured mammalian cels, carbonyl iron is positive and electrolytic iron is negative OECD TG 476

Zinc : As a result of genetic mutation test by in vitro mitotic recombination, negative

Similar materials : 7733-02-0

Germ cell toxicity

Manganese : As a result of the teratogenicity test in mice, embryo lethality and malformed fetus (brain escape) occurred.

Reproductive toxicity expected

Iron : N/A

Zinc : As a result of second generation oral toxicity test using rats, There was a signidicant effect on sex maturation, matingm pregnancy and early lactation of adult rats, but, no significant effect on reproductive toxicity was observed NOAEL = 7.5 mg/kg bw/day(F1)
(Similar materials : Zinc chloride) (OECD TG 416)
As a result of Developmental / teratology toxicity test for rabbits, Adults and fetuses of rabbits were not affected
(Similar materials : 7733-02-0) NOAEL = 60 mg/kg bw/day

Specific target organ toxicity(Single exposure)

Manganese : causes pneumonia

Iron : N/A

Zinc : N/A

Specific target organ toxicity(Repeated exposure)

Manganese : Influences respiratory and nervous system
As a result of repeated inhalation toxicity test for monkeys for 10 months, There is a toxic effect on pulmonary vascular lymphatic proliferation, interstitial lung accumulation, pulmonary necrosis with dust, appearance of bronchial secretions, hyperplastic lung wall, emphysema, and atelectasisNOAEL = 0.7 mg/m³

Iron : As a result of oral target organ systemic toxicity test on rats,
the liver are affected
As a result of inhalation target organ systemic toxicity test or rats,
NOAEC = 5mg/m³

Zinc : Oral repeated long term systemic toxicity test on mouse, Animals at very high concentrations showed low food intake, growth retardation, histopathological lesions and proliferation of red cell immature cells.
NOEL = 3,000 ppm Similar materials : 7733-02-0 OECD TG 408

Aspiration hazard : N/A

Other harmful effects : N/A

12. Ministry of Labor examination

A. Ecotoxicity

Fish

Manganese : LC50 > 3.6 mg/ℓ 96 hr Oncorhynchus mykiss (OECD Guideline 203, GLP)

Iron : LC50 13.6 mg/ℓ 96 hr (Danio rerio, LC0, 96h, >100,000mg/L,

Similar materials : 51274-00-1, OECD Guideline 203,

Brachydanio rerio, LL0, LC50, 96h, >10,000mg/L, Similar materials :1317-61-9)

Zinc : LC50 0.439 mg/ℓ 96 hr other (Cottus bairdii)

Crustacea

Manganese : EC50 > 1.6 mg/ℓ 48 hr Daphnia magna (OECD TG 202, GLP)

Iron : EC50 > 100 mg/ℓ 48 hr Daphnia magna (Similar materials CAS No. 1309-37-1

OECD TG 202)

Zinc : EC50 0.416 mg/ℓ 48 hr Ceriodaphnia dubia (OECD TG 202)

Algae

Manganese : EC50 4.5 mg/ℓ 72 hr (test species : Desmodesmus subspicatus,

OECD TG 201, GLP)

Iron : N/A

Zinc : NOEC 0.05 mg/ℓ 72 hr Seienastrum capricornutum (OECD TG 201, GLP)

B. Persistence and degradability

Persistence : N/A

Degradability : N/A

C. Bioaccumulative potential

Accumulation

Manganese : BCF ≤ 81

Iron : N/A

Zinc : 600 (fish)

Biodegradable

Manganese : N/A

Iron : N/A

Zinc : (Not applicable to biodergradability test)

D. Mobility in soil : N/A

E. Other adverse effects

Manganese : Crustacea : Ceriodaphnia dubia : NOEC = 1.7 mg/L 8d OECD TG 211, GLP

Fish : Oncorhynchus mykis : NOEC = 0.77 mg/L 100d

Algae : Ditylum brightwellii : EC50 = 1.5 mg/L 5d

Iron : N/A

Zinc : Fish : Cottus bairdii : NOEC = 0.169 – 0.172 mg/L 30d

Crustacea : Daphnia magna : NOEC = 0.048 – 0.156 mg/L 21d

Similar materials CAS No. 7646-85-7 OECD TG 211

Algae : Ceramium tenuicore : NOEC = 7.2 – 18 μg/L 7d

13. Disposal considerations

A. Disposal method

Manganese : N/A

Iron

Use one of the following methods

1. Solidify
2. Land a designated waste in a managed landfill
3. Incinerate spent catalysts containing flammable materials
4. In case of incinerating waste catalyst containing halogenated material, incinerate at high temperature

Zinc : N/A

B. Disposal precaution : Dispose of contents container according to applicable regulations

14. Transport information

A. UN Number (UN No.)

Manganese : 3089

Iron : 3089

Zinc: 1436

B. UN proper shipping name

Manganese : Metal powder(Flammable)(Except that the name of the product is not specified)

METAL POWDER, FLAMMABLE, N.O.S.

Iron : Metal powder(Flammable)(Except that the name of the product is not specified)

METAL POWDER, FLAMMABLE, N.O.S.

Zinc: ZINC POWDER or ZINC DUST

C. Transport hazard

Manganese : 4.1

Iron : 4.1

Zinc: 4.3

D. Packing group

Manganese : Ⅱ

Iron : Ⅱ

Zinc: Ⅰ

E. Environmental hazards

Manganese : Not applicable

Iron : Not Applicable

Zinc: Applicable(MP)

F. Special safety measures that the user needs or needs to know about transport or means of transport.

Emergency measures in case of fire F-G

Emergency measures in case of leak S-G

15. Regulatory information

A. Industrial Safety and Health Act

Manganese : Toxic substances to be controlled

Special medical examination subject substance (diagnosis period: 12 months)

Exposure standard setting substance

Iron : Toxic substances to be controlled

Exposure standard setting substance

Zinc : Toxic substances to be controlled

B. Toxic Chemical Control Act : N/A

C. Dangerous Material Safety Control Act

Manganese : Class 2 Metal powder 500kg

Iron : Class 2 Iron powder500kg

Zinc: Class 2 Metal powdwe 500kg

D. Wastes Management Act

Manganese : N/A

Iron : Designated waste

Zinc : N/A

E. Other requirements in domestic and other countries

Domestic regulation

Residual Organic Pollutant Control Act : N/A

Foreign regulation

US Administration Information(OSHA Rule : N/A

US Administration Information(CERCLA Rule)

Manganese : N/A

Iron : N/A

Zinc : 453.599kg 1000lb

US Administration Information (EPCRA 302 Rule) : N/A

US Administration Information (EPCRA 304 Rule) : N/A

US Administration Information (EPCRA 313 Rule)

Manganese : Applicable

Iron : N/A

Zinc : Applicable

US Administration Information (Rotterdam Convention material) : N/A

US Administration Information (Stockholm Convention substance) : N/A

US Administration Information (Montreal Protocol substance) : N/A

EU Classification information (Confirmed classification result)

Manganese : N/A

Iron : N/A

Zinc: Pyr. Sol. 1

Water-react. 1

Aquatic Acute 1

Aquatic Chronic 1

EU Classification information (Risk phrases)

Manganese : N/A

Iron : N/A

Zinc: H250, H260, H400, H410

EU Classification information (Safety phrases) : N/A

16. Other information

A. Source of material

Manganese

ECHA(Appearance)

ECHA(Colour)

HSDB(E. Melting point/Freezing point)

ECHA(I. Flammability(solid, gas))

HSDB(K. Vapour pressure)

1.(N. Specific gravity)

HSDB(S. Molecular weight)

ECHA(Oral)

ECHA(Inhalation)

ECHA (Skin corrosive/irritant)

ECHA (Serious eye damage/eye irritation)

ECHA (Skin sensitization)

ECHA (Germ cell Mutagenicity)

CICAD, NITE (Germ cell toxicity)

CICAD (Specific target organ toxicity(Single exposure))

NITE, CICAD (Specific target organ toxicity(Repeated exposure))

ECHA (Fish)

ECHA (Crustacea)

ECHA (Algae)

NITE (Persistence)

ECHA (D. Mobility in soil)

ECHA, NITE(E. Other adverse effects)

Iron

HSDB (Appearance)

HSDB (Colour)

HSDB (E. Melting point/Freezing point)

HSDB (F. Initial boiling point and boiling range)

HSDB (K. Vapour pressure)

ICSC (L. Solubility)

ICSC (N. Specific gravity)

pubchem (S. Molecular weight)

ECHA (Oral)

ECHA (Dermal)

ECHA (Skin corrosion or irritation)

ECHA (Serious eye damage or irritation)

ECHA (Skin sensitization)

ECHA (Germ cell mutagenicity)

(Reproductive toxicity)

NITE, CICAD (Specific target organ toxicity (Repeated exposure))

ECHA (Fish)

ECHA (Crustacean)

ECHA (D. Mobility in soil)

Zinc

ICSC(Appearance)

ICSC(Colour)

HSDB(B. Colour)

ICSC(E. Meting point/freezing point)

ICSC(F. Initial boiling point and boiling range)

ICSC(K. Vapour pressure)

ICSC(L. Solubility)

ICSC(N. Specific gravity)

NLM(O. N-octanol/water Partition coefficient)

ICSC(P. Auto-ignition temperature)

ICSC(S. Molecular weight)

ECHA(Oral)

ECHA(Inhalation)

IUCLID (Skin corrosion or irritation)

ECHA(Serious eye damage or irritation)

OECD(Skin sensitization)

ECHA(Germ cell mutagenicity)

ECHA(Reproductive toxicity)

ECHA(Specific target organ toxicity (Repeated exposure))

ECHA(Fish)

ECHA(Crustacea)

ECHA(Algae)

IUCLID(Persistence)

ECHA(E. Other adverse effects)

B. Issuing date : 2004.12

C. Revision number : 6 Times

D. Revision number : 2025.12.31

E. Others

This information is based on the industrial Safety and Health Act and the knowledge and related materials to date. However, the risk of hazardous substances is not written to all the risks of hazardous substances exist there may be unknown hazards of all chemicals in this material may be prescribed. Therefore, our customers and potential customers should review this information and precaution, look precautions carefully

and verify suitability about applicable laws and regulations related to the use and disposal of this product.

This information is intended solely for the purpose of describing the health, safety and environmental requirements of the product handler and should not be construed as an endorsement of the characteristics or quality of the product.

Please understand that it is the sole responsibility of the user to evaluate the final suitability of the product, as it is impossible to control the actual application of this product. It is necessary to establish appropriate safety measures in accordance with the application and usage in case of special handling.

This document can be revised based on the new information.