MSDS

TIN PLATE

SHINHWA DYNAMICS Co.,Ltd.

1.Information about chemical products and company

A. Product — Tin plate

B. Recommended use and usage restrictions

Recommended use	For food, miscellaneous, and other containers
Usage restrictions	No data

C. Supplier

Company	SHINHWA SILUP CO., LTD.
Address	31, Beonnyeong 2-ro, Danwon-gu, Ansan-si, Gyeonggi-do, Republic of Korea
MSDS Writer	Quality control department
Homepage	http://shinhwatp.co.kr
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2.Warning signs including precautionary measures statements

Picture

Sign	Warning
Hazardous statements	H335 It may cause respiratory system irritation. H250 When exposed to air, it ignites itself.
Precautionary measures	
Prevention	P210 Keep away from heat, spark, flame, and high heat. P222 Keep out of contact with the air. P261 Avoid inhalation of dust, fume, gas, mist, steam, spray. P271 Only handle outdoors or in well ventilated areas. P280 Wear protective gloves, clothing, safety glasses, etc.
Response	P304+P340 Move to fresh air when inhaled and rest in a breathable position. P312 If you feel uncomfortable, see a doctor to check. P335+P334 Shake off any substances on the skin, soak in cold water or cover with a wet bandage.
Storage	P403+P233 Store containers tightly sealed in a well-ventilated place.
Disposal	P405 Store in a locked storage area P501 Dispose of containers in accordance with the relevant regulations.

Other hazards and risks (NFPA) not included in the hazard and risk classification criteria

Tin (Sn)	Sanitation: 0	Fire : No data	Reactivity: 0
Iron (Fe)	Sanitation: 2	Fire : No data	Reactivity: No data

3.Name and content of components

Material	CAS No.	Content
Tin	7440-31-5	2.0 ~ 22.4g/m^2
Iron	7439-89-6	Balance

※ In manufacturing, small amounts of silicon (0.03% max), manganese (0.5% max), aluminum (0.07% max), nickel (0.01% max), copper (0.03% max), molyboden 0.01% max), and vanadium (0.05% max) may be added.

※ This product is a solidified finished product, and MSDS is not exposed to chemicals contained in the product.
May be partially exposed in melting conditions, such as items excluded from preparation, cutting, or welding

4.First aid tips

A. When there's a substance in your eye	Get emergency medical attention. Wash skin and eyes immediately in running water for at least 20 minutes upon contact with the substance.
B. When it comes into contact with the skin,	Prevent the spread of contamination in the event of minor skin contact. If you feel uncomfortable, see a doctor. Remove contaminated clothes and shoes and isolate contaminated areas.
C. When inhaled	If you are exposed to excessive amounts of dust or fume, remove it with clean air and take medical measures if you have cough or other symptoms. Keep warm and steady. Move to fresh air If you do not breathe, perform artificial respiration.
D.When you eat	Ensure that medical personnel are aware of the substance and take protective measures.

5. Handling method in case of explosion or fire

A. Proper (inappropriate) fire control	CO2(inappropriate) Big fire (appropriate) :Dry sand. Drying chemical, Limestone, soda ash * Water (inappropriate) Small fire (appropriate) : Dry sand. Drying chemical, Limestone, soda ash *Foam (inappropriate) Container may explode when heated Leakage is at risk of fire/explosion Inhalation of decomposition products may result in serious injury or death Can be re-ignited after digestion
B. Specific hazards arising from chemicals	May ignite in contact with moisture flammable/combustible substances Some substances can burn quickly with flashes Some may explode in the event of fire or heating Serious burns to the skin and eyes when in contact May produce irritating, corrosive and toxic gases in the event of fire It may be molten and transported, so be careful. Keep water out of the container. If not dangerous, move the container from the fire area. Keep safe distance away from the area and digest.
C. Protective equipment and preventive measures to be worn during fire fighting	In the event of a tank fire, use unmanned fire extinguishing equipment in the event of a large fire, and if not possible, let it burn. Cool the container with plenty of water even after extinguishing the fire in the tank. If there is a high tone or discoloration of the tank during a tank fire, withdraw immediately. In case of tank fire, extinguish at maximum distance or use unmanned fire extinguishing equipment. In the event of a tank fire, get out of the tank in flames.

6.How to deal with leakage accidents

A. Actions and protective gear necessary to protect the human body	Avoid inhalation of (dust, fume, gas, mist, steam, spray). Do not touch or walk around the exposure. Remove all ignition sources.

	Stop the leak if it's not dangerous. Pay attention to substances and conditions to avoid. Wear protective steam protection clothing in case of leakage without fire.
B.Action required to protect the environment	Leakage may cause contamination
C.Purifying or removing methods	Prevent inflow into waterways, sewers, basement, and confined spaces. Cover with dry sand/soil, other non-flammable substances and cover with plastic sheets to prevent spread and rain. Using a clean explosion proof tool, collect the leak and place it in a loosely covered plastic container.

7.Handling and storage method

A.Safety Handling Guidelines	Avoid inhalation of (dust, fume, gas, mist, steam, spray). Refer to engineering management and personal protective equipment. Only handle outdoors or in well ventilated areas. Use carefully for handling/storage.
B.Safe Storage Method	Pay attention to substances and conditions to avoid. Store tightly sealed in a well ventilated area.

8.Exposure protection and personal protection

A.Exposure standards, biological exposure standards, etc. of chemicals

Domestic regulations	TWA-2mg/m^3 TIN (Metal) TWA-0.1mg/m^3 TIN (organic compounds) TWA-2mg/m^3 Iron
ACGIH regulations	TWA-2mg/m^3 TIN TWA-2mg/m^3 TIN TWA-0.1mg/m^3 TIN
Organic Compounds Biological	No data
Exposure Standards and others	No data
B.Proper engineering management	If dust, fume, or mist is generated during operation, ventilate air pollution so that it is maintained below the exposure standard. Annotation (metal)
C. Personal protective gear	Annotation (Organic Compounds)
Respiratory protection	Wear respiratory protective gear that is certified by the Korea Occupational Safety and Health Agency to match the physical chemical properties of the exposed particulate matter. If the exposure concentration is less than 1 mg/m3, wear a suitable

	type of filter. If the exposure concentration is lower than 2.5 mg/m3, wear a loose-fitting hood/helmet type electric respirator or continuous flow dust mask with the appropriate type of filter.
Eye protection	If the exposure concentration is less than 5 mg/m3, wear a front-facing or electrically powered half-type or air-supplied continuous flow/pressure demand half-type respirator with appropriate filters. If the exposure concentration is less than 100 mg/m3, wear a front-facing or helmet/hood type or pressure-required transmission mask with a suitable filter.
Hand Protection	Wear self-air supply (SCBA) or pressure-demand self-air supply (SCBA) respirators with appropriate filters if the exposure concentration is lower than 1000 mg/m3.
physical protection	Wear breathable goggles to protect the eyes against particulate matter that may cause irritation or other health problems. Install emergency cleaning facilities (shower type) and face washing facilities in a location where workers can easily access them.
Type of protective material	Wear appropriate protective gloves considering the physical and chemical properties of the chemical. Wear appropriate chemical resistant gloves. Wear heat-resistant gloves when working on high heat. Wear appropriate protective gloves considering the physical and chemical properties of the chemical. Wear proper chemical resistant protective clothing. Wear heat-resistant clothing when working with high heat.

9.Physical Chemical Properties

TIN

Physical Status	Solid (liquid 232℃)	Water solubility	insoluble
Colors and Smells	White(gloss), odorless	Boiling point	Not Applicable
Vapor pressure	No data	Evaporation rate	Not Applicable
Vapor density	Not Applicable	melting point	2260℃
Weight (Water=1)	7.2	Hydrogenion index (pH)	Not Applicable

Iron

Physical Status	Solid (liquid 1535℃)	Water solubility	insoluble
Colors and Smells	White or gray,	Boiling point	Not Applicable

Vapor pressure Vapor density Weight (Water=1)	odorless 1mmHg(at 1787℃) Not Applicable 7.85	Evaporation rate melting point Hydrogen ion index (pH)	Not Applicable 2750℃ Not Applicable

10.Safety and responsiveness

A. Chemical stability and harmfulness the likelihood of a reaction	Leakage could be a risk of fire/explosion Some can be burned but not easily ignited Non-flammable, the substance itself does not burn, but it can decompose when heated and cause corrosive/toxic fume May produce irritating, corrosive and toxic gases in the event of fire Serious burns to the skin and eyes when in contact Inhalation of decomposition products can cause serious injury or death. Some may break down explosively in the event of fire or be able to re-ignite after extinguishing a fire ignite upon contact with moisture inflammable combustible material Some substances can flash and ride quickly. Some react violently with water.
B.conditions to be avoided	Sources of heat, spark, flame, etc. dampness
C.substance to be avoided	combustible material hot water
D.Hazardous substances produced during decomposition	corrosive toxic fume irritating, corrosive, toxic gases

11.Information on toxicity

A.Information on possible exposure pathways	Substances that may have systemic effects on mucous membranes, eyes and skin(ACGIH, Ministry of Employment Notice No.2018-24;skin)
B.Health Hazard Information	
acute toxicity	
oral	
	LD50 > 2000mg/kg Rat (OECD TG 423, GLP)- Tin
transdermal skin	LD50 > 98600mg/kg Rat (OECD TG 401 GLP)-Iron
	LD50 > 2000mg/kg Rat (OECD TG 423, GLP)-Tin
Inhalation	LD50 > 20000mg/kg Guinea pig-Iron

	Dust LD50 〉4.75mg/ℓ 4 Hr Rat (OECD TG 403, GLP)-Tin
skin corrosive or irritating	Dust LC50>100mg36HrRat (Not applicable to classification due to lack of reliability of data such as mausoleum, hamster, guinea pig, etc.)
severe eye damage or irritation	As a result of skin corrosiveness irritation test using rabbits, the irritation index is zero, so no irritation OECD TG 404.GLP
respiratory sensitivity	No irritation as a result of eye injury irritation test using rabbits, no significant irritation effects were observed OECD TG 405.GLP
Skin irritability	No data
carcinogenic	Human, guinea pig, rat and mouse data review results on skin hypersensitivity, no hypersensitivity-Tin Skin hypersensitivity test results on guinea pigs show that all iron oxide substances are not hypersensitive Similar substances: 1309-37-1, 1317-61-9, 1310-14-1
Industrial Safety and Health Act	
Ministry of Employment and Labor Notice	No data No data
IARC	No data
OSHA	No data
ACGIH	A4(Tin and organic compounds, as Sn)
NTP	No data
EU CLP	No data
germ cell mutagenicity	Genetic mutation test results using mammalian cultured cells in test tubes negative regardless of presence or absence of metabolic active systemOECD TG 476, GLP-Tin
reproductive toxicity	Chromosome abnormality test results using mammalian cultured cells in test tubes, negative regardless of metabolic activity OECD TG 473, GLP-Tin Genetic mutations using mammalian cultured cells in the test tube showed positive for carbony Iron and negative for electrolytic Iron. OECD TG 476-Iron
specific target long-term toxicity (one exposure)	Results of oral reproductive toxicity test using rats:, NOEL 〉1,000mg/kg/day(OECD TG 421)
specific target long-term toxicity (repeated exposure)	EHC15 Classified as Category 1 because pneumoconiosis appeared in workers handling metal tin according to data caused irritation to the respiratory system pulmonary injury seen in workers handling metal tin-Tin Results of repeated oral toxicity test using rats on 28 days, no effect

suction hazard	is observed even at the highest concentration. NOEL〉1,000mg/kg bw/day OECD TG 407.GLP-Tin
Other Hazardous Effects	Oral Target Organ Systemic Toxicity Test Results in Rats, Liver Impact - Iron Results of inhalation targeted organ systemic toxicity test in rats, NOAEC-5mgm3-iron No data No data
12. environmental impact	
A. ecotoxic fish	
	LC50 >0.0124mg/ℓ 96 Hr Pimephales promelas(OECD Guideline 203, GLP)-Tin ※source:ECHA LC50 13.6mg/ℓ 96 Hr (Danio rerio, LC0, 96h, >100,000mg/L, analogous substance:51274-00-1, OECD Guideline 203, Brachydanio rerio, LLO, LC50, 96h, > 10,000mg/L, analogous substance:1317-61-9-Iron ※Source:ECHA
crustaceans	EC50 >100mg/ℓ 48 Hr Daphnia magna(analogous substance CAS No. 1309-37-1 OECD TG 202)-Iron ※Source:ECHA
bird	LC50 >0.0192mg/ℓ 72 Hr etc.(Pseudokirchnerella subcapitata, OECD TG 201, GLP, No significant effects observed in poorly soluble substances - Tin ※Source:ECHA
B.Residual and Decomposable	
remanency	No data
degradability	No data
C.bioconcentrability	
concentrability	No data
biodegradability	No data
D.soil mobility	(log kd-5.3)-Iron ※Source:ECHA
E.Other adverse effects	Ceriodaphnia dubia:LOEC-200㎍/L 7d EPA 1002.0 ※Source:ECHA
13.Disposal Considerations	
A.disposal method	Process in one of the following ways 1.solidify 2.Reclamation in a managed landfill facility where designated waste can be reclaimed. 3.Burn the pulmonary catalyst containing combustible substances 4.Incineration of pulmonary catalysts containing halogen substances
B.Disposal Considerations	should be carried out at high temperatures.

	Dispose of the contents in accordance with the relevant laws and regulations.

14.information required for transportation

A.UN number (UN No.)	1383
B.Proper shipment name	Other pyrophoric metals or pyrophoric alloys(PYROPHORIC METAL, N.O.S. or PYROPHORIC ALLOY, N.O.S)
C.Transportation risk rating	4.2
D.Container Class	I
E.Marine Pollutants	No data

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

emergency measures in case of fire	F-G
emergency measures in the event of a spill	S-M

15.Current state of regulation

A.Regulations under the Industrial Safety and Health Act	Substances subject to working environment measurement (measurement cycle: 6 months) controlled hazardous substances Substances subject to special medical examination (diagnosis cycle: 12 months) Exposure standard setting substance
B.Regulations under the Chemical Substances Management Act	Not applicable
C.Regulations under the Hazardous Materials Safety Management Act	Class 2 Metal content 500kg-tin Class 2 Iron 500kg-CJF
D.Regulations under the Waste Management Act	designated waste
E.etc.	
domestic regulation	
Other domestic regulations	No data
foreign regulation	
US Management	

Information (OSHA Regulations)	No data
US Management Information(CERCLA regulations)	No data
US Management Information(EPCRA 302regulations)	No data
US Management Information(EPCRA 304regulations)	No data
US Management Information(EPCRA 313regulations)	No data
US Management Information (Rotterdam Convention Substances)	No data
US Management Information (Stockholm-contracted substances)	No data
US Management Information (Montreal Protocol Substances)	No data
EU classification information(confirmed classification results)	No data
EU classification information(dangerous sign)	No data
EU classification information(safety sign)	No data

16.Additional References

A.source of data

HSDB(property)

HSDB(smell)

ICSC(melting point)

ICSC (Melt Point)

HSDB (solubility)
ICSC (Specific gravity)
ECHA (orally)
ECHA (Transdermal)
ECHA (Inhalation)
ECHA (skin corrosive or irritating)
ECHA (severe eye damage or irritating)
ECHA (Dermatological Sensitivity)
ECHA (Germ Cell Mutagenicity)
ECHA (Reproductive Toxicity)
NITE, IPCS (specific target long-term toxicity (one exposure))
ECHA (specific target long-term toxicity (repeated exposure))
ECHA (fish)
ECHA (crustaceans)
ECHA (birds)
ECHA (Soil Mobility)
ECHA (Other Harmful Effects)
B.Original creation date: April 11, 2015.
C.the number of revisions and the date of the last revision;
Number of revisions: 3
The last revision date is February 17th, 2022.
D.Other
Refer to: Material Safety and Health Materials of Korea Industrial Safety Management Corporation
Although this data has been prepared for the purpose of communicating information to users in accordance with known knowledge and the Industrial Safety and Health Act, it cannot be said that all hazardous substances specified in this data are described. Therefore, the user must carefully consider the precautions before using this information to ensure compliance with applicable laws and regulations relating to use and disposal.

Ensure that this document does not guarantee responsibility for the consequences of reference material and that final compliance assessments are made at the discretion of the user in the use of the product.

This document is written according to the standard used, so it is recommended that the person handling it should develop a suitable safety measure for special handling.

This document is intended for informational purposes and should not be understood as guaranteeing the characteristics and quality of the product.

- This data was prepared in accordance with Article 41 of the Industrial Safety and Sanitation Act.-