Electrolytic Tinplate
Material Safety Data Sheet(MSDS)

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Location:Baoshan District , Shanghai, P.R.China

Section 1 Identification

Product Name : Electrolytic Tinplate
Recommended Use of the Chemical and Restrictions on Use: None
Name, Address, and Telephone Number:

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Section 2 Hazard(s) Identification

2.1Classification of the Chemical

As sold, this product, Electrolytic Tinplate is not hazardous,This formed solid metal product poses little or no immediate health or fire hazard. When product is subjected to welding, burning, melting, sawing, brazing, grinding or other similar processes, potentially hazardous airborne particulate and fumes may be generated. The categories of Health Hazards as defined in "Globally Harmonized System of Classification and Labelling of OF Chemicals (GHS).

2.2 Signal Word, Hazard Statement(s), Symbols and Precautionary Statement(s)

Hazard Symbol	Hazard Classification	Signal Word	Hazard Statement(s)	Precautionary Statement(s)
	Carcinogenicity - 2 Toxic to Reproduction - 2 Single Target Organ Toxicity (STOT) Repeat Exposure -1	**Danger**	Suspected of causing cancer. Suspected of damaging fertility or the unborn child. Causes damage to lungs through prolonged or repeated inhalation exposure. Harmful if swallowed. May cause an allergic skin reaction. May cause respiratory irritation. Causes eye irritation.	Do not breathe dusts / fume / spray. Wear protective gloves / protective clothing / eye protection / face protection. Contaminated work clothing must not be allowed out of the workplace. Use only outdoors or in well ventilated areas. Wash thoroughly after handling. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not eat, drink or smoke when using this product. If inhaled: Remove person to fresh air and keep comfortable for breathing. If exposed, concerned or feel unwell: Get medical advice/attention. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If on skin: Wash with plenty of water. If irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse. Dispose of contents in accordance with federal, state and local regulations.
	Acute Toxicity-Oral 4 Skin Sensitization - 1 STOT Single Exposure - 3			
NA	Eye Irritation - 2B			

2.3 Hazards Not Otherwise Classified: None Known
2.4 Unknown Acute Toxicity Statement : None Known

Section 3 Composition/Information on Ingredients

Chemical Name, synonyms, CAS Number and EC Number, and Concentration

Chemical Name		CAS Number	EC Number	% weight
Base Metal	Iron (Fe)	7439-89-6	231-096-4	>98
	Aluminum (Al)	7429-90-5	231-072-3	≤0.10
	Manganese (Mn)	7439-96-5	231-105-1	≤0.60
Metallic Coating	Tin (Sn)	7440-31-5	231-141-8	0.029-1.24
	Chromium (Cr)	7440-47-3	231-157-5	≤0.0007

Footnote:

CAS- Chemical Abstract Service

EC- European Community

Percent weight of metallic coating is a percent of the total product.

Section 4 – First-aid Measures

4.1 Description of Necessary Measures

If exposed, concerned or feel unwell: Get medical advice/attention.

Inhalation: Electrolytic Tinplate as sold/shipped is not a likely form of exposure. However during further processing (welding, grinding, burning, etc.). If inhaled: Remove person to fresh air and keep comfortable for breathing. If exposed, concerned or feel unwell: Get medical advice/attention.

Eye Contact: Electrolytic Tinplate as sold/shipped is not a likely form of exposure. However during further processing (welding, grinding, burning, etc.). If in 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. If exposed, concerned or feel unwell: Get medical advice/attention.

Skin Contact: If on skin: Wash thoroughly after handling. Wash with plenty of water. If irritation or rash occurs: Get medical advice/attention. Take off and wash contaminated clothing before reuse.

Ingestion: Electrolytic Tinplate as sold/shipped is not a likely form of exposure. However during further processing (welding, grinding, burning, etc.). If swallowed: Call a poison center/doctor if you feel unwell. Rinse mouth. If exposed, concerned or feel unwell: Get medical advice/attention.

4.2 Most Important Symptoms/Effects, Acute and Delayed (chronic)

Inhalation: This product as sold/shipped is not likely to present an acute or chronic health effect.

Eye: This product as sold/shipped is not likely to present an acute or chronic health effect.

Skin: This product as sold/shipped is not likely to present an acute or chronic health effect.

Ingestion: This product as sold/shipped is not likely to present an acute or chronic health effect.

4.3 Immediate Medical Attention and Special Treatment

None Known

Section 5 Fire-fighting Measures

5.1 Suitable (and unsuitable) Extinguishing Media

Not applicable for Electrolytic Tinplate as sold/shipped. Use extinguishers appropriate for surrounding materials.

5.2 Specific Hazards Arising From the Chemical:

Not applicable for this product as sold/shipped. When burned, toxic smoke and vapor may be emitted.

5.3 Special Protective Equipment and Precautions for Fire-fighters

Self-contained NIOSH approved respiratory protection and full protective clothing should be worn when fumes and/or smoke from fire are present. Heat and flames cause emittance of acrid smoke and fumes. Do not release runoff from fire control methods to sewers or waterways. Firefighters should wear full face-piece self-contained breathing apparatus and chemical protective clothing with thermal protection. Direct water stream will scatter and spread flames and, therefore, should not be used.

Section 6 Accidental Release Measures

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

Not applicable for Electrolytic Tinplate as sold/shipped. For spills involving finely divided particles, clean-up personnel should be protected against contact with eyes and skin.

6.2 Methods and Materials for Containment and Clean Up

Not applicable for this product as sold/shipped. If material is in a dry state, avoid inhalation of dust. Fine, dry material should be removed by vacuuming or wet sweeping methods to prevent spreading of dust. Avoid using compressed air. Do not release into sewers or waterways. Collect material in appropriate, labeled containers for recovery or disposal in accordance with relatedl regulations.

Section 7 - Handling and Storage

7.1 Precautions for Safe Handling

Not applicable for Electrolytic Tinplate as sold/shipped, however further processing (welding, burning, grinding, etc.) with the potential for generating high concentrations of airborne particulates should be evaluated and controlled as necessary. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Practice good housekeeping. Avoid breathing metal fumes and/or dust. Do not eat, drink or smoke when using this product.

7.2 Conditions for Safe Storage, Including any Incompatibilities

Store away from acids and incompatible materials.

Section 8 - Exposure Controls / Personal Protection

8.1 Occupational Exposure Limits (OELs)

Electrolytic Tinplate as sold/shipped in its physical form does not present an inhalation, ingestion or contact hazard, nor would any of the following exposure data apply. However, operations such as high temperature (burning, welding, sawing, brazing, machining and grinding) may produce fumes and/or particulates. The following exposure limits are offered as reference, for an experience industrial hygienist to review.

Ingredients	OSHA PEL[1]
Iron (Fe)	10 mg/m³ (as iron oxide fume)
Aluminum (Al)	15 mg/m³ (total dust, PNOR[2]) 5.0 mg/m³ (as respirable fraction, PNOR[2])
Manganese (Mn)	5.0 mg/m³ (as Fume & Mn compounds)
Chromium (Cr)	1.0 mg/m³ (as Cr, metal) 0.5 mg/m³ (as Cr II & III, inorganic compounds) 0.005 mg/m³ (as Cr VI, inorganic compounds & certain water insoluble)

NE - None Established

1. OSHA PELs (Permissible Exposure Limits) are 8-hour TWA (Time-Weighted Average) concentrations unless otherwise noted.
2. PNOR (Particulates Not Otherwise Regulated). All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered .

8.2 Appropriate Engineering Controls

Use controls as appropriate to minimize exposure to metal fumes and dusts during handling operations. Provide general or local exhaust ventilation systems to minimize airborne concentrations. Local exhaust is necessary for use in enclosed or confined spaces. Provide sufficient general/local exhaust ventilation in pattern/volume to control inhalation exposures below current exposure limits.

8.3 Individual Protection Measures

Respiratory Protection:

Seek professional advice prior to respirator selection and use. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. Concentration in air of the various contaminants determines the extent of respiratory protection needed.

Warning!Air-purifying respirators both negative-pressure, and powered-air do not protect workers in oxygen-deficient atmospheres.

Eyes: Wear appropriate eye protection to prevent eye contact. For operations, which result in elevating the temperature of the product to or above its melting point or result in the generation of airborne particulates, use safety glasses to prevent eye contact. Contact lenses should not be worn where industrial exposures to this material are likely. Use safety glasses or goggles as required for welding, burning, sawing, brazing, grinding or machining operations.

Skin: Wear appropriate personal protective clothing to prevent skin contact. Cut resistant gloves and sleeves should be worn when working with steel products. For operations, which result in elevating the temperature of the product to or above its melting point or result in the generation of airborne particulates, use protective clothing, and gloves to prevent skin contact. Protective gloves should be worn as required for welding, burning or handling operations. Contaminated work clothing must not be allowed out of the workplace.

Other Protective Equipment: An eyewash fountain and deluge shower should be readily available in the work area.

Section 9 Physical and Chemical Properties

Physical State: Solid
Appearance: Metallic Gray
Odor: Odorless
Relative Density: 7.85 g/cc

Specific Gravity(H2O=1,at 4°C): 7.85
Melting Point/Freezing Point: ~2750 °F (~1510 °C)
Water Solubility: Insoluble

Section 10 Stability and Reactivity

Reactivity: Not Determined (ND)
Chemical Stability: Steel products are stable under normal storage and handling conditions.

Possibility of Hazardous Reaction: None Known

Conditions to Avoid: Storage with strong acids or calcium hypochlorite.

Incompatible Materials: Will react with strong acids to form hydrogen. Iron oxide dusts in contact with calcium hypochlorite evolve oxygen and may cause an explosion.

Hazardous Decomposition Products: Thermal oxidative decomposition of steel products can produce fumes containing oxides of iron and manganese as well as other alloying elements.

Section 11 - Toxicological Information

The following toxicity data has been determined for Electrolytic Tinplate as a mixture when further processed using the information available for its components applied to the guidance on the preparation of an SDS under the GHS requirements of OSHA .

11.1 Hazard Classification

Hazard Classification	Hazard Category		Hazard Symbols	Signal Word	Hazard Statement
	EU	OSHA			
Acute Toxicity Hazard (covers Categories 1-5)	NA*	4		**Warning**	Harmful if swallowed.
Eye Damage/ Irritation (covers Categories 1, 2A and 2B)	NA*	2B	No Pictogram	**Warning**	Causes eye irritation
Skin/Dermal Sensitization (covers Category 1)	1	1		**Warning**	May cause an allergic skin reaction.
Carcinogenicity (covers Categories 1A, 1B and 2)	2	2		**Warning**	Suspected of causing cancer.
Toxic to eproduction (covers Categories 1A, 1B and 2)	NA*	2		**Warning**	Suspected of damaging fertility or the unborn child.
Specific Target Organ Toxicity (STOT) Following Single Exposure (covers Categories 1-3)	NA*	3		**Warning**	May cause respiratory irritation.
STOT following Repeated Exposure (covers Categories 1 and 2)	1	1		**Danger**	Causes damage to lungs through prolonged or repeated inhalation exposure.

* Not Applicable

11.2 Information on Toxicological Effects

a. No LC50 or LD50 has been established for **Electrolytic Tinplate** . The following data has been determined for the components:

Iron: Rat LD50 =98.6 g/kg (REACH)
Rat LD50 =1060 mg/kg (IUCLID)
Rat LD50 =984 mg/kg (IUCLID)
Rabbit LD50 =890 mg/kg (IUCLID)
Guinea Pig LD50 =20 g/kg (TOXNET)
Human LDLO =77 g/kg (IUCLID)

Aluminum: Rat LD50 > 15.9 g/kg (REACH)

Manganese: Rat LD50 > 2000 mg/kg (REACH)
Rat LD50 > 9000 mg/kg (NLM Toxnet)

b. No Skin (Dermal) Irritation data available for Electrolytic Tinplate .

c. No Eye Irritation data available for Electrolytic Tinplate. The following Eye Irritation information was found for the components:

Iron: Causes eye irritation;

d. No Skin (Dermal) Sensitization data available for Electrolytic Tinplate.

e. No Respiratory Sensitization data available for Electrolytic Tinplate or its components.

f. No Germ Cell Mutagenicity data available for Electrolytic Tinplate

g. Carcinogenicity: IARC, NTP, and OSHA do not list Electrolytic Tinplate as carcinogens.

The following Carcinogenicity information was found for the components:

Welding Fumes - IARC Group 2B carcinogen, a mixture that is possibly carcinogenic to humans.

Chromium (as metal and trivalent chromium compounds) – IARC Group 3 carcinogens, not classifiable as to their human carcinogenicity.

h. No Toxic to Reproduction data available for Electrolytic Tinplate .

i. No Specific Target Organ Toxicity (STOT) following a Single Exposure data available for Electrolytic Tinplate.The

following STOT following a Single Exposure data was found for the components:
Iron : Irritating to respiratory tract.
Aluminum: Repeated exposure associated with Asthma, fibrosis in lungs and encephalopathy in humans.

j. No Specific Target Organ Toxicity (STOT) following Repeated Exposure data was available for Electrolytic Tinplate as a whole. The following STOT following Repeated Exposure data was found for the components:
Aluminum: Reviews have found chronic exposure to aluminum flake has been reported to cause pneumoconiosis in workers. Repeat oral exposure to aluminum results in decrements in neurobehavioral function and development.
Manganese: Inhalation of metal fumes - Degenerative changes in human Brain; Behavioral: Changes in motor activity and muscle weakness (Whitlock et al., 1966).
The above toxicity information was determined from available scientific sources to illustrate the prevailing posture of the scientific community. The scientific resources includes: The American Conference of Governmental Industrial Hygienist (ACGIH) Documentation of the Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs) with Other Worldwide Occupational Exposure Values 2013, The International Agency for Research on Cancer (IARC), The National Toxicology Program (NTP) updated documentation, the World Health Organization (WHO) and other available resources, the International Uniform Chemical Information Database (IUCLID), European Union Risk Assessment Report (EU-RAR), Concise International Chemical Assessment Documents (CICAD), European Union Scientific Committee for Occupational Exposure Limits (EU-SCOEL), Agency for Toxic Substances and Disease Registry (ATSDR), Hazardous Substance Data Bank (HSDB), and International Programme on Chemical Safety (IPCS).

The following health hazard information is provided regardless to classification criteria and is based on the individual component(s) and potential resultant components from further processing:
Acute Effects by component:
• **Iron and Oxides:** Iron is harmful if swallowed, causes skin irritation, and causes eye irritation. Contact with iron oxide has been reported to cause skin irritation and serious eye damage.
• **Aluminum:** Not Reported/ Not Classified
• **Chromium, Oxides and Hexavalent Chrome:** Hexavalent chrome causes damage to gastrointestinal tract, lung, severe skin burns and eye damage, serious eye damage, skin contact may cause an allergic skin reaction. Inhalation may cause allergic or asthmatic symptoms or breathing difficulties.
• **Manganese and Oxides:** Manganese and Manganese oxide are harmful if swallowed.
Delayed (chronic) Effects by Component:
• **Iron and Oxides:** Chronic inhalation of excessive concentrations of iron oxide fumes or dusts may result in the development of a benign pneumoconiosis, called siderosis, which is observable as an X-ray change. No physical impairment of lung function has been associated with siderosis. Inhalation of excessive concentrations of ferric oxide may enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens. Iron oxide is listed as a Group 3 (not classifiable) carcinogen by the International Agency for Research on Cancer (IARC).
• **Aluminum:** Chronic inhalation of finely divided powder has been reported to cause pulmonary fibrosis and emphysema. Repeated skin contact has been associated with bleeding into the tissue, delayed hypersensitivity and granulomas. Chronic exposure to aluminum flake has been reported to cause pneumoconiosis in workers. Repeat oral exposure to aluminum results in decrements in neurobehavioral function and development.
• **Chromium, Oxides and Hexavalent Chromium:** The health hazards associated with exposure to chromium are dependent upon its oxidation state. The metal form (chromium as it exists in this product) is of very low toxicity. The hexavalent form is very toxic. Repeated or prolonged exposure to hexavalent chromium compounds may cause respiratory irritation, nosebleed, ulceration and perforation of the nasal septum. Industrial exposure to certain forms of hexavalent chromium has been related to an increased incidence of cancer. NTP (The National Toxicology Program) Fourth Annual report on Carcinogens cites "certain Chromium compounds" as human carcinogens. ACGIH has reviewed the toxicity data and concluded that chromium metal is not classifiable as a human carcinogen. Hexavalent chromium may cause genetic defects and is suspected of damaging the unborn child. Developmental toxicity in the mouse, suspected of damaging fertility or the unborn child.
• **Manganese and Oxides:** Chronic exposure to high concentrations of manganese fumes and dusts may adversely affect the central nervous system with symptoms including languor, sleepiness, weakness, emotional disturbances, spastic gait, mask-like facial expression and paralysis. Animal studies indicate that manganese exposure may increase susceptibility to bacterial and viral infections. Occupational overexposure (Manganese) is a progressive, disabling neurological syndrome that typically begins with relatively mild symptoms and evolves to include altered gait, fine tremor, and sometimes, psychiatric disturbances. May cause damage to lungs with repeated or prolonged exposure. Neurobehavioral alterations in worker populations exposed to MnO including: speed and coordination of motor function are especially impaired.

Section 12 - Ecological Information

12.1 Ecotoxicity (aquatic & terrestrial): No Data Available for Electrolytic Tinplate as sold/shipped. However, individual components of the product when processed have been found to be toxic to the environment. Metal dusts may migrate into soil and groundwater and be ingested by wildlife as follows:
Iron Oxide: LC50: >1000 mg/L; Fish 48 h-EC50 > 100 mg/L (Currenta, 2008k); 96 h-LC0 ≥ 50,000 mg/L. Test substance:

Bayferrox 130 red (95 – 97% Fe_2O_3; < 4% SiO_2 and Al_2O_3) (Bayer, 1989a).
Aluminum Oxide: LC50 >100 mg/l for fish and algae.
12.2 Persistence & Degradability: No Data Available
12.3 Bioaccumulative Potential: No Data Available
12.4 Other Adverse Effects: None Known
Additional Information:
Hazard Category: Not Reported
Signal Word: No Signal Word
Hazard Symbol: No Symbol
Hazard Statement: No Statement

Section 13 - Disposal Considerations

Electrolytic Tinplate should be recycled whenever possible. Product dusts and fumes from processing operations should also be recycled, or classified by a competent environmental professional and disposed of in accordance with applicable regulations.

Section 14 - Transport Information

No special requirement for transportation.

Section 15 - Regulatory Information

Electrolytic Tinplate as as a whole is not listed as a hazardous substance.

Section 16 - Other Information

ABBREVIATIONS/ACRONYMS:

CAS	Chemical Abstracts Service	**OSHA**	Occupational Safety and Health Administration
CFR	Code of Federal Regulations	**PEL**	Permissible Exposure Limit
CNS	Central Nervous System	**PNOR**	Particulate Not Otherwise Regulated
IARC	International Agency for Research on Cancer	**PNOC**	Particulate Not Otherwise Classified
LC50	Median Lethal Concentration	**ppm**	parts per million
LD50	Median Lethal Dose	**RTECS**	Registry of Toxic Effects of Chemical Substances
LD_{Lo}	Lowest Dose to have killed animals or humans	**SARA**	Superfund Amendment and Reauthorization Act
LEL	Lower Explosive Limit	**SCBA**	Self-contained Breathing Apparatus
LOEL	Lowest Observed Effect Level	**SDS**	Safety Data Sheet
LOAEC	Lowest Observable Adverse Effect Concentration	**STEL**	Short-term Exposure Limit
$\mu g/m^3$	microgram per cubic meter of air	**TLV**	Threshold Limit Value
mg/m^3	milligram per cubic meter of air	**TWA**	Time-weighted Average
IARC	International Agency for Research on Cancer	**UEL**	Upper Explosive Limit

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