



United States Steel Corporation

Tin Mill Filter Cake PSA Safety Data Sheet (SDS)

USS IHS Number: IHS 82338
(Replaces USS Code Number IHS 23)

Locations: Gary Works

Original: 12/16/2010

Revision: 8/15/2017

Expiration: 8/15/2020

Section 1 – Identification

1(a) Product Identifier used on Label: Tin Mill Filter Cake PSA

1(b) Other Means of Identification: Tin Plating Filter Cake {Phenol Sulfonic Acid (PSA) Method}

1(c) Recommended use of the chemical and restrictions on use: Processing for Tin Recovery; None

1(d) Name, Address, and Telephone Number:

United States Steel Corporation Phone number: (412) 433-6840 (8:00 am to 5:00 pm)
600 Grant Street, Room 1662 FAX: (412) 433-5019
Pittsburgh, PA 15219-2800

1(e) Emergency Phone Number: 1-800-262-8200 (CHEMTREC)

Section 2 – Hazard(s) Identification

2(a) Classification of the Chemical: Tin Mill Filter Cake PSA is considered a hazardous material according to the criteria specified in REACH [REGULATION (EC) No 1907/2006] and CLP [REGULATION (EC) No 1272/2008] and OSHA 29 CFR 1910.1200 Hazard Communication Standard. The categories of Health Hazards as defined in "GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS (GHS), Third revised edition ST/SG/AC.10/30/Rev. 3" United Nations, New York and Geneva, 2009 have been evaluated. Refer to Section 3, 8 and 11 for additional information.

2(b) Signal Word, Hazard Statement(s), Symbols and Precautionary Statement(s):

Hazard Symbol	Hazard Classification	Signal Word	Hazard Statement(s)	Precautionary Statement(s)
	Carcinogenicity-1	Danger	May cause cancer. May damage fertility or the unborn child. May cause an allergic skin reaction.	Avoid breathing dusts or fume. Wear protective gloves / protective clothing / eye protection / face protection. Contaminated work clothing must not be allowed out of the workplace Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. If exposed, concerned: Get medical advice/attention, If on skin: Wash with plenty of water. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical advice/attention. Dispose of contents in accordance with federal, state and local regulations.
	Reproductive Toxicity - 1A			
	Skin Sensitization - 1			

2(c) Hazards not Otherwise Classified: None Known

2(d) Unknown Acute Toxicity Statement (Mixture): None Known

Section 3 – Composition/Information on Ingredients

3(a-c) Chemical Name, Common Name (Synonyms), CAS Number and Other Identifiers, and Concentration:

Chemical Name	CAS Number	EC Number	% weight
Tin	7440-31-5	231-141-8	20-56
Water	7732-18-5	231-791-2	15-35
Carbon	7440-44-0	231-153-3	0.7-8.5
Oil and Grease	Varies	Varies	0-6.8

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Section 3 – Composition/Information on Ingredients (continued)

3(a-c) Chemical Name, Common Name (Synonyms), CAS Number and Other Identifiers, and Concentration (continued):

Chemical Name	CAS Number	EC Number	% weight
Iron Oxide	1309-37-1	215-168-2	0-1.7
Antimony	7440-36-0	231-146-5	0-1
Lead	7439-92-1	231-100-4	0-0.1
Nickel	7440-02-0	231-111-4	0-0.1
Arsenic	7440-38-2	231-148-6	0-0.1

EC- European Community

CAS- Chemical Abstract Service

Section 4 – First-aid Measures

4(a) Description of Necessary Measures: If exposed, concerned or feel unwell: Get medical advice/attention, call a poison center or Doctor.

- **Inhalation:** If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center or Doctor if you feel unwell.
- **Eye Contact:** If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or Doctor.
- **Skin Contact:** If on skin: Wash with plenty of water. Take off contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical advice/attention.
- **Ingestion:** If swallowed: Call a poison center or Doctor if you feel unwell.

4(b) Most Important Symptoms/Effects, Acute and Delayed (Chronic):

Acute effects:

- **Inhalation:** Excessive exposure to high concentrations of dust may cause irritation to the eyes, skin and mucous membranes of the upper respiratory tract.
- **Eye:** Excessive exposure to high concentrations of dust may cause irritation to the eyes.
- **Skin:** Skin contact with dusts may cause irritation or sensitization, possibly leading to dermatitis. Skin contact may cause physical abrasion.
- **Ingestion:** Ingestion of dust may cause nausea and/or vomiting.

Chronic Effects:

Individuals with chronic respiratory disorders (i.e., asthma, chronic bronchitis, emphysema, etc.) may be adversely affected by any fume or airborne particulate matter exposure. Persons with pre-existing skin disorders may be more susceptible to dermatitis.

4(c) Immediate Medical Attention and Special Treatment: Treat symptomatically.

Section 5 – Fire-fighting Measures

5(a) Suitable (and Unsuitable) Extinguishing Media: Use extinguishers appropriate for surrounding materials.

5(b) Specific Hazards Arising from the Chemical: When burned, toxic smoke and vapor may be emitted.

5(c) 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(a) Personal Precautions, Protective Equipment and Emergency Procedures: Use only outdoors or in a well-ventilated area. Clean-up personnel should be protected against contact with eyes and skin. If material is in a dry state, avoid inhalation of dust. Personnel should be protected against contact with eyes and skin. Do not release into sewers or waterways.

6(b) Methods and Materials for Containment and Clean Up: Collect material in appropriate, labeled containers for recovery or disposal in accordance with federal, state, and local regulations. Follow applicable OSHA regulations (29 CFR 1910.120) and all other pertinent state and federal requirement.

Section 7 - Handling and Storage

7(a) Precautions for Safe Handling: Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Do not breathe dusts or fume. Wear protective gloves / protective clothing / eye protection / face protection. Contaminated work clothing must not be allowed out of the workplace. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid direct contact on skin, eyes or on clothing. Emergency safety showers and eye wash stations should be present. Use only outdoors or in well ventilated area.

7(b) Conditions for Safe Storage, including any Incompatibilities: Whenever feasible, store locked up.

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Section 8 - Exposure Controls / Personal Protection

8(a) Occupational Exposure Limits (OELs): The following exposure limits is offered as reference, for an experience industrial hygienist to review.

Ingredients	OSHA PEL ¹	ACGIH TLV ²	NIOSH REL ³	IDLH ⁴
Tin	2.0 mg/m ³ (as inorganic compounds, Sn)	2.0 mg/m ³ (as metal and inorganic compounds, Sn)	2.0 mg/m ³ (also applies to other inorganic tin compounds, as Sn except tin oxides)	100 mg/m ³ (as Sn)
Carbon	15 mg/m ³ (as total dust, PNOR) ⁵ 5.0 mg/m ³ (as respirable fraction, PNOR)	10 mg/m ³ (as inhalable fraction ⁶ , PNOS ⁷) 3.0 mg/m ³ (as respirable fraction ⁸ , PNOS)	NE	NE
Iron Oxides	10 mg/m ³ (as iron oxide fume)	5.0 mg/m ³	5.0 mg/m ³ (as iron oxide dust and fume)	2,500 mg/m ³
Antimony and compounds as Sb	0.5 mg/m ³	0.5 mg/m ³	0.5 mg/m ³	50 mg/m ³
Lead Oxide and Lead Compounds	0.05 mg/m ³ ⁹ "AL" 0.03 mg/m ³	0.05 mg/m ³	0.05 mg/m ³ ¹⁰	100 mg/m ³
Nickel	1.0 mg/m ³ (as Ni metal & insoluble compounds)	1.5 mg/m ³ (as inhalable fraction Ni metal) 0.2 mg/m ³ (as inhalable fraction Ni inorganic only insoluble and soluble compounds)	0.015 mg/m ³ (as Ni metal & insoluble and soluble compounds)	10 mg/m ³ (as Ni)
Arsenic	0.01 mg/m ³ (inorganic compounds) "AL" 0.005 mg/m ³	0.01 mg/m ³	0.002 mg/m ³ (15-minute)	5.0 mg/m ³ (as As)

NE - None Established

- OSHA PELs (Permissible Exposure Limits) are 8-hour TWA (time-weighted average) concentrations unless otherwise noted. A ("C") designation denotes a ceiling limit, which should not be exceeded during any part of the working exposure unless otherwise noted. An Action level (AL) is used by OSHA and NIOSH to express a health or physical hazard. They indicate the level of a harmful or toxic substance/activity, which requires medical surveillance, increased industrial hygiene monitoring, or biological monitoring. Action Levels are generally set at one half of the PEL but the actual level may vary from standard to standard. The intent is to identify a level at which the vast majority of randomly sampled exposures will be below the PEL.
- Threshold Limit Values (TLV) established by the American Conference of Governmental Industrial Hygienists (ACGIH) are 8-hour TWA concentrations unless otherwise noted. ACGIH TLVs are for guideline purposes only and as such are not legal, regulatory limits for compliance purposes. A Short Term Exposure Limit (STEL) is defined as the maximum concentration to which workers can be exposed for a short period of time (15 minutes) for only four times throughout the day with at least one hour between exposures.
- The National Institute for Occupational Safety and Health Recommended Exposure Limits (NIOSH-REL) - Compendium of Policy and Statements. NIOSH, Cincinnati, OH (1992). NIOSH is the federal agency designated to conduct research relative to occupational safety and health. As is the case with ACGIH TLVs, NIOSH RELs are for guideline purposes only and as such are not legal, regulatory limits for compliance purposes.
- The "immediately dangerous to life or health air concentration values (IDLHs)" are used by NIOSH as part of the respirator selection criteria and were first developed in the mid-1970's by NIOSH. The Documentation for Immediately Dangerous to Life or Health Concentrations (IDLHs) is a compilation of the rationale and sources of information used by NIOSH during the original determination of 387 IDLHs and their subsequent review and revision in 1994.
- PNOR (Particulates Not Otherwise Regulated). All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by a limit which is the same as the inert or nuisance dust limit of 15 mg/m³ for total dust and 5 mg/m³ for the respirable fraction.
- Inhalable fraction. The concentration of inhalable particulate for the application of this TLV is to be determined from the fraction passing a size-selector with the characteristics defined in the ACGIH 2017 TLVs[®] and BEIs[®] (Biological Exposure Indices) Appendix D, paragraph A.
- PNOS (Particulates Not Otherwise Specified). Particulates identified under the PNOS heading are "nuisance dusts" containing no asbestos and <1% crystalline silica.
- Respirable fraction. The concentration of respirable dust for the application of this limit is to be determined from the fraction passing a size-selector with the characteristics defined in ACGIH 2017 TLVs[®] and BEIs[®] Appendix D, paragraph C.
- OSHA considers "Lead" to mean metallic lead, all inorganic lead compounds (lead oxides and lead salts), and a class of organic compounds called soaps; all other lead compounds are excluded from this definition. The OSHA PEL and other OSHA requirements can be found in 29 CFR 1910.1025. The OSHA PEL (8-hour TWA) for lead in "non-ferrous foundries with less than 20 employees" is 0.075 mg/m³.
- NIOSH considers "Lead" to mean metallic lead, lead oxides, and lead salts (including organic salts such as lead soaps but excluding lead arsenate). The NIOSH REL for lead (8-hour TWA) is 0.05 mg/m³; air concentrations should be maintained so that worker blood lead remains less than 0.060 mg Pb/100 g of whole blood.

8(b) Appropriate Engineering Controls: Local exhaust ventilation should be used to control the emission of air contaminants. General dilution ventilation may assist with the reduction of air contaminant concentrations.

- Respiratory Protection:** Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, use only a NIOSH-approved respirator. 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. Half-face, negative-pressure, air-purifying respirator equipped with P100 filter is acceptable for concentrations up to 10 times the exposure limit. Full-face, negative-pressure, air-purifying respirator equipped with P100 filter is acceptable for concentrations up to 50 times the exposure limit. Protection by air-purifying negative-pressure and powered air respirators is limited. Use a positive-pressure-demand, full-face, supplied air respirator or self-contained breathing apparatus (SCBA) for concentrations above 50 times the exposure limit. If exposure is above the IDLH (immediately dangerous to life or health) for any of the constituents, or there is a possibility of an uncontrolled release or exposure levels are unknown, then use a positive-demand, full-face, supplied air respirator with escape bottle or SCBA.

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. Use safety glasses with side shields or chemical goggles.
- Skin:** Persons handling this product should wear appropriate clothing to prevent skin contact. Wear protective gloves. 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.

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Section 9 - Physical and Chemical Properties

<p>9(a) Appearance (physical state, color, etc.): Gray, granular, moist precipitate</p> <p>9(b) Odor: Odorless</p> <p>9(c) Odor Threshold: ND</p> <p>9(d) pH: 2.1</p> <p>9(e) Melting Point/Freezing Point: 450 °F, 232° C (Tin)</p> <p>9(f) Initial Boiling Point and Boiling Range: NA</p> <p>9(g) Flash Point: ND</p> <p>9(h) Evaporation Rate: ND</p> <p>9(i) Flammability (solid, gas): Not flammable</p> <p>NA - Not Applicable ND - Not Determined for product as a whole</p>	<p>9(j) Lower/Upper Flammability or Explosive Limits: ND</p> <p>9(k) Vapor Pressure: ND</p> <p>9(l) Vapor Density (Air = 1): ND</p> <p>9(m) Relative Density: 2.2-3.2 (SG)</p> <p>9(n) Solubility(ies): ND</p> <p>9(o) Partition Coefficient n-octanol/water: NA</p> <p>9(p) Auto-ignition Temperature: ND</p> <p>9(q) Decomposition Temperature: ND</p> <p>9(r) Viscosity: ND</p>
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Section 10 - Stability and Reactivity

10(a) Reactivity: Not Determined (ND)

10(b) Chemical Stability: Tin Mill Filter Cake PSA is stable under normal storage and handling conditions.

10(c) Possibility of Hazardous Reaction: None Known




10(d) Conditions to Avoid: Storage with strong acids or calcium hypochlorite.

10(e) Incompatible Materials: Iron oxide dusts in contact with calcium hypochlorite evolve oxygen and may cause an explosion.

10(f) Hazardous Decomposition Products: Toxic fumes and vapors may be released at elevated temperatures.

Section 11 - Toxicological Information

11(a-e) Information on Toxicological Effects: The following toxicity data has been determined for Tin Mill Filter Cake PSA by using the information available for its components applied to the guidance on the preparation of an SDS under the GHS requirements of OSHA and the EU CPL:

Hazard Classification	Hazard Category		Hazard Symbols	Signal Word	Hazard Statement
	EU	OSHA			
Skin/Dermal Sensitization (covers Category 1)	1	1 ^d		Warning	May cause an allergic skin reaction.
Carcinogenicity (covers Categories 1A, 1B, 2)	1	1 ^e		Danger	May cause cancer.
Toxic Reproduction (covers Categories 1A, 1B, 2)	1A	1A ^h		Danger	May damage fertility or the unborn child.

* NR Not Rated - Available data does not meet criteria for classification.

The Toxicological data listed below are presented regardless to classification criteria. Individual hazard classification categories where the toxicological information has met or exceeded a classification criteria threshold are listed above.

- a. No LC₅₀ or LD₅₀ has been established for Tin Mill Filter Cake PSA as a mixture. The following data has been determined for the components:
- | | |
|--|---|
| <ul style="list-style-type: none"> • Carbon: LD₅₀= >10,000 mg/kg (Oral/ Rat) • Nickel: LD₅₀ >9000 mg/kg (Oral/Rat); NOAEC >10.2 mg/l (Inhalation/Rat) • Iron Oxide: LD₅₀= >10,000 mg/kg (Oral/ Rat) | <ul style="list-style-type: none"> • Arsenic: LD₅₀ = 145 mg/kg (Oral/ Mouse) <li style="padding-left: 20px;">LD₅₀ = 763 mg/kg ((Oral/ Rat) <li style="padding-left: 20px;">TD₁₀ = 7857 mg/kg (Oral/ Man) |
|--|---|
- b. No Skin (Dermal) Irritation data available for Tin Mill Filter Cake PSA as a mixture. The following Skin (Dermal) Irritation data has been determined for the components:
- **Iron Oxide:** Moderately irritating.
 - **Arsenic:** Reported irritant.
- c. No Eye Irritation data available for Tin Mill Filter Cake PSA as a mixture. The following Eye Irritation information was found for the components:
- **Iron Oxide:** Severely irritating; may cause burns.
 - **Nickel:** Slight eye irritation from particulate abrasion only.
 - **Arsenic:** Reported irritant.
- d. No Skin (Dermal)/Respiratory Sensitization data available for Tin Mill Filter Cake PSA as a mixture or its individual components.
- **Nickel:** May cause allergic skin sensitization.

Section 11 - Toxicological Information (continued)

11(a-e) Information on Toxicological Effects (continued):

- e. No Aspiration Hazard data available for **Tin Mill Filter Cake PSA** as a mixture or its individual components.
- f. No Germ Cell Mutagenicity data available for **Tin Mill Filter Cake PSA** as a mixture. The following Germ Cell Mutagenicity information was found for the components:
- **Iron Oxide:** Both positive and negative data.
 - **Nickel:** EU RAR has found positive results in vitro and in vivo but insufficient data for classification.
- g. Carcinogenicity: IARC, NTP, and OSHA do not list **Tin Mill Filter Cake PSA** as carcinogens. The following Carcinogenicity information was found for the components:
- **Nickel and certain nickel compounds** – Group 2B - metallic nickel Group 1 - nickel compounds ACGIH confirmed human carcinogen. Nickel – EURAR Insufficient evidence to conclude carcinogenic potential in animals or humans; suspect carcinogen classification Category 2 Suspected of causing cancer.
 - **Iron Oxide:** IARC-3, TLV-A4
 - **Lead:** NTP-R, IARC - 2B, EPA - Probable human carcinogen and ACGIH - A3
 - **Arsenic:** NTP-Known, IARC - 1, EPA - Human carcinogen and ACGIH - A1
- h. No Toxic to Reproduction data available for **Tin Mill Filter Cake PSA** as a mixture. The following Toxic to Reproductive information was found for the components:
- **Lead:** Male rats oral 60 day NOEL 250 mg/L. Effects on testes (lowest dose). Mouse Reproduction study effects at 0.5% only dose tested. Rat Teratology study LOEL 0.05% Birth weight, size and effects on testis. Reproductive, endocrine and growth effects have been reported.
 - **Nickel:** Effects on fertility.
- i. No Specific Target Organ Toxicity (STOT) following a Single Exposure data available for **Tin Mill Filter Cake PSA** as a mixture. The following STOT following a Single Exposure data was found for the components:
- **Iron Oxide:** May cause lung irritation.
- j. No Specific Target Organ Toxicity (STOT) following Repeated Exposure data was available for **Tin Mill Filter Cake PSA** as a mixture. The following STOT following Repeated Exposure data was found for the components:
- **Tin and Tin Oxide:** CICAD has found Occupational exposures to tin can cause a benign pneumoconiosis termed 'stannosis'.
 - **Iron Oxide:** Some pulmonary and lung effects reported.
 - **Lead:** Rat Oral 6 mo NOEL 0.0015 mg/kg CNS Testes and Kidney Effects. Rat inhalation – immunosuppression, Dermal – percutaneous absorption
 - **Nickel:** Rat 4 wk inhalation LOEL 4 mg/m³ Lung and Lymph node histopathology. Rat 2 yr inhalation LOEL 0.1 mg/ m³ Pigment in kidney, effects on hematopoiesis spleen and bone marrow and adrenal tumor, Rat 13 Week Inhalation LOAEC 1.0 mg/m³ Lung weights, and Alveolar histopathology.

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 2017, 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 (IUCSID), 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):

Acute Effects by Component:

- **Tin:** Not Reported/ Not Classified
- **Carbon:** Not Reported/Not Classified
- **Iron (and Iron Oxide):** 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.
- **Antimony:** Not Reported/ Not Classified
- **Lead:** Acute exposure to lead can be manifested as abdominal pain, nausea, constipation, anorexia, or vomiting; and, in severe cases coma or death.
- **Nickel:** Nickel may cause allergic skin sensitization.
- **Arsenic:** Eye irritation has been reported in workers exposed to arsenic containing dusts.

Delayed (chronic) Effects by Component:

- **Tin:** No systemic effects have been reported from industrial exposure to tin. Occupational exposures to tin can cause a benign pneumoconiosis termed 'stannosis'. No cases of massive fibrosis from over-exposure to tin have been reported.
- **Carbon:** Chronic inhalation may lead to decreased pulmonary function.
- **Iron (as Iron Oxide):** Chronic inhalation of excessive concentrations of iron oxide fumes or dusts may result in the development of a benign lung disease, 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).
- **Antimony:** Not Reported/ Not Classified
- **Lead:** Lead compounds can be toxic when ingested or inhaled. Lead is a cumulative poison. The predominant effects of excessive exposure are anemia, nervous system disorders, and kidney damage. Nervous system disorders may be displayed as irritability, headaches, insomnia, convulsions, muscular tremors, or palsy of the extremities. Excessive exposure can have adverse effects on human reproduction. Lead interferes with normal function of the adult and developing central nervous system in humans. Lead interferes with different enzyme systems. For this reason many organs or organ systems are potential targets for lead. Lead can damage fertility or the unborn child.

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Section 11 - Toxicological Information (continued)

Delayed (chronic) Effects by Component (continued):

- **Nickel:** Exposure to nickel dusts and fumes can cause sensitization dermatitis, respiratory irritation, asthma, pulmonary fibrosis, edema, and may cause nasal or lung cancer in humans. Causes damage to lungs through prolonged or repeated inhalation exposure. IARC lists nickel and certain nickel compounds as Group 2B carcinogens (sufficient animal data). ACGIH 2017 TLVs® and BEIs® lists insoluble nickel compounds as confirmed human carcinogens. Suspected of damaging the unborn child.
- **Arsenic:** Known Human Carcinogen (skin cancer). Multiple organ tumors observed after inhalation and drinking water exposures.

Section 12 - Ecological Information

12(a) Ecotoxicity (aquatic & terrestrial): No data available for the product, **Tin Mill Filter Cake PSA** as a mixture. However, individual components of the product have been found to be toxic to the environment. Dusts may migrate into soil and groundwater and be ingested by wildlife as follows:

- **Iron Oxide:** LC₅₀: >1000 mg/L; Fish
- **Nickel Oxide:** IUCLID found LC₅₀ in fish, invertebrates and algae > 100 mg/l.

12(b) Persistence & Degradability: No Data Available

12(c) Bioaccumulative Potential: No Data Available

12(d) Mobility (in soil): No Data Available

12(e) Other Adverse Effects: None Known

Additional Information:

Hazard Category: Category 1

Signal Word: Warning

Hazard Symbol:



Hazard Statement: Very Toxic to aquatic life with long lasting effects.

Section 13 - Disposal Considerations

Disposal: Dispose of contents/container in accordance with local/regional/international regulations.

Container Cleaning and Disposal: Follow applicable federal, state and local regulations. Observe safe handling precautions. European Waste Catalogue 11 01 09 – sludges and filter cakes containing dangerous substances; hazardous wastes

Please note this information is for Tin Mill Filter Cake PSA in its original form. Any alterations can void this information.

Section 14 - Transport Information

14 (a-g) Transportation Information:

US Department of Transportation (DOT) under 49 CFR 172.101 does not regulate **Tin Mill Filter Cake PSA** as a hazardous material. All federal, state, and local laws and regulations that apply to the transport of this type of material must be adhered to.

<p>Shipping Name: Not Regulated Shipping Symbols: NA Hazard Class: NA UN No.: NA Packing Group: NA DOT/IMO Label: NA Special Provisions (172.102): NA</p>	<p>Packaging Authorizations a) Exceptions: NA b) Non-bulk: NA c) Bulk: NA</p>	<p>Quantity Limitations a) Passenger Aircraft or Rail: NA b) Cargo Aircraft Only: NA Vessel Stowage Location: NA DOT reportable quantities: NA</p>
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International Maritime Dangerous Goods (IMDG) and the Regulations Concerning the International Carriage of Dangerous Goods by Rail (RID) classification, packaging and shipping requirements follow the US DOT Hazardous Materials Regulation.

Regulations Concerning the International Carriage of Dangerous Goods by Road (ADR) does not regulate **Tin Mill Filter Cake PSA** as a hazardous material.

<p>Shipping Name: Not Regulated Classification Code: NA UN No.: NA Packing Group: NA ADR Label: NA Special Provisions: NA Limited Quantities: NA</p>	<p>Packaging a) Packing Instructions: NA b) Special Packing Provisions: NA c) Mixed Packing Provisions: NA</p>	<p>Portable Tanks & Bulk Containers a) Instructions: NA b) Special Provisions: NA</p>
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Section 14 - Transport Information (continued)

14 (a-g) Transportation Information (continued):

International Air Transport Association (IATA) does not regulate **Tin Mill Filter Cake PSA** as a hazardous material.

Shipping Name: Not Regulated Class/Division: NA Hazard Label (s): NA UN No.: N A Packing Group: NA Excepted Quantities (EQ): NA	Passenger & Cargo Aircraft		Cargo Aircraft Only: Pkg Inst: NA	Special Provisions: NA
	Limited Quantity (EQ)			
	Pkg Inst: NA	Pkg Inst: NA	Max Net Qty/Pkg: NA	Max Net Qty/Pkg: NA

Pkg Inst – Packing Instructions

Max Net Qty/Pkg – Maximum Net Quantity per Package

ERG – Emergency Response Drill Code

Tin Mill Filter Cake PSA does not have a **Transport Dangerous Goods (TDG)** classification.

Section 15 - Regulatory Information

Regulatory Information: *The following listing of regulations relating to a U. S. Steel product may not be complete and should not be solely relied upon for all regulatory compliance responsibilities.* This product and/or its constituents are subject to the following regulations:

SARA Potential Hazard Categories: Immediate Acute Health Hazard, Delayed Chronic Health Hazard.

Section 313 Supplier Notification: The product, **Tin Mill Filter Cake PSA** contains the following toxic chemicals subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372:

CAS #	Chemical Name	Percent by Weight
7440-36-0	Antimony	1 max
7439-92-1	Lead	0.1 max
7440-02-0	Nickel	0.1 max
744-38-2	Arsenic	0.1 max

State Regulations: The product, **Tin Mill Filter Cake PSA** as a mixture is not listed in any state regulations. However, individual components of the product are listed in various state regulations.

California Prop. 65: This product can expose you to nickel which is known to the State of California to cause cancer, and lead and lead compounds which is known to the State of California to cause cancer and reproductive toxicity. For more information go to www.P65Warnings.ca.gov.

Other Regulations:

WHMIS Classification (Canadian): The product, **Tin Mill Filter Cake PSA** is not listed as a mixture. However individual components are listed.

Ingredients	WHMIS Classification
Antimony Powder	Combustible Dust
Lead	Carcinogenicity - Category 2; Reproductive Toxicity - Category 1A; Specific target organ toxicity - repeated exposure - Category 1
Nickel	Skin sensitization – Category 1; Carcinogenicity – Category 2; Specific target organ toxicity - repeated exposure - Category 1
Arsenic	Carcinogenicity – Category 1A

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.

Section 16 - Other Information

Prepared By: United States Steel Corporation

Revision History:

08/15/2017 – Update WHMIS 2015

2/11/2014 - Update to OSHA HAZ COM 2012

Expiration Date: 08/15/2020

Additional Information:

Hazardous Material Identification System (HMIS) Classification

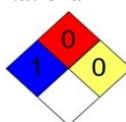
Health Hazard	1
Fire Hazard	0
Physical Hazard	0

HEALTH= 1, Denotes possible chronic hazard if airborne dusts or fumes are generated Irritation or minor reversible injury possible.

FIRE= 0, Materials that will not burn.

PHYSICAL HAZARDS = 0, Materials that are normally stable, even under fire conditions, and will not react with water, polymerize, decompose, condense, or self-react. Non-explosives.

National Fire Protection Association (NFPA)



HEALTH = 1, Exposure could cause irritation but only minor residual injury even if no treatment is given.

FIRE = 0, Materials that will not burn.

INSTABILITY = 0, Normally stable, even under fire exposure conditions, and are not reactive with water.

Tin Mill Filter Cake PSA

USS IHS No.: IHS82338

Rev. 8/17

Section 16 - Other Information (continued)

ABBREVIATIONS/ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists	NIF	No Information Found
BEIs	Biological Exposure Indices	NIOSH	National Institute for Occupational Safety and Health
CAS	Chemical Abstracts Service	NTP	National Toxicology Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	ORC	Organization Resources Counselors
CFR	Code of Federal Regulations	OSHA	Occupational Safety and Health Administration
CNS	Central Nervous System	PEL	Permissible Exposure Limit
GI, GIT	Gastro-Intestinal, Gastro-Intestinal Tract	PNOR	Particulate Not Otherwise Regulated
HMIS	Hazardous Materials Identification System	PNOC	Particulate Not Otherwise Classified
IARC	International Agency for Research on Cancer	PPE	Personal Protective Equipment
LC50	Median Lethal Concentration	ppm	parts per million
LD50	Median Lethal Dose	RCRA	Resource Conservation and Recovery Act
LD_{Lo}	Lowest Dose to have killed animals or humans	RTECS	Registry of Toxic Effects of Chemical Substances
LEL	Lower Explosive Limit	SARA	Superfund Amendment and Reauthorization Act
µg/m³	microgram per cubic meter of air	SCBA	Self-contained Breathing Apparatus
mg/m³	milligram per cubic meter of air	STEL	Short-term Exposure Limit
mppcf	million particles per cubic foot	TLV	Threshold Limit Value
SDS	Safety Data Sheet	TWA	Time-weighted Average
MSHA	Mine Safety and Health Administration	UEL	Upper Explosive Limit
NFPA	National Fire Protection Association		

Disclaimer: This information is taken from sources or based upon data believed to be reliable. However, United States Steel Corporation makes no warranty as to the absolute correctness or sufficiency of any of the foregoing or that additional or other measures may not be required under particular conditions.