United States Steel Corporation

Waste Pickle Liquor

Safety Data Sheet (SDS)

USS IHS Number: 8661

Locations: East Chicago Tin, Fairfield, Gary, Granite City, Great Lakes, Hamilton, Midwest, and Mon Valley

Original: 10/24/2011 **Revision: 07/08/2019**

Section 1 – Identification

1(a) Product Identifier used on Label: Waste Pickle Liquor

1(b) Other Means of Identification: Spent Pickle Liquor**,** Ferrous Chloride Solution., Waste Pickle Liquor, Waste Acid

1(c) Recommended use of the chemical and restrictions on use: None

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

United States Steel Corporation
600 Grant Street, Room 1662
Pittsburgh, PA 15219-2800

Phone number: (412) 433-6840 (8:00 am to 5:00 pm)
FAX: (412) 433-5019

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

Section 2 – Hazard(s) Identification

2(a) Classification of the Chemical: Waste Pickle Liquor 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 LABELING 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)
	Eye Irritation - 1 Skin Irritation - 1A	**Danger**	Causes severe skin burns and serious eye damage. Harmful if swallowed or inhaled.	Do not breathe mists, vapors or sprays. Wear protective gloves/protective clothing/eye protection/face protection. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. If inhaled: Remove person to fresh air and keep comfortable for breathing. Immediately call a poison center or doctor/physician. 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/physician. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If swallowed: Call a poison center or doctor/physician if you feel unwell. Rinse mouth. Do NOT induce vomiting. Dispose of contents in accordance with federal, state and local regulations. Store locked up.
	Acute Toxicity-Oral/Inhalation - 4			

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	% Volume
Ferrous Chloride	231-843-4	7758-94-3	12.4 - 27.8
Hydrochloric Acid	231-595-7	7647-01-0	1.7 - 7.0
Water	231-791-2	7732-18-5	65.2 - 85.9

Section 3 – Composition/Information on Ingredients (continued)

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

Waste Pickle Liquor contains small amounts of various constituents in addition to those listed. These small quantities are frequently referred to as "trace" or "residual" constituents that generally originate in the raw materials used. **Waste Pickle Liquor** may contain the following trace or residual constituents: chromium (III) oxide, calcium oxide, and aluminum oxide.

EC- European Community

CAS- Chemical Abstract Service

Section 4 – First-aid Measures

4(a) Description of Necessary Measures:

- **Inhalation** If inhaled: Remove person to fresh air and keep comfortable for breathing. Immediately call a poison center or doctor/physician.
- **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 (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse.
- **Ingestion:** If swallowed: Call a poison center or doctor/physician if you feel unwell. Rinse mouth. Do NOT induce vomiting.

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

Acute effects:

- **Inhalation: Corrosive!** Inhalation of vapors can cause coughing**,** choking, inflammation of the nose, throat, and upper respiratory tract, and in severe cases pulmonary edema, circulatory failure, and death.
- **Eye: Corrosive!** Vapors are irritation and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.
- **Skin: Corrosive!** Can cause redness, pain and severe skin burns. Concentrated solutions cause deep ulcers and discolor skin.
- **Ingestion: Corrosive!** Causes damage to respiratory and gastrointestinal tracts with oral exposures. Causes damage to cardiovascular system following oral exposure.

Chronic Effects:

Individuals with chronic respiratory disorders (i.e., asthma, chronic bronchitis, emphysema, etc.) may be adversely affected by low level exposures. 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: Irritating gasses and vapors may form in fire.

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: For spills, personnel should be protected against contact with eyes and skin and avoid inhalation of vapor/mist. Use water spray to contain acid vapors. Ventilate area of leak or spill. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e.g., vermiculite, dry sand, earth), and place in an appropriately marked chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer.

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 requirements.

Section 7 - Handling and Storage

7(a) Precautions for Safe Handling: Do not breathe mists, vapors or sprays. Wear protective gloves/protective clothing/eye protection/face protection. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Emergency safety showers and eye wash stations should be present.

7(b) Conditions for Safe Storage, including any Incompatibilities: Whenever feasible, store locked up. Do not store in metal containers.

Section 8 - Exposure Controls / Personal Protection

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

Ingredients	OSHA PEL [1]	ACGIH TLV [2]	NIOSH REL [3]	IDLH [4]
Ferrous Chloride	10 mg/m³ (as iron oxide fume)	1.0 mg/m³ (as iron salts (soluble, as Fe)	1.0 mg/m³ (as iron salts (soluble, as Fe)	NE
Hydrochloric Acid	"C" 5.0 ppm	"C" 2.0 ppm	"C" 5.0 ppm	50 ppm

NE - None Established

1. 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.
2. 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.
3. 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.
4. 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.

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. Emergency eye wash stations and deluge safety showers should be available in the work area.

8(c) Individual Protection Measures:

- **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 an Acid gas/Particulate filter is acceptable for concentrations up to 10 times the exposure limit. Full-face, negative-pressure, air-purifying respirator equipped with an Acid gas/Particulate 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 eye protection/face protection. A face shield should be used when appropriate to prevent contact with splashed materials. Chemical goggles, face shields or glasses should be worn to prevent eye contact. Contact lenses should not be worn where industrial exposure to this material is likely.
- **Skin**: Persons handling this product should wear appropriate clothing to prevent skin contact. Take off contaminated clothing and wash before reuse. Contaminated work clothing should not be allowed out of the workplace. Wear protective gloves.
- **Other protective equipment**: An eyewash fountain and deluge shower should be readily available in the work area.

Section 9 - Physical and Chemical Properties

9(a) Appearance (physical state, color, etc.): Greenish-yellow liquid

9(b) Odor: Slightly pungent, irritating

9(c) Odor Threshold: NA

9(d) pH: <2

9(e) Melting Point/Freezing Point: NA

9(f) Initial Boiling Point and Boiling Range: ≈220°F (104.4°C)

9(g) Flash Point: NA

9(h) Evaporation Rate: NA

9(i)Flammability (solid, gas): Not flammable

9(j) Upper/Lower Flammability or Explosive Limits: NA

9(k) Vapor Pressure: NA

9(l) Vapor Density (Air = 1): NA

9(m) Relative Density: ≈1.1 - 1.25SG

9(n) Solubility(ies): Water Soluble

9(o) Partition Coefficient n-octanol/water: NA

9(p) Auto-ignition Temperature: ND

9(q) Decomposition Temperature: ND

9(r) Viscosity: ND

NA - Not Applicable

ND - Not Determined for product as a whole

Section 10 - Stability and Reactivity

10(a) Reactivity: Not Determined (ND)

10(b) Chemical Stability: Waste Pickle Liquor is stable under normal storage and handling conditions. Containers may burst when heated.

10(c) Possibility of Hazardous Reaction: None Known

Section 10 - Stability and Reactivity (continued)

10(d) Conditions to Avoid: Heat, flames, sparks and other sources of ignition. Dangerous gases may accumulate in confined spaces. May ignite or explode on contact with combustible materials.

10(e) Incompatible Materials: Metals, bases (alkaline materials), ethylene oxide, halocarbons, acids, and combustible materials. Forms shock sensitive explosive mixtures with some metals (e.g. potassium; sodium).

10(f) Hazardous Decomposition Products: Thermal decomposition: hydrochloric acid. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated.

Section 11 - Toxicological Information

11 Information on Toxicological Effects: The following toxicity data has been determined for **Waste Pickle Liquor** 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			
Acute Toxicity Hazard (covers Categories 1-4)	4	4[a]		**Warning**	Harmful if swallowed or inhaled.
Skin Irritation (covers Categories 1A, 1B, 1C, and 2)	1A	1A[b]		**Danger**	Causes severe skin burns and eye damage.
Eye Damage/Irritation (covers Categories 1, 2A and 2B)	1	1[c]		**Danger**	Causes serious eye damage.

* 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 LC_{50} or LD_{50} has been established for **Ferrous Chloride Solution**. The following data has been determined for the components:

- **Iron Oxide:** Rat LD_{50} = 700 mg/kg
  Rabbit LD_{50} = 900 mg/kg
- **Ferrous Chloride**: Rat LD_{50} = 500 mg/kg
  Rat LD_{50} = 29.74 mg/kg(REACH)
  Rat LD_{50} = 450 mg/kg Toxnet

b. No Skin (Dermal) Irritation data available for **Waste Pickle Liquor** as a mixture. The following Skin (Dermal) Irritation data has been determined for the components:

- **Hydrochloric Acid:** Corrosive
- **Ferrous Chloride:** Prolonged skin contact may cause irritation.

c. No Eye Irritation data available for **Waste Pickle Liquor** as a mixture. The following Eye Irritation information was found for the components:

- **Hydrochloric Acid:** Corrosive
- **Ferrous Chloride:** Rabbit: Irreversible effect on eye (Corrosive) (REACH).

d. No Skin (Dermal)/Respiratory Sensitization data available for **Waste Pickle Liquor** as a mixture or its individual components.

e. No Aspiration Hazard data available for **Waste Pickle Liquor** as a mixture or its individual components.

f. No Germ Cell Mutagenicity data available for **Waste Pickle Liquor** as a mixture. The following Germ Cell Mutagenicity information was found for the components:

- **Hydrochloric Acid:** Not active. Any positive responses seen as pH artifacts.

g. Carcinogenicity: IARC, NTP, and OSHA do not list **Waste Pickle Liquor** as carcinogens. The following Carcinogenicity information was found for the components:

- **Hydrochloric Acid:** Not carcinogenic in 2 year inhalation study in rats at concentrations up to 10 ppm. IARC Cat 3, ACGIH A4.

h. No Toxic Reproduction data available for **Waste Pickle Liquor** as a mixture or its individual components.

i. No Specific Target Organ Toxicity (STOT) following a Single Exposure data available for **Waste Pickle Liquor** as a mixture or its individual components.

- **Hydrochloric Acid:** HSDB reports respiratory tract and gastrointestinal tract irritation or corrosion.
- **Ferrous Chloride:** HSDB reports damage occurs in blood vessels in poisoning.

j. No Specific Target Organ Toxicity (STOT) following Repeated Exposure data was available for **Waste Pickle Liquor** as a mixture. The following STOT following Repeated Exposure data was found for the components:

- **Hydrochloric Acid:** Respiratory tract irritation observed at 10 ppm and above.

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 (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).

Section 11 - Toxicological Information (continued)

The following health hazard information is provided regardless to classification criteria and is based on the individual component(s):

Acute Effects by Component:

- **FERROUS CHLORIDE:** Signs and symptoms of severe poisoning with large amounts of ferrous salts consist of abdominal pain, diarrhea, or vomiting brown or bloody stomach contents, pallor or cyanosis, lassitude, drowsiness, hyperventilation due to acidosis, and cardiovascular collapse. If death does not occur within 6 hours, there may be a transient period of apparent recovery, followed by death in 12 to 24 hours. The corrosive injury to the stomach may result in subsequent pyloric stenosis or gastric scarring. Hemorrhagic gastroenteritis and hepatic damage are prominent findings at autopsy.
- **HYDROCHLORIC ACID:** The toxicity of HCl is related to exposure to high concentrations of acid. The acid causes irritation to skin, eyes, respiratory tract and other exposed areas. Skin and eye Irritation of HCl aqueous solutions are dependent on concentration of HCl. Aqueous solutions of HCl up to10% were not irritating to skin in rabbits. However, a 15% solution and higher was corrosive to rabbit skin. Aqueous solutions of HCl of 10% and over were corrosive to Eye irritation. However, in humans, a 4% solution was slightly irritating to skin of humans.

Delayed (chronic) Effects by Component:

- **FERROUS CHLORIDE:** Repeated ingestion may cause liver damage.
- **HYDROGEN CHLORIDE:** Respiratory tract irritation observed at 10 ppm and above in repeat-dose inhalation studies.

Section 12 - Ecological Information

12(a) Ecotoxicity (aquatic & terrestrial): No Data Available for the product as a mixture.

12(b) Persistence & Degradability: No Data Available

12(c) Bioaccumulative Potential: No Data Available

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

12(a) Ecotoxicity (aquatic & terrestrial): No Data Available for the product, as a mixture.

12(e) Other Adverse Effects: None Known

Additional Information:

Hazard Category: No Category **Hazard Category:** No Category

Hazard Symbol: No Hazard Symbol

Hazard Statement: No Hazard Statement

Section 13 - Disposal Considerations

Disposal: Dispose of contents/container in accordance with local/regional/international regulations. Test waste material for corrosivity, D002, prior to disposal.

Container Cleaning and Disposal: Follow applicable federal, state and local regulations. Observe safe handling precautions.

Please note this information is for Waste Pickle Liquor 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 regulates **Waste Pickle Liquor** 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.

Shipping Name: Ferrous chloride, solution **Shipping Symbols:** D **Hazard Class:** 8 **UN No** NA1760 **Packing Group:** II **DOT/ IMO Label:** 8 **Special Provisions (172.102):** B3,IB2, T11, TP2, TP27	**Packaging Authorizations** **a) Exceptions:** 154 **b) Non-bulk:** 202 **c) Bulk:** 242	**Quantity Limitations** **a) Passenger, Aircraft, or Railcar:** 1L **b) Cargo Aircraft Only:** 30L **Vessel Stowage Requirements** **a) Vessel Stowage:** B **b) Other:** 40 **DOT Reportable Quantities**: NA

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 **Waste Pickle Liquor** as a hazardous material.

Shipping Name: Corrosive Liquid, N.O.S. **Classification Code:** 8 **UN No.:** UN1760 **Packing Group:** II **ADR Label:** NA **Special Provisions:** 274 **Limited Quantities:** 1L	**Packaging** **a) Packing Instructions:** P001 **b) Special Packing Provisions:** NA **c) Mixed Packing Provisions:** NA	**Portable Tanks & Bulk Containers** **a) Instructions:** T11 **b) Special Provisions:** TP2, TP27

Section 14 - Transport Information (continued)

International Air Transport Association (IATA) does not regulate **Waste Pickle Liquor** as a hazardous material.

	Passenger & Cargo Aircraft		Cargo Aircraft Only	Special Provisions:
Shipping Name: Corrosive Liquid, N.O.S. **Class/Division:** 8 **Hazard Label (s):** Corrosive **UN No.:** UN1760 **Packing Group:** II **Excepted Quantities (EQ):** E2	**Limited Quantity (EQ)** **Pkg Inst:** Y808 **Max Net Qty/Pkg:** 0.5 L	**Pkg Inst:** 808 **Max Net Qty/Pkg:** 1L	**Pkg Inst:** 812 **Max Net Qty/Pkg:** 30L	NA **ERG Code:** 154

Pkg Inst – Packing Instructions Max Net Qty/Pkg – Maximum Net Quantity per Package ERG – Emergency Response Drill Code

Transport Dangerous Goods (TDG) classification: Corrosive liquid, acidic, inorganic, n.o.s.

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, **Waste Pickle Liquor does not** contain 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.

State Regulations: The product, **Waste Pickle Liquor** 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: Does not contain elements known to the State of California to cause cancer or reproductive toxicity.

Other Regulations:

WHMIS Classification (Canadian): The product, **Waste Pickle Liquor** is not listed as a mixture. However individual components are listed.

Ingredients	WHMIS Classification
Ferrous Chloride	Acute toxicity - Oral - Category 4; Serious Eye Damage - Category 1
Hydrochloric Acid	Acute toxicity - inhalation - Category 2; Skin Corrosion - Category 1; Serious Eye Damage - Category 1; Health Hazards not otherwise Classified - Category 1

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:

09/15/2017 – Update to OSHA HAZ COM 2012 & WHMIS 2015
06/28/2011 - Update of content and format to comply with GHS
11/25/1986 - Original

Expiration Date: 07/08/2021

07/08/2019 – Update Section 9, pH value

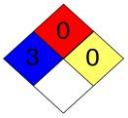
Additional Information:

Hazardous Material Identification System (HMIS) Classification

Health Hazard	**3**
Fire Hazard	**0**
Physical Hazard	**0**

HEALTH= **3**, * Major injury likely unless prompt action is taken and medical treatment is given.
FIRE = **0** (Material will not burn).
Physical Hazards = **0** (Materials that are normally stable)

National Fire Protection Association (NFPA)



HEALTH = **3**, Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.
FIRE = **0** (Material will not burn).
INSTABILITY = **0** (Normally stable)

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

Section 16 - Other Information (continued)

ABBREVIATIONS/ACRONYMS (continued):

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.