SAFETY Data Sheet (SDS)

Section 1 – Identification

Product identifier: Coated Steel Sheet – Carbon Steel

Other means of product use: Metal Drywall accessories, Studs< metal Lath, and Plaster Accessories

Synonym: Cold rolled sheet, H.D.G. (Hot Dipped Galvanized)

SDS#: 52115

Supplier's details: Phillips Manufacturing Company
4949 South 30th Street
Omaha, NE 69107
402-339-3800
www.phillipsmfg.com

Emergency Telephone #: 800-822-5055

Section 2 – Hazard(s) Identification

2(a) Classification of the Chemical: As sold this product, is considered an article under Reach regulation (Reach Regulation EC) No 1907/2006 and is not subject to classification under CLP regulation (REGULATION (ec) no 1272/2008. However, Coated Steel Sheet is not exempt as an article under OSHA's Hazard Communication Standard (29 CFR 1910.1200) due to its downstream use, thus this product is considered a mixture and a hazardous material. Therefore, the categories of Health Hazards as defined in GLOBALY HARMAONIZED SYSTEM OF CLASSIFICATION AND LABELING OF CHEMICALS (GHS), Third revision 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 statements(s), symbols and precautionary statement(s):

Hazard Symbol	Hazard Classification	Signal Word	Hazard Statement(s)
	Carcinogenicity – 2 Reproductive Toxicity – 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 the lungs and central nervous system through prolonged or repeated inhalation exposure • Harmful if swallowed • May cause an allergic skin reaction. • Harmful in contact with skin • May causes eye irritation
	Acute Toxicity-Oral – 4 Skin Sensation – 1 STOT Single Exposure - 3		
NA	Eye Irritation-2B		

Precautionary Statement(s):

Prevention	Response	Storage/Disposal
Do not breathe dusts / Fumes / Gas /Mist / Vapor / sprat. Wear protective gloves / protective clothing / eye protection / face protection. Contamination work clothing must not be allowed out of the work place. 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 contacts 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 and wash contaminated clothing before reuse. Call a poison center if feeling unwell	\All steel associated with this category can be and should be recycled. If material is not to be recycled dispose of in accordance with federal, state and local regulations.

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2(c) Hazards not otherwise classified: Unknown **2(D) Unknown acute toxicity statement (mixture):** None Known

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Section 3 – Composition/Information on Ingredients

3(a-c) Chemical name, common name (synonyms), CAS n umber and other identifiers, and concentration

Chemical name	CAS Number	EC Number	% weight
Iron	7439-89-6	231-096-4	95 - 99.9
Manganese	7439-96-5	231-105-1	0.5 - 2.0
Nickel	7440-02-0	231-111-4	0.004 – 0.5
Silicon	7440-21-3	231-130-8	0.001 – 1.05

EC – European Community

CAS- Chemical Abstract Service

- All commercial steel products contain small amounts of various elements in addition to those listed. These small amounts are frequently referred to as "trace" or "residual" elements that generally originate in the raw materials used. Steel products may contain the following trace elements: aluminum (0.01 – 0.5), boron (< 0.005 max, typically 0.001%), calcium (<0.005 max typically 0.0003%), carbon (.06max), chromium (0.7 max), columbium (<0.15 max, typically 0.002%), copper (0.4 max), molybdenum (< 0.4 max typically 0.006%), phosphorous (< 0.1 max typically 0.01%), sulfur (<0.04 max, typically, 0.007%), Tin (<0.03 max, typically 0.002%), titanium (< 0.15 max, typically 0.002%) and vanadium (< 0.15 max, typically 0.001%). Other trace elements not frequently identified, may include antimony, arsenic, cadmium, cobalt, lead, and zirconium.
- Product surfaces may be treated with small amounts of corrosion-inhibiting oil that may contain mineral oil or petroleum distillates, or paints, generally applied at the customers request. Refer to the coating manufacture's SDS for hazards associated with the coatings. Refer to the following table for additional information.

Base Metal Coating (if applicable)[1]

Chemical name	CAS Number	EC Number	% weight[2]
Aluminum	7429-90-5	231-072-3	0 - 85
Nickel (Ni) ZnNi EG	7440-02-0	231-111-4	10 – 30
Galvalume[3]	Mixture	Mixture	98 min
Zinc Galvanize (GI) Galvanneal (GA) ZnNi EG	7440-66-6	231-175-3	(GI) 99 min (GA) 85 min.[4] (ZnNi) 70 - 90
Zincroplex Coating[5]	Mixture	Mixture	0.5 - 4.9
Zincrometal®SL	Mixture	Mixture	0.5 - 5.9

Other Coating (If applicable) [1] <0.8 total

Chemical Name	CAS Number	EC Number	% weight[2]
Barium Chromate	10-2944-03	231-157-5	10
Chem Phos 2007	Varies[7]	Varies	0.004 - 0.017[8]
Chem Treat – Chrome	7440-47-3	231-157-5	0.3 – 12 MG/FT2
Epoxy Resin	Varies	Varies	40 – 60
Phosphate Treat	7664-38-2	231-633-2	100 – 200 MG/FT2
Silicates	Varies	Varies	3 - 30
Zinc Potassium Chromate	11103-86-9	234-329-8	1
DiamondPlus[tm]	Mixture	Mixture	<0.1[9]

1. Refer to product specification for coating applicability
2. Percentages are expressed as typical ranges or maximum concentrations of trace elements in the coating. For the purpose of communicating the potential hazards of the finished product. Consult product specifications for specific composition information.
3. Galvalume coated steel is steel that is plated on one or both sides with 55% Aluminum, min. 40% Zinc Alloy coating. The balance is a mixture of silicon and potentially the trace elements found in steel produces. See Section 2 Notes.
4. In addition to trace elements, as stated in Section 2 Notes, the balance of the Galvanneal coating is alloyed Iron from the base metal.
5. Zincroplex® coated steel is steel that is coated on one or both sides with zinc or zinc alloy coating (such as electrogalvanized, hot dip galvanized, or galvanealed steel), followed by the application (on one side) of coatings of Dacromet® III (an inorganic zinc dust/chromic oxide coating) and Zincromet® SPX (an organic coating containing zinc dust). For more information on Zincroplex® coating. See product MSDS: Zincroplex® Manufacturer: Metal Coatings International.
6. Zincrometal® coated stell is steel that is coated with **Zincrometal® SL** (an inorganic zinc dust/ chromic oxide coating followed by an organic coating containing zinc dust). For more information on coating see. See product MSDS: Zincrometal®SL. Manufacturer: Metal Coatings International.
7. The coating consist of a mixture of crystalline and amorphous forms of Phosphophylite and Hopeite
8. Percentages listed are calculated from typical coating weights of 0.3 – 0.8 g/m^3 and substrates thickness of 0.6 – 1.1 mm (4.67 – 8.57 kg/m^2)
9. DiamondPlus[tm] coated steel % weight is expressed as a concentration of the coating mass weight to full product mass weight.

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Section 4 – First-aid Measures

4(A) Description of necessary measures:

- **Inhalation Coated Steel Sheet** as sold/shipped is not a likely form of exposure. However, during further processing (welding, grinding, burning, ect.), if inhaled: remove person to fresh air and keep comfortable for breathing, If exposed, concerned, or feel unwell seek medical attention.
- **Eye Contact: Coated Sheet Steel** as sold/ shipped is not likely form of exposure. However, during further processing (welding, grinding, burning, ect.), 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 seek medical attention. If exposed, concerned or feel unwell seek medical attention.
- **Skin Contact:** If on skin: wash thoroughly after handling. Wash with plenty water. If irritation or rash occurs seek medical attention. Take off and wash contaminated clothing before reuse. If exposed, concerned or feel unwell get medical attention.
- **Ingestion: Coated Steel Sheet** as sold/shipped is not likely form of exposure, however, during further processing (welding, grinding, burning, ect.), if swallowed call a poison doctor or center. If you feel unwell rinse mouth. If exposed, concerned, or feel unwell seek medical attention.

4(b) Most important symptoms/effects, acute and delayed (chronic) :

- **Inhalation: Coated Steel Sheet** as sold/shipped is not likely to present acute or chronic health effects.
- **Eye: Coated Steel Sheet** as sold/shipped is not likely to present acute or chronic health effects.
- **Skin: Coated Steel Sheet** as sold/shipped is not likely to present acute or chronic health effects.
- **Ingestion: Coated Steel Sheet** as sold/shipped is not likely to present acute or chronic health effects.

However during further processing (welding, grinding, burning, etc.) individual components may illicit an acute or chronic health effect. Refer to Section 11-Toxicological Information

4(c) Immediate Medical Attention and Special Treatments: None Known

Section 5 – Fire-Fighting Measures

5(a) Suitable (and unsuitable) Extinguishing Media: Not Applicable for **Coated Steel Sheet** as sold/ shipped. Use extinguishers appropriate for surrounding materials.

5(b) Specific Hazards arising from the chemical: Not Applicable for **Coated Steel Sheet** as sold/shipped. When burned, toxic smoke, fume 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: Not Applicable for **Coated Steel Sheet** as sold/shipped. For spills involving finely divided particles, clean-up personnel should be protected against contact with eyes and skin. IF material is in dry state, avoid inhalation of dust

6(b) Methods and materials for containment and clean-up: Not Applicable for **Coated Steel Sheet** as sold/shipped. Collect material in appropriate. Labeled container for recovery or disposal in accordance with federal, state, and local regulations. Fallow 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: Not Applicable for **Coated Steel Sheet** as sold/shipped. However, further processing (welding, grinding, burning, etc.) with the potential for generating high concentrations of airborne particles should be evaluated and controlled as necessary. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use only outdoor or in well ventilated areas. Practice good housekeeping. Avoid breathing metal fumes and/or dust. Do not eat, drink, or smoke when using this product. Cut resistant gloves and sleeves should be worn when working with steel products.

7(b) Conditions for safe storage, including any incompatibilities: Store away from acids and incompatible materials

Section 8 – Exposure Controls/ Personal Protection

8(a) Occupational Exposure Limits (OELs): Coated Steel Sheet as sold/shipped in it's physical form does not present an inhalation, ingestion or contact hazard, not would any of the fallowing exposure data apply. However, operations such as burning, welding (high temperature), sawing, brazing, machining, grinding, etc. May produce fumes and/or particulates. The fallowing exposure limits are offered as reference for an experienced industrial hygienist review.

Ingredients	OSHA PEL[1]	ACGIH TLV[2]	NIOSH REL[1]	IDLH[4]
Iron	10 mg/m^3 (as iron oxide fume)	5.0 mg/^{3} (as iron oxide dust and fume)	5.0 mg/m^3 (as iron oxide dust and fume)	2,500 mg Fe/m^3
Manganese	(c) 5.0 mg/m^3 (as fume & Mn compounds)	0.2 mg/m^3	(c) 5.0 mg/m^3 1.0 mg/m^3 (as fumes) (STEL) 3.0 mg/m^3	500 mg Mn/m^3

Nickel	1.0 mg/m³ (as Ni metal & insoluble compounds)	1.5 mg/m³ (as inhalable fraction[3] Ni metal) 0.2 mg/m³ (as inhalable fraction Ni inorganic only insoluble and soluble compounds)	0.015 mg/m³ (as Ni metal & insoluble and soluble compounds)	10 mg/m³ (as Ni)
Silicon	15 mg/m³ (total dust, PNOR[6]) 5.0 mg/m³ (as respirable fractions , PNOR)	10 mg/m³	10 mg/m³ (as total dust) 5.0 mg/m³ (as respirable dust)	NE

8(a) Occupational Exposure Limits (OELs) (continued):

NE- None Established

1. OSHA Permissible Exposure Limits (PELs) 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. A Peak is defined as the acceptable maximum peak for a maximum duration above the ceiling concentration for an eight-hour shift. A skin notation refers to the potential significant contribution to the overall exposure by the cutaneous route, either by contact with vapors or, of probable greater significance, by direct skin contact with the substance. A Short Term Exposure Limit (STEL) is defined as a 15-minute exposure. Whish should not be exceeded at any time during the work day, An Actual 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 Hygienist (ACGIH) are 8-hour TWA concentrations unless otherwise noted. 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 hours throughout the day with at least on hour between exposures. A “skin” notation refers to the potential significant contribution to the overall exposure by the cutaneous route, either by contact with vapors or, of probable greater significance, by direct skin contact with the substance. ACGIH-TLVs are only recommended guidelines based upon consensus agreement of the membership of the ACGIH. As such, the ACGIH TLVs are for guideline use purposes and are not legal regulatory standards for compliance purposes. The TLVs are designed for use by individuals trained in the discipline of the industrial hygiene relative to the evaluation of exposure to various chemical or biological substances and physical agents that may be found in the work place.
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 health and safety. As is the case with ACGIH TLVs, NIOSHA RELs are for guideline purpose 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 compilation of the rationale and sources of information used by NIOSH during the original determination of 387 IDLHs and their sub sequential review and revision in 1994.
5. 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 2013 TLVs® and BEIs® (Biological Exposure Indices) Appendix D, paragraph A.
6. 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 15 mg/m³ for total dust and 5 mg/m³ for the respirable fractions.

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

- **Respiratory Protection:** Seek Professional advice prior to respirator selection and use. Fallow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, use only a OSHA-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 extend 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 IDLH (Immediate 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-demanded, 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. 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 work place.
- **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

9(a) Appearance (physical state, color, etc.): Solid, Metallic grey
9(b) Odor: Odorless
9(c) Odor Threshold: NA
9(d) pH: NA
9(e) Melting Point/Freezing Point: ~2750° F (~1510 C)
9(f) Initial Boiling Point and Boiling Range: ND
9(g) Flash Point: NA
9(h) Evaporation Rate: NA
9(i) Flammability (solid, gas): Non-flammable, non-combustible
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: 7.85
9(n) Solubility(ies): Insoluble
9(o) Partition Coefficient n-octanol/water: ND
9(p) Auto-ignition Temperature: NA
9(q) Decomposition Temperature: NA
9(r) Viscosity: NA

NA- not applicable
ND- Not determined for product as a whole

Section 10 – Stability and Reactivity

10(a) Reactivity: Not determined (ND) for product in a solid form. Do not use water on molten metal.
10(b) Chemical Stability: Steel product are stable under normal storage and handling conditions.
10(c) Possibility of hazardous reactions: None known.
10(d) Conditions to Avoid: Storage with strong acids or calcium hypochlorite.
10(e) Incompatible Materials: Will react with strong acids to form hydrogen. Iron oxide dust in contact with calcium hypochlorite evolve oxygen and may cause an explosion.
10(f) 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

11 Information on toxicological effects: The fallowing toxicity data has been determined for **Coated Steel Sheet** when further processed using the information available for its components applied to the guidance on the preparation of an SDS under 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)	NA*	4[8]		**Warning**	Harmful If Swallowed
Eye Damage/Irritation (covers categories 1, 2A and 2B	NA*	2B[c]	No Pictogram	**Warning**	Causes eye irritation
Skin/Dermal Sensitization (covers Category 1)	NA*	1[d]		**Warning**	May cause an allergic skin reaction
Carcinogenicity (covers Categories 1A, 1B, and 2)	NA*	2[g]		**Warning**	Suspected of causing cancer
Toxic Reproduction (covers Categories 1A, 1B, and 2	NA*	**2[h]**		**Warning**	Suspected of damaging fertility or the unborn child
Specific Target Organ Toxicity (STOT) following single Exposure (covers Categories 1 – 3)	NA*	**3[1]**		**Warning**	May cause respiratory irritation
STOT following Repeated Exposure (covers Categories 1 and 2)	NA*	1[j]		**Warning**	Causes damaged to lungs and central nervous system through prolonged or repeated inhalation exposure

*Not Applicable – Semi-formed steel products are considered articles under Reach regulation (REACH REGULATIONS (EC) No 1907/2006) and are not subject to classification under CLP regulation (REGULATION (EC) No 1272/2008)

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 **Coated Steel Sheet.** The following data has been determined for the components:

Iron: RAT LD_{50} = 98.6 g/kg (REACH)
RAT LD_{50} = 1060 mg/kg (IUCLID)
RAT LD_{50} = 984 mg/kg (IUCLID)
Rabbit LD_{50} = 890 mg/kg (IUCLID)
Guinea Pig LD_{50} = 20 g/kg (TOXNET)

Nickel: LD_{50} > 9000 mg/kg (Oral/Rat)

Silicon: l_{d50} = 3160 mg/kg (ORAL/Rat)

Manganese: RAT LD_{50} >2000 mg/kg (REACH)
RAT LD_{50} >9000 mg/kg (NLMToxnet)

b. No skin (Dermal) irritation data available for **Coated Steel Sheet** as a mixture or its components.
c. No Eye Irritation data available for **Coated Steel Sheet** as a mixture. The following Eye Irritation information was found for the components:
   - **Iron:** Causes eye irritation.
   - **Silicon:** Slight eye irritation in rabbit protocol.
   - **Nickel:** Slight eye irritation from particulate abrasion only.
d. No Skin (Dermal) Sensitization data available **Coated Steel Sheet** as a mixture. The following Skin (Dermal) Sensitization information was found for the components:
   - **Nickel:** May cause allergic skin sensitization.
e. No Respiratory Sensitization data available for **Coated Steel Sheet** as a mixture or its components.
f. No Germ Cell Mutagenicity data available for **Coated Sheet Steel** as a mixture. The following Mutagenicity and Genotoxicity information was found for the components:
   - **Iron:** IUCLID has found some positive negative findings in vitro.
   - **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 **Coated Steel Sheet** 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.
   - **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.
h. No Toxic Reproduction data available for **Coated Steel Sheet** as a mixture. The following Toxic Reproductive information was found for the components.
i. No Specific Target Organ Toxicity (STOT) following a Single Exposure data available for **Coated Steel Sheet** as a mixture. The following STOT following a Single Exposure data was found for the component.
   - **Iron:** Irritating to Respiratory tract.
j. No Specific Target Organ Toxicity (STOT) following Repeated Exposure data was available for **Coated Steel Sheet** as a whole. The following STOT following Repeated Exposure data was found for the components.
   - **Manganese:** inhalation of metal fumes – Degenerative changes in human Brain: Behavioral: Changes in motor activity and muscle weakness (*Whitlock et al., 1966*).
   - **Nickel:** RAT 4 wk inhalation LOEL 4 mg/m^3 lung and lymph node histopathology. RAT 2 yr inhalation LOEL 0.1 mg/m^3 Pigment in kidney, effects on hematopoiesis spleen and bone marrow and adrenal tumor. Rat 13 week Inhalation LOAEC 1.0 mg/m^3 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 include: The American Conference of Governmental Industrial Hygienist (ACGIH) Documentation of the Threshold Limit Values (TLVs) and Biological Exposure indices (BEIs) with Other World Wide Occupational Exposure Values 2009, 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 Data Base (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:

- **Inhalation:** Excessive exposure to high concentrations of metal dust may cause irritation to the eyes, skin and mucous membranes of the upper respiratory tract. Excessive inhalation of fumes from freshly formed metal oxide particles sized below 1.5 micrometers and usually between 0.02 – 0.05 micrometers from many metals can produce an acute reaction known as “metal fume fever”, Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), metallic taste in the mouth, dryness and irritation of the throat followed by weakness and muscle pain. The symptoms come on in a few hours after excessive exposures and usually last from 12 to 48 hours. Long-term effects from metal fume fever have not been noted. Freshly form oxide fumes of manganese have been associated with causing metal fume fever.
- **Eye:** Excessive exposure to high concentrations of metal dust may cause irritation to the eyes.
- **Skin:** Skin contact with metal dusts may cause irritation or sensitization, possibly leading to dermatitis. Skin contact with metallic fumes and dusts may cause physical abrasion.
- **Ingestion:** Ingestion of harmful amounts of this product as distributed is unlikely due to its solid insoluble form. Ingestion of metal dust may cause nausea or vomiting.

Acute Effects by component:

- **Iron and iron oxides:** iron is harmful if swallowed, causes skin irritation, and causes eye irritation. Contact with iron oxide has been reported to causes skin irritation and serious eye damage. Particles of iron or iron compounds, which become imbedded in the eye, may cause rust stains unless removed fairly promptly.
- **Manganese and manganese oxides:** Manganese and Manganese oxide are harmful if swallowed.
- **Nickel and nickel oxides:** Nickel may cause allergic skin sensitization. Nickel oxide may cause an allergic skin reaction.
- **Silicon and silicon oxides:** May be harmful if swallowed.

Delayed (chronic) Effects by components:

- **Iron and Iron 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 the 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 (Non-classifiable) carcinogen by the International Agency for Research on Cancer (IARC).
- **Manganese and manganese 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 over exposure (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 manganese oxides include: speed and coordination of motor function are specially impaired.
- **Nickel and nickel oxides:** Exposure to nickel dusts and fumes can cause sensitization dermatitis, respiratory irritation, asthma, pulmonary fibrosis, edema, it may cause nasal or lung cancer in humans. Nickel causes damage to lungs through prolonged or repeated inhalation exposure. IARC list nickel and certain nickel compounds as Group 2B carcinogens (sufficient animal data). ACGIH 2013 TLVs® and BEIs® list insoluble nickel compounds as confirmed human carcinogens. Nickel is suspected damaging the unborn child.
- **Silicon and silicon oxides:** Silicon dusts are a low health risk by inhalation and should be treated as a nuisance dust. Eye contact with pure material can cause particulate irritation. Skin contact with silicon dusts may cause physical abrasion.

Section 12 – Ecological Information

12(a) Ecotoxicity (aquatic & terrestrial): No Data Available for **Coated Steel Sheet** 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:** LC_{50}:>1000 mg/L; Fish 48 h-EC_{50} > 100 mg/L (Currenta, 2008k); 96 h-LC_0 ≥ 50,000 mg/L Test substance: Bayferrox 130 red (95 – 97% Fe_2O_3; < 4% SiO_2 and $A1_2O_3$) (Bayer, 1989a)
- **Hexavalent Chrome:** EU RAR listed as category 1, found acute EC_{50} LD_{50} to algae and invertebrates < 1 mg.
- **Nickel Oxide:** IUCLID found LC_{50} in fish, invertebrates and algae > 100 mg/1.

12(b) Persistence & Degradability: No Data Available for **Coated Steel Sheet** as sold/shipped or individual components.
12(c) Bio accumulative Potential: No Data Available for **Coated Steel Sheet** as sold/shipped or individual components.
12(d) Mobility (in soil): No data available for **Coated Steel Sheet** as sold/shipped or individual components. However, individual components of the product have been found to be absorbed by plants from soil.
12(e) Other adverse effects: None Known
Additional Information:
Hazard Category: Not Reported
Hazard symbol: No Symbol
Hazard Statement: No Statement
Signal Word: No Signal Word

Section 13 – Disposal Considerations

Disposal: Steel scrap 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 if in accordance with applicable federal, state or local regulations.
Container Cleaning and Disposal: Follow applicable federal, state and local regulations. Observe safe handling precautions. European Waste Catalogue (EWC): 16-01-17 (ferrous metals), 12-01-99 (wastes not otherwise specified), 16-03-04 (off specification batches and unused products), or 15-01-04 (metallic packaging).
Please note this information is for Coated Steel Sheet in its original form. Any alterations can void this information.

14(a-g) Transportation Information:
US Department of Transportation (DOT) under 49 CFR 172.101 **does not** regulate **Coated Steel Sheet** as a Hazardous material. All federal, state, and local laws and regulations that may apply to the transport of this type of material must be adhered to.

Shipping Name: Not Applicable (NA) **Shipping Symbols**: NA **Hazard Class:** NA **UN No:** NA **Packing Group:** NA **DOT/IMO Label:** NA	**Packaging Authorizations** **a) Exceptions:** NA **b) Group:** NA **Authorization:** NA	**Quantity Limitations** **a) Passenger, Aircraft, or Railcar:** NA **b) Cargo Aircraft Only:** NA **Vessel Stowage Requirements** **a) Vessel Stowage:** NA **b) Other:** NA **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 Material Regulation.

SAFETY Data Sheet (SDS)

Regulations Concerning the International Carriage of Dangerous Goods by Road (ADR) does not regulate **Coated Steel Sheet** as a Hazardous material.

Shipping Name: Not Applicable (NA) **Classification Code:** NA **UN No:** NA **Packing Group:** NA **Excepted Quantities:** NA	**Packaging** **a) Packing Instructions:** NA **b) Special Packing Provisions:** NA **Mixed Packing Provisions:** NA	**Portable Tanks & Bulk Containers** **a) Instructions:** NA **Special Provisions:** NA

International Air Transport Association (IATA) does not regulate **Coated Steel Sheet** as a hazardous material.

Shipping Name: Not Applicable (NA) **Class/Division:** NA Hazard Label (s) **NA UN No:** NA **Excepted Quantities (EQ):** NA	**Passenger & Cargo Aircraft Limited Quantity (EQ)**		**Cargo Aircraft Only Pkg Inst:** NA **Max Net Qty/Pkg:** NA	**Special Provisions:** NA **ERG Code:** NA
	Pkg Inst: NA **Max Net Qty/Pkg:** NA	**Pkg Inst:** NA **Max Net Qty/Pkg:** NA		

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

Transport Dangerous Goods (TDG) Classification: Coated Steel Sheet does not have a TDG classification.

Section 15 – Regulatory Information

Regulatory Information: *The following listing of regulations relating to products produced by Phillips Manufacturing 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:

OSHA Regulations: Air Contaminant (29 CFR 1910.1000, Table Z-1, Z-2, z-3): the product, **Coated Steel Sheet** as a whole is not listed. However. Individual components of the product are listed: Refer to Section 8, Exposure Controls and Personal Protection.

EPA Regulations: The product, **Coated Steel Sheet** is not listed as a whole. However, Individual components of the product are listed:

Components	Regulations
Manganese	CAA, SARA 313, SDWA
Nickel	CCA, CERCLA, CWA, SARA 313

SARA 311/312 Potential Hazard Categories: Immediate Acute Health Hazard; Delayed Chronic Health Hazard

Regulation key:

CAA Clean air act (42 USC Sec. 7412; 40 CFR Part 61 [as of: 8/18/06])

CERLA Comprehensive Environmental Responses, Compensation and Liability Act (42 USC Secs. 9601(14), 9603(a); 40 CFR Sec. 302.4, Table 302.4 and App. A)

CWA Clean Water Act (33 USC Secs. 1311; 1314(b), (c), (e), (g); 136(b), (c) [as of 8/2/06])

RCRA Resource Conservation Recovery Act (42 USC Sec. 6921; 40 CFR Part 261 App VIII)

SARA Superfund Amendments and Reauthorization Act of 1986 Title III Section 302 Extremely Hazardous Substances (42 USC Secs. 11023, 13106; 40 CFR sec. 372.65) and Section 313 Toxic Chemicals (42 USC Secs. 11023, 13106; 40 CFR Sec. 372.65 [as of 6/30/05])

TSCA Toxic Substance Control Act (15 U.S.C $_{s/s}$ 2601 et seq. [1976])

SDWA Safe Drinking Water Act (42 U.S.C.. $_{s/s}$ 300f et seq. [1974])

Section 313 Supplier Notifications: The Product, **Coated Steel Sheet** contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-to-Know Act and 40 CFR part 372:

CAS #	Chemical Name	Percent by Weight
7439-96-5	Manganese	2.0 max
7440-02-0	Nickel	0.5 max

State Regulations: The Product, **Coated Steel Sheet** as a whole is not listed in any state regulations. However, individual components of the product are listed in various state regulations:

Pennsylvania Right to Know: contains regulated material in the following categories:

- Hazardous Substances: Manganese and Silicon
- Environmental Hazards: Manganese and Nickel
- Special Hazardous Substances: Nickel

California Prop. 65: Contains elements known to the State of California to cause cancer or reproductive toxicity. This includes Nickel.

New Jersey: Contains regulated material in the following categories:

- Hazardous Substance: Manganese, and Nickel

Minnesota: Manganese, Nickel and Silicon

Massachusetts: Manganese and Nickel

SAFETY Data Sheet (SDS)

Other Regulations:
WHMIS Classification (Canadian): The product, Coated Steel Sheet is not listed as a whole. However, individual components are listed.

Ingredients	WHMIS Classification
Iron	B4, D2B
Manganese	B4, D2A
Nickel	D2A, D2B

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

Section 16 – Other Information

Prepared By: Matthew Lamb

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

Revised Date: 10/12/2016

National Fire Protection Association (NFPA)

HEALTH= 1, Exposure could cause irritation but only minor residual injury even if no treatment is given.
Flammability= 0, Materials that will not burn
Instability= 0, Normally stable, even under fire exposure conditions, and are not reactive with water,

ABBREVIATIONS/ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists		NIF	No Information Found
BEIs	Biological Exposure Indices		NIOSH	National Institution 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 Material 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
LOEL	Lowest Observed Effect Level		SCBA	Self-contained Breathing Apparatus
LOAEC	Lowest Observable Adverse Effect Concentration		SDS	Safety Data Sheet
$\mu g/m^3$	microgram per cubic meter of air		STEL	Short-term Exposure Limit
Mg/m^3	milligram per cubic meter of air		TLV	Threshold Limit Value
mppcf	million particles per cubic foot		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. Our objective in sending this information is to help your protect the health and safety of your personnel and to comply with the OSHA Hazard Communication Standa rd and Title III of the Emergency Planning and Community Right-to-Know Act. Phillips Manufacturing Company makes no warranty as to the absolute correctness, completeness, or sufficiency of any of the foregoing, or any additional, or other measures that may not be required under particular conditions .