# Safety Data Sheet

## 1. IDENTIFICATION

GHS PRODUCT IDENTIFIER: Duplex Stainless Steels

MATERIAL NAMES: 2202, 2205, 2507

RECOMMENDED USE OF THE CHEMICAL AND RESTRICTIONS OF USE: Solid stainless-steel products, various forms and uses, manufacture of articles.

MANUFACTURER'S DETAILS: Combined Metals Company, 1 Hauk Dr., Hampshire, IL. 60140

PHONE: 847-683-0500

DATE: 7/20/2026

## 2. HAZARD IDENTIFICATION

Classification: Stainless steel is considered an article, not a chemical and not hazardous in its solid form, so this product is exempted from the OSHA Hazardous Communication Standard. However, certain processes such as cutting, milling, grinding, melting and welding could result in some hazardous materials being emitted. The following classification information is for the hazardous elements which may be emitted during these processes.

SIGNAL WORD, HAZARD STATEMENTS & SYMBOLS: DANGER

| SYMBOLS | HAZARD | GHS CLASSIFICATION | HAZARD STATEMENTS |
|---|---|---|---|
| | Carcinogenicity | Category – 1B | May cause cancer |
| | Respiratory Sensitizer | Category – 1 | May cause allergy or asthma symptoms or breathing difficulties if inhaled. |
| | STOT (repeated exposure) | Category – 1 | Causes damage to organs through prolonged or repeated exposure. |
| | Toxic to Reproduction | Category – 1B | Suspected of damaging the unborn child |
| | Acute Oral Toxicity | Category – 4 | Harmful if swallowed |
| | Skin Sensitizer | Category – 1 | May cause allergic skin reaction |
| | STOT (single exposure) | Category - 3 | May cause respiratory irritation |
| N/A | Eye Irritation | Category – 2B | Causes eye irritations. |

**Precautionary Statements:**

| PREVENTION | FIRST AID RESPONSE |
|---|---|
| Do not breathe dust/fume/gas/vapor/spray.<br>Use in well- ventilated area.<br>Wash thoroughly after handling.<br>Do not eat, drink or smoke when handling this product.<br>Obtain special instructions before use.<br>Do not handle until all safety precautions have been read and understood.<br>Contaminated work clothing should not be allowed out of the workplace. | Eyes: Flush eyes with plenty of water for at least 15 minutes. Seek medical attention if eye irritation persists<br>Skin: Wash affected area with mild soap and water. Seek medical attention if skin irritation persists.<br>Inhalation: Remove to fresh air. Check for clear airway, breathing and presence of pulse. If necessary, administer CPR. Consult a physician immediately.<br>Ingestion: Dust may irritate mouth and gastrointestinal tract, If ingested, seek medical attention promptly. |
| **STORAGE** | **DISPOSAL** |
| Store away from acids and incompatible materials<br>Store in accordance with federal/provincial/state or local regulations | Steel scrap should be recycled whenever possible<br>Otherwise, dispose of in accordance with applicable federal/provincial/state or local regulations |

## 3. COMPOSITION

All values are expressed as weight percent and are approximate. The percent composition reflects the range that is possible within this group of products. These are not the technical specifications for particular product. All grades do not include all hazardous ingredients.

| COMPONENT | CAS NUMBER | PERCENT |
|---|---|---|
| Iron | 7439-89-6 | 61 - 72 |
| Chromium | 7440-47-3 | 22.5 - 25 |
| Nickel | 7440-02-0 | 1.9 - 7 |
| Manganese | 7439-96-5 | 1.2 - |
| Silicon | 7440-21-3 | .1 - 1 |
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The above listing is a summary of elements used in the steel. Other trace elements may also be present in minute amounts. These small quantities (typically less than 0.1%) are frequently referred to as “trace” or “residual” elements; generally, they originate in the raw material. Such elements would include Carbon (C), Cobalt (Co), Phosphorus (P), Sulfur (S), Copper (Cu), Titanium (Ti), Nitrogen (N), Aluminum (Al), Tantalum (Ta), Vanadium (V), Boron (B), Columbium (Cb), Lead (Pb), (Fe) Tungsten (W), Silver (Ag), Silicon (Si) and Beryllium (Be).

## 4. FIRST AID

EYE CONTACT: Wash with copious amounts of water for 15 minutes to ensure that no articles remain in the eye. Seek medical advice if irritation persists.

SKIN CONTACT: If irritation develops, wash skin thoroughly with soap and water. Seek medical attention if necessary.

INHALATION: Remove from dusty area to fresh air. If discomfort persists, consult physician.

INGESTION: If significant amounts of dust are ingested consult a physician.

SYMPTOMS/EFFECTS: Stainless steel as a solid and shipped is not likely to present an acute or chronic health effects. However, during processing (cutting, milling, grinding, melting or welding) emitted byproducts may cause irritations, difficulty in breathing, coughing or wheezing. May cause allergic skin reactions.

MEDICAL ATTENTION: Notes to physicians: May cause sensitization by skin contact or inhalation. Treat symptomatically.

## 5. FIRE FIGHTING MEASURES

SUITABLE EXTINGUISHING MEDIA: Non-flammable. Will not support combustion. Not applicable for solid product. Use extinguishers appropriate for surrounding materials. Do not use water on molten metal. A fire involving finely divided alloy should be treated as Class D Combustible metal fire.

SPECIFIC HAZARDS ARISING FROM MATERIAL: Not applicable for solid product.

HAZARDOUS COMBUSTION PRODUCTS: Not applicable for solid formed alloy. Toxic metal and metallic oxide fumes may be evolved from fires involving finely divided alloy.

SPECIAL FIRE FIGHTING INSTRUCTIONS: For solid formed alloy, as appropriate for surrounding fire. Firefighters should wear self-contained NIOSH-approved breathing apparatus and full protective clothing.

EXPLOSION DATA: Solid formed alloy does not constitute a fire or explosion hazard. However, finely divided suspended particulates may present a fire and explosion hazard in the presence of an ignition source.

## 6. ACCIDENT RELEASE

PRECAUTIONS / EMERGENCY PROCEDURES: Not applicable to stainless steel in solid state. Avoid dust formation. Ensure adequate ventilation. Clean –up personnel should be protected against inhalation and eye and skin contact.

ENVIRONMENTAL PRECAUTIONS: Not applicable to stainless steel in solid state.

CONTAINMENT AND CLEANING UP: Not applicable to stainless steel in solid state.

## 7. HANDLING AND STORAGE

PRECAUTIONS OF SAFE HANDLING: Not applicable to stainless steel in solid state. Operations with the potential for generating high concentrations of airborne particles should be evaluated and controlled as necessary. Practice good housekeeping. Avoid breathing metal fumes and/or dust.

CONDITIONS FOR SAFE STORAGE: No special storage conditions for stainless steel in solid state

INCOMPATIBLE PRODUCTS: Store away from acids and incompatible materials.

## 8. EXPOSURE CONTROL

Control Parameters: There are no exposure limits for stainless steel. The exposure limit for iron-containing fumes has been established at 5 mg/m3 with ACGIH's TWA. The individual complex compounds with the fume may have lower exposure limits.

| COMPONENT | CAS NUMBER | OSHA PEL (mg/m3) | TLV ACGIH (mg/m3) |
|---|---|---|---|
| Iron | 7439-89-6 | 10 mg/m3<br>Iron Oxide - Fume | 5 mg/m3<br>Iron Oxide – Dust & Fume |
| Nickel | 7440-02-0 | 1 mg/$m^3$, Metal, soluble & insoluble compounds | 1.5 mg/ $m^3$ Metal<br>0.1 mg/ $m^3$ Soluble compounds<br>0.2 mg/ $m^3$, Insoluble compounds |
| Chromium | 7440-47-3 | 1 mg/ $m^3$ , Metal & insoluble salt<br>0.5 mg/$m^3$, Cr (III)<br>5 µg/$m^3$, Cr (VI)<br>2.5 µg/$m^3$ Action Level Cr (VI) | 0.5 mg/$m^3$ Metal and Cr (III)<br>0.05 mg/$m^3$, Cr (VI) & water soluble compounds<br>0.01 mg/$m^3$, Cr (VI) Insoluble compounds |
| Manganese | 7439-96-5 | 5 mg/$m^3$ (ceiling) | 0.2 mg/$m^3$ |
| Molybdenum | 7439-98-7 | 5 mg/$m^3$ Soluble compounds as MO<br>15 mg/$m^3$ Total dust | 5 mg/$m^3$ Soluble compounds as MO<br>10 mg/$m^3$ Insoluble compounds as MO |
| Copper | 7440-50-8 | 0.1 mg/$m^3$ Fume<br>1.0 mg/$m^3$ Dust & Mist | 0.2 mg/$m^3$ Fume<br>1.0 mg/$m^3$ Dust & Mist |
| Silicon | 7440-21-3 | 15 mg/$m^3$ Total dust<br>5 mg/$m^3$ Respirable dust | 10 mg/$m^3$ Total dust |
| Aluminum | 7429-90-5 | 15 mg/$m^3$ Metal & Total dust<br>5 mg/$m^3$ Respirable dust | 1 mg/$m^3$ Respirable dust<br>5 mg/$m^3$ Welding fume |
| Cobalt | 7440-48-4 | 0.1 mg/$m^3$ Metal, Dust & Fume | 0.02 mg/$m^3$ Metal, Dust & Fume |
| Vanadium | 1314-62-1 | 0.5 mg/$m^3$ (ceiling) Vanadium Pentoxide dust<br>0.1 mg/$m^3$ (ceiling) Vanadium Pentoxide fume | 0.05 mg/$m^3$ Vanadium Pentoxide |
| Tungsten | 7440-33-7 | 15mg/m3 Total Dust<br>5mg/m3 Respirable Dust | 1.0 mg/ $m^3$, 3 mg/m3 STEL Soluble<br>5.0 mg/ $m^3$, 10 mg/m3 STEL Insoluble |
| Tantalum | 7440-25-7 | 5 mg/ $m^3$ Metal & Oxide Dust<br>10 mg/ $m^3$ STEL | 5 mg/ $m^3$ Metal & Oxide Dust |
| Titanium | 7440-32-6 | 15 mg/ $m^3$ Titanium Dioxide Total Dust | 10 mg/ $m^3$ Titanium Dioxide Total Dust |
| Lead | 7439-92-1 | 0.05 mg/ $m^3$ | 0.05 mg/ $m^3$ |

Note: OSHA PEL's and Threshold Limit Values (TLV) established by the Occupational Health and Safety Administration and the American Conference of Governmental Industrial Hygienists (ACGIH) are 8 hour Time Weighted Averages concentrations unless otherwise noted.

Appropriate Engineering Controls: Local and or general exhaust ventilation should be used to keep worker exposure below applicable exposure limits during welding, brazing, grinding, machining, and other processes which may generate airborne contaminants.

Individual Protective Measures: Dependent upon process being performed on material each operation must be addressed for

## 9. PERSONAL PROTECTION

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| Gloves: | Suitable for protection against physical injury and skin contact during handling and processing. |
| Eyes: | Safety glasses or goggles should be worn when there is probability of flying particles or elevated levels of dust or fume. |
| Clothing: | N/A |
| Respirator: | If concentrations exceed established limits use NIOSH/MSHA approved particulate respirators (dust & fume or high efficiency dust and fume) when grinding or welding. |
| Footwear: | N/A |
| Other: | N/A |

## 10. CHEMICAL / PHYSICAL PROPERTIES

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|---|---|---|---|
| Physical State | Solid | Appearance | Solid Silver-grey metallic |
| Odor | Odorless | Odor Threshold | Not Applicable |
| pH | Not Applicable | Melting Point | 2500 – 2800 $^{o}$F |
| Boiling Point | Not Applicable | Flash Point | Not Applicable |
| Evaporation Rate | Not Applicable | Flammability (solid, gas) | Not flammable |
| Upper Flammable Limit% | Not Applicable | Lower Flammable Limit | Not Applicable |
| Vapor Pressure | Not Applicable | Vapor Density | Not Applicable |
| Relative Density | Not Applicable | Specific gravity | 7.65 – 7.94 |
| Solubility | Not Applicable | Partition Coefficient | No data |
| Auto-ignition Temp © | Not Applicable | Decomposition Temperature | No data |
| Viscosity | Not Applicable | | |
| Other Information | Not Applicable | | |

## 11. STABILITY & REACTIVITY

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| REACTIVITY: | Not determined for product in solid form. |
| CHEMICAL STABILITY: | Stable under normal conditions of transport, storage and use for solid formed product. |
| POSSIBILITY OF HAZARDOUS REACTIONS: | Hazardous polymerization will not occur. |
| CONDITIONS TO AVOID: | Contact with mineral acids will release flammable hydrogen gas. Dust formation. |
| INCOMPATIBLE MATERIALS: | Oxidizers, reacts with strong acids to form explosive hydrogen gas. |
| HAZARDOUS DECOMPOSITION PRODUCTS: | During certain operations such as welding, burning, melting or hot rolling, metal fumes may be generated. Hexavalent chromium, which is a suspect carcinogen may result from pickling stainless. |

## 12. TOXICOGLOGY

| COMPONENT | $LD_{50}$ ORAL | $LD_{50}$ DERMAL | $LD_{50}$ INHALATION | OTHER |
|---|---|---|---|---|
| Iron | 30,000 mg/kg Oral -Rat | - | - | - |
| Nickel | >9,000 mg/kg Oral -Rat | - | - | - |
| Chromium | No data available | - | - | - |
| Manganese | 9,000 mg/kg Oral -Rat | - | - | - |
| Molybdenum | No data available | - | - | - |
| Copper | No data available | - | - | - |
| Silicon | 3,160 mg/kg | - | - | - |
| Aluminum | No data available | - | - | - |
| Cobalt | 6,171 mg/kg Oral -Rat | - | - | - |

LIKELY ROUTES OF ENTRY: None for stainless steel in its natural state.

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| EYES: | High concentration of dust may cause irritation to the eyes |
| SKIN: | Prolonged skin contact with dust may cause skin irritation to sensitive individuals |
| INHALATION: | Inhalation of metal particulate or elemental oxide fumes generated during welding, burning or grinding machining may pose acute or chronic health effects. |

SYMPTOMS RELATED TO THE PHYSICAL, CHEMICAL AND TOXICOLOGICAL CHARACTERISTICS:

None for stainless steel in its natural solid shape

EFFECTS OF ACUTE EXPOSURE TO MATERIAL:

MANGANESE & COPPER: Inhalation overexposure to manganese or copper (or zinc coated products) may cause metal fume fever characterized by fever and chills (flue like symptoms) which appear 4-6 hours after exposure with no long-term effects.

EFFECTS OF CHRONIC EXPOSURE TO MATERIAL:

CHROMIUM: IARC lists certain hexavalent chromium compounds under its Group 1 category "confirmed carcinogenicity to humans." And metallic chromium under its group 3 category – "not classifiable as to their carcinogenicity to humans." Chromium metal is classified as a carcinogenic by NTP. Dermatitis may result from exposure to chromium fumes.

Nickel: IARC lists metallic nickel under its Group 2B category – "possibly carcinogenic to humans." Nickel may cause skin sensitivity.

COBALT: Cobalt dust may result in an asthma-like condition (cough, shortness of breath). IARC lists metallic cobalt under its Group 2B category – "possibly carcinogenic to humans."

COPPER: Copper fumes my result in Wilson's Disease (characterized by hepatic cirrhosis, brain damage, demyelination, renal disease, and copper deposition in the cornea.

IRON: Inhalation overexposures may cause a benign pneumoconiosis (siderosis) with few or no symptoms.

MANGANESE: Existing studies are inadequate to assess its carcinogenicity. Susceptible to Parkinson's disease, metal fume fever and kidney damage.

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| STOT (Single Exposure): | No data |
| STOT (Repeated Exposure): | Respiratory system. Allergic skin reactions. |
| Mutagenicity of Material: | N/A |
| Reproductive Effects: | N/A |
| Teratogenicity of Material | N/A |
| Carcinogenicity of Material | CHROMIUM: IARC lists certain hexavalent chromium compounds under its Group 1 category "confirmed carcinogenicity to humans." And metallic chromium under it's group 3 category – "not classifiable as to their carcinogenicity to humans." Chromium metal is classified as a carcinogenic by NTP.<br>Nickel: IARC lists metallic nickel under its Group 2B category – "possibly carcinogenic to humans.<br>COBALT: IARC lists metallic cobalt under it's Group 2B category – "possibly carcinogenic to humans." |
| Synergistic Materials: | N/A |
| Aspiration Hazard | No Data |
| Sensitization of Material | N/A |
| $LD_{50}$ (of Material) | Not established |
| $LC_{50}$ (of Material) | Not established |

Notes:

- STOT – Specific Target Organ Toxicity
- International Agency for Research on Cancer (IARC) Summaries & Evaluation (2008)
- 3rd Annual Report on Carcinogens as prepared by the National Toxicology Program (NTP)Iron containing welding fumes has an exposure limit of 5 mg/m3 (ACGIH-TLV'S 2011), welding fumes may also contain contaminants from flues or welding consumables. Prolonged skin contact may cause reddening and drying of skin or dermatitis in sensitive individuals due to nickel and/or chromium content in steel.

## 13. ECOLOGICAL INFORMATION

ECOTOXICITY: No data available for stainless steel in its natural solid state. However, individual components of the material have been found to be toxic to the environment.

| COMPONENT | TOXICITY TO FISH | TOXICITY TO ALGAE | TOXICITY TO MICROORGANISMS |
|---|---|---|---|
| Iron | $LC_{50}$ Common Carp 96 hr. 0.56 mg/l | - | - |
| Chromium | $LC_{50}$ Fathead minnow 96 hr. 10-100 mg/l | - | - |
| Nickel | $LC_{50}$ Common Carp 96 hr. 1.3 mg/l | $EC_{50}$ Freshwater Algae 72 hr. 0.18 mg/l | EC50 Water Flea 48 hr. 1.0 mg/l |

PERSISTENCE AND DEGRADABILITY: No data available

BIOACCUMULATIVE POTENTIAL: No data available

MOBILITY IN SOIL: No data available for stainless steel in its natural solid state. Individual metal dusts may mitigate into soil and groundwater and be absorbed by plants.

OTHER ADVERSE EFFECTS None known.

## 14. DISPOSAL CONSIDERATIONS

Waste Disposal Methods: Steel scrap should be recycled whenever possible.

Container Cleaning and Disposal: Dispose of in accordance with applicable federal, provincial/state or local regulations.

## 15. TRANSPORATION CONSIDERATIONS

GENERAL SHIPPING INFORMATION: Stainless steel is not regulated for shipping.

SHIPPING NAME AND DESCRIPTION: N/A
UN NUMBER: N/A
HAZARD CLASS: N/A
PACKING GROUP/RISK GROUP: N/A

NOTE: Stainless steel transported in coiled form is under tension and represents a significant source of potential energy due to the tension induced by coiling; it will uncoil to try to lay flat in a long strip when banding is cut or other forces are released. Uncoiling can be sudden and catastrophic and measures should be taken to ensure that uncoiling will not occur.

TRANSPORT REGULATIONS:
Canadian Transportation of Dangerous Goods Regulations (TDG) March 2011
US Department of Transportation (DOT) Hazardous Materials shipping information (Title 49 – Transportation March 2011)

## 16. REGULATORY INFORMATION

REGULATORY INFORMATION: The following listing of regulation relating to CMC products may not be complete and should not be solely relied upon for all regulatory compliance responsibilities.

ADDITIONAL CANADIAN REGULATIONS:
WHIMS CLASSIFICATION: Class D2A/D28: Materials causing other toxic effects.
DOMESTIC SUBSTANCES LIST: The components of this material are on the federal DSL inventory
OTHER CANADIAN REGULATIONS: N/A

ADDITIONAL US REGUALTIONS: The components of this material are subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA = Oct 2006) as follows:

| CHEMICAL NAME | SARA 302 (40 CFR 355, Appendix A) | SARA 304 (40 CFR Table 302.4) | SARA 313 (40 CFR 372.65) | CERCLA Reportable quantities |
|---|---|---|---|---|
| Aluminum | No | No | Yes | None listed |
| Chromium | No | No | Yes | 5,000 lb. |
| Cobalt | No | No | Yes | None listed |
| Copper | No | No | Yes | 5,000 lb. |
| Manganese | No | No | Yes | None listed |
| Nickel | No | No | Yes | 100 lb. |

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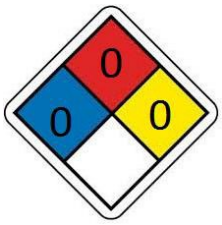
| SARA THRESHOLD PLANNING QUANTITY: | There are no specific Threshold Planning Quantities for the components of the material. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs. (4.540 kg) therefore applies, per 40 CFR 370.20. |
| TSCA INVENTORY STATUS: | The components for this material are listed on the Toxic Substances Control Act Inventory. |
| CERCLA REPROTABLE QUANTITY (RQ): | RQ'S for Hazardous Substances in the Comprehensive Environmental Response, Compensation, and Liability Act are : Chromium = 5,000 lbs. (2270 kg); Cooper = 5,000 lbs. (2270 kg); Nickel = 500 lb. (45 kg). |
| CALIFORNIA (PROPOSITION 65) | The Chromium (VI) component of this material is known in the State of California to cause cancer.<br>The Nickel component of this material is known in the State of California to cause cancer.<br>The Cobalt component of this material is known in the State of California to cause cancer.<br>Arsenic (inorganic), Cadmium and Lead are possible trace elements known in the State of California to cause cancer. |
| OTHER FEDERAL REGULATIONS: | PENNSYLVANIA R-T-K LIST: Aluminum, Manganese, Molybdenum, Nickel, Silicon, Chromium, Cobalt, Copper and Tantalum.<br>NEW JERSEY R-T-K LIST: Aluminum, Chromium, Copper, Cobalt, Manganese and Nickel. |

## 17. OTHER INFORMATION

STAINLESS STEEL

HAZARD LABEL RATING SYSTEMS:

NATIONAL FIRE PROTECTION CODE:
NFPA H=0 F=0 R=0




HAZARDOUS MATERIALS IDENTIFICATION SYSTEM:
HMIS CODE: H=1* F=0 R=0 PPE: SEE SECTION 8
*Denotes possible chronic hazard if airborne dusts or fumes are generated.

| | |
|---|---|
| **HEALTH** | 1* |
| **FLAMMABILITY** | 0 |
| **REACTIVITY** | 0 |
| **OTHER** | |

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