SDS

SAFETY DATA SHEET

Duferco
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South Africa
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DSCL (Pictograms)	DSCL (Classification)	Protective Clothing
	R53 – May cause long-term adverse effects in the aquatic environment	

SECTION 1: Chemical Product and Company Identification		
Product Name/ Trade Name	***HOT ROLLED STEEL***	**Code** Not available
Supplier	Duferco Steel Processing (Pty) Ltd 1 Potassium Street, Industrial Park, Saldanha, 7395	**CAS#** Not applicable
Synonym	Not applicable	**DSL**
Chemical Name	Not applicable	**CI#**
Chemical Family	Not applicable	**In case of emergency:**
Chemical Formula	Not applicable	**+27 (0)22 7097000**
Manufacturer	Duferco Steel Processing (Pty) Ltd 1 Potassium Street, Industrial Park, Saldanha, 7395	**Material Uses:** Commercial Applications Structural Applications

SECTION 2: Hazardous Ingredients

Component Name	CAS#	% By weight	OSHA PEL Final Rule Limits
Base Metal:			
Carbon	7440-44-0	0.005 - 0.20	15 mg/m³ - Total Dust(PNOR), 5 mg/m³ - Respirable Fraction(PNOR)
Chromium	7440-47-3	0.004 - 0.12	1 mg/m³ - Chromium Metal
Iron	7439-89-6	>90	10 mg/m³ as Iron Oxide fume
Manganese	7439-96-5	0.14 - 0.8	1 mg/m³ as fume; 5 mg/m³ as dust
Nickel	7440-02-0	0 - 0.1	1 mg/m³
Silicon	7440-21-3	0 - 0.22	5 mg/m³ Respirable Dust; 15 mg/m³ Total Dust

Notes:

- All commercial steel products may contain small amounts of various elements in addition to those specified. These small quantities may exist as intentional additions, or as "trace" or "residual" elements that generally originate in the raw materials used. These elements may include: aluminium, antimony, arsenic, boron, cadmium, calcium, cobalt, columbium(niobium), copper, lead, molybdenum, tin, titanium, vanadium, and zirconium.
- Percentages are expressed as typical ranges or maximum concentrations of trace elements for the purpose of communicating the potential hazards of the finished product. Consult product specifications for the specific composition information.
- PNOR (Particulates Not Otherwise Regulated). All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by a limit which is the same as the inert or nuisance dust limit of 15 mg/m³ for total dust and 5 mg/m³ for the respirable fraction.

SECTION 3: Hazard Identification

✱✱✱✱✱ Emergency Overview ✱✱✱✱✱

This rolled solid metal product poses little or no immediate health or fire hazard. When product is subjected to welding, burning, melting, sawing, brazing, grinding or other similar processes, potentially hazardous airborne particulate and fumes may be generated. These operations should be performed in well-ventilated areas. Avoid inhalation of metal dusts and fumes. Iron or steel foreign bodies imbedded in the cornea of the eye will produce rust stains unless removed fairly promptly. If appropriate, respiratory protection and other personal protective equipment should be used.

Chemical Surface Treatments/Coatings: The possible presence of chemical surface treatments and oil coatings should be considered when evaluating potential employee health hazards and exposures during handling and welding or other fume generating activities. Removal of surface coatings should be considered prior to such activities. Repeated or prolonged contact with chemical surface treatments or oil residue may cause skin irritation, dermatitis, ulceration or allergic reactions in sensitized individuals. Torching or burning operations on steel products with surface treatments, oil coatings, paint or acrylic films may produce emissions that can be irritating to the eyes and respiratory tract.

Health Effects/Signs and Symptoms: Steel products in their usual physical form do not pose a health hazard; inhalation of metal dust and fume may result from further processing of the material by the user, particularly during welding, burning, grinding, and machine activities, and should be evaluated by an industrial hygienist. The possible presence of non-metallic surface coatings should also be considered when evaluating potential employee exposures.

Carbon (C): Chronic inhalation of high concentrations to carbon may cause pulmonary disorders.

Iron (Fe): Chronic inhalation of excessive concentrations of iron oxide fumes or dusts may result in the development of a benign pneumoconiosis, called siderosis, which is observable as an X-ray change. No physical impairment of lung function has been associated with siderosis. Inhalation of excessive concentrations of ferric oxide may enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens. Iron oxide is listed as a Group 3 (not classifiable) carcinogen by IARC.

Chromium (Cr): The health hazards associated with exposure to chromium are dependent upon its oxidation state. The metal form (chromium as it exists in this product) is of very low toxicity. The hexavalent form is very toxic. Repeated or prolonged exposure to hexavalent chromium compounds may cause respiratory irritation, nosebleed, ulceration and perforation of the nasal septum. Industrial exposure to certain forms of hexavalent chromium has been related to an increased incidence of cancer.

Manganese (Mn): 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.

Nickel (Ni): Exposure to nickel dusts and fumes can cause sensitization dermatitis, respiratory irritation, asthma, pulmonary fibrosis, edema and may cause nasal or lung cancer in humans. Studies have linked Ni and certain Ni compounds to an increased incidence of cancer of the respiratory system.

Silicon (Si): 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.

Zinc (Zn): Acute exposure to zinc oxide fumes can result in metal fume fever, a temporary flu-like illness with symptoms such as dizziness, chills, fever, headache and nausea.

Non-metallic Coatings (Optional): Prolonged and/or repeated skin contact with lubricants and rust inhibitors may cause dermatitis. In addition, inhalation of excessive concentrations of vapours or gases, e.g., carbon monoxide (from welding, burning, etc.) may result in dizziness, nausea, headaches and respiratory tract irritation.

Potential Chronic Health Effects: **Carcinogen Effects:** The National Toxicology Program (NTP) and the International Agency for Research on Cancer (IARC) consider (1) chromium and certain chromium compounds to be known human carcinogens and (2) nickel and certain nickel compounds to be probable human carcinogens.

Usual Route(s) of Entry: Inhalation

Medical Conditions Possibly Aggravated: Not determined for these products. Individuals with chronic diseases or disorders should consult a physician regarding workplace exposures to ingredients.

SECTION 4: First Aid Measures

Eye Contact	Treat for foreign body in the eye. Seek medical attention.
Skin Contact	Not anticipated to pose a significant skin hazard. However, should dermatitis develop, wash affected areas with mild soap and warm water. Seek medical attention if condition persists.
Ingestion	Not considered an ingestion hazard. However, if ingested, seek medical attention.
Inhalation	Remove from excessive exposure levels. Give artificial respiration if breathing has stopped. Seek medical attention.

SECTION 5: Fire-Fighting Measures

Flash Point: Not applicable
Flash Point Method: Not applicable
LEL: Not applicable
UEL: Not applicable
Burning Rate: Not applicable
Auto-ignition Temperature: Not applicable
Flammability Classification: Non-flammable, non-combustible
Extinguishing Media: Not applicable for solid product. Use extinguishers appropriate for surrounding materials.
Unusual Fire or Explosion Hazards: Not applicable for solid product. Do not use water on molten metal.
Hazardous Combustion Products: At temperatures above the melting point, fumes containing metal oxides and other alloying elements may be liberated.
Fire-Fighting Instructions: Do not release runoff from fire control methods to sewers or waterways.
Fire-Fighting Equipment: Wear a self-contained breathing apparatus (SCBA) with a full face-piece operated in pressure-demand or positive-pressure mode and full protective clothing.

SECTION 6: Accidental Release Measures

Steps to be followed if material is released or spilled	Not Applicable to steel in solid state. Clean-up personnel should protect against contact with eyes and skin.
Waste disposal method(s)	Excess product can be recycled, disposed in an appropriately permitted waste landfill, or disposed by other methods in accordance with Federal, State and Local Laws and Regulations Regulations.

SECTION 7: Handling and Storage

Handling Precautions: Use lifting and work devices, e.g., crane, hoist, etc., within rated capacities and in accordance with manufacturer's instructions when handling these products. Operations with the potential for generating high concentrations of airborne particles should be evaluated and controlled as needed. Minimize generation of airborne dust and fume. Avoid breathing metal dust or fumes. Practice good housekeeping and ensure that safe storage and handling practices are followed.

Storage Requirements: Store away from acids and incompatible materials.

SECTION 8: Exposure Controls/Personal Protection

Engineering Controls (Ventilation, etc.)	Use controls as appropriate to minimize exposure to metal fumes and dusts during handling operations.
Eye Protection	Use safety glasses and/or other protective eyewear as specified by a safety professional when exposure to eye and face hazards exists, such as flying objects, molten metal, and injurious light radiation (e.g., welding and burning)
Skin Protection	Use protective gloves and/or other protective equipment as specified by a safety professional when welding, burning, or handling.
Respiratory Protection	When engineering controls are not feasible or sufficient to lower exposure levels below the applicable exposure limit, use a NIOSH(*National Institute for Occupational Safety and Health*)-approved respirator which protects against dusts and metal fumes, as specified by an industrial hygienist or safety professional in accordance with manufacturer instructions and use limitations.
Protective Clothing/Equipment:	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, gloves and safety glasses to prevent skin and eye contact.

SECTION 9: Physical and Chemical Properties

Physical state: Solid	**Melting Point:** 2570 – 2800°F (1410 - 1539°C)
Appearance: Metallic lustre	**Vapor Pressure:** Not applicable
Odour: Odourless	**Vapor Density (Air=1):** Not applicable
Odor Threshold: Not applicable	**Formula Weight:** Not applicable
Specific Gravity (H_2O = 1): 7.6 - 7.9 g/cm^3	**pH:** Not applicable

SECTION 10: Stability and Reactivity

Stability: Steel products are stable under normal storage and handling conditions.
Polymerization: Hazardous polymerization will not occur.
Chemical Incompatibilities: Will react with strong acids to form hydrogen. Iron oxide dusts in contact with calcium hypochlorite evolve oxygen and may cause an explosion.
Conditions to Avoid: Storage with strong acids or calcium hypochlorite.
Hazardous Decomposition Products: Thermal oxidative decomposition of Pickled Hot Rolled steel products can produce fumes containing oxides of iron and manganese as well as other elements.

SECTION 11: Toxicological Information

Toxicity Data:* No information is available for the product as a mixture. The possible presence of chemical surface treatments and oil coatings should be considered when evaluating potential employee health hazards and exposures during handling and welding or other fume generating activities.
Eye Effects: Eye contact with the individual components may cause particulate irritation. Implantation of iron particles in guinea pig corneas have resulted in rust rings with corneal softening about rust ring.
Skin Effects: Not anticipated to pose significant skin hazards. Skin contact with the individual components may cause physical abrasion, irritation, dermatitis, ulcerations and sensitizations.
Chronic Effects: See section 3
Acute Inhalation Effects: Inhalation of the individual alloy components has been shown to cause various respiratory effects.
Acute Oral Effects: No data available
Other: No LC50 or LD50 has been established for the mixture as a whole. Iron LD50: 30 g/kg oral (rat). Aluminum LD50: No data. Boron LD50: 2000 mg/kg orl (mouse). Calcium LD50: No data. Carbon LD50: No data. Chromium LDLo: 71 mg/kg GIT orl (human). Columbium LD50: No data. Copper LDLo: 120 ug/kg GIT ipl (rat). Manganese LD50: 9 g/kg oral (rat). Molybdenum LDLo: 114 mg/kg ipr (rat). Nickel LDLo: 5 mg/kg orl (guinea pig) Phosphorous LD50: No data. Silicon LD50: No data. Sulfur LD50: No data. Tin LD50: No data. Titanium LD50: No data. Vanadium LD50: 59 mg/kg scu (rabbit).
Carcinogenicity: Chromium and Nickel
Mutagenicity: No data available
Teratogenicity: No data available
* See NIOSH, RTECS (NO7400000), for additional toxicity data on iron oxide, (BD1200000) for aluminum oxide, (EV8040000) for calcium, (ED7350000) for boron, (FF5250000) for carbon, GB5425000) for chromium, (GL5325000) for copper, (OO9275000) for manganese, (QA4680000) for molybdenum, (QR5950000) for nickel, (TH3500000) for phosphorous, (WM0400000) for silicon, (WS4250000) for sulfur, (XP7320000) for tin, (XR1700000) for titanium, (YW2460000) for vanadium pentoxide.

SECTION 12: Ecological Information

Ecotoxicity: No data available for the product as a whole. However, individual components of the product have been found to be toxic to the environment. Metal dusts may migrate into soil and groundwater and be ingested by wildlife.
Environmental Fate: No data available.
Environmental Degradation: No data available.
Soil Absorption/Mobility: No data available for the product as a whole. However, individual components of the product have been found to be absorbed by plants from soil.

SECTION 13: Disposal Considerations

Disposal: This material is considered to be a solid waste, not a hazardous waste. Follow applicable Federal, State, and Local Laws and Regulations for disposal of solid waste and airborne particulates accumulated during handling operations of the product. Waste steel products can be recycled for further use.
Disposal Regulatory Requirements: None
Container Cleaning and Disposal: Follow applicable Federal, State and Local Laws and Regulations. Observe safe handling precautions.

SECTION 14: Transport Information

DOT Transportation Data (49 CFR 172.101)

Pickled Hot Rolled Steel are not listed as hazardous substances under 49 CFR 172.101.

Shipping Name: Not applicable

Shipping Symbols: Not applicable

Hazard Class: Not applicable

ID No.: Not applicable

Packing Group: Not applicable

Label: Not applicable

Special Provisions (172.102): None

Packaging Authorizations

a) Exceptions: None

b) Non-bulk Packaging: Not applicable

c) Bulk Packaging: Not applicable

Quantity Limitations

a) Passenger, Aircraft, or Railcar: Not applicable

b) Cargo Aircraft Only: Not applicable

Vessel Stowage Requirements

a) Vessel Stowage: Not applicable

b) Other: Not applicable

SECTION 15: Regulatory Information

Regulatory Information: Steel products as a whole are not listed in South African Legislation. However, individual components of the product could be listed in regulations and the user should determine the applicable Federal, State and Local Laws and Regulations to ensure compliance with applicable laws and regulations.

SECTION 16: Other Information

ABBREVIATION/ACRONYMS:

CAS	Chemical Abstracts Service
CFR	Code of Federal Regulations
DOT	Department of Transportation
DSCL	Dangerous Substances Classification & Labelling
GI, GIT	Gastro-Intestinal, Gastro-Intestinal Tract
IARC	International Agency for Research on Cancer
IPL	Independent Physiological Lab
IPR	Independent Professional Review
LC50	Median Lethal Concentration
LD50	Median Lethal Dose
LD Lo	Lowest Dose to have killed animals or humans
LEL	Lower Explosive Limit
mg/m^3	milligram per cubic meter of air
SDS	Safety Data Sheet

NIF	No Information Found
NIOSH	National Institute for Occupational Safety & Health
NTP	National Toxicology Program
ORC	Organization Resources Counsellors
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PNOR	Particulate Not Otherwise Regulated
PPE	Personal Protective Equipment
RCRA	Resource Conservation and Recovery Act
RTECS	Registry of Toxic Effects of Chemical Substances
SCBA	Self-contained Breathing Apparatus
SCU	Single Chain Urinary-type
ZnO	Zinc Oxide
UEL	Upper Explosive Limit

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