

STAINLESS STEEL MATERIAL SAFETY DATA SHEET

MATERIAL IDENTIFICATION AND USE MATERIAL NAME: STAINLESS STEEL SYNONYMS: Includes all Sheet products, Plate, Strip, Bar, Slab, Ingot, Structural shapes and Tubular Products. WHMIS CLASS: D2A, D2B		SUPPLIER: RUSSEL METALS INC. ADDRESS: 1900 MINNESOTA COURT, MISSISSAUGA, ONTARIO. CANADA. L5N 3C9. TEL: 905-819-7295 FAX: 905-819-7262 FORM #: MSDS-04-2011. DATE: NOVEMBER 2011
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1. PRODUCT INFORMATION

MATERIAL NAME: STAINLESS STEEL

FORM #: MSDS-04-2011

DATE: NOVEMBER 2011

MATERIAL USE: MANUFACTURE OF ARTICLES

2. HAZARDOUS INGREDIENTS

BASE METAL (ALL VALUES ARE EXPRESSED AS WEIGHT PERCENT AND ARE APPROXIMATES)

A Threshold Limit Value (TLV) has not been established for steel overall. The listing below is a summary of the elements used in the Russel Steel products. The exposure limit for iron-containing fumes has been established at 5 mg/m³ (as iron oxide - respirable) with ACGIH's TLV. The individual complex compounds within the fume may have lower exposure limits than the general fume.

COMPONENT	CAS NUMBER	TLV ACGIH (mg/m ³)	LD ₅₀	ELECTRIC ALLOY STEEL	TOOL STEELS	300/400 SERIES STAINLESS STEEL
IRON	7439-89-6	5.0 (as Iron Oxide - Respirable)	30,000 mg/kg Oral-Rat	95	90	80
CHROMIUM	7440-47-3	0.5 (Metal & Cr+3) 0.05 (Cr +6 Soluble) 0.01 (Cr +6 Insoluble)	U	5	25	30
NICKEL	7440-02-0	1.5 (Metal, Inhalable) 0.2 (Insoluble, Inhalable) 0.1 (Soluble, Inhalable)	>9,000 mg/kg Oral-Rat	5	5	35
MOLYBDENUM	7439-98-7	10.0 (Insoluble, Inhalable) 3.0 (Insoluble, Respirable) 0.5 (Soluble, Respirable)	U	2	5	6
VANADIUM	7440-62-2	0.05 (Inhalable Dust or Fume as V ₂ O ₅)	U	2	5	--
COBALT	7440-48-4	0.02 (Cobalt & Inorganic Compounds as Cobalt)	6,171 mg/kg Oral-Rat	.75	8	1
MANGANESE	7439-96-5	0.2 (as Inorganic Manganese)	9,000 mg/kg Oral-Rat	--	--	2.5
ALUMINUM	7429-90-5	1.0 (Metal & Insoluble Compounds - Respirable)	U	1.5	--	--
SILICON	7440-21-3	10.0 (Inhalable), 3.0 (Respirable-as non fibrous Silicon Carbide)	3,160 mg/kg Oral-Rat	2	2.5	--
COPPER	7440-50-8	1.0 (Dust) 0.2 (Fume)	U	--	--	5

NOTES:

- Threshold Limit Values (TLV) established by the American Conference of Governmental Industrial Hygienists (ACGIH - 2011) are 8-hour Time Weighted Average concentrations unless otherwise noted.
- Ingredients listed as required by the WHMIS Ingredient Disclosure List of the Hazardous Products Act (Canada).
- For exact composition, refer to analysis or specifications.

NON-METALLIC COATINGS

DRY-LUBE	Mixture of Borate and Carbonate Soap lubricants for metal forming.	SLUSHING OIL	Protective coatings containing small quantities of anti-oxidants.
PRE-LUBE	Petroleum based oil coating used for metal forming.	VANISHING OIL	Solvent applied petroleum oil protective coating leaving a wax-like protective coating.
LUBE-OIL	Lubricating protective petroleum based oil.		

NOTE: Individual coating components are present at values below the reporting requirements of the WHMIS Ingredient Disclosure List.

3. HAZARDS IDENTIFICATION

ROUTES OF ENTRY:

None in its natural solid state.
High concentrations of dust may cause irritation to the eyes. Prolonged skin contact with coated steel may cause skin irritation in sensitive individuals. Inhalation of metal particulate or elemental oxide fumes generated during welding, burning, grinding or machining may pose acute or chronic health effects.

TARGET ORGANS:

Respiratory system.

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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 (i.e. flu-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 human carcinogens" and metallic chromium under its Group 3 category - "not classifiable as to their carcinogenicity to humans". Chromium metal is classified as carcinogenic by NTP.
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".
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.

NOTES:

- International Agency for Research on Cancer (IARC) - Summaries & Evaluations (2008).
- 3rd Annual Report on Carcinogens as prepared by the National Toxicology Program (NTP).

4. FIRST AID MEASURES

EYES: FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. SEEK MEDICAL ATTENTION IF EYE IRRITATION PERSISTS.

SKIN: MAINTAIN GOOD PERSONAL HYGIENE. WASH AFFECTED AREA WITH MILD SOAP AND WATER. SEEK MEDICAL ATTENTION IF SKIN IRRITATION PERSISTS.

INHALATION: REMOVE TO FRESH AIR. CHECK FOR CLEAR AIRWAY, BREATHING AND PRESENCE OF PULSE. IF NECESSARY ADMINISTER CPR. CONSULT A PHYSICIAN IMMEDIATELY.

INGESTION: RARE IN INDUSTRY. DUST MAY IRRITATE MOUTH AND GASTROINTESTINAL TRACT. IF INGESTED, SEEK MEDICAL ATTENTION PROMPTLY.

5. FIRE FIGHTING MEASURES

FLAMMABILITY CLASSIFICATION: Non-flammable. Will not support combustion.

MEANS OF EXTINCTION: Not applicable for solid product. Use extinguishers appropriate for surrounding materials.

FLASH POINT (°C): N/A **AUTO-IGNITION TEMP (°C):** N/A

UPPER FLAMMABLE LIMIT % BY VOL.: N/A **LOWER FLAMMABLE LIMIT % BY VOL.:** N/A

SENSITIVITY TO STATIC DISCHARGE: N/A **EXPLOSION DATA (SENSITIVITY TO IMPACT):** No

HAZARDOUS COMBUSTION PRODUCTS: At temperatures above the melting point, fumes containing metal oxides and other alloying elements may be liberated.

UNUSUAL FIRE HAZARDS: None for this product. Do not use water on molten metal.

SPECIAL FIRE FIGHTING: None for this product.

6. ACCIDENTAL RELEASE MEASURES

LEAK AND SPILL PROCEDURES: Not applicable to steel in solid state. For spills involving fine dusts, remove by vacuuming or wet sweeping methods to prevent spreading of dust. Avoid inhalation of dusts.

7. HANDLING AND STORAGE

HANDLING: Operations with the potential for generating high concentrations of airborne particulates should be evaluated and controlled as necessary. Practice good housekeeping. Avoid breathing metal fumes and/or dust.

STORAGE: Store away from acids and incompatible materials.

8. EXPOSURE CONTROLS

ENGINEERING CONTROLS: (e.g. ventilation, enclosures, specify) General or local exhaust during welding or grinding operations.

PERSONAL PROTECTIVE EQUIPMENT: Dependent upon process being performed on material each operation must be addressed for suitable equipment.

GLOVES (Specify): Wear gloves as required **EYES (Specify):** Safety glasses or goggles as required.

CLOTHING (Specify): N/A **FOOTWEAR (Specify):** N/A

RESPIRATOR (Specify): If concentrations exceed established limits use NIOSH/MSHA approved particulate respirators (dust & fume or high efficiency dust fume) when grinding or welding.

OTHER (Specify): N/A

9. CHEMICAL AND PHYSICAL PROPERTIES

PHYSICAL STATE: Solid	APPEARANCE: Silver Grey Metallic (Steel)	ODOUR: Not Applicable
BOILING POINT: Not Applicable	VAPOUR PRESSURE: Not Applicable	VAPOUR DENSITY: Not Applicable
MELTING POINT: 1530°C (2786°F)	DENSITY: 7.86	pH: Not Applicable
EVAPORATION RATE: Not Applicable	SOLUBILITY: Not Applicable	

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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
Vanadium	No	No	No	None listed

SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the components of this 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 of this material are listed on the Toxic Substances Control Act Inventory.
CERCLA REPORTABLE QUANTITY (RQ): RQ's for Hazardous Substances in the Comprehensive Environmental Response, Compensation, and Liability Act are: Chromium = 5000 lb. (2270 kg); Copper = 5000 lb. (2270 kg); Nickel = 100 lb. (45 kg).

CALIFORNIA (PROPOSITION 65): The Chromium (VI) component of this material is known in the State of California to cause cancer. The Nickel component of this material is known in the State of California to cause cancer. The Cobalt component of this material is known in the State of California to cause cancer.

OTHER U.S. FEDERAL REGULATIONS: N/A.

ADDITIONAL EUROPEAN UNION REGULATIONS:

RoHS & WEEE: This MSDS follows the European Union Directive "Restriction on the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment" (2002/95/EC) and the "Waste Electrical and Electronic Equipment (WEEE)" Directive (2002/96/EC).

Lead (Pb): Lead is not intentionally added to stainless steel however, it may exist in trace levels. Although not analyzed, lead levels in steel are typically well below the EU Directive limit of 0.1%.

Chromium VI (Cr +6): Note, the EU Directive has a lead exemption limit of up to 0.35% as an alloying element in steel. The hexavalent oxidation state of chromium does not normally exist as part of a metal or alloy.

16. OTHER INFORMATION

HAZARD LABEL RATING SYSTEMS:

NFPA CODE: H=0 F=0 R=0

HMIS CODE: H=1 * F=0 R=0 PPE: See Section 8

* Denotes possible chronic hazard if airborne dusts or fumes are generated.

PREPARED BY: RUSSEL METALS INC. AND ENVIROTEST INC. **DATE:** NOVEMBER 2011

TELEPHONE: 905-819-7295 **NOTE:** CONTACT SUPPLIER FOR ADDITIONAL PRODUCT INFORMATION

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