

MATERIAL SAFETY DATA SHEET

MATERIAL IDENTIFICATION AND USE

MATERIAL NAME: STEEL

INCLUDES ALL SHEET PRODUCTS, PLATE, STRIP, BAR, SLAB, INGOTS, STRUCTURAL SHAPES AND TUBULAR PRODUCTS.

MATERIAL USE: MANUFACTURE OF ARTICLES



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HAZARDOUS INGREDIENTS BASE METAL			(ALL VALUES ARE EXPRESSED AS WEIGHT PERCENT)					
COMPONENT *	CAS NUMBER	TLV ACGIH (mg/m ³)	LD50	CARBON & H.S.L.A. STEELS	ELECTRIC STEELS	LEADED & LOW ALLOY STEELS	RAILS & TIE PLATES	TUBULAR PRODUCTS
IRON	7438-89-6	5 (Fume)	U	91-99	91-99	92-96	94.96	94-96
MANGANESE	7439-96-5	5	>9 gm/kg (oral-rat)	<2.0	<2.0	<2.2	<1.1	<1.7
CHROMIUM	7440-47-3	0.5	U	<0.1	<1.0	<1.7	<1.6	<0.7
NICKEL	7440-02-0	1	>9 gm/kg (oral-rat)	<1.0	<0.1	<2.1	<0.15	<0.5
COPPER	7440-50-8	1	U	<1.0	-	-	<0.1	<0.5
PHOSPHOROUS	7732-14-0	0.1	U	<1.25	-	-	-	<0.1
MOLYBDENUM	7439-9807	10	U	-	-	-	<0.12	<1.0
LEAD	7439-92-1	0.15	U	-	-	<0.35	-	-

* AS REQUIRED BY WHMIS INGREDIENT DISCLOSURE LIST. FOR EXACT COMPOSITION REFER TO ANALYSIS OR SPECIFICATIONS.

METALLIC AND NON-METALLIC COATINGS

GALVANIZE - GALVANNEAL	HOT DIPPED ZINC (CAS 7440-66-6) COATING. COATING WEIGHTS RANGE FROM 15 TO 500 g/m ² PER SIDE. MAY BE CHEMICALLY PASSIVATED WITH A CHROMIUM COMPOUND WHICH LEAVES A RESIDUAL CHROMIUM LEVEL OF 11 TO 40 mg/m ² PER SIDE. PETROLEUM BASED RUST PREVENTIVE OILS ARE APPLIED TO OILED PRODUCT. TYPICAL OIL COATING WEIGHTS RANGE FROM 1.1 TO 5.4 g/m ² PER SIDE.	DRY-LUBE PRE-LUBE LUBE OIL	MIXTURE OF BORATE AND CARBONATE SOAP LUBRICANTS FOR METAL FORMING. PETROLEUM BASED OIL COATING USED FOR METAL FORMING. LUBRICATING PROTECTIVE PETROLEUM BASED OIL.
GALVALUME	HOT DIPPED ZINC (CAS 7440-66-6) 43% AND ALUMINUM (CAS 7429-90-5) 55% COATING. COATING WEIGHTS RANGE FROM 50 TO 150 g/m ² PER SIDE. MAY ALSO BE PASSIVATED OR OILED SIMILAR TO GALVALIZE MATERIAL.	SLUSHING OIL VARNISHING OIL	MINERAL OIL BASED PROTECTIVE COATING CONTAINING SMALL QUANTITIES OF ANTI-OXIDANTS. SOLVENT APPLIED PETROLEUM OIL PROTECTIVE COATING LEAVING A WAX-LIKE PROTECTIVE COATING.
TIN PLATE	ELECTROPLATED WITH TIN (CAS 7440-31-5) COATING. COATING WEIGHTS RANGE FROM 0.9 TO 15 g/m ² PER SIDE. TREATED WITH CHROMIUM PASSIVATION SOLUTION WHICH LEAVES A CHROMIUM RESIDUE OF .05 TO 7.5 mg/m ² PER SIDE. MAY BE COATED WITH AN EDIBLE OIL TO PREVENT SCRATCHING, OIL COATING TYPICALLY 0.1 MICRO INCHES THICK.	PRECOATED ZINCROMETAL	CURED PAINT/RESIN FILM APPLIED TO SHEET STEEL, GALVANIZED OR GALVALUME COATED STEEL SHEET. PROTECTIVE COATING OF ZINC RICH PAINT OVER A CHROMATE BASED PRIMER COMPOUND. COATING IS APPLIED TO ONE SIDE OF STRIP. TYPICAL COATING WEIGHTS RANGE FROM 0.215 TO 0.325 g/m ²
CHROMIUM	ELECTROPLATED WITH CHROMIUM (CAS 7440-47-3) COATING. COATING WEIGHTS RANGE FROM 0.1 TO 0.17 g/m ² PER SIDE. MAY BE COATED WITH EDIBLE OIL SIMILAR TO TIN PLATE.		
C2 COATING-ELECTRICAL	GLASS FILM COMPOSED OF MAGNESIUM ORTHO-SILICATE FORMED DURING HIGH TEMPERATURE ANNEAL.		
C3 COATING-ELECTRICAL	OIL MODIFIED POLYESTER RESIN VARNISH FILM.		
C5M COATING-ELECTRICAL	AN INORGANIZ IRON-SILICATE COMPLEX THAT IS HEAT AND OIL RESISTANT WITH GOOD INSULATING PROPERTIES.		

NOTE: INDIVIDUAL COATING COMPONENTS ARE PRESENT AT VALUES BELOW THE REPORTING REQUIREMENTS OF THE WHMIS INGREDIENT DISCLOSURE LIST. □

FIRE AND EXPLOSION HAZARDS

-- NOT APPLICABLE --

REACTIVITY DATE

CHEMICAL STABILITY: YES

CONDITIONS OF REACTIVITY: na

HAZARDOUS DECOMPOSITION PRODUCTS: na

INCOMPATIBILITY TO OTHER SUBSTANCES: YES

CONTACT WITH MINERAL ACIDS WILL RELEASE HYDROGEN GAS

PAGE -1- LEGEND: na NOT APPLICABLE, U UNKNOWN

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS OBTAINED FROM THE USE THEREOF.

MATERIAL NAME: STEEL

PHYSICAL DATA

PHYSICAL STATE: SOLID ODOUR: na EVAPORATION RATE: na BOILING POINT: na
VAPOUR PRESSURE: na VAPOUR DENSITY: na FREEZING POINT: 1530 C DENSITY: 7.86
COEFFICIENT WATER/OIL DISTRIBUTION: na pH: na ODOUR THRESHOLD: na
APPEARANCE: SILVER GREY METALLIC (STEEL) SOLUBILITY IN WATER: na

PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT: DEPENDENT UPON PROCESS BEING PERFORMED ON MATERIAL. EACH OPERATION MUST BE ADDRESSED FOR SUITABLE EQUIPMENT.
GLOVES (Specify): LEATHER-FACED EYE (Specify): na
CLOTHING (Specify): na FOOTWEAR (Specify): na
RESPIRATORY (Specify): na OTHER (Specify): FUME FILTER RESPIRATOR, GLOVES & EYEWEAR REQUIRED DURING WELDING.
ENGINEERING CONTROLS (e.g. ventilation, enclosures, specify) GENERAL OR LOCAL EXHAUST VENTILATION DURING WELDING.
LEAK AND SPILL PROCEDURES: na
WASTE DISPOSAL: na
STORAGE REQUIREMENTS: KEEP STORED MATERIAL DRY TO PREVENT CORROSION.
SPECIAL SHIPPING INFORMATION: na

TOXICOLOGICAL PROPERTIES OF MATERIAL

ROUTE OF ENTRY: 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.

EFFECTS OF ACUTE EXPOSURE TO MATERIAL: INHALATION OF OVEREXPOSURE TO MANGANESE, COPPER OR ZINC (COATED PRODUCTS) MAY CAUSE METAL FUME FEVER CHARACTERIZED BY FEVER AND CHILLS (i.e. FLU-LIKE SYMPTOMS) APPEARS 4-6 HOURS AFTER EXPOSURE WITH NO LONG-TERM EFFECTS.

EFFECTS OF CHRONIC EXPOSURE TO MATERIAL: PROLONGED INHALATION OVEREXPOSURE TO METAL FUME FROM PRODUCT MAY CAUSE THE FOLLOWING EFFECTS: BENIGN PNEUMONOCONIOSIS (SIDEROSIS) WITH FEW OR NO SYMPTOMS (IRON OXIDE); CERTAIN NICKEL AND CHROMIUM COMPOUNDS HAVE BEEN LISTED WITH IARC AS NASAL AND LUNG CARCINOGENS. COBALT DUST MAY RESULT IN AN ASTHAMA-LIKE CONDITION (COUGH/SHORTNESS OF BREATH).

IRRITANCY OF MATERIAL: na SENSITIZATION TO MATERIAL: na MUTAGENICITY OF MATERIAL: na
REPRODUCTIVE EFFECTS: na TERATOGENICITY OF MATERIAL: na SYNERGISTIC MATERIALS: na
CARCINOGENICITY OF MATERIAL: IARC LISTS CERTAIN HEXAVALENT CHROMIUM COMPOUNDS UNDER ITS GROUP 1 CATEGORY -- "CONFIRMED HUMAN CARCINOGEN".
IARC LISTS NICKEL AND CERTAIN NICKEL COMPOUNDS UNDER ITS GROUP 2A CATEGORY -- "SUSPECTED HUMAN CARCINOGEN".

NOTE: IRON CONTAINING WELDING FUME HAS AN EXPOSURE LIMIT OF 5mg/m³ (ACGIH-TLV's 1988-89). WELDING FUME MAY ALSO CONTAIN CONTAMINANTS FROM FLUXES OR WELDING CONSUMABLES.

FIRST AID MEASURES

SKIN: MAINTAIN GOOD PERSONAL HYGIENE, WASH WITH SOAP AND WATER, SEEK MEDICAL ATTENTION IF NECESSARY.
INHALATION: REMOVE TO FRESH AIR, SEEK MEDICAL ATTENTION IF NECESSARY.

PREPARATION OF MATERIAL SAFETY DATA SHEET

PREPARED BY: CSCI

Preparation Date: March 1, 2003

NOTE: CONTACT SUPPLIER FOR ADDITIONAL PRODUCT INFORMATION.