ThyssenKrupp Materuials NA, Inc.

MATERIAL SAFETY DATA SHEET

Stainless Steel

SECTION I. MATERIAL IDENTIFICATION

COMPANY	RE-ISSUE DATE	IDENTIFICATION NUMBER
ThyssenKrupp Materials NA, Inc. 22355 West Eleven Mile Road Southfield, Michigan 48033	5-Dec-08	N/A
TRADE NAME	**EMERGENCY PHONE NUMBER**	**PREPARED BY:**
Stainless Steel	(248) 233-5681	J. VanValkenburg
CHEMICAL NAME	**FORMULA DOT**	**IDENTIFICATION NO.**
Stainless	N/A	N/A

SECTION II HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENT		% COMPOSITION		OSHA-mg/m3
BASE METAL	**CAS NUMBER**	**BY WEIGHT**	**OSHA-PEL**	**8-HR. - TWA**
IRON	7439-89-6	60-88	IRON OXIDE FUME	10
NOT ALL OF THE ELEMENTS LISTED BELOW ARE PRESENT IN ALL ALLOYS OF STAINLESS STEEL.				
ALLOYING		**% COMPOSITION**		**OSHA-mg/m3**
ELEMENTS	**CAS NUMBER**	**BY WEIGHT (1)**	**OSHA-PEL**	**8-HR. - TWA**
CARBON	7440-44-0	.01-2.0	AS CARBON	15
MANGANESE	7439-96-5	.01-6.0	AS MANGANESE	5
PHOSPHORUS	7723-14-0	.01-2.0	AS PHOSPHORUS	0.1
SULFUR	7446-09-5	.01-2.0	AS SULFUR DIOXIDE	15
SILICON	7440-21-3	.01-2.0	AS SILICON DUST/FUME	5
TITANIUM	7440-32-6	.01-6.0	AS DUST/FUME	15
COBALT	7440-48-4	.01-2.0	AS DUST/FUME	0.1
TANTALUM	7440-25-7	.15-.45	AS TANTALUM	5
NICKEL	7440-02-0	.01-27	AS NICKEL	1
CHROMIUM	7440-47-3	.01-30	SOLUBLE CHROMIC/SALTS	0.5
COLUMBIUM	7440-03-1	.00-1.0	AS COLUMBIUM DUST	15
TUNGSTEN	7440-33-7	.00-1.8	AS TUNGSTEN DUST	15
MOLYBDENUM	7439-98-7	.01-6.0	SOLUBLE MOLY. COMPOUNDS	15
SELENIUM	7782-49-2	.03-.35	AS SELENIUM	0.2
COPPER	7440-50-8	.01-6.0	AS COPPER DUST	1
			AS COPPER FUME	0.1
ALUMINUM	7429-90-5	.01-1 .5	AS ALUMINUM	15

PEL=Permlssible Exposure Limit (1) % of Alloying Material Vanes with Grade of Material. Other trace elements of <1% May be in Present.

SECTION III. PHYSICAL DATA

MATERIAL (At Normal Conditions)	APPEARANCE AND ODOR
SOLID	Metallic appearance; No Odor
MELTING POINT	**SPECIFIC GRAVITY**
2400 Deg. F (1300 Deg. C)	About 7-9

SECTION IV. FIRE AND EXPLOSIVE

SPECIAL FIRE FIGHTING PROCEDURES: Stainless Steel alloy dust with hydrogen may form explosive air mixtures. Small chips, fine turnings and dust may ignite readily. Explosion potential may exist when dust and fines are dispensed in the air. Avoid contact with metal oxides, molten aluminum and moisture. Stainless Steel Products in their solid state present no fire or explosive hazard.

SECTION V. REACTIVITY DATA

STABILITY	CONDITIONS TO AVOID
Stable	Be Aware Of Unsecured Loads

HAZARDOUS DECOMPOSITION PRODUCTS

Metallic Dust Or Fumes May Be Produced During Welding, Burning, Grinding And Possibly Machining. Refer To ANSI Z49.1

SECTION VI. Environmental

SPILL OR LEAK PROCEDURES	N/A
WASTE DISPOSAL METHODS	Disposal must comply with applicable Federal, State and Local disposal and discharge laws.

SECTION VII. HEALTH HAZARD DATA

NOTE:	STEEL, PRODUCTS IN THEIR NATURAL STATE DO NOT PRESENT AN INHALATION OR CONTACT HAZARD, HOWEVER OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND, OR DUST WHICH MAY PRESENT HEALTH HAZARDS. THERE IS NO AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH) THRESHOLD LIMIT VALUE (TLV) OR OSHA EXPOSURE LIMIT (PEL) FOR STEEL.
EFFECTS OF OVEREXPOSURE:	
Acute -	Dust or fume may cause irritation to the eyes, nose, or throat and may leave a metallic taste in the mouth. Inhalation of oxides of Manganese, or Copper may be manifested as flu-like symptoms commonly known as "metal fume fever". Phosphorous dust is considered a nuisance dust.
Chronic -	Tantalum dust and fume can be toxic when Inhaled. Selenium may cause respiratory nerve, intestinal, liver and kidney damage.
Aluminum:	Inhalation of Aluminum Oxide fume or an accumulation of Silicon in the lungs may result in benign pneumoconiosis.
Cobalt:	Lung inflammation and damage, and diffuse pulmonary fibrosis from inhalation. Classified as a carcinogen by IARC.
Chromium:	May enter and affect the body through inhalation, ingestion, or skin contact. The National Toxicology Program (NTP) and the Internal Agency for Research on Cancer (IARC) report they possess sufficient evidence to establish a causal relationship for human cancer from Chromium.
Copper:	Inhalation may cause nose and throat irritation and metal fume fever and prolonged contact may cause dermatitis, discoloration of skin, hair and teeth.
Iron:	inhalation of Iron Oxide fume or dust may result in a condition known as siderosis.
Titanium:	Inhalation may cause Fibrosis of the Lungs. Has caused lung cancer m animals
Tungsten:	Inhalation or contact may cause irritation of eyes skin and respiratory system, and cause changes in the blood.
Manganese:	Inhalation may result in symptoms such as headache, restlessness, neurological dysfunction, or muscular weakness. Inhalation may result in scarring of the lungs and reproductive harm in males.
Nickel:	Inhalation may result m inflammation of the respiratory tract and fever. The National Toxicology Program (NTP) and the International Agency for Research on Cancer (IARC) report they possess limited evidence for human cancer from Nickel and Nickel compounds.
Sulfur:	Inhalation of Sulfur Dioxide gas can cause irritation of the respiratory tract, causing bronchial irritation, difficulty breathing and pulmonary edema.
Molybdenum:	Slight irritation of senses Animal studies suggest digestive disturbances and development of pneumoconiosis anemia, and gout l.
Columbium:	Not listed in the 1994 Guide to Chemical Hazards
Welding Fume:	Is listed as a possible carcinogen to humans.
Coatings:	If coated with oil, contact may cause skin irritation/dermatitis.

SECTION VIII. EMERGENCY AND FIRST AID PROCEDURES

Inhalation:	In the event of excessive exposure to dust or fume, remove the employee to fresh air. If breathing is difficult administer artificial respiration or oxygen. Obtain immediate medical assistance.
Skin:	Abrasions and cuts should be washed and closed by a clean compress and be immediately medically treated. Should skin irritation occur, wash affected area with mild soap and rinse with clean warm water. Obtain Medical Assistance.
Eyes:	Depending on the type and nature of exposure, relief may be obtained by fresh air or rinsing the eyes with clean water. Obtain medical assistance.
Medical Conditions Aggravated by Exposure:	
	Persons with a predisposition to respiratory disorders may be adversely affected by particulates or respiratory irritants generated during the mfg. process.

SECTION IX. SPECIAL PROTECTION INFORMATION & CONTROL MEASURES

Note:	Consult your regional codes or Code of Federal Regulations, Title 29, Part 1910. Subpart G-Occupational Health and Environmental Control, Subpart I Personal Protective Equipment. Subpart P-Welding, Cutting, and Brazing, and Subpart Z-Toxic and Hazardous Substances. Certain welding type activities may produce hazardous substances such as carbon monoxide, ozone, phosgene in the presence of certain chemicals, or produce Inert suffocating atmospheres in addition to the production of ultraviolet radiation and/or noise.
Ventilation:	Additional air make up systems may be required if, local exhaust or ventilation systems are not sufficient to maintain exposure levels to contaminates below prescribed limits. When inhalation controls are not sufficient to reduce the exposure below the applicable exposure limit then use OSHA/NIOSH approved respiratory protection within the use limitations of the respirator.
Personal Protection:	To avoid contact use appropriate protective gloves or clothing to protect against cutting edges Appropriate heat shielding garments should be used for activities using or generating heat. Eyes should be protected by using safetyglasses, goggles, helmet, face shield as appropriate to the operation.
Precautions to be taken in handling and storage:	
	Be alert to sharp edges and unsecured lifts.

SECTION X. OTHER INFORMATION

SARA Section 313 Toxic Chemical List, de minimis Concentrations	
	> 1.0% Copper, Aluminum, Selenium and Manganese
	> 0.1 % Chromium, and Nickel
California Proposition 65	
	The state of California lists cadmium and cadmium compounds, cobalt, lead, nickel, and chromium (hexavalent compounds), as chemicals known to cause cancer and reproductive toxicity. Cadmium, cadmium compounds, and lead may be present as impurities of the manufacturing process. Chromium (hexavalent compounds) may be generated during certain manufacturing processes.

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