

MATERIAL SAFETY DATA SHEET

STAINLESS STEEL ALLOYS

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SECTION 1 - IDENTIFICATION

PRODUCT: STAINLESS STEEL ALLOYS

CHEMICAL FORMULA: ALLOY OF IRON, CHROMIUM, NICKEL WITH VARIOUS OTHER ALLOYING INGREDIENTS AS LISTED IN SECTION 2.

SECTION 2 - INGREDIENTS INCLUDING HAZARDOUS COMPONENTS

THIS SECTION COVERS THE MATERIALS CONTAINED IN THE PRODUCT AS SHIPPED AND IS APPLICABLE TO MECHANICAL CUTTING OR GRINDING. THE FUMES AND GASES PRODUCED DURING WELDING ARE COVERED IN SECTION 4.

<u>Chemical^A Component</u>	<u>CAS Number</u>	<u>Wt. %</u>	<u>OSHA PEL (2)</u>	<u>ACGIH TLV (3)</u>	<u>NTP Listed (4)</u>	<u>IARC Listed (5)</u>
Iron	7439-89-6	48-89	None	None	No	No
*Chromium	7440-47-3	10-27	1	.5 as CRII or CRIII	No	No
*Nickel	7440-02-0	0-35	1	1	Yes	No
*Manganese	7439-96-5	0-15	C5 (6)	C5	No	Yes-Grp 1
Tungsten	7440-33-7	0-4	None	5	No	No
Molybdenum	7439-98-7	0-4	15	10	No	No
*Aluminum	7429-90-5	0-2	15	15	No	No
*Copper	7440-50-8	0-4	1	1	No	No
Silicon	7440-21-3	0-5	15	10	No	No
*Cobalt	7440-48-7	0-5	0	.05	No	No

COATINGS: CERTAIN MATERIALS SUCH AS LIME, ALKALINE SALTS OR OILS AND CERTAIN RESIDUALS (< 1% TOTAL WEIGHT OF PRODUCT) MAY REMAIN ON THE PRODUCT SURFACE.

- NOTES:
1. As defined by OSHA (29CFR1910.1200) or certain state regulations.
 2. Permissible Exposure Limit - (mg/m³) - OSHA (29CFR1910).
 3. Threshold Limit Value - (mg/m³) - American Conference of Governmental Industrial Hygienists.
 4. National Toxicology Program - Annual Report on Carcinogens
 5. International Agency for Research on Cancer
 6. C Values are maximum (ceiling) limits.

^A SARA TITLE III - SECTION 313 SUPPLIER NOTIFICATION:

* DENOTES TOXIC CHEMICALS CONTAINED IN THIS PRODUCT WHICH ARE SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) OF 1986 AND 40 CFR PART 372.

SECTION 3 - PHYSICAL DATA

STAINLESS STEEL PRODUCTS AS SHIPPED ARE METAL ALLOYS IN SOLID SOLUTION AND ARE NONHAZARDOUS, NONFLAMMABLE, AND NONREACTIVE.

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

NONFLAMMABLE: HOWEVER, WELDING ARCS AND SPARKS CAN IGNITE FLAMMABLE LIQUIDS, VAPORS, AND COMBUSTIBLE SOLIDS.

SECTION 5 - REACTIVITY DATA

HAZARDOUS REACTION PRODUCTS:

WELDING FUMES AND GASES FROM WELDING CANNOT BE CLASSIFIED SIMPLY. THE COMPOSITION AND QUANTITY OF BOTH DEPEND ON THE METAL BEING PROCESSED, PROCEDURES AND THE ELECTRODES USED. THE CONSTITUENTS OF THE FUME ARE GENERALLY DIFFERENT FROM THE INGREDIENTS LISTED IN SECTION 1 AND MAY INCLUDE OXIDES OF THE METALS, CHROMATES, FLUORIDES AND COMPLEX METALLICS. THE GASES MAY INCLUDE CARBON MONOXIDE, OXIDES OF NITROGEN AND OZONE. THE FOLLOWING EXPOSURE LIMITS APPLY TO THOSE FUMES AND GASES WHICH MAY BE FOUND IN THE WELDING ENVIRONMENT.

<u>Chemical Component</u>	<u>OSHA PEL</u>	<u>ACGIH TLV</u>	<u>NTP Listed</u>	<u>IARC Listed</u>
Aluminum	None	5	No	No
Carbon Monoxide (CO)	50ppm	50PPM	No	No
Chromium (Chromates)	0.1	0.05	Yes	Yes
Cobalt Fume	0.1	0.05	No	No
Copper Fume	0.1	0.2	No	No
Iron Oxide Fume	10	5	No	No
Manganese Fume	C5	1	No	No
Molybdenum (Soluble)	5	5	No	No
Nickel (Soluble)	1	0.1	No	No
Nitrogen Dioxides (NO)	C5PPM	3PPM	No	Yes
Ozone (O)	0.1PPM	0.1PPM	No	No
Silicon	None	10	No	No
Tungsten Fume	None	1	No	No

(PEL/TLV Values are mg/m³ except where indicated as PPM)

ACID PICKLING THE REACTION BY-PRODUCTS MAY CONTAIN HEXAVALENT CHROMIUM WHICH IS A HAZARDOUS WASTE AND A SUSPECTED CARCINOGEN.

SECTION 6 - HEALTH HAZARD DATA

NO TOXIC EFFECTS WOULD BE EXPECTED FROM ITS INERT SOLID FORM. PROLONGED EXPOSURE TO DUSTS, FUMES AND GASES GENERATED DURING MECHANICAL CUTTING, GRINDING OR WELDING MAY CAUSE ADVERSE HEALTH EFFECTS SUCH AS RESPIRATORY IRRITATION, IRRITABILITY, COUGHING, HEADACHES, NAUSEA, DIZZINESS OR FEVER. THESE EFFECTS ARE ASSOCIATED WITH THE FOLLOWING CHEMICAL COMPONENTS:

INHALATION:

IRON SIDEROSIS, NO FIBROSIS.

CHROMIUM THE DUSTS OF CHROMIUM METAL ARE USUALLY REPORTED TO BE RELATIVELY NON-TOXIC, ALTHOUGH THERE ARE REPORTS OF A NODULAR TYPE OF PULMONARY DISEASE WITH IMPAIRMENT OF LUNG FUNCTION. SOME INSOLUBLE CHROMIUM COMPOUNDS ARE SUSPECT CARCINOGENS.

NICKEL RESPIRATORY IRRITATION AND PNEUMONITIS; SEVERAL NICKEL COMPOUNDS, INCLUDING NICKEL OXIDE, ARE SUSPECTED LUNG AND NASAL CARCINOGENS.

MANGANESE PNEUMONITIS, CNS INVOLVEMENT, INCLUDING IRRITABILITY, DIFFICULTY IN WALKING, SPEECH DISORDERS, COMPULSIVE BEHAVIOR, MASK-LIKE FACE AND A PARKINSON-LIKE SYNDROME.

ALUMINUM NO KNOWN HEALTH EFFECTS. GENERALLY CONSIDERED TO BE IN THE NUISANCE DUST CATEGORY.

SILICON MAY PRODUCE X-RAY CHANGES IN THE LUNGS WITHOUT DISABILITY.

SECTION 6 - HEALTH HAZARD DATA (CONTINUED)

TUNGSTEN SOME EVIDENCE OF PULMONARY INVOLVEMENT, SUCH AS COUGH.

MOLYBDENUM IRRITATION OF THE NOSE AND THROAT, WEIGHT LOSS, AND DIGESTIVE DISTURBANCES IN ANIMALS. NO INDUSTRIAL POISONING HAS BEEN REPORTED.

COPPER *METAL FUME FEVER* - SYMPTOMS MAY INCLUDE COUGH, HEADACHE, METALLIC TASTE IN MOUTH, NAUSEA, FEVER, CHILLING, PAIN IN MUSCLES AND JOINTS. THIS CONDITION IS TRANSITORY, USUALLY LASTING ONE DAY OR LESS.

COBALT ASTHMA; MAY CAUSE INTERSTITIAL PNEUMONITIS AND SENSITIZATION OF THE RESPIRATORY SYSTEM.

SKIN CONTACT:

DERMATITIS DUE TO SENSITIZATION MAY OCCUR IN SOME INDIVIDUALS FROM EXPOSURE TO NICKEL AND CHROMIUM FUMES.

EYE CONTACT:

MAY CAUSE IRRITATION, CONJUNCTIVITIS, CORNEAL DAMAGE.

INGESTION:

MAY CAUSE IRRITATION OF THE MOUTH AND THROAT.

NOTE: SOME CONSTITUENTS POSE MORE POTENTIAL HAZARDS THAN OTHERS, DEPENDING UPON THEIR INHERENT TOXICITY AND CONCENTRATION. OF SPECIAL CONCERN ARE CHROMIUM, NICKEL AND PERHAPS MANGANESE

AGGRAVATION OF PREEXISTING RESPIRATORY OR ALLERGIC CONDITIONS MAY OCCUR IN SOME WORKERS.

INHALATION: SEEK MEDICAL ATTENTION, IF NECESSARY.

SKIN: IF IRRITATION DEVELOPS REMOVE CONTAMINATED CLOTHING IMMEDIATELY, AND WASH CONTAMINATED SKIN WITH SOAP OR MILD DETERGENT AND WATER FOR FIVE MINUTES. IF IRRITATION PERSISTS, SEEK MEDICAL ATTENTION.

EYES: IN CASE OF CONTACT, IMMEDIATELY WASH EYES WITH LARGE AMOUNTS OF WATER FOR FIFTEEN MINUTES, OCCASIONALLY LIFTING EYELIDS.

INGESTION: SEEK MEDICAL ATTENTION, IF NECESSARY.

SECTION 7 - SPILL OR LEAK PROCEDURES

COLLECT RESIDUE FROM CUTTING, GRINDING, OR WELDING OPERATIONS INTO A SUITABLE CONTAINER. DISPOSE OF IN ACCORDANCE WITH EPA OR LOCAL REGULATIONS.

SECTION 8 - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION

NECESSARY WHEN PERMISSIBLE EXPOSURE LIMITS MAY BE EXCEEDED DURING CUTTING, GRINDING, OR WELDING. USE AIR-SUPPLIED RESPIRATOR IN CONFINED SPACES. USE ONLY NIOSH APPROVED RESPIRATOR IN ACCORDANCE WITH 29CFR1910.134.

SECTION 8 - SPECIAL PROTECTION INFORMATION (CONTINUED)

VENTILATION

USE LOCAL EXHAUST WHEN CUTTING, GRINDING, OR WELDING. *IMPORTANT* - MAINTAIN EXPOSURES BELOW THE LIMITS IN SECTION 1 AND 4. CONFINED SPACES REQUIRE SPECIAL ATTENTION TO PROVISION OF ADEQUATE VENTILATION.

EYE PROTECTION AND PROTECTIVE CLOTHING

REQUIRED WHEN CUTTING, GRINDING, OR WELDING. WEAR GLOVES, FACE PROTECTION, AND FLAME RETARDANT CLOTHING. DO NOT EXPOSE SKIN. SELECT WELDING LENS SHADE FROM AWS PUBLICATION F2.2.

SECTION 9 - SPECIAL PRECAUTIONS

IMPORTANT: MAINTAIN EXPOSURES BELOW THE PEL/TLV. USE INDUSTRIAL HYGIENE AIR MONITORING TO ENSURE THAT YOUR USE OF THIS MATERIAL DOES NOT CREATE EXPOSURES WHICH EXCEED PEL/TLV. ALWAYS USE EXHAUST VENTILATION. REFER TO THE FOLLOWING SOURCES FOR IMPORTANT ADDITIONAL INFORMATION:

ANSI Z49.1
THE AMERICAN WELDING SOCIETY
P.O. BOX 351040
MIAMI, FL 33135

OSHA (29CFR1910)
U.S. DEPARTMENT OF LABOR
WASHINGTON, D.C. 20210

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