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Material Safety Data Sheet
Complies with 29 CFR 1910.1200.
OSHA HAZARD COMMUNICATION RULE

INCONEL

REVISION DATE: 03-01-90

SECTION 1: Product Identification

Product Name: Nickel Based Alloy Steel
Common Name: Nickel 2XX, Monel Alloy 4XX, Inconel Alloy 6XX & 7XX, Incoloy Alloy 8XX

SECTION 2: Hazardous Ingredients

Note: Products under normal conditions do not represent an inhalation, ingestion or contact health hazard.

Base Metal, Alloying Elements and Metallic Coatings	CAS#	WT%	OSHA PEL	ACGIH TLV (mg/m^3) (2)

Ingredients	CAS#	PEL	TLV (2)	Ingredients	CAS#	PEL	TLV (2)
Aluminum (Al)	7429-90-5	15	10	Nickel (Ni)	7440-02-0	1	1
Chromium (Cr)	7440-47-3	1	.5	Niobium (Nb)	7440-03-1	5	5 (Ta)
Cobalt (Co)	7440-48-4	.05	.1 (dust & fume)	Silicon (Si)	7740-21-3	10	10 (total dust)
Copper (Cu)	7440-50-8	1	1 (dust & mist)	Tantalum (Ta)	7440-25-7	5	5
Iron (Fe)	7439-89-6	10	5 (as iron oxide)	Titanium (Ti)	7440-32-6	10	10 (total dust)
Manganese (Mn)	7439-96-5	5	5 (as dust - ceiling)	Tungsten (W)	7440-37-7	5	5
Molybdenum (Mo)	7439-98-7	10	10 (insoluble compound)	Yttrium (Y)	7440-65-5	1	1

UNS Numbers	Al	Cr	Co	Cu	Fe	Mn	Mo	Ni	Nb	Si	Ta	Ti	W	Y
No 2200 Series Commercially Pure Alloy		<2				<5		95-99				<5	<5	
No 4400-No 5500 Series (Ni-Cu Alloy)	<5	<1		27-68	<1	<5		31-67		<1		<2		
No 6600-No 7700 Series (Ni-Cr Alloy)	<5	15-48	0-13		1-40	<5	2-10	39-80	<5		<2	<3	<5	<1
No 8800-No 9900 Series (Ni-Fe-Cr Alloy)	<5	.1-30	0-15	<2	30-84	<1	<5	.1-42	<5			<3		<1

(1)% of Alloying Material Varies with Grade of Material (2) 1985 - 1986 ACGIH Threshold Limit Value

SECTION 3: Physical and Chemical Properties

Material is (at normal conditions): SOLID

Melting Point: >2300°F

Material appearance and odor: Gray-black, Odorless

Specific Gravity: Approximately 7

SECTION 4: Fire and Explosion Data

Extinguishing Media: NA
Special Fire Fighting Procedures: Steel products in the solid state present no fire or explosion hazard.
Unusual Fire and Explosion Hazards: NA

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SECTION 5: Reactivity Data

Stability: Stable

Conditions to Avoid: NA

Incompatibility (Materials to void): Reacts with strong acids to produce hydrogen gas.
Hazardous Decomposition Products: Metallic dust or fumes may be produced during welding, burning, grinding and possible machining.

SECTION 6: Health Hazard Data

NOTE: STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AND INHALATION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED.

Major Exposure Hazard: INHALATION

Effects of Overexposure:
Short term exposure to fumes/dust may produce irritation of eyes and respiratory system. Inhalation of high concentrations of freshly formed oxide fumes of iron, manganese and copper may cause metal fume fever characterized by a metallic taste in the mouth, dryness and irritation of the throat and influenza like symptoms.

Chronic inhalation of high concentrations of iron oxide fumes or dust may lead to benign pneumoconiosis (siderosis). Inhalation of high concentrations of ferric oxide may possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.

Chromium and nickel and their compounds are listed in the 3rd Annual Report on Carcinogens, as prepared by the National Toxicology Program (NTP). Exposure to high concentrations of dust and fumes can cause sensitization dermatitis, inflammation and/or ulceration of upper respiratory tract and possibly cancer of the nasal passages and lungs.

Recent epidemiological studies of workers melting and working alloys containing nickel/chromium have found no increased risk of cancer.

Suspected Cancer Agent: Yes, NTP

Emergency First Aid Procedures: If exposed to excessive levels of metal fumes, remove to fresh air, seek medical attention immediately. Eyes: Flush with water for at least 15 minutes.

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SECTION 7: Spill or Leak Procedures

Spill or leak procedures: NA
Waste Disposal Method: In accordance with local, state and federal regulations.

SECTION 8: Special Protection

Respiratory: NIOSH/MSHA - approved dust and fume, respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.

Ventilation: Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding or machining when exposure exceeds TLV's.

Eye Protection: Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

SECTION 9: Special Precautions

In welding, precautions should be taken for airborne contaminants which my originate from components of the welding rod. Arc or spark generated when welding or burning could be source of ignition for combustible and flammable materials.

NA: Not applicable ND: No data found