

MATERIAL SAFETY DATA SHEET

TRADE NAME (Common Name or Synonym)

Nickel Based Alloy Steel

CHEMICAL NAME

Alloys 200, 400, 600, 800 series

I. INGREDIENTS

NOTE: PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

Ingredients	CAS Number	TLV (2)	Ingredients	CAS Number	TLV (2)
Aluminum (Al)	7429-90-5	10	Nickel (Ni)	7440-02-0	1
Chromium (Cr)	7440-47-3	.5	Niobium (Nb)	None	None Established
Cobalt (Co)	7440-48-4	.1 (Dust & Fume)	Silicon (Si)	7440-21-3	10 (Total Dust)
Copper (Cu)	7440-50-8	1 (Dust & Mist)	Tantalum (Ta)	7440-25-7	5
Iron (Fe)	1309-37-1	10 (As Iron-Oxide)	Titanium (Ti)	7440-32-6	10 (Total Dust)
Manganese (Mn)	7439-96-5	5 (As Dust-Ceiling)	Tungsten (W)	7440-33-7	5
Molybdenum (Mo)	7439-98-7	10 (Insoluble Comp.)	Yttrium (Y)	7440-65-5	1

UNS Numbers	Al	Cr	Co	Cu	Fe	Mn	Mo	Ni	Nb	Si	Ta	Ti	W	Y
N02200 Series (Commercially Pure Ni Alloy)		<2				<5		95-99				<5	<5	
N04400 - N05500 Series (Ni-Cu Alloy)	<5	<1		27-68	<1	<5		31-67		<1	<2			
N06600 - N07700 Series (Ni-Cr Alloy)	<5	15-48	0-13		1-40	<5	2-10	39-80	<5		<2	<3	<5	<1
N08800 - N09900 Series (Ni-Fe-Cr Alloy)	<5	.1-30	0.15	<2	30-84	<5	<5	.1-42	<5			<3		<1

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL (2) 1985-1986 ACGIH THRESHOLD LIMIT VALUE.

II. PHYSICAL DATA

MATERIAL IS (At Normal Conditions)			APPEARANCE AND ODOR		
<input type="checkbox"/> LIQUID <input checked="" type="checkbox"/> SOLID <input type="checkbox"/> GAS <input type="checkbox"/> OTHER			Grey-Black, Odorless		
ACIDITY/ALKALINITY	Melting Point	2300 °F	Specific Gravity (H ₂ O = 1)	Approx. 7	VAPOR PRESSURE
pH = N/A	Boiling Point	N/A °F	Solubility in water (% by weight)	N/A	(mm Hg at 20°C)
					N/A

III. PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION	NIOSH/MSHA approved dust and fume respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.	HANDS, ARMS AND BODY	Protective gloves should be worn as required for welding, burning, or handling operations.
EYES AND FACE	Safety glasses or goggles should be utilized as required by exposure.	OTHER CLOTHING AND EQUIPMENT	As required depending on operations and safety codes.

IV. EMERGENCY MEDICAL PROCEDURES

INHALATION EYE CONTACT SKIN CONTACT INGESTION	Remove to fresh air. If condition continues, consult a physician. Flush thoroughly with running water to remove particulates, obtain medical attention. Remove particles by washing thoroughly with soap and water. Seek medical attention if condition persists. If significant amounts of metal are ingested, consult physician.
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V. HEALTH/SAFETY INFORMATION

Health	<p>Short term exposure to fumes/dust may product 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.</p> <p>Chronic inhalation of high concentrations of iron-oxide fumes or dust may lead to a 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.</p> <p>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 nasal passages and lungs.</p> <p>Recent epidemiological studies of workers melting and working alloys containing nickel/chromium have found no increased risk of cancer.</p>			
Fire and Explosion	FLASH POINT N/A °F	AUTO IGNITION TEMPERATURE N/A °F	FLAMMABLE LIMITS IN AIR Lower Upper N/A % N/A %	EXTINGUISHING MEDIA N/A
	FIRE AND EXPLOSION HAZARDS Steel products in the solid state present no fire or explosion hazard.			EXTINGUISHING MEDIA NOT TO BE USED Do not use water on molten metal.
Reactivity	STABILITY <input type="checkbox"/> Stable <input type="checkbox"/> Unstable	INCOMPATIBILITY (MATERIALS TO AVOID) Reacts with strong acids to produce Hydrogen Gas		
	CONDITIONS TO AVOID	N/A		
	HAZARDOUS DECOMPOSITION PRODUCTS Metallic dust or fumes may be produced during welding, burning, grinding and possibly machining. Refer to ANSI Z49.1			

VI. ENVIRONMENTAL

<p>SPILL OR LEAK PROCEDURES Fine turnings and small chips should be swept or vacuumed. Scrap metal can be reclaimed for reuse.</p> <p>WASTE DISPOSAL METHOD* Used or unused product should be disposed of in accordance with Federal, State or Local laws and Regulations.</p> <p style="text-align: center;">* Disposer must comply with Federal, State and Local disposal or discharge laws.</p>
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VII. ADDITIONAL INFORMATION

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