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MATERIAL SAFETY DATA SHEET

TRADE NAME (Common Name or Synonym)	CHEMICAL NAME
Nickel Based Alloy Steel	Alloys 200, 400, 600, 800 series

I. INGREDIENTS

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

Ingredients	CAS Number	TVL (2)	Ingredients	CAS Number	TVL (2)
Aluminum (Al)	7429·90·5	10.0	Nickel (Ni)	7440-02-0	1
Chromium (Cr)	7440-47-3	0.5	Niobium (Nb)	7440-03-1	None Established
Cobalt (Co)	7440-48-4	0.1 (Dust & Fume)	Silicon (SI)	7440-21-3	10 (Total Dust)
Copper (Cu)	7440-50-8	1.0 (Dust & Fume)	Tantalum (Ta)	7440-25-7	5
Iron (Fe)	1309-37-1	10.0 (As Oxide-Iron)	Titanium (Ti)	7440-32-6	10 (Total Dust)
Manganese (Mn)	7439-96-5	5.0 (As Dust Ceiling)	Tungsten (W)	7440-33-7	5
Molybdenum (Mo)	7439-98-7	10.0 (Insoluble Comp.)	Yittrium (Y)	7440-65-5	1

% Alloying Elements (1)

UNS Number	Al	Cr	Co	Cu	Fe	Mn	Mo	Ni	Nb	Si	Ta	Ti	W	Y
NO2200 series (Commercially Pure Ni Alloy)		<2				<5		95-99				<5	<5	
NO4400-NO5500 Series (Ni-Cu Alloy)	<5	<1		27-68	<1	<5		31-97		<1	<2			
NO6600-NO7700 Series (Ni-Cr Alloy)	<5	15-48	0-13		1-40	<5	2-10	39-80	<5		<2	<3	<5	<1
NO8800-NO9900 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

II. PHYSICAL DATA

MATERIAL IS (At Normal Conditions)	APPREARANCE AND ODOR	% VOLATILE BY VOLUME	VAPOR DENSITY
☐LIQUID ■SOLID ☐GAS ☐OTHER	Grey-Black, Odorless	N/A	N/A

ACIDITY/ALKALINITY			
pH = N/A	Melting Point Approx. 2300°F Boiling Point N/A °F	Specific Gravity (H2O)= 1) Approx. 7 Solubility in water (% by weight) N/A	VAPOR PRESSURE (mm Hg at 20° C) N/A

III. PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION Appropriate dust/mist/fume respirator should be used to avoid excessive inhalation of particles. If exposure limits are reached or exceeded use NIOSH approved equipment.	HANDS, ARMS AND BODY Protective gloves should be worn as required for welding, burning or handling operations.
EYES AND FACE Safety glasses should be worn when grinding or cutting. Face shields should be worn when welding or cutting.	OTHER CLOTHING AND EQUIPTMENT As required depending on operations and safety codes.

IV. EMERGENCY MEDICAL PROCEDURES

INHALATION: Remove to fresh air; if condition continues, consult a physician.
EYE CONTACT: Flush thoroughly with running water to remove particles; obtain medical attention.
SKIN CONTACT: Remove particles by washing thoroughly with soap and water. Seek medical attention if condition persists.
INGESTION: If significant amounts of material are ingested, consult a physician.

V. HEALTH/SAFETY INFORMATION

Health

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 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 a benign pneumoconiosis (siderosis). Inhalation of high concentrations of ferric oxide may possible enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens. the following elements may lead to the conditions listed opposite the element:

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.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Individuals with chronic respiratory disorders (i.e.: asthma, chronic bronchitis, emphysema, etc.) may be adversely effected by any fumes or airborne particulate matter exposure.

Fire and Explosion

FLASH POINT	AUTO IGNITION TEMPERATURE	FLAMMABLE LIMITS IN AIR	EXTINGUISHING MEDIA
N/A ° F	N/A	Lower % Upper N / A %	N/A

FIRE AND EXPLOSION HAZARDS	EXTINGUISHING MEDIA NOT TO BE USED
Steel products in the solid state present no fire or explosion hazard.	Do not use water on molten metal

Reactivity

STABILITY	INCOMPATIBILITY (MATERIALS TO AVOID)
■ Stable ☐ Unstable	Reacts with strong acids from hydrogen gas.

CONDITIONS TO AVOID: N/A

HAZARDSOUS DECOMPOSITION PRODUCTS:
Metallic dust or fumes may be produced during welding, burning, grinding and possibly machining. Refer to ANSI Z49.1.

VI. ENVIRONMENTAL

SPILL OR LEAK PROCEDURES: Fine turnings and small chips should be swept or vacuumed. Scrap metal can be reclaimed for re-use

WASTE DISPOSAL METHOD: Used or unused products should be disposed of in accordance with Federal, State or Local Laws and Regulations. Disposer must comply with Federal, State and Local disposal or discharge laws.

VII. ADDITIONAL INFORMATION

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