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MATERIAL SAFETY DATA SHEET

Company National Flange & Fitting Co. P.O. Box 924149 Houston, Texas 77292	*Issue Date* November 1, 1999 *Identification* Flanges & Related Products
Trade Names Examples of Material Used: ASTM, ASME Stainless: A-182 F-304, A-182 F-304L, A-182 F-316 A-182 F-316L, A-182 F-304 H Carbon A-105, A-350-LF 2 Alloy: A-182-F11	*Emergency Phone Number* (713) 688-2515 *Chemical Family* Metals *Form* Flanges, Forgings, Forged Bar

I. INGREDIENTS

MATERIAL OR COMPONENT	CAS NUMBER	% WEIGHT	EXPOSURE LIMITS	
Base Metal			OSHA PEL (mg/m3)	ACGIH TLV (mg/m3)
Iron (Fe)	7439-89-6	Balance	10 (Fe_2O_3 Fume)	5.0 (Fe_2O_3 Fume)
Alloying Elements				
Aluminum (A1)	7429-90-5	0.10-1.8	None Listed	5.0 as welding fume
Carbon (C)	7440-44-0	0.01-1.5	None Listed	Non Listed
Chromium (Cr)	7440-47-3	0.01-27	1.0 as chrome	0.5 as chrome
Cobalt (Co)	7440-48-4	8 Max	0.1 as cobalt and fume	0.05 as fume
Copper (Cu)	7440-50-8	0.04-4	0.2 as copper; 1.0 as dust	0.2 as fume; 1.0 as dust
Lead (Pb)	7439-92-1	0.15-0.35	0.5 as fume & dust	0.15 as dust & fume
Manganese (Mn)	7439-96-5	0.05-10.0	5 as manganese	5 as dust; 1 as fume
Molybdenum (Mo)	7439-98-7	0-4	15 as insoluble compds	10 as insoluble compds
Nickel (Ni)	7440-02-0	0-22	1.0 as Nickel	1.0 as Nickel
Phosphorous (P)	7723-14-0	.001-0.15	0.1 as Phosphorous	0.1 as Phosphorous
Silicon (Si)	7440-21-3	0.15-2.20	None Listed	10 total dust
Sulfur (S)	7704-34-9	0.001-0.35	13 sulfur dioxide	5 sulfur dioxide
Tungsten (W)	7440-33-7	0-18	None Listed	5 insoluble compds
Vanadium (V)	7440-62-2	0.01-1.0	0.5 dust; 0.1 fume	0.05 dust & fume
Zinc (Zn) coating	1314-13-2	10 Max	5.0 as fume	5.0 as fume

NOTE: The above listing is a summary of elements used in alloying steel. Various grades of steel will contain different combinations of these elemens. Trace elements may also be present in minute amounts.

II. PHYSICAL DATA

Material is (At Normal Conditions) Solid		*Appearance and Odor* Painted Black or Machined - Odorless	
Acidity/Alkalinity ph=NA	*Approx* Melting Point 2700-2750F Boiling Point NA	Specific Gravity (H_2O=1)-7 Solubility in water (% by weight)-NA	*Vapor Pressure* (mm Hg at 20°C) NA

III. PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection NIOSH approved dust/mist/fume respirator should be used during welding or burning if OSHA PEL or TLV is exceeded.	*Hands, Arms and Body* Use appropriate clothing such as welders aprons & gloves when welding or burning. Check local codes.
Eyes and Face Safety glasses should always be worn when grinding or cutting; face shields should be worn when welding or burning.	*Other Clothing and Equipment* As required

IV. EMERGENCY MEDICAL PROCEDURES

Inhalation:	Remove to fresh air; if condition continues, consult physician.
Eye Contact:	Immediately flush well with running water to remove particulate; get medical attention.
Skin Contact:	If irritation develops, remove clothing and wash well with soap and water. If condition persists, seek medical attention.
Ingestion:	If significant amounts of metal are ingested, seek medical attention.

V. HEALTH/SAFETY INFORMATION

HEALTH

Steel products in the natural state do not present an inhalation, ingestion, or contact health hazard. However, operations such as welding, burning, sawing, brazing, grinding, and possibly machining, which results in elevating the temperature of the product to or above its melting point or results in the generation of airborne particulates may present hazards. The above operations should be performed in well ventilated areas. The major exposure hazard is inhalation.

Effects of overexposure:

Acute: Excessive inhalation of all metallic fumes and dusts may result in irritation of eyes, nose, and throat. Also high concentrations of fumes and dusts of iron-oxide, manganese, copper, & selenium may result in metal fume fever. Typical symptoms consists of a metallic taste in the mouth, dryness and irritation of the throat, chills and fever, and usually last from 12 to 48 hours.

Chronic: Chronic and prolonged inhalation of high concentrations of fumes or dust of the following elements may lead to the conditions listed opposite the element:

Iron (iron-oxide): Pulmonary effects, siderosis.
Manganese: Bronchitis, pneumonitis, lack of coordination.
Chromium: Various forms of dermatitis, inflammation and/or ulceration of upper respiratory tract, and possibly cancer of nasal passages and lungs. Based on available information, there does not appear to be any evidence that exposure to welding fume induces human cancer.
Nickel: SAME AS CHROMIUM.
Selenium: Nasal and bronchial irritation, gastro-intestinal disturbances, garlic odor of breath.
Copper: Pulmonary effects.
Vanadium: No reported cases of exposure to vanadium.
Cobalt: Inhalation of cobalt dust may cause an asthma-like disease with cough and dyspnea.
Molybdenum: Pain in joints, hands and feet.

Occupational Exposure Limits
See Section I.

FIRE AND EXPLOSION

Fire and Explosion Hazards	*Extinguishing Media Not to be Used*
Flanges present no fire or explosion hazard	NA

REACTIVITY

Stability	*Incompatibility (Materials to Avoid)*
Stable	Reacts with strong acids to form hydrogen gas.

Conditions to Avoid Keep Area Well Ventilated
Non-ventilated areas when cutting, welding, burning, or brazing; avoid generation of airborne dusts and fumes.

Hazardous Decomposition Products
Metallic oxides.

VI. ENVIRONMENTAL

Spill or leak procedure NA	Special Precautions: Use good housekeeping practices to prevent accumulation of dust and to keep airborne dust to a minimum.
Waste Disposal Method	Dust, etc. — follow federal, state, and local regulations regarding disposal.

VII. COATINGS

Coatings are applied to finished machined flanges. Normal coatings used by National Flange & Fitting Co. are listed below:

1) Paint (See Attached M.S.D.S.)
2) Hot Dip Galvanize (See Attached M.S.D.S.)
3) Light Oil (See Attached M.S.D.S.)

If these coatings may create a hazardous condition in your further processing protective caution should be exercised. If another specific coating is required, caution should be taken to prevent a hazardous condition in further processing of the product.

VIII. ADDITIONAL INFORMATION

Disclaimer
The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, express or implied regarding the accuracy or correctness.
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