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## MATERIAL SAFETY DATA SHEET TO THE ATTENTION OF THE PLANT MANAGER/SAFETY DIRECTOR

To comply with the Occupational Safety and Health Administration Hazard Communication Standard # 29 C.F.R. 1910.1200, High Temp Metals Inc., as a distributor, is required to furnish MATERIAL SAFETY DATA SHEETS for those products which are deemed hazardous. These primary metals, when improperly handled and improperly processed, have produced cancer in laboratory animals. In normal processing of specialty steels, there has been no indication of critical health hazards. This Material Safety Data Sheet also incorporates #40 CFR 372.45, Supplier Notification. Notification is hereby given that metal alloys received from High Temp Metals Inc. may contain toxic chemicals which are subject to the reporting requirements of SARA 313 of the Emergency Planning and Community Right-To-Know Act of 1986. See Section I for description of product, and Section III lists the chemicals and CAS numbers. Although reasonable care has been taken to provide current and accurate information in the MSDS, High Temp Metals extends no warranties, expressed or implied, makes no representations regarding the accuracy or completeness of the information and assumes no liability for any loss, damage or injury of any kind which may result from or arise out of the use of or reliance on the information by any person. Responsibility for the compliance with federal, state, and local law regulations concerning the use of this product rests solely upon the purchaser.

### SECTION I -- PRODUCT DESCRIPTION

A tasteless, odorless, solid metal in the form of sheet, bar, plate, tubing, strip, block, and billet. The alloy identification, or trade name, is located on all shippers, invoices, and packing slips accompanying this shipment. The percentage of each hazardous ingredient is listed on the certification accompanying each shipment.

### SECTION II -- HEALTH HAZARD DATA

This product, in the form that it is sold, does not constitute a physical or a health hazard. Welding, cutting, melting, grinding, or any processing that causes the release of dust or fumes may cause some of the ingredients to change to a form which could affect exposed workers. Please refer to the original manufacturer, producing mill, or a physician, for the information indicating the symptoms, and first aid requirements when using these materials.

### SECTION III -- HAZARDOUS INGREDIENTS

ELEMENT	CAS NO.	ELEMENT	CAS NO.	ELEMENT	CAS NO.
Aluminum(Al)	7429-90-5	Copper(Cu)	7440-50-8	Selenium(Se)	7782-49-2
Carbon(C)	7440-44-0	Iron(Fe)	7439-89-6	Silicon(Si)	7440-21-3
Chromium(Cr)	7440-47-3	Manganese(Mn)	7439-96-5	Titanium(Ti)	7440-32-6
Cobalt(Co)	7440-48-4	Molybdenum(Mo)	7439-98-7	Tungsten(W)	7440-33-7
Columbium(Cb) or (Nb)	7440-03-1	Nickel(Ni)	7440-02-0	Vanadium(V)	7440-62-2

### SECTION IV -- FIRST AID MEASURES

**Skin:** Wash skin with soap and water to remove any metallic particles. If a rash or burn develops, seek medical attention.

**Eyes:** Flush particles from eyes with clean water for at least 15 minutes. If irritation persists or burn develops, seek medical attention.

**Inhalation:** Remove from exposure. If respiratory irritation persists, seek medical attention.

**Ingestion:** If metallic particles are swallowed, seek medical assistance.

**Advice to physician:** Treat symptomatically

### SECTION V -- FIRE AND EXPLOSION DATA

**FLASH POINT:** NONE

**FIRE POINT:** NONE - The product is noncombustible material.

### SECTION VI -- ACCIDENTAL RELEASE MEASURES

In solid form this material poses no special clean-up problems. If this material is in powder or dust form, notify safety personnel, isolate the area and deny entry. Do not sweep. Clean-up should be conducted with a vacuum system utilizing a high efficiency particulate air (HEPA) filtration system. Caution should be taken to minimize airborne generation of powder or dust and avoid contamination of air and water. Cleanup personnel should protect against exposure. Properly label all materials collected in waste container. Follow applicable emergency response regulations, such as OSHA (29CFR 1910.120).

### SECTION VII -- HANDLING AND STORAGE

**HANDLING PRECAUTIONS** - Dust and welding fume should be moved or transported to minimize spill or release potential.

**STORAGE PRECAUTIONS** - In solid form, these materials pose no hazards.

### SECTION VIII -- EXPOSURE CONTROL/PERSONAL PROTECTION

**VENTILATION REQUIREMENTS:** Use general or local exhaust ventilation to keep airborne concentrations of dust and fumes below the TLV. Consult a professional hygienist.

**PERSONAL PROTECTION EQUIPMENT:** Always consult a professional hygienist.

**RESPIRATORY PROTECTION:** If fumes, misting, or dust conditions occur, consult a professional hygienist. Provide NIOSH approved respirators.

**EYE PROTECTION:** Safety glasses should always be worn when grinding or cutting. Face shields should be worn with proper eye protection when welding or burning.

**GLOVES:** Gloves and barrier creams may be necessary to prevent skin sensitization and dermatitis.

**OTHER CLOTHING OR EQUIPMENT:** As required, and as prescribed by a professional hygienist.

## SECTION IX – PHYSICAL AND CHEMICAL PROPERTIES

**BOILING POINT:** 686/5660 C

**VAPOR PRESSURE:** NIL

**SOLUBILITY IN WATER:** INSOLUABLE

**ODOR:** ODORLESS

**MELTING POINT:** 217/3410 C

**SPECIFIC GRAVITY:** 1.8/19.3

**APPEARANCE:** SOLID METAL

## SECTION X – STABILITY AND REACTIVITY

**Stability:** Solid metal alloys in mill product forms are stable under normal conditions.

**Reactivity:** May react in contact with strong acids to release gaseous acid decomposition products. Fume is produced during welding. Expected fume constituents include oxides of metal as iron, manganese, nickel and chromium. Expected gaseous products would include carbon oxides, nitrogen oxides and ozone. Contamination, dirt, surface protections, paint or primer on the base material can affect the composition of the fumes. If you have any questions or need any added information, please contact the producing mill, a professional hygienist, or a professional metallurgist. We urge you to distribute this information among the personnel processing and handling this material so that they are fully advised of any health hazards when exposed to this product.

## SECTION XI – TOXICOLOGICAL INFORMATION

Nickel and cobalt are classified as Category 3 carcinogens. The exposure route of concern is inhalation. As shipped, these complex alloys in massive form have no known toxicological properties other than causing allergic reactions in individuals sensitive to the metal(s) contained in the alloys. However, dust from flux or user-generated dusts and fumes may on contact with the skin or eyes produce mechanical irritation. Chronic exposures coupled with sweat could cause dermatitis (skin) or conjunctivitis (eyes). Excessive inhalation of dust or user-generated fumes from welding or metal spraying may, depending on the specific features of the process used, pose a long-term health hazard. The International Agency for Research on Cancer (IARC) has concluded that welding fumes are possibly carcinogenic to humans. The ingredients of fumes and gases generated in welding, metals spraying and grinding will depend on the base metal and the details of the specific process being used. Ingredients may include metals, metal oxides, chromates, fluorides, carbon monoxide, ozone, and oxides of nitrogen.

**DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:**

Chromium - The International Agency for Research on Cancer (IARC) considers hexavalent chromium to be a carcinogen (lung, nasal) but does not have adequate evidence for chromium metal and trivalent chromium. Fumes have been associated with lung fibrosis. Iron - Prolonged inhalation of iron oxide fumes can lead to siderosis, which presents as a benign pneumoconiosis. Molybdenum - Repeated inhalation of fumes has caused kidney damage, respiratory irritation and liver damage in animals. Nickel - Nickel metal is "reasonably anticipated to be a human carcinogen" (National Toxicology Program's 10th Report). IARC states that nickel metal is possibly carcinogenic to humans. Epidemiological studies of workers exposed to nickel powders, dusts and fumes in the nickel alloy and stainless steel producing industries do not indicate a significant respiratory cancer hazard. Inhalation of nickel powder produced malignant tumors in rodent studies. Single intratracheal installations of nickel powder at levels close to the LD50 have caused malignancies in hamsters. Nickel can cause skin sensitization in susceptible individuals through prolonged contact with skin.

## SECTION XII – ECOLOGICAL INFORMATION

Solid metal alloys in mill product forms products are not considered toxic to aquatic species. It is believed that finely divided product, based on its components, will be hazardous to fish, animals, plants and the environment if released, the degree of which would depend on the particle size and quantity released. In addition, if particles are small enough, material may be ingested by wildlife, with possible toxic effects. The solid product is not expected to migrate easily into soil or groundwater based upon its insoluble form, however, finely divided material can become mobile in water and contaminate soil and groundwater.

## SECTION XIII -- DISPOSAL CONSIDERATION

This product is a solid metal, and has no potential for spillage or leakage. Material solids may be sold as scrap. Dust should be disposed of as required by federal, state, and local regulations.

## SECTION XIV – TRANSPORTATION - NOT APPLICABLE

## SECTION XV – REGULATORY INFORMATION

Alloys containing less than 1% of nickel or cobalt are not classified as "dangerous for supply". Alloys containing more than 1% of either metal are classified as the metals themselves. However, in recognition of their essentially non-hazardous nature, these alloys in the massive form are not required to be labeled as hazardous.

## SECTION XVI – OTHER INFORMATION

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