



TMX is a Division of Thyssen Inc., N.A.  
**MATERIAL SAFETY DATA SHEET**

**SECTION I. MATERIAL IDENTIFICATION**

<b>COMPANY</b> Thyssen Inc. N.A./TMX Division 400 Renaissance Center, Suite 1800 Detroit, Michigan 48243	<b>RE-ISSUE DATE</b> 1-May-99	<b>IDENTIFICATION NUMBER</b> N/A
<b>TRADE NAME</b> Nickel Base Alloy	<b>EMERGENCY PHONE NUMBER</b> (313) 567-5282	<b>PREPARED BY:</b> L. J. Switaj
<b>CHEMICAL NAME</b> Nickel	<b>FORMULA</b> N/A	<b>DOT IDENTIFICATION NO.</b> N/A

**SECTION II. HAZARDOUS INGREDIENTS**

MATERIAL OR COMPONENT	% COMPOSITION		OSHA-PEL	OSHA-mg/m3 8-HR. - TWA
BASE METAL	CAS NUMBER	BY WEIGHT		
NICKEL	7440-02-0	30-99	NICKEL FUME	1.0
<b>NOT ALL OF THE ELEMENTS LISTED BELOW ARE PRESENT IN ALL ALLOYS OF NICKEL</b>				
ALLOYING ELEMENTS	CAS NUMBER	% COMPOSITION BY WEIGHT (1)	OSHA-PEL	OSHA-mg/m3 8-HR. - TWA
CARBON	7440-44-0	.01-2.0	AS CARBON	15
MANGANESE	7439-96-5	.01-5.0	AS MANGANESE	5.0
IRON	7439-89-6	.01-44	IRON OXIDE FUME	10
BORON	7440-42-8	.001-.004	AS DUST/FUME	10
SILICON	7440-21-3	.01-2.0	AS SILICON DUST/FUME	5.0
TITANIUM	7440-32-6	.01-5.0	AS DUST/FUME	15
COBALT	7440-48-4	.01-13	AS DUST/FUME	0.1
TANTALUM	7440-25-7	.01-5.0	AS TANTALUM	5.0
NIObIUM	7440-03-1	.01-5.0	AS NIObIUM DUST	15
CHROMIUM	7440-47-3	.01-48	SOLUBLE CHROMIC/SALTS	0.5
YITTRIUM	7440-65-5	.00-1.0	AS YITTRIUM DUST	15
TUNGSTEN	7440-33-7	.00-5.0	AS TUNGSTEN DUST	15
MOLYBDENUM	7439-98-7	.01-16	SOLUBLE MOLY. COMPOUNDS	15
COPPER	7440-50-8	.01-45	AS COPPER DUST	1.0
			AS COPPER FUME	0.1
ALUMINUM	7429-90-5	.00-5.0	AS ALUMINUM	15

PEL=Permissible Exposure Limit (1) % of Alloying Material Varies with Grade of Material. Other trace elements of <1% May be in Present.

**SECTION III. PHYSICAL DATA**

<b>MATERIAL (At Normal Conditions)</b> SOLID	<b>APPEARANCE AND ODOR</b> Silver to grayish black color. No Odor
<b>MELTING POINT</b> >2300 Deg. F (1260 Deg. C)	<b>SPECIFIC GRAVITY</b> About 7.6-7.8

**SECTION IV. FIRE AND EXPLOSIVE**

<b>SPECIAL FIRE FIGHTING PROCEDURES</b> Nickel Products In Their Solid State Present No Fire Or Explosive Hazard
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**SECTION V. REACTIVITY DATA**

<b>STABILITY</b> Stable	<b>CONDITIONS TO AVOID</b> Reacts with strong acid to form hydrogen gas.
<b>HAZARDOUS DECOMPOSITION PRODUCTS</b> Metallic Dust Or Fumes May Be Produced During Welding, Burning, Grinding And Possibly Machining. Refer To ANSI Z49.1	

**SECTION VI. Environmental**

<b>SPILL OR LEAK PROCEDURES</b>	N/A
<b>WASTE DISPOSAL METHODS</b>	Disposal must comply with applicable Federal, State and Local disposal and discharge laws.

## SECTION VII. HEALTH HAZARD DATA

**NOTE:** NICKEL PRODUCTS IN THEIR NATURAL STATE DO NOT PRESENT AN INHALATION OR CONTACT HAZARD, HOWEVER OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUST WHICH MAY PRESENT HEALTH HAZARDS.

### EFFECTS OF OVEREXPOSURE:

**Acute -** Dust or fume may cause irritation to the eyes, nose, or throat and may leave a metallic taste in the mouth. Inhalation of oxides of Manganese, or Copper may be manifested as flu-like symptoms commonly known as "metal fume fever". Phosphorous dust is considered a nuisance dust.

**Chronic -** Tantalum dust and fume can be toxic when inhaled.

**Aluminum:** Inhalation of Aluminum Oxide fume or an accumulation of Silicon in the lungs may result in benign pneumoconiosis.

**Cobalt:** Lung inflammation and damage, and diffuse pulmonary fibrosis from inhalation. Classified as a carcinogen by IARC.

**Chromium:** May enter and affect the body through inhalation, ingestion, or skin contact. The National Toxicology Program (NTP) and the Internal Agency for Research on Cancer (IARC) report they possess sufficient evidence to establish a causal relationship for human cancer from Chromium.

**Copper:** Inhalation may cause nose and throat irritation and prolonged contact may cause dermatitis.

**Iron:** Inhalation of Iron Oxide fume or dust may result in a condition known as siderosis.

**Titanium:** Inhalation may cause Fibrosis of the Lungs. Has caused lung cancer in animals.

**Tungsten:** Inhalation or contact may cause irritation of eyes skin and respiratory system, and cause changes in the blood.

**Manganese:** Inhalation may result in symptoms such as headache, restlessness, neurological dysfunction, or muscular weakness.

**Nickel:** Inhalation may result in inflammation of the respiratory tract and fever. The National Toxicology Program (NTP) and the International Agency for Research on Cancer (IARC) report they possess limited evidence for human cancer from Nickel and Nickel compounds.  
Inhalation of Sulfur Dioxide gas can cause irritation of the respiratory tract, causing bronchial irritation, difficulty in breathing and pulmonary edema.

**Molybdenum:** Slight irritation of senses. Animal studies suggest digestive disturbances and development of pneumoconiosis, anemia, and gout.

## SECTION VIII. EMERGENCY AND FIRST AID PROCEDURES

**Inhalation** In the event of excessive exposure to dust or fume, remove the employee to fresh air. If breathing is difficult administer artificial respiration or oxygen. Obtain immediate medical assistance.

**Skin:** Abrasions and cuts should be washed and closed by a clean compress and be immediately medically treated. Should skin irritation occur, wash affected area with mild soap and rinse with clean warm water.

**Eyes:** Depending on the type and nature of exposure, relief may be obtained by fresh air or rinsing the eyes with clean water. Obtain medical assistance.

**Medical Conditions Aggravated by Exposure:**  
Persons with a predisposition to respiratory disorders may be adversely affected by particulates or respiratory irritants generated during the mfg. process.

## SECTION IX. SPECIAL PROTECTION INFORMATION & CONTROL MEASURES

**Note:** Consult your regional codes or Code of Federal Regulations, Title 29, Part 1910, Subpart G-Occupational Health and Environmental Control, Subpart I Personal Protective Equipment, Subpart P-Welding, Cutting, and Brazing, and Subpart Z-Toxic and Hazardous Substances. Certain welding type activities may produce hazardous substances such as carbon monoxide, ozone, phosgene in the presence of certain chemicals, or produce inert suffocating atmospheres in addition to the production of ultraviolet radiation and/or noise.

**Ventilation:** Local exhaust or ventilation systems sufficient to maintain exposure levels to contaminants below prescribed limits may be required. When inhalation controls are not sufficient to reduce the exposure below the applicable exposure limit then use OSHA/NIOSH approved respiratory protection within the use limitations of the respirator.

**Personal Protection:** To avoid contact use appropriate protective gloves or clothing to protect against cutting edges. Appropriate heat shielding garments should be used for activities using or generating heat. Eyes should be protected by using safetyglasses, goggles, helmet, face shield as appropriate to the operation.

**Precautions to be taken in handling and storage:**  
Be alert to sharp edges and unsecured lifts.

## SECTION X. OTHER INFORMATION

### SARA Section 313 Toxic Chemical List, de minimis Concentrations

> 1.0%: Copper, Aluminum, and Manganese  
> 0.1%: Chromium and Nickel

### California Proposition 65

The state of California lists chromium (hexavalent compounds), as chemicals known to cause cancer and reproductive toxicity. Cadmium, cadmium compounds, and lead may be present as impurities of the manufacturing process. Chromium (hexavalent compounds) may be generated during certain manufacturing processes.

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