

Material Safety Data Sheet



140 MXC - Nano Composite Wire

1. Product and company identification

Product name	: 140 MXC - Nano Composite Wire
Supplier	: TAF A Inc. A Praxair Surface Technologies Company 146 Pembroke Rd. Concord, NH 03301
Manufacturer	:
Code	: 140 MXC - Nano Composite Wire
MSDS #	: 140 MXC - Nano Composite Wire
Validation date	: 10/4/2012.
Print date	: 10/4/2012.
Responsible name	: Sarah Behling
In case of emergency	: 603-224-9585 Chemtrec 1-800-424-9300
Product type	: Solid.

2. Hazards identification

Emergency overview

Physical state	: Solid. [Wire]
Color	: Gray.
Odor	: Odorless.
Signal word	: CAUTION!
Hazard statements	: MAY BE HARMFUL IF SWALLOWED. MAY CAUSE EYE AND SKIN IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.
Precautionary measures	: Do not ingest. Do not eat, drink or smoke when using this product. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.
OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Routes of entry : Dermal contact. Eye contact. Inhalation.

Potential acute health effects

Inhalation	: No known significant effects or critical hazards.
Ingestion	: Harmful if swallowed.
Skin	: Slightly irritating to the skin.
Eyes	: Slightly irritating to the eyes.

Potential chronic health effects

Chronic effects	: Contains material that may cause target organ damage, based on animal data.
Carcinogenicity	: No known significant effects or critical hazards.
Mutagenicity	: No known significant effects or critical hazards.
Teratogenicity	: No known significant effects or critical hazards.
Developmental effects	: No known significant effects or critical hazards.
Fertility effects	: No known significant effects or critical hazards.
Target organs	: Contains material which may cause damage to the following organs: blood, kidneys, lungs, the nervous system, liver, cardiovascular system, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.

Over-exposure signs/symptoms

Inhalation	: No specific data.
Ingestion	: No specific data.

2. Hazards identification

- Skin** : Adverse symptoms may include the following:
irritation
redness
- Eyes** : Adverse symptoms may include the following:
irritation
watering
redness
- Medical conditions aggravated by over-exposure** : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

3. Composition/information on ingredients

Name	CAS number	%
Chromium	7440-47-3	5 - 20
Molybdenum	7439-98-7	1 - 5
Tungsten	7440-33-7	5 - 20
Carbon	7440-44-0	1 - 5
Manganese	7439-96-5	1 - 5
niobium	7440-03-1	5 - 20
Silicon	7440-21-3	<2
Boron	7440-42-8	1 - 5
Iron	7439-89-6	20 - 50

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
- Notes to physician** : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

- Flammability of the product** : No specific fire or explosion hazard.
- Extinguishing media**
- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

5. Fire-fighting measures

- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
metal oxide/oxides
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Methods for cleaning up**
- Small spill** : Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Do not ingest. Avoid contact with eyes, skin and clothing. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8. Exposure controls/personal protection

Ingredient	Exposure limits
Chromium	<p>ACGIH TLV (United States, 2/2010). Notes: measured as Cr TWA: 0.5 mg/m³, (measured as Cr) 8 hour(s). Form: Inorganic</p> <p>NIOSH REL (United States, 6/2009). Notes: See Appendix C - Supplemental Exposure Limits TWA: 0.5 mg/m³ 10 hour(s).</p> <p>OSHA PEL (United States, 6/2010). Notes: as Cr TWA: 1 mg/m³, (as Cr) 8 hour(s).</p> <p>OSHA PEL 1989 (United States, 3/1989). TWA: 1 mg/m³ 8 hour(s).</p>
Tungsten	<p>ACGIH TLV (United States, 2/2010). TWA: 5 mg/m³, (as W) 8 hour(s). Form: Insoluble STEL: 10 mg/m³, (as W) 15 minute(s). Form: Insoluble</p> <p>NIOSH REL (United States, 6/2009). Notes: Note: The REL also</p>

8. Exposure controls/personal protection

Molybdenum	<p>applies to other insoluble tungsten compounds (as W). STEL: 10 mg/m³, (as W) 15 minute(s). TWA: 5 mg/m³, (as W) 10 hour(s). ACGIH TLV (United States, 2/2010). TWA: 10 mg/m³, (as Mo) 8 hour(s). Form: Inhalable fraction</p>
Manganese	<p>ACGIH TLV (United States, 2/2010). Notes: as Mo TWA: 3 mg/m³, (as Mo) 8 hour(s). Form: Respirable fraction OSHA PEL (United States, 6/2010). Notes: as Mn CEIL: 5 mg/m³, (as Mn) Form: Fume OSHA PEL 1989 (United States, 3/1989). Notes: as Mn STEL: 3 mg/m³, (as Mn) 15 minute(s). Form: Fume TWA: 1 mg/m³, (as Mn) 8 hour(s). Form: Fume ACGIH TLV (United States, 2/2010). Notes: as Mn TWA: 0.2 mg/m³, (as Mn) 8 hour(s).</p>
Silicon	<p>OSHA PEL (United States, 6/2010). TWA: 5 mg/m³ 8 hour(s). Form: Respirable fraction TWA: 15 mg/m³ 8 hour(s). Form: Total dust OSHA PEL 1989 (United States, 3/1989). TWA: 5 mg/m³ 8 hour(s). Form: Respirable fraction TWA: 10 mg/m³ 8 hour(s). Form: Total dust NIOSH REL (United States, 6/2009). TWA: 10 mg/m³ 10 hour(s). Form: Total</p>

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Personal protection**
- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products.
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state	: Solid. [Wire]
Color	: Gray.
Odor	: Odorless.
Melting/freezing point	: 1204.4°C (2199.9°F)
VOC content	: 0 lbs/gal (0 g/l)
Solubility	: Insoluble in the following materials: cold water and hot water.

10. Stability and reactivity

Chemical stability	: The product is stable.
Conditions to avoid	: No specific data.
Incompatible materials	: No specific data.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.

11. Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Manganese	LD50 Oral	Rat	9 g/kg	-
Boron	LD50 Oral	Rat	650 mg/kg	-
Silicon	LD50 Oral	Rat	3160 mg/kg	-

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Tungsten	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
Manganese	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
Silicon	Eyes - Mild irritant	Rabbit	-	3 milligrams	-

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Chromium	A4	3	-	-	-	-

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

11. Toxicological information

Conclusion/Summary : Not available.

12. Ecological information

Ecotoxicity : No known significant effects or critical hazards.

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
Chromium	Acute EC50 17.8 mg/L Marine water	Algae - Dunaliella tertiolecta - Exponential growth phase	72 hours
	Acute EC50 5 ppm Marine water	Aquatic plants - Macrocystis pyrifera - Young	4 days
	Acute LC50 87.5 ppm Marine water	Crustaceans - Scylla serrata - Intermolt - 9 cm - 95 g	48 hours
Molybdenum	Acute LC50 14.3 ppm Fresh water	Fish - Cyprinus carpio	96 hours
	Acute LC50 800 mg/L Fresh water	Fish - Oncorhynchus mykiss - 20 mm	96 hours
Manganese	Acute EC50 31000 ug/L Fresh water	Aquatic plants - Lemna minor	4 days
	Acute EC50 40000 ug/L Fresh water	Daphnia - Daphnia magna	48 hours
	Chronic NOEC 28000 ug/L Fresh water	Daphnia - Daphnia magna	48 hours
Boron	Acute EC50 >60000 ug/L Fresh water	Aquatic plants - Lemna minor	4 days

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

Other adverse effects : No known significant effects or critical hazards.

13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
DOT Classification	Not regulated.	-	-	-	-	-
TDG Classification	Not regulated.	-	-	-	-	-
Mexico Classification	Not regulated.	-	-	-	-	-
ADR/RID Class	Not regulated.	-	-	-	-	-

14. Transport information

IMDG Class	Not regulated.	-	-	-	-
IATA-DGR Class	Not regulated.	-	-	-	-

PG* : Packing group

15. Regulatory information

HCS Classification : Target organ effects

U.S. Federal regulations : **TSCA 8(a) PAIR**: Tungsten

TSCA 8(a) IUR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.

SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: Molybdenum; Tungsten; Carbon; Manganese; Silicon

SARA 311/312 MSDS distribution - chemical inventory - hazard identification:

Molybdenum: Immediate (acute) health hazard, Delayed (chronic) health hazard;

Tungsten: Immediate (acute) health hazard, Delayed (chronic) health hazard; Carbon:

Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard;

Manganese: reactive, Immediate (acute) health hazard, Delayed (chronic) health hazard;

Silicon: Fire hazard, Immediate (acute) health hazard; Iron: Fire hazard

Clean Water Act (CWA) 307: Chromium

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 313

	Product name	CAS number	Concentration
Form R - Reporting requirements	Chromium	7440-47-3	5 - 20
	Manganese	7439-96-5	1 - 5
Supplier notification	Chromium	7440-47-3	5 - 20
	Manganese	7439-96-5	1 - 5

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations

Massachusetts : The following components are listed: CHROMIUM; TUNGSTEN; MOLYBDENUM; MANGANESE; SILICON DUST

New York : The following components are listed: Chromium

New Jersey : The following components are listed: CHROMIUM; TUNGSTEN; MOLYBDENUM; MANGANESE; BORON; SILICON

Pennsylvania : The following components are listed: CHROMIUM; TUNGSTEN; MOLYBDENUM; MANGANESE; SILICON

15. Regulatory information

- Canada inventory** : All components are listed or exempted.
- International regulations**
- International lists** : **Australia inventory (AICS)**: All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: Not determined.
Korea inventory: Not determined.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): Not determined.
- Chemical Weapons Convention List Schedule I Chemicals** : Not listed
- Chemical Weapons Convention List Schedule II Chemicals** : Not listed
- Chemical Weapons Convention List Schedule III Chemicals** : Not listed

16. Other information

- Label requirements** : MAY BE HARMFUL IF SWALLOWED. MAY CAUSE EYE AND SKIN IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

- Hazardous Material Information System (U.S.A.)** :

Health	1
Flammability	0
Physical hazards	0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

- National Fire Protection Association (U.S.A.)** :



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

- Date of printing** : 10/4/2012.
- Date of issue** : 10/4/2012.
- Date of previous issue** : No previous validation.

16. Other information

Version : 1

Prepared by : Not available.

✔ Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.