United Nuclear

Scientific Equipment & Supplies

Issuing Date: August 19, 2016

SAFETY DATA SHEET

SECTION 1: IDENTIFICATION

Product Name: Nickel and/or Chromium Alloy Wire

Alternate Identification: (See Section 3)

Product Use: Resistance Wire

Company: United Nuclear Scientific
125 N. 8th Street
Klamath Falls, OR 97601
Phone: (541) 205-6855

24 HR Emergency Phone: (800) 255-3924 VelocityEHS (USA)

Bare nickel and/or chromium alloy wire supplied by MWS Wire Industries is classified as an article and pose no hazard as shipped and required label elements are based on this status.

Hazard classification: Not classified

Signal word, hazard statement, symbol & precautionary statement: None

Hazards not otherwise classified: Solid metallic nickel and/or chromium alloys do not constitute a hazard. Some industrial processes (like welding, sawing, grinding, etc.) may result in the formation of fumes or dust. Airborne concentrations of nickel fumes or dust may:

- Readily ignite
- Create poisonous gas in the event of a fire
- Cause "metal fume fever" or lung irritation if inhaled
- Cause eye irritation

Nickel and/or chromium alloys are suspected to be carcinogenic. Nickel is absorbed through skin contact and may cause superficial irritation. Some people develop nickel allergies as a dermatitis of the skin or rarely as asthma in the lungs. Nickel may be harmful if swallowed.

SECTION 3: COMPOSITION

Ingredients	CAS No
Aluminum	7429-90-5
Cadmium	7440-43-9
Cobalt	7440-48-4
Copper	7440-50-8
Chromium*	7440-47-3
Iron	1309-37-1
Manganese	439-96-5
Molybdenum 7	439-98-7
Nickel	7440-02-0
Silicon	7440-21-3
Titanium	7440-32-6

Alloy	Composition
MWS 800	75 Ni, 20 Cr, 2.5 Al, 2.5 Cu
MWS 675	61 Ni, 15 Cr, bal Fe
MWS 650	80 Ni, 20 Cr
MWS 294	55 Cu, 45 Ni
MWS 294R	29 Ni, 17 Co, bal Cu
MWS 180	22 Ni, bal Cu
MWS 120	70 Ni, 30 Fe
MWS 90	12 Ni, bal Cu
MWS 60	6 Ni, bal Cu
MWS 30	2 Ni., bal Cu
Stainless Steel 302	18 Cr, 9 Ni, bal Fe
Stainless Steel 304	18.5 Cr, 9.5 Ni, bal Fe
Stainless Steel 316	17 Cr, 12 Ni, 2.3 Mo, bal Fe
Stainless Steel 17-7 PH	17 Cr, 7 Ni, 1.1 Al, bal Fe
Stainless Steel 321	18 Cr, 11 Ni, .4 Ti, bal Fe
Alloy 42	42 Ni, bal Fe
Alloy 52	50 Ni, bal Fe
Manganin	13 Mn, 4 Ni, bal Cu
Monel® 400	70 Cu, 30 Ni
Inconel® 600	76 Ni, 15 Cr, 8 Fe, .5 Mn
Inconel® X 750	73 Ni, 15.5 Cr, 7 Fe, 2.5 Ti, 1 Cb, .7 Al
Tin Plated Nickel	90-96 Ni, 4-10 Sn
Nickel Silver	55-72 Cu, 12-18 Ni, bal Zn
Dumet	42 Ni, 1 Mn, 32-37 Fe, bal Cu
Nickel 200	99.5 Ni
Nickel 205	99.5 Ni
Nickel 211	95 Ni, 4.9 Mn
Nickel 270	99.98 Ni
Nickel Plated Copper	90-96 Cu, 4-10 Ni
Nickel Clad Copper	73 Cu, 27 Ni
Chromel®	90 Ni, 10 Cr
Alumel®	2 Al, 2 Mn, bal Ni
Kanthal A-1®(MWS 875)	5.5 Al, 22 Cr, bal Fe
Cu Alloy 135 (CDA 18135)	99.2 Cu, .4 Cr, .4 Cd

SECTION 4: FIRST AID MEASURES

Eyes: If nuisance dust, smoke or fume is created by burning or soldering, personnel in the vicinity may experience eye irritation. Rinse with water for 15 minutes and contact physician as needed.

Inhalation: If dust, smoke or fume is created by burning, soldering, or abrasion, personnel in the vicinity may experience nose and throat irritation. Move to fresh air immediately and seek medical attention if needed.

Ingestion: Not expected route of exposure. In case of ingestion seek immediate medical attention.

SECTION 5: FIRE FIGHTING MEASURES

Nickel is noncombustible except as a powder. Wire presents minimal explosion or fire hazard. Use extinguishing media suitable for a metal fire such as dry sand or a Class D extinguisher. Do not attempt to extinguish fire with water or Carbon Dioxide foam extinguishers. Poisonous gasses are produced in a metal fire. Fire fighters should use self-contained breathing apparatus if necessary.

SECTION 6: ACCIDENTAL RELEASE MEASURES

In solid form nickel wire poses no special clean up problems. If material is in powder or dust form, clean up should be conducted to minimize airborne powder and dust and to avoid contamination of air and water. Unprocessed wire is an easily contained solid material and has reclamation value as scrap. Where this is not practical, it may be disposed in accordance with state and federal regulations. Do not allow into drains or water sources.

SECTION 7: HANDLING AND STORAGE

Safe Handling and Storage: Wear safety glasses when risk of eye injury is present, particularly during machining, grinding, welding, powder handling, etc. Gloves and other protective equipment may be required during handling operations as appropriate to the circumstances of exposure. Always wash hands after handling nickel products. Wash any nickel contaminated clothing before reuse.

Handle spools by the flanges and use powered lift equipment when necessary to lift or move heavy reels. The optimum storage environment is low humidity and temperature controlled to avoid extremes.

Incompatible Products: Nickel is incompatible with strong acids, ammonia, ammonia nitrate, p-dioaxane, fluorine, hydrazine, hydrogen, magnesium silicate, methonol, strong oxidizers, potassium, sulfur, selenium, wood and other combustibles, and nickel nitrate.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Substance	CAS No.	TLV	PEL	TEL
Aluminum	7429-90-5	10 (D) / 5 (F)	NS	20
Cadmium	7440-43-9	0.002 (D)	0.005	
Cobalt	7440-48-4	0.1	0.1	NS
Copper	7440-50-8	1 (D) / 0.2 (F)	1 (D) / 0.1 (F)	2
Chromium**	7440-47-3	0.5	1	NS
Iron	1309-37-1	5 (F)	10	NS
Manganese	7439-96-5	5* (D) / 1 (F)	5*	3
Molybdenum	7439-98-7	10	15	20
Nickel	7440-02-0	1	1	NS
Silicon	7440-21-3	5 (D)	NS	NS
Titanium	7440-32-6	NS	NS	NS

Note: TLV - American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (mg/m^3)

PEL - OSHA Permissible Exposure Level (mg/m^3), 8 hour time weighted average

STEL - ACHIH Short Term Exposure Limit (mg/m^3), 15 minutes maximum

* Ceiling Level (Not to be exceeded) D = Dust F = Fume NS = Not Specified

* Nickel chromium products as provided contain chromium in the zero valence state. As such, chromium metal does not present any unusual health hazard. However, processes generating airborne particles may create concentrations of hexavalent chromium.

Engineering Controls: Operations that generate fume or dust created by burning, soldering, mechanical insulation stripping or abrasion should be conducted under a fume hood or in an area with good local ventilation as required by the circumstances of exposure.

Personal Protective Equipment: Wear safety glasses when the risk of eye injury is present, particularly during machining, grinding, soldering, brazing, welding, powder handling, etc. Gloves and other protective equipment may be required during handling operations as appropriate to the circumstances of exposure.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Name	Appearance & Odor	Specific Gravity	Melting Temp °C
MWS 800	All solid with no odor.	8.10	1350
MWS 675	Nickel and Chromium alloys	8.247	350
MWS 650	are normally silvery gray in	8.412	1400
MWS 294	color although some alloys	8.90	1210
MWS 294R	may be coated with graphite	8.36	1450
MWS 180	or copper.	8.90	1100
MWS 120		8.46	1425
MWS 90	These alloys are	8.90	1100
MWS 60	insoluble.	8.90	1100
MWS 30		8.90	1100
Stainless Steel 302		7.90	1421
Stainless Steel 304		7.90	1454
Stainless Steel 316		7.81	1399
Stainless Steel 17-7 PH		7.90	No Data
Stainless Steel 321		8.36	1427
Alloy 42		8.10	1425
Alloy 52		8.25	1425
Manganin		8.192	1020
Monel® 400		8.90	1350
Inconel® 600		8.43	1413
Inconel® X 750		8.25	1427
Tin Plated Nickel		8.79	1446
Nickel Silver		8.70	1100
Dumet		No Data	No Data
Nickel 200		8.90	1446
Nickel 205		8.90	1446
Nickel 211		8.73	1427
Nickel 270		8.90	1454
Nickel Plated Copper		8.90	1083
Nickel Clad Copper		8.90	1440
Chromel®		8.73	1430
Alumel®		8.60	1400
Kanthal A-1® (MWS 875)		7.10	1510
Cu Alloy 135 (CDA 18135)		8.94	1080

SECTION 10: STABILITY AND REACTIVITY

Reactivity: Nickel and/or Chromium alloy metal has low chemical reactivity with air, water and common solvents.

Chemical Stability: Nickel and/ chromium alloy wire is chemically stable

Possibility of Hazardous Reactions: None under normal use

Conditions to avoid (e.g., static discharge, shock or vibration): None known.

Incompatible Materials: Strong oxidizing agents

SECTION 11: TOXICOLOGICAL INFORMATION

Exposure to high doses of nickel and other listed alloy ingredients can be harmful. Exposure to nickel dust can irritate he nose, mouth, and eyes, and cause headaches, dizziness, nausea, and diarrhea. Workers exposed to nickel dust report a number of symptoms that are suggestive of respiratory irritation, including coughing, sneezing, thoracic pain and runny nose. The New Jersey Department of Health reports inhaling Nickel can cause a sore and/or hole in the septum dividing the inner nose (Source New Jersey Right to Know Hazardous Substance Fact Sheet).

Intentionally high intakes of nickel may cause liver and kidney damage. The US Department of Health and Human Services has determined nickel metal may reasonably be anticipated to be a carcinogen and some compounds may be a carcinogenic to humans.

(Source: Agency for Toxic Substances & Disease Registry, Public Health Statement for Copper)

Metallic Nickel has been listed as reasonably anticipated to be a human carcinogen from studies in experimental animals by the NTP. IARC concludes there is a small but significant elevation in lung cancer risk for workers exposed to metallic nickel. OSHA lists Nickel metal as a health risk for nasal, sinus, and lung cancers.

SECTION 12: ECOLOGICAL INFORMATION

Nickel alloy metals are not acutely toxic.

Ecotoxicity: Nickel is an essential micronutrient. Studies have shown that aquatic species differ greatly in their sensitivity to nickel with some able to tolerate high concentrations while others are adversely affected by very low concentrations.

Persistence and degradability: Nickel metal does not biodegrade and is expected to be persistent in the environment.

Bioaccumulative potential: No data

Other adverse effects: Excessive concentration of dissolved Nickel can be detrimental to the growth and health of plant life and aquatic life.

SECTION 13: DISPOSAL CONSIDERATIONS

Nickel and/Chromium alloy wire has reclamation value. If this is not practical, it must be disposed in accordance with local, state and federal regulation, which may require specific labeling, packaging, transportation and disposal procedures.

RCRA Hazardous Waste Number: Not regulated.

SECTION 14: TRANSPORT INFORMATION

UN Number: Not Applicable

UN Shipping Name: Not Applicable

D.O.T. Shipping Name: Not regulated

Hazard Class: Not Applicable

Packing Group: Not Applicable

Transport in Bulk: Not Applicable

Environmental Hazards: See Section 12 above

Special Precautions: None known.

SECTION 15: REGULATORY INFORMATION

SARA TITLE III SECTION 313: Nickel is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR Part 372 of the Federal Register. Additional information can be obtained from the Emergency Planning and Community Right-To-Know Information Hot Line, US EPA, (800) 424-9346.

CERCLA Reportable Quantity [RQ]: 100 pounds for pieces <.004" in diameter

EC RoHS DIRECTIVE COMPLIANCE: Nickel and/or chromium alloy wire complies with Directive 2011/65/EU [recast of RoHS Directive 2002/95/EC] of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

ECHA REACH COMPLIANCE: Nickel and/or chromium alloy wire meets the definition of an article under REACH and does not contain SVHC listed as of the revision date of this SDS.

SECTION 16: OTHER INFORMATION

SDS Title: Nickel and/or Chromium Alloy Wire Revision Date: August 17, 2016

United Nuclear Scientific has attempted to provide current and accurate information in this data sheet, however United Nuclear Scientific makes no representations regarding the accuracy or completeness of the information. Information is supplied upon the condition that the persons receiving it will make their own determinations as to its suitability prior to use. United Nuclear Scientific assumes no liability for any loss, damage or injury of any kind which may arise out of the use or reliance on the information by any person. No warranties, either express or implied, of merchantability, fitness for a particular purpose or of any other nature are made with respect to the foregoing information or the product to which the information refers.

Applicability to REACH: Nickel and/or Chromium Alloy wire meets the definition of an article and as such, is outside the scope of Article 31 of REACH. This SDS conforms to 29 CFR 1900.1200 and is provided as a convenience for our customers. It is not intended, nor required to comply with REACH SDS requirements. *(Source: ECHA, Guidance on the compilation of safety data sheets, Version 2.1, February 2014).*