

MSDS 004
Revised 11/2010

MATERIAL SAFETY DATA SHEET

MWS Wire Industries
31200 Cedar Valley Drive
Westlake Village, CA 91362
(818) 991-8553

Trade Name: See Pages 4 and 5 for trade names, composition and insulation glossary

Chemical Family: Insulated Nickel and/or Chromium Alloys

Chemical Formula:

HAZARDOUS INGREDIENTS

<u>Ingredient</u>	<u>CAS No.</u>	<u>TLV</u>	<u>PEL</u>	<u>STEL</u>
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/m³)

PEL - OSHA Permissible Exposure Level (mg/m³), 8 hour time weighted average

STEL - ACHIH Short Term Exposure Limit (mg/m³), 15 minutes maximum

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

Metallic wire constitutes 85-99% of total product weight. Resin insulation coatings constitute 1-15% of the total product weight.

PHYSICAL DATA

Boiling Point °C: NA

Vapor Pressure: NA

Vapor Density: N/A

% Volatile: NA

Evaporation Rate: NA

Solubility in H₂O: Insoluble

Melting Temperature and Specific Gravity: See Page 4

Appearance & Odor: Solid with no odor to very mild cresol odor. Color varies with type of coating. Basic colors are red, green, brown and amber. Special colors are also produced.

FIRE & EXPLOSION HAZARD DATA

Flash Point: N/A

Fire or Explosion Hazard: N/A

Note: Nickel/chromium alloys are nonflammable, although sparks from welding may ignite flammable or combustible materials. Use extinguishing media suitable for surrounding materials. Fire fighters should use self-contained breathing apparatus as deemed necessary.

HEALTH HAZARD DATA

Fine powders, granules and fumes from welding or abrasive operations may pose a health hazard.

Short Term Exposure: Dust and fumes irritate the eyes, nose and throat. Symptoms may include cough, metallic taste in mouth, fever, fatigue and nausea.

Long Term Exposure: Watering of the eyes, headaches, difficulty in breathing, coughing, severe chest pains and in acute cases, lung disease, lung fibrosis, pneumoconiosis or neurological damage. Prolonged skin contact with nickel may sensitize the skin and produce a rash.

Emergency First Aid Procedure:

- In case of fume inhalation, remove from exposure and consult a physician.
- In case of eye contact, flush with large amounts of water for at least fifteen minutes. Seek medical attention.
- In case of ingestion, seek immediate medical attention.

Nickel and Chromium have been listed by either the International Agency for Cancer Research (IACR) or the National Toxicology Program (NTP) as potential carcinogens.

REACTIVITY DATA

Stability: Stable. Further processing such as grinding or welding can generate various metallic oxides, complex metallic compounds and gases such as carbon monoxide, ozone and nitrogen oxide.

SPILL, LEAK, DISPOSAL PROCEDURES

Scrap metal may have reclamation value. Where this is not practical, it may be disposed in accordance with state and federal regulations. In solid form, these alloys pose no special clean up problems. If material is in powder or dust form, clean up should be conducted to minimize generation of airborne powder and dust and to avoid contamination of water. Depending on the quantity, spills or releases to the environment may require a report to the National Response Center at (800) 424-8802.

EPCRA SECTION 313

Products listed herein contain toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act 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, at (800) 535-0202.

CALIFORNIA PROPOSITION 65 WARNING

Nickel is known by the State of California to cause cancer, birth defects or other reproductive harm. See preceding data for health hazard information.

EC RoHS DIRECTIVE COMPLIANCE

The products listed on pages 4 and 5 of this MSDS except Copper Alloy 135 (CDA 18135) are in compliance with Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. Chromium contained in these products is chromium metal, not hexavalent chromium. There may be trace lead content ranging from zero to 200 ppm, below the RoHS threshold of 1000 ppm for lead.

ECHA REACH COMPLIANCE

Nickel/Chromium wire meets the definition of an article under REACH and does not contain SVHC listed as of the revision date of this MSDS. Also see http://www.mwswire.com/pdf_files/reach.pdf for more information on MWS Wire products and REACH.

SPECIAL PROTECTION

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.

SPECIAL PRECAUTIONS

When welding, melting, casting, grinding, sanding, polishing or otherwise abrading the surface of nickel/chromium alloys in a manner which generates finely divided particles, an exposure to airborne nickel or chromium in excess of the occupational standard can occur. Use with adequate ventilation to meet listed exposure limits. Processes generating airborne nickel or chromium must be air sampled to determine exposure levels. Where exposure data indicate, medical surveillance should be conducted.

PACKAGING & LABELING REQUIREMENTS

D.O.T. Shipping Name: Not regulated

Hazard Class: NA

MWS Wire Industries (MWS) has attempted to provide current and accurate information in this data sheet, however MWS 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. MWS 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. Contact person: Ken Goss at (818) 991-8553.

NICKEL / CHROMIUM ALLOY DATA

<u>Name</u>	<u>Composition</u>	<u>Specific Gravity</u>	<u>Melting Temp °C</u>
MWS 800	75 Ni, 20 Cr, 2.5 Al, 2.5 Cu	8.10	1350
MWS 675	61 Ni, 15 Cr, bal Fe	8.247	1350
MWS 650	80 Ni, 20 Cr	8.412	1400
MWS 294	55 Cu, 45 Ni	8.90	1210
MWS 294R	29 Ni, 17 Co, bal Cu	8.36	1450
MWS 180	22 Ni, bal Cu	8.90	1100
MWS 120	70 Ni, 30 Fe	8.46	1425
MWS 90	12 Ni, bal Cu	8.90	1100
MWS 60	6 Ni, bal Cu	8.90	1100
MWS 30	2 Ni., bal Cu	8.90	1100
Stainless Steel 302	18 Cr, 9 Ni, bal Fe	7.90	1421
Stainless Steel 304	18.5 Cr, 9.5 Ni, bal Fe	7.90	1454
Stainless Steel 316	17 Cr, 12 Ni, 2.3 Mo, bal Fe	7.81	1399
Stainless Steel 17-7 PH	17 Cr, 7 Ni, 1.1 Al, bal Fe	7.90	No Data
Stainless Steel 321	18 Cr, 11 Ni, .4 Ti, bal Fe	8.36	1427
Alloy 42	42 Ni, bal Fe	8.10	1425
Alloy 52	50 Ni, bal Fe	8.25	1425
Manganin	13 Mn, 4 Ni, bal Cu	8.192	1020
Monel® 400	70 Cu, 30 Ni	8.90	1350
Inconel® 600	76 Ni, 15 Cr, 8 Fe, .5 Mn	8.43	1413
Inconel® X 750	73 Ni, 15.5 Cr, 7 Fe, 2.5 Ti, 1 Cb, .7 Al	8.25	1427
Tin Plated Nickel	90-96 Ni, 4-10 Sn	8.79	1446
Nickel Silver	55-72 Cu, 12-18 Ni, bal Zn	8.70	1100
Dumet	42 Ni, 1 Mn, 32-37 Fe, bal Cu	No Data	No Data

NICKEL / CHROMIUM ALLOY DATA (continued)

<u>Name</u>	<u>Composition</u>	<u>Specific Gravity</u>	<u>Melting Temp °C</u>
Nickel 200	99.5 Ni	8.90	1446
Nickel 205	99.5 Ni	8.90	1446
Nickel 211	95 Ni, 4.9 Mn	8.73	1427
Nickel 270	99.98 Ni	8.90	1454
Nickel Plated Copper	90-96 Cu, 4-10 Ni	8.90	1083
Nickel Clad Copper	73 Cu, 27 Ni	8.90	1440
Chromel®	90 Ni, 10 Cr	8.73	1430
Alumel®	2 Al, 2 Mn, bal Ni	8.60	1400
Kanthal A-1® (MWS 875)	5.5 Al, 22 Cr, bal Fe	7.10	1510
Cu Alloy 135 (CDA 18135)	99.2 Cu, .4 Cr, .4 Cd	8.94	1080

INSULATION GLOSSARY

<u>Name</u>	<u>NEMA Temperature Class</u>	<u>Description</u>
Plain Enamel	105 C	Synthetic oleoresinous
Formvar ¹	105 C	Polyvinyl Formal
Polyurethane	155 / 180 C	Modified Polyurethane
Polyurethane Nylon	155 / 180 C	Modified Polyurethane with Polyamide overcoat
Solderable Polyesterimide	180 C	Polyesterimide
Polyester 200	180 C	Modified Polyester
Armored Polyester	200 C	Modified Polyester or Polyesterimide with Amide-Imide overcoat
ML ²	240 C	Polyimide
All insulations may be supplied with a bondable overcoat.		
Butvar Bond		Polyvinyl Butyral
Polyester Bond		Polyester
Epoxy Bond		Epoxy
Polyamide Bond		Polyamide

¹ Chisso Corp. Registered Trademark

² IST (USA) Corp. Registered Trademark