

NATIONAL ELECTRIC WIRE COMPANY

MATERIAL SAFETY DATA SHEET

Ni-Cr, Ni-Cr-Fe and Ni-Fe Alloys

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SECTION 1 - PRODUCT IDENTIFICATION

The MSDS covers all National Electric Wire Company alloys which contain nickel-chromium, nickel-chromium-iron and nickel-iron.

Trade name and nominal composition are listed in Section 2A.

SECTION 2A - TRADE NAME AND NOMINAL COMPOSITION

WEIGHT % - 1% or greater

PRODUCT NAME	Cr	Fe	Mn	Ni*	Si	Other	Spec Grav.	Approx. Melt. Pt. C
NiCrC	16	24		59	1		8.2	1350
NiCrKP	9			91			8.7	1425
NiCrSiINP	14			85	1		8.4	1425
NiCrC Ox	10	27	3	60			8.1	1350
NiCrA	20			79	1		8.4	1400
NiCrACb	20			78	1	1Cb	8.4	1400
NiCr30	30			69	1		8.2	1400
NiCrAA	20	8		70	2		8.0	1450
NiCrF	20		1	73		3Al 2Cu	8.4	1400
NiCrDCb	21	41		35	2	1Cb	8.0	1380
NiCrD	20	44		35	1		8.0	1380
NiCrI	21	40		37	2		8.0	1350
NiCrAE1	20			80			8.4	1400
NiCrFe600	15	8		77			8.0	1450
NiCr62	15	7		76		2Cb	8.0	1450
HiTCR		28		72			8.4	1425
NiFe52		52		48			8.3	1425
NiFe42		42		58			8.1	1425
NiFe36		36		64			8.0	1425
Even R	20		1	73.5	1	2.5Al	8.44	1400

*Includes elements plus other trace elements.

SECTION 3 - PHYSICAL DATA

Boiling Point:	2750°C \pm200
Specific Gravity (H₂O=1):	8.3 \pm0.4
Percent Volatile By Volume:	0
Percent Solid By Weight:	100
Solubility In Water:	0
Appearance and Odor:	Grey metallic. Odorless.

Alloy products are solid metals shaped as wire, rod or strip.

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

Speical fire fighting procedures: None

Unusual fire and explosion hazards: None

Material is unflammable; however, welding arcs and sparks can ignite flammable liquids and vapors and combustible solids.

SECTION 5 - HEALTH HAZARD DATA

Under normal handling and use, exposure to solid, massive forms of alloy presents few health hazards. They may include skin irritation or other allergic reactions in sensitive individuals.

Exposure Limits:

Section 2 lists specific hazardous ingredients and exposure limits. Section 6 lists exposure limits for hazardous reaction products that might be formed by welding and high temperature cutting. Determine actual exposure by industrial hygiene monitoring.

Effects of Exposure to Dust, Welding Fume and Gases

Short Term Exposure:

Nausea, tightness of chest, fever, irritation of eyes, nose, throat and skin; loss of conciousness due to welding gases or lack of oxygen.

Long Term Exposure:

Adverse effects may include skin sensitization, neurological damage and respiratory disease (bronchial asthma, lung fibrosis or pneumoconiosis). According to OSHA 29CFR1910.1200 nickel and chromium are considered possible carcinogens. Recent epidemiological studies of workers melting and working alloys containing nickel-chromium have found no increased risk of cancer.

Emergency First Aid:

Remove from exposure and obtain prompt medical attention. Administer oxygen if victim is unconscious. If not breathing, resuscitate immediately.

SECTION 6 - REACTIVITY INFORMATION

Stability: Material is stable.

Incompatibility: Avoid acids. Contact with mineral acids will release hydrogen - a very readily combustible gas.

Hazardous Reaction Products:

Fumes and gases from welding and high temperature cutting contain constituents different from the ingredients listed in Section 2 and may include oxides of the metals, chromates, fluorides and complex metallics. The gases may include carbon monoxide, ozone and nitrogen oxides.

The following exposure limits apply to those fumes and gases which may be found in the welding or high temperature cutting environment.

<u>SUBSTANCE</u>	<u>PEL</u>	<u>TLV</u>
Aluminum Fume (Al)	None	5.0
Carbon Monoxide (CO)	50ppm	50 ppm
Chromium (Chromates)	0.1	0.05
Cobalt Fume (Co)	0.1	0.05
Copper Fume (Cu)	0.1	0.2
Fluorides (as F)	2.5	2.5
Iron Oxide Fume (as Fe)	10.0	5.0
Manganese Fume (Mn)	5.0	1.0
Molybdenum (soluble) (Mo)	5.0	5.0
Nickel (soluble) (Ni)	1.0	0.1
Nitrogen Dioxide (NO ₂)	5.0 ppm	3 ppm
Ozone (O ₃)	0.1 ppm	0.1 ppm
Phosgene (COCl ₂)	0.1 ppm	0.1 ppm

PEL/TLV values are mg/m³ except where indicated as ppm

SECTION 7 - SPILL OR LEAK PROCEDURES

Under normal handling and uses material is not volatile or dusty and does not present spillage and leakage problems. No protection required, except avoid prolonged or repeated direct skin contact if sensitive to metals. Use gloves.

If however, material is released or spilled from cutting, grinding or welding operations, vacuum residue into suitable containers and dispose of in accordance with EPA or local regulations.

SECTION 8 - SPECIAL PROTECTION INFORMATION

Respiratory:

If solid metal alloys are converted in manufacturing (including grinding, high temperature cutting and welding) processes to dusts, fumes, gases or mists, and ventilation is not adequate to maintain exposures below the limits specified in Sections 2 and 6, then respiratory protection should be used. Use only NIOSH (National Institute For Occupational Safety and Health) approved respirators in accordance with OSHA 29CFR1910.134.

Ventilation:

If solid metal alloys are converted to dusts, fumes or mists, maintain working environment below the exposure limits specified in Sections 2 and 6 by use of adequate exhaust ventilation.

Protective Gloves:

Leather or rubber gloves are recommended.

Eye Protection:

Use safety goggles when cutting, grinding or welding.

Other Protective Equipment:

When cutting, grinding or welding, wear gloves, face protection and flame retardant clothing. Select welding lense shade from AWS Publication F2.2.

SECTION 9 - SPECIAL PRECAUTIONS

Material in solid form does not require special precautions in handling and storing. However, use industrial hygiene air monitoring to ensure that the use of this material does not create exposures which exceed the levels specified in Sections 2 and 6.