



UNIQUE WELDING ALLOYS

a division of Weldamax (Pty) Ltd

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: G312

Recommended use and restriction on use

Recommended use: SMAW (Shielded Metal Arc Welding)
Restrictions on use: Not known.

Manufacturer/Importer/Supplier/Distributor Information

Supplier:
Doris Industrial CO., Ltd.
3F., No. 92, Ning Po West Street,
Taipei, Taiwan 100
Phone: +886 2-23961663
Fax: +886-2-23961683
E-mail: doris.ind@msa.hinet.net

2. HAZARDS IDENTIFICATION

Classified according to the criteria of the Globally Harmonized System of Classification and Labeling of Chemicals(GHS), OSHA Hazard Communication Standard (29 CFR 1910.1200) and the Canadian Controlled Products Regulations.

Hazard Classification

Not classified as hazardous according to applicable GHS hazard classification criteria.

Label Elements

Hazard Symbol:
Signal Word:
Hazard Statement
Precautionary Statement

No symbol
No signal word.
Not applicable
Not applicable

Other hazards which do not result in GHS classification

Electrical Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, or if there is a high risk of unavoidable or accidental contact with work piece, use the following equipment:
Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control.

Arc rays can injure eyes and burn skin. Welding arc and sparks can ignite combustibles and flammable materials. Overexposure to welding fumes and gases can be hazardous. Read and understand the manufacturer's instructions, Safety Data Sheets and the precautionary labels before using this product. Refer to Section 8

Substance(s) formed under the conditions of use:

The welding fume produced from this welding electrode may contain the following constituent(s) and/or their complex metallic oxides as well as solid particles or other constituents from the consumables, base metal, or base metal coating not listed below:

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www.uniquewelding.co.za

Chemical Identity	CAS No.
Carbon dioxide	124-38-9
Carbon monoxide	630-08-0
Nitrogen dioxide	10102-44-0
Ozone	10028-15-6
Manganese	7439-96-5
Nickel	7440-02-0
Chromium oxide	1308-38-9
Fluorides	16984-48-8
Chromium (VI)	18540-29-9

3. COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Ingredients

Chemical Identity	CAS number	Content in percent (%)
Iron	7439-89-6	20-<50
Titanium dioxide	13463-67-7	10-<20
Chromium and chromium alloys	7440-47-3	20-<50
Limestone	1317-65-3	5-<10
Manganese	7439-96-5	1-<5
Sodium silicate	1344-09-8	1-<5
Fluorides (as F)	16984-48-8	0.1-<1
Potassium Carbonate	12136-45-7	0.1-<1
Silicon	7440-21-3	0.1-<1
Quartz	14808-60-7	0.1-<1
Molybdenum	7439-98-7	0.1-<1
Nickel	7440-02-0	5-<10
Copper and/or copper alloys and compounds (as Cu)	7440-50-8	0.1-<1

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Composition Comments:

The term "Hazardous Ingredients" should be interpreted as a term defined in Hazard Communication standards and does not necessarily imply the existence of a welding hazard. The product may contain additional nonhazardous ingredients or may form additional compounds under the condition of use. Refer to Sections 2 and 8 for more information.

4. FIRST AID MEASURES

Ingestion:

Unlikely due to form of product, except for granular materials. Avoid hand, clothing, food, and drink contact with metal fume or powder which can cause ingestion of particulate during hand to mouth activities such as drinking, eating, smoking, etc. If ingested, do not induce vomiting. Contact a poison control center. Unless the poison control center advises otherwise, wash out mouth thoroughly with water. If symptoms develop, seek medical attention at once.

Inhalation:

Move to fresh air if breathing is difficult. If breathing has stopped, perform artificial respiration and obtain medical assistance at once.

Skin Contact:

Remove contaminated clothing and wash the skin thoroughly with soap and water. For reddened or blistered skin, or thermal burns, obtain medical assistance at once.

Eye contact:

Dust or fume from this product should be flushed from the eyes with copious amounts of clean, tepid water until transported to an emergency medical facility. Do not allow victim to rub or keep eyes tightly closed. Obtain medical assistance at once.

Arc rays can injure eyes. If exposed to arc rays, move victim to dark room, remove contact lenses as necessary for treatment, cover eyes with a padded dressing and rest. Obtain medical assistance if symptoms persist.

Most important symptoms/effects, acute and delayed

Symptoms: Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema).

Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung), central nervous system effects, bronchitis and other pulmonary effects. Refer to Section 11 for more information.

Hazards: Welding hazards are complex and may include physical and health hazards such as but not limited to electric shock, physical strains, radiation burns (eye flash), thermal burns due to hot metal or spatter and potential health effects of overexposure to welding fume or dust. Refer to Section 11 for more information.

Indication of immediate medical attention and special treatment needed
Treatment: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

General Fire Hazards: As shipped, this product is nonflammable. However, welding arc and sparks can ignite combustibles and flammable products. Read and understand American National Standard Z49.1, "Safety In Welding, Cutting and Allied Processes" and National Fire Protection Association NFPA 51B, "Standard for Fire Prevention During Welding, Cutting and Other Hot Work" before using this product.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: As shipped, the product will not burn. In case of fire in the surroundings: use appropriate extinguishing agent.

Unsuitable extinguishing media: None known

Specific hazards arising from the chemical: Welding arc and sparks can ignite combustibles and flammable products.

Special protective equipment and precautions for firefighters

Special fire fighting procedures: Use standard firefighting procedures and consider the hazards of other involved materials.

Special protective equipment for fire-fighters: Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures If airborne dust and/or fume is present, use adequate engineering controls and, if needed, personal protection to prevent overexposure. Refer to recommendations in Section 8

Methods and material for containment and cleaning up Clean up spills immediately, observing precautions in the personal protective equipment in Section 8. Avoid generating dust. Prevent product from entering any drains, sewers or water sources. Refer to Section 13 for proper disposal.

Environmental Precautions: Avoid release to the environment. Prevent further leakage or spillage if safe to do so.

7. HANDLING AND STORAGE

Precautions for safe handling:

Keep formation of airborne dusts to a minimum. Provide appropriate exhaust ventilation at places where dust is formed.
Read and understand the manufacturer's instruction and the Precautionary label on the product. See American National Standard Z49.1, "Safety in Welding, Cutting and Allied Processes" published by the American Welding Society, <http://pubs.aws.org> and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, www.gpo.gov.

Conditions for safe storage, including any incompatibilities:

Store in closed original container in a dry place. Store away from incompatible materials. Store in accordance with local/regional/national regulations.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control Parameters

Occupational Exposure Limits:

Chemical Identity	Type	Exposure Limit Values	Source
Iron	TWA	10 mg/m ³	US. ACGIH Threshold Limit Values
Titanium dioxide	TWA	10 mg/m ³	US ACGIH Threshold Limit Values (12 2010)
Titanium dioxide – Total dust	PEL	15 mg/m ³	US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Chromium and chromium alloys or compounds (as Cr)	TWA	0.5 mg/m ³	US ACGIH Threshold Limit Values (12 2010)
	PEL	1 mg/m ³	US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	0.5 mg/m ³	US NIOSH: Pocket Guide to Chemical Hazards (2005)
Limestone – Total dust	PEL	15 mg/m ³	US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Limestone – Respirable fraction	REL	5 mg/m ³	US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Limestone - Respirable	REL	10 mg/m ³	US NIOSH: Pocket Guide to Chemical Hazards (2005)
Limestone - Total	REL	5 mg/m ³	US NIOSH: Pocket Guide to Chemical Hazards (2005)
Manganese – Fume. – as Mn	Ceiling	5 mg/m ³	US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	1 mg/m ³	US NIOSH: Pocket Guide to Chemical Hazards (2005)
	STEL	3 mg/m ³	US NIOSH: Pocket Guide to Chemical Hazards (2005)
Manganese – Inhalable fraction – as Mn	TWA	0.1 mg/m ³	US ACGIH Threshold Limit Values (03 2014)
Manganese – Respirable fraction –as Mn	TWA	0.02 mg/m ³	US ACGIH Threshold Limit Values (03 2014)
Sodium silicate	TWA	10 mg/m ³	US. ACGIH Threshold Limit Values
Fluorides (as F) –as F	TWA	2.5 mg/m ³	US ACGIH Threshold Limit Values (12 2010)
	PEL	2.5 mg/m ³	US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Fluorides (as F) – Dust.	TWA	2.5 mg/m ³	US OSHA Table Z-2 (29 CFR 1910.1000) (02.2006)
Potassium oxide	TWA	10 mg/m ³	US. ACGIH Threshold Limit Values
Silicon – Total dust	PEL	15 mg/m ³	US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Silicon – Respirable fraction	PEL	5 mg/m ³	US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Silicon - Respirable	REL	5 mg/m ³	US NIOSH: Pocket Guide to Chemical Hazards (2005)
Silicon - Total	REL	10 mg/m ³	US NIOSH: Pocket Guide to Chemical Hazards (2005)
Quartz – Respirable fraction	TWA	0.025 mg/m ³	US ACGIH Threshold Limit Values (12 2010)
Quartz - Respirable	TWA	2.4 millions of particles per cubic foot of air	US OSHA Table Z-3 (29 CFR 1910.1000) (2000)
	TWA	0.1 mg/m ³	US OSHA Table Z-3 (29 CFR 1910.1000)

			(2000)
Quartz – Total dust	TWA	0.3 mg/m3	US OSHA Table Z-3 (29 CFR 1910.1000) (2000)
Quartz – Respirable dust	REL	0.05 mg/m3	US NIOSH: Pocket Guide to Chemical Hazards (2005)
Molybdenum – Total dust – as Mo	PEL	15 mg/m3	US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Molybdenum – Inhalable fraction – as Mo	TWA	10 mg/m3	US ACGIH Threshold Limit Values (03 2014)
Molybdenum – Respirable fraction – as Mo	TWA	3 mg/m3	US ACGIH Threshold Limit Values (03 2014)
Nickel – Inhalable fraction	TWA	1.5 mg/m3	US ACGIH Threshold Limit Values (12 2010)
Nickel – as Ni	PEL	1 mg/m3	US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	0.015 mg/m3	US NIOSH: Pocket Guide to Chemical Hazards (2005)
Copper and/or copper alloys and compounds (as Cu)- Fume -as Cu	PEL	0.1 mg/m3	US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Copper and/or copper alloys and compounds (as Cu)-Dust and mist	PEL	1 mg/m3	US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	1 mg/m3	US NIOSH: Pocket Guide to Chemical Hazards (2005)
	TWA	1 mg/m3	US ACGIH Threshold Limit Values (03 2014)
Copper and/or copper alloys and compounds (as Cu)-Fume-as Cu	TWA	0.2 mg/m3	US ACGIH Threshold Limit Values (03 2014)

Biological Limit Values:

Chemical Identity	Exposure Limit Values	Source
Fluorides (as F) (Fluoride: Sampling time: Prior to shift)	2 mg/l (Urine)	ACGIH BEL (03 2013)
Fluorides (as F) (Fluoride: Sampling time: End of shift)	3 mg/l (Urine)	ACGIH BEL (03 2013)

Additional exposure limits under the conditions of use:

Chemical Identity	Type	Exposure Limit Values	Source
Carbon dioxide	TWA	5,000 ppm	US ACGIH Threshold Limit Values (12 2010)
	STEL	30,000 ppm	US ACGIH Threshold Limit Values (12 2010)
	PEL	5,000 ppm 9,000mg/m3	US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	STEL	30,000 ppm 54,000mg/m3	US NIOSH: Pocket Guide to Chemical Hazards (2005)
	REL	5,000 ppm 9,000mg/m3	US NIOSH: Pocket Guide to Chemical Hazards (2005)
Carbon monoxide	TWA	25 ppm	US ACGIH Threshold Limit Values (12 2010)
	PEL	50 ppm 55mg/m3	US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	35 ppm 40mg/m3	US NIOSH: Pocket Guide to Chemical Hazards (2005)
	Ceil_Time	200 ppm 229mg/m3	US NIOSH: Pocket Guide to Chemical Hazards (2005)
Nitrogen dioxide	TWA	0.2 ppm	US ACGIH Threshold Limit Values (12 2012)
	Ceiling	5 ppm 9mg/m3	US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	STEL	1 ppm 1.8mg/m3	US NIOSH: Pocket Guide to Chemical Hazards (2005)
Ozone	PEL	0.1 ppm 0.2mg/m3	US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	Cell_Time	0.1 ppm 0.2mg/m3	US NIOSH: Pocket Guide to Chemical

			Hazards (2005)
	TWA	0.05 ppm	US ACGIH Threshold Limit Values (03 2014)
	TWA	0.20 ppm	US ACGIH Threshold Limit Values (03 2014)
	TWA	0.10 ppm	US ACGIH Threshold Limit Values (03 2014)
	TWA	0.08 ppm	US ACGIH Threshold Limit Values (03 2014)
Manganese-Fume-as Mn	Ceiling	5mg/m3	US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	1mg/m3	US NIOSH: Pocket Guide to Chemical Hazards (2005)
	STEL	3mg/m3	US NIOSH: Pocket Guide to Chemical Hazards (2005)
Manganese-Inhalable fraction – as Mn	TWA	0.1mg/m3	US ACGIH Threshold Limit Values (03 2014)
Manganese-Respirable Fraction – as Mn	TWA	0.02mg/m3	US ACGIH Threshold Limit Values (03 2014)
Nickel – Inhalable fraction	TWA	1.5mg/m3	US ACGIH Threshold Limit Values (12 2010)
Nickel – as Ni	PEL	1mg/m3	US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	0.015mg/m3	US NIOSH: Pocket Guide to Chemical Hazards (2005)
Chromium oxide – as Cr	TWA	0.5mg/m3	US ACGIH Threshold Limit Values (03 2012)
	PEL	0.5mg/m3	US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	0.5mg/m3	US NIOSH: Pocket Guide to Chemical Hazards (2005)
Chromium (VI)– as Cr	TWA	0.05mg/m3	US ACGIH Threshold Limit Values (12 2010)
	REL	0.5mg/m3	US NIOSH: Pocket Guide to Chemical Hazards (2010)

Appropriate Engineering Controls

Ventilation: Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. **Keep exposure as low as possible.**

Individual protection measures, such as personal protective equipment

General information:

Exposure Guidelines: Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs) are values published by the American Conference of Government Industrial Hygienists (ACGIH). ACGIH Statement of Positions Regarding the TLVs® and BEIs® states that the TLV-TWA should be used as a guide in the control of health hazards and should not be used to indicate a fine line between safe and dangerous exposures. See Section 10 for information on potential fume constituents of health interest. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists.

Maximum Fume Exposure Guideline™ (MFEG)™ for this product (based on content of Manganese) is 0.5 mg/m3. This exposure guideline is calculated using the most conservative value of the ACGIH TLV or OSHA PEL for the stated substance.

Eye/face protection:

Wear helmet or use face shield with filter lens shade number 12 or darker for open arc processes. No specific lens shade recommendation for submerged arc processes. Shield others by providing screens and flash goggles.

- Skin Protection**
- Hand Protection:** Wear protective gloves. Suitable gloves can be recommended by the glove Supplier
- Other:** **Protective Clothing:** Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. See Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Wear dry gloves free of holes or split seams. Train the welder not to permit electrically live parts or electrodes to contact skin or clothing or gloves if they are wet. Insulate yourself from the work piece and ground using dry plywood, rubber mats or other dry insulation.
- Respiratory Protection:** Keep your head out of fumes. Use enough ventilation and local exhaust to keep fumes and gases from your breathing zone and the general area. An approved respirator should be used unless exposure assessments are below applicable exposure limits.
- Hygiene measures:** Do not eat, drink or smoke when using the product. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.3 and F1.5, available from the American Welding Society, www.aws.org.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Steel rod with extruded flux coating
Physical state:	Solid
Form:	Solid
Color:	No data available.
Odor:	No data available.
Odor threshold:	No data available.
pH:	Not applicable
Melting point/freezing point:	No data available.
Initial boiling point and boiling range:	No data available.
Flash Point:	Not applicable
Evaporation rate:	Not applicable
Flammability (solid, gas):	No data available.
Upper/lower limit on flammability or explosive limits	
Flammability limit - upper (%):	No data available.
Flammability limit - lower (%):	No data available.
Explosive limit - upper (%):	No data available.
Explosive limit - lower (%):	No data available.
Vapor pressure:	Not applicable
Vapor density:	Not applicable
Relative density:	No data available.
Solubility(ies)	
Solubility in water:	No data available.
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	No data available.
Auto-ignition temperature:	No data available.
Decomposition temperature:	No data available.
Viscosity:	Not applicable

10. STABILITY AND REACTIVITY

Reactivity:	The product is non-reactive under normal conditions of use, storage and transport.
Chemical Stability:	Material is stable under normal conditions.
Possibility of Hazardous Reactions:	No data available.

- Conditions to Avoid:** Avoid heat or contamination.
- Incompatible Materials:** Strong oxidizing substances. Strong acids. Strong bases.
- Hazardous Decomposition Products:** Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedure and electrodes used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the worker area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.)
- When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 3. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 3, plus those from the base metal and coating, etc., as noted above. Reasonably expected fume constituents produced during arc welding include the oxides of iron, manganese and other metals present in the welding consumable or base metal. Hexavalent chromium compounds may be in the welding fume of consumables or base metals which contain chromium. Gaseous and particulate fluoride may be in the welding fume of consumables which contain fluoride. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

- Ingestion:** Health injuries from ingestion are not known or expected under normal use.
- Inhalation:** Potential chronic health hazards related to the use of welding consumables are most applicable to the inhalation route of exposure. Refer to Inhalation statements in Section 11.
- Skin Contact:** Arc rays can burn skin. Skin cancer has been reported.
- Eye contact:** Arc rays can injure eyes.

Symptoms related to the physical, chemical and toxicological characteristics

- Inhalation:** Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung), central nervous system effects, bronchitis and other pulmonary effects. Respiratory exposure to the crystalline silica present in this welding electrode is not anticipated during normal use. Respiratory overexposure to airborne crystalline silica is known to cause silicosis, a form of disabling pulmonary fibrosis which can be progressive and may lead to death. Crystalline silica is on the IARC (International Agency for Research on Cancer) and NTP (National Toxicology Program) lists as posing a cancer risk to humans.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral	
Product:	Not classified
Specified substance(s):	
Iron	LD 50 (Rat): 98.6 g/kg
Limestone	LD 50 (Rat): 6,450 mg/kg
Sodium silicate	LD 50 (Rat): 1.1 g/kg

Fluorides (as F) LD 50 (Rat): 4,250 mg/kg
Copper and/or copper alloys and compounds (as Cu) LD 50 (Rat): 481 mg/kg

Dermal Product: Not classified

Inhalation Product: Not classified
Specified substance(s):
Potassium carbonate LC 50 (Rat, 4.5 h): >7.6 mg/l

Repeated Dose Toxicity Product: Not classified

Skin Corrosion/Irritation Product: Not classified

Serious Eye Damage/Eye Irritation Product: Not classified

Respiratory or Skin Sensitization Product: Not classified

Carcinogenicity Product: Arc rays: Skin cancer has been reported.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:
Titanium dioxide Overall evaluation: 2B. Possibly carcinogenic to humans.
Quartz Overall evaluation: 1. Carcinogenic to humans.
Nickel Overall evaluation: 2B. Possibly carcinogenic to humans.

US. National Toxicology Program (NTP) Report on Carcinogens:
Quartz Known To Be Human Carcinogen.
Nickel Reasonably Anticipated to be a Human Carcinogen.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):
No carcinogenic components identified

Germ Cell Mutagenicity In vitro Product: Not classified

In vivo Product: Not classified

Reproductive Toxicity Product: Not classified

Specific Target Organ Toxicity - Single Exposure Product: Not classified

Specific Target Organ Toxicity - Repeated Exposure Product: Not classified

Aspiration Hazard Product: Not classified

Other Effects: Organic polymers may be used in the manufacture of various welding consumables. Overexposure to their decomposition byproducts may result in a condition known as polymer fume fever. Polymer fume fever usually occurs within 4 to 8 hours of exposure with the presentation of flu like symptoms, including mild pulmonary irritation with or without an increase in body temperature. Signs of exposure can include an increase in white blood cell count. Resolution of symptoms typically occurs quickly, usually not lasting longer than 48 hours.

Symptoms related to the physical, chemical and toxicological characteristics under the condition of use

Inhalation:

Specified substance(s):
Manganese

Overexposure to manganese fumes may affect the brain and central nervous system, resulting in poor coordination, difficulty speaking, and arm or leg tremor. This condition can be irreversible.

Nickel

Nickel and its compounds are on the IARC and NTP lists as posing Respiratory cancer risk, and are skin sensitizers with symptoms ranging from slight Itch to severe dermatitis

Additional toxicological Information under the conditions of use:

Acute toxicity

Oral

Specified substance(s):

Calcium fluoride LD 50 (Rat): 27 - 59 mg/kg

Inhalation

Specified substance(s):

Carbon dioxide LC Lo (Human, 5 min): 90000 ppm
Carbon monoxide LC 50 (Rat, 4 h): 1,300 mg/l
Nitrogen dioxide LC 50 (Rat, 4 h): 88 ppm
Ozone LC Lo (Human, 30 min): 50 ppm
Chromium(VI) LC 50 (Rat, 4h): 33-70 mg/m³

Carcinogenicity

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

Specified substance(s):

Nickel Overall evaluation: 2B. Possibly carcinogenic to humans.
Chromium (VI) Overall evaluation: 1. carcinogenicity to humans.

US. National Toxicology Program (NTP) Report on Carcinogens:

Specified substance(s):

Nickel: Reasonably Anticipated to be a Human Carcinogen.
Chromium (VI) Known To Be Human Carcinogen

12. ECOLOGICAL INFORMATION

Ecotoxicity

Acute hazards to the aquatic environment:

Fish

Product: Not classified.

Specified substance(s):

Sodium silicate LC 50 (Western mosquitofish (*Gambusia affinis*), 96 h): 1,800 mg/l
Molybdenum LC 50 (Rainbow trout, donaldson trout (*Oncorhynchus mykiss*), 96 h): 800 mg/l
Nickel LC 50 (Fathead minnow (*Pimephales promelas*), 96 h): 2.916 mg/l
Copper and/or copper Alloy and compounds LC 50 (Fathead minnow (*Pimephales promelas*), 96 h): 1.6 mg/l

Aquatic Invertebrates

Product: Not classified.

Specified substance(s):

Manganese EC50 (Water flea (*Daphnia magna*), 48 h): 40 mg/l
Sodium silicate EC50 (Water flea (*Ceriodaphnia dubia*), 48 h): 22.94 - 49.01 mg/l
Nickel EC50 (Water flea (*Daphnia magna*), 48 h): 1 mg/l
Copper and/or copper Alloys and compounds EC50 (Water flea (*Daphnia magna*), 48h): 0.102 mg/l

Chronic hazards to the aquatic environment:

Fish

Product: Not classified.

Aquatic Invertebrates

Product: Not classified.

**Toxicity to Aquatic Plants
Product:** Not classified.

Persistence and Degradability

**Biodegradation
Product:** No data available.

Bioaccumulative Potential

**Bioconcentration Factor (BCF)
Product:** No data available.

Specified substance(s):
Nickel Zebra mussel (*Dreissena polymorpha*), Bioconcentration Factor (BCF): 5,000 - 10,000 (Lotic) Bioconcentration factor calculated using dry weight tissue conc

Mobility in Soil: No data available.

13. DISPOSAL CONSIDERATIONS

General information: The generation of waste should be avoided or minimized whenever possible. When practical, recycle in an environmentally acceptable, regulatory compliant manner. Dispose of non-recyclable products in accordance with all applicable Federal, State, Provincial, and Local requirements.

Disposal Instructions: Wash before dispose. Dispose to controlled facilities. Disposal of this product May be regulated as a Hazardous Waste. The welding consumable and/or by-product from the welding process (including, but not limited to slag, dust, etc.) may contain levels of leachable heavy metals such as Barium or Chromium. Prior to disposal, a representative sample must be analyzed in accordance with US EPA's Toxicity Characteristic Leaching Procedure (TCLP) to determine if any constituents exist above regulated threshold levels. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner according to Federal, State and Local Regulations.

14. TRANSPORT INFORMATION

DOT

UN Number:
UN Proper Shipping Name: NOT DG REGULATED
Transport Hazard Class(es)
Class: NR
Label(s): -
Packing Group: -
Marine Pollutant: Not regulated.
Special precautions for user: -

IMDG

UN Number:
UN Proper Shipping Name: NOT DG REGULATED
Transport Hazard Class(es)
Class: NR
Label(s): -
Packing Group: -
Marine Pollutant: Not regulated.
Special precautions for user: -

IATA

UN Number:
Proper Shipping Name: NOT DG REGULATED
Transport Hazard Class(es):
Class: NR
Label(s): -
Packing Group: -
Environmental Hazards: Not regulated.

Special precautions for user: -
 Other information
 Passenger and cargo aircraft: Allowed.
 Cargo aircraft only: Allowed.

TDG

UN Number:
 UN Proper Shipping Name: NOT DG REGULATED
 Transport Hazard Class(es)
 Class: NR
 Label(s): -
 Packing Group: -
 Marine Pollutant: Not regulated.
 Special precautions for user: -

15. REGULATORY INFORMATION

US Federal Regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
 None present or none present in regulated quantities.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
 None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):

<u>Chemical Identity</u>	<u>Reportable quantity</u>
Chromium and chromium alloys or compounds (as Cr)	5000lbs.
Manganese	Included in the regulation but with no data values. See regulation for further details.
Nickel	100lbs.

16. OTHER INFORMATION

The Maximum Fume Exposure Guideline™ (MFEG)™ is a guideline limit for total welding fume exposure for a specific consumable product which may be used by employers to manage worker exposure to welding fume where that product is used. The MFEG™ is an estimate of the level of total welding fume exposure for a given product above which the exposure limit for one of the fume constituents may be exceeded. The exposure limits referenced are the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV®) and the U.S. OSHA Permissible Exposure Limit (PEL) whichever limit is lower. The MFEG™ never exceeds 5 mg/m³ which is the maximum recommended exposure limit for total welding fume. The MFEG™ is intended to serve as a general guideline to assist in the management of workplace exposure to welding fume and does not replace the regular measurement and analysis of worker exposure to individual welding fume constituents.

The Maximum Dust Exposure Guideline™ (MDEG)™ is provided to assist with the management of workplace exposures where granular solid welding products or other materials are being utilized. It is derived from relevant compositional data and estimates the lowest level of total airborne dust exposure, for a given product, at which some specific constituent might potentially exceed its individual exposure limit. The specific exposure limits referenced are the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV®) and the U. S. OSHA Permissible Exposure Limit (PEL), which ever value is the lowest. The MDEG™ is never greater than 10 mg/m³ as this is the airborne exposure guideline for total particulate (total dust). The MDEG™ is intended to serve as a general guideline to assist in the management of workplace exposure and does not replace the regular measurement and analysis of worker exposure to individual airborne dust constituents.