



Johnson Matthey

Johnson Matthey Flux Coated Bronze Welding Rods

Johnson Matthey

Chemwatch Hazard Alert Code: 2

Chemwatch: 31-3367

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Safety Data Sheet according to WHS and ADG requirements

L.GHS.AUS.EN

SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier

Product name	Johnson Matthey Flux Coated Bronze Welding Rods
Synonyms	Flux Coated Bronze Welding Rods, flux coated bronze welding rods mang coat nickel coat, MANG COAT, NICKEL COAT, SILBRAZE
Other means of identification	Not Available

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Gas torch braze welding.
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Details of the supplier of the safety data sheet

Registered company name	Johnson Matthey
Address	64 Lillee Crescent vic 3043 Australia
Telephone	1800009580
Fax	1800068335
Website	www.matthey.com.au
Email	Not Available

Emergency telephone number

Association / Organisation	Poisons helpline
Emergency telephone numbers	131126
Other emergency telephone numbers	Not Available

SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

HAZARDOUS CHEMICAL. NON-DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.

CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability	0	
Toxicity	2	
Body Contact	2	
Reactivity	0	
Chronic	2	

0 = Minimum
1 = Low
2 = Moderate
3 = High
4 = Extreme

Poisons Schedule	S6
Classification ^[1]	Skin Sensitizer Category 1*, Carcinogenicity Category 2, Specific target organ toxicity - repeated exposure Category 1
Legend:	1. Classified by Chemwatch; 2. Classification drawn from HSIS ; 3. Classification drawn from EC Directive 1272/2008 - Annex VI

Label elements

GHS label elements	
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SIGNAL WORD	DANGER
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Hazard statement(s)

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H317	May cause an allergic skin reaction.*
H351	Suspected of causing cancer.
H372	Causes damage to organs.

Precautionary statement(s) Prevention

P201	Obtain special instructions before use.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P281	Use personal protective equipment as required.

Precautionary statement(s) Response

P308+P313	IF exposed or concerned: Get medical advice/attention.
P363	Wash contaminated clothing before reuse.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P314	Get medical advice/attention if you feel unwell.

Precautionary statement(s) Storage

P405	Store locked up.
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Precautionary statement(s) Disposal

P501	Dispose of contents/container in accordance with local regulations.
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SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS**Substances**

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
		Rods consisting of,
7440-02-0	0-15	<u>nickel</u>
7440-50-8	30-60	<u>copper</u>
Not Available	10-30	flux coating, proprietary
7440-66-6	30-60	<u>zinc</u>
7439-96-5	0-5	<u>manganese</u>
7440-31-5	0-5	<u>tin</u>
7440-21-3	0-1	<u>silicon</u>
7440-09-7	10-60	<u>potassium</u>
16984-48-8	10-60	<u>fluorides as F-</u>
7440-42-8	0-60	<u>boron</u>
		in use may generate
Not avail.		<u>welding fumes</u>

SECTION 4 FIRST AID MEASURES**Description of first aid measures**

Eye Contact	<ul style="list-style-type: none"> ▶ Generally not applicable.
Skin Contact	If skin or hair contact occurs: <ul style="list-style-type: none"> ▶ Flush skin and hair with running water (and soap if available). ▶ Seek medical attention in event of irritation.
Inhalation	<ul style="list-style-type: none"> ▶ If fumes, aerosols or combustion products are inhaled remove from contaminated area. ▶ Other measures are usually unnecessary.
Ingestion	<ul style="list-style-type: none"> ▶ Immediately give a glass of water. ▶ First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

Indication of any immediate medical attention and special treatment needed

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Copper, magnesium, aluminium, antimony, iron, manganese, nickel, zinc (and their compounds) in welding, brazing, galvanising or smelting operations all give rise to thermally produced particulates of smaller dimension than may be produced if the metals are divided mechanically. Where insufficient ventilation or respiratory protection is available these particulates may produce "metal fume fever" in workers from an acute or long term exposure.

- ▶ Onset occurs in 4-6 hours generally on the evening following exposure. Tolerance develops in workers but may be lost over the weekend. (Monday Morning Fever)
- ▶ Pulmonary function tests may indicate reduced lung volumes, small airway obstruction and decreased carbon monoxide diffusing capacity but these abnormalities resolve after several months.
- ▶ Although mildly elevated urinary levels of heavy metal may occur they do not correlate with clinical effects.
- ▶ The general approach to treatment is recognition of the disease, supportive care and prevention of exposure.
- ▶ Seriously symptomatic patients should receive chest x-rays, have arterial blood gases determined and be observed for the development of tracheobronchitis and pulmonary edema.

[Ellenhorn and Barceloux: Medical Toxicology]

SECTION 5 FIREFIGHTING MEASURES

Extinguishing media

- ▶ There is no restriction on the type of extinguisher which may be used.
- ▶ Use extinguishing media suitable for surrounding area.

Special hazards arising from the substrate or mixture

Fire Incompatibility	Welding arc and metal sparks can ignite combustibles. No known incompatibility with normal range of industrial materials
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Advice for firefighters

Fire Fighting	<ul style="list-style-type: none"> ▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ Wear breathing apparatus plus protective gloves in the event of a fire. ▶ Prevent, by any means available, spillage from entering drains or water courses. ▶ Use fire fighting procedures suitable for surrounding area. Slight hazard when exposed to heat, flame and oxidisers.
Fire/Explosion Hazard	<ul style="list-style-type: none"> ▶ Non combustible. ▶ Not considered a significant fire risk, however containers may burn. Decomposition may produce toxic fumes of; metal oxides May emit poisonous fumes.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	<ul style="list-style-type: none"> ▶ Clean up all spills immediately. ▶ Secure load if safe to do so. ▶ Bundle/collect recoverable product. ▶ Collect remaining material in containers with covers for disposal.
Major Spills	<ul style="list-style-type: none"> ▶ Clean up all spills immediately. ▶ Wear protective clothing, safety glasses, dust mask, gloves. ▶ Secure load if safe to do so. Bundle/collect recoverable product.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

Safe handling	<ul style="list-style-type: none"> ▶ Avoid all personal contact, including inhalation. ▶ Wear protective clothing when risk of exposure occurs. ▶ Use in a well-ventilated area. ▶ Prevent concentration in hollows and sumps.
Other information	<ul style="list-style-type: none"> ▶ Store away from incompatible materials.

Conditions for safe storage, including any incompatibilities

Suitable container	<ul style="list-style-type: none"> ▶ Packaging as recommended by manufacturer. ▶ Check that containers are clearly labelled
Storage incompatibility	Welding electrodes should not be allowed to come into contact with strong acids or other substances which are corrosive to metals.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	nickel	Nickel, metal	1 mg/m3	Not Available	Not Available	Sen

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Australia Exposure Standards	copper	Copper (fume) / Copper, dusts & mists (as Cu)	0.2 mg/m ³ / 1 mg/m ³	Not Available	Not Available	Not Available
Australia Exposure Standards	zinc	Fume (thermally generated) (respirable dust)	2 mg/m ³	Not Available	Not Available	Not Available
Australia Exposure Standards	manganese	Manganese, fume (as Mn)	1 mg/m ³	3 mg/m ³	Not Available	Not Available
Australia Exposure Standards	tin	Tin, metal	2 mg/m ³	Not Available	Not Available	Not Available
Australia Exposure Standards	silicon	Silicon	10 mg/m ³	Not Available	Not Available	Not Available
Australia Exposure Standards	fluorides as F-	Fluorides (as F)	2.5 mg/m ³	Not Available	Not Available	Not Available
Australia Exposure Standards	boron	Fume (thermally generated) (respirable dust)	2 mg/m ³	Not Available	Not Available	Not Available

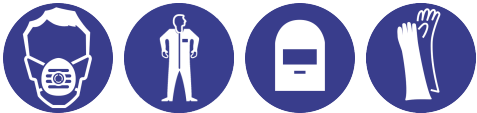
EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
nickel	Nickel	4.5 mg/m ³	50 mg/m ³	99 mg/m ³
copper	Copper	1 mg/m ³	1 mg/m ³	45 mg/m ³
zinc	Zinc	1.9 mg/m ³	21 mg/m ³	120 mg/m ³
manganese	Manganese	3 mg/m ³	5 mg/m ³	1800 mg/m ³
tin	Tin	6 mg/m ³	67 mg/m ³	400 mg/m ³
silicon	Silicon	45 mg/m ³	100 mg/m ³	630 mg/m ³
potassium	Potassium	2.3 mg/m ³	25 mg/m ³	150 mg/m ³
fluorides as F-	Fluorides (as F)	2.5 mg/m ³	2.5 mg/m ³	500 mg/m ³
boron	Boron	7.9 mg/m ³	87 mg/m ³	130 mg/m ³

Ingredient	Original IDLH	Revised IDLH
nickel	N.E. mg/m ³ / N.E. ppm	10 mg/m ³
copper	N.E. mg/m ³ / N.E. ppm	100 mg/m ³
flux coating, proprietary	Not Available	Not Available
zinc	Not Available	Not Available
manganese	N.E. mg/m ³ / N.E. ppm	500 mg/m ³
tin	Unknown mg/m ³ / 400 mg/m ³ / Unknown ppm	25 mg/m ³ / 100 mg/m ³
silicon	Not Available	Not Available
potassium	Not Available	Not Available
fluorides as F-	500 mg/m ³	250 mg/m ³
boron	Not Available	Not Available
welding fumes	Not Available	Not Available

MATERIAL DATA

Exposure controls

Appropriate engineering controls	<p>If risk of inhalation or overexposure exists, wear SAA approved respirator or work in fume hood.</p> <p>Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.</p> <p>The basic types of engineering controls are:</p> <p>Process controls which involve changing the way a job activity or process is done to reduce the risk.</p> <p>Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.</p>
Personal protection	
Eye and face protection	<ul style="list-style-type: none"> Goggles or other suitable eye protection shall be used during all gas welding or oxygen cutting operations. Spectacles without side shields, with suitable filter lenses are permitted for use during gas welding operations on light work, for torch brazing or for inspection. For most open welding/brazing operations, goggles, even with appropriate filters, will not afford sufficient facial protection for operators. Where possible use welding helmets or handshields corresponding to EN 175, ANSI Z49:12005, AS 1336 and AS 1338 which provide the maximum possible facial protection from flying particles and fragments. Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. <p>Welding helmet with suitable filter. Welding hand shield with suitable filter.</p>
Skin protection	See Hand protection below
Hands/feet protection	<p>Wear general protective gloves, eg. light weight rubber gloves.</p> <p>Welding Gloves</p> <p>Safety footwear</p>
Body protection	See Other protection below
Other protection	<p>Aprons, sleeves, shoulder covers, leggings or spats of pliable flame resistant leather or other suitable materials may also be required in positions where these areas of the body will encounter hot metal.</p> <ul style="list-style-type: none"> Eyewash unit. <p>Overalls</p>
Thermal hazards	Not Available

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Respiratory protection

- ▶ Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
- ▶ The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
- ▶ Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory protection. These may be government mandated or vendor recommended.
- ▶ Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
- ▶ Use approved positive flow mask if significant quantities of dust becomes airborne.
- ▶ Try to avoid creating dust conditions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Metal rods 750mm long, 2 to 5mm in diameter; does not mix with water.		
Physical state	Manufactured	Relative density (Water = 1)	Not Applicable
Odour	Not Available	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	Not Applicable
pH (as supplied)	Not Applicable	Decomposition temperature	Not Available
Melting point / freezing point (°C)	865	Viscosity (cSt)	Not Applicable
Initial boiling point and boiling range (°C)	Not Available	Molecular weight (g/mol)	Not Applicable
Flash point (°C)	Not Available	Taste	Not Available
Evaporation rate	Not Applicable	Explosive properties	Not Available
Flammability	Not Available	Oxidising properties	Not Available
Upper Explosive Limit (%)	Not Applicable	Surface Tension (dyn/cm or mN/m)	Not Applicable
Lower Explosive Limit (%)	Not Applicable	Volatile Component (%vol)	Not Applicable
Vapour pressure (kPa)	Not Applicable	Gas group	Not Available
Solubility in water (g/L)	Immiscible	pH as a solution (1%)	Not Applicable
Vapour density (Air = 1)	Not Applicable	VOC g/L	Not Available

SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
Chemical stability	Product is considered stable and hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhaled	Effects on lungs are significantly enhanced in the presence of respirable particles. Overexposure to respirable dust may produce wheezing, coughing and breathing difficulties leading to or symptomatic of impaired respiratory function. Fumes evolved during welding operations may be irritating to the upper-respiratory tract and may be harmful if inhaled.
Ingestion	Not normally a hazard due to physical form of product.
Skin Contact	Skin contact does not normally present a hazard, though it is always possible that occasionally individuals may be found who react to substances usually regarded as inert.
Eye	Fumes from welding/brazing operations may be irritating to the eyes.
Chronic	On the basis, primarily, of animal experiments, concern has been expressed that the material may produce carcinogenic or mutagenic effects; in respect of the available information, however, there presently exists inadequate data for making a satisfactory assessment. Principal route of exposure is inhalation of welding fumes from electrodes and workpiece. Reaction products arising from electrode core and flux appear as welding fume depending on welding conditions, relative volatilities of metal oxides and any coatings on the workpiece. Studies of lung cancer among welders indicate that they may experience a 30-40% increased risk compared to the general population. Since smoking and exposure to other cancer-causing agents, such as asbestos fibre, may influence these results, it is not clear whether welding, in fact, represents a significant lung cancer risk. Metallic dusts generated by the industrial process give rise to a number of potential health problems. The larger particles, above 5 micron, are nose and throat irritants. Smaller particles however, may cause lung deterioration. Particles of less than 1.5 micron can be trapped in the lungs and, dependent on the nature of the particle, may give rise to further serious health consequences. May cause SENSITISATION by skin contact. Toxic: danger of serious damage to health by prolonged exposure through inhalation.

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Johnson Matthey Flux Coated Bronze Welding Rods	TOXICITY	IRRITATION
	Not Available	Not Available
nickel	TOXICITY Oral (rat) LD50: 5000 mg/kg ^[2]	IRRITATION Not Available
copper	TOXICITY dermal (rat) LD50: >2000 mg/kg ^[1]	IRRITATION Nil Reported
	Inhalation (rat) LC50: 0.733 mg/l/4hr ^[1]	
	Inhalation (rat) LC50: 1.03 mg/l/4hr ^[1]	
	Inhalation (rat) LC50: 1.67 mg/l/4hr ^[1]	
	Oral (rat) LD50: 300-500 mg/kg ^[1]	
zinc	TOXICITY Dermal (rabbit) LD50: 1130 mg/kg ^[2] Oral (rat) LD50: >2000 mg/kg ^[1]	IRRITATION Not Available
manganese	TOXICITY Oral (rat) LD50: >2000 mg/kg ^[1]	IRRITATION Eye (rabbit): 500 mg/24h - mild Skin (rabbit): 500 mg/24h - mild
tin	TOXICITY dermal (rat) LD50: >2000 mg/kg ^[1] Oral (rat) LD50: >2000 mg/kg ^[1]	IRRITATION Not Available
silicon	TOXICITY Dermal (rabbit) LD50: >5000 mg/kg ^[1]	IRRITATION Nil reported
	Oral (rat) LD50: 3160 mg/kg ^[2]	
potassium	TOXICITY Not Available	IRRITATION Not Available
fluorides as F-	TOXICITY Not Available	IRRITATION Nil reported
boron	TOXICITY Oral (rat) LD50: 650 mg/kg ^[2]	IRRITATION Not Available
welding fumes	TOXICITY Not Available	IRRITATION Not Available

Legend: 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances

NICKEL	The following information refers to contact allergens as a group and may not be specific to this product. Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. Tenth Annual Report on Carcinogens: Substance anticipated to be Carcinogen [National Toxicology Program: U.S. Dep. of Health & Human Services 2002] Oral (rat) TDLo: 500 mg/kg/5D-I Inhalation (rat) TCLo: 0.1 mg/m ³ /24H/17W-C
COPPER	for copper and its compounds (typically copper chloride): Acute toxicity: There are no reliable acute oral toxicity results available. In an acute dermal toxicity study (OECD TG 402), one group of 5 male rats and 5 groups of 5 female rats received doses of 1000, 1500 and 2000 mg/kg bw via dermal application for 24 hours. The LD50 values of copper monochloride were 2,000 mg/kg bw or greater for male (no deaths observed) and 1,224 mg/kg bw for female. Four females died at both 1500 and 2000 mg/kg bw, and one at 1,000 mg/kg bw. WARNING: Inhalation of high concentrations of copper fume may cause "metal fume fever", an acute industrial disease of short duration. Symptoms are tiredness, influenza like respiratory tract irritation with fever.
SILICON	Intraperitoneal injection of silicon produced only minor local trauma and foreign body reaction. Parenterally administered elemental silica is considered biologically inert. Dogs and rats fed 800 mg silicon/kg/day (as the dioxide) for 1 month showed no clinical signs or histological changes. The compound was largely eliminated in the faeces.
BORON	Elemental boron produces lower foetal body weight in rats. As dose levels increase the effects seen include rib effects, increased foetal cardiovascular malformations in the rabbit and severe testicular pathology in the rat, including testicular atrophy and sterility. Reduced foetal weight also occurs in mice.

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WELDING FUMES	Most welding is performed using electric arc processes - manual metal arc, metal inert gas (MIG) and tungsten inert gas welding (TIG) – and most welding is on mild steel. There has been considerable evidence over several decades regarding cancer risks in relation to welding activities. Several case-control studies reported excess risks of ocular melanoma in welders. This association may be due to the presence in some welding environments of fumes of thorium-232, which is used in tungsten welding rods. Not available. Refer to individual constituents.
NICKEL & WELDING FUMES	WARNING: This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans.
ZINC & MANGANESE	The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.
MANGANESE & SILICON	The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
TIN & SILICON & POTASSIUM	No significant acute toxicological data identified in literature search.
SILICON & POTASSIUM & BORON	Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS.

Acute Toxicity	☹	Carcinogenicity	✔
Skin Irritation/Corrosion	☹	Reproductivity	☹
Serious Eye Damage/Irritation	☹	STOT - Single Exposure	☹
Respiratory or Skin sensitisation	✔	STOT - Repeated Exposure	✔
Mutagenicity	☹	Aspiration Hazard	☹

Legend: ✘ – Data available but does not fill the criteria for classification
 ✔ – Data required to make classification available
 ☹ – Data Not Available to make classification

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

Ingredient	Endpoint	Test Duration (hr)	Species	Value	Source
nickel	BCF	1440	Algae or other aquatic plants	0.47mg/L	4
nickel	LC50	96	Fish	0.000475mg/L	4
nickel	EC50	48	Crustacea	0.013mg/L	5
nickel	EC50	72	Crustacea	0.00513mg/L	2
nickel	EC50	72	Algae or other aquatic plants	0.0407mg/L	2
nickel	NOEC	72	Algae or other aquatic plants	0.0035mg/L	2
copper	BCF	960	Fish	200mg/L	4
copper	EC50	72	Algae or other aquatic plants	0.013335mg/L	4
copper	NOEC	96	Crustacea	0.0008mg/L	4
copper	EC50	48	Crustacea	0.001mg/L	5
copper	EC50	96	Crustacea	0.001mg/L	5
copper	LC50	96	Fish	0.0028mg/L	2
zinc	BCF	360	Algae or other aquatic plants	9mg/L	4
zinc	EC50	72	Algae or other aquatic plants	0.106mg/L	4
zinc	LC50	96	Fish	0.00272mg/L	4
zinc	EC50	120	Fish	0.00033mg/L	5
zinc	EC50	48	Crustacea	0.04mg/L	5
zinc	NOEC	72	Algae or other aquatic plants	0.000084981mg/L	2
manganese	BCFD	37	Algae or other aquatic plants	2.2mg/L	4
manganese	LC50	96	Fish	>3.6mg/L	2
manganese	EC50	48	Crustacea	>1.6mg/L	2
manganese	NOEC	48	Crustacea	1.6mg/L	2
manganese	EC50	72	Algae or other aquatic plants	2.8mg/L	2
manganese	EC50	72	Algae or other aquatic plants	4.5mg/L	2
tin	EC50	48	Crustacea	0.00018mg/L	5
tin	LC50	96	Fish	>0.0124mg/L	2
tin	NOEC	168	Crustacea	<0.005mg/L	2
tin	EC50	72	Algae or other aquatic plants	>0.0192mg/L	2
silicon	EC50	72	Algae or other aquatic plants	ca.250mg/L	2

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potassium	EC50	24	Crustacea	400mg/L	5
fluorides as F-	EC50	384	Crustacea	14.559mg/L	3
fluorides as F-	EC50	96	Algae or other aquatic plants	347.670mg/L	3
fluorides as F-	LC50	96	Fish	63.215mg/L	3
fluorides as F-	EC50	48	Crustacea	36.2mg/L	5
fluorides as F-	NOEC	504	Crustacea	14mg/L	5
boron	BCF	336	Algae or other aquatic plants	8.5mg/L	4
boron	EC50	336	Algae or other aquatic plants	8.5mg/L	4
boron	EC50	48	Crustacea	230mg/L	5
boron	NOEC	576	Fish	0.001mg/L	5
boron	LC50	96	Fish	74mg/L	2
boron	EC50	96	Algae or other aquatic plants	15.4mg/L	2

Legend:

Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

Metal-containing inorganic substances generally have negligible vapour pressure and are not expected to partition to air. Once released to surface waters and moist soils their fate depends on solubility and dissociation in water. Environmental processes (such as oxidation and the presence of acids or bases) may transform insoluble metals to more soluble ionic forms. Microbiological processes may also transform insoluble metals to more soluble forms.

DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
fluorides as F-	LOW	LOW

Bioaccumulative potential

Ingredient	Bioaccumulation
fluorides as F-	LOW (LogKOW = 0.2259)

Mobility in soil

Ingredient	Mobility
fluorides as F-	LOW (KOC = 14.3)

SECTION 13 DISPOSAL CONSIDERATIONS**Waste treatment methods**

Product / Packaging disposal	<ul style="list-style-type: none"> ▶ Containers may still present a chemical hazard/ danger when empty. ▶ Return to supplier for reuse/ recycling if possible. <p>Otherwise:</p> <ul style="list-style-type: none"> ▶ If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill. ▶ Where possible retain label warnings and SDS and observe all notices pertaining to the product. ▶ Recycle wherever possible or consult manufacturer for recycling options. ▶ Consult State Land Waste Management Authority for disposal. ▶ Bury residue in an authorised landfill. ▶ Recycle containers if possible, or dispose of in an authorised landfill.
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SECTION 14 TRANSPORT INFORMATION**Labels Required**

Marine Pollutant	NO
HAZCHEM	Not Applicable

Land transport (ADG): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

SECTION 15 REGULATORY INFORMATION

Safety, health and environmental regulations / legislation specific for the substance or mixture

NICKEL(7440-02-0) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Continued...

Johnson Matthey Flux Coated Bronze Welding Rods

Australia Exposure Standards Australia Hazardous Substances Information System - Consolidated Lists	Australia Inventory of Chemical Substances (AICS)
COPPER(7440-50-8) IS FOUND ON THE FOLLOWING REGULATORY LISTS	
Australia Exposure Standards Australia Hazardous Substances Information System - Consolidated Lists	Australia Inventory of Chemical Substances (AICS) International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
ZINC(7440-66-6) IS FOUND ON THE FOLLOWING REGULATORY LISTS	
Australia Exposure Standards Australia Hazardous Substances Information System - Consolidated Lists	Australia Inventory of Chemical Substances (AICS) International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
MANGANESE(7439-96-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS	
Australia Exposure Standards Australia Hazardous Substances Information System - Consolidated Lists Australia Inventory of Chemical Substances (AICS)	International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft
TIN(7440-31-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS	
Australia Exposure Standards Australia Hazardous Substances Information System - Consolidated Lists	Australia Inventory of Chemical Substances (AICS)
SILICON(7440-21-3) IS FOUND ON THE FOLLOWING REGULATORY LISTS	
Australia Exposure Standards Australia Inventory of Chemical Substances (AICS)	International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
POTASSIUM(7440-09-7) IS FOUND ON THE FOLLOWING REGULATORY LISTS	
Australia Hazardous Substances Information System - Consolidated Lists Australia Inventory of Chemical Substances (AICS)	International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft
FLUORIDES AS F-(16984-48-8) IS FOUND ON THE FOLLOWING REGULATORY LISTS	
Australia Exposure Standards Australia Hazardous Substances Information System - Consolidated Lists	International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
BORON(7440-42-8) IS FOUND ON THE FOLLOWING REGULATORY LISTS	
Australia Exposure Standards Australia Inventory of Chemical Substances (AICS)	International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
WELDING FUMES(NOT AVAIL.) IS FOUND ON THE FOLLOWING REGULATORY LISTS	
Not Applicable	

National Inventory	Status
Australia - AICS	N (fluorides as F-)
Canada - DSL	Y
Canada - NDSL	N (zinc; potassium; manganese; copper; silicon; boron; fluorides as F-; nickel; tin)
China - IECSC	Y
Europe - EINEC / ELINCS / NLP	N (fluorides as F-)
Japan - ENCS	N (zinc; potassium; manganese; copper; silicon; boron; fluorides as F-; nickel; tin)
Korea - KECI	N (fluorides as F-)
New Zealand - NZIoC	Y
Philippines - PICCS	Y
USA - TSCA	N (fluorides as F-)
Legend:	Y = All ingredients are on the inventory N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)

SECTION 16 OTHER INFORMATION

Other information

Ingredients with multiple cas numbers

Name	CAS No
copper	7440-50-8, 133353-46-5, 133353-47-6, 195161-80-9, 65555-90-0, 72514-83-1
silicon	7440-21-3, 152284-21-4, 157383-37-4, 160371-18-6, 17375-03-0, 71536-23-7, 72516-01-9, 72516-02-0, 72516-03-1, 90337-93-2

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:
www.chemwatch.net

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

Continued...

Johnson Matthey Flux Coated Bronze Welding Rods

PC—TWA: Permissible Concentration-Time Weighted Average
PC—STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit,
IDLH: Immediately Dangerous to Life or Health Concentrations
OSF: Odour Safety Factor
NOAEL: No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index

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