



Reviewed on 10/02/2022

## Safety Data Sheet

### 1 IDENTIFICATION

#### Product identifier

**Trade name:** Listed in Section 2 Under Class/Product Name

**Other means of identification:** Low-Alloy Steels and Tool Steels  
SDS # 0059

#### Recommended use and restriction on use

**Recommended use:** Metal Welding

**Restrictions on use:** No further relevant information available.

#### Manufacturer/Importer/Supplier/Distributor information

##### Importer:

Harris Products Group  
14 Queensland Rd  
Darra, QLD, Australia 4076  
(07) 33753670

**Safety Data Sheet Questions:** [sales@hgea.com.au](mailto:sales@hgea.com.au)

**Website:** <http://www.harrisproductsgroup.com.au>

**Poisons Information Centre/Helpline (24 hours) Australia 13 11 26**

### 2 HAZARD(S) IDENTIFICATION

#### GHS classification of the substance/mixture.

Classified according to the Globally Harmonised System of Classification and labelling of Chemicals (GHS) including Work, Health and Safety regulations, Australia.

#### Classification of the substance or mixture

**EMERGENCY OVERVIEW:** These products consist of solid wire or rods, which are odourless and may be copper coated or flux coated rods that are odourless. Chromium and Quartz (components of this product) are possible carcinogens. There are no immediate health hazards associated with the wire or rod form of this product.

These products are not reactive. If involved in a fire, these products may generate irritating iron fumes and a variety of iron compounds. Emergency responders must wear personal protective equipment suitable for the situation to which they are responding. However, inhaling dusts, fumes or mists which may be generated during certain manufacturing procedures (burning, melting, welding, swing, brazing, grinding and machining) may be hazardous to your health. Dusts may also be irritating to the unprotected skin or eyes.

The classification given below pertains to the product during processing:

<b>GHS Classification(s)</b>	Respiratory Sensitisation - 1 Skin Sensitisation - 1 Carcinogenicity - 2 Reproduction Toxicity - 2 Specific Organ Toxicity – Repeated Exposure 1
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#### Label elements



**Signal word**

**Danger**

**Hazard Statements:****H334** – May cause allergy or asthma symptoms or breathing difficulties if inhaled**H317** - May cause an allergic skin reaction**H351** – Suspected of causing cancer**H361** – Suspected of damaging fertility or the unborn child**H372** - Causes damage to organs through prolonged or repeated exposure**Precautionary Statements:****P201** - Obtain special instructions before use**P202** - Do not handle until all safety precautions have been read and understood**P260** - Do not breathe dust/fume/gas/mist/vapours/spray P261 - Avoid breathing dust/fume/gas/mist/vapours/spray P264 - Wash thoroughly after handling**P270** - Do not eat, drink or smoke when using this product**P272** - Contaminated work clothing should not be allowed in the workplace**P273** - Avoid release to the environment**P280** - Wear protective gloves/protective clothing/eye protection/face protection**P301+P312** - IF SWALLOWED: call a POISON CENTER or doctor/physician if you feel unwell**P302+P352** - IF ON SKIN: Wash with plenty of soap and water**P308+P313** - IF exposed or concerned: Get medical advice/attention**P314** - Get medical advice and attention if you feel unwell P321 - Specific treatment (see label)**P330** - If swallowed, rinse mouth**P333+P313** - If skin irritation or rash occurs: Get medical advice/attention**P362+P364** - Take off contaminated clothing and wash it before reuse**Storage Statement(s):****P405** - Store locked up**Disposal Statement(s):****P501** - Dispose of contents/container in accordance with regulations**Unknown Acute Toxicity** Not available**Other Hazards** No information provided**3 Composition/information on ingredients****Chemical characterization: Mixtures****Description:** Mixture: consisting of the following components.

Class Product Name	C Carbon (Graphite Synthetic) 7440-44-0	Mn Manganese 7439-96-5	Si Silicon 7440-21-3	V Vanadium 1314-62-1	W Tungsten 7440-33-7	Cr Chromium 7440-47-3	Mo Molybdenum 7439-98-7	Fe Iron 1309-37-1
4130	0.28-0.33	0.40-0.60	0.15-0.60			0.8-1.1	0.15-0.25	Balance
ER80S-B2	0.07-0.12	0.40-0.70	0.40-0.70	(a)	(C)	1.20-1.50	0.40-0.65	Balance
ER80S-B6	0.10	0.40-0.70	0.50	(a)	(C)	4.50-6.00	0.45-0.65	Balance
ER90S-B3	0.07-0.12	0.40-0.70	0.40-0.70	(a)	(C)	2.30-2.70	0.90-1.20	Balance
3OH	1.00	1.20	0.30	0.10	0.50	0.50		Balance
3HW	0.30-0.450	0.20-0.50	0.80-1.20	0.50	1.00-1.80	4.75-5.50	1.25-1.80	Balance
3HSS	0.90	0.30	0.30	2.00	6.50		5.00	Balance
3FH	0.30	0.50	0.50			1.00	0.20	Balance
3AH	0.95-1.05	1.00	0.50	0.15-0.50		4.75-5.50	0.90-1.40	Balance
3WH	1.05	0.20	0.20	0.20		(a)		Balance
COATED ELECTRODES ( Flux Coating listed in the next table)								
4WH	0.50-1.00	0.25-0.75	0.20-0.50	0.25-0.50		1.00-1.50	1.50-2.00	Balance
4HSS	0.70-1.00	0.75	1.00	1.00-2.50	5.00-7.00	3.00-5.00	4.00-6.00	Balance
4AH	0.70-1.00	0.25-0.50	0.25-0.50	0.75-1.00	1.00-1.25	4.75-5.25	1.75-2.25	Balance
4HW	0.25-0.50	0.50-1.00	0.50-1.00	0.25-0.50	1.00-1.50	4.75-5.50	1.50-2.00	Balance
4OH	0.75	1.00	0.50	0.50	0.50	1.50	1.50	Balance
4FH	0.25-0.35	0.40-0.60	0.15-0.30			0.80-1.10	0.15-0.25	Balance
Single values are maximums., S and P = 0.40% max ., (a) :Cu=0.50,(C):Ni=0.6								

CAS	Ingredient Flux Coating	Proportion %
6487-48-5	Potassium Oxalate	1.5
1312-76-1	Potassium Silicate	10.00
12056-51-8	Potassium Titanate	10.00
14808-60-7	Quartz	5.00
70131-50-9	Bentonite	6.00
1317-65-3	Calcium Carbonate	50.00
14542-24-5	Calcium Fluoride (F Fluoride)	20.00
9004-32-4	Sodium Carbonymethyl Cellulose	5.00
1344-09-8	Sodium Silicate	11.00
14807-96-6	Talc (containing no asbestos fibres)	5.00
7782-42-5	Carbon/Graphite (neutral)	1.60

**Additional information:**

For the listed ingredient(s), the identity and exact percentage(s) are being withheld as a trade secret.

**SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE:** During welding operations, the most significant route of over-exposure is via inhalation of fumes.

**INHALATION:** Inhalation is not anticipated to be a significant route of over-exposure to the wire or rods. Inhalation of large amounts of particulates generated by these products during metal processing operations may result in pneumoconiosis (a disease of the lungs). Repeated over-exposures, via inhalation, to the dusts or fumes generated by these products may have adverse effects on the lungs with possible pulmonary edema and emphysema (life-threatening lung injuries). Refer to Section 10 (Stability and Reactivity) for information on the specific composition of welding fumes and gases.

**CONTACT WITH SKIN or EYES:** Contact of these products with the skin is not anticipated to be irritating. Contact with the wire or rod form of these products can be physically damaging to the eye. Fumes generated during welding operations can be irritating to the skin and eyes. Symptoms of skin over-exposure may include irritation and redness; prolonged or repeated skin over-exposures may lead to dermatitis. Contact with the molten wire or rods will burn contaminated skin or eyes.

**SKIN ABSORPTION:** Skin absorption is not known to be a significant route of over-exposure for any component of these products.

**INGESTION:** Ingestion is not anticipated to be a route of occupational exposure for these products.

**INJECTION:** Though not a likely route of occupational exposure for these products, injection (via punctures or lacerations in the skin) may cause local reddening, tissue swelling, and discomfort.

**HEALTH EFFECTS OR RISKS FROM EXPOSURE:** An Explanation in Lay Terms. Symptoms associated with over-exposure to these products and the fumes generated during welding operations are as follows:

**ACUTE:** The chief acute health hazard associated with these products would be the potential for irritation of contaminated skin and eyes when exposed to fumes during welding operations. Inhalation of large amounts of particulates generated by these products during metal processing operations can result in pneumoconiosis (a disease of the lungs). Contact with the molten material will burn contaminated skin or eyes.

**CHRONIC:** Chronic skin over-exposure to the fumes of these products during welding operations may produce dermatitis (red, inflamed skin). Repeated over-exposures to the fumes generated by these products via inhalation can have adverse effects on the lungs (e.g., pulmonary edema and emphysema). Repeated or prolonged ingestion exposures to > 50-100 mg of Iron per day can result in deposition of iron in the body tissues, which can cause disease.

**Composition comments:**

The term "Dangerous Components" should be interpreted as a term defined in Hazard Communication standards and does not necessarily imply the existence of a 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.

**First-aid measures****Description of first aid measures**

Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take a copy of label and SDS to health professional with victim.

**SKIN EXPOSURE:** If fumes generated by welding operations involving these products contaminate the skin, begin decontamination with running water. If molten material contaminates the skin, immediately begin decontamination with cold, running water. Minimum flushing is for 15 minutes. Victim must seek medical attention if any adverse reaction occurs.

**EYE EXPOSURE:** If fumes generated by welding operations involving these products enter the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek immediate medical attention.

**INHALATION:** If fumes generated by welding operations involving these products are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions.

**INGESTION:** If swallowed call physician immediately! Do not induce vomiting unless directed by medical personnel. Rinse mouth with water if person is conscious. Never give fluids or induce vomiting if person is unconscious, having convulsions, or not breathing.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Skin, respiratory, pancreas, and liver disorders may be aggravated by prolonged over-exposures to the dusts or fumes generated by these products.

**RECOMMENDATIONS TO PHYSICIANS:** Treat symptoms and eliminate overexposure.

## 5 Fire-fighting measures

### Extinguishing media

Water spray, Halon, Dry Chemical, Carbon Dioxide, Foam or any ABC class.

### Special hazards arising from the substance or mixture

None – not flammable.

**Unusual fire and explosion hazards:** If melted these products may decompose and produce irritating fumes containing iron compounds and metal oxides. The molten material can present a significant thermal hazard to firefighters.

**FLASH POINT, °C (method):** Not flammable.

**AUTOIGNITION TEMPERATURE, °C:** Not flammable.

### Additional information:

Read and understand the Work Safe Australia Code of Practice on Welding Processes and "Standard for Fire Prevention During Welding, Cutting and Other Hot Work" before using this product. Section 274 of the Work Health and Safety Act (the WHS Act.)

## 6 Accidental release measures

### Personal precautions, protective equipment and emergency procedures

These products are solid metal rods, with no spill or leak hazards.

### Environmental precautions:

Avoid discharge into drains, water courses or onto the ground.

### Methods and material for containment and cleaning up:

Contain spill, then place in a suitable container. Minimize dust generation. Do not flush to sewer or allow to enter waterways. Use appropriate Personal Protective Equipment (PPE). Do not use solvents or thinners.

**Methods for cleaning up:** Scoop up material and place in a disposal container. Provide ventilation.

### Reference to other sections

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

## 7 Handling and storage

### Handling:

#### Precautions for safe handling

Do not eat or drink while handling these products. Use ventilation and other engineering controls to minimize potential exposure to these products. All employees who handle this material should be trained to handle it

safely. Use in a properly ventilated location. Avoid breathing fumes of these products during welding or brazing operations. Read and understand the manufacturer's instruction and the precautionary label on the product. See the Australian Standard - AS 1674.1 – 1997 – Reconfirmed 2016. Safety in Welding and Allied Processes Australia.

**Conditions for safe storage, including any incompatibilities**

**Storage:**

All employees who handle these products should be trained to handle it safely. Use in a well-ventilated location. Avoid breathing fumes of these products during welding operations. Open containers on a stable surface. Packages of these products must be properly labelled. Store packages in a cool, dry location. Storage in an atmosphere that is wet, moist, or highly humid may lead to corrosion of these products. Store away from incompatible materials (see Section 10, Stability and Reactivity).

**Specific end use(s)** No further relevant information available.

## 8 Exposure controls/personal protection

**Control parameters**

**Exposure Guidelines:**

Refer to the Safe Environments risk management document – Welding Fume -

<http://www.safeenvironments.com.au/welding-fume/> The exposure standard refers to the publication by Work Safe Australia "Workplace Exposure Standard for Airborne Contaminants" with the Date of Effect being 22 December 2011. Work Safe Australia note that "exposure standards do not represent a fine dividing line between a healthy and unhealthy work environment. Natural biological variation and the range of individual susceptibilities mean that a small number of people might experience adverse health effects below the exposure standard.

<b>Hazard Classification for Chemical Composition For Electrodes</b>					
CAS #	Ingredient	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>
7440-44-0	Carbon (Graphite Synthetic)		N/A		
7439-96-5	Manganese Fume		1		3
7440-21-3	Silicon		10		
1314-62-1	Vanadium		0.05		
7440-33-7	Tungsten		1		
7440-47-3	Chromium Metal		0.05		
7439-98-7	Molybdenum		10		
1309-37-1	Iron Oxide Fume		5		
<b>Hazard Classification for Chemical Composition For Coated Electrodes</b>					
6487-48-5	Potassium Oxalate		Not Established		
1312-76-1	Potassium Silicate		Not Established		
12056-51-8	Potassium Titanate		Not Established		
14808-60-7	Quartz		0.01		
70131-50-9	Bentonite		10		
1317-65-3	Calcium Carbonate Dust		10		
14542-24-5	Calcium Fluoride (F Fluoride)		Not Established		
9004-32-4	Sodium Carbonylmethyl Cellulose		Not Established		
1344-09-8	Sodium Silicate		Not Established		
14807-96-6	Talc (containing no asbestos fibres)		2.5		
7782-42-5	Carbon/Graphite (neutral)		3		

Reference: ACGIH Biological Exposure Indices

Refer to Worksafe Australia for standards:

[http://www.safeworkaustralia.gov.au/sites/SWA/about/Publications/Documents/639/Workplace\\_Exposure\\_Standards\\_for\\_Airborne\\_Contaminants.pdf](http://www.safeworkaustralia.gov.au/sites/SWA/about/Publications/Documents/639/Workplace_Exposure_Standards_for_Airborne_Contaminants.pdf)

**Exposure controls****Personal protective equipment:****General protective and hygienic measures:**

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Engineering controls:** No further relevant information available.

**Ventilation**

Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain vapour levels below the recommended exposure standard.

**Breathing equipment:**

Where an inhalation risk exists, wear a Class P2 (Metal fume) respirator. If using product in a confined area, wear an Air-line respirator.

**Protection of hands:**

Wear welding gloves for routine industrial use.

**Eye protection:**

Wear safety glasses with side shields (or goggles). When these products are used for welding, it is recommended that safety glasses, goggles, or face-shield with filter lens of appropriate shade number (per ANSI Z49.1-1988, "Safety in Welding and Cutting") be worn.

**Body protection:** Protective work clothing**9 Physical and chemical properties****Information on basic physical and chemical properties:****General Information**

PRODUCT			
<b>Appearance - Product</b>	Solid Rods with metallic lustre	<b>Physical State - Product</b>	Solid
<b>Odour - Product</b>	Odourless	<b>Odour Threshold</b>	Not Available
<b>Flammability</b>	Not Available	<b>Flash Point</b>	Not Available
<b>pH</b>	Not Applicable	<b>Auto Igniting</b>	Not Available
<b>Melting point/range</b>	Not Available	<b>Solubility water</b>	Insoluble
<b>Vapour Pressure, mmHg@1284°C</b>	Not Available		
<b>Vapour Density</b>	Not applicable	<b>Density at 20°C (68°F)</b>	Not Applicable
<b>Boiling Point &amp; boiling range</b>	3000°C	<b>Evaporation Rate</b>	Not Available
<b>Freezing/Melting Point</b>	1535°C	<b>Specific Gravity (water = 1)</b>	7.86

## 10 Stability and reactivity

**Stability:** Stable.

**Decomposition Products:** Aluminium compounds and metal oxides.

**NOTE:** The composition and quality of welding fumes and gases are dependent upon the metal being welded, the process, the procedure, and the electrodes used. Other conditions that could also influence the composition and quantity of fumes and gases to which workers may be exposed include the following: any coatings on metal being welded (e.g. paint, plating, or galvanizing), the number of welders and the volume of the work area, the quality of ventilation, the position of the welder's head with respect to the fume plume, and the presence of other contaminants in the atmosphere. When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2 (Composition and Information on Ingredients). Fume and gas decomposition products, and not the ingredients in the electrode, are important. Concentration of the given fume or gas component may decrease or increase by many times the original concentration. New compounds in the electrode may form.

Decomposition products of normal operations include not only those originating from volatilization, reaction, or oxidation of the product's components but also those from base metals and any coating (as noted previously). The best method to determine the actual composition of generated fumes and gases is to take an air sample from inside the welder's helmet if worn or in breathing zone. For additional information, refer to the American Welding Society Publication, "Fumes and Gases in the Welding Environment".

**Materials with which substance is incompatible:** Strong acids, strong oxidizers, halogens, phosphorous.

**Hazardous polymerization:** Will not occur.

**Conditions to avoid:** Avoid uncontrolled exposure to extreme temperatures and incompatible materials.

## 11 Toxicological information

**Information on toxicological effects:**

**Toxicity data:** Presented below are toxicological data available for the components of these products present in concentration greater than 1%.

CAS	Name	Oral Toxicity LD50	Intravenous Toxicity LD50	Inhalation Toxicity LD50
7440-44-0	Carbon (Graphite Synthetic)	>5mg/kg rat	440mg/kg Mouse	
7439-96-5	Manganese	>2000 mg/kg Rat		
7440-21-3	Silicon	3160 mg/kg Rat	>5000 mg/kg Rabbit	
1314-62-1	Vanadium	10mg/kg Rat 5mg/kg Mouse	12mg/kg Rat 23mg/kg Mouse	6mg/kg Rat 10mg/kg Mouse
7440-33-7	Tungsten	Not Established		
7440-47-3	Chromium Metal	Not Established		
7439-98-7	Molybdenum	Not Established		
1309-37-1	Iron Oxide	Not Established		
7440-44-0	Carbon (Graphite Synthetic)		440mg/kg Mouse	
<b>Toxicological Classification for Chemical Composition For Coated Electrodes</b>				
6487-48-5	Potassium Oxalate	660mg/kg Rat		
1312-76-1	Potassium Silicate	Not Established		
12056-51-8	Potassium Titanate	>2000mg/kg Rat		>2000mg/kg Rat
14808-60-7	Quartz			200mg/kg Rat
70131-50-9	Bentonite	Not Established		
1317-65-3	Calcium Carbonate	>2000mg/kg Rat	>2000mg/kg Rat	
14542-24-5	Calcium Fluoride (F Fluoride)	15000- 27000mg/kg Rat		6824 mg/L rat 4hrs
9004-32-4	Sodium Carboxymethyl Cellulose	27000mg/kg Rat	>2gm/kg Rabbit	>5800mg/m <sup>3</sup> /4h Rat
1344-09-8	Sodium Silicate	1960mg/kg Rat	>4640mg/kg Rabbit	
14807-96-6	Talc (containing no asbestos fibres)	Not Established		



**Mutagenicity:** These products are not reported to produce mutagenic effects in humans.

**Embryo toxicity:** These products are not reported to produce embryo toxic effects in humans.

**Teratogenicity:** These products are not reported to cause teratogenic effects in humans. Clinical studies on test animals exposed to relatively high doses of Molybdenum and Tungsten (components of these products) indicate teratogenic effects.

**Reproductive Toxicity:** These products are not reported to cause reproductive effects in humans. Clinical studies on test animals exposed to relatively high doses of Molybdenum and Tungsten (components of these products) indicate adverse reproductive effects.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Skin, respiratory, pancreas, and liver disorders may be aggravated by prolonged over-exposures to the dusts or fumes generated by these products.

**RECOMMENDATIONS TO PHYSICIANS:** Treat symptoms and eliminate overexposure.

**BIOLOGICAL EXPOSURE INDICES:** Currently, there are no Biological Exposure Indices (BEIs) associated with components of these products.

## 12 Ecological information

**ENVIRONMENTAL STABILITY:** The components of these products occur naturally in the environment and are expected to persist in the environment for an extended period of time. Iron will react with water and air to form a variety of stable iron oxides.

**EFFECT OF MATERIAL ON PLANTS or ANIMALS:** The components of these products occur naturally in the environment and are essential for plant and animal life.

**EFFECT OF CHEMICAL ON AQUATIC LIFE:** These products are not expected to cause adverse effects on aquatic life.

## 13 Disposal considerations

### Waste treatment methods

#### Recommendation:

Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.

**Uncleaned packagings:** Empty containers should be taken to an approved waste handling site for recycling or disposal.

**Recommendation:** Disposal must be made according to official regulations.

## 14 Transport Information

This product is not classed as hazardous.

UN-Number DOT, ADR, ADN, IMDG, IATA	Not Regulated
UN proper shipping name DOT, ADR, ADN, IMDG, IATA	Not Regulated
Transport hazard class(es) DOT, ADR, ADN, IMDG, IATA Class	Not Regulated
Packing group DOT, ADR, IMDG, IATA	Not Regulated
Environmental hazards: Marine pollutant:	No
Special precautions for user	Not applicable.
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
UN "Model Regulation":	Not regulated.



## 15 Regulatory information

**Product Name:** Listed in Section 2 Under Class/Product Name  
Low Alloy Steels and Tool Steels

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

**Poison Schedule:**

Classified as a Schedule 6 (S6) Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

**Classifications:**

Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

Refer to the Australian Inventory of Chemical Substances – AICS at <https://www.nicnas.gov.au/chemicals-on-AICS#main>

**Poison schedule:** Classified as a Schedule 6 (S6) Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP). <https://www.legislation.gov.au/Details/F2016L01638>

**Classifications:** Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

## 16 Other information

### References

Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice

Standard for the Uniform Scheduling of Medicines and Poisons

Australian Code for the Transport of Dangerous Goods by Road & Rail.

Modell Work Health and Safety Regulations, Schedule 10: Prohibited carcinogens, restricted carcinogens and restricted hazardous chemicals.

Workplace exposure standards for airborne contaminants, Safe work, Australia

American Conference of Industrial Hygienists (ACGIH)

Globally Harmonised System of classification and labelling of chemicals.

**WELDING (1):** Due to the diversity of welding techniques, processes, materials used, nature of the surface being welded and the presence of contaminants, the fumes & gases associated with welding will vary in composition and quantity. When assessing a welding process, the toxic fumes generated may not only be associated with the parent metal, filler wire or electrode. The welding/cutting arc may generate nitrogen oxides, carbon monoxide & other gases, whilst UV radiation emitted from some arcs generates ozone. Ozone may irritate mucous membranes and cause pulmonary oedema & haemorrhage. Shielding gases (e.g. carbon dioxide and inert gases i.e. argon and helium) in high concentrations, in confined spaces, may reduce oxygen in the atmosphere to dangerous levels, resulting in possible asphyxiation.

**WELDING (2):** In addition to complying with individual exposure standards for specific contaminants, where current manual welding processes are used, the fume concentration inside the welder's helmet should not exceed 5 mg/m<sup>3</sup> ( unless otherwise classified) when collected in accordance with Australian Standard AS 3853.1: Fume from welding and allied processes - Guide to methods for the sampling and analysis of particulate matter and AS 3853.2: Fume from welding and allied processes - Guide to methods for the sampling and analysis of gases. Airway irritation and metal fume fever are the most common acute effects from welding fumes. Reported to cause reduced sperm quality in welders.

**WELDING (3):** Other gases and fumes associated with welding processes include: Inert shielding gases (e.g. argon, carbon dioxide, helium) which may reduce the atmospheric oxygen content in poorly ventilated areas. UV-radiation and Infra-Red radiation may decompose chlorinated degreasing agents to form highly toxic and irritating phosgene gas. This may occur if a metal has been degreased but inadequately dried or when vapours from a nearby degreasing bath enter the welding zone.

**WELDING (4):** Welding fumes may contain a wide variety of chemical contaminants, including oxides and salts of metals and other compounds which may be generated from electrodes, filler wire, flux materials and from the welded material (e.g. painted surfaces). Welding stainless-steel and its alloys generates nickel and chromium (VI) compounds. Welding fumes are retained in the lungs. Sparingly soluble compounds may be released slowly from the lungs. Welding fume is classified as possibly carcinogenic to humans (IARC Group 2B).

**PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:**

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

**Disclaimer:**

We urge each end user and recipient of this SDS to study it carefully. If necessary, consult an industrial hygienist or other expert to understand this information and safeguard the environment and protect workers from potential hazards associated with the handling or use of this product.

Harris Products Group cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for use, handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.

**WARNING: PRODUCT COMPONENTS PRESENT HEALTH AND SAFETY HAZARDS. READ AND UNDERSTAND THIS MATERIAL SAFETY DATA SHEET (M.S.DS.). ALSO, FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.**

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