



## Welding Electrodes Type AWS E6013

Total Tools Importing Pty Ltd

Chemwatch Hazard Alert Code: 2

Chemwatch: 73-5438

Issue Date: 06/01/2017

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Print Date: 09/01/2017

Safety Data Sheet according to WHS and ADG requirements

S.GHS.AUS.EN

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

#### Product Identifier

|                               |  |
|-------------------------------|--|
| Product name                  | Welding Electrodes Type AWS E6013        |
| Synonyms                      | AWS E6013, 2.0mm/2.5mm/3.2mm/4.0mm/5.0mm |
| Other means of identification | Not Available                            |

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

|                          |                       |
|--------------------------|-----------------------|
| Relevant identified uses | Used for arc welding. |
|--------------------------|-----------------------|

#### Details of the supplier of the safety data sheet

|                         |  |
|-------------------------|--|
| Registered company name | Total Tools Importing Pty Ltd                    |
| Address                 | 20 Thackray Rd Port Melbourne VIC 3207 Australia |
| Telephone               | 03 9261 1947                                     |
| Fax                     | 03 9261 1999                                     |
| Website                 | Not Available                                    |
| Email                   | enquiries@totaltools.com.au                      |

#### Emergency telephone number

|                                   |               |
|-----------------------------------|---------------|
| Association / Organisation        | Not Available |
| Emergency telephone numbers       | 03 9261 1900  |
| 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.

|                               |  |
|-------------------------------|--|
| Poisons Schedule              | Not Applicable   |
| Classification <sup>[1]</sup> | Acute Toxicity (Inhalation) Category 4, Carcinogenicity Category 2   |
| 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 |  |
|--------------------|--|

Continued...

SIGNAL WORD **WARNING****Hazard statement(s)**

|             |                              |
|-------------|------------------------------|
| <b>H332</b> | Harmful if inhaled.          |
| <b>H351</b> | Suspected of causing cancer. |

**Supplementary statement(s)**

Not Applicable

**Precautionary statement(s) Prevention**

|             |   |
|-------------|---|
| <b>P201</b> | Obtain special instructions before use.         |
| <b>P271</b> | Use only outdoors or in a well-ventilated area. |
| <b>P281</b> | Use personal protective equipment as required.  |
| <b>P261</b> | Avoid breathing dust/fumes.                     |

**Precautionary statement(s) Response**

|                  |  |
|------------------|--|
| <b>P308+P313</b> | IF exposed or concerned: Get medical advice/attention.   |
| <b>P312</b>      | Call a POISON CENTER or doctor/physician if you feel unwell.                                     |
| <b>P304+P340</b> | IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. |

**Precautionary statement(s) Storage**

|             |                  |
|-------------|------------------|
| <b>P405</b> | Store locked up. |
|-------------|------------------|

**Precautionary statement(s) Disposal**

|             |   |
|-------------|---|
| <b>P501</b> | Dispose of contents/container in accordance with local regulations. |
|-------------|---|

**SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS****Substances**

See section below for composition of Mixtures

**Mixtures**

| CAS No     | %[weight] | Name                                       |
|------------|-----------|--|
|            |           | welding electrode which upon use generates |
| Not avail. | >60       | <u>welding fumes</u>                       |
|            |           | as   |
|            |           | iron fumes                                 |
| 7439-96-5. |           | <u>manganese fume</u>                      |
|            |           | silicon, sulfur and phosphorous fumes      |

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

|                     |   |
|---------------------|---|
| <b>Eye Contact</b>  | <ul style="list-style-type: none"> <li>▶ Particulate bodies from welding spatter may be removed carefully.</li> <li>▶ <b>DO NOT attempt to remove particles attached to or embedded in eye.</b></li> <li>▶ Lay victim down, on stretcher if available and pad <b>BOTH</b> eyes, make sure dressing does not press on the injured eye by placing thick pads under dressing, above and below the eye.</li> <li>▶ Seek urgent medical assistance, or transport to hospital.</li> <li>▶ For "arc eye", i.e. welding flash or UV light burns to the eye:</li> <li>▶ Place eye pads or light clean dressings over both eyes.</li> <li>▶ Seek medical assistance.</li> </ul> |
| <b>Skin Contact</b> | <p>If skin or hair contact occurs:</p> <ul style="list-style-type: none"> <li>▶ Flush skin and hair with running water (and soap if available).</li> <li>▶ Seek medical attention in event of irritation.</li> </ul> <p>For thermal burns:</p> <ul style="list-style-type: none"> <li>▶ Decontaminate area around burn.</li> <li>▶ Consider the use of cold packs and topical antibiotics.</li> </ul> <p>For first-degree burns (affecting top layer of skin)</p>   |

Continued...

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|                   |   |
|-------------------|---|
|                   | <ul style="list-style-type: none"> <li>▶ Hold burned skin under cool (not cold) running water or immerse in cool water until pain subsides.</li> <li>▶ Use compresses if running water is not available.</li> <li>▶ Cover with sterile non-adhesive bandage or clean cloth.</li> <li>▶ Do NOT apply butter or ointments; this may cause infection.</li> <li>▶ Give over-the-counter pain relievers if pain increases or swelling, redness, fever occur.</li> </ul> <p>For second-degree burns (affecting top two layers of skin)</p> <ul style="list-style-type: none"> <li>▶ Cool the burn by immerse in cold running water for 10-15 minutes.</li> <li>▶ Use compresses if running water is not available.</li> <li>▶ Do NOT apply ice as this may lower body temperature and cause further damage.</li> <li>▶ Do NOT break blisters or apply butter or ointments; this may cause infection.</li> <li>▶ Protect burn by cover loosely with sterile, nonstick bandage and secure in place with gauze or tape.</li> </ul> <p>To prevent shock: (unless the person has a head, neck, or leg injury, or it would cause discomfort):</p> <ul style="list-style-type: none"> <li>▶ Lay the person flat.</li> <li>▶ Elevate feet about 12 inches.</li> <li>▶ Elevate burn area above heart level, if possible.</li> <li>▶ Cover the person with coat or blanket.</li> <li>▶ Seek medical assistance.</li> </ul> <p>For third-degree burns</p> <p>Seek immediate medical or emergency assistance.</p> <p>In the mean time:</p> <ul style="list-style-type: none"> <li>▶ Protect burn area cover loosely with sterile, nonstick bandage or, for large areas, a sheet or other material that will not leave lint in wound.</li> <li>▶ Separate burned toes and fingers with dry, sterile dressings.</li> <li>▶ Do not soak burn in water or apply ointments or butter; this may cause infection.</li> <li>▶ To prevent shock see above.</li> <li>▶ For an airway burn, do not place pillow under the person's head when the person is lying down. This can close the airway.</li> <li>▶ Have a person with a facial burn sit up.</li> <li>▶ Check pulse and breathing to monitor for shock until emergency help arrives.</li> </ul> |
| <b>Inhalation</b> | <ul style="list-style-type: none"> <li>▶ If fumes or combustion products are inhaled remove from contaminated area.</li> <li>▶ Lay patient down. Keep warm and rested.</li> <li>▶ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.</li> <li>▶ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.</li> <li>▶ Transport to hospital, or doctor.</li> </ul>   |
| <b>Ingestion</b>  | Not normally a hazard due to the physical form of product. The material is a physical irritant to the gastro-intestinal tract   |

**Indication of any immediate medical attention and special treatment needed**

For carbon monoxide intoxications:

- ▶ Administer pure oxygen by the best means possible. An oro-nasal mask is usually best. Artificial respiration is necessary wherever breathing is inadequate. Apnoeic patients have often been saved by persistent and efficient artificial ventilation. A patent airway must be carefully maintained. Patients with 40% carboxyhaemoglobin or more and an uncompensated metabolic acidosis (arterial pH less than 7.4) should be managed aggressively with ventilatory support/ hyperbaric oxygenation.
- ▶ Gastric aspiration and lavage early in the course of therapy may prevent aspiration pneumonitis and reveal the presence of ingested intoxicants.
- ▶ Avoid stimulant drugs including carbon dioxide. **DO NOT inject methylene blue.**
- ▶ Hypothermia has been employed to reduce the patient's oxygen requirement.
- ▶ Consider antibiotics as prophylaxis against pulmonary infection.
- ▶ A whole blood transfusion may be useful if it can be given early in the treatment program.
- ▶ Infuse sodium bicarbonate and balanced electrolyte solutions if blood analyses indicate a significant metabolic acidosis.
- ▶ Ancillary therapy for brain oedema may be necessary if hypoxia has been severe.
- ▶ Ensure absolute rest in bed for at least 48 hours; in severe poisonings, 2 to 4 weeks in bed may prevent sequelae.
- ▶ Watch for late neurological, psychiatric and cardiac complications. GOSSELIN, SMITH HODGE: Clinical Toxicology of Commercial Products 5th Ed.

**BIOLOGICAL EXPOSURE INDEX (BEI)**

These represent the determinants observed in specimens collected from a healthy worker exposed at the Exposure Standard (ES or TLV):

| Determinant                        | Sampling time | Index               | Comments |
|------------------------------------|---------------|---------------------|----------|
| Carboxyhaemoglobin in blood        | end of shift  | 3.5% of haemoglobin | B, NS    |
| Carbon monoxide in end-exhaled air | end of shift  | 20 ppm              | B, NS    |

B: Background levels occur in specimens collected from subjects NOT exposed

NS: Non-specific determinant; also observed after exposure to other material

**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**

|                             |             |
|-----------------------------|-------------|
| <b>Fire Incompatibility</b> | None known. |
|-----------------------------|-------------|

### Advice for firefighters

|                              |   |
|------------------------------|---|
| <b>Fire Fighting</b>         | <ul style="list-style-type: none"> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ Wear breathing apparatus plus protective gloves in the event of a fire.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water courses.</li> <li>▶ Use fire fighting procedures suitable for surrounding area.</li> <li>▶ <b>DO NOT</b> approach containers suspected to be hot.</li> <li>▶ Cool fire exposed containers with water spray from a protected location.</li> </ul> <p>Slight hazard when exposed to heat, flame and oxidisers.</p> |
| <b>Fire/Explosion Hazard</b> | <p>Articles and manufactured articles may constitute a fire hazard where polymers form their outer layers or where combustible packaging remains in place.</p> <p>Certain substances, found throughout their construction, may degrade or become volatile when heated to high temperatures. This may create a secondary hazard.</p> <p>Welding arc and metal sparks can ignite combustibles.</p>  |
| <b>HAZCHEM</b>               | Not Applicable  |

## 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

|                     |  |
|---------------------|--|
| <b>Minor Spills</b> | <ul style="list-style-type: none"> <li>▶ Clean up all spills immediately.</li> <li>▶ Secure load if safe to do so.</li> <li>▶ Bundle/collect recoverable product.</li> <li>▶ Collect remaining material in containers with covers for disposal.</li> </ul>   |
| <b>Major Spills</b> | <ul style="list-style-type: none"> <li>▶ Clean up all spills immediately.</li> <li>▶ Wear protective clothing, safety glasses, dust mask, gloves.</li> <li>▶ Secure load if safe to do so. Bundle/collect recoverable product.</li> <li>▶ Use dry clean up procedures and avoid generating dust.</li> <li>▶ Vacuum up (consider explosion-proof machines designed to be grounded during storage and use).</li> </ul> |

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

## SECTION 7 HANDLING AND STORAGE

### Precautions for safe handling

|                          |  |
|--------------------------|--|
| <b>Safe handling</b>     | <ul style="list-style-type: none"> <li>▶ Avoid all personal contact, including inhalation.</li> <li>▶ Wear protective clothing when risk of exposure occurs.</li> <li>▶ Use in a well-ventilated area.</li> <li>▶ Prevent concentration in hollows and sumps.</li> <li>▶ <b>DO NOT enter confined spaces until atmosphere has been checked.</b></li> <li>▶ <b>DO NOT allow material to contact humans, exposed food or food utensils.</b></li> </ul> |
| <b>Other information</b> | <ul style="list-style-type: none"> <li>▶ Keep dry.</li> <li>▶ Store under cover.</li> <li>▶ Protect containers against physical damage.</li> <li>▶ Observe manufacturer's storage and handling recommendations contained within this SDS.</li> </ul>   |

### Conditions for safe storage, including any incompatibilities

|                                |  |
|--------------------------------|--|
| <b>Suitable container</b>      | <p>Generally packaging as originally supplied with the article or manufactured item is sufficient to protect against physical hazards.</p> <p>If repackaging is required ensure the article is intact and does not show signs of wear. As far as is practicably possible, reuse the original packaging or something providing a similar level of protection to both the article and the handler.</p>   |
| <b>Storage incompatibility</b> | <p>Welding electrodes should not be allowed to come into contact with strong acids or other substances which are corrosive to metals.</p> <ul style="list-style-type: none"> <li>▶ Avoid cross contamination between the two liquid parts of product (kit).</li> <li>▶ If two part products are mixed or allowed to mix in proportions other than manufacturer's recommendation, polymerisation with gelation and evolution of heat (exotherm) may occur.</li> <li>▶ This excess heat may generate toxic vapour</li> </ul> |

## SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

### Control parameters

#### OCCUPATIONAL EXPOSURE LIMITS (OEL)

##### INGREDIENT DATA

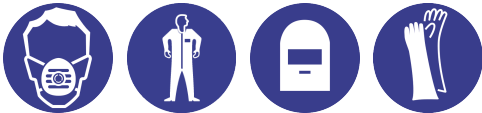
| Source                       | Ingredient     | Material name                            | TWA                 | STEL                | Peak          | Notes         |
|------------------------------|----------------|--|---------------------|---------------------|---------------|---------------|
| Australia Exposure Standards | welding fumes  | Welding fumes (not otherwise classified) | 5 mg/m <sup>3</sup> | Not Available       | Not Available | Not Available |
| Australia Exposure Standards | manganese fume | Manganese, fume (as Mn)                  | 1 mg/m <sup>3</sup> | 3 mg/m <sup>3</sup> | Not Available | Not Available |

##### EMERGENCY LIMITS

| Ingredient     | Material name | TEEL-1              | TEEL-2              | TEEL-3                  |
|----------------|---------------|---------------------|---------------------|-------------------------|
| manganese fume | Manganese     | 3 mg/m <sup>3</sup> | 5 mg/m <sup>3</sup> | 1,800 mg/m <sup>3</sup> |

| Ingredient     | Original IDLH                     | Revised IDLH          |
|----------------|-----------------------------------|-----------------------|
| welding fumes  | Not Available                     | Not Available         |
| manganese fume | N.E. mg/m <sup>3</sup> / N.E. ppm | 500 mg/m <sup>3</sup> |

### Exposure controls

|   |   |
|---|---|
| <b>Appropriate engineering controls</b> | <p>For manual arc welding operations the nature of ventilation is determined by the location of the work.</p> <ul style="list-style-type: none"> <li>▶ For outdoor work, natural ventilation is generally sufficient.</li> <li>▶ For indoor work, conducted in open spaces, use mechanical (general exhaust or plenum) ventilation. (Open work spaces exceed 300 cubic metres per welder)</li> <li>▶ For work conducted in limited or confined spaces, mechanical ventilation, using local exhaust systems, is required. (In confined spaces always check that oxygen has not been depleted by excessive rusting of steel or snowflake corrosion of aluminium)</li> </ul> <p>Mechanical or local exhaust ventilation may not be required where the process working time does not exceed 24 mins. (in an 8 hr. shift) provided the work is intermittent (a maximum of 5 mins. every hour).</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. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.</p> <p><b>FUMIGATION:</b></p> <p>Microbiological safety cabinets must always be fumigated if a large spill of infectious material occurs within them, before filters are changed or any maintenance work is carried out which involves access to the interior of the cabinet (air duct maintenance for example).</p> <ul style="list-style-type: none"> <li>▶ Fumigation should be conducted with the night door securely sealed and the non-return valve left closed.</li> <li>▶ Passive migration of the fumigant through the filter is allowable. Alternately the valve may be left open and the fan may be run for 10 to 15 seconds thus ensuring penetration of filter medium. The valve should then be closed and the fan switched off allowing the remainder of the fumigant to disperse within the cabinet. After at least six hours the fumigant should be exhausted to atmosphere by switching on the fan and allowing room air to enter through, for example, the night door bung-hole.</li> </ul> |
| <b>Personal protection</b>              |    |
| <b>Eye and face protection</b>          | <ul style="list-style-type: none"> <li>▶ 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.</li> <li>▶ 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. [WRIA-WTIA Technical Note 7]</li> <li>▶ An approved face shield or welding helmet can also have filters for optical radiation protection, and offer additional protection against debris and sparks.</li> </ul>   |

|                              |   |
|------------------------------|---|
|                              | <ul style="list-style-type: none"> <li>▶ UV blocking protective spectacles with side shields or welding goggles are considered primary protection, with the face shield or welding helmet considered secondary protection.</li> </ul> <p>For submerged arc welding use a lens shade which gives just sufficient arc brightness to allow weld pool control.</p>  |
| <b>Skin protection</b>       | See Hand protection below   |
| <b>Hands/feet protection</b> | <p>Wear general protective gloves, eg. light weight rubber gloves.</p> <ul style="list-style-type: none"> <li>▶ Welding gloves conforming to Standards such as EN 12477:2001, ANSI Z49.1, AS/NZS 2161:2008 produced from leather, rubber, treated cotton, or aluminised</li> <li>▶ These gloves protect against mechanical risk caused by abrasion, blade cut, tear and puncture</li> <li>▶ Other gloves which protect against thermal risks (heat and fire) might also be considered - these comply with different standards to those mentioned above.</li> <li>▶ One pair of gloves may not be suitable for all processes. For example, gloves that are suitable for low current Gas Tungsten Arc Welding (GTAW) (thin and flexible) would not be proper for high-current Air Carbon Arc Cutting (CAC-A) (insulated, tough, and durable)</li> </ul> |
| <b>Body protection</b>       | See Other protection below  |
| <b>Other protection</b>      | <p>Before starting; consider that protection should be provided for all personnel within 10 metres of any open arc welding operation. Welding sites must be adequately shielded with screens of non flammable materials. Screens should permit ventilation at floor and ceiling levels.</p> <ul style="list-style-type: none"> <li>▶ Overalls.</li> <li>▶ P.V.C. apron.</li> <li>▶ Barrier cream.</li> <li>▶ Skin cleansing cream.</li> <li>▶ Eye wash unit.</li> </ul>   |
| <b>Thermal hazards</b>       | Not Available   |

### Respiratory protection

Welding of powder coated metal requires good general area ventilation, and ventilated mask as local heat causes minor coating decomposition releasing highly discomforting fume which may be harmful if exposure is regular.

Welding or flame cutting of metals with chromate pigmented primers or coatings may result in inhalation of highly toxic chromate fumes. Exposures may be significant in enclosed or poorly ventilated areas.

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

|   |                                      |  |                |
|---|--------------------------------------|--|----------------|
| <b>Appearance</b>                                   | Dark grey solid; insoluble in water. |  |                |
| <b>Physical state</b>                               | Manufactured                         | <b>Relative density (Water = 1)</b>            | Not Available  |
| <b>Odour</b>  | Not Available                        | <b>Partition coefficient n-octanol / water</b> | Not Available  |
| <b>Odour threshold</b>                              | Not Available                        | <b>Auto-ignition temperature (°C)</b>          | Not Applicable |
| <b>pH (as supplied)</b>                             | Not Applicable                       | <b>Decomposition temperature</b>               | Not Applicable |
| <b>Melting point / freezing point (°C)</b>          | Not Applicable                       | <b>Viscosity (cSt)</b>                         | Not Applicable |
| <b>Initial boiling point and boiling range (°C)</b> | Not Applicable                       | <b>Molecular weight (g/mol)</b>                | Not Applicable |
| <b>Flash point (°C)</b>                             | Not Applicable                       | <b>Taste</b>                                   | Not Available  |
| <b>Evaporation rate</b>                             | Not Applicable                       | <b>Explosive properties</b>                    | Not Available  |
| <b>Flammability</b>                                 | Not Applicable                       | <b>Oxidising properties</b>                    | Not Available  |
| <b>Upper Explosive Limit (%)</b>                    | Not Applicable                       | <b>Surface Tension (dyn/cm or mN/m)</b>        | Not Applicable |
| <b>Lower Explosive Limit (%)</b>                    | Not Applicable                       | <b>Volatile Component (%vol)</b>               | Not Applicable |
| <b>Vapour pressure (kPa)</b>                        | Not Applicable                       | <b>Gas group</b>                               | Not Available  |
| <b>Solubility in water (g/L)</b>                    | Immiscible                           | <b>pH as a solution (1%)</b>                   | Not Applicable |
| <b>Vapour density (Air = 1)</b>                     | Not Applicable                       | <b>VOC g/L</b>                                 | Not Applicable |

**SECTION 10 STABILITY AND REACTIVITY**

|   |  |
|---|--|
| <b>Reactivity</b>                         | See section 7  |
| <b>Chemical stability</b>                 | <ul style="list-style-type: none"> <li>▶ Unstable in the presence of incompatible materials.</li> <li>▶ Product is considered stable.</li> <li>▶ Hazardous polymerisation will not occur.</li> </ul> |
| <b>Possibility of hazardous reactions</b> | See section 7  |
| <b>Conditions to avoid</b>                | See section 7  |
| <b>Incompatible materials</b>             | See section 7  |
| <b>Hazardous decomposition products</b>   | See section 5  |

**SECTION 11 TOXICOLOGICAL INFORMATION****Information on toxicological effects**

|  |  |                   |
|--|--|-------------------|
| <b>Inhaled</b>                           | Fumes evolved during welding operations may be irritating to the upper-respiratory tract and may be harmful if inhaled.  |                   |
| <b>Ingestion</b>                         | Not normally a hazard due to physical form of product.   |                   |
| <b>Skin Contact</b>                      | <p>Ultraviolet radiation (UV) is generated by the electric arc in the welding process. Skin exposure to UV can result in severe burns, in many cases without prior warning.</p> <p>Exposure to infrared radiation (IR), produced by the electric arc and other flame cutting equipment may heat the skin surface and the tissues immediately below the surface. Except for this effect, which can progress to thermal burns in some situations, infrared radiation is not dangerous to welders. Most welders protect themselves from IR (and UV) with a welder's helmet (or glasses) and protective clothing.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p> <p>Skin contact does <b>not</b> normally present a hazard, though it is always possible that occasionally individuals may be found who react to substances usually regarded as inert.</p>  |                   |
| <b>Eye</b>                               | <p>Ultraviolet (UV) radiation can also damage the lens of the eye. Many arc welders are aware of the condition known as "arc-eye," a sensation of sand in the eyes. This condition is caused by excessive eye exposure to UV. Exposure to ultraviolet rays may also increase the skin effects of some industrial chemicals (coal tar and cresol compounds, for example).</p> <p>Exposure of the human eye to intense visible light can produce adaptation, pupillary reflex, and shading of the eyes. Such actions are protective mechanisms to prevent excessive light from being focused on the retina.</p> <p>Fumes from welding/brazing operations may be irritating to the eyes.</p>  |                   |
| <b>Chronic</b>                           | <p>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. Whilst mild steel welding represents little risk, the stainless steel welder, exposed to chromium and nickel fume, may be at risk and it is this factor which may account for the overall increase in lung cancer incidence among welders. Cold isolated electrodes are relatively harmless.</p> <p>Metal oxides generated by industrial processes such as welding, give rise to a number of potential health problems. Particles smaller than 5 micron (respirables) articles 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.</p> <p>Welding fume with high levels of ferrous materials may lead to particle deposition in the lungs (siderosis) after long exposure. This clears up when exposure stops. Chronic exposure to iron dusts may lead to eye disorders.</p> <p>Silica and silicates in welding fumes are non-crystalline and believed to be non-harmful.</p> <p>Other welding process exposures can arise from radiant energy UV flash burns, thermal burns or electric shock</p> <p>The welding arc emits ultraviolet radiation at wavelengths that have the potential to produce skin tumours in animals and in over-exposed individuals, however, no confirmatory studies of this effect in welders have been reported.</p> |                   |
| <b>Welding Electrodes Type AWS E6013</b> | <b>TOXICITY</b>  | <b>IRRITATION</b> |
|  | Not Available  | Not Available     |
| <b>welding fumes</b>                     | <b>TOXICITY</b>  | <b>IRRITATION</b> |
|  | Not Available  | Not Available     |

**Welding Electrodes Type AWS E6013**

|                       |   |   |
|-----------------------|---|---|
| <b>manganese fume</b> | <b>TOXICITY</b>   | <b>IRRITATION</b>   |
|                       | Oral (rat) LD50: >2000 mg/kg <sup>[1]</sup>   | Eye (rabbit) 500mg/24H Mild<br>Skin (rabbit) 500mg/24H Mild |
| <b>Legend:</b>        | 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 |   |

|                      |  |
|----------------------|--|
| <b>WELDING FUMES</b> | <p><b>WARNING:</b> This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans. 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. Different welding environments may present different and complex profiles of exposures. In one study to characterise welding fume aerosol nanoparticles in mild steel metal active gas welding showed a mass median diameter (MMMD) of 200-300 nm. Not available. Refer to individual constituents.</p> |
|----------------------|--|

|  |   |                                 |   |
|--|---|---------------------------------|---|
| <b>Acute Toxicity</b>                    | ✓ | <b>Carcinogenicity</b>          | ✓ |
| <b>Skin Irritation/Corrosion</b>         | ⊘ | <b>Reproductivity</b>           | ⊘ |
| <b>Serious Eye Damage/Irritation</b>     | ⊘ | <b>STOT - Single Exposure</b>   | ⊘ |
| <b>Respiratory or Skin sensitisation</b> | ⊘ | <b>STOT - Repeated Exposure</b> | ⊘ |
| <b>Mutagenicity</b>                      | ⊘ | <b>Aspiration Hazard</b>        | ⊘ |

**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 |
|----------------|----------|--------------------|-------------------------------|----------|--------|
| manganese fume | LC50     | 96                 | Fish                          | >3.6mg/L | 2      |
| manganese fume | EC50     | 48                 | Crustacea                     | >1.6mg/L | 2      |
| manganese fume | EC50     | 72                 | Algae or other aquatic plants | 2.8mg/L  | 2      |
| manganese fume | BCFD     | 37                 | Algae or other aquatic plants | 2.2mg/L  | 4      |
| manganese fume | EC50     | 72                 | Algae or other aquatic plants | 4.5mg/L  | 2      |
| manganese fume | NOEC     | 48                 | Crustacea                     | 1.6mg/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

**DO NOT** discharge into sewer or waterways.

**Persistence and degradability**

| Ingredient | Persistence: Water/Soil               | Persistence: Air                      |
|------------|---------------------------------------|---------------------------------------|
|            | No Data available for all ingredients | No Data available for all ingredients |

**Bioaccumulative potential**

| Ingredient | Bioaccumulation                       |
|------------|---------------------------------------|
|            | No Data available for all ingredients |

**Mobility in soil**

| Ingredient | Mobility |
|------------|----------|
|            |          |



**Welding Electrodes Type AWS E6013**

No Data available for all ingredients

**SECTION 13 DISPOSAL CONSIDERATIONS**

**Waste treatment methods**

|                                     |   |
|-------------------------------------|---|
| <b>Product / Packaging disposal</b> | <ul style="list-style-type: none"> <li>Recycle wherever possible or consult manufacturer for recycling options.</li> <li>Consult State Land Waste Management Authority for disposal.</li> </ul> |
|-------------------------------------|---|

**SECTION 14 TRANSPORT INFORMATION**

**Labels Required**

|                         |                |
|-------------------------|----------------|
| <b>Marine Pollutant</b> | NO             |
| <b>HAZCHEM</b>          | 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**

**WELDING FUMES(NOT AVAIL.) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

|  |   |
|--|---|
| Australia Exposure Standards   | International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs |
| Australia Hazardous Substances Information System - Consolidated Lists |   |

**MANGANESE FUME(7439-96-5.) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

|  |   |
|--|---|
| Australia Exposure Standards   | Australia Inventory of Chemical Substances (AICS) |
| Australia Hazardous Substances Information System - Consolidated Lists |   |

| National Inventory            | Status  |
|-------------------------------|---|
| Australia - AICS              | N (welding fumes)   |
| Canada - DSL                  | N (welding fumes)   |
| Canada - NDSL                 | N (manganese fume; welding fumes)   |
| China - IECSC                 | N (welding fumes)   |
| Europe - EINEC / ELINCS / NLP | N (welding fumes)   |
| Japan - ENCS                  | N (manganese fume; welding fumes)   |
| Korea - KECI                  | N (welding fumes)   |
| New Zealand - NZIoC           | N (welding fumes)   |
| Philippines - PICCS           | N (welding fumes)   |
| USA - TSCA                    | N (welding fumes)   |
| <b>Legend:</b>                | <p>Y = All ingredients are on the inventory<br/>                     N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)</p> |

**SECTION 16 OTHER INFORMATION**

**Other information**

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](http://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

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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