SAFETY DATA SHEET (SDS)
GOUGING RODS

Please ensure that this SDS is received by the appropriate persons

Review Date: 1/11/2022 v01 **Emergency: 0860 02 02 02** **Document Number: AFX-SDS-0168**

1. PRODUCT AND COMPANY IDENTIFICATION

Product Synonym	CARBON GOUGE
Product Specification	CARBON GOUGE
Product Classification and Brands	The following Afrox rods and electrodes are covered by this SDS: .
Recommended use:	Gouging of steel
Product Code	W054915, W054917, W054918, W054919; W054926; W054933; W054934; W436128
Company Identification	African Oxygen Limited Grayston Office Park, Building 7 128 Peter Road Sandown, Sandton, 2196 Tel. No: (011) 490-0400 Fax No: (011) 490-0530 Email: customer.service@afrox.linde.com www.afrox.com
Emergency Numbers	**0860 02 02 02 (Afrox)**

2. HAZARD IDENTIFICATION

Classification	Classification under South African Hazardous Chemical Substances Regulations subsequently amended. (HCS) Classification under the Globally Harmonized System of classification and labelling of chemicals (GHS)

There are no recognised hazards associated directly with unused Gouging consumables prior to Gouging.
Packaged consumables may be heavy and should be handled and stored with care. FOLLOW MANUAL HANDLING REGULATIONS.
Wire wound on reels or spools or supplied in bulk packages can be coiled under tension. Take care to avoid the wire uncoiling rapidly when released. WEAR GLOVES AND EYE PROTECTION
When using these consumables as part of the Gouging process additional potential hazards are likely:
Electric shock from the Gouging equipment or electrode. This can be fatal. Hot metal spatter and heat from the electric arc and the Gouging flame, which can cause burns to the hand and body, and may cause fire if in contact with combustible materials.
UV, IR and light radiation from the arc, which can produce 'arc eye' and possible eye damage to unprotected eyes. WEAR SUITABLE PROTECTIVE EQUIPMENT.
Fumes produced from the Gouging consumable, material being welded, the arc radiation and the Gouging flame:

- Particulate fume such as complex metal oxides and silicates from the weld materials.
- Gaseous fume such as ozone and nitrogen oxides from the action of arc radiation on the atmosphere, and carbon monoxide and dioxide from oxidation of carbon in the components, and from the flame combustion products.
- Short term inhalation of these fumes and gases may lead to irritation of the nose, throat and eyes.
- Long term overexposure or inhalation of high levels of fumes may result in harmful effects to the respiratory system, central nervous system and lungs.
- Local extraction and /or ventilation should be used to ensure that all hazardous ingredients in the fume are kept below their individual occupational exposure standards in the welder's and other workers' breathing zones.

NOTE: If Gouging is performed on plated or coated materials such as galvanised steel, excessive fume may be produced which contains additional hazardous components, and may result in metal fume fever and other health effects.

Emergency Overview	Colour: copper metal Odour: None Taste: None Physical State: solid Form: Rods
Adverse Health Effects	Gouging fumes will cause irritation
Chemical Hazards	None
Biological Hazards	None
Vapour Inhalation	Gouging fumes will cause irritation
GHS Classification	Skin Irritation, Category 2 Eye Damage, Category 1 Carcinogenicity, Category 2 Skin corrosion/irritation, Category 1
GHS Pictogram	
GHS Signal Words	Danger
GHS Hazard Statements	**H314**: Causes severe skin burns and eye damage **H315**: Causes skin irritation **H318**: Causes serious eye damage **H319**: Causes serious eye irritation **H335**: May cause respiratory irritation **H351**: Suspected of causing cancer **H373**: May cause damage to organs through prolonged or repeated exposure
GHS Precautionary Statements	**Prevention:** P201: Obtain special instruction before use P202: Do not handle until all safety precautions have been read and understood P261: Avoid breathing dust/fume/mist/ vapours P264: Wash skin and hair thoroughly after handling P271: Use only outdoors or in a well-ventilated area

	P280:Wear protective gloves/eye protection/face protection P281: Use personal protective equipment as required **Response:** P302+P352: IF ON SKIN: Wash with plenty of soap and water. P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P308+P313: If exposed or concerned: Get medical advice/attention. P310: Immediately call a POISON CENTER or doctor/physician. P332+P313: IF skin irritation occurs: Get medical advice/attention P362: Take off contaminated clothing and was before reuse P363: Wash contaminated clothing before reuse P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing P337 + P313: If eye irritation persists: Get medical advice/attention **Storage:** P403: Store in a well-ventilated place **Disposal** P501: Dispose of contents/container in accordance with local / regional / national / international regulations.
Other Hazards that do not result in classification	None

3. COMPOSITION OF INGREDIENTS

These rods are made from solid carbon with a copper coating, rod consumables covered by this data sheet are given below.

Chemical Identity	CAS #	Range %
Cellulose	9004-34-6	10-20
Iron Oxide	1317-61-9	1-11
#Manganese	7439-96-5	1-11
Titanium Dioxide	13463-67-7	1-11
Potassium Silicate	1312-76-1	1-11
Sodium Silicate	1344-09-8	1-11
Iron	7439-89-6	60-70

4. FIRST AID MEASURES

Eye contact	For eye effects such as arc eye and dusts. Irrigate eye with sterile water, cover with damp dressing and refer for immediate medical attention if irritation persists Flush eyes with water for at least 15 minutes. Get medical attention.
Skin Contact	Flush skin with large amounts of water. If irritation develops and persists, get medical attention
Ingestion	Ingestion is considered unlikely due to product form Rinse mouth. Obtain medical attention immediately if ingested.
Inhalation	Gouging fumes-If breathing is difficult, bring the patient in fresh air; breathe in fresh air deeply. Get medical attention immediately
Electric shock	Disconnect and turn off the power. Use a nonconductive material to pull victim away from contact with live parts or wires. Immediately contact a physician

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Welding arcs and sparks can ignite combustible and flammable materials. Use the extinguishing media recommended for the burning material and fire situation
Unsuitable extinguishing media:	Do not use water on molten metal. Large fires may be flooded with water from a distance
Specific Hazards	Fumes may be toxic Keep away from heat/spark/open flames/hot surfaces – No smoking. Iron oxides, Manganese/manganese oxides, Sodium oxides, Silicon oxides
Special fire fighting procedures:	In case of fire: Continue water spray from protected position until container stays cool. Use extinguishants to contain the fire.
Special protective equipment for firefighters:	Exposed Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces a self-contained breathing apparatus

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:	No specific measures required for the Gouging consumable prior to gouging. Gouging should not be carried out in the presence of flammable materials, vapours, tanks, cisterns and pipes and other containers which have held Refer Section 8
Measures in case of unintentional release	No specific actions for Gouging consumable
Environmental Precautions	No environmental hazard known. Refer Section 13
Methods and material for containment	Solid objects may be picked up and placed into a container. Liquids or pastes should be scooped up and placed into a container.

and cleaning up:	Wear proper protective equipment while handling these materials. Do not discard as refuse

7. HANDLING AND STORAGE

Safe Handling	No special precautions are required for these Gouging consumables. Gouging wires and rods are dense materials and can give rise to a handling hazard when reels, spools, bulk packs and multiple packages are lifted or handled incorrectly or with poor lifting posture. Good practice for handling and storage should be adopted to prevent physical injuries.
Conditions for safe storage, including any incompatibilities	Store in dry place in closed packages. Keep separate from chemical substances like acids and strong bases, which could cause chemical reactions. Ground/Bond container and receiving equipment

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Occupational Exposure Hazards (HCS)

Chemical Identity	CAS #	OEL 8Hrs TWA Mg/m3
Cellulose	9004-34-6	10
Iron Oxide fume [as Fe]	1317-61-9	10 (R)
#Manganese inorganic compounds [as M]	7439-96-5	0.2
Titanium Dioxide	13463-67-7	10
Potassium Silicate	1312-76-1	unknown
Sodium Silicate	1344-09-8	unknown

General	Welders should not touch live electrical parts and should insulate themselves from the work and the ground. Welders should not touch hot parts of the consumable, the torch assembly or the components being welded, and should avoid contact with the Gouging flame. Manufacturer's guidelines for the use of electrical Gouging machines, gas cylinders, gas control equipment and gas Gouging equipment should be observed at all times. Welders and co-workers should be educated about the health hazards associated with Gouging fumes and trained to keep their heads out of the fume plume. During Gouging, fumes and gases will be produced and emitted from the Gouging process. The content of the fume is dependent on the wire or rod type, shielding gas (if used) and base material being welded. The amount and concentration of fume generated is dependent on factors such as current, voltage (when electric arc Gouging), gas flow settings, flame size and type (when gas Gouging), Gouging practices and number of welders in a given area. By following recommended Gouging practices, fume production can sometimes be minimised. For the solid aluminium wires and rods covered by this data sheet, the main constituents of the fume will be aluminium, manganese, magnesium and copper oxides and silicates, mainly in the form of complex compounds. There will also be smaller amounts of other complex metal oxides and silicates. Gaseous ozone and nitrous oxides are also formed by arc radiation, and carbon monoxide and carbon dioxide can also be present due to oxidation of carbon in the components, and from the flame combustion products. In some cases, ozone levels can be high, and additional controls may be needed. Fume Composition data for the main solid aluminium wires and rods are given below. Fume exposure should be controlled to below the recognised exposure limit for each of the individual constituents, and to below 5 mgm/m3 for the total particulate fume.
Engineering Control Measures	Avoid exposure to welding fumes, radiation, spatter, electric shock, heated materials and dust. Ensure sufficient ventilation, local exhaust, or both, to keep welding fumes and gases from breathing zone and general area. Keep work place and protective clothing clean and dry. Train welders to avoid contact with live electrical parts and insulate conductive parts. Check condition of protective clothing and equipment on a regular basis. **A Risk assessment should be conducted to evaluate the suitability of PPE to the task being performed**
Personal Protection	Welders and co-workers in the vicinity should wear protective clothing and eye protection appropriate to the Gouging process being used, as specified by local standards.
Eyes	As appropriate for the Gouging process being used, welders should wear a welding helmet or welding goggles fitted with the correct optical Gouging filter for the operation. Suitable protective Gouging screens and goggles should be provided, and used by others working in the same area.

Hands	Welders should wear suitable hand protection such a welding gloves or gauntlets of a suitable standard. Co-workers should also wear suitable hand protection against hot metal, sparks and spatter.
Body protection:	Suitable clothes for Gouging should be worn such as non-light reflective fireproof overalls, leather apron, Gouging helmet (for arc Gouging), suitable head protection and Gouging goggles (for gas Gouging), leather boots spats and gloves.
Feet	Wear safety shoes while handling containers

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Solid
Appearance	Copper plating for the surface of the black carbon rod
Colour	Copper
Odour:	Odourless
Odour Threshold:	Not available
pH Value:	Not available
Melting Point/Range:	Carbon 3527℃ Copper 1084℃
Boiling Point:	Carbon 4027℃ Copper 2927℃.
Flash point:	Not Available
Evaporation rate:	Not Available
Explosion limits:	Not Available
Vapour pressure:	Not Available
Density 20ºC:	Carbon 1.7g/cm3 Copper 8.9g/cm3
Relative density:	6-9 g/cm3
Solubility:	Insoluble in water
Partition coefficient:	Not Available
Auto-ignition temperature	Not Available
Decomposition temperature	Not Available

10. STABILITY AND REACTIVITY

Reactivity & Stability	There are no stability or reactivity hazards from Gouging rods as supplied.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	Strong acid and strong alkali react to form hydrogen which is highly flammable
Conditions to avoid	Any condition where product will be contaminated with acid or alkali's
Incompatible Materials	Acids and alkali's
Hazardous Decomposition of Products	Hydrogen will be generated if acid or alkali gets in contact with the product. When this product is used in a welding process, hazardous decomposition product would include those from volatilization, reaction or oxidation of the material listed in section 3 and those from the base metal and coating. The amount of fumes generated from this product varies with welding parameters and dimensions.

11. TOXOLOGICAL INFORMATION

Gouging fumes if inhaled can potentially produce several differing health effects caused by the metal containing particles and the gases produced during the Gouging process, both of which are present in the 'fumes'. The exact nature of any likely health effect is dependent on the consumable, material being welded, weld process, all of which affect fume quantity and composition, as well as the use of adequate ventilation, respirators, or breathing equipment as circumstances require.

Inhalation of the fumes/gases produced during Gouging may lead to irritation to the nose throat and eyes. The range of health effects include respiratory effects with symptoms such as asthma, impaired respiratory and lung function, chronic bronchitis, metal fume fever, pneumoconiosis, possible emphysema and acute pulmonary oedema.

Other potential health effects at elevated levels of exposure include central nervous effects possible lung cancer, bone disease, skin and fertility effects. Unprotected skin exposed to UV and IR radiation from the Gouging arc may burn or redden, and UV radiation is potentially a carcinogen. UV radiation can affect the unprotected eye by producing an acute condition known as 'arc eye'. Specific effects relevant to major particulate and gaseous fume constituents produced when Gouging with these wires and rods

Overexposure to welding fumes may affect pulmonary function and eyes. Overexposure to manganese and manganese compounds above safe exposure limits can cause irreversible damage to the central nervous system, including the brain, symptoms of which may include slurred speech, lethargy, tremor, muscular weakness, psychological disturbances and spastic gait. Prolonged inhalation of titanium dioxide (Classified 2B by IARC) above safe exposure limits can cause cancer

Copper and Zinc

Copper and zinc in Gouging fume is the main cause of any metal fume fever observed during Gouging. Metal fume fever is a delayed respiratory effect produced by inhalation of fume. Symptoms include sweating, chills, fever, muscle aches and high temperature. These acute symptoms normally alleviate within 24-48 hours.

Ozone and Nitrogen oxides

In electric arc Gouging, these gases are formed due to interactions of the arc with the surrounding air. Both gases can produce eye, respiratory and lung irritation and also can produce longer term lung effects such as decreased lung capacity, chronic bronchitis, and emphysema. Of particular concern with both gases is that exposure to high levels (eg due to build up in confined spaces) can result in acute lung effects such as delayed pulmonary oedema. Carbon monoxide and carbon dioxide Carbon monoxide (CO) is a chemical asphyxiant and its toxicity is due to its affinity for oxygen carrying blood haemoglobin causing fatigue, weakness, dizziness and eventual unconsciousness and possible death. Carbon dioxide (CO2) is mainly an asphyxiant but can exert some toxic properties by increasing pulse and heart rate. During the normal uses of these wires and rods, these gases can be produced by oxidation of carbon in the components and from the flame combustion products.

12. ECOLOGICAL INFORMATION

Toxicity	Welding rods contain metals which are considered to be very toxic towards aquatic organisms. Finely divided welding rods are therefore considered harmful to aquatic organisms
Persistence and degradability	The welding rods consist of elements that can not degrade any further in the environment.
Bio-accumulative Potential Product	Welding rods contain heavy metals which bio accumulates in the food chain. The following figures are the bio concentration factor (BCF) for the substances on their own BCF: Iron, BCF: 140000 Manganese, BCF: 59052
Mobility in soil	Welding rods are not soluble in water or soil. Particles formed by working welding rods can be transported in the air
Results of PBT and vPvB assessment	No data
Other adverse effects	In massive form, welding rods present no hazards to the aquatic environment. Welding materials could degrade into components originating from the materials used in the welding process. Avoid exposure to conditions that could lead to accumulation in soils or groundwater. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment
Effect on ozone layer	No data
Effect on the global warming (CO2=1)	No data

13. DISPOSAL CONSIDERATIONS

Disposal Methods	For product elimination, consult recycling companies or appropriate local authority
Disposal of Packaging	May be disposed in approved landfills provided local regulations are observed

14. TRANSPORT INFORMATION

Road Transportation

UN No.	Non known
Shipping Name	Gouging rods
ERG No.	Not specified
Class	2.2
Subsidiary Risk	Non specified
Hazchem Warning	Non specified

Sea Transportation

IMDG	Not known
Shipping Name	Gouging rods
ERG No.	Non specified
Class	Non specified
Subsidiary Risk	Non specified
Label	Non specified

Air Transportation

ICAO/IATA Code	Not specified
Class	Not specified
Packing Group:	Non known
Packaging instructions	Cargo: not specified Passenger: not specified

15. REGULATORY INFORMATION

National legislation OHSact and Regulations 85 of 1993.

SANS 11014:2010 Edition 1	Safety data sheet for chemical products - Content and order of sections
SANS 10228:2012 Edition 6	The identification and classification of dangerous goods for transport by road and rail modes
SANS 10234:2019 Edition 2	Globally Harmonized System of classification and labelling of chemicals (GHS)
SUPPLEMENT TO SANS 10234 Edition 1	List of classification and labelling of chemicals in accordance with the Globally Harmonized System (GHS)
SABS 0238 (SANS 1238)	Gouging and Thermal Cutting Process

16. OTHER INFORMATION

- Ensure all national/local regulations are observed.
- Ensure users and relevant persons understand the asphyxiation hazard
- Regularly check supplier's information sources for updated versions of SDS's

Revision Date	1/11/2022 v01

Bibliography

Compressed Gas Association, Arlington, Virginia
Handbook of Compressed Gases - 3rd Edition
Matheson Gas Data Book - 6th Edition
SANS 11014 - Safety data sheet for chemical products: Content and order of sections
SANS 10234 - List of classification and labelling of chemicals in accordance with the Globally Harmonized System (GHS)

EXCLUSION OF LIABILITY