Linde Bangladesh Limited

MATERIAL SAFETY DATA SHEET

For Welding Consumables and Related Products

Complies with OSHA's Hazard Communication Standard (29CFR 1910.1200)

MSDS NO.: **CE004 Hardsurfacing Covered Electrodes**
Date: **18/01/10**
Revision No.: **05**
Sizes: **All**

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name:	HARDFACING COVERED WELDING ELECTRODES
Product Brands:	Duroid 350R, Duroid 650R, Hardcraft 650B, Mangcraft
Product Specification:	AWS SFA 5.13-80 EFeMn or other
Product Classification:	EFeMn-A or others
Recommended Use:	Shielded Metal Arc Welding
Supplier:	Linde Bangladesh Limited
Address:	285 Tejgaon I/A, Dhaka – 1208
Telephone Number:	+ (8802) 8870322 - 27 (akm.tareq@linde.com)
Emergency Telephone Number	(24 hour)**:** + (880171) 3062077
Telefax:	+ (8802) 8870329

SECTION 2: HAZARD IDENTIFICATION

Classified as Dangerous to EC 1272/2008

The products to specifications containing Nickel in its inhalable form, such as AWS 5.13-80 E.FeMn, are considered hazardous in the unused state

- Suspected of causing cancer (Carc2, H351/EC 1272/2008, Carc, Cat3, R40/Directive 67/548 EC)
- May cause an allergic skin reaction (Skin sens 1, H317/EC1272/2008, R43/ Directive 67/548 EC)

Packaged consumables may be heavy, and should be handled and stored with care. FOLLOW MANUAL HANDLING REGULATIONS.

Some low levels of dust may be produced during handling. DO NOT BREATHE THE DUST.

When using these electrodes as part of the welding process additional potential hazards are likely. These are:

- Electric shock from the welding equipment or electrode. This can be fatal.
- Hot metal spatter and heat, 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 welding consumable, material being welded, and the arc radiation. These consist of:
    - Particulate fume such as complex metal oxides, fluorides, and silicates from the weld materials. (Details of the fume constituents are given in section 8 of this document).
    - Gaseous fume such as ozone and nitrogen oxides from the action of arc radiation on the atmosphere, and carbon monoxide and dioxide from the dissociation of some flux constituents during welding.
        - Toxic if inhaled (H331) / EC1272 / 2008, (R20 / Directive 67 / 548EEC) (T:R23 and Xn:R20 / Directive 67 / 548 / EC)
        - May cause cancer (H350 / Carc1A) (Carc.Cat1;R45 / Directive 67 / 548 EC)
        - May cause allergy or asthma symptoms or breathing difficulties if inhaled (H334) / EC1272 / 2008 (R42 and Xi:R37 / Directive67 / 548 / EC)
        - May cause genetic defects (H340) / Suspected of damaging fertility or the unborn child (H361) / EC1272 / 2008 (Muta.cat2:R46 and Repr.Cat.3:R62 / Directive67 / 548 / EC)
        - Causes damage to organs (H372) / EC1272 / 2008 (T:R48 / 23 / and Xn; R48 / 20 / Directive 67 / 548 / EC)
        - Harmful if swallowed (H302 / EC1272 / 2008, R22 / Directive 67 / 548EEC)
        - Toxic in contact with the skin (H311) / May cause an allergic skin reaction (H317) / Causes serious eye irritation (H319) / EC1272 / 2008 (T:R23 / R43 / Xi;R36 / Directive 67 / 548 / EC)

    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 FUME 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

    Fume collected in extraction systems may consist of heavy metal compound and should be disposed of (or recycled) in line with local regulations if applicable)

        - Very toxic to aquatic life (H400) / Very toxic to aquatic life with long lasting effects (H410) / EC1272 / 2008 (N:R50-53 / Directive 67 / 548 / EC)
        - May cause long lasting harmful effects to aquatic life (H413 / EC1272 / 2008) (R53 / Directive 67 / 548 / EC)

NOTE; If welding 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.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

These electrodes consist of a carbon steel inner core with a flux coating and are considered mixtures to EC 1272 / 2008. The carbon steel inner core is an uncoated solid rod. The flux coatings vary depending on the type of electrode, and contain varying amounts of metal powders, ferro-alloy powders, graphite, mineral ores, inorganic oxides, carbonates and fluorides, cellulosic compounds and other siliceous materials all mixed together with liquid silicate binders.

Specific details of the contents of the core wire and flux coating for the electrode types covered by this data sheet are given below.

TABLE 1: COMPOSITION OF CORE WIRE (WT%)

Stainless steel core	**%C** CAS Number 7440-44-0	**%Si** CAS Number 7440-21-3	**%Mn** CAS Number 7439-96-5	**%Cr** CAS Number 7440-47-3	**%Ni** CAS Number 7440-02-0	**%Mo** CAS Number 7439-98-7	**%Fe** CAS Number 7439-89-6
Ranges	0.02-0.09	0.1max	0.35-0.60	0.04max	0.06max	0.02 max	balance

TABLE 2: COMPOSITION OF FLUX COATINGS (WT%)

Flux coating		**CAS No.**	**Hazard Classification 67 / 548 / EC**	**Hazard Classification 1272 / 2008**
Limestone and / or Calcium Carbonate	0-35	1317-65-3		
Mica (total inhalable dust) (respirable dust)	0-10	12001-26-2		
Kaolin (respirable dust)	0-10	1332-58-7		
Graphite (total inhalable dust) (respirable dust)	0-5	7440-44-0		
Mineral Silicates (total inhalable dust) (respirable dust)	0-20	1332-58-7 1344-95-2		
Inorganic Fluorides (as F)	0-30	16984-48-8		
Manganese and its Inorganic compounds (as Mn)	0-30	7439-96-5 and others		

Flux coating		CAS No.	Hazard Classification 67/548/EC	Hazard Classification 1272/2008
Aluminium (total inhalable dust) (respirable dust)	0-5	7429-90-5	F;R15-17 F;R15, R10	H261/Water react2 H250/Pyr.Sol1 H228/Flam.Sol1.
Rutile/ Titanium oxide (total inhalable dust) (respirable dust)	0-40	13463-67-7		
Nickel and its inorganic compounds (soluble, as Ni) (insoluble, as Ni)	0-5	7440-02-0	Carc.Cat3, R40 R43	Carc2/,H351 Skin sens/ 1 H317
Silicon and Silicon alloys, (as Si) (total inhalable dust) (respirable dust)	0-10	7440-21-3		
Molybdenum compounds (as Mo) (soluble compounds) (insoluble compounds)	0-8	7439-98-7		
Chromium Chromium III compounds Chromium VI compounds	0-40	7440-47-3		
Cobalt	0-2	7440-36-0		
Silicate Binders	0-35	1344-09-8		
Ferro Vanadium	0-6			
Ferro Boron	0-23			
Others				

SECTION 4: FIRST AID MEASURES

No first aid measures should be required for the unused electrode consumables.

During welding

Inhalation

If inhaled remove patient to fresh air and keep at rest in a position comfortable for breathing.. If exposed or concerned call a doctor.

For skin contact / burns

Submerge affected area in cold water until burning sensation ceases and refer for immediate medical attention.

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. If on skin immediately wash with water, Get medical attention for skin irritation..

Ingestion

Ingestion is considered unlikely due to product form. However, if detached flux coating is swallowed do not induce vomiting. Seek medical attention. Advice to doctor: treat symptomatically. Rinse mouth.

Electric shock

If necessary resuscitate and seek immediate medical attention.

SECTION 5: FIRE FIGHTING MEASURES

No specific measures required for these welding consumable prior to welding.

During welding

Welding should not be carried out in the presence of flammable materials, vapours, tanks, cisterns and pipes and other containers which have held flammable substances unless these have been checked and certified safe.

SECTION 6: ACCIDENTAL RELEASE MEASURES

No specific actions for these welding consumable prior to use. See sections 12 and 13 for ecological considerations.

Welding in proximity to stored or used halogenated solvents may produce toxic and irritant gases. Prohibit welding in areas where these solvents are used.

SECTION 7: HANDLING AND STORAGE (FOR SAFETY)

Welding electrodes are dense materials and can give rise to a handling hazard when multiple packages of the electrodes are lifted or handled incorrectly or with poor lifting posture. Gloves should be worn. Wash thoroughly after handling.

Good practice for handling and storage should be adopted to prevent physical injuries.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Prevention

Welders should not touch live electrical parts, and should insulate themselves from the work and the ground. Manufacturer's guidelines for the use of electrical welding machines should be observed at all times.

Welders and co-workers should be educated about the health hazards associated with welding fume, and trained to keep their heads out of the fume plume. Do not breathe the dust or fume.

During welding, fumes and gases will be produced and emitted from the welding process. The content of the fume is dependent on the electrode type, shielding gas, base materials being welded and surface coatings. The amount and concentration of fume generated also depends on factors such as current, voltage, welding practices and number of welders in a given area. Follow recommended welding practices to minimise fume production. Do not eat, drink or smoke when using this product.

For hard-surfacing electrodes, the main constituents of the fume will be iron, chromium, manganese, nickel, sodium, potassium and calcium oxides, fluorides and silicates, mainly in the form of complex oxides and other 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 dissociation of some of the flux constituents.

Fume composition data for some common hard-surfacing electrodes are given below, and the individual exposure limits for the constituents (when specified) are also given.

Fume exposure should be controlled to below the recognised exposure limit for each of the individual constituents.

TABLE 3: FUME COMPOSITION DATA (WEIGHT %)[1]

Electrode specification	%Fe*	%Mn*	%Si*	%Cr*	%Ni*	%Mo*	%Ti	%Na*	%K*	%Ca*	%F*
AWS A5.13-80 EFeMn	34.04	34.52	0.64	-	2.23	-	-	3.07	8.05	4.07	-
Rutile electrodes with deposited hardness 350 HV	59.44	7.59	5.76	0.73	-	<1	1.06	1.28	1.53		-
Rutile electrodes with deposited hardness 650HV	55.33	3.33	6.85	5.54	-		1.63	2.49	3.08	0.69	
Basic electrode with deposited hardness 650HV	33.89	4.23	2.57	4.17				6.54	11.88	15.48	
Typical range for other hardfacing electrodes	4-40	0-31	0-6	0-20	<2	0-3		0-8	1-14	0-16	0-15

[1] % by weight

TABLE 4: HAZARDOUS FUME COMPONENTS

Welding fume component	CAS No.	WEL[2] 8hr TWA	WEL[2] 15min TWA	Hazard Classification 67/548/EC	Hazard Classification (GHS) 1272/2008
Iron oxide fume (as Fe)	1309-37-1	5	10		
Manganese and its inorganic compounds (as Mn)	7439-96-5	0.5		R20/R22	H332/H302 Acute Tox.4
Silica, amorphous (total inhalable dust)	-	6			
(respirable dust)		2.4			
Titanium dioxide (total inhalable dust)	13463-67-7	10			
(respirable dust)		4			
Calcium Oxide	1305-78-8	2			
Calcium Silicate (total inhalable dust)	1344-95-2	10			
(respirable dust)		4			
Fluoride, inorganic (as F)	16984-48-8	2.5			
Chromium VI compounds (as Cr)	1333-82-0	0.05		R45/R46/R62/R26/R24R25/R48/R23R35/R42/R43/R50/R53	H350 Carc. 1A/H340/H361f/H331 Acute Tox. 3/H311/H372//H334/H410H400/
Chromium III compounds (as Cr)	24613-89-6	0.5		R45/R35 R43/R53	H350/H340/H317/ H400/H410
Nickel and its inorganic compounds (as Ni)					
water soluble	7440-02-0	0.1		R40/R43/ R49/R53	H350i/H351 Carc 2/H317 Skin sens 1/H413 Aquatic Ch.4
water insoluble		0.5			
Molybdenum compounds (as Mo)					H373/Stot RE 2
soluble	7439-98-7	5		R48/R20/R22R36/ R37	H319/Eye Imt 2
insoluble		10			H335 Stot SE 3
Cobalt and cobalt compounds (as Co)		0.1		R42/43 R53	H334 Resp.sens.1 H317 skin.sens1 H413 Aqua.chronic.4
Vanadium pentoxide	1314-62-1	0.05			
Diboron trioxide	1303-86-2	10	20		
Carbon monoxide	630-08-0	30ppm	200ppm		
Carbon dioxide	124-38-9	5000ppm	15000ppm		
Nitrogen dioxide (NO_2)	10102-44-0	0.5 ppm[3]	0.95 ppm[3]		
Ozone (O_3)	10028-15-6		0.2 ppm[4]		
Nitrogen monoxide (NO)	10102-43-9	0.5 ppm[3]	0.63 ppm[3]		

[1] Units are in mgm/ m^3, except when stated otherwise

[2] WEL Workplace Exposure Limits

[3]As recommended by MAK Commission based on scientific experience and is not established law

[4] As recommended by EH 40 (2007) in the UK

The fume analysis for the hard-surfacing electrodes covered by this data sheet, when used for welding clean, uncoated stainless steel of matching composition, indicates that as long as the fume exposure limits are met, fume levels of the other constituents will generally be below their respective exposure limits.

The exceptions are manganese, chromium, nickel, cobalt and vanadium as these have low exposure limits, and additional controls to their individual limits may be required. Obtain special instructions before use. Do not handle or weld until all safety precautions have been read and understood.

THE FUME LEVELS GIVEN ABOVE WERE GENERATED UNDER LABORATORY CONDITIONS WHEN WELDING CLEAN MATERIALOF SIMILAR COMPOSITION TO THE ELECTRODE BEING USED, AND USING THE MANUFACTURERS RECOMMENDED WELDING PARAMETERS. THEY ARE INDICATIVE OF REASONABLY EXPECTED FUME LEVELS. ACTUAL FUME LEVELS WILL VARY IN PRACTICE, DEPENDING ON THE WELDING PARAMETERS AND OTHER CONDITIONS, AND MAY BE HIGHER OR LOWER THAN THOSE LISTED ABOVE.

Additional fume may arise when these electrodes are used to weld contaminated base materials, coated or plated steels, other metals and alloys, OR WHEN INCORRECT WELDING CONDITIONS ARE USED.

THE ONLY ACCURATE WAY TO DETERMINE THE COMPOSITION AND QUANTITY OF FUMES AND GASES TO WHICH WORKERS ARE EXPOSED IS TO TAKE AIR SAMPLES FROM INSIDE THE WELDERS HELMET, IF WORN, OR IN THE WORKER'S BREATHING ZONES.

Individual fume measurements should be made in these cases using recognised sampling and analysis standards. Based on the results of these measurements, additional fume controls may be required to ensure that all the fume constituents are controlled below their exposure limits.

Controls

Good general ventilation, and/or local fume extraction at the arc should be used to control the fumes and gases produced during welding to below their individual recognised exposure limits when measured in the welder's and co-workers' breathing zone. In addition the ventilation and extraction should also be sufficient to ensure that the total particulate fume levels are reduced when measured in the breathing zone. Avoid breathing dust, fume, and gas. Get medical attention if you feel unwell.

In confined spaces where ventilation is not adequate, an air fed breathing system should be used. All precautions for working in confined space should be observed. Refer to AS/NZS 2865 'Safe Working in a Confined Space'. Contaminated work clothing should not be allowed outside the area.

Where fume levels exceed the recognised exposure limits, wear respiratory protection in the form of a Class P2 (metal fume) respirator.

Personal Protection

Welders and co-workers in the vicinity should wear protective gloves, protective clothing, eye protection and face protection appropriate to arc welding as specified by local standards.

Protection of Body and Skin

Suitable clothes for welding should be worn such as non light reflective fire resistant clothing, overalls, leather apron, welding helmet, leather boots spats and gloves. Remove all contaminated clothing after the welding operation, and wash contaminated clothing before reuse

Protection of Hands

Welders should wear suitable hand protection such a welding gloves or gauntlets of a suitable standard. Co-worker should also wear suitable hand protection against hot metal, sparks and spatter.

Eye Protection

Welders should wear a welding helmet fitted with the appropriate optical welding filter for the operation. Suitable protective welding screens and goggles should be provided, (e.g. ANSI Z87.1 / AWS F2.2) and used by others working in the same area.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Solid
Colour	Generally greyish, but other colours can be present
Form	Metal wire with flux coating
Odour	Odourless
pH	Not available
Vapour pressure	Not relevant
Vapour Density	Not relevant
Boiling point / range	Not relevant
Melting Point	~1500ºC
Solubility in water	Insoluble
Density	Not available
Explosive / ignition point	Non flammable. No fire or explosion hazard exists

SECTION 10: STABILITY AND REACTIVITY

There are no stability or reactivity hazards from electrodes as supplied.

Hazardous decomposition products such as metal oxide fumes and gases (see Section 8) are produced during welding.

SECTION 11: TOXICOLOGICAL INFORMATION

Inhaling welding fumes can be dangerous to your health. Welding fumes contain various particles and gases produced by the welding process. The International Agency for Research on Cancer has classified welding fumes as possibly carcinogenic to humans.

Welding fumes may irritate the nose, throat and eyes and may aggravate pre-existing respiratory problems such as asthma, emphysema or chronic bronchitis. Exposure to excessive concentrations of welding fumes may also lead to metal fume fever, dizziness, nausea, skin irritation, or impairment of pulmonary function, and possibly neurological injury. The potential health effects from welding fumes depends on the consumable, base material, surface coatings, air contamination, welding process, ventilation, and use, if necessary, of respirators and exhaust equipment. Consult with the specific toxicity data below to assess the health risk when using any particular welding process. See also the additional information below regarding the potential health effects of specific fume components.

Unprotected skin exposed to UV and IR radiation from the welding 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 welding with these electrodes include:

Iron

The chief component of fume generated by welding carbon steels is iron oxide. Iron oxide is generally considered only a nuisance material, but the fume particles can accumulate in the lungs and lead to a benign pneumoconiosis called siderosis.

Manganese

Manganese compounds are also found in welding fumes. Sustained exposure to manganese or manganese compounds above applicable limits can cause manganism, a form of irreversible brain damage. The symptoms of manganism may include tremors, slurred speech, impaired movement, spastic gait, lethargy, muscular weakness and psychological disturbances. Persons who believe they may have been overexposed to manganese compounds should consult a physician.

Chronic exposure to manganese at levels below that required to produce manganism may lead to impaired reproductive function in men. It has been reported that chronic exposure to manganese at levels below that required to produce manganism may lead to cognitive and neurobehavioral deficits. Respiratory symptoms may result from acute exposure to high concentrations or chronic low level exposure.

Fluorides

The main source of fluorides is the flux coatings on some welding electrodes, such as basic types (E7016, 7018, 7028), and this produces mainly fluoride particulate fume. Fluorides at high concentrations are respiratory tract irritants and if absorbed through chronic inhalation may damage the lungs and lead to a bone disease known as fluorosis.

Silica

Silica is found in welding fumes produced by copper alloy wires and rods, and is produced mainly as amorphous silica. Inhalation of this form of silica at high concentrations may lead to lung inflammation but has not been associated to any significant degree with lung pneumoconiosis which is associated with crystalline forms of silica.

Rutile Sand

Mainly present as titanium dioxide, which is a respiratory tract irritant and classified as possibly carcinogenic to humans.

Chromium

Chromium can exist in differing forms in welding fumes and this can determine the potential health effects. The most toxic form of chromium is hexavalent chromium (Cr6+) which is classified as a human carcinogen. The other main form of chromium found in welding fumes, trivalent chromium (Cr3+), is considerably less toxic and is not classified as a carcinogen. Both types of chromium are found in the fume from this product.

Hexavalent chromium is genotoxic and exposure is associated with lung, nasal and sinus cancer. It can produce respiratory tract effects including nasal ulceration and lung diseases. It can also cause sensitisation, resulting in allergic contact dermatitis and possibly asthma; irritation of the nose, lungs, skin and eyes; and can have adverse effects on the blood, kidneys and reproductive system. Trivalent chromium affects the respiratory system and can cause skin sensitisation.

Nickel

Nickel compounds are classified as human carcinogens and occupational exposure is associated with lung and nasal cancer. The other main health effect of nickel is allergic contact dermatitis (nickel 'itch'), and this can be elicited by extremely low exposures in pre-sensitised individuals. Respiratory symptoms, such as lung irritation, pneumonia and asthma, may be induced. Similar to chromium, nickel exists in the fume produced from stainless steel welding.

Cobalt

Exposure to cobalt dust/fume has been reported to cause respiratory effects, including cough, respiratory tissue inflammation, lung fibrosis and decreased lung function. These lung effects have mainly been associated with tungsten carbide grinding dust containing cobalt. Sensitisation to cobalt can also occur, resulting in asthma or allergic contact dermatitis. Cobalt and its compounds are classified as possibly carcinogenic to humans and are genotoxic.

Vanadium

Vanadium is a respiratory, skin and eye irritant and can act as a systemic poison producing effects on the gastro-intestinal, central nervous system and blood and the heart. If inhaled it can cause severe respiratory irritation, nosebleeds, wheezing chest, green/black tongue, bronchitis and bronchopneumonia. Vanadium pentoxide is classified as possibly carcinogenic to humans and vanadium compounds may also be toxic to the reproductive system and genotoxic.

Boron

Boron can act as a central nervous system depressant and gastrointestinal irritant. Symptoms include nausea, vomiting, diarrhoea and rash. It is likely that boron compounds will exert this action mainly through ingestion. Acute exposure to airborne boron can cause respiratory and eye irritation. Boron can form very toxic hydrides such as diborane gas, which is severely damaging to the lungs.

Ozone and Nitrogen oxides

These gases are formed due to interactions of the arc with the surrounding air. Ozone, nitrogen dioxide and nitric oxide can irritate the eyes, and respiratory tract including the lungs. They can also produce longer term lung effects such as decreased lung function, possibly chronic bronchitis, and (for nitrogen dioxide) emphysema. Of particular concern with these gases is that acute exposure to high levels (e.g. due to build up in confined spaces) can result in severe lung effects such as delayed pulmonary oedema. Ozone may be genotoxic and / or carcinogenic. Nitrous oxide is used as an anaesthetic, so clearly it affects the central nervous system, and it can also affect the peripheral nervous system. Nitrous and nitric oxide can have adverse effects on the blood.

Carbon monoxide and Carbon dioxide

These gases are mainly formed through decomposition of some electrodes' components, or from oxidation of any carbon in the wires and rods, or from the shielding gas.

Carbon monoxide (CO) is a chemical asphyxiant that binds to blood haemoglobin, reducing the blood's oxygen-transport capacity. High exposures can cause fatigue, weakness, dizziness, loss of consciousness and, eventually, even death. At lower levels, exposure to carbon monoxide may lead to toxicity in the respiratory, cardiovascular and central nervous systems.

Carbon dioxide (CO_2) is mainly a simple asphyxiant. At low levels of exposure, pulse and heart rate may increase, followed by respiratory and heart effects at higher concentrations, and ultimately unconsciousness and death.

SECTION 12: ECOLOGICAL INFORMATION

The welding process produces particulate fumes and gases which may cause long term adverse effects in the environment if released directly into the atmosphere. Welding fumes from electrodes covered by this data sheet can produce carbon dioxide gas, which is dangerous to the ozone layer.

Fume collected from the welding operation and extraction units should not be allowed to leach into groundwater or collect in soil.

SECTION 13: DISPOSAL CONSIDERATIONS

Packaging, stub ends and slag residue should be disposed of as general waste or recycled. Fume collected from extraction units and from cleaning operations will contain chromium and nickel compounds which can be harmful to aquatic life. The residue should be disposed of in accordance with local regulations. Collect all spillage.

SECTION 14: TRANSPORT INFORMATION

No special requirements are necessary in transporting these products.

SECTION 15: REGULATORY INFORMATION

Label Information: **DANGER**. Do not remove or cover this label. Protect yourself and others. Read and understand this information. Electric shock can kill. Keep your head out of the fume .Arc rays and fume can affect others in your workplace. Comply with your employer's safety practices and procedures: protect others.

Hazards related to electrodes in their delivered form:

Hazards to EC 1272/2008: H351, H317

Hazards related to fume:

H302,H350, H350i, H340,H361f, H331,H311, H372, H319, H334, H317, H400, H410, H413.

Hazards to 1999/45/EC: R20,R22, R23, R24/R26, R35/R37, R40, R42,R43,R45, R46, R48/R50, R53

Safety data sheets available on request from www.linde-gas.com.bd

SECTION 16: OTHER INFORMATION

The customer should provide this Safety Data Sheet to any person involved in the materials use or further distribution. **The Linde Group** requests the users (or distributors) of this product to read this Safety Data Sheet carefully before usage.

References to other relevant publications

E.g. British Standard BS EN 169:1992 'Filter Requirements for Personal Eye Protection for Arc Welding'

H phrase to EC 1272/2008;

H302: Harmful if swallowed/acute toxicity 4

H350: May cause cancer/Carc 1A

H340: May cause genetic defects

H361: Suspected of damaging fertility or the unborn child

H331: Toxic if inhaled

H311: Toxic in contact with the skin

H372: Causes damage to organs

H317: May cause an allergic skin reaction

H319: Causes serious eye irritation

H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled

H400: Very toxic to aquatic life/ H410: Very toxic to aquatic life with long lasting effects

H413: May cause long lasting harmful effects to aquatic life

P phrases to EC1272/2008: P201,P202,
P260,P261,P264,P270,P272,P273,P280,P281,P301=P310,P302+P352,P304+P340,P308,P311,P312 P321,
P330,,P313, P314,P361,P363,P391,P501

The information contained in this Material Safety Data Sheet relates only to the specific materials designated and may not be valid for such material used in combination with any other material or in any process.

Information is given in good faith and is based on the latest information available to The Linde Group and is, to the best of The Linde Groups knowledge and belief, accurate and reliable at the time of preparation. However, no representation, warranty or guarantee is made as to the accuracy, reliability or completeness of the information, and The Linde Group assumes no responsibility and disclaims any liability incurred in using this information.

The product is supplied on the condition that the user accepts the responsibility to satisfy himself as to the suitability and completeness of such information for his own particular use. Freedom from patent rights must not be assumed.