

Version number: 1

Replaces SDS: 2014-01-21

Issued: 2016-05-10

Not for sale in the USA

Section 1. IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / **UNDERTAKING**

1.1 Product identifier

Trade name STAINLESS STELL COVERED ELECTRODES

(Oerlikon Inox 307, Afrox 308L, Superweld 308L, Afrox 308L(-196), Oerlikon Supranox 308H, Afrox 309L, Superweld 309L, Oerlikon Supranox 309L, Afrox 310, Afrox 316L, Superweld 316L, Afrox 316L (-196), Oerlikon Supranox 316L, Oerlikon Supranox 317L, Oerlikon Inox 347, Oerlikon Citochrome 13-4, Afrox E3CR12, Oerlikon Batox CU (904L), Oerlikon Inox 4462), Afrox 312

Article-no

Product	Diameter	Electrode	Current	Pack	Item	Item
Packaging	(mm)	Length	(A)	Mass	Number	Number
Data		(mm)		(kg)	(multi-kg	
					pack)	
Oerlikon	2,5	-	60-90	3 x 5,0	-	W113022
Inox 307	3,2	-	120-150	3 x 5,0	-	W113023
	4,0	-	180-210	3 x 5,0	-	W113024
	5,0	-	220-240	3 x 5,0	-	W113025
Afrox	2,5	300	45-80	3 x 5,0	W075702	_
MIG/TIG	3,25	350	70-120	3 x 5,0	W075702 W075703	_
308L				•		-
300L	4,0	350	100-150	3 x 5,0	W075704	-
Superweld	2,5	-	50-90	3 x 5,0	_	W085702
308L	3,2	_	80-130	3 x 5,0	_	W085703
	4,0		100-170	3 x 5,0		W085704
	,	-		,		VV003704
Afrox 308L	2,5	350	40-80	3 x 4,0	W087705	-
(-196)	3,25	350	80-120-	3 x 4,0	W087706	-
	4,0	350	100-150	3 x 4,0	W087707	-
Oerlikon	2,5	-	50-75	3 x 5,0	-	W113912
Supranox	3,2	-	70-110	3 x 5,0	-	W113913
308H	4,0	-	110-150	3 x 5,0	-	W113914



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						Item Number (1kg electrode pack)
Afrox 309L	2,5	300	40-80	3 x 4,0	W075772	W072772
	3,25	350	70-105	3 x 4,0	W075773	W072773
	4,0	350	90-145	3 x 4,0	W075774	-
	5,0	350	140-190	3 x 4,0	W075775	-
DriPac	2,5	300	40-80	2 x 6,0	W075776	-
Range	3,25	350	70-105	2 x 6,0	W075777	-
	4,0	350	90-145	2 x 6,0	W075778	-
	5,0	350	140-190	2 x 6,0	W075779	-
Superweld	2,5	300	50-85	3 x 5,0	W085772	-
309L	3,25	350	80-120	3 x 5,0	W085773	-
	4,0	350	100-150	3 x 5,0	W085774	-
Oerlikon	2,5	300	45-80	3 x 5,0	W113042	-
Supranox	3,2	350	75-120	3 x 5,0	W113043	-
309L	4,0	350	100-150	3 x 5,0	W113044	-
	5,0	350	130-230	3 x 5,0	W113045	-
Afrox 310	2,5	300	50-70	3 x 4,0	W075732	-
	3,25	350	80-95	3 x 4,0	W075733	-
	4,0	350	95-130	3 x 4,0	W075734	-
Afrox 316L	2,0	300	30-60	3 x 3,0	W075751	-
	2,5	300	40-80	3 x 4,0	W075752	W072782
	3,25	350	80-105	3 x 4,0	W075753	W072783
	4,0	350	90-145	3 x 4,0	W075754	-
	5,0	350	140-190	3 x 4,0	W075755	-
	2,5(DriPac)	300	40-80	3 x 2,0	W075756	-
	3,25(DriPac)	350	70-105	3 x 2,0	W075757	-
	4,0(DriPac)	350	90-145	3 x 2,0	W075758	-
	5,0(DriPac)	350	140-190	3 x 2,0	W075759	-
Superweld	2,5	300	50-90	3 x 5,0	W085752	-
316L	3,25	350	70-130	3 x 5,0	W085753	-
	4,0	350	100-170	3 x 5,0	W085754	-
Afrox 316L	2,5	350	40-80	3 x 4,0	W087755	-
(-196)	3,25	350	80-120	3 x 4,0	W087756	-
	4,0	350	100-150	3 x 4,0	W087757	-



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Oerlikon	2,5	300	45-80	3 x 5,0	W113062	-
Supranox	3,2	350	70-120	3 x 5,0	W113063	-
316L	4,0	350	100-150	3 x 5,0	W113064	-
	5,0	350	130-230	3 x 5,0	W113065	-
Oerlikon	2,5	-	50-75	3 x 5,0	W113412	-
Supranox	3,2	-	75-100	3 x 5,0	W113413	-
317L	4,0	-	110-150	3 x 5,0	W113414	-
Oerlikon	2,5	-	45-80	3 x 5,0	W113072	-
Inox 347	3,2	-	70-120	3 x 5,0	W113073	-
	4,0	-	100-150	3 x 5,0	W113074	-
Oerlikon	2,5	-	85-120	3 x 5,0	W113112	-
Citochrome	3,2	-	75-120	3 x 5,0	W113113	-
13-4	4,0	-	110-155	3 x 5,0	W113114	-
Afrox	3,2	-	70-130	3 x 5,0	W075843	-
E3CR12	4,0	-	100-170	3 x 5,0	W075844	-
Oerlikon	2,5	-	50-75	5,0	W113092	-
Batox Cu	3,2	-	65-105	5,0	W113093	-
(904L)	4,0	-	85-150	5,0	W113094	-
Oerlikon	2,5	-	50-80	3 x 5,0	W113002	-
Inox 4462	3,2	-	70-120	3 x 5,0	W113003	-
	4,0	-	90-150	3 x 5,0	W113004	-
Afrox 312	2,5	300	45-80	3 x 4,0	W072682	W072692
	3,2	350	75-105	3 x 4,0	W072683	W072693
	4,0	350	110-150	3 x 4,0	-	-

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

Article type SMAW Stainless steel covered electrodes Classification: AWS SFA 5.9 (or other)

Use Electric arc welding

1.3 Details of the supplier of the safety data sheet

Supplier BOC Zimbabwe

Street address 1282 Hull Road

Southerton, Harare

P.O Box 1282 Harare

Telephone (04) 757171

Fax (04) 755780



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1.4 Emergency telephone number

Available outside office hours Yes

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Emergency phone number

0860 02 02 02

Other

Additional product information

Web site: www.afrox.co.za

Section 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to the Regulation (EC) 1271/2008 [CLP] applicable

2.2 Label elements

Not applicable

2.3 Other hazards

This product contains: Nickel as classified as sensitising and limited evidence of carcinogenic effect. The form of this product does not contribute to a hazard classification of the product.

When the product is used in the welding process the most important hazards are:

Overexposure to fumes and gases from welding can be dangerous to health.

Watch out for splatter, hot metal and slag. It may cause skin burn and cause fire.

Arc rays can injure eyes and burn skin. Electric shock can kill. Avoid touching live electrical parts.

Section 3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

This product is a mixture and please refer to Section 3.2

3.2 Mixtures

Stainless steel core	%C	%Si	%Mn	%Cr	%Ni	%Мо	%Fe
Ranges	.0115 0.09-0.13	1.00max 0.2-0.5	0.3-2.5 1.4-2.0	13-32 29-31	0-22 8.5-10	0-3.0 0.35max	Balance

Flux coating	E312 E308, 309, 310	E309M0, 316, 317	E309Nb, 347	E410	CAS No.	
Limestone and/or Calcium Carbonate	0-20	0-20	0-20	0-20	1317-65- 3	<13%



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Mica (total inhalable dust) (respirable dust)	0-12	0-12	0-12	0-12	12001- 26-2	N/A
Kaolin (respirable dust)	0-15	0-15	0-15	0-15	1332-58- 7	N/A
Cellulose (total inhalable dust) (respirable dust)	0-2	0-2	0-2	-	9004-34-	N/A
Mineral Silicates (total inhalable dust) (respirable dust)	0-30	0-30	0-30	0-15	1332-58- 7 1344-95- 2	<6%
Inorganic Fluorides (as F)	0-6	0-6	0-6	0-5	16984- 48-8	<4%
Manganese and its Inorganic compounds (as Mn)	0-5	0-5	0-5	0-5	7439-96- 5 and others	<3%
Aluminium (total inhalable dust) (respirable dust)	0-2	0-2	0-2	0-2	7429-90- 5	<2%
Rutile/ Titanium oxide (total inhalable dust) (respirable dust)	0-45	0-45	0-45	0-45	13463- 67-7	<33%
Nickel and its inorganic compounds (soluble, as Ni) (insoluble, as Ni)	0-15	0-15	0-15	0-15	7440-02- 0	<2%
Silicon and Silicon alloys, (as Si) (total inhalable dust) (respirable dust)	0-5	0-5	0-5	0-5	7440-21- 3	<1%
Molybdenum compounds (as Mo) (soluble compounds) (insoluble compounds)	-	0-5	-	-	7439-98- 7	N/A
Chromium Chromium III compounds Chromium VI compounds	0-30	0-30	0-30	0-30	7440-47- 3	<12%
Antimony oxide	0-2	0-2	0-2	0-2	7440-36- 0	N/A
Silicate Binders	0-25	0-25	0-25	0-25	1344-09- 8	<23%
Others						

BOC GASESA Member of The Linde Group

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Section 4. FIRST AND MEASURES

4.1 Description of first aid measures

Inhalation IF INHALED: If breathing is difficult, remove to fresh air and keep at rest in a position

comfortable for breathing. Call a physician if symptoms occur.

Skin contact Burns should be treated by a doctor.

Eye contact IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if

present and easy to do. Continue rinsing. Burns from radiation, see doctor.

Ingestion Contact a doctor if more than an insignificant amount has been swallowed.

4.2 Most important symptoms and effects, both acute and delayed

Inhalation Inhalation of vapours may cause irritation of the respiratory system in very susceptible

persons.

4.3 Indication of any immediate medical attention and special treatment needed

Not applicable

Section 5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

with diffuse jet of water or foam.

5.2 Special hazards arising from the substance or mixture

Not applicable

5.3 Advice for fire fighters

Special protective equipment for Wear self contained breathing apparatus

fire fighters

Section 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

General ventilation and local fume extraction must be adequate to keep fume concentrations within safe limits. Use respiratory equipment when welding in a confined space. Wear protective clothing and eye protection appropriate to arc welding. Skin contact



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should be avoided to prevent possible allergic reactions.

6.2 Environmental precautions

Try to prevent the material from entering drains or water courses.

6.3 Methods and material for containment and cleaning up

Not applicable

6.4 Reference to other sections

For *Personal protection* see section 8. For *Disposal* see section 13. For *Environmental precautions* see section 12. For *Precautions* for safe handling see 7.1.

Section 7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Preventive handling precautions	Ensure adequate ventilation for the welder and others. Use respiratory equipment when
	welding in a confined space. Wear protective clothing and eye protection appropriate to arc
	welding. Remove all flammable materials and liquids before welding.
General hygiene	Wash hands before breaks and immediately after handling the product.

7.2 Conditions for safe storage, including any incompatibilities

Store welding consumables inside a room without humidity. Do not store welding consumables directly on the ground or beside walls. Store away from chemical substances like acids which could cause chemical reactions.

7.3 Specific end use(s)

Welding process.

Section 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Welding fume component	CAS No.	ES- TWA	ES-STEL
Total welding fume (particulate)	-	5	
Iron oxide fume (as Fe)	1309-37-1	5	10
Manganese and its inorganic compounds (as Mn)	7439-96-5	1	3
Silica, amorphous			
(total inhalable dust)	-	6	
(respirable dust)		2.4	



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Magnesium oxide (as Mg)			
(total inhalable dust)	1309-48-4	10	
(fume and respirable dust)		4	10
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	
Nitrogen dioxide (NO ₂)	10102-44-0	3ppm	5ppm
Ozone (O ₃)	10028-15-6	0.2 ppm	
Nitrogen monoxide (NO)	10102-43-9	25ppm	35ppm

8.2 Exposure controls

Environmental Exposure Control - Refer to Section 6 of this SDS

Technical precaution measures General ventilation and local fume extraction must be adequate to keep fume

concentrations within safe limits.

Eye / face protection Wear eye protection appropriate for welding.

Safety gloves Skin contact should be avoided to prevent possible allergic reactions.

Other skin protection Wear body protection which helps to prevent injury from radiation, sparks and electric

shock.

Respiratory protection Use respiratory equipment when welding in a confined space. Wear protective clothing

and eye protection appropriate to arc welding.

Section 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance, colour Grey

Appearance, physical state Rod

Auto-ignition temperature Not applicable

Auto-inflammability Not auto-flammable

Decomposition temperature Not applicable

Evaporation rate Not applicable
Explosive properties Not explosive

Flammability (solid gas) Not applicable



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Flash point Not applicable

Form Metal wire with flux coating

Initial boiling point and boiling Not applicable

range

Melting point / Freezing point Not applicable

Odour Odourless

Odour threshold Not applicable

Oxidising properties Not applicable

Partition coefficient: n-octanol / Not applicable

water

pH value Not applicable

Relative density Not applicable

Solubility Not applicable

Solubility in water Insoluble

Upper / lower flammability or Not applicable

explosive limits

Vapour density Not applicable

Vapour pressure Not applicable

Viscosity Not applicable

9.2 Other information

Not applicable

Other

Density 7.96g/cm³

Section 10. STABILITY AND REACTIVITY

10.1 Reactivity

Not applicable

10.2 Chemical stability

Stable at normal conditions.

10.3 Possibility of hazardous reactions

Not applicable

10.4 Conditions to avoid



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None under normal conditions

10.5 Incompatible materials

Not applicable

10.6 Hazardous decomposition products

Welding fumes and gases. Additional fume may arise from coatings and contaminants on the base material.

Welding fume component	CAS No.	Classification (67/548EEC)	· · · · · · · · · · · · · · · · · · ·		Concentration of classified fume components
Aluminium oxide (Al)	1344-28-1	-	-	-	1.8 to 1.2
Barium (Ba)	7440-39-3	-	-	-	≤0.1
Bismuth oxide (Bi)	12640-40-3	-	-	-	≤0.1
Calcium (Ca)	1305-78-8	-	-	-	0.1 to 11.6
Cobalt oxide (Co)	1307-96-6	R22: Harmful if swallowed	Acute tox 4 (oral)	H302	≤0.1
, ,		R43: May cause sensitisation by contact	Skin sens. 1	H317	
		R45: May cause cancer	Carc. 1B	H350	≤0.1
Chromium III compounds (as Cr)	24613-89-6	R35: Causes severe burns R43: May cause	Skin Corr. 1A	H314	
Promise (mail)		sensitisation by skin contact	Skin Sens. 1	H317	
Copper oxide (Cu)	1317-38-0	-	-	-	≤0.1
Iron oxide (Fe)	1332-37-2	-	-	-	11.9 to 54.9
Potassium (K)	7440-09-7	R34: Causes burns	Skin Corr. 1B	H314	0.6 to 23.8
Lithium (Li)	7439-93-2	R34: Causes burns	Skin Corr. 1B	H314	0.1 to 0.8
Magnesium oxide (Mg)	1309-48-4	-	-	-	0.1 to 5.3
Manganese (Mn)	7439-96-5	-	-	-	0.7 to 8.2
Molybdenum (Mo)	7439-98-7	Molybdenum trioxide R36/37: Irritating to eyes and respiratory system	Molybdenum trioxide Carc. 2	H351 H319	≤0.1
woryouchum (wo)	1437-70-1	R40: Limited evidence of carcinogenic effect	Eye Irrit. 2	Н335	
Codium (No)	7440 22 5	D24: Cougas humas	STOT SE 3 Skin Corr. 1B	H314	0.5 to 8.7
Sodium (Na)	7440-23-5	R34: Causes burns	Skin Corr. 1B	П314	0.5 (0 8./



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Nickel (Ni)	7440-02-0	R40: Limited evidence of carcinogenic effect R43: May cause sensitisation by skin contact R48/23: Toxic danger of serious damage to health by prolonged exposure through inhalation R52/53: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment	Carc. 2 Skin sens 1 STOT RE 1	H351 H317 H372	0.1 to 0.2
Lead (Pb)	7439-92-1	-	-	-	0.1 to 1.8
Silicon (Si)	7440-21-3	-	-	-	2.1 to 16.3
Titanium dioxide (Ti)	13463-67-7	-	-	-	0.1 to 3.2
Vanadium (V)	7440-62-2	-	-	-	≤0.1
Zinc (Zn)	7440-66-6	-	-	-	0.1 to 3.5
Fluoride (F-)	16984-48-8	-	-	-	0.1 to 21.4

The classification information above relates to the fume during use



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Final Fume classific	cation	
Classification	H phrase	Text
Acute Toxicity (Inhal): Category 3	H331	Toxic if inhaled
Acute Toxicity (Oral/Dermal): Category 4	H302/H312	Harmful if swallowed or in contact with skin
Skin corrosion/irritation: Category 1A	H314	Causes severe skin burns and eye damage
Skin sensitisation: Category 1	H317	May cause an allergic skin reaction
Respiratory sensitisation: Category 1	H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
Carcinogenicity: Category 1A	H350	May cause cancer
Mutagen: Category 1B	H340	May cause genetic defects
Reproductive toxicity: Category 2	H361f	Suspected of damaging fertility
Specific Target Organ Toxicity: Single exposure Category 3	H335	May cause respiratory irritation
Specific Target Organ Toxicity: Repeated exposure Category 2	Н373	May cause damage to organs through prolonged or repeated exposure

Analysis wt %		
Al 0.6 to 2.2	Ni 0.2 to 1.3	
Ca 0.5 to 1.9	Mn 1.9 to 4.7	



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Fe	3.1 to 8.1	Si 5,9 to 13.6
K	13.6 to 40.4	Ti 0.9 to 4.3
F-	7.1 to 18.2	Zn 0.1 to 3.5
Na	0.5 to 8.7	Cr (VI) 2.6 to 5.5

Section 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Conditions to avoid: none in the form supplied

When welding, fumes and gases generated can be dangerous to health.

Acute toxicology Excessive exposures may affect human health, as follows: Aspiration may cause pulmonary

oedema and pneumonitis Short-term overexposure can cause dizziness, nausea and irritation

of the nose, throat or eyes.

Irritation Not applicable

Corrosive effects Not applicable

Sensitisation May cause sensitisation by skin contact

Mutagenicity Not applicable

Carcinogenicity Welding fumes are possibly carcinogenic to humans

Repeated dose toxicity Not applicable
Reproductive toxicity Not applicable

Section 12. ECOLOGICAL INFORMATION

12.1 Toxicity

The welding process can effect the environment if fume is released directly into the atmosphere. Residues from welding consumables could degrade and accumulate into soils and ground water.

Aquatic Cr(VI) is suspected of being very toxic to aquatic organisms and may cause long term adverse

effects in the aquatic environment.

Acute fish toxicity LC50 Fish 96h:

Manganese: 2,91 mg/l

Aluminiumoxide: >100 mg/l Salmo trutta

Acute algae toxicity IC50 Algae 72h:

Manganese: 0,55 mg/l

Aluminiumoxide: >100 mg/l Selenastrum capricornatum (green algae)

Acute crustacean toxicity EC50 Daphnia 48h:



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Manganese: 5,2 mg/l

Aluminiumoxide: >100 mg/l Daphnia magna (Water flea)

12.2 Persistence and degradability

Not applicable

12.3 Bio accumulative potential

Bioconcentration factor (BCF):

Iron: 140000

Manganese: 59052

12.4 Mobility in Soil

Not applicable

12.5 Results of PBT and vPvB assessment

Not applicable

12.6 Other adverse effects

Not applicable

Section 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Disposal considerations

Dispose of any product, residue or packing material according to national and local regulations. Spent fume extraction filters shall be disposed of as dangerous waste.

Other

Waste code (EWC) 12 01 13 – welding waste

Section 14. TRANSPORT INFORMATION

14.1 UN number

Not applicable

14.2 UN proper shipping name

Not applicable

14.3 Transport hazard class(es)



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Not applicable

14.4 Packing group

Not applicable

14.5 Environmental hazards

Not applicable

14.6 Special precautions for user

Not applicable

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

Other

Dangerous goods

No

Section 15. REGUATORY INFORMATION

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

EU regulations The product does not need to be labelled in accordance with EC directives or respective

national laws.

National regulations EH40/2005 Workplace exposure limits

The Waste Regulations 2011 No. 988

Local laws and regulations should be carefully observed.

15.2 Chemical safety assessment

Not applicable

Section 16. OTHER INFORMATION

References to key literature and Regulation (EC) No 1907/2006 of the European Parliament and of the Council, (REACH).

data sources Regulation (EC) No 1272/2008 of the European Parliament and of the Council.

EH40/2005 Workplace exposure limits.

The Waste regulations 2011 No.988

KIFS 2005:7

www.prevent.se



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C&L Inventory database

Annex VI CLP Regulation (EC) 1272/2008

Phrase meaning

H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
H350	May cause cancer
H340	May cause genetic defects
H361f	Suspected of damaging fertility
H335	May cause respiratory irritation
H373	May cause damage to organs through prolonged or repeated exposure

Other

Manufacturer's notes

Read this Safety Data Sheet carefully and become aware of hazards implied and the safety information.

End of document