SAFETY DATA SHEET
CE 002 Stainless steel Covered Electrodes

BOC
A Member of The Linde Group

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Not for sale in the USA
Ensure that this SDS is received by the appropriate person

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

1.1 Product identifier

Trade name BOC STAINLESS STEEL MMA 316L / 312 / 309L / 308L ELECTRODES

Article-no

Product / Article	Diameter(mm)	Packaging (kg)	Part Number
BOC ELECTRODES SS 316L	1.6	1.5	49300
	1.6	1.0	49301
	2.5	4	49302
	2.5	2.5	49303
	2.5	1.0	49304
	3.2	5	49305
	3.2	2.5	49306
	3.2	1.0	49307
	4.0	5	49308
	4.0	2.5	49309
	4.0	1.0	49310
BOC ELECTRODES SS 312	2.5	4	49311
	2.5	2.5	49312
	2.5	1.0	49313
	3.2	5	49314
	3.2	2.5	49315
	3.2	1.0	49316
	4.0	5	49317
	4.0	2.5	49318
	4.0	1.0	49319
BOC ELECTRODES SS 309L	2.5	4	49320
	2.5	2.5	49321
	2.5	1.0	49322
	3.2	5	49323
	3.2	2.5	49324
	3.2	1.0	49325
	4.0	5	49326
	4.0	2.5	49327
	4.0	1	49328
BOC ELECTRODES SS 308L	2.5	4	49290
	2.5	2.5	49292
	2.5	1	49293
	3.2	5	49294
	3.2	2.5	49295
	3.2	1	49296
	4.0	5	49297
	4.0	2.5	49298
	4.0	1	49299

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

Article type	SMAW Stainless steel covered electrodes Classification: ISO 3581
Use	Electric arc welding

1.3 Details of the supplier of the safety data sheet

Supplier	BOC Limited
Street address	Customer Service Centre, Priestley Road, Worsley, Manchester, M28 2UT, United Kingdom
Telephone	+44 (0)800 111 333
Fax	+44 (0)800 111 555
Email	custserv@boc.com

1.4 Emergency telephone number

Available outside office hours	Yes
Emergency phone number	+44 (0)800 111 333

Other

Additional product information	**Web site** www.BOConline.co.uk

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**	**%Mo**	**%Fe**
Ranges	.01-.15	1.00max	0.3-2.5	13-32	0-22	0-3.0	balance

Flux coating	**E308, 309, 310,312**	**E309M0, 316, 317**	**CAS No.**
Limestone and / or Calcium Carbonate	0-20	0-20	1317-65-3
Mica (total inhalable dust) (respirable dust)	0-12	0-12	12001-26-2
Kaolin (respirable dust)	0-15	0-15	1332-58-7
Cellulose (total inhalable dust) (respirable dust)	0-2	0-2	9004-34-6
Mineral Silicates (total inhalable dust) (respirable dust)	0-30	0-30	1332-58-7 1344-95-2
Inorganic Fluorides (as F)	0-6	0-6	16984-48-8
Manganese and its Inorganic compounds (as Mn)	0-5	0-5	7439-96-5 and others
Aluminium (total inhalable dust) (respirable dust)	0-2	0-2	7429-90-5
Rutile / Titanium oxide (total inhalable dust) (respirable dust)	0-45	0-45	13463-67-7
Nickel and its inorganic compounds (soluble, as Ni) (insoluble, as Ni)	0-15	0-15	0-15	0-15	7440-02-0
Silicon and Silicon alloys, (as Si) (total inhalable dust) (respirable dust)	0-5	0-5	0-5	0-5	7440-21-3
Molybdenum compounds (as Mo) (soluble compounds) (insoluble compounds)	-	0-5	-	-	7439-98-7

Chromium Chromium III compounds Chromium VI compounds	0-30	0-30	0-30	0-30	7440-47-3
Antimony oxide	0-2	0-2	0-2	0-2	7440-36-0
Silicate Binders	0-25	0-25	0-25	0-25	1344-09-8
Others					

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

Suitable extinguishing media	Carbon dioxide (CO_2), powder or diffuse jet of water. In case of major fire: Extinguish fire 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 fire fighters	Wear self contained breathing apparatus

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 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	
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
Flash point	Not applicable
Form	Metal wire with flux coating
Initial boiling point and boiling range	Not applicable
Melting point / Freezing point	Not applicable
Odour	Odourless
Odour threshold	Not applicable
Oxidising properties	Not applicable
Partition coefficient: n-octanol / water	Not applicable
pH value	Not applicable
Relative density	Not applicable
Solubility	Not applicable
Solubility in water	Insoluble
Upper / lower flammability or explosive limits	Not applicable
Vapour density	Not applicable
Vapour pressure	Not applicable
Viscosity	Not applicable

9.2 Other information

Not applicable

Other

Density	7.96g / cm^3

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

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)	CLP (1272/2008)		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 R43: May cause sensitisation by contact	Acute tox 4 (oral) Skin sens. 1	H302 H317	≤0.1
Chromium III compounds (as Cr)	24613-89-6	R45: May cause cancer R35: Causes severe burns R43: May cause sensitisation by skin contact	Carc. 1B Skin Corr. 1A Skin Sens. 1	H350 H314 H317	≤0.1
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 R40: Limited evidence of carcinogenic effect	Molybdenum trioxide Carc. 2 Eye Irrit. 2 STOT SE 3	H351 H319 H335	≤0.1
Sodium (Na)	7440-23-5	R34: Causes burns	Skin Corr. 1B	H314	0.5 to 8.7
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

Final Fume classification		
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	H373	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
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:

	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)

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 data sources	Regulation (EC) No 1907 / 2006 of the European Parliament and of the Council, (REACH).
	Regulation (EC) No 1272 / 2008 of the European Parliament and of the Council.
	EH40 / 2005 Workplace exposure limits.
	The Waste regulations 2011 No.988
	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.

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