Safety Data Sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)

DW-NC276

Version number: 2.0
Replaces version of: 2013-09-23 (1)

Revision: 2017-08-02

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name: **DW-NC276** (electrodes for flux cored arc welding)

Registration number (REACH): not relevant (mixture)

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

Relevant identified uses: Welding and soldering product
The product is intended for professional use

Specific process or activity: welding (welding process)

1.3 Details of the supplier of the safety data sheet

Kobelco Welding of Europe B.V.
Eisterweg 8
6422 PN Heerlen
Netherlands

Telephone: +31(0)45-5471111
Telefax: +31(0)45-5471100
e-mail: info@kobelcowelding.nl

e-mail (competent person): info@kobelcowelding.nl

1.4 Emergency telephone number

Emergency information service: +31(0)45-5471111
This number is only available during the following office hours: Mon-Fri 09:00 - 17:00

Poison centre		
Country	**Name**	**Telephone**
United Kingdom	National Poisons Information Service (NPIS) (medical professionals only)	0344-8920111
United Kingdom	NHS (general public)	non-emergency: 111 or a doctor; emergency: 999

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 (CLP)

Section	Hazard class	Category	Hazard class and category	Hazard statement
3.1I	acute toxicity (inhal.)	2	Acute Tox. 2	H330
3.2	skin corrosion/irritation	2	Skin Irrit. 2	H315
3.3	serious eye damage/eye irritation	2	Eye Irrit. 2	H319
3.4R	respiratory sensitisation	1B	Resp. Sens. 1B	H334
3.4S	skin sensitisation	1	Skin Sens. 1	H317
3.6	carcinogenicity	1B	Carc. 1B	H350
3.7	reproductive toxicity	1B	Repr. 1B	H360F
3.9	specific target organ toxicity - repeated exposure	1	STOT RE 1	H372
4.1A	hazardous to the aquatic environment - acute hazard	1	Aquatic Acute 1	H400

Section	Hazard class	Category	Hazard class and category	Hazard state-ment
4.1C	hazardous to the aquatic environment - chronic hazard	2	Aquatic Chronic 2	H411

Code	Supplemental hazard information
EUH032	contact with acids liberates very toxic gas

For full text of abbreviations: see SECTION 16.

The most important adverse physicochemical, human health and environmental effects

Delayed or immediate effects can be expected after short or long-term exposure. Spillage and fire water can cause pollution of watercourses.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 (CLP)

- signal word: danger

- pictograms

GHS06, GHS08, GHS09

- hazard statements

H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H350	May cause cancer.
H360F	May damage fertility.
H372	Causes damage to organs through prolonged or repeated exposure.
H410	Very toxic to aquatic life with long lasting effects.

- precautionary statements

P201	Obtain special instructions before use.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P304+P340	IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor.
P342+P311	If experiencing respiratory symptoms: Call a POISON CENTER/doctor.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.

- supplemental hazard information

EUH032	Contact with acids liberates very toxic gas.

- hazardous ingredients for labelling: nickel powder (particle diameter < 1mm), Cobalt (respirable powder), Dipotassium hexafluorosilicate

2.3 Other hazards

Avoid breathing dust. Avoid contact with eyes. Avoid skin contact.
When this product is used in a welding process, the most significant hazards are electric shock, fumes, gases, radiation, spatter, slag and heat.
Shock: electric shock can kill.
Fumes: Overexposure to welding fumes may result in symptoms like dizziness, nausea, dryness or irritation of the nose, throat or eyes. Chronic overexposure to welding fumes may affect pulmonary function.
Gases: gases may cause gas poisoning.
Radiation: arc rays can severely damage eyes or skin.
Spatter, slag and heat: spatter and slag can damage eyes. Spatter, slag, melting material, arc rays and hot welds can cause burn injuries and start fires.

Results of PBT and vPvB assessment

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

SECTION 3: Composition/information on ingredients

3.1 Substances

Not relevant (mixture)

3.2 Mixtures

The product does not contain any (other) ingredients which are classified according to present knowledge of the supplier and contribute to the classification of the substance and hence require reporting in this section.

Name of substance	Identifier	Wt%	Classification acc. to GHS	Pictograms	Notes	Specific Conc. Limits	M-Factors
Nickel	CAS No 7440-02-0 EC No 231-111-4 REACH Reg. No 01-2119438727-29-xxxx	40 – 60	Skin Sens. 1 / H317 Carc. 2 / H351 STOT RE 1 / H372 Aquatic Chronic 3 / H412		IARC: 2B		
Chromium	CAS No 7440-47-3 EC No 231-157-5 REACH Reg. No 01-2119485652-31-xxxx	8 – 25			IOELV		
Tungsten (<1,5µm)	CAS No 7440-33-7 EC No 231-143-9 REACH Reg. No 01-2119488910-30-xxxx	≤ 5	Flam. Sol. 1 / H228 Self-heat. 2 / H252				
Cobalt (respirable powder)	CAS No 7440-48-4 EC No 231-158-0	≤ 3	Acute Tox. 4 / H302 Acute Tox. 1 / H330 Eye Irrit. 2 / H319 Resp. Sens. 1B / H334 Skin Sens. 1 / H317 Carc. 1B / H350 Repr. 1B / H360F Aquatic Acute 1 / H400 Aquatic Chronic 1 / H410				M-factor (acute) = 10.0

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Name of substance	Identifier	Wt%	Classification acc. to GHS	Pictograms	Notes	Specific Conc. Limits	M-Factors
Sodium fluoride	CAS No 7681-49-4 EC No 231-667-8 Index No 009-004-00-7	≤ 1	Acute Tox. 3 / H301 Skin Irrit. 2 / H315 Eye Irrit. 2 / H319 EUH032		GHS-HC IOELV		
Copper Powder	CAS No 7440-50-8 EC No 231-159-6 REACH Reg. No 01-2119480154-42-xxxx	≤ 1	Aquatic Acute 1 / H400 Aquatic Chronic 3 / H412				
Dipotassium hexafluorosilicate	CAS No 16871-90-2 EC No 240-896-2 Index No 009-012-00-0 REACH Reg. No 01-2119539421-45-xxxx	≤ 1	Acute Tox. 3 / H301 Acute Tox. 3 / H311 Acute Tox. 2 / H330		A(a) GHS-HC		
Manganese dioxide	CAS No 1313-13-9 EC No 215-202-6	≤ 1	Acute Tox. 4 / H302 Acute Tox. 4 / H332 STOT RE 2 / H373				M-factor (acute) = 10.0
Dipotassium oxide	CAS No 12136-45-7 EC No 235-227-6 REACH Reg. No 01-2120109032-77-xxxx	≤ 1	Skin Corr. 1A / H314 Eye Dam. 1 / H318				

Notes

A(a): The name of substance is a general description. It is required that the correct name is stated on the label
GHS-HC: Harmonised classification (the classification of the substance corresponds to the entry in the list according to 1272/2008/EC, Annex VI)
IARC 2B: IARC group 2B: possibly carcinogenic to humans (International Agency for Research on Cancer)
IOELV: Substance with a community indicative occupational exposure limit value

Remarks

For full text of H-phrases: see SECTION 16. All the percentages given are percentages by weight unless stated otherwise.

SECTION 4: First aid measures

4.1 Description of first aid measures

General notes

Do not leave affected person unattended. Remove victim out of the danger area. Keep affected person warm, still and covered. Take off immediately all contaminated clothing. In all cases of doubt, or when symptoms persist, seek medical advice. In case of unconsciousness place person in the recovery position. Never give anything by mouth. Disconnect and turn off the power. If the victim is semi- or unconscious, open the airway. If the victim cannot breath, give artificial respiration. If there is no pulse, massage the chest and apply artificial respiration.

Electrical shock

Disconnect and turn off the power. If the victim is semi- or unconscious, open the airway. If the victim cannot breath, give artificial respiration. If there is no pulse, massage the chest and apply artificial respiration.

Following inhalation

Provide fresh air. If breathing is irregular or stopped, immediately seek medical assistance and start first aid actions. In case of respiratory tract irritation, consult a physician. If experiencing respiratory symptoms: Call a doctor.

Following skin contact

Brush off loose particles from skin. Rinse skin with water/shower.

Following eye contact

Remove contact lenses, if present and easy to do. Continue rinsing. Irrigate copiously with clean, fresh water for at least 15 minutes, holding the eyelids apart.

Following ingestion

Rinse mouth with water (only if the person is conscious). Do NOT induce vomiting. Call a POISON CENTER or doctor if you feel unwell.

4.2 Most important symptoms and effects, both acute and delayed

No further relevant information available.

4.3 Indication of any immediate medical attention and special treatment needed

For specialist advice physicians should contact the anti poison control centre.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Alcohol resistant foam, Dry extinguishing powder, Carbon dioxide (CO2), Water spray

5.2 Special hazards arising from the substance or mixture

No further relevant information available.

Hazardous combustion products

During fire hazardous fumes/smoke could be produced.

5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes. Co-ordinate firefighting measures to the fire surroundings. Do not allow firefighting water to enter drains or water courses. Collect contaminated firefighting water separately. Fight fire with normal precautions from a reasonable distance.

Special protective equipment for firefighters

Self-contained breathing apparatus (EN 133). Standard protective clothing for firefighters.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Remove persons to safety.

For emergency responders

Wear breathing apparatus if exposed to vapours/dust/spray/gases. Use personal protective equipment as required.

6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it. If substance has entered a water course or sewer, inform the responsible authority.

6.3 Methods and material for containment and cleaning up

Advices on how to contain a spill

Covering of drains. Take up mechanically.

Advices on how to clean up a spill

Take up mechanically.

Other information relating to spills and releases

Place in appropriate containers for disposal. Ventilate affected area.

6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Keep away from fire.

Recommendations

- measures to prevent fire as well as aerosol and dust generation

No special measures are necessary.

Advice on general occupational hygiene

Wash hands after use. Do not eat, drink and smoke in work areas. Remove contaminated clothing and protective equipment before entering eating areas. Never keep food or drink in the vicinity of chemicals. Never place chemicals in containers that are normally used for food or drink. Keep away from food, drink and animal feedingstuffs.

7.2 Conditions for safe storage, including any incompatibilities

Managing of associated risks

- explosive atmospheres

Removal of dust deposits.

- flammability hazards

Keep away from fire. Keep away from combustible material.

- incompatible substances or mixtures

Acids, Alkalis, Oxidisers

Control of effects

Protect against external exposure, such as
High temperatures, Humidity

Consideration of other advice
Store in a well-ventilated place. Keep container tightly closed.

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

- ventilation requirements
Keep any substance that emits harmful vapours or gases in a place that allows these to be permanently extracted. Use local and general ventilation.

- packaging compatibilities
Only packagings which are approved (e.g. acc. to ADR) may be used.

7.3 Specific end use(s)
Welding (welding process).

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

National limit values

Occupational exposure limit values (Workplace Exposure Limits)

Country	Name of agent	CAS No	Notation	Identifier	TWA [ppm]	TWA [mg/m³]	STEL [ppm]	STEL [mg/m³]	Source
EU	manganese	7439-96-5	i	IOELV		0.2			2017/164/EU
EU	chromium	7440-47-3		IOELV		2			2006/15/EC
EU	fluorine, inorganic compounds	7681-49-4		IOELV		2.5			2000/39/EC
GB	dust		i	WEL		10			EH40/2005
GB	dust		r	WEL		4			EH40/2005
GB	titanium dioxide	13463-67-7	i	WEL		10			EH40/2005
GB	titanium dioxide	13463-67-7	r	WEL		4			EH40/2005
GB	manganese	7439-96-5		WEL		0.5			EH40/2005
GB	nickel	7440-02-0		WEL		0.1			EH40/2005
GB	tungsten	7440-33-7		WEL		5		10	EH40/2005
GB	chromium	7440-47-3		WEL		0.5			EH40/2005
GB	cobalt	7440-48-4		WEL		0.1			EH40/2005
GB	copper	7440-50-8	dm	WEL		1		2	EH40/2005
GB	copper	7440-50-8	fume	WEL		0.2			EH40/2005
GB	silica, amorphous	7631-86-9	i	WEL		6			EH40/2005
GB	silica, amorphous	7631-86-9	r	WEL		2.4			EH40/2005
GB	fluorine, inorganic compounds	7681-49-4	F	WEL		2.5			EH40/2005

Notation

dm	as dusts and mists
F	calculated as F (fluorine)
fume	as fume

Notation

i	inhalable fraction
r	respirable fraction
STEL	short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period unless otherwise specified
TWA	time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average

Relevant DNELs/DMELs/PNECs and other threshold levels

Relevant DNELs of components of the mixture

Name of substance	CAS No	End-point	Threshold level	Protection goal, route of exposure	Used in	Exposure time
nickel powder (particle diameter < 1mm)	7440-02-0	DNEL	0.05 mg/m³	human, inhalatory	worker (industry)	chronic - local effects
nickel powder (particle diameter < 1mm)	7440-02-0	DNEL	0.05 mg/m³	human, inhalatory	worker (industry)	chronic - systemic effects
nickel powder (particle diameter < 1mm)	7440-02-0	DNEL	0.05 mg/m³	human, inhalatory	worker (industry)	acute - systemic effects
nickel powder (particle diameter < 1mm)	7440-02-0	DNEL	4 mg/m³	human, inhalatory	worker (industry)	acute - local effects
Chromium	7440-47-3	DNEL	0.5 mg/m³	human, inhalatory	worker (industry)	chronic - local effects
Tungsten (<1,5µm)	7440-33-7	DNEL	5.8 mg/m³	human, inhalatory	worker (industry)	chronic - systemic effects
Tungsten (<1,5µm)	7440-33-7	DNEL	1.7 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
sodium fluoride	7681-49-4	DNEL	2.5 mg/m³	human, inhalatory	worker (industry)	acute - systemic effects
sodium fluoride	7681-49-4	DNEL	2.5 mg/m³	human, inhalatory	worker (industry)	chronic - local effects
sodium fluoride	7681-49-4	DNEL	0.36 mg/kg bw/day	human, dermal	worker (industry)	acute - systemic effects
sodium fluoride	7681-49-4	DNEL	0.36 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
Copper Powder	7440-50-8	DNEL	1 mg/m³	human, inhalatory	worker (industry)	acute - local effects
Copper Powder	7440-50-8	DNEL	273 mg/kg	human, dermal	worker (industry)	acute - systemic effects
Copper Powder	7440-50-8	DNEL	20 mg/m³	human, inhalatory	worker (industry)	acute - systemic effects
Copper Powder	7440-50-8	DNEL	1 mg/m³	human, inhalatory	worker (industry)	chronic - local effects
Copper Powder	7440-50-8	DNEL	137 mg/kg	human, dermal	worker (industry)	chronic - systemic effects
Dipotassium hexafluorosilicate	16871-90-2	DNEL	2.5 mg/m³	human, inhalatory	worker (industry)	chronic - systemic effects
Dipotassium hexafluorosilicate	16871-90-2	DNEL	2.5 mg/m³	human, inhalatory	worker (industry)	acute - systemic effects
Dipotassium hexafluorosilicate	16871-90-2	DNEL	2.5 mg/m³	human, inhalatory	worker (industry)	chronic - local effects
Dipotassium hexafluorosilicate	16871-90-2	DNEL	2.5 mg/m³	human, inhalatory	worker (industry)	acute - local effects

Relevant DNELs of components of the mixture						
Name of substance	**CAS No**	**End-point**	**Threshold level**	**Protection goal, route of exposure**	**Used in**	**Exposure time**
Manganese dioxide	1313-13-9	DNEL	0.2 mg/m³	human, inhalatory	worker (industry)	chronic - systemic effects
Manganese dioxide	1313-13-9	DNEL	0.004 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
Dipotassium oxide	12136-45-7	DNEL	15.83 mg/m³	human, inhalatory	worker (industry)	chronic - systemic effects
Dipotassium oxide	12136-45-7	DNEL	15.83 mg/m³	human, inhalatory	worker (industry)	acute - systemic effects
Dipotassium oxide	12136-45-7	DNEL	15.83 mg/m³	human, inhalatory	worker (industry)	chronic - local effects
Dipotassium oxide	12136-45-7	DNEL	15.83 mg/m³	human, inhalatory	worker (industry)	acute - local effects
Dipotassium oxide	12136-45-7	DNEL	9.1 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
Dipotassium oxide	12136-45-7	DNEL	200 mg/kg bw/day	human, dermal	worker (industry)	acute - systemic effects

Relevant PNECs of components of the mixture						
Name of substance	**CAS No**	**End-point**	**Threshold level**	**Organism**	**Environmental compartment**	**Exposure time**
Chromium	7440-47-3	PNEC	6.5 µg/l	aquatic organisms	freshwater	short-term (single instance)
Chromium	7440-47-3	PNEC	205.7 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Chromium	7440-47-3	PNEC	21.1 mg/kg	terrestrial organisms	soil	short-term (single instance)
Tungsten (<1,5µm)	7440-33-7	PNEC	0.338 mg/l	aquatic organisms	freshwater	short-term (single instance)
Tungsten (<1,5µm)	7440-33-7	PNEC	0.034 mg/l	aquatic organisms	marine water	short-term (single instance)
Tungsten (<1,5µm)	7440-33-7	PNEC	5.86 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Tungsten (<1,5µm)	7440-33-7	PNEC	960 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Tungsten (<1,5µm)	7440-33-7	PNEC	96 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
Tungsten (<1,5µm)	7440-33-7	PNEC	2.17 mg/kg	terrestrial organisms	soil	short-term (single instance)
sodium fluoride	7681-49-4	PNEC	0.9 mg/l	aquatic organisms	freshwater	short-term (single instance)
sodium fluoride	7681-49-4	PNEC	51 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
sodium fluoride	7681-49-4	PNEC	11 mg/kg	terrestrial organisms	soil	short-term (single instance)
Copper Powder	7440-50-8	PNEC	7.8 µg/l	aquatic organisms	freshwater	short-term (single instance)

Relevant PNECs of components of the mixture						
Name of substance	**CAS No**	**End-point**	**Threshold level**	**Organism**	**Environmental compartment**	**Exposure time**
Copper Powder	7440-50-8	PNEC	5.2 µg/l	aquatic organisms	marine water	short-term (single instance)
Copper Powder	7440-50-8	PNEC	230 µg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Copper Powder	7440-50-8	PNEC	87 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Copper Powder	7440-50-8	PNEC	676 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
Copper Powder	7440-50-8	PNEC	65 mg/kg	terrestrial organisms	soil	short-term (single instance)
Dipotassium hexafluorosilicate	16871-90-2	PNEC	0.9 mg/l	aquatic organisms	freshwater	short-term (single instance)
Dipotassium hexafluorosilicate	16871-90-2	PNEC	0.9 mg/l	aquatic organisms	marine water	short-term (single instance)
Dipotassium hexafluorosilicate	16871-90-2	PNEC	51 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Dipotassium hexafluorosilicate	16871-90-2	PNEC	11 mg/kg	terrestrial organisms	soil	short-term (single instance)
Manganese dioxide	1313-13-9	PNEC	0 mg/l	aquatic organisms	freshwater	short-term (single instance)
Manganese dioxide	1313-13-9	PNEC	0 mg/l	aquatic organisms	marine water	short-term (single instance)
Manganese dioxide	1313-13-9	PNEC	100 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Manganese dioxide	1313-13-9	PNEC	0.037 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Manganese dioxide	1313-13-9	PNEC	0.004 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
Manganese dioxide	1313-13-9	PNEC	0.028 mg/kg	terrestrial organisms	soil	short-term (single instance)
Dipotassium oxide	12136-45-7	PNEC	9.176 mg/l	aquatic organisms	freshwater	short-term (single instance)
Dipotassium oxide	12136-45-7	PNEC	0.918 mg/l	aquatic organisms	marine water	short-term (single instance)
Dipotassium oxide	12136-45-7	PNEC	2.2 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Dipotassium oxide	12136-45-7	PNEC	17.75 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Dipotassium oxide	12136-45-7	PNEC	1.78 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
Dipotassium oxide	12136-45-7	PNEC	85 mg/kg	terrestrial organisms	soil	short-term (single instance)

8.2 Exposure controls

Appropriate engineering controls

Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases below the TLVs in the worker's breathing zone and the general area. Use extra ventilation when welding galvanized plate or coated plate.

Individual protection measures (personal protective equipment)

Eye/face protection

Wear helmet or use face shield with filter lens. As a rule of thumb, start with a shade which is too dark to see the weld zone. Then go to the next lighter shade which gives sufficient view of the weld zone. Provide protective screens and flash goggles, if necessary, to shield others.

Skin protection

Protective clothing (EN 340).

- hand protection

Welding gloves according to EN12477:2001 and A1:2005 in case of arc welding. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. The exact break through time should be requested at the protective glove manufacturer and must be observed.

- breakthrough times of the glove material

>480 minutes (permeation: level 6).

- other protection measures

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended. Wash hands thoroughly after handling. Wear head, hand and bodyprotection which help to prevent injury form radiation, sparks and electric shock. At a m inimum this includes welder's gloves and protective face shield and may include arm protectors, aprons, hats, shoulder protection as well as dark substantial clothing.
Train the welder not to touch live electrical parts and to insulate himself from work and ground.

Respiratory protection

Use respirable fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below TLV. Keep head out of the fumes and gases.

Ear protection

Wear earplugs or earmuffs when using engine driven arc welding machine or pulsed arc welding machine that generates high-level noise.

Environmental exposure controls

Use appropriate container to avoid environmental contamination. Keep away from drains, surface and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state	solid (electrode)
Colour	grey
Odour	odourless

Other safety parameters

pH (value)	not applicable
Melting point/freezing point	not determined
Initial boiling point and boiling range	not determined
Flash point	not applicable
Evaporation rate	not determined
Flammability (solid, gas)	this material is combustible, but will not ignite readily
Explosion limits of dust clouds	not determined
Vapour pressure	0 Pa at 25 °C
Density	not determined
Vapour density	this information is not available
Relative density	information on this property is not available
Solubility(ies)	not determined

Partition coefficient

- n-octanol/water (log KOW)	this information is not available

Auto-ignition temperature	information on this property is not available
Viscosity	not relevant (solid matter)
Explosive properties	none
Oxidising properties	none

9.2 Other information

Of no significance.

SECTION 10: Stability and reactivity

10.1 Reactivity

Contact with chemical substances could cause generation of gas.

10.2 Chemical stability

See below "Conditions to avoid".

10.3 Possibility of hazardous reactions

Reacts with:. Acids. Alkalis. Oxidising substances.

10.4 Conditions to avoid

Keep away from heat.

10.5 Incompatible materials

Oxidisers, Acids, Alkalis

10.6 Hazardous decomposition products

Reasonably anticipated hazardous decomposition products produced as a result of use, storage, spill and heating are not known. Hazardous decomposition products includes those from the volatilization, reaction or oxidation of the material listed in section 3 and those from the base metal and coating. Manganese has a low exposure limit, in some countries, that may be easily exceeded. Reasonably expected gaseous products would include carbon oxides, nitrogen oxides and ozone. Reasonably expected fume constituents of this product would include oxides of metals

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Inhalation of welding fumes and gases can be dangerous to your health. The composition and quantity of both are dependent upon the material being worked, the process, procedures and consumables used.

Classification procedure

The method for classification of the mixture is based on ingredients of the mixture (additivity formula).

Classification according to GHS (1272/2008/EC, CLP)

Acute toxicity

Fatal if inhaled. Overexposure to gases, fumes and dusts may inclide irritation of the eyes, lungs, nose and throat. Some toxic gases (associated with welding) may cause pulmonary edema, asphyxiation and death. Acute overexposure may include signs and symptoms such as watery eyes, nose and throat irritation, headache, dizziness, difficulty in breathing, frequent coughing or chest pain. Exposure to the fluoride ion may cause hypocalcaemia-calcium deficiency in the blood that can result in muscle cramps and inflammation and necrosis of mucous membranes.

GHS of the United Nations, annex 4:

Acute toxicity of components of the mixture

Name of substance	CAS No	Exposure route	Endpoint	Value	Species
Nickel	7440-02-0	oral	LD50	>9,000 $^{mg}/_{kg}$	rat
Sodium fluoride	7681-49-4	oral	LD50	223 $^{mg}/_{kg}$	rat
Dipotassium hexafluorosilicate	16871-90-2	oral	LD50	<2,000 $^{mg}/_{kg}$	rat
Dipotassium hexafluorosilicate	16871-90-2	inhalation: dust/mist	LC50	2.021 $^{mg}/_{l}$/4h	rat
Dipotassium oxide	12136-45-7	oral	LD50	>2,000 $^{mg}/_{kg}$	rat
Dipotassium oxide	12136-45-7	dermal	LD50	>5,000 $^{mg}/_{kg}$	rat

Skin corrosion/irritation

Causes skin irritation.

Serious eye damage/eye irritation

Causes serious eye irritation.

Respiratory or skin sensitisation

May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.

Germ cell mutagenicity

Shall not be classified as germ cell mutagenic.

Carcinogenicity

May cause cancer.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans						
Name of substance	**CAS No**	**Wt%**	**Classification**	**Remarks**	**Number**	**Date indication**
nickel powder (particle diameter < 1mm)	7440-02-0	60	2B		Volume 49	1990
Chromium	7440-47-3	25	3		Volume 49	1990
Cobalt (respirable powder)	7440-48-4	3	2B		Volume 52	1991

Legend

2B	Possibly carcinogenic to humans
3	Not classifiable as to carcinogenicity in humans

Reproductive toxicity

May damage fertility.

Summary of evaluation of the CMR properties

Nickel is considered carcinogenic. Long term overexplosure to nickel fumes may also cause pulmonary fibrosis and oedema. Welding fumes (not otherwise specified) are possibly carcinogenic to humans.

Specific target organ toxicity - repeated exposure

Causes damage to organs through prolonged or repeated exposure. Nickel is considered carcinogenic. Long term overexplosure to nickel fumes may also cause pulmonary fibrosis and oedema. Overexposure to air contaminants may lead to their accumulation in the lungs, a condition which may be seen as dense areas on chest X-rays. The severity of the change is proportional to the length of the exposure. The changes may be caused by non-work factors such as smoking, etc. Long term exposure to welding and allied processes gasses, dusts and fumes may contribute to pulmonary irritation or pneumoconiosis. Overexposure to manganese compounds may affect the central nervous system, symptoms of which are languor, sleepiness, muscular weakness, emotional disturbances and spastic gait. The effect of manganese on the nervous systeem is irreversible. Inhalation of to much iron oxide fume over a long time can cause siderosis, sometimes called "iron pigmentation"of the lung, which can be seen on a cest x-ray but causes little or no disability. Chronic overexposure to iron (>50-100 mg Fe per day) can result in pathological deposition of iron in body tissues of which are firbrosis of the pancreas, diabetes mellitus and lever cirrhosis. Chronic fluoride absorption can result in osseous fluor sis, increased radiographic density of the bones and mottling of the teeth. Chromium (in some forms) is considered carcinogenic. Chromium compounds have a corrosive action on the skin and mucous membranes and forms lesions on exposed skin and the nasal septum. Liver damage and allergic skin rash have also been reported. Overexposure to copper fumes may lead to copper poisoning, resulting in hemolytic anemia and liver, kidney and spleen damage.

Aspiration hazard

Shall not be classified as presenting an aspiration hazard.

SECTION 12: Ecological information

12.1 Toxicity

Very toxic to aquatic life with long lasting effects.

Aquatic toxicity (acute) of components of the mixture					
Name of substance	**CAS No**	**Endpoint**	**Value**	**Species**	**Exposure time**
nickel powder (particle diameter < 1mm)	7440-02-0	LC50	15.3 mg/l	fish	96 h
nickel powder (particle diameter < 1mm)	7440-02-0	EC50	561.3 µg/l	aquatic invertebrates	96 h
nickel powder (particle diameter < 1mm)	7440-02-0	ErC50	<148 µg/l	algae	72 h
sodium fluoride	7681-49-4	EC50	48 mg/l	aquatic invertebrates	96 h
Dipotassium hexafluoro-silicate	16871-90-2	EC50	35.4 mg/l	aquatic invertebrates	48 h
Dipotassium hexafluoro-silicate	16871-90-2	ErC50	19.6 mg/l	algae	72 h
Manganese dioxide	1313-13-9	EC50	>0.073 mg/l	aquatic invertebrates	48 h
Dipotassium oxide	12136-45-7	LC50	880 mg/l	fish	96 h
Dipotassium oxide	12136-45-7	EC50	880 mg/l	aquatic invertebrates	48 h

Aquatic toxicity (chronic) of components of the mixture					
Name of substance	**CAS No**	**Endpoint**	**Value**	**Species**	**Exposure time**
nickel powder (particle diameter < 1mm)	7440-02-0	ErC50	8,363 µg/l	fish	40 d
nickel powder (particle diameter < 1mm)	7440-02-0	LC50	204 µg/l	aquatic invertebrates	21 d
nickel powder (particle diameter < 1mm)	7440-02-0	EbC50	6.2 µg/l	aquatic invertebrates	30 d
nickel powder (particle diameter < 1mm)	7440-02-0	EC50	406 µg/l	aquatic invertebrates	24 h
Dipotassium hexafluoro-silicate	16871-90-2	EC50	216 mg/l	microorganisms	3 h
Manganese dioxide	1313-13-9	EC50	>1,000 mg/l	microorganisms	3 h
Dipotassium oxide	12136-45-7	LC50	950 mg/l	fish	24 h
Dipotassium oxide	12136-45-7	EC50	880 mg/l	aquatic invertebrates	24 h

12.2 Persistence and degradability

No further relevant information available.

12.3 Bioaccumulative potential

No further relevant information available.

Bioaccumulative potential of components of the mixture				
Name of substance	**CAS No**	**BCF**	**Log KOW**	**BOD5/COD**
nickel powder (particle diameter < 1mm)	7440-02-0	26,500		
Cobalt (respirable powder)	7440-48-4	4.6		
sodium fluoride	7681-49-4	58		
Dipotassium oxide	12136-45-7	3.162	-5.08 (pH value: 7, 25 °C)	

12.4 Mobility in soil

Not mobile.

12.5 Results of PBT and vPvB assessment

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

12.6 Other adverse effects

No further relevant information available.

Endocrine disrupting potential

None of the ingredients are listed.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Sewage disposal-relevant information

Do not empty into drains. Avoid release to the environment.

Waste treatment of containers/packagings

It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used. Handle contaminated packages in the same way as the substance itself.

Remarks

Please consider the relevant national or regional provisions. Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities.

SECTION 14: Transport information

14.1 UN number

14.2 UN proper shipping name

not relevant

14.3 Transport hazard class(es)

Class

(toxic substances)

14.4 Packing group

(substance presenting medium danger)

14.5 Environmental hazards

non-environmentally hazardous acc. to the dangerous goods regulations

14.6 Special precautions for user

Provisions for dangerous goods (ADR) should be complied within the premises.

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

No data available.

SECTION 15: Regulatory information

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

Relevant provisions of the European Union (EU)

Restrictions according to REACH, Annex XVII

Dangerous substances with restrictions (REACH, Annex XVII)					
Name of substance	**Name acc. to inventory**	**CAS No**	**Type of registration**	**Conditions of restriction**	**No**
nickel powder (particle diameter < 1mm)	nickel	7440-02-0	1907/2006/EC annex XVII	R27	27

Legend

R27 1. Shall not be used:
(a) in any post assemblies which are inserted into pierced ears and other pierced parts of the human body unless the rate of nickel release from such post assemblies is less than 0,2 µg/cm2/week (migration limit);
(b) in articles intended to come into direct and prolonged contact with the skin such as:
- earrings,
- necklaces, bracelets and chains, anklets, finger rings,
- wrist-watch cases, watch straps and tighteners,
- rivet buttons, tighteners, rivets, zippers and metal marks, when these are used in garments,
if the rate of nickel release from the parts of these articles coming into direct and prolonged contact with the skin is greater than 0,5 µg/cm2/week.
(c) in articles referred to in point (b) where these have a non-nickel coating unless such coating is sufficient to ensure that the rate of nickel release from those parts of such articles coming into direct and prolonged contact with the skin will not exceed 0,5 µg/cm2/week for a period of at least two years of normal use of the article.
2. Articles which are the subject of paragraph 1 shall not be placed on the market unless they conform to the requirements set out in that paragraph.
3. The standards adopted by the European Committee for Standardisation (CEN) shall be used as the test methods for demonstrating the conformity of articles to paragraphs 1 and 2.

List of substances subject to authorisation (REACH, Annex XIV)

None of the ingredients are listed.

Regulation 166/2006/EC concerning the establishment of a European Pollutant Release and Transfer Register (PRTR)

Pollutant release and transfer registers (PRTR)			
Name of substance	**CAS No**	**Remarks**	**Threshold for releases to air (kg/year)**
Copper Powder	7440-50-8	(8)	100
nickel powder (particle diameter < 1mm)	7440-02-0	(8)	50
Chromium	7440-47-3	(8)	100

Legend

(8) All metals shall be reported as the total mass of the element in all chemical forms present in the release

Directive 2000/60/EC establishing a framework for Community action in the field of water policy (WFD)

Water Framework Directive (WFD)			
Name of substance	**CAS No**	**Listed in**	**Remarks**
nickel powder (particle diameter < 1mm)	7440-02-0	Annex X	

Legend
annex X List of priority substances in the field of water policy

Regulation 98/2013/EU on the marketing and use of explosives precursors

None of the ingredients are listed.

15.2 Chemical Safety Assessment

No chemical safety assessment has been carried out for this mixture.

SECTION 16: Other information

Indication of changes (revised safety data sheet)

Complete revised version.

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
2000/39/EC	Comission Directive establishing a first list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC
2006/15/EC	Comission Directive establishing a second list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Directives 91/322/EEC and 2000/39/EC
2017/164/EU	Comission Directive establishing a fourth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC, and amending Commission Directives 91/322/EEC, 2000/39/EC and 2009/161/EU
Acute Tox.	Acute toxicity
ADN	Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)
ADR	Accord européen relatif au transport international des marchandises dangereuses par route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
Aquatic Acute	Hazardous to the aquatic environment - acute hazard
Aquatic Chronic	Hazardous to the aquatic environment - chronic hazard
BCF	Bioconcentration factor
BOD	Biochemical Oxygen Demand
Carc.	Carcinogenicity
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
CLP	Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
CMR	Carcinogenic, Mutagenic or toxic for Reproduction
COD	Chemical oxygen demand
DGR	Dangerous Goods Regulations (see IATA/DGR)
DMEL	Derived Minimal Effect Level
DNEL	Derived No-Effect Level
EC No	The EC Inventory (EINECS, ELINCS and the NLP-list) is the source for the seven-digit EC number, an identifier of substances commercially available within the EU (European Union)
EH40/2005	EH40/2005 Workplace exposure limits (http://www.nationalarchives.gov.uk/doc/open-government-licence/)
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances

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Abbr.	Descriptions of used abbreviations
Eye Dam.	Seriously damaging to the eye
Eye Irrit.	Irritant to the eye
Flam. Sol.	Flammable solid
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
IMDG	International Maritime Dangerous Goods Code
index No	The Index number is the identification code given to the substance in Part 3 of Annex VI to Regulation (EC) No 1272/2008
IOELV	Indicative occupational exposure limit value
log KOW	n-Octanol/water
MARPOL	International Convention for the Prevention of Pollution from Ships (abbr. of "Marine Pollutant")
M-factor	Means a multiplying factor. It is applied to the concentration of a substance classified as hazardous to the aquatic environment acute category 1 or chronic category 1, and is used to derive by the summation method the classification of a mixture in which the substance is present
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
ppm	Parts per million
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
Repr.	Reproductive toxicity
Resp. Sens.	Respiratory sensitisation
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)
Self-heat.	Self-heating material
Skin Corr.	Corrosive to skin
Skin Irrit.	Irritant to skin
Skin Sens.	Skin sensitisation
STEL	Short-term exposure limit
STOT RE	Specific target organ toxicity - repeated exposure
TWA	Time-weighted average
vPvB	Very Persistent and very Bioaccumulative
WEL	Workplace exposure limit

Key literature references and sources for data

Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures. Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU.

Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN). International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

Classification procedure

Physical and chemical properties: The classification is based on tested mixture.
Health hazards, Environmental hazards: The method for classification of the mixture is based on ingredients of the mixture (additivity formula).

List of relevant phrases (code and full text as stated in chapter 2 and 3)

Code	Text
H228	Flammable solid.
H252	Self-heating in large quantities; may catch fire.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H350	May cause cancer.
H351	Suspected of causing cancer.
H360F	May damage fertility.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

Disclaimer

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.

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Warning text on the label

WARNING: PROTECT yourself and others. Read and understand this information.
FUMES AND GASES can be hazardous to your health.
ARC RAYS can injure eyes and burn skin.
ELECTRIC SHOCK can KILL.

- Before use, read and understand the manufacturer's instructions, Material Safety Data Sheets (MSDSs), and your employer's safety practices.
- Keep your head out of the fumes.
- Use adequate ventilation, exhaust at the arc, or both, to keep fumes and gases from your breathing zone and the general area.
- Wear correct eye, ear, and body protection.
- Do not touch free electrical parts.