DW-329A

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

1.1 Product identifier

Trade name	**DW-329A**
Registration number (REACH)	not relevant (mixture)
Unique formula identifier (UFI)	H470-S0H5-V00A-K2HR

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
e-mail: marketing.kwe@kobelco.com

e-mail (competent person)	hse.kwe@kobelco.com

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**
Ireland	National Poisons Information Centre (NPIC)	Consumer: 01 809 2166 (8am-10pm) | Healthcare Professional: 1 809 2566 (24/7)

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 state-ment
3.4S	skin sensitisation	1	Skin Sens. 1	H317
3.6	carcinogenicity	2	Carc. 2	H351
3.9	specific target organ toxicity - repeated exposure	1	STOT RE 1	H372

For full text of H-phrases: 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.

2.2 Label elements

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

- signal word Danger

- pictograms

GHS07, GHS08

- hazard statements

H317	May cause an allergic skin reaction.
H351	Suspected of causing cancer.
H372	Causes damage to organs through prolonged or repeated exposure.

- precautionary statements

P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P314	Get medical advice/attention if you feel unwell.
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

- hazardous ingredients for labelling

Contains: nickel powder.

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 and nervous system.
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.

Substance(s) formed under the conditions of use.
The welding fumes produced from this welding electrode may contain the listed constituent(s) of Sec.3 and/or their complex metallic oxides as well as solid particles or other constituents from the consumables, base metal, or base metal coating not listed Sec.3. The welding fumes may contain Mn, Ni, Cr(VI) and their compounds. Refer to Sec.8 and 10.

Results of PBT and vPvB assessment

Does not contain a PBT-/vPvB-substance at a concentration of ≥ 0,1%.

Endocrine disrupting properties

Contains an endocrine disruptor (ED) at a concentration of ≥ 0,1%. (Section 11 & 12).

SECTION 3: Composition/information on ingredients

3.1 Substances

Not relevant (mixture).

3.2 Mixtures

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

Name of substance	Identifier	Wt%	Classification acc. to GHS	Pictograms	Notes	Remarks
Chromium	CAS No 7440-47-3 EC No 231-157-5 REACH Reg. No	18 – 28			IOELV	

Name of substance	Identifier	Wt%	Classification acc. to GHS	Pictograms	Notes	Remarks
	01-2119485652-31-xxxx					
Nickel	CAS No 7440-02-0 EC No 231-111-4 Index No 028-002-01-4 REACH Reg. No 01-2119438727-29-xxxx	5 – 13	Skin Sens. 1 / H317 Carc. 2 / H351 STOT RE 1 / H372 Aquatic Chronic 3 / H412		GHS-HC	
Manganese	CAS No 7439-96-5 EC No 231-105-1 REACH Reg. No 01-2119449803-34-xxxx	< 3			IOELV	
Sodium fluoride	CAS No 7681-49-4 EC No 231-667-8 Index No 009-004-00-7 REACH Reg. No 01-2119539420-47-xxxx	< 1	Acute Tox. 3 / H301 Acute Tox. 3 / H331 Skin Irrit. 2 / H315 Eye Irrit. 2 / H319 STOT RE 2 / H373 EUH032		GHS-HC IOELV	

Notes

GHS-HC: Harmonised classification (the classification of the substance corresponds to the entry in the list according to 1272/2008/EC, Annex VI)
IOELV: Substance with a community indicative occupational exposure limit value

Name of substance	Identifier	Specific Conc. Limits	M-Factors	ATE	Exposure route
sodium fluoride	CAS No 7681-49-4 EC No 231-667-8	-	-	223 $^{mg}/_{kg}$ 1 $^{mg}/_{l}$/4h	oral inhalation: dust/mist

Remarks

For full text of H-phrases: see SECTION 16.

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. If experiencing respiratory symptoms: Call a doctor.

Following skin contact

Brush off loose particles from skin. Rinse skin with water/shower. Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention.

Following eye contact

Do not rub the eyes. Mechanical stress can cause damage to the cornea. Irrigate copiously with clean, fresh water for at least 15 minutes, holding the eyelids apart. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Following ingestion

Rinse mouth with water (only if the person is conscious). Call a POISON CENTER or doctor if you feel unwell.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms.
Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema).
Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung), central nervous system effects, bronchitis and other pulmonary effects. Refer to Section 11 for more information.
Hazards.
Welding hazards are complex and may include physical and health hazards such as but not limited to electric shock, physical strains, radiation burns (eye flash), thermal burns due to hot metal or spatter and potential health effects of overexposure to welding fume or dust. Refer to Section 11 for more information.

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

As shipped, this product is non flammable. However, welding arc and spark can ignite combustible and flammable products, Co-ordinate firefighting measures to the fire surroundings, 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. Carbon monoxide (CO). Carbon dioxide (CO2).

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. If airborne dust and/or fume is present, use adequate engineering controls and, if needed, personal protection to prevent overexposure. Refer to recommendations in Section 8.

6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.

6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill

Covering of drains.

Advice 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

Reduction of fumes and dusts.
Keep formation of airborne dusts to a minimum. Provide appropriate exhaust ventilation at places were dust is formed. Read and understand the manufacturer's instruction and the possible precautionary label on the product.
Prevention of electric shock.
Do not touch live electrical parts such as the welding wire and welding machine terminals. Wear insulated gloves and safety boots. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting , kneeling or lying, or if there is a high risk of unavoidable or accidental contact with workpiece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control.
Prevention of fire and explosion.
Remove flammable and combustible materials and liquids.
Prevention of harm when handling welding consumables.
Handle with care to avoid stings and cuts. Hold the welding wire manually when loosening the wire.

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

Use local and general ventilation.

- packaging compatibilities

Keep only in original container.

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	Identifier	TWA [ppm]	TWA [mg/m³]	STEL [ppm]	STEL [mg/m³]	Notation	Source
EU	manganese	7439-96-5	IOELV		0.2			i	2017/164/EU
EU	manganese	7439-96-5	IOELV		0.05			r	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
IE	dusts, non-specific		OELV		10			i	S.I. No. 619 of 2001
IE	dusts, non-specific		OELV		4			r	S.I. No. 619 of 2001
IE	manganese	7439-96-5	OELV		0.2		3	fume, i	S.I. No. 619 of 2001
IE	manganese	7439-96-5	OELV		0.02			fume, r	S.I. No. 619 of 2001
IE	manganese	7439-96-5	OELV		0.2			i	S.I. No. 619 of 2001
IE	manganese	7439-96-5	OELV		0.05			r	S.I. No. 619 of 2001
IE	chromium	7440-47-3	OELV		2				S.I. No. 619 of 2001
IE	fluorides, inorganic	7681-49-4	OELV		2.5				S.I. No. 619 of 2001

Notation

fume	as fume
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 (unless otherwise specified)

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**
chromium	7440-47-3	DNEL	0.5 mg/m³	human, inhalatory	worker (industry)	chronic - local effects
nickel powder	7440-02-0	DNEL	0.05 mg/m³	human, inhalatory	worker (industry)	chronic - systemic effects
nickel powder	7440-02-0	DNEL	0.05 mg/m³	human, inhalatory	worker (industry)	chronic - local effects
nickel powder	7440-02-0	DNEL	11.9 mg/m³	human, inhalatory	worker (industry)	acute - local effects
Manganese	7439-96-5	DNEL	0.2 mg/m³	human, inhalatory	worker (industry)	chronic - systemic effects
Manganese	7439-96-5	DNEL	0.2 mg/m³	human, inhalatory	worker (industry)	chronic - local effects
Manganese	7439-96-5	DNEL	0.2 mg/m³	human, inhalatory	worker (industry)	acute - local effects
Manganese	7439-96-5	DNEL	0.004 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic 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	5.5 mg/m³	human, inhalatory	worker (industry)	chronic - systemic effects
sodium fluoride	7681-49-4	DNEL	5.5 mg/m³	human, inhalatory	worker (industry)	acute - systemic effects
sodium fluoride	7681-49-4	DNEL	5.5 mg/m³	human, inhalatory	worker (industry)	chronic - local effects
sodium fluoride	7681-49-4	DNEL	5.5 mg/m³	human, inhalatory	worker (industry)	acute - local effects
sodium fluoride	7681-49-4	DNEL	0.8 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects

Relevant PNECs of components						
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)
nickel powder	7440-02-0	PNEC	6.1 µg/l	aquatic organisms	freshwater	short-term (single instance)
nickel powder	7440-02-0	PNEC	9.55 µg/l	aquatic organisms	marine water	short-term (single instance)
nickel powder	7440-02-0	PNEC	0.33 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
nickel powder	7440-02-0	PNEC	109 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
nickel powder	7440-02-0	PNEC	109 mg/kg	aquatic organisms	marine sediment	short-term (single instance)

Relevant PNECs of components						
Name of sub-stance	**CAS No**	**End-point**	**Threshold level**	**Organism**	**Environmental compartment**	**Exposure time**
nickel powder	7440-02-0	PNEC	39.3 $^{mg}/_{kg}$	terrestrial organ-isms	soil	short-term (single instance)
Manganese	7439-96-5	PNEC	0.028 $^{mg}/_{l}$	aquatic organisms	water	intermittent release
Manganese	7439-96-5	PNEC	0.455 $^{mg}/_{l}$	aquatic organisms	freshwater	short-term (single instance)
Manganese	7439-96-5	PNEC	0.005 $^{mg}/_{l}$	aquatic organisms	marine water	short-term (single instance)
Manganese	7439-96-5	PNEC	20.4 $^{mg}/_{l}$	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Manganese	7439-96-5	PNEC	0.578 $^{mg}/_{kg}$	aquatic organisms	freshwater sediment	short-term (single instance)
Manganese	7439-96-5	PNEC	0.058 $^{mg}/_{kg}$	aquatic organisms	marine sediment	short-term (single instance)
Manganese	7439-96-5	PNEC	14.58 $^{mg}/_{kg}$	terrestrial organ-isms	soil	short-term (single instance)
sodium fluoride	7681-49-4	PNEC	0.4 $^{mg}/_{l}$	aquatic organisms	freshwater	short-term (single instance)
sodium fluoride	7681-49-4	PNEC	0.023 $^{mg}/_{l}$	aquatic organisms	marine water	short-term (single instance)
sodium fluoride	7681-49-4	PNEC	112.7 $^{mg}/_{l}$	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
sodium fluoride	7681-49-4	PNEC	12 $^{mg}/_{kg}$	terrestrial organ-isms	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. Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits.

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

Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Wear dry gloves free of holes or split seams. Train the welder not to permit electrically live parts or electrodes to contact skin or clothing or gloves if they are wet. Insulate yourself from the work piece and ground using dry plywood, rubber mats or other dry insulation.

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 time of the glove material

Use gloves with a minimum breakthrough time 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 minimum 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.

Ear protection

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

Advice on hygiene measures

Do not eat, drink or smoke when using this product. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

Respiratory protection

Keep your head out of fumes. Use enough ventilation and local exhaust to keep fumes and gases from your breathing zone and the general area. 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.

Environmental exposure controls

Take appropriate precautions to avoid uncontrolled release into the environment. Keep away from drains, surface and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	solid: wire or rod
Colour	grey
Odour	characteristic
Melting point/freezing point	>723 K calculated value, referring to a component of the mixture
Boiling point or initial boiling point and boiling range	not determined
Flammability	non-combustible
Lower and upper explosion limit	LEL: UEL: not relevant
Flash point	not applicable
Auto-ignition temperature	information on this property is not available
Decomposition temperature	no data available
pH (value)	not applicable
Kinematic viscosity	not relevant
Solubility	not determined

Partition coefficient n-octanol/water (log value)	this information is not available

Vapour pressure	not determined

Density and/or relative density

Density	not determined
Relative vapour density	information on this property is not available

Particle characteristics	no data available

9.2 Other information

Information with regard to physical hazard classes	hazard classes acc. to GHS (physical hazards): not relevant
Other safety characteristics	there is no additional information

SECTION 10: Stability and reactivity

10.1 Reactivity

Contact with chemical substances could cause generation of gas.

10.2 Chemical stability

The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3 Possibility of hazardous reactions

Contact with acids, alkalis and oxidizing agents could cause reaction and generation of gas.

10.4 Conditions to avoid

Keep away from heat Acids Alkalis Oxidisers.

10.5 Incompatible materials

Oxidisers, Acids, Alkalis

10.6 Hazardous decomposition products

Manganese has a low exposure limit, in some countries, that may be easily exceeded. Welding fumes and gases are generated as byproducts during the welding. The composition and quantity of fumes and gases cannot be recognized simply. The composition and quantity of the fumes and gases are dependent upon the base metal being welded (included coating such as solvent, paint, plating), the welding process, welding procedure, welding parameter and electrodes used. Other conditions which also influence the quantity of the fumes and gases to which workers may be exposed include the number of welding spots, the volume of the worker area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.). The fumes and gases are different in percent and form from the ingredients listed in Section 3. The fumes and gases include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 3, plus those from the base metal and coating, etc., as noted above. Reasonably expected fume constituents produced during arc welding include the oxides of iron, manganese and other metals present in the welding consumable or base metal. And, it is known that these metal oxides are complex oxides, not single compounds. Hexavalent chromium compounds may be in the welding fume of consumables or base metals which contain chromium. Nickel compounds may be in the welding fume of consumables or base metals which contain Nickel. Gaseous and particulate fluoride may be in the welding fume of consumables which contain fluoride. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

The International Agency for Research on Cancer (IARC) has determined welding fumes and ultraviolet radiation from welding

are carcinogenic to humans (Group 1). According to IARC, welding fumes cause cancer of the lung and positive associations have been observed with cancer of the kidney. Also according to IARC, ultraviolet radiation from welding causes ocular melanoma. IARC identifies gouging, brazing, carbon arc or plasma arc cutting, and soldering as processes closely related to welding. Read and understand the manufacturer's instructions, Safety Data Sheets and the precautionary labels before using this product.

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

Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema).
Cr: The presence of chromium/chromate in welding fumes can cause irritation of nasal membranes and skin.
Ni: The presence of nickel compounds in fume can cause metallic taste, nausea, tightness of chest, fever.
F: Exposure to the fluoride ion in welding fumes may cause hypocalcemia-calcium deficiency in the blood that can result in muscle cramps and inflammation and necrosis of mucous membranes.
Gases: Some toxic gases associated with welding may cause pulmonary edema, asphyxiation, and death.

Acute toxicity estimate (ATE) of components			
Name of substance	**CAS No**	**Exposure route**	**ATE**
sodium fluoride	7681-49-4	oral	223 $^{mg}/_{kg}$
sodium fluoride	7681-49-4	inhalation: dust/mist	1 $^{mg}/_{l}$/4h

Acute toxicity of components					
Name of substance	**CAS No**	**Exposure route**	**Endpoint**	**Value**	**Species**
Chromium	7440-47-3	inhalation: dust/mist	LC50	>5.41 $^{mg}/_{l}$/4h	rat
Nickel	7440-02-0	oral	LD50	>9,000 $^{mg}/_{kg}$	rat
Manganese	7439-96-5	oral	LD50	>2,000 $^{mg}/_{kg}$	rat
Manganese	7439-96-5	inhalation: dust/mist	LC50	>5.14 $^{mg}/_{l}$/4h	rat
Sodium fluoride	7681-49-4	oral	LD50	223 $^{mg}/_{kg}$	rat
Sodium fluoride	7681-49-4	inhalation: dust/mist	LC50	1 $^{mg}/_{l}$/4h	rat
Sodium fluoride	7681-49-4	dermal	LD50	>2,000 $^{mg}/_{kg}$	rat

Skin corrosion/irritation

Shall not be classified as corrosive/irritant to skin.

Serious eye damage/eye irritation

Shall not be classified as seriously damaging to the eye or eye irritant.

Respiratory or skin sensitisation

May cause an allergic skin reaction.
Ni: Nickel and its compounds are skin sensitizers with symptoms ranging from slight itch to severe dermatitis.
Cr: Chromates may cause allergic reactions, including skin rash. Asthma has been reported in some sensitized individuals. Skin contact may result in irritation, ulceration, sensitization, and contact dermatitis.

Germ cell mutagenicity

Shall not be classified as germ cell mutagenic.

Carcinogenicity

Suspected of causing cancer.

Reproductive toxicity

Shall not be classified as a reproductive toxicant.

Summary of evaluation of the CMR properties

Welding fumes (not otherwise specified) are possibly carcinogenic to humans.
SiO2: Crystalline silica is classified as a human carcinogen (Group I) by the IARC (International Agency for Research on Cancer).
Ni: Nickel is considered carcinogenic. Long term overexplosure to nickel fumes may also cause pulmonary fibrosis and oedema.
Cr: Chromium (in some forms) is considered carcinogenic. Hexavalent chromium and its compounds are on the IARC and NTP lists as posing a cancer risk to humans.
Arc rays: Skin cancer has been reported.

Name acc. to inventory	CAS No	Wt%	Classification	Remarks	Number	Date indication
welding fumes		100	1			2018
nickel	7440-02-0	13	2B			1990
chromium	7440-47-3	28	3			1990
Fluorides (inorganic)		0.9	3	used in drinking-water		1987

Legend

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

Specific target organ toxicity - single exposure

Shall not be classified as a specific target organ toxicant (single exposure).

Specific target organ toxicity - repeated exposure

Causes damage to organs through prolonged or repeated exposure.
Long term exposure to welding and allied processes gasses, dusts and fumes may contribute to pulmonary irritation or pneumoconiosis and other pulmonary effects. 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.
Ni: Nickel is considered carcinogenic. Long term overexplosure to nickel fumes may also cause pulmonary fibrosis and oedema.
Cr: Chromates may cause ulceration, perforation of the nasal septum, and severe irritation of the bronchial tubes and lungs. Liver damage have also been reported. Chromates contain the hexavalent form of chromium.
Mn: 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.
Fe: 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.
SiO2: Overexposure to crystalline silica present in dust from flux can cause severe lung damage (silicosis). Respiratory overexposure to airborne crystalline silica is known to cause silicosis, a form of disabling pulmonary fibrosis which can be progressive and may lead to death.
F: Chronic fluoride absorption can result in osseous fluor sis, increased radiographic density of the bones and mottling of the teeth.

Aspiration hazard

Shall not be classified as presenting an aspiration hazard.

Other information

Organic polymers may be used in the manufacture of various welding consumables. Overexposure to their decomposition byproducts may result in a condition known as polymer fume fever. Polymer fume fever usually occurs within 4 to 8 hours of exposure with the presentation of flu like symptoms, including mild pulmonary irritation with or without an increase in body temperature. Signs of exposure can include an increase in white blood cell count. Resolution of symptoms typically occurs quickly, usually not lasting longer than 48 hours.

11.2 Information on other hazards

Endocrine disrupting properties

Contains an endocrine disruptor (ED) at a concentration of ≥ 0,1%.

Endocrine Disruptor lists							
Name of substance	**CAS No**	**Endocrine disruptor for human health**	**Endocrine disruptor for the environment**	**Listed in**	**Regulatory field**	**Status**	**Year**
sodium fluoride	7681-49-4	yes		List II	CLH	Classification proposed	2024

Legend

List II Substances under evaluation for endocrine disruption under an EU legislation

Other information

There is no additional information.

SECTION 12: Ecological information

12.1 Toxicity

Shall not be classified as hazardous to the aquatic environment.

Aquatic toxicity (acute) of components of the mixture					
Name of substance	**CAS No**	**Endpoint**	**Value**	**Species**	**Exposure time**
nickel powder	7440-02-0	LC50	15.3 mg/l	rainbow trout (Oncorhynchus mykiss)	96 h
nickel powder	7440-02-0	EC50	0.32 mg/l	aquatic invertebrates	72 h
nickel powder	7440-02-0	NOEC	0.5 mg/l	aquatic invertebrates	72 h
nickel powder	7440-02-0	LOEC	>4,407 µg/l	aquatic invertebrates	48 h
nickel powder	7440-02-0	growth (EbCx) 10%	89 µg/l	aquatic invertebrates	72 h
Manganese	7439-96-5	ErC50	4.5 mg/l	algae	72 h
Manganese	7439-96-5	LC50	>3.6 mg/l	rainbow trout (Oncorhynchus mykiss)	96 h
Manganese	7439-96-5	EC50	>1.6 mg/l	daphnia magna	48 h
Manganese	7439-96-5	NOEC	3.6 mg/l	rainbow trout (Oncorhynchus mykiss)	96 h
Manganese	7439-96-5	LOEC	5.3 mg/l	green algae (Desmodesmus subspicatus)	72 h
Manganese	7439-96-5	growth rate (ErCx) 10%	3.4 mg/l	algae	72 h
Manganese	7439-96-5	growth (EbCx) 10%	3.4 mg/l	green algae (Desmodesmus subspicatus)	72 h
sodium fluoride	7681-49-4	EC50	48 mg/l	aquatic invertebrates	96 h
sodium fluoride	7681-49-4	NOEC	83 mg/l	microorganisms	48 h

Aquatic toxicity (chronic) of components of the mixture					
Name of substance	**CAS No**	**Endpoint**	**Value**	**Species**	**Exposure time**
nickel powder	7440-02-0	EC50	8,363 µg/l	fish	40 d
nickel powder	7440-02-0	LC50	204 µg/l	aquatic invertebrates	21 d
nickel powder	7440-02-0	NOEC	108.9 µg/l	fathead minnow (Pimephales promelas)	30 d
nickel powder	7440-02-0	LOEC	433.5 µg/l	fathead minnow (Pimephales promelas)	30 d
nickel powder	7440-02-0	growth (EbCx) 10%	3,599 µg/l	fish	40 d
Manganese	7439-96-5	LC50	<15.61 mg/l	fish	28 d
Manganese	7439-96-5	EC50	1,000 mg/l	microorganisms	3 h
Manganese	7439-96-5	NOEC	1.7 mg/l	water flea (Daphnia)	8 d
Manganese	7439-96-5	growth (EbCx) 20%	<1.1 mg/l	aquatic invertebrates	21 d
sodium fluoride	7681-49-4	NOEC	7.1 mg/l	microorganisms	20 h
sodium fluoride	7681-49-4	growth (EbCx) 10%	1,127 mg/l	microorganisms	3 h

12.2 Persistence and degradability

No further relevant information available.

12.3 Bioaccumulative potential

No further relevant information available.

12.4 Mobility in soil

Not mobile.

12.5 Results of PBT and vPvB assessment

Does not contain a PBT-/vPvB-substance at a concentration of ≥ 0,1%.

12.6 Endocrine disrupting properties

Contains an endocrine disruptor (ED) at a concentration of ≥ 0,1%.

Endocrine Disruptor lists							
Name of substance	**CAS No**	**Endocrine disruptor for human health**	**Endocrine disruptor for the environment**	**Listed in**	**Regulatory field**	**Status**	**Year**
sodium fluoride	7681-49-4	yes		List II	CLH	Classification proposed	2024

Legend

List II Substances under evaluation for endocrine disruption under an EU legislation

12.7 Other adverse effects

No further relevant information available.

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

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 or ID number**	not subject to transport regulations
14.2	**UN proper shipping name**	not relevant
14.3	**Transport hazard class(es)**	none
14.4	**Packing group**	not assigned
14.5	**Environmental hazards**	non-environmentally hazardous acc. to the dangerous goods regulations

14.6 Special precautions for user

There is no additional information.

14.7 Maritime transport in bulk according to IMO instruments

No data available.

Additional information for each of the UN Model Regulations

International Maritime Dangerous Goods Code (IMDG) - additional information

Not subject to IMDG.

International Civil Aviation Organization (ICAO-IATA/DGR) - additional information

Not subject to ICAO-IATA.

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

Name	Name acc. to inventory	Restriction	No
nickel powder	nickel	R27	27
nickel powder	substances in tattoo inks and permanent make-up	R75	75
chromium	substances in tattoo inks and permanent make-up	R75	75
sodium fluoride	substances in tattoo inks and permanent make-up	R75	75

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 re-

Legend

lease 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 µ g/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.

R75 1. Shall not be placed on the market in mixtures for use for tattooing purposes, and mixtures containing any such substances shall not be used for tattooing purposes, after 4 January 2022 if the substance or substances in question is or are present in the following circumstances:
(a) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as carcinogen category 1A, 1B or 2, or germ cell mutagen category 1A, 1B or 2, the substance is present in the mixture in a concentration equal to or greater than 0,00005 % by weight;
(b) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as reproductive toxicant category 1A, 1B or 2, the substance is present in the mixture in a concentration equal to or greater than 0,001 % by weight;
(c) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as skin sensitiser category 1, 1A or 1B, the substance is present in the mixture in a concentration equal to or greater than 0,001 % by weight;
(d) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as skin corrosive category 1, 1A, 1B or 1C or skin irritant category 2, or as serious eye damage category 1 or eye irritant category 2, the substance is present in the mixture in a concentration equal to or greater than:
(i) 0,1 % by weight, if the substance is used solely as a pH regulator;
(ii) 0,01 % by weight, in all other cases;
(e) in the case of a substance listed in Annex II to Regulation (EC) No 1223/2009 (*1), the substance is present in the mixture in a concentration equal to or greater than 0,00005 % by weight;
(f) in the case of a substance for which a condition of one or more of the following kinds is specified in column g (Product type, Body parts) of the table in Annex IV to Regulation (EC) No 1223/2009, the substance is present in the mixture in a concentration equal to or greater than 0,00005 % by weight:
(i) “Rinse-off products”;
(ii) “Not to be used in products applied on mucous membranes”;
(iii) “Not to be used in eye products”;
(g) in the case of a substance for which a condition is specified in column h (Maximum concentration in ready for use preparation) or column i (Other) of the table in Annex IV to Regulation (EC) No 1223/2009, the substance is present in the mixture in a concentration, or in some other way, that does not accord with the condition specified in that column;
(h) in the case of a substance listed in Appendix 13 to this Annex, the substance is present in the mixture in a concentration equal to or greater than the concentration limit specified for that substance in that Appendix.
2. For the purposes of this entry use of a mixture “for tattooing purposes” means injection or introduction of the mixture into a person’s skin, mucous membrane or eyeball, by any process or procedure (including procedures commonly referred to as permanent make-up, cosmetic tattooing, micro-blading and micro-pigmentation), with the aim of making a mark or design on his or her body.
3. If a substance not listed in Appendix 13 falls within more than one of points (a) to (g) of paragraph 1, the strictest concentration limit laid down in the points in question shall apply to that substance. If a substance listed in Appendix 13 also falls within one or more of points (a) to (g) of paragraph 1, the concentration limit laid down in point (h) of paragraph 1 shall apply to that substance.
4. By way of derogation, paragraph 1 shall not apply to the following substances until 4 January 2023:
(a) Pigment Blue 15:3 (CI 74160, EC No 205-685-1, CAS No 147-14-8);
(b) Pigment Green 7 (CI 74260, EC No 215-524-7, CAS No 1328-53-6).
5. If Part 3 of Annex VI to Regulation (EC) No 1272/2008 is amended after 4 January 2021 to classify or re-classify a substance such that the substance then becomes caught by point (a), (b), (c) or (d) of paragraph 1 of this entry, or such that it then falls within a different one of those points from the one within which it fell previously, and the date of application of that new or revised classification is after the date referred to in paragraph 1 or, as the case may be, paragraph 4 of this entry, that amendment shall, for the purposes of applying this entry to that substance, be treated as taking effect on the date of application of that new or revised classification.
6. If Annex II or Annex IV to Regulation (EC) No 1223/2009 is amended after 4 January 2021 to list or change the listing of a substance such that the substance then becomes caught by point (e), (f) or (g) of paragraph 1 of this entry, or such that it then falls within a different one of those points from the one within which it fell previously, and the amendment takes effect after the date referred to in paragraph 1 or, as the case may be, paragraph 4 of this entry, that amendment shall, for the purposes of applying this entry to that substance, be treated as taking effect from the date falling 18 months after entry into force of the act by which that amendment was made.
7. Suppliers placing a mixture on the market for use for tattooing purposes shall ensure that, after 4 January 2022, the mixture is marked with the following information:
(a) the statement “Mixture for use in tattoos or permanent make-up”;
(b) a reference number to uniquely identify the batch;
(c) the list of ingredients in accordance with the nomenclature established in the glossary of common ingredient names pursuant to Article 33 of Regulation (EC) No 1223/2009, or in the absence of a common ingredient name, the IUPAC name. In the absence of a common ingredient name or IUPAC name, the CAS and EC number. Ingredients shall be listed in descending order by weight or volume of the ingredients at the time of formulation. “Ingredient” means any substance added during the process of formulation and present in the mixture for use for tattooing purposes. Impurities shall not be regarded as ingredients. If the name of a substance, used as ingredient within the meaning of this entry, is already required to be stated on the label in accordance with Regulation (EC) No 1272/2008, that ingredient does not need to be marked in accordance with this Regulation;
(d) the additional statement “pH regulator” for substances falling under point (d)(i) of paragraph 1;
(e) the statement "Contains nickel. Can cause allergic reactions." if the mixture contains nickel below the concentration limit specified in Appendix 13;
(f) the statement "Contains chromium (VI). Can cause allergic reactions." if the mixture contains chromium (VI) below the concentration

Legend

limit specified in Appendix 13;
(g) safety instructions for use insofar as they are not already required to be stated on the label by Regulation (EC) No 1272/2008.
The information shall be clearly visible, easily legible and marked in a way that is indelible.
The information shall be written in the official language(s) of the Member State(s) where the mixture is placed on the market, unless the Member State(s) concerned provide(s) otherwise.
Where necessary because of the size of the package, the information listed in the first subparagraph, except for point (a), shall be included instead in the instructions for use.
Before using a mixture for tattooing purposes, the person using the mixture shall provide the person undergoing the procedure with the information marked on the package or included in the instructions for use pursuant to this paragraph.
8. Mixtures that do not contain the statement “Mixture for use in tattoos or permanent make-up” shall not be used for tattooing purposes.
9. This entry does not apply to substances that are gases at temperature of 20 °C and pressure of 101,3 kPa, or generate a vapour pressure of more than 300 kPa at temperature of 50 °C, with the exception of formaldehyde (CAS No 50-00-0, EC No 200-001-8).
10. This entry does not apply to the placing on the market of a mixture for use for tattooing purposes, or to the use of a mixture for tattooing purposes, when placed on the market exclusively as a medical device or an accessory to a medical device, within the meaning of Regulation (EU) 2017/745, or when used exclusively as a medical device or an accessory to a medical device, within the same meaning. Where the placing on the market or use may not be exclusively as a medical device or an accessory to a medical device, the requirements of Regulation (EU) 2017/745 and of this Regulation shall apply cumulatively.

List of substances subject to authorisation (REACH, Annex XIV) / SVHC - candidate list

Not relevant.

Seveso Directive

2012/18/EU (Seveso III)			
No	**Dangerous substance/hazard categories**	**Qualifying quantity (tonnes) for the application of lower and upper-tier requirements**	**Notes**
	not assigned		

Regulation concerning the establishment of a European Pollutant Release and Transfer Register (PRTR)

Pollutant release and transfer registers (PRTR)			
Name acc. to inventory	**CAS No**	**Remarks**	**Threshold for releases to air (kg/year)**
nickel	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

Water Framework Directive (WFD)

List of pollutants (WFD)				
Name of substance	**Name acc. to inventory**	**CAS No**	**Listed in**	**Remarks**
nickel powder	nickel	7440-02-0	b)	
nickel powder	nickel	7440-02-0	c)	
nickel powder	Substances and preparations, or the breakdown products of such, which have been proved to possess carcinogenic or mutagenic properties or properties which may affect steroidogenic, thyroid, reproduction or other endocrine-related functions in or via the aquatic environment		a)	
nickel powder	Metals and their compounds		a)	
chromium	Metals and their compounds		a)	

List of pollutants (WFD)				
Name of substance	**Name acc. to inventory**	**CAS No**	**Listed in**	**Remarks**
Manganese	Substances and preparations, or the breakdown products of such, which have been proved to possess carcinogenic or mutagenic properties or properties which may affect steroidogenic, thyroid, reproduction or other endocrine-related functions in or via the aquatic environment		a)	
Manganese	Metals and their compounds		a)	
sodium fluoride	Metals and their compounds		a)	

Legend

a) Indicative list of the main pollutants
b) List of priority substances in the field of water policy
c) Environmental Quality Standards for Priority Substances and certain other pollutants

Regulation (EU) 2019/1148 of the European Parliament and of the Council of 20 June 2019 on the marketing and use of explosives precursors, amending Regulation (EC) No 1907/2006 and repealing Regulation (EU) No 98/2013

None of the ingredients are listed.

Regulation on persistent organic pollutants (POP)

None of the ingredients are listed.

Restrictions of occupation

Directive 94/33/EC on the protection of young people at work / Observe national regulations on protection of young people at work.
Directive 92/85/EEC on the introduction of measures to encourage improvements in the safety and health at work of pregnant workers and workers who have recently given birth or are breastfeeding / Observe national regulations on maternity protection.

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)

Change in composition. Complete revision of the safety data sheet.

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
2000/39/EC	Commission Directive establishing a first list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC
2006/15/EC	Commission 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	Commission 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
ADR	Accord relatif au transport international des marchandises dangereuses par route (Agreement concerning the International Carriage of Dangerous Goods by Road)
Aquatic Chronic	Hazardous to the aquatic environment - chronic hazard
ATE	Acute Toxicity Estimate
Carc.	Carcinogenicity

Abbr.	Descriptions of used abbreviations
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
CLH	Harmonised classification and labelling
CLP	Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
CMR	Carcinogenic, Mutagenic or toxic for Reproduction
DGR	Dangerous Goods Regulations (see IATA/DGR)
DMEL	Derived Minimal Effect Level
DNEL	Derived No-Effect Level
EC50	Effective Concentration 50 %. The EC50 corresponds to the concentration of a tested substance causing 50 % changes in response (e.g. on growth) during a specified time interval
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)
ED	Endocrine disruptor
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
ErC50	≡ EC50: in this method, that concentration of test substance which results in a 50 % reduction in either growth (EbC50) or growth rate (ErC50) relative to the control
Eye Dam.	Seriously damaging to the eye
Eye Irrit.	Irritant to the eye
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
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
LC50	Lethal Concentration 50%: the LC50 corresponds to the concentration of a tested substance causing 50 % lethality during a specified time interval
LD50	Lethal Dose 50 %: the LD50 corresponds to the dose of a tested substance causing 50 % lethality during a specified time interval
LEL	Lower explosion limit (LEL)
LOEC	Lowest Observed Effect Concentration
NLP	No-Longer Polymer
NOEC	No Observed Effect Concentration
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
ppm	Parts per million
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)
S.I. No. 619 of 2001	Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001

Abbr.	Descriptions of used abbreviations
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
SVHC	Substance of Very High Concern
TWA	Time-weighted average
UEL	Upper explosion limit (UEL)
vPvB	Very Persistent and very Bioaccumulative

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 2020/878/EU.

Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). Regulations concerning the International Carriage of Dangerous Goods by Rail (RID). 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 section 2 and 3)

Code	Text
H301	Toxic if swallowed.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H351	Suspected of causing cancer.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.
H412	Harmful to aquatic life with long lasting effects.

Disclaimer

The information given in this SDS is based on the present level of our knowledge and experience. This information is believed to be accurate as of the revision date shown above. However, no warranty, expressed or implied, is given. Because the conditions or methods of use are beyond KOBE STEEL, LTD.'s control, we assume no liability resulting from the use of this product. Regulatory requirements are subject to change and may differ between various locations. Compliance with all applicable Federal, State, Provincial, and local laws and regulations remain the responsibility of the user. If necessary, consult an industrial hygienist or other expert to understand this information and safeguard the environment and protect workers from potential hazards associated with the handling or use of this product.

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.

Annex to the extended Safety Data Sheet (eSDS)
Exposure Scenario:

Read and understand the “Recommendations for Exposure Scenarios, Risk Management Measures and to identify Operational Conditions under which metals, alloys and metallic articles may be safely welded”, which is available from your supplier and at http://european-welding.org/health-safety.