



Your welding power

MATERIAL SAFETY DATA SHEET MSDSENG218

INE NI-FE

Edition number:	2
Date of compilation:	30 March 2023
Supersedes:	MSDSENG218 ed. 1 dated 17-10-2018

in accordance to Commission Regulation (EU) 2020/878 of 18 June 2020

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SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

INE NI-FE

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

Covered electrodes for manual metal arc welding.

1.3 Details of the supplier of the safety data sheet

INE SpA, Via Facca 10, 35013 Cittadella (Padova), Italy
Tel. : +39 049/9481111
Fax: + 39 049/9400249
Internet: www.ine.it
E mail: ine@ine.it

1.4 Emergency telephone number

INE SpA +39 049/9481111
Hours of operation: 8.30-12-30 and 13.30-17.30

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

This product doesn't meet the criteria of classification in any hazard class according to the applicable Regulations. However the form in which product is placed on the market does not present a danger, such preparations do not require a label.

2.2. Label elements

No labelling applicable.

2.3 Other hazards

- Results of evaluation of PTB and vPvB substances: the covered electrode does not meet the criteria for PBT or vPvB in accordance with Annex XIII.
- Heat: spatter and melting metal can cause burn injuries.
- Radiation: UV, IR radiations. Arc ray can severely damage eyes or skin.
- Fumes: formation of dangerous fumes during use. Inhalation of welding fumes may cause respiratory irritation. Cough. Excessive or prolonged inhalation of fumes may cause metal fume fever.
- Electricity: electric shocks can kill.
- Magnetic fields: persons with a pacemaker should not go near welding or cutting operations until they have consulted their doctor and obtained information from the manufacturer of the device.
- Noise: Noises generated by welding equipment could damage auditory system.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Non applicabile.



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3.2 Mixtures

The substances in the preparation are as follows:

Name of the substance	Range of concentration	CAS Number	EC Number	REACH Number	Hazard class	hazard statements
					According to European Regulation 1272/2008	
Nickel (ingot) GHS07 GHS08	42 ÷ 50 %	7440-02-0	231-111-4	01-2119438727-29	Skin Sens. 1 Carc. 2 STOT RE 1 Aquatic Chronic 3	H317 H351 H372 H412
Iron	30 ÷ 40 %	7439-89-6	231-096-4	01-2119462838-24	–	–
Strontium Carbonate	10 ÷ 15 %	1633-05-2	216-643-7	–	–	–
Aluminium silicate	≤ 1 %	12141-46-7	235-253-8	–	–	–
Carbon	1 ÷ 2 %	7440-44-0	231-153-3	–	–	–
Fluoride GHS08	2 ÷ 5 %	7789-75-5	232-188-7	–	STOT RE 1	H372
Copper	≤ 1 %	7440-50-8	231-159-6	01-2119480154-42	–	–
Manganese	≤ 1 %	7439-96-5	231-105-1	01-2119449803-34	–	–
Silicates	1 ÷ 2 %	1344-09-8	215-687-4	–	–	–

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

Welding fume inhalation: assure fresh air breathing. Obtain medical attention if breathing difficulty persists.

Skin contact with hot metal: Flush with plenty of water. Seek medical advice. Seek medical attention if burns develop. Take off immediately all contaminated clothing.

Eye contact with hot metal: rinse immediately with plenty of water. Seek medical attention immediately. In case of burns from radiations, seek medical attention.

4.2 Most important symptoms and effects, both acute and delayed

See 2.3.

4.3 Indication of any immediate medical attention and special treatment needed

No additional information available.

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable: powder, carbon dioxide.

Unsuitable: water.

5.2 Special hazards arising from the substance or mixture

The product for arc welding process is not flammable.

5.3 Advice for firefighters

Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Not applicable.

6.2 Environmental precautions

Not applicable.



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6.3 Methods and material for containment and cleaning up

Solid product: collect with mechanical equipments, sweep or shovel into suitable containers.

6.4 Reference to other sections

Section number 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

No special precautions necessary the product. During its use, a system of aspiration system and/or ventilation such as to ensure the fulfillment of exposition standards shall be planned.

Do not eat, drink and smocking in the workplaces. Wash hands shower when leaving the working areas. Remove contaminated clothes and protective equipment before to enter in the areas where you eat.

7.2 Conditions for safe storage, including any incompatibilities

Avoid the contact with chemical substances like acids or bases

High-density solid product. Avoid storage in unstable positions

7.3 Specific end use(s)

Not applicable.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

The following substances may be produced during the welding process in the fume:

Substance	CAS Number	TLV-TWA [mg/m ³] *	Gestis Limit value (8 h) [mg/m ³] **
Nickel (and inorganic compounds)		0.2	0.2
Fe oxides (powder and fumes as Fe)	1309-37-1	5	5
Manganese and inorganic compounds (as Mn)	7439-96-5	0.1	0.2
Manganese, fume or respirable dust	7439-96-5		0.2
Ozone	10028-15-6	0.1	0.1
Fluorides (as F)		2.5	2.5

* References of TLV limit values taken from "2021 TLVs and BEIs", ACGIH ed. 2021.

** Reference IFA limit values taken from IFA ((Institute for Occupational Safety and Health). Date of update: April 2020

8.2 Exposure controls

- Protection in case of insufficient ventilation: wear suitable respiratory equipment. Do not breathe gas/fumes/vapour.
- Hand protection: Welding gloves.
- Skin protection: Skin protection appropriate to the conditions of use should be provided.
- It is recommended to use of Exposure Scenario in addition to the provided information.



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SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

PROPERTIES	VALUE
Appearance:	Solid, grey
Odour	Odourless
Odour threshold;	Not applicable
pH	Not applicable
Melting point/freezing point [°C]	ca 1500 / Not applicable
Initial boiling point and boiling range	No data available
Flash point;	No data available
Evaporation rate;	No data available
Flammability (solid, gas);	No data available
Upper/lower flammability or explosive limits;	No data available
Vapour pressure;	No data available
Vapour density;	No data available
Relative density [kg/dm ³]	~ 5
Solubility(ies);	No data available
Partition coefficient: n-octanol/water;	No data available
Auto-ignition temperature;	No data available
Decomposition temperature;	No data available
Viscosity;	No data available
Explosive properties	No data available
Oxidising properties.	No data available

9.2 Other information

No additional information available.

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

None under normal conditions.

10.2 Chemical stability

Stable under normal conditions (< 300°C).

10.3 Possibility of hazardous reactions

None under normal conditions.

10.4 Conditions to avoid

None under normal conditions.

10.5 Incompatible materials

Contact with chemical substances like acids or bases, this product could cause generation of gas.

10.6 Hazardous decomposition products

Formation of dangerous fumes during use. Welding fumes are classified carcinogen by the IARC (International Agency for Research on Cancer): Group 1, Carcinogenic to humans. The amount of fumes generated change with the welding parameters and the diameters of the consumable; it could be develop from the reaction of oxidation of the components listed in section 3 or included in the base material.



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SECTION 11: TOXICOLOGICAL INFORMATION

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

Acute toxicity	Not classified
Skin corrosion/irritation	Not classified
Serious eye damage/irritation	Not classified
Respiratory or skin sensitisation	Not classified
Germ cell mutagenicity	Not classified
Carcinogenicity	See Section 8 and 10 for welding fumes
Reproductive toxicity	Not classified
STOT-single exposure	Not classified
STOT-repeated exposure	See Section 8 and 10 for welding fumes
Aspiration hazard	Not classified

11.2 Information on other hazards

No additional information available.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

The covered electrodes, in massive form, don't present hazards to the environment. Avoid the condition that can lead to their corrosion and the release of the metals in the environment.

12.2 Persistence and degradability

The covered electrodes, in massive form, don't present hazards to the environment. Avoid the condition that can lead to their corrosion and the release of the metals in the environment.

12.3 Bioaccumulative potential

The covered electrodes, in massive form, don't present hazards to the environment. Avoid the condition that can lead to their corrosion and the release of the metals in the environment.

12.4 Mobility in soil

The covered electrodes, in massive form, don't present hazards to the environment. Avoid the condition that can lead to their corrosion and the release of the metals in the environment.

12.5 Results of PBT and vPvB assessment

The covered electrodes, in massive form, don't present hazards to the environment. Avoid the condition that can lead to their corrosion and the release of the metals in the environment.

12.6 Endocrine disrupting properties

It does not contain substances having endocrine disrupting properties with respect to non-target organisms as they do not meet the criteria in Section B of Regulation (EU) 2017/2100.

12.7 Other adverse effects

The covered electrodes, in massive form, don't present hazards to the environment. Avoid the condition that can lead to their corrosion and the release of the metals in the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Regional legislation (waste): Dispose in a safe manner in accordance with local/national regulations.

Waste code for the industrial waste according to Commission Decision 2014/955/EU:

- 12 01 02: powder and particulate of ferrous materials.
- 12 01 13: welding wastes.



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SECTION 14: TRANSPORT INFORMATION

14.1 UN number:

Product is not classified as dangerous good for transport and have no UN number.

14.2 UN proper shipping name

Not applicable.

14.3 Transport hazard class(es)

Not applicable.

14.4 Packing group

Not applicable.

14.5 Environmental hazards

The product is not environmentally hazardous according to the criteria of the UN Model Regulations (as reflected in the IMDG Code, ADR, RID and ADN) and/or a marine pollutant according to the IMDG Code.

14.6 Special precautions for user

There are no any special precautions
No additional information available.

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

Not applicable.

SECTION 15: REGULATORY INFORMATION

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

EU regulations

It does not contain substances subject to authorization according to REACH (Annex XIV).

It does not contain substances subject to REACH restrictions (Annex XVII).

Additional rules, limitations and legal prescriptions:

Directive 2015/863 / EU (RoHS III), Directive 2013/28 / EU: the product complies with the mentioned directives and the related applicable obligations.

National regulations

No data available.

15.2 Chemical safety assessment

No further information available.

SECTION 16: OTHER INFORMATION

The contents and the format of this safety data sheet comply with the Commission Regulation (EU) 2020/878, Regulation (EC) No. 1907/2006 and Regulation (EC) No 1272/2008 (CLP Regulation).

FULL TEXT OF HAZARD CLASSES AND HAZARD STATEMENT USED IN SECTION 3

Skin Sens. 1: Skin sensitization, category 1;

Carc. 2: Carcinogenicity, category 2;

STOT RE 1: Specific target organ toxicity (repeated exposure), category 1;

Aquatic Chronic 3: Hazardous to the aquatic environment - chronic hazard, category 3;

H317: May cause an allergic skin reaction;



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H351: Suspected of causing cancer;
H372: Causes damage to organs through prolonged or repeated exposure;
H412: Harmful to aquatic life with long lasting effects.

LEGEND:

- ✓ PBT: persistent, bioaccumulative and toxic;
- ✓ vPvB: very persistent and very bioaccumulative;
- ✓ TLV-TWA: threshold limit value - time weighted average;

BIBLIOGRAPHY

- ✓ Commission Regulation (EU) 2020/878;
- ✓ Regulation (EC) No 1907/2006;
- ✓ Regulation (EC) No 1272/2008;
- ✓ Guidance on the compilation of safety data sheets, Version 4.0 December 2020;
- ✓ <http://echa.europa.eu>;
- ✓ <http://limitvalue.ifa.dguv.de>;
- ✓ European Welding Association: recommendations for Exposure Scenarios, Risk Management Measures and to Welding Exposure Scenario WES 2021;
- ✓ 2014/955/EU: Commission Decision of 18 December 2014 amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament and of the Council Text with EEA relevance

DISCLAIMER OF LIABILITY: The information in this sheet is based on the knowledge available when it was published. The user must ensure that the information is applicable and exhaustive for the application. The information contained in this sheet is only applicable for this product. The product must not be used for any application that is not allowed, in this case we will not be responsible for any damage caused. The user must respect current Safety, Health and Environmental legislation. This information concerns Safety and is not a substitute to the technical data of the product. This sheet cancels and replaces the previous ones.



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EXPOSURE SCENARIO

Guidance and Recommendations for Exposure Scenarios, Risk Management Measures and to identify Operational Conditions under which metals, alloys and metallic articles and mixtures may be safely welded regarding welding fumes and gases exposure

Welding/Brazing produces fumes, which can affect human health.

Welding and allied processes generate a varying mixture of fumes (airborne particles) and gases, which, if inhaled or swallowed, constitute a health hazard.

The degree of risk will depend on the composition of the fume, the concentration of the fume and duration of exposure.

The fume composition is dependent upon the material being worked, the process and consumables being used, coatings on the work such as paint, galvanizing or plating, oil or contaminants from cleaning and degreasing activities.

The amount of fumes generated is dependent on the welding process, the welding parameters, the shielding gas, the type of consumable and the potential coating on the work.

A systematic approach to the assessment of exposure is necessary, taking into account the particular circumstances for the operator and ancillary worker that can be exposed.

General Rules to reduce exposure to welding fumes and gases

Considering the emission of fumes when welding brazing or cutting of metals, it is recommended to (1) arrange risk management measures through applying general information and guidelines provided by this document and (2) using the information provided by the Safety Data Sheet, issued in accordance with REACH, by the welding consumable manufacturer.

The employer shall ensure that the risk from welding fumes to the safety and health of workers is eliminated or reduced to a minimum. Start every new work with an Occupational Safety & Health Risk Inventory.

The following principles shall be applied, unless local regulation say otherwise:

- 1. Substitution:**
Select the applicable process/base material combinations with the lowest emission, whenever possible
Set welding process with the lowest emission parameters (e.g. welding parameters/arc mode transfer, shielding gas composition) *
- 2. Technological Means:**
Apply the relevant collective protective measures (general ventilation, local exhaust ventilation) in accordance with class number.
- 3. Organizational Measures:**
Limit the time a worker is exposed to welding fumes,
Establish and apply Welding Procedure Specifications
- 4. Personal Protective Equipment:**
To protect the worker, wear the relevant personal protective equipment in accordance with the duty cycle

In addition, compliance with the National Regulations regarding the exposure of welders and related personnel to welding fumes, their components with specific occupational exposure limit, and gaseous substances with specific occupational exposure limits shall be verified. It is therefore strongly recommended to seek clarification of specific national legislation that may apply.

* In MIG / MAG process , innovative waveform controlled processes generate less welding fumes and particles than conventional processes - The use of such processes can be an additional measure to reduce the exposure of the welder and or workers



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Risk Management Measures for Individual process/base material combinations

According to the welding or allied process and the base material to be welded, a general guidance on *Technological means* is proposed in the table below.

An approximate ranking to mitigate the risk of welding fumes and gases exposure is given for each welding or allied process/base material combination.

The individual process/base material combinations are ranked from the lowest emission ones (**Class I**) to the highest emission ones (**Class VIII**).

NOTE: The International Institute of Welding (IIW) assessed the publication of IARC Monograph 118. Based on the current state of knowledge, IIW confirms its statement from 2011 on "Lung cancer and welding" and encourages all those responsible to reduce the exposure to welding fume to a minimum. It also recommends that to eliminate the excess risk of lung cancer, welders and their managers must ensure that exposure to welding fume is minimized, at least to national guidelines. This IIW statement is posted both on IIW and EWA website.

For each class, general recommendations on Ventilation/Extraction/Filtration and Personal Protection Equipment are proposed.

Class ¹	Process (according to ISO 4063)	Base Materials	Remarks	Ventilation / Extraction / Filtration ¹⁴	PPE ² DC<15%	PPE ² DC>15%
Non-confined space¹⁶						
I	GTAW 141	All	Except Aluminum	GV low ³	n.r.	n.r.
	SAW 12					
	Autogenous 3					
	PAW 15					
	ESW/EGW 72/73					
	Resistance 2					
	Stud welding 78					
	Solid state 521					
Gases Brazing 9	All	Except Cd- alloys	GV low ³	n.r.	n.r.	
II	GTAW 141	Aluminum	n.a.	GV medium ⁴	n.a.	FFP2 ⁵
III	MMAW 111	All	Except Be-, V-, Mn-, Ni- alloys and Stainless ⁶	GV low ⁷ LEV low ¹²	Improved helmet ¹⁶	FFP2 ⁵
	FCAW 136/137	All	Except Stainless and Ni- alloys ⁶			
	GMAW 131/135	All	Except Cu-, Be-, V- alloys ⁶			
	Powder Plasma Arc 152	All	Except Be-, V-, Cu-, Mn-, Ni-alloys and Stainless ⁶			
IV	All processes class I	Painted / primed / oiled / galvanized	No Pb containing primer	GV low ³	FFP2 ⁵	FFP3 ⁸ , TH2/P2, or LDH3
	All processes class III	Painted / primed / oiled / galvanized	No Pb containing primer	GV low ⁷ LEV low ¹²		
V	MMAW 111	Stainless, Ni-, Be-, and V- alloys	n.a.	LEV high ¹⁰	TH3/P3, LDH3 ¹¹	TH3/P3, LDH3 ¹¹
	FCAW 136/137	Stainless, Mn- and Ni-alloys				
	GMAW 131	Cu-alloys				
	Powder Plasma Arc 152	Stainless, Mn-, Ni-, and Cu- alloys				



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Class ¹	Process (according to ISO 4063)	Base Materials	Remarks	Ventilation / Extraction / Filtration ¹⁴	PPE ² DC<15%	PPE ² DC>15%
Non-confined space¹⁶						
VI	GMAW 131	Be-, and V- alloys	n.a.	Reduced (negative) pressured area ⁹ LEV low ¹²	TH3/P3, LDH3 ¹¹	TH3/P3, LDH3 ¹¹
	Powder Plasma Arc 152					
VII	Self shielded FCAW 114	Un-, high alloyed steel	Cored wire, not containing Ba	Reduced (negative) pressured area ⁹ LEV medium ¹³	TH3/P3, LDH3 ¹¹	TH3/P3, LDH3 ¹¹
	Self-shielded FCAW 114	Un-, high alloyed steel	Cored wire, containing Ba			
	All	Painted / primed / galvanized	Paint / Primer containing Pb	Reduced (negative) pressured area ⁹ LEV high ¹⁰		
	Arc Gouging and Cutting 8	All	n.a.			
	Thermal Spray	All	n.a.			
	Gases Brazing 9	Cd- alloys	n.a.			
Closed system or Confined space¹⁵						
I	Laser Welding 52	All	Closed system	GV medium ⁴	n.a.	n.a.
	Laser Cutting 84					
	Electron Beam 51					
VIII	All	All	Confined space	LEV high ¹⁰ External air supply	LDH3 ¹¹	LDH3 ¹¹

Notes:

- 1 Class: approximate ranking to mitigate risk by selecting process/material combinations with the lowest value. Identified collective and individual risk management measures shall be applied
- 2 Personal Protective Equipment (PPE) required avoiding exceeding the National Exposure Limit Value (DC: Duty cycle expressed on 8 hours)
- 3 General Ventilation (GV) Low. With additional Local Exhaust Ventilation (LEV) and extracted air to the outside, the GV or LEV capacity may be reduced to 1/5 of the original requirement.
- 4 General Ventilation (GV) Medium (double compared to Low)
- 5 Filtrating half mask (FFP2)
- 6 When an alloyed consumable is used, measures from "Class V" are required
- 7 General Ventilation (GV) Low. When no Local Exhaust Ventilation, the ventilation requirement is 5-fold
- 8 Filtrating half mask (FFP3), helmet with powered filters (TH2/P2), or helmet with external air supply (LDH2)
- 9 Reduced (negative) pressured Area: A separate, ventilated area where reduced (negative) pressure, compared to the surrounded area, is maintained
- 10 Local Exhaust Ventilation (LEV) High, extraction at source (includes table, hood, arm or torch extraction)
- 11 Helmet with powered filters (TH3/P3), or helmet with external air supply (LDH3)
- 12 Local Exhaust Ventilation (LEV) Low, extraction at source (includes table, hood, arm or torch extraction)
- 13 Local Exhaust Ventilation (LEV) Medium, extraction at source (includes table, hood, arm or torch extraction)
- 14 Recommended measures to comply with national maximum allowable limits. Extracted fumes, for all materials except unalloyed steel and aluminum, shall be filtered before release in the outside environment.
- 15 A confined space, despite its name, is not necessarily small. Examples of confined spaces include ship, silos, vats, utility vaults, tanks, etc.
- 16 Improved helmet, designed to avoid direct flow of welding fumes inside
- n.a. Not applicable
- n.r. Not recommended

International Standards & EU Regulations

The following ISO standards and European Union Directives address general information for risk assessments of exposure to welding fumes and gases released by welding and allied processes. In addition, national regulations and recommendations need to be consulted and applied.



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ISO 4063:2009	Welding and allied processes -- Nomenclature of processes and reference numbers
ISO EN 21904-1:2020	Health and safety in welding and allied processes -- Equipment for capture and separation of welding fume -- Part 1: General requirements
ISO EN 21904-2:2020	Health and safety in welding and allied processes -- Equipment for capture and separation of welding fume -- Part 2: Requirements for testing and marking of separation efficiency
ISO EN 21904-3:2018	Health and safety in welding and allied processes — Requirements, testing and marking of equipment for air filtration — Part 3: Determination of the capture efficiency of on-torch welding fume extraction devices
ISO EN 21904-4:2020	Health and safety in welding and allied processes -- Equipment for capture and separation of welding fume -- Part 4: Determination of the minimum air volume flow rate of capture devices
ISO 15607:2003	Specification and qualification of welding procedures for metallic materials — General rules
EN ISO 15609:	Specification and qualification of welding procedures for metallic materials - Welding procedure specification part1 -> part 6
ISO 17916:2016	Safety of thermal cutting machines
EN 149:2001+A1:2009	Respiratory protective devices. Filtering half masks to protect against particles. Requirements, testing, marking
EN 14594:2018	Respiratory protective devices. Continuous flow compressed air line breathing devices. Requirements, testing and marking
EN 12941:1998+A2:2008	Respiratory protective devices. Powered filtering devices incorporating a helmet or a hood. Requirements, testing, marking
EN 143:2000	Respiratory protective devices. Particle filters. Requirements, testing, marking
Directive 98/24/EC	on the protection of the health and safety of workers from the risks related to chemical agents at work
Directive 2004/37/EC	on the protection of workers from the risks related to exposure to carcinogens or mutagens at work
Directive 2017/2398	Amending Directive 2004/37/EC on chromium VI exposure limit
Directive 2017/164/EU	indicative occupational exposure limit values (for nitrogen oxides)
Directive 2019/130	Amending Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens or mutagens at work



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Use Descriptor System according to REACH Regulation

REACH use descriptor system is a system developed by ECHA¹ to facilitate chemical risk assessment and supply chain communication.

Welding fumes and gases are secondary non-intentional byproducts generated during welding operations. As such, they are not considered as substances or mixtures under REACH definition. They are not intended to be used by workers or consumers.

However, occupational exposure to welding fumes and gases may represent a risk similar to the ones of the substances and mixtures regulated by REACH.

The identification of hazards, the evaluation of their risks and the putting in place of control measures to secure the health and safety can be implemented with REACH methodology. This system has been applied to welding fumes and gases.

The system firstly describes the Life Cycle Stage. The EWA welding consumable manufacturers define 2 life cycle stages: a) manufacture of the product and b) the application at an industrial site.

In addition, REACH uses five descriptors:

- Sector of use (**SU**), [NOTE: previously listed SU3 and SU10 have been removed by ECHA¹]
- Process category (**PROC**),
- Product category (**PC**),
- Article category (**AC**) and
- Environmental release category (**ERC**)

to describe identified uses.

The applicable descriptors for welding consumables are:

Manufacture of consumables:

SU14 SU15 PC7 PC38 PROC5 PROC21 PROC22 PROC23 PROC24 PROC25 ERC 2 ERC3 AC7

Industrial and Professional welding:

SU15 SU17 PC7 PC38 PROC21 PROC22 PROC23 PROC24 PROC25 ERC5 ERC8c ERC8f AC1 AC2 AC7

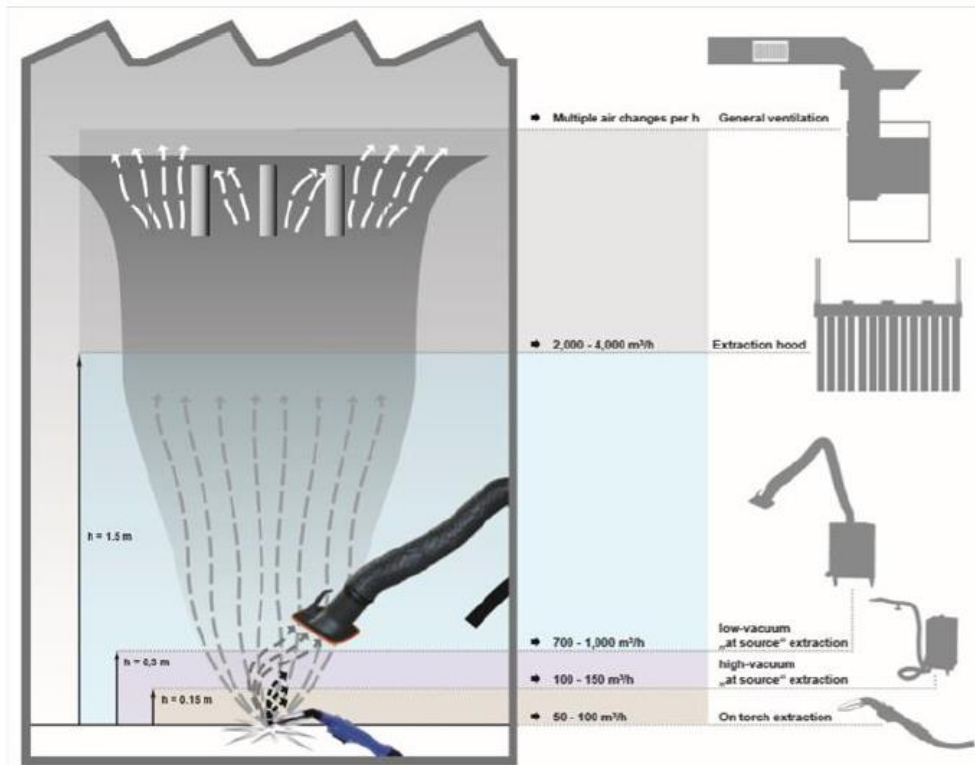
SU14	Manufacture of basic metals, including alloys
SU15	Manufacture of fabricated metal products, except machinery and equipment
SU17	General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
PC7	Base metals and alloys
PC38	Welding and soldering products, flux products
PROC5	Mixing or blending in batch processes
PROC21	Low energy manipulation of substances bound in materials and/or articles
PROC22	Potentially closed processing operations with minerals/metals at elevated temperature. Industrial setting
PROC23	Open processing and transfer operations with minerals/metals at elevated temperature
PROC24	High (mechanical) energy work-up of substances bound in materials and/or articles
PROC25	Other hot work operations with metals
ERC2	Formulation of preparations
ERC3	Formulation into solid matrix
ERC5	Industrial use resulting in inclusion into or onto a matrix
AC1	Vehicles
AC2	Machinery, mechanical appliances, electrical/electronic articles
AC7	Metal articles

¹ Guidance on Information Requirements and Chemical Safety Assessment, Chapter R.12: Use description, Version 3.0 December 2015 (https://echa.europa.eu/documents/10162/13632/information_requirements_r12_en.pdf)

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Annex: Illustration of welding fume extraction systems (optional)



Note: Illustration of welding fume extraction systems is only an example. Compliance, with national country legislation, is needed if different

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