Safety Data Sheet

acc. to OSHA HCS

Printing date 05/20/2022 Reviewed on 11/15/2021

1 Identification

· **Product identifier**

· **Trade name: UV 420 TTR H4**
· **CAS Number:** -
· **EINECS Number:** -
· **Application of the substance / the mixture** Flux for Submerged Arc Welding

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**

voestalpine Böhler Welding Germany GmbH
Hafenstr. 21
59067 Hamm, Germany
www.voestalpine.com/welding

voestalpine Böhler Welding USA
1601 Gillingham Suite 110
Sugar Land, TX 77478

www.voestalpine.com/welding
-

· **Information department:**

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-

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-

· **Emergency telephone number:**

NCEC
+1 202 464 2554 (USA, Canada)
+44 1865 407333 (English)
+44 1235 239670 (English, French, Spain, Portuguese)
-

NCEC

+1 202 464 2554 (USA, Canada)

+44 1865 407333 (English)

+44 1235 239670 (English, French, Spain)
-

2 Hazard(s) identification

· **Classification of the substance or mixture**
Classified according to the criteria of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), OSHA Hazard Communication Standard (29 CFR 1910.1200) and the Canadian Controlled Products Regulations.

The Product does not meet the criteria for classification in any hazard class according to GHS.

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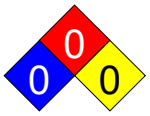
· **Label elements**
· **GHS label elements** Void
· **Hazard pictograms** Void
· **Signal word** Void
· **Hazard statements** Void
· **Information pertaining to particular dangers for man and environment:**
· **NFPA ratings (scale 0 - 4)**



Health = 0
Fire = 0
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = *0
Fire = 0
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Mixtures**
· **Description:** Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:**

CAS: 1309-48-4 EINECS: 215-171-9	magnesium oxide	25-50%
CAS: 1344-28-1 EINECS: 215-691-6	aluminium oxide	12.5-25%
CAS: 1312-76-1 EINECS: 215-199-1	potassium silicate Skin Irritation 2, H315 Eye Irritation 2B, H320	2.5-5%
CAS: 1344-09-8 EINECS: 215-687-4	Silicic acid, sodium salt Skin Corrosion 1C, H314; Eye Damage 1, H318 Specific Target Organ Toxicity - Single Exposure 3, H335	2.5-5%
CAS: 7439-96-5 EINECS: 231-105-1	manganese	0.1-2.5%

4 First-aid measures

· **Description of first aid measures**
· **General information:** No special measures required.
· **After inhalation:** Supply fresh air; consult doctor in case of complaints.
· **After skin contact:** Generally the product does not irritate the skin.
· **After eye contact:** Rinse opened eye for several minutes under running water.
· **After swallowing:** Seek medical treatment.
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.

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· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** Suitable to surrounding conditions
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters** -
· **Protective equipment:** No special measures required.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Ensure adequate ventilation
Use respiratory protective device against the effects of fumes/dust/aerosol.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:** Pick up mechanically.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**		
1309-48-4	magnesium oxide	30 mg/m³
14542-23-5	calcium fluoride	15 mg/m³
1344-28-1	aluminium oxide	15 mg/m³
1312-76-1	potassium silicate	30 mg/m³
1344-09-8	Silicic acid, sodium salt	5.9 mg/m³
7439-96-5	manganese	3 mg/m³
7439-89-6	iron	3.2 mg/m³
7440-32-6	titanium	30 mg/m³
7440-21-3	silicon	45 mg/m³
7440-47-3	chromium	1.5 mg/m³

· **PAC-2:**		
1309-48-4	magnesium oxide	120 mg/m³
14542-23-5	calcium fluoride	170 mg/m³
1344-28-1	aluminium oxide	170 mg/m³
1312-76-1	potassium silicate	330 mg/m³
1344-09-8	Silicic acid, sodium salt	65 mg/m³
7439-96-5	manganese	5 mg/m³
7439-89-6	iron	35 mg/m³
7440-32-6	titanium	330 mg/m³
7440-21-3	silicon	100 mg/m³
7440-47-3	chromium	17 mg/m³

· **PAC-3:**		
1309-48-4	magnesium oxide	730 mg/m³
14542-23-5	calcium fluoride	1,000 mg/m³

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1344-28-1	aluminium oxide	990 mg/m³
1312-76-1	potassium silicate	2,000 mg/m³
1344-09-8	Silicic acid, sodium salt	390 mg/m³
7439-96-5	manganese	1,800 mg/m³
7439-89-6	iron	150 mg/m³
7440-32-6	titanium	2,000 mg/m³
7440-21-3	silicon	630 mg/m³
7440-47-3	chromium	99 mg/m³

7 Handling and storage

· **Handling:**
· **Precautions for safe handling** Ensure that suitable extractors are available on processing machines
· **Information about protection against explosions and fires:** No special measures required.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:** None.
· **Specific end use(s)** No further relevant information available.

*

8 Exposure controls/personal protection

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:**
The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit.
At this time, the other constituents have no known exposure limits.

1309-48-4 magnesium oxide	
PEL	Long-term value: 15* mg/m³ fume; *total particulate
TLV	Long-term value: 10* mg/m³ *as inhalable fraction, A4
1344-28-1 aluminium oxide	
PEL	Long-term value: 15*; 5** mg/m³ *Total dust; ** Respirable fraction
REL	Long-term value: 10* 5** mg/m³ as Al*Total dust**Respirable/pyro powd./welding f.
TLV	Long-term value: 1* mg/m³ as Al; *as respirable fraction, A4
7439-96-5 manganese	
PEL	Ceiling limit value: 5 mg/m³ as Mn
REL	Short-term value: 3 mg/m³ Long-term value: 1 mg/m³ fume, as Mn
TLV	Long-term value: 0.02* 0.1** mg/m³ as Mn; A4, *respirable **inhalable fraction

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· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:** Wash hands before breaks and at the end of work.
· **Breathing equipment:** Filter P2
· **Protection of hands:**
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
· **Material of gloves** Leather gloves
· **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:** Safety glasses
· **Body protection:**
Protective work clothing
Wear hand, head, and body protection which help to prevent injury from radiation, sparks, and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, and well as dark substantial clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Granulate
Color:	Not determined.
· **Odor:**	Odorless
· **Odor threshold:**	Not determined.
· **pH-value:**	Not applicable.
· **Flash point:**	Not applicable.
· **Flammability (solid, gaseous):**	Not determined.
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Density:**	Not determined.
· **Relative density**	Not determined.
· **Vapor density**	Not applicable.
· **Evaporation rate**	Not applicable.
· **Water:**	Insoluble.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Dynamic:**	Not applicable.
· **Kinematic:**	Not applicable.

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· **Solvent separation test**	
VOC content:	0.00 %
Solids content:	100.0 %
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:**
No decomposition if used and stored according to specifications.
· **Possibility of hazardous reactions** Attacks materials containing glass and silicate.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:**
Reasonably expected fume constituents could include:
iron oxide, silicon dioxide, potassium oxide, manganese oxide, sodium oxide, titanium dioxide, aluminum oxide, calcium oxid, fluoride.
Submerged arc welding as a welding process emits only low levels of pollutants. The welding fumes composition is determined by the type of wire being used.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**
· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** No irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
The product is not subject to classification according to internally approved calculation methods for preparations:
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**		
14542-23-5	calcium fluoride	3
13983-17-0	Wollastonite	3

· **NTP (National Toxicology Program)**
None of the ingredients is listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**
None of the ingredients is listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.

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· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:** Water hazard class 1 (Self-assessment): slightly hazardous for water
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:** Must be specially treated adhering to official regulations.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	Void
· **DOT, ADR, ADN, IMDG, IATA**	Void
· **UN proper shipping name**	
· **DOT, ADR, ADN, IMDG, IATA**	Void
· **Transport hazard class(es)**	
· **DOT, ADR, ADN, IMDG, IATA**	
· **Class**	Void
· **Packing group**	
· **DOT, ADR, IMDG, IATA**	Void
· **Environmental hazards:**	
· **Marine pollutant:**	No
· **Special precautions for user**	Not applicable.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	Not dangerous according to the above specifications.
· **UN "Model Regulation":**	- Void

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
No further relevant information available.
· **Sara**

· **Section 355 (extremely hazardous substances):**
None of the ingredient is listed

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· **Section 313 (Specific toxic chemical listings):**

1344-28-1	aluminium oxide
7439-96-5	manganese

· **TSCA (Toxic Substances Control Act):**

1309-48-4	magnesium oxide	ACTIVE
14542-23-5	calcium fluoride	ACTIVE
1344-28-1	aluminium oxide	ACTIVE
1312-76-1	potassium silicate	ACTIVE
1344-09-8	Silicic acid, sodium salt	ACTIVE
7439-96-5	manganese	ACTIVE
7439-89-6	iron	ACTIVE
7440-32-6	titanium	ACTIVE
7440-21-3	silicon	ACTIVE

· **Hazardous Air Pollutants**

7439-96-5	manganese

· **Proposition 65**

· **Chemicals known to cause cancer:**

None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**

None of the ingredients is listed.

· **Cancerogenity categories**

· **EPA (Environmental Protection Agency)**

7439-96-5	manganese	D

· **TLV (Threshold Limit Value)**

1309-48-4	magnesium oxide	A4
14542-23-5	calcium fluoride	A4
1344-28-1	aluminium oxide	A4

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

None of the ingredients is listed.

· **GHS label elements** Void
· **Hazard pictograms** Void
· **Signal word** Void
· **Hazard statements** Void
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Additional information:**
Recommendations for exposure scenarios, measures for risk management and identification of working conditions under which metals, metal alloys and products made of metal can be safely worked can be found attached.

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Detailed information can be found on our webpage www.voestalpine.com (Environment, REACH at voestalpine).

European Welding Association

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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 space[16]			
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 space[16]						
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]		
	Self-shielded FCAW 114	Un-, high alloyed steel	Cored wire, containing Ba	Reduced (negative) pressured area[9] LEV high[10]	TH3/P3, LDH3[11]	TH3/P3, LDH3[11]
	All	Painted / primed / galvanized	Paint / Primer containing Pb			
	Arc Gouging and Cutting 8	All	n.a.			
	Thermal Spray	All	n.a.			
	Gases Brazing 9	Cd- alloys	n.a.			
Closed system or Confined space[15]						
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 ECHA[1] 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 ECHA[1]]*
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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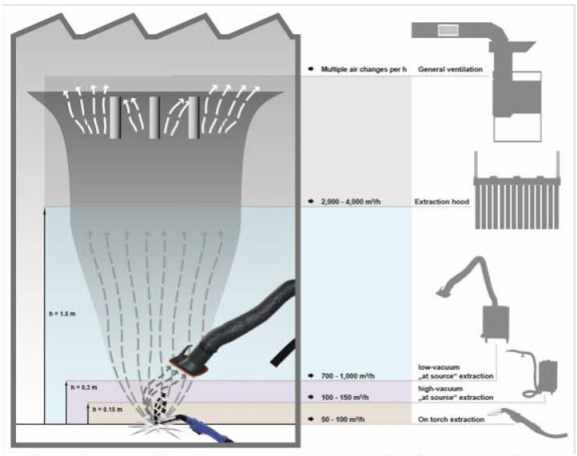
Annex: Illustration of welding fume extraction systems (optional)



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

This document has been prepared by the members of EWA technical committees. These members are working for different European producers of welding equipment and welding consumables (which are members of EWA). All EWA technical information documents are based on EWA members' experience and technical knowledge at the time of publication. Such technical information documents provide voluntary guidance and are not binding.

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· ***Department issuing SDS:***
R&D
Procurement/Logistics

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· ***Contact:***
Helena Stabel
Chris Smith
· ***Date of preparation / last revision*** *11/15/2021 / 7*
· ***Abbreviations and acronyms:***
NCEC - National Chemical Emergency Centre (=Carechem24)
ADR: Accord relatif au transport international des marchandises dangereuses par route (European Agreement Concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
TRGS: Technische Regeln für Gefahrstoffe (Technical Rules for Dangerous Substances, BAuA, Germany)
VOC: Volatile Organic Compounds (USA, EU)
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Skin Corrosion 1C: Skin corrosion/irritation – Category 1C
Skin Irritation 2: Skin corrosion/irritation – Category 2
Eye Damage 1: Serious eye damage/eye irritation – Category 1
Eye Irritation 2B: Serious eye damage/eye irritation – Category 2B
Specific Target Organ Toxicity - Single Exposure 3: Specific target organ toxicity (single exposure) – Category 3
· **** Data compared to the previous version altered.***