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

1.1. Product identifier

Product Name **Formic Acid 85%**

Substance Name Formic acid 85%
CAS No 64-18-6
EC No 200-579-1
REACH registration number 01-2119491174-37-0001

Synonyms

Pure substance/mixture Substance

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

Industrial Manufacture of substances. Formulation and (re)packing of substances and mixtures. Use in laboratories. Use as an intermediate. Use as a processing aid. Use in cleaning agents. Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers. Use in oil field drilling and production operations.

Professional Use in laboratories. Use as a processing aid. Use in cleaning agents.

Consumer Use in cleaning agents.

Application Chemical intermediate. Manufacture of textiles, leather, fur. Feed additive. Cleaning agent.

Uses advised against Not identified.

1.3. Details of the supplier of the safety data sheet

Manufacturer

Perstorp Specialty Chemicals AB
SE-284 80 Perstorp, Sweden
Tel. +46 435 380 00
www.perstorp.com

E-mail address productinfo@perstorp.com

1.4. Emergency telephone number

Europe (+)1 760 476 3961 (contract no: 334101)

United Kingdom (+)44 8 08 189 0979 (contract no: 334101)

SECTION 2: Hazards identification

Hazards description

Inhalation: Inhalation of vapours may cause smarting pain in nose and throat, cough and hoarseness. Inhalation of high concentrations may also cause pulmonary oedema that may occur after several hours. Prolonged and repeated contact with vapours may cause inflammation in nose and throat, chronic bronchitis and dental corrosion.
Skin contact: Skin contact may cause severe burns with redness, smarting pain and wounds. Prolonged and repeated contact with vapours may cause calluses.
Eye contact: Splashes causes intensive pain and corneal burns. Risk of permanent eye damage. Vapours may be substantially irritating.
Ingestion: Ingestion may cause severe burns with burning pain, vomiting and eventually shock and kidney damage. Risk of

permanent damage due to scarring of the esophagus and stomach.

2.1. Classification of the substance or mixture

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

Acute toxicity - Oral	Category 4 - (H302)
Acute toxicity - Inhalation (Vapours)	Category 3 - (H331)
Skin corrosion/irritation	Category 1 Sub-category B - (H314)
Serious eye damage/eye irritation	Category 1 - (H318)

2.2. Label elements

Symbols/Pictograms

Signal word
Danger

Hazard statements
H331 - Toxic if inhaled
H314 - Causes severe skin burns and eye damage
H302 - Harmful if swallowed
EUH071 - Corrosive to the respiratory tract

Precautionary Statements
P280 - Wear protective clothing/eye protection
P260 - Do not breathe vapour
P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower
P310 - Immediately call a POISON CENTER or doctor

Formic acid 85%

2.3. Other hazards

Combustible liquid
This substance does not meet the criteria for classification as PBT or vPvB
This product does not contain any known or suspected endocrine disruptors

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	EC No	REACH registration number	Weight-%	Classification according to Regulation (EC) No. 1272/2008 [CLP]	Specific concentration limit (SCL)	M-Factor	M-Factor (long-term)
Formic acid 'CAS #:' 64-18-6	200-579-1	01-2119491174-37-0001	84-86	Flam. Liq. 3 (H226) Skin Corr. 1A (H314) Eye Dam. 1 (H318) Acute Tox. 3 (H331) Acute Tox. 4 (H302) (EUH071)	Skin Corr. 1A :: C>=90% Skin Corr. 1B :: 10%<=C<90% Skin Irrit. 2 :: 2%<=C<10% Eye Irrit. 2 :: 2%<=C<10% Eye Dam. 1 :: C>=10%	No data available	No data available

Classification according to Regulation (EC) No. 1272/2008 [CLP] - Notes
[A] - Not classified, Data are conclusive but insufficient for classification

Full text of H- and EUH-phrases: see section 16

Acute Toxicity Estimate
If LD50/LC50 data is not available or does not correspond to the classification category, then the appropriate conversion value from CLP Annex I, Table 3.1.2, is used to calculate the acute toxicity estimate (ATEmix) for classifying a mixture based on its components

Chemical name	Oral LD50 mg/kg	Dermal LD50 mg/kg	Inhalation LC50 - 4 hour - dust/mist - mg/L	Inhalation LC50 - 4 hour - vapour - mg/L	Inhalation LC50 - 4 hour - gas - ppm
Formic acid 'CAS #:' 64-18-6	730	5001	-	7.85	Not applicable

This product does not contain candidate substances of very high concern at a concentration >=0.1% (Regulation (EC) No. 1907/2006 (REACH), Article 59)

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice Begin first-aid measures immediately!. Causes severe skin burns and eye damage. If unconscious place in recovery position and seek medical advice. First aider: Pay attention to self-protection. Emergency shower and eye wash facilities must exist in the work place.

Inhalation Remove to fresh air. Call a doctor or poison control centre immediately. If experiencing respiratory symptoms:. Artificial respiration and/or oxygen may be necessary.

Skin contact Wash off immediately with plenty of water for at least 15 minutes. Use lukewarm water if possible. Take off contaminated clothing. Seek immediate medical attention/advice.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Use lukewarm water if possible. Seek immediate medical attention/advice.

Ingestion Do NOT induce vomiting. Clean mouth with water and drink plenty of water afterwards. Remove from exposure, lie down. Seek immediate medical attention/advice.

Self-protection of the first aider Avoid any direct contact with the product.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms Inhalation: Inhalation of vapours may cause smarting pain in nose and throat, cough and hoarseness. Inhalation of high concentrations may also cause pulmonary oedema that may occur after several hours. Prolonged and repeated contact with vapours may cause inflammation in nose and throat, chronic bronchitis and dental corrosion. Skin contact: Skin contact may cause severe burns with redness, smarting pain and wounds. Eye contact: Splashes causes intensive pain and corneal burns. Risk of permanent eye damage. Vapours may be substantially irritating. Ingestion: Ingestion may cause severe burns with burning pain, vomiting and eventually shock and kidney damage. Risk of permanent damage due to scarring of the esophagus and stomach.

4.3. Indication of any immediate medical attention and special treatment needed

Note to doctors Product is a corrosive material. Use of gastric lavage or emesis is contra-indicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal oedema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure. Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable Extinguishing Media Carbon dioxide (CO2). Extinguishing powder. Water spray (fog). Alcohol resistant foam.

Small Fire Carbon dioxide (CO2). Extinguishing powder.
Large Fire Alcohol resistant foam. Water spray (fog).

Unsuitable extinguishing media High volume water jet.

5.2. Special hazards arising from the substance or mixture

In the event of fire and/or explosion do not breathe fumes. Most vapours are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks). The product causes burns of eyes, skin and mucous membranes. Vapours may form explosive mixture with air. Keep product and empty container away from heat and sources of ignition. Thermal decomposition can lead to release of irritating and toxic gases and vapours.

Hazardous combustion products Carbon monoxide (CO). Carbon dioxide (CO2).

5.3. Advice for firefighters

Special protective equipment and precautions for fire-fighters Keep away from sources of ignition. Prevent fire fighting water from entering surface water or groundwater. Cool containers with spray water from a safe distance. Never use welding or cutting torch on or near container (even empty) because product may ignite explosively.

Additional information
Cool containers with flooding quantities of water until well after fire is out. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Evacuate personnel to safe areas. Avoid contact with skin, eyes or clothing. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Remove all sources of ignition. Ensure adequate ventilation, especially in confined areas. Prevent further leakage or spillage if safe to do so.

6.2. Environmental precautions

Environmental precautions Do not allow into any sewer, on the ground or into any body of water. Should not be released into the environment. Local authorities should be advised if significant spillages cannot be contained. Dilute with plenty of water. See Section 12 for additional ecological information.

6.3. Methods and material for containment and cleaning up

Methods for containment .
Small spill Dilute with water and wipe up or absorb with inert material.
Large spill Dyke to collect large liquid spills. Pump up the product into a spare container suitably labelled.

Methods for cleaning up Flush area with flooding quantities of water.

6.4. Reference to other sections

Reference to other sections See Section 7,8,13 for more information.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling Ensure adequate ventilation, especially in confined areas. Keep away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity). Take precautionary measures against static discharges. Use spark-proof tools and explosion-proof equipment. Avoid contact with skin and eyes. In case of insufficient ventilation, wear suitable respiratory equipment. Use only with adequate ventilation and in closed systems. For details, see the separate exposure scenario(s).

General hygiene considerations When using do not eat, drink or smoke. Take off all contaminated clothing and wash it before re-use.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions Keep tightly closed in a dry and cool place. Keep in properly labelled containers. Keep away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity).

7.3. Specific end use(s)

Risk Management Methods (RMM) For details, see the separate exposure scenario(s).

Section 8 - EU - Great Britain

8.1. Control parameters

Exposure Limits

Keep personal exposure levels below Derived No Effect Level (DNEL) and national exposure limit values (if existing).

Chemical name	European Union	United Kingdom
Formic acid 64-18-6	TWA: 5 ppm TWA: 9 mg/m³	TWA: 5 ppm TWA: 9.6 mg/m³ STEL: 15 ppm STEL: 28.8 mg/m³

Derived No Effect Level (DNEL) - worker

Formic acid (64-18-6)			
Type	Exposure route	DNEL	Remarks
Chronic effects, local	Inhalation	9.5	mg/m³
Chronic effects, systemic	Inhalation	9.5	mg/m³

Derived No Effect Level (DNEL) - Consumer

Formic acid (64-18-6)			
Type	Exposure route	DNEL	Remarks
Chronic effects, local	Inhalation	3	mg/m³
Chronic effects, systemic	Inhalation	3	mg/m³

Predicted No Effect Concentration (PNEC)

Formic acid (64-18-6)		
Environmental compartment	Predicted No Effect Concentration (PNEC)	Remarks
Freshwater	2	mg/l
Freshwater sediment	13.4	mg/kg dry weight
Marine water	0.2	mg/l
Marine sediment	1.34	mg/kg dry weight
Impact on Sewage Treatment	7.2	mg/l
Soil	1.5	mg/kg dry weight

8.2. Exposure controls

Appropriate engineering controls Emergency shower and eye wash facilities must exist in the work place. Ensure adequate ventilation, especially in confined areas. Comply with 2014/34/EU concerning equipment and protective systems intended for use in potentially explosive atmospheres and, Directive 1999/92/EC regarding minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres.

Individual protection measures, such as personal protective equipment

Eye/face protection: Tight sealing safety goggles. Face protection shield.

Hand protection: Wear suitable gloves.

Gloves				
Duration of contact	material	Glove thickness	Break through time	Remarks
Suitable materials also with prolonged, direct contact (protective index 6, corresponding > 480 minutes of permeation time according to EN 374):	Chloroprene rubber, CR	=>0.55 mm	>480 min	
Suitable materials also with prolonged, direct contact (protective index 6, corresponding > 480 minutes of permeation time according to EN 374):	Butyl rubber	=>0.8 mm	> 480 min	

Skin and body protection: Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes).

Respiratory protection: Suitable respiratory protection for lower concentrations or short-term exposure:
Gas filter for gases/vapours of organic compounds (boiling point >65°C, e. g. Type A)
Suitable respiratory protection for higher concentrations or long-term exposure:
Self-contained breathing apparatus.

Environmental exposure controls As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state Liquid
Colour colourless
Odour Pungent
Odour threshold > 11 ppm

Property	**Values**	**Remarks • Method**
Melting point / freezing point	< -20 °C / -4 °F	
Boiling point / boiling range	107 °C / 225 °F	OECD Test No. 103: Boiling Point
Flammability (solid, gas)		Not applicable
Explosive limits		
Upper explosive limits	48 Vol-%	
Lower explosive limits	15 Vol-%	
Flash point	62 °C / 144 °F	ASTM (ASTM D 7094-04)
Autoignition temperature	> 500 °C / 932 °F	(ASTM E 659-78)
Decomposition temperature		Not applicable
pH	-1.5	@ 20 °C
Kinematic viscosity		No information available
Dynamic viscosity	1.6 mPa s	(@20°C; ISO 3219)
Explosive properties		The product is not explosive. However, formation of explosive air/vapour mixtures are possible.
Oxidising properties		Not oxidising.
Water solubility		@ 20 °C OECD Test No. 105: Water Solubility
Solubility(ies)		No information available
Partition coefficient	-0.6	log Pow (@20°C; OECD 107) Partition Coefficient (n-octanol/water)

Vapour pressure	5.7 kPa	@25°C; litt.)
Vapour density		No information available
Relative density		No information available
Density	1.19 g/cm3	(@20°C; ISO 2811-2)
Bulk density		Not applicable
Particle characteristics		No information available

9.2.1. Information with regards to physical hazard classes

Explosives	Not applicable
Flammable gases	Not applicable
Aerosols	Not applicable
Oxidising gases	Not applicable
Gases under pressure	Not applicable
Flammable solids	
Burning Rate	Not applicable
Self-reactive substances and mixtures	Not applicable
Pyrophoric liquids	Not applicable
Pyrophoric solids	Not applicable
Self-heating substances and mixtures	Not applicable
Oxidising liquids	Not applicable
Oxidising solids	Not applicable
Oxidising properties	
Organic peroxides	Not applicable
Desensitised explosives	Not applicable

9.2.2. Other safety characteristics
No information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity The substance may act as a source for a formyl group or a hydride ion. Due to its high acidity, its solutions in alcohols form esters spontaneously. Formic acid has as well reducing properties and can reduce solutions of gold, silver, and platinum to the metals. Formic acid has ability to participate in addition reactions with alkenes. The substance and alkenes readily react to form formate esters.

10.2. Chemical stability

Stability Stable under normal conditions.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions Vapours may form explosive mixture with air. Contact with metals may evolve flammable hydrogen gas. Reacts with. Strong bases. Oxidising substances. Mixtures with high formic acid content can decompose spontaneously and create overpressure and receptacle burst. Sunlight and heat will increase the risk of decomposition.

10.4. Conditions to avoid

Conditions to avoid Direct sunlight and heat.

10.5. Incompatible materials

Incompatible materials Formic acid may react with alkalies and oxidizing materials such as peroxides, nitric acid, and chromic acid. It is also incompatible with concentrated sulphuric acid, nitromethane, finely powdered metals, permanganates, strong bases och oxidizing agents.

10.6. Hazardous decomposition products

Hazardous decomposition products Carbon monoxide (CO).

SECTION 11: Toxicological information

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

Information on likely routes of exposure
Inhalation. Dermal.

Symptoms related to the physical, chemical and toxicological characteristics

Most important symptoms and effects, both acute and delayed Inhalation: Inhalation of vapours may cause smarting pain in nose and throat, cough and hoarseness. Inhalation of high concentrations may also cause pulmonary oedema that may occur after several hours. Prolonged and repeated contact with vapours may cause inflammation in nose and throat, chronic bronchitis and dental corrosion. Skin contact: Skin contact may cause severe burns with redness, smarting pain and wounds. Eye contact: Splashes causes intensive pain and corneal burns. Risk of permanent eye damage. Vapours may be substantially irritating. Ingestion: Ingestion may cause severe burns with burning pain, vomiting and eventually shock and kidney damage. Risk of permanent damage due to scarring of the esophagus and stomach.

Numerical measures of toxicity
Acute toxicity Toxic by inhalation. Harmful if swallowed.

Formic acid (64-18-6)				
Method	Species	Exposure route	Effective dose	Remarks
OECD Test No. 401: Acute Oral Toxicity	Rat	Oral	730	LD50 (lethal dose) mg/kg
OECD Test No. 402: Acute Dermal Toxicity	Mouse	Dermal	>2000	LD0 mg/kg
OECD Test No. 403: Acute Inhalation Toxicity	Rat	Inhalation	7.85	LC50 mg/l

Skin corrosion/irritation Causes burns.

Formic acid (64-18-6)			
Method	Species	Exposure route	Results:
Unknown	human data	Dermal	Corrosive

Serious eye damage/eye irritation Causes burns. Risk of serious damage to eyes.

Formic acid (64-18-6)			
Method	Species	Exposure route	Results:
Unknown	human data	Eye	strongly corrosive

Respiratory or skin sensitisation No sensitising effects known.

Formic acid (64-18-6)			
Method	Species	Exposure route	Results:
OECD Test No. 406: Skin Sensitisation	Guinea pig	Skin	Not a skin sensitiser

Germ cell mutagenicity Not mutagenic.

Formic acid (64-18-6)		
Method	Species	Results:
OECD Test No. 471: Bacterial Reverse Mutation Test	in vitro	Negative

OECD Test No. 473: In vitro Mammalian Chromosome Aberration Test	in vitro	Negative
OECD Test No. 476: In vitro Mammalian Cell Gene Mutation Test	in vitro	Negative
OECD Test No. 479: Genetic Toxicology: In vitro Sister Chromatid Exchange Assay in Mammalian Cells	in vitro	Negative
OECD Test No. 477: Genetic Toxicology: Sex-Linked Recessive Lethal Test in Drosophila melanogaster	in vivo	Negative

Carcinogenicity There is no indication for any carcinogenic potential since all in vitro and in vivo mutagenicity studies are negative.

Formic acid (64-18-6)				
Method	Species	Exposure route	Effective dose	Remarks
OECD Test No. 453: Combined Chronic Toxicity/Carcinogenicity Studies	Rat	Oral	2000	NOAEL mg/kg bw/d No carcinogenic effects have been observed. read-across from supporting substance (structural analogue)

Reproductive toxicity No impairment of fertility has been observed. No embryotoxic or teratogenic effects have been observed.

Formic acid (64-18-6)				
Method	Species	Exposure route	Effective dose	Remarks
OECD Test No. 414: Pre-natal Development Toxicity Study	rabbit	Oral	667	NOAEL mg/kg bw/d No embryotoxic or teratogenic effects have been observed. read-across from supporting substance (structural analogue)
OECD Test No. 416: Two-Generation Reproduction Toxicity	Rat	Oral	650	NOAEL mg/kg bw/d A two-generation reproduction toxicity study performed with a read-across substance did not indicate any potential for reproductive or developmental toxicity.

STOT - single exposure

Formic acid (64-18-6)				
Method	Species	Exposure route	Effective dose	Remarks
Unknown	human data	Inhalation		May give smarting pain in nose and throat, headache, tiredness, dizziness and coughing. High concentration can give difficulties in breathing.

STOT - repeated exposure

Formic acid (64-18-6)				
Method	Species	Exposure route	Effective dose	Remarks
OECD Test No. 453: Combined Chronic Toxicity/Carcinogenicity	Rat	Oral	2000	LOAEL mg/kg bw/d read-across from supporting substance

Studies				(structural analogue)
OECD Test No. 453: Combined Chronic Toxicity/Carcinogenicity Studies	Rat	Oral	400	NOAEL mg/kg bw/d read-across from supporting substance (structural analogue)
OECD Test No. 413: Sub-chronic Inhalation Toxicity: 90-day Study	Rat	Inhalation	0.244	LOAEL mg/l read-across from supporting substance (structural analogue)
OECD Test No. 413: Sub-chronic Inhalation Toxicity: 90-day Study	Rat	Inhalation	0.122	NOAEL mg/l read-across from supporting substance (structural analogue)
OECD Test No. 413: Sub-chronic Inhalation Toxicity: 90-day Study	Rat	Inhalation	0.244	NOAEL mg/l systemic toxicity read-across from supporting substance (structural analogue)

Aspiration hazard No information available.

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

Endocrine disrupting properties This product does not contain any known or suspected endocrine disruptors.

11.2.2. Other information

Other adverse effects No information available.

SECTION 12: Ecological information

12.1. Toxicity

Low toxicity to aquatic organisms.

Formic acid (64-18-6)					
Method	Species	Exposure route	Effective dose	Exposure time	Remarks
OECD Test No. 203: Fish, Acute Toxicity Test	Brachydanio rerio	Freshwater	130	96h	LC50 (lethal concentration) mg/l read-across from supporting substance (structural analogue)
OECD Test No. 202: Daphnia sp., Acute Immobilisation Test	Daphnia magna	Freshwater	365	48h	EC50 (effective concentration) mg/l read-across from supporting substance (structural analogue)
OECD Test No. 201: Freshwater Algae and Cyanobacteria, Growth Inhibition Test	Pseudokirchneriella subcapitata	Freshwater	1240	72h	EC50 (effective concentration) mg/l read-across from supporting substance (structural analogue)
OECD Test No. 203: Fish, Acute Toxicity Test	Brachydanio rerio	Freshwater	90	96h	NOEC mg/l read-across from supporting substance

					(structural analogue)
OECD Test No. 202: Daphnia sp., Acute Immobilisation Test	Daphnia magna	Freshwater	180	48h	NOEC mg/l read-across from supporting substance (structural analogue)
OECD Test No. 211: Daphnia magna Reproduction Test	Daphnia magna	Freshwater	>=100	21d	NOEC mg/l
OECD Test No. 201: Freshwater Algae and Cyanobacteria, Growth Inhibition Test	Pseudokirchneriella subcapitata	Freshwater	<76.8	72h	NOEC mg/l read-across from supporting substance (structural analogue)
Regulation (EC) No. 440/2008, Annex, C.3	Bacteria toxicity	Freshwater	72	13d	NOEC mg/l

12.2. Persistence and degradability

Readily biodegradable.

Formic acid (64-18-6)			
Method	Value	Exposure time	Results:
OECD Test No. 301C: Ready Biodegradability: Modified MITI Test (I) (TG 301 C)	100%	28d	Readily biodegradable
EU Method C.4-B	99%	11d	Readily biodegradable
EU Method C.4-B	98%	14d	Readily biodegradable

12.3. Bioaccumulative potential

Not bioaccumulable.

Chemical name	Partition coefficient	Bioconcentration factor (BCF)
Formic acid	-2.1	

12.4. Mobility in soil

The product does not adsorb to suspended solids and sediment based upon the log Koc which indicates a high mobility in soil.

12.5. Results of PBT and vPvB assessment

This substance does not meet the criteria for classification as PBT or vPvB.

12.6. Endocrine disrupting properties

This product does not contain any known or suspected endocrine disruptors.

12.7. Other adverse effects

Emissions to water lowers the pH. This may cause local damage to fish and aquatic organisms in the discharge area.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste from residues/unused The product is classified as hazardous waste and must be disposed of as such.

products	Incinerate at a licensed installation.
Contaminated packaging	Thoroughly emptied and clean packaging may be recycled.
Waste codes / waste designations according to EWC / AVV	Waste codes should be assigned by the user based on the application for which the product was used.

SECTION 14: Transport information

ADR Road transport

14.1 UN number or ID number	UN1779
14.2 UN proper shipping name	Formic acid
Proper Shipping Description	UN1779 Formic acid , 8 (3), II, (D/E)
14.3 Transport hazard class(es)	8
Subsidiary class	3
14.4 Packing Group	II
14.5 Environmental hazard	Not applicable
14.6 Special precautions for user	None
Tunnel restriction code	(D/E)
Limited quantity (LQ)	1 L
ADR Hazard Id (Kemmler Number)	83

RID Rail transport

14.1 UN number	UN1779
14.2 UN proper shipping name	Formic acid
Proper Shipping Description	UN1779 Formic acid , 8 (3), II
14.3 Transport hazard class(es)	8
Subsidiary hazard class	-
14.4 Packing Group	II
14.5 Environmental hazard	Not applicable
14.6 Special precautions for user	None

IMDG Sea transport

14.1 UN number or ID number	UN1779
14.2 UN proper shipping name	Formic acid
Proper Shipping Description	UN1779 Formic acid , 8 (3), II
14.3 Transport hazard class(es)	8
Subsidiary hazard class	3
14.4 Packing Group	II
14.5 Marine pollutant	Not applicable
14.6 Special precautions for user	None
EmS-No	F-E, S-C
Limited quantity (LQ)	1 L
14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code	Y, S/P,3,2,G

IATA Air transport

14.1 UN number or ID number	UN1779
14.2 UN proper shipping name	Formic acid
14.3 Transport hazard class(es)	8
Subsidiary hazard class	3
14.4 Packing group	II
Proper Shipping Description	UN1779 Formic acid , 8 (3), II
14.5 Environmental hazard	Not applicable
14.6 Special precautions for user	None
Limited quantity (LQ)	0.5 L
ERG Code	8L

SECTION 15: Regulatory information

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

International Regulations
Not applicable.

European Union

Take note of Directive 94/33/EC on the protection of young people at work
Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

National regulations

Germany
Water hazard class (WGK) slightly hazardous to water (WGK 1)

TA Luft (German Air Pollution Control Regulation)

Chemical name	Type	Class
Formic acid - 64-18-6	5.2.5	I

15.2. Chemical safety assessment
A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Key or legend to abbreviations and acronyms used in the safety data sheet

Full text of H-Statements referred to under section 3
H226 - Flammable liquid and vapour
H314 - Causes severe skin burns and eye damage
H331 - Toxic if inhaled
H302 - Harmful if swallowed
EUH071 - Corrosive to the respiratory tract

Legend
REACH: Registration, Evaluation, Authorization, and Restriction of Chemicals (REACh) Regulation (EC 1907/2006)
CLP: The Classification, Labelling and Packaging of Substances and Mixtures (CLP) Regulation (EC 1272/2008)
SVHC: Substances of Very High Concern for Authorisation:
PBT: Persistent, Bioaccumulative, and Toxic (PBT) Chemicals
vPvB: Very Persistent and very Bioaccumulative (vPvB) Chemicals
ED: Endocrine disrupting potential

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Reason for revision Reason for revision: COMMISSION REGULATION (EU) 2020/878 of 18 June 2020

This safety data sheet complies with the requirements of: Regulation (EC) No. 1907/2006, COMMISSION REGULATION (EU) 2020/878 of 18 June 2020.

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

EGHS - BE

Exposure scenario

ES 1 - Manufacture of substances
ES 2 - Formulation and (re)packing of substances and mixtures, Industrial
ES 3 - Use in laboratories, Industrial
ES 4 - Use in laboratories, Professional
ES 5 - Use as an intermediate, Industrial
ES 6 - Use as a processing aid, Industrial
ES 7 - Use as a processing aid, Professional
ES 8 - Use in cleaning agents, Industrial
ES 9 - Use in cleaning agents, Professional
ES 10 - Use in cleaning agents, Consumer
ES 11 - Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers, Industrial
ES 12 - Use in oil field drilling and production operations, Industrial

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	ES 1 - Formic Acid 85%
Chemical Name	Formic acid
CAS No	64-18-6
EC No	200-579-1
REACH registration number	01-2119491174-37-0001

Exposure scenario

Section 1 - Title

Title	ES 1 - Manufacture of substances
Version	2
Product Name	Formic Acid 85%
Revision Date	16-Nov-2021
Sector(s) of use	SU8 - Manufacture of bulk, large scale chemicals (including petroleum products) SU9 - Manufacture of fine chemicals

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) ERC1 - Manufacture of substances

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Section 2.2 - Control of worker exposure

Control of worker exposure	
Title	Contributing Scenario [CS]
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100 %
Physical form of product	Liquid
Exposure duration	>4h

Use frequency	Covers frequency up to 5 days per week
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Outdoor (30%)

Title	Contributing Scenario [CS]
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100 %
Physical form of product	Liquid
Exposure duration	>4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Provide enhanced general ventilation by mechanical means
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use

Title	Contributing Scenario [CS]
Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100 %
Physical form of product	Liquid
Exposure duration	>4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use

Title	Contributing Scenario [CS]
Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	>4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental exposure

Environmental release category(ies) ERC1 - Manufacture of substances

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Control of worker exposure

Calculation method EasyTRA

Title	Exposure route	Calculation method	predicted exposure level	Risk characterisation ratio (RCR)
Contributing Scenario [CS] PROC 1	Worker - inhalative, long-term - local	EasyTRA	0.013424 mg/m³	0.001413
Contributing Scenario [CS] PROC 2	Worker - inhalative, long-term - local	EasyTRA	2.877 mg/m³	0.302799
Contributing Scenario [CS] PROC 3	Worker - inhalative, long-term - local	EasyTRA	1.918 mg/m³	0.201866
Contributing Scenario [CS] PROC 4	Worker - inhalative, long-term - local	EasyTRA	3.835 mg/m³	0.403732

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	ES 2 - Formic Acid 85%
Chemical Name	Formic acid
CAS No	64-18-6
EC No	200-579-1
REACH registration number	01-2119491174-37-0001

Exposure scenario

Section 1 - Title

Title	ES 2 - Formulation and (re)packing of substances and mixtures, Industrial
Version	2
Product Name	Formic Acid 85%
Revision Date	16-Nov-2021

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) ERC2 - Formulation of preparations (mixtures)

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Section 2.2 - Control of worker exposure

Control of worker exposure	
Title	Contributing Scenario [CS]
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100 %
Physical form of product	Liquid
Exposure duration	>4h
Use frequency	Covers frequency up to 5 days per week
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Outdoor (30%)

Title	Contributing Scenario [CS]
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100 %
Physical form of product	Liquid
Exposure duration	>4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)

to control dispersion from source towards the worker	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use

Title	Contributing Scenario [CS]
Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100 %
Physical form of product	Liquid
Exposure duration	>4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use

Title	Contributing Scenario [CS]
Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	>4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use

Title	Contributing Scenario [CS]
Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	>4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use

Title	Contributing Scenario [CS]
Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	> 4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use

Title	Contributing Scenario [CS]
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	>4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use

Title	Contributing Scenario [CS]
Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	>4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental exposure

Environmental release category(ies) ERC2 - Formulation of preparations (mixtures)

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Control of worker exposure

Calculation method EasyTRA

Title	Exposure route	Calculation method	predicted exposure level	Risk characterisation ratio (RCR)
Contributing Scenario [CS] PROC 1	Worker - inhalative, long-term - local	EasyTRA	0.013424 mg/m³	0.001413
Contributing Scenario [CS] PROC 2	Worker - inhalative, long-term - local	EasyTRA	2.877 mg/m³	0.302799
Contributing Scenario [CS] PROC 3	Worker - inhalative, long-term - local	EasyTRA	1.918 mg/m³	0.201866
Contributing Scenario [CS] PROC 4	Worker - inhalative, long-term - local	EasyTRA	3.835 mg/m³	0.403732
Contributing Scenario [CS] PROC 5	Worker - inhalative, long-term - local	EasyTRA	6.712 mg/m³	0.70653
Contributing Scenario [CS] PROC 8a	Worker - inhalative, long-term - local	EasyTRA	6.712 mg/m³	0.70653
Contributing Scenario [CS] PROC 8b	Worker - inhalative, long-term - local	EasyTRA	2.397 mg/m³	0.252332
Contributing Scenario [CS] PROC 9	Worker - inhalative, long-term - local	EasyTRA	6.712 mg/m³	0.70653

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	ES 3 - Formic Acid 85%
Chemical Name	Formic acid
CAS No	64-18-6
EC No	200-579-1
REACH registration number	01-2119491174-37-0001

Exposure scenario

Section 1 - Title

Title	ES 3 - Use in laboratories, Industrial
Version	2
Product Name	Formic Acid 85%
Revision Date	16-Nov-2021

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Section 2.2 - Control of worker exposure

Control of worker exposure	
Title	Contributing Scenario [CS]
Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	>4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental exposure

Environmental release category(ies) ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Control of worker exposure

Calculation method EasyTRA

Title	Exposure route	Calculation method	predicted exposure level	Risk characterisation ratio (RCR)
Contributing Scenario [CS] PROC 15	Worker - inhalative, long-term - local	EasyTRA	1.918 mg/m³	0.201866

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	ES 4 - Formic Acid 85%
Chemical Name	Formic acid
CAS No	64-18-6
EC No	200-579-1
REACH registration number	01-2119491174-37-0001

Exposure scenario

Section 1 - Title

Title	ES4 - Use in laboratories, Professional
Version	2
Product Name	Formic Acid 85%
Revision Date	16-Nov-2021

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) ERC8a - Wide dispersive indoor use of processing aids in open systems

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Section 2.2 - Control of worker exposure

Control of worker exposure	
Title	Contributing Scenario [CS]
Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	>4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental exposure

Environmental release category(ies) ERC8a - Wide dispersive indoor use of processing aids in open systems

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Control of worker exposure

Calculation method EasyTRA

Title	Exposure route	Calculation method	predicted exposure level	Risk characterisation ratio (RCR)
Contributing Scenario [CS] PROC 15	Worker - inhalative, long-term - local	EasyTRA	3.835 mg/m³	0.403732

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	ES 5 - Formic Acid 85%
Chemical Name	Formic acid
CAS No	64-18-6
EC No	200-579-1
REACH registration number	01-2119491174-37-0001

Exposure scenario

Section 1 - Title

Title	ES5 - Use as an intermediate, Industrial
Version	2
Product Name	Formic Acid 85%
Revision Date	16-Nov-2021

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Section 2.2 - Control of worker exposure

Control of worker exposure	
Title	Contributing Scenario [CS]
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100 %
Physical form of product	Liquid
Exposure duration	>4h
Use frequency	Covers frequency up to 5 days per week
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Outdoor (30%)

Title	Contributing Scenario [CS]
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100 %
Physical form of product	Liquid
Exposure duration	> 4h
Use frequency	Covers frequency up to 5 days per week

Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Provide enhanced general ventilation by mechanical means
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use

Title	Contributing Scenario [CS]
Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100 %
Physical form of product	Liquid
Exposure duration	> 4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use

Title	Contributing Scenario [CS]
Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	> 4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental exposure

Environmental release category(ies) ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Control of worker exposure

Calculation method EasyTRA

Title	Exposure route	Calculation method	predicted exposure level	Risk characterisation ratio (RCR)
Contributing Scenario [CS] PROC 1	Worker - inhalative, long-term - local	EasyTRA	0.013424 mg/m³	0.001413
Contributing Scenario [CS] PROC 2	Worker - inhalative, long-term - local	EasyTRA	2.877 mg/m³	0.302799
Contributing Scenario [CS] PROC 3	Worker - inhalative, long-term - local	EasyTRA	1.918 mg/m³	0.201866
Contributing Scenario [CS] PROC 4	Worker - inhalative, long-term - local	EasyTRA	3.835 mg/m³	0.403732

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	ES 6 - Formic Acid 85%
Chemical Name	Formic acid
CAS No	64-18-6
EC No	200-579-1
REACH registration number	01-2119491174-37-0001

Exposure scenario

Section 1 - Title

Title	ES6 - Use as a processing aid, Industrial
Version	2
Product Name	Formic Acid 85%
Revision Date	16-Nov-2021

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies)

ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
ERC5 - Industrial use resulting in inclusion into or onto a matrix
ERC6b - Industrial use of reactive processing aids

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Section 2.2 - Control of worker exposure

Control of worker exposure	
Title	Contributing Scenario [CS]
Process category(ies)	PROC6 - Calendaring operations PROC10 - Roller application or brushing PROC13 - Treatment of articles by dipping and pouring PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	> 4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Respiratory protection not applicable Use suitable eye protection Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	No specific measures identified
Indoor/Outdoor use	Indoor use

Title	Contributing Scenario [CS]
Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	> 4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Respiratory protection not applicable Use suitable eye protection Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	No specific measures identified
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental exposure

Environmental release category(ies)

ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
ERC5 - Industrial use resulting in inclusion into or onto a matrix
ERC6b - Industrial use of reactive processing aids

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Control of worker exposure

Calculation method EasyTRA

Title	Exposure route	Calculation method	predicted exposure level	Risk characterisation ratio (RCR)
Contributing Scenario [CS] PROC 6, 10, 13, 14	Worker - inhalative, long-term - local	EasyTRA	3.356 mg/m³	0.353265
Contributing Scenario [CS] PROC 7	Worker - inhalative, long-term - local	EasyTRA	7.191 mg/m³	0.756997

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	ES 7 - Formic Acid 85%
Chemical Name	Formic acid
CAS No	64-18-6
EC No	200-579-1
REACH registration number	01-2119491174-37-0001

Exposure scenario

Section 1 - Title

Title	ES7 - Use as a processing aid, Professional
Version	2
Product Name	Formic Acid 85%
Revision Date	16-Nov-2021

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies)

ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix
ERC8d - Wide dispersive outdoor use of processing aids in open systems
ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Section 2.2 - Control of worker exposure

Control of worker exposure	
Title	Contributing Scenario [CS]
Process category(ies)	PROC10 - Roller application or brushing PROC13 - Treatment of articles by dipping and pouring PROC19 - Hand-mixing with intimate contact and only PPE available
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	> 4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	In case of insufficient ventilation, wear suitable respiratory equipment Use suitable eye protection Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	No specific measures identified

Indoor/Outdoor use	Indoor use

Title	Contributing Scenario [CS]
Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	> 4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Respiratory protection not applicable Use suitable eye protection Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	No specific measures identified
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental exposure

Environmental release category(ies)

ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix
ERC8d - Wide dispersive outdoor use of processing aids in open systems
ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Control of worker exposure

Calculation method EasyTRA

Title	Exposure route	Calculation method	predicted exposure level	Risk characterisation ratio (RCR)
Contributing Scenario [CS] PROC 10, 11, 13, 19	Worker - inhalative, long-term - local	EasyTRA	6.712 mg/m³	0.70653

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	ES 8 - Formic Acid 85%
Chemical Name	Formic acid
CAS No	64-18-6
EC No	200-579-1
REACH registration number	01-2119491174-37-0001

Exposure scenario

Section 1 - Title

Title	ES8 - Use in cleaning agents, Industrial
Version	2
Product Name	Formic Acid 85%
Revision Date	16-Nov-2021

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Section 2.2 - Control of worker exposure

Control of worker exposure	
Title	Contributing Scenario [CS]
Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	> 4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	In case of insufficient ventilation, wear suitable respiratory equipment Use suitable eye protection Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	No specific measures identified
Indoor/Outdoor use	Indoor use

Title	Contributing Scenario [CS]
Process category(ies)	PROC10 - Roller application or brushing PROC13 - Treatment of articles by dipping and pouring

Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	> 4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Respiratory protection not applicable Use suitable eye protection Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	No specific measures identified
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental exposure

Environmental release category(ies) ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Control of worker exposure

Calculation method EasyTRA

Title	Exposure route	Calculation method	predicted exposure level	Risk characterisation ratio (RCR)
Contributing Scenario [CS] PROC 7	Worker - inhalative, long-term - local	EasyTRA	7.191 mg/m³	0.756997
Contributing Scenario [CS] PROC 10, 13	Worker - inhalative, long-term - local	EasyTRA	3.356 mg/m³	0.353265

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	ES 9 - Formic Acid 85%
Chemical Name	Formic acid
CAS No	64-18-6
EC No	200-579-1
REACH registration number	01-2119491174-37-0001

Exposure scenario

Section 1 - Title

Title	ES9 - Use in cleaning agents, Professional
Version	2
Product Name	Formic Acid 85%
Revision Date	16-Nov-2021

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) ERC8a - Wide dispersive indoor use of processing aids in open systems

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Section 2.2 - Control of worker exposure

Control of worker exposure	
Title	Contributing Scenario [CS]
Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC10 - Roller application or brushing PROC13 - Treatment of articles by dipping and pouring PROC19 - Hand-mixing with intimate contact and only PPE available
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	> 4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	In case of insufficient ventilation, wear suitable respiratory equipment Use suitable eye protection Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	No specific measures identified
Indoor/Outdoor use	Indoor use

Title	Contributing Scenario [CS]
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	> 4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Respiratory protection not applicable Use suitable eye protection Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	No specific measures identified
Indoor/Outdoor use	Indoor use

Title	Contributing Scenario [CS]
Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	5%
Physical form of product	Liquid
Exposure duration	> 4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	In case of insufficient ventilation, wear suitable respiratory equipment Use suitable eye protection Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	No specific measures identified
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental exposure

Environmental release category(ies) ERC8a - Wide dispersive indoor use of processing aids in open systems

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Control of worker exposure

Calculation method EasyTRA

Title	Exposure route	Calculation method	predicted exposure level	Risk characterisation ratio (RCR)
Contributing Scenario [CS] PROC 8a, 10, 11, 13, 19	Worker - inhalative, long-term - local	EasyTRA	6.712 mg/m³	0.70653
Contributing Scenario [CS] PROC 8b	Worker - inhalative, long-term - local	EasyTRA	3.356 mg/m³	0.353265

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	ES 10 - Formic Acid 85%
Chemical Name	Formic acid
CAS No	64-18-6
EC No	200-579-1
REACH registration number	01-2119491174-37-0001

Exposure scenario

Section 1 - Title

Title	ES10 - Use in cleaning agents, Consumer
Version	2
Product Name	Formic Acid 85%
Revision Date	16-Nov-2021
Product category(ies)	PC35 - Washing and cleaning products (including solvent based products)

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) ERC8d - Wide dispersive outdoor use of processing aids in open systems

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Section 2.2 - Control of consumer exposure

Control of consumer exposure	
Title	Contributing Scenario [CS] 1
Product (sub) category(ies)	PC35 - Washing and cleaning products (including solvent based products)
Covers concentrations up to	5%
Physical form of product	Sprays
Exposure duration	Avoid carrying out operation for more than 1 hour
Use frequency	365 days per year
Risk management measures	None
Use in room with a volume of minimum	15 m3
Minimum room ventilation rate for handling/application (air changes per hour)	2.5 l/h

Title	Contributing Scenario [CS] 2
Product (sub) category(ies)	PC35 - Washing and cleaning products (including solvent based products)
Covers concentrations up to	5%
Physical form of product	Spray application with complete evaporation of volatiles
Exposure duration	Avoid carrying out operation for more than 1 hour
Use frequency	365 days per year

Risk management measures	None
Use in room with a volume of minimum	15 m3
Minimum room ventilation rate for handling/application (air changes per hour)	2.5 l/h

Title	Contributing Scenario [CS] 3
Product (sub) category(ies)	PC35 - Washing and cleaning products (including solvent based products)
Covers concentrations up to	5%
Physical form of product	Sprays
Exposure duration	Avoid carrying out operation for more than 25 min
Use frequency	Covers exposure up to 52 days per year
Risk management measures	None
Use in room with a volume of minimum	10 m3
Minimum room ventilation rate for handling/application (air changes per hour)	2 l/h

Title	Contributing Scenario [CS] 4
Product (sub) category(ies)	PC35 - Washing and cleaning products (including solvent based products)
Covers concentrations up to	5%
Physical form of product	Spray application with complete evaporation of volatiles
Exposure duration	Avoid carrying out operation for more than 20 min
Use frequency	Covers exposure up to 52 days per year
Risk management measures	None
Use in room with a volume of minimum	10 m3
Minimum room ventilation rate for handling/application (air changes per hour)	2 l/h

Section 3 - Exposure estimation

Environmental exposure

Environmental release category(ies) ERC8d - Wide dispersive outdoor use of processing aids in open systems

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Control of consumer exposure

Calculation method The Consexpo model has been used to estimate consumer exposures unless otherwise indicated

Title	Exposure route	Calculation method	predicted exposure level	Risk characterisation ratio (RCR)
Contributing Scenario [CS] 1, PC 35	Consumer - inhalative, long-term - systemic	EasyTRA	0.005157 mg/m^3	0.001719
Contributing Scenario [CS] 2, PC 35	Consumer - inhalative, long-term - systemic	EasyTRA	0.826085 mg/m^3	0.275362
Contributing Scenario [CS] 3, PC 35	Consumer - inhalative, long-term - systemic	EasyTRA	0.066819 mg/m^3	0.022273
Contributing Scenario [CS] 4,	Consumer - inhalative,	EasyTRA	1.766 mg/m^3	0.588562

PC 35	long-term - systemic			

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	ES 11 - Formic Acid 85%
Chemical Name	Formic acid
CAS No	64-18-6
EC No	200-579-1
REACH registration number	01-2119491174-37-0001

Exposure scenario

Section 1 - Title

Title	ES11 - Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers, Industrial
Version	2
Product Name	Formic Acid 85%
Revision Date	16-Nov-2021

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) ERC6c - Industrial use of monomers for manufacture of thermoplastics

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Section 2.2 - Control of worker exposure

Control of worker exposure	
Title	Contributing Scenario [CS]
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
Covers concentrations up to	2%
Physical form of product	Liquid
Exposure duration	> 4h
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	None
Conditions and measures related to personal protection, hygiene and health evaluation	Respiratory protection not applicable Use suitable eye protection Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training For further specification, refer to section 8 of the SDS
Organisational measures to prevent	No specific measures identified

/limit releases, dispersion and exposure	
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental exposure

Environmental release category(ies) ERC6c - Industrial use of monomers for manufacture of thermoplastics

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Control of worker exposure

Calculation method EasyTRA

Title	Exposure route	Calculation method	predicted exposure level	Risk characterisation ratio (RCR)
Contributing Scenario [CS] PROC 1	Worker - inhalative, long-term - local	EasyTRA	0.000384 mg/m³	0.00004
Contributing Scenario [CS] PROC 2	Worker - inhalative, long-term - local	EasyTRA	0.191772 mg/m³	0.020187
Contributing Scenario [CS] PROC 3	Worker - inhalative, long-term - local	EasyTRA	0.383545 mg/m³	0.040373
Contributing Scenario [CS] PROC 4	Worker - inhalative, long-term - local	EasyTRA	0.76709 mg/m³	0.080746
Contributing Scenario [CS] PROC 5, 14	Worker - inhalative, long-term - local	EasyTRA	1.918 mg/m³	0.201866

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	ES 12 - Formic Acid 85%
Chemical Name	Formic acid
CAS No	64-18-6
EC No	200-579-1
REACH registration number	01-2119491174-37-0001

Exposure scenario

Section 1 - Title

Title	ES12 - Use in oil field drilling and production operations, Industrial
Version	2
Product Name	Formic Acid 85%
Revision Date	16-Nov-2021

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Section 2.2 - Control of worker exposure

Control of worker exposure	
Title	Contributing Scenario [CS]
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	20 %
Physical form of product	Liquid
Exposure duration	>4h
Use frequency	Covers frequency up to 5 days per week
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Outdoor (30%)

Title	Contributing Scenario [CS]
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	20 %
Physical form of product	Liquid
Exposure duration	>4h

Use frequency	Covers frequency up to 5 days per week
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use

Title	Contributing Scenario [CS]
Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	20 %
Physical form of product	Liquid
Exposure duration	> 4 hours/day
Use frequency	Covers frequency up to 5 days per week
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Use suitable eye protection Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin For further specification, refer to section 8 of the SDS
Organisational measures to prevent /limit releases, dispersion and exposure	Provide specific activity training to operators to minimize exposures Regular inspection and maintenance of equipment and machines Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental exposure

Environmental release category(ies) ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Remarks
As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Control of worker exposure

Calculation method EasyTRA

Title	Exposure route	Calculation method	predicted exposure level	Risk characterisation ratio (RCR)
Contributing Scenario [CS] PROC 1	Worker - inhalative, long-term - local	EasyTRA	0.02685 mg/m³	0.000283
Contributing Scenario [CS] PROC 2	Worker - inhalative, long-term - local	EasyTRA	1.918 mg/m³	0.201866
Contributing Scenario [CS] PROC 3	Worker - inhalative, long-term - local	EasyTRA	3.835 mg/m³	0.403732
Contributing Scenario [CS] PROC 4	Worker - inhalative, long-term - local	EasyTRA	5.37 mg/m³	0.565224

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.