1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product information

Trade name	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)
Company	Evonik Industries AG Advanced Intermediates Chemicals Management (660-112) Postfach 1345 D-63403 Hanau, Germany
Telephone	+49 (0)6181 59-3964
Telefax	+49 (0)6181 59-2083
Email address	sds-info@evonik.com
Emergency telephone number	+49 (0)2365 49-2232
Emergency telephone number(Telefax)	+49 (0)2365 49-4423
	Plant fire brigade, Infracor GmbH
Use of the Substance / Preparation	Polymer production. Solvent Excipient For detailed exposure scenarios see Annexes.
REACH-No.	01-2119484658-20-0032

2. HAZARDS IDENTIFICATION

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

EU-CLP as per Regulation (EU) No. 1272/2008, Annex VI

Flammable liquids	Category 2	H225
Acute toxicity (oral)	Category 4	H302
Skin irritation	Category 2	H315
Eye irritation	Category 2	H319
Carcinogenicity	Category 1B	H350
Specific Target Organ Toxicity - Single exposure (inhalation, respiratory tract)	Category 3	H335

From Annex VI, Directive (EC) No. 1272/2008 supplemental classification with:

Acute toxicity	Category 3	H331

Classification as per Directive 67/548/EC or Directive 1999/45/EC

F, Highly flammable
R11: Highly flammable.

Carc.Cat.2, Carcinogenic Category 2
R45: May cause cancer.

Xn, Harmful
R20/22: Harmful by inhalation and if swallowed.

Xi, Irritant
R36/37/38: Irritating to eyes, respiratory system and skin.

From Appendix 1, EEC Directive 67/548/EEC deviating and / or additional classification with:

T, Toxic
R23: Toxic by inhalation.

GHS-Labelling

Statutory basis: EU-CLP as per Regulation (EU) No. 1272/2008

hazard-defining component(s) (GHS)

- 1,2-dichloroethane

Symbol(s)

Signal word: Danger

Hazard statement:
H225 - Highly flammable liquid and vapour.
H302 - Harmful if swallowed.
H315 - Causes skin irritation.
H319 - Causes serious eye irritation.
H331 - Toxic if inhaled.
H335 - May cause respiratory irritation.
H350 - May cause cancer.

Precautionary statement: Prevention:
P201 - Obtain special instructions before use.
P264 - Wash hands thoroughly with soap and water after handling.
P281 - Use personal protective equipment as required.

Precautionary statement: Reaction:
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 - IF exposed or concerned: Get medical advice/attention.

Precautionary statement: Storage:
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed.

Supplemental hazard / labelling elements (EU):

Restricted to professional users.

Other Hazards

Not a PBT, vPvB substance as per the criteria of the REACH Ordinance.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Information on ingredients / Hazardous components as per EU-CLP Regulation (EC) No. 1272/2008

• 1,2-dichloroethane

CAS-No. 107-06-2 EC-No. 203-458-1 REACH-No. 01-2119484658-20-0032

Flammable liquids	Category 2	H225
Acute toxicity (oral)	Category 4	H302
Skin irritation	Category 2	H315
Eye irritation	Category 2	H319
Carcinogenicity	Category 1B	H350
Specific Target Organ Toxicity - Single exposure (inhalation, respiratory tract)	Category 3	H335

Remarks: From Annex VI, Directive (EC) No. 1272/2008 supplemental classification with:

Acute toxicity	Category 3	H331

Remarks: Not a PBT, vPvB substance as per the criteria of the REACH Ordinance.

The substance is listed in the candidate list according to Article 59 (1) of the REACH Regulation.
The substance is listed in Annex XVII of the REACH Regulation

Information on ingredients / Hazardous components as per Directive 67/548/EC or Directive 1999/45/EC

- **1,2-dichloroethane**

CAS-No. 107-06-2 EC-No. 203-458-1 REACH-No. 01-2119484658-20-0032

F; R11
Carc.Cat.2; R45
Xn; R20/22
Xi; R36/37/38

From Appendix 1, EEC Directive 67/548/EEC deviating and / or additional classification with:
T; R23

The substance is listed in Annex XVII of the REACH Regulation The substance is listed in the candidate list according to Article 59 (1) of the REACH Regulation.

Texts of H phrases, see in Chapter 16
See chapter 16 for text of risk phrases

4. FIRST AID MEASURES

Description of first aid measures

Pay attention to self-protection.
Remove victims from hazardous area. Immediately remove soiled or soaked clothing and remove it to a safe distance. Keep victim warm, in a stabilized position and covered.
Do not leave victims unattended.
If the casualty is unconscious: Place the victim in the recovery position.

Inhalation

Inhalation is possible if aerosols, mists, dusts, or smoke form.
Move victims into fresh air.
With labored breathing: Provide with oxygen. Consult a doctor.
If the casualty is not breathing: Perform mouth-to-mouth resuscitation, notify emergency physician immediately.

Skin contact

Wash off affected area immediately with plenty of water for at least 15 minutes.
With liposoluble substances, products, or preparations, continue decontamination with polyethylene glycol 400 after initial rinsing with water and then wash with water and soap.
If symptoms persist, consult a physician for treatment.

Eye contact

With eye held open, thoroughly rinse immediately with plenty of water for at least 10 minutes.
Consult an ophthalmologist immediately if the symptoms persist.
When dealing with caustic substances, notify emergency physician immediately (key words: burns in eye).

Ingestion

Rinse out mouth.
Immediately give large quantities of water to drink.
Consult a physician immediately.
When dealing with caustic substances, notify emergency physician immediately.

Most important symptoms and effects, both acute and delayed

Indication of any immediate medical attention and special treatment needed

In case of substances with high water solubility, inhalation of vapors, aerosols, mists, and smoke from caustic substances, products, and preparations, as well as caustic gases, results in irritations up to formation of necrosis in the upper respiratory tract.
The initial focus is on the local action: signs of irritation of the respiratory tract such as coughing, burning behind the sternum, tears, burning in the eyes or nose.
There is a fundamental risk of acute toxic pulmonary edema!
In case of substances with low water solubility, only slight local irritations may appear at first, but after several hours of latency without symptoms, may develop into increasingly labored breathing and cyanosis as a result of a delayed pulmonary edema.
There is a danger of underestimating the severity of the intoxication!

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Water spray, foam, CO2, dry powder.

Unsuitable extinguishing media

high volume water jet

Special hazards arising from the substance or mixture

Hazardous fumes in fires, specific to the product:
hydrogen chloride
Under certain fire conditions, traces of other toxic products may occur.
Closed container may rupture if strongly heated.
In case of fire cool endangered containers with water.

Special protective equipment for fire-fighters

In case of fire: full protective suit and wear a self contained respiratory apparatus

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Keep away from sources of ignition - No smoking.
Do not allow to enter drains (danger of explosion).
Wear personal protective equipment; see section 8.
Keep unauthorized persons away.
Immediately evacuate personnel to safe areas.
Ensure adequate ventilation.

Environmental precautions

Prevent product from entering drains.
Do not allow entrance in sewage water, soil or stretches of water.

Methods and material for containment and cleaning up

Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Suitable absorbents:
universal absorbent
Fill into marked, sealable containers.

7. HANDLING AND STORAGE

Handling

Precautions for safe handling

If possible, use material transfer/filling, metering and blending plants that are closed, or provide for local suction devices.
Wear personal protective equipment; see section 8.

Advice on protection against fire and explosion

Take precautionary measures against static charges, keep away from sources of ignition.
Explosion protection equipment required.

Storage

Conditions for safe storage, including any incompatibilities

Comply with storage regulations and regulations prohibiting storage of hazardous substances in non-stationary containers in the same room (TRGS 510).

Suitable materials	stainless steel, iron
Unsuitable materials	light metals and their alloys

Specific use(s)

For more details see annexes Exposure scenario.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

CAS-No.	107-06-2	EC-No.	203-458-1
Control parameters	5 ppm 21 mg/m3		Time Weighted Average (TWA):(EH40 WEL)
Control parameters			Skin designation:(EH40 WEL)
Remarks	Can be absorbed through the skin.		

• 1,2-dichloroethane

CAS-No.	107-06-2	EC-No.	203-458-1
Control parameters	5 ppm 21 mg/m3		Time Weighted Average (TWA):(EH40 WEL)
Control parameters			Skin designation:(EH40 WEL)
	Can be absorbed through the skin.		

DNEL/DMEL values

End Use	Worker
Routes of exposure	dermal
Possible health damage	Long-term - systemic effects
Value	62.4 mg/kg bodyweight/day
End Use	Worker
Routes of exposure	Inhalation
Possible health damage	Long-term - systemic effects
Value	6.6 mg/m3

PNEC values

	Freshwater
Value	1.1 mg/l
	marine water
Value	0.11 mg/l
	water - intermittent releases
Value	1.36 mg/l

	sewage treatment plant
Value	27.8 mg/l
	Fresh water sediment
Value	11.1 mg/kg
	Marine sediment
Value	1.11 mg/kg
	soil
Value	1.8 mg/kg
	oral (secondary poisoning)
Value	8.33 mg/kg

Engineering measures

If possible, use material transfer/filling, metering and blending plants that are closed.
Priority should be given to closed-system units.
Leak detection recommended
If contact with gases or vapours cannot be excluded: Extraction at the emission source required.

Exposure controls

Minimization of emissions by means of suitable technical measures such as flanges and valves with low leakage rates, recirculation of vapours.

Personal protective equipment

Respiratory protection

In case of dusts/vapours/aerosols being formed or if the limit values like TLV are exceeded:
use respiratory equipment with suitable filter (filter type ABEK) or wear a self contained respiratory apparatus
Suitable filter: B, code colour grey
Note time limit for wearing respiratory protective equipment.

Hand protection

Applies to handling for longer periods or of large amounts

Glove material	gloves of chloroprene-rubber (e.g. neoprene), Fluorinated rubber (FKM), for example: Vitoject 890, Kächele-Cama Latex GmbH (KCL), Germany
Material thickness	0.7 mm
Method	DIN EN 374
Glove material	butyl-rubber, for example: Butoject 898, Kächele-Cama Latex GmbH (KCL), Germany
Material thickness	0.7 mm
Method	DIN EN 374

Eye protection

close-fitting protective goggles (e.g. closed goggles)

Hygiene measures

Do not inhale vapours / aerosols.
Avoid contact with skin and eyes.
Smoking, eating and drinking should be prohibited in the application area.

Protective measures

full protective suit, if necessary

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	liquid
Colour	colourless

Odour	of chloroform
Smell threshold:	No data available

Information on basic physical and chemical properties

pH	No data available
Melting point/range	-36 °C (literature value)
Boiling point/range	83.6 °C (1013 hPa) (literature value)
Flash point	13 °C (1013 hPa) Method: DIN 51 755 (literature value)
Evaporation rate	No data available
Flammability (solid, gas)	not applicable liquid
Autoinflammability	440 °C (1013 hPa) Method: DIN 51 794 (literature value)
Thermal decomposition	Distills without decomposition at atmospheric pressure. In flames and at hot surfaces, toxic and pungent smelling decomposition products (e.g. hydrogen chloride) may be formed.
Oxidizing properties	not oxidizing
Explosiveness	Not explosive
Lower explosion limit	6.2 %(V)
Upper explosion limit	16 %(V)
Vapour pressure	102.47 hPa (25 °C) (literature value)
Density	1.25 g/cm3 (20 °C) (literature value)
Relative density	No data available
Water solubility	7.9 g/l (25 °C) Method: OECD Test Guideline 105 (literature value)
Partition coefficient (n-octanol/water)	log Pow: 1.45 (20 °C) Method: OECD TG 107 (measured)
Viscosity, dynamic	0.829 mPa.s(20 °C) (literature value)

Further information

Surface tension	32.45 mN/m (20 °C)

(literature value)

10. STABILITY AND REACTIVITY

Possibility of hazardous reactions
Reacts violently with:
strong oxidants
alkali metals
alkaline earth metals
light-metal powders
alkali metal amides

Conditions to avoid
light
air
humidity

Hazardous decomposition products
Decomposition products from hydrolysis in water
hydrogen chloride

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity
LD50 mouse(female): 413 mg/kg
Method: OECD Test Guideline 401
literature

Acute inhalation toxicity
LC50 rat(male/female): 7.8 mg/l / 8 h
Method: OECD Test Guideline 403
literature

Acute dermal toxicity
LD50 Rabbit(male): 4890 mg/kg
Method: OECD Test Guideline 402
literature

Skin irritation
Rabbit
irritating
Method: OECD Test Guideline 404
Has skin-degreasing properties.
literature

Eye irritation
Rabbit
irritating
Method: Draize Test
literature

Sensitization
mouse: not sensitizing
Method: OECD TG 429
literature

Repeated dose toxicity
Oral Rat(male/female) / 90-day
NOAEL: 37.5 mg/kg
Method: OECD TG 408
literature

inhalative mouse(male/female)
Number of exposures: 5 days/weeks, 6 hours/day
NOAEL: 0.041 mg/l

Method: OECD Test Guideline 453
literature

Assessment of STOT single exposure	No data available
Assessment of STOT repeat exposure	No data available
Risk of aspiration toxicity	No data available
Gentoxicity in vitro	gene mutation S. typhimurium / E. coli positive Metabolic activation: without Method: OECD TG 471 literature Ames test Salmonella typhimurium positive and negative test results Metabolic activation: with or without Method: OECD TG 471 literature gene mutation rat hepatocytes positive Metabolic activation: without Method: OECD TG 482 literature
Gentoxicity in vivo	Cytogenetic test Drosophila melanogaste Inhalative positive Method: OECD TG 477 literature Tests for mutagenic potential with various end points. mouse intraperitoneal 24 hours positive Method: OECD TG 479 literature Micronucleus test mouse Oral 41 weeks negative Method: OECD TG 474 literature
Carcinogenicity	inhalative Rat(male/female): 2 years target organ/effect: Kidney / tumours, Liver / tumours Method: OECD Test Guideline 453 The product has proved carcinogenic in chronic inhalation experiments on animals. Carc. Cat. 2
Toxicity to reproduction	Two-generation study Oral mouse(male/female) NOAEL (No Observed Adverse Effect Level) of parents: 50 mg/kg NOAEL F1: 50 mg/kg NOAEL F2: 50 mg/kg Method: OECD Test Guideline 416 no evidence of reproductiontoxic properties literature
Teratogenicity	Oral Rat(female) Number of exposures: daily

Test period: 20 days
Method: OECD TG 414
no evidence of teratogenic properties
literature

inhalative Rat(female)
Number of exposures: 6 hours/day
Test period: 20 days
Method: OECD TG 414
no evidence of teratogenic properties
literature

Toxicology Assessment

Acute effects: Harmful if swallowed.
May cause respiratory irritation.
Toxic if inhaled.
Due to the data available, the classification criteria for all further toxicological end points are not fulfilled

CMR assessment

Carcinogenicity: May cause cancer.
Mutagenicity: The classification criteria are not met based on the available data.
Toxicity to reproduction: The classification criteria are not met based on the available data.

12. ECOLOGICAL INFORMATION

Ecotoxicity effects

Toxicity to fish:
LC50 flow-through test Pimephales promelas: 136 mg/l / 96 h
Method: OECD TG 203
literature

MATC flow-through test Pimephales promelas: 29 - 59 mg/l / 32 d
Method: US-EPA
literature

Toxicity in aquatic invertebrates:
EC50 static test Daphnia magna: 160 mg/l / 48 h
literature

EC50 static test Artemia salina: 320 mg/l / 24 h
literature

static test Daphnia magna: 11 mg/l / 28 d
Method: ASTM
literature

Toxicity to algae:
EC50 static test scenedesmus subspicatus: 166 mg/l / 96 h
Method: OECD TG 201
literature

Toxicity to bacteria:
NOEC static test Pseudomonas putida: 135 mg/l / 16 h
literature

IC50 static test Activated sludge: 2780 mg/l / 24 h
Method: OECD TG 209
literature

Toxicity in organisms which live in the soil	LC50 Eisenia foetida: 0.06 mg/cm2 / 48 h Method: EEC 79/831 literature
Toxicity in terrestrial plants	ED 50 Nicotiana tabacum: 17.1 mg/l / 2 h literature

Ecotoxicology Assessment

Acute aquatic toxicity	The classification criteria are not met based on the available data.
Chronic aquatic toxicity	The classification criteria are not met based on the available data.

Results of PBT assessment

Not a PBT, vPvB substance as per the criteria of the REACH Ordinance.

13. DISPOSAL CONSIDERATIONS

Product

With respect to local regulations, e.g. dispose of to suitable waste incineration plant.
No waste key number as per the European Waste Types List can be assigned to this product, since such classification is based on the (as yet undetermined) use to which the product is put by the consumer.
The waste key number must be determined as per the European Waste Types List (decision on EU Waste Types List 2000/532/EC) in cooperation with the disposal firm / producing firm / official authority.

Uncleaned packaging

Do not reuse empty containers and dispose of in accordance with the regulations issued by the appropriate local authorities.

14. TRANSPORT INFORMATION

Land transport ADR/RID/GGVSEB (Germany)

Class	3
ADR/RID-Labels	3 (6.1)
UN-No	1184
Packaging group	II
orange warning plate	336 / 1184
Tunnel Restriction Code (ADR)	(D/E)

Description of the goods (Technical name)
ETHYLENE DICHLORIDE

Sea transport IMDG-Code/GGVSee (Germany)

Class	3
Subsidiary risk	6.1
UN-No	1184
Packaging group	II
EmS	F-E, S-D

Proper technical name (Proper shipping name)
ETHYLENE DICHLORIDE

Air transport ICAO-TI/IATA-DGR

Class	3
Subsidiary risk	6.1
UN-No	1184
Packaging group	II

Proper technical name (Proper shipping name)
Ethylene dichloride

Inland waterway transport ADN/GGVSEB (Germany)

Class	3
ADR/RID-Labels	3 (6.1)
UN-No / Substance number	1184
Packaging group	II

Description of the goods (Technical name)
ETHYLENE DICHLORIDE

Loading instructions/Remarks

IATA_C	ERG-Code 3P
IATA_P	ERG-Code 3P
IMDG	Clear of living quarters.
ADN	Comply with supplemental regulations as per Table C, Column 20 ADN! Hazard acc. to ADN, Table C, Column 5: 3 + 6.1 + CMR

Transport/further information

Keep separate from foodstuffs, luxury foods, feedstuffs

15. REGULATORY INFORMATION

Chemical safety assessment : A substance safety assessment was carried out for this product.

registration

Europe (EINECS/ELINCS)	listed/registered
USA (TSCA)	listed/registered
Canada (DSL)	listed/registered
Australia (AICS)	listed/registered
Japan (MITI)	listed/registered
Korea (TCCL)	listed/registered
Philippines (PICCS)	listed/registered
China	listed/registered
Switzerland	listed/registered
New Zealand	listed/registered

National legislation

Major Accident Hazard Legislation	The product is subject to the EC directive 96/82/EC and amendments (see regulations concerning malfunctions).
employment restriction	Please note Directive 92/85/EEC (Pregnant Workers Directive) and amendments. Please note Directive 94/33/EC (Protection of Young Workers at the Workplace Directive) and amendments.

16. OTHER INFORMATION

Risk phrase (R phrase) texts

- **1,2-dichloroethane**

  R11 Highly flammable.

R45	May cause cancer.
R20/22	Harmful by inhalation and if swallowed.
R36/37/38	Irritating to eyes, respiratory system and skin.
R23	Toxic by inhalation.

Texts of the H-phrases

- **1,2-dichloroethane**

H225	Highly flammable liquid and vapour.
H302	Harmful if swallowed.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H350	May cause cancer.
H335	May cause respiratory irritation.
H331	Toxic if inhaled.

Further information

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

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.

Legend

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADNR	European agreement concerning the international carriage of dangerous goods by inland waterways (ADN)
ASTM	American Society for Testing and Materials
ATP	Adaptation to Technical Progress
BCF	Bioconcentration Factor
BetrSichV	German Ordinance on Industrial Safety and Health
c. c.	closed cup
CAS	Chemical Abstract Services
CESIO	European Committee of Organic Surfactants and their Intermediates
ChemG	German Chemicals Act
CMR	Carcinogenic-Mutagenic-toxic for Reproduction
DIN	German Institute for Standardization
DNEL	Derived No Effect Level
EINECS	European Inventory of Existing Commercial Chemical Substances
GefStoffV	German Ordinance on Hazardous Substances
GGVSEB	German ordinance for road, rail and inland waterway transportation of dangerous goods
GGVSee	German ordinance for sea transportation of dangerous goods
GLP	Good Laboratory Practice.
GMO	Genetic Modified Organism
IATA DGR	International Air Transport Association – Dangerous Goods Regulations
ICAO-TI	International Civil Aviation Organisation - Technical Instructions
IMDG Code	International Maritime Dangerous Goods Code
ISO	International Organization For Standardization
LOAEL	Lowest Observed Adverse Effect Level
LOEL	Lowest Observed Effect Level
NOAEL	No Observed Adverse Effect Level
NOEC	No Observed Effect Concentration
NOEL	No Observed Effect Level
o. c.	open cup
OECD	Organisation for Economic Cooperation and Development
OEL	Occupational Exposure Limit
PBT	Persistent, Bioaccumulative, Toxic
PEC	Predicted Environmental Concentration
PNEC	Predicted No Effect Concentration
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
TA	Technical Instructions (German Ordinance)
TPR	Third Party Representative (Art. 4)
TRGS	Technical Rules for Hazardous Substances (German Regulations)
VCI	German "Verband der Chemischen Industrie e. V."
vPvB	Very Persistent, Very Bioaccumulative
VOC	Volatile Organic Compounds
VwVwS	German Administrative Regulation on the Classification of Substances Hazardous to Waters into Water Hazard Classes
WGK	German Water Hazard Class
WHO	World Health Organization

ANNEX

Exposure scenario	**ES1:Use as monomer for production of polymers or as (transported) isolated intermediate, both under strictly controlled conditions** **ES 2: Use as processing aid, inhibitor,solvent or extraction agent, all under strictly controlled conditions.**

---

1. Short title of exposure scenario

ES1:Use as monomer for production of polymers or as (transported) isolated intermediate, both under strictly controlled conditions

2. Description of activities/process(es) covered in the Exposure Scenario

Sector of use		Main user groups
	SU3	Industrial uses: Uses of substances as such or in preparations at industrial sites
		Sectors of end-use
	SU8	Manufacture of bulk, large scale chemicals (including petroleum products)
Process category	PROC1	Use in closed process, no likelihood of exposure
	PROC3	Use in closed batch process (synthesis or formulation)
	PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.

3. Application conditions

3.1 Duration and frequency

Remarks(Long-term)	not applicable for qualitative asessment

Environment

Continuous exposure	not applicable for qualitative asessment

4.1 Physical form

liquid

4.2 Concentration of substance in preparation

Remarks	not applicable

4.3 Amount used per time or per activity

Remarks	not applicable for qualitative asessment

5. Other operational conditions

Remarks	not applicable for qualitative asessment

6. RISK MANAGEMENT MEASURES

6.1.1 Occupational Measures

RMMs apply to all PROCs

Organizational protective measures	Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Substance-handling procedures are well documented and strictly

	supervised by the site operator Procedural and/or control technologies are required to minimise emissions and the resulting exposure during cleaning and maintenance procedures or if there is a risk of the occupational exposure limit being exceeded. The product should only be handled by trained personnel. Assumes a good basic standard of occupational hygiene is implemented.
Technical protective measures	The substance has to be rigorously contained by technical means during its whole lifecycle including manufacture, purification, cleaning, and maintenance of equipment, sampling, analysis, loading and unloading of equipment or vessels, waste disposal or purification and storage. Consider technical advances and process upgrades (including automation) for the elimination of releases. minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenario; clear up spills immediately and dispose of waste safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.
Personal protective measures	Wear personal protective equipment; see section 8.
Remarks	Risk Management Measures are based on qualitative risk characterisation.

6.1.2 Consumer related measures

Not relevant for this exposure scenario.

6.2 Environment related measures

Industrial use of substances in closed systems

Remarks	No relevant environmental emissions are anticipated with this identified use.

7. Waste related measures

Prescribed disposal method	dispose of to suitable waste incineration plant.
Remarks	Use in closed, continuous process with occasional controlled exposure

8. Prediction of exposure

Remarks	No exposure expected

9. Guidance to downstream user

The substance must be handled under strictly controlled conditions according to Article 18 of the REACH regulation:

---

1. Short title of exposure scenario

ES 2: Use as processing aid, inhibitor,solvent or extraction agent, all under strictly controlled conditions.

2. Description of activities/process(es) covered in the Exposure Scenario

Sector of use		Main user groups
	SU3	Industrial uses: Uses of substances as such or in preparations at industrial sites
		Sectors of end-use
	SU8	Manufacture of bulk, large scale chemicals (including petroleum products)
	SU9	Manufacture of fine chemicals
Process category	PROC1	Use in closed process, no likelihood of exposure
	PROC3	Use in closed batch process (synthesis or formulation)
	PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.

3. Application conditions

3.1 Duration and frequency

Remarks(Long-term): not applicable for qualitative asessment

Environment

Continuous exposure: not applicable for qualitative asessment

4.1 Physical form

liquid

4.2 Concentration of substance in preparation

Remarks: not applicable

4.3 Amount used per time or per activity

Remarks: not applicable for qualitative asessment

5. Other operational conditions

Remarks: not applicable for qualitative asessment

6. RISK MANAGEMENT MEASURES

6.1.1 Occupational Measures

RMMs apply to all PROCs

Organizational protective measures	Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Substance-handling procedures are well documented and strictly supervised by the site operator Procedural and/or control technologies are required to minimise emissions and the resulting exposure during cleaning and maintenance procedures or if there is a risk of the occupational exposure limit being exceeded. The product should only be handled by trained personnel. Assumes a good basic standard of occupational hygiene is implemented.
Technical protective measures	The substance has to be rigorously contained by technical means during its whole lifecycle including manufacture, purification, cleaning, and maintenance of equipment, sampling, analysis, loading and unloading of equipment or vessels, waste disposal or purification and storage.

Consider technical advances and process upgrades (including automation) for the elimination of releases. minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenario; clear up spills immediately and dispose of waste safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.

Personal protective measures: Wear personal protective equipment; see section 8.

Remarks: Risk Management Measures are based on qualitative risk characterisation.

6.1.2 Consumer related measures

Not relevant for this exposure scenario.

6.2 Environment related measures

Industrial use of substances in closed systems

Remarks: No relevant environmental emissions are anticipated with this identified use.

7. Waste related measures

Prescribed disposal method: dispose of to suitable waste incineration plant.

Remarks: Use in closed, continuous process with occasional controlled exposure

8. Prediction of exposure

Remarks: No exposure expected

9. Guidance to downstream user

The substance must be handled under strictly controlled conditions according to Article 18 of the REACH regulation: