SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878

Version 9.0
Revision Date 16.09.2026
Print Date 16.09.2026

GENERIC EU MSDS - NO COUNTRY SPECIFIC DATA - NO OEL DATA

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

1.1 Product identifiers

Product name	:	Dichloromethane EMPROVE® ESSENTIAL Ph Eur,BP,NF
Product Number	:	1.06049
Catalogue No.	:	106049
Brand	:	Millipore
Index-No.	:	602-004-00-3
REACH No.	:	01-2119480404-41-XXXX
CAS-No.	:	75-09-2

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

Identified uses	:	Pharmaceutical production and analysis

1.3 Details of the supplier of the safety data sheet

Company	:	Merck KGaA Frankfurter Str. 250 D-64271 DARMSTADT
Telephone	:	+49 (0)6151 72-0
Fax	:	+49 6151 727780
E-mail address	:	TechnicalService@merckgroup.com

1.4 Emergency telephone number

Emergency Phone #	:	+(44)-870-8200418 (CHEMTREC (GB)) +(353)-19014670 (CHEMTREC Ireland) 001-803-017-9114 (CHEMTREC India)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Skin irritation, Category 2	H315: Causes skin irritation.
Eye irritation, Category 2	H319: Causes serious eye irritation.
Carcinogenicity, Category 2	H351: Suspected of causing cancer.

The life science business of Merck operates as MilliporeSigma in the US and Canada

Specific target organ toxicity - single exposure, Category 3, Central nervous system	H336: May cause drowsiness or dizziness.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word : Warning

Hazard statements :

H315	Causes skin irritation.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.

Precautionary statements :

Prevention:

P202	Do not handle until all safety precautions have been read and understood.
P261	Avoid breathing mist or vapours.
P264	Wash skin thoroughly after handling.

Response:

P302 + P352 IF ON SKIN: Wash with plenty of water.

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.

Reduced Labelling (<= 125 ml)

Hazard pictograms :

Signal word	Warning
Hazard Statements	
H351	Suspected of causing cancer.
Precautionary Statements	
P202	Do not handle until all safety precautions have been read and understood.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
Supplemental Hazard	none

The life science business of Merck operates as MilliporeSigma in the US and Canada

Statements

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.1 Substances

Index-No. : 602-004-00-3

EC-No. : 200-838-9

Components

Chemical name	CAS-No. EC-No.	Concentration (% w/w)	M-Factor, SCL, ATE
Dichloromethane	75-09-2 200-838-9	>= 90 - <= 100	specific concentration limit STOT SE 3; H336 20 %

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Show this safety data sheet to the doctor in attendance.

If inhaled : After inhalation: fresh air. Call in physician.

In case of skin contact : In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

In case of eye contact : After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

The life science business of Merck operates as MilliporeSigma in the US and Canada

If swallowed	:	After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2 GHS label elements) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	:	For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire fighting	:	Not combustible. Fire may cause evolution of: Hydrogen chloride gas Phosgene Ambient fire may liberate hazardous vapours.
Hazardous combustion products	:	Carbon oxides Hydrogen chloride gas

5.3 Advice for firefighters

Special protective equipment for fire-fighters	:	Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.
Further information	:	Suppress (knock down) gases/vapours/mists with a water spray jet. 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	:	Advice for non-emergency personnel: Do not breathe vapours, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

The life science business of Merck operates as MilliporeSigma in the US and Canada

Wear appropriate personal protective equipment, as indicated in Section 8.

6.2 Environmental precautions

Environmental precautions	:	Do not let product enter drains.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up	:	Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

For disposal considerations see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling	:	Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.
Hygiene measures	:	Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
Temperature class	:	T1

For precautions see section 2 GHS label elements

7.2 Conditions for safe storage, including any incompatibilities

Further information on storage conditions	:	Protected from light. Tightly closed. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorised persons.
Storage class (TRGS 510)	:	6.1D, Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects
Further information on storage stability	:	Recommended storage temperature if relevant, see product label.
Recommended storage temperature	:	Recommended storage temperature if relevant, see product label.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

The life science business of Merck operates as MilliporeSigma in the US and Canada

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006

Substance name	End Use	Exposure routes	Potential health effects	Value
	Workers	Inhalation	Long-term systemic effects	176 mg/m3
	Workers	Skin contact	Long-term systemic effects	12 mg/kg BW/d

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006

Substance name	Environmental Compartment	Value
	Soil	0,33 mg/kg
	Marine water	0,031 mg/l
	Fresh water	0,31 mg/l
	Marine sediment	0,26 mg/kg
	Fresh water sediment	2,57 mg/kg
	Sewage treatment plant	26 mg/l

8.2 Exposure controls

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection : Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
Safety glasses

Hand protection
- Material : Viton®
- Break through time : 120 min
- Glove thickness : 0,7 mm
- Protective index : Splash contact
- Manufacturer : Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Remarks : This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Skin and body protection : protective clothing

Respiratory protection : required when vapours/aerosols are generated.

Recommended Filter type: : Filter AX (EN 371)

The life science business of Merck operates as MilliporeSigma in the US and Canada

The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Environmental exposure controls

Advice : Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	liquid (20 °C, 1.013 hPa)
Colour	:	colourless
Odour	:	ether-like
Odour Threshold	:	250 ppm
Melting point/ range	:	-95 °C (1.013 hPa)
Boiling point/boiling range	:	40 °C (1.013 hPa)
Flammability	:	No data available
Upper explosion limit / Upper flammability limit	:	Upper explosion limit 22 %(V)
Lower explosion limit / Lower flammability limit	:	Lower explosion limit 13 %(V)
Flash point	:	does not flash
Autoignition temperature	:	556,1 °C
Decomposition temperature	:	No data available
pH	:	No data available
Viscosity		
Viscosity, dynamic	:	0,42 mPa.s (25 °C)
Viscosity, kinematic	:	No data available

The life science business of Merck operates as MilliporeSigma in the US and Canada

Flow time	:	No data available
Solubility(ies) Water solubility	: :	 13,2 g/l (25 °C) pH: 7
Partition coefficient: n-octanol/water	:	log Pow: 1,25 (20 °C) pH: 7 Method: (experimental) Bioaccumulation is not expected.
Vapour pressure	:	584 hPa (25 °C)
Relative density	:	No data available
Density	:	1,33 g/cm3 (20 °C)
Relative vapour density	:	2,93

9.2 Other information

Explosives	:	Not classified as explosive.
Oxidizing properties	:	none
Burning rate	:	No data available
Self-ignition	:	605 °C 1.013 hPa Method: DIN 51794
Evaporation rate	:	0,71
Refractive index	:	1,42 at 20 °C 589,3 nm
Molecular weight	:	84,93 g/mol

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available

The life science business of Merck operates as MilliporeSigma in the US and Canada

10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .
Contains the following stabiliser(s):
2-methyl-2-butene(0,002 %)

10.3 Possibility of hazardous reactions

Hazardous reactions : Risk of explosion with:

Alkali metals
nitrogen oxides
nitrogen dioxide
Potassium
sodium azide
perchloric acid
Nitric acid
aluminium chloride
Amines
Oxygen
(as liquefied gas)
powdered aluminium
sodium
aromatic hydrocarbons
with
powdered aluminium
Exothermic reaction with:

Alkaline earth metals
Powdered metals
amides
alcoholates
nonmetallic oxides
potassium tert-butanolate
sodium amide
Lithium

10.4 Conditions to avoid

Conditions to avoid : no information available

10.5 Incompatible materials

No data available

10.6 Hazardous decomposition products

For Hazardous combustion products in the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male and female - > 2.000 mg/kg
(OECD Test Guideline 401)
LC50 Inhalation - Mouse - 4 h - 86 mg/l - vapour

Remarks: (ECHA)

The life science business of Merck operates as MilliporeSigma in the US and Canada

Symptoms: Possible damages:, mucosal irritations
LD50 Dermal - Rat - male and female - > 2.000 mg/kg
(OECD Test Guideline 402)

Skin corrosion/irritation
Skin - Rabbit
Result: Irritations - 4 h
(OECD Test Guideline 404)
Remarks: Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Eye irritation
Remarks: (ECHA)
Remarks: Risk of corneal clouding.

Respiratory or skin sensitization
Local lymph node assay (LLNA) - Mouse
Result: negative
(OECD Test Guideline 429)

Germ cell mutagenicity
Test Type: Mutagenicity (mammal cell test): chromosome aberration.
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: positive
Test Type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: positive

Test Type: In vivo micronucleus test
Species: Mouse
Cell type: Bone marrow
Application Route: Gavage
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity
Suspected of causing cancer.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
Inhalation - May cause drowsiness or dizziness. - Central nervous system

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

The life science business of Merck operates as MilliporeSigma in the US and Canada

11.2 Additional Information

Endocrine disrupting properties

Product:

Assessment	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Repeated dose toxicity - Rat - male and female - Oral - 104 Weeks - No observed adverse effect level - 6 mg/kg

Repeated dose toxicity - Rat - male and female - Inhalation - 104 Weeks

Dizziness, Nausea, Vomiting, narcosis, Cough, irritant effects, Unconsciousness, Shortness of breath, respiratory paralysis, somnolence, depressed respiration, CNS disorders, inebriation
Risk of corneal clouding.
The following applies to aliphatic halogenated hydrocarbons in general: systemic effect: narcosis, cardiovascular disorders. Toxic effect on liver, kidneys.
Dichloromethane is metabolized in the body producing carbon monoxide which increases and sustains carboxyhemoglobin levels in the blood, reducing the oxygen-carrying capacity of the blood.
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Systemic effects:

After absorption of large quantities:

CNS disorders
Drowsiness
Dizziness
drop in blood pressure
Cardiac irregularities
depressed respiration
inebriation
Unconsciousness
narcosis

Swallowing may result in damage to the following:

Liver
Kidney

The following applies to aliphatic halogenated hydrocarbons in general: systemic effect: narcosis, cardiovascular disorders. Toxic effect on liver, kidneys.

Other dangerous properties can not be excluded.

This substance should be handled with particular care.

The life science business of Merck operates as MilliporeSigma in the US and Canada

SECTION 12: Ecological information

12.1 Toxicity

Components:

Dichloromethane:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 193,00 mg/l End point: mortality Exposure time: 96 h Test Type: flow-through test Analytical monitoring: yes Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates	:	LC50 (Daphnia magna (Water flea)): 27 mg/l End point: mortality Exposure time: 48 h Test Type: static test Method: US-EPA
Toxicity to microorganisms	:	EC50 (activated sludge): 2.590 mg/l Exposure time: 40 min Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 209
Toxicity to fish (Chronic toxicity)	:	LC50: 471 mg/l End point: mortality Exposure time: 8 d Species: Pimephales promelas (fathead minnow) Test Type: flow-through test Analytical monitoring: yes Remarks: (ECHA)

12.2 Persistence and degradability

Components:

Dichloromethane:

Biodegradability	:	Test Type: aerobic Inoculum: activated sludge, non-adapted Concentration: 5 mg/l Result: Readily biodegradable. Biodegradation: 68 % Exposure time: 28 d Method: OECD Test Guideline 301D GLP: yes

The life science business of Merck operates as MilliporeSigma in the US and Canada

12.3 Bioaccumulative potential

Components:

Dichloromethane:

Bioaccumulation	:	Species: Cyprinus carpio (Carp) Exposure time: 6 Weeks Concentration: 250 µg/l Bioconcentration factor (BCF): 2 - 5,4 Method: OECD Test Guideline 305 GLP: yes Species: Cyprinus carpio (Carp) Exposure time: 6 Weeks Concentration: 25 µg/l Bioconcentration factor (BCF): 6 - 40 Method: OECD Test Guideline 305 GLP: yes
Partition coefficient: n-octanol/water	:	log Pow: 1,25 (20 °C) pH: 7 Method: (experimental) Remarks: Bioaccumulation is not expected.

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Product:

Assessment	:	This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Components:

Dichloromethane:

Assessment	:	Not persistent, bioaccumulative, and toxic (PBT). Not very persistent and very bioaccumulative (vPvB).
	:	Substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

12.6 Endocrine disrupting properties

Product:

Assessment	:	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

The life science business of Merck operates as MilliporeSigma in the US and Canada

12.7 Other adverse effects

Components:

Dichloromethane:

Ozone-Depletion Potential : The figures relating to ozone-depleting potential are estimates based on existing knowledge and will be reviewed and revised periodically in the light of decisions taken by the Parties.
Regulation: Regulation (EU) No 2024/590 on substances that deplete the ozone layer (Update: 2024-02-20)
Group: Annex II Ozone-Depleting Substances Referred To In Article 2, Point (A), Not Controlled Under The Protocol

Regulation (EU) No 2024/590 on substances that deplete the ozone layer

Components:

Dichloromethane:

100-year global warming potential: 11,2
Further information: The figures relating to ozone-depleting potential are estimates based on existing knowledge and will be reviewed and revised periodically in the light of decisions taken by the Parties., Annex II Ozone-Depleting Substances Referred To In Article 2, Point (A), Not Controlled Under The Protocol

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

14.1 UN number or ID number

ADR : UN 1593

IMDG : UN 1593

IATA : UN 1593

14.2 UN proper shipping name

ADR : DICHLOROMETHANE

IMDG : DICHLOROMETHANE

IATA : Dichloromethane

The life science business of Merck operates as MilliporeSigma in the US and Canada

14.3 Transport hazard class(es)

		Class	Subsidiary risks
ADR	:	6.1	
IMDG	:	6.1	
IATA	:	6.1	

14.4 Packing group

ADR

Packing group	:	III
Classification Code	:	T1
Hazard Identification Number	:	60
Labels	:	6.1
Tunnel restriction code	:	(E)

IMDG

Packing group	:	III
Labels	:	6.1
EmS Code	:	F-A, S-A

IATA (Cargo)

Packing instruction (cargo aircraft)	:	663
Packing instruction (LQ)	:	Y642
Packing group	:	III
Labels	:	Division 6.1 - Toxic substances

IATA_P (Passenger)

Packing instruction (passenger aircraft)	:	655
Packing instruction (LQ)	:	Y642
Packing group	:	III
Labels	:	Division 6.1 - Toxic substances

14.5 Environmental hazards

ADR

Environmentally hazardous	:	no

IMDG

Marine pollutant	:	no

14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

The life science business of Merck operates as MilliporeSigma in the US and Canada

SECTION 15: Regulatory information

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	:	Conditions of restriction for the following entries must be considered:: Number on list 3 Number on list 59: Dichloromethane Number on list 75 If you intend to use this product as tattoo ink, please contact your vendor.
REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	Not applicable
Regulation (EU) No 2024/590 on substances that deplete the ozone layer	:	Dichloromethane
Regulation (EU) 2019/1021 on persistent organic pollutants (recast)	:	Not applicable
REACH - List of substances subject to authorisation (Annex XIV)	:	Not applicable
Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.		Not applicable

15.2 Chemical safety assessment

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

SECTION 16: Other information

Relevant changes since previous version

Annex

Full text of H-Statements

H336	:	May cause drowsiness or dizziness.

Full text of other abbreviations

Carc.	:	Carcinogenicity
Eye Irrit.	:	Eye irritation
Skin Irrit.	:	Skin irritation
STOT SE	:	Specific target organ toxicity - single exposure
STOT SE	:	Specific target organ toxicity - single exposure

The life science business of Merck operates as MilliporeSigma in the US and Canada

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; BGW - Biological Limit Values; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonised System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organisation; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardisation; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); LSPN - List of Hazardous Notified Substances (Chile); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organisation for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Other information : The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.
Copyright 2025 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.

The life science business of Merck operates as MilliporeSigma in the US and Canada

The life science business of Merck operates as MilliporeSigma in the US and Canada

Annex: Exposure scenario

Identified uses:

Use: Manufacturing and on-site use

SU0: Other
PROC1: Use in closed process, no likelihood of exposure
ERC1: Manufacture of substances

Use: Industrial use

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
SU8, SU9: Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals
PROC2: Use in closed, continuous process with occasional controlled exposure **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

Use: Industrial use

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
SU8, SU9: Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals
PROC3: Use in closed batch process (synthesis or formulation) **PROC15:** Use as laboratory reagent
ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

Use: Used as laboratory reagent

SU0: Other
PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC15:** Use as laboratory reagent
ERC8a: Wide dispersive indoor use of processing aids in open systems

Use: Used as laboratory reagent

SU0: Other
PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
ERC8a: Wide dispersive indoor use of processing aids in open systems

The life science business of Merck operates as MilliporeSigma in the US and Canada

Use: Manufacturing and on-site use

SU0: Other
PROC2: Use in closed, continuous process with occasional controlled exposure **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
ERC1: Manufacture of substances

Use: Manufacturing and on-site use

SU0: Other
PROC3: Use in closed batch process (synthesis or formulation) **PROC15:** Use as laboratory reagent
ERC1: Manufacture of substances

Use: Formulation of preparations

SU0: Other
PC1: Adhesives, sealants **PC9a:** Coatings and paints, thinners, paint removers
PROC3: Use in closed batch process (synthesis or formulation) **PROC15:** Use as laboratory reagent
ERC2: Formulation of preparations

Use: Formulation of preparations

SU0: Other
PC1: Adhesives, sealants **PC9a:** Coatings and paints, thinners, paint removers
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 (multistage and/ or significant contact) **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
ERC2: Formulation of preparations

Use: Industrial use

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
SU0: Other
PROC1: Use in closed process, no likelihood of exposure

The life science business of Merck operates as MilliporeSigma in the US and Canada

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Use: Industrial use

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
SU0: Other
PROC2: Use in closed, continuous process with occasional controlled exposure **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC10:** Roller application or brushing
ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Use: Industrial use

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
SU0: Other
PROC3: Use in closed batch process (synthesis or formulation) **PROC15:** Use as laboratory reagent
ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Use: Industrial use

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
SU8, SU9: Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals
PROC1: Use in closed process, no likelihood of exposure
ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

The life science business of Merck operates as MilliporeSigma in the US and Canada

1. Short title of Exposure Scenario: Manufacturing and on-site use

Sectors of end-use : **SU0**
Process categories : **PROC1**
Environmental Release Categories : **ERC1:**

2. Exposure scenario

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC1	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	0,034 mg/kg BW/d	0,003
PROC1	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	0,035 mg/m³	0

*Risk characterisation ratio

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

The life science business of Merck operates as MilliporeSigma in the US and Canada

1. Short title of Exposure Scenario: Industrial use

Main User Groups	:	**SU 3**
Sectors of end-use	:	**SU8, SU9**
Process categories	:	**PROC2, PROC4, PROC8a, PROC8b**
Environmental Release Categories	:	**ERC6a:**

2. Exposure scenario

2.1 Contributing scenario controlling environmental exposure for: ERC6a

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.2 Contributing scenario controlling worker exposure for: PROC2, PROC4, PROC8a, PROC8b

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid substance

Frequency and duration of use

Application duration	:	> 4 h
Frequency of use	:	0 days/year

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor

Technical conditions and measures

Provide adequate ventilation., Good work practice required.

Organisational measures to prevent /limit releases, dispersion and exposure

Ensure operatives are trained to minimise exposures.

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection and gloves., For personal protection see section 8.

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC2	ECETOC TRA	Without Local	Dermal	0,137 mg/kg	0,011

The life science business of Merck operates as MilliporeSigma in the US and Canada

		Exhaust Ventilation		BW/d	
PROC2	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	88,47 mg/m³	0,503
PROC4	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	35,38 mg/m³	0,201
PROC4	ECETOC TRA	With Local Exhaust Ventilation	Dermal	0,686 mg/kg BW/d	0,057
PROC8a	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	88,47 mg/m³	0,503
PROC8a	ECETOC TRA	With Local Exhaust Ventilation	Dermal	1,371 mg/kg BW/d	0,114
PROC8b	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	26,54 mg/m³	0,151
PROC8b	ECETOC TRA	With Local Exhaust Ventilation	Dermal	1,371 mg/kg BW/d	0,114

*Risk characterisation ratio

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

---

1. Short title of Exposure Scenario: Industrial use

Main User Groups : **SU 3**
Sectors of end-use : **SU8, SU9**
Process categories : **PROC3, PROC15**
Environmental Release Categories : **ERC6a:**

2. Exposure scenario

2.1 Contributing scenario controlling environmental exposure for: ERC6a

Product characteristics
Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.2 Contributing scenario controlling worker exposure for: PROC3, PROC15

Product characteristics
Concentration of the Substance in : Covers the percentage of the substance in the product

The life science business of Merck operates as MilliporeSigma in the US and Canada

Mixture/Article up to 100 % (unless stated differently).
Physical Form (at time of use) : Liquid substance

Frequency and duration of use
Application duration : 1 - 4 h
Frequency of use : 0 days/year

Other operational conditions affecting workers exposure
Outdoor / Indoor : Indoor

Technical conditions and measures
Provide adequate ventilation., Good work practice required.

Organisational measures to prevent /limit releases, dispersion and exposure
Ensure operatives are trained to minimise exposures.

Conditions and measures related to personal protection, hygiene and health evaluation
Use suitable eye protection and gloves., For personal protection see section 8.

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC3	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	106,1 mg/m³	0,603
PROC3	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	0,021 mg/kg BW/d	0,002
PROC15	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	0,01 mg/kg BW/d	0,001
PROC15	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	106,1 mg/m³	0,603

*Risk characterisation ratio

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

The life science business of Merck operates as MilliporeSigma in the US and Canada

1. Short title of Exposure Scenario: Used as laboratory reagent

Sectors of end-use : **SU0**
Process categories : **PROC8a, PROC9, PROC15**
Environmental Release Categories : **ERC8a:**

2. Exposure scenario

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC8a	ECETOC TRA	With Local Exhaust Ventilation	Dermal	1,371 mg/kg BW/d	0,114
PROC8a	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	88,47 mg/m³	0,503
PROC9	ECETOC TRA	With Local Exhaust Ventilation	Dermal	0,686 mg/kg BW/d	0,057
PROC9	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	70,77 mg/m³	0,402
PROC15	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	106,1 mg/m³	0,603
PROC15	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	0,01 mg/kg BW/d	0,001

*Risk characterisation ratio

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on

The life science business of Merck operates as MilliporeSigma in the US and Canada

Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

1. Short title of Exposure Scenario: Used as laboratory reagent

Sectors of end-use : **SU0**
Process categories : **PROC8b**
Environmental Release Categories : **ERC8a:**

2. Exposure scenario

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC8b	ECETOC TRA	With Local Exhaust Ventilation	Dermal	1,371 mg/kg BW/d	0,114
PROC8b	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	26,54 mg/m³	0,151

*Risk characterisation ratio

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

1. Short title of Exposure Scenario: Manufacturing and on-site use

Sectors of end-use : **SU0**
Process categories : **PROC2, PROC4, PROC8a, PROC8b, PROC9**
Environmental Release Categories : **ERC1:**

The life science business of Merck operates as MilliporeSigma in the US and Canada

2. Exposure scenario

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC2	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	0,137 mg/kg BW/d	0,011
PROC2	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	88,47 mg/m³	0,503
PROC4	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	35,38 mg/m³	0,201
PROC4	ECETOC TRA	With Local Exhaust Ventilation	Dermal	0,686 mg/kg BW/d	0,057
PROC8a	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	88,47 mg/m³	0,503
PROC8a	ECETOC TRA	With Local Exhaust Ventilation	Dermal	1,371 mg/kg BW/d	0,114
PROC8b	ECETOC TRA	With Local Exhaust Ventilation	Dermal	1,371 mg/kg BW/d	0,114
PROC8b	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	26,54 mg/m³	0,151
PROC9	ECETOC TRA	With Local Exhaust Ventilation	Dermal	0,686 mg/kg BW/d	0,057
PROC9	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	70,77 mg/m³	0,402

*Risk characterisation ratio

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk

The life science business of Merck operates as MilliporeSigma in the US and Canada

Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

1. Short title of Exposure Scenario: Manufacturing and on-site use

Sectors of end-use : **SU0**
Process categories : **PROC3, PROC15**
Environmental Release Categories : **ERC1:**

2. Exposure scenario

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC3	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	0,021 mg/kg BW/d	0,002
PROC3	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	106,1 mg/m³	0,603
PROC15	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	106,1 mg/m³	0,603
PROC15	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	0,01 mg/kg BW/d	0,001

*Risk characterisation ratio

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

The life science business of Merck operates as MilliporeSigma in the US and Canada

1. Short title of Exposure Scenario: Formulation of preparations

Sectors of end-use : **SU0**
Chemical product category : **PC1, PC9a**
Process categories : **PROC3, PROC15**
Environmental Release Categories : **ERC2:**

2. Exposure scenario

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC3	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	106,1 mg/m³	0,603
PROC3	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	0,021 mg/kg BW/d	0,002
PROC15	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	0,01 mg/kg BW/d	0,001
PROC15	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	106,1 mg/m³	0,603

*Risk characterisation ratio

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

The life science business of Merck operates as MilliporeSigma in the US and Canada

1. Short title of Exposure Scenario: Formulation of preparations

Sectors of end-use : **SU0**
Chemical product category : **PC1, PC9a**
Process categories : **PROC4, PROC5, PROC8a, PROC8b, PROC9**
Environmental Release Categories : **ERC2:**

2. Exposure scenario

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC4	ECETOC TRA	With Local Exhaust Ventilation	Dermal	0,686 mg/kg BW/d	0,057
PROC4	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	35,38 mg/m³	0,201
PROC5	ECETOC TRA	With Local Exhaust Ventilation	Dermal	0,686 mg/kg BW/d	0,057
PROC5	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	88,47 mg/m³	0,503
PROC8a	ECETOC TRA	With Local Exhaust Ventilation	Dermal	1,371 mg/kg BW/d	0,114
PROC8a	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	88,47 mg/m³	0,503
PROC8b	ECETOC TRA	With Local Exhaust Ventilation	Dermal	1,371 mg/kg BW/d	0,114
PROC8b	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	26,54 mg/m³	0,151
PROC9	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	70,77 mg/m³	0,402

The life science business of Merck operates as MilliporeSigma in the US and Canada

PROC9	ECETOC TRA	With Local Exhaust Ventilation	Dermal	0,686 mg/kg BW/d	0,057

*Risk characterisation ratio

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

---

1. Short title of Exposure Scenario: Industrial use

Main User Groups : **SU 3**
Sectors of end-use : **SU0**
Process categories : **PROC1**
Environmental Release Categories : **ERC4:**

2. Exposure scenario

2.1 Contributing scenario controlling environmental exposure for: ERC4

Product characteristics
Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.2 Contributing scenario controlling worker exposure for: PROC1

Product characteristics
Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Liquid substance

Frequency and duration of use
Application duration : > 4 h
Frequency of use : 0 days/year

Other operational conditions affecting workers exposure
Outdoor / Indoor : Indoor

Technical conditions and measures
Provide adequate ventilation., Good work practice required.

Organisational measures to prevent /limit releases, dispersion and exposure
Ensure operatives are trained to minimise exposures.

Conditions and measures related to personal protection, hygiene and health evaluation
For personal protection see section 8.

The life science business of Merck operates as MilliporeSigma in the US and Canada

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC1	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	0,035 mg/m³	0
PROC1	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	0,034 mg/kg BW/d	0,003

*Risk characterisation ratio

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

---

1. Short title of Exposure Scenario: Industrial use

Main User Groups : **SU 3**
Sectors of end-use : **SU0**
Process categories : **PROC2, PROC4, PROC8b, PROC10**
Environmental Release Categories : **ERC4:**

2. Exposure scenario

2.1 Contributing scenario controlling environmental exposure for: ERC4

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.2 Contributing scenario controlling worker exposure for: PROC2, PROC4, PROC8b, PROC10

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Liquid substance

Frequency and duration of use

The life science business of Merck operates as MilliporeSigma in the US and Canada

Application duration : > 4 h
Frequency of use : 0 days/year

Other operational conditions affecting workers exposure
Outdoor / Indoor : Indoor

Technical conditions and measures
Provide adequate ventilation., Good work practice required.

Organisational measures to prevent /limit releases, dispersion and exposure
Ensure operatives are trained to minimise exposures.

Conditions and measures related to personal protection, hygiene and health evaluation
Use suitable eye protection and gloves., For personal protection see section 8.

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC2	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	88,47 mg/m³	0,503
PROC2	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	0,137 mg/kg BW/d	0,011
PROC4	ECETOC TRA	With Local Exhaust Ventilation	Dermal	0,686 mg/kg BW/d	0,057
PROC4	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	35,38 mg/m³	0,201
PROC8b	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	26,54 mg/m³	0,151
PROC8b	ECETOC TRA	With Local Exhaust Ventilation	Dermal	1,371 mg/kg BW/d	0,114

*Risk characterisation ratio

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk

The life science business of Merck operates as MilliporeSigma in the US and Canada

Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

1. Short title of Exposure Scenario: Industrial use

Main User Groups	:	**SU 3**
Sectors of end-use	:	**SU0**
Process categories	:	**PROC3, PROC15**
Environmental Release Categories	:	**ERC4:**

2. Exposure scenario

2.1 Contributing scenario controlling environmental exposure for: ERC4

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.2 Contributing scenario controlling worker exposure for: PROC3, PROC15

Product characteristics

Concentration of the Substance in Mixture/Article	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	:	Liquid substance

Frequency and duration of use

Application duration	:	1 - 4 h
Frequency of use	:	0 days/year

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor

Technical conditions and measures

Provide adequate ventilation., Good work practice required.

Organisational measures to prevent /limit releases, dispersion and exposure

Ensure operatives are trained to minimise exposures.

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection and gloves., For personal protection see section 8.

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

The life science business of Merck operates as MilliporeSigma in the US and Canada

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC3	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	0,021 mg/kg BW/d	0,002
PROC3	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	106,1 mg/m³	0,603
PROC15	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	106,1 mg/m³	0,603
PROC15	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	0,01 mg/kg BW/d	0,001

*Risk characterisation ratio

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

---

1. Short title of Exposure Scenario: Industrial use

Main User Groups : **SU 3**
Sectors of end-use : **SU8, SU9**
Process categories : **PROC1**
Environmental Release Categories : **ERC6a:**

2. Exposure scenario

2.1 Contributing scenario controlling environmental exposure for: ERC6a

Product characteristics
Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.2 Contributing scenario controlling worker exposure for: PROC1

Product characteristics
Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Liquid substance

Frequency and duration of use
Application duration : 1 - 4 h
Frequency of use : 0 days/year

Other operational conditions affecting workers exposure
Outdoor / Indoor : Indoor

The life science business of Merck operates as MilliporeSigma in the US and Canada

Technical conditions and measures
Provide adequate ventilation., Good work practice required.

Organisational measures to prevent /limit releases, dispersion and exposure
Ensure operatives are trained to minimise exposures.

Conditions and measures related to personal protection, hygiene and health evaluation
For personal protection see section 8.

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC1	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	0,035 mg/m³	0
PROC1	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	0,034 mg/kg BW/d	0,003

*Risk characterisation ratio

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

The life science business of Merck operates as MilliporeSigma in the US and Canada