

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006



METHYL TERTIARY BUTYL ETHER

Gen. Variant: SDS_FR

Version 1.6

Revision Date 01/08/2020

Print Date 01/28/2021

SDS No.: BE106

1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name : METHYL TERTIARY BUTYL ETHER
Synonyms : Methyl t-Butyl Ether (MTBE), Tert-Butyl Methyl Ether, MTBE
Substance name : Methyl Tertiary Butyl Ether
Substance No. : 216-653-1 (EINECS)
Chemical characterization : Alkyl ethers

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

Identified uses : Manufacture of substances; Use in a fuel; Formulation;
Distribution of substance; Use as intermediate; Use as a
process solvent and extraction agent

1.3 Details of the supplier of the safety data sheet

Company	Registration number	Telephone
Lyondell Chimie France S.A.S. Zone Industrielle Portuaire 13270 Fos sur Mer France	01-2119452786-27-0001	+31 10 275 5770
Lyondell Chemie Nederland, B.V. Delftseplein 27E 3013 AA Rotterdam Netherlands	01-2119452786-27-0000	31 (0) 10 275 55 00

E-mail address : product.safety@lyb.com
Responsible/issuing person

1.4 Emergency telephone number

Lyondell Chimie France S.A.S. +32 3 575 1235
Lyondell Chemie Nederland, B.V. +32 3 575 1235

Poison Center:

ORFILA (INRS)
FR: + 33 (0)1 45 42 59 59
24 hours all days

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2. Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Flammable liquids
Skin corrosion/irritation

Category 2: H225
Category 2: H315

2.2 Label elements

Labeling (REGULATION (EC) No 1272/2008)

Hazard pictograms :



Signal word : Danger

Hazard Statements : H225 Highly flammable liquid and vapour.
H315 Causes skin irritation.

Precautionary Statements : **Prevention:**
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P243 Take precautionary measures against static discharge.
P280 Wear protective gloves/ eye protection/ face protection.

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

Storage:
P403 + P235 Store in a well-ventilated place. Keep cool.

2.3 Other hazards

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This substance is not considered to be persistent, bioaccumulating and toxic (PBT).
This substance is not considered to be very persistent and very bioaccumulating (vPvB).

3. Composition/information on ingredients

3.1 Substances

Components

Chemical name	CAS-No. EINECS-No. / ELINCS No./EC-No.	Weight %	Component Type
tert-butyl methyl ether	1634-04-4 216-653-1	>= 97.0 %	A
methanol	67-56-1 200-659-6	0.0 - 1.0 %	C

Key:

(A) Substance

(C) Impurity

4. First aid measures

4.1 Description of first-aid measures

General advice : Always observe self-protection methods
Move out of dangerous area.
Remove contaminated shoes and clothing.
Consult a physician.
Show this material safety data sheet to the doctor in attendance.
Aspiration into the lungs during swallowing or vomiting can cause lung damage, possibly leading to chronic lung dysfunction or death.

If inhaled : Remove victim to fresh air and keep at rest in a position comfortable for breathing.
Do not leave the victim unattended.
Keep patient warm and at rest.
Get immediate medical advice/ attention.
If breathing is difficult, give oxygen.
If unconscious, place in recovery position and seek medical advice.
If breathing has stopped, apply artificial respiration.

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- In case of skin contact : Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes.
If skin irritation persists, call a physician.
- In case of eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes.
Remove contact lenses, if present and easy to do. Continue rinsing.
Seek immediate medical attention, preferably an ophthalmologist.
- If swallowed : Rinse mouth with water.
If conscious, drink plenty of water.
Do NOT induce vomiting.
Aspiration may cause lung damage.
If vomiting does occur, have victim lean forward to reduce risk of aspiration.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
Get immediate medical advice/ attention.

4.2 Most important symptoms and effects, both acute and delayed

- Symptoms : If inhalation occurs signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest congestion, shortness of breath and/or fever.
Side effect onset may be delayed.
Overexposure may produce anesthetic or narcotic effects.
- Hazards : May be harmful if swallowed.
May be harmful if swallowed and enters airways.
Inhalation may cause CNS depression.

4.3 Indication of any immediate medical attention and special treatment needed

- Treatment : In case of ingestion, the stomach should be emptied by gastric lavage under qualified medical supervision.

5. Fire-fighting measures

5.1 Extinguishing media

- Suitable extinguishing media : SMALL FIRE: Use dry chemicals, CO2, water spray or alcohol-resistant foam. LARGE FIRE: Use water spray, water

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fog or alcohol-resistant foam.

Unsuitable extinguishing media : Do not use solid water stream - may spread fire.

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire fighting : Releases flammable vapors below normal ambient temperatures.
Flammable vapors may be heavier than air.
May travel long distances along the ground before igniting and flashing back to vapor source.
When mixed with air and exposed to ignition source, vapors can burn in open or explode if confined.
Move containers from fire area if it can be done without risk.
Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
Cool containers with flooding quantities of water until well after fire is out.
Do not use straight streams.
Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
Always stay away from tanks engulfed in fire.
For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

5.3 Advice for firefighters

Special protective equipment for fire-fighters : Wear positive pressure self-contained breathing apparatus (SCBA).
Structural firefighter's protective clothing will only provide limited protection.

Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment.
Ensure adequate ventilation.

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Evacuate personnel to safe areas.
Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

6.2 Environmental precautions

Environmental precautions : MTBE is highly volatile, partially water soluble and has only a minimal tendency to adhere to soil particles. Even small volumes can pose a threat to the environment and nearby water resources. Surface spills can reach groundwater through porous soil or cracked surfaces. All efforts should be made to prevent any leaks or spills, and to protect water resources. Where spills are possible, a comprehensive spill response plan should be developed and implemented. If a leak or spill reaches the groundwater, the groundwater may become contaminated. If the groundwater is a source of drinking water, the associated drinking water well(s) could become contaminated. MTBE can impart an unpleasant taste and odor to water at very low concentrations.

6.3 Methods and materials for containment and cleaning up

Methods for containment / : Highly flammable liquid.
Methods for cleaning up : Release can cause fire or explosion.
Eliminate all sources of ignition.
All equipment used when handling this product must be grounded.
Do not touch or walk through spilled material.
Stop leak if you can do it without risk.
Prevent entry into waterways, sewers, basements or confined areas.
A vapor suppressing foam may be used to reduce vapors.
Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
Use clean non-sparking tools to collect absorbed material.
Water spray may reduce vapor; but may not prevent ignition in closed spaces.
Dike large spills and place materials in salvage containers.

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7. Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Keep container tightly closed when not in use.
Extinguish all ignition sources.
Wear recommended personal protective equipment.
Containers must be properly grounded before beginning transfer.
All electrical equipment should be grounded and conform to applicable electric codes and regulatory requirements.
Check atmosphere for explosiveness and oxygen deficiencies.
Ensure adequate ventilation, especially in confined areas.
Observe precautions pertaining to confined space entry.
Use only non-sparking tools.
Carefully vent any internal pressure before removing closure.
Isolate, vent, drain, wash and purge systems or equipment before maintenance or repair.
Handle empty containers with care; vapor/residue may be flammable.
Avoid contact with incompatible agents.
Keep away from heat and sources of ignition.
Use special care to avoid static electric charges.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Store only in tightly closed, properly vented containers away from heat, sparks, open flame and strong oxidizing agents.
Soft steel; avoid most plastics, Viton and Flourel.
Store closed drums with bung in up position.
Vapor space above stored liquid may be flammable/explosive unless blanketed with inert gas.
Electrical installations / working materials must comply with the technological safety standards.
No smoking.
Do not puncture or incinerate containers.

7.3 Specific end use(s)

: See Section 1.2.

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8. Exposure controls/personal protection**8.1 Control parameters****Ingredients with workplace control parameters****Occupational Exposure Limits**

Components	CAS-No.	Type	Limit Value	Basis Revision Date	Additional Information
tert-butyl methyl ether	1634-04-4	TWA	50 ppm	US (ACGIH) 2012	
tert-butyl methyl ether	1634-04-4	STEL	100 ppm 367 mg/m3	2009/161/EU (EU) December 17, 2009	
tert-butyl methyl ether	1634-04-4	TWA	50 ppm 183.5 mg/m3	2009/161/EU (EU) December 17, 2009	
tert-butyl methyl ether	1634-04-4	VLCT	100 ppm 367 mg/m3	OEL (FR) July 2012	
	Remarks: restrictive limit				
tert-butyl methyl ether	1634-04-4	VME	50 ppm 183.5 mg/m3	OEL (FR) July 2012	
	restrictive limit				

Consult local authorities for acceptable exposure limits.

DN(M)EL : End Use: Workers
 Exposure routes: Inhalation
 Potential health effects: Acute effects
 Value: 357 mg/m3
 Local effects

DN(M)EL : End Use: Workers

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		Exposure routes: Skin contact Potential health effects: Long term Value: 5100 mg/kg bw/day Systemic effects
DN(M)EL	:	End Use: Workers Exposure routes: Inhalation Potential health effects: Long term Value: 178.5 mg/m3 Systemic effects
DN(M)EL	:	End Use: General Population Exposure routes: Inhalation Potential health effects: Acute effects Value: 214 mg/m3 Local effects
DN(M)EL	:	End Use: General Population Exposure routes: Inhalation Potential health effects: Long term Value: 53.6 mg/m3 Systemic effects
DN(M)EL	:	End Use: General Population Exposure routes: Skin contact Potential health effects: Long term Value: 3570 mg/kg bw/day Systemic effects
DN(M)EL	:	End Use: General Population Exposure routes: Ingestion Potential health effects: Long term Value: 7.1 mg/kg bw/day Systemic effects
PNEC	:	Fresh water Value: 5.1 mg/l Assessment factor -10
PNEC	:	Sea water Value: 0.26 mg/l Assessment factor -100
PNEC	:	Intermittent Releases Value: 47.2 mg/l Assessment factor -10
PNEC	:	Fresh water sediment Value: 23 mg/kg d.w.
PNEC	:	Sea sediment

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Value: 1.17 mg/kg d.w.

PNEC : Sewage Treatment Plant
Value: 71 mg/l
Assessment factor -10

PNEC : Soil
Value: 1.56 mg/kg dw
Assessment factor -100

8.2 Exposure controls

Engineering measures

Provide local exhaust or general room ventilation to minimize dust and/or vapor concentrations. Electrical equipment should be grounded and conform to applicable electrical code.

Personal protective equipment

Respiratory protection : If exposure exceeds the exposure limit(s), use respiratory equipment recommended or approved by appropriate local, state or international agency.
Wear a respirator conforming to EN 140 with type A filter or better.

Hand protection : Protective gloves complying with EN 374.
Wear chemical resistant gloves such as:
4H(tm)(PE/EVAL).
The suitability for a specific workplace should be discussed with the producers of the protective gloves.
Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye and face protection : Wear safety glasses. Where the opportunity for a splash or spray caused by high pressure or agitation of the material is possible, use a face shield and chemical goggles.

Skin and body protection : Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Use PPE that is chemical resistant to the product and prevents skin contact.
Fire retardant clothing is appropriate for routine occupational use.

Hygiene measures : Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics

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of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the hazards and/or potential hazards that may be encountered during use.

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Use good personal hygiene practices.

Wash hands before eating, drinking, smoking, or using toilet facilities.

Take off contaminated clothing and wash before reuse.

Handle in accordance with good industrial hygiene and safety practice.

Wash hands before breaks and at the end of workday.

Environmental exposure controls

General advice : See section 6.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	: liquid
Color	: clear colorless
Odor	: Turpentine-like odor.
Odor Threshold	: 0.053 ppm (based on 2-methylpentane)
Flash point	: -28 °C
Lower explosion limit	: ~ 2.5 vol%
Upper explosion limit	: ~ 15.1 vol%
Flammability (solid, gas)	: Not applicable
Oxidizing properties	: The substance or mixture is not classified as oxidizing.
Autoignition temperature	: ~ 460 °C

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Molecular weight	: 88.15 g/mol
Decomposition temperature	: not determined
Melting point/range	: -108.6 °C
Boiling point/boiling range	: 55.3 °C at 1013.0 hPa
Vapor pressure	: 330 hPa at 25 °C
Density	: ~ 0.74 g/cm ³ at 20 °C (Water = 1.0 at 4°C (39.2°F))
Water solubility	: 41.850 g/l at 20 °C
Partition coefficient: n-octanol/water	: log Pow: 1.06 at 20 °C
Viscosity, dynamic	: ~ 0.3 mPa.s at 25 °C
Viscosity, kinematic	: 0.464 mm ² /s at 20 °C
Relative vapor density	: ~ 3 at 20 °C (Air = 1.0)
Surface tension	: 18.1 mN/m at 40 °C Neat liquid 72.5 mN/m at 21.5 °C Aqueous solution
Explosive properties	: Not explosive

9.2 Other information

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Other information : No additional information available.

10. Stability and reactivity

10.1 Reactivity

May react with oxygen to form peroxides.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions : Not expected to occur.

10.4 Conditions to avoid

Conditions to avoid : Heat, sparks, open flame, other ignition sources, and oxidizing conditions.

10.5 Incompatible materials

Materials to avoid : Contact with strong acids can decompose this material and generate extremely flammable isobutylene.
Strong oxidizing agents.
May accumulate static electrical charges, and may cause ignition of the vapors

10.6 Hazardous decomposition products

Hazardous decomposition products : Combustion may produce oxides of carbon and other toxic gases.

Thermal decomposition : Note: Thermal decomposition may produce carbon monoxide and other toxic vapors.

11. Toxicological information

11.1 Information on toxicological effects

Product Summary : The below given information is based on the assessment of the product including impurities.

Acute toxicity

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- Acute oral toxicity** :
- Not classified
 - May be harmful if swallowed.
- : LD50: > 3,800 mg/kg
- Species: Rat
- Test substance: Methyl tertiary butyl ether
- Acute inhalation toxicity** :
- Based on acute toxicity values, not classified.
- : LC50: > 20 mg/l
- Exposure time: 4 HOURS
- Species: Rat
- Acute dermal toxicity** :
- Based on acute toxicity values, not classified.
- : LD50: > 2,000 mg/kg
- Species: Rat
- Skin corrosion/irritation** :
- Classified
 - Causes skin irritation.
 - Based on CLP classification
- Serious eye damage/eye irritation** :
- Based on eye irritation values, not classified.
- Respiratory or skin sensitization** :
- Skin sensitization
 - Not classified
 - No adverse effect observed.
- : Respiratory sensitization
- Not classified
 - No study available.
- Chronic toxicity**

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Carcinogenicity : Not classified
No adverse effect observed.

Germ cell mutagenicity : Not classified
No adverse effect observed.

Reproductive toxicity

Effects on fertility / : Not classified
Effects on or via lactation : No adverse effect observed.

Effects on Development : Not classified
No adverse effect observed.

Target Organ Systemic Toxicant - Single exposure

: Based on single exposure toxicity values, not classified.

Target Organ Systemic Toxicant - Repeated exposure

: Based on repeated exposure toxicity values, not classified.

Aspiration hazard : Not classified
May be harmful if swallowed and enters airways.

12. Ecological information

12.1 Ecotoxicology Assessment

Short-term (acute) aquatic hazard : Based on acute aquatic toxicity values, not classified.

Long-term (chronic) aquatic hazard : Based on chronic aquatic toxicity values, not classified.

Toxicity to fish : Low acute toxicity to fish

Toxicity to daphnia and other aquatic invertebrates : Low acute toxicity to aquatic invertebrates.

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Toxicity to algae : Low toxicity to algae.

Toxicity to bacteria : Low toxicity to sewage microbes.

Toxicity to fish (Chronic toxicity) : Low chronic toxicity to fish.

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : Low chronic toxicity to aquatic invertebrates.

12.2 Persistence and degradability

Biodegradability : Inherently biodegradable.

: Biodegradation: 0 - 1.8 %
(After 28 days in a ready biodegradability test)

: May be degraded by adapted microorganisms in an adapted sewage treatment plant under aerobic conditions.

Stability in water : Not expected to hydrolyze readily.

Stability in soil : Low potential for soil adsorption expected

12.3 Bioaccumulative potential

Bioaccumulation : Low potential for bioaccumulation.

: Bioconcentration factor (BCF): 1.5

12.4 Mobility in soil

Distribution among environmental compartments : Level I fugacity modelling shows that 93.9% of MTBE partitions to the atmosphere.

12.5 Results of PBT and vPvB assessment

Result : This substance is not considered to be persistent, bioaccumulating and toxic (PBT)., This substance is not

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considered to be very persistent and very bioaccumulating (vPvB).

12.6 Other adverse effects

Environmental fate and pathways

: As a VOC, MTBE can contribute to the formation of photochemical smog in the presence of other VOC's. MTBE presents a potential concern to groundwater supplies. If released to the environment, relatively small amounts of MTBE may impart an unpleasant and distasteful odor and taste to groundwater which can render such groundwater unsuitable for consumption. Therefore, care should be used when handling, storing or transferring MTBE or gasoline blended with MTBE to insure that such product is not released into the environment and is not allowed to migrate to groundwater. Because of its solubility in water (4.3%) and relatively low organic carbon partitioning coefficient ($K_{oc}=9.1$), MTBE is mobile in soil and, accordingly, every release into the environment has the potential for damaging groundwater supplies. Once in the groundwater, MTBE may migrate faster and farther than most other hydrocarbons and may be present at the leading edge of a groundwater contaminant plume. MTBE may not biodegrade as promptly as other gasoline constituents and may require additional and more costly remediation procedures. Other information regarding MTBE is available through the Chemical Abstracts Service, American Petroleum Institute publications, the U.S. Environmental Protection Agency and elsewhere.

12.7 Other information

Additional ecological information

: No additional information available.

13. Disposal considerations

13.1 Waste treatment methods

Product

: Contaminated product, soil or water may be hazardous waste due to potentially low flash point.
Comply with applicable local, state or international regulations

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concerning solid or hazardous waste disposal and/or container disposal.
Assure effluent complies with applicable regulations.
Landfill solids at permitted sites.
Use registered transporters.
Burn concentrated liquids in systems designed for low flash point material.
Avoid flame-outs.
Assure emissions comply with applicable regulations.
Avoid overloading/poisoning plant biomass.
Dilute aqueous waste may biodegrade.

14. Transport information

ADR

UN number : 2398
UN proper shipping name : METHYL tert-BUTYL ETHER
Transport hazard class(es) : 3
Packing group : II
Classification Code : F1
Hazard Identification Number : 33
Labels : 3
Tunnel restriction code : D/E
Environmentally hazardous : no

ADN

UN number : 2398
UN proper shipping name : METHYL TERT-BUTYL ETHER
Transport hazard class(es) : 3
Packing group : II
Classification Code : F1
Labels : 3
Environmentally hazardous : no

IMDG

UN number : 2398
Description of the goods : METHYL TERT-BUTYL ETHER
Class : 3
Packing group : II

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Labels : 3
EmS Number 1 : F-E
EmS Number 2 : S-D

Marine pollutant : no

RID

UN number : 2398
Description of the goods : METHYL TERT-BUTYL ETHER
Transport hazard class(es) : 3
Packing group : II
Classification Code : F1
Hazard Identification Number : 33
Labels : 3
Environmentally hazardous : no

BLG (MARPOL Annex II)

Description of the goods : METHYL TERT-BUTYL ETHER
Pollution category : Z
Ship type : 3

IATA

: Not Supported
: If transportation information is required, please contact
Logistics Compliance at: dangerousgoods@lyb.com

15. Regulatory information

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

US (ACGIH) : Confirmed animal carcinogen with unknown relevance to humans.

Occupational Illnesses (R-461-3, France) : Health effects caused by professional use of liquid organic solvents (indicated in the table).

International Agency for Research on Cancer : Not Classifiable
Monograph 73 [1999]

REACH Annex XVII

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This product contains an ingredient listed in Annex XVII of the REACH Regulation 1907/2006/EC.

Component	CASRN	Remarks
Methanol	67-56-1	Use restricted. See item 69.

REACH status

If the product has been purchased from any company of the LyondellBasell group of companies registered in the European Union, we confirm that the chemical substance in this product has been registered under REACH, in accordance with the deadlines set forth in REACH. (Regulation (EU) No. 1907/2006)

Other international regulations

Global Inventory Status

The ingredients of this product are compliant with the following chemical inventory requirements or exemptions.

*Additional Explanatory Status Statements follow the table, as necessary.

Country/Region	Inventory	Status Description
Australia	AICS	Compliant
Canada	DSL	Compliant
China	IECSC	Compliant
Europe	REACH	See REACH Compliance Statement
Japan	ENCS	Compliant
Korea	KECI	Compliant
New Zealand	NZIoC	Compliant
Philippines	PICCS	Compliant
United States of America	TSCA	Compliant
Taiwan	TCSCA	Compliant

Contact product.safety@lyb.com for additional global inventory information.

15.2 Chemical safety assessment

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

16. OTHER INFORMATION

Material safety datasheet sections which have been updated:

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Material safety datasheet sections which have been updated:

Revised Section(s): exposure scenarios

Full text of H-Statements referred to under sections 2 and 3.

H225 Highly flammable liquid and vapour.
H315 Causes skin irritation.

Abbreviations and Acronyms

ACGIH - American Conference of Governmental Industrial Hygienists
ACGIH_BEIs - American Conference of Governmental Industrial Hygienists_Biological Exposure Indices
ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road
AICS - Australian Inventory of Chemical Substances
ASTM - American Society for Testing and Materials
BEL - Biological Exposure Limits
BTEX - Benzene, Toluene, Ethylbenzene, Xylenes
CAS - Chemical Abstracts Service
CEFIC - European Chemical Industry Council
CLP - Classification Packaging and Labelling
COC - Cleveland Open-Cup
CS - Consumer Scenario
DIN - Deutsches Institut für Normung
DN(M)EL - Derived No (Minimal) Effect Level
DSL - Canada Domestic Substance List
EC - European Commission
EC50 - Median Effective Concentration
ECETOC - European Center on Ecotoxicology and Toxicology of Chemicals
ECHA - European Chemicals Agency
EL50 - Effective Loading fifty
ELINCS - EHR-Lab Interoperability and Connectivity Specification
ENCS - Japanese Existing and New Chemical Substances Inventory
ERC - Environmental Release Category
EUSES - European Union System for the Evaluation of Substances
EWC - European Waste Code
GHS - Globally Harmonized System of Classification and Labelling of Ch
IARC - International Agency for Research on Cancer
IATA - International Air Transport Association
IC50 - Inhibitory Concentration fifty IL50 = Inhibitory Level fifty
IMDG - International Maritime Dangerous Goods
IECSC - Chinese Chemicals Inventory
IOELV - Indicative Occupational Exposure Limit Values
IP346 - Institute of Petroleum test method N° 346 for the determination of polycyclic aromatics
DMSO-extractables

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KECI - Korea Existing Chemicals Inventory
Koc - Organic Carbon/Water Partition Coefficient
LC50 - Lethal Concentration fifty
LD50 - Lethal Dose fifty per cent.
LL/EL/IL - Lethal Loading/Effective Loading/Inhibitory Loading
LL50 - Lethal Loading fifty
MAK Commission - Permanent Senate Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area
MARPOL - International Convention for the Prevention of Pollution from Ships
No. - Number
NOEC/NOEL - No Observed Effect Concentration / No Observed Effect Level
NZIoC - New Zealand Inventory of Chemicals
OE_HP - Occupational Exposure - High Production Volume
OECD - Organization for Economic Co-operation and Development
OEL - Occupational Exposure Limit
PBT - Persistent, Bio accumulative and Toxic
PICCS - Philippine Inventory of Chemicals and Chemical Substances
PNEC - Predicted No Effect Concentration
PPE - Personal Protective Equipment
PROC - Process Category
QSAR - Quantitative Structure-Activity Relationship
REACH - Registration Evaluation and Authorization of Chemicals
RID - Regulations Relating to International Carriage of Dangerous Goods by Rail
SDS - Safety Data Sheet
SKIN_DES - Skin Designation
STEL - Short term exposure limit
STP - Standard Temperature and Pressure
TSCA - Taiwan inventory of chemicals
TGD - Technical Guidance Document
TRA - Targeted Risk Assessment
TSCA - US Toxic Substances Control Act
TWA - Time-Weighted Average
UN - United Nations
vPvB - very Persistent and very Bioaccumulative
WGK - German Water Endangerment Class

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Numerical Data Presentation

The presentation of numerical data, such as that used for physical and chemical properties and toxicological values, is expressed using a comma (,) to separate digits into groups of three and a period (.) as the decimal marker. For example, 1,234.56 mg/kg = 1 234,56 mg/kg.

Language Translations

The information presented in this document has been translated from English by a vendor LyondellBasell believes to be reliable. LyondellBasell and its vendor have made a good-faith effort to verify the accuracy of the translation, but assume no liability or other responsibility for any errors that may have occurred. Please refer to our web site (www.lyondellbasell.com) for the original document written in English.

End of Material Safety Data Sheet

Section 1: Title of Exposure Scenario

Short title Manufacture of substances

Use Descriptors

Sector of use:

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites

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Process category:

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

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

PROC15: Use as laboratory reagent

Environmental release category:

ERC1: Manufacture of substances

Processes, tasks activities covered

GES1_I: Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.

Section 2: Operational conditions and risk management measures

Section 2.1: Control of environmental exposure

Product characteristics

Physical Form (at time of use) Liquid, vapour pressure > 10 kPa

Water solubility Substance is a unique structure

Predominantly hydrophobic

Biodegradability Readily biodegradable.

Amount used

Fraction of EU tonnage used in region 0.25

Regional production volume 967108 kg/day

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Frequency and duration of use

Continuous process

300 days per year of operation.

Environment factors not influenced by risk management

Dilution Factor (River) 10

Dilution Factor (Coastal Areas) 100

Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air 5E-03

Emission or Release Factor: Water 1E-02

Emission or Release Factor: Soil 1E-04

Remarks Fraction of main source: 0.4

Technical conditions and measures / Organizational measures

No air emission controls required; required removal efficiency is 0%.
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of $\geq 99\%$
Soil emission controls are not applicable as there is no direct release to soil.
Prevent discharge of undissolved substance to or recover from onsite wastewater.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via domestic sewage treatment: 99%.
Assumed domestic sewage treatment plant flow (m³/d): 2000.

Conditions and measures related to external treatment of waste for disposal

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External treatment and disposal of waste should comply with applicable local and/or national regulations

Conditions and measures related to external recovery of waste

External recovery and recycling of waste should comply with applicable local and/or national regulations

Other environmental control measures additional to above

None

Section 2.2: Control of worker exposure

Product characteristics

Physical Form (at time of use) Liquid, vapour pressure > 10 kPa

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

Amount used

Remarks Not applicable.

Frequency and duration of use

Remarks Covers daily exposures up to 8 hours (unless stated differently).
Continuous process

Human factors not influenced by risk management

None

Other operational conditions affecting workers exposure

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Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature. Outdoor use Common practices vary across sites thus conservative process release estimates used.

Contributing scenario controlling worker exposure for:

Risk Management Measures

G19: General measures (skin irritants)

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off skin contamination immediately. Provide basic employee training to prevent / minimize exposures and to report any skin effects that may develop.

CS15: General exposures (closed systems)

No specific measures identified.

CS15: General exposures (closed systems) CS56: with sample collection

Ensure operation is undertaken outdoors.

CS15: General exposures (closed systems) CS37: Use in contained batch processes CS56: with sample collection

Provide extraction ventilation at points where emissions occur.

CS16: General exposures (open systems) CS55: Batch process CS56: with sample collection CS45: Filling/preparation of equipment from drums or containers.

Ensure material transfers are under containment or extract ventilation.

CS2: Process sampling CS81: Dedicated facility

Avoid carrying out activities involving exposure for more than 1 hour.
Provide extraction ventilation at points where emissions occur.

CS36: Laboratory activities CS47: Cleaning CS50: Wiping CS51: Rolling, Brushing

Handle in a fume cupboard or under extract ventilation.

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CS501: Bulk closed loading
and unloading CS81:
Dedicated facility

Avoid carrying out activities involving exposure for more than 4 hours.
or;
Wear a respirator conforming to EN140 with Type A filter or better.

CS39: Equipment cleaning
and maintenance CS82:
Non-dedicated facility

Avoid carrying out activities involving exposure for more than 4 hours.
or;
Wear a respirator conforming to EN140 with Type A filter or better.
Drain down and flush system prior to equipment opening or maintenance.

CS67: Material storage
CS15: General exposures
(closed systems)

No specific measures identified.

CS67: Material storage
CS15: General exposures
(closed systems) CS56: with
sample collection

Avoid carrying out activities involving exposure for more than 4 hours.
or;
Wear a respirator conforming to EN140 with Type A filter or better.

Section 3: Exposure estimation and reference to its source

Health ECETOC TRA worker v3

Environment Used the EUSES model

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

Health No additional remarks.

Environment Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Section 1: Title of Exposure Scenario

Short title Formulation & (re)packing of substance and mixtures

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Use Descriptors

Sector of use:

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites

Process category:

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

PROC5: Mixing or blending in batch processes for formulation of preparations and articles (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)

PROC15: Use as laboratory reagent

Environmental release category:

ERC2: Formulation of preparations

: ESVOC SpERC 2.2v1

Processes, tasks activities covered

Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, large and small scale packing, maintenance and associated laboratory activities

Section 2: Operational conditions and risk management measures

Section 2.1: Control of environmental exposure

Product characteristics

Physical Form (at time of use) Liquid, vapour pressure > 10 kPa

Water solubility Substance is a unique structure

Predominantly hydrophobic

Biodegradability Readily biodegradable.

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Amount used

Regional tonnage	659000 tonnes/year
Fraction of EU production volume for region	0.25
Fraction of tonnage for application	0.985
Fraction of chemical in formulation	0.15

Frequency and duration of use

Continuous process

300 days per year of operation.

Environment factors not influenced by risk management

Dilution Factor (River)	10
Dilution Factor (Coastal Areas)	100

Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air	2.50E-02
Emission or Release Factor: Water	5.00E-03
Emission or Release Factor: Soil	1.00E-04
Remarks	Fraction of main source: 0.05

Technical conditions and measures / Organizational measures

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No air emission controls required; required removal efficiency is 0%.
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of $\geq 99\%$ Assume industrial waste water treatment plant flow (m3/d): 2000.
Soil emission controls are not applicable as there is no direct release to soil.
Prevent discharge of undissolved substance to or recover from onsite wastewater.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via domestic sewage treatment: 99%.
Assumed domestic sewage treatment plant flow (m3/d): 2000.

Conditions and measures related to external treatment of waste for disposal

External treatment and disposal of waste should comply with applicable local and/or national regulations

Conditions and measures related to external recovery of waste

External recovery and recycling of waste should comply with applicable local and/or national regulations

Other environmental control measures additional to above

None

Section 2.2: Control of worker exposure

Product characteristics

Physical Form (at time of use) Liquid, vapour pressure > 10 kPa

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

Amount used

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Remarks Not applicable.

Frequency and duration of use

Remarks Covers daily exposures up to 8 hours (unless stated differently).

Continuous process

Human factors not influenced by risk management

None

Other operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature. Outdoor use Common practices vary across sites thus conservative process release estimates used.

Contributing scenario controlling worker exposure for:

Risk Management Measures

G19: General measures (skin irritants)

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off skin contamination immediately. Provide basic employee training to prevent / minimize exposures and to report any skin effects that may develop.

CS15: General exposures (closed systems)

No specific measures identified.

CS15: General exposures (closed systems) CS56: with sample collection

Provide a good standard of general or controlled ventilation (3 to 5 air changes per hour).

CS15: General exposures (closed systems) CS37: Use in contained batch processes CS56: with sample collection

Provide extraction ventilation at points where emissions occur.

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CS16: General exposures (open systems) CS55: Batch process CS56: with sample collection CS45: Filling/ preparation of equipment from drums or containers.

Provide extraction ventilation at points where emissions occur.

CS16: General exposures (open systems) CS136: Batch processes at elevated temperatures CS56: with sample collection

Provide extraction ventilation at points where emissions occur.
Formulate in enclosed or ventilated mixing vessels

CS2: Process sampling

Avoid carrying out activities involving exposure for more than 15 minutes.
or;
Wear a respirator conforming to EN140 with Type A filter or better.
Provide extraction ventilation at points where emissions occur.

CS36: Laboratory activities CS47: Cleaning CS50: Wiping CS51: Rolling, Brushing

Handle in a fume cupboard or under extract ventilation.

CS14: Bulk transfers CS81: Dedicated facility : (e.g. Road/rail car bottom loading/unloading; marine vessel/barge loading/unloading;)

Provide extract ventilation to material transfer points and other openings.

CS30: Mixing operations (open systems) CS55: Batch process

Provide extraction ventilation at points where emissions occur.

CS34: Manual CS22: Transfer from/pouring from containers CS82: Non-dedicated facility

Avoid carrying out activities involving exposure for more than 1 hour.
or;
Wear a respirator conforming to EN140 with Type A filter or better.
Ensure material transfers are under containment or extract ventilation.

CS8: Drum/batch transfers

Avoid carrying out activities involving exposure for more than

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CS81: Dedicated facility
1 hour.
or;
Wear a respirator conforming to EN140 with Type A filter or better.
Minimize exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.
Use drum pumps.

CS6: Drum and small package filling CS81: Dedicated facility
Fill containers/cans at dedicated filling points supplied with local extract ventilation.
Use drum pumps.

CS39: Equipment cleaning and maintenance CS82: Non-dedicated facility
Avoid carrying out activities involving exposure for more than 4 hours.
or;
Wear a respirator conforming to EN140 with Type A filter or better.
Drain down and flush system prior to equipment opening or maintenance.

CS67: Material storage
CS15: General exposures (closed systems)
No specific measures identified.

CS67: Material storage
CS15: General exposures (closed systems) CS56: with sample collection
Avoid carrying out activities involving exposure for more than 4 hours.
or;
Wear a respirator conforming to EN140 with Type A filter or better.

Section 3: Exposure estimation and reference to its source

Health ECETOC TRA worker v3

Environment Used the EUSES model
ESVOC SpERC 4

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

Health No additional remarks.

Environment Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define

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appropriate site-specific risk management measures
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional
RMMs or a site-specific chemical safety assessment is required.
Further details on scaling and control technologies are provided in SpERC
factsheet

Section 1: Title of Exposure Scenario

Short title Use as intermediate

Use Descriptors

Sector of use:

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites

Process category:

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

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

PROC15: Use as laboratory reagent

Environmental release category:

ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

: ESVOC SpERC 6.1a.v1

Processes, tasks activities covered

GES1B_I: Use of substance as an intermediate (not related to Strictly Controlled Conditions).

Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory
activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk
container).

Section 2: Operational conditions and risk management measures

Section 2.1: Control of environmental exposure

Product characteristics

Physical Form (at time of use) Liquid, vapour pressure > 10 kPa

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Water solubility

Substance is a unique structure

Predominantly hydrophobic

Biodegradability

Readily biodegradable.

Amount used

Regional use tonnage (tonnes/year) 8030

Fraction of EU tonnage used in region 0.25

Fraction of tonnage for application 0.012

Fraction of chemical in formulation 1

Frequency and duration of use

Continuous process

300 days per year of operation.

Environment factors not influenced by risk management

Dilution Factor (River) 10

Dilution Factor (Coastal Areas) 100

Other given operational conditions affecting environmental exposure

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Emission or Release Factor: Air 5.00E-03

Emission or Release Factor: Water 1.00E-02

Emission or Release Factor: Soil 1.00E-03

Remarks Fraction of main source: 1.0

Technical conditions and measures / Organizational measures

No air emission controls required; required removal efficiency is 0%.
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of $\geq 90\%$ Assume industrial waste water treatment plant flow (m3/d): 2000.
Soil emission controls are not applicable as there is no direct release to soil.
Prevent discharge of undissolved substance to or recover from wastewater

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via domestic sewage treatment 90%
Assumed domestic sewage treatment plant flow (m3/d): 2000.

Conditions and measures related to external treatment of waste for disposal

External treatment and disposal of waste should comply with applicable local and/or national regulations

Conditions and measures related to external recovery of waste

External recovery and recycling of waste should comply with applicable local and/or national regulations

Other environmental control measures additional to above

None

Section 2.2: Control of worker exposure

Product characteristics

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Physical Form (at time of use)

Liquid, vapour pressure > 10 kPa

Concentration of the Substance in Mixture/Article

Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Amount used

Remarks

Not applicable.

Frequency and duration of use

Remarks

Covers daily exposures up to 8 hours (unless stated differently).
Continuous process

Human factors not influenced by risk management

None

Other operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature. Outdoor use Common practices vary across sites thus conservative process release estimates used.

Contributing scenario controlling worker exposure for:

Risk Management Measures

G19: General measures (skin irritants)

Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimize exposures and to report any skin problems that may develop.

CS15: General exposures (closed systems)

No specific measures identified.

CS15: General exposures

Ensure operation is undertaken outdoors.

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(closed systems) CS56: with sample collection

CS15: General exposures (closed systems) CS37: Use in contained batch processes CS56: with sample collection

Provide extraction ventilation at points where emissions occur.

CS16: General exposures (open systems) CS55: Batch process CS56: with sample collection CS45: Filling/preparation of equipment from drums or containers.

Ensure material transfers are under containment or extract ventilation.

CS2: Process sampling CS81: Dedicated facility

Avoid carrying out activities involving exposure for more than 1 hour.
Provide extraction ventilation at points where emissions occur.

CS36: Laboratory activities CS47: Cleaning CS50: Wiping CS51: Rolling, Brushing

Handle in a fume cupboard or under extract ventilation.

CS501: Bulk closed loading and unloading CS81: Dedicated facility

Avoid carrying out activities involving exposure for more than 4 hours.
or;
Wear a respirator conforming to EN140 with Type A filter or better.

CS39: Equipment cleaning and maintenance CS82: Non-dedicated facility

Avoid carrying out activities involving exposure for more than 4 hours.
or;
Wear a respirator conforming to EN140 with Type A filter or better.
Drain down and flush system prior to equipment opening or maintenance.

CS67: Material storage CS14: Bulk transfers

No specific measures identified.

CS67: Material storage CS15: General exposures (closed systems) CS55: Batch process

Avoid carrying out activities involving exposure for more than 4 hours.
or;
Wear a respirator conforming to EN140 with Type A filter or

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better.

Section 3: Exposure estimation and reference to its source

Health ECETOC TRA worker v3

Environment Used the EUSES model
ESVOC SpERC 2

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

Health No additional remarks.

Environment Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.
Further details on scaling and control technologies are provided in SpERC factsheet

Section 1: Title of Exposure Scenario

Short title Use as process solvent or extraction agent

Use Descriptors

Sector of use:

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites

Process category:

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

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

PROC15: Use as laboratory reagent

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Environmental release category:

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

: ESVOC SPERC 4.24.v1

Processes, tasks activities covered

Use as a process solvent and extraction agent

Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

Section 2: Operational conditions and risk management measures

Section 2.1: Control of environmental exposure

Product characteristics

Physical Form (at time of use) Liquid, vapour pressure > 10 kPa

Water solubility Substance is a unique structure

Predominantly hydrophobic

Biodegradability Readily biodegradable.

Amount used

Fraction of EU tonnage used in region 0.25

Regional use tonnage (tonnes/year) 2010

Fraction of tonnage for application 0.003

Fraction of chemical in formulation 1

Frequency and duration of use

Continuous process

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20 days per year of operation.

Environment factors not influenced by risk management

Dilution Factor (River) 10

Dilution Factor (Coastal Areas) 100

Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air 2.50E-02

Emission or Release Factor: Water 2.00E-02

Emission or Release Factor: Soil 1.00E-04

Remarks Fraction of main source: 0.3

Technical conditions and measures / Organizational measures

No air emission controls required; required removal efficiency is 0%.
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of $\geq 99\%$. Assume industrial waste water treatment plant flow (m³/d): 2000.
Prevent discharge of undissolved substance to or recover from onsite wastewater.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via domestic sewage treatment: 99%.
Assumed domestic sewage treatment plant flow (m³/d): 2000.

Conditions and measures related to external treatment of waste for disposal

External treatment and disposal of waste should comply with applicable local and/or national regulations

Conditions and measures related to external recovery of waste

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External recovery and recycling of waste should comply with applicable local and/or national regulations

Other environmental control measures additional to above

None

Section 2.2: Control of worker exposure

Product characteristics

Physical Form (at time of use) Liquid, vapour pressure > 10 kPa

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

Amount used

Remarks Not applicable.

Frequency and duration of use

Remarks Covers daily exposures up to 8 hours (unless stated differently).
Continuous process

Human factors not influenced by risk management

None

Other operational conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature. Assumes a good basic standard of occupational hygiene is implemented. Outdoor use Common practices vary across sites thus conservative process release estimates used.

**Contributing scenario
controlling worker**

Risk Management Measures

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exposure for:

G19: General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off skin contamination immediately. Provide basic employee training to prevent / minimize exposures and to report any skin effects that may develop.
CS15: General exposures (closed systems)	No specific measures identified.
CS15: General exposures (closed systems) CS56: with sample collection	Ensure operation is undertaken outdoors.
CS15: General exposures (closed systems) CS37: Use in contained batch processes CS56: with sample collection	Provide extraction ventilation at points where emissions occur.
CS16: General exposures (open systems) CS55: Batch process CS56: with sample collection CS45: Filling/ preparation of equipment from drums or containers.	Ensure material transfers are under containment or extract ventilation.
CS2: Process sampling CS81: Dedicated facility	Avoid carrying out activities involving exposure for more than 1 hour. Provide extraction ventilation at points where emissions occur.
CS36: Laboratory activities CS47: Cleaning CS50: Wiping CS51: Rolling, Brushing	Handle in a fume cupboard or under extract ventilation.
CS501: Bulk closed loading and unloading CS81: Dedicated facility	Avoid carrying out activities involving exposure for more than 4 hours. or; Wear a respirator conforming to EN140 with Type A filter or better.
CS39: Equipment cleaning	Avoid carrying out activities involving exposure for more than

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and maintenance CS82:
Non-dedicated facility

4 hours.
or;
Wear a respirator conforming to EN140 with Type A filter or better.
Drain down and flush system prior to equipment opening or maintenance.

CS67: Material storage
CS15: General exposures
(closed systems)

No specific measures identified.

CS67: Material storage
CS15: General exposures
(closed systems) CS56: with
sample collection

Avoid carrying out activities involving exposure for more than 4 hours.
or;
Wear a respirator conforming to EN140 with Type A filter or better.

Section 3: Exposure estimation and reference to its source

Health ECETOC TRA worker v3

Environment Used the EUSES model
ESIG SpERC 38

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

Health No additional remarks.

Environment Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.
Further details on scaling and control technologies are provided in SpERC factsheet

Section 1: Title of Exposure Scenario

Short title Distribution of substance

Use Descriptors

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Sector of use:

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites

Process category:

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

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)

PROC15: Use as laboratory reagent

Environmental release category:

ERC1: Manufacture of substances

ERC2: Formulation of preparations

: ESVOC SpERC 1.1b.v1

Processes, tasks activities covered

GES1A_I: Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.

Section 2: Operational conditions and risk management measures

Section 2.1: Control of environmental exposure

Product characteristics

Physical Form (at time of use) Liquid, vapour pressure > 10 kPa

Water solubility Substance is a unique structure

Predominantly hydrophobic

Biodegradability Readily biodegradable.

Amount used

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Regional tonnage (tonnes per year) - transport 659000

Fraction of EU production volume for region - transport 0.25

Fraction of tonnage for application - transport 0.985

Fraction of chemical in formulation - transport 0.15

Regional tonnage (kg per day) - storage 8.4

Frequency and duration of use

Continuous process

300 days per year of operation.

Environment factors not influenced by risk management

Dilution Factor (River) 10

Dilution Factor (Coastal Areas) 100

Other given operational conditions affecting environmental exposure

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Emission or Release Factor: Air 1E-04

Emission or Release Factor: Water 1E-05

Emission or Release Factor: Soil 0E+00

Remarks
Transport
Fraction of main source: 0.05
Bulk product storage
Local release to air (kg/day): 0
Local release to waste water (kg/day): 8.4
Local release to soil (kg/day): 0
Fraction of main source: 1.0

Technical conditions and measures / Organizational measures

No air emission controls required; required removal efficiency is 0%.
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%): Transport: 95. Storage: 99.
Assume industrial waste water treatment plant flow (m³/d): 2000.
Soil emission controls are not applicable as there is no direct release to soil.
Prevent discharge of undissolved substance to or recover from onsite wastewater.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via domestic sewage treatment (%): Transport: 95.
Storage: 99.
Assumed domestic sewage treatment plant flow (m³/d): 2000.

Conditions and measures related to external treatment of waste for disposal

External treatment and disposal of waste should comply with applicable local and/or national regulations

Conditions and measures related to external recovery of waste

External recovery and recycling of waste should comply with applicable local and/or national regulations

Other environmental control measures additional to above

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None

Section 2.2: Control of worker exposure

Product characteristics

Physical Form (at time of use) Liquid, vapour pressure > 10 kPa

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

Amount used

Remarks Not applicable.

Frequency and duration of use

Remarks Covers daily exposures up to 8 hours (unless stated differently).
Continuous process

Human factors not influenced by risk management

Not applicable.

Other operational conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature. Assumes a good basic standard of occupational hygiene is implemented. Outdoor use Common practices vary across sites thus conservative process release estimates used.

Contributing scenario controlling worker exposure for:

Risk Management Measures

G19: General measures (skin irritants)

Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee

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training to prevent / minimize exposures and to report any skin problems that may develop.

CS15: General exposures
(closed systems)

No specific measures identified.

CS15: General exposures
(closed systems) CS56: with
sample collection

Ensure operation is undertaken outdoors.

CS15: General exposures
(closed systems) CS37: Use
in contained batch processes
CS56: with sample collection

Avoid carrying out activities involving exposure for more than
4 hours.
or;
Wear a respirator conforming to EN140 with Type A filter or
better.
Ensure operation is undertaken outdoors.

CS16: General exposures
(open systems) CS55: Batch
process CS56: with sample
collection CS45: Filling/
preparation of equipment
from drums or containers.

Provide extraction ventilation at points where emissions
occur.
Ensure samples are obtained under containment or extract
ventilation.

CS2: Process sampling

Avoid carrying out activities involving exposure for more than
15 minutes.
or;
Wear a respirator conforming to EN140 with Type A filter or
better.
Ensure operation is undertaken outdoors.

CS36: Laboratory activities
CS47: Cleaning CS50:
Wiping CS51: Rolling,
Brushing

Handle in a fume cupboard or under extract ventilation.

CS501: Bulk closed loading
and unloading CS81:
Dedicated facility

Avoid carrying out activities involving exposure for more than
1 hour.
or;
Wear a respirator conforming to EN140 with Type A filter or
better.
Ensure operation is undertaken outdoors.

CS503: bulk open loading
and unloading CS82: Non-
dedicated facility

Ensure material transfers are under containment or extract
ventilation.
or;

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Wear a respirator conforming to EN140 with Type A filter or better.

CS6: Drum and small package filling CS81: Dedicated facility

Use drum pumps.
Fill containers/cans at dedicated filling points supplied with local extract ventilation.

CS39: Equipment cleaning and maintenance CS82: Non-dedicated facility

Drain down and flush system prior to equipment opening or maintenance.

CS67: Material storage CS15: General exposures (closed systems)

No specific measures identified.

CS67: Material storage CS15: General exposures (closed systems) CS56: with sample collection

Ensure operation is undertaken outdoors.

Section 3: Exposure estimation and reference to its source

Health ECETOC TRA worker v3

Environment Used the EUSES model
ESVOC SpERC 3

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

Health No additional remarks.

Environment Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.
Further details on scaling and control technologies are provided in SpERC factsheet

Section 1: Title of Exposure Scenario

Short title Use in a fuel

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Use Descriptors

Sector of use:

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites

Process category:

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities

PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities

PROC16: Using material as fuel sources, limited exposure to unburned product to be expected

Environmental release category:

ERC6b: Industrial use of reactive processing aids

: ESVO C SpERC 7.12a.v1

Processes, tasks activities covered

GES12_I, GES12_P: Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

Section 2: Operational conditions and risk management measures

Section 2.1: Control of environmental exposure

Product characteristics

Physical Form (at time of use) Liquid, vapour pressure > 10 kPa

Water solubility Substance is a unique structure

Predominantly hydrophobic

Biodegradability Readily biodegradable.

Amount used

Regional use tonnage (tonnes/year) 659000

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Fraction of EU production volume for region 0.25

Fraction of tonnage for application 0.985

Average local daily tonnage (kg/d) 0.15

Frequency and duration of use

Continuous process

365 days per year of operation.

Environment factors not influenced by risk management

Dilution Factor (River) 10

Dilution Factor (Coastal Areas) 100

Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air 2.50E-03

Emission or Release Factor: Water 1.00E-05

Emission or Release Factor: Soil 0E+00

Remarks Fraction of main source: 0.02

Technical conditions and measures / Organizational measures

No air emission controls required; required removal efficiency is 0%.
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of $\geq 95\%$
No soil emission controls required; required removal efficiency is 0%.
Prevent discharge of undissolved substance to or recover from wastewater

Conditions and measures related to municipal sewage treatment plant

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Estimated substance removal from wastewater via domestic sewage treatment 95.0%
Assumed domestic sewage treatment plant flow (m3/d): 2000.

Conditions and measures related to external treatment of waste for disposal

External treatment and disposal of waste should comply with applicable local and/or national regulations

Conditions and measures related to external recovery of waste

External recovery and recycling of waste should comply with applicable local and/or national regulations

Other environmental control measures additional to above

None

Section 2.2: Control of worker exposure

Product characteristics

Physical Form (at time of use) Liquid, vapour pressure > 10 kPa

Concentration of the Substance in Mixture/Article Covers percentage substance in the product up to 15 %.

Amount used

Remarks Not applicable.

Frequency and duration of use

Remarks Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management

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None

Other operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature. Outdoor use Common practices vary across sites thus conservative process release estimates used.

Contributing scenario controlling worker exposure for:

Risk Management Measures

G19: General measures (skin irritants)

Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimize exposures and to report any skin problems that may develop.

CS14: Bulk transfers CS55: Batch process CS56: with sample collection CS45: Filling/ preparation of equipment from drums or containers.

Use vapor recovery units when necessary. Ensure material transfers are under containment or extract ventilation.

CS8: Drum/batch transfers CS45: Filling/ preparation of equipment from drums or containers. CS14: Bulk transfers CS81: Dedicated facility

Use drum pumps.

CS15: General exposures (closed systems)

No specific measures identified.

CS15: General exposures (closed systems) CS56: with sample collection

No specific measures identified.

CS15: General exposures (closed systems) CS37: Use in contained batch processes CS56: with sample collection

Avoid carrying out activities involving exposure for more than 4 hours.
or;
Wear a respirator conforming to EN140 with Type A filter or

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better.

CS511: use as a fuel (closed system)

No specific measures identified.

CS55: Batch process CS107: (closed systems)

Avoid carrying out activities involving exposure for more than 4 hours.
or;
Wear a respirator conforming to EN140 with Type A filter or better.

CS39: Equipment cleaning and maintenance CS82: Non-dedicated facility : e.g fuel pump repair indoor

Avoid carrying out activities involving exposure for more than 4 hours.
or;
Wear a respirator conforming to EN140 with Type A filter or better.
Drain down and flush system prior to equipment opening or maintenance.

CS67: Material storage
CS15: General exposures (closed systems)

No specific measures identified.

CS67: Material storage
CS15: General exposures (closed systems) CS56: with sample collection

Ensure operation is undertaken outdoors.

Section 3: Exposure estimation and reference to its source

Health ECETOC TRA worker v3

Environment Used the EUSES model
ESVOC SpERC 28

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

Health No additional remarks.

Environment Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional

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RMMs or a site-specific chemical safety assessment is required.
Further details on scaling and control technologies are provided in SpERC factsheet

Section 1: Title of Exposure Scenario

Short title Use in a fuel

Use Descriptors

Sector of use:

SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Process category:

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

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)

PROC16: Using material as fuel sources, limited exposure to unburned product to be expected

Environmental release category:

ERC8b: Wide dispersive indoor use of reactive substances in open systems

ERC8e: Wide dispersive outdoor use of reactive substances in open systems

SpERC 29: ESVOC SpERC 29

Processes, tasks activities covered

Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

Section 2: Operational conditions and risk management measures

Section 2.1: Control of environmental exposure

Product characteristics

Physical Form (at time of use) Liquid, vapour pressure > 10 kPa

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Water solubility

Substance is a unique structure

Predominantly hydrophobic

Biodegradability

Readily biodegradable.

Amount used

Regional tonnage 659000

Fraction of EU production volume for region 0.25

Fraction of tonnage for application 0.985

Fraction of chemical in formulation 0.15

Frequency and duration of use

Continuous process

365 days per year of operation.

Environment factors not influenced by risk management

Dilution Factor (River) 10

Dilution Factor (Coastal Areas) 100

Other given operational conditions affecting environmental exposure

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Emission or Release Factor: Air 1E-02

Emission or Release Factor: Water 5.00E-05

Emission or Release Factor: Soil 5.00E-05

Remarks Fraction of main source: 6.24E-04

Technical conditions and measures / Organizational measures

No air emission controls required; required removal efficiency is 0%.
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of $\geq 37\%$ Assume industrial waste water treatment plant flow (m3/d): 2000.
Soil emission controls are not applicable as there is no direct release to soil.
Prevent discharge of undissolved substance to or recover from wastewater

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via domestic sewage treatment 37%
Assumed domestic sewage treatment plant effluent flow is 2000 m3/d

Conditions and measures related to external treatment of waste for disposal

External treatment and disposal of waste should comply with applicable local and/or national regulations

Conditions and measures related to external recovery of waste

External recovery and recycling of waste should comply with applicable local and/or national regulations

Other environmental control measures additional to above

None

Section 2.2: Control of worker exposure

Product characteristics

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Physical Form (at time of use) Liquid, vapour pressure > 10 kPa

Concentration of the Substance in Mixture/Article Limit the substance content in the product to 15 %.

Amount used

Remarks Not applicable.

Frequency and duration of use

Remarks Covers daily exposures up to 8 hours (unless stated differently).
Continuous process

Human factors not influenced by risk management

Not applicable.

Other operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature. Outdoor use Common practices vary across sites thus conservative process release estimates used.

Contributing scenario controlling worker exposure for:

Risk Management Measures

G19: General measures (skin irritants)

Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimize exposures and to report any skin problems that may develop.

CS14: Bulk transfers CS55: Batch process CS45: Filling/ preparation of equipment from drums or containers.

Use vapor recovery units when necessary. Ensure material transfers are under containment or extract ventilation.

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CS8: Drum/batch transfers
CS45: Filling/ preparation of
equipment from drums or
containers. CS14: Bulk
transfers CS81: Dedicated
facility

Use vapor recovery units when necessary.
Ensure material transfers are under containment or extract
ventilation.

: Refuelling vehicles

Ensure operation is undertaken outdoors.

CS15: General exposures
(closed systems) CS56: with
sample collection

No specific measures identified.

CS15: General exposures
(closed systems) CS37: Use
in contained batch processes
CS56: with sample collection

Ensure operation is undertaken outdoors.

CS6: Drum and small
package filling CS81:
Dedicated facility

Avoid carrying out activities involving exposure for more than
1 hour.
or;
Wear a respirator conforming to EN140 with Type A filter or
better.
Use drum pumps or carefully pour from container.

CS511: use as a fuel (closed
system)

Ensure operation is undertaken outdoors.

CS39: Equipment cleaning
and maintenance CS82:
Non-dedicated facility : e.g
fuel pump repair indoor

Avoid carrying out activities involving exposure for more than
4 hours.
or;
Wear a respirator conforming to EN140 with Type A filter or
better.
Drain down system prior to equipment opening or
maintenance.

CS39: Equipment cleaning
and maintenance CS82:
Non-dedicated facility : e.g
fuel pump repair outdoor

Avoid carrying out activities involving exposure for more than
4 hours.
or;
Wear a respirator conforming to EN140 with Type A filter or
better.
Drain down system prior to equipment opening or
maintenance.

CS67: Material storage

No specific measures identified.

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CS15: General exposures
(closed systems)

Section 3: Exposure estimation and reference to its source

Health ECETOC TRA worker v3

Environment Used the EUSES model
ESIG SpERCs

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

Health No additional remarks.

Environment Not applicable for wide dispersive uses.

Section 1: Title of Exposure Scenario

Short title Use in a fuel

Use Descriptors

Sector of use:

SU21: Consumer uses

Product category:

PC13: Fuels

Environmental release category:

ERC8b: Wide dispersive indoor use of reactive substances in open systems

ERC8e: Wide dispersive outdoor use of reactive substances in open systems

SpERC 30: ESVOC SpERC 30

Processes, tasks activities covered

GES12_C: Covers consumer uses in liquid fuels

Section 2: Operational conditions and risk management measures

Section 2.1: Control of environmental exposure

Product characteristics

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Print Date 01/28/2021

SDS No.: BE106

Physical Form (at time of use) Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure

Water solubility Substance is a unique structure

Biodegradability Readily biodegradable.

Amount used

Regional tonnage 659000

Fraction of EU production volume for region 0.25

Fraction of tonnage for application 0.985

Fraction of chemical in formulation 0.15

Frequency and duration of use

Continuous process

365 days per year of operation.

Environment factors not influenced by risk management

Dilution Factor (River) 10

Dilution Factor (Coastal Areas) 100

Other given operational conditions affecting environmental exposure

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006



METHYL TERTIARY BUTYL ETHER

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Emission or Release Factor: Air 1E-02

Emission or Release Factor: Water 5E-05

Emission or Release Factor: Soil 5E-05

Remarks Fraction of main source: 6.24E-04

Technical conditions and measures / Organizational measures

No air emission controls required; required removal efficiency is 0%.
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of $\geq 37\%$ Assume industrial waste water treatment plant flow (m3/d): 2000.
Soil emission controls are not applicable as there is no direct release to soil.
Prevent discharge of undissolved substance to or recover from wastewater

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via domestic sewage treatment 37%
Assumed domestic sewage treatment plant effluent flow is 2000 m3/d

Conditions and measures related to external treatment of waste for disposal

External treatment and disposal of waste should comply with applicable local and/or national regulations

Conditions and measures related to external recovery of waste

External recovery and recycling of waste should comply with applicable local and/or national regulations

Other environmental control measures additional to above

None

Section 2.2: Control of consumer exposure

Product characteristics

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Concentration of the Substance in Mixture/Article Limit the substance content in the product to 15 %.

Amount used

Remarks See contributing scenarios below

Frequency and duration of use

Remarks See contributing scenarios below

Human factors not influenced by risk management

Contributing scenario controlling consumer exposure for:

Fuels Liquid: automotive refuelling

Operational conditions and risk management measures

Indoor / Outdoor

Covers outdoor use

Remarks:

For each use event, covers use amounts up to 37500 g
Covers use up to:
3 minutes per event.

Remarks:

Covers use up to:
1 times per week.

Remarks:

No specific RMMs identified beyond those OCs stated

Fuels Liquid: garden equipment - refuelling

Operational conditions and risk management measures

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lyondellbasell

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Indoor / Outdoor

Covers outdoor use

Remarks:

For each use event, covers
use amounts up to 750 g
Covers use up to:
2 minutes per event.

Remarks:

Covers use up to:
26 times per year.

Remarks:

No specific RMMs identified
beyond those OCs stated

Fuels Liquid: scooter refuelling

Operational conditions and risk management measures

Indoor / Outdoor

Covers outdoor use

Remarks:

For each use event, covers
use amounts up to 3750 g
Covers use up to:
2 minutes per event.

Remarks:

Covers use up to:
1 times per week.

Remarks:

No specific RMMs identified
beyond those OCs stated

Fuels Refueling of boats

Operational conditions and risk management measures

Indoor / Outdoor

Covers outdoor use

Remarks:

For each use event, covers
use amounts up to 225000 g
Covers use up to:
18 minutes per event.

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Remarks:

Covers use up to:
1 times per week.

Remarks:

No specific RMMs identified
beyond those OCs stated

Fuels Refueling of boats

Operational conditions and risk management measures

Indoor / Outdoor

Covers outdoor use

Remarks:

For each use event, covers
use amounts up to 127500 g
Covers use up to:
12 minutes per event.

Remarks:

Covers use up to:
1 times per week.

Remarks:

No specific RMMs identified
beyond those OCs stated

Section 3: Exposure estimation and reference to its source

Health

Based on ESIG GES Consumer with refined exposure modifiers from SCEDS.

Environment

Used the EUSES model

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

Health

Not applicable.

Environment

Not applicable for wide dispersive uses.