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

1.1 Product identifier

Trade name/designation	Dimethyl ether
Art-Nr(n).	2800, 70280
Substance name	dimethyl ether
INDEX No.	603-019-00-8
EC No.	204-065-8
REACH No.	01-2119472128-37
CAS No.	115-10-6

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

Sector of uses [SU]
SU3 Industrial uses
SU8 Manufacture of bulk, large scale chemicals (including petroleum products)
SU9 Manufacture of fine chemicals
SU10 Formulation [mixing] of preparations and/or re-packaging (excluding alloys)
SU21 Consumer uses: Private households (= general public = consumers)
SU22 Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Process categories [PROC]
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)
PROC7 Industrial spraying
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)
PROC11 Non industrial spraying
PROC12 Use of blowing agents in manufacture of foam
PROC14 Production of preparations or articles by tabletting, compression, extrusion, pelletisation
PROC15 Use as laboratory reagent

* **Environmental release categories [ERC]**
ERC1 Manufacture of substances
ERC2 Formulation into mixture
ERC4 Industrial use of processing aids in processes and products, not becoming part of articles
ERC6a Industrial use resulting in manufacture of another substance (use of intermediates)
ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)

* **Product Categories [PC]**
PC1 Adhesives, sealants
PC3 Air care products
PC4 Anti-Freeze and de-icing products
PC8 Biocidal products
PC9a Coatings and paints, thinners, paint removers
PC39 Cosmetics, personal care products

1.3 Details of the supplier of the safety data sheet

Supplier
GHC Gerling, Holz & Co. Handels GmbH
Ruhrstraße 113
D-22761 Hamburg
Telephone +49 40 853 123 0
E-mail hamburg@ghc.de
Website www.ghc.com

Department responsible for information:
GHC Gerling, Holz & Co. Handels GmbH
Telephone +49 40 853 123 0

E-mail (competent person):
msds@ghc.de

*** 1.4 Emergency telephone number**

EN: Poison Information Center Mainz +49 6131 19240

* SECTION 2: Hazards identification

*** 2.1 Classification of the substance or mixture**

Classification according to Regulation (EC) No 1272/2008 [CLP]	Classification procedure
Flam. Gas 1A, H220	
Press. Gas (Liq.), H280	

Hazard statements for physical hazards
H220 Extremely flammable gas.
H280 Contains gas under pressure; may explode if heated.

*** 2.2 Label elements**

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

Hazard pictograms

GHS02

Signal word
Danger

Hazard statements
H220 Extremely flammable gas.
H280 Contains gas under pressure; may explode if heated.

Precautionary statements
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 In case of leakage, eliminate all ignition sources.
P403 Store in a well-ventilated place.

* **Supplemental hazard information**
EIGA0357 Asphyxiant in high concentrations.
Please return container with residual pressure.

*** 2.3 Other hazards**

Adverse physicochemical effects
May form explosive peroxides.

* **Adverse human health effects and symptoms**
Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.
The inhalation of gas / vapour in high concentrations may cause cardiac arrhythmia.
Contact with liquid may cause cold burns/frostbite.

* **Other adverse effects**
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.

* **Results of PBT and vPvB assessment**
The substance/mixture does not contain components meeting the PBT/vPvB criteria of the Reach Regulation, Annex XIII, at levels of 0.1% or higher.

* SECTION 3: Composition / information on ingredients

* 3.1 Substances

Substance name	dimethyl ether
INDEX No.	603-019-00-8
EC No.	204-065-8
REACH No.	01-2119472128-37
CAS No.	115-10-6
ATE	ATE(inhalation gas): 164000 ppm

Additional information
Content: >= 99,9 %

3.2 Mixtures

not applicable

* SECTION 4: First aid measures

* 4.1 Description of first aid measures

General information
Remove contaminated, saturated clothing immediately.
First aider: Pay attention to self-protection!
Call a physician immediately.

Following inhalation
Remove casualty to fresh air and keep warm and at rest.
In the event of pulmonary irritation treat initially with corticoid spray, e.g. Ventolair- or Pulmicort- metered-dose aerosol (Ventolair and Pulmicort are registrated trademarks).
In case of respiratory standstill give artificial respiration by respiratory bag (Ambu bag) or respirator. Obtain medical assistance.

* **Following skin contact**
In case of skin contact rinse with warm water.
In case of frostbite, wash with plenty of water; do not remove clothing.
In case of frostbite rinse with lukewarm (not hot) water for at least 15 minutes. Do not remove clothing frozen to the skin.
Thaw with lukewarm water. Apply a sterile dressing. Obtain medical assistance.

After eye contact
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical assistance.

Following ingestion
Ingestion is not considered a potential route of exposure.

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

* **Symptoms**
Unconsciousness
Cardiac arrhythmias
Dyspnoea
Nausea

Effects
Pulmonary oedema

4.3 Indication of any immediate medical attention and special treatment needed

Notes for the doctor
Treat symptomatically.
To supervise the blood circulation.
Do not give any catecholamines.
Pulmonary oedema prophylaxis.

* SECTION 5: Firefighting measures

* 5.1 Extinguishing media

* **Suitable extinguishing media**
Extinguishing powder
alcohol resistant foam
Water spray jet

Unsuitable extinguishing media
Full water jet
Carbon dioxide (CO2)

* 5.2 Special hazards arising from the substance or mixture

* **Hazardous combustion products**
In case of fire formation of dangerous gases possible.
Carbon monoxide
Carbon dioxide (CO2)

* 5.3 Advice for firefighters

* **Special protective equipment for firefighters**
Wear a self-contained breathing apparatus and chemical protective clothing.

*** Additional information**
If possible, shut off gas valves and move containers to a safe location.
Use water spray jet to protect personnel and to cool endangered containers.
Exposure to fire may cause rupture / explosion of the containers.
Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire.
Dispose of fire residues and contaminated extinguishing water in accordance with local, official regulations.

* SECTION 6: Accidental release measures

* 6.1 Personal precautions, protective equipment and emergency procedures

* **For non-emergency personnel**
Use personal protection equipment.
Leave the danger area.
Keep people away and stay on the upwind side.

* **For emergency responders**
Personal protection by wearing close-fitting protective clothing and breathing apparatus.
Pay attention to extension of gas especially at ground (heavier than air) and in direction of the wind.
Eliminate all ignition sources if safe to do so.
Remove persons to safety.

* 6.2 Environmental precautions

If possible, stop flow of product.
Do not allow to enter into soil/subsoil.
Do not allow to enter into surface water or drains.

* 6.3 Methods and material for containment and cleaning up

* **For containment**
If necessary, secure leaky pressure receptacles using a salvage container.
Prevent the liquid from spreading over a wide area (set up barriers, cover sewage systems).
Limit expansion of the gas (water spray jet).

* **For cleaning up**
Leave to vapourize.
Provide adequate ventilation.

6.4 Reference to other sections

Disposal: see section 13
Personal protection equipment: see section 8

* SECTION 7: Handling and storage

* 7.1 Precautions for safe handling

*

Protective measures
Use only in well-ventilated areas.
Transfer and handle product only in closed systems.
Usual measures for fire prevention.
Containers' temperature should not be increased above 50 °C.
The working pressure in the receptacle must not exceed the saturation vapour pressure of the pure product resulting at a temperature of 50 °C.
Prevent cylinders from falling over.
Take precautionary measures against static discharges. Ground barrels and installations. Use only antistatically equipped (spark-free) tools.
Use explosion-proof machinery, apparatus, ventilation facilities, tools etc.
Ensure valve protection device is correctly fitted.
Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
Open valve slowly to avoid pressure shock.
Do not allow backflow into the container.
Entering of water into the container must be prevented.
No water to valves, flanges and other fittings.
Purging of pipes and valves with inert gases - to avoid: water, solvents.

Advices on general occupational hygiene
When using do not eat, drink, smoke, sniff.
Wash hands before breaks and after work.
Remove contaminated clothing and protective equipment before entering eating areas.

* 7.2 Conditions for safe storage, including any incompatibilities

*

Requirements for storage rooms and vessels
All regulations and local requirements for the storage of containers have to be respected.
Keep container tightly closed and in a well-ventilated place.
Containers' temperature should not be increased above 50 °C.
Prevent cylinders from falling over.
Only use containers specifically approved for the substance/product.
Information on suitable materials for receptacles and valves see ISO 11114.

Storage class
2A Gases (except aerosol dispensers and lighters)

*

Materials to avoid
Do not store together with explosives.
Do not store together with flammable liquids.
Do not store together with flammable solids.
Do not store together with pyrophoric and self-heating substances.
Do not store together with oxidizing liquids or oxidizing solids.
Do not store together with toxic liquids or toxic solids.
Do not store together with infectious substances.
Do not store together with radioactive material.
Do not store together with food or feed.

* 7.3 Specific end use(s)

*

Recommendation
See section 1.2
Exposure scenarios (ES) see annex to this safety data sheet.

* SECTION 8: Exposure controls/personal protection

* 8.1 Control parameters

*

Occupational exposure limit values

CAS No.	EC No.	Substance name	occupational exposure limit value
115-10-6	204-065-8	Dimethyl ether	1000 [ml/m³(ppm)] 1920 [mg/m³] (IE)

* **DNEL worker**

CAS No.	Substance name	DNEL value	DNEL type	Remark
115-10-6	dimethyl ether	1894 mg/m³	long-term inhalative (systemic)	Assessment factor 12.5, repeated dose toxicity.

* **DNEL Consumer**

CAS No.	Substance name	DNEL value	DNEL type	Remark
115-10-6	dimethyl ether	471 mg/m³	long-term inhalative (systemic)	Assessment factor 25, repeated dose toxicity.

* **PNEC**

CAS No.	Substance name	PNEC Value	PNEC type	Remark
115-10-6	dimethyl ether	0.016 mg/L	aquatic, marine water	Assessment factor 10000
115-10-6	dimethyl ether	0.045 mg/kg dw	soil	
115-10-6	dimethyl ether	0.069 mg/kg dw	sediment, marine water	
115-10-6	dimethyl ether	0.155 mg/L	aquatic, freshwater	Assessment factor 1000
115-10-6	dimethyl ether	0.681 mg/kg dw	sediment, freshwater	
115-10-6	dimethyl ether	1.549 mg/L	aquatic, intermittent release	Assessment factor 100
115-10-6	dimethyl ether	160 mg/L	sewage treatment plant (STP)	Assessment factor 10

* **8.2 Exposure controls**

Appropriate engineering controls

Technical measures to prevent exposure
Transfer and handle only in enclosed systems.

* **Personal protection equipment**

Eye/face protection
Protective goggles according to EN 166, in case of increased risk add protective face shield.

* **Hand protection**
Safety gloves according to EN 388:
Chromate-free leather

Body protection:
Safety shoes with steel toecap.
Body covering work clothing or chemical resistant suit at increased risk.

Respiratory protection
Keep self contained breathing apparatus readily available for emergency use.
Respiratory protection necessary at:
high concentrations
Suitable respiratory protection apparatus:
Respiratory protection complying with EN 137.
Short term: filter apparatus, filter AX
In case of rescue and maintenance activities in storage containers use environment-independent breathing apparatus because of risk of suffocation due to displacement of oxygen.

* **Thermal hazards**
Use cold-resistant protective equipment.

* **Environmental exposure controls**

* **Remark**
Prevent release to the environment.

* SECTION 9: Physical and chemical properties

* 9.1 Information on basic physical and chemical properties

Physical state
Gaseous / liquefied under pressure.

Colour
colourless

Odour
like:
Ether

Safety relevant basis data

	Value	Method	Source, Remark
Odour threshold:			not determined
Melting point/freezing point			not applicable
Boiling point or initial boiling point and boiling range	-24.8 °C pressure 1013 hPa		
flammability			inflammable
Lower and upper explosion limit	Upper explosion limit 24.4 Vol-%		
Lower and upper explosion limit	Lower explosion limit 2.8 Vol-%		
Flash point			not applicable
Auto-ignition temperature	240 °C		
Decomposition temperature			No decomposition if used as directed.
pH			not applicable
Viscosity			not applicable
Solubility(ies)	Water solubility 70 g/L (20°C)		
Partition coefficient n-octanol/water (log value)	0.1		
Vapour pressure	5130 hPa (20°C)		
Density and/or relative density			not applicable
Relative vapour density	1.63		air = 1
particle characteristics			not applicable

* 9.2 Other information

*** Information with regard to physical hazard classes**

*** Gases under pressure**

Safety characteristics

	Value	Method, Result	Source, Remark
Critical temperature	126.9 °C		

*** Other information**
Vapours are heavier than air.

* SECTION 10: Stability and reactivity

* 10.1 Reactivity

Formation of explosive gas mixtures in contact with air.
May form explosive peroxides.

*** 10.2 Chemical stability**

The substance is chemically stable under recommended conditions of storage, use and temperature.

*** 10.3 Possibility of hazardous reactions**

Reactions with numerous chemical compounds.
Reactions with oxidising agents.
Risk of explosion in contact with fluorine.

*** 10.4 Conditions to avoid**

Heat sources / heat - risk of bursting.
Ignition sources, open flames, glowing metal surfaces, etc.

*** 10.5 Incompatible materials**

Acetylene
Hydrogen bromide (HBr)
Chlorine
Hydrochloric gas
Nitrogen oxides (NOx)

10.6 Hazardous decomposition products

When handled and stored appropriately, no dangerous decomposition products are known.

* SECTION 11: Toxicological information

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

*** Acute toxicity**

*** Animal data**

	Effective dose	Method,Evaluation	Source, Remark
Acute oral toxicity			Study technically not feasible.
Acute dermal toxicity			Study technically not feasible.
Acute inhalation toxicity	CAS No.115-10-6 dimethyl ether Acute inhalation toxicity (gas) LC50: 164000 ppm Species Rat Exposure time 4 h	OECD 403	

*** Assessment/classification**
Based on available data, the classification criteria are not met.

*** Skin corrosion/irritation**

*** Other information**
Study technically not feasible.

*** Serious eye damage/irritation**

*** Other information**
Study technically not feasible.

*** Sensitisation to the respiratory tract**

*** Other information**
No data available

*** Skin sensitisation**

*** Other information**
Study technically not feasible.

* **Germ cell mutagenicity**

	Value	Method	Result / Evaluation	Remark
In vitro mutagenicity/genotoxicity		OECD 471	negative	
In vivo mutagenicity/genotoxicity		OECD 477	negative	

* **Assessment/classification**
Based on available data, the classification criteria are not met.

* **Carcinogenicity**

Animal data

	Value	Method	Result / Evaluation	Remark
Carcinogenicity	inhalative NOAEL(C): 47106 mg/m3 Species Rat Exposure duration 2 a	OECD 453		

* **Assessment/classification**
Based on available data, the classification criteria are not met.

* **Reproductive toxicity**

Animal data

	Value	Method	Result / Evaluation	Remark
Reproductive toxicity	inhalative ≥ 16000 ppm Species Rat	OECD 422		

* **Assessment/classification**
Based on available data, the classification criteria are not met.

* **STOT-single exposure**

* **STOT SE 1 and 2**

* **Assessment/classification**
Based on available data, the classification criteria are not met.

* **STOT-repeated exposure**

* **Animal data**

	Effective dose	Method	Specific effects:	Organs affected:	Source, Remark
Inhalative specific target organ toxicity (repeated exposure)	NOAEL(C): 25000 ppm Species Rat Exposure duration 2 a	OECD 452			

* **Assessment/classification**
Based on available data, the classification criteria are not met.

* **Aspiration hazard**

* **Assessment/classification**
Study technically not feasible.

11.2 Information on other hazards

No data available

* SECTION 12: Ecological information

* 12.1 Toxicity

* **Aquatic toxicity**

	Effective dose	Method,Evaluation	Source, Remark
Acute (short-term) fish toxicity	LC50: > 4100 mg/L Species Poecilia reticulata (Guppy) Test duration 96 h	NEN 6504	
Chronic (long-term) fish toxicity	not determined		
Acute (short-term) toxicity to crustacea	EC50 > 4400 mg/L Species Daphnia magna (Big water flea) Test duration 48 h	NEN 6501	
Chronic (long-term) toxicity to aquatic invertebrate	not determined		
Acute (short-term) toxicity to algae and cyanobacteria	EC50 154.9 mg/L Test duration 96 h	QSAR	
Chronic (long-term) toxicity to aquatic algae and cyanobacteria	not determined		
Toxicity to other aquatic plants/organisms	not determined		
Toxicity to microorganisms	EC10 > 1600 mg/L Species Pseudomonas putida		

* 12.2 Persistence and degradability

	Value	Method	Source, Remark
Biodegradation	Degradation rate 5 % Test duration 28 d	OECD 301 D	CAS No.115-10-6 dimethyl ether

* **Assessment/classification**
Not readily biodegradable (according to OECD criteria)

* 12.3 Bioaccumulative potential

* **Assessment/classification**
Based on the n-octanol/water partition coefficient accumulation in organisms is not expected.

* 12.4 Mobility in soil

	Value	Distribution	Transport type	Method	Remark
Half-life time in soil	CAS No.115-10-6 dimethyl ether 7.759 L/kg			KOC value	

* 12.5 Results of PBT and vPvB assessment

The substance/mixture does not contain components meeting the PBT/vPvB criteria of the Reach Regulation, Annex XIII, at levels of 0.1% or higher.

* 12.6 Endocrine disrupting properties

	Effective dose	Method,Evaluation	Source, Remark
Endocrine disrupting properties			See section 2.3

* 12.7 Other adverse effects

	Value	Method	Source, Remark
Global warming potential (GWP)	1		

* SECTION 13: Disposal considerations

* 13.1 Waste treatment methods

Waste codes/waste designations according to EWC/AVV

Waste code product	Waste name
160504 *	gases in pressure containers (including halons) containing hazardous substances

* **Appropriate disposal / Product**
Waste disposal according to directive 2008/98/EC, covering waste and dangerous waste.
Prevent release to the environment. No disposal via the sewage.

Appropriate disposal / Package
Transportable pressure equipment (empty, residual pressure): Return to supplier / manufacturer.

* SECTION 14: Transport information

	Land transport (ADR/RID)	Sea transport (IMDG)	Air transport (ICAO-TI / IATA-DGR)
14.1 UN number or ID number	UN 1033	UN 1033	UN 1033
14.2 UN proper shipping name	DIMETHYL ETHER	DIMETHYL ETHER	Dimethyl ether
14.3 Transport hazard class(es)	2.1	2.1	2.1
14.4 Packing group	-	-	-
14.5 Environmental hazards	No	No	No

14.6 Special precautions for user

The protective measures listed in Sections 6, 7 and 8 of the Safety Data Sheet have to be considered.

14.7 Maritime transport in bulk according to IMO instruments

No carriage in bulk.

Land transport (ADR/RID)

UN number or ID number	UN 1033
UN proper shipping name	DIMETHYL ETHER
Transport hazard class(es)	2.1
Hazard label(s)	2.1
Classification code	2F
Packing group	-
Environmental hazards	No
Limited quantity (LQ)	0
Special provisions	662
Tunnel restriction code	B/D

*** Sea transport (IMDG)**

UN number or ID number	UN 1033
UN proper shipping name	DIMETHYL ETHER
Transport hazard class(es)	2.1
Packing group	-
Environmental hazards	No
Limited quantity (LQ)	0
Marine pollutant	No
EmS	F-D, S-U

*** Air transport (ICAO-TI / IATA-DGR)**

UN number or ID number	UN 1033
UN proper shipping name	Dimethyl ether
Transport hazard class(es)	2.1
Packing group	-
Environmental hazards	No

* SECTION 15: Regulatory information

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

*** EU legislation**

*** Restrictions of occupation**
Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.
Observe restrictions to employment for juvenils according to the 'juvenile work protection guideline' (94/33/EC).

*** Other regulations (EU)**

*** To follow:**
Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Annex XVII No 40.
Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances.
National and local regulations concerning chemicals shall be observed.

*** Directive 2010/75/EU on industrial emissions [Industrial Emissions Directive] VOC**
VOC-value 99.9 %

15.2 Chemical Safety Assessment

*** National regulations**

For this substance a chemical safety assessment has been carried out.

* SECTION 16: Other information

Key literature references and sources for data
Information from our suppliers and data from the "GESTIS Substances Database" and the "Registered Substances" database of the European Chemicals Agency (ECHA) were used to create this safety data sheet.

*** Additional information**
The information contained herein is based on the state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

Relevant H- and EUH-phrases (Number and full text)

H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.

Indication of changes
* Data changed compared with the previous version

Annex: Exposure scenarios

Identified Uses according to the Use Descriptor System
Uses - Worker
Title : Manufacture of substance- Industrial

Uses - Worker
Title : Use as an intermediate- Industrial

Uses - Worker
Title : Formulation & (re)packing of substances and mixtures- Industrial

Uses - Worker
Title : Use as a propellant- Industrial

Uses - Worker
Title : Use as a propellant- Professional

Uses - Worker
Title : Blowing agents- Industrial

Uses - Worker
Title : Use in laboratories- Professional

Identified Uses according to the Use Descriptor System
Uses - Consumer
Title : Use as a propellant - Consumer

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

Annex: Exposure scenarios

Exposure Scenario - Worker

SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Manufacture of substance- Industrial
Use Descriptor	**Sector of Use**: SU 3, SU8, SU9 **Process Categories**: PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8b, PROC 9, PROC 15 **Environmental Release Categories**: ERC1
Scope of process	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 Worker Exposure**
Product Characteristics	
Physical form of product	Gas/liquefied gas
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes use at not more than 20°C above ambient temperature (unless stated differently). Assumes a good basic standard of occupational hygiene is implemented.	

Contributing Scenarios	**Risk Management Measures**
General risk management measures applicable to all activities	No other specific measures identified.

Section 2.2	**Control of Environmental Exposure**
Substance is a unique structure.	
Not biodegradable.	
Amounts Used	
Fraction of EU tonnage used in region:	1,0E+00
Regional use tonnage (tonnes/year):	3,0E+04
Fraction of Regional tonnage used locally:	1,0E+00
Annual site tonnage (tonnes/year):	3,0E+04
Maximum daily site tonnage (kg/day):	9,4E+04
Frequency and Duration of Use	
Emission Days (days/year):	320
Environmental factors not influenced by risk management	

Annex: Exposure scenarios

Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other Operational Conditions affecting Environmental Exposure	
Release fraction to air from process (initial release prior to RMM):	5,0E-03
Release fraction to wastewater from process (initial release prior to RMM):	0
Release fraction to soil from process (initial release prior to RMM):	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%)	99,5
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%)	0
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	0
Conditions and Measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	0
Assumed domestic sewage treatment plant flow (m3/d)	2.000
Conditions and Measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment
Used ECETOC TRA model.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO**
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	

Section 4.2 -Environment

Annex: Exposure scenarios

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.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex: Exposure scenarios

Exposure Scenario - Worker

SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Use as an intermediate- Industrial
Use Descriptor	**Sector of Use**: SU 3, SU8, SU9 **Process Categories**: PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8b, PROC 9, PROC 15 **Environmental Release Categories**: ERC6a
Scope of process	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 Worker Exposure**
Product Characteristics	
Physical form of product	Gas/liquefied gas
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes use at not more than 20°C above ambient temperature (unless stated differently). Assumes a good basic standard of occupational hygiene is implemented.	

Contributing Scenarios	**Risk Management Measures**
General risk management measures applicable to all activities	No other specific measures identified.

Section 2.2	**Control of Environmental Exposure**
Substance is a unique structure.	
Not biodegradable.	
Amounts Used	
Fraction of EU tonnage used in region:	1,0E+00
Regional use tonnage (tonnes/year):	3,0E+04
Fraction of Regional tonnage used locally:	1,0E+00
Annual site tonnage (tonnes/year):	3,0E+04
Maximum daily site tonnage (kg/day):	9,4E+04
Frequency and Duration of Use	
Emission Days (days/year):	320
Environmental factors not influenced by risk management	

Annex: Exposure scenarios

Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other Operational Conditions affecting Environmental Exposure	
Release fraction to air from process (initial release prior to RMM):	5,0E-03
Release fraction to wastewater from process (initial release prior to RMM):	0
Release fraction to soil from process (initial release prior to RMM):	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%)	99,5
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%)	0
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	0
Conditions and Measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	0
Assumed domestic sewage treatment plant flow (m3/d)	2.000
Conditions and Measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or regional regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or regional regulations.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment
Used ECETOC TRA model.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO**
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	

Annex: Exposure scenarios

Section 4.2 -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.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex: Exposure scenarios

Exposure Scenario - Worker

SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Formulation & (re)packing of substances and mixtures- Industrial
Use Descriptor	**Sector of Use**: SU 3, SU 10 **Process Categories**: PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8b, PROC 9, PROC 15 **Environmental Release Categories**: ERC2
Scope of process	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**

Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Gas/liquefied gas
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes use at not more than 20°C above ambient temperature (unless stated differently). Assumes a good basic standard of occupational hygiene is implemented.	

Contributing Scenarios	**Risk Management Measures**
General risk management measures applicable to all activities	No other specific measures identified.

Section 2.2	**Control of Environmental Exposure**
Substance is a unique structure.	
Not biodegradable.	
Amounts Used	
Fraction of EU tonnage used in region:	1
Regional use tonnage (tonnes/year):	6,0E+03
Fraction of Regional tonnage used locally:	1
Annual site tonnage (tonnes/year):	6,0E+03
Maximum daily site tonnage (kg/day):	2,0E+04
Frequency and Duration of Use	
Emission Days (days/year):	300

Annex: Exposure scenarios

Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other Operational Conditions affecting Environmental Exposure	
Release fraction to air from process (initial release prior to RMM):	2,0E-03
Release fraction to wastewater from process (initial release prior to RMM):	0
Release fraction to soil from process (initial release prior to RMM):	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%)	0
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	0
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	
Conditions and Measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	0
Assumed domestic sewage treatment plant flow (m3/d)	2.000
Conditions and Measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or regional regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or regional regulations.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment
Used ECETOC TRA model.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO**
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	

Annex: Exposure scenarios

Section 4.2 -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.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex: Exposure scenarios

Exposure Scenario - Worker

SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Use as a propellant- Industrial
Use Descriptor	**Sector of Use**: SU 3 **Process Categories**: PROC 7 **Environmental Release Categories**: ERC8a, ERC8d
Scope of process	Use as a propellant in professional aerosol products.

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**

Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Gas/liquefied gas
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes use at not more than 20°C above ambient temperature (unless stated differently). Assumes a good basic standard of occupational hygiene is implemented.	

Contributing Scenarios	**Risk Management Measures**
General risk management measures applicable to all activities	No other specific measures identified.

Section 2.2	**Control of Environmental Exposure**
Substance is a unique structure.	
Not biodegradable.	
Amounts Used	
Fraction of EU tonnage used in region:	0,1
Regional use tonnage (tonnes/year):	1,5E+03
Fraction of Regional tonnage used locally:	0,0002
Annual site tonnage (tonnes/year):	3
Maximum daily site tonnage (kg/day):	8,2
Frequency and Duration of Use	
Emission Days (days/year):	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other Operational Conditions affecting Environmental Exposure	
Release fraction to air from process (initial release prior to RMM):	1,0E+00
Release fraction to wastewater from process (initial release prior to	0

Annex: Exposure scenarios

RMM):	
Release fraction to soil from process (initial release prior to RMM):	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%)	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%)	0
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	0
Conditions and Measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	0
Assumed domestic sewage treatment plant flow (m3/d)	2.000
Conditions and Measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or regional regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or regional regulations.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment
Used ECETOC TRA model.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO**
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	

Section 4.2 -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.
Required removal efficiency for air can be achieved using on-site technologies, either alone

Annex: Exposure scenarios

or in combination.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex: Exposure scenarios

Exposure Scenario - Worker

SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Use as a propellant- Professional
Use Descriptor	**Sector of Use**: SU 22 **Process Categories**: PROC 11 **Environmental Release Categories**: ERC8a, ERC8d
Scope of process	Use as a propellant in professional aerosol products.

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**

Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Gas/liquefied gas
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes use at not more than 20°C above ambient temperature (unless stated differently). Assumes a good basic standard of occupational hygiene is implemented.	

Contributing Scenarios	**Risk Management Measures**
General risk management measures applicable to all activities	No other specific measures identified.

Section 2.2	**Control of Environmental Exposure**
Substance is a unique structure.	
Not biodegradable.	
Amounts Used	
Fraction of EU tonnage used in region:	1,0E-01
Regional use tonnage (tonnes/year):	1,5E+03
Fraction of Regional tonnage used locally:	2,0E-03
Annual site tonnage (tonnes/year):	3,0E+01
Maximum daily site tonnage (kg/day):	8,2E+01
Frequency and Duration of Use	
Emission Days (days/year):	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other Operational Conditions affecting Environmental Exposure	
Release fraction to air from process (initial release prior to RMM):	1
Release fraction to wastewater from process (initial release prior to	0

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RMM):	
Release fraction to soil from process (initial release prior to RMM):	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%)	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%)	0
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	0
Conditions and Measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	0
Assumed domestic sewage treatment plant flow (m3/d)	2.000
Conditions and Measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or regional regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or regional regulations.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment
Used ECETOC TRA model.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO**
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	

Section 4.2 -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.
Required removal efficiency for air can be achieved using on-site technologies, either alone

Annex: Exposure scenarios

or in combination.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex: Exposure scenarios

Exposure Scenario - Worker

SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Blowing agents- Industrial
Use Descriptor	**Sector of Use**: SU 3 **Process Categories**: PROC 5, PROC 12, PROC 14 **Environmental Release Categories**: ERC4
Scope of process	Use as a blowing agent for rigid and flexible foams, including material transfers, mixing and injection, curing, cutting, storage and packing.

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**

Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Gas/liquefied gas
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes use at not more than 20°C above ambient temperature (unless stated differently). Assumes a good basic standard of occupational hygiene is implemented.	

Contributing Scenarios	**Risk Management Measures**
General risk management measures applicable to all activities	No other specific measures identified.

Section 2.2	**Control of Environmental Exposure**
Substance is a unique structure.	
Not biodegradable.	
Amounts Used	
Fraction of EU tonnage used in region:	1,0E+00
Regional use tonnage (tonnes/year):	3,0E+02
Fraction of Regional tonnage used locally:	1,0E+00
Annual site tonnage (tonnes/year):	3,0E+02
Maximum daily site tonnage (kg/day):	9,4E+02
Frequency and Duration of Use	
Emission Days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other Operational Conditions affecting Environmental Exposure	

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Release fraction to air from process (initial release prior to RMM):	5,0E-01
Release fraction to wastewater from process (initial release prior to RMM):	0
Release fraction to soil from process (initial release prior to RMM):	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%)	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%)	0
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	0
Conditions and Measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	0
Assumed domestic sewage treatment plant flow (m3/d)	2.000
Conditions and Measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or regional regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or regional regulations.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment
Used ECETOC TRA model.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO**
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	

Section 4.2 -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

Annex: Exposure scenarios

measures.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex: Exposure scenarios

Exposure Scenario - Worker

SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Use in laboratories- Professional
Use Descriptor	**Sector of Use**: SU 22 **Process Categories**: PROC 15 **Environmental Release Categories**: ERC8a
Scope of process	Use of small quantities within laboratory settings, including material transfers and equipment cleaning.

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**

Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes use at not more than 20°C above ambient temperature (unless stated differently). Assumes a good basic standard of occupational hygiene is implemented.	

Contributing Scenarios	**Risk Management Measures**
General risk management measures applicable to all activities	No other specific measures identified.

Section 2.2	**Control of Environmental Exposure**
Substance is a unique structure.	
Not biodegradable.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO**
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management	

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Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Section 4.2 -Environment

Annex: Exposure scenarios

Exposure Scenario - Consumer

SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Use as a propellant - Consumer
Use Descriptor	**Sector of Use**: SU 21 **Product Categories**: PC1, PC3, PC4, PC8, PC9a, PC39 **Environmental Release Categories**: ERC8a, ERC8d
Scope of process	Use as a propellant in household consumer aerosol products.

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**

Section 2.1	**Control of Consumer Exposure**
Product Characteristics	
Physical form of product	Gas/liquefied gas
Concentration of the Substance in Mixture/Article	Unless stated otherwise.
	Covers concentration up to (%): 50 %
Amounts Used	
Unless stated otherwise.	
for each use event, covers amount up to (g):	10
Frequency and Duration of Use	
Unless stated otherwise.	
covers use up to (times/day of use):	4
Covers use up to (hours/event):	0,25
Other Operational Conditions affecting Exposure	
Unless stated otherwise.	
Covers use under typical household ventilation.	

Product Categories	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**
General measures applicable to all Product Categories.	Covers use in room size of 2,5 m3
	No specific risk management measure identified beyond those operational conditions stated.

Section 2.2	**Control of Environmental Exposure**
Substance is a unique structure.	
Not biodegradable.	
Amounts Used	
Fraction of EU tonnage used in region:	0,1
Regional use tonnage (tonnes/year):	3,0E+03
Fraction of Regional tonnage used locally:	0,1

Annex: Exposure scenarios

Annual site tonnage (tonnes/year):	3,0E+02
Maximum daily site tonnage (kg/day):	8,2E+02
Frequency and Duration of Use	
Emission Days (days/year):	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other Operational Conditions affecting Environmental Exposure	
Release fraction to air from process (initial release prior to RMM):	1
Release fraction to wastewater from process (initial release prior to RMM):	0
Release fraction to soil from process (initial release prior to RMM):	0
Conditions and Measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	0
Assumed domestic sewage treatment plant flow (m3/d)	2.000
Conditions and Measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or regional regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or regional regulations.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated. The Consexpo model has been used to estimate consumer exposures unless otherwise indicated.	

Section 3.2 -Environment
Used ECETOC TRA model.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO**
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	

Section 4.2 -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

Annex: Exposure scenarios

measures.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.