

According to Regulation (EC) No. 1907/2006 (REACH)

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

1.1 Product identifier

Product name XYZ

REACH Registration Number

Registration number	Substance Identification	CAS number
XX-XXXXXX-XX-0003	CXXXe	XXX-XX-4

Formula

X₃X₆X₆X₆

Molecular weight

222.1

Synonyms

XXXXX-triXXXX, PerXXXX-XXXXX-2,2-XXXX

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

Relevant identified uses

Main use category

Industrial use, Professional use.

Specific use(s)

Further information: see exposure scenarios attached to the safety data sheet.

Uses advised against

No additional information available.

1.3 Details of the supplier of the safety data sheet

Supplier

XXXXX XXXXX Ltd
XXXX, XXXXX XXXX
XXXXXXXX, XXXXXXXXXXXX
XXXXXXXX, XXXXXXXXXXX, XXXX XXX
Tel:+XX (0) 99999 999 / 9999
XXXXX@XXXXX.net

Contact Person

XXXXX XXXX

Manufacturer

XXXXXXXXX INC [XXXXXXXXXXXXX]
XXXX XXX XXXXX XXXX
4509 XXXX XXXX XXXXX
XXXXXXXX, TN XXXXX
XXXXXX@XXXX.com

1.4 Emergency telephone number

Poison control center: +XXXX-XX1-5XX0

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

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

Expl. Div. 1.1 H201

Acute Tox.3 (Oral) H301

STOT SE 1 H370

STOT RE 2 H373

2.2 Label elements

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

Hazard pictograms

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Signal Word

Danger

Hazard Statements

H201	Explosive; mass explosion hazard.
H301	Toxic if swallowed.
H370	Cause damage to organs.
H373	May cause damage to organs through prolonged or repeated exposure.

Precautionary Statements

P210	Keep away from heat, hot surfaces, sparks, open flame and other ignition sources. No smoking.
P230	Keep wetted with water.
P234	Keep only in original container.
P240	Ground/bond container and receiving equipment.
P250	Do not subject to grinding/shock/friction.
P260	Do not breathe dust.
P264	Wash hands thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTRE or doctor/physician. Rinse mouth.
P308 + P311	If exposed or concerned: Call a POISON CENTRE/doctor.
P321	Specific treatment (see Section 4).
P370 + P380	In case of fire: evacuate area.
P372	Explosion risk in case of fire.
P373	Do NOT fight fire when fire reaches explosives.
P401	Store in accordance with local, regional, national, and international regulations.
P405	Store locked up.
P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3 Other hazards

Other hazards which do not result in classification

Product does not meet criteria for PBT or vPvB in accordance with Annex XIII of Regulation (EC) No 1907/2006.

SECTION 3: Composition/information on ingredients

3.1 Substances

Substance name	Product identifier	Percentage (wt/wt)	Classification
			EC 1272/2008
CXXXe	(CAS No.) XXX-XX-4 (EC No.) XXX-XXX-1 (REACH Registration No.) XX-XXXXXX-XX-0003	100	Expl. Div. 1.1, H201 Acute Tox.3 (Oral), H301 STOT SE 1, H370 STOT RE 2, H373

See section 16 for full text of Hazard Statements.

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3.2 Mixtures

Not applicable.

SECTION 4: First aid measures

4.1 Description of first aid measures

General

Take affected persons out of danger area and lay down. Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

Inhalation

Remove victim to fresh air. In all cases of doubt or when symptoms persist, seek medical attention.

Ingestion

Immediately call a POISON CENTRE or doctor/physician. Rinse mouth. Do NOT induce vomiting.

Skin contact

Rinse skin with water or shower. If skin irritation occurs: Get medical advice/attention.

Eye contact

Rinse cautiously with water for several minutes. In all cases of doubt or when symptoms persist, seek medical attention.

4.2 Most important symptoms and effects, both acute and delayed

Toxic if swallowed. Causes damage to organs. May cause damage to organs through prolonged or repeated exposure.

4.3 Indication of any immediate medical attention and special treatment needed

If exposed or concerned, get medical advice and attention. If you feel unwell, seek medical advice (show the label where possible).

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

DO NOT FIGHT FIRES INVOLVING EXPLOSIVES.

Unsuitable extinguishing media

No further relevant information available.

5.2 Special hazards arising from the substance or mixture

The product is stable under normal conditions.

5.3 Advice for firefighters

Wear self-contained respiratory protective device. Wear fully protective suit.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For Non-emergency Personnel

Use appropriate personal protection equipment (PPE). See also section 8. Evacuate danger area.

6.1.2 For Emergency Responders

Do not get in eyes, on skin, or on clothing. Do not breathe dust or fumes.

6.2 Environmental precautions

Do not allow to enter sewers/ surface or ground water.

6.3 Methods and material for containment and cleaning up

Absorb and/or contain spill with inert material, then place in suitable container. Follow local, state and federal regulations. Dispose contaminated material as waste according to section 13.

6.4 Reference to other sections

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

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SECTION 7: Handling and storage

- 7.1 Precautions for safe handling** Ensure good ventilation/exhaustion at the workplace. Protect against electrostatic charges. Keep ignition sources away - Do not smoke.
- 7.2 Conditions for safe storage, including any incompatibilities** Keep in a cool, dry and dark place. Avoid alkalis, strong acids and physical sensitizers. Bases. Oxidisers.
- Storage class** Unspecified storage.
- 7.3 Specific end use(s)** Further information: see exposure scenarios attached to this safety data sheet.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Exposure limit(s)

CXXXe (XXX-XX-4)		
Austria	MAK (mg/m ³)	1,5 mg/m ³
Austria	MAK Short time value (mg/m ³)	3 mg/m ³
Belgium	Limit value (mg/m ³)	0,5 mg/m ³
France	VME (mg/m ³)	1,5 mg/m ³
Greece	OEL TWA (mg/m ³)	1,5 mg/m ³
Greece	OEL STEL (mg/m ³)	3 mg/m ³
USA ACGIH	ACGIH TWA (mg/m ³)	0,5 mg/m ³
Spain	VLA-ED (mg/m ³)	0,5 mg/m ³
Switzerland	VME (mg/m ³)	1,5 mg/m ³ (Inhalable)
Denmark	Grænseværdie (langvarig) (mg/m ³)	1,5 mg/m ³
Estonia	OEL TWA (mg/m ³)	1,5 mg/m ³
Finland	HTP-arvo (8h) (mg/m ³)	1,5 mg/m ³
Finland	HTP-arvo (15 min)	4,5 mg/m ³
Ireland	OEL (8 hours ref) (ppm)	0,5 ppm
Ireland	OEL (15 min ref) (mg/m ³)	1,5 mg/m ³ (calculated)
Norway	Gjennomsnittsverdier (AN) (mg/m ³)	1,5 mg/m ³
Norway	Gjennomsnittsverdier (Korttidsverdi) (mg/m ³)	3 mg/m ³
Poland	NDS (mg/m ³)	1 mg/m ³
Poland	NDSch (mg/m ³)	3 mg/m ³
Romania	OEL TWA (mg/m ³)	2 mg/m ³
Romania	OEL STEL (mg/m ³)	6 mg/m ³
Slovenia	OEL TWA (mg/m ³)	1,5 mg/m ³
Portugal	OEL TWA (mg/m ³)	0,5 mg/m ³
Portugal	OEL chemical category (PT)	A4 - Not Classifiable as a Human Carcinogen, skin - potential for cutaneous exposure

CXXXe (XXX-XX-4)DNEL - Workers				
Route of	Acute effects local	Acute effects systemic	Chronic effects local	Chronic effects systemic

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exposure				
Oral	-	-	-	-
Dermal	No hazard identified	3.36 mg/kg bw/day	No hazard identified	0.04 mg/kg bw/day
Inhalation	No hazard identified	8.29 mg/m ³	No hazard identified	0.31 mg/m ³

CXXXe (XXX-XX-4) DNEL - General Population				
Route of exposure	Acute effects local	Acute effects systemic	Chronic effects local	Chronic effects systemic
Oral	-	0.2 mg/kg bw/day	-	0.1 mg/kg bw/day
Dermal	No hazard identified	No hazard identified	No hazard identified	No hazard identified
Inhalation	No hazard identified	No hazard identified	No hazard identified	No hazard identified

CXXXe (XXX-XX-4) PNEC	
Environmental protection target	PNEC
Fresh water	No hazard identified
Freshwater sediments	No hazard identified
Marine water	No hazard identified
Marine sediments	No hazard identified
Food chain	No potential to cause toxic effects if accumulated (in higher organisms) via the food chain
Microorganisms in sewage treatment	No hazard identified
Soil (agricultural)	7.56 mg/kg soil dw
Air	No hazard identified

8.2 Exposure controls

Appropriate engineering controls

Use engineering controls to reduce air contamination to permissible exposure level. Ensure adequate ventilation.

Personal Protection equipment

Gloves. Protective clothing. Safety glasses. Insufficient ventilation: wear respiratory protection.



Respiratory equipment

Use an approved respirator or self-contained breathing apparatus.

Hand protection

Wear chemically resistant protective gloves.

Eye protection

Chemical goggles or safety glasses.

Skin and Body Protection

Wear suitable protective clothing.

Other protection

Wear appropriate clothing to prevent any possibility of skin contact.

Environmental Exposure Controls

Avoid release to the environment.

General protective and hygienic measures

DO NOT SMOKE IN WORK AREA! Wash hands at the end of each work shift and before eating, smoking and using the toilet. Wash promptly if skin becomes wet or contaminated. Promptly remove any clothing that becomes contaminated. When using does not eat, drink or smoke.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Granular, off-white solid. Tan to Brown.

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Physical state	Solid.
Colour	Off-white. Tan to Brown.
Odour	No data available.
Odour threshold	No data available.
pH	No data available.
Melting point	205 °C (401 °F).
Freezing point	No data available.
Initial boiling point and boiling range	No data available.
Flash point	No data available.
Evaporation rate	No data available.
Flammability (solid, gas)	No data available.
Upper / lower flammability or explosive limits	No data available.
Vapour Pressure	No data available.
Vapour Density (Air = 1)	No data available.
Relative density	1,8
Solubility	Water: Low solubility 34,8 - 38,9 mg/l
Partition Coefficient (N-Octanol/Water)	0.87 Log Kow
Auto-ignition temperature	No data available.
Decomposition temperature	No data available.
Viscosity	Not applicable.
Explosive properties	Class 1.1D - Explosives (with a mass explosion hazard).
Oxidising properties	No data available.
9.2 Other information	
VOC content	<1 %

SECTION 10: Stability and reactivity

10.1 Reactivity	The product may react with incompatible materials or physical sensitizers.
10.2 Chemical stability	The product is stable under normal conditions.
10.3 Possibility of hazardous reactions	Hazardous polymerization will not occur.
10.4 Conditions to avoid	Keep away from open flames, hot surfaces and sources of ignition.
10.5 Incompatible materials	Avoid alkalis, strong acids and physical sensitizers. Bases. Oxidisers.
10.6 Hazardous decomposition products	Nitrogen Compounds. Carbon oxides (CO, CO ₂).

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute Toxicity

Oral: Toxic if swallowed.

CXXXe (XXX-XX-4)	
LD ₅₀ Oral Rat	71 mg/kg

Skin Corrosion/Irritation	Not classified.
Serious Eye Damage/Irritation	Not classified.
Respiratory or Skin Sensitization	Not classified.
Germ Cell Mutagenicity	Not classified.
Carcinogenicity	Not classified.
Reproductive Toxicity	Not classified.

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Specific Target Organ Toxicity (Single Exposure)

Causes damage to organs (central nervous system) (if swallowed).

Specific Target Organ Toxicity (Repeated Exposure)

May cause damage to organs (central nervous system) through prolonged or repeated exposure (if swallowed).

Aspiration Hazard

Not classified.

SECTION 12: Ecological information

12.1 Toxicity

CXXXe (XXX-XX-4)	
LC ₅₀ fish	11,14 -14,97 mg/l (Exposure time: 96 h - Species: <i>Pimephales promelas</i> [flow-through])

12.2 Persistence and degradability

No further relevant information available.

12.3 Bioaccumulative potential

CXXXe (XXX-XX-4)	
Log Pow	0,87 (@ 23 °C/73,4 °F)

12.4 Mobility in soil

No further relevant information available.

12.5 Results of PBT and vPvB assessment

Product does not meet criteria for PBT or vPvB in accordance with Annex XIII of Regulation (EC) No 1907/2006.

12.6 Other adverse effects

No further relevant information available.






SECTION 13: Disposal considerations

13.1 Waste treatment methods

Must not be disposed together with household garbage. Do not allow product to reach sewage system. Disposal should comply with all local, regional, national, and international regulations.

SECTION 14: Transport information

In accordance with ADR/RID/IMDG/IATA/ADN

ADR	IMDG	IATA	ADN	RID
14.1. UN number				
OXX5	OXX5	OXX5	OXX5	OXX5
14.2 UN proper shipping name				
SUXXXX, EXXXXXX, N.O.S.	SUXXXX, EXXXXXX, N.O.S.	SUXXXX, EXXXXXX, N.O.S.	SUXXXX, EXXXXXX, N.O.S.	SUXXXX, EXXXXXX, N.O.S.
14.3 Transport hazard class(es)				
1.1D	1.1D	1.1D	1.1D	1.1D
				
14.4 Packing group				

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Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
14.5 Environmental hazards				
Environmentally Hazardous Substance: No	Environmentally Hazardous Substance: No Marine pollutant: No	Environmentally Hazardous Substance: No	Environmentally Hazardous Substance: No	Environmentally Hazardous Substance: No

14.6 Special precautions for user

No additional information available.

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture Relevant information regarding the European legislation

EU Regulation (EC) No. 1907/2006 (REACH) Regulation (EC) no.1907/2006 of the European Parliament and of the Council regarding the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) Regulation.

Regulation (EC) No. 1272/2008 of the European parliament and of the council on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

Commission regulation (EU) No 453/2010, amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR).

Regulation referring to the International Carriage of Dangerous Goods by Rail (RID).

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - Authorisation List

Contains no REACH Annex XIV substances.

Candidate List of substances of very high concern for Authorisation

Contains no substance on the REACH candidate list.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Contains no substances with Annex XVII restrictions.

VOC content <1%

EU Inventory Listed

15.2 Chemical Safety Assessment

A Chemical Safety Assessment has been carried out.

SECTION 16: Other information

Revision Date

16-03-2016

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Version

1

Abbreviations and acronyms

Expl.Div. 1.1

Explosive Category 1.1

Acute Tox.3 (Oral)

Acute toxicity (oral) Category 3

STOT SE 1

Specific target organ toxicity (Single exposure) Category 1

STOT RE 2

Specific target organ toxicity (repeated exposure) Category 2

Hazard Statements In Full

H201

Explosive; mass explosion hazard.

H301

Toxic if swallowed.

H370

Causes damage to organs.

H373

May cause damage to organs through prolonged or repeated exposure.

Disclaimer

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 SCENARIO

Exposure Scenario(ES) Number	Life cycle stage covered by ES			Sector of Use (SU)	Product Category (PC) or Article category (AC)	Process category (PROC)	Environmental Release Category (ERC)
	Formulation	Use at Industrial site	Use by professional worker				
ES 1 Formulation of mixtures	X			SU10: Formulation of preparations	PC 11: Explosives	PROC 3 PROC 8a PROC 9	ERC 2
ES2 Manufacture of ammunition		X		SU0: C25.4.0 Manufacture of weapons and of ammunition	PC11: Explosives	PROC 5 PROC 8b PROC 9 PROC 14	ERC 5

EXPOSURE SCENARIO 1: FORMULATION OF MIXTURES

1. Formulation of mixtures	
Environment Contributing Scenario(s)	
CS1: Formulation of mixture in closed and open systems	ERC 2
Worker Contributing Scenario(s)	
CS2: Formulation of mixtures in closed batch process	PROC 3

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CS3: Transfer of mixtures into containers/vessels	PROC 9
CS4: Maintenance and cleaning operations after formulation of mixtures	PROC 8a
2. Conditions of use affecting exposure	
Control of environmental exposure: Formulation of mixture in closed and open systems (ERC 2)	
Product characteristics	Solid (powder), liquid solutions
Amount used, frequency and duration of use (or from service life)	
Daily use at site	<= 2 tonnes/day
Annual use at a site	<= 380 tonnes/year
Percentage of tonnage used at regional scale	100 %
Conditions and measures related to sewage treatment plant	
Municipal STP	No
Conditions and measures related to treatment of waste (including article waste)	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other conditions affecting environmental exposure	
Discharge rate of effluent	>= 1.3E4 m ³ /d
Receiving surface water flow rate	>= 3.456E7 m ³ /d
Technical conditions and measures at process level (source) to prevent release	
Collect discharges contained in waste water. Explosive wastes must be destroyed by open-air incineration.	
Conditions and measures related to external treatment of waste for disposal	
Wastes are destroyed by burning by a qualified unit. Contaminated packing materials shall be destroyed under the same conditions as wastes.	
Control of worker exposure: Formulation of mixtures in closed batch process (PROC 3)	
Product (article) characteristics	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amount used (or contained in articles), frequency and duration of use/exposure	
Duration of activity	1 to 4 hours per day
Frequency	220 days/year
Technical and organisational conditions and measures	
General ventilation	Enhanced general ventilation (5-10 air changes per hour).
Containment	Closed batch process with occasional controlled exposure.
Local exhaust ventilation	No [Effectiveness Inhal: 0%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Dermal Protection	Yes (chemically resistant gloves conforming to EN374 with basic employee training) [Effectiveness Dermal: 90%]
Respiratory Protection	Yes (Respirator with APF of 20) [Effectiveness Inhal: 95%]
Hygiene measures	Wash hands before breaks and immediately after handling the product. During use, do not eat or

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	drink. Avoid any contact with skin, eyes, and clothes. Remove and wash any contaminated clothing before reusing it.
Other conditions affecting workers exposure	
Place of use	Indoor
Process temperature (for solid)	Use inside at ambient temperature and up to 60° C.
Skin surface potentially exposed	One hand face only (240 cm ²).
Technical conditions and measures to control dispersal from source towards the worker	
General protection measures: Provide sufficient ventilation and/or renewal in the workshops.	
Organisational measures to prevent/limit releases, dispersals, and exposures	
Control in place to verify that risk management measures in place are correctly used and the operating conditions monitored.	
Control of worker exposure: Transfer of mixtures into containers/vessels (PROC 9)	
Product (article) characteristics	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amount used (or contained in articles), frequency and duration of use/exposure	
Duration of activity	1 to 4 hours per day
Frequency	220 days/year
Technical and organisational conditions and measures	
General ventilation	Enhanced general ventilation (5-10 air changes per hour)
Containment	Semi-closed process with occasional controlled exposure
Local exhaust ventilation	Yes [Effectiveness Inhal: 90%]
Local exhaust ventilation (for dermal)	Yes [Effectiveness Dermal: 90%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Dermal Protection	Yes (chemically resistant gloves conforming to EN374 with specific activity training) [Effectiveness Dermal: 95%]
Respiratory Protection	Yes (Respirator with APF of 10) [Effectiveness Inhal: 90%]
Hygiene measures	Wash hands before breaks and immediately after handling the product. During use, do not eat or drink. Avoid any contact with skin, eyes, and clothes. Remove and wash any contaminated clothing before reusing it.
Other conditions affecting workers exposure	
Place of use	Indoor
Process temperature (for solid)	Use inside at ambient temperature and up to 60° C.
Skin surface potentially exposed	Two hands face (480 cm ²)
Technical conditions and measures to control dispersal from source towards the worker	
General protection measures: Provide sufficient ventilation and/or renewal in the workshops.	
Organisational measures to prevent/limit releases, dispersals, and exposures	
Ensure minimisation of manual phases.	

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Regular cleaning of work area equipment.	
Control in place to verify that risk management measures in place are correctly used and the operating conditions monitored.	
Control of worker exposure: Maintenance and cleaning operations after formulation of mixtures (PROC 8a)	
Product (article) characteristics	
Dustiness of material	Dust possible depending on the product's particle size characteristics.
Concentration of substance in mixture	Substance as such.
Amount used (or contained in articles), frequency and duration of use/exposure	
Duration of activity	1 to 4 hours per day
Frequency	220 days/year
Technical and organisational conditions and measures	
General ventilation	Enhanced general ventilation (5-10 air changes per hour)
Containment	No
Local exhaust ventilation	Yes [Effectiveness Inhal: 90%]
Local exhaust ventilation (for dermal)	Yes [Effectiveness Dermal: 90%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Dermal Protection	Yes (chemically resistant gloves conforming to EN374 with basic employee training) [Effectiveness Dermal: 95%]
Respiratory Protection	Yes (Respirator with APF of 10) [Effectiveness Inhal: 90%]
Other conditions affecting workers exposure	
Place of use	Indoor
Process temperature (for solid)	Use inside at ambient temperature and up to 60°C.
Skin surface potentially exposed	Two hands (960 cm ²)
Technical conditions and measures to control dispersal from source towards the worker	
General protection measures: Provide sufficient ventilation and/or renewal in the workshops.	
Organisational measures to prevent/limit releases, dispersals, and exposures	
Ensure minimisation of manual phases.	
Regular cleaning of work area equipment.	
Control in place to verify that risk management measures in place are correctly used and the operating conditions monitored.	
3. Exposure estimation and reference to its source	
Environment	
No exposure evaluation presented for the environment.	
Workers	
The worker exposure estimate was calculated using the CHESAR software (ECETOC TRA method).	
Worker exposure: Formulation of mixtures in closed batch process (PROC 3)	

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Worker exposure	Exposure level	DNEL	Ratio
Inhalation - Long-term Systemic	3 E-4 mg/m ³ /day	0.31 mg/m ³	9.7 E-4
Inhalation- Acute Systemic	0.006 mg/m ³ /day	8.29 mg/m ³	3 E-4
Dermal - Long-term Systemic	0.014 mg/kg of b.w./day	0.04 mg/kg of b.w./day	3 E-4

Worker exposure: Transfer of mixtures into containers/vessels (PROC 9)

Worker exposure	Exposure level	DNEL	Ratio
Inhalation - Long-term Systemic	6 E-5 mg/m ³ /day	0.31 mg/m ³	6 E-5
Inhalation- Acute Systemic	0.001 mg/m ³ /day	8.29 mg/m ³	6 E-5
Dermal - Long-term Systemic	0.007 mg/kg of b.w./day	0.04 mg/kg of b.w./day	6 E-5

Worker exposure: Maintenance and cleaning operations after formulation of mixtures (PROC 8a)

Worker exposure	Exposure level	DNEL	Ratio
Inhalation - Long-term Systemic	3 E-4 mg/m ³ /day	0.31 mg/m ³	9.7 E-5
Inhalation- Acute Systemic	0.006 mg/m ³ /day	8.29 mg/m ³	3 E-4
Dermal - Long-term Systemic	0.014 mg/kg of b.w./day	0.04 mg/kg of b.w./day	3 E-4

4. Guidance to downstream user to evaluate whether he works inside the boundaries set by the exposure scenario

Other good practices (operational conditions and risk management measures) established within the chemical industry are also recommended and communicated by means of the SDS, such as

- Minimise number of staff exposed.
- Extract the contaminant efficiently.
- Minimisation of manual phases.
- Avoidance of contact with contaminated tools and objects.
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that management measures in place are being used correctly and conditions followed.
- Training staff on good practice.
- Good standard of personal hygiene.

EXPOSURE SCENARIO 2: MANUFACTURE OF AMMUNITION

1. Manufacture of ammunition

Environment Contributing Scenario(s)

CS1: Production of ammunitions	ERC 5
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Worker Contributing Scenario(s)	
CS2: Transfer of substance or preparation into small containers	PROC 9
CS3: Heating, melting and casting in munitions	PROC 14
CS4: Mixing in batch processes for formulation	PROC 5
CS5: Transfer of substance or preparation into large containers	PROC 8b
2. Conditions of use affecting exposure	
Control of environmental exposure: Production of ammunitions (ERC 5)	
Product characteristics	Solid (powder), solutions
Amount used, frequency and duration of use (or from service life)	
Daily use at site	<= 1.25 tonnes/day
Annual use at a site	<= 25 tonnes/year
Percentage of tonnage used at regional scale	100 %
Conditions and measures related to sewage treatment plant	
Municipal STP	No
Conditions and measures related to treatment of waste (including article waste)	
Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)	
Other conditions affecting environmental exposure	
Discharge rate of effluent	>= 1.3E4 m ³ /d
Receiving surface water flow rate	>= 3.456E7 m ³ /d
Technical conditions and measures at process level (source) to prevent release	
Collect discharges contained in waste water. Explosive wastes must be destroyed by open-air incineration.	
Conditions and measures related to external treatment of waste for disposal	
Wastes are destroyed by burning by a qualified unit. Contaminated packing materials shall be destroyed under the same conditions as wastes.	
Control of worker exposure: Transfer of substance or preparation into small containers (PROC 9)	
Product (article) characteristics	
Dustiness of material	Low
Concentration of substance in mixture	Substance as such
Amount used (or contained in articles), frequency and duration of use/exposure	
Duration of activity	1 to 4 hours per day
Frequency	220 days/year
Technical and organisational conditions and measures	
General ventilation	Enhanced general ventilation (5-10 air changes per hour).
Containment	Semi-closed process with occasional controlled exposure.
Local exhaust ventilation	Yes [Effectiveness Inhal: 90%]
Local exhaust ventilation (for dermal)	Yes [Effectiveness Dermal: 90%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Dermal Protection	Yes (chemically resistant gloves conforming to EN374 with specific activity training) [Effectiveness

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	Dermal: 95%]
Respiratory Protection	Yes (Respirator with APF of 20) [Effectiveness Inhal: 95%]
Hygiene measures	Wash hands before breaks and immediately after handling the product. During use, do not eat or drink. Avoid any contact with skin, eyes, and clothes. Remove and wash any contaminated clothing before reusing it.
Other conditions affecting workers exposure	
Place of use	Indoor
Process temperature (for solid)	Use inside at ambient temperature and up to 60° C.
Skin surface potentially exposed	Two hands face only (480 cm ²)
Technical conditions and measures to control dispersal from source towards the worker	
General protection measures: Provide sufficient ventilation and/or renewal in the workshops.	
Control of worker exposure: Heating, melting and casting in munitions (PROC 14)	
Product (article) characteristics	
Dustiness of material	Dust possible depending on the product's particle size characteristics.
Concentration of substance in mixture	Substance as such
Amount used (or contained in articles), frequency and duration of use/exposure	
Duration of activity	1 to 4 hours per day
Frequency	220 days/year
Technical and organisational conditions and measures	
General ventilation	Enhanced general ventilation (5-10 air changes per hour)
Containment	No.
Local exhaust ventilation	Yes [Effectiveness Inhal: 90%]
Local exhaust ventilation (for dermal)	Yes [Effectiveness Dermal: 90%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Dermal Protection	Yes (chemically resistant gloves conforming to EN374 with specific activity training) [Effectiveness Dermal: 95%]
Respiratory Protection	Yes (Respirator with APF of 20) [Effectiveness Inhal: 90%]
Hygiene measures	Wash hands before breaks and immediately after handling the product. During use, do not eat or drink. Avoid any contact with skin, eyes, and clothes. Remove and wash any contaminated clothing before reusing it.
Other conditions affecting workers exposure	
Place of use	Indoor
Process temperature (for solid)	Use inside at ambient temperature and up to 60° C.
Skin surface potentially exposed	Two hands face (480 cm ²)
Technical conditions and measures to control dispersal from source towards the worker	
General protection measures: Provide sufficient ventilation and/or renewal in the workshops.	
Organisational measures to prevent/limit releases, dispersals, and exposures	

XYZ

Ensure minimisation of manual phases.	
Regular cleaning of work area equipment.	
Control of worker exposure: Mixing in batch processes for formulation (PROC 5)	
Product (article) characteristics	
Dustiness of material	Dust possible depending on the product's particle size characteristics.
Concentration of substance in mixture	Substance as such.
Amount used (or contained in articles), frequency and duration of use/exposure	
Duration of activity	1 to 4 hours per day
Frequency	220 days/year
Technical and organisational conditions and measures	
General ventilation	Enhanced general ventilation (5-10 air changes per hour)
Containment	No
Local exhaust ventilation	Yes [Effectiveness Inhal: 90%]
Local exhaust ventilation (for dermal)	Yes [Effectiveness Dermal: 90%]
Occupational Health and Safety Management System	Advanced
Conditions and measures related to personal protection, hygiene and health evaluation	
Dermal Protection	Yes (chemically resistant gloves conforming to EN374 with basic employee training) [Effectiveness Dermal: 95%]
Respiratory Protection	Yes (Respirator with APF of 20) [Effectiveness Inhal: 95%]
Hygiene measures	Wash hands before breaks and immediately after handling the product. During use, do not eat or drink. Avoid any contact with skin, eyes, and clothes. Remove and wash any contaminated clothing before reusing it.
Other conditions affecting workers exposure	
Place of use	Indoor
Process temperature (for solid)	Use inside at ambient temperature and up to 60° C.
Skin surface potentially exposed	Two hands face (480 cm ²)
Technical conditions and measures to control dispersal from source towards the worker	
General protection measures: Provide sufficient ventilation and/or renewal in the workshops.	
Organisational measures to prevent/limit releases, dispersals, and exposures	
Ensure minimisation of manual phases.	
Regular cleaning of work area equipment.	
Control of worker exposure: Transfer of substance or preparation into large containers (PROC 8b)	
Product (article) characteristics	
Dustiness of material	Dust possible depending on the product's particle size characteristics.
Concentration of substance in mixture	Substance as such.
Amount used (or contained in articles), frequency and duration of use/exposure	
Duration of activity	1 to 4 hours per day
Frequency	220 days/year
Technical and organisational conditions and measures	

XYZ

General ventilation	Enhanced general ventilation (5-10 air changes per hour)																		
Containment	Semi-closed process with occasional controlled exposure																		
Local exhaust ventilation	Yes [Effectiveness Inhal: 95%]																		
Local exhaust ventilation (for dermal)	Yes [Effectiveness Dermal: 95%]																		
Occupational Health and Safety Management System	Advanced																		
Conditions and measures related to personal protection, hygiene and health evaluation																			
Dermal Protection	Yes (chemically resistant gloves conforming to EN374 with specific activity training) [Effectiveness Dermal: 95%]																		
Respiratory Protection	Yes (Respirator with APF of 20) [Effectiveness Inhal: 95%]																		
Hygiene measures	Wash hands before breaks and immediately after handling the product. During use, do not eat or drink. Avoid any contact with skin, eyes, and clothes. Remove and wash any contaminated clothing before reusing it.																		
Other conditions affecting workers exposure																			
Place of use	Indoor																		
Process temperature (for solid)	Use inside at ambient temperature and up to 60° C.																		
Skin surface potentially exposed	Two hands (960 cm ²)																		
Technical conditions and measures to control dispersal from source towards the worker																			
General protection measures: Provide sufficient ventilation and/or renewal in the workshops.																			
Organisational measures to prevent/limit releases, dispersals, and exposures																			
Ensure minimisation of manual phases.																			
Regular cleaning of work area equipment.																			
3. Exposure estimation and reference to its source																			
Environment																			
No exposure evaluation presented for the environment.																			
Workers																			
The worker exposure estimate was calculated using the CHESAR software (ECETOC TRA method).																			
Worker exposure: Transfer of substance or preparation into small containers (PROC 9)																			
<table border="1"> <thead> <tr> <th>Worker exposure</th> <th>Exposure level</th> <th>DNEL</th> <th>Ratio</th> </tr> </thead> <tbody> <tr> <td>Inhalation - Long-term Systemic</td> <td>3 E-5 mg/m³/day</td> <td>0.31 mg/m³</td> <td>9.6 E-5</td> </tr> <tr> <td>Inhalation- Acute Systemic</td> <td>6 E-4 mg/m³/day</td> <td>8.29 mg/m³</td> <td>7.2 E-5</td> </tr> <tr> <td>Dermal - Long-term Systemic</td> <td>0.007 mg/kg of b.w./day</td> <td>0.04 mg/kg of b.w./day</td> <td>0.175</td> </tr> </tbody> </table>				Worker exposure	Exposure level	DNEL	Ratio	Inhalation - Long-term Systemic	3 E-5 mg/m ³ /day	0.31 mg/m ³	9.6 E-5	Inhalation- Acute Systemic	6 E-4 mg/m ³ /day	8.29 mg/m ³	7.2 E-5	Dermal - Long-term Systemic	0.007 mg/kg of b.w./day	0.04 mg/kg of b.w./day	0.175
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Worker exposure: Heating, melting and casting in munitions (PROC 14)																			
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XYZ

Inhalation- Acute Systemic	6 E-4 mg/m ³ /day	8.29 mg/m ³	7.2 E-5
Dermal - Long-term Systemic	0.003 mg/kg of b.w./day	0.04 mg/kg of b.w./day	0.075

Worker exposure: Mixing in batch processes for formulation (PROC 5)

Worker exposure	Exposure level	DNEL	Ratio
Inhalation - Long-term Systemic	0.003 mg/m ³ /day	0.31 mg/m ³	9.6 E-3
Inhalation- Acute Systemic	0.06 mg/m ³ /day	8.29 mg/m ³	0.007
Dermal - Long-term Systemic	0.014 mg/kg of b.w./day	0.04 mg/kg of b.w./day	0.35

Worker exposure: Transfer of substance or preparation into large containers (PROC 8b)

Worker exposure	Exposure level	DNEL	Ratio
Inhalation - Long-term Systemic	1.5 E-5 mg/m ³ /day	0.31 mg/m ³	4.8 E-5
Inhalation- Acute Systemic	3 E-4 mg/m ³ /day	8.29 mg/m ³	3.6 E-4
Dermal - Long-term Systemic	0.007 mg/kg of b.w./day	0.04 mg/kg of b.w./day	0.175

4. Guidance to downstream user to evaluate whether he works inside the boundaries set by the exposure scenario

Other good practices (operational conditions and risk management measures) established within the chemical industry are also recommended and communicated by means of the SDS, such as

- Minimise number of staff exposed.
- Extract the contaminant efficiently.
- Minimisation of manual phases.
- Avoidance of contact with contaminated tools and objects.
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that management measures in place are being used correctly and conditions followed.
- Training staff on good practice.
- Good standard of personal hygiene.