L(+)-Lactic Acid 90%

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

1.1 Product identifier

Trade name	:	L(+)-Lactic Acid 90%
Substance name	:	L(+)-lactic acid
Product name	:	L(+)-lactic acid aqueous solution 90%
Molecular formula	:	C3-H6-O3
Chemical identity	:	S(+)-2-Hydroxypropanoic acid
CAS-No.	:	79-33-4
EC-No.	:	201-196-2
REACH Registration Number	:	01-2119474164-39-0004
Unique Formula Identifier (UFI)	:	5M4V-DJ5D-100S-CR3H

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

Use of the Substance/Mixture	:	Food additive, Feed additive, Personal care, Cleaning agent, Biocidal product, Industrial use, Pharmaceutical raw material
Recommended restrictions on use	:	None known.

1.3 Details of the supplier of the safety data sheet

Company	:	Jungbunzlauer S.A. Z.I. Portuaire BP 32 67390 Marckolsheim France www.jungbunzlauer.com
Telephone	:	+33 388 582-929
Telefax	:	+33 388 582-941
Responsible/issuing person	:	msds@jungbunzlauer.com

1.4 Emergency telephone number

National Chemical Emergency Centre (NCEC)
+44 1865 407 333
ORFILA (INRS)
0 1 45 42 59 59

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Skin corrosion, Category 1	H314: Causes severe skin burns and eye damage.
Serious eye damage, Category 1	H318: Causes serious eye damage.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word : Danger

Hazard statements : H314 Causes severe skin burns and eye damage.

Supplemental Hazard Statements : EUH071 Corrosive to the respiratory tract.

Precautionary statements :

Prevention:

P260 Do not breathe vapours.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.

Hazardous components which must be listed on the label:

L(+)-lactic acid

2.3 Other hazards

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

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

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

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Chemical nature : Liquid

Components

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
L(+)-lactic acid	79-33-4 201-196-2 607-743-00-5 01-2119474164-39-0004Biocidal Products Regulation Article 95 list	Skin Corr. 1C; H314 Eye Dam. 1; H318 EUH071	>= 90 - <= 100

Non-hazardous ingredients

Chemical name	CAS-No. EC-No. Registration number	Concentration (% w/w)
H2O	7732-18-5 231-791-2 exempted according to REACH Annex IV	>= 0 - <= 10

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.

Protection of first-aiders : Wear personal protective equipment.

If inhaled : If breathed in, move person into fresh air.

No artificial respiration, mouth-to-mouth or mouth to nose. Use suitable instruments/apparatus.

If unconscious, place in recovery position and seek medical advice.
If symptoms persist, call a physician.

In case of skin contact : Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.
If on skin, rinse well with water.
If on clothes, remove clothes.

In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Small amounts splashed into eyes can cause irreversible tissue damage and blindness.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : Clean mouth with water and drink afterwards plenty of water.
Keep respiratory tract clear.
Do NOT induce vomiting.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : Severe eye irritation
Erythema
Skin disorders

Risks : Causes serious eye damage.
Corrosive to the respiratory tract.
Causes severe burns.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Water mist

Dry powder
Carbon dioxide (CO2)
Foam

Unsuitable extinguishing media : High volume water jet

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting : Exposure to decomposition products may be a hazard to health.

Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous combustion products : Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).

5.3 Advice for firefighters

Special protective equipment for firefighters : Use personal protective equipment.

Wear self-contained breathing apparatus for firefighting if necessary.

Further information : Standard procedure for chemical fires.
Use water spray to cool unopened containers.
In the event of fire and/or explosion do not breathe fumes.

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

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Material can create slippery conditions.
Use personal protective equipment.

6.2 Environmental precautions

Environmental precautions : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Clean contaminated surface thoroughly.

Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

See sections: 7, 8, 11, 12 and 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Technical measures	:	Avoid temperatures above 200°C.
Local/Total ventilation	:	Ensure adequate ventilation, especially in confined areas.
Advice on safe handling	:	Do not breathe vapours/dust. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. To avoid spills during handling keep bottle on a metal tray. Dispose of rinse water in accordance with local and national regulations.
Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety practice. Take off all contaminated clothing immediately. Wash contaminated clothing before re-use. When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	:	Keep in an area equipped with acid resistant flooring. Store in original container. Keep container tightly closed in a dry and well-ventilated place. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.
Further information on storage conditions	:	Keep away from direct sunlight.
Advice on common storage	:	Incompatible with bases.
Recommended storage temperature	:	> 5 °C
Further information on	:	No decomposition if stored and applied as directed.

storage stability

Packaging material : Suitable material: Plastic container of HDPE, Stainless steel 316L

7.3 Specific end use(s)

Specific use(s) : none

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Contains no substances with occupational exposure limit values.

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

Substance name	Environmental Compartment	Value
L(+)-lactic acid	Water	1,3 mg/l

8.2 Exposure controls

Engineering measures

Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

Eye protection : Ensure that eyewash stations and safety showers are close to the workstation location.
Safety glasses with side-shields

Eye wash bottle with pure water
Tightly fitting safety goggles
Wear face-shield and protective suit for abnormal processing problems.

Hand protection
Remarks : Wear suitable gloves tested to EN374.

The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Skin and body protection : acid-resistant protective clothing
Long sleeved clothing
Footwear protecting against chemicals

Impervious clothing
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Respiratory protection : In the case of vapour formation use a respirator with an approved filter.
Half mask with a particle filter P2 (EN 143)

No personal respiratory protective equipment normally

required.

Protective measures : Avoid contact with skin and clothing.
Wash skin thoroughly after handling.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	Aqueous solution, viscous
Colour	:	colourless, light yellow
Odour	:	characteristic
Odour Threshold	:	Not relevant
Melting point/freezing point	:	< -80 °C (ca. 1.013,25 hPa)
Boiling point/boiling range	:	110 - 130 °C
Flammability	:	Not applicable
Upper explosion limit / Upper flammability limit	:	Not applicable
Lower explosion limit / Lower flammability limit	:	Not applicable
Flash point	:	Not applicable
Auto-ignition temperature	:	400 °C
Decomposition temperature	:	No data available
pH	:	< 2 (25 °C)
Viscosity		
Viscosity, dynamic	:	18,4 mPa.s (25 °C)
Viscosity, kinematic	:	No data available
Solubility(ies)		
Water solubility	:	completely miscible
Partition coefficient: n-octanol/water	:	log Pow: -0,54 (20 °C)
Vapour pressure	:	ca. 0,038 Pa (20 °C)
Density	:	1,0 - 1,3 g/cm3

Relative vapour density	:	No data available

9.2 Other information

Explosives	:	Not applicable
Oxidizing properties	:	Not applicable
Flammability (liquids)	:	Not applicable
Metal corrosion rate	:	Not classified due to data which are conclusive although insufficient for classification.
Evaporation rate	:	Not applicable
Surface tension	:	70,7 mN/m, 1 g/l, 20 °C

SECTION 10: Stability and reactivity

10.1 Reactivity

No decomposition if stored and applied as directed.

10.2 Chemical stability

No decomposition if stored and applied as directed.

10.3 Possibility of hazardous reactions

Hazardous reactions	:	No decomposition if stored and applied as directed.

10.4 Conditions to avoid

Conditions to avoid	:	Temperature > 200 °C

10.5 Incompatible materials

Materials to avoid	:	Bases Oxidizing agents

10.6 Hazardous decomposition products

Build-up of dangerous/toxic fumes possible in cases of fire/high temperature.
Carbon dioxide (CO2)
Carbon monoxide

SECTION 11: Toxicological information

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

Acute toxicity

Not classified based on available information.

Components:

L(+)-lactic acid:

Acute oral toxicity	:	LD50 Oral (Rat, female): 3.543 mg/kg Test substance: Lactic acid Assessment: The substance or mixture has no acute oral toxicity LD50 Oral (Rat, male): 4.936 mg/kg Test substance: Lactic acid Assessment: The substance or mixture has no acute oral toxicity
Acute inhalation toxicity	:	LC50 (Rat, male and female): 7,94 mg/l Exposure time: 4 h Test atmosphere: vapour Test substance: Lactic acid Assessment: The substance or mixture has no acute inhalation toxicity, Corrosive to the respiratory tract.
Acute dermal toxicity	:	LD50 Dermal (Rabbit): 2.000 mg/kg Test substance: Lactic acid Assessment: The substance or mixture has no acute dermal toxicity

Skin corrosion/irritation

Causes severe burns.

Product:

Remarks	:	Extremely corrosive and destructive to tissue.

Components:

L(+)-lactic acid:

Species	:	Rabbit
Exposure time	:	4 h
Assessment	:	Corrosive after 1 to 4 hours of exposure
Result	:	Corrosive after 1 to 4 hours of exposure
Test substance	:	Lactic acid

Serious eye damage/eye irritation

Causes serious eye damage.

Product:

Remarks	:	May cause irreversible eye damage.

Components:

L(+)-lactic acid:

Species	:	chicken
Result	:	Severe irritation

Test substance : Lactic acid

Respiratory or skin sensitisation

Skin sensitisation
Not classified based on available information.

Respiratory sensitisation
Not classified based on available information.

Components:

L(+)-lactic acid:

Species	:	Guinea pig
Result	:	Does not cause skin sensitisation.

Germ cell mutagenicity
Not classified based on available information.

Components:

L(+)-lactic acid:

Germ cell mutagenicity-Assessment	:	In vitro tests did not show mutagenic effects

Carcinogenicity
Not classified based on available information.

Components:

L(+)-lactic acid:

Species	:	Rat, male and female
Result	:	Animal testing did not show any carcinogenic effects.
Test substance	:	Calcium lactate

Reproductive toxicity
Not classified based on available information.

Components:

L(+)-lactic acid:

STOT - single exposure
Corrosive to the respiratory tract.

Components:

L(+)-lactic acid:

Assessment	:	No data available

STOT - repeated exposure
Not classified based on available information.

Components:

L(+)-lactic acid:

Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Repeated dose toxicity

Components:

L(+)-lactic acid:

Species	:	Rat
LOAEL	:	886 mg/kg
Application Route	:	Dermal
Exposure time	:	13 wk
Number of exposures	:	5 d/wk
Dose	:	886 mg/kg bw
Test substance	:	Lactic acid
Assessment	:	slight irritation

Species	:	Rat, female
NOAEL	:	50.000 mg/l
Application Route	:	Oral
Exposure time	:	13 wk
Number of exposures	:	1/d
Dose	:	5%
Test substance	:	Calcium lactate
Assessment	:	No adverse effects

Aspiration toxicity

Not classified based on available information.

Components:

L(+)-lactic acid:

No data available

11.2 Information on other hazards

Endocrine disrupting properties

Product:

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

Components:

L(+)-lactic acid:

Assessment : The substance/mixture does not contain components

considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Further information

Product:

Remarks : No data available

SECTION 12: Ecological information

12.1 Toxicity

Components:

L(+)-lactic acid:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 130 mg/l
Exposure time: 96 h
Test substance: Lactic acid
Not classified

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 130 mg/l
End point: Immobilization
Exposure time: 48 h
Test substance: Lactic acid
Not classified due to data which are conclusive although insufficient for classification.

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (algae)): > 2.800 mg/l
Exposure time: 72 h
Test substance: Lactic acid
Not classified due to data which are conclusive although insufficient for classification.

NOEC (Pseudokirchneriella subcapitata (green algae)): 1.900 mg/l
Exposure time: 70 h
Test substance: Lactic acid
Not classified due to data which are conclusive although insufficient for classification.

Toxicity to microorganisms : EC50 (activated sludge): > 100 mg/l
Exposure time: 3 h
Test Type: Respiration inhibition
Test substance: Lactic acid
Not classified due to data which are conclusive although insufficient for classification.

Toxicity to fish (Chronic : LOEC: ca. 2,18 mg/l

toxicity)		Exposure time: 90 d Species: Fish (Oreochromus mossambica) Test substance: Lactic acid Environmental exposure assessment for this scenario is not relevant.
Toxicity to terrestrial organisms	:	LC50: > 2.250 mg/kg Exposure time: 14 d Species: Colinus virginianus (Bobwhite quail) Test substance: Lactic acid

12.2 Persistence and degradability

Components:

L(+)-lactic acid:

Biodegradability	:	Test Type: Closed Bottle test Inoculum: activated sludge Biodegradation: 80 % Related to: Biochemical oxygen demand Exposure time: 28 d Method: OECD Test Guideline 301 Test substance: L(+)-Lactic acid Readily biodegradable. Test Type: Ready biodegradability Method: QSAR Test substance: Lactic acid Readily biodegradable.
Stability in water	:	Not applicable

12.3 Bioaccumulative potential

Components:

L(+)-lactic acid:

Bioaccumulation	:	The product is miscible in water and readily biodegradable in both water and soil. Accumulation is not expected.
Partition coefficient: n-octanol/water	:	log Pow: -0,54 (20 °C)

12.4 Mobility in soil

Components:

L(+)-lactic acid:

Mobility	:	Method: Calculation, Mackay Level III Fugacity Model After release, disperses through ground water.
Distribution among	:	Koc: < 20,9, log Koc: < 1,32

environmental compartments		Method: OECD Test Guideline 121 Lactic acid
Stability in soil	:	Readily biodegradable.

12.5 Results of PBT and vPvB assessment

Product:

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

Components:

L(+)-lactic acid:

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

12.6 Endocrine disrupting properties

Product:

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

Components:

L(+)-lactic acid:

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

Non-hazardous ingredients:

12.7 Other adverse effects

Product:

Additional ecological information	:	No data available

Components:

L(+)-lactic acid:

Additional ecological information	:	No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product	:	In accordance with local and national regulations. Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14: Transport information

14.1 UN number or ID number

ADR	:	UN 3265
RID	:	UN 3265
IMDG	:	UN 3265
IATA	:	UN 3265

14.2 UN proper shipping name

ADR	:	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (lactic acid)
RID	:	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (lactic acid)
IMDG	:	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (lactic acid)
IATA	:	Corrosive liquid, acidic, organic, n.o.s. (lactic acid)

14.3 Transport hazard class(es)

ADR	:	8
RID	:	8
IMDG	:	8
IATA	:	8

14.4 Packing group

ADR

Packing group	:	III
Classification Code	:	C3
Hazard Identification Number	:	80

Labels	:	8
Tunnel restriction code	:	(E)

RID

Packing group	:	III
Classification Code	:	C3
Hazard Identification Number	:	80
Labels	:	8

IMDG

Packing group	:	III
Labels	:	8
EmS Code	:	F-A, S-B

IATA (Cargo)

Packing instruction (cargo aircraft)	:	856
Packing instruction (LQ)	:	Y841
Packing group	:	III
Labels	:	Class 8 - Corrosive substances

IATA (Passenger)

Packing instruction (passenger aircraft)	:	852
Packing instruction (LQ)	:	Y841
Packing group	:	III
Labels	:	Class 8 - Corrosive substances

14.5 Environmental hazards

ADR

Environmentally hazardous	:	no

RID

Environmentally hazardous	:	no

IMDG

Marine pollutant	:	no

14.6 Special precautions for user

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

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	:	Conditions of restriction for the following entries should be considered: Number on list 3

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	Not applicable
Regulation (EC) No 1005/2009 on substances that deplete the ozone layer	:	Not applicable
Regulation (EU) 2019/1021 on persistent organic pollutants (recast)	:	Not applicable
Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals	:	Not applicable
REACH - List of substances subject to authorisation (Annex XIV)	:	Not applicable

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances. Not applicable

Occupational Illnesses (R-461-3, France)	:	Not applicable
Reinforced medical supervision (R4624-18)	:	The product has no CMR properties
Volatile organic compounds	:	Directive 2010/75/EU of 24 November 2010 on industrial emissions (integrated pollution prevention and control) Not applicable

Other regulations:

Directive 2010/75/EU of 24 November 2010 on industrial emissions (integrated pollution prevention and control)
is applicable if lactic acid is used for the production of biocides

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

The components of this product are reported in the following inventories:

TCSI	:	On the inventory, or in compliance with the inventory
TSCA	:	All substances listed as active on the TSCA inventory
AIIC	:	On the inventory, or in compliance with the inventory
DSL	:	All components of this product are on the Canadian DSL
ENCS	:	On the inventory, or in compliance with the inventory

ISHL	:	On the inventory, or in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	On the inventory, or in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory
NZIoC	:	On the inventory, or in compliance with the inventory
REACH	:	This substance has been registered according to Regulation (EC) No. 1907/2006 (REACH). Notification number: 01-2119474164-39-000

15.2 Chemical safety assessment

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

SECTION 16: Other information

Full text of H-Statements

H314	:	Causes severe skin burns and eye damage.
H318	:	Causes serious eye damage.
EUH071	:	Corrosive to the respiratory tract.

Full text of other abbreviations

Eye Dam.	:	Serious eye damage
Skin Corr.	:	Skin corrosion

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention;

PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Classification of the mixture:		**Classification procedure:**
Skin Corr. 1	H314	Based on product data or assessment
Eye Dam. 1	H318	Based on product data or assessment

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Annex

Exposure Scenario

Number	Title
ES1	Manufacture.
ES2	Formulation or re-packing
ES3	Formulation or re-packing
ES4	Use at industrial sites; Various products (PC1, PC2, PC9a, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC36, PC37); Various sectors (SU1, SU2a, SU2b, SU4, SU8, SU9).
ES5	Use at industrial sites; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC37, PC38); Various sectors (SU8, SU9).
ES6	Use at industrial sites; Various products (PC4, PC21, PC24); Various sectors (SU2a, SU2b, SU17, SU19, SU23).
ES7	Use at industrial sites; Various products (PC1, PC9a, PC18, PC20, PC23, PC26, PC32, PC34); Various sectors (SU4, SU5, SU6a, SU6b, SU7, SU11, SU12, SU13, SU18).
ES8	Use at industrial sites; Various products (PC9a, PC15, PC20, PC21, PC35, PC37); Various sectors (SU8, SU9, SU12).
ES9	Use at industrial sites; Various products (PC2, PC9a, PC15, PC20, PC21, PC35, PC36, PC37); Various sectors (SU4, SU8, SU9).
ES10	Use at industrial sites; Other (PC0).
ES11	Use at industrial sites; Other (PC0); Building and construction work (SU19).
ES12	Widespread use by professional workers; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC38); Various sectors (SU1, SU20).
ES13	Widespread use by professional workers; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC38); Other (SU0).
ES14	Widespread use by professional workers; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC37, PC38); Various sectors (SU0, SU1, SU8, SU9).
ES15	Widespread use by professional workers; Various products (PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31); Various sectors (SU4, SU5, SU6a, SU6b, SU7, SU11, SU12, SU13, SU18).
ES16	Consumer use; Various products (PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31, PC35).
ES17	Consumer use; Various products (PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31, PC35).
ES18	Service life - workers; Various articles (AC0, AC1, AC7, AC10, AC11, AC13).

ES19	Service life - workers; Various articles (AC0, AC1, AC7, AC10, AC11, AC13).
ES20	Service life - workers; Various articles (AC4a, AC4g).
ES21	Service life - consumers; Various articles (AC1, AC2, AC4a, AC4g, AC7, AC10, AC11, AC13).

ES1: Manufacture.

1.1. Title section

Exposure Scenario name	:	Manufacture
Structured Short Title	:	Manufacture.

Environment		
CS1	**Manufacture of the substance**	ERC1
Worker		
CS2	**various processes**	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15, PROC28

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: Manufacture of the substance (ERC1)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid

1.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Use as laboratory reagent (PROC15) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Technical and organisational conditions and measures		
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Ensure regular inspection, cleaning and maintenance of equipment and machines. Clear spills immediately. Ensure daily cleaning of the equipment.		
Ensure adequate ventilation, especially in confined areas. Avoid temperatures above 200°C. Ensure that eyewash stations and safety showers are close to the workstation location.		
Closed systems Training of staff on good practice Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.		
Open systems Minimisation of staff exposed Segregation of the emitting process Effective contaminant extraction Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Minimisation of manual phases Avoid contact with contaminated tools and objects. Regular cleaning of work area Regular cleaning of equipment		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.		
Use suitable eye protection.		
Handle in accordance with good industrial hygiene and safety practice.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure: Manufacture of the substance (ERC1)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

1.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Use as laboratory reagent (PROC15) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

1.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Not relevant

ES2: Formulation or re-packing

2.1. Title section

Exposure Scenario name	:	Formulation into mixture
Structured Short Title	:	Formulation or re-packing

Environment		
CS1	**Formulation into mixture**	ERC2
Worker		
CS2	**various processes**	PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC13, PROC14, PROC15, PROC19, PROC26, PROC28

2.2. Conditions of use affecting exposure

2.2.1. Control of environmental exposure: Formulation into mixture (ERC2)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid

2.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production

where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Manual activities involving hand contact (PROC19) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid
Amount used, frequency and duration of use (or from service life)
Duration : Exposure duration <= 8 h
Technical and organisational conditions and measures
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Ensure regular inspection, cleaning and maintenance of equipment and machines. Clear spills immediately. Ensure daily cleaning of the equipment.
Ensure adequate ventilation, especially in confined areas. Avoid temperatures above 200°C. Ensure that eyewash stations and safety showers are close to the workstation location.
Closed systems Training of staff on good practice Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.
Open systems Minimisation of staff exposed Segregation of the emitting process Effective contaminant extraction Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Minimisation of manual phases Avoid contact with contaminated tools and objects. Regular cleaning of work area Regular cleaning of equipment
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.

Use suitable eye protection.		
Handle in accordance with good industrial hygiene and safety practice.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

2.3. Exposure estimation and reference to its source

2.3.1. Environmental release and exposure: Formulation into mixture (ERC2)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

2.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Manual activities involving hand contact (PROC19) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

2.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES3: Formulation or re-packing

3.1. Title section

Exposure Scenario name	:	Formulation into solid matrix
Structured Short Title	:	Formulation or re-packing

Environment		
CS1	**Formulation into solid matrix**	ERC3
Worker		
CS2	**various processes**	PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC13, PROC14, PROC15, PROC19, PROC26, PROC28

3.2. Conditions of use affecting exposure

3.2.1. Control of environmental exposure: Formulation into solid matrix (ERC3)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid

3.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production

where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Manual activities involving hand contact (PROC19) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid
Amount used, frequency and duration of use (or from service life)
Duration : Exposure duration <= 8 h
Technical and organisational conditions and measures
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Ensure regular inspection, cleaning and maintenance of equipment and machines. Clear spills immediately. Ensure daily cleaning of the equipment.
Ensure adequate ventilation, especially in confined areas. Avoid temperatures above 200°C. Ensure that eyewash stations and safety showers are close to the workstation location.
Closed systems Training of staff on good practice Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.
Open systems Minimisation of staff exposed Segregation of the emitting process Effective contaminant extraction Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Minimisation of manual phases Avoid contact with contaminated tools and objects. Regular cleaning of work area Regular cleaning of equipment
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.

Use suitable eye protection.		
Handle in accordance with good industrial hygiene and safety practice.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

3.3. Exposure estimation and reference to its source

3.3.1. Environmental release and exposure: Formulation into solid matrix (ERC3)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

3.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Manual activities involving hand contact (PROC19) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

3.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES4: Use at industrial sites; Various products (PC1, PC2, PC9a, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC36, PC37); Various sectors (SU1, SU2a, SU2b, SU4, SU8, SU9).

4.1. Title section

Exposure Scenario name	:	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
Structured Short Title	:	Use at industrial sites; Various products (PC1, PC2, PC9a, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC36, PC37); Various sectors (SU1, SU2a, SU2b, SU4, SU8, SU9).

Environment		
CS1	**Use of non-reactive processing aid at industrial site (no inclusion into or onto article)**	ERC4
Worker		
CS2	**various processes**	PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15, PROC16, PROC17, PROC18, PROC19, PROC20, PROC21, PROC24, PROC26, PROC28

4.2. Conditions of use affecting exposure

4.2.1. Control of environmental exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid

4.2.2. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid
Amount used, frequency and duration of use (or from service life)
Duration : Exposure duration <= 8 h
Technical and organisational conditions and measures
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Ensure regular inspection, cleaning and maintenance of equipment and machines. Clear spills immediately. Ensure daily cleaning of the equipment.
Ensure adequate ventilation, especially in confined areas.

Avoid temperatures above 200°C. Ensure that eyewash stations and safety showers are close to the workstation location.
Closed systems Training of staff on good practice Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.
Open systems Minimisation of staff exposed Segregation of the emitting process Effective contaminant extraction Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Minimisation of manual phases Avoid contact with contaminated tools and objects. Regular cleaning of work area Regular cleaning of equipment
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.
Use suitable eye protection.
Handle in accordance with good industrial hygiene and safety practice.
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

4.3. Exposure estimation and reference to its source

4.3.1. Environmental release and exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

4.3.2. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) /

Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

4.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES5: Use at industrial sites; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC37, PC38); Various sectors (SU8, SU9).

5.1. Title section

Exposure Scenario name	:	Use of reactive processing aid at industrial site (no inclusion into or onto article)
Structured Short Title	:	Use at industrial sites; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC37, PC38); Various sectors (SU8, SU9).

Environment		
CS1	**Use of reactive processing aid at industrial site (no inclusion into or onto article)**	ERC6b
Worker		
CS2	**various processes**	PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15, PROC16, PROC17, PROC18, PROC19, PROC20, PROC21, PROC24, PROC26, PROC28

5.2. Conditions of use affecting exposure

5.2.1. Control of environmental exposure: Use of reactive processing aid at industrial site (no inclusion into or onto article) (ERC6b)

Product (article) characteristics	
Covers percentage substance in the product up to 100 %.	
Physical form of product	: Liquid

5.2.2. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics	
Covers percentage substance in the product up to 100 %.	
Physical form of product	: Liquid
Amount used, frequency and duration of use (or from service life)	
Duration	: Exposure duration <= 8 h
Technical and organisational conditions and measures	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Ensure regular inspection, cleaning and maintenance of equipment and machines. Clear spills immediately. Ensure daily cleaning of the equipment.	
Ensure adequate ventilation, especially in confined areas. Avoid temperatures above 200°C. Ensure that eyewash stations and safety showers are close to the workstation location.	
Closed systems Training of staff on good practice Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.	

Open systems Minimisation of staff exposed Segregation of the emitting process Effective contaminant extraction Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Minimisation of manual phases Avoid contact with contaminated tools and objects. Regular cleaning of work area Regular cleaning of equipment
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.
Use suitable eye protection.
Handle in accordance with good industrial hygiene and safety practice.
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

5.3. Exposure estimation and reference to its source

5.3.1. Environmental release and exposure: Use of reactive processing aid at industrial site (no inclusion into or onto article) (ERC6b)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

5.3.2. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials and/or articles

(PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

5.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES6: Use at industrial sites; Various products (PC4, PC21, PC24); Various sectors (SU2a, SU2b, SU17, SU19, SU23).

6.1. Title section

Exposure Scenario name	:	Use of functional fluid at industrial site
Structured Short Title	:	Use at industrial sites; Various products (PC4, PC21, PC24); Various sectors (SU2a, SU2b, SU17, SU19, SU23).

Environment		
CS1	**Use of functional fluid at industrial site**	ERC7
Worker		
CS2	**various processes**	PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15, PROC16, PROC17, PROC18, PROC19, PROC20, PROC24, PROC26, PROC28

6.2. Conditions of use affecting exposure

6.2.1. Control of environmental exposure: Use of functional fluid at industrial site (ERC7)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid

6.2.2. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid
Amount used, frequency and duration of use (or from service life)
Duration : Exposure duration <= 8 h
Technical and organisational conditions and measures
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Ensure regular inspection, cleaning and maintenance of equipment and machines. Clear spills immediately. Ensure daily cleaning of the equipment.
Ensure adequate ventilation, especially in confined areas. Avoid temperatures above 200°C. Ensure that eyewash stations and safety showers are close to the workstation location.
Closed systems Training of staff on good practice Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.
Open systems Minimisation of staff exposed Segregation of the emitting process Effective contaminant extraction Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Minimisation of manual phases Avoid contact with contaminated tools and objects. Regular cleaning of work area Regular cleaning of equipment

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.
Use suitable eye protection.
Handle in accordance with good industrial hygiene and safety practice.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

6.3. Exposure estimation and reference to its source

6.3.1. Environmental release and exposure: Use of functional fluid at industrial site (ERC7)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

6.3.2. Worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative	

			approach used to conclude safe use.	

6.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES7: Use at industrial sites; Various products (PC1, PC9a, PC18, PC20, PC23, PC26, PC32, PC34); Various sectors (SU4, SU5, SU6a, SU6b, SU7, SU11, SU12, SU13, SU18).

7.1. Title section

Exposure Scenario name	:	Use at industrial site leading to inclusion into/onto article
Structured Short Title	:	Use at industrial sites; Various products (PC1, PC9a, PC18, PC20, PC23, PC26, PC32, PC34); Various sectors (SU4, SU5, SU6a, SU6b, SU7, SU11, SU12, SU13, SU18).

Environment		
CS1	**Use at industrial site leading to inclusion into/onto article**	ERC5
Worker		
CS2	**various processes**	PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC13, PROC28

7.2. Conditions of use affecting exposure

7.2.1. Control of environmental exposure: Use at industrial site leading to inclusion into/onto article (ERC5)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid

7.2.2. Control of worker exposure: Mixing or blending in batch processes (PROC5) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.

Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Technical and organisational conditions and measures		
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Ensure regular inspection, cleaning and maintenance of equipment and machines. Clear spills immediately. Ensure daily cleaning of the equipment.		
Ensure adequate ventilation, especially in confined areas. Avoid temperatures above 200°C. Ensure that eyewash stations and safety showers are close to the workstation location.		
Closed systems Training of staff on good practice Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.		
Open systems Minimisation of staff exposed Segregation of the emitting process Effective contaminant extraction Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Minimisation of manual phases Avoid contact with contaminated tools and objects. Regular cleaning of work area Regular cleaning of equipment		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.		
Use suitable eye protection.		
Handle in accordance with good industrial hygiene and safety practice.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

7.3. Exposure estimation and reference to its source

7.3.1. Environmental release and exposure: Use at industrial site leading to inclusion into/onto article (ERC5)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

7.3.2. Worker exposure: Mixing or blending in batch processes (PROC5) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

7.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES8: Use at industrial sites; Various products (PC9a, PC15, PC20, PC21, PC35, PC37); Various sectors (SU8, SU9, SU12).

8.1. Title section

Exposure Scenario name	:	Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
Structured Short Title	:	Use at industrial sites; Various products (PC9a, PC15, PC20, PC21, PC35, PC37); Various sectors (SU8, SU9, SU12).

Environment		
CS1	**Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)**	ERC6d
Worker		
CS2	**various processes**	PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC15, PROC21, PROC26, PROC28

8.2. Conditions of use affecting exposure

8.2.1. Control of environmental exposure: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6d)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid

8.2.2. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) /

Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Use as laboratory reagent (PROC15) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid
Amount used, frequency and duration of use (or from service life)
Duration : Exposure duration <= 8 h
Technical and organisational conditions and measures
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Ensure regular inspection, cleaning and maintenance of equipment and machines. Clear spills immediately. Ensure daily cleaning of the equipment.
Ensure adequate ventilation, especially in confined areas. Avoid temperatures above 200°C. Ensure that eyewash stations and safety showers are close to the workstation location.
Closed systems Training of staff on good practice Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.
Open systems Minimisation of staff exposed Segregation of the emitting process Effective contaminant extraction Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Minimisation of manual phases Avoid contact with contaminated tools and objects. Regular cleaning of work area Regular cleaning of equipment
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.
Use suitable eye protection.
Handle in accordance with good industrial hygiene and safety practice.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

8.3. Exposure estimation and reference to its source

8.3.1. Environmental release and exposure: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6d)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

8.3.2. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Use as laboratory reagent (PROC15) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	**Health effect**	**Exposure indicator**	**Exposure level**	**RCR**
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

8.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.

If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES9: Use at industrial sites; Various products (PC2, PC9a, PC15, PC20, PC21, PC35, PC36, PC37); Various sectors (SU4, SU8, SU9).

9.1. Title section

Exposure Scenario name	:	Use as intermediate
Structured Short Title	:	Use at industrial sites; Various products (PC2, PC9a, PC15, PC20, PC21, PC35, PC36, PC37); Various sectors (SU4, SU8, SU9).

Environment		
CS1	**Use of intermediate**	ERC6a
Worker		
CS2	**various processes**	PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC15, PROC21, PROC26, PROC28

9.2. Conditions of use affecting exposure

9.2.1. Control of environmental exposure: Use of intermediate (ERC6a)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid

9.2.2. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including

weighing) (PROC9) / Use as laboratory reagent (PROC15) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid
Amount used, frequency and duration of use (or from service life)
Duration : Exposure duration <= 8 h
Technical and organisational conditions and measures
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Ensure regular inspection, cleaning and maintenance of equipment and machines. Clear spills immediately. Ensure daily cleaning of the equipment.
Ensure adequate ventilation, especially in confined areas. Avoid temperatures above 200°C. Ensure that eyewash stations and safety showers are close to the workstation location.
Closed systems Training of staff on good practice Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.
Open systems Minimisation of staff exposed Segregation of the emitting process Effective contaminant extraction Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Minimisation of manual phases Avoid contact with contaminated tools and objects. Regular cleaning of work area Regular cleaning of equipment
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.
Use suitable eye protection.
Handle in accordance with good industrial hygiene and safety practice.
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

9.3. Exposure estimation and reference to its source

9.3.1. Environmental release and exposure: Use of intermediate (ERC6a)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

9.3.2. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Use as laboratory reagent (PROC15) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

9.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES10: Use at industrial sites; Other (PC0).

10.1. Title section

Exposure Scenario name	:	Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)
Structured Short Title	:	Use at industrial sites; Other (PC0).

Environment		
CS1	**Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)**	ERC6c
Worker		
CS2	**various processes**	PROC1, PROC2, PROC3, PROC4, PROC5, PROC28

10.2. Conditions of use affecting exposure

10.2.1. Control of environmental exposure: Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6c)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid

10.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics

Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Technical and organisational conditions and measures		
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Ensure regular inspection, cleaning and maintenance of equipment and machines. Clear spills immediately. Ensure daily cleaning of the equipment.		
Ensure adequate ventilation, especially in confined areas. Avoid temperatures above 200°C. Ensure that eyewash stations and safety showers are close to the workstation location.		
Closed systems Training of staff on good practice Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.		
Open systems Minimisation of staff exposed Segregation of the emitting process Effective contaminant extraction Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Minimisation of manual phases Avoid contact with contaminated tools and objects. Regular cleaning of work area Regular cleaning of equipment		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.		
Use suitable eye protection.		
Handle in accordance with good industrial hygiene and safety practice.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

10.3. Exposure estimation and reference to its source

10.3.1. Environmental release and exposure: Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6c)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

10.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

10.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES11: Use at industrial sites; Other (PC0); Building and construction work (SU19).

11.1. Title section

Exposure Scenario name	:	Other: building and construction preparations
Structured Short Title	:	Use at industrial sites; Other (PC0); Building and construction work (SU19).

Environment		
CS1	**Use at industrial site leading to inclusion into/onto article**	ERC5
Worker		
CS2	**various processes**	PROC5, PROC8a, PROC8b, PROC9, PROC28

11.2. Conditions of use affecting exposure

11.2.1. Control of environmental exposure: Use at industrial site leading to inclusion into/onto article (ERC5)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid

11.2.2. Control of worker exposure: Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Technical and organisational conditions and measures		
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Ensure regular inspection, cleaning and maintenance of equipment and machines. Clear spills immediately. Ensure daily cleaning of the equipment.		
Ensure adequate ventilation, especially in confined areas. Avoid temperatures above 200°C. Ensure that eyewash stations and safety showers are close to the workstation location.		
Closed systems Training of staff on good practice Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.		
Open systems Minimisation of staff exposed Segregation of the emitting process Effective contaminant extraction Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Minimisation of manual phases Avoid contact with contaminated tools and objects. Regular cleaning of work area Regular cleaning of equipment		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.		
Use suitable eye protection.		
Handle in accordance with good industrial hygiene and safety practice.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

11.3. Exposure estimation and reference to its source

11.3.1. Environmental release and exposure: Use at industrial site leading to inclusion into/onto article (ERC5)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

11.3.2. Worker exposure: Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

11.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES12: Widespread use by professional workers; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC38); Various sectors (SU1, SU20).

12.1. Title section

Exposure Scenario name	:	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor), Outdoor
Structured Short Title	:	Widespread use by professional workers; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC38); Various sectors (SU1, SU20).

Environment		
CS1	**Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor), Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)**	ERC8d, ERC8a
Worker		
CS2	**various processes**	PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC15, PROC16, PROC17, PROC18, PROC19, PROC20, PROC24, PROC26, PROC28

12.2. Conditions of use affecting exposure

12.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d) / Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid

12.2.2. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Non-industrial spraying (PROC11) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid
Amount used, frequency and duration of use (or from service life)
Duration : Exposure duration <= 8 h
Technical and organisational conditions and measures
Ensure adequate ventilation, especially in confined areas. Avoid temperatures above 200°C. Ensure that eyewash stations and safety showers are close to the workstation location.
Closed systems Training of staff on good practice Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Open systems Minimisation of staff exposed Segregation of the emitting process Effective contaminant extraction Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Minimisation of manual phases Avoid contact with contaminated tools and objects. Regular cleaning of work area Regular cleaning of equipment
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.
Use suitable eye protection.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

12.3. Exposure estimation and reference to its source

12.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d) / Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

12.3.2. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Non-industrial spraying (PROC11) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) /

Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

12.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES13: Widespread use by professional workers; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC38); Other (SU0).

13.1. Title section

Exposure Scenario name	:	Widespread use of reactive processing aid (no inclusion into or onto article, indoor), Outdoor
Structured Short Title	:	Widespread use by professional workers; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC38); Other (SU0).

Environment		
CS1	**Widespread use of reactive processing aid (no inclusion into or onto article, outdoor), Widespread use of reactive processing aid (no inclusion into or onto article, indoor)**	ERC8e, ERC8b
Worker		
CS2	**various processes**	PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC15, PROC16, PROC17, PROC18, PROC19, PROC20, PROC24, PROC26, PROC28

13.2. Conditions of use affecting exposure

13.2.1. Control of environmental exposure: Widespread use of reactive processing aid (no inclusion into or onto article, outdoor) (ERC8e) / Widespread use of reactive processing aid (no inclusion into or onto article, indoor) (ERC8b)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid

13.2.2. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Non-industrial spraying (PROC11) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid
Amount used, frequency and duration of use (or from service life)
Duration : Exposure duration <= 8 h
Technical and organisational conditions and measures
Ensure adequate ventilation, especially in confined areas. Avoid temperatures above 200°C. Ensure that eyewash stations and safety showers are close to the workstation location.
Closed systems Training of staff on good practice Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.
Open systems

Minimisation of staff exposed Segregation of the emitting process Effective contaminant extraction Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Minimisation of manual phases Avoid contact with contaminated tools and objects. Regular cleaning of work area Regular cleaning of equipment

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.
Use suitable eye protection.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

13.3. Exposure estimation and reference to its source

13.3.1. Environmental release and exposure: Widespread use of reactive processing aid (no inclusion into or onto article, outdoor) (ERC8e) / Widespread use of reactive processing aid (no inclusion into or onto article, indoor) (ERC8b)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

13.3.2. Worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Non-industrial spraying (PROC11) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

13.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES14: Widespread use by professional workers; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC37, PC38); Various sectors (SU0, SU1, SU8, SU9).

14.1. Title section

Exposure Scenario name	:	Use in functional fluids
Structured Short Title	:	Widespread use by professional workers; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC37, PC38); Various sectors (SU0, SU1, SU8, SU9).

Environment		
CS1	**Widespread use of functional fluid (outdoor), Widespread use of functional fluid (indoor)**	ERC9b, ERC9a
Worker		
CS2	**various processes**	PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC15, PROC16, PROC17, PROC18, PROC19, PROC20, PROC21, PROC24, PROC26, PROC28

14.2. Conditions of use affecting exposure

14.2.1. Control of environmental exposure: Widespread use of functional fluid (outdoor) (ERC9b) / Widespread use of functional fluid (indoor) (ERC9a)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid

14.2.2. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Non-industrial spraying (PROC11) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid
Amount used, frequency and duration of use (or from service life)
Duration : Exposure duration <= 8 h
Technical and organisational conditions and measures
Ensure adequate ventilation, especially in confined areas. Avoid temperatures above 200°C. Ensure that eyewash stations and safety showers are close to the workstation location.
Closed systems Training of staff on good practice Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Open systems Minimisation of staff exposed Segregation of the emitting process Effective contaminant extraction Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Minimisation of manual phases Avoid contact with contaminated tools and objects. Regular cleaning of work area Regular cleaning of equipment
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.
Use suitable eye protection.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

14.3. Exposure estimation and reference to its source

14.3.1. Environmental release and exposure: Widespread use of functional fluid (outdoor) (ERC9b) / Widespread use of functional fluid (indoor) (ERC9a)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

14.3.2. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Non-industrial spraying (PROC11) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials

and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

14.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES15: Widespread use by professional workers; Various products (PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31); Various sectors (SU4, SU5, SU6a, SU6b, SU7, SU11, SU12, SU13, SU18).

15.1. Title section

Exposure Scenario name	:	Widespread use leading to inclusion into/onto article (outdoor)
Structured Short Title	:	Widespread use by professional workers; Various products (PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31); Various sectors (SU4, SU5, SU6a, SU6b, SU7, SU11, SU12, SU13, SU18).

Environment		
CS1	**Widespread use leading to inclusion into/onto article (outdoor)**	ERC8f
Worker		
CS2	**various processes**	PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC15, PROC18, PROC19, PROC26, PROC28

15.2. Conditions of use affecting exposure

15.2.1. Control of environmental exposure: Widespread use leading to inclusion into/onto article (outdoor) (ERC8f)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid

15.2.2. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Non-industrial spraying (PROC11) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.
Physical form of product : Liquid
Amount used, frequency and duration of use (or from service life)
Duration : Exposure duration <= 8 h
Technical and organisational conditions and measures
Ensure adequate ventilation, especially in confined areas. Avoid temperatures above 200°C. Ensure that eyewash stations and safety showers are close to the workstation location.
Closed systems Training of staff on good practice Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.
Open systems Minimisation of staff exposed Segregation of the emitting process Effective contaminant extraction Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Minimisation of manual phases Avoid contact with contaminated tools and objects. Regular cleaning of work area Regular cleaning of equipment
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.
Use suitable eye protection.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

15.3. Exposure estimation and reference to its source

15.3.1. Environmental release and exposure: Widespread use leading to inclusion into/onto article (outdoor) (ERC8f)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

15.3.2. Worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Non-industrial spraying (PROC11) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

15.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure

scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES16: Consumer use; Various products (PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31, PC35).

16.1. Title section

Exposure Scenario name	:	Consumer use, (with service life)
Structured Short Title	:	Consumer use; Various products (PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31, PC35).

Environment		
CS1	**Widespread use leading to inclusion into/onto article (outdoor)**	ERC8f
Consumer		
CS2	**Various products**	PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31, PC35

16.2. Conditions of use affecting exposure

16.2.1. Control of environmental exposure: Widespread use leading to inclusion into/onto article (outdoor) (ERC8f)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.

16.2.2. Control of consumer exposure: Adhesives, sealants (PC1) / Anti-Freeze and de-icing products (PC4) / Biocidal products (e.g. Disinfectants, pest control) (PC8) / Fillers, putties, plasters, modelling clay (PC9b) / Finger paints (PC9c) / Non-metal-surface treatment products (PC15) / Products such as pH-regulators, flocculants, precipitants, neutralization agents (PC20) / Lubricants, greases, release products (PC24) / Polishes and wax blends (PC31) / Washing and cleaning products (including solvent based products) (PC35)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.

16.3. Exposure estimation and reference to its source

16.3.1. Environmental release and exposure: Widespread use leading to inclusion into/onto article (outdoor) (ERC8f)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

16.3.2. Consumer exposure: Adhesives, sealants (PC1) / Anti-Freeze and de-icing products (PC4) / Biocidal products (e.g. Disinfectants, pest control) (PC8) / Fillers, putties, plasters, modelling clay (PC9b) / Finger paints (PC9c) / Non-metal-surface treatment products (PC15) / Products such as pH-regulators, flocculants, precipitants, neutralization agents (PC20) / Lubricants, greases, release products (PC24) / Polishes and wax blends (PC31) / Washing and cleaning products (including solvent based products) (PC35)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

16.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Not applicable

ES17: Consumer use; Various products (PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31, PC35).

17.1. Title section

Exposure Scenario name	:	Consumer use, (without service life)
Structured Short Title	:	Consumer use; Various products (PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31, PC35).

Environment		
CS1	**Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor), Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)**	ERC8d, ERC8a
Consumer		
CS2	**Various products**	PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31, PC35

17.2. Conditions of use affecting exposure

17.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d) / Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.

17.2.2. Control of consumer exposure: Adhesives, sealants (PC1) / Anti-Freeze and de-icing products (PC4) / Biocidal products (e.g. Disinfectants, pest control) (PC8) / Fillers, putties, plasters, modelling clay (PC9b) / Finger paints (PC9c) / Non-metal-surface treatment products (PC15) / Products such as pH-regulators, flocculants, precipitants, neutralization agents (PC20) / Lubricants, greases, release products (PC24) / Polishes and wax blends (PC31) / Washing and cleaning products (including solvent based products) (PC35)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.

17.3. Exposure estimation and reference to its source

17.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d) / Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

17.3.2. Consumer exposure: Adhesives, sealants (PC1) / Anti-Freeze and de-icing products (PC4) / Biocidal products (e.g. Disinfectants, pest control) (PC8) / Fillers, putties, plasters, modelling clay (PC9b) / Finger paints (PC9c) / Non-metal-surface treatment products (PC15) / Products such as pH-regulators, flocculants, precipitants, neutralization agents (PC20) / Lubricants, greases, release products (PC24) / Polishes and wax blends (PC31) / Washing and cleaning products (including solvent based products) (PC35)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

17.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Not applicable

ES18: Service life - workers; Various articles (AC0, AC1, AC7, AC10, AC11, AC13).

18.1. Title section

Exposure Scenario name	:	Processing of articles at industrial sites with low release, Processing of articles at industrial sites with high release
Structured Short Title	:	Service life - workers; Various articles (AC0, AC1, AC7, AC10, AC11, AC13).

Environment		
CS1	**Processing of articles at industrial sites with high release, Processing of articles at industrial sites with low release**	ERC12b, ERC12a
Worker		
CS2	**various processes**	PROC21, PROC24, PROC28

18.2. Conditions of use affecting exposure

18.2.1. Control of environmental exposure: Processing of articles at industrial sites with high release (ERC12b) / Processing of articles at industrial sites with low release (ERC12a)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid

18.2.2. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		

Duration	:	Exposure duration <= 8 h
Technical and organisational conditions and measures		
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Ensure regular inspection, cleaning and maintenance of equipment and machines. Clear spills immediately. Ensure daily cleaning of the equipment.		
Ensure adequate ventilation, especially in confined areas. Avoid temperatures above 200°C. Ensure that eyewash stations and safety showers are close to the workstation location.		
Closed systems Training of staff on good practice Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.		
Open systems Minimisation of staff exposed Segregation of the emitting process Effective contaminant extraction Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Minimisation of manual phases Avoid contact with contaminated tools and objects. Regular cleaning of work area Regular cleaning of equipment		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable gloves tested to EN374. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.		
Use suitable eye protection.		
Handle in accordance with good industrial hygiene and safety practice.		
For further specification, refer to section 8 of the SDS.		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

18.3. Exposure estimation and reference to its source

18.3.1. Environmental release and exposure: Processing of articles at industrial sites with high release (ERC12b) / Processing of articles at industrial sites with low release (ERC12a)

Additional information on exposure estimation

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

18.3.2. Worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

18.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES19: Service life - workers; Various articles (AC0, AC1, AC7, AC10, AC11, AC13).

19.1. Title section

Exposure Scenario name	:	Use of articles at industrial sites with low release
Structured Short Title	:	Service life - workers; Various articles (AC0, AC1, AC7, AC10, AC11, AC13).

Environment		
CS1	**Use of articles at industrial sites with low release**	ERC12c
Worker		
CS2	**various processes**	PROC21, PROC28

19.2. Conditions of use affecting exposure

19.2.1. Control of environmental exposure: Use of articles at industrial sites with low release (ERC12c)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid

19.2.2. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid
Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h
Technical and organisational conditions and measures		

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Ensure regular inspection, cleaning and maintenance of equipment and machines. Clear spills immediately. Ensure daily cleaning of the equipment.
Ensure adequate ventilation, especially in confined areas. Avoid temperatures above 200°C. Ensure that eyewash stations and safety showers are close to the workstation location.
Closed systems Training of staff on good practice Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.
Open systems Minimisation of staff exposed Segregation of the emitting process Effective contaminant extraction Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Minimisation of manual phases Avoid contact with contaminated tools and objects. Regular cleaning of work area Regular cleaning of equipment
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.
Use suitable eye protection.
Handle in accordance with good industrial hygiene and safety practice.
For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor use
Temperature : Assumes process temperature up to 40 °C

19.3. Exposure estimation and reference to its source

19.3.1. Environmental release and exposure: Use of articles at industrial sites with low release (ERC12c)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

19.3.2. Worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

19.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES20: Service life - workers; Various articles (AC4a, AC4g).

20.1. Title section

Exposure Scenario name	:	Widespread use of articles with high or intended release (indoor), Outdoor, Widespread use of articles with low release (indoor)
Structured Short Title	:	Service life - workers; Various articles (AC4a, AC4g).

Environment		
CS1	**Widespread use of articles with high or intended release (outdoor), Widespread use of articles with low release (outdoor), Widespread use of articles with low release (indoor), Widespread use of articles with high or intended release (indoor)**	ERC10b, ERC10a, ERC11a, ERC11b
Worker		
CS2	**various processes**	PROC21, PROC24

20.2. Conditions of use affecting exposure

20.2.1. Control of environmental exposure: Widespread use of articles with high or intended release (outdoor) (ERC10b) / Widespread use of articles with low release (outdoor) (ERC10a) / Widespread use of articles with low release (indoor) (ERC11a) / Widespread use of articles with high or intended release (indoor) (ERC11b)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid

20.2.2. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24)

Product (article) characteristics		
Covers percentage substance in the product up to 100 %.		
Physical form of product	:	Liquid

Amount used, frequency and duration of use (or from service life)		
Duration	:	Exposure duration <= 8 h

Technical and organisational conditions and measures
Ensure adequate ventilation, especially in confined areas. Avoid temperatures above 200°C. Ensure that eyewash stations and safety showers are close to the workstation location.
Closed systems Training of staff on good practice Assumes a good basic standard of occupational hygiene is implemented Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.
Open systems Minimisation of staff exposed Segregation of the emitting process Effective contaminant extraction Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Minimisation of manual phases Avoid contact with contaminated tools and objects. Regular cleaning of work area Regular cleaning of equipment

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.
Use suitable eye protection.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C

20.3. Exposure estimation and reference to its source

20.3.1. Environmental release and exposure: Widespread use of articles with high or intended release (outdoor) (ERC10b) / Widespread use of articles with low release (outdoor) (ERC10a) / Widespread use of articles with low release (indoor) (ERC11a) / Widespread use of articles with high or intended release (indoor) (ERC11b)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

20.3.2. Worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

20.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

ES21: Service life - consumers; Various articles (AC1, AC2, AC4a, AC4g, AC7, AC10, AC11, AC13).

21.1. Title section

Exposure Scenario name	:	Widespread use of articles with high or intended release (outdoor), Indoor
Structured Short Title	:	Service life - consumers; Various articles (AC1, AC2, AC4a, AC4g, AC7, AC10, AC11, AC13).

Environment		
CS1	**Widespread use of articles with high or intended release (outdoor), Widespread use of articles with low release (outdoor), Widespread use of articles with low release (indoor), Widespread use of articles with high or intended release (indoor)**	ERC10b, ERC10a, ERC11a, ERC11b
Consumer		
CS2	**Various articles**	AC1, AC2, AC4a, AC4g, AC7, AC10, AC11, AC13

21.2. Conditions of use affecting exposure

21.2.1. Control of environmental exposure: Widespread use of articles with high or intended release (outdoor) (ERC10b) / Widespread use of articles with low release (outdoor) (ERC10a) / Widespread use of articles with low release (indoor) (ERC11a) / Widespread use of articles with high or intended release (indoor) (ERC11b)

Product (article) characteristics
Covers percentage substance in the product up to 100 %.

21.2.2. Control of consumer exposure: Vehicles (AC1) / Machinery, mechanical appliances, electrical/electronic articles (AC2) / Stone, plaster, cement, glass and ceramic articles: Large surface area articles (AC4a) / Other articles made of stone, plaster, cement, glass or ceramic (AC4g) / Metal articles (AC7) / Rubber articles (AC10) / Wood articles (AC11) / Plastic articles (AC13)

Product (article) characteristics

Covers percentage substance in the product up to 100 %.

21.3. Exposure estimation and reference to its source

21.3.1. Environmental release and exposure: Widespread use of articles with high or intended release (outdoor) (ERC10b) / Widespread use of articles with low release (outdoor) (ERC10a) / Widespread use of articles with low release (indoor) (ERC11a) / Widespread use of articles with high or intended release (indoor) (ERC11b)

Additional information on exposure estimation
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

21.3.2. Consumer exposure: Vehicles (AC1) / Machinery, mechanical appliances, electrical/electronic articles (AC2) / Stone, plaster, cement, glass and ceramic articles: Large surface area articles (AC4a) / Other articles made of stone, plaster, cement, glass or ceramic (AC4g) / Metal articles (AC7) / Rubber articles (AC10) / Wood articles (AC11) / Plastic articles (AC13)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR
Eye			Qualitative approach used to conclude safe use.	
dermal			Qualitative approach used to conclude safe use.	
inhalative			Qualitative approach used to conclude safe use.	

21.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Not applicable