SAFETY DATA SHEET

according to REACH Regulation (EC) No. 1907/2006, as amended by UK REACH Regulations SI 2019/758

Trimethylolpropane flake
10690

Version / Revision	4.01	**Revision Date**	27-Jan-2023
Supersedes Version	4.00***	**Issuing date**	27-Jan-2023

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

1.1. Product identifier

Identification of the substance/preparation **Trimethylolpropane flake**

CAS-No 77-99-6
EC No. 201-074-9

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

Identified uses Intermediate
Polymerization
Uses advised against None

1.3. Details of the supplier of the safety data sheet

Company/Undertaking Identification
OQ Chemicals GmbH
Rheinpromenade 4A
D-40789 Monheim
Germany

Product Information
Product Stewardship
FAX: +49 (0)208 693 2053
email: sc.psq@oq.com

1.4. Emergency telephone number

Emergency telephone number +44 (0) 1235 239 670 (UK)
available 24/7

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

This substance is classified based on Directive 1272/2008/EC and its amendments (CLP Regulation)

Reproductive toxicity Category 2, H361

Additional information
For full text of Hazard- and EU Hazard-statements see SECTION 16.

2.2. Label elements

Labelling according to Regulation 1272/2008/EC and its amendments (CLP Regulation).

Hazard pictograms

Signal word	**Warning**
Hazard statements	H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.
Precautionary statements	P201: Obtain special instructions before use. P202: Do not handle until all safety precautions have been read and understood. P280: Wear protective gloves/protective clothing/eye protection/face protection. P308 + P313: IF exposed or concerned: Get medical advice/ attention. P405: Store locked up. P501: Dispose of contents/container in accordance with local regulation.

2.3. Other hazards

Dust can form an explosive mixture in air

PBT and vPvB assessment	This substance is not considered to be persistent, bioaccumulating nor toxic (PBT), nor very persistent nor very bioaccumulating (vPvB)
Endocrine disrupting assessments	The substance is not listed on the candidate list according to Art. 59(1), REACh. The substance was not assessed as having endocrine disrupting properties according to regulation 2017/2100/EU or 2018/605/EU.

SECTION 3: Composition / information on ingredients

3.1. Substances

Component	CAS-No	1272/2008/EC	Concentration (%)
Trimethylolpropane (TMP)	77-99-6	Repr. 2; H361fd	> 98,0

For full text of Hazard- and EU Hazard-statements see SECTION 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation
Keep at rest. Aerate with fresh air. When symptoms persist or in all cases of doubt seek medical advice.

Skin
Wash off immediately with plenty of water. When symptoms persist or in all cases of doubt seek medical advice.

Eyes
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses. Immediate medical attention is required.

Ingestion

Call a physician immediately. Do not induce vomiting without medical advice.

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

Main symptoms
cough.

Special hazard
Lung irritation.

4.3. Indication of any immediate medical attention and special treatment needed

General advice
Remove contaminated, soaked clothing immediately and dispose of safely. First aider needs to protect himself.

Treat symptomatically. If ingested, irrigate the stomach using activated charcoal.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media
foam, dry chemical, carbon dioxide (CO2), water spray

Unsuitable Extinguishing Media
Do not use a solid water stream as it may scatter and spread fire.

5.2. Special hazards arising from the substance or mixture

Under conditions giving incomplete combustion, hazardous gases produced may consist of:
carbon monoxide (CO)
carbon dioxide (CO2)
Combustion gases of organic materials must in principle be graded as inhalation poisons
Dust can form an explosive mixture in air

5.3. Advice for firefighters

Special protective equipment for firefighters
Fire fighter protection should include a self-contained breathing apparatus (NIOSH-approved or EN 133) and full fire-fighting turn out gear.

Precautions for firefighting
Cool containers / tanks with water spray. Dike and collect water used to fight fire. Keep people away from and upwind of fire.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: For personal protective equipment see section 8. Avoid contact with skin and eyes. Do not breathe dust. Keep people away from and upwind of spill/leak. Ensure adequate ventilation, especially in confined areas. Keep away from heat and sources of ignition.
For emergency responders: Personal protection see section 8.

6.2. Environmental precautions

Prevent further leakage or spillage. Do not discharge product into the aquatic environment without pretreatment (biological treatment plant).

6.3. Methods and material for containment and cleaning up

Methods for containment
Stop the flow of material, if possible without risk. Dike spilled material, where this is possible.

Methods for cleaning up
Use mechanical handling equipment. Keep in suitable, closed containers for disposal. Dispose of in accordance with local regulations. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours).

6.4. Reference to other sections

For personal protective equipment see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Further info may be available in the appropriate Exposure scenarios in the annex to this SDS.

Advice on safe handling
Avoid dust formation. Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. Provide sufficient air exchange and/or exhaust in work rooms. Handle product only in closed system or provide appropriate exhaust ventilation at machinery.

Hygiene measures
When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Incompatible products
strong oxidizing agents

7.2. Conditions for safe storage, including any incompatibilities

Advice on protection against fire and explosion
Risk of dust explosion in fine crystalline powder form. Dust can form an explosive mixture in air. Keep away from sources of ignition - No smoking. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). In case of fire, emergency cooling with water spray should be available. Ground and bond containers when transferring material.

Technical measures/Storage conditions
Keep containers tightly closed in a cool, well-ventilated place. Handle and open container with care. Protect from moisture.

Unsuitable material
None known

Temperature class
T2

7.3. Specific end use(s)

Intermediate
Polymerization
For specific end use information see the annex of this safety data sheet

SECTION 8: Exposure controls / personal protection

8.1. Control parameters

Exposure limits European Union

No exposure limits established

Exposure limits UK

EH40 WELs

Component	TWA (mg/m³)	TWA (ppm)	STEL (mg/m³)	STEL (ppm)
Dust, general threshold limit value (respirable fraction) CAS: -	4			
Dust, general threshold limit value (inhalable fraction) CAS: -	10			

Note
For details and further information please refer to the original regulation.

DNEL & PNEC

Trimethylolpropane (TMP), CAS: 77-99-6

Workers

DN(M)EL - long-term exposure - systemic effects - Inhalation	3,3 mg/m³
DN(M)EL - acute / short-term exposure - systemic effects - Inhalation	No hazard identified
DN(M)EL - long-term exposure - local effects - Inhalation	No hazard identified
DN(M)EL - acute / short-term exposure - local effects - Inhalation	No hazard identified
DN(M)EL - long-term exposure - systemic effects - Dermal	0,94 mg/kg bw/day
DN(M)EL - acute / short-term exposure - systemic effects - Dermal	No hazard identified
DN(M)EL - long-term exposure - local effects - Dermal	No hazard identified
DN(M)EL - acute / short-term exposure - local effects - Dermal	No hazard identified
DN(M)EL - local effects - eyes	No hazard identified

General population

DN(M)EL - long-term exposure - systemic effects - Inhalation	0,58 mg/m³
DN(M)EL - acute / short-term exposure - systemic effects - Inhalation	No hazard identified
DN(M)EL - long-term exposure - local effects - Inhalation	No hazard identified
DN(M)EL - acute / short-term exposure - local effects - Inhalation	No hazard identified
DN(M)EL - long-term exposure - systemic effects - Dermal	0,34 mg/kg bw/day
DN(M)EL - acute / short-term exposure - systemic effects - Dermal	No hazard identified
DN(M)EL - long-term exposure - local effects - Dermal	No hazard identified
DN(M)EL - acute / short-term exposure - local effects - Dermal	No hazard identified
DN(M)EL - long-term exposure - systemic effects - Oral	0,34 mg/kg bw/day

DN(M)EL - acute / short-term exposure - systemic effects - Oral	No hazard identified
DN(M)EL - local effects - eyes	No hazard identified

Environment

PNEC aqua - freshwater	No hazard identified
PNEC aqua - marine water	No hazard identified
PNEC STP	No hazard identified
PNEC sediment - marine water	No hazard identified
PNEC soil	No hazard identified
Secondary poisoning	No potential for bioaccumulation

8.2. Exposure controls

Special adaptations (REACh)
Not applicable.

Appropriate Engineering controls
General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred. Explosion-proof equipment (for example fans, switches, and grounded ducts) should be used in mechanical ventilation systems.

Personal protective equipment

General industrial hygiene practice
Avoid contact with skin, eyes and clothing. Do not breathe dust or mist. Ensure that eyewash stations and safety showers are close to the workstation location.

Hygiene measures
When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Eye protection
Tightly fitting safety goggles.
Equipment should conform to EN 166

Hand protection
Wear protective gloves. Recommendations are listed below. Other protective material may be used, depending on the situation, if adequate degradation and permeation data is available. If other chemicals are used in conjunction with this chemical, material selection should be based on protection for all chemicals present.

Suitable material	nitrile rubber
Evaluation	according to EN 374: level 6
Glove thickness	approx 0,55 mm
Break through time	> 480 min

Suitable material	polyvinylchloride / nitrile rubber
Evaluation	according to EN 374: level 6
Glove thickness	approx 0,9 mm
Break through time	> 480 min

Skin and body protection
Impervious clothing. Wear face-shield and protective suit for abnormal processing problems.

Respiratory protection

Respirator with a dust filter. Full mask with above mentioned filter according to producers using requirements or self-contained breathing apparatus. Equipment should conform to EN 136 or EN 140 and EN 143.

Environmental exposure controls
Use product only in closed system. If leakage can not be prevented, the substance needs to be suck off at the emersion point, if possible without danger. Observe the exposure limits, clean exhaust air if needed. If recycling is not practicable, dispose of in compliance with local regulations. Inform the responsible authorities in case of leakage into the atmosphere, or of entry into waterways, soil or drains.

Additional advice
Further details on substance data can be found in the registration dossier under the following link: http://echa.europa.eu/information-on-chemicals/registered-substances.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Flakes wax like
Colour	white
Odour	odourless
Odour threshold	No data available
Melting point/freezing point	58 °C
Boiling point or initial boiling point and boiling range	304 °C @ 1013 hPa
Flammability	Even if not classified as flammable, the product is capable of catching fire or being set on fire.***
Lower explosion limit	2 Vol %
Upper explosion limit	11,8 Vol %
Flash point	149 - 180 °C
Autoignition temperature	~ 375 °C
Method	DIN 51794
Decomposition temperature	No data available
pH	5,6 @ 25 °C (77 °F)
Kinematic Viscosity	No data available
Solubility	100 - 1000 g/l @ 20 °C, in water
Partition coefficient n-octanol/water (log value)	-0,47 (measured)

Vapour pressure

Values [hPa]	Values [kPa]	Values [atm]	@ °C	@ °F	Method
< 0,001	< 0,0001	< 0,0001	20	68	

Density and/or relative density

Values	@ °C	@ °F	Method
1,084 - 1,09	20	68	

Relative vapour density	4,63 (Air = 1) @ 20 °C (68 °F)
Particle characteristics	No data available

9.2. Other information

Explosive properties	Does not apply, substance is not explosive. There are no chemical groups associated with explosive properties
Oxidizing properties	Does not apply, substance is not oxidising. There are no chemical groups associated with oxidizing properties
Molecular weight	134,17
Molecular formula	C6 H14 O3
Evaporation rate	No data available

hygroscopic.

SECTION 10: Stability and Reactivity

10.1. Reactivity

The reactivity of the product corresponds to the typical reactivity shown by the substance group as described in any text book on organic chemistry.

10.2. Chemical stability

Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

Dust can form an explosive mixture in air.

10.4. Conditions to avoid

Avoid contact with heat, sparks, open flame and static discharge. Avoid any source of ignition.

10.5. Incompatible materials

strong oxidizing agents.

10.6. Hazardous decomposition products

No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

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

Likely routes of exposure Ingestion, Inhalation, Eye contact, Skin contact

Acute toxicity				
Trimethylolpropane (TMP) (77-99-6)				
Routes of Exposure	Endpoint	Values	Species	Method
Oral	LD50	~ 14700 mg/kg	rat, male	OECD 401
Dermal	LD50	> 10000 mg/kg	rabbit	OECD 402
Inhalative	LC50	> 0,85 mg/l (4h)	rat, male	

Trimethylolpropane (TMP), CAS: 77-99-6
Assessment
Based on available data, the classification criteria are not met for:
Acute oral toxicity
Acute dermal toxicity
Acute inhalation toxicity
STOT SE

Irritation and corrosion				
Trimethylolpropane (TMP) (77-99-6)				
Target Organ Effects	Species	Result	Method	
Skin	rabbit	No skin irritation		

Eyes	rabbit	No eye irritation		

Trimethylolpropane (TMP), CAS: 77-99-6
Assessment
Based on available data, the classification criteria are not met for:
skin irritation/corrosion
eye irritation/corrosion
For respiratory irritation, no data are available

Sensitization				
Trimethylolpropane (TMP) (77-99-6)				
Target Organ Effects	Species	Evaluation	Method	
Skin	mouse	not sensitizing	OECD 429	

Trimethylolpropane (TMP), CAS: 77-99-6
Assessment
Based on available data, the classification criteria are not met for:
Skin sensitization
For respiratory sensitization, no data are available

Subacute, subchronic and prolonged toxicity				
Trimethylolpropane (TMP) (77-99-6)				
Type	Dose	Species	Method	
Subchronic toxicity	NOAEL: ~ 67 mg/kg/d (90d)	rat, male/female		Oral

Trimethylolpropane (TMP), CAS: 77-99-6
Assessment
Based on available data, the classification criteria are not met for:
STOT RE

Carcinogenicity, Mutagenicity, Reproductive toxicity					
Trimethylolpropane (TMP) (77-99-6)					
Type	Dose	Species	Evaluation	Method	
Mutagenicity		Salmonella typhimurium	negative	OECD 471 (Ames)	In vitro study
Mutagenicity		CHL	negative	OECD 473 (Chromosomal Aberration)	In vitro study
Mutagenicity		V79 cells, Chinese hamster	negative	OECD 476 (Mammalian Gene Mutation)	In vitro study
Reproductive toxicity	NOAEL 800 mg/kg/d	rat, parental		OECD 422, Oral	in vivo
Reproductive toxicity	NOAEL 800 mg/kg/d	rat, 1. Generation, male/female		OECD 422, Oral	in vivo
Reproductive toxicity	NOAEL: 740 ppm	rat rat, parental		OECD 443 Oral	in vivo
Reproductive toxicity	NOAEL: 2200 ppm	rat, 1. Generation, male/female		OECD 443 Oral	in vivo
Developmental Toxicity	NOAEL 100 mg/kg/d	rat		OECD 414, Oral	in vivo
Developmental Toxicity	NOAEL 100	rabbit		OECD 414, Oral	in vivo

	mg/kg/d				

Trimethylolpropane (TMP), CAS: 77-99-6
CMR Classification
The available data on CMR properties are summarized in the table above. They do not indicate a classification into categories 1A or 1B
The substance has been classified as:
Repr. 2
Evaluation
In vitro tests did not show mutagenic effects
In the absence of specific alerts no cancer testing is required
Suspected of damaging fertility or the unborn child

Trimethylolpropane (TMP), CAS: 77-99-6
Main symptoms
cough.
Target Organ Systemic Toxicant - Single exposure
Based on available data, the classification criteria are not met for:
STOT SE
Target Organ Systemic Toxicant - Repeated exposure
Based on available data, the classification criteria are not met for:
STOT RE
Aspiration toxicity
no data available

11.2. Information on other hazards

Endocrine disrupting properties
The substance has not been identified as having endocrine disrupting properties in accordance with section 2.3.
Note
Handle in accordance with good industrial hygiene and safety practice. Further details on substance data can be found in the registration dossier under the following link:
http://echa.europa.eu/information-on-chemicals/registered-substances.

SECTION 12: Ecological information

12.1. Toxicity

Acute aquatic toxicity			
Trimethylolpropane (TMP) (77-99-6)			
Species	Exposure time	Dose	Method
Daphnia magna (Water flea)	48h	EC50: 13000 mg/l	
Alburnus alburnus	96h	LC50: > 1000 mg/l	DEV L8
Pseudokirchneriella subcapitata	72h	EC50: > 1000 mg/l	
Activated sludge (domestic)	3 h	EC50: > 1000 mg/l	DIN 38412, part 11

Long term toxicity				
Trimethylolpropane (TMP) (77-99-6)				
Type	Species	Dose	Method	
Mortality	Daphnia magna (Water flea)	NOEC: > 1000 mg/l (21d)		

12.2. Persistence and degradability

Trimethylolpropane (TMP), CAS: 77-99-6
Biodegradation
6 % (28 d), activated sludge, industrial, non-adapted, OECD 301 E, Not readily biodegradable,
100 % (28 d), activated sludge, OECD 302 B (Zahn-Wellens Test), Inherently biodegradable.

Abiotic Degradation		
Trimethylolpropane (TMP) (77-99-6)		
Type	Result	Method
Hydrolysis	Half-life (DT50): > 356 d @ 25°C	OECD 111
Photolysis	Half-life (DT50): 1,2 days	calculated

12.3. Bioaccumulative potential

Trimethylolpropane (TMP) (77-99-6)		
Type	Result	Method
log Pow	-0,47	measured
log BCF	< 2	calculated, OECD 305 C

12.4. Mobility in soil

Trimethylolpropane (TMP) (77-99-6)		
Type	Result	Method
Surface tension	71 mN/m @ 20 °C (68 °F)	measured
Adsorption/Desorption	Koc: 1,5	calculated
Distribution to environmental compartments	Air: 0,32 Soil: 59,7 Water: 39,9 Sediment: 0,07	Calculation according Mackay, Level III

12.5. Results of PBT and vPvB assessment

Trimethylolpropane (TMP), CAS: 77-99-6
PBT and vPvB assessment
This substance is not considered to be persistent, bioaccumulating nor toxic (PBT), nor very persistent nor very bioaccumulating (vPvB)

12.6. Endocrine disrupting properties

The substance has not been identified as having endocrine disrupting properties in accordance with section 2.3.

12.7. Other adverse effects

Trimethylolpropane (TMP), CAS: 77-99-6
No data available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product Information
Disposal required in compliance with all waste management related state and local regulations. The choice of the appropriate method of disposal depends on the product composition by the time of disposal as well as the local

statutes and possibilities for disposal.
Hazardous waste according to European Waste Catalogue (EWC)

Uncleaned empty packaging
Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse.

SECTION 14: Transport information

Section 14.1 - 14.6

ADR/RID Not restricted

ADN ADN: Container and Tanker
Not restricted

ICAO-TI / IATA-DGR Not restricted

IMDG Not restricted

14.7. Maritime transport in bulk according to IMO instruments not applicable

SECTION 15: Regulatory information

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

Regulation 1272/2008, Annex VI
not listed

DI 2012/18/EU (Seveso III)
Category not subject

DI 1999/13/EC (VOC Guideline)

Component	Status
Trimethylolpropane (TMP) CAS: 77-99-6	not subject

The REACH etc. (Amendment etc.) (EU Exit) Regulations 2019 No. 758

Component	Status
Trimethylolpropane (TMP) CAS: 77-99-6	The substance will not be pre-registered

For details and further information please refer to the original regulation.

International Inventories

Trimethylolpropane (TMP), CAS: 77-99-6
AICS (AU)
DSL (CA)
IECSC (CN)
EC-No. 2010749 (EU)
ENCS (2)-245 (JP)
ISHL (2)-245 (JP)
KECI KE-13838 (KR)
INSQ (MX)
PICCS (PH)
TSCA (US)
NZIoC-NZ with note
TCSI (TW)

National regulatory information Great Britain

Releases to air (Pollution Inventory Substances)

Component	Annual reporting level threshold
Trimethylolpropane (TMP) CAS: 77-99-6	not listed
Dust, general threshold limit value (inhalable fraction) CAS: -	10 tonnes, listed as particulates - total

Releases to water (Pollution Inventory Substances)
not subject

Releases to sewer (Pollution Inventory Substances)
not subject
For details and further information please refer to the original regulation

15.2. Chemical safety assessment

The Chemical Safety Report (CSR) has been generated. For Exposure Scenarios see the annex.

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3
H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.

Abbreviations
A table of terms and abbreviations can be found under the following link:
http://echa.europa.eu/documents/10162/13632/information_requirements_r20_en.pdf

Training advice
For effective first-aid, special training / education is needed.

Sources of key data used to compile the datasheet
Information contained in this safety data sheet is based on OQ owned data and public sources deemed valid or acceptable. The absence of data elements required by OSHA, ANSI or Annex II, Regulation 1907/2006/EC indicates, that no data meeting these requirements is available.

Further information for the safety data sheet

Changes against the previous version are marked by ***. Observe national and local legal requirements. For more information, other material safety data sheets or technical data sheets please consult the OQ homepage (www.chemicals.oq.com).

Disclaimer

For industrial use only. The information contained herein is accurate to the best of our knowledge. We do not suggest or guarantee that any hazards listed herein are the only ones which exist. OQ Chemicals makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances. User has the sole responsibility to determine the suitability of the materials for any use and the manner of use contemplated. User must meet all applicable safety and health standards.

End of Safety Data Sheet

General information

Other combinations of operational conditions may also be safe. Please contact OQ in case your local operational conditions differ from the ones described below and you are unsure if they are also safe
Wear protective gloves/clothing and eye/face protection, where direct contact with substance is possible
For further specification, refer to section 8 of the SDS.

1 Industrial use resulting in manufacture of another substance (use of intermediates)
2 Polymerisation

Number of the ES 1

Short title of the exposure scenario

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

Sector of uses [SU]
SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites
SU9: Manufacture of fine chemicals

Process categories [PROC]
PROC1: Use in closed process, no likelihood of exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC15: Use as laboratory reagent

Environmental release categories [ERC]
ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

Product characteristics
Refer to attached safety data sheets

Processes and activities covered by the exposure scenario
Use as an intermediate (not related to Strictly Controlled Conditions). Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (ncluding marine vessel/barge, road/rail car and bulk container).

Further explanations
Industrial use
Assumes use at not more than 20°C above ambient temperature (unless stated differently)
Assumes an advanced standard of occupational Health and Safety Management System

Number of the contributing scenario 1
Contributing exposure scenario controlling environmental exposure for ERC 6a

Further specification
release factors for (Sp)ERC were modified Specific Environmental Release Categories [SPERC] SpERC ESVOC 6.1a.v1
assessment tool used: chesar 3.4
Amounts used
Daily amount per site: 23,3 to
Annual amount per site: 7000 to
Environment factors not influenced by risk management
River flow rate: 18000 m³/d
Other given operational conditions affecting environmental exposure
Indoor/Outdoor use
Technical conditions and measures at process level (source) to prevent release
Release fraction to air from process: 0,001%
Release fraction to wastewater from process: 1%
Release fraction to soil from process: 0,01%
Conditions and measures related to municipal sewage treatment plant
Size of municipal sewage system/ treatment plant (m³/d): 2000
The minimum grade of elimination in the sewage plant is (%): 40,83
Conditions and measures related to external treatment of waste for disposal
Dispose of waste product or used containers according to local regulations

Number of the contributing scenario **2**
Contributing exposure scenario controlling worker exposure for PROC 1

Further specification
Assessment tool used: chesar 3.4
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Solid, low dustiness
Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Assumes use at not more than 20°C above ambient temperature (unless stated differently)
Indoor and outdoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent /limit releases, dispersion and exposure
Only properly trained and authorised personnel shall handle the substance
substance-handling procedures shall be well documented and supervised
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. For further specification, refer to section 8 of the SDS.

Number of the contributing scenario **3**
Contributing exposure scenario controlling worker exposure for PROC 3, PROC 15

Further specification
Assessment tool used: chesar 3.4
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Solid, low dustiness
Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Assumes use at not more than 20°C above ambient temperature (unless stated differently)
Indoor and outdoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent /limit releases, dispersion and exposure
Only properly trained and authorised personnel shall handle the substance
substance-handling procedures shall be well documented and supervised
Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. For further specification, refer to section 8 of the SDS.

Number of the contributing scenario 4
Contributing exposure scenario controlling worker exposure for PROC 4, PROC 8b, PROC 9

Further specification
Assessment tool used: chesar 3.4
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Solid, low dustiness
Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Assumes use at not more than 20°C above ambient temperature (unless stated differently)
Indoor and outdoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent /limit releases, dispersion and exposure
Only properly trained and authorised personnel shall handle the substance
substance-handling procedures shall be well documented and supervised
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. For further specification, refer to section 8 of the SDS.

Fresh Water (Pelagic)	RCR: < 1
Fresh Water (Sediment)	RCR: < 1
Marine Water (Pelagic)	RCR: < 1
Marine Water (Sediment)	RCR: < 1
Air	RCR: < 1
Agricultural Soil	RCR: < 1
Sewage Treatment Plant (Effluent)	RCR: < 1
Proc 1	combined routes RCR: < 1
Proc 3	combined routes RCR: < 1
Proc 4	combined routes RCR: < 1
Proc 8b	combined routes RCR: < 1
Proc 9	combined routes RCR: < 1
Proc 15	combined routes RCR: < 1

Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES
Usage of relase factors allows downstream users to verify in a first approximation, if the combination of local usage and production conditions meets the defined release quantities resulting from this exposure scenario (calculated as M(site) [see amounts used, contributing scenario 1] x release factor [Technical conditions and measures at process level (source) to prevent release; contributing scenario 1])

associated uses:

Other combinations of operational conditions may also be safe. Please contact OQ in case your local operational conditions differ from the ones described above and you are unsure if they are also safe

Number of the ES 2

Short title of the exposure scenario
Polymerisation

Sector of uses [SU]
SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites
SU12: Manufacture of plastics products, including compounding and conversion

Process categories [PROC]
PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC14: production of preparations or articles by tabletting, compression, extrusion, pelettisation
PROC15: Use as laboratory reagent

Environmental release categories [ERC]
ERC6c: Industrial use of monomers for manufacture of thermoplastics

Product characteristics
Refer to attached safety data sheets

Processes and activities covered by the exposure scenario
Manufacture of polymers from monomers in continuous and batch processes, including sparging, discharging and reactor maintenance and immediate polymer product formation (i.e. compounding, pelletisation, product off-gassing)

Further explanations
Industrial use
Assumes use at not more than 20°C above ambient temperature (unless stated differently)
Assumes an advanced standard of occupational Health and Safety Management System

Number of the contributing scenario **1**
Contributing exposure scenario controlling environmental exposure for ERC 6c

Further specification
release factors for (Sp)ERC were modified, Specific Environmental Release Categories [SPERC], OECD ESD, No. 3 (OECD 2004/2009),
assessment tool used:, chesar 3.4.
Amounts used
Daily amount per site: 51 to
Annual amount per site: 17000 to
Environment factors not influenced by risk management
River flow rate: 18000 m³/d
Other given operational conditions affecting environmental exposure
Indoor/Outdoor use
Technical conditions and measures at process level (source) to prevent release
Release fraction to air from process: 0%
Release fraction to wastewater from process: 0,01%
Release fraction to soil from process: 0%
Conditions and measures related to municipal sewage treatment plant
Size of municipal sewage system/ treatment plant (m³/d): 2000
The minimum grade of elimination in the sewage plant is (%): 40,83
Conditions and measures related to external treatment of waste for disposal
Dispose of waste product or used containers according to local regulations

Number of the contributing scenario **2**
Contributing exposure scenario controlling worker exposure for PROC 1

Further specification

Assessment tool used: chesar 3.4
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Solid, low dustiness
Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Assumes use at not more than 20°C above ambient temperature (unless stated differently)
Indoor and outdoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent /limit releases, dispersion and exposure
Only properly trained and authorised personnel shall handle the substance
substance-handling procedures shall be well documented and supervised
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. For further specification, refer to section 8 of the SDS.

Number of the contributing scenario **3**
Contributing exposure scenario controlling worker exposure for PROC 2, PROC 3, PROC 15

Further specification
Assessment tool used: chesar 3.4
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Solid, low dustiness
Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Assumes use at not more than 20°C above ambient temperature (unless stated differently)
Indoor and outdoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent /limit releases, dispersion and exposure
Only properly trained and authorised personnel shall handle the substance
substance-handling procedures shall be well documented and supervised
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. For further specification, refer to section 8 of the SDS.

Number of the contributing scenario **4**
Contributing exposure scenario controlling worker exposure for PROC 4, PROC 5, PROC 8b, PROC 9, PROC 14

Further specification
Assessment tool used: chesar 3.4
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Solid, low dustiness
Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Assumes use at not more than 20°C above ambient temperature (unless stated differently)
Indoor and outdoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent /limit releases, dispersion and exposure
Only properly trained and authorised personnel shall handle the substance
substance-handling procedures shall be well documented and supervised
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. For further specification, refer to section 8 of the SDS.
Fresh Water (Pelagic) RCR: < 1

Fresh Water (Sediment)	RCR: < 1
Marine Water (Pelagic)	RCR: < 1
Marine Water (Sediment)	RCR: < 1
Air	RCR: < 1
Agricultural Soil	RCR: < 1
Sewage Treatment Plant (Effluent)	RCR: < 1
Proc 1	combined routes RCR: < 1
Proc 2	combined routes RCR: < 1
Proc 3	combined routes RCR: < 1
Proc 4	combined routes RCR: < 1
Proc 5	combined routes RCR: < 1
Proc 8b	combined routes RCR: < 1
Proc 9	combined routes RCR: < 1
Proc 14	combined routes RCR: < 1
Proc 15	combined routes RCR: < 1

Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES
Usage of relase factors allows downstream users to verify in a first approximation, if the combination of local usage and production conditions meets the defined release quantities resulting from this exposure scenario (calculated as M(site) [see amounts used, contributing scenario 1] x release factor [Technical conditions and measures at process level (source) to prevent release; contributing scenario 1])
For specific information regarding the SPERC used please refer to the ESIG webpage https://www.esig.org/reach-ges/environment/

associated uses:

Other combinations of operational conditions may also be safe. Please contact OQ in case your local operational conditions differ from the ones described above and you are unsure if they are also safe