

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006 (REACH) and Regulation (EU) No. 2015/830

INEOS Phenol

Alpha-Methylstyrene

Revision date: 6/8/2018
Version: 13

Language: en-GB,IE

Date of print: 28/9/2018
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SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name: Alpha-Methylstyrene
REACH registration No.: 01-2119472426-35-XXXX
Location Germany: 01-2119472426-35-0000
Location Belgium: 01-2119472426-35-0001

CAS-Number: 98-83-9
EC-number: 202-705-0
EU index number: 601-027-00-6

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

General use: Raw material for the production of plastics and synthetic resins

Identified uses:	Industrial use:	
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1.3 Details of the supplier of the safety data sheet

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1.4 Emergency telephone number

Telephone: +32 14 58 45 45 (B.I.G.)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to EC regulation 1272/2008 (CLP)

Flam. Liq. 3; H226	Flammable liquid and vapour.
Eye Irrit. 2; H319	Causes serious eye irritation.
Skin Sens. 1B; H317	May cause an allergic skin reaction.
Repr. 2; H361	Suspected of damaging fertility or the unborn child.
STOT SE 3; H335	May cause respiratory irritation.
Asp. Tox. 1; H304	May be fatal if swallowed and enters airways.
Aquatic Chronic 2; H411	Toxic to aquatic life with long lasting effects.
Additional information	Self-classified: Aquatic Chronic 3; H412: Harmful to aquatic life with long lasting effects. Specific concentration limit (SCL): STOT SE H335 C >= 25%

2.2 Label elements

Labelling (CLP)



Signal word:

Danger

Hazard statements:	H226	Flammable liquid and vapour.
	H304	May be fatal if swallowed and enters airways.
	H317	May cause an allergic skin reaction.
	H319	Causes serious eye irritation.
	H335	May cause respiratory irritation.
	H361	Suspected of damaging fertility or the unborn child.
	H411	Toxic to aquatic life with long lasting effects.
Precautionary statements:	P201	Obtain special instructions before use.
	P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
	P233	Keep container tightly closed.
	P273	Avoid release to the environment.
	P280	Wear protective gloves/protective clothing/eye protection/face protection.
	P301+P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
	P302+P352	IF ON SKIN: Wash with plenty of water/soap.
	P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
	P312	Call a POISON CENTER/doctor if you feel unwell.
	P331	Do NOT induce vomiting.
	P405	Store locked up.
	P501	Dispose of contents/container to hazardous or special waste collection point.

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2.3 Other hazards

Vapours are heavier than air and will spread at floor level.
Polymerisation in the presence of acids. Danger of polymerisation above 50 °C. Heat development leads to selfignition.

Results of PBT and vPvB assessment:

This substance does not meet the PBT/vPvB criteria of REACH, Annex XIII.

SECTION 3: Composition / information on ingredients

3.1 Substances

Chemical characterisation: $C_9H_{10} = C_6H_5C(CH_3)=CH_2$
2-Phenylpropene, alpha-Methylstyrene, Isopropenylbenzene
CAS-Number: 98-83-9
EC-number: 202-705-0
EU index number: 601-027-00-6
RTECS-Number: WL5075300

SECTION 4: First aid measures

4.1 Description of first aid measures

General information: In all cases of doubt, or when symptoms persist, seek medical advice.
If victim is at risk of losing consciousness, position and transport on their side. Do not allow victim to become chilled. Keep victim warm.

In case of inhalation: Move victim to fresh air, put at rest and loosen restrictive clothing.
In case of irregular breathing or respiratory arrest provide artificial respiration. Seek medical attention.

Following skin contact: Take off immediately all contaminated clothing. Wash contaminated clothing before reuse.
Remove residues with soap and water. In case of skin reactions, consult a physician.

After eye contact: Immediately flush eyes with plenty of flowing water for 10 to 15 minutes holding eyelids apart. Subsequently consult an ophthalmologist.

After swallowing: Rinse mouth immediately and drink plenty of water.
Do not induce vomiting. Danger of aspiration. Seek medical attention.
Never give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed

May cause respiratory irritation. May be fatal if swallowed and enters airways. May cause an allergic skin reaction. Causes serious eye irritation.

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically. On irritation of the respiratory system use an aerosol dispenser and treat with 5 doses of dexamethasone aerosol (e.g. Auxiloson, Thomae) every 10 minutes until symptoms cease.
In case of intense exposure check liver and renal function.
Concentration > 600 ppm: Leads to severe irritation of the mucous membranes.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media:
Extinguishing powder, Foam, water spray jet
In enclosed areas: carbon dioxide

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Extinguishing media which must not be used for safety reasons:

Full water jet

5.2 Special hazards arising from the substance or mixture

Flammable liquid and vapour. Vapours are heavier than air.
In case of fire may be liberated: Carbon monoxide and carbon dioxide.

5.3 Advice for firefighters

Special protective equipment for firefighters:

Wear self-contained positive pressure breathing apparatus and full firefighting protective clothing.

Additional information:

Hazchem-Code: 3Y

Cool endangered containers with water spray and, if possible, remove from danger zone. Heating causes rise in pressure with risk of bursting.
Contaminated fire-fighting water must be collected separately. Do not allow water used to extinguish fire to enter drains, ground or waterways. Fire residuals and contaminated extinguishing water must be disposed of in accordance with the regulations of the local authorities.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Avoid contact with the substance. Wear suitable protective clothing.
Do not breathe vapour/aerosol. Provide adequate ventilation. Take off contaminated clothing and wash it before reuse.

6.2 Environmental precautions

Do not allow to penetrate into soil, waterbodies or drains.
In case of release, notify competent authorities.

6.3 Methods and material for containment and cleaning up

Take up with non-flammable, liquid binding material (e.g. sand/earth/diatomaceous earth/vermiculit) and perform disposal according to instructions.

Additional information:

Remove all sources of ignition. Close all lower level rooms.

6.4 Reference to other sections

Refer additionally to section 8 and 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advices on safe handling:

Eliminate all ignition sources if safe to do so.
Provide adequate ventilation, and local exhaust as needed.
Filling and transfer: Handle substance within a predominantly closed system provided with extract ventilation. Provide room air exhaust at ground level. Do not use air pressure to deliver. Avoid the formation of aerosol. Use only explosion-proof equipment.
Do not breathe vapours. Avoid contact with skin, eyes, and clothing. Take off contaminated clothing and wash it before reuse.

Precautions against fire and explosion:

Keep away from sources of ignition - No smoking. Do not weld.
Work on containers and pipelines is permitted only after thorough purging and inerting.
Protect against heat /sun rays. Danger of polymerization > 50 °C.
Heat development leads to selfignition.

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7.2 Conditions for safe storage, including any incompatibilities

Requirements for storerooms and containers:

Keep container tightly closed in a cool, well-ventilated place.
Do not allow the product to enter the ground. Avoid heat and light.
Qualified materials: Refined steel, steel, aluminium.
Unsuitable materials: Plastic.

Hints on joint storage:

Do not store together with combustible or self-igniting materials or any highly flammable solids.
Keep away from food, drink and animal feedingstuffs.

7.3 Specific end use(s)

Raw material for the production of plastics and synthetic resins

SECTION 8: Exposure controls/personal protection

All exposure relevant information (human health and environment) is summarised in annexes to this safety data sheet.

8.1 Control parameters

Occupational exposure limit values:

Type	Limit value
Europe: IOELV: STEL	492 mg/m ³ ; 100 ppm
Europe: IOELV: TWA	246 mg/m ³ ; 50 ppm
Great Britain: WEL-STEL	491 mg/m ³ ; 100 ppm
Great Britain: WEL-TWA	246 mg/m ³ ; 50 ppm
Ireland: 15 minutes	492 mg/m ³ ; 100 ppm
Ireland: 8 hours	246 mg/m ³ ; 50 ppm

DNEL/DMEL:

DNEL long-term, workers, inhalative, systemic: 246 mg/m³.
DNEL short-term, workers, inhalative, local: 492 mg/m³.
DNEL long-term, workers, dermal, systemic: 2.8 mg/kg bw/d.
DNEL long-term, workers, dermal, local: 0.105 mg/kg bw/d.
DNEL long-term, consumers, inhalative, systemic: 4.83 mg/m³.
DNEL long-term, consumers, dermal, systemic: 1.4 mg/kg bw/d.
DNEL long-term, consumers, dermal, local: 0.052 mg/cm² bw/d.
DNEL long-term, consumers, oral, systemic: 0.1 mg/kg bw/d.

PNEC:

PNEC water (freshwater): 0.008 mg/L.
PNEC water (marine water): 0.0008 mg/L.
PNEC water (intermittent release): 0.01645 mg/L.
PNEC sediment (freshwater): 0.583 mg/kg dwt.
PNEC sediment (marine water): 0.0583 mg/kg dwt.
PNEC soil: 0.112 mg/kg dwt.
PNEC sewage treatment plant: 66.15 mg/L.

8.2 Exposure controls

Make sure there is sufficient air exchange and / or that working rooms are air suctioned.

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Personal protection equipment

Occupational exposure controls

All information for relevant exposure scenarios including operational conditions and risk management measures are listed in 'Annex I: worker exposure and risk assessment'.

Respiratory protection: Respiratory protection must be worn whenever the WEL levels have been exceeded. Use filter type A (= against vapours of organic substances) according to EN 14387. (Class 1 up to 0.1 Vol-%, Class 2 up to 0.5 Vol-%, Class 3 exceeding 1 Vol-%).

Hand protection: The following applies to gloves-specific training in general: see exposure scenario. Protective gloves according to EN 374. Glove material: PVA (Polyvinyl alcohol) Breakthrough time: 360 min. Glove material: Fluororubber (Viton). Breakthrough time: 480 min, Layer thickness: 0.30 mm Observe glove manufacturer's instructions concerning penetrability and breakthrough time. Application duration > 6 h/d : Glove material: Fluororubber (Viton).

Eye protection: Tightly sealed goggles according to EN 166.

Body protection: Wear suitable protective clothing. Rubber coat and trousers. Safety shoes according to EN 345-347. In case of handling larger quantities: flame-retardant protective clothing, antistatic.

General protection and hygiene measures:

Do not breathe vapours. Avoid contact with skin, eyes, and clothing. Immediately remove any contaminated clothing, shoes or stockings. Wash contaminated clothing before reuse. Wash hands before breaks and after work. When using do not eat, drink or smoke. Have eye wash bottle or eye rinse ready at work place.

Alternatives to the personal protective measures as mentioned can only be determined in agreement with a responsible safety expert.

Environmental exposure controls

All information for relevant exposure scenarios including operational conditions and risk management measures are listed in 'Annex II: Environmental Exposure and Risk Assessment and Annex III: Environmental Exposure Calculation Tool'.

Waste air is to be released into the atmosphere only via suitable separators/filter.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	Form: liquid Colour: colourless
Odour:	aromatic, unpleasant
Odour threshold:	0.4 mg/m ³ (0.082 ppm)
pH value:	at 20 °C, 500 g/L: 5 - 6
Melting point/freezing point:	-23.2 °C
Initial boiling point and boiling range:	approx. 165 °C
Flash point/flash point range:	40 - 54 °C (c.c.)
Evaporation rate:	No data available
Flammability:	Flammable liquid and vapour.
Explosion limits:	LEL (Lower Explosion Limit): 0.70 Vol-% UEL (Upper Explosive Limit): 6.10 Vol-%

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Vapour pressure:	at 20 °C: 2.53 hPa at 50 °C: 15 hPa
Vapour density:	4.08 ((Air = 1))
Density:	at 20 °C: 0.91 g/mL
Solubility:	soluble in organic solvents (diethyl ether, benzene, chloroform, ethanol)
Water solubility:	at 25 °C: 0.1 g/L
Partition coefficient: n-octanol/water:	No data available
Auto-ignition temperature:	574 °C
Decomposition temperature:	No data available
Viscosity, dynamic:	at 20 °C: 0.94 mPa*s
Explosive properties:	No data available
Oxidizing characteristics:	No data available

9.2 Other information

Additional information:	Molar mass: 118.18 g/mol Partition coefficient: n-octanol/water: 3.48 log P(o/w)
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SECTION 10: Stability and reactivity

10.1 Reactivity

Flammable liquid and vapour. Vapours are heavier than air.
Polymerization can occur under certain conditions. See section 10.3.

10.2 Chemical stability

Product is stable under normal storage conditions.

10.3 Possibility of hazardous reactions

Polymerisation in the presence of acids. Polymerization along with heat production.
Heat development leads to selfignition.
Due to the high vapour pressure, bursting danger to containers/vessels when temperature increases.
Polymerisation occurs strongly exotherm and can lead to violent reactions.
As polymerisation inhibitor 4-tert-Butylpyrocatechol is used. (10 - 20 ppm).

10.4 Conditions to avoid

Pressure (danger of polymerization).
Do not expose to temperatures exceeding 50 °C/122 °F.

10.5 Incompatible materials

Acids, peroxides, metal salts, organic metal compounds, oxidizing agents

10.6 Hazardous decomposition products

In case of fire may be liberated: Carbon monoxide and carbon dioxide.

Thermal decomposition: No data available

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity:	LD50 Rat, oral: 4900 mg/kg bw
	LD50 Rabbit, dermal: 14560 mg/kg bw
	LC50 Rat, inhalative: 22.85 mg/L/6h

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Toxicological effects:

Acute toxicity (oral): Based on available data, the classification criteria are not met.

Acute toxicity (dermal): Based on available data, the classification criteria are not met.

Acute toxicity (inhalative): Based on available data, the classification criteria are not met.

Irritating to respiratory system. Causes tears.

Concentration > 600 ppm: Leads to severe irritation of the mucous membranes.

In case of prolonged exposure: Possible danger of damage to liver and kidneys.

Skin corrosion/irritation: Based on available data, the classification criteria are not met.

Rabbit: Not an irritant (Draize).

Serious eye damage/irritation: Eye Irrit. 2; H319 = Causes serious eye irritation.

Rabbit: Not an irritant.

Human experience: Eye and nasal irritation in human volunteers exposed to concentrations higher than STEL and OEL.

Sensitisation to the respiratory tract: Based on available data, the classification criteria are not met.

Skin sensitisation: Skin Sens. 1B; H317 = May cause an allergic skin reaction.

Skin sensitisation: LLNA, EC3 : 46% (OECD429)

Human experience: May cause allergies in rare instances.

Germ cell mutagenicity/Genotoxicity: Based on available data, the classification criteria are not met.

Bacterial mutagenicity: Negative (OECD 471 & 472).

Chromosomal aberrations mammalian cells in-vitro: Negative (OECD 473).

Gene-mutations mammalian cells in-vitro: Negative (OECD 476).

Sister chromatid exchange mammalian cells: Negative (OECD 474).

Micronucleus test: in-vivo (Mouse): Negative (OECD 474).

Carcinogenicity: Based on available data, the classification criteria are not met.

At long term exposure Rat/Mouse: Negative (OECD 451).

Reproductive toxicity: Repr. 2; H361 = Suspected of damaging fertility or the unborn child. Reproduction toxicity (AMS) : Based on available data, the classification criteria are not met. (OECD 422).

Developmental toxicity/teratogenicity (Styrene): Fulfilling criteria Repr. 2, H361d (OECD 414)

Effects on or via lactation: Lack of data.

Specific target organ toxicity (single exposure): STOT SE 3; H335 = May cause respiratory irritation.

Eye and nasal irritation in human volunteers exposed to concentrations higher than STEL and OEL.

Specific target organ toxicity (repeated exposure): Based on available data, the classification criteria are not met.

Aspiration hazard: Asp. Tox. 1; H304 = May be fatal if swallowed and enters airways.

Symptoms

Burning eyes and skin. Irritation of nose, throat, lung. Cough, nausea, dizziness, unconsciousness.

In case of prolonged exposure: Possible danger of damage to liver and kidneys.

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SECTION 12: Ecological information

12.1 Toxicity

Aquatic toxicity: Harmful to aquatic life with long lasting effects.

Algae toxicity:
EC50 *Desmodesmus subspicatus* (green algae): 11.441 mg/L/72h.
NOEC *Desmodesmus subspicatus* (green algae): 2.26 mg/L/72h.

Daphnia toxicity:
EC50 *Daphnia magna* (Big water flea): 1.645 mg/L/48h.
NOEC *Daphnia magna* (Big water flea): 0.401 mg/L/21d.

Fish toxicity:
LC50 *Brachydanio rerio* (zebra-fish): 2.97 mg/L/96h.

12.2 Persistence and degradability

Further details: Abiotic degradation:
Atmospheric compartment:
Direct photolysis is to be expected.
Indirect photodegradation by reaction with OH radicals.
Half-life time approx. 7,3 h.

Compartment water:
Stable at pH 4 - 7 and 9 (25 °C). Hydrolysis not to be expected.

Biodegradation:
56 %/21d (OECD 301 D /EU C.4-E).
Not readily biodegradable (according to OECD criteria).
Available OECD-Tests indicate rapid biodegradability according to CLP criteria.
56 %/28d in activated sludge (OECD 302 C).
Inherently biodegradable.
Evidence for rapid biodegradability.
Product is not readily biodegradable.
21%/28d (OECD301F)

Effects in sewage plants: Bacterial toxicity:
EC 10 activated sludge: 661.5 mg/L/3h.

12.3 Bioaccumulative potential

Bioaccumulative potential low.
Secondary poisoning via the food chain is unlikely to occur.

Bioconcentration factor (BCF):
12 - 140 at 25 °C (OECD 305 C).

12.4 Mobility in soil

Environmental distribution:
Adsorption/Desorption soil:
Adsorption coefficient (Koc): 692 at 20 °C.
The soil sorption coefficient indicates a high sorption potential onto soil organic matter.

Volatility rate:
H = 258 - 439 Pa * m³/mol at 25 °C.
The product is highly volatile.

12.5 Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of REACH, Annex XIII.

12.6 Other adverse effects

General information: Do not allow to enter into ground-water, surface water or drains.
Avoid spills and leaks. Very small amounts contaminates drinking water.

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SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste key number: 07 01 99 = Wastes from the manufacture, formulation, supply and use (MFSU) of basic organic chemicals
MFSU = manufacture, formulation, supply and use

Recommendation: Possible alternatives:
070104*: Other organic solvents, washing liquids and mother liquors.
070108*: Other still bottoms and reaction residues.
Incinerate according to applicable local, state and federal regulations.
Discharge into the environment must be avoided.

Contaminated packaging

Recommendation: Dispose of waste according to applicable legislation.
Handle contaminated packages in the same way as the substance itself.
Non-contaminated packages may be recycled.

SECTION 14: Transport information

14.1 UN number

ADR/RID, IMDG, IATA-DGR:
UN 2303

14.2 UN proper shipping name

ADR/RID, IMDG, IATA-DGR:
UN 2303, ISOPROPENYLBENZENE

14.3 Transport hazard class(es)

ADR/RID: Class 3, Code: F1
IMDG: Class 3, Subrisk -
IATA-DGR: Class 3

14.4 Packing group

ADR/RID, IMDG, IATA-DGR:
III

14.5 Environmental hazards

Marine pollutant: yes

14.6 Special precautions for user

Land transport (ADR/RID)

Warning board: ADR/RID: Kemmler-number 30, UN number UN 2303
Hazard label: 3
Limited quantities: 5 L
EQ: E1
Contaminated packaging - Instructions: P001 IBC03 LP01 R001
Special provisions for packing together: MP19
Portable tanks - Instructions: T2
Portable tanks - Special provisions: TP1
Tank coding: LGBF
Tunnel restriction code: D/E



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Sea transport (IMDG)

EmS: F-E, S-D
Special provisions: -
Limited quantities: 5 L
Excepted quantities: E1
Contaminated packaging - Instructions: P001, LP01
Contaminated packaging - Provisions: -
IBC - Instructions: IBC03
IBC - Provisions: -
Tank instructions - IMO: -
Tank instructions - UN: T2
Tank instructions - Provisions: TP1
Stowage and handling: Category A.
Properties and observations: Colourless liquid. Flashpoint: 38°C to 54°C c.c. Explosive limits: 0,7% to 6,6%. Immiscible with water. Irritating to skin, eyes and mucous membranes.
Segregation group: none

Air transport (IATA)

Hazard label: Flamm. liquid
Excepted Quantity Code: E1
Passenger and Cargo Aircraft: Ltd.Qty.: Pack.Instr. Y344 - Max. Net Qty/Pkg. 10 L
Passenger and Cargo Aircraft: Pack.Instr. 355 - Max. Net Qty/Pkg. 60 L
Cargo Aircraft only: Pack.Instr. 366 - Max. Net Qty/Pkg. 220 L
Emergency Response Guide-Code (ERG): 3L

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

Pollution category: Y
Vessel type: 2
Product name: alpha-Methylstyrene

SECTION 15: Regulatory information

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

National regulations - Great Britain

Hazchem-Code: 3Y
No data available

National regulations - EC member states

Volatile organic compounds (VOC):
100 % by weight

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Labelling of packaging with <= 125mL content



Signal word:

Danger

Hazard statements:

H304

May be fatal if swallowed and enters airways.

H317

May cause an allergic skin reaction.

H335

May cause respiratory irritation.

H361

Suspected of damaging fertility or the unborn child.

Precautionary statements:

P201

Obtain special instructions before use.

P280

Wear protective gloves/protective clothing/eye protection/face protection.

P301+P310

IF SWALLOWED: Immediately call a POISON CENTER/doctor.

P302+P352

IF ON SKIN: Wash with plenty of water/soap.

P304+P340

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P312

Call a POISON CENTER/doctor if you feel unwell.

P331

Do NOT induce vomiting.

P405

Store locked up.

Further regulations, limitations and legal requirements:

Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances [Seveso-III-Directive] P5c and E2

Use restriction according to REACH annex XVII, no.: 40

The placing on the market and the use of the substance is not permitted in decorative articles, games and fun games.

15.2 Chemical Safety Assessment

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

SECTION 16: Other information

Further information

Literature: REACH Registration Dossier Alphamethylstyrene. P&D-REACH Consortium, 06/2016

Reason of change: Changes in section 1.4: emergency phone number

Changes in section 5.1: extinguishing media

Date of first version: 19/11/2010

Department issuing data sheet

Contact person: see section 1: Dept. responsible for information

For abbreviations and acronyms, see: ECHA Guidance on information requirements and chemical safety assessment, chapter R.20 (Table of terms and abbreviations).

The information in this data sheet has been established to our best knowledge and was up-to-date at time of revision. It does not represent a guarantee for the properties of the product described in terms of the legal warranty regulations.

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Alpha-Methylstyrene

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Exposure Scenario 1: Generic exposure scenario (GES): 2-Phenylpropene

List of use descriptors

Sectors of use [SU]: SU3: Industrial uses

Application

Remark: Process categories [PROC] 1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 10, 14, 15: ES2, ES3
Process categories [PROC] 1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 10, 13, 14, 15: ES4, ES5, ES6, ES7
Process categories [PROC] 10, 15: ES8

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Contributing exposure scenario 1

Use in closed process, no likelihood of exposure.

General exposures (closed systems); Process sampling. (worker)

List of use descriptors

Process categories [PROC]:

PROC1: Use in closed process, no likelihood of exposure

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Operational conditions

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: palm of one hand (240 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 40 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 0.049 mg/m³

Inhalative, local, acute: 0.197 mg/m³

Dermal, systemic, long-term: 0.034 mg/kg bw/d

Dermal, local, long-term: 0.01 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: < 0.01

Inhalative, local, acute: < 0.01

Dermal, systemic, long-term: 0.012

Dermal, local, long-term: 0.095

Combined routes systemic, long-term: 0.012

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure.

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Contributing exposure scenario 2

Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.

General exposures (closed systems); continuous process; Process sampling. (worker)

List of use descriptors

Process categories [PROC]:

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

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

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Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 24.62 mg/m³
Inhalative, local, acute: 98.48 mg/m³
Dermal, systemic, long-term: 0.068 mg/kg bw/d
Dermal, local, long-term: 0.01 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.1
Inhalative, local, acute: 0.2
Dermal, systemic, long-term: 0.024
Dermal, local, long-term: 0.095
Combined routes systemic, long-term: 0.124

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure.

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 3

Use in closed batch process (synthesis or formulation).

General exposures (closed systems); Process sampling. (worker)

List of use descriptors

Process categories [PROC]:

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

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: palm of one hand (240 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 49.24 mg/m³
Inhalative, local, acute: 197 mg/m³
Dermal, systemic, long-term: 0.034 mg/kg bw/d
Dermal, local, long-term: 0.01 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.2
Inhalative, local, acute: 0.4
Dermal, systemic, long-term: 0.012
Dermal, local, long-term: 0.096
Combined routes systemic, long-term: 0.213

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Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure.

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 4

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

Process sampling Open systems. (worker)

List of use descriptors

Process categories [PROC]:

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

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 98.48 mg/m³

Inhalative, local, acute: 393.9 mg/m³

Dermal, systemic, long-term: 0.343 mg/kg bw/d

Dermal, local, long-term: 0.05 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.4

Inhalative, local, acute: 0.801

Dermal, systemic, long-term: 0.123

Dermal, local, long-term: 0.478

Combined routes systemic, long-term: 0.523

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Handle substance within a closed system. Use in semi-closed process with opportunity for exposure

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

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Contributing exposure scenario 5

Mixing or blending in batch processes (Alternative 1).

Mixing operations (open systems); Process sampling. Batch process. (worker)

List of use descriptors

Process categories [PROC]:

PROC5: Mixing or blending in batch processes

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 24.62 mg/m³

Inhalative, local, acute: 98.48 mg/m³

Dermal, systemic, long-term: 0.069 mg/kg bw/d

Dermal, local, long-term: 0.01 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.1

Inhalative, local, acute: 0.2

Dermal, systemic, long-term: 0.024

Dermal, local, long-term: 0.096

Combined routes systemic, long-term: 0.124

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Dermal, local exhaust ventilation - efficiency of at least [%]: 90

Inhalative, local exhaust ventilation - efficiency of at least [%]: 90

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 6

Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (Alternative 2).

Mixing operations (open systems); Process sampling. Batch process. (worker)

List of use descriptors

Process categories [PROC]:

PROC5: Mixing or blending in batch processes

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 4h

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Human factors not influenced by risk management:

Exposed skin surface assumed: palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 14.77 mg/m³

Inhalative, local, acute: 98.48 mg/m³

Dermal, systemic, long-term: 0.411 mg/kg bw/d

Dermal, local, long-term: 0.06 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.06

Inhalative, local, acute: 0.2

Dermal, systemic, long-term: 0.147

Dermal, local, long-term: 0.573

Combined routes systemic, long-term: 0.207

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Wear a respirator providing a minimum efficiency of (%): 90%

Contributing exposure scenario 7

Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (Alternative 3).

Mixing operations (open systems); Process sampling. Batch process. (worker)

List of use descriptors

Process categories [PROC]:

PROC5: Mixing or blending in batch processes

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 1h

Human factors not influenced by risk management:

Exposed skin surface assumed: palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: for indoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

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Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 14.77 mg/m³
Inhalative, local, acute: 295.4 mg/m³
Dermal, systemic, long-term: 0.137 mg/kg bw/d
Dermal, local, long-term: 0.02 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.06
Inhalative, local, acute: 0.6
Dermal, systemic, long-term: 0.049
Dermal, local, long-term: 0.191
Combined routes systemic, long-term: 0.109

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a good standard of controlled ventilation (5 to 10 air changes per hour)..

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 1 hour.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 8

Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (Alternative 4).

Mixing operations (open systems); Process sampling. Batch process. (worker)

List of use descriptors

Process categories [PROC]:

PROC5: Mixing or blending in batch processes

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 1h

Human factors not influenced by risk management:

Exposed skin surface assumed: palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 40 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 4.924 mg/m³
Inhalative, local, acute: 98.48 mg/m³
Dermal, systemic, long-term: 0.686 mg/kg bw/d
Dermal, local, long-term: 0.1 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.02
Inhalative, local, acute: 0.2
Dermal, systemic, long-term: 0.245
Dermal, local, long-term: 0.955
Combined routes systemic, long-term: 0.265

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Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 1 hour.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 9

Calendering operations (Alternative 1). Calendering (including Banburys) (worker)

List of use descriptors

Process categories [PROC]:

PROC6: Calendering operations

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: Both hands (960 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 2.462 mg/m³

Inhalative, local, acute: 9.848 mg/m³

Dermal, systemic, long-term: 0.137 mg/kg bw/d

Dermal, local, long-term: 0.01 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.01

Inhalative, local, acute: 0.02

Dermal, systemic, long-term: 0.049

Dermal, local, long-term: 0.096

Combined routes systemic, long-term: 0.059

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Inhalative, dermal, local exhaust ventilation - efficiency of at least [%]: 90

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 10

Calendering operations (Alternative 2). Calendering (including Banburys) (worker)

List of use descriptors

Process categories [PROC]:

PROC6: Calendering operations

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Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa
Concentration of the substance in a mixture: Covers percentage substance in the product up to 100 %.
Duration and frequency of use: Covers daily exposures up to 4h
Human factors not influenced by risk management: Exposed skin surface assumed: Both hands (960 cm²)
Other relevant operational conditions: Place of use: Indoor and outdoor use
Assumes process temperature up to 90 °C
Other information: Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:
Inhalative, systemic, long-term: 14.77 mg/m³
Inhalative, local, acute: 98.48 mg/m³
Dermal, systemic, long-term: 1.372 mg/kg bw/d
Dermal, local, long-term: 0.1 mg/cm²
Risk characterisation ratio (RCR):
Inhalative, systemic, long-term: 0.06
Inhalative, local, acute: 0.2
Dermal, systemic, long-term: 0.49
Dermal, local, long-term: 0.956
Combined routes systemic, long-term: 0.55

Risk management measures

Technical conditions and measures at process level (source) to prevent release:
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Operational conditions and risk management measures:
Assumes a good basic standard of occupational hygiene is implemented.
Avoid carrying out activities involving exposure for more than 4 hours.
Conditions and measures related to personal protection, hygiene and health evaluation:
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 11

Calendering operations (Alternative 3). Calendering (including Banburys) (worker)

List of use descriptors

Process categories [PROC]:
PROC6: Calendering operations

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa
Concentration of the substance in a mixture: Covers percentage substance in the product up to 5-25 %.
Duration and frequency of use: Covers daily exposures up to 8h
Human factors not influenced by risk management: Exposed skin surface assumed: Both hands (960 cm²)
Other relevant operational conditions: Place of use: Indoor and outdoor use
Assumes process temperature up to 90 °C
Other information: Methods used: TRA Workers 3.0

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Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 14.77 mg/m³
Inhalative, local, acute: 59.09 mg/m³
Dermal, systemic, long-term: 0.823 mg/kg bw/d
Dermal, local, long-term: 0.06 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.06
Inhalative, local, acute: 0.12
Dermal, systemic, long-term: 0.294
Dermal, local, long-term: 0.573
Combined routes systemic, long-term: 0.354

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Limit the substance content in the product to 25 %.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 12

Industrial spraying (Alternative 1, indoor). Spraying/fogging by machine application. (worker)

List of use descriptors

Process categories [PROC]:

PROC7: Industrial spraying

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: Hands and forearms (1500 cm²)

Other relevant operational conditions:

Place of use: Indoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 61.55 mg/m³
Inhalative, local, acute: 246.2 mg/m³
Dermal, systemic, long-term: 0.107 mg/kg bw/d
Dermal, local, long-term: 0.005 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.25
Inhalative, local, acute: 0.5
Dermal, systemic, long-term: 0.038
Dermal, local, long-term: 0.048
Combined routes systemic, long-term: 0.289

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Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Inhalative, dermal, local exhaust ventilation - efficiency of at least [%]: 95

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 13

Industrial spraying (Alternative 2, indoor). Spraying/fogging by machine application (worker)

List of use descriptors

Process categories [PROC]:

PROC7: Industrial spraying

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 5-25 %.

Duration and frequency of use:

Covers daily exposures up to 4h

Human factors not influenced by risk management:

Exposed skin surface assumed: Hands and forearms (1500 cm²)

Other relevant operational conditions:

Place of use: Indoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 44.32 mg/m³

Inhalative, local, acute: 295.4 mg/m³

Dermal, systemic, long-term: 0.772 mg/kg bw/d

Dermal, local, long-term: 0.036 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.18

Inhalative, local, acute: 0.6

Dermal, systemic, long-term: 0.276

Dermal, local, long-term: 0.344

Combined routes systemic, long-term: 0.456

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Limit the substance content in the product to 25 %.

Avoid carrying out activities involving exposure for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Wear a respirator providing a minimum efficiency of (%): 90 (APF 10)

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Contributing exposure scenario 14

Industrial spraying (Alternative 1, outdoor). Spraying/fogging by machine application (worker)

List of use descriptors

Process categories [PROC]:

PROC7: Industrial spraying

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 1h

Human factors not influenced by risk management:

Exposed skin surface assumed: Hands and forearms (1500 cm²)

Other relevant operational conditions:

Place of use: outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 17.23 mg/m³

Inhalative, local, acute: 344.7 mg/m³

Dermal, systemic, long-term: 0.429 mg/kg bw/d

Dermal, local, long-term: 0.02 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.07

Inhalative, local, acute: 0.701

Dermal, systemic, long-term: 0.153

Dermal, local, long-term: 0.191

Combined routes systemic, long-term: 0.223

Risk management measures

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 1 hour.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Wear a respirator providing a minimum efficiency of (%): 90 (APF 10)

Contributing exposure scenario 15

Industrial spraying (Alternative 2, outdoor). Spraying/fogging by machine application (worker)

List of use descriptors

Process categories [PROC]:

PROC7: Industrial spraying

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 5-25 %.

Duration and frequency of use:

Covers daily exposures up to 4h

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Human factors not influenced by risk management:

Exposed skin surface assumed: Hands and forearms (1500 cm²)

Other relevant operational conditions:

Place of use: outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 31.02 mg/m³

Inhalative, local, acute: 206.8 mg/m³

Dermal, systemic, long-term: 0.772 mg/kg bw/d

Dermal, local, long-term: 0.036 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.126

Inhalative, local, acute: 0.42

Dermal, systemic, long-term: 0.276

Dermal, local, long-term: 0.344

Combined routes systemic, long-term: 0.402

Risk management measures

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Limit the substance content in the product to 25 %.

Avoid carrying out activities involving exposure for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Wear a respirator providing a minimum efficiency of (%): 90 (APF 10)

Contributing exposure scenario 16

Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (Alternative 1).

Bulk transfers; non-dedicated facility. Transfer from/pouring from containers (worker)

List of use descriptors

Process categories [PROC]:

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: Both hands (960 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

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Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 24.62 mg/m³
Inhalative, local, acute: 98.48 mg/m³
Dermal, systemic, long-term: 0.069 mg/kg bw/d
Dermal, local, long-term: 0.005 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.1
Inhalative, local, acute: 0.2
Dermal, systemic, long-term: 0.024
Dermal, local, long-term: 0.048
Combined routes systemic, long-term: 0.124

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Inhalative, dermal, local exhaust ventilation - efficiency of at least [%]: 90

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 17

Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (Alternative 2).

Bulk transfers; non-dedicated facility. Transfer from/pouring from containers. (worker)

List of use descriptors

Process categories [PROC]:

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 4h

Human factors not influenced by risk management:

Exposed skin surface assumed: Both hands (960 cm²)

Other relevant operational conditions:

Place of use: Outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 10.34 mg/m³
Inhalative, local, acute: 68.94 mg/m³
Dermal, systemic, long-term: 0.411 mg/kg bw/d
Dermal, local, long-term: 0.03 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.042
Inhalative, local, acute: 0.14
Dermal, systemic, long-term: 0.147
Dermal, local, long-term: 0.287
Combined routes systemic, long-term: 0.189

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Risk management measures

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Wear a respirator providing a minimum efficiency of (%): 90 (APF 10)

Contributing exposure scenario 18

Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (Alternative 1).

Bulk transfers; dedicated facility; Transfer from/pouring from containers (worker)

List of use descriptors

Process categories [PROC]:

PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: Both hands (960 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 6.155 mg/m³

Inhalative, local, acute: 24.62 mg/m³

Dermal, systemic, long-term: 0.034 mg/kg bw/d

Dermal, local, long-term: 0.002 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.025

Inhalative, local, acute: 0.05

Dermal, systemic, long-term: 0.012

Dermal, local, long-term: 0.024

Combined routes systemic, long-term: 0.037

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Inhalative, dermal, local exhaust ventilation - efficiency of at least [%]: 95

Semi-closed process; With occasional controlled exposure.

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

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Contributing exposure scenario 19

Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (Alternative 2).

Bulk transfers; dedicated facility; Transfer from/pouring from containers. (worker)

List of use descriptors

Process categories [PROC]:

PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 4h

Human factors not influenced by risk management:

Exposed skin surface assumed: Both hands (960 cm²)

Other relevant operational conditions:

Place of use: Outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 51.7 mg/m³

Inhalative, local, acute: 344.7 mg/m³

Dermal, systemic, long-term: 0.411 mg/kg bw/d

Dermal, local, long-term: 0.03 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.21

Inhalative, local, acute: 0.701

Dermal, systemic, long-term: 0.147

Dermal, local, long-term: 0.287

Combined routes systemic, long-term: 0.357

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Semi-closed process; With occasional controlled exposure.

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 20

Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (Alternative 1; indoor). Small package filling; Dedicated facility; Pouring from small containers. (worker)

List of use descriptors

Process categories [PROC]:

PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

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Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 24.62 mg/m³

Inhalative, local, acute: 98.48 mg/m³

Dermal, systemic, long-term: 0.034 mg/kg bw/d

Dermal, local, long-term: 0.005 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.1

Inhalative, local, acute: 0.2

Dermal, systemic, long-term: 0.012

Dermal, local, long-term: 0.048

Combined routes systemic, long-term: 0.112

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Inhalative, dermal, local exhaust ventilation - efficiency of at least [%]: 90

Semi-closed process; With occasional controlled exposure.

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 21

Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (Alternative 2; indoor). Small package filling; Dedicated facility; Pouring from small containers. (worker)

List of use descriptors

Process categories [PROC]:

PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 4h

Human factors not influenced by risk management:

Exposed skin surface assumed: palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: For indoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

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Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 14.77 mg/m³
Inhalative, local, acute: 98.48 mg/m³
Dermal, systemic, long-term: 0.206 mg/kg bw/d
Dermal, local, long-term: 0.03 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.06
Inhalative, local, acute: 0.2
Dermal, systemic, long-term: 0.074
Dermal, local, long-term: 0.287
Combined routes systemic, long-term: 0.134

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Semi-closed process; With occasional controlled exposure.

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.
Avoid carrying out activities involving exposure for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%
Wear a respirator providing a minimum efficiency of (%): 90 (APF 10)

Contributing exposure scenario 22

Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (Alternative 1, outdoor).

Small package filling; Dedicated facility; Pouring from small containers. (worker)

List of use descriptors

Process categories [PROC]:

PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 5-25 %.

Duration and frequency of use:

Covers daily exposures up to 4h

Human factors not influenced by risk management:

Exposed skin surface assumed: palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: Outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 62.04 mg/m³
Inhalative, local, acute: 413.6 mg/m³
Dermal, systemic, long-term: 0.124 mg/kg bw/d
Dermal, local, long-term: 0.018 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.252
Inhalative, local, acute: 0.841
Dermal, systemic, long-term: 0.044
Dermal, local, long-term: 0.172
Combined routes systemic, long-term: 0.296

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Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Semi-closed process; With occasional controlled exposure.

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Limit the substance content in the product to 25 %.

Avoid carrying out activities involving exposure for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 23

Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (Alternative 2, outdoor).

Small package filling; Dedicated facility; Pouring from small containers. (worker)

List of use descriptors

Process categories [PROC]:

PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 4h

Human factors not influenced by risk management:

Exposed skin surface assumed: palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: Outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 10.34 mg/m³

Inhalative, local, acute: 68.94 mg/m³

Dermal, systemic, long-term: 0.206 mg/kg bw/d

Dermal, local, long-term: 0.03 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.042

Inhalative, local, acute: 0.14

Dermal, systemic, long-term: 0.074

Dermal, local, long-term: 0.287

Combined routes systemic, long-term: 0.116

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Semi-closed process; With occasional controlled exposure.

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Wear a respirator providing a minimum efficiency of (%): 90 (APF 10)

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Contributing exposure scenario 24

Roller application or brushing (Alternative 1, indoor). Equipment cleaning and maintenance. (worker)

List of use descriptors

Process categories [PROC]:

PROC10: Roller application or brushing

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 4h

Human factors not influenced by risk management:

Exposed skin surface assumed: Both hands (960 cm²)

Other relevant operational conditions:

Place of use: Indoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 14.77 mg/m³

Inhalative, local, acute: 98.48 mg/m³

Dermal, systemic, long-term: 0.823 mg/kg bw/d

Dermal, local, long-term: 0.06 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.06

Inhalative, local, acute: 0.2

Dermal, systemic, long-term: 0.294

Dermal, local, long-term: 0.573

Combined routes systemic, long-term: 0.354

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 25

Roller application or brushing (Alternative 2, indoor). Equipment cleaning and maintenance. (worker)

List of use descriptors

Process categories [PROC]:

PROC10: Roller application or brushing

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 5-25 %.

Duration and frequency of use:

Covers daily exposures up to 8h

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Human factors not influenced by risk management:

Exposed skin surface assumed: Both hands (960 cm²)

Other relevant operational conditions:

Place of use: Indoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 14.77 mg/m³

Inhalative, local, acute: 59.09 mg/m³

Dermal, systemic, long-term: 0.823 mg/kg bw/d

Dermal, local, long-term: 0.06 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.06

Inhalative, local, acute: 0.12

Dermal, systemic, long-term: 0.294

Dermal, local, long-term: 0.573

Combined routes systemic, long-term: 0.354

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Inhalative, local exhaust ventilation - efficiency of at least [%]: 90

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Limit the substance content in the product to 25 %.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 26

Roller application or brushing (Alternative 3, indoor). Equipment cleaning and maintenance. (worker)

List of use descriptors

Process categories [PROC]:

PROC10: Roller application or brushing

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 1-5 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: Both hands (960 cm²)

Other relevant operational conditions:

Place of use: Indoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

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Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 49.24 mg/m³
Inhalative, local, acute: 197 mg/m³
Dermal, systemic, long-term: 0.274 mg/kg bw/d
Dermal, local, long-term: 0.02 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.2
Inhalative, local, acute: 0.4
Dermal, systemic, long-term: 0.098
Dermal, local, long-term: 0.191
Combined routes systemic, long-term: 0.298

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 27

Roller application or brushing (Alternative 4, indoor). Equipment cleaning and maintenance. (worker)

List of use descriptors

Process categories [PROC]:

PROC10: Roller application or brushing

Operational conditions

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: Both hands (960 cm²)

Other relevant operational conditions:

Place of use: Indoor use

Assumes process temperature up to 40 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 49.24 mg/m³
Inhalative, local, acute: 197 mg/m³
Dermal, systemic, long-term: 1.372 mg/kg bw/d
Dermal, local, long-term: 0.1 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.2
Inhalative, local, acute: 0.4
Dermal, systemic, long-term: 0.49
Dermal, local, long-term: 0.956
Combined routes systemic, long-term: 0.69

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Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 28

Roller application or brushing (Alternative 1, outdoor). Equipment cleaning and maintenance. (worker)

List of use descriptors

Process categories [PROC]:

PROC10: Roller application or brushing

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 4h

Human factors not influenced by risk management:

Exposed skin surface assumed: Both hands (960 cm²)

Other relevant operational conditions:

Place of use: Outdoor use.

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 10.34 mg/m³

Inhalative, local, acute: 68.94 mg/m³

Dermal, systemic, long-term: 0.823 mg/kg bw/d

Dermal, local, long-term: 0.06 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.042

Inhalative, local, acute: 0.14

Dermal, systemic, long-term: 0.294

Dermal, local, long-term: 0.573

Combined routes systemic, long-term: 0.336

Risk management measures

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Wear a respirator providing a minimum efficiency of (%): 90 (APF 10)

Contributing exposure scenario 29

Roller application or brushing (Alternative 2, outdoor). Equipment cleaning and maintenance. (worker)

List of use descriptors

Process categories [PROC]:

PROC10: Roller application or brushing

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Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa
Concentration of the substance in a mixture: Covers percentage substance in the product up to 5-25 %.
Duration and frequency of use: Covers daily exposures up to 4h
Human factors not influenced by risk management: Exposed skin surface assumed: Both hands (960 cm²)
Other relevant operational conditions: Place of use: Outdoor use.
Assumes process temperature up to 90 °C
Other information: Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:
Inhalative, systemic, long-term: 62.04 mg/m³
Inhalative, local, acute: 413.6 mg/m³
Dermal, systemic, long-term: 0.494 mg/kg bw/d
Dermal, local, long-term: 0.036 mg/cm²
Risk characterisation ratio (RCR):
Inhalative, systemic, long-term: 0.252
Inhalative, local, acute: 0.841
Dermal, systemic, long-term: 0.176
Dermal, local, long-term: 0.344
Combined routes systemic, long-term: 0.428

Risk management measures

Operational conditions and risk management measures:
Assumes a good basic standard of occupational hygiene is implemented.
Limit the substance content in the product to 25 %.
Avoid carrying out activities involving exposure for more than 4 hours.
Conditions and measures related to personal protection, hygiene and health evaluation:
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 30

Roller application or brushing (Alternative 3, outdoor). Equipment cleaning and maintenance. (worker)

List of use descriptors

Process categories [PROC]:
PROC10: Roller application or brushing

Operational conditions

Concentration of the substance in a mixture: Covers percentage substance in the product up to 100 %.
Duration and frequency of use: Covers daily exposures up to 8h
Human factors not influenced by risk management: Exposed skin surface assumed: Both hands (960 cm²)
Other relevant operational conditions: Place of use: Outdoor use.
Assumes process temperature up to 40 °C
Other information: Methods used: TRA Workers 3.0

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Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 34.47 mg/m³
Inhalative, local, acute: 137.9 mg/m³
Dermal, systemic, long-term: 1.372 mg/kg bw/d
Dermal, local, long-term: 0.1 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.14
Inhalative, local, acute: 0.28
Dermal, systemic, long-term: 0.49
Dermal, local, long-term: 0.956
Combined routes systemic, long-term: 0.63

Risk management measures

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 31

Treatment of articles by dipping and pouring (Alternative 1). Dipping, immersion and pouring (worker)

List of use descriptors

Process categories [PROC]:

PROC13: Treatment of articles by dipping and pouring

Operational conditions

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: Palm of one hand (480 cm²)

Other relevant operational conditions:

Place of use: Indoor use
Assumes process temperature up to 40 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 4.924 mg/m³
Inhalative, local, acute: 19.7 mg/m³
Dermal, systemic, long-term: 0.069 mg/kg bw/d
Dermal, local, long-term: 0.01 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.02
Inhalative, local, acute: 0.04
Dermal, systemic, long-term: 0.024
Dermal, local, long-term: 0.096
Combined routes systemic, long-term: 0.044

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Inhalative, dermal, local exhaust ventilation - efficiency of at least [%]: 90

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

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Contributing exposure scenario 32

Treatment of articles by dipping and pouring (Alternative 2). Dipping, immersion and pouring (worker)

List of use descriptors

Process categories [PROC]:

PROC13: Treatment of articles by dipping and pouring

Operational conditions

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: Palm of one hand (480 cm²)

Other relevant operational conditions:

Place of use: Indoor use

Assumes process temperature up to 40 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 49.24 mg/m³

Inhalative, local, acute: 197 mg/m³

Dermal, systemic, long-term: 0.686 mg/kg bw/d

Dermal, local, long-term: 0.1 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.2

Inhalative, local, acute: 0.4

Dermal, systemic, long-term: 0.245

Dermal, local, long-term: 0.955

Combined routes systemic, long-term: 0.445

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 33

Production of preparations or articles by tableting, compression, extrusion, pelletisation (Alternative 1). (worker)

List of use descriptors

Process categories [PROC]:

PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation

Operational conditions

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

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Human factors not influenced by risk management:

Exposed skin surface assumed: Palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 40 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 2.462 mg/m³

Inhalative, local, acute: 9.848 mg/m³

Dermal, systemic, long-term: 0.017 mg/kg bw/d

Dermal, local, long-term: 0.003 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.01

Inhalative, local, acute: 0.02

Dermal, systemic, long-term: <0.01

Dermal, local, long-term: 0.024

Combined routes systemic, long-term: 0.016

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Inhalative, dermal, local exhaust ventilation - efficiency of at least [%]: 90

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 34

Production of preparations or articles by tableting, compression, extrusion, pelletisation (Alternative 2). (worker)

List of use descriptors

Process categories [PROC]:

PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation

Operational conditions

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 4h

Human factors not influenced by risk management:

Exposed skin surface assumed: Palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 40 °C

Other information:

Methods used: TRA Workers 3.0

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Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 14.77 mg/m³
Inhalative, local, acute: 98.48 mg/m³
Dermal, systemic, long-term: 0.172 mg/kg bw/d
Dermal, local, long-term: 0.025 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.06
Inhalative, local, acute: 0.2
Dermal, systemic, long-term: 0.061
Dermal, local, long-term: 0.239
Combined routes systemic, long-term: 0.121

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Contributing exposure scenario 35

Use as laboratory reagent. Laboratory activities (worker)

List of use descriptors

Process categories [PROC]:

PROC15: Use as laboratory reagent

Operational conditions

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: Palm of one hand (240 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 40 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 24.62 mg/m³
Inhalative, local, acute: 98.48 mg/m³
Dermal, systemic, long-term: 0.017 mg/kg bw/d
Dermal, local, long-term: 0.005 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.1
Inhalative, local, acute: 0.2
Dermal, systemic, long-term: <0.01
Dermal, local, long-term: 0.047
Combined routes systemic, long-term: 0.106

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Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%

Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Health: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment: Used EUSES model. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

'ECT AMS': The Excel-tool enables the performance of scaling calculation for specific local environmental conditions. It can be downloaded from the web page of the Phenol & Derivatives REACH-consortium:

<http://www.reachcentrum.eu/EN/consortium-management/consortia-under-reach/phenol-derivatives-reach-consortium.aspx>

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Exposure Scenario 2: Manufacture (site A - F). Ecological information

List of use descriptors

Sectors of use [SU]: SU3: Industrial uses

Application

Activities and processes: Manufacture, Processing, Formulating, Distribution of substance or mixture. Includes recycling/recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.

Remark: Contributing Scenarios (workers) refer to ES1:
Process categories [PROC]: 1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 10, 14, 15

Contributing Scenarios:	1	Manufacture (site A) (environment)	Page 43
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Contributing exposure scenario 1

Manufacture (site A) (environment)

List of use descriptors

Environmental release categories [ERC]:
ERC1: Manufacture of the substance

Specific Environmental Release Categories [SPERC]:
SpERCESVOC 1.1.v1
SpERCESVOC 1.1.m.v1

Operational conditions

Concentration of the substance in a mixture:
Covers percentage substance in the product up to 100 %.

Duration and frequency of use:
365 d/y

Environment factors not influenced by risk management:
Emission factors:
Release fraction to wastewater from process: 0.03 %
Release fraction to air from process: 0.1 %
Release fraction to soil from process: 0.01 %
Release fraction to waste from process: 0 %
Receiving surface water flow is $\geq 2,157,800 \text{ m}^3/\text{d}$. (dilution factor >1000)

Other relevant operational conditions:
Indoor/Outdoor use
Process optimized for highly efficient use of raw materials (very minimal environmental release)
Equipment cleaning: No release to wastewater from process as such, wastewater emissions limited to release generated from final equipment cleaning step using water.
Typical measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs: e.g. thermal wet scrubber, gas removal and/or air filtration, particle removal and/or thermal oxidation and/or vapour recovery, adsorption.
Treat air emission to provide a typical removal efficiency of (%): Vapour recovery system effectiveness, air: 90%

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Exposure prediction

Exposure estimation and reference to its source:

Predicted environmental concentration (PEC) local:

Water (freshwater): 0.002 mg/L

Sediment (freshwater): 0.126 mg/kg dw

Water (marine water): 6.409E-06 mg/L

Sediment (marine water): 0.0004666 mg/kg dw

Sewage treatment plant (stp): 1.655 mg/L

Agriculture soil: 0.005 mg/kg dw

Indirect exposure to humans via the environment: 0.046 mg/m³ (inhalative)

Indirect exposure to humans via the environment: 0.0007497 mg/kg bw/d (oral, food)

Risk characterisation ratio (RCR):

Water (freshwater): 0.216

Sediment (freshwater): 0.216

Water (marine water): < 0.01

Sediment (marine water): < 0.01

Sewage treatment plant (stp): 0.025

Agriculture soil: 0.044

Indirect exposure to humans via the environment: < 0.01 (inhalative)

Indirect exposure to humans via the environment: < 0.01 (oral, food)

Indirect exposure to humans via the environment: 0.017 (combined routes)

Disposal considerations

Conditions and measures related to sewage treatment plant:

Estimated substance removal from wastewater via domestic sewage treatment (%):

92.75 %

Assumed domestic sewage treatment plant flow (m³/d): >= 2,160 m³/d

No application of sewage sludge to soil.

Conditions and measures related to external treatment of waste for disposal:

Dispose of waste or used sacks/containers according to local regulations.

Contributing exposure scenario 2

Manufacture (site B) (environment)

List of use descriptors

Environmental release categories [ERC]:

ERC1: Manufacture of the substance

Specific Environmental Release Categories [SPERC]:

SpERCESVOC 1.1.v1

SpERCESVOC 1.1.m.v1

Operational conditions

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

365 d/y

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Environment factors not influenced by risk management:

Emission factors:

Release fraction to wastewater from process: 0.03 %
Release fraction to air from process: 0.1 %
Release fraction to soil from process: 0.01 %
Release fraction to waste from process: 0 %
Receiving surface water flow is $\geq 1,279,000 \text{ m}^3/\text{d}$. (dilution factor: 545)

Other relevant operational conditions:

Indoor/Outdoor use

Process optimized for highly efficient use of raw materials (very minimal environmental release)
Equipment cleaning: No release to wastewater from process as such, wastewater emissions limited to release generated from final equipment cleaning step using water.
Typical measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs: e.g. thermal wet scrubber, gas removal and/or air filtration, particle removal and/or thermal oxidation and/or vapour recovery, adsorption.
Treat air emission to provide a typical removal efficiency of (%): Vapour recovery system effectiveness, air: 90%

Exposure prediction

Exposure estimation and reference to its source:

Predicted environmental concentration (PEC) local:
Water (freshwater): 0.003 mg/L
Sediment (freshwater): 0.209 mg/kg dw
Water (marine water): $6.409\text{E-}06$ mg/L
Sediment (marine water): 0.0004666 mg/kg dw
Sewage treatment plant (stp): 1.521 mg/L
Agriculture soil: 0.005 mg/kg dw
Indirect exposure to humans via the environment: 0.046 mg/m^3 (inhalative)
Indirect exposure to humans via the environment: 0.001 mg/kg bw/d (oral, food)

Risk characterisation ratio (RCR):

Water (freshwater): 0.358
Sediment (freshwater): 0.358
Water (marine water): < 0.01
Sediment (marine water): < 0.01
Sewage treatment plant (stp): 0.023
Agriculture soil: 0.044
Indirect exposure to humans via the environment: < 0.01 (inhalative)
Indirect exposure to humans via the environment: 0.01 (oral, food)
Indirect exposure to humans via the environment: 0.02 (combined routes)

Disposal considerations

Conditions and measures related to sewage treatment plant:

Estimated substance removal from wastewater via domestic sewage treatment (%): 92.75 %
Assumed domestic sewage treatment plant flow (m^3/d): $\geq 2,350 \text{ m}^3/\text{d}$
No application of sewage sludge to soil.

Conditions and measures related to external treatment of waste for disposal:

Dispose of waste or used sacks/containers according to local regulations.

Contributing exposure scenario 3

Manufacture (site C) (environment)

List of use descriptors

Environmental release categories [ERC]:

ERC1: Manufacture of the substance

Specific Environmental Release Categories [SPERC]:

SpERCEVOC 1.1.v1
SpERCEVOC 1.1.m.v1

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Operational conditions

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

365 d/y

Environment factors not influenced by risk management:

Emission factors:

Release fraction to wastewater from process: 0.03 %

Release fraction to air from process: 0.1 %

Release fraction to soil from process: 0.01 %

Release fraction to waste from process: 0 %

Receiving surface water flow is $\geq 5,184,000 \text{ m}^3/\text{d}$. (dilution factor: 211)

Other relevant operational conditions:

Indoor/Outdoor use

Process optimized for highly efficient use of raw materials (very minimal environmental release)

Equipment cleaning: No release to wastewater from process as such, wastewater emissions limited to release generated from final equipment cleaning step using water.

Typical measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs: e.g. thermal wet scrubber, gas removal and/or air filtration, particle removal and/or thermal oxidation and/or vapour recovery, adsorption.

Treat air emission to provide a typical removal efficiency of (%): Vapour recovery system effectiveness, air: 90%

Exposure prediction

Exposure estimation and reference to its source:

Predicted environmental concentration (PEC) local:

Water (freshwater): 0.0001159 mg/L

Sediment (freshwater): 0.008 mg/kg dw

Water (marine water): 6.409E-06 mg/L

Sediment (marine water): 0.0004666 mg/kg dw

Sewage treatment plant (stp): 0.008 mg/L

Agriculture soil: 0.000297 mg/kg dw

Indirect exposure to humans via the environment: 0.003 mg/m³ (inhalative)

Indirect exposure to humans via the environment: 4.816E-05 mg/kg bw/d (oral, food)

Risk characterisation ratio (RCR):

Water (freshwater): 0.014

Sediment (freshwater): 0.014

Water (marine water): < 0.01

Sediment (marine water): < 0.01

Sewage treatment plant (stp): < 0.01

Agriculture soil: < 0.01

Indirect exposure to humans via the environment: < 0.01 (inhalative)

Indirect exposure to humans via the environment: < 0.01 (oral, food)

Indirect exposure to humans via the environment: < 0.01 (combined routes)

Disposal considerations

Conditions and measures related to sewage treatment plant:

Estimated substance removal from wastewater via domestic sewage treatment (%): 92.74 %

Assumed domestic sewage treatment plant flow (m³/d): $\geq 24,700 \text{ m}^3/\text{d}$

No application of sewage sludge to soil.

Conditions and measures related to external treatment of waste for disposal:

Dispose of waste or used sacks/containers according to local regulations.

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Contributing exposure scenario 4

Manufacture (site D) (environment)

List of use descriptors

Environmental release categories [ERC]:

ERC1: Manufacture of the substance

Specific Environmental Release Categories [SPERC]:

SpERCESVOC 1.1.v1

SpERCESVOC 1.1.m.v1

Operational conditions

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

355 d/y

Environment factors not influenced by risk management:

Emission factors:

Release fraction to wastewater from process: 0.03 %

Release fraction to air from process: 0.1 %

Release fraction to soil from process: 0.01 %

Release fraction to waste from process: 0 %

Receiving surface water flow is $\geq 14,980,000.00 \text{ m}^3/\text{d}$. (dilution factor >1000)

Other relevant operational conditions:

Indoor/Outdoor use

Process optimized for highly efficient use of raw materials (very minimal environmental release)

Equipment cleaning: No release to wastewater from process as such, wastewater emissions limited to release generated from final equipment cleaning step using water. Typical measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs: e.g. thermal wet scrubber, gas removal and/or air filtration, particle removal and/or thermal oxidation and/or vapour recovery, adsorption. Treat air emission to provide a typical removal efficiency of (%): Vapour recovery system effectiveness, air: 90%

Exposure prediction

Exposure estimation and reference to its source:

Predicted environmental concentration (PEC) local:

Water (freshwater): 0.0001138 mg/L

Sediment (freshwater): 0.008 mg/kg dw

Water (marine water): 6.409E-06 mg/L

Sediment (marine water): 0.0004666 mg/kg dw

Sewage treatment plant (stp): 0.038 mg/L

Agriculture soil: 0.0007613 mg/kg dw

Indirect exposure to humans via the environment: 0.007 mg/m³ (inhalative)

Indirect exposure to humans via the environment: 7.851E-05 mg/kg bw/d (oral, food)

Risk characterisation ratio (RCR):

Water (freshwater): 0.014

Sediment (freshwater): 0.014

Water (marine water): < 0.01

Sediment (marine water): < 0.01

Sewage treatment plant (stp): < 0.01

Agriculture soil: < 0.01

Indirect exposure to humans via the environment: < 0.01 (inhalative)

Indirect exposure to humans via the environment: < 0.01 (oral, food)

Indirect exposure to humans via the environment: < 0.01 (combined routes)

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Disposal considerations

Conditions and measures related to sewage treatment plant:

Estimated substance removal from wastewater via domestic sewage treatment (%):
92.74 %
Assumed domestic sewage treatment plant flow (m³/d): >= 15,000 m³/d
No application of sewage sludge to soil.

Conditions and measures related to external treatment of waste for disposal:

Dispose of waste or used sacks/containers according to local regulations.

Contributing exposure scenario 5

Manufacture (site E) (environment)

List of use descriptors

Environmental release categories [ERC]:

ERC1: Manufacture of the substance

Specific Environmental Release Categories [SPERC]:

SpERCESVOC 1.1.v1

SpERCESVOC 1.1.m.v1

Operational conditions

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

350 d/y

Environment factors not influenced by risk management:

Emission factors:

Release fraction to wastewater from process: 0.0002821 % (measured values)

Release fraction to air from process: 0.1 %

Release fraction to soil from process: 0.01 %

Release fraction to waste from process: 0 %

Discharge rate effluent: >= 2,500 m³/d

Receiving surface water flow is >= 0 m³/d.

Local marine water dilution factor: <= 75

Other relevant operational conditions:

Indoor/Outdoor use

On-site waste water treatment: Acclimated biological treatment, effectiveness, water: 92.73%

Process optimized for highly efficient use of raw materials (very minimal environmental release)

Equipment cleaning: No release to wastewater from process as such, wastewater emissions limited to release generated from final equipment cleaning step using water.

Typical measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs: e.g. thermal wet scrubber, gas removal and/or air filtration, particle removal and/or thermal oxidation and/or vapour recovery, adsorption.

Treat air emission to provide a typical removal efficiency of (%): Vapour recovery system effectiveness, air: 90%

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Exposure prediction

Exposure estimation and reference to its source:

Predicted environmental concentration (PEC) local:

Water (freshwater): 7.617E-05 mg/L

Sediment (freshwater): 0.006 mg/kg dw

Water (marine water): 0.000672 mg/L

Sediment (marine water): 0.049 mg/kg dw

Sewage treatment plant (stp): 0 mg/L

Agriculture soil: 0.001 mg/kg dw

Indirect exposure to humans via the environment: 0.012 mg/m³ (inhalative)

Indirect exposure to humans via the environment: 0.000104 mg/kg bw/d (oral, food)

Risk characterisation ratio (RCR):

Water (freshwater): < 0.01

Sediment (freshwater): < 0.01

Water (marine water): 0.84

Sediment (marine water): 0.839

Sewage treatment plant (stp): < 0.01

Agriculture soil: 0.01

Indirect exposure to humans via the environment: < 0.01 (inhalative)

Indirect exposure to humans via the environment: < 0.01 (oral, food)

Indirect exposure to humans via the environment: < 0.01 (combined routes)

Disposal considerations

Conditions and measures related to sewage treatment plant:

Estimated substance removal from wastewater via domestic sewage treatment (%): 0 %

Conditions and measures related to external treatment of waste for disposal:

Dispose of waste or used sacks/containers according to local regulations.

Contributing exposure scenario 6

Manufacture (site F) (environment)

List of use descriptors

Environmental release categories [ERC]:

ERC1: Manufacture of the substance

Specific Environmental Release Categories [SPERC]:

SpERCEVOC 1.1.v1

SpERCEVOC 1.1.m.v1

Operational conditions

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

360 d/y

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Environment factors not influenced by risk management:

Emission factors:

Release fraction to wastewater from process: 0.03 %
Release fraction to air from process: 0.1 %
Release fraction to soil from process: 0.01 %
Release fraction to waste from process: 0 %
Receiving surface water flow is $\geq 6,739,000 \text{ m}^3/\text{d}$. (dilution factor: 282)

Other relevant operational conditions:

Indoor/Outdoor use

Process optimized for highly efficient use of raw materials (very minimal environmental release)
Equipment cleaning: No release to wastewater from process as such, wastewater emissions limited to release generated from final equipment cleaning step using water.
Typical measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs: e.g. thermal wet scrubber, gas removal and/or air filtration, particle removal and/or thermal oxidation and/or vapour recovery, adsorption.
Treat air emission to provide a typical removal efficiency of (%): Vapour recovery system effectiveness, air: 90%

Exposure prediction

Exposure estimation and reference to its source:

Predicted environmental concentration (PEC) local:
Water (freshwater): 0.000246 mg/L
Sediment (freshwater): 0.018 mg/kg dw
Water (marine water): 6.409E-06 mg/L
Sediment (marine water): 0.0004666 mg/kg dw
Sewage treatment plant (stp): 0.048 mg/L
Agriculture soil: 0.002 mg/kg dw
Indirect exposure to humans via the environment: 0.015 mg/m³ (inhalative)
Indirect exposure to humans via the environment: 0.0001637 mg/kg bw/d (oral, food)

Risk characterisation ratio (RCR):

Water (freshwater): 0.031
Sediment (freshwater): 0.031
Water (marine water): < 0.01
Sediment (marine water): < 0.01
Sewage treatment plant (stp): < 0.01
Agriculture soil: 0.014
Indirect exposure to humans via the environment: < 0.01 (inhalative)
Indirect exposure to humans via the environment: < 0.01 (oral, food)
Indirect exposure to humans via the environment: < 0.01 (combined routes)

Disposal considerations

Conditions and measures related to sewage treatment plant:

Estimated substance removal from wastewater via domestic sewage treatment (%): 92.74 %
Assumed domestic sewage treatment plant flow (m³/d): $\geq 24,000 \text{ m}^3/\text{d}$
No application of sewage sludge to soil.

Conditions and measures related to external treatment of waste for disposal:

Dispose of waste or used sacks/containers according to local regulations.

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Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Health: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment: Used EUSES model. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

'ECT AMS': The Excel-tool enables the performance of scaling calculation for specific local environmental conditions. It can be downloaded from the web page of the Phenol & Derivatives REACH-consortium:
<http://www.reachcentrum.eu/EN/consortium-management/consortia-under-reach/phenol-derivatives-reach-consortium.aspx>

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Exposure Scenario 3: Formulating. Ecological information

List of use descriptors

Sectors of use [SU]: SU3: Industrial uses

Application

Remark: Contributing Scenarios (workers) refer to ES1:
Process categories [PROC]: 1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 10, 14, 15

Contributing Scenarios: 1 Formulating (environment)

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Contributing exposure scenario 1

Formulating (environment)

List of use descriptors

Environmental release categories [ERC]:
ERC2: Formulation into mixture

Specific Environmental Release Categories [SPERC]:
SpERCESVOC 2.2.v1
SpERCESVOC 2.2.h.v1

Operational conditions

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Amount used, frequency and duration of use (or from service life)

Daily amount per site (tonnes/day): up to 26.7

Annual site tonnage (tonnes/year): up to 8,000

Environment factors not influenced by risk management:

Emission factors:

Release fraction to wastewater from process: 0.006 %

Release fraction to air from process: 0.5 %

Release fraction to soil from process: 0.01 %

Release fraction to waste from process: 0 %

Other relevant operational conditions:

Indoor use

Process optimized for highly efficient use of raw materials (very minimal environmental release)

Typical measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs: e.g. thermal wet scrubber, gas removal and/or air filtration, particle removal and/or thermal oxidation and/or vapour recovery, adsorption.

Equipment cleaning: No release to wastewater from process as such, wastewater emissions limited to release generated from final equipment cleaning step using water.

On-site waste water treatment. Acclimated biological treatment: Effectiveness, water: 70%

Exhaust air treatment: Upgrade of the system in place or additional air treatment measures, such as wet scrubber and/or air filtration and/or thermal oxidation and/or vapour recovery systems, in order to achieve a reduction of the air emissions.

Effectiveness, air 50%

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Exposure prediction

Exposure estimation and reference to its source:

Predicted environmental concentration (PEC) local:
Water (freshwater): 0.006 mg/L
Sediment (freshwater): 0.427 mg/kg dw
Water (marine water): 0.0005858 mg/L
Sediment (marine water): 0.043 mg/kg dw
Sewage treatment plant (stp): 0.058 mg/L
Agriculture soil: 0.003 mg/kg dw
Indirect exposure to humans via the environment: 0.031 mg/m³ (inhalative)
Indirect exposure to humans via the environment: 0.001 mg/kg bw/d (oral, food)

Risk characterisation ratio (RCR):

Water (freshwater): 0.734
Sediment (freshwater): 0.733
Water (marine water): 0.732
Sediment (marine water): 0.732
Sewage treatment plant (stp): < 0.01
Agriculture soil: < 0.027
Indirect exposure to humans via the environment: < 0.01 (inhalative)
Indirect exposure to humans via the environment: 0.014 (oral, food)
Indirect exposure to humans via the environment: 0.02 (combined routes)

Disposal considerations

Conditions and measures related to sewage treatment plant:

Estimated substance removal from wastewater via domestic sewage treatment (%):
92.8 %
Assumed domestic sewage treatment plant flow (m³/d): $\geq 2,000$ m³/d
No application of sewage sludge to soil.

Conditions and measures related to external treatment of waste for disposal:

Dispose of waste or used sacks/containers according to local regulations.

Conditions and measures related to external recovery of waste:

Receiving surface water flow $\geq 18,000$ m³/d

Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Health: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment: Used EUSES model. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

'ECT AMS': The Excel-tool enables the performance of scaling calculation for specific local environmental conditions. It can be downloaded from the web page of the Phenol & Derivatives REACH-consortium:
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Exposure Scenario 4: Use at industrial site - Use as a solvent. Ecological information

List of use descriptors

Sectors of use [SU]: SU3: Industrial uses

Application

Remark: Contributing Scenarios (workers) refer to ES1:
Process categories [PROC]: 1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 10, 13, 14, 15

Contributing Scenarios: 1 Use as a solvent (environment)

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Contributing exposure scenario 1

Use as a solvent (environment)

List of use descriptors

Environmental release categories [ERC]:

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

Specific Environmental Release Categories [SPERC]:

SpERCESVOC spERCs (10-100 mL WS)

Operational conditions

Duration and frequency of use:

Amount used, frequency and duration of use (or from service life)

Daily amount per site: up to 1.67 tonnes/day

Annual site tonnage (tonnes/year): up to 500.0

Fraction of EU tonnage used in region: 100 %

Environment factors not influenced by risk management:

Emission factors:

Release fraction to wastewater from process: 0.07 %

Release fraction to air from process: 30 %

Release fraction to soil from process: 5 %

Release fraction to waste from process: 0 %

Other relevant operational conditions:

Exhaust air treatment:

Upgrade of the system in place or additional air treatment measures, such as wet scrubber and/or air filtration and/or thermal oxidation and/or vapour recovery systems, in order to achieve a reduction of the air emissions.

Effectiveness, air 70%

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Exposure prediction

Exposure estimation and reference to its source:

Predicted environmental concentration (PEC) local:
Water (freshwater): 0.004 mg/L
Sediment (freshwater): 0.314 mg/kg dw
Water (marine water): 0.0004297 mg/L
Sediment (marine water): 0.031 mg/kg dw
Sewage treatment plant (stp): 0.042 mg/L
Agriculture soil: 0.098 mg/kg dw
Indirect exposure to humans via the environment: 0.114 mg/m³ (inhalative)
Indirect exposure to humans via the environment: 0.002 mg/kg bw/d (oral, food)

Risk characterisation ratio (RCR):

Water (freshwater): 0.539
Sediment (freshwater): 0.538
Water (marine water): 0.537
Sediment (marine water): 0.536
Sewage treatment plant (stp): < 0.01
Agriculture soil: 0.878
Indirect exposure to humans via the environment: 0.024 (inhalative)
Indirect exposure to humans via the environment: 0.019 (oral, food)
Indirect exposure to humans via the environment: 0.043 (combined routes)

Disposal considerations

Conditions and measures related to sewage treatment plant:

Municipal Sewage Treatment Plant: Effectiveness water: 92.75 %
Discharge rate \geq 2,000 m³/d
Application of the STP sludge on agricultural soil.

Conditions and measures related to external treatment of waste for disposal:

Dispose of waste or used sacks/containers according to local regulations.

Conditions and measures related to external recovery of waste:

Receiving surface water flow \geq 18,000

Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Health: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment: Used EUSES model. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

'ECT AMS': The Excel-tool enables the performance of scaling calculation for specific local environmental conditions. It can be downloaded from the web page of the Phenol & Derivatives REACH-consortium:
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Exposure Scenario 5: Use at industrial site - Use as an intermediate. Ecological information

List of use descriptors

Sectors of use [SU]: SU3: Industrial uses

Application

Remark: Contributing Scenarios (workers) refer to ES1:
Process categories [PROC]: 1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 10, 13, 14, 15

Contributing Scenarios: 1 Use as an intermediate (environment)

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Contributing exposure scenario 1

Use as an intermediate (environment)

List of use descriptors

Environmental release categories [ERC]:

ERC6a: Use of intermediate

Specific Environmental Release Categories [SPERC]:

SpERCESVOC 6.1a.v1

SpERCESVOC 6.1a.m.v1

Operational conditions

Duration and frequency of use:

Amount used, frequency and duration of use (or from service life)

Daily amount per site: up to 15 tonnes/day

Annual site tonnage (tonnes/year): up to 4,500

Fraction of EU tonnage used in region: 100 %

Environment factors not influenced by risk management:

Emission factors:

Release fraction to wastewater from process: 0.009 %

Release fraction to air from process: 0.05 %

Release fraction to soil from process: 0.1 %

Release fraction to waste from process: 0 %

Other relevant operational conditions:

Indoor use

Process optimized for highly efficient use of raw materials (very minimal environmental release)

Typical measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs: e.g. thermal wet scrubber, gas removal and/or air filtration, particle removal and/or thermal oxidation and/or vapour recovery, adsorption.

Equipment cleaning: No release to wastewater from process as such, wastewater emissions limited to release generated from final equipment cleaning step using water.

On-site waste water treatment:

Acclimated biological treatment: Effectiveness, water: 70%

Exhaust air treatment:

Upgrade of the system in place or additional air treatment measures, such as wet scrubber and/or air filtration and/or thermal oxidation and/or vapour recovery systems, in order to achieve a reduction of the air emissions. Effectiveness, air 50%

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Exposure prediction

Exposure estimation and reference to its source:

Predicted environmental concentration (PEC) local:
Water (freshwater): 0.005 mg/L
Sediment (freshwater): 0.361 mg/kg dw
Water (marine water): 0.0004952 mg/L
Sediment (marine water): 0.036 mg/kg dw
Sewage treatment plant (stp): 0.049 mg/L
Agriculture soil: 0.101 mg/kg dw
Indirect exposure to humans via the environment: 0.002 mg/m³ (inhalative)
Indirect exposure to humans via the environment: 0.001 mg/kg bw/d (oral, food)

Risk characterisation ratio (RCR):

Water (freshwater): 0.62
Sediment (freshwater): 0.62
Water (marine water): 0.619
Sediment (marine water): 0.618
Sewage treatment plant (stp): < 0.01
Agriculture soil: 0.9
Indirect exposure to humans via the environment: < 0.01 (inhalative)
Indirect exposure to humans via the environment: 0.013 (oral, food)
Indirect exposure to humans via the environment: 0.013 (combined routes)

Disposal considerations

Conditions and measures related to sewage treatment plant:

Municipal Sewage Treatment Plant: Effectiveness water: 92.75 %
Discharge rate \geq 2,000 m³/d
Application of the STP sludge on agricultural soil.

Conditions and measures related to external treatment of waste for disposal:

Dispose of waste or used sacks/containers according to local regulations.

Conditions and measures related to external recovery of waste:

Receiving surface water flow \geq 18,000

Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Health: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment: Used EUSES model. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

'ECT AMS': The Excel-tool enables the performance of scaling calculation for specific local environmental conditions. It can be downloaded from the web page of the Phenol & Derivatives REACH-consortium:
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Exposure Scenario 6: Use at industrial site: Rubber production and processing. Ecological information

List of use descriptors

Sectors of use [SU]: SU3: Industrial uses

Application

Remark: Contributing Scenarios (workers) refer to ES1:
Process categories [PROC]: 1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 10, 13, 14, 15

Contributing Scenarios: 1 Rubber production and processing (environment)

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Contributing exposure scenario 1

Rubber production and processing (environment)

List of use descriptors

Environmental release categories [ERC]:

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

Operational conditions

Duration and frequency of use:

Amount used, frequency and duration of use (or from service life)

Daily amount per site: up to 40 tonnes/day

Annual site tonnage (tonnes/year): up to 12,000

Fraction of EU tonnage used in region: 100 %

Environment factors not influenced by risk management:

Emission factors:

Release fraction to wastewater from process: 0.005 %

Release fraction to air from process: 7 %

Release fraction to soil from process: 0.025 %

Release fraction to waste from process: 0 %

Other relevant operational conditions:

Exhaust air treatment:

Upgrade of the system in place or additional air treatment measures, such as wet scrubber and/or air filtration and/or thermal oxidation and/or vapour recovery systems, in order to achieve a reduction of the air emissions.

Effectiveness, air 80%

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Exposure prediction

Exposure estimation and reference to its source:

Predicted environmental concentration (PEC) local:

Water (freshwater): 0.007 mg/L

Sediment (freshwater): 0.533 mg/kg dw

Water (marine water): 0.0007305 mg/L

Sediment (marine water): 0.053 mg/kg dw

Sewage treatment plant (stp): 0.072 mg/L

Agriculture soil: 0.063 mg/kg dw

Indirect exposure to humans via the environment: 0.64 mg/m³ (inhalative)

Indirect exposure to humans via the environment: 0.006 mg/kg bw/d (oral, food)

Risk characterisation ratio (RCR):

Water (freshwater): 0.915

Sediment (freshwater): 0.914

Water (marine water): 0.913

Sediment (marine water): 0.912

Sewage treatment plant (stp): < 0.01

Agriculture soil: 0.56

Indirect exposure to humans via the environment: 0.132 (inhalative)

Indirect exposure to humans via the environment: 0.06 (oral, food)

Indirect exposure to humans via the environment: 0.193 (combined routes)

Disposal considerations

Conditions and measures related to sewage treatment plant:

Municipal Sewage Treatment Plant: Effectiveness water: 92.75 %

Discharge rate \geq 2,000 m³/d

No application of sewage sludge to soil.

Conditions and measures related to external treatment of waste for disposal:

Dispose of waste or used sacks/containers according to local regulations.

Conditions and measures related to external recovery of waste:

Receiving surface water flow \geq 18,000

Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Health: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment: Used EUSES model. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

'ECT AMS': The Excel-tool enables the performance of scaling calculation for specific local environmental conditions. It can be downloaded from the web page of the Phenol & Derivatives REACH-consortium:

<http://www.reachcentrum.eu/EN/consortium-management/consortia-under-reach/phenol-derivatives-reach-consortium.aspx>

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Exposure Scenario 7: Use at industrial site: Polymer manufacturing and processing. Ecological information

List of use descriptors

Sectors of use [SU]: SU3: Industrial uses

Application

Remark: Contributing Scenarios (workers) refer to ES1:
Process categories [PROC]: 1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 10, 13, 14, 15

Contributing Scenarios: 1 Polymer manufacturing and processing (environment)

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Contributing exposure scenario 1

Polymer manufacturing and processing (environment)

List of use descriptors

Environmental release categories [ERC]:

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

Operational conditions

Duration and frequency of use:

Amount used, frequency and duration of use (or from service life)

Daily amount per site: up to 123.3 tonnes/day

Annual site tonnage (tonnes/year): up to 4,500

Fraction of EU tonnage used in region: 100 %

Environment factors not influenced by risk management:

Emission factors:

Release fraction to wastewater from process: 0.002 %

Release fraction to air from process: 1.75 %

Release fraction to soil from process: 0.025 %

Other relevant operational conditions:

On-site waste water treatment:

Acclimated biological treatment: Effectiveness, water: 70%

Exhaust air treatment:

Upgrade of the system in place or additional air treatment measures, such as wet scrubber and/or air filtration and/or thermal oxidation and/or vapour recovery systems, in order to achieve a reduction of the air emissions. Effectiveness, air 50%

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Exposure prediction

Exposure estimation and reference to its source:

Predicted environmental concentration (PEC) local:

Water (freshwater): 0.007 mg/L

Sediment (freshwater): 0.493 mg/kg dw

Water (marine water): 0.000676 mg/L

Sediment (marine water): 0.049 mg/kg dw

Sewage treatment plant (stp): 0.067 mg/L

Agriculture soil: 0.059 mg/kg dw

Indirect exposure to humans via the environment: 0.6 mg/m³ (inhalative)

Indirect exposure to humans via the environment: 0.006 mg/kg bw/d (oral, food)

Risk characterisation ratio (RCR):

Water (freshwater): 0.846

Sediment (freshwater): 0.846

Water (marine water): 0.845

Sediment (marine water): 0.844

Sewage treatment plant (stp): < 0.01

Agriculture soil: 0.525

Indirect exposure to humans via the environment: 0.124 (inhalative)

Indirect exposure to humans via the environment: 0.059 (oral, food)

Indirect exposure to humans via the environment: 0.183 (combined routes)

Disposal considerations

Conditions and measures related to sewage treatment plant:

Municipal Sewage Treatment Plant: Effectiveness water: 92.75 %

Discharge rate \geq 2,000 m³/d

No application of sewage sludge to soil.

Conditions and measures related to external treatment of waste for disposal:

Dispose of waste or used sacks/containers according to local regulations.

Conditions and measures related to external recovery of waste:

Receiving surface water flow \geq 18,000

Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Health: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment: Used EUSES model. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

'ECT AMS': The Excel-tool enables the performance of scaling calculation for specific local environmental conditions. It can be downloaded from the web page of the Phenol & Derivatives REACH-consortium:
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Exposure Scenario 8: Use at industrial site: Laboratory use. Ecological information

List of use descriptors

Sectors of use [SU]: SU3: Industrial uses

Application

Remark: Contributing Scenarios (workers) refer to ES1:
Process categories [PROC]: 10,15

Contributing Scenarios: 1 Laboratory use (environment)

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Contributing exposure scenario 1

Laboratory use (environment)

List of use descriptors

Environmental release categories [ERC]:

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

Operational conditions

Duration and frequency of use:

Amount used, frequency and duration of use (or from service life)

Daily amount per site: up to 0.025 tonnes/day

Annual site tonnage (tonnes/year): up to 0.5

Fraction of EU tonnage used in region: 100 %

Environment factors not influenced by risk management:

Emission factors:

Release fraction to wastewater from process: 0.005 %

Release fraction to air from process: 35 %

Release fraction to soil from process: 0.025 %

Exposure prediction

Exposure estimation and reference to its source:

Predicted environmental concentration (PEC) local:

Water (freshwater): 8.069E-05 mg/L

Sediment (freshwater): 0.006 mg/kg dw

Water (marine water): 6.862E-06 mg/L

Sediment (marine water): 0.0004952 mg/kg dw

Sewage treatment plant (stp): 4.53E-05 mg/L

Agriculture soil: 0.0001215 mg/kg dw

Indirect exposure to humans via the environment: 0.0002631 mg/m³ (inhalative)

Indirect exposure to humans via the environment: 2.082E-05 mg/kg bw/d (oral, food)

Risk characterisation ratio (RCR):

Water (freshwater): 0.01

Sediment (freshwater): 0.01

Water (marine water): <0.01

Sediment (marine water): < 0.01

Sewage treatment plant (stp): < 0.01

Agriculture soil: < 0.01

Indirect exposure to humans via the environment: < 0.01 (inhalative)

Indirect exposure to humans via the environment: < 0.01 (oral, food)

Indirect exposure to humans via the environment: < 0.01 (combined routes)

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Disposal considerations

Conditions and measures related to sewage treatment plant:

Municipal Sewage Treatment Plant: Effectiveness water: 92.75 %

Discharge rate $\geq 2,000 \text{ m}^3/\text{d}$

Application of the STP sludge on agricultural soil.

Conditions and measures related to external treatment of waste for disposal:

Dispose of waste or used sacks/containers according to local regulations.

Conditions and measures related to external recovery of waste:

Receiving surface water flow $\geq 18,000$

Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Health: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment: Used EUSES model. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

'ECT AMS': The Excel-tool enables the performance of scaling calculation for specific local environmental conditions. It can be downloaded from the web page of the Phenol & Derivatives REACH-consortium:

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Exposure Scenario 9: Generic exposure scenario (GES): 2-Phenylpropene

List of use descriptors

Sectors of use [SU]: SU22: Professional uses

Application

Remark: Process categories [PROC] 1, 2, 4, 5, 8a, 8b, 10, 11, 14, 15, 19: ES10, ES11
Process categories [PROC] 10, 15: ES12

Contributing Scenarios:	1	Use in closed process, no likelihood of exposure. General exposures (closed systems); Process sampling. (worker)	Page 65
	2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions. General exposures (closed systems); continuous process. Process sampling. (worker)	Page 65
	3	Use in batch and other process (synthesis) where opportunity for exposure arises (Alternative 1). Batch process. Process sampling (worker)	Page 66
	4	Use in batch and other process (synthesis) where opportunity for exposure arises (Alternative 2). Batch process. Process sampling (worker)	Page 67
	5	Use in batch and other process (synthesis) where opportunity for exposure arises (Alternative 3). Batch process. Process sampling (worker)	Page 68
	6	Mixing or blending in batch processes (Alternative 1). Mixing operations (open systems); batch process. Process sampling (worker)	Page 69
	7	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (Alternative 2). Mixing operations (open systems); batch process. Process sampling (worker)	Page 69
	8	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (Alternative 1). Bulk transfers; Transfer from/pouring from containers. (worker)	Page 70
	9	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (Alternative 2). Bulk transfers; Transfer from/pouring from containers. (worker)	Page 71
	10	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (Alternative 1). Bulk transfers; Transfer from/pouring from containers. (worker)	Page 72
	11	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (Alternative 2). Bulk transfers; Transfer from/pouring from containers. (worker)	Page 73
	12	Roller application or brushing (Alternative 1). Rolling, Brushing. Equipment cleaning and maintenance. (worker)	Page 73
	13	Roller application or brushing (Alternative 2). Rolling, Brushing. Equipment cleaning and maintenance. (worker)	Page 74
	14	Non industrial spraying (Alternative 1). (worker)	Page 75
	15	Non industrial spraying (Alternative 2). (worker)	Page 76
	16	Production of preparations or articles by tableting, compression, extrusion, pelletisation (Alternative 1). (worker)	Page 76
	17	Production of preparations or articles by tableting, compression, extrusion, pelletisation (Alternative 2). (worker)	Page 77
	18	Production of preparations or articles by tableting, compression, extrusion, pelletisation (Alternative 3). (worker)	Page 78
	19	Use as laboratory reagent. (worker)	Page 79

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Contributing Scenarios:	20	Manual activities involving hand contact (Alternative 1). (worker)	Page 79
	21	Manual activities involving hand contact (Alternative 2). (worker)	Page 80
	22	Manual activities involving hand contact (Alternative 3). (worker)	Page 81

Contributing exposure scenario 1

Use in closed process, no likelihood of exposure.

General exposures (closed systems); Process sampling. (worker)

List of use descriptors

Process categories [PROC]:

PROC1: Use in closed process, no likelihood of exposure

Operational conditions

Product characteristics: Liquid, Vapour pressure: 990 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: palm of one hand (240 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 40 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 0.049 mg/m³

Inhalative, local, acute: 0.197 mg/m³

Dermal, systemic, long-term: 0.034 mg/kg bw/d

Dermal, local, long-term: 0.01 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term:< 0.01

Inhalative, local, acute:< 0.01

Dermal, systemic, long-term: 0.012

Dermal, local, long-term: 0.095

Combined routes systemic, long-term: 0.012

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure.

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Contributing exposure scenario 2

Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.

General exposures (closed systems); continuous process. Process sampling. (worker)

List of use descriptors

Process categories [PROC]:

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

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

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Human factors not influenced by risk management:

Exposed skin surface assumed: palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 98.48 mg/m³

Inhalative, local, acute: 393.9 mg/m³

Dermal, systemic, long-term: 0.137 mg/kg bw/d

Dermal, local, long-term: 0.02 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.4

Inhalative, local, acute: 0.801

Dermal, systemic, long-term: 0.049

Dermal, local, long-term: 0.191

Combined routes systemic, long-term: 0.449

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Handle substance within a closed system.

Use in closed, continuous process with occasional controlled exposure

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

Contributing exposure scenario 3

Use in batch and other process (synthesis) where opportunity for exposure arises (Alternative 1).

Batch process. Process sampling (worker)

List of use descriptors

Process categories [PROC]:

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

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

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Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 49.24 mg/m³
Inhalative, local, acute: 197 mg/m³
Dermal, systemic, long-term: 0.137 mg/kg bw/d
Dermal, local, long-term: 0.02 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.2
Inhalative, local, acute: 0.4
Dermal, systemic, long-term: 0.049
Dermal, local, long-term: 0.191
Combined routes systemic, long-term: 0.249

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Handle substance within a closed system. Use in semi-closed processes. With occasional controlled exposure.
Dermal, local exhaust ventilation - efficiency of at least [%]: 80

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

Contributing exposure scenario 4

Use in batch and other process (synthesis) where opportunity for exposure arises (Alternative 2).

Batch process. Process sampling (worker)

List of use descriptors

Process categories [PROC]:

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

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 4h

Human factors not influenced by risk management:

Exposed skin surface assumed: palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use
Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 14.77 mg/m³
Inhalative, local, acute: 98.48 mg/m³
Dermal, systemic, long-term: 0.412 mg/kg bw/d
Dermal, local, long-term: 0.06 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.06
Inhalative, local, acute: 0.2
Dermal, systemic, long-term: 0.147
Dermal, local, long-term: 0.574
Combined routes systemic, long-term: 0.207

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Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Use in semi-closed process with opportunity for exposure

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

Wear a respirator providing a minimum efficiency of (%): 90%

Contributing exposure scenario 5

Use in batch and other process (synthesis) where opportunity for exposure arises (Alternative 3).

Batch process. Process sampling (worker)

List of use descriptors

Process categories [PROC]:

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

Operational conditions

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 4h

Human factors not influenced by risk management:

Exposed skin surface assumed: palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 40 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 29.54 mg/m³

Inhalative, local, acute: 197 mg/m³

Dermal, systemic, long-term: 0.686 mg/kg bw/d

Dermal, local, long-term: 0.1 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.12

Inhalative, local, acute: 0.4

Dermal, systemic, long-term: 0.245

Dermal, local, long-term: 0.956

Combined routes systemic, long-term: 0.365

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Use in semi-closed process with opportunity for exposure

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

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Contributing exposure scenario 6

Mixing or blending in batch processes (Alternative 1).

Mixing operations (open systems); batch process. Process sampling (worker)

List of use descriptors

Process categories [PROC]:

PROC5: Mixing or blending in batch processes

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 98.48 mg/m³

Inhalative, local, acute: 393.9 mg/m³

Dermal, systemic, long-term: 0.274 mg/kg bw/d

Dermal, local, long-term: 0.04 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.4

Inhalative, local, acute: 0.801

Dermal, systemic, long-term: 0.098

Dermal, local, long-term: 0.229

Combined routes systemic, long-term: 0.498

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Dermal, local exhaust ventilation - efficiency of at least [%]: 80

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

Contributing exposure scenario 7

Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (Alternative 2).

Mixing operations (open systems); batch process. Process sampling (worker)

List of use descriptors

Process categories [PROC]:

PROC5: Mixing or blending in batch processes

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 1h

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Human factors not influenced by risk management:

Exposed skin surface assumed: palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 9.848 mg/m³

Inhalative, local, acute: 197 mg/m³

Dermal, systemic, long-term: 0.274 mg/kg bw/d

Dermal, local, long-term: 0.04 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.04

Inhalative, local, acute: 0.4

Dermal, systemic, long-term: 0.098

Dermal, local, long-term: 0.382

Combined routes systemic, long-term: 0.138

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 1 hour.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

Wear a respirator providing a minimum efficiency of (%): 90% (APF 10)

Contributing exposure scenario 8

Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (Alternative 1).

Bulk transfers; Transfer from/pouring from containers. (worker)

List of use descriptors

Process categories [PROC]:

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: Both hands (960 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

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Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 98.48 mg/m³
Inhalative, local, acute: 393.9 mg/m³
Dermal, systemic, long-term: 0.274 mg/kg bw/d
Dermal, local, long-term: 0.02 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.4
Inhalative, local, acute: 0.801
Dermal, systemic, long-term: 0.098
Dermal, local, long-term: 0.191
Combined routes systemic, long-term: 0.498

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Dermal, local exhaust ventilation - efficiency of at least [%]: 80

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

Contributing exposure scenario 9

Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (Alternative 2).

Bulk transfers; Transfer from/pouring from containers. (worker)

List of use descriptors

Process categories [PROC]:

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 4h

Human factors not influenced by risk management:

Exposed skin surface assumed: Both hands (960 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 29.54 mg/m³
Inhalative, local, acute: 197 mg/m³
Dermal, systemic, long-term: 0.823 mg/kg bw/d
Dermal, local, long-term: 0.06 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.12
Inhalative, local, acute: 0.4
Dermal, systemic, long-term: 0.294
Dermal, local, long-term: 0.573
Combined routes systemic, long-term: 0.414

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Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

Wear a respirator providing a minimum efficiency of (%): 90 (APF 10)

Contributing exposure scenario 10

Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (Alternative 1).

Bulk transfers; Transfer from/pouring from containers. (worker)

List of use descriptors

Process categories [PROC]:

PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: Both hands (960 cm²)

Other relevant operational conditions:

Place of use: Indoor/Outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 24.62 mg/m³

Inhalative, local, acute: 98.48 mg/m³

Dermal, systemic, long-term: 0.274 mg/kg bw/d

Dermal, local, long-term: 0.02 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.1

Inhalative, local, acute: 0.2

Dermal, systemic, long-term: 0.098

Dermal, local, long-term: 0.191

Combined routes systemic, long-term: 0.198

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Use in semi-closed processes. With occasional controlled exposure.

Inhalative, local exhaust ventilation - efficiency of at least [%]: 90

Dermal, local exhaust ventilation - efficiency of at least [%]: 80

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

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Contributing exposure scenario 11

Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (Alternative 2).

Bulk transfers; Transfer from/pouring from containers. (worker)

List of use descriptors

Process categories [PROC]:

PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 4h

Human factors not influenced by risk management:

Exposed skin surface assumed: Both hands (960 cm²)

Other relevant operational conditions:

Place of use: Indoor/Outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 14.77 mg/m³

Inhalative, local, acute: 98.48 mg/m³

Dermal, systemic, long-term: 0.823 mg/kg bw/d

Dermal, local, long-term: 0.06 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.06

Inhalative, local, acute: 0.2

Dermal, systemic, long-term: 0.294

Dermal, local, long-term: 0.573

Combined routes systemic, long-term: 0.354

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Use in semi-closed processes. With occasional controlled exposure.

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

Wear a respirator providing a minimum efficiency of (%): 90 (APF 10)

Contributing exposure scenario 12

Roller application or brushing (Alternative 1).

Rolling, Brushing. Equipment cleaning and maintenance. (worker)

List of use descriptors

Process categories [PROC]:

PROC10: Roller application or brushing

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 1h

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Human factors not influenced by risk management:

Exposed skin surface assumed: Both hands (960 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 19.7 mg/m³

Inhalative, local, acute: 393.9 mg/m³

Dermal, systemic, long-term: 0.549 mg/kg bw/d

Dermal, local, long-term: 0.04 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.08

Inhalative, local, acute: 0.801

Dermal, systemic, long-term: 0.196

Dermal, local, long-term: 0.382

Combined routes systemic, long-term: 0.276

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Inhalative, local exhaust ventilation - efficiency of at least [%]: 80

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 1 hour.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

Contributing exposure scenario 13

Roller application or brushing (Alternative 2).

Rolling, Brushing. Equipment cleaning and maintenance. (worker)

List of use descriptors

Process categories [PROC]:

PROC10: Roller application or brushing

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 5-25 %.

Duration and frequency of use:

Covers daily exposures up to 4h

Human factors not influenced by risk management:

Exposed skin surface assumed: Both hands (960 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

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Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 17.73 mg/m³
Inhalative, local, acute: 118.2 mg/m³
Dermal, systemic, long-term: 0.988 mg/kg bw/d
Dermal, local, long-term: 0.072 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.072
Inhalative, local, acute: 0.24
Dermal, systemic, long-term: 0.353
Dermal, local, long-term: 0.688
Combined routes systemic, long-term: 0.425

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

Wear a respirator providing a minimum efficiency of (%): 90 (APF 10)

Contributing exposure scenario 14

Non industrial spraying (Alternative 1). (worker)

List of use descriptors

Process categories [PROC]:

PROC11: Non industrial spraying

Operational conditions

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 1h

Human factors not influenced by risk management:

Exposed skin surface assumed: Hands and forearms (1500 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use Assumes process temperature up to 40 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 19.7 mg/m³
Inhalative, local, acute: 393.9 mg/m³
Dermal, systemic, long-term: 2.143 mg/kg bw/d
Dermal, local, long-term: 0.1 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.08
Inhalative, local, acute: 0.801
Dermal, systemic, long-term: 0.765
Dermal, local, long-term: 0.956
Combined routes systemic, long-term: 0.845

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Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 1 hour.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

Contributing exposure scenario 15

Non industrial spraying (Alternative 2). (worker)

List of use descriptors

Process categories [PROC]:

PROC11: Non industrial spraying

Operational conditions

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 1-5 %.

Duration and frequency of use:

Covers daily exposures up to 1h

Human factors not influenced by risk management:

Exposed skin surface assumed: Hands and forearms (1500 cm²)

Other relevant operational conditions:

Place of use: Indoor and outdoor use

Assumes process temperature up to 40 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 19.7 mg/m³

Inhalative, local, acute: 393.9 mg/m³

Dermal, systemic, long-term: 2.143 mg/kg bw/d

Dermal, local, long-term: 0.1 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.08

Inhalative, local, acute: 0.801

Dermal, systemic, long-term: 0.765

Dermal, local, long-term: 0.956

Combined routes systemic, long-term: 0.845

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 1 hour.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

Contributing exposure scenario 16

Production of preparations or articles by tableting, compression, extrusion, pelletisation (Alternative 1). (worker)

List of use descriptors

Process categories [PROC]:

PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation

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Operational conditions

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: Palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: Indoor/Outdoor use

Assumes process temperature up to 40 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 9.848 mg/m³

Inhalative, local, acute: 39.39 mg/m³

Dermal, systemic, long-term: 0.069 mg/kg bw/d

Dermal, local, long-term: 0.01 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.04

Inhalative, local, acute: 0.08

Dermal, systemic, long-term: 0.024

Dermal, local, long-term: 0.096

Combined routes systemic, long-term: 0.065

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Inhalative, local exhaust ventilation - efficiency of at least [%]: 80

Dermal, local exhaust ventilation - efficiency of at least [%]: 80

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

Contributing exposure scenario 17

Production of preparations or articles by tableting, compression, extrusion, pelletisation (Alternative 2). (worker)

List of use descriptors

Process categories [PROC]:

PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation

Operational conditions

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 5-25 %.

Duration and frequency of use:

Covers daily exposures up to 4h

Human factors not influenced by risk management:

Exposed skin surface assumed: Palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: Indoor/Outdoor use

Assumes process temperature up to 40 °C

Other information:

Methods used: TRA Workers 3.0

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Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 17.73 mg/m³
Inhalative, local, acute: 118.2 mg/m³
Dermal, systemic, long-term: 0.206 mg/kg bw/d
Dermal, local, long-term: 0.03 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.072
Inhalative, local, acute: 0.24
Dermal, systemic, long-term: 0.074
Dermal, local, long-term: 0.287
Combined routes systemic, long-term: 0.146

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Limit the substance content in the product to 25 %.

Avoid carrying out activities involving exposure for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

Contributing exposure scenario 18

Production of preparations or articles by tableting, compression, extrusion, pelletisation (Alternative 3). (worker)

List of use descriptors

Process categories [PROC]:

PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation

Operational conditions

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 1h

Human factors not influenced by risk management:

Exposed skin surface assumed: Palm of both hands (480 cm²)

Other relevant operational conditions:

Place of use: Indoor/Outdoor use

Assumes process temperature up to 40 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 9.848 mg/m³
Inhalative, local, acute: 197 mg/m³
Dermal, systemic, long-term: 0.343 mg/kg bw/d
Dermal, local, long-term: 0.05 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.04
Inhalative, local, acute: 0.4
Dermal, systemic, long-term: 0.123
Dermal, local, long-term: 0.478
Combined routes systemic, long-term: 0.162

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Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Avoid carrying out activities involving exposure for more than 1 hour.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

Contributing exposure scenario 19

Use as laboratory reagent. (worker)

List of use descriptors

Process categories [PROC]:

PROC15: Use as laboratory reagent

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 100 %.

Duration and frequency of use:

Covers daily exposures up to 8h

Human factors not influenced by risk management:

Exposed skin surface assumed: Palm of one hand (240 cm²)

Other relevant operational conditions:

Place of use: Indoor/Outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 49.24 mg/m³

Inhalative, local, acute: 197 mg/m³

Dermal, systemic, long-term: 0.034 mg/kg bw/d

Dermal, local, long-term: 0.01 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.2

Inhalative, local, acute: 0.4

Dermal, systemic, long-term: 0.012

Dermal, local, long-term: 0.095

Combined routes systemic, long-term: 0.212

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

Contributing exposure scenario 20

Manual activities involving hand contact (Alternative 1). (worker)

List of use descriptors

Process categories [PROC]:

PROC19: Hand-mixing with intimate contact and only PPE available

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Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa
Concentration of the substance in a mixture: Covers percentage substance in the product up to 100 %.
Duration and frequency of use: Covers daily exposures up to up to 15 min
Human factors not influenced by risk management: Exposed skin surface assumed: Hands and forearms (1980 cm²)
Other relevant operational conditions: Place of use: Indoor/Outdoor use
Assumes process temperature up to 90 °C
Other information: Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:
Inhalative, systemic, long-term: 4.924 mg/m³
Inhalative, local, acute: 197 mg/m³
Dermal, systemic, long-term: 1.414 mg/kg bw/d
Dermal, local, long-term: 0.05 mg/cm²
Risk characterisation ratio (RCR):
Inhalative, systemic, long-term: 0.02
Inhalative, local, acute: 0.4
Dermal, systemic, long-term: 0.505
Dermal, local, long-term: 0.478
Combined routes systemic, long-term: 0.525

Risk management measures

Technical conditions and measures at process level (source) to prevent release:
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Operational conditions and risk management measures:
Assumes a good basic standard of occupational hygiene is implemented.
Avoid carrying out activities involving exposure for more than 15 minutes.
Conditions and measures related to personal protection, hygiene and health evaluation:
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%
Wear a respirator providing a minimum efficiency of (%): 90 (APF 10)

Contributing exposure scenario 21

Manual activities involving hand contact (Alternative 2). (worker)

List of use descriptors

Process categories [PROC]:
PROC19: Hand-mixing with intimate contact and only PPE available

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa
Concentration of the substance in a mixture: Covers percentage substance in the product up to 100 %.
Duration and frequency of use: Covers daily exposures up to 15 min
Human factors not influenced by risk management: Exposed skin surface assumed: Hands and forearms (1980 cm²)
Other relevant operational conditions: Place of use: Indoor/Outdoor use
Assumes process temperature up to 90 °C
Other information: Methods used: TRA Workers 3.0

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Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 9.848 mg/m³
Inhalative, local, acute: 393.9 mg/m³
Dermal, systemic, long-term: 1.414 mg/kg bw/d
Dermal, local, long-term: 0.05 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.04
Inhalative, local, acute: 0.801
Dermal, systemic, long-term: 0.505
Dermal, local, long-term: 0.478
Combined routes systemic, long-term: 0.545

Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Inhalative, local exhaust ventilation - efficiency of at least [%]: 80

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.
Avoid carrying out activities involving exposure for more than 15 minutes.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

Contributing exposure scenario 22

Manual activities involving hand contact (Alternative 3). (worker)

List of use descriptors

Process categories [PROC]:

PROC19: Hand-mixing with intimate contact and only PPE available

Operational conditions

Product characteristics: Liquid, Vapour pressure at 90 °C: up to 8000 Pa

Concentration of the substance in a mixture:

Covers percentage substance in the product up to 5-25 %.

Duration and frequency of use:

Covers daily exposures up to 1h

Human factors not influenced by risk management:

Exposed skin surface assumed: Hands and forearms (1980 cm²)

Other relevant operational conditions:

Place of use: Indoor/Outdoor use

Assumes process temperature up to 90 °C

Other information:

Methods used: TRA Workers 3.0

Exposure prediction

Exposure estimation and reference to its source:

Inhalative, systemic, long-term: 11.82 mg/m³
Inhalative, local, acute: 236.4 mg/m³
Dermal, systemic, long-term: 1.697 mg/kg bw/d
Dermal, local, long-term: 0.06 mg/cm²

Risk characterisation ratio (RCR):

Inhalative, systemic, long-term: 0.048
Inhalative, local, acute: 0.48
Dermal, systemic, long-term: 0.606
Dermal, local, long-term: 0.573
Combined routes systemic, long-term: 0.654

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Risk management measures

Technical conditions and measures at process level (source) to prevent release:

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Inhalative, local exhaust ventilation - efficiency of at least [%]: 80

Operational conditions and risk management measures:

Assumes a good basic standard of occupational hygiene is implemented.

Limit the substance content in the product to 25 %.

Avoid carrying out activities involving exposure for more than 15 minutes.

Conditions and measures related to personal protection, hygiene and health evaluation:

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 90%

Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Health: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment: Used EUSES model. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

'ECT AMS': The Excel-tool enables the performance of scaling calculation for specific local environmental conditions. It can be downloaded from the web page of the Phenol & Derivatives REACH-consortium:
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Exposure Scenario 10: Polymer manufacturing and processing (processing aid). Ecological information

List of use descriptors

Sectors of use [SU]: SU22: Professional uses

Application

Remark: Contributing Scenarios (workers) refer to ES9:
Process categories [PROC]: 1, 2, 4, 5, 8a, 8b, 10, 11, 14, 15, 19

Contributing Scenarios: 1 Polymer manufacturing and processing (processing aid) (environment) Page 83

Contributing exposure scenario 1

Polymer manufacturing and processing (processing aid) (environment)

List of use descriptors

Environmental release categories [ERC]:

ERC8d: wide dispersive outdoor use of processing aids in open systems

ERC8a: wide dispersive indoor use of processing aids in open systems

Specific Environmental Release Categories [SPERC]:

SpERCESVOC 8.21b.v1

SpERCESVOC 8.21b.v1

Operational conditions

Duration and frequency of use:

Amount used, frequency and duration of use (or from service life)

Daily amount per site: up to 0.008 tonnes/day

Fraction of EU tonnage used in region: 10 %

Environment factors not influenced by risk management:

Emission factors:

Release fraction to wastewater from process: 1 %

Release fraction to air from process: 98 %

Release fraction to soil from process: 1 %

Release fraction to waste from process: 0 %

Exposure prediction

Exposure estimation and reference to its source:

Predicted environmental concentration (PEC) local:

Water (freshwater): 0.0003749 mg/L

Sediment (freshwater): 0.027 mg/kg dw

Water (marine water): 3.628E-05 mg/L

Sediment (marine water): 0.003 mg/kg dw

Sewage treatment plant (stp): 0.003 mg/L

Agriculture soil: 0.006 mg/kg dw

Indirect exposure to humans via the environment: 0.0001365 mg/m³ (inhalative)

Indirect exposure to humans via the environment: 0.0001105 mg/kg bw/d (oral, food)

Risk characterisation ratio (RCR):

Water (freshwater): 0.047

Sediment (freshwater): 0.047

Water (marine water): 0.045

Sediment (marine water): 0.045

Sewage treatment plant (stp): < 0.01

Agriculture soil: 0.055

Indirect exposure to humans via the environment: < 0.01 (inhalative)

Indirect exposure to humans via the environment: < 0.01 (oral, food)

Indirect exposure to humans via the environment: < 0.01 (combined routes)

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Disposal considerations

Conditions and measures related to sewage treatment plant:

Municipal Sewage Treatment Plant: Effectiveness water: 92.75 %

Discharge rate $\geq 2,000 \text{ m}^3/\text{d}$

Application of the STP sludge on agricultural soil.

Conditions and measures related to external treatment of waste for disposal:

Dispose of waste or used sacks/containers according to local regulations.

Conditions and measures related to external recovery of waste:

Receiving surface water flow $\geq 18,000$

Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Health: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment: Used EUSES model. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

'ECT AMS': The Excel-tool enables the performance of scaling calculation for specific local environmental conditions. It can be downloaded from the web page of the Phenol & Derivatives REACH-consortium:

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Exposure Scenario 11: Polymer manufacturing and processing (inclusion into a matrix). Ecological information

List of use descriptors

Sectors of use [SU]: SU22: Professional uses

Application

Remark: Contributing Scenarios (workers) refer to ES9:
Process categories [PROC]: 1, 2, 4, 5, 8a, 8b, 10, 11, 14, 15, 19

Contributing Scenarios: 1 Polymer manufacturing and processing (inclusion into a matrix)
(environment)

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Contributing exposure scenario 1

Polymer manufacturing and processing (inclusion into a matrix) (environment)

List of use descriptors

Environmental release categories [ERC]:

ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix

ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix

Operational conditions

Duration and frequency of use:

Amount used, frequency and duration of use (or from service life)

Daily amount per site: up to 0.008 tonnes/day

Fraction of EU tonnage used in region: 10 %

Environment factors not influenced by risk management:

Emission factors:

Release fraction to wastewater from process: 1 %

Release fraction to air from process: 15 %

Release fraction to soil from process: 0.5 %

Exposure prediction

Exposure estimation and reference to its source:

Predicted environmental concentration (PEC) local:

Water (freshwater): 0.0003749 mg/L

Sediment (freshwater): 0.027 mg/kg dw

Water (marine water): 3.628E-05 mg/L

Sediment (marine water): 0.003 mg/kg dw

Sewage treatment plant (stp): 0.003 mg/L

Agriculture soil: 0.006 mg/kg dw

Indirect exposure to humans via the environment: 0.0001365 mg/m³ (inhalative)

Indirect exposure to humans via the environment: 0.0001105 mg/kg bw/d (oral, food)

Risk characterisation ratio (RCR):

Water (freshwater): 0.047

Sediment (freshwater): 0.047

Water (marine water): 0.045

Sediment (marine water): 0.045

Sewage treatment plant (stp): < 0.01

Agriculture soil: 0.055

Indirect exposure to humans via the environment: < 0.01 (inhalative)

Indirect exposure to humans via the environment: < 0.01 (oral, food)

Indirect exposure to humans via the environment: < 0.01 (combined routes)

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Disposal considerations

Conditions and measures related to sewage treatment plant:

Municipal Sewage Treatment Plant: Effectiveness water: 92.75 %

Discharge rate $\geq 2,000 \text{ m}^3/\text{d}$

Application of the STP sludge on agricultural soil.

Conditions and measures related to external treatment of waste for disposal:

Dispose of waste or used sacks/containers according to local regulations.

Conditions and measures related to external recovery of waste:

Receiving surface water flow $\geq 18,000$

Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Health: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment: Used EUSES model. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

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Exposure Scenario 12: Laboratory use. Ecological information

List of use descriptors

Sectors of use [SU]: SU22: Professional uses

Application

Remark: Contributing Scenarios (workers) refer to ES9:
Process categories [PROC]: 10, 15

Contributing Scenarios: 1 Laboratory use (environment)

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Contributing exposure scenario 1

Laboratory use (environment)

List of use descriptors

Environmental release categories [ERC]:
ERC8a: wide dispersive indoor use of processing aids in open systems

Operational conditions

Duration and frequency of use:

Amount used, frequency and duration of use (or from service life)
Daily amount per site: up to 2.75E-07 tonnes/day
Fraction of EU tonnage used in region: 10 %

Environment factors not influenced by risk management:

Emission factors:
Release fraction to wastewater from process: 100 %
Release fraction to air from process: 100 %
Release fraction to soil from process: 0 %

Exposure prediction

Exposure estimation and reference to its source:

Predicted environmental concentration (PEC) local:
Water (freshwater): 7.716E-05 mg/L
Sediment (freshwater): 0.006 mg/kg dw
Water (marine water): 6.509E-06 mg/L
Sediment (marine water): 0.00047389 mg/kg dw
Sewage treatment plant (stp): 9.967E-06 mg/L
Agriculture soil: 3.575E-05 mg/kg dw
Indirect exposure to humans via the environment: 0.0001299 mg/m³ (inhalative)
Indirect exposure to humans via the environment: 1.986E-05 mg/kg bw/d (oral, food)

Risk characterisation ratio (RCR):

Water (freshwater): < 0.01
Sediment (freshwater): < 0.01
Water (marine water): < 0.01
Sediment (marine water): < 0.01
Sewage treatment plant (stp): < 0.01
Agriculture soil: < 0.01
Indirect exposure to humans via the environment: < 0.01 (inhalative)
Indirect exposure to humans via the environment: < 0.01 (oral, food)
Indirect exposure to humans via the environment: < 0.01 (combined routes)

Disposal considerations

Conditions and measures related to sewage treatment plant:

Municipal Sewage Treatment Plant: Effectiveness water: 92.75 %
Discharge rate \geq 2,000 m³/d
Application of the STP sludge on agricultural soil.

Conditions and measures related to external treatment of waste for disposal:

Dispose of waste or used sacks/containers according to local regulations.

Conditions and measures related to external recovery of waste:

Receiving surface water flow \geq 18,000

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Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Health: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment: Used EUSES model. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

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