

# SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

## Phenol

Version 16.0

Revision Date 20.12.2011

Print Date 21.12.2011

### 1. Identification of the substance/mixture and of the company/undertaking

#### 1.1 Product identifier

Trade name : Phenol  
Registration number : 01-2119471329-32-0006, 01-2119471329-32-XXXX  
Substance name : phenol  
Substance No. : 203-632-7

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

Use of the Substance/Mixture : Raw material in chemical industry, Manufacture, Processing, Distribution, Laboratory use, Use in coatings, Use as binders and release agents, Use in rubber production and processing, Use in polymer production, Use in polymer processing, Phenolic resin processing (uses of downstream users of phenolic resins)

#### 1.3 Details of the supplier of the safety data sheet

Manufacturer : Borealis Polymers Oy  
P.O.Box 330, FI-06101 Porvoo, Finland  
Telephone: +358 9 394900  
  
Supplier : Borealis AG  
Wagramerstrasse 17-19, 1220 Vienna, Austria  
Telephone: +43 1 22400 0  
  
E-mail address : [sds@borealisgroup.com](mailto:sds@borealisgroup.com)

#### 1.4 Emergency telephone number

Contact your national emergency telephone number.

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## 2. Hazards identification

### 2.1 Classification of the substance or mixture

#### Classification (REGULATION (EC) No 1272/2008)

Acute toxicity, Category 3	H301: Toxic if swallowed.
Acute toxicity, Category 3	H311: Toxic in contact with skin.
Skin corrosion, Category 1B	H314: Causes severe skin burns and eye damage.
Acute toxicity, Category 3	H331: Toxic if inhaled.
Germ cell mutagenicity, Category 2	H341: Suspected of causing genetic defects.
Specific target organ toxicity - repeated exposure, Category 2	H373: May cause damage to organs through prolonged or repeated exposure.

#### Classification (67/548/EEC, 1999/45/EC)

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Mutagenic Category 3  
Toxic

Corrosive  
Harmful

R68: Possible risk of irreversible effects.  
R23/24/25: Toxic by inhalation, in contact with skin and if swallowed.  
R34: Causes burns.  
R48/20/21/22: Harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.

### 2.2 Label elements

#### Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :



Signal word : Danger

Hazard statements : H301 Toxic if swallowed.  
H311 Toxic in contact with skin.  
H314 Causes severe skin burns and eye damage.  
H331 Toxic if inhaled.  
H341 Suspected of causing genetic defects.  
H373 May cause damage to organs through prolonged or repeated exposure.

Precautionary statements : **Prevention:**  
P260 Do not breathe dust.  
P281 Use personal protective equipment as required.  
**Response:**  
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.  
P322 Specific measures (see additional labelling on this label).  
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P309 + P311 IF exposed or if you feel unwell: Call a POISON CENTER or doctor/ physician.

Hazardous components which must be listed on the label:

- 108-95-2 phenol

#### Additional Labelling:

After contact with skin, wash immediately with plenty of polyethylene glycol (in disposable cloths) and with plenty of water.

### 2.3 Other hazards

May be fatal if absorbed through skin.  
May cause irreversible eye damage.

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Symptoms may be delayed.  
See chapter 4.  
Vapours may form explosive mixtures with air.  
Readily degradable.

### 3. Composition/information on ingredients

#### 3.1 Substances

Chemical Name	CAS-No. EINECS-No. / ELINCS No.	Concentration [%]
phenol	108-95-2 203-632-7	<= 100

### 4. First aid measures

#### 4.1 Description of first aid measures

- General advice : Plan first aid action before beginning work with this product.  
First aider needs to protect himself.  
Move the victim to fresh air.  
Keep at rest.  
Remove contaminated clothing and shoes.  
If unconscious place in recovery position and seek medical advice.  
Keep available:  
Eye wash bottle with pure water and disposable cloths in polyethylene glycol at the workplace and in vehicles.  
In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
- If inhaled : Remove from exposure.  
Keep warm and at rest and provide fresh air.  
Give oxygen or artificial respiration if needed.  
Immediate medical attention is required.
- In case of skin contact : Take off all contaminated clothing immediately.  
Wash off with polyethylene glycol (in disposable cloths) and with plenty of water.  
Keep on washing until medical assistance is obtained and skin is not white.
- In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.  
Continue rinsing eyes during transport to hospital.
- If swallowed : Rinse mouth.  
Drink plenty of water.  
Do NOT induce vomiting.  
Immediate medical attention is required.

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

- Symptoms : Symptoms of poisoning:  
Vomiting

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Convulsions  
Irregular cardiac activity  
Unconsciousness  
Breathing difficulties  
Death.

Inhalation:  
Irritation  
Shortness of breath  
Lung oedema

Skin contact:  
Skin disorders  
Corrosion  
Dermatitis  
Necrosis  
Death.

Ingestion:  
Severe irritation  
corrosive effects  
acute lethal effects

Risks : Symptoms may be delayed.

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

Treatment : There is no specific antidote available.  
After contact with skin, wash immediately with plenty of polyethylene glycol (in disposable cloths) and with plenty of water.  
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
If ingested, irrigate the stomach using activated charcoal in addition.

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## 5. Firefighting measures

### 5.1 Extinguishing media

Suitable extinguishing media : Dry powder  
Carbon dioxide (CO<sub>2</sub>)  
Alcohol-resistant foam  
Water mist

Unsuitable extinguishing media : High volume water jet

### 5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting : Flammable.  
Vapours are heavier than air and may spread along floors.  
Vapours may form explosive mixtures with air.  
Burning produces noxious and toxic fumes.  
See chapter 10.

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### 5.3 Advice for firefighters

- Special protective equipment for firefighters : Wear self-contained breathing apparatus and protective suit.
- Further information : Keep people away from and upwind of spill/leak.  
Keep away from heat and sources of ignition.  
Observe the risk of explosion.  
Cool containers / tanks with water spray.  
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.  
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

## 6. Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

- Personal precautions : Remove all sources of ignition.  
Keep people away from and upwind of spill/leak.  
Do not breathe vapours.  
Avoid breathing dust.  
Avoid all contact with the product.  
Use personal protective equipment.  
Ensure adequate ventilation.  
Attempt to stop leakage without personal risk.

### 6.2 Environmental precautions

- Environmental precautions : Should not be released into the environment.  
Prevent product from entering drains.  
If the product contaminates rivers and lakes or drains inform respective authorities.

### 6.3 Methods and materials for containment and cleaning up

- Methods for cleaning up : Allow to solidify, use mechanical handling equipment.  
Shovel into suitable container for disposal.  
Large molten masses:  
Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).  
Clean thoroughly.

### 6.4 Reference to other sections

- For personal protection see section 8.  
For disposal considerations see section 13.

## 7. Handling and storage

### 7.1 Precautions for safe handling

- Advice on safe handling : Handle only in a place equipped with local exhaust (or other appropriate exhaust).

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Avoid inhalation of vapour or mist.  
 Avoid contact with skin, eyes and clothing.  
 Handle with extreme care.  
 Ensure adequate ventilation.

Advice on protection against fire and explosion : Keep away from sources of ignition - No smoking.

**7.2 Conditions for safe storage, including any incompatibilities**

Requirements for storage areas and containers : Keep container tightly closed and in a well-ventilated place.  
 Protect from sunlight.  
 Suitable materials for containers:  
 Stainless steel  
 Unsuitable materials for containers:  
 Aluminium  
 Lead  
 Copper  
 Copper alloys  
 Zinc  
 Unlined steel  
 May attack many plastics, rubbers and coatings.

Further information on storage conditions : Keep locked up or in an area accessible only to qualified or authorised persons.  
 Take precautionary measures against static discharges.  
 To avoid ignition of vapours by static electricity discharge, all metal parts of the equipment must be grounded.  
 Ensure that eye flushing systems and safety showers are located close to the working place.

Advice on common storage : Keep away from food, drink and animal feedingstuffs.  
 Keep away from incompatible materials.  
 See chapter 10.

German storage class : 6.1A Combustible substances, toxic

Other data : Recommended storage temperature:  
 15 - 25 °C (solid)  
 55 - 60 °C (liquid)

**7.3 Specific end uses**

Remarks : Reserved for industrial and professional use.

**8. Exposure controls/personal protection**

**8.1 Control parameters**

Components	CAS-No.	Value	Control parameters	Update	Basis
phenol	108-95-2	TWA	2 ppm 8 mg/m3	2009-12-19	2009/161/EU

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Further information	:	skin: Identifies the possibility of significant uptake through the skin Indicative			
		STEL	4 ppm 16 mg/m <sup>3</sup>	2009-12-19	2009/161/EU
Further information	:	skin: Identifies the possibility of significant uptake through the skin Indicative			

DNEL : End Use: Workers  
Exposure routes: Inhalation  
Potential health effects: Long-term  
Value: 8 mg/m<sup>3</sup>

: End Use: Workers  
Exposure routes: Skin contact  
Potential health effects: Long-term  
Value: 1,23 mg/kg bw/d

PNEC : Fresh water  
Value: 0,0077 mg/l

: Marine water  
Value: 0,00077 mg/l

: Fresh water sediment  
Value: 0,0915 mg/kg dwt

: Marine sediment  
Value: 0,00915 mg/kg dwt

: Soil  
Value: 0,136 mg/kg dwt

## 8.2 Exposure controls

### Engineering measures

Minimise exposure using measures such as closed systems, dedicated facilities and suitable general / local exhaust ventilation.

Ensure safe systems of work or equivalent arrangements are in place to manage risks.

Regularly inspect, test and maintain all control measures.

### Personal protective equipment

Respiratory protection : In case of insufficient ventilation, wear suitable respiratory equipment.  
Respirator with combination filter for vapour/particulate (EN

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- 141).  
ABEK-P3-filter
- Hand protection : Protective gloves complying with EN 374.
- : thick PVC  
Break through time: > 480 min
- : Neoprene  
Break through time: 140 min
- : polyvinylchloride (PVC)  
Break through time: 75 min
- : Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.
- Eye protection : Wear goggles (DIN EN 58211) and if needed face-shield.
- Skin and body protection : Wear suitable protective clothing.  
Safety shoes according to EN 345-347.  
If splashes are likely to occur:  
Complete suit protecting against chemicals
- Hygiene measures : Avoid contact with skin and eyes.  
Take off immediately all contaminated clothing.  
When using, do not eat, drink or smoke.  
Keep away from food, drink and animal feedingstuffs.  
Clear up spills immediately and dispose of waste safely.  
Wash hands before breaks and immediately after handling the product.  
Use a high fat protective cream after cleaning skin.
- Protective measures : Avoid exposure - obtain special instructions before use.  
Ensure that eye flushing systems and safety showers are located close to the working place.  
Provide specific activity training to operators to minimise exposures.  
Consider the need for risk based health surveillance.  
Identify and implement corrective actions.

### Environmental exposure controls

- General advice : Should not be released into the environment.  
Prevent product from entering drains.  
If the product contaminates rivers and lakes or drains inform respective authorities.

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## 9. Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

Appearance	: liquid, > 40,9 °C solid, < 40,9 °C
Colour	: colourless (liquid), white (solid) : Change in colour if exposed to air and light:., pink, red
Odour	: pungent
Odour Threshold	: 0,006 - 6 ppm
pH	: 4 - 5, Concentration: 10,00 g/l, 20 °C
Melting point	: 40,9 °C
Boiling point	: 181,9 °C, 1.013 hPa
Flash point	: 81 °C, ISO 2719
Lower explosion limit	: 1,3 %(V)
Upper explosion limit	: 9,0 %(V)
Vapour pressure	: 0,2 hPa, 20 °C 3 hPa, 50 °C
Relative vapour density	: 3,2, 20 °C, (Air = 1.0)
Density	: 1,07 g/cm <sup>3</sup> , 20 °C 1,13 g/cm <sup>3</sup> , 25 °C, DIN 51757
Water solubility	: 84 g/l, 20 °C 87 g/l, 25 °C 68 °C, completely miscible
Solubility in other solvents	: Solvent: Fat solubility, Soluble in most organic solvents.
Partition coefficient: n-octanol/water	: log Pow: 1,47
Ignition temperature	: 595 °C, DIN 51794
Viscosity, dynamic	: 3,437 mPa.s, 50 °C

### 9.2 Other information

Molecular Weight	: 94,11 g/mol
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## 10. Stability and reactivity

### 10.1 Reactivity

No dangerous reaction known under conditions of normal use.

### 10.2 Chemical stability

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May attack many plastics, rubbers and coatings. hygroscopic

### 10.3 Possibility of hazardous reactions

Hazardous reactions : No dangerous reaction known under conditions of normal use.

### 10.4 Conditions to avoid

Conditions to avoid : Exposure to air.  
Exposure to sunlight.  
Keep away from heat and sources of ignition.  
No decomposition if used as directed.

### 10.5 Incompatible materials

Materials to avoid : Oxidizing agents  
Aldehydes  
Isocyanates  
Nitrites  
Nitride  
Friedel-Crafts catalysts  
Metals  
Vapours may form explosive mixtures with air.

### 10.6 Hazardous decomposition products

Hazardous decomposition products : Heating or fire can release toxic and corrosive gases.  
Under fire conditions:  
Carbon monoxide  
Carbon dioxide (CO<sub>2</sub>)

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## 11. Toxicological information

### 11.1 Information on toxicological effects

#### Product

Acute oral toxicity : LD50: 340 mg/kg, rat, OECD Test Guideline 401  
: LDLo: 140 mg/kg, Humans

Acute inhalation toxicity : LC50: > 900 mg/m<sup>3</sup>, 8 h, rat, Irritation of mucous membranes,  
Shortness of breath, Respiratory disorders,  
Toxic., Danger of serious damage to health by prolonged  
exposure.

Acute dermal toxicity : LD50: 660 mg/kg, rat, OECD Test Guideline 402

Skin corrosion/irritation : Causes burns., Exposure quickly causes a strong corrosive  
action upon all body tissue., Possible risk of irreversible  
effects.

Serious eye damage/eye  
irritation : Classification: Causes serious eye damage., May cause  
irreversible eye damage.

Respiratory or skin  
sensitization : Did not cause sensitization on laboratory animals.

Germ cell mutagenicity

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Genotoxicity in vitro	: Ames test, Result: negative, OECD Test Guideline 471 : Chromosome aberration test in vitro, Result: positive : in vitro assay, Result: positive, Mutagenicity (micronucleus test) : In vitro gene mutation study in mammalian cells, Result: positive, OECD Test Guideline 476
Genotoxicity in vivo	: in vivo assay, Mutagenicity (micronucleus test), Result: weak positive
Assessment	: In vitro tests showed mutagenic effects, Suspected of causing genetic defects.
Carcinogenicity	: Animal testing did not show any carcinogenic effects., IARC: (International Agency for Research on Cancer), Group 3: Not classifiable as to its carcinogenicity to humans
Reproductive toxicity	: No known effect.
STOT - repeated exposure	: Prolonged exposure may cause chronic effects:, disorder of nervous system., injuries to liver and kidneys., Repeated skin contact:, dermatitis., disorder of pigmentation.  Assessment: May cause damage to organs through prolonged or repeated exposure.
Acute effects (Assessment)	: Toxic if swallowed., Toxic in contact with skin., Toxic if inhaled.
Further information	: Symptoms may be delayed.

## 12. Ecological information

### 12.1 Toxicity

#### **Product:**

Toxicity to fish	: LC50: 8,9 mg/l, 96 h, Oncorhynchus mykiss (rainbow trout)
Toxicity to daphnia and other aquatic invertebrates.	: EC50: 3,1 mg/l, 48 h, Ceriodaphnia dubia (water flea)
Toxicity to algae	: EC50: 61,1 mg/l, 96 h, Pseudokirchneriella subcapitata (green algae) : EC50: 76 mg/l, 72 h, Entomoneis cf punctulata (diatom) : EC50: 61,82 mg/l, 7 d, Lemna minor (duckweed)
Toxicity to bacteria	: IC50: 21 mg/l, 24 h, Nitrosomonas sp
Toxicity to fish (Chronic)	: NOEC: 0,077 mg/l, 60 d, Cirrhina mrigala

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toxicity)

Toxicity to daphnia and other aquatic invertebrates. (Chronic toxicity) : EC10: 0,46 mg/l, 16 d, Daphnia magna (Water flea)

### 12.2 Persistence and degradability

#### Product:

Biodegradability : 62 %, Result: Readily biodegradable., activated sludge, OECD Test Guideline 301C  
: anaerobic, 80,1 %, Result: Readily biodegradable., activated sludge, ECETOC method  
: 86 - 96 %, Result: Readily biodegradable., Water  
: Abiotic degradation: Prone to photochemical degradation, reacting with OH radicals and ozone. Estimated atmospheric half-life: ca. 14 days

### 12.3 Bioaccumulative potential

#### Product:

Bioaccumulation : Danio rerio (zebra fish), Bioconcentration factor (BCF): 17,5, Elimination: yes, OECD Test Guideline 305E, Bioaccumulation not expected.

### 12.4 Mobility in soil

#### Product:

Mobility : Air, 1%  
: Water, 98.5%, The product evaporates slowly., The product is soluble in water.  
: Soil, 0.5%, High mobility  
Physico-chemical removability : Degradation in soil:., completely, 2 - 5 days, Readily degradable.

### 12.5 Results of PBT and vPvB assessment

#### Product:

Assessment : This substance is not considered to be persistent, bioaccumulating nor toxic (PBT)., This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

### 12.6 Other adverse effects

#### Product:

Chemical Oxygen Demand (COD) : 2.300 mg/g  
Additional ecological : Should not be released into the environment., Prevent product

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information

from entering drains.

### 13. Disposal considerations

#### 13.1 Waste treatment methods

- Product : Dispose of as hazardous waste in compliance with local and national regulations.  
Where possible recycling is preferred to disposal or incineration.  
European waste code:  
07 01 99 (wastes not otherwise specified (basic organic chemicals))
- Contaminated packaging : Dispose of as hazardous waste in compliance with local and national regulations.  
Reuse or recycle if not contaminated.

### 14. Transport information

#### 14.1 UN number

- ADR : 2312  
IMDG : 2312

#### 14.2 Proper shipping name

- ADR : PHENOL, MOLTEN  
IMDG : PHENOL, MOLTEN

#### 14.3 Transport hazard class

- ADR : 6.1  
IMDG : 6.1

#### 14.4 Packing group

- ADR  
Packaging group : II  
Hazard identification No : 60  
Labels : 6.1  
Tunnel restriction code : D/E
- IMDG  
Packaging group : II  
EmS Number : F-A, S-A

#### 14.5 Environmental hazards

- ADR  
Environmentally hazardous : no

IMDG

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Marine pollutant : no

### 14.6 Special precautions for user

Other UN-Number: 1671 (PHENOL, SOLID)

### 14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Ship type : 2  
Pollution category : Y

## 15. Regulatory information

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

Major Accident Hazard : 96/82/EC Update: 2003  
Legislation Toxic  
Category: 2

Water contaminating class : WGK 2 water endangering  
(Germany) ID No.: 170  
Update: 2005-07-30

Other regulations : Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work.  
Take note of Dir 94/33/EC on the protection of young people at work.  
Take note of Dir 92/85/EEC on the safety and health at work of pregnant workers.

### 15.2 Chemical Safety Assessment

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

## 16. Other information

### Full text of R-phrases referred to under sections 2 and 3

R23/24/25 Toxic by inhalation, in contact with skin and if swallowed.  
R34 Causes burns.  
R48/20/21/22 Harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.  
R68 Possible risk of irreversible effects.

### Full text of H-Statements referred to under sections 2 and 3.

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H301	Toxic if swallowed.
H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.
H331	Toxic if inhaled.
H341	Suspected of causing genetic defects.
H373	May cause damage to organs through prolonged or repeated exposure.

### Further information

Other information : Changes since the last version are highlighted in the margin.  
This version replaces all previous versions.

Issuer : Borealis, Group Product Stewardship / Mikaela Eriksson &  
Andreas Ekholm

Sources of key data used to compile the Safety Data Sheet : REACH Registration Dossier Phenol. P&D-REACH Consortium, 2010  
International Chemical Safety Card, Phenol, October 2001 (<http://www.inchem.org/documents/icsc/icsc/eics0070.htm>)  
IPCS Environmental Health Criteria 161, WHO, 1994 ([www.inchem.org/documents/ehc/ehc/ehc161.htm](http://www.inchem.org/documents/ehc/ehc/ehc161.htm))  
Environment Guide 71; Environmental properties of chemicals, Finnish Environment Institute, Helsinki 2000

### Disclaimer

To the best of our knowledge, the information contained herein is accurate and reliable as of the date of publication, however we do not assume any liability whatsoever for the accuracy and completeness of such information.

**Borealis makes no warranties which extend beyond the description contained herein. Nothing herein shall constitute any warranty of merchantability or fitness for a particular purpose.**

**It is the customer's responsibility to inspect and test our products in order to satisfy itself as to the suitability of the products for the customer's particular purpose. The customer is responsible for the appropriate, safe and legal use, processing and handling of our products.**

No liability can be accepted in respect of the use of Borealis' products in conjunction with other materials. The information contained herein relates exclusively to our products when not used in conjunction with any third party materials.

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### Identified uses:

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#### Use: Industrial use

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- Main User Groups : **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
- Process categories : **PROC1:** Use in closed process, no likelihood of exposure  
**PROC2:** Use in closed, continuous process with occasional controlled exposure  
**PROC3:** Use in closed batch process (synthesis or formulation)  
**PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises  
**PROC5:** Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)  
**PROC6:** Calendering operations  
**PROC7:** Industrial spraying  
**PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities  
**PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities  
**PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing)  
**PROC10:** Roller application or brushing  
**PROC13:** Treatment of articles by dipping and pouring  
**PROC14:** Production of preparations or articles by tableting, compression, extrusion, pelletisation  
**PROC15:** Use as laboratory reagent
- Environmental Release Categories : **ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d:** Manufacture of substances, Formulation of preparations, Formulation in materials, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use resulting in inclusion into or onto a matrix, Industrial use resulting in manufacture of another substance (use of intermediates), Industrial use of reactive processing aids, Industrial use of monomers for manufacture of thermoplastics, Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers

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#### Use: Professional use

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- Main User Groups : **SU 22:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
- Process categories : **PROC1:** Use in closed process, no likelihood of exposure  
**PROC2:** Use in closed, continuous process with occasional controlled exposure  
**PROC3:** Use in closed batch process (synthesis or

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formulation)

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

**PROC5:** Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)

**PROC6:** Calendering operations

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

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

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

**PROC10:** Roller application or brushing

**PROC11:** Non industrial spraying

**PROC13:** Treatment of articles by dipping and pouring

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

**PROC15:** Use as laboratory reagent

Environmental Release Categories : **ERC2, ERC4, ERC6b, ERC6c, ERC6d, ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f:** Formulation of preparations, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of reactive processing aids, Industrial use of monomers for manufacture of thermoplastics, Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers, Wide dispersive indoor use of processing aids in open systems, Wide dispersive indoor use of reactive substances in open systems, Wide dispersive indoor use resulting in inclusion into or onto a matrix, Wide dispersive outdoor use of processing aids in open systems, Wide dispersive outdoor use of reactive substances in open systems, Wide dispersive outdoor use resulting in inclusion into or onto a matrix

## Phenol - Industrial

### Identified Industrial Generic Exposure Scenarios (GESs) of Phenol

GES No.	Subsector	Main SU	Description	PROC	ERC	Phenol
EC No.						203-632-7
CAS No.						108-95-2
1	Manufacture, Processing and Distribution of substances and mixtures	All Industrial Uses (SU3)	Manufacture, Processing (see examples below1), Formulation and Distribution of the substance or mixtures. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities	PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC14, PROC15	ERC1, ERC2, ERC4, ERC6a  ERCs are to be checked with the ECT tool	x
2	Use in laboratories	All Industrial Uses (SU3)	Use of the substance within laboratory settings, including material transfers and equipment cleaning	PROC10, PROC15	ERC4  ERCs are to be checked with the ECT tool	x
3	Uses in Coatings	All Industrial Uses (SU3)	Covers the use in coatings (paints, inks, adhesives, and production of textiles, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, spreader, dip, flow, fluidised bed on production lines and film formation) and equipment cleaning, maintenance and associated laboratory activities.	PROC5, PROC8a, PROC10, PROC13	ERC4  ERCs are to be checked with the ECT tool	x + PROC1, PROC2, PROC3, PROC4, PROC7, PROC8b, PROC9, PROC15 + ERC3 ERC5
4	Use as binders and release agents	All Industrial Uses (SU3)	Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing), mould forming and casting, and handling of waste.	PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13	ERC5  ERCs are to be checked with the ECT tool	x + PROC14 ERC3
5	Rubber production and processing	All Industrial Uses (SU3)	Manufacture of tyres and general rubber articles, including processing of raw (uncured) rubber, handling and mixing of rubber additives, vulcanising, cooling and finishing.	PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14	ERC6d  ERCs are to be checked with the ECT tool	x

## Phenol - Industrial

GES No.	Subsector	Main SU	Description	PROC	ERC	Phenol
EC No.						203-632-7
CAS No.						108-95-2
6	Polymer manufacturing	All Industrial Uses (SU3)	Manufacturing of formulated polymers including material transfers, additives handling (e.g. pigments, stabilisers, fillers, plasticisers, etc.), moulding, curing and forming activities, material re-works, storage and associated maintenance.	PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15	ERC6d ERCs are to be checked with the ECT tool	x
7	Polymer processing	All Industrial Uses (SU3)	Processing of formulated polymers including material transfers, additives handling (e.g. pigments, stabilisers, fillers, plasticisers, etc.), moulding, curing and forming activities, material re-works, storage and associated maintenance.	PROC1, PROC2, PROC3, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC14, PROC15	ERC6d ERCs are to be checked with the ECT tool	x
8	Phenolic Resin processing (DU uses of Phenolic Resins)	All Industrial Uses (SU3)	Processing resins including material transfers, moulding and forming activities, material re-works and associated maintenance. Identified DU uses eg: Foundry, Hot Tops and refractory, Electrical laminates, Felt bonding, Friction, Mineral wool, Wood products, Impregnated paper, abrasives, Foam.	PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15	ERC2, ERC4, ERC6b, ERC6c, ERC6d ERCs are to be checked with the ECT tool	x

<sup>1</sup> Examples for processing: use as intermediate,  
use as monomer etc.  
use as solvent,  
use for the manufacturing of resins

<sup>2</sup> Polymer Examples: FRP, UV, VE

Please note also: PC's and AC's are only for consumer.  
For checking ERC's please use the respective environmental calculation tool (ECT) ECT Acetone or ECT Phenol or ECT Cumene or ECT AMS or ECT ACP

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### 1. Short title of Exposure Scenario: Industrial use

- Main User Groups : **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
- Process categories : **PROC1:** Use in closed process, no likelihood of exposure  
**PROC2:** Use in closed, continuous process with occasional controlled exposure  
**PROC3:** Use in closed batch process (synthesis or formulation)  
**PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises  
**PROC5:** Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)  
**PROC6:** Calendering operations  
**PROC7:** Industrial spraying  
**PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities  
**PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities  
**PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing)  
**PROC10:** Roller application or brushing  
**PROC13:** Treatment of articles by dipping and pouring  
**PROC14:** Production of preparations or articles by tableting, compression, extrusion, pelletisation  
**PROC15:** Use as laboratory reagent
- Environmental Release Categories : **ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d:** Manufacture of substances, Formulation of preparations, Formulation in materials, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use resulting in inclusion into or onto a matrix, Industrial use resulting in manufacture of another substance (use of intermediates), Industrial use of reactive processing aids, Industrial use of monomers for manufacture of thermoplastics, Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers

**2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d: Manufacture of substances, Formulation of preparations, Formulation in materials, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use resulting in inclusion into or onto a matrix, Industrial use resulting in manufacture of another substance (use of intermediates), Industrial use of reactive processing aids, Industrial use of monomers for manufacture of thermoplastics, Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers**

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### Amount used

Annual amount per site :  
Remarks : To be defined by site. Use the calculation tool: ECT Phenol:  
<http://www.reachcentrum.eu/en/consortium-management/consortia-under-reach/phenol-derivatives-reach-consortium/phenol-derivatives-dossiers.aspx>

### Environment factors not influenced by risk management

Remarks : Dilution Factor (River): To be defined by site.  
Remarks : Dilution Factor (Coastal Areas): To be defined by site.

### Other given operational conditions affecting environmental exposure

Number of emission days per year : 360

### Technical conditions and measures / Organizational measures

Air : Closed system Exhaust ventilation equipped with scrubbers ,  
or: Charcoal adsorbers (Effectiveness (of a measure): 90 %)  
Remarks : Common practices vary across sites thus conservative  
process release estimates used. To be defined by site. Use  
the calculation tool: ECT Phenol:  
<http://www.reachcentrum.eu/en/consortium-management/consortia-under-reach/phenol-derivatives-reach-consortium/phenol-derivatives-dossiers.aspx>

### Conditions and measures related to municipal sewage treatment plant

Remarks : Flow rate of sewage treatment plant effluent: To be defined by  
site. Use the calculation tool: ECT Phenol:  
<http://www.reachcentrum.eu/en/consortium-management/consortia-under-reach/phenol-derivatives-reach-consortium/phenol-derivatives-dossiers.aspx>

### Conditions and measures related to external recovery of waste

Remarks : Contain and dispose of waste according to local regulations.

---

### 2.2 Contributing scenario controlling worker exposure for: General risk management measures applicable to all activities

**PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact), Calendring operations, Industrial spraying, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Roller application or brushing, Treatment of articles by dipping and pouring, Production of preparations or articles by tableting, compression, extrusion, pelletisation, Use as laboratory reagent**

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### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product between 3 and 100 % (unless stated differently).  
Remarks : Liquid, vapour pressure < 0.5 kPa Liquid, vapour pressure 0.5 - 10 kPa

### Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently).

### Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented.

### Technical conditions and measures

Drain down and flush system prior to equipment opening or maintenance.

### Organisational measures to prevent /limit releases, dispersion and exposure

Minimise exposure using measures such as closed systems, dedicated facilities and suitable general / local exhaust ventilation. Where there is potential for exposure: Ensure safe systems of work or equivalent arrangements are in place to manage risks. Provide specific activity training to operators to minimise exposures. Clear up spills immediately and dispose of waste safely. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance. Identify and implement corrective actions.

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

Use personal protective equipment as required.

---

### 2.3 Contributing scenario controlling worker exposure for: General exposures (closed systems), Process sampling, elevated temperature PROC1: Use in closed process, no likelihood of exposure

---

#### Technical conditions and measures

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

---

### 2.4 Contributing scenario controlling worker exposure for: General exposures (closed systems), Process sampling, elevated temperature PROC1: Use in closed process, no likelihood of exposure

---

#### Technical conditions and measures

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

#### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 3 %.

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### **2.5 Contributing scenario controlling worker exposure for: General exposures (closed systems), Continuous process, Process sampling, elevated temperature PROC2: Use in closed, continuous process with occasional controlled exposure**

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#### **Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

#### **Technical conditions and measures**

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

---

### **2.6 Contributing scenario controlling worker exposure for: General exposures (closed systems), Continuous process, Process sampling, elevated temperature, (closed systems) PROC2: Use in closed, continuous process with occasional controlled exposure**

---

#### **Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

#### **Technical conditions and measures**

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

#### **Organisational measures to prevent /limit releases, dispersion and exposure**

Limit the substance content in the product to 3 %.

#### **Conditions and measures related to personal protection, hygiene and health evaluation**

Wear suitable gloves tested to EN374.

---

### **2.7 Contributing scenario controlling worker exposure for: General exposures (closed systems), Batch process, Process sampling, with local exhaust ventilation, elevated temperature, Occasional exposure PROC3: Use in closed batch process (synthesis or formulation)**

---

#### **Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

#### **Technical conditions and measures**

Sample via a closed loop or other system to avoid exposure. Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 90 %)

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### 2.8 Contributing scenario controlling worker exposure for: General exposures (closed systems), Batch process, (closed systems), elevated temperature, Occasional exposure

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

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

#### Technical conditions and measures

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

#### Organisational measures to prevent /limit releases, dispersion and exposure

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

---

### 2.9 Contributing scenario controlling worker exposure for: General exposures (closed systems), Batch process, (closed systems), elevated temperature, Occasional exposure, @ temp < 58 °C = low volatility

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

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

#### Technical conditions and measures

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

#### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 25 %.

---

### 2.10 Contributing scenario controlling worker exposure for: General exposures (closed systems), Batch process, (closed systems), elevated temperature, Occasional exposure

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

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

#### Technical conditions and measures

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

#### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 3 %.

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**2.11 Contributing scenario controlling worker exposure for: Process sampling, (open systems), with local exhaust ventilation, elevated temperature, Occasional exposure PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises**

---

**Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

**Technical conditions and measures**

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 90 %)

---

**2.12 Contributing scenario controlling worker exposure for: Process sampling, (open systems), elevated temperature, Occasional exposure PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises**

---

**Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

**Organisational measures to prevent /limit releases, dispersion and exposure**

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

---

**2.13 Contributing scenario controlling worker exposure for: Process sampling, (open systems), with local exhaust ventilation, elevated temperature, Occasional exposure PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises**

---

**Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

**Organisational measures to prevent /limit releases, dispersion and exposure**

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

---

**2.14 Contributing scenario controlling worker exposure for: Mixing operations (open systems), Batch process, Process sampling, with local exhaust ventilation, elevated temperature, Occasional exposure PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)**

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**Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

**Technical conditions and measures**

---

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Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 90 %)

---

### 2.15 Contributing scenario controlling worker exposure for: Mixing operations (open systems), Batch process, Process sampling, elevated temperature, Occasional exposure

**PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)**

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

#### Organisational measures to prevent /limit releases, dispersion and exposure

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

---

### 2.16 Contributing scenario controlling worker exposure for: Mixing operations (open systems), Batch process, Process sampling, elevated temperature, Occasional exposure

**PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)**

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

#### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 3 %.

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

Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.

---

### 2.17 Contributing scenario controlling worker exposure for: Mixing operations (open systems), Batch process, Process sampling, with local exhaust ventilation, elevated temperature, Occasional exposure

**PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)**

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 114.5 °C = medium volatility

#### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 90 %)

#### Organisational measures to prevent /limit releases, dispersion and exposure

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

---

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### 2.18 Contributing scenario controlling worker exposure for: Calendering (including Banburys), with local exhaust ventilation, Occasional exposure PROC6: Calendering operations

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

#### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 90 %)

---

### 2.19 Contributing scenario controlling worker exposure for: Calendering (including Banburys), Occasional exposure PROC6: Calendering operations

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

#### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation.

#### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 3 %.

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

Wear suitable gloves tested to EN374.

---

### 2.20 Contributing scenario controlling worker exposure for: Calendering (including Banburys), with local exhaust ventilation, Occasional exposure PROC6: Calendering operations

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 114.5 °C = medium volatility

#### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 90 %)

#### Organisational measures to prevent /limit releases, dispersion and exposure

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

---

### 2.21 Contributing scenario controlling worker exposure for: Spraying/ fogging by machine application, with local exhaust ventilation PROC7: Industrial spraying

---

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### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 95 %)

### Organisational measures to prevent /limit releases, dispersion and exposure

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

---

### 2.22 Contributing scenario controlling worker exposure for: Spraying/ fogging by machine application, with local exhaust ventilation PROC7: Industrial spraying

---

### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 95 %)

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

Wear a respirator conforming to EN140 with Type A filter or better.

---

### 2.23 Contributing scenario controlling worker exposure for: Spraying/ fogging by machine application, with local exhaust ventilation PROC7: Industrial spraying

---

### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 95 %)

### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 3 %.

---

### 2.24 Contributing scenario controlling worker exposure for: Bulk transfers, Non-dedicated facility, Transfer from/pouring from containers, with local exhaust ventilation, elevated temperature, Occasional exposure PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities

---

### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 90 %)

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**2.25 Contributing scenario controlling worker exposure for: Bulk transfers, Non-dedicated facility, Transfer from/pouring from containers, elevated temperature, Occasional exposure**

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

---

**Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

**Organisational measures to prevent /limit releases, dispersion and exposure**

Limit the substance content in the product to 25 %. Avoid carrying out activities involving exposure for more than 1 hour.

---

**2.26 Contributing scenario controlling worker exposure for: Bulk transfers, Non-dedicated facility, Transfer from/pouring from containers, elevated temperature, Occasional exposure**

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

---

**Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

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

Wear a respirator conforming to EN140 with Type A filter or better.

---

**2.27 Contributing scenario controlling worker exposure for: Bulk transfers, Non-dedicated facility, Transfer from/pouring from containers, elevated temperature, Occasional exposure**

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

---

**Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

**Organisational measures to prevent /limit releases, dispersion and exposure**

Limit the substance content in the product to 3 %. 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.

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**2.28 Contributing scenario controlling worker exposure for: Bulk transfers, Non-dedicated facility, Transfer from/pouring from containers, with local exhaust ventilation, elevated temperature, Occasional exposure**  
**PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities**

---

**Other operational conditions affecting workers exposure**

Remarks : @ temp < 114.5 °C = medium volatility

**Technical conditions and measures**

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 90 %)

**Organisational measures to prevent /limit releases, dispersion and exposure**

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

---

**2.29 Contributing scenario controlling worker exposure for: Bulk transfers, Dedicated facility, Transfer from/pouring from containers, with local exhaust ventilation, elevated temperature, Occasional exposure**  
**PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities**

---

**Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

**Technical conditions and measures**

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 97 %)

---

**2.30 Contributing scenario controlling worker exposure for: Bulk transfers, Dedicated facility, Transfer from/pouring from containers, elevated temperature, Occasional exposure**  
**PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities**

---

**Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

**Organisational measures to prevent /limit releases, dispersion and exposure**

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

---

**2.31 Contributing scenario controlling worker exposure for: Bulk transfers, Dedicated facility, Transfer from/pouring from containers, elevated temperature, Occasional exposure**

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

---

#### **Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

#### **Organisational measures to prevent /limit releases, dispersion and exposure**

Limit the substance content in the product to 25 %. Avoid carrying out activities involving exposure for more than 4 hours.

---

### **2.32 Contributing scenario controlling worker exposure for: Bulk transfers, Dedicated facility, Transfer from/pouring from containers, elevated temperature, Occasional exposure**

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

---

#### **Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

#### **Organisational measures to prevent /limit releases, dispersion and exposure**

Limit the substance content in the product to 3 %.

#### **Conditions and measures related to personal protection, hygiene and health evaluation**

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

---

### **2.33 Contributing scenario controlling worker exposure for: Bulk transfers, Dedicated facility, Transfer from/pouring from containers, with local exhaust ventilation, elevated temperature, Occasional exposure**

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

---

#### **Other operational conditions affecting workers exposure**

Remarks : @ temp < 114.5 °C = medium volatility

#### **Technical conditions and measures**

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 97 %)

#### **Organisational measures to prevent /limit releases, dispersion and exposure**

Limit the substance content in the product to 25 %.

---

### **2.34 Contributing scenario controlling worker exposure for: Small package filling, Dedicated facility, Transfer from/pouring from containers, with local exhaust ventilation, elevated temperature, Occasional exposure**

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

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### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 90 %)

---

**2.35 Contributing scenario controlling worker exposure for: Small package filling, Dedicated facility, Transfer from/pouring from containers, elevated temperature, Occasional exposure**  
**PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)**

---

### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 25 %. Avoid carrying out activities involving exposure for more than 4 hours.

---

**2.36 Contributing scenario controlling worker exposure for: Small package filling, Dedicated facility, Transfer from/pouring from containers, elevated temperature, Occasional exposure**  
**PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)**

---

### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 3 %.

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

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

---

**2.37 Contributing scenario controlling worker exposure for: Rolling, Brushing, with local exhaust ventilation, elevated temperature**  
**PROC10: Roller application or brushing**

---

### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 90 %)

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### 2.38 Contributing scenario controlling worker exposure for: Rolling, Brushing, elevated temperature PROC10: Roller application or brushing

---

#### Organisational measures to prevent /limit releases, dispersion and exposure

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

---

### 2.39 Contributing scenario controlling worker exposure for: Equipment cleaning and maintenance, elevated temperature, equipment prewashed/rinsed automatically PROC10: Roller application or brushing

---

#### Technical conditions and measures

Drain or remove substance from equipment prior to break-in or maintenance.

#### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 5 %. Avoid carrying out operation 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 intensive management supervision controls.

---

### 2.40 Contributing scenario controlling worker exposure for: Dipping, immersion and pouring, with local exhaust ventilation, elevated temperature, Occasional exposure PROC13: Treatment of articles by dipping and pouring

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

#### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 90 %)

---

### 2.41 Contributing scenario controlling worker exposure for: Dipping, immersion and pouring, elevated temperature, Occasional exposure PROC13: Treatment of articles by dipping and pouring

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

#### Organisational measures to prevent /limit releases, dispersion and exposure

---

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Limit the substance content in the product to 25 %. Avoid carrying out activities involving exposure for more than 1 hour.

---

### 2.42 Contributing scenario controlling worker exposure for: Dipping, immersion and pouring, elevated temperature, Occasional exposure PROC13: Treatment of articles by dipping and pouring

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

#### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 3 %. Avoid carrying out activities involving exposure for more than 4 hours.

---

### 2.43 Contributing scenario controlling worker exposure for: Production or preparation or articles by tableting, compression, extrusion or pelletisation, with local exhaust ventilation, elevated temperature, Occasional exposure PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

#### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 90 %)

---

### 2.44 Contributing scenario controlling worker exposure for: Production or preparation or articles by tableting, compression, extrusion or pelletisation, elevated temperature, Occasional exposure PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

#### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 25 %. Avoid carrying out activities involving exposure for more than 4 hours.

---

### 2.45 Contributing scenario controlling worker exposure for: Production or preparation or articles by tableting, compression, extrusion or pelletisation, elevated temperature, Occasional exposure

---

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

**Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

**Organisational measures to prevent /limit releases, dispersion and exposure**

Limit the substance content in the product to 3 %.

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

**2.46 Contributing scenario controlling worker exposure for: Production or preparation or articles by tableting, compression, extrusion or pelletisation, with local exhaust ventilation, elevated temperature, Occasional exposure  
PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation**

**Other operational conditions affecting workers exposure**

Remarks : @ temp < 114.5 °C = medium volatility

**Technical conditions and measures**

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 90 %)

**Organisational measures to prevent /limit releases, dispersion and exposure**

Limit the substance content in the product to 25 %. Avoid carrying out activities involving exposure for more than 4 hours.

**2.47 Contributing scenario controlling worker exposure for: Laboratory activities, with local exhaust ventilation, Occasional exposure  
PROC15: Use as laboratory reagent**

**Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

**Technical conditions and measures**

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 90 %)

**3. Exposure estimation and reference to its source**

**Workers**

Contributing	Exposure	Specific conditions	Value	Level of	RCR
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Scenario	Assessment Method		Exposure	
PROC1	ECETOC TRA		Inhalation	0,01 ppm
			Dermal	0,01
PROC1	ECETOC TRA		Inhalation	0,002 ppm
			Dermal	0,34 mg/kg/day
PROC2	ECETOC TRA		Inhalation	1 ppm
			Dermal	0,50
PROC2	ECETOC TRA		Inhalation	0,2 ppm
			Dermal	0,10
PROC3	ECETOC TRA		Inhalation	0,27 mg/kg/day
			Dermal	0,22
PROC3	ECETOC TRA		Inhalation	0,3 ppm
			Dermal	0,15
PROC3	ECETOC TRA		Inhalation	1,8 ppm
			Dermal	0,90
PROC3	ECETOC TRA		Inhalation	1,8 ppm
			Dermal	0,90
PROC3	ECETOC TRA		Inhalation	0,6 ppm
			Dermal	0,30
PROC4	ECETOC TRA		Inhalation	0,34 mg/kg/day
			Dermal	0,28
PROC4	ECETOC TRA		Inhalation	0,5 ppm
			Dermal	0,25
PROC4	ECETOC TRA		Inhalation	1 ppm
			Dermal	0,50
PROC4	ECETOC TRA		Inhalation	2 ppm
			Dermal	1,00
PROC5	ECETOC TRA		Inhalation	0,5 ppm
			Dermal	0,25
PROC5	ECETOC TRA		Inhalation	1 ppm
			Dermal	0,50
PROC5	ECETOC TRA		Inhalation	1 ppm
			Dermal	0,50
PROC5	ECETOC TRA		Inhalation	0,27 mg/kg/day
			Dermal	0,22
PROC5	ECETOC TRA		Inhalation	1 ppm
			Dermal	0,50
PROC6	ECETOC TRA		Inhalation	0,5 ppm
			Dermal	0,25
PROC6	ECETOC TRA		Inhalation	1 ppm
			Dermal	0,50
PROC6	ECETOC TRA		Inhalation	0,27 mg/kg/day
			Dermal	0,22
PROC6	ECETOC TRA		Inhalation	1 ppm
			Dermal	0,50
PROC7	ECETOC TRA		Inhalation	1 ppm
			Dermal	0,50
PROC7	ECETOC TRA		Inhalation	0,5 ppm
			Dermal	0,25
PROC7	ECETOC TRA		Inhalation	1 ppm
			Dermal	0,50
PROC7	ECETOC TRA		Inhalation	0,14 mg/kg/day
			Dermal	0,11
PROC8a	ECETOC TRA		Inhalation	1 ppm
			Dermal	0,50
PROC8a	ECETOC TRA		Inhalation	1,2 ppm
			Dermal	0,60
PROC8a	ECETOC TRA		Inhalation	1 ppm
			Dermal	0,50
PROC8a	ECETOC TRA		Inhalation	1 ppm
			Dermal	0,50
PROC8a	ECETOC TRA		Inhalation	0,4 ppm
			Dermal	0,20
PROC8a	ECETOC TRA		Inhalation	0,69 mg/kg/day
			Dermal	0,56
PROC8a	ECETOC TRA		Inhalation	1 ppm
				0,50

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			Dermal		0,00
PROC8b	ECETOC TRA		Inhalation	0,15 ppm	0,08
			Dermal		0,00
PROC8b	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal		0,00
PROC8b	ECETOC TRA		Inhalation	1,8 ppm	0,90
			Dermal		0,00
PROC8b	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal	0,34 mg/kg/day	0,28
PROC8b	ECETOC TRA		Inhalation	0,9 ppm	0,45
			Dermal		0,00
PROC9	ECETOC TRA		Inhalation	0,5 ppm	0,25
			Dermal	0,69 mg/kg/day	0,56
PROC9	ECETOC TRA		Inhalation	1,8 ppm	0,90
			Dermal		0,00
PROC9	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal	0,34 mg/kg/day	0,28
PROC10	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal		0,00
PROC10	ECETOC TRA		Inhalation	2 ppm	1,00
			Dermal		0,00
PROC10	ECETOC TRA		Inhalation	1,2 ppm	0,60
			Dermal	0,11 mg/kg/day	0,26
PROC13	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal		0,00
PROC13	ECETOC TRA		Inhalation	1,2 ppm	0,60
			Dermal		0,00
PROC13	ECETOC TRA		Inhalation	1,2 ppm	0,60
			Dermal	0,27 mg/kg/day	0,22
PROC14	ECETOC TRA		Inhalation	0,5 ppm	0,25
			Dermal		0,00
PROC14	ECETOC TRA		Inhalation	1,8 ppm	0,90
			Dermal		0,00
PROC14	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal	0,34 mg/kg/day	0,28
PROC14	ECETOC TRA		Inhalation	1,8 ppm	0,90
			Dermal		0,00
PROC15	ECETOC TRA		Inhalation	0,5 ppm	0,25
			Dermal		0,00

#### 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

The safety data sheet at hand provides the user with risk management measures and operational conditions which enables him to work safely with the substance / mixture. If other risk management measures / operational conditions are adopted, the user has to ensure, that the risks are managed to at least equivalent levels.

## Phenol - Professional

### Identified Professional Generic Exposure Scenarios (GESs) of Phenol

GES No.	Subsector	Main SU	Description	PROC	ERC	Phenol
EC No.						203-632-7
CAS No.						108-95-2
1	Use in laboratories	All Professional Uses (SU22)	Use of small quantities within laboratory settings, including material transfers and equipment cleaning	PROC10, PROC15	ERC8a ERCs are to be checked with the ECT tool	x
2	Uses in Coatings	All Professional Uses (SU22)	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, brush, spreader by hand or similar methods), and equipment cleaning, maintenance and associated laboratory activities.	PROC5, PROC8a, PROC10, PROC13	ERC8a, ERC8c, ERC8d, ERC8f ERCs are to be checked with the ECT tool	x up to 3%
3	Use as binders and release agents	All Professional Uses (SU22)	Covers the use as binders and release agents including material transfers, mixing, application by spraying, brushing, and handling of waste.	PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC 8a, PROC8b, PROC9, PROC10, PROC11	ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f ERCs are to be checked with the ECT tool	x + PROC14
4	Polymer manufacturing	All Professional Uses (SU22)	Manufacturing of formulated polymers including material transfers, moulding and forming activities, material re-works and associated maintenance.	PROC8a	ERC8a, ERC8d, ERC8c, ERC8f ERCs are to be checked with the ECT tool	x + PROC1 PROC2 PROC8b PROC9 PROC14
5	Polymer processing	All Professional Uses (SU22)	Processing of formulated polymers including material transfers, moulding and forming activities, material re-works and associated maintenance.	PROC8a	ERC8a, ERC8d, ERC8c, ERC8f ERCs are to be checked with the ECT tool	x + PROC1 PROC2 PROC8b PROC9 PROC14
6	Phenolic Resin processing (DU uses of Phenolic Resins)	All Professional Uses (SU22)	Processing resins including material transfers, moulding and forming activities, material re-works and associated maintenance. Identified DU uses eg: Foundry, Hot Tops and refractory, Electrical laminates, Felt bonding, Friction, Mineral wool, Wood products, Impregnated paper, abrasives, Foam.	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC15	ERC2, ERC4, ERC6b, ERC6c, ERC6d ERCs are to be checked with the ECT tool	x

<sup>2</sup> Polymer Examples: FRP, UV, VE

Please note also: PC's and AC's are only for consumer.  
For checking ERC's please use the respective environmental calculation tool (ECT) ECT Acetone or ECT Phenol or ECT Cumene or ECT AMS or ECT ACP

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### 1. Short title of Exposure Scenario: Professional use

- Main User Groups : **SU 22:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
- Process categories : **PROC1:** Use in closed process, no likelihood of exposure  
**PROC2:** Use in closed, continuous process with occasional controlled exposure  
**PROC3:** Use in closed batch process (synthesis or formulation)  
**PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises  
**PROC5:** Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)  
**PROC6:** Calendering operations  
**PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities  
**PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities  
**PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing)  
**PROC10:** Roller application or brushing  
**PROC11:** Non industrial spraying  
**PROC13:** Treatment of articles by dipping and pouring  
**PROC14:** Production of preparations or articles by tableting, compression, extrusion, pelletisation  
**PROC15:** Use as laboratory reagent
- Environmental Release Categories : **ERC2, ERC4, ERC6b, ERC6c, ERC6d, ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f:** Formulation of preparations, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of reactive processing aids, Industrial use of monomers for manufacture of thermoplastics, Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers, Wide dispersive indoor use of processing aids in open systems, Wide dispersive indoor use of reactive substances in open systems, Wide dispersive indoor use resulting in inclusion into or onto a matrix, Wide dispersive outdoor use of processing aids in open systems, Wide dispersive outdoor use of reactive substances in open systems, Wide dispersive outdoor use resulting in inclusion into or onto a matrix

**2.1 Contributing scenario controlling environmental exposure for: ERC2, ERC4, ERC6b, ERC6c, ERC6d, ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f: Formulation of preparations, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of reactive processing aids, Industrial use of monomers for manufacture of thermoplastics, Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers, Wide dispersive**

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**indoor use of processing aids in open systems, Wide dispersive indoor use of reactive substances in open systems, Wide dispersive indoor use resulting in inclusion into or onto a matrix, Wide dispersive outdoor use of processing aids in open systems, Wide dispersive outdoor use of reactive substances in open systems, Wide dispersive outdoor use resulting in inclusion into or onto a matrix**

### Amount used

Annual amount per site :  
Remarks : To be defined by site. Use the calculation tool: ECT Phenol:  
<http://www.reachcentrum.eu/en/consortium-management/consortia-under-reach/phenol-derivatives-reach-consortium/phenol-derivatives-dossiers.aspx>

### Environment factors not influenced by risk management

Remarks : Dilution Factor (River): To be defined by site.  
Remarks : Dilution Factor (Coastal Areas): To be defined by site.

### Other given operational conditions affecting environmental exposure

Number of emission days per year : 360

### Technical conditions and measures / Organizational measures

Air : Closed system Exhaust ventilation equipped with scrubbers ,  
or: Charcoal adsorbers (Effectiveness (of a measure): 90 %)  
Remarks : Common practices vary across sites thus conservative  
process release estimates used. To be defined by site. Use  
the calculation tool: ECT Phenol:  
<http://www.reachcentrum.eu/en/consortium-management/consortia-under-reach/phenol-derivatives-reach-consortium/phenol-derivatives-dossiers.aspx>

### Conditions and measures related to municipal sewage treatment plant

Remarks : Flow rate of sewage treatment plant effluent: To be defined by  
site. Use the calculation tool: ECT Phenol:  
<http://www.reachcentrum.eu/en/consortium-management/consortia-under-reach/phenol-derivatives-reach-consortium/phenol-derivatives-dossiers.aspx>

### Conditions and measures related to external recovery of waste

Remarks : Contain and dispose of waste according to local regulations.

### 2.2 Contributing scenario controlling worker exposure for: General risk management measures applicable to all activities

**PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact), Calendring operations, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large**

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**containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Roller application or brushing, Non industrial spraying, Treatment of articles by dipping and pouring, Production of preparations or articles by tableting, compression, extrusion, pelletisation, Use as laboratory reagent**

### Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product between 3 and 100 % (unless stated differently).  
Remarks : Liquid, vapour pressure < 0.5 kPa Liquid, vapour pressure 0.5 - 10 kPa

### Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently).

### Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented.

### Technical conditions and measures

Drain down and flush system prior to equipment opening or maintenance.

### Organisational measures to prevent /limit releases, dispersion and exposure

Minimise exposure using measures such as closed systems, dedicated facilities and suitable general / local exhaust ventilation. Where there is potential for exposure: Ensure safe systems of work or equivalent arrangements are in place to manage risks. Provide specific activity training to operators to minimise exposures. Clear up spills immediately and dispose of waste safely. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance. Identify and implement corrective actions.

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

Use personal protective equipment as required.

---

## 2.3 Contributing scenario controlling worker exposure for: General exposures (closed systems), Process sampling, elevated temperature, Occasional exposure PROC1: Use in closed process, no likelihood of exposure

---

### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Technical conditions and measures

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

---

## 2.4 Contributing scenario controlling worker exposure for: General exposures (closed systems), Process sampling, elevated temperature, Occasional exposure PROC1: Use in closed process, no likelihood of exposure

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### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Technical conditions and measures

Sample via a closed loop or other system to avoid exposure. Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.

### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 3 %.

---

## 2.5 Contributing scenario controlling worker exposure for: General exposures (closed systems), Continuous process, Process sampling, elevated temperature, Occasional exposure

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

### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Technical conditions and measures

Sample via a closed loop or other system to avoid exposure. Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 80 %)

---

## 2.6 Contributing scenario controlling worker exposure for: General exposures (closed systems), Continuous process, Process sampling, elevated temperature, (closed systems), Occasional exposure

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

### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Technical conditions and measures

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

### Organisational measures to prevent /limit releases, dispersion and exposure

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

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

Wear suitable gloves tested to EN374.

---

## 2.7 Contributing scenario controlling worker exposure for: General exposures (closed systems), Continuous process, Process sampling, elevated temperature, (closed systems), Occasional exposure

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

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### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Technical conditions and measures

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

### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 3 %.

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

Wear suitable gloves tested to EN374.

---

## 2.8 Contributing scenario controlling worker exposure for: General exposures (closed systems), Batch process, Process sampling, with local exhaust ventilation, Occasional exposure PROC3: Use in closed batch process (synthesis or formulation)

---

### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Technical conditions and measures

Sample via a closed loop or other system to avoid exposure. Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 80 %)

---

## 2.9 Contributing scenario controlling worker exposure for: General exposures (closed systems), Batch process, (closed systems), elevated temperature, Occasional exposure PROC3: Use in closed batch process (synthesis or formulation)

---

### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Technical conditions and measures

Sample via a closed loop or other system to avoid exposure. Handle substance within a closed system. Ensure operation is undertaken outdoors.

### Organisational measures to prevent /limit releases, dispersion and exposure

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

---

## 2.10 Contributing scenario controlling worker exposure for: General exposures (closed systems), Batch process, (closed systems), elevated temperature, Occasional exposure PROC3: Use in closed batch process (synthesis or formulation)

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### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Technical conditions and measures

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

### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 3 %. Avoid carrying out activities involving exposure for more than 1 hour.

---

### 2.11 Contributing scenario controlling worker exposure for: Process sampling, (open systems), with local exhaust ventilation, elevated temperature, Occasional exposure PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

---

### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 80 %)

---

### 2.12 Contributing scenario controlling worker exposure for: Process sampling, (open systems), elevated temperature, Occasional exposure PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

---

### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Organisational measures to prevent /limit releases, dispersion and exposure

Avoid carrying out activities involving exposure for more than 15 minutes.

---

### 2.13 Contributing scenario controlling worker exposure for: Process sampling, (open systems), elevated temperature, Occasional exposure PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

---

### Other operational conditions affecting workers exposure

Remarks : @ temp < 114.5 °C = medium volatility

### Technical conditions and measures

Provide the operation with a properly sited receiving hood. (Effectiveness (of a measure): 97 %)

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**2.14 Contributing scenario controlling worker exposure for: Process sampling, (open systems), elevated temperature, Occasional exposure**  
**PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises**

---

**Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

**Organisational measures to prevent /limit releases, dispersion and exposure**

Limit the substance content in the product to 3 %. Avoid carrying out activities involving exposure for more than 4 hours.

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

Wear suitable gloves tested to EN374.

---

**2.15 Contributing scenario controlling worker exposure for: Mixing operations (open systems), Batch process, Process sampling, with local exhaust ventilation, Occasional exposure**  
**PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)**

---

**Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

**Technical conditions and measures**

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 80 %)

**Organisational measures to prevent /limit releases, dispersion and exposure**

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

---

**2.16 Contributing scenario controlling worker exposure for: Mixing operations (open systems), Batch process, Process sampling, elevated temperature, Occasional exposure**  
**PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)**

---

**Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

**Organisational measures to prevent /limit releases, dispersion and exposure**

Avoid carrying out activities involving exposure for more than 15 minutes.

---

**2.17 Contributing scenario controlling worker exposure for: Mixing operations (open systems), Batch process, Process sampling, elevated temperature, Occasional exposure**

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### **PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)**

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#### **Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

#### **Technical conditions and measures**

Ensure material transfers are under containment or extract ventilation.

#### **Organisational measures to prevent /limit releases, dispersion and exposure**

Limit the substance content in the product to 3 %. 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 'basic' employee training.

---

### **2.18 Contributing scenario controlling worker exposure for: Calendering (including Banburys), with local exhaust ventilation, elevated temperature, Occasional exposure PROC6: Calendering operations**

---

#### **Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

#### **Technical conditions and measures**

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 80 %)

#### **Organisational measures to prevent /limit releases, dispersion and exposure**

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

---

### **2.19 Contributing scenario controlling worker exposure for: Calendering (including Banburys), elevated temperature, Occasional exposure PROC6: Calendering operations**

---

#### **Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

#### **Technical conditions and measures**

Ensure material transfers are under containment or extract ventilation.

#### **Organisational measures to prevent /limit releases, dispersion and exposure**

Avoid carrying out activities involving exposure for more than 15 minutes.

---

### **2.20 Contributing scenario controlling worker exposure for: Calendering (including Banburys), with local exhaust ventilation, elevated temperature, Occasional exposure PROC6: Calendering operations**

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### Other operational conditions affecting workers exposure

Remarks : @ temp < 114.5 °C = medium volatility

### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 80 %)

### Organisational measures to prevent /limit releases, dispersion and exposure

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

---

## 2.21 Contributing scenario controlling worker exposure for: Calendering (including Banburys), with local exhaust ventilation, elevated temperature, Occasional exposure PROC6: Calendering operations

---

### Other operational conditions affecting workers exposure

Remarks : @ temp < 114.5 °C = medium volatility

### Technical conditions and measures

Provide the operation with a properly sited receiving hood. (Effectiveness (of a measure): 97 %)

### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 25 %.

---

## 2.22 Contributing scenario controlling worker exposure for: Bulk transfers, Non-dedicated facility, Transfer from/pouring from containers, Occasional exposure PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities

---

### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 80 %)

### Organisational measures to prevent /limit releases, dispersion and exposure

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

---

## 2.23 Contributing scenario controlling worker exposure for: Bulk transfers, Non-dedicated facility, Transfer from/pouring from containers, with local exhaust ventilation, Occasional exposure PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities

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### Other operational conditions affecting workers exposure

Remarks : @ temp < 114.5 °C = medium volatility

### Technical conditions and measures

Provide the operation with a properly sited receiving hood. (Effectiveness (of a measure): 99 %)

---

### 2.24 Contributing scenario controlling worker exposure for: Bulk transfers, Non-dedicated facility, Transfer from/pouring from containers, elevated temperature, Occasional exposure

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

---

### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Technical conditions and measures

Ensure operation is undertaken outdoors.

### Organisational measures to prevent /limit releases, dispersion and exposure

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

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

Wear a respirator conforming to EN140 with Type A filter or better.

---

### 2.25 Contributing scenario controlling worker exposure for: Bulk transfers, Dedicated facility, Transfer from/pouring from containers, Occasional exposure

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

---

### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 90 %)

---

### 2.26 Contributing scenario controlling worker exposure for: Bulk transfers, Dedicated facility, Transfer from/pouring from containers, Occasional exposure

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

---

### Other operational conditions affecting workers exposure

Remarks : @ temp < 114.5 °C = medium volatility

### Technical conditions and measures

Provide the operation with a properly sited receiving hood. (Effectiveness (of a measure): 99 %)

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**2.27 Contributing scenario controlling worker exposure for: Bulk transfers, Dedicated facility, Transfer from/pouring from containers, Occasional exposure**  
**PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities**

---

**Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

**Organisational measures to prevent /limit releases, dispersion and exposure**

Avoid carrying out activities involving exposure for more than 15 minutes.

---

**2.28 Contributing scenario controlling worker exposure for: Bulk transfers, Dedicated facility, Transfer from/pouring from containers, Occasional exposure**  
**PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities**

---

**Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

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

Wear a respirator conforming to EN140 with Type A filter or better.

---

**2.29 Contributing scenario controlling worker exposure for: Bulk transfers, Dedicated facility, Transfer from/pouring from containers, with local exhaust ventilation, Occasional exposure**  
**PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities**

---

**Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

**Technical conditions and measures**

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 80 %)

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**2.30 Contributing scenario controlling worker exposure for: Rolling, Brushing, with local exhaust ventilation, Occasional exposure**  
**PROC10: Roller application or brushing**

---

**Other operational conditions affecting workers exposure**

Remarks : @ temp < 58 °C = low volatility

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### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 80 %)

### Organisational measures to prevent /limit releases, dispersion and exposure

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

---

### 2.31 Contributing scenario controlling worker exposure for: Rolling, Brushing, Equipment cleaning and maintenance, with local exhaust ventilation, Occasional exposure

#### PROC10: Roller application or brushing

---

### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 80 %)

### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 3 %.

---

### 2.32 Contributing scenario controlling worker exposure for: Equipment cleaning and maintenance, equipment prewashed/rinsed automatically

#### PROC10: Roller application or brushing

---

### Technical conditions and measures

Drain or remove substance from equipment prior to break-in or maintenance.

### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 3 %. 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 intensive management supervision controls.

---

### 2.33 Contributing scenario controlling worker exposure for: Rolling, Brushing, Occasional exposure

#### PROC10: Roller application or brushing

---

### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Organisational measures to prevent /limit releases, dispersion and exposure

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Limit the substance content in the product to 25 %. Avoid carrying out activities involving exposure for more than 1 hour.

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

Wear a respirator conforming to EN140 with Type A filter or better.

---

### 2.34 Contributing scenario controlling worker exposure for: Spraying/ fogging by manual application, with local exhaust ventilation, Occasional exposure PROC11: Non industrial spraying

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

#### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 80 %)

#### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 3 %. Avoid carrying out activities involving exposure for more than 1 hour.

---

### 2.35 Contributing scenario controlling worker exposure for: Spraying/ fogging by manual application, with local exhaust ventilation, Occasional exposure PROC11: Non industrial spraying

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

#### Technical conditions and measures

Ensure operation is undertaken outdoors. Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 80 %)

#### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 25 %. Avoid carrying out activities involving exposure for more than 15 minutes.

---

### 2.36 Contributing scenario controlling worker exposure for: Spraying/ fogging by manual application, with local exhaust ventilation, Occasional exposure PROC11: Non industrial spraying

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

#### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 80 %)

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### Organisational measures to prevent /limit releases, dispersion and exposure

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

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

Wear a respirator conforming to EN140 with Type A filter or better.

---

### 2.37 Contributing scenario controlling worker exposure for: Dipping, immersion and pouring, with local exhaust ventilation, Occasional exposure PROC13: Treatment of articles by dipping and pouring

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

#### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 80 %)

### Organisational measures to prevent /limit releases, dispersion and exposure

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

---

### 2.38 Contributing scenario controlling worker exposure for: Dipping, immersion and pouring, Occasional exposure PROC13: Treatment of articles by dipping and pouring

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Organisational measures to prevent /limit releases, dispersion and exposure

Avoid carrying out activities involving exposure for more than 15 minutes.

---

### 2.39 Contributing scenario controlling worker exposure for: Dipping, immersion and pouring, Occasional exposure PROC13: Treatment of articles by dipping and pouring

---

#### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Organisational measures to prevent /limit releases, dispersion and exposure

Limit the substance content in the product to 3 %. 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 'basic' employee training.

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**2.40 Contributing scenario controlling worker exposure for: Production or preparation of articles by tableting, compression, extrusion or pelletisation, with local exhaust ventilation, Occasional exposure**  
**PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation**

---

### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 80 %)

### Organisational measures to prevent /limit releases, dispersion and exposure

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

---

**2.41 Contributing scenario controlling worker exposure for: Production or preparation of articles by tableting, compression, extrusion or pelletisation, with local exhaust ventilation, Occasional exposure**  
**PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation**

---

### Other operational conditions affecting workers exposure

Remarks : @ temp < 114.5 °C = medium volatility

### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 99 %)

---

**2.42 Contributing scenario controlling worker exposure for: Laboratory activities, with local exhaust ventilation, Occasional exposure**  
**PROC15: Use as laboratory reagent**

---

### Other operational conditions affecting workers exposure

Remarks : @ temp < 58 °C = low volatility

### Technical conditions and measures

Ensure material transfers are under containment or extract ventilation. (Effectiveness (of a measure): 80 %)

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## 3. Exposure estimation and reference to its source

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### Workers

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Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1	ECETOC TRA		Inhalation	0,01 ppm	0,01
			Dermal		0,00
PROC1	ECETOC TRA		Inhalation	0,002 ppm	0,00
			Dermal	0,07 mg/kg/day	0,06
PROC2	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal		0,00
PROC2	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal		0,00
PROC2	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal	0,27 mg/kg/day	0,22
PROC3	ECETOC TRA		Inhalation	0,6 ppm	0,30
			Dermal		0,00
PROC3	ECETOC TRA		Inhalation	1,8 ppm	0,90
			Dermal		0,00
PROC3	ECETOC TRA		Inhalation	0,36 ppm	0,18
			Dermal	0,07 mg/kg/day	0,06
PROC4	ECETOC TRA		Inhalation	2 ppm	1,00
			Dermal		0,00
PROC4	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal		0,00
PROC4	ECETOC TRA		Inhalation	1,5 ppm	0,75
			Dermal		0,00
PROC4	ECETOC TRA		Inhalation	1,2 ppm	0,60
			Dermal	0,27 mg/kg/day	0,22
PROC5	ECETOC TRA		Inhalation	1,2 ppm	0,60
			Dermal		0,00
PROC5	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal		0,00
PROC5	ECETOC TRA		Inhalation	1,2 ppm	0,60
			Dermal	0,27 mg/kg/day	0,22
PROC6	ECETOC TRA		Inhalation	1,2 ppm	0,60
			Dermal		0,00
PROC6	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal		0,00
PROC6	ECETOC TRA		Inhalation	1,2 ppm	0,60
			Dermal		0,00
PROC6	ECETOC TRA		Inhalation	1,8 ppm	0,90
			Dermal		0,00
PROC8a	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal		0,00
PROC8a	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal		0,00
PROC8a	ECETOC TRA		Inhalation	0,35 ppm	0,18
			Dermal		0,00
PROC8b	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal		0,00
PROC8b	ECETOC TRA		Inhalation	0,5 ppm	0,25
			Dermal		0,00
PROC8b	ECETOC TRA		Inhalation	1 ppm	0,50

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			Dermal		0,00
PROC8b	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal		0,00
PROC8b	ECETOC TRA		Inhalation	2 ppm	1,00
			Dermal		0,00
PROC10	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal		0,00
PROC10	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal	0,27 mg/kg/day	0,22
PROC10	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal	0,11 mg/kg/day	0,09
PROC10	ECETOC TRA		Inhalation	0,30 ppm	0,15
			Dermal		0,00
PROC11	ECETOC TRA		Inhalation	0,8 ppm	0,40
			Dermal	0,43 mg/kg/day	0,35
PROC11	ECETOC TRA		Inhalation	0,84 ppm	0,42
			Dermal		0,00
PROC11	ECETOC TRA		Inhalation	1,2 ppm	0,60
			Dermal	0,43 mg/kg/day	0,35
PROC13	ECETOC TRA		Inhalation	1,2 ppm	0,60
			Dermal		0,00
PROC13	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal		0,00
PROC13	ECETOC TRA		Inhalation	1,2 ppm	0,60
			Dermal	0,27 mg/kg/day	0,22
PROC14	ECETOC TRA		Inhalation	1,2 ppm	0,60
			Dermal		0,00
PROC14	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal		0,00
PROC15	ECETOC TRA		Inhalation	1 ppm	0,50
			Dermal		0,00

#### 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

The safety data sheet at hand provides the user with risk management measures and operational conditions which enables him to work safely with the substance / mixture. If other risk management measures / operational conditions are adopted, the user has to ensure, that the risks are managed to at least equivalent levels.