



**Safety Data Sheet**  
**Dow Chemical Company Ltd**  
Safety Data Sheet according to Reg. (EC) N. 453/2010

**Product Name:** PHENOL SYNTHETIC

**Revision Date:** 2011/12/15

**Print Date:** 16 Dec 2011

Dow Chemical Company Ltd encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

## **Section 1. Identification of the substance/preparation and of the company/undertaking**

### **1.1 Product identifiers**

**Product Name**

PHENOL SYNTHETIC

**Chemical Name:** Phenol

**CAS-No.** 108-95-2

**EC-No.** 203-632-7

**REACH Registration Number**

01-2119471329-32-0012

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

**Identified uses**

Industrial use resulting in manufacture of another substance (use of intermediates) Use as monomer in the manufacture of polymers, industrial. Polymer processing, industrial. Industrial uses: Formulation. Uses in Coatings, professional. Use as binders and release agents, professional. Polymer processing, professional. Professional uses: Formulation.

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

**COMPANY IDENTIFICATION**

Dow Chemical Company Ltd  
Diamond House, Lotus Park  
Kingsbury Crescent  
TW18 3AG Staines, Middlesex  
United Kingdom

Customer Information Number:

0203 139 4000  
SDSQuestion@dow.com

### **1.4 EMERGENCY TELEPHONE NUMBER**

**24-Hour Emergency Contact:**

0031 115 694 982

**Local Emergency Contact:**

00 31 115 69 4982

## Section 2. Hazards Identification

### 2.1 Classification of the substance or mixture

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

Acute toxicity (Oral)	Category 3	H301	Toxic if swallowed.
Acute toxicity (Dermal)	Category 3	H311	Toxic in contact with skin.
Acute toxicity (Inhalation - mist)	Category 3	H331	Toxic if inhaled.
Skin corrosion/irritation	Category 1	H314	Causes severe skin burns and eye damage.
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 according to EU Directives 67/548/EEC or 1999/45/EC

	Toxic for reproduction - category 3.	R68	Possible risk of irreversible effects.
T		R23/24/25	Toxic by inhalation, in contact with skin and if swallowed.
C		R34	Causes burns.
Xn		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.**

**H331 Toxic if inhaled.**

**H314 Causes severe skin burns and eye damage.**

**H341 Suspected of causing genetic defects.**

**H373 May cause damage to organs through prolonged or repeated exposure.**

#### Precautionary Statements:

**P262** Do not get in eyes, on skin, or on clothing.

**P281** Use personal protective equipment as required.

**P302 + P352** IF ON SKIN: Wash with plenty of soap and water.

**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.

**P501** Dispose of contents and container to licensed, permitted incinerator, or other thermal destruction device.

### 2.3 Other Hazards

No information available.

## Section 3. Composition/information on ingredients

### 3.1 Substance

This product is a substance.

CAS-No. / EC-No. / Index	REACH No.	Amount	Component	Classification: REGULATION (EC) No 1272/2008
CAS-No. 108-95-2 EC-No. 203-632-7 Index 604-001-00-2	01- 2119471329- 32	> 99.9 %	Phenol	Muta., 2, H341 Acute Tox., 3, H331 Acute Tox., 3, H311 Acute Tox., 3, H301 STOT RE, 2, H373 Skin Corr., 1B, H314
CAS-No. / EC-No. / Index	Amount	Component	Classification: 67/548/EEC	
CAS-No. 108-95-2 EC-No. 203-632-7 Index 604-001-00-2	> 99.9 %	Phenol	Muta. 3: R68; T: R23/24/25; Xn: R48/20/21/22; C: R34	

For the full text of the H-Statements mentioned in this Section, see Section 16.  
See Section 16 for full text of R-phrases.

## Section 4. First-aid measures

### 4.1 Description of first aid measures

**General advice:** First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

**Inhalation:** Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

**Skin Contact:** Initial decontamination of any exposure to phenol should immediately be flushed with copious amounts of water. All potentially contaminated clothing and shoes should be removed while the exposed individual is in the safety shower. A thorough washing using water and a non-abrasive soap should be done for a minimum of 30 minutes. Destroy contaminated leather items such as shoes, belts, and watchbands. At facilities with availability of a decontamination solution and delivery equipment, such systems can be used to supplement the initial soap and water decontamination. Exposed areas should be immediately washed with copious amounts of water and non-abrasive soap for 1-2 minutes prior to the use of Phenol Decontamination Equipment. Spray mixture on affected body parts, from top to bottom (injured person's eyes should be closed). Immediately resume shower, wash off treatment mixture for 1-2 minutes. Step out of shower stream or stop shower, and re-spray affected areas with treatment mixture. Resume shower, wash of treatment mixture for 1-2 minutes; continue this cycle of spray and rinse until rescue services arrive. Example decontamination mixtures include PEG300/ethanol (or industrial methylated spirits) 2:1, or available polypropylene/rapeseed oil proprietary mixtures, or polyvinylpyrrolidone/detergent mixtures. Alternatively this material may be

removed from the skin by repeatedly spraying/swabbing the skin with polyethylene glycol or polypropylene glycol mixture, alternating with rinsing with large quantities of water for 1 - 2 minutes. This cycle of spraying/swabbing the skin and rinsing should continue for 30 minutes. Phenol destroys the nerve endings in the skin; the absence of pain does not necessarily mean the skin has been properly decontaminated. Suitable emergency safety shower facility should be immediately available.

**Eye Contact:** Wash immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.

**Ingestion:** Seek medical attention immediately. Do not induce vomiting. Give one cup (8 ounces or 240 ml) of water or milk if available and transport to a medical facility. Do not give anything by mouth unless the person is fully conscious. Never give anything by mouth to an unconscious person.

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

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), no additional symptoms and effects are anticipated.

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

Maintain adequate ventilation and oxygenation of the patient. May cause asthma-like (reactive airways) symptoms. Bronchodilators, expectorants, antitussives and corticosteroids may be of help. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist. If burn is present, treat as any thermal burn, after decontamination. The determination of urinary phenols may be useful in determining the extent of exposure. Due to irritant properties, swallowing may result in burns/ulceration of mouth, stomach and lower gastrointestinal tract with subsequent stricture. Aspiration of vomitus may cause lung injury. Suggest endotracheal/esophageal control if lavage is done. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome).

## Section 5. Fire Fighting Measures

### 5.1 Extinguishing Media

Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. General purpose synthetic foams (including AFFF type) or protein foams are preferred if available. Alcohol resistant foams (ATC type) may function. Water fog, applied gently may be used as a blanket for fire extinguishment.

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

**Hazardous Combustion Products:** During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Hydrocarbons. Carbon monoxide. Carbon dioxide.

**Unusual Fire and Explosion Hazards:** Container may vent and/or rupture due to fire. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

### 5.3 Advice for firefighters

**Fire Fighting Procedures:** Keep people away. Isolate fire and deny unnecessary entry. Cool surroundings with water to localize fire zone. Do not use direct water stream. May spread fire. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Water fog, applied gently may be used as a blanket for fire extinguishment.

**Special Protective Equipment for Firefighters:** Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers,

boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

## Section 6. Accidental Release Measures

**6.1 Personal precautions, protective equipment and emergency procedures:** Evacuate area. Only trained and properly protected personnel must be involved in clean-up operations. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection. Refer to Section 7, Handling, for additional precautionary measures.

**6.2 Environmental precautions:** Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

**6.3 Methods and materials for containment and cleaning up:** Contain spilled material if possible. Small spills: Absorb with materials such as: Sand. Dirt. Non-combustible material. Large spills: Remove with shovel. Collect in suitable and properly labeled containers. Suitable containers include: Steel drums. Contact Dow for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

## Section 7. Handling and Storage

### 7.1 Precautions for safe handling

#### Handling

**General Handling:** Do not get in eyes, on skin, on clothing. Avoid breathing vapor. Do not swallow. Keep away from heat, sparks and flame. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

**Other Precautions:** Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers.

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

#### Storage

Do not store in: Brass. Bronze. Copper. Iron. Lead. Avoid moisture. Avoid contact with air (oxygen). Overheating of transport vehicles and storage vessels must be prevented as it may result in a potential spill through thermal expansion.

**Shelf life: Use within**      **Storage temperature:**  
12 Months                      < 60 °C

### 7.3 Specific end uses

See the technical data sheet on this product for further information.

## Section 8. Exposure Controls / Personal Protection

### 8.1 Control parameters

#### Exposure Limits

Component	List	Type	Value
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Phenol	UK WEL	TWA	2 ppm SKIN
	ACGIH	TWA	5 ppm SKIN, BEI
	EU IOELV	TWA	7.8 mg/m <sup>3</sup> 2 ppm SKIN

A BEI notation following the exposure guideline refers to a guidance value for assessing biological monitoring results as an indicator of the uptake of a substance from all routes of exposures.

A "skin" notation following the inhalation exposure guideline refers to the potential for dermal absorption of the material including mucous membranes and the eyes either by contact with vapors or by direct skin contact.

It is intended to alert the reader that inhalation may not be the only route of exposure and that measures to minimize dermal exposures should be considered.

### Derived No Effect Level (DNEL)

#### Workers

Potential Health Effects	Possible route(s) of exposure:	Value
Acute - systemic effects	Skin contact	no data available
Acute - systemic effects	Inhalation	no data available
Acute - local effects	Skin contact	Not available
Acute - local effects	Inhalation	16 mg/m <sup>3</sup>
Long-term - systemic effects	Skin contact	1.23 mg/kg bw/day
Long-term - systemic effects	Inhalation	8 mg/m <sup>3</sup>
Long-term - local effects	Skin contact	no data available
Long-term - local effects	Inhalation	no data available

#### Consumers

Potential Health Effects	Possible route(s) of exposure:	Value
Acute - systemic effects	Skin contact	no data available
Acute - systemic effects	Inhalation	no data available
Acute - systemic effects	Ingestion	no data available
Acute - local effects	Skin contact	no data available
Acute - local effects	Inhalation	no data available
Long-term - systemic effects	Skin contact	0.4 mg/kg bw/day
Long-term - systemic effects	Inhalation	1.32 mg/m <sup>3</sup>
Long-term - systemic effects	Ingestion	0.4 mg/kg bw/day
Long-term - local effects	Skin contact	no data available
Long-term - local effects	Inhalation	no data available

### Predicted No Effect Concentration (PNEC)

Compartment	Value	Remarks
Fresh water	0.0077 mg/l	
Marine water	0.00077 mg/l	
Intermittent releases	0.031 mg/l	
STP	2.1 mg/l	
Fresh water sediment	0.0915 mg/kg d.w.	
Marine sediment	0.00915 mg/kg d.w.	
Soil	0.136 mg/kg d.w.	

### 8.2 Exposure controls

#### Personal Protection

**Eye/Face Protection:** Use chemical goggles. Chemical goggles should be consistent with EN 166 or equivalent. Wear a face-shield which allows use of chemical goggles, or wear a full-face respirator, to protect face and eyes when there is any likelihood of splashes.

**Skin Protection:** Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task. Use chemical protective clothing resistant to this material, when there is any possibility of skin contact.

**Hand protection:** Use gloves, chemically resistant to this material, at all times. Use chemical resistant gloves classified under Standard EN374: Protective gloves against chemicals and micro-organisms. Examples of preferred glove barrier materials include: Butyl rubber. Chlorinated polyethylene. Neoprene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl chloride ("PVC" or "vinyl"). Styrene/butadiene rubber. Examples of acceptable glove barrier materials include: Natural rubber ("latex"). Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl alcohol ("PVA"). When prolonged or frequently repeated contact may occur, a glove with a protection class of 6 (breakthrough time greater than 480 minutes according to EN 374) is recommended. When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

**Respiratory Protection:** Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use an approved respirator. Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus. Use the following CE approved air-purifying respirator: Organic vapor cartridge with a particulate pre-filter, type AP2.

**Ingestion:** Avoid ingestion of even very small amounts; do not consume or store food or tobacco in the work area; wash hands and face before smoking or eating.

## Engineering Controls

**Ventilation:** Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

## Section 9. Physical and Chemical Properties

### 9.1 Information on basic physical and chemical properties

#### Appearance

Physical State	Crystals
Color	White
Odor	Aromatic
Odor Threshold	No test data available
pH	Not applicable
Melting Point	40.9 °C <i>Literature</i>
Freezing Point	40.9 °C <i>Literature</i>
Boiling Point (760 mmHg)	181.8 °C <i>Literature</i> .
Flash Point - Closed Cup	81 °C <i>Literature</i>
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	The product is not flammable. <i>Literature</i>
Flammable Limits In Air	<b>Lower:</b> 1.4 %(V) <i>Literature</i> <b>Upper:</b> 9.5 %(V) <i>Literature</i>
Vapor Pressure	0.15 hPa @ 20 °C <i>Literature</i>
Vapor Density (air = 1)	1.07 @ 20 °C <i>Literature</i>
Specific Gravity (H <sub>2</sub> O = 1)	1.132 25 °C/4 °C <i>Literature</i>
Solubility in water (by weight)	84 g/l @ 20 °C <i>Literature</i>
Autoignition Temperature	715 °C <i>Literature</i>
Decomposition Temperature	No test data available

<b>Dynamic Viscosity</b>	3.437 mPa.s @ 50 °C
<b>Kinematic Viscosity</b>	No test data available
<b>Explosive properties</b>	no data available
<b>Oxidizing properties</b>	no data available

## 9.2 Other information

<b>Molecular Weight</b>	94.0 g/mol <i>Literature</i>
<b>Surface tension</b>	71.3 mN/m @ 20 °C <i>0.118% solution of phenol in water</i>

## Section 10. Stability and Reactivity

### 10.1 Reactivity

No dangerous reaction known under conditions of normal use.

### 10.2 Chemical stability

Unstable at elevated temperatures.

### 10.3 Possibility of hazardous reactions

Polymerization will not occur.

**10.4 Conditions to Avoid:** Avoid contact with air (oxygen). Exposure to elevated temperatures can cause product to decompose. Avoid static discharge. Avoid moisture. Avoid direct sunlight.

**10.5 Incompatible Materials:** Avoid contact with: Strong acids. Strong bases. Strong oxidizers. Avoid contact with metals such as: Zinc. Magnesium.

### 10.6 Hazardous decomposition products

Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon monoxide. Carbon dioxide. Hydrocarbons. Toxic flammable gases can be released during decomposition.

## Section 11. Toxicological Information

### 11.1 Information on toxicological effects

#### Acute Toxicity

##### Ingestion

Moderate toxicity if swallowed. Swallowing may result in burns of the mouth and throat.

LD50, rat, male and female 340 mg/kg

##### Aspiration hazard

Based on physical properties, not likely to be an aspiration hazard.

##### Dermal

Rapidly absorbed through skin in amounts which could cause death.

LD50, rabbit 850 mg/kg

LD50, rat, female 660 mg/kg

##### Inhalation

Excessive exposure may cause severe irritation to upper respiratory tract (nose and throat) and lungs. Prolonged excessive exposure may cause adverse effects. May cause pulmonary edema (fluid in the lungs.) May cause central nervous system effects. Effects may be delayed.

LC50, 8 h, Mist, rat > 1.8 mg/l

##### Eye damage/eye irritation

May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur. Material may be handled at elevated temperatures; contact with heated material may cause thermal burns.

**Skin corrosion/irritation**

Brief contact may cause severe skin burns. Symptoms may include pain, severe local redness and tissue damage.

**Sensitization****Skin**

Did not cause allergic skin reactions when tested in guinea pigs.

**Respiratory**

No relevant data found.

**Repeated Dose Toxicity**

Repeated excessive exposure to phenol may cause central nervous system effects (including respiratory, motor difficulties, and paralysis), digestive disturbances, liver and kidney effects.

**Chronic Toxicity and Carcinogenicity**

Did not cause cancer in laboratory animals.

**Developmental Toxicity**

Phenol has been toxic to the fetus in laboratory animals at doses toxic to the mother. Birth defects (cleft palate) were seen in mice at maternally lethal doses. This is a common developmental abnormality in mice and is associated with stress to the maternal animals.

**Reproductive Toxicity**

In animal studies, phenol did not interfere with reproduction. Toxicity to the newborn animals was observed at doses that were toxic to the maternal animals.

**Genetic Toxicology**

In vitro genetic toxicity studies were negative in some cases and positive in other cases.

## Section 12. Ecological Information

**12.1 Toxicity**Data for Component: Phenol

Material is toxic to aquatic organisms (LC50/EC50/IC50 between 1 and 10 mg/L in the most sensitive species).

**Fish Acute & Prolonged Toxicity**

LC50, *Oncorhynchus mykiss* (rainbow trout), 96 h: 5.02 - 13.1 mg/l

**Aquatic Invertebrate Acute Toxicity**

LC50, *Ceriodaphnia Dubia* (water flea), 48 h: 4.3 - 20 mg/l

**Aquatic Plant Toxicity**

EC50, *Skeletonema costatum*, biomass growth inhibition, 48 h: 50 mg/l

EC50, *Lemna minor* (duckweed), biomass growth inhibition, 7 d: 177 - 303 mg/l

**12.2 Persistence and Degradability**Data for Component: Phenol

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

**OECD Biodegradation Tests:**

Biodegradation	Exposure Time	Method	10 Day Window
62 %	100 h	OECD 301C Test	Not applicable
85 %	14 d	OECD 301C Test	Not applicable

**12.3 Bioaccumulative potential**Data for Component: Phenol

**Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

**Partition coefficient, n-octanol/water (log Pow):** 1.47 Measured

**Bioconcentration Factor (BCF):** 1.9 - 20; Fish; Measured

## 12.4 Mobility in soil

Data for Component: **Phenol**

**Mobility in soil:** Potential for mobility in soil is high (Koc between 50 and 150).

**Partition coefficient, soil organic carbon/water (Koc):** 27 - 91 Estimated.

**Henry's Law Constant (H):** 2.2E-02 Pa\*m<sup>3</sup>/mole.; 20 °C Calculated

## 12.5 Results of PBT and vPvB assessment

Data for Component: **Phenol**

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

## 12.6 Other adverse effects

Data for Component: **Phenol**

No relevant data found.

# Section 13. Disposal Considerations

## 13.1 Waste treatment methods

This product, when being disposed of in its unused and uncontaminated state should be treated as a hazardous waste according to EC Directive 2008/98/EC. Any disposal practices must be in compliance with all national and provincial laws and any municipal or local by-laws governing hazardous waste. For used, contaminated and residual materials additional evaluations may be required. Do not dump into any sewers, on the ground, or into any body of water.

# Section 14. Transport Information

## ROAD & RAIL

**Proper Shipping Name:** PHENOL, MOLTEN

**Hazard Class:** 6.1 **ID Number:** UN2312 **Packing Group:** PG II

**Classification:** T1

**Hazard identification No:** 60

**Tremcard Number:** 61S2312

**Environmental Hazard:** No

## OCEAN

**Proper Shipping Name:** PHENOL, MOLTEN

**Hazard Class:** 6.1 **ID Number:** UN2312 **Packing Group:** PG II

**EMS Number:** F-A,S-A

**Marine pollutant.:** No

## AIR

**Proper Shipping Name:** PHENOL, MOLTEN

**Hazard Class:** 6.1 **ID Number:** UN2312 **Packing Group:** PG II

**Cargo Packing Instruction:** 676

**Passenger Packing Instruction:** 669

AIRCRAFT SHIPMENTS ARE FORBIDDEN BY ICAO/IATA REGULATIONS.

**Environmental Hazard:** No

**INLAND WATERWAYS****Proper Shipping Name:** PHENOL, MOLTEN**Hazard Class:** 6.1 **ID Number:** UN2312 **Packing Group:** PG II**Classification:** T1**Hazard identification No:** 60**Tremcard Number:** 61S2312**Environmental Hazard:** No**Section 15. Regulatory Information****15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture****US. Toxic Substances Control Act**

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

**European Inventory of Existing Commercial Chemical Substances (EINECS)**

The components of this product are on the EINECS inventory or are exempt from inventory requirements.

**15.2 Chemical Safety Assessment**

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

**Section 16. Other Information****Hazard statement in the composition section**

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.

**Risk-phrases in the Composition section**

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.

**Revision**

Identification Number: 50071 / 3005 / Issue Date 2011/12/15 / Version: 2.0

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

*Dow Chemical Company Ltd urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ*

*between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.*

<b>Section 1</b>	<b>Exposure Scenario: Worker</b>
<b>Title</b>	<b><i>Manufacture of substance, industrial</i></b>
Sector of Use	<i>SU3</i>
Process Category	<i>PROC1; PROC2; PROC3; PROC4; PROC5; PROC6; PROC8a; PROC8b; PROC9; PROC10; PROC14; PROC15</i>
Product Category	<i>n/a</i>
Article Category	<i>n/a</i>
Environmental Release Category	<i>ERC1; ERC2; ERC4; ERC6a</i>
Specific Environmental Release Category	<i>n/a</i>
Processes, tasks, activities covered	<i>Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities</i>
<b>Section 2</b>	<b>Operational conditions and risk management measures</b>
<b>Product characteristics</b>	
Physical form of product	<i>Liquid</i>
Volatility	<i>Liquid, vapour pressure 0.5 - 10 kPa at STP</i>
Dustiness	<i>n/a</i>
Concentration in a preparation/product (wt.%)	<i>3% - 100%</i>
Other product characteristics	<i>Substance is a unique structure. Phenol or benzonitrile. Readily biodegradable.</i>
<b>Section 2.1</b>	<b>Control of worker exposure</b>
<b>Operational conditions</b>	
Amounts used	<i>n/a</i>
Frequency and duration of use	<i>Covers daily exposures up to 8 hours (unless stated differently)</i>
Human factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions affecting worker exposure	<i>Assumes a good basic standard of occupational hygiene is implemented</i>

Risk Management Measures	
Contributing Scenarios	
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General exposures (closed systems) Process sampling elevated temperature	Sample via a closed loop system Handle substance within a closed system
General exposures (closed systems) Process sampling elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system
General exposures (closed systems) Continuous process Process sampling elevated temperature	Sample via a closed loop system Handle substance within a closed system
General exposures (closed systems) Continuous process Process sampling elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system; Wear suitable gloves tested to EN374.
General exposures (closed systems) Batch process Process sampling with local exhaust ventilation	Sample via a closed loop system Handle substance within a closed system; Ensure material transfers are under containment or extract ventilation
General exposures (closed systems) Batch process elevated temperature	Sample via a closed loop system Handle substance within a closed system; Avoid carrying out activities involving exposure for more than 4 hours

General exposures (closed systems) Batch process elevated temperature	Sample via a closed loop system Limit the substance content in the product to 25 % Handle substance within a closed system
General exposures (closed systems) Batch process elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system
Process sampling (open systems) with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Process sampling (open systems) elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Process sampling (open systems) with local exhaust ventilation elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Mixing operations (open systems) Batch process Process sampling with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Mixing operations (open systems) Batch process Process sampling elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Mixing operations (open systems) Batch process Process sampling elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.
Mixing operations (open systems) Batch process Process sampling with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Calendering (including Banburys) with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Calendering (including Banburys)	Limit the substance content in the product to 3%; Ensure material transfers are under containment or extract ventilation; Wear suitable gloves tested to EN374.

Calendering (including Banburys) with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Non-dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Wear a respirator conforming to EN140 with Type A filter or better.
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 3%; Avoid carrying out activities involving exposure for more than 1 hour; Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Bulk transfers Non-dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Bulk transfers Dedicated facility Transfer from/pouring from containers elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 4 hours

Bulk transfers Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Bulk transfers Dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Limit the substance content in the product to 25 % ; Ensure material transfers are under containment or extract ventilation
Small package filling Dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Small package filling Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 4 hours
Small package filling Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Rolling, Brushing with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Rolling, Brushing elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Equipment cleaning and maintenance elevated temperature	Limit the substance content in the product to 5 %; Drain or remove substance from equipment prior to break-in or maintenance ; Avoid carrying out operation for more than 4 hours; Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.
Production or preparation of articles by tableting, compression, extrusion or pelletisation with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation

Production or preparation or articles by tableting, compression, extrusion or pelletisation elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 4 hours
Production or preparation or articles by tableting, compression, extrusion or pelletisation elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Production or preparation or articles by tableting, compression, extrusion or pelletisation with local exhaust ventilation elevated temperature	Limit the substance content in the product to 25 % ; Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 4 hours
Laboratory activities with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
<b>Section 2.2</b>	<b>Control of environmental exposure</b>
<b>Operational conditions</b>	
Amounts used -- Maximum daily site tonnage (kg/d)	<i>n/a</i>
Frequency of use	<i>n/a</i>
Duration of use (Emission Days/year)	<i>360</i>
Environmental factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions of use affecting environmental exposure	<i>Indoor/Outdoor use.</i>

<b>Risk Management Measures</b>	
Technical conditions and measures at process level (source) to prevent release	<i>Common practices vary across sites thus conservative process release estimates used.</i>
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	<i>Treat air emission to provide the required removal efficiency of (%): 90 (closed systems) Activated carbon filter to reduce emissions to air. Wet scrubber for gas removal.</i>
Organisation measures to prevent/limit release from site	<i>n/a</i>
Conditions and measures related to municipal sewage treatment plant	<i>n/a</i>
Conditions and measures related to external treatment of waste for disposal	<i>External treatment and disposal of waste should comply with applicable local and/or national regulations.</i>
Conditions and measures related to external recovery of waste	<i>External recovery and recycling of waste should comply with applicable local and/or national regulations.</i>
Other environmental measures	<i>n/a</i>
<b>Section 3</b>	<b>Exposure Estimation</b>
<b>3.1 Health</b>	<i>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.</i>
<b>3.2 Environment</b>	<i>Used EUSES model.</i>
<b>Section 4</b>	<b>Guidance to check compliance with the Exposure Scenario</b>
<b>4.1 Health</b>	<i>Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</i>
<b>4.2 Environment</b>	<i>Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a>).</i>

<b>Section 1</b>	<b>Exposure Scenario: Worker</b>
<b>Title</b>	<b><i>Use in laboratories, industrial</i></b>
Sector of Use	<i>SU3</i>
Process Category	<i>PROC10; PROC15</i>
Product Category	<i>n/a</i>
Article Category	<i>n/a</i>
Environmental Release Category	<i>ERC4</i>

Specific Environmental Release Category	<i>n/a</i>
Processes, tasks, activities covered	<i>Use of the substance within laboratory settings, including material transfers and equipment cleaning</i>
<b>Section 2</b>	<b>Operational conditions and risk management measures</b>
<b>Product characteristics</b>	
Physical form of product	<i>Liquid</i>
Volatility	<i>Liquid, vapour pressure &lt; 0.5 kPa at STP</i>
Dustiness	<i>n/a</i>
Concentration in a preparation/product (wt.%)	<i>3% - 100%</i>
Other product characteristics	<i>Substance is a unique structure. Phenol or benzonitrile. Readily biodegradable.</i>
<b>Section 2.1</b>	<b>Control of worker exposure</b>
<b>Operational conditions</b>	
Amounts used	<i>n/a</i>
Frequency and duration of use	<i>Covers daily exposures up to 8 hours (unless stated differently)</i>
Human factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions affecting worker exposure	<i>Assumes a good basic standard of occupational hygiene is implemented</i>

<b>Risk Management Measures</b>	
<b>Contributing Scenarios</b>	
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
Rolling, Brushing with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Rolling, Brushing elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Equipment cleaning and maintenance elevated temperature	Limit the substance content in the product to 5 %; Drain or remove substance from equipment prior to break-in or maintenance ; Avoid carrying out operation for more than 4 hours; Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.
Laboratory activities with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
<b>Section 2.2</b>	<b>Control of environmental exposure</b>
<b>Operational conditions</b>	
Amounts used -- Maximum daily site tonnage (kg/d)	<i>n/a</i>
Frequency of use	<i>n/a</i>
Duration of use (Emission Days/year)	360
Environmental factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions of use affecting environmental exposure	<i>Indoor/Outdoor use.</i>

<b>Risk Management Measures</b>	
Technical conditions and measures at process level (source) to prevent release	<i>Common practices vary across sites thus conservative process release estimates used.</i>
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	<i>Treat air emission to provide the required removal efficiency of (%): 90 (closed systems) Activated carbon filter to reduce emissions to air. Wet scrubber for gas removal.</i>
Organisation measures to prevent/limit release from site	<i>n/a</i>
Conditions and measures related to municipal sewage treatment plant	<i>n/a</i>
Conditions and measures related to external treatment of waste for disposal	<i>External treatment and disposal of waste should comply with applicable local and/or national regulations.</i>
Conditions and measures related to external recovery of waste	<i>External recovery and recycling of waste should comply with applicable local and/or national regulations.</i>
Other environmental measures	<i>n/a</i>
<b>Section 3</b>	<b>Exposure Estimation</b>
<b>3.1 Health</b>	<i>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.</i>
<b>3.2 Environment</b>	<i>Used EUSES model.</i>
<b>Section 4</b>	<b>Guidance to check compliance with the Exposure Scenario</b>
<b>4.1 Health</b>	<i>Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</i>
<b>4.2 Environment</b>	<i>Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a>).</i>

<b>Section 1</b>	<b>Exposure Scenario: Worker</b>
<b>Title</b>	<b><i>Uses in Coatings, industrial</i></b>
<b>Sector of Use</b>	<i>SU3</i>
<b>Process Category</b>	<i>PROC5; PROC8a; PROC10; PROC13</i>

Product Category	n/a
Article Category	n/a
Environmental Release Category	ERC4
Specific Environmental Release Category	n/a
Processes, tasks, activities covered	<i>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, spreader, dip, flow, fluidised bed on production lines and film formation) and equipment cleaning, maintenance and associated laboratory activities.</i>
<b>Section 2</b>	<b>Operational conditions and risk management measures</b>
<b>Product characteristics</b>	
Physical form of product	<i>Liquid</i>
Volatility	<i>Liquid, vapour pressure 0.5 - 10 kPa at STP</i>
Dustiness	n/a
Concentration in a preparation/product (wt.%)	3% - 100%
Other product characteristics	<i>Substance is a unique structure. Phenol or benzonitrile. Readily biodegradable.</i>

<b>Section 2.1</b>	<b>Control of worker exposure</b>
<b>Operational conditions</b>	
Amounts used	<i>n/a</i>
Frequency and duration of use	<i>Covers daily exposures up to 8 hours (unless stated differently)</i>
Human factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions affecting worker exposure	<i>Assumes a good basic standard of occupational hygiene is implemented</i>
<b>Risk Management Measures</b>	
<b>Contributing Scenarios</b>	
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
Mixing operations (open systems) Batch process Process sampling with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Mixing operations (open systems) Batch process Process sampling elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Mixing operations (open systems) Batch process Process sampling elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.

Mixing operations (open systems) Batch process Process sampling with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Non-dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Wear a respirator conforming to EN140 with Type A filter or better.
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 3%; Avoid carrying out activities involving exposure for more than 1 hour; Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Non-dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Rolling, Brushing with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Rolling, Brushing elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Equipment cleaning and maintenance elevated temperature	Limit the substance content in the product to 5 %; Drain or remove substance from equipment prior to break-in or maintenance ; Avoid carrying out operation for more than 4 hours; Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.
Dipping, immersion and pouring with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Dipping, immersion and pouring elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 1 hour
Dipping, immersion and pouring elevated temperature	Limit the substance content in the product to 3%; Avoid carrying out activities involving exposure for more than 4 hours
<b>Section 2.2</b>	<b>Control of environmental exposure</b>
<b>Operational conditions</b>	
Amounts used -- Maximum daily site tonnage (kg/d)	n/a

Frequency of use	<i>n/a</i>
Duration of use (Emission Days/year)	<i>360</i>
Environmental factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions of use affecting environmental exposure	<i>Indoor/Outdoor use.</i>
<b>Risk Management Measures</b>	
Technical conditions and measures at process level (source) to prevent release	<i>Common practices vary across sites thus conservative process release estimates used.</i>
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	<i>Treat air emission to provide the required removal efficiency of (%): 90 (closed systems) Activated carbon filter to reduce emissions to air. Wet scrubber for gas removal.</i>
Organisation measures to prevent/limit release from site	<i>n/a</i>
Conditions and measures related to municipal sewage treatment plant	<i>n/a</i>
Conditions and measures related to external treatment of waste for disposal	<i>External treatment and disposal of waste should comply with applicable local and/or national regulations.</i>
Conditions and measures related to external recovery of waste	<i>External recovery and recycling of waste should comply with applicable local and/or national regulations.</i>
Other environmental measures	<i>n/a</i>

<b>Section 3</b>	<b>Exposure Estimation</b>
<b>3.1 Health</b>	<i>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.</i>
<b>3.2 Environment</b>	<i>Used EUSES model.</i>
<b>Section 4</b>	<b>Guidance to check compliance with the Exposure Scenario</b>
<b>4.1 Health</b>	<i>Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</i>
<b>4.2 Environment</b>	<i>Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a>).</i>

<b>Section 1</b>	<b>Exposure Scenario: Worker</b>
<b>Title</b>	<b><i>Use as binders and release agents, industrial</i></b>
Sector of Use	<i>SU3</i>
Process Category	<i>PROC1; PROC2; PROC3; PROC4; PROC5; PROC6; PROC7; PROC8a; PROC8b; PROC9; PROC10; PROC13</i>
Product Category	<i>n/a</i>
Article Category	<i>n/a</i>
Environmental Release Category	<i>ERC5</i>
Specific Environmental Release Category	<i>n/a</i>
Processes, tasks, activities covered	<i>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.</i>
<b>Section 2</b>	<b>Operational conditions and risk management measures</b>
<b>Product characteristics</b>	
Physical form of product	<i>Liquid</i>

Volatility	<i>Liquid, vapour pressure 0.5 - 10 kPa at STP</i>
Dustiness	<i>n/a</i>
Concentration in a preparation/product (wt.%)	<i>3% - 100%</i>
Other product characteristics	<i>Substance is a unique structure. Phenol or benzonitrile. Readily biodegradable.</i>
<b>Section 2.1</b>	<b>Control of worker exposure</b>
<b>Operational conditions</b>	
Amounts used	<i>n/a</i>
Frequency and duration of use	<i>Covers daily exposures up to 8 hours (unless stated differently)</i>
Human factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions affecting worker exposure	<i>Assumes a good basic standard of occupational hygiene is implemented</i>

Risk Management Measures	
Contributing Scenarios	
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General exposures (closed systems) Process sampling elevated temperature	Sample via a closed loop system Handle substance within a closed system
General exposures (closed systems) Process sampling elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system
General exposures (closed systems) Continuous process Process sampling elevated temperature	Sample via a closed loop system Handle substance within a closed system
General exposures (closed systems) Continuous process Process sampling elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system; Wear suitable gloves tested to EN374.
General exposures (closed systems) Batch process Process sampling with local exhaust ventilation	Sample via a closed loop system Handle substance within a closed system; Ensure material transfers are under containment or extract ventilation
General exposures (closed systems) Batch process elevated temperature	Sample via a closed loop system Handle substance within a closed system; Avoid carrying out activities involving exposure for more than 4 hours

General exposures (closed systems) Batch process elevated temperature	Sample via a closed loop system Limit the substance content in the product to 25 % Handle substance within a closed system
General exposures (closed systems) Batch process elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system
Process sampling (open systems) with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Process sampling (open systems) elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Process sampling (open systems) with local exhaust ventilation elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Mixing operations (open systems) Batch process Process sampling with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Mixing operations (open systems) Batch process Process sampling elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Mixing operations (open systems) Batch process Process sampling elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.
Mixing operations (open systems) Batch process Process sampling with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Calendering (including Banburys) with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Calendering (including Banburys)	Limit the substance content in the product to 3%; Ensure material transfers are under containment or extract ventilation; Wear suitable gloves tested to EN374.
Calendering (including Banburys) with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour

Spraying/fogging by machine application with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Spraying/fogging by machine application with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Wear a respirator conforming to EN140 with Type A filter or better.
Spraying/fogging by machine application with local exhaust ventilation	Limit the substance content in the product to 3%; Ensure material transfers are under containment or extract ventilation
Bulk transfers Non-dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Wear a respirator conforming to EN140 with Type A filter or better.
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 3%; Avoid carrying out activities involving exposure for more than 1 hour; Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Bulk transfers Non-dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Bulk transfers Dedicated facility Transfer from/pouring from containers elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour

Bulk transfers Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 4 hours
Bulk transfers Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Bulk transfers Dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Limit the substance content in the product to 25 % ; Ensure material transfers are under containment or extract ventilation
Small package filling Dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Small package filling Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 4 hours
Small package filling Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Rolling, Brushing with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Rolling, Brushing elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Equipment cleaning and maintenance elevated temperature	Limit the substance content in the product to 5 %; Drain or remove substance from equipment prior to break-in or maintenance ; Avoid carrying out operation for more than 4 hours; Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.
Dipping, immersion and pouring with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation

Dipping, immersion and pouring elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 1 hour
Dipping, immersion and pouring elevated temperature	Limit the substance content in the product to 3%; Avoid carrying out activities involving exposure for more than 4 hours
<b>Section 2.2</b>	<b>Control of environmental exposure</b>
<b>Operational conditions</b>	
Amounts used -- Maximum daily site tonnage (kg/d)	N/A
Frequency of use	n/a
Duration of use (Emission Days/year)	360
Environmental factors not influenced by risk management	n/a
Other Operational Conditions of use affecting environmental exposure	<i>Indoor/Outdoor use.</i>
<b>Risk Management Measures</b>	
Technical conditions and measures at process level (source) to prevent release	<i>Common practices vary across sites thus conservative process release estimates used.</i>
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	<i>Treat air emission to provide the required removal efficiency of (%): 90 (closed systems) Activated carbon filter to reduce emissions to air. Wet scrubber for gas removal.</i>
Organisation measures to prevent/limit release from site	n/a
Conditions and measures related to municipal sewage treatment plant	n/a
Conditions and measures related to external treatment of waste for disposal	<i>External treatment and disposal of waste should comply with applicable local and/or national regulations.</i>
Conditions and measures related to external recovery of waste	<i>External recovery and recycling of waste should comply with applicable local and/or national regulations.</i>
Other environmental measures	n/a

<b>Section 3</b>	<b>Exposure Estimation</b>
<b>3.1 Health</b>	<i>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.</i>
<b>3.2 Environment</b>	<i>Used EUSES model.</i>
<b>Section 4</b>	<b>Guidance to check compliance with the Exposure Scenario</b>
<b>4.1 Health</b>	<i>Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</i>
<b>4.2 Environment</b>	<i>Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a>).</i>

<b>Section 1</b>	<b>Exposure Scenario: Worker</b>
<b>Title</b>	<b><i>Polymer production, industrial</i></b>
Sector of Use	SU3
Process Category	<i>PROC1; PROC2; PROC3; PROC4; PROC5; PROC6; PROC8a; PROC8b; PROC9; PROC10; PROC13; PROC14; PROC15</i>
Product Category	<i>n/a</i>
Article Category	<i>n/a</i>
Environmental Release Category	<i>ERC6d</i>
Specific Environmental Release Category	<i>n/a</i>
Processes, tasks, activities covered	<i>Manufacture of polymers from monomers in continuous and batch processes. Including production, recycling, degassing, discharging, reactor maintenance and immediate polymer product formation (i.e. compounding, pelletisation product off-gassing).</i>
<b>Section 2</b>	<b>Operational conditions and risk management measures</b>

<b>Product characteristics</b>	
Physical form of product	<i>Liquid</i>
Volatility	<i>Liquid, vapour pressure 0.5 - 10 kPa at STP</i>
Dustiness	<i>n/a</i>
Concentration in a preparation/product (wt.%)	<i>3% - 100%</i>
Other product characteristics	<i>Substance is a unique structure. Phenol or benzonitrile. Readily biodegradable.</i>
<b>Section 2.1</b>	<b>Control of worker exposure</b>
<b>Operational conditions</b>	
Amounts used	<i>n/a</i>
Frequency and duration of use	<i>Covers daily exposures up to 8 hours (unless stated differently)</i>
Human factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions affecting worker exposure	<i>Assumes a good basic standard of occupational hygiene is implemented</i>

Risk Management Measures	
Contributing Scenarios	
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General exposures (closed systems) Process sampling elevated temperature	Sample via a closed loop system Handle substance within a closed system
General exposures (closed systems) Process sampling elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system
General exposures (closed systems) Continuous process Process sampling elevated temperature	Sample via a closed loop system Handle substance within a closed system
General exposures (closed systems) Continuous process Process sampling elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system; Wear suitable gloves tested to EN374.
General exposures (closed systems) Batch process Process sampling with local exhaust ventilation	Sample via a closed loop system Handle substance within a closed system; Ensure material transfers are under containment or extract ventilation
General exposures (closed systems) Batch process elevated temperature	Sample via a closed loop system Handle substance within a closed system; Avoid carrying out activities involving exposure for more than 4 hours

General exposures (closed systems) Batch process elevated temperature	Sample via a closed loop system Limit the substance content in the product to 25 % Handle substance within a closed system
General exposures (closed systems) Batch process elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system
Process sampling (open systems) with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Process sampling (open systems) elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Process sampling (open systems) with local exhaust ventilation elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Mixing operations (open systems) Batch process Process sampling with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Mixing operations (open systems) Batch process Process sampling elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Mixing operations (open systems) Batch process Process sampling elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.
Mixing operations (open systems) Batch process Process sampling with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Calendering (including Banburys) with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Calendering (including Banburys)	Limit the substance content in the product to 3%; Ensure material transfers are under containment or extract ventilation; Wear suitable gloves tested to EN374.

Calendering (including Banburys) with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Non-dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Wear a respirator conforming to EN140 with Type A filter or better.
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 3%; Avoid carrying out activities involving exposure for more than 1 hour; Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Bulk transfers Non-dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Bulk transfers Dedicated facility Transfer from/pouring from containers elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 4 hours

Bulk transfers Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Bulk transfers Dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Limit the substance content in the product to 25 % ; Ensure material transfers are under containment or extract ventilation
Small package filling Dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Small package filling Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 4 hours
Small package filling Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Rolling, Brushing with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Rolling, Brushing elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Equipment cleaning and maintenance elevated temperature	Limit the substance content in the product to 5 %; Drain or remove substance from equipment prior to break-in or maintenance ; Avoid carrying out operation for more than 4 hours; Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.
Dipping, immersion and pouring with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Dipping, immersion and pouring elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 1 hour

Dipping, immersion and pouring elevated temperature	Limit the substance content in the product to 3%; Avoid carrying out activities involving exposure for more than 4 hours
Production or preparation of articles by tableting, compression, extrusion or pelletisation with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Production or preparation of articles by tableting, compression, extrusion or pelletisation elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 4 hours
Production or preparation of articles by tableting, compression, extrusion or pelletisation elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Production or preparation of articles by tableting, compression, extrusion or pelletisation with local exhaust ventilation elevated temperature	Limit the substance content in the product to 25 % ; Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 4 hours
Laboratory activities with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
<b>Section 2.2</b>	<b>Control of environmental exposure</b>
<b>Operational conditions</b>	
Amounts used -- Maximum daily site tonnage (kg/d)	<i>n/a</i>
Frequency of use	<i>n/a</i>
Duration of use (Emission Days/year)	<i>360</i>
Environmental factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions of use affecting environmental exposure	<i>Indoor/Outdoor use.</i>

<b>Risk Management Measures</b>	
Technical conditions and measures at process level (source) to prevent release	<i>Common practices vary across sites thus conservative process release estimates used.</i>
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	<i>Treat air emission to provide a typical removal efficiency of (%): 90 (closed systems) Activated carbon filter to reduce emissions to air. Wet scrubber for gas removal.</i>
Organisation measures to prevent/limit release from site	<i>n/a</i>
Conditions and measures related to municipal sewage treatment plant	<i>n/a</i>
Conditions and measures related to external treatment of waste for disposal	<i>External treatment and disposal of waste should comply with applicable local and/or national regulations.</i>
Conditions and measures related to external recovery of waste	<i>External recovery and recycling of waste should comply with applicable local and/or national regulations.</i>
Other environmental measures	<i>n/a</i>
<b>Section 3</b>	<b>Exposure Estimation</b>
<b>3.1 Health</b>	<i>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.</i>
<b>3.2 Environment</b>	<i>n/a</i>
<b>Section 4</b>	<b>Guidance to check compliance with the Exposure Scenario</b>
<b>4.1 Health</b>	<i>Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</i>
<b>4.2 Environment</b>	<i>n/a</i>

<b>Section 1</b>	<b>Exposure Scenario: Worker</b>
<b>Title</b>	<b><i>Polymer processing, industrial</i></b>
Sector of Use	<i>SU3</i>
Process Category	<i>PROC1; PROC2; PROC3; PROC4; PROC5; PROC6; PROC8a; PROC8b; PROC9; PROC10; PROC13; PROC14; PROC15</i>
Product Category	<i>n/a</i>
Article Category	<i>n/a</i>
Environmental Release Category	<i>ERC6d</i>
Specific Environmental Release Category	<i>n/a</i>

Processes, tasks, activities covered	<i>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.</i>
<b>Section 2</b>	<b>Operational conditions and risk management measures</b>
<b>Product characteristics</b>	
Physical form of product	<i>Liquid</i>
Volatility	<i>Liquid, vapour pressure 0.5 - 10 kPa at STP</i>
Dustiness	<i>n/a</i>
Concentration in a preparation/product (wt.%)	<i>3% - 100%</i>
Other product characteristics	<i>Substance is a unique structure. Phenol or benzonitrile. Readily biodegradable.</i>
<b>Section 2.1</b>	<b>Control of worker exposure</b>
<b>Operational conditions</b>	
Amounts used	<i>n/a</i>
Frequency and duration of use	<i>Covers daily exposures up to 8 hours (unless stated differently)</i>
Human factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions affecting worker exposure	<i>Assumes a good basic standard of occupational hygiene is implemented</i>

Risk Management Measures	
Contributing Scenarios	
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General exposures (closed systems) Process sampling elevated temperature	Sample via a closed loop system Handle substance within a closed system
General exposures (closed systems) Process sampling elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system
General exposures (closed systems) Continuous process Process sampling elevated temperature	Sample via a closed loop system Handle substance within a closed system
General exposures (closed systems) Continuous process Process sampling elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system; Wear suitable gloves tested to EN374.
General exposures (closed systems) Batch process Process sampling with local exhaust ventilation	Sample via a closed loop system Handle substance within a closed system; Ensure material transfers are under containment or extract ventilation
General exposures (closed systems) Batch process elevated temperature	Sample via a closed loop system Handle substance within a closed system; Avoid carrying out activities involving exposure for more than 4 hours

General exposures (closed systems) Batch process elevated temperature	Sample via a closed loop system Limit the substance content in the product to 25 % Handle substance within a closed system
General exposures (closed systems) Batch process elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system
Process sampling (open systems) with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Process sampling (open systems) elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Process sampling (open systems) with local exhaust ventilation elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Mixing operations (open systems) Batch process Process sampling with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Mixing operations (open systems) Batch process Process sampling elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Mixing operations (open systems) Batch process Process sampling elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.
Mixing operations (open systems) Batch process Process sampling with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Calendering (including Banburys) with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Calendering (including Banburys)	Limit the substance content in the product to 3%; Ensure material transfers are under containment or extract ventilation; Wear suitable gloves tested to EN374.

Calendering (including Banburys) with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Non-dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Wear a respirator conforming to EN140 with Type A filter or better.
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 3%; Avoid carrying out activities involving exposure for more than 1 hour; Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Bulk transfers Non-dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Bulk transfers Dedicated facility Transfer from/pouring from containers elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 4 hours

Bulk transfers Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Bulk transfers Dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Limit the substance content in the product to 25 % ; Ensure material transfers are under containment or extract ventilation
Small package filling Dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Small package filling Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 4 hours
Small package filling Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Rolling, Brushing with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Rolling, Brushing elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Equipment cleaning and maintenance elevated temperature	Limit the substance content in the product to 5 %; Drain or remove substance from equipment prior to break-in or maintenance ; Avoid carrying out operation for more than 4 hours; Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.
Dipping, immersion and pouring with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Dipping, immersion and pouring elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 1 hour

Dipping, immersion and pouring elevated temperature	Limit the substance content in the product to 3%; Avoid carrying out activities involving exposure for more than 4 hours
Production or preparation of articles by tableting, compression, extrusion or pelletisation with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Production or preparation of articles by tableting, compression, extrusion or pelletisation elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 4 hours
Production or preparation of articles by tableting, compression, extrusion or pelletisation elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Production or preparation of articles by tableting, compression, extrusion or pelletisation with local exhaust ventilation elevated temperature	Limit the substance content in the product to 25 % ; Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 4 hours
Laboratory activities with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
<b>Section 2.2</b>	<b>Control of environmental exposure</b>
<b>Operational conditions</b>	
Amounts used -- Maximum daily site tonnage (kg/d)	<i>n/a</i>
Frequency of use	<i>n/a</i>
Duration of use (Emission Days/year)	<i>360</i>
Environmental factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions of use affecting environmental exposure	<i>Indoor/Outdoor use.</i>

<b>Risk Management Measures</b>	
Technical conditions and measures at process level (source) to prevent release	<i>Common practices vary across sites thus conservative process release estimates used.</i>
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	<i>Treat air emission to provide a typical removal efficiency of (%): 90 (closed systems) Activated carbon filter to reduce emissions to air. Wet scrubber for gas removal.</i>
Organisation measures to prevent/limit release from site	<i>n/a</i>
Conditions and measures related to municipal sewage treatment plant	<i>n/a</i>
Conditions and measures related to external treatment of waste for disposal	<i>External treatment and disposal of waste should comply with applicable local and/or national regulations.</i>
Conditions and measures related to external recovery of waste	<i>External recovery and recycling of waste should comply with applicable local and/or national regulations.</i>
Other environmental measures	<i>n/a</i>
<b>Section 3</b>	<b>Exposure Estimation</b>
<b>3.1 Health</b>	<i>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.</i>
<b>3.2 Environment</b>	<i>Used EUSES model.</i>
<b>Section 4</b>	<b>Guidance to check compliance with the Exposure Scenario</b>
<b>4.1 Health</b>	<i>Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</i>
<b>4.2 Environment</b>	<i>Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a>).</i>

<b>Section 1</b>	<b>Exposure Scenario: Worker</b>
<b>Title</b>	<b><i>Use in phenolics resin processing, industrial</i></b>
Sector of Use	<i>SU3</i>
Process Category	<i>PROC1; PROC2; PROC3; PROC4; PROC5; PROC7; PROC8a; PROC8b; PROC9; PROC10; PROC13; PROC14; PROC15</i>
Product Category	<i>n/a</i>
Article Category	<i>n/a</i>

Environmental Release Category	<i>ERC2; ERC4; ERC6b; ERC6c; ERC6d</i>
Specific Environmental Release Category	<i>n/a</i>
Processes, tasks, activities covered	<i>Manufacture of polymers from monomers in continuous and batch processes. Including production, recycling, degassing, discharging, reactor maintenance and immediate polymer product formation (i.e. compounding, pelletisation product off-gassing).</i>
<b>Section 2</b>	<b>Operational conditions and risk management measures</b>
<b>Product characteristics</b>	
Physical form of product	<i>Liquid</i>
Volatility	<i>Liquid, vapour pressure 0.5 - 10 kPa at STP</i>
Dustiness	<i>n/a</i>
Concentration in a preparation/product (wt.%)	<i>3% - 100%</i>
Other product characteristics	<i>Substance is a unique structure. Phenol or benzonitrile. Readily biodegradable.</i>
<b>Section 2.1</b>	<b>Control of worker exposure</b>
<b>Operational conditions</b>	
Amounts used	<i>n/a</i>
Frequency and duration of use	<i>Covers daily exposures up to 8 hours (unless stated differently)</i>
Human factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions affecting worker exposure	<i>Assumes a good basic standard of occupational hygiene is implemented</i>

Risk Management Measures	
Contributing Scenarios	
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General exposures (closed systems) Process sampling elevated temperature	Sample via a closed loop system Handle substance within a closed system
General exposures (closed systems) Process sampling elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system
General exposures (closed systems) Continuous process Process sampling elevated temperature	Sample via a closed loop system Handle substance within a closed system
General exposures (closed systems) Continuous process Process sampling elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system; Wear suitable gloves tested to EN374.
General exposures (closed systems) Batch process Process sampling with local exhaust ventilation	Sample via a closed loop system Handle substance within a closed system; Ensure material transfers are under containment or extract ventilation
General exposures (closed systems) Batch process elevated temperature	Sample via a closed loop system Handle substance within a closed system; Avoid carrying out activities involving exposure for more than 4 hours

General exposures (closed systems) Batch process elevated temperature	Sample via a closed loop system Limit the substance content in the product to 25 % Handle substance within a closed system
General exposures (closed systems) Batch process elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system
Process sampling (open systems) with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Process sampling (open systems) elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Process sampling (open systems) with local exhaust ventilation elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Mixing operations (open systems) Batch process Process sampling with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Mixing operations (open systems) Batch process Process sampling elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Mixing operations (open systems) Batch process Process sampling elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.
Mixing operations (open systems) Batch process Process sampling with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Spraying/fogging by machine application with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Spraying/fogging by machine application with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Wear a respirator conforming to EN140 with Type A filter or better.

Spraying/fogging by machine application with local exhaust ventilation	Limit the substance content in the product to 3%; Ensure material transfers are under containment or extract ventilation
Bulk transfers Non-dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Wear a respirator conforming to EN140 with Type A filter or better.
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 3%; Avoid carrying out activities involving exposure for more than 1 hour; Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Bulk transfers Non-dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Bulk transfers Dedicated facility Transfer from/pouring from containers elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 4 hours

Bulk transfers Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Bulk transfers Dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Limit the substance content in the product to 25 % ; Ensure material transfers are under containment or extract ventilation
Small package filling Dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Small package filling Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 4 hours
Small package filling Dedicated facility Transfer from/pouring from containers elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Rolling, Brushing with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Rolling, Brushing elevated temperature	Avoid carrying out activities involving exposure for more than 1 hour
Equipment cleaning and maintenance elevated temperature	Limit the substance content in the product to 5 %; Drain or remove substance from equipment prior to break-in or maintenance ; Avoid carrying out operation for more than 4 hours; Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.
Dipping, immersion and pouring with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Dipping, immersion and pouring elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 1 hour

Dipping, immersion and pouring elevated temperature	Limit the substance content in the product to 3%; Avoid carrying out activities involving exposure for more than 4 hours
Production or preparation of articles by tableting, compression, extrusion or pelletisation with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Production or preparation of articles by tableting, compression, extrusion or pelletisation elevated temperature	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 4 hours
Production or preparation of articles by tableting, compression, extrusion or pelletisation elevated temperature	Limit the substance content in the product to 3%; Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Production or preparation of articles by tableting, compression, extrusion or pelletisation with local exhaust ventilation elevated temperature	Limit the substance content in the product to 25 % ; Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 4 hours
Laboratory activities with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
<b>Section 2.2</b>	<b>Control of environmental exposure</b>
<b>Operational conditions</b>	
Amounts used -- Maximum daily site tonnage (kg/d)	<i>n/a</i>
Frequency of use	<i>n/a</i>
Duration of use (Emission Days/year)	<i>360</i>
Environmental factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions of use affecting environmental exposure	<i>Indoor/Outdoor use.</i>

<b>Risk Management Measures</b>	
Technical conditions and measures at process level (source) to prevent release	<i>Common practices vary across sites thus conservative process release estimates used.</i>
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	<i>Treat air emission to provide a typical removal efficiency of (%): 90 (closed systems) Activated carbon filter to reduce emissions to air. Wet scrubber for gas removal.</i>
Organisation measures to prevent/limit release from site	<i>n/a</i>
Conditions and measures related to municipal sewage treatment plant	<i>n/a</i>
Conditions and measures related to external treatment of waste for disposal	<i>External treatment and disposal of waste should comply with applicable local and/or national regulations.</i>
Conditions and measures related to external recovery of waste	<i>External recovery and recycling of waste should comply with applicable local and/or national regulations.</i>
Other environmental measures	<i>n/a</i>
<b>Section 3</b>	<b>Exposure Estimation</b>
<b>3.1 Health</b>	<i>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.</i>
<b>3.2 Environment</b>	<i>Used EUSES model.</i>
<b>Section 4</b>	<b>Guidance to check compliance with the Exposure Scenario</b>
<b>4.1 Health</b>	<i>Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</i>
<b>4.2 Environment</b>	<i>Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.</i>

<b>Section 1</b>	<b>Exposure Scenario: Worker</b>
<b>Title</b>	<b><i>Use in laboratories, professional</i></b>
Sector of Use	<i>SU22</i>
Process Category	<i>PROC10; PROC15</i>
Product Category	<i>n/a</i>
Article Category	<i>n/a</i>
Environmental Release Category	<i>ERC8a</i>

Specific Environmental Release Category	<i>n/a</i>
Processes, tasks, activities covered	<i>Use of small quantities within laboratory settings, including material transfers and equipment cleaning</i>
<b>Section 2</b>	<b>Operational conditions and risk management measures</b>
<b>Product characteristics</b>	
Physical form of product	<i>Liquid</i>
Volatility	<i>Liquid, vapour pressure &lt; 0.5 kPa at STP</i>
Dustiness	<i>n/a</i>
Concentration in a preparation/product (wt.%)	<i>3% - 100%</i>
Other product characteristics	<i>Substance is a unique structure. Phenol or benzonitrile. Readily biodegradable.</i>
<b>Section 2.1</b>	<b>Control of worker exposure</b>
<b>Operational conditions</b>	
Amounts used	<i>n/a</i>
Frequency and duration of use	<i>Covers daily exposures up to 8 hours (unless stated differently)</i>
Human factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions affecting worker exposure	<i>Assumes a good basic standard of occupational hygiene is implemented</i>

Risk Management Measures	
Contributing Scenarios	
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
Rolling, Brushing with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Rolling, Brushing Equipment cleaning and maintenance with local exhaust ventilation	Limit the substance content in the product to 5 %; Ensure material transfers are under containment or extract ventilation
Equipment cleaning and maintenance	Limit the substance content in the product to 3%; Drain or remove substance from equipment prior to break-in or maintenance ; Avoid carrying out activities involving exposure for more than 1 hour; Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.
Rolling, Brushing	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 1 hour; Wear a respirator conforming to EN140 with Type A filter or better.
Use as a laboratory reagent with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation

Section 2.2	Control of environmental exposure
<b>Operational conditions</b>	
Amounts used -- Maximum daily site tonnage (kg/d)	<i>n/a</i>
Frequency of use	<i>n/a</i>
Duration of use (Emission Days/year)	<i>360</i>
Environmental factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions of use affecting environmental exposure	<i>Indoor/Outdoor use.</i>
<b>Risk Management Measures</b>	
Technical conditions and measures at process level (source) to prevent release	<i>Common practices vary across sites thus conservative process release estimates used.</i>
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	<i>Treat air emission to provide a typical removal efficiency of (%): 90 (closed systems) Activated carbon filter to reduce emissions to air. Wet scrubber for gas removal.</i>
Organisation measures to prevent/limit release from site	<i>n/a</i>
Conditions and measures related to municipal sewage treatment plant	<i>n/a</i>
Conditions and measures related to external treatment of waste for disposal	<i>External treatment and disposal of waste should comply with applicable local and/or national regulations.</i>
Conditions and measures related to external recovery of waste	<i>External recovery and recycling of waste should comply with applicable local and/or national regulations.</i>
Other environmental measures	<i>n/a</i>

<b>Section 3</b>	<b>Exposure Estimation</b>
<b>3.1 Health</b>	<i>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.</i>
<b>3.2 Environment</b>	<i>Used EUSES model.</i>
<b>Section 4</b>	<b>Guidance to check compliance with the Exposure Scenario</b>
<b>4.1 Health</b>	<i>Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</i>
<b>4.2 Environment</b>	<i>Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a>).</i>

<b>Section 1</b>	<b>Exposure Scenario: Worker</b>
<b>Title</b>	<b><i>Uses in Coatings, professional</i></b>
Sector of Use	<i>SU22</i>
Process Category	<i>PROC5; PROC8a; PROC10; PROC13</i>
Product Category	<i>n/a</i>
Article Category	<i>n/a</i>
Environmental Release Category	<i>ERC8a; ERC8c; ERC8d; ERC8f</i>
Specific Environmental Release Category	<i>n/a</i>
Processes, tasks, activities covered	<i>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 film formation), and equipment cleaning, maintenance and associated laboratory activities.</i>
<b>Section 2</b>	<b>Operational conditions and risk management measures</b>
<b>Product characteristics</b>	
Physical form of product	<i>Liquid</i>
Volatility	<i>Liquid, vapour pressure 0.5 - 10 kPa at STP</i>
Dustiness	<i>n/a</i>
Concentration in a preparation/product (wt.%)	<i>3% to 100%</i>
Other product characteristics	<i>Substance is a unique structure. Phenol or benzonitrile. Readily biodegradable.</i>
<b>Section 2.1</b>	<b>Control of worker exposure</b>
<b>Operational conditions</b>	
Amounts used	<i>n/a</i>
Frequency and duration of use	<i>Covers daily exposures up to 8 hours (unless stated differently)</i>
Human factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions affecting worker exposure	<i>Assumes a good basic standard of occupational hygiene is implemented</i>

Risk Management Measures	
Contributing Scenarios	
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
Mixing operations (open systems) Batch process Process sampling with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 4 hours
Mixing operations (open systems) Batch process Transfer from/pouring from containers elevated temperature	Avoid carrying out activities involving exposure for more than 15 minutes
Mixing operations (open systems) Batch process Process sampling elevated temperature	Limit the substance content in the product to 3%; Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 4 hours; Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Bulk transfers Non-dedicated facility Transfer from/pouring from containers	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Non-dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Provide the operation with a properly sited receiving hood
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Ensure operation is undertaken outdoors ; Avoid carrying out activities involving exposure for more than 1 hour; Wear a respirator conforming to EN140 with Type A filter or better.

Rolling, Brushing with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Rolling, Brushing Equipment cleaning and maintenance with local exhaust ventilation	Limit the substance content in the product to 5 %; Ensure material transfers are under containment or extract ventilation
Equipment cleaning and maintenance	Limit the substance content in the product to 3%; Drain or remove substance from equipment prior to break-in or maintenance ; Avoid carrying out activities involving exposure for more than 1 hour; Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.
Rolling, Brushing	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 1 hour; Wear a respirator conforming to EN140 with Type A filter or better.
Dipping, immersion and pouring with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 4 hours
Dipping, immersion and pouring	Avoid carrying out activities involving exposure for more than 15 minutes
Dipping, immersion and pouring	Limit the substance content in the product to 3%; Avoid carrying out activities involving exposure for more than 4 hours; Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
<b>Section 2.2</b>	<b>Control of environmental exposure</b>
<b>Operational conditions</b>	
Amounts used -- Maximum daily site tonnage (kg/d)	<i>n/a</i>
Frequency of use	<i>n/a</i>
Duration of use (Emission Days/year)	<i>360</i>
Environmental factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions of use affecting environmental exposure	<i>Indoor/Outdoor use.</i>

<b>Risk Management Measures</b>	
Technical conditions and measures at process level (source) to prevent release	<i>Common practices vary across sites thus conservative process release estimates used.</i>
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	<i>Treat air emission to provide a typical removal efficiency of (%): 90 (closed systems) Activated carbon filter to reduce emissions to air. Wet scrubber for gas removal.</i>
Organisation measures to prevent/limit release from site	<i>n/a</i>
Conditions and measures related to municipal sewage treatment plant	<i>n/a</i>
Conditions and measures related to external treatment of waste for disposal	<i>External treatment and disposal of waste should comply with applicable local and/or national regulations.</i>
Conditions and measures related to external recovery of waste	<i>External recovery and recycling of waste should comply with applicable local and/or national regulations.</i>
Other environmental measures	<i>n/a</i>
<b>Section 3</b>	<b>Exposure Estimation</b>
<b>3.1 Health</b>	<i>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.</i>
<b>3.2 Environment</b>	<i>Used EUSES model.</i>
<b>Section 4</b>	<b>Guidance to check compliance with the Exposure Scenario</b>
<b>4.1 Health</b>	<i>Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</i>
<b>4.2 Environment</b>	<i>Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a>).</i>

<b>Section 1</b>	<b>Exposure Scenario: Worker</b>
<b>Title</b>	<b><i>Use as binders and release agents, professional</i></b>
Sector of Use	SU22
Process Category	PROC1; PROC2; PROC3; PROC4; PROC5; PROC6; PROC8a; PROC8b; PROC9; PROC10; PROC11
Product Category	n/a
Article Category	n/a
Environmental Release Category	ERC8a; ERC8b; ERC8c; ERC8d; ERC8e; ERC8f
Specific Environmental Release Category	n/a
Processes, tasks, activities covered	<i>Covers the use as binders and release agents including material transfers, mixing, application by spraying, brushing, and handling of waste.</i>
<b>Section 2</b>	<b>Operational conditions and risk management measures</b>
<b>Product characteristics</b>	
Physical form of product	<i>Liquid</i>
Volatility	<i>Liquid, vapour pressure 0.5 - 10 kPa at STP</i>
Dustiness	n/a
Concentration in a preparation/product (wt.%)	3%- 100%
Other product characteristics	<i>Substance is a unique structure. Phenol or benzonitrile. Readily biodegradable.</i>
<b>Section 2.1</b>	<b>Control of worker exposure</b>
<b>Operational conditions</b>	
Amounts used	n/a
Frequency and duration of use	<i>Covers daily exposures up to 8 hours (unless stated differently)</i>
Human factors not influenced by risk management	n/a
Other Operational Conditions affecting worker exposure	<i>Assumes a good basic standard of occupational hygiene is implemented</i>

Risk Management Measures	
Contributing Scenarios	
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General exposures (closed systems) Process sampling elevated temperature	Sample via a closed loop system Handle substance within a closed system
General exposures (closed systems) Process sampling elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system; Ensure material transfers are under containment or extract ventilation
General exposures (closed systems) Continuous process Process sampling elevated temperature	Sample via a closed loop system Handle substance within a closed system; Ensure material transfers are under containment or extract ventilation
General exposures (closed systems) Continuous process Process sampling elevated temperature	Sample via a closed loop system Handle substance within a closed system; Avoid carrying out activities involving exposure for more than 1 hour
General exposures (closed systems) Continuous process Process sampling elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system
General exposures (closed systems) Batch process Process sampling with local exhaust ventilation	Sample via a closed loop system Handle substance within a closed system; Ensure material transfers are under containment or extract ventilation

General exposures (closed systems) Batch process elevated temperature	Sample via a closed loop system Handle substance within a closed system; Ensure operation is undertaken outdoors ; Avoid carrying out activities involving exposure for more than 1 hour
General exposures (closed systems) Batch process elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system; Avoid carrying out activities involving exposure for more than 1 hour
Process sampling (open systems) with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Process sampling (open systems) elevated temperature	Avoid carrying out activities involving exposure for more than 15 minutes
Process sampling (open systems) elevated temperature	Provide the operation with a properly sited receiving hood
Process sampling (open systems) elevated temperature	Limit the substance content in the product to 3%; Avoid carrying out activities involving exposure for more than 4 hours; Wear suitable gloves tested to EN374.
Mixing operations (open systems) Batch process Process sampling with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 4 hours
Mixing operations (open systems) Batch process Process sampling elevated temperature	Avoid carrying out activities involving exposure for more than 15 minutes
Mixing operations (open systems) Batch process Process sampling elevated temperature	Limit the substance content in the product to 3%; Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 4 hours; Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Calendering (including Banburys) with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 4 hours
Calendering (including Banburys) elevated temperature	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 15 minutes
Calendering (including Banburys) with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 4 hours

Calendering (including Banburys) with local exhaust ventilation elevated temperature	Limit the substance content in the product to 25 % ; Provide the operation with a properly sited receiving hood
Bulk transfers Non-dedicated facility Transfer from/pouring from containers	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Non-dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Provide the operation with a properly sited receiving hood
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Ensure operation is undertaken outdoors ; Avoid carrying out activities involving exposure for more than 1 hour; Wear a respirator conforming to EN140 with Type A filter or better.
Bulk transfers Dedicated facility Transfer from/pouring from containers	Ensure material transfers are under containment or extract ventilation
Bulk transfers Dedicated facility Transfer from/pouring from containers	Provide the operation with a properly sited receiving hood
Bulk transfers Dedicated facility Transfer from/pouring from containers	Avoid carrying out activities involving exposure for more than 15 minutes
Bulk transfers Dedicated facility Transfer from/pouring from containers	Wear a respirator conforming to EN140 with Type A filter or better.
Bulk transfers Dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Rolling, Brushing with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour

Rolling, Brushing Equipment cleaning and maintenance with local exhaust ventilation	Limit the substance content in the product to 5 %; Ensure material transfers are under containment or extract ventilation
Equipment cleaning and maintenance	Limit the substance content in the product to 3%; Drain or remove substance from equipment prior to break-in or maintenance ; Avoid carrying out activities involving exposure for more than 1 hour; Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.
Rolling, Brushing	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 1 hour; Wear a respirator conforming to EN140 with Type A filter or better.
Spraying/fogging by manual application with local exhaust ventilation	Limit the substance content in the product to 5 %; Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Spraying/fogging by manual application with local exhaust ventilation	Limit the substance content in the product to 25 % ; Ensure operation is undertaken outdoors Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 15 minutes
Spraying/fogging by manual application with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 4 hours; Wear a respirator conforming to EN140 with Type A filter or better.
<b>Section 2.2</b>	<b>Control of environmental exposure</b>
<b>Operational conditions</b>	
Amounts used -- Maximum daily site tonnage (kg/d)	<i>n/a</i>
Frequency of use	<i>n/a</i>
Duration of use (Emission Days/year)	<i>360</i>
Environmental factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions of use affecting environmental exposure	<i>Indoor/Outdoor use.</i>

<b>Risk Management Measures</b>	
Technical conditions and measures at process level (source) to prevent release	<i>Common practices vary across sites thus conservative process release estimates used.</i>
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	<i>Treat air emission to provide a typical removal efficiency of (%): 90 (closed systems) Activated carbon filter to reduce emissions to air. Wet scrubber for gas removal.</i>
Organisation measures to prevent/limit release from site	<i>n/a</i>
Conditions and measures related to municipal sewage treatment plant	<i>n/a</i>
Conditions and measures related to external treatment of waste for disposal	<i>External treatment and disposal of waste should comply with applicable local and/or national regulations.</i>
Conditions and measures related to external recovery of waste	<i>External recovery and recycling of waste should comply with applicable local and/or national regulations.</i>
Other environmental measures	<i>n/a</i>
<b>Section 3</b>	<b>Exposure Estimation</b>
<b>3.1 Health</b>	<i>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.</i>
<b>3.2 Environment</b>	<i>Used EUSES model.</i>
<b>Section 4</b>	<b>Guidance to check compliance with the Exposure Scenario</b>
<b>4.1 Health</b>	<i>Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</i>
<b>4.2 Environment</b>	<i>Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a>).</i>

<b>Section 1</b>	<b>Exposure Scenario: Worker</b>
<b>Title</b>	<b><i>Polymer production, professional</i></b>
Sector of Use	<i>SU22</i>
Process Category	<i>PROC8a</i>
Product Category	<i>n/a</i>
Article Category	<i>n/a</i>
Environmental Release Category	<i>ERC8a; ERC8d; ERC8c; ERC8f</i>

Specific Environmental Release Category	n/a
Processes, tasks, activities covered	<i>Manufacture of polymers from monomers in continuous and batch processes. Including production, recycling, degassing, discharging, reactor maintenance and immediate polymer product formation (i.e. compounding, pelletisation product off-gassing).</i>
<b>Section 2</b>	<b>Operational conditions and risk management measures</b>
<b>Product characteristics</b>	
Physical form of product	<i>Liquid</i>
Volatility	<i>Liquid, vapour pressure 0.5 - 10 kPa at STP</i>
Dustiness	<i>n/a</i>
Concentration in a preparation/product (wt.%)	<i>3% - 100%</i>
Other product characteristics	<i>Substance is a unique structure. Phenol or benzonitrile. Readily biodegradable.</i>
<b>Section 2.1</b>	<b>Control of worker exposure</b>
<b>Operational conditions</b>	
Amounts used	<i>n/a</i>
Frequency and duration of use	<i>Covers daily exposures up to 8 hours (unless stated differently)</i>
Human factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions affecting worker exposure	<i>Assumes a good basic standard of occupational hygiene is implemented</i>

<b>Risk Management Measures</b>	
<b>Contributing Scenarios</b>	
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
Bulk transfers Non-dedicated facility Transfer from/pouring from containers	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Non-dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Provide the operation with a properly sited receiving hood
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Ensure operation is undertaken outdoors ; Avoid carrying out activities involving exposure for more than 1 hour; Wear a respirator conforming to EN140 with Type A filter or better.
<b>Section 2.2</b>	<b>Control of environmental exposure</b>
<b>Operational conditions</b>	
Amounts used -- Maximum daily site tonnage (kg/d)	<i>n/a</i>
Frequency of use	<i>n/a</i>
Duration of use (Emission Days/year)	360
Environmental factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions of use affecting environmental exposure	<i>Indoor/Outdoor use.</i>

<b>Risk Management Measures</b>	
Technical conditions and measures at process level (source) to prevent release	<i>Common practices vary across sites thus conservative process release estimates used.</i>
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	<i>Treat air emission to provide a typical removal efficiency of (%): 90 (closed systems) Activated carbon filter to reduce emissions to air. Wet scrubber for gas removal.</i>
Organisation measures to prevent/limit release from site	<i>n/a</i>
Conditions and measures related to municipal sewage treatment plant	<i>n/a</i>
Conditions and measures related to external treatment of waste for disposal	<i>External treatment and disposal of waste should comply with applicable local and/or national regulations.</i>
Conditions and measures related to external recovery of waste	<i>External recovery and recycling of waste should comply with applicable local and/or national regulations.</i>
Other environmental measures	<i>n/a</i>
<b>Section 3</b>	<b>Exposure Estimation</b>
<b>3.1 Health</b>	<i>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.</i>
<b>3.2 Environment</b>	<i>Used EUSES model.</i>
<b>Section 4</b>	<b>Guidance to check compliance with the Exposure Scenario</b>
<b>4.1 Health</b>	<i>Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</i>
<b>4.2 Environment</b>	<i>Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a>).</i>

<b>Section 1</b>	<b>Exposure Scenario: Worker</b>
<b>Title</b>	<b><i>Polymer processing, professional</i></b>
Sector of Use	<i>SU22</i>
Process Category	<i>PROC8a</i>
Product Category	<i>n/a</i>
Article Category	<i>n/a</i>
Environmental Release Category	<i>ERC8a; ERC8d; ERC8c; ERC8f</i>
Specific Environmental Release Category	<i>n/a</i>
Processes, tasks, activities covered	<i>Processing of formulated polymers including material transfers, moulding and forming activities, material re-works and associated maintenance.</i>
<b>Section 2</b>	<b>Operational conditions and risk management measures</b>
<b>Product characteristics</b>	
Physical form of product	<i>Liquid</i>
Volatility	<i>Liquid, vapour pressure 0.5 - 10 kPa at STP</i>
Dustiness	<i>n/a</i>
Concentration in a preparation/product (wt.%)	<i>3% - 100%</i>
Other product characteristics	<i>Substance is a unique structure. Phenol or benzonitrile. Readily biodegradable.</i>
<b>Section 2.1</b>	<b>Control of worker exposure</b>
<b>Operational conditions</b>	
Amounts used	<i>n/a</i>
Frequency and duration of use	<i>Covers daily exposures up to 8 hours (unless stated differently)</i>
Human factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions affecting worker exposure	<i>Assumes a good basic standard of occupational hygiene is implemented</i>

<b>Risk Management Measures</b>	
<b>Contributing Scenarios</b>	
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
Bulk transfers Non-dedicated facility Transfer from/pouring from containers	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Bulk transfers Non-dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Provide the operation with a properly sited receiving hood
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Ensure operation is undertaken outdoors ; Avoid carrying out activities involving exposure for more than 1 hour; Wear a respirator conforming to EN140 with Type A filter or better.
<b>Section 2.2</b>	<b>Control of environmental exposure</b>
<b>Operational conditions</b>	
Amounts used -- Maximum daily site tonnage (kg/d)	<i>n/a</i>
Frequency of use	<i>n/a</i>
Duration of use (Emission Days/year)	360
Environmental factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions of use affecting environmental exposure	<i>Indoor/Outdoor use.</i>

<b>Risk Management Measures</b>	
Technical conditions and measures at process level (source) to prevent release	<i>Common practices vary across sites thus conservative process release estimates used.</i>
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	<i>Treat air emission to provide a typical removal efficiency of (%): 90 (closed systems) Activated carbon filter to reduce emissions to air. Wet scrubber for gas removal.</i>
Organisation measures to prevent/limit release from site	<i>n/a</i>
Conditions and measures related to municipal sewage treatment plant	<i>n/a</i>
Conditions and measures related to external treatment of waste for disposal	<i>External treatment and disposal of waste should comply with applicable local and/or national regulations.</i>
Conditions and measures related to external recovery of waste	<i>External recovery and recycling of waste should comply with applicable local and/or national regulations.</i>
Other environmental measures	<i>n/a</i>
<b>Section 3</b>	<b>Exposure Estimation</b>
<b>3.1 Health</b>	<i>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.</i>
<b>3.2 Environment</b>	<i>Used EUSES model.</i>
<b>Section 4</b>	<b>Guidance to check compliance with the Exposure Scenario</b>
<b>4.1 Health</b>	<i>Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</i>
<b>4.2 Environment</b>	<i>Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a>).</i>

<b>Section 1</b>	<b>Exposure Scenario: Worker</b>
<b>Title</b>	<b><i>Use in phenolics resin processing, professional</i></b>
Sector of Use	SU22
Process Category	PROC1; PROC2; PROC3; PROC4; PROC5; PROC8a; PROC8b; PROC9; PROC10; PROC11; PROC13; PROC14; PROC15
Product Category	n/a
Article Category	n/a
Environmental Release Category	ERC2; ERC4; ERC6b; ERC6c; ERC6d
Specific Environmental Release Category	n/a
Processes, tasks, activities covered	<i>Processing of formulated polymers including material transfers, moulding and forming activities, material re-works and associated maintenance.</i>
<b>Section 2</b>	<b>Operational conditions and risk management measures</b>
<b>Product characteristics</b>	
Physical form of product	<i>Liquid</i>
Volatility	<i>Liquid, vapour pressure 0.5 - 10 kPa at STP</i>
Dustiness	n/a
Concentration in a preparation/product (wt.%)	3% - 100%
Other product characteristics	<i>Substance is a unique structure. Phenol or benzonitrile. Readily biodegradable.</i>
<b>Section 2.1</b>	<b>Control of worker exposure</b>
<b>Operational conditions</b>	
Amounts used	n/a
Frequency and duration of use	<i>Covers daily exposures up to 8 hours (unless stated differently)</i>
Human factors not influenced by risk management	n/a
Other Operational Conditions affecting worker exposure	<i>Assumes a good basic standard of occupational hygiene is implemented</i>

Risk Management Measures	
Contributing Scenarios	
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General exposures (closed systems) Process sampling elevated temperature	Sample via a closed loop system Handle substance within a closed system
General exposures (closed systems) Process sampling elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system; Ensure material transfers are under containment or extract ventilation
General exposures (closed systems) Continuous process Process sampling elevated temperature	Sample via a closed loop system Handle substance within a closed system; Ensure material transfers are under containment or extract ventilation
General exposures (closed systems) Continuous process Process sampling elevated temperature	Sample via a closed loop system Handle substance within a closed system; Avoid carrying out activities involving exposure for more than 1 hour
General exposures (closed systems) Continuous process Process sampling elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system
General exposures (closed systems) Batch process Process sampling with local exhaust ventilation	Sample via a closed loop system Handle substance within a closed system; Ensure material transfers are under containment or extract ventilation

General exposures (closed systems) Batch process elevated temperature	Sample via a closed loop system Handle substance within a closed system; Ensure operation is undertaken outdoors ; Avoid carrying out activities involving exposure for more than 1 hour
General exposures (closed systems) Batch process (closed systems) elevated temperature	Sample via a closed loop system Limit the substance content in the product to 3% Handle substance within a closed system; Avoid carrying out activities involving exposure for more than 1 hour
Process sampling (open systems) with local exhaust ventilation elevated temperature	Ensure material transfers are under containment or extract ventilation
Process sampling (open systems) elevated temperature	Avoid carrying out activities involving exposure for more than 15 minutes
Process sampling (open systems) elevated temperature	Provide the operation with a properly sited receiving hood
Process sampling (open systems) elevated temperature	Limit the substance content in the product to 3%; Avoid carrying out activities involving exposure for more than 4 hours; Wear suitable gloves tested to EN374.
Mixing operations (open systems) Batch process Process sampling with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 4 hours
Mixing operations (open systems) Batch process Process sampling elevated temperature	Avoid carrying out activities involving exposure for more than 15 minutes
Mixing operations (open systems) Batch process Process sampling elevated temperature	Limit the substance content in the product to 3%; Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 4 hours; Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Bulk transfers Non-dedicated facility Transfer from/pouring from containers	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour

Bulk transfers Non-dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Provide the operation with a properly sited receiving hood
Bulk transfers Non-dedicated facility Transfer from/pouring from containers elevated temperature	Ensure operation is undertaken outdoors ; Avoid carrying out activities involving exposure for more than 1 hour; Wear a respirator conforming to EN140 with Type A filter or better.
Bulk transfers Dedicated facility Transfer from/pouring from containers	Ensure material transfers are under containment or extract ventilation
Bulk transfers Dedicated facility Transfer from/pouring from containers	Provide the operation with a properly sited receiving hood
Bulk transfers Dedicated facility Transfer from/pouring from containers	Avoid carrying out activities involving exposure for more than 15 minutes
Bulk transfers Dedicated facility Transfer from/pouring from containers	Wear a respirator conforming to EN140 with Type A filter or better.
Bulk transfers Dedicated facility Transfer from/pouring from containers with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Rolling, Brushing with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Rolling, Brushing Equipment cleaning and maintenance with local exhaust ventilation	Limit the substance content in the product to 5 %; Ensure material transfers are under containment or extract ventilation
Equipment cleaning and maintenance	Limit the substance content in the product to 3%; Drain or remove substance from equipment prior to break-in or maintenance ; Avoid carrying out activities involving exposure for more than 1 hour; Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.

Rolling, Brushing	Limit the substance content in the product to 25 % ; Avoid carrying out activities involving exposure for more than 1 hour; Wear a respirator conforming to EN140 with Type A filter or better.
Spraying/fogging by manual application with local exhaust ventilation	Limit the substance content in the product to 5 %; Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 1 hour
Spraying/fogging by manual application with local exhaust ventilation	Limit the substance content in the product to 25 % ; Ensure operation is undertaken outdoors Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 15 minutes
Spraying/fogging by manual application with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 4 hours; Wear a respirator conforming to EN140 with Type A filter or better.
Dipping, immersion and pouring with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 4 hours
Dipping, immersion and pouring	Avoid carrying out activities involving exposure for more than 15 minutes
Dipping, immersion and pouring	Limit the substance content in the product to 3%; Avoid carrying out activities involving exposure for more than 4 hours; Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Production or preparation or articles by tableting, compression, extrusion or pelletisation with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation; Avoid carrying out activities involving exposure for more than 4 hours
Production or preparation or articles by tableting, compression, extrusion or pelletisation with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation
Laboratory activities with local exhaust ventilation	Ensure material transfers are under containment or extract ventilation

Section 2.2	Control of environmental exposure
<b>Operational conditions</b>	
Amounts used -- Maximum daily site tonnage (kg/d)	<i>n/a</i>
Frequency of use	<i>n/a</i>
Duration of use (Emission Days/year)	<i>360</i>
Environmental factors not influenced by risk management	<i>n/a</i>
Other Operational Conditions of use affecting environmental exposure	<i>Indoor/Outdoor use.</i>
<b>Risk Management Measures</b>	
Technical conditions and measures at process level (source) to prevent release	<i>Common practices vary across sites thus conservative process release estimates used.</i>
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	<i>Treat air emission to provide a typical removal efficiency of (%): 90 (closed systems) Activated carbon filter to reduce emissions to air. Wet scrubber for gas removal.</i>
Organisation measures to prevent/limit release from site	<i>n/a</i>
Conditions and measures related to municipal sewage treatment plant	<i>n/a</i>
Conditions and measures related to external treatment of waste for disposal	<i>External treatment and disposal of waste should comply with applicable local and/or national regulations.</i>
Conditions and measures related to external recovery of waste	<i>External recovery and recycling of waste should comply with applicable local and/or national regulations.</i>
Other environmental measures	<i>n/a</i>

<b>Section 3</b>	<b>Exposure Estimation</b>
<b>3.1 Health</b>	<i>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.</i>
<b>3.2 Environment</b>	<i>Used EUSES model.</i>
<b>Section 4</b>	<b>Guidance to check compliance with the Exposure Scenario</b>
<b>4.1 Health</b>	<i>Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</i>
<b>4.2 Environment</b>	<i>Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a>).</i>