SAFETY DATA SHEET
According to EC No 1907/2006 as amended as at the date of this SDS

Phenol

Version	Revision Date:	SDS Number:	Date of last issue: -
1.0	12.03.2024	800001001034	Print Date 19.03.2024

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

1.1 Product identifier

Trade name	:	Phenol
Product code	:	S1223
Registration number EU	:	01-2119471329-32-0001
CAS-No.	:	108-95-2
Other means of identification	:	Hydroxybenzene, Phenyl hydroxide, Phenylic acid

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

Use of the Substance/Mixture	:	Use as an intermediate in industrial chemicals manufacture. Please refer to section 16 and/or the annexes for the registered uses under REACH.
Uses advised against	:	Restricted to professional users., This product must not be used in applications other than the above without first seeking the advice of the supplier., Do not use in the manufacture or preparation of foods, drugs, or cosmetics.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier	:	**Shell Chemicals Europe B.V.** PO Box 2334 3000 CH Rotterdam Netherlands
Telephone	:	+31 (0)10 441 5137 / +31 (0)10 441 5191
Telefax	:	+31 (0)20 716 8316 / +31 (0)20 713 9230
Contact for Safety Data Sheet	:	sccmsds@shell.com

1.4 Emergency telephone number

+44 (0) 1235 239 670 (This telephone number is available 24 hours per day, 7 days per week)
Giftnotruf (Berlin): +49 (0) 30 3068 6700

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Acute toxicity, Category 3, Oral	H301: Toxic if swallowed.
Acute toxicity, Category 3, Dermal	H311: Toxic in contact with skin.

Acute toxicity, Category 3, Inhalation	H331: Toxic if inhaled.
Skin corrosion, Category 1B	H314: Causes severe skin burns and eye damage.
Serious eye damage, Category 1	H318: Causes serious eye damage.
Germ cell mutagenicity, Category 2	H341: Suspected of causing genetic defects.
Specific target organ toxicity - repeated exposure, Category 2, Kidney , Liver , Skin , Respiratory system , Heart	H373: May cause damage to organs through prolonged or repeated exposure.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word : Danger

Hazard statements :

PHYSICAL HAZARDS:
Not classified as a physical hazard according to CLP criteria.

HEALTH HAZARDS:
H301 Toxic if swallowed.
H311 Toxic in contact with skin.
H314 Causes severe skin burns and eye damage.
H318 Causes serious eye damage.
H331 Toxic if inhaled.
H341 Suspected of causing genetic defects.
H373 May cause damage to organs (Kidney, Liver, Skin, Respiratory system, Heart) through prolonged or repeated exposure.

ENVIRONMENTAL HAZARDS:
Not classified as environmental hazard according to CLP criteria.

Precautionary statements :

Prevention:

P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P302 + P352 IF ON SKIN: Wash with plenty of water and soap.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with wa-

ter for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.

Storage:

No precautionary phrases.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Other hazards

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

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

Risk of explosion if heated under confinement.
Even with proper grounding and bonding, this material can still accumulate an electrostatic charge.
If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur.

SECTION 3: Composition/information on ingredients

3.1 Substances

Components

Chemical name	CAS-No. EC-No.	Concentration (% w/w)
Phenol	108-95-2 203-632-7	<= 100

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : DO NOT DELAY.
Keep victim calm. Obtain medical treatment immediately.

Protection of first-aiders : When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.

If inhaled	:	Call emergency number for your location / facility. Remove to fresh air. Do not attempt to rescue the victim unless proper respiratory protection is worn. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting, or unresponsive, give 100% oxygen with rescue breathing or Cardio-Pulmonary Resuscitation as required and transport to the nearest medical facility.
In case of skin contact	:	Call emergency number for your location / facility. DO NOT DELAY. Rescuers should AVOID DIRECT CONTACT. Rescuers should wear protective clothing and gloves while treating patients whose skin is contaminated with phenol. Rapid skin decontamination is critical. To remove phenol from a small affected body area (10% of body area or less, e.g. a finger, hand or arm), remove any contaminated clothing and swab the area promptly and repeatedly with cotton soaked in PEG-300 or PEG-400 (polyethylene glycol-300 or 400). If possible, immerse the contaminated area directly in PEG-300 or PEG-400. If a larger body area has been contaminated, immediately remove all phenol-contaminated clothing and shoes under a shower with lukewarm, gently flowing water. After several minutes flushing, decontaminate the affected areas with repeated swabbing or spraying with PEG-300 or PEG-400. If PEG-300 or PEG-400 is not available, do not delay removing contaminated clothing and flushing the affected area with lukewarm, gently flowing water for at least 60 minutes. DO NOT INTERRUPT FLUSHING. Transport to the nearest medical facility for additional treatment. Double-bag contaminated clothing and personal belongings for disposal. All burns should receive medical attention.
In case of eye contact	:	Immediately flush eye(s) with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Transport to the nearest medical facility for additional treatment. All burns should receive medical attention.
If swallowed	:	Call emergency number for your location / facility. If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Rinse mouth. Do not induce vomiting. If victim is alert, rinse mouth and drink 1/2 to 1 glass of water to help dilute the material. Do not give liquids to a drowsy, convulsing, or unconscious person. Transport to nearest medical facility for additional treatment.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms	:	Phenol can be rapidly absorbed through skin causing systemic poisoning and possibly death. Phenol has local anesthetic properties, and can cause exten-

sive damage before pain is felt.
Corrosive to skin.
Contact with the skin can cause chemical burns, redness, swelling, and tissue damage.
Corrosive to eyes.
Contact can cause severe eye damage including chemical burns, pain, clouding of the eye surface, inflammation of the eye, and may result in permanent loss of vision.

Swallowing of corrosive chemicals may cause immediate pain and burning in the mouth, throat, and stomach followed by vomiting and diarrhea.

Burns and tearing of the esophagus and stomach are possible.
Respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing.
Kidney damage may be indicated by changes in urine output or appearance, pain upon urination or in the lower back, or general oedema (swelling from fluid retention).

Liver damage may be indicated by loss of appetite, jaundice (yellowish skin and eye colour), fatigue, bleeding or easy bruising and sometimes pain and swelling in the upper right abdomen.

Heart damage may be evidenced by shortness of breath and, in severe cases, by collapse (cardiac arrest).
Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, lightheadedness, headache, nausea and loss of coordination.
Continued inhalation may result in unconsciousness and death.
Symptoms may vary by the agent. Symptoms may extend to being locally corrosive to involving generalized systems including respiratory system, circulatory system, central nervous system (CNS), and may lead to death.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : IMMEDIATE TREATMENT IS EXTREMELY IMPORTANT!
Artificial respiration and/or oxygen may be necessary.
Call a doctor or poison control center for guidance.
Treat symptomatically.
Transport to the nearest medical facility for additional treatment.
Absorption through the skin may occur on prolonged or repeated exposure.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Alcohol-resistant foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.

Unsuitable extinguishing media : Do not use water in a jet.

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting : Material will not burn unless preheated.
Carbon monoxide may be evolved if incomplete combustion occurs.

5.3 Advice for firefighters

Special protective equipment for firefighters : Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).

Specific extinguishing methods : Standard procedure for chemical fires.

Further information : Clear fire area of all non-emergency personnel.
Keep adjacent containers cool by spraying with water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions :

Observe all relevant local and international regulations.
Avoid inhaling vapour and/or mists.
Stay upwind and keep out of low areas.
Avoid contact with the skin.
Isolate hazard area and deny entry to unnecessary or unprotected personnel.
Notify authorities if any exposure to the general public or the environment occurs or is likely to occur.
Local authorities should be advised if significant spillages cannot be contained.
6.1.1 For non emergency personnel:
Avoid contact with skin, eyes and clothing.
Isolate hazard area and deny entry to unnecessary or unprotected personnel.
Do not breathe fumes, vapour.

Do not operate electrical equipment.
6.1.2 For emergency responders:
Avoid contact with skin, eyes and clothing.
Isolate hazard area and deny entry to unnecessary or unprotected personnel.
Use personal protective equipment.
Do not breathe fumes, vapour.
Do not operate electrical equipment.

6.2 Environmental precautions

Environmental precautions : Remove all possible sources of ignition in the surrounding area.
Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers.
Attempt to disperse the vapour or to direct its flow to a safe location, for example by using fog sprays.
Take precautionary measures against static discharge.
Ensure electrical continuity by bonding and grounding (earthing) all equipment.
Ventilate contaminated area thoroughly.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : If molten allow to congeal.
Attempt to disperse the vapour or to direct its flow to a safe location, for example by using fog sprays.
Do not use water in a jet.
For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely
For small liquid spills (< 1 drum), transfer by mechanical means to a labeled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.

6.4 Reference to other sections

For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet., For guidance on disposal of spilled material see Section 13 of this Safety Data Sheet.
Proper disposal should be evaluated based on regulatory status of this material (refer to Section 13), potential contamination from subsequent use and spillage, and regulations governing disposal in the local area.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Technical measures : Avoid breathing of or direct contact with material. Only use in

well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet.
Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
Ensure that all local regulations regarding handling and storage facilities are followed.

Advice on safe handling : Avoid exposure. Obtain special instructions before use.
Avoid inhaling vapour and/or mists.
Ventilate workplace in such a way that the Occupational Exposure Limit (OEL) is not exceeded.
Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks.
Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding (earthing) all equipment to reduce the risk.
The vapours in the head space of the storage vessel may lie in the flammable/explosive range and hence may be flammable.
Do not empty into drains.

Product Transfer : Lines should be purged with nitrogen before and after product transfer. Steam coils may be used as a heating medium. Refer to guidance under Handling section.

Hygiene measures : Wash hands before eating, drinking, smoking and using the toilet.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Refer to section 15 for any additional specific legislation covering the packaging and storage of this product.

Storage class (TRGS 510) : 11, Combustible Solids

Further information on storage stability : A reliable fixed sprinkler/deluge system should be installed.
Must be stored in a diked (bunded) well- ventilated area, away from sunlight, ignition sources and other sources of heat.
Tanks must be specifically designed for use with this product.
Tanks should be fitted with a vapour recovery system.
Nitrogen blanket recommended.
Tanks should be fitted with heating coils in areas where ambient conditions can result in handling temperatures below the freezing point/pour point of the product.
Cleaning, inspection and maintenance of storage tanks is a specialist operation, which requires the implementation of strict procedures and precautions.
These include issuing of work permits, gas-freeing of tanks, using a manned harness and lifelines and wearing air-supplied breathing apparatus.

Packaging material : Suitable material: Stainless steel.
Unsuitable material: Aluminium alloys., Copper., Zinc., For containers, or container linings avoid copper, copper alloys, zinc., For lines and fittings, avoid copper, copper alloys, zinc., Natural and synthetic rubbers.

Container Advice : Containers, even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers.

7.3 Specific end use(s)

Specific use(s) : Please refer to section 16 and/or the annexes for the registered uses under REACH.

Ensure that all local regulations regarding handling and storage facilities are followed.
See additional references that provide safe handling practices for liquids that are determined to be static accumulators: American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practices on Static Electricity).
IEC/TS 60079-32-1: Electrostatic hazards, guidance

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
Phenol	108-95-2	AGW (Vapour and aerosols)	2 ppm 8 mg/m3	DE TRGS 900
	Peak-limit: excursion factor (category): 2;(II)			
	Further information: Skin absorption			
Phenol		TWA	2 ppm 8 mg/m3	2009/161/EU
	Further information: Identifies the possibility of significant uptake through the skin, Indicative			
Phenol		STEL	4 ppm 16 mg/m3	2009/161/EU
	Further information: Identifies the possibility of significant uptake through the skin, Indicative			

Biological occupational exposure limits

Substance name	CAS-No.	Control parameters	Sampling time	Basis
Phenol	108-95-2	phenol: 120 mg/g creatinine (Urine)	Immediately after exposure or after working hours	TRGS 903

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Exposure routes	Potential health effects	Value
Phenol	Workers	Inhalation	Acute local effects	16 mg/m3
Phenol	Workers	Inhalation	Long-term systemic effects	8 mg/m3
Phenol	Workers	Dermal	Long-term systemic effects	1,23 mg/kg bw/day
Phenol	Consumers	Inhalation	Long-term systemic effects	1,32 mg/m3
Phenol	Consumers	Dermal	Long-term systemic effects	0,4 mg/kg bw/day
Phenol	Consumers	Oral	Long-term systemic effects	0,4 mg/kg bw/day

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

Substance name	Environmental Compartment	Value
Phenol		
Remarks:	Exposure assessments have not been presented for the environment therefore PNEC values not required.	

8.2 Exposure controls

Engineering measures

Read in conjunction with the Exposure Scenario for your specific use contained in the Annex.
Use sealed systems as far as possible.
Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits.
Local exhaust ventilation is recommended.
Eye washes and showers for emergency use.
Firewater monitors and deluge systems are recommended.
The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include:

Personal protective equipment

Read in conjunction with the Exposure Scenario for your specific use contained in the Annex.
The provided information is made in consideration of the PPE directive (Council Directive 89/686/EEC) and the CEN European Committee for Standardisation (CEN) standards.

Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Eye protection : Wear goggles for use against liquids and gas, combined with face shield.

Hand protection

Remarks : Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove sup-

pliers. Contaminated gloves should be replaced. Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection. Longer term protection: Viton. Butyl rubber. Incidental contact/Splash protection: Nitrile rubber gloves.
Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Glove thickness should be typically greater than 0.35 mm depending on the glove make and model. When handling heated product, wear heat resistant gloves, safety hat with chin strap, face shield (preferably with a chin guard), safety glasses, heat resistant coveralls (with cuffs over gloves and legs over boots), neck protection and heavy duty boots, e.g. leather for heat resistance.

Skin and body protection : Where risk of splashing or in spillage clean up, use chemical resistant one-piece overall with integral hood, chemical resistant knee length boots and chemical resistant gloves. Otherwise use chemical resistant apron and gauntlets.
When handling heated product, wear heat resistant gloves, safety hat with chin strap, face shield (preferably with a chin guard), safety glasses, heat resistant coveralls (with cuffs over gloves and legs over boots), neck protection and heavy duty boots, e.g. leather for heat resistance.

Respiratory protection : In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material.
If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation.
Check with respiratory protective equipment suppliers.
Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus.
Where air-filtering respirators are suitable, select an appropriate combination of mask and filter.
Where respiratory protective equipment is required, use a

full-face mask.
Select a filter suitable for organic gases and vapours [Type A boiling point > 65°C (149°F)] meeting EN14387.

Thermal hazards : When handling heated product, wear heat resistant gloves, safety hat with chin strap, face shield (preferably with a chin guard), safety glasses, heat resistant coveralls (with cuffs over gloves and legs over boots), neck protection and heavy duty boots, e.g. leather for heat resistance.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state : White crystals below 109º F. Clear liquid on melting.

Colour : Data not available

Odour : Phenolic, sweet

Odour Threshold : < 0,05 ppm

Melting point/freezing point : Typical 40,7 °C

Boiling point/boiling range : 181 °C

Flammability

Flammability (solid, gas) : Not applicable

Lower explosion limit and upper explosion limit / flammability limit

Upper explosion limit / upper flammability limit : 8,6 %(V)

Lower explosion limit / Lower flammability limit : 1,5 %(V)

Flash point : 79,4 °C
Method: Tag closed cup

Auto-ignition temperature : 716 °C

Decomposition temperature

Decomposition temperature : Data not available

pH : Data not available

Viscosity

Viscosity, dynamic : 3,6 mPa.s (50 °C)

		Method: ASTM D445
		< 50 mPa.s (41 °C) Method: ASTM D445
Viscosity, kinematic	:	3,4 mm2/s (50 °C) Method: ASTM D445
		1,1 mm2/s (100 °C) Method: ASTM D445
		2,6 mm2/s (60 °C) Method: ASTM D445
		4,2 mm2/s (41 °C) Method: ASTM D445
Solubility(ies)		
Water solubility	:	Moderate
Partition coefficient: n-octanol/water	:	log Pow: < 1,47
Vapour pressure	:	0,35 kPa (50 °C)
Relative density	:	1,1 Method: ASTM D4052
Density	:	1.071 kg/m3 (20 °C) Method: ASTM D4052
Relative vapour density	:	3,2
Particle characteristics		
Particle size	:	Data not available

9.2 Other information

Explosive properties	:	Not applicable
Oxidizing properties	:	Data not available
Evaporation rate	:	Data not available
Conductivity	:	3,5 µS/cm at 50 °C Method: ASTM D-4308
		Electrical conductivity: > 10,000 pS/m
		A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid, This material is not expected to be

a static accumulator.

Surface tension	:	Data not available
Molecular weight	:	94,1 g/mol

SECTION 10: Stability and reactivity

10.1 Reactivity

The product does not pose any further reactivity hazards in addition to those listed in the following sub-paragraph.

10.2 Chemical stability

No hazardous reaction is expected when handled and stored according to provisions
Reacts with strong oxidising agents.

10.3 Possibility of hazardous reactions

Hazardous reactions	:	Stable under normal conditions.

10.4 Conditions to avoid

Conditions to avoid	:	Exposure to air. Exposure to sunlight. Do not store or handle in aluminium equipment at temperatures above 120 ºF (48.9 ºC). Prevent vapour accumulation. Avoid heat, sparks, open flames and other ignition sources. In certain circumstances product can ignite due to static electricity.

10.5 Incompatible materials

Materials to avoid	:	Aluminum Zinc. Avoid contact with strong oxidizing agents, copper and copper alloys. Avoid contact with calcium hypochlorite.

10.6 Hazardous decomposition products

Hazardous decomposition products are not expected to form during normal storage.

SECTION 11: Toxicological information

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

Information on likely routes of exposure	:	Skin and eye contact are the primary routes of exposure although exposure may occur through inhalation or following accidental ingestion. This material penetrates the intact skin and eye rapidly as a liquid or mist, producing severe burns.

Acute toxicity

Components:

Phenol:

Acute oral toxicity	:	LD 50 (Rat): 340 - 530 mg/kg Method: Test(s) equivalent or similar to OECD Test Guideline 401 Remarks: Toxic if swallowed.
Acute inhalation toxicity	:	LC 50 (Rat, female): > 900 mg/m3 Exposure time: 8 h Test atmosphere: Aerosol Method: Test(s) equivalent or similar to OECD Test Guideline 403 Remarks: Toxic if inhaled.
Acute dermal toxicity	:	LD 50 (Rat, female): 660 mg/kg bw Method: Test(s) equivalent or similar to OECD Test Guideline 402 Remarks: Toxic in contact with skin.

Skin corrosion/irritation

Components:

Phenol:

Species	:	Rabbit
Method	:	Acceptable non-standard method.
Remarks	:	Causes severe skin burns and eye damage. Contact with hot material can cause thermal burns which may result in permanent skin damage and/or blindness.

Serious eye damage/eye irritation

Components:

Phenol:

Species	:	Rabbit
Method	:	Test(s) equivalent or similar to OECD Test Guideline 405
Remarks	:	Causes serious eye irritation. Contact with hot material can cause thermal burns which may result in permanent skin damage and/or blindness.

Respiratory or skin sensitisation

Components:

Phenol:

Species	:	Guinea pig

Method : Test(s) equivalent or similar to OECD Test Guideline 406
Remarks : Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Components:

Phenol:

Genotoxicity in vitro : Method: Test(s) equivalent or similar to OECD Test Guideline 473
Remarks: Suspected of causing genetic defects.

Method: Test(s) equivalent or similar to OECD Test Guideline 476
Remarks: Suspected of causing genetic defects.

Method: Test(s) equivalent or similar to OECD Test Guideline 487
Remarks: Suspected of causing genetic defects.

Genotoxicity in vivo : Species: Mouse
Method: Test(s) equivalent or similar to OECD Test Guideline 474
Remarks: Suspected of causing genetic defects.

Germ cell mutagenicity- Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Carcinogenicity

Components:

Phenol:

Species : Rat, male and female
Application Route : Oral
Method : Test(s) equivalent or similar to OECD Test Guideline 453
Remarks : Based on available data, the classification criteria are not met.
IARC Group 3: Not classifiable as to its carcinogenicity to humans.

Carcinogenicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Material	GHS/CLP Carcinogenicity Classification
Phenol	No carcinogenicity classification.

Material	Other Carcinogenicity Classification
Phenol	IARC: Group 3: Not classifiable as to its carcinogenicity to humans

Reproductive toxicity

Components:

Phenol:

Effects on fertility	:	Species: Rat Sex: male and female Application Route: Oral Method: Equivalent or similar to OECD Test Guideline 416 Remarks: Based on available data, the classification criteria are not met.
Reproductive toxicity - Assessment	:	This product does not meet the criteria for classification in categories 1A/1B.

STOT - single exposure

Components:

Phenol:

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

STOT - repeated exposure

Components:

Phenol:

Target Organs	:	Kidney, Liver, Skin, Central nervous system
Remarks	:	May cause damage to organs or organ systems through prolonged or repeated exposure. Kidney: can cause kidney damage. Liver: can cause liver damage. Respiratory system: caused breathing difficulty in animals. Heart: can cause heart damage

Repeated dose toxicity

Components:

Phenol:

Species	:	Rat, male and female
Application Route	:	Oral
Method	:	Test(s) equivalent or similar to OECD Test Guideline 451
Target Organs	:	Kidney, Liver, Skin, Central nervous system
Species	:	Rat, male and female
Application Route	:	Inhalation
Test atmosphere	:	vapour
Method	:	Test(s) equivalent or similar to OECD Test Guideline 412

Target Organs	:	Kidney, Liver, Skin, Central nervous system
Species	:	Rabbit
Application Route	:	Dermal
Method	:	Literature data
Target Organs	:	Kidney, Liver, Skin, Central nervous system

Aspiration toxicity

Components:

Phenol:

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

11.2 Information on other hazards

Endocrine disrupting properties

Product:

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

Further information

Product:

Remarks	:	Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Components:

Phenol:

Remarks	:	Classifications by other authorities under varying regulatory frameworks may exist.

SECTION 12: Ecological information

12.1 Toxicity

Components:

Phenol:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 8,9 mg/l Exposure time: 96 h Method: Other guideline method. Remarks: Very toxic.

Remarks: LL/EL/IL50 > 1 <= 10 mg/l

Toxicity to daphnia and other aquatic invertebrates : EC50 (Ceriodaphnia dubia (water flea)): 3,1 mg/l
Exposure time: 48 h
Method: Other guideline method.
Remarks: Very toxic.

Remarks: LL/EL/IL50 > 1 <= 10 mg/l

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (algae)): 61,1 mg/l
Exposure time: 96 h
Method: Other guideline method.
Remarks: Harmful

Remarks: LL/EL/IL50 >10 <= 100 mg/l

Toxicity to microorganisms : IC50 (Nitrosomonas): 21 mg/l
Exposure time: 24 h
Method: Other guideline method.
Remarks: Harmful

Remarks: LL/EL/IL50 >10 <= 100 mg/l

Toxicity to fish (Chronic toxicity) : NOEC: 0,077 mg/l
Exposure time: 60 d
Species: Mrigal (Cirrhinus mrigala)
Method: Other guideline method.
Remarks: Data not available

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 0,46 mg/l
Exposure time: 16 d
Species: Daphnia magna (Water flea)
Method: Other guideline method.
Remarks: Data not available

12.2 Persistence and degradability

Components:

Phenol:

Biodegradability : Biodegradation: 62 %
Exposure time: 100 h
Method: OECD Test Guideline 301C
Remarks: Readily biodegradable.

12.3 Bioaccumulative potential

Components:

Phenol:

Bioaccumulation : Species: Danio rerio (zebra fish)

Bioconcentration factor (BCF): 17,5
Method: OECD Test Guideline 305
Remarks: Contains components with the potential to bioaccumulate.

12.4 Mobility in soil

Components:

Phenol:

Mobility : Remarks: If the product enters soil, one or more constituents will or may be mobile and may contaminate groundwater.

12.5 Results of PBT and vPvB assessment

Components:

Phenol:

Assessment : The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not considered to be PBT or vPvB..

12.6 Endocrine disrupting properties

Product:

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

12.7 Other adverse effects

Product:

Additional ecological information : Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : Recover or recycle if possible.
It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.

Do not dispose into the environment, in drains or in water courses.
Waste product should not be allowed to contaminate soil or water.

Disposal should be in accordance with applicable regional, national, and local laws and regulations.
Local regulations may be more stringent than regional or national requirements and must be complied with.

Contaminated packaging : Drain container thoroughly.
After draining, vent in a safe place away from sparks and fire.

SECTION 14: Transport information

14.1 UN number or ID number

ADN	:	2312
ADR	:	2312
RID	:	2312
IMDG	:	2312
IATA	:	1671

14.2 UN proper shipping name

ADN	:	PHENOL, MOLTEN
ADR	:	PHENOL, MOLTEN
RID	:	PHENOL, MOLTEN
IMDG	:	PHENOL, MOLTEN
IATA	:	PHENOL, SOLID

14.3 Transport hazard class(es)

ADN	:	6.1
ADR	:	6.1
RID	:	6.1
IMDG	:	6.1
IATA	:	6.1

14.4 Packing group

ADN

Packing group	:	II
Classification Code	:	T1
Labels	:	6.1 (N3, S)
CDNI Inland Water Waste Agreement	:	NST 8191 Phenol

ADR

Packing group	:	II
Classification Code	:	T1
Hazard Identification Number	:	60
Labels	:	6.1

RID

Packing group : II
Classification Code : T1
Hazard Identification Number : 60
Labels : 6.1

IMDG
Packing group : II
Labels : 6.1

IATA
Packing group : II
Labels : 6.1

14.5 Environmental hazards

ADN
Environmentally hazardous : yes

ADR
Environmentally hazardous : no

RID
Environmentally hazardous : no

IMDG
Marine pollutant : no

14.6 Special precautions for user

Remarks : Special Precautions: Refer to Section 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport.

14.7 Maritime transport in bulk according to IMO instruments

Pollution category : Y
Ship type : 2
Product name : Phenol

Additional Information : This product may be transported under nitrogen blanketing. Nitrogen is an odourless and invisible gas. Exposure to nitrogen enriched atmospheres displaces available oxygen which may cause asphyxiation or death. Personnel must observe strict safety precautions when involved with a confined space entry.

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

SECTION 15: Regulatory information

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, : Not applicable

mixtures and articles (Annex XVII)

REACH - List of substances subject to authorisation (Annex XIV)	:	Product is not subject to Authorisation under REACH.
REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	This product does not contain substances of very high concern (Regulation (EC) No 1907/2006 (REACH), Article 57).

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.	H2	ACUTE TOXIC

Water hazard class (Germany)	:	WGK 2 obviously hazardous to water Code Number: 170 Remarks: Classification according to AwSV

Other regulations:

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

Product is subject Betriebs-Sicherheits-Verordnung (BetrSichV).
Compliance with paragraph 22 of Youth Employment Law.
Take note of Law on the protection of mothers at work, in education and in studies (Maternity Protection Act - MuSchG).
Product is subject to Stoerfallverordnung (12. BImSchV) based on Seveso III directive (2012/18/EU).

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

AIIC	:	Listed
DSL	:	Listed
IECSC	:	Listed
ENCS	:	Listed
KECI	:	Listed
NZIoC	:	Listed
PICCS	:	Listed
TCSI	:	Listed
TSCA	:	Listed

15.2 Chemical safety assessment

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

SECTION 16: Other information

Full text of other abbreviations

2009/161/EU	:	Europe. COMMISSION DIRECTIVE 2009/161/EU establishing a third list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Commission Directive 2000/39/EC
DE TRGS 900	:	Germany. TRGS 900 - Occupational exposure limit values.
TRGS 903	:	TRGS 903 - Biological limit values
2009/161/EU / TWA	:	Limit Value - eight hours
2009/161/EU / STEL	:	Short term exposure limit
DE TRGS 900 / AGW	:	Time Weighted Average

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Training advice	:	Provide adequate information, instruction and training for op-

erators.

Other information	:	For Industry guidance and tools on REACH please visit the CEFIC website at http://cefic.org/Industry-support. The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not considered to be PBT or vPvB. A vertical bar (|) in the left margin indicates an amendment from the previous version.
Sources of key data used to compile the Safety Data Sheet	:	The quoted data are from, but not limited to, one or more sources of information (e.g. toxicological data from Shell Health Services, material suppliers' data, CONCAWE, EU IUCLID date base, EC 1272 regulation, etc).

Identified Uses according to the Use Descriptor System

Uses - Worker
Title : Manufacture of substance
- Industrial

Uses - Worker
Title : Use as an intermediate
- Industrial

Uses - Worker
Title : Distribution of substance
- Industrial

Uses - Worker
Title : Formulation & (re)packing of substances and mixtures
- Industrial

Uses - Worker
Title : Uses in Coatings
- Industrial

Uses - Worker
Title : Uses in Coatings
- Professional

Uses - Worker
Title : Use as binders and release agents
- Industrial

Uses - Worker

Title	:	Use as binders and release agents - Professional

Uses - Worker

Title	:	Polymer production - Industrial

Uses - Worker

Title	:	Phenolic resin applications - Professional

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

DE / EN

Exposure Scenario - Worker

300000000662	
SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Manufacture of substance- Industrial
Use Descriptor	**Sector of Use**: SU3, SU8, SU9 **Process Categories**: PROC 1, PROC 2, PROC 3, PROC 8a, PROC 8b, PROC 15 **Environmental Release Categories**: ERC1, ERC4
Scope of process	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.

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**
Additional Information	No exposure assessment presented for the environment.
Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Solid, low dustiness Liquid, vapour pressure < 0.5 kPa at STP
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently).	
Contributing Scenarios	**Risk Management Measures**
General measures (corrosives)	Handle substance within a closed system. Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)elevated temperature	No other specific measures identified.

Bulk product storage	Store substance within a closed system.
Use in contained batch processes	Avoid carrying out activities involving exposure for more than 4 hours Sample via a closed loop or other system to avoid exposure
Bulk transfers	Use dedicated equipment. Transfer via enclosed lines. Clear transfer lines prior to de-coupling.
Drum/batch transfers	Use dedicated equipment. Avoid carrying out activities involving exposure for more than 1 hour.
Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle.
Laboratory activities	Handle in a fume cupboard or under extract ventilation.
Section 2.2	**Control of Environmental Exposure**
No exposure assessment presented for the environment.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment
No exposure assessment presented for the environment.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO**
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	

Section 4.2 -Environment
No exposure assessment presented for the environment.

Exposure Scenario - Worker

300000000664	
SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Use as an intermediate- Industrial
Use Descriptor	**Sector of Use**: SU3, SU8, SU9 **Process Categories**: PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 15 **Environmental Release Categories**: ERC6a
Scope of process	Use of substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**
Additional Information	No exposure assessment presented for the environment.
Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Solid, low dustiness Liquid, vapour pressure < 0.5 kPa at STP
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently).	
Contributing Scenarios	**Risk Management Measures**
General measures (corrosives)	Handle substance within a closed system. Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
Bulk product storage	Store substance within a closed system.
Bulk transfers	Use dedicated equipment.

	Transfer via enclosed lines. Clear transfer lines prior to de-coupling.
Drum/batch transfers	Use dedicated equipment. Ensure material transfers are under containment or extract ventilation. , or: Avoid carrying out activities involving exposure for more than 1 hour.
Product sampling.	Ensure dedicated sample points are provided. Avoid carrying out activities involving exposure for more than 1 hour.
Laboratory activities	Handle in a fume cupboard or under extract ventilation.
General exposures (closed systems)	No other specific measures identified.
General exposures (open systems)	Minimise exposure by extracted full enclosure for the operation or equipment.
Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle.
Section 2.2	**Control of Environmental Exposure**
No exposure assessment presented for the environment.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment
No exposure assessment presented for the environment.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO**
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	

Section 4.2 -Environment
No exposure assessment presented for the environment.

Exposure Scenario - Worker

300000000663	
SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Distribution of substance- Industrial
Use Descriptor	**Sector of Use**: SU3, SU8, SU9 **Process Categories**: PROC 1, PROC 2, PROC 3, PROC 8a, PROC 8b, PROC 9, PROC 15 **Environmental Release Categories**: ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC 6C,, ERC7
Scope of process	Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**
Additional Information	No exposure assessment presented for the environment.
Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Solid, low dustiness Liquid, vapour pressure < 0.5 kPa at STP
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently).	
Contributing Scenarios	**Risk Management Measures**
General measures (corrosives)	Handle substance within a closed system. Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
Bulk product storage	Store substance within a closed system.
Bulk transfers	Use dedicated equipment.

	Transfer via enclosed lines. Clear transfer lines prior to de-coupling.
Drum/batch transfers	Use dedicated equipment. Ensure material transfers are under containment or extract ventilation. , or: Avoid carrying out activities involving exposure for more than 1 hour.
Product sampling.	Ensure dedicated sample points are provided. Avoid carrying out activities involving exposure for more than 1 hour.
Laboratory activities	Handle in a fume cupboard or under extract ventilation.
Drum and small package filling	Fill containers/cans at dedicated filling points supplied with local extract ventilation.
Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle.
Section 2.2	**Control of Environmental Exposure**
No exposure assessment presented for the environment.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment
No exposure assessment presented for the environment.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO**
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	

Section 4.2 -Environment
No exposure assessment presented for the environment.

Exposure Scenario - Worker

300000000665	
SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Formulation & (re)packing of substances and mixtures- Industrial
Use Descriptor	**Sector of Use**: SU3, SU10 **Process Categories**: PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 9, PROC 14, PROC 15 **Environmental Release Categories**: ERC2
Scope of process	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**
Additional Information	No exposure assessment presented for the environment.
Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Solid, low dustiness Liquid, vapour pressure < 0.5 kPa at STP
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently).	
Contributing Scenarios	**Risk Management Measures**
General measures (corrosives)	Handle substance within a closed system. Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
Bulk product storage	Store substance within a closed system.

Bulk transfers	Use dedicated equipment. Transfer via enclosed lines. Clear transfer lines prior to de-coupling.
Drum/batch transfers	Use dedicated equipment. Ensure material transfers are under containment or extract ventilation. , or: Avoid carrying out activities involving exposure for more than 1 hour.
Product sampling.	Ensure dedicated sample points are provided. Avoid carrying out activities involving exposure for more than 1 hour.
Laboratory activities	Handle in a fume cupboard or under extract ventilation.
Mixing operations (closed systems)	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).
Mixing operations (open systems)	Minimise exposure by extracted full enclosure for the operation or equipment.
Batch processes at elevated temperatures	Provide extraction ventilation at points where emissions occur.
Material transfers	Ensure material transfers are under containment or extract ventilation.
Drum and small package filling	Fill containers/cans at dedicated filling points supplied with local extract ventilation.
Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle.
Section 2.2	**Control of Environmental Exposure**
No exposure assessment presented for the environment.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment
No exposure assessment presented for the environment.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE**

	EXPOSURE SCENARIO
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	

Section 4.2 -Environment
No exposure assessment presented for the environment.

Exposure Scenario - Worker

300000000704	
SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Uses in Coatings- Industrial
Use Descriptor	**Sector of Use**: SU3 **Process Categories**: PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 7, PROC 8a, PROC 8b, PROC 10, PROC 13, PROC 15 **Environmental Release Categories**: ERC4
Scope of process	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.

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**
Additional Information	No exposure assessment presented for the environment.
Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently).	
Contributing Scenarios	**Risk Management Measures**
General measures (corrosives)	Handle substance within a closed system. Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	No other specific measures identified.

Use in contained batch processesMixing operations (closed systems)	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).
Mixing operations (open systems)Batch process	Minimise exposure by extracted full enclosure for the operation or equipment.
Film formation - force drying, stoving and other technologies.	Minimise exposure by extracted full enclosure for the operation or equipment.
Film formation - air drying	Use ventilation to extract vapours from freshly coated articles/objects.
Spraying/ fogging by machine application	Carry out in a vented booth provided with laminar airflow. Automate activity where possible.
Rolling, Brushing	Use long handled brushes and rollers where possible. Provide extraction ventilation at points where emissions occur.
Dipping, immersion and pouring	Provide extraction ventilation at points where emissions occur.
Laboratory activities	Handle in a fume cupboard or under extract ventilation.
Material transfersBulk product storage	Ensure material transfers are under containment or extract ventilation. Store substance within a closed system.
Bulk transfers	Use dedicated equipment. Transfer via enclosed lines. Clear transfer lines prior to de-coupling.
Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle.
Section 2.2	**Control of Environmental Exposure**
No exposure assessment presented for the environment.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment
No exposure assessment presented for the environment.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE**

	EXPOSURE SCENARIO
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	

Section 4.2 -Environment
No exposure assessment presented for the environment.

Exposure Scenario - Worker

300000000708	
SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Uses in Coatings- Professional
Use Descriptor	**Sector of Use**: SU22 **Process Categories**: PROC 5, PROC 8a, PROC 10, PROC 13 **Environmental Release Categories**: ERC8a, ERC8d
Scope of process	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.

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**
Additional Information	No exposure assessment presented for the environment.
Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently).	
Contributing Scenarios	**Risk Management Measures**
General measures (corrosives)	Handle substance within a closed system. Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
Filling/ preparation of equipment from drums or containers.	Ensure material transfers are under containment or extract ventilation. Avoid carrying out activities involving exposure for more than

	1 hour.
General exposures (closed systems)Use in contained systems	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).
Preparation of material for application	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Avoid carrying out activities involving exposure for more than 1 hour.
Mixing operations (open systems)	Minimise exposure by extracted full enclosure for the operation or equipment.
Film formation - air drying	Use ventilation to extract vapours from freshly coated articles/objects.
Material transfersDrum/batch transfers	Use drum pumps or carefully pour from container.
Roller, spreader, flow application	Limit the substance content in the product to 25 %. Use long handled brushes and rollers where possible. Provide extraction ventilation at points where emissions occur. Avoid carrying out activities involving exposure for more than 1 hour.
Spraying/ fogging by manual application	Limit the substance content in the product to 25 %. Carry out in a vented booth or extracted enclosure. Wear a respirator conforming to EN140 with Type A filter or better. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
Dipping, immersion and pouring	Limit the substance content in the product to 25 %. Provide extraction ventilation at points where emissions occur.
Laboratory activities	Handle in a fume cupboard or under extract ventilation.
Equipment cleaning and maintenance	Drain down system prior to equipment opening or maintenance. Avoid carrying out activities involving exposure for more than 1 hour.
Section 2.2	**Control of Environmental Exposure**
No exposure assessment presented for the environment.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment
No exposure assessment presented for the environment.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO**
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	

Section 4.2 -Environment
No exposure assessment presented for the environment.

Exposure Scenario - Worker

300000000712	
SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Use as binders and release agents- Industrial
Use Descriptor	**Sector of Use**: SU3 **Process Categories**: PROC 1, PROC 2, PROC 3, PROC 4, PROC 6, PROC 7, PROC 8a, PROC 8b, PROC 10, PROC 13, PROC 14 **Environmental Release Categories**: ERC4
Scope of process	Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing), and handling of waste.

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**
Additional Information	No exposure assessment presented for the environment.
Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently).	
Contributing Scenarios	**Risk Management Measures**
General measures (corrosives)	Handle substance within a closed system. Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
Material transfers(closed systems)	Ensure material transfers are under containment or extract ventilation. Store substance within a closed system.
Material transfersBatch	Transfer via enclosed lines.

process	Clear transfer lines prior to de-coupling.
Drum/batch transfers	Use dedicated equipment. Use drum pumps. , or: Transfer via enclosed lines. Clear transfer lines prior to de-coupling.
Mixing operations (closed systems)	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).
Mixing operations (open systems)	Provide extraction ventilation at points where emissions occur.
Mold forming	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.
Casting operations	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.
Spraying/ fogging by manual application	Carry out in a vented booth or extracted enclosure. Wear a respirator conforming to EN140 with Type A filter or better. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
Spraying/ fogging by machine application	Carry out in a vented booth provided with laminar airflow. Automate activity where possible.
ManualRolling, Brushing	Use long handled brushes and rollers where possible. Provide extraction ventilation at points where emissions occur.
Bulk product storage	Store substance within a closed system.
Section 2.2	**Control of Environmental Exposure**
No exposure assessment presented for the environment.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment
No exposure assessment presented for the environment.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE**

	EXPOSURE SCENARIO
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	

Section 4.2 -Environment
No exposure assessment presented for the environment.

Exposure Scenario - Worker

300000000716	
SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Use as binders and release agents- Professional
Use Descriptor	**Sector of Use**: SU22 **Process Categories**: PROC 1, PROC 2, PROC 3, PROC 4, PROC 6, PROC 8a, PROC 8b, PROC 10, PROC 11, PROC 14 **Environmental Release Categories**: ERC8a, ERC8d
Scope of process	Covers the use as binders and release agents including material transfers, mixing, application by spraying, brushing, and handling of waste.

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**
Additional Information	No exposure assessment presented for the environment.
Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently).	
Contributing Scenarios	**Risk Management Measures**
General measures (corrosives)	Handle substance within a closed system. Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
Material transfers(closed systems)	Ensure material transfers are under containment or extract ventilation. Store substance within a closed system.
Material transfersBatch	Transfer via enclosed lines.

process	Avoid carrying out activities involving exposure for more than 1 hour.
Drum/batch transfers	Use dedicated equipment. Use drum pumps. , or: Clear transfer lines prior to de-coupling. Avoid carrying out activities involving exposure for more than 1 hour.
Mixing operations (closed systems)	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).
Mixing operations (open systems)	Provide extraction ventilation at points where emissions occur. Automate activity where possible. , or: Use long handled tools where possible.
Mold forming	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Avoid carrying out activities involving exposure for more than 4 hours
Casting operations	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Avoid carrying out activities involving exposure for more than 4 hours
Spraying/ fogging by manual application	Limit the substance content in the product to 25 %. Carry out in a vented booth or extracted enclosure. Wear a respirator conforming to EN140 with Type A filter or better. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
Spraying/ fogging by machine application	Carry out in a vented booth provided with laminar airflow. Automate activity where possible.
ManualRolling, Brushing	Use long handled brushes and rollers where possible. Provide extraction ventilation at points where emissions occur. Avoid carrying out activities involving exposure for more than 1 hour.
Bulk product storage	Put lids on containers immediately after use.
Section 2.2	**Control of Environmental Exposure**
No exposure assessment presented for the environment.	

SECTION 3	EXPOSURE ESTIMATION

Section 3.1 - Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

Section 3.2 -Environment

No exposure assessment presented for the environment.

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO

Section 4.1 - Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Section 4.2 -Environment

No exposure assessment presented for the environment.

Exposure Scenario - Worker

300000000718	
SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Polymer production- Industrial
Use Descriptor	**Sector of Use**: SU3, SU10 **Process Categories**: PROC 1, PROC 2, PROC 3, PROC 8a, PROC 8b, PROC 15 **Environmental Release Categories**: ERC 6C
Scope of process	Manufacture of polymers from monomers in continuous and batch processes. Including production, re-cycling and recovery, degassing, discharging, reactor maintenance and immediate polymer product formation (i.e. compounding, pelletisation, product off-gassing).

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**
Additional Information	No exposure assessment presented for the environment.
Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently).	
Contributing Scenarios	**Risk Management Measures**
General measures (corrosives)	Handle substance within a closed system. Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
Bulk transferswith sample collection	Store substance within a closed system. Ensure dedicated sample points are provided.
Polymerisation (bulk and	Ensure dedicated sample points are provided.

batch)Continuous process-with sample collection	
Polymerisation (bulk and batch)Batch processwith sample collection	Ensure dedicated sample points are provided.
Finishing operations	Limit the substance content in the product to 1 %.
Intermediate polymer storage	Limit the substance content in the product to 1 %.
Additivation and stabilisation	Limit the substance content in the product to 1 %.
Bulk product storage	No other specific measures identified.
Product packaging	Limit the substance content in the product to 1 %.
Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle.
Section 2.2	**Control of Environmental Exposure**
No exposure assessment presented for the environment.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment
No exposure assessment presented for the environment.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO**
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	

Section 4.2 -Environment
No exposure assessment presented for the environment.

Exposure Scenario - Worker

300000000721	
SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Phenolic resin applications- Professional
Use Descriptor	**Sector of Use**: SU22 **Process Categories**: PROC10, PROC11, PROC2, PROC3, PROC4, PROC6, PROC8a, PROC8b **Environmental Release Categories**: ERC8a, ERC8d
Scope of process	Covers the use in reactive resins including material transfers, mixing, application by e.g. spraying, brushing, dipping, casting and moulding, curing, and handling of waste.

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**
Additional Information	No exposure assessment presented for the environment.
Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently).	
Contributing Scenarios	**Risk Management Measures**
General measures (corrosives)	Handle substance within a closed system. Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
Bulk product storage	Store substance within a closed system. Put lids on containers immediately after use.
Material transfers(closed systems)	Ensure material transfers are under containment or extract ventilation. Store substance within a closed system.

Material transfersBatch process	Transfer via enclosed lines. Clear transfer lines prior to de-coupling. Avoid carrying out activities involving exposure for more than 1 hour.
Drum/batch transfers	Use dedicated equipment. Use drum pumps. , or: Transfer via enclosed lines. Clear transfer lines prior to de-coupling. Avoid carrying out activities involving exposure for more than 1 hour.
Pouring from small containers	Carefully pour from containers. Avoid carrying out activities involving exposure for more than 15 minutes.
Mixing operations (closed systems)	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).
Mixing operations (open systems)	Provide extraction ventilation at points where emissions occur. Automate activity where possible. , or: Use long handled tools where possible.
Mold forming	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Avoid carrying out activities involving exposure for more than 4 hours
Casting operations	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Avoid carrying out activities involving exposure for more than 4 hours
Spraying/ fogging by manual application	Limit the substance content in the product to 25 %. Carry out in a vented booth or extracted enclosure. Wear a respirator conforming to EN140 with Type A filter or better. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
Spraying/ fogging by machine application	Carry out in a vented booth provided with laminar airflow. Automate activity where possible.
ManualRolling, Brushing	Use long handled brushes and rollers where possible. Provide extraction ventilation at points where emissions occur.

	Avoid carrying out activities involving exposure for more than 1 hour.
Dipping, immersion and pouring	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Avoid carrying out activities involving exposure for more than 4 hours
Production or preparation or articles by tabletting, compression, extrusion or pelletisation	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Avoid carrying out activities involving exposure for more than 4 hours
Injection moulding of articles	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Avoid carrying out activities involving exposure for more than 4 hours
Product packaging	Limit the substance content in the product to 1 %. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).
Section 2.2	**Control of Environmental Exposure**
No exposure assessment presented for the environment.	

SECTION 3	**EXPOSURE ESTIMATION**
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment
No exposure assessment presented for the environment.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO**
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	

Section 4.2 -Environment
No exposure assessment presented for the environment.