

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

## Caustic Soda PEARL/SOLID

Version 3.0

Print Date 2013/07/26

Revision date / valid from 2013/07/26

MSDS code: MCSF001

### Section 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1. Product identifier

Trade name : Caustic Soda PEARL/SOLID  
 Substance name : sodium hydroxide  
 Index-No. : 011-002-00-6  
 CAS-No. : 1310-73-2  
 EC-No. : 215-185-5  
 Registration number : 01-2119457892-27-xxxx

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

Use of the Substance/Mixture : Identified use: See table in front of appendix for a complete overview of identified uses.  
 Uses advised against : At this moment we have not identified any uses advised against

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

Company : Brenntag UK & Ireland  
 Albion House, Rawdon Park  
 GB LS19 7XX Leeds Yeadon  
 Telephone : +44 (0) 113 3879 200  
 Telefax : +44 (0) 113 3879 280  
 E-mail address : msds@brenntag.co.uk

#### 1.4. Emergency telephone number

Emergency telephone number : Emergency only telephone number (open 24 hours):  
 +44 (0) 1865 407333 (N.C.E.C. Culham)

### Section 2: Hazards identification

#### 2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

REGULATION (EC) No 1272/2008			
Hazard class	Hazard category	Target Organs	Hazard statements
Corrosive to metals	Category 1	---	H290
Skin corrosion/irritation	Category 1A	---	H314

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

### Classification according to EU Directives 67/548/EEC or 1999/45/EC

Directive 67/548/EEC or 1999/45/EC	
Hazard symbol / Category of danger	Risk phrases
Corrosive (C)	R35


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

### Most important adverse effects

- Human Health : See section 11 for toxicological information.
- Physical and chemical hazards : See section 9 for physicochemical information.
- Potential environmental effects : See section 12 for environmental information.

## 2.2. Label elements

### Labelling according to Regulation (EC) No 1272/2008

- Hazard symbols : 
- Signal word : Danger
- Hazard statements : H290 May be corrosive to metals.  
H314 Causes severe skin burns and eye damage.
- Precautionary statements
- Prevention : P234 Keep only in original container.  
P260 Do not breathe dust.  
P280 Wear protective gloves/ eye protection/ face protection.
- Response : P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.  
P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.  
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

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### Hazardous components which must be listed on the label:

- sodium hydroxide

### 2.3. Other hazards

For Results of PBT and vPvB assessment see section 12.5.

## Section 3: Composition/information on ingredients

### 3.1. Substances

Hazardous components	Amount [%]	Classification (REGULATION (EC) No 1272/2008)		Classification (67/548/EEC)
		Hazard class / Hazard category	Hazard statements	
<b>sodium hydroxide</b>				
Index-No. : 011-002-00-6		Met. Corr.1	H290	Corrosive; C; R35
CAS-No. : 1310-73-2	<= 100	Skin Corr.1A	H314	
EC-No. : 215-185-5				
Registration : 01-2119457892-27-xxxx				

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

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

## Section 4: First aid measures

### 4.1. Description of first aid measures

General advice	: Take off contaminated clothing and shoes immediately.
If inhaled	: In case of accident by inhalation: remove casualty to fresh air and keep at rest. If breathing is irregular or stopped, administer artificial respiration. Call a physician immediately.
In case of skin contact	: Wash off immediately with plenty of water for at least 15 minutes. Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.
In case of eye contact	: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Consult an eye specialist immediately. Go to an ophthalmic hospital if possible.
If swallowed	: Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Call a physician immediately. If a person vomits when lying on his back, place him in the recovery position.

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

Symptoms	: See Section 11 for more detailed information on health effects and symptoms.
Effects	: See Section 11 for more detailed information on health effects and symptoms.

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

Treatment	: Treat symptomatically. No further information available.
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## Section 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media	: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. The product itself does not burn.
Unsuitable extinguishing media	: No information available.

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

Specific hazards during firefighting	: Forms slippery/greasy layers with water.
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### 5.3. Advice for firefighters

Special protective equipment for firefighters	: In the event of fire, wear self-contained breathing apparatus. Wear appropriate body protection (full protective suit)
Further information	: Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

## Section 6: Accidental release measures

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

Personal precautions	: Use personal protective equipment. Keep away unprotected persons. Avoid dust formation. Avoid contact with the skin and the eyes. Do not breathe dust. For personal protection see section 8.
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### 6.2. Environmental precautions

Environmental precautions	: Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration. If the product contaminates rivers and lakes or drains inform respective authorities.
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### 6.3. Methods and materials for containment and cleaning up

Methods and materials for containment and cleaning	: Use mechanical handling equipment. Keep in suitable, closed containers for disposal.
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up

Further information : Danger of slipping if spilled Treat recovered material as described in the section "Disposal considerations".

### 6.4. Reference to other sections

See Section 1 for emergency contact information.  
See Section 8 for information on personal protective equipment.  
See Section 13 for waste treatment information.

## Section 7: Handling and storage

### 7.1. Precautions for safe handling

Advice on safe handling : Keep container tightly closed. Use personal protective equipment. Avoid dust formation. Provide sufficient air exchange and/or exhaust in work rooms. Avoid contact with the skin and the eyes. Do not breathe dust. Emergency eye wash fountains and emergency showers should be available in the immediate vicinity.

Hygiene measures : Keep away from food, drink and animal feedingstuffs. Smoking, eating and drinking should be prohibited in the application area. Wash hands before breaks and at the end of workday. Take off contaminated clothing and shoes immediately.

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

Requirements for storage areas and containers : Keep in an area equipped with alkali resistant flooring. Store in original container.

Advice on protection against fire and explosion : The product is not flammable. Normal measures for preventive fire protection.

Further information on storage conditions : Keep tightly closed in a dry and cool place. Product is hygroscopic.

Advice on common storage : Keep away from food, drink and animal feedingstuffs. Do not store together with acids and ammonium salts. Materials to avoid: Organic peroxides

German storage class : 8B: Non-combustible substances, corrosive

### 7.3. Specific end use(s)

Specific use(s) : Identified use: See table in front of appendix for a complete overview of identified uses.

## Section 8: Exposure controls/personal protection

### 8.1. Control parameters

## Caustic Soda PEARL/SOLID

### Derived No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)

DNEL		
Workers, Inhalation	:	1 mg/m <sup>3</sup>
Short-term exposition		
DNEL		
Population, Inhalation	:	1 mg/m <sup>3</sup>
Long-term exposition		

<b>Component:</b>	<b>sodium hydroxide</b>	<b>CAS-No.</b>
		<b>1310-73-2</b>

### Other Occupational Exposure Limit Values

EH40 WEL, Short Term Exposure Limit (STEL):  
2 mg/m<sup>3</sup>

ELV (IE), Short Term Exposure Limit (STEL):  
2 mg/m<sup>3</sup>

## 8.2. Exposure controls

### Appropriate engineering controls

Refer to protective measures listed in sections 7 and 8.  
Emergency eye wash fountains and emergency showers should be available in the immediate vicinity.

### Personal protective equipment

#### *Respiratory protection*

Advice : Required if dust is released  
Recommended Filter type:  
Particle filter:P2  
Particle filter:P3

#### *Hand protection*

Advice : The glove material has to be impermeable and resistant to the product / the substance / the preparation.  
Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).  
The following materials are suitable:  
fluorocarbon rubber  
polychloroprene  
natural rubber  
butyl-rubber  
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

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Protective gloves should be replaced at first signs of wear.

### *Eye protection*

Advice : Tightly fitting safety goggles

### *Skin and body protection*

Advice : impervious clothing

### **Environmental exposure controls**

General advice : Do not flush into surface water or sanitary sewer system.  
Avoid subsoil penetration.  
If the product contaminates rivers and lakes or drains inform respective authorities.

## Section 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Form	: solid
Colour	: white
Odour	: odourless
Odour Threshold	: no data available
pH	: > 14 (100 g/l; 20 °C)
Melting point/range	: 323 °C (1013 hPa)
Boiling point/boiling range	: 1,388 °C (1013 hPa)
Flash point	: not applicable
Evaporation rate	: negligible
Flammability (solid, gas)	: The product is not flammable.
Upper explosion limit	: not applicable
Lower explosion limit	: not applicable
Vapour pressure	: not applicable
Relative vapour density	: not applicable
Density	: 2.13 g/cm <sup>3</sup>
Water solubility	: 1000 g/l (25 °C)

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Solubility in other solvents	:	139 g/l (Ethanol; 20 °C)
		238 g/l (methanol; 20 °C)
Partition coefficient: n-octanol/water	:	no data available
Auto-ignition temperature	:	not applicable
Thermal decomposition	:	no data available
Viscosity, dynamic	:	not applicable
Explosivity	:	Product is not explosive.
Oxidizing properties	:	no data available

### 9.2. Other information

No further information available.

## Section 10: Stability and reactivity

### 10.1. Reactivity

Advice : Reacts with acids.  
Gives off hydrogen by reaction with base metals (zinc, aluminium).

### 10.2. Chemical stability

Advice : Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

Hazardous reactions : Gives off hydrogen by reaction with base metals (zinc, aluminium). Reacts exothermic with water Reacts exothermic with acids.

### 10.4. Conditions to avoid

Conditions to avoid : Protect from humidity and keep away from water. Product is hygroscopic.

### 10.5. Incompatible materials

Materials to avoid : Materials to avoid: Acids, Light metals, Water, Alcohols

### 10.6. Hazardous decomposition products

Hazardous decomposition products : No information available.

## Section 11: Toxicological information



## Caustic Soda PEARL/SOLID

### 11.1. Information on toxicological effects

#### Acute toxicity

##### Oral

If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach.

##### Inhalation

Please find this information in the listing of the component/components below in the MSDS.

##### Dermal

Please find this information in the listing of the component/components below in the MSDS.

#### Irritation

##### Skin

Result : May cause serious corrosive damage with deep slow-healing ulcer. Even dilute solution burns. First the skin feels slippery-later pain, blistering & ulcer may occur.

##### Eyes

Result : Splashes in the eyes may cause painful burns, which may result in permanent damage to the eyes.

#### Sensitisation

Result : No sensitizing effect known.

#### CMR effects

##### CMR Properties

Carcinogenicity : Please find this information in the listing of the component/components below in the MSDS.

Mutagenicity : Please find this information in the listing of the component/components below in the MSDS.

Teratogenicity : no data available

Reproductive toxicity : Please find this information in the listing of the component/components below in the MSDS.

**Caustic Soda PEARL/SOLID**
**Specific Target Organ Toxicity**
**Single exposure**

remark : The substance or mixture is not classified as specific target organ toxicant, single exposure.

**Repeated exposure**

remark : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

**Other toxic properties**
**Aspiration hazard**

No aspiration toxicity classification

<b>Component:</b>	<b>sodium hydroxide</b>	<b>CAS-No.</b>
		<b>1310-73-2</b>

**Acute toxicity**
**Oral**

no data available

**Inhalation**

no data available

**Dermal**

no data available

**Irritation**
**Skin**

Result : Very corrosive (rabbit)

**Eyes**

Result : Very corrosive (rabbit)  
Risk of serious damage to eyes.

**Sensitisation**

Result : Patch test on human volunteers did not demonstrate sensitisation properties.

## Caustic Soda PEARL/SOLID

### CMR effects

#### CMR Properties

Carcinogenicity	:	No experimental references for cancerogenity available.
Mutagenicity	:	In vitro tests did not show mutagenic effects In vivo tests did not show mutagenic effects
Teratogenicity	:	no data available
Reproductive toxicity	:	Not expected to be impair fertility.

### Specific Target Organ Toxicity

#### Single exposure

remark	:	The substance or mixture is not classified as specific target organ toxicant, single exposure.
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#### Repeated exposure

remark	:	The substance or mixture is not classified as specific target organ toxicant, repeated exposure.
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### Other toxic properties

#### Aspiration hazard

No aspiration toxicity classification

## Section 12: Ecological information

### 12.1. Toxicity

<b>Component:</b>	<b>sodium hydroxide</b>	<b>CAS-No.</b> <b>1310-73-2</b>
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#### Acute toxicity

##### Fish

LC50	:	125 mg/l (Gambusia affinis; 96 h)
LC50	:	145 mg/l (Poecilia reticulata; 24 h)

#### Toxicity to daphnia and other aquatic invertebrates

EC50	:	76 mg/l (Daphnia magna; 24 h)
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### Bacteria

EC50 : 22 mg/l (Photobacterium phosphoreum; 15 min)

### 12.2. Persistence and degradability

<b>Component:</b>	<b>sodium hydroxide</b>	<b>CAS-No.</b>
		<b>1310-73-2</b>

### Persistence and degradability

#### Persistence

Result : no data available

#### Biodegradability

Result : The methods for determining biodegradability are not applicable to inorganic substances.

### 12.3. Bioaccumulative potential

<b>Component:</b>	<b>sodium hydroxide</b>	<b>CAS-No.</b>
		<b>1310-73-2</b>

### Bioaccumulation

Result : Does not bioaccumulate.

### 12.4. Mobility in soil

<b>Component:</b>	<b>sodium hydroxide</b>	<b>CAS-No.</b>
		<b>1310-73-2</b>

### Mobility

: The product is mobile in water environment.

### 12.5. Results of PBT and vPvB assessment

<b>Component:</b>	<b>sodium hydroxide</b>	<b>CAS-No.</b>
		<b>1310-73-2</b>

### Results of PBT and vPvB assessment

Result : no data available

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### 12.6. Other adverse effects

#### Additional ecological information

Result : Harmful effects to aquatic organisms due to pH-shift.  
Neutralization is normally necessary before waste water is discharged into water treatment plants.  
Do not flush into surface water or sanitary sewer system.

## Section 13: Disposal considerations

### 13.1. Waste treatment methods

Product : Disposal together with normal waste is not allowed. Special disposal required according to local regulations. Do not let product enter drains. Contact waste disposal services.

Contaminated packaging : Empty contaminated packagings thoroughly. They can be recycled after thorough and proper cleaning. Packagings that cannot be cleaned are to be disposed of in the same manner as the product.

European Waste Catalogue Number : No waste code according to the European Waste Catalogue can be assigned for this product, as the intended use dictates the assignment. The waste code is established in consultation with the regional waste disposer.

## Section 14: Transport information

### 14.1. UN number

1823

### 14.2. UN proper shipping name

ADR : SODIUM HYDROXIDE, SOLID  
RID : SODIUM HYDROXIDE, SOLID  
IMDG : SODIUM HYDROXIDE, SOLID

### 14.3. Transport hazard class(es)

ADR-Class : 8  
(Labels; Classification Code; Hazard identification No; Tunnel restriction code) 8; C6; 80; (E)

RID-Class : 8  
(Labels; Classification Code; Hazard identification No) 8; C6; 80

IMDG-Class : 8  
(Labels; EmS) 8; F-A, S-B

## Caustic Soda PEARL/SOLID

### 14.4. Packaging group

ADR : II  
 RID : II  
 IMDG : II

### 14.5. Environmental hazards

Labeling according to 5.2.1.8 ADR : no  
 Labeling according to 5.2.1.8 RID : no  
 Labeling according to 5.2.1.6.3 IMDG : no  
 Classification as environmentally hazardous according to 2.9.3 IMDG : no  
 Classified as "P" according to 2.10 IMDG : no

### 14.6. Special precautions for user

Not applicable.

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

IMDG : Not applicable.

## Section 15: Regulatory information

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

#### sodium hydroxide



EU. Regulation No 1451/2007 [Biocides], Annex I, Active substances identified as existing (OJ (L 325)  
 Listed EC Number: 215-185-5

:

#### Notification status

##### sodium hydroxide:

Regulatory List	Notification	Notification number
AICS	YES	
DSL	YES	
EINECS	YES	215-185-5
ENCS (JP)	YES	(2)-1972
ENCS (JP)	YES	(1)-410
INV (CN)	YES	
ISHL (JP)	YES	(2)-1972
ISHL (JP)	YES	(1)-410
KECI (KR)	YES	KE-31487
KECI (KR)	YES	97-1-136
NZIOC	YES	HSR001547
PICCS (PH)	YES	
TSCA	YES	

**Caustic Soda PEARL/SOLID****15.2. Chemical Safety Assessment**

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

**Section 16: Other information****Full text of R-phrases referred to under sections 2 and 3.**

R35 Causes severe burns.

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

H290 May be corrosive to metals.  
H314 Causes severe skin burns and eye damage.

**Further information**

Other information : Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use. The information provided in this Safety Data Sheet is correct to our knowledge at the date of its revision. The information given only describes the products with regard to safety arrangements and is not to be considered as a warranty or quality specification and does not constitute a legal relationship.  
The information contained in this Safety Data Sheet relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text

|| Indicates updated section.

## Caustic Soda PEARL/SOLID

No.	Short title	Main User Group (SU)	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Environmental Release Category (ERC)	Article Category (AC)	Specified
1	Manufacture of substance - liquid	3	8	NA	1, 2, 3, 4, 8a, 8b, 9	1	NA	ES035
2	Manufacture of substance - solid	3	8	NA	1, 2, 3, 4, 8a, 8b, 9	1	NA	ES057
3	Industrial use	3	NA	NA	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 15	2, 4, 6a, 6b, 7	NA	ES065
4	Professional use	22	NA	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 10, 11, 13, 15	8a, 8b, 8d, 9a	NA	ES067
5	Consumer use	21	NA	20, 35, 39	NA	8a, 8b, 8d, 9a	NA	ES075



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### 1. Short title of Exposure Scenario 1: Manufacture of substance - liquid

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products)
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p>
Environmental Release Categories	ERC1: Manufacture of substances

### 2.1 Contributing scenario controlling environmental exposure for: ERC1

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
Other given operational conditions affecting environmental exposure	Continuous exposure	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Application Area	Industrial use
	Water	Regular control of the pH value during introduction into open waters is required.,In general discharges should be carried out such that pH changes in receiving surface waters are minimised.,In general most aquatic organisms can tolerate pH values in the range of 6-9. This is also reflected in the description of standard OECD tests with aquatic organisms.,Risk management measures related to the environment aim to avoid discharging the substance into municipal wastewater or to surface water, in case such discharges are expected to cause significant pH changes.
Conditions and measures related to external treatment of waste for disposal	Disposal methods	Waste should be reused or discharged to the industrial wastewater and further neutralized if needed.

### 2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
Frequency and duration of use	Frequency of use	200 days/year
	Frequency of use	8 hours/day
Technical conditions and measures to control dispersion from source towards the worker	Application Area	Industrial use
	Use closed systems or covering of open containers (e.g. screens) Transport over pipes, technical barrel filling/emptying of barrel with automatic systems (suction pumps etc.)	

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	Use of pliers, grip arms with long handles with manual use to avoid direct contact and exposure by splashes (no working over one's head)	
Organisational measures to prevent /limit releases, dispersion and exposure	Application Area	Industrial use
	Replacing, where appropriated, manual processes by automated and/or closed processes. This would avoid irritating mists, sprayings and subsequent potential splashes. Workers in the risky process/areas identified should be trained a) to avoid to work without respiratory protection and b) to understand the corrosive properties and, especially, the respiratory inhalation effects and c) to follow the safety procedures instructed by the employer. The employer has also to ascertain that the required PPE is available	
Conditions and measures related to personal protection, hygiene and health evaluation	Application Area	Industrial use
	In case of dust or aerosol formation: use respiratory protection with approved filter (P2) Wear chemically resistant gloves. material: butyl-rubber, PVC, polychloroprene with natural latex liner, material thickness: 0.5 mm, breakthrough time: >480 min material: nitrile-rubber, fluorinated rubber, material thickness: 0.35-0.4 mm, breakthrough time: > 480 min wear tightly fitting safety goggles, face-shield Wear suitable protective clothing, aprons, shield and suits If splashes are likely to occur: Rubber or plastic boots	

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

**Environment**

The aquatic effect and risk assessment only deals with the effect on organisms/ecosystems due to possible pH changes related to OH- discharges, as the toxicity of the metal ion is expected to be insignificant compared to the (potential) pH effect. The high water solubility and very low vapour pressure indicates that the substance will be found predominantly in water. When the risk management measures related to the environment are implemented, there is no exposure to the activated sludge of a sewage treatment plant and there is no exposure to the receiving surface water. The sediment compartment is not considered, because it is not relevant for the substance. If emitted to the aquatic compartment, sorption to sediment particles will be negligible. Significant emissions to air are not expected due to the very low vapour pressure of the substance. If emitted to air as a water-based aerosol, the substance will be rapidly neutralised as a result of its reaction with CO<sub>2</sub> (or acids). Significant emissions to the terrestrial environment are not expected. The sludge application route is not relevant for the emission to agricultural soil, as no sorption of the substance to particulate matter will occur in STPs/WWTPs. If emitted to soil, sorption to soil particles will be negligible. Depending on the buffer capacity of the soil, OH- will be neutralised in the soil pore water or the pH may increase. Bioaccumulation will not occur.

**Workers**

PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9 Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9	Modeled exposure data, very low vapour pressure, without local exhaust ventilation, without respiratory protection	Inhalation worker exposure	0.17mg/m <sup>3</sup>	0.17
PROC1, PROC2, PROC3, PROC4, PROC8a,	Measured exposure data, worst-case	Worker - inhalative, short-term - local	0.33mg/m <sup>3</sup>	0.33

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PROC8b, PROC9				
PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9	Measured exposure data, worst-case	Worker - inhalative, long- term - local	0.14mg/m <sup>3</sup>	0.14

This substance is corrosive. For the handling of corrosive substances and formulations, immediate dermal contacts occur only occasionally and it is assumed that repeated daily dermal exposure can be neglected. Dermal exposure to the substance was not quantified. The substance is not expected to be systemically available in the body under normal handling and use conditions. Systemic effects of NaOH after dermal or inhalation exposure are not expected to occur.

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

The DU works inside the boundaries set by the ES if either the proposed risk management measures as described above are met or the downstream user can demonstrate on his own that his operational conditions and implemented risk management measures are adequate. This has to be done by showing that they limit the inhalation and dermal exposure to a level below the respective DNEL (given that the processes and activities in question are covered by the PROCs listed above) as given below  
If measured data are not available, the DU may make use of an appropriate scaling tool such as ECETOC TRA.  
Important note: By demonstrating a safe use when comparing exposure estimates with the long-term DNEL, the acute DNEL is therefore also covered (according to R.14 guidance, acute exposure levels can be derived by multiplying long-term exposure estimates by a factor of 2).

#### Additional good practice advice beyond the REACH Chemical Safety Assessment

Local exhaust ventilation is not required but good practice.  
General ventilation is good practice unless local exhaust ventilation

## Caustic Soda PEARL/SOLID

### 1. Short title of Exposure Scenario 2: Manufacture of substance - solid

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products)
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p>
Environmental Release Categories	ERC1: Manufacture of substances

### 2.1 Contributing scenario controlling environmental exposure for: ERC1

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Other given operational conditions affecting environmental exposure	Continuous exposure	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Application Area	Industrial use
	Water	Regular control of the pH value during introduction into open waters is required.,In general discharges should be carried out such that pH changes in receiving surface waters are minimised.,In general most aquatic organisms can tolerate pH values in the range of 6-9. This is also reflected in the description of standard OECD tests with aquatic organisms.,Risk management measures related to the environment aim to avoid discharging the substance into municipal wastewater or to surface water, in case such discharges are expected to cause significant pH changes.

### 2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	solid
Frequency and duration of use	Frequency of use	200 days/year
	Frequency of use	8 hours/day
Technical conditions and measures to control dispersion from source towards the worker	Application Area	Industrial use
	<p>Use closed systems or covering of open containers (e.g. screens)</p> <p>Transport over pipes, technical barrel filling/emptying of barrel with automatic systems (suction pumps etc.)</p> <p>Use of pliers, grip arms with long handles with manual use to avoid direct contact and exposure by splashes (no working over one's head)</p>	
Organisational measures to	Application Area	Industrial use

## Caustic Soda PEARL/SOLID

prevent /limit releases, dispersion and exposure	Replacing, where appropriated, manual processes by automated and/or closed processes. This would avoid irritating mists, sprayings and subsequent potential splashes. Workers in the risky process/areas identified should be trained a) to avoid to work without respiratory protection and b) to understand the corrosive properties and, especially, the respiratory inhalation effects and c) to follow the safety procedures instructed by the employer. The employer has also to ascertain that the required PPE is available	
Conditions and measures related to personal protection, hygiene and health evaluation	Application Area	Industrial use
	In case of dust or aerosol formation: use respiratory protection with approved filter (P2) Wear chemically resistant gloves. material: butyl-rubber, PVC, polychloroprene with natural latex liner, material thickness: 0.5 mm, breakthrough time: >480 min material: nitrile-rubber, fluorinated rubber, material thickness: 0.35-0.4 mm, breakthrough time: > 480 min wear tightly fitting safety goggles, face-shield Wear suitable protective clothing, aprons, shield and suits If splashes are likely to occur: Rubber or plastic boots	

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

#### Environment

The aquatic effect and risk assessment only deals with the effect on organisms/ecosystems due to possible pH changes related to OH<sup>-</sup> discharges, as the toxicity of the metal ion is expected to be insignificant compared to the (potential) pH effect. The high water solubility and very low vapour pressure indicates that the substance will be found predominantly in water. When the risk management measures related to the environment are implemented, there is no exposure to the activated sludge of a sewage treatment plant and there is no exposure to the receiving surface water. The sediment compartment is not considered, because it is not relevant for the substance. If emitted to the aquatic compartment, sorption to sediment particles will be negligible. Significant emissions to air are not expected due to the very low vapour pressure of the substance. If emitted to air as a water-based aerosol, the substance will be rapidly neutralised as a result of its reaction with CO<sub>2</sub> (or acids). Significant emissions to the terrestrial environment are not expected. The sludge application route is not relevant for the emission to agricultural soil, as no sorption of the substance to particulate matter will occur in STPs/WWTPs. If emitted to soil, sorption to soil particles will be negligible. Depending on the buffer capacity of the soil, OH<sup>-</sup> will be neutralised in the soil pore water or the pH may increase. Bioaccumulation will not occur.

#### Workers

PROC1, PROC2, PROC3, PROC4, PROC8a, PROC9 Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1, PROC2	Modeled exposure data, Low dustiness, no LEV, no respiratory protection (RPE)	Inhalation worker exposure	0.01mg/m <sup>3</sup>	0.01
PROC3, PROC9	Modeled exposure data, Low dustiness, no LEV, no respiratory protection (RPE)	Inhalation worker exposure	0.1mg/m <sup>3</sup>	0.1
PROC4, PROC8a	Modeled exposure data, Low dustiness, no LEV, no respiratory protection (RPE)	Inhalation worker exposure	0.5mg/m <sup>3</sup>	0.5
PROC9	Measured exposure data, worst-case	Worker - inhalative, short-term - local	0.26mg/m <sup>3</sup>	0.26

## Caustic Soda PEARL/SOLID

This substance is corrosive. For the handling of corrosive substances and formulations, immediate dermal contacts occur only occasionally and it is assumed that repeated daily dermal exposure can be neglected. Dermal exposure to the substance was not quantified. The substance is not expected to be systemically available in the body under normal handling and use conditions. Systemic effects of NaOH after dermal or inhalation exposure are not expected to occur.

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

The DU works inside the boundaries set by the ES if either the proposed risk management measures as described above are met or the downstream user can demonstrate on his own that his operational conditions and implemented risk management measures are adequate. This has to be done by showing that they limit the inhalation and dermal exposure to a level below the respective DNEL (given that the processes and activities in question are covered by the PROCs listed above) as given below

If measured data are not available, the DU may make use of an appropriate scaling tool such as ECETOC TRA. Important note: By demonstrating a safe use when comparing exposure estimates with the long-term DNEL, the acute DNEL is therefore also covered (according to R.14 guidance, acute exposure levels can be derived by multiplying long-term exposure estimates by a factor of 2).

### Additional good practice advice beyond the REACH Chemical Safety Assessment

Local exhaust ventilation is not required but good practice.  
General ventilation is good practice unless local exhaust ventilation

## Caustic Soda PEARL/SOLID

### 1. Short title of Exposure Scenario 3: Industrial use

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC7: Industrial spraying</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC10: Roller application or brushing</p> <p>PROC13: Treatment of articles by dipping and pouring</p> <p>PROC15: Use as laboratory reagent</p>
Environmental Release Categories	<p>ERC2: Formulation of preparations</p> <p>ERC4: Industrial use of processing aids in processes and products, not becoming part of articles</p> <p>ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)</p> <p>ERC6b: Industrial use of reactive processing aids</p> <p>ERC7: Industrial use of substances in closed systems</p>

### 2.1 Contributing scenario controlling environmental exposure for: ERC2, ERC4, ERC6a, ERC6b, ERC7

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Other given operational conditions affecting environmental exposure	Continuous exposure	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Application Area	Industrial use
	Water	Regular control of the pH value during introduction into open waters is required. In general discharges should be carried out such that pH changes in receiving surface waters are minimised. In general most aquatic organisms can tolerate pH values in the range of 6-9. This is also reflected in the description of standard OECD tests with aquatic organisms. Risk management measures related to the environment aim to avoid discharging the substance into municipal wastewater or to surface water, in case such discharges are expected to cause significant pH changes.
Conditions and measures related to external treatment of waste for disposal	Disposal methods	Waste should be reused or discharged to the industrial wastewater and further neutralized if needed.

### 2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC15

Product characteristics	Concentration of the Substance in	Covers percentage substance in the product up to 100 % (unless stated differently).
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## Caustic Soda PEARL/SOLID

	Mixture/Article	
	Physical Form (at time of use)	liquid
	Physical Form (at time of use)	Solid, low dustiness
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	200 days/year
Technical conditions and measures to control dispersion from source towards the worker	Application Area	Industrial use
	Use closed systems or covering of open containers (e.g. screens) Transport over pipes, technical barrel filling/emptying of barrel with automatic systems (suction pumps etc.) Use of pliers, grip arms with long handles with manual use to avoid direct contact and exposure by splashes (no working over one's head)	
Organisational measures to prevent /limit releases, dispersion and exposure	Application Area	Industrial use
	Replacing, where appropriated, manual processes by automated and/or closed processes. This would avoid irritating mists, sprayings and subsequent potential splashes. Workers in the risky process/areas identified should be trained a) to avoid to work without respiratory protection and b) to understand the corrosive properties and, especially, the respiratory inhalation effects and c) to follow the safety procedures instructed by the employer. The employer has also to ascertain that the required PPE is available	
Conditions and measures related to personal protection, hygiene and health evaluation	Application Area	Industrial use
	In case of dust or aerosol formation: use respiratory protection with approved filter (P2) Wear chemically resistant gloves. material: butyl-rubber, PVC, polychloroprene with natural latex liner, material thickness: 0.5 mm, breakthrough time: >480 min material: nitrile-rubber, fluorinated rubber, material thickness: 0.35-0.4 mm, breakthrough time: > 480 min If splashes are likely to occur: wear tightly fitting safety goggles, face-shield Wear suitable protective clothing, aprons, shield and suits Rubber or plastic boots	

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

#### Environment

The aquatic effect and risk assessment only deals with the effect on organisms/ecosystems due to possible pH changes related to OH<sup>-</sup> discharges, as the toxicity of the metal ion is expected to be insignificant compared to the (potential) pH effect. The high water solubility and very low vapour pressure indicates that the substance will be found predominantly in water. When the risk management measures related to the environment are implemented, there is no exposure to the activated sludge of a sewage treatment plant and there is no exposure to the receiving surface water. The sediment compartment is not considered, because it is not relevant for the substance. If emitted to the aquatic compartment, sorption to sediment particles will be negligible. Significant emissions to air are not expected due to the very low vapour pressure of the substance. If emitted to air as a water-based aerosol, the substance will be rapidly neutralised as a result of its reaction with CO<sub>2</sub> (or acids). Significant emissions to the terrestrial environment are not expected. The sludge application route is not relevant for the emission to agricultural soil, as no sorption of the substance to particulate matter will occur in STPs/WWTPs. If emitted to soil, sorption to soil particles will be negligible. Depending on the buffer capacity of the soil, OH<sup>-</sup> will be neutralised in the soil pore water or the pH may increase. Bioaccumulation will not occur.

#### Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
R49592 / Version 3.0		24/30		EN



## Caustic Soda PEARL/SOLID

PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15, PROC19, PROC23, PROC24	liquid, no LEV, no respiratory protection (RPE)	Worker - inhalative, short-term - local	0.17mg/m <sup>3</sup>	---
PROC1, PROC2	solid, no LEV, no respiratory protection (RPE)	Worker - inhalative, short-term - local	0.01mg/m <sup>3</sup>	---
PROC3, PROC15	solid, no LEV, no respiratory protection (RPE)	Worker - inhalative, short-term - local	0.1mg/m <sup>3</sup>	---
PROC4, PROC5, PROC14	solid, no respiratory protection (RPE)	Worker - inhalative, short-term - local	0.2mg/m <sup>3</sup>	---
PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC19	solid, no LEV, no respiratory protection (RPE)	Worker - inhalative, short-term - local	0.5mg/m <sup>3</sup>	---
PROC23	solid, with RPE (90%)	Worker - inhalative, short-term - local	0.4mg/m <sup>3</sup>	---
PROC24	solid, with RPE (90%)	Worker - inhalative, short-term - local	0.5mg/m <sup>3</sup>	---

This substance is corrosive. For the handling of corrosive substances and formulations, immediate dermal contacts occur only occasionally and it is assumed that repeated daily dermal exposure can be neglected. Dermal exposure to the substance was not quantified. The substance is not expected to be systemically available in the body under normal handling and use conditions. Systemic effects of NaOH after dermal or inhalation exposure are not expected to occur. Based on workplace measurements and following the proposed risk management measures controlling worker and professional exposure, the inhalation exposure is below the DNEL.

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

The DU works inside the boundaries set by the ES if either the proposed risk management measures as described above are met or the downstream user can demonstrate on his own that his operational conditions and implemented risk management measures are adequate. This has to be done by showing that they limit the inhalation and dermal exposure to a level below the respective DNEL (given that the processes and activities in question are covered by the PROCs listed above) as given below.

If measured data are not available, the DU may make use of an appropriate scaling tool such as ECETOC TRA.

Important note: By demonstrating a safe use when comparing exposure estimates with the long-term DNEL, the acute DNEL is therefore also covered (according to R.14 guidance, acute exposure levels can be derived by multiplying long-term exposure estimates by a factor of 2).

#### Additional good practice advice beyond the REACH Chemical Safety Assessment

Local exhaust ventilation is not required but good practice.  
General ventilation is good practice unless local exhaust ventilation

**Caustic Soda PEARL/SOLID**

**1. Short title of Exposure Scenario 4: Professional use**

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC10: Roller application or brushing</p> <p>PROC11: Non industrial spraying</p> <p>PROC13: Treatment of articles by dipping and pouring</p> <p>PROC15: Use as laboratory reagent</p>
Environmental Release Categories	<p>ERC8a: Wide dispersive indoor use of processing aids in open systems</p> <p>ERC8b: Wide dispersive indoor use of reactive substances in open systems</p> <p>ERC8d: Wide dispersive outdoor use of processing aids in open systems</p> <p>ERC9a: Wide dispersive indoor use of substances in closed systems</p>

**2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8b, ERC8d, ERC9a**

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Other given operational conditions affecting environmental exposure	Continuous exposure	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Application Area	Professional use
	Water	Regular control of the pH value during introduction into open waters is required. In general discharges should be carried out such that pH changes in receiving surface waters are minimised. In general most aquatic organisms can tolerate pH values in the range of 6-9. This is also reflected in the description of standard OECD tests with aquatic organisms. Risk management measures related to the environment aim to avoid discharging the substance into municipal wastewater or to surface water, in case such discharges are expected to cause significant pH changes.
Conditions and measures related to external treatment of waste for disposal	Disposal methods	Waste should be reused or discharged to the industrial wastewater and further neutralized if needed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC15**

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid

## Caustic Soda PEARL/SOLID

	Physical Form (at time of use)	Solid, low dustiness
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	200 days/year
Technical conditions and measures to control dispersion from source towards the worker	Application Area	Professional use
	Use of pliers, grip arms with long handles with manual use to avoid direct contact and exposure by splashes (no working over one's head) Where possible use of specific dispensers and pumps specifically designed to prevent splashes/spills/exposure to occur.	
Organisational measures to prevent /limit releases, dispersion and exposure	Application Area	Professional use
	Replacing, where appropriated, manual processes by automated and/or closed processes. This would avoid irritating mists, sprayings and subsequent potential splashes. Workers in the risky process/areas identified should be trained a) to avoid to work without respiratory protection and b) to understand the corrosive properties and, especially, the respiratory inhalation effects and c) to follow the safety procedures instructed by the employer. The employer has also to ascertain that the required PPE is available	
Conditions and measures related to personal protection, hygiene and health evaluation	Application Area	Professional use
	In case of dust or aerosol formation: use respiratory protection with approved filter (P2) Wear chemically resistant gloves. material: butyl-rubber, PVC, polychloroprene with natural latex liner, material thickness: 0.5 mm, breakthrough time: >480 min material: nitrile-rubber, fluorinated rubber, material thickness: 0.35-0.4 mm, breakthrough time: > 480 min If splashes are likely to occur: wear tightly fitting safety goggles, face-shield Wear suitable protective clothing, aprons, shield and suits Rubber or plastic boots	

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

#### Environment

The aquatic effect and risk assessment only deals with the effect on organisms/ecosystems due to possible pH changes related to OH<sup>-</sup> discharges, as the toxicity of the metal ion is expected to be insignificant compared to the (potential) pH effect. The high water solubility and very low vapour pressure indicates that the substance will be found predominantly in water. When the risk management measures related to the environment are implemented, there is no exposure to the activated sludge of a sewage treatment plant and there is no exposure to the receiving surface water. The sediment compartment is not considered, because it is not relevant for the substance. If emitted to the aquatic compartment, sorption to sediment particles will be negligible. Significant emissions to air are not expected due to the very low vapour pressure of the substance. If emitted to air as a water-based aerosol, the substance will be rapidly neutralised as a result of its reaction with CO<sub>2</sub> (or acids). Significant emissions to the terrestrial environment are not expected. The sludge application route is not relevant for the emission to agricultural soil, as no sorption of the substance to particulate matter will occur in STPs/WWTPs. If emitted to soil, sorption to soil particles will be negligible. Depending on the buffer capacity of the soil, OH<sup>-</sup> will be neutralised in the soil pore water or the pH may increase. Bioaccumulation will not occur.

#### Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1, PROC2, PROC3, PROC4,	liquid, no LEV, no respiratory protection (RPE)	Worker - inhalative, short-term - local	0.17mg/m <sup>3</sup>	---

## Caustic Soda PEARL/SOLID

PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC15, PROC19, PROC23, PROC24				
PROC1, PROC2	solid, no LEV, no respiratory protection (RPE)	Worker - inhalative, short-term - local	0.01mg/m <sup>3</sup>	---
PROC3, PROC15	solid, no LEV, no respiratory protection (RPE)	Worker - inhalative, short-term - local	0.1mg/m <sup>3</sup>	---
PROC4, PROC5, PROC11, PROC14	solid, no respiratory protection (RPE)	Worker - inhalative, short-term - local	0.2mg/m <sup>3</sup>	---
PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC19	solid, no LEV, no respiratory protection (RPE)	Worker - inhalative, short-term - local	0.5mg/m <sup>3</sup>	---
PROC23	solid, with RPE (90%)	Worker - inhalative, short-term - local	0.4mg/m <sup>3</sup>	---
PROC24	solid, with RPE (90%)	Worker - inhalative, short-term - local	0.5mg/m <sup>3</sup>	---

This substance is corrosive. For the handling of corrosive substances and formulations, immediate dermal contacts occur only occasionally and it is assumed that repeated daily dermal exposure can be neglected. Dermal exposure to the substance was not quantified. The substance is not expected to be systemically available in the body under normal handling and use conditions. Systemic effects of NaOH after dermal or inhalation exposure are not expected to occur. Based on workplace measurements and following the proposed risk management measures controlling worker and professional exposure, the inhalation exposure is below the DNEL.

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

The DU works inside the boundaries set by the ES if either the proposed risk management measures as described above are met or the downstream user can demonstrate on his own that his operational conditions and implemented risk management measures are adequate. This has to be done by showing that they limit the inhalation and dermal exposure to a level below the respective DNEL (given that the processes and activities in question are covered by the PROCs listed above) as given below

If measured data are not available, the DU may make use of an appropriate scaling tool such as ECETOC TRA. Important note: By demonstrating a safe use when comparing exposure estimates with the long-term DNEL, the acute DNEL is therefore also covered (according to R.14 guidance, acute exposure levels can be derived by multiplying long-term exposure estimates by a factor of 2).

#### Additional good practice advice beyond the REACH Chemical Safety Assessment

Local exhaust ventilation is not required but good practice.  
General ventilation is good practice unless local exhaust ventilation

## Caustic Soda PEARL/SOLID

### 1. Short title of Exposure Scenario 5: Consumer use

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC20: Products such as ph-regulators, flocculants, precipitants, neutralization agents PC35: Washing and cleaning products (including solvent based products) PC39: Cosmetics, personal care products
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems ERC9a: Wide dispersive indoor use of substances in closed systems

### 2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8b, ERC8d, ERC9a

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	There are no specific risk management measures related to environment.	
Conditions and measures related to external treatment of waste for disposal	Disposal methods	This material and its container must be disposed of in a safe way (e.g. by returning to a public recycling facility)., If container is empty, trash as regular municipal waste., Batteries should be recycled as much as possible (e.g. by returning to a public recycling facility)., Recovery of the substance from alkaline batteries includes emptying the electrolyte, collection and neutralization.

### 2.2 Contributing scenario controlling consumer exposure for: PC20, PC35, PC39

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Physical Form (at time of use)	Solid, low dustiness
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	It is required to use resistant labelling-package to avoid its auto-damage and loss of the label integrity, under normal use and storage of the product. The lack of quality of the package provokes the physical loss of information on hazards and use instructions.
	Consumer Measures	In case of dust or aerosol formation: use respiratory protection with approved filter (P2)

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

#### Environment

## Caustic Soda PEARL/SOLID

Consumer uses relate to already diluted products which will further be neutralized quickly in the sewer, well before reaching a WWTP or surface water.

### Consumers

ConsExpo and SrayExpo

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PC20, PC35, PC39	Assessed only for the most critical use, (use of the substance in a spray oven cleaner)	consumer inhalation, acute - local	0.3 - 1.6mg/m <sup>3</sup>	< 1

The calculated short-term exposure is slightly higher than the long term DNEL for inhalation, but smaller than the short term occupational exposure limit. The substance will be rapidly neutralised as a result of its reaction with CO<sub>2</sub> (or other acids) Consumer exposure to the substance in batteries is zero because batteries are sealed articles with a long service life maintenance.

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

The DU works inside the boundaries set by the ES if either the proposed risk management measures as described above are met or the downstream user can demonstrate on his own that his operational conditions and implemented risk management measures are adequate. This has to be done by showing that they limit the inhalation and dermal exposure to a level below the respective DNEL (given that the processes and activities in question are covered by the PCs listed above) as given below

If measured data are not available, the DU may make use of an appropriate scaling tool such as ConsExpo software.

Important note: By demonstrating a safe use when comparing exposure estimates with the long-term DNEL, the acute DNEL is therefore also covered (according to R.14 guidance, acute exposure levels can be derived by multiplying long-term exposure estimates by a factor of 2).