Safety Data Sheet according to Regulation (EU) No. 1907/2006

CAUSTIC SODA SOLUTION (50%)

Revision 3.0 Revision Date 02.01.2018 Print Date 02.01.2018

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

1.1 Product identifier

CAUSTIC SODA SOLUTION (50%)

CAS-No.: 1310-73-2

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

Use:
Starting material for industrial applications
For details of the identified uses according to REACH-Regulation (EU) No. 1907/2006 refer to the annex of this safety data sheet.

1.3 Details of the supplier of the safety data sheet

-Company:	Goulding Chemicals Ltd.
-Address:	Centre Park Road, Marina, Cork, Ireland
-Telephone:	+353 (021) 4911611
-Fax:	+353 (021) 4911660
-Contact Email	larry.egar@gouldings.ie

1.4 Emergency telephone number

-Emergency telephone number (outside of office hours): +353 (021) 4911619

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Corrosive to metals, Category 1 (H290) Skin corrosion, Category 1A (H314)
Serious eye damage, Category 1 (H318)

2.2 Label elements

Danger
Hazardous components which must be listed on the label sodium hydroxide (caustic soda) **Hazard statements:**
H290 May be corrosive to metals.
H314 Causes severe skin burns and eye damage.

Precautionary statements:
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
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.

P308 IF exposed or concerned:
P310 Immediately call a POISON CENTER or doctor/ physician.

2.3 Other hazards

No information available.

SECTION 3: Composition/information on ingredients

Type of product: Mixture

3.2 Mixtures Hazardous components

sodium hydroxide (caustic soda) Concentration [wt.-%]: >= 50 - < 75
Index-No.: 011-002-00-6
EC-No.: 215-185-5
REACH Registration Number: 01-2119457892-27-0006
CAS-No.: 1310-73-2
Classification (1272/2008/CE): Met. Corr. 1 H290 Skin Corr. 1A H314 Eye Dam. 1 H318 Specific threshold concentration (GHS):

Skin Corr. 1A	H314	>= 5 %
Skin Irrit. 2	H315	0.5 - < 2 %
Eye Irrit. 2	H319	0.5 - < 2 %
Skin Corr. 1B	H314	2 - < 5 %

Candidate List of Substances of Very High Concern for Authorisation
This product does not contain substances of very high concern (Regulation (EC) No 1907/2006 (REACH), Article 57).

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice: Remove victims from the danger zone without endangering your own safety. Remove contaminated clothing (including underwear and shoes) immediately.

If inhaled: Bring accident victims out into the fresh air. If patient has difficulty in breathing, administer oxygen, keep the patient calm and warm. Call a physician immediately.

In case of skin contact: After contact with skin, wash immediately with plenty of water. Apply sterile protective bandage; consult GP.

In case of eye contact: Hold the eyes open and rinse with preferably lukewarm water for a sufficiently long period of time (at least 10 minutes). Contact an ophthalmologist.

If swallowed: If swallowed, rinse mouth with water (only if the person is conscious). DO NOT induce the patient to vomit, medical advice is required.

4.2 Most important symptoms and effects, both acute and delayed Notes to physician: See Section 11 for information on toxicology.

4.3 Indication of any immediate medical attention and special treatment needed Therapeutic measures: Basic first aid, decontamination, symptomatic treatment. Treat with a corticoid metered aerosol depending on the amount inhaled.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media: Carbon dioxide (CO2), Foam, extinguishing powder, in cases of larger fires, water spray should be used.

Unsuitable extinguishing media: High volume water jet

5.2 Special hazards arising from the substance or mixture

Burning releases carbon monoxide, carbon dioxide, oxides of nitrogen and traces of hydrogen cyanide. In the event of fire and/or explosion do not breathe fumes.

5.3 Advice for fire-fighters

During fire-fighting respirator with independent air-supply and airtight garment is required.

Fight fire in early stages if safe to do so. Containers at risk from fire should be cooled with water and, if possible, removed from the danger area. Do not allow contaminated extinguishing water to enter the soil, ground-water or surface waters.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Put on protective equipment (see section 8). Ensure adequate ventilation/exhaust extraction. Keep unauthorized persons away.

6.2 Environment related measures

Do not flush into surface water or sanitary sewer system.

6.3 Methods and material for containment and cleaning up

Take up with absorbent for chemicals or, if necessary with dry sand. Fill into labeled, sealable containers. Also place used cleaning materials into closable receptacles.

6.4 Reference to other sections

For further disposal measures see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

If an annex according to REACH-Regulation (EU) No. 1907/2006 is attached to this MSDS, the general conditions of use are further specified in the corresponding exposure scenarios.

Handle and open container with care. Provide sufficient air exchange and/or exhaust in work rooms.

Organize work procedures so that workers are not exposed to the effects of the products. Vent waste air only via suitable separators or scrubbers.

Precautions should generally be taken against electrostatic charges according to the equipment used and the way the product is handled and packaged.

The precautions required in the handling of irritant or corrosive substances must be taken. Contact with skin and eyes and inhalation of vapors must be avoided under all circumstances.

Careful attention to industrial and personal hygiene is essential. Keep away from foodstuffs, drinks and tobacco. Wash hands before breaks and at the end of workday. Keep working clothes separately. Change contaminated or soaked clothing immediately. If the full protective suit becomes contaminated, first take a shower with the suit on.

7.2 Conditions for safe storage, including any incompatibilities

Keep container dry and tightly closed in a cool and well ventilated place.

Storage class (TRGS 510) : 8B: Non-combustible, corrosive

7.3 Specific end use(s)

No information available.

SECTION 8: Exposure controls/personal protection

If an annex according to Regulation (EU) No. 1907/2006 is attached to this MSDS, the general RMMs are further specified in the corresponding exposure scenarios.

UK Workplace Exposure Limits (WEL), per EH40 document (Health & Safety Executive). If no UK value exists, EU exposure limits given where available.

8.1 Control parameters

Components with workplace control parameters

Substance	CAS-No.	Basis	Type	Value	Ceiling Limit Value	Remarks
sodium hydroxide (caustic soda)	1310-73-2	EH40 WEL	STEL	2 mg/m3		

Derived No Effect Level (DNEL) or Derived Minimal Effect Level (DMEL)

sodium hydroxide (caustic soda)

Value type	Route of exposure	Health Effects	Value	Remarks
Worker (short-term)				
DNEL	Dermal	- local effects	< 2 %	
DNEL	Inhalation	- local effects		no data available
Worker (long-term)				
DNEL	Dermal	- local effects		no data available
DNEL	Inhalation	- local effects	1 mg/m³ air	Most sensitive endpoint: Irritation (respiratory tract)

Predicted No Effect Concentration (PNEC)

sodium hydroxide (caustic soda)

Compartment	Value	Remarks
Freshwater		not applicable
Marine water		not applicable
Sediment		Not relevant
Soil		Not relevant
STP (sewage-treatment plant)		not applicable
Oral		Not relevant

8.2 Exposure controls Appropriate engineering controls
For technical protective measures to limit exposure see also Section 7 "Handling and storage".

Respiratory protection
If vapors form, respirators must be used. In the event of vapors up to 0,5 % vol. percent, use a filtered respirator with DIN EN 141 B-P2 (color code grey/white) combination filter and with DIN 141 B-P3 combination filter up to 1 % vol. At higher concentrations or under uncertain conditions a respirator with independent air supply must be used.

Further recommendations regarding respiratory protection can be found in the individual exposure scenarios in the appendix.

Hand protection
Suitable materials for safety gloves; EN 374:
Nitrile rubber - NBR: thickness >=0,35mm; breakthrough time >=480min.
Polyvinyl chloride - PVC: thickness >=0,5mm; breakthrough time >=480min.
Polychloroprene - CR: thickness >=0,5mm; breakthrough time >=480min.
Butyl rubber - IIR: thickness >=0,5mm; breakthrough time >=480min.

Fluorinated rubber - FKM: thickness >=0,4mm; breakthrough time >=480min. Recommendation: contaminated gloves should be disposed of.

Eye protection
Wear eye/face protection.

Skin and body protection
Impervious protective clothing. On possible contact with the product (sampling, product leakage): full protection or chemical protection clothing.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	liquid	
Colour:	colourless	
Odour:	odourless	
Odour Threshold:	not established	
pH:	> 14 at 100 g/l at 20 °C	
Freezing temperature:	12 °C	
Boiling point/boiling range:	140 °C at 1,013 hPa	
Flash point:	not applicable	
Evaporation rate:	not established	
Flammability (solid, gas):	not applicable	
Burning number:	not applicable	
Vapour pressure:	not established	
Vapour density:	not established	
Density:	1.52 g/cm³ at 20 °C	DIN 51757
Miscibility with water:	miscible at 15 °C	
Surface tension:	not established	
Partition coefficient (n−octanol/water):	not established	
Auto-ignition temperature:	not applicable	
Ignition temperature:	not applicable	
Decomposition temperature:	not established	
Viscosity, dynamic:	79 mPa.s at 20 °C	
Explosive properties:	not established	
Dust explosion class:	not applicable	
Oxidising properties:	not established	

9.2 Other information

The indicated values do not necessarily correspond to the product specification. Please refer to the product information sheet or the technical information sheet for specification data.

SECTION 10: Stability and reactivity

10.1 Reactivity

This information is not available.

10.2 Chemical stability

This information is not available.

10.3 Possibility of hazardous reactions

Reacts violently with Acids and metals (e.g.) Aluminium, Magnesium, Zinc under generation of hydrogen.

10.4 Conditions to avoid

This information is not available.

10.5 Incompatible materials

This information is not available.

10.6 Hazardous decomposition products

No hazardous decomposition products when stored and handled correctly.

SECTION 11: Toxicological information

Toxicological studies on the product are not yet available.

Please find below the data available to us:

11.1 Information on toxicological effects

Acute toxicity, oral
sodium hydroxide
(caustic soda) No valid
data available.
Study scientifically not justified.

Acute toxicity, dermal
sodium hydroxide (caustic soda)

No valid data available. Study scientifically not justified.

Acute toxicity,
inhalation sodium
hydroxide (caustic soda)
No valid data available.
Study scientifically not justified.

Primary skin irritation sodium hydroxide (caustic soda)

Species: In vitro test system

Result: Corrosive
Classification: Causes severe burns.
Method: In Vitro Membrane Barrier Test Method for Skin Corrosion - CORROSITEX

Primary mucosae
irritation sodium hydroxide
(caustic soda)
Since this substance is already classified “corrosive”, the risk of serious damage to the eyes is implicit.

Sensitisation
sodium hydroxide (caustic soda) Skin sensitisation:
Species: Human experience
Result: negative
Classification: Does not cause skin sensitization.

Respiratory sensitization

No data available.

Subacute, subchronic and prolonged toxicity
sodium hydroxide (caustic soda) No valid data available.

Carcinogenicity
sodium hydroxide (caustic soda) No data available.

Reproductive toxicity/Fertility sodium hydroxide (caustic soda)
No data available.

Reproductive toxicity/Teratogenicity
sodium hydroxide (caustic soda) No valid data available.

Genotoxicity in vitro
sodium hydroxide
(caustic soda)
Test type: Salmonella/microsome test (Ames test) Result: No indication of mutagenic effects.

Test type: Chromosome aberration test in vitro
Result: negative

Genotoxicity in vivo
sodium hydroxide

(caustic soda) No valid
data available.
STOT evaluation – one-time exposure sodium hydroxide (caustic soda)
Based on available data, the classification criteria are not met.

STOT evaluation – repeated exposure sodium hydroxide (caustic soda)
Based on available data, the classification criteria are not met.

Aspiration toxicity

sodium hydroxide

(caustic soda)

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

CMR Assessment
sodium hydroxide (caustic soda)
Carcinogenicity: No data available.
Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Based on available data, the classification criteria are not met.
Teratogenicity: No valid data available.
Reproductive toxicity/Fertility: No data available.

Toxicology Assessment sodium hydroxide (caustic soda)
Acute effects: The product causes burns of eyes, skin and mucous membranes.

Additional information
sodium hydroxide
(caustic soda)
May cause caustic burns to the mouth, throat or stomach if swallowed. After swallowing danger of the stomach perforation. On inhalation: Irritation of mucous membrane, coughing and shortness of breath.

SECTION 12: Ecological information

Ecotoxicological studies of the product are not available.

Do not allow to escape into waterways, wastewater or soil.

Please find below the data available to us:

12.1 Toxicity Acute Fish toxicity
sodium hydroxide (caustic soda)
LC50 35 - 189 mg/l
Species: Fish
Effect concentrations in the aquatic environment are attributable to a change in pH value.

Chronic Fish toxicity
sodium hydroxide
(caustic soda) No data
available.
Acute toxicity for daphnia sodium hydroxide (caustic soda)
EC50 40.4 mg/l
Species: Ceriodaphnia sp.
Exposure duration: 48 h
Effect concentrations in the aquatic environment are attributable to a change in pH value.

Chronic toxicity to
daphnia sodium
hydroxide (caustic soda)
No data available.

Acute toxicity for
algae sodium hydroxide
(caustic soda) No data
available.
Effect concentrations in the aquatic environment are attributable to a change in pH value.

Acute bacterial
toxicity sodium
hydroxide (caustic
soda) No valid data
available.
Effect concentrations in the aquatic environment are attributable to a change in pH value.

Ecotoxicology
Assessment sodium
hydroxide (caustic soda)
Acute aquatic toxicity: Neutralisation will reduce ecotoxic effects.
Chronic aquatic toxicity: A chronic aquatic toxicity is not expected.
Toxicity Data on Soil: Not expected to adsorb on soil.
Impact on Sewage Treatment: Neutralization is normally necessary before waste water is discharged into water treatment plants.

12.2 Persistence and degradability

Biodegradability
sodium hydroxide
(caustic soda)
The methods for determining the biological degradability are not applicable to inorganic substances.

Stability in water
sodium hydroxide (caustic soda)

not applicable

Photodegradation
sodium hydroxide
(caustic soda)
no data available

Volatility (Henry's Law constant)
sodium hydroxide (caustic soda)

The substance has to be scored as non-volatile from water.

12.3 Bioaccumulative potential

Bioaccumulation
sodium hydroxide
(caustic soda)
An accumulation in aquatic organisms is not to be expected.

12.4 Mobility in soil Distribution among environmental compartments
sodium hydroxide (caustic soda)
Adsorption/Soil
Mobile in soils

Environmental distribution
sodium hydroxide (caustic soda)
The target compartement is water.

12.5 Results of PBT and vPvB assessment

sodium hydroxide (caustic soda)
This substance does not meet the criteria for classification as PBT or vPvB.

12.6 Other adverse

effects sodium hydroxide

(caustic soda)

Toxic effect on fish, plankton and on sedentary organisms, also through shifting of pH value. Causes no biological oxygen consumption. No inhibition of activity of waste bacteria after neutralization.

SECTION 13: Disposal considerations

Dispose in accordance with applicable international, national and local laws, ordinances and statutes. For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used.

13.1 Waste treatment methods

After containers have been emptied as thoroughly as possible (e.g. by pouring, scraping or draining until "drip-dry"), they can be sent to an appropriate collection point set up within the framework of the existing take-back scheme of the chemical industry. Containers must be recycled in compliance with national legislation and environmental regulations.

None disposal into waste water.

SECTION 14: Transport information

ADR/RID

14.1 UN number	:	1824
14.2 UN proper shipping name	:	SODIUM HYDROXIDE SOLUTION
14.3 Transport hazard class(es)	:	8
Hazard Identification Number	:	80
14.4 Packing group	:	II
14.5 Environmental hazards	:	no

Limited quantity regulations applicable in accordance with chapter 3.4 ADR/RID in compliance with threshold value

ADN

14.1 UN number	:	1824
14.2 UN proper shipping name	:	SODIUM HYDROXIDE SOLUTION
14.3 Transport hazard class(es)	:	8
Hazard Identification Number	:	80
14.4 Packing group	:	II
14.5 Environmental hazards	:	no

ADN (tanker only)

14.1 UN number	:	1824
14.2 UN proper shipping name	:	SODIUM HYDROXIDE SOLUTION
14.3 Transport hazard class(es)	:	8 (N3)
14.4 Packing group	:	II
14.5 Environmental hazards	:	yes

IATA

14.1 UN number	:	1824
14.2 UN proper shipping name	:	SODIUM HYDROXIDE SOLUTION
14.3 Transport hazard class(es)	:	8
14.4 Packing group	:	II
14.5 Environmental hazards	:	no

IMDG

14.1 UN number	:	1824
14.2 UN proper shipping name	:	SODIUM HYDROXIDE SOLUTION
14.3 Transport hazard class(es)	:	8
14.4 Packing group	:	II
14.5 Environmental hazards	:	no

14.6 Special precautions for user

See section 6 - 8.

Additional information	:	Corrosive. Keep away from foodstuffs, acids and alkalis.

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Pollution category: Y - Ship type: 3

SECTION 15: Regulatory information

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

Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances.
not applicable

Water contaminating class (Germany)
1 slightly water endangering
(in accordance with Annex 4 to the Directive on Water-Hazardous Substances)

Any existing national regulations on the handling of irritant or corrosive substances must be observed.

15.2 Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for:
sodium hydroxide (caustic soda)

SECTION 16: Other information

Full text of the hazard statements of the CLP classification (1272/2008/CE) referred to under sections 2, 3 and 10.

H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.

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

Further information
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.

End of Safety Data Sheet

Annex - Exposure Scenario

The operational conditions and the implementation of Risk Management Measures (RMM) are dependent on the following priority-/lead substances for the respective exposure routes:

Lead substance(s),
Oral: sodium hydroxide
(caustic soda)

Lead substance(s),
Inhalative: sodium hydroxide
(caustic soda)

Lead substance(s),
Dermal: sodium hydroxide
(caustic soda)

Lead substance(s),
Eyes: sodium hydroxide
(caustic soda)

Lead substance(s), aquatic environment: Not relevant

Summary of Exposure Scenarios

- **Industrial and professional use (ES1)** : **SU 3; SU 1-24; PC 0-40; PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC15, PROC19, PROC23, PROC24, -; ERC1, ERC2, ERC4, ERC6a, ERC6b, ERC7, ERC8a, ERC8b, ERC8d, ERC9a, -**

- **Consumer end use (ES2)** : **SU 21; PC 0-40; ERC8a, ERC8b, ERC8d, ERC9a, -**

1. Short title of Exposure Scenario: - Industrial and professional use (ES1)

Main User Groups	: **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: **SU 1-24:** Used for different purposes in a variety of sectors and categories.
Product category	: **PC 0-40:** Used for different purposes in a variety of sectors and categories.
Process category	: **PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC5:** Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) **PROC7:** Industrial spraying **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC10:** Roller application or brushing **PROC11:** Non industrial spraying **PROC13:** Treatment of articles by dipping and pouring **PROC14:** Production of preparations or articles by tabletting, compression, extrusion, pelletisation **PROC15:** Use as laboratory reagent **PROC19:** Hand-mixing with intimate contact and only PPE available **PROC23:** Open processing and transfer operations with minerals/ metals at elevated temperature **PROC24:** High (mechanical) energy work-up of substances bound in materials and/ or articles **-:** The categories mentioned above are assumed to be the most important ones but other categories could also be possible.
Environmental release category	: **ERC1:** Manufacture of substances **ERC2:** Formulation of preparations

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
ERC6a: Industrial use resulting in manufacture of another substance
(use of intermediates)
ERC6b: Industrial use of reactive processing aids
ERC7: Industrial use of substances in closed systems
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 **-:** The categories mentioned above are assumed to be the most important ones but other categories could also be possible.

2.1 Contributing scenario controlling worker exposure for:
PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC15, PROC19, PROC23, PROC24, -, PC 0-40 [sodium hydroxide (caustic soda)] - Industrial and professional use

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Product characteristics

Concentration of the Substance in Mixture/Article

Remarks	: All concentrations covered.
Physical Form (at time of use)	: Solid and liquid applications, Dustiness: Low

Frequency and duration of use

: 8 hours/day

Technical conditions and measures

For products containing the solid or liquid substance at concentrations > 2%:

Replacing, where appropriate, manual processes by automated and/or closed processes. This would avoid irritating mists, sprayings and subsequent potential splashes:

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). Local exhaust ventilation and/or general ventilation is good practice.

Organisational measures to prevent /limit releases, dispersion and exposure

For products containing the solid or liquid substance at concentrations > 2%:

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 of the substance and c) to follow the safety procedures instructed by the employer.

Where possible for professional use, use of specific dispensers and pumps specifically designed to prevent splashes/spills/exposure to occur.

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

For products containing the solid or liquid substance at concentrations > 2%:

If product dust is present, wear an anti-dust mask with at least a P2 filter. If vapors form, respirators must be used. At higher concentrations or under uncertain conditions a respirator with independent air supply must be used. Wearing of permeation resistant gloves with suitable materials for safety gloves is required. If splashes are likely to occur, wear tightly fitting safety goggles, faceshield. Wear suitable protective clothing, aprons, shield and suits. If splashes are likely to occur, wear: Rubber or plastic boots

If product dust is present, wear an anti-dust mask with at least a P2 filter. If vapors form, respirators must be used. At higher concentrations or under uncertain conditions a respirator with independent air supply must be used. Wearing of permeation resistant gloves with suitable materials for safety gloves is required. These are butyl-rubber, PVC, polychloroprene with natural latex liner, material thickness: 0.5 mm, breakthrough time: > 480 min OR 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, faceshield. Wear suitable protective clothing, aprons, shield and suits. If splashes are likely to occur, wear: Rubber or plastic boots

3. Exposure estimation and reference to its source

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterisation ratio (Exposure value/DNEL)
2.1 PROC 1	ECETOC TRA	Liquid substance	long term, inhalation	0.17 mg/m³	0.17
2.1 PROC 2	ECETOC TRA	Liquid substance	long term, inhalation	0.17 mg/m³	0.17

2.1 PROC 3	ECETOC TRA	Liquid substance	long term, inhalation	0.17 mg/m³	0.17
2.1 PROC 4	ECETOC TRA	Liquid substance	long term, inhalation	0.17 mg/m³	0.17
2.1 PROC 5	ECETOC TRA	Liquid substance	long term, inhalation	0.17 mg/m³	0.17
2.1 PROC 7	ECETOC TRA	Liquid substance	long term, inhalation	0.17 mg/m³	0.17
2.1 PROC 8a	ECETOC TRA	Liquid substance	long term, inhalation	0.17 mg/m³	0.17
2.1 PROC 8b	ECETOC TRA	Liquid substance	long term, inhalation	0.17 mg/m³	0.17
2.1 PROC 9	ECETOC TRA	Liquid substance	long term,	0.17 mg/m³	0.17
			inhalation		
2.1 PROC 10	ECETOC TRA	Liquid substance	long term, inhalation	0.17 mg/m³	0.17
2.1 PROC 11	ECETOC TRA	Liquid substance	long term, inhalation	0.17 mg/m³	0.17
2.1 PROC 13	ECETOC TRA	Liquid substance	long term, inhalation	0.17 mg/m³	0.17
2.1 PROC 14	ECETOC TRA	Liquid substance	long term, inhalation	0.17 mg/m³	0.17
2.1 PROC 15	ECETOC TRA	Liquid substance	long term, inhalation	0.17 mg/m³	0.17
2.1 PROC 19	ECETOC TRA	Liquid substance	long term, inhalation	0.17 mg/m³	0.17
2.1 PROC 23	ECETOC TRA	Liquid substance	long term, inhalation	0.17 mg/m³	0.17
2.1 PROC 24	ECETOC TRA	Liquid substance	long term, inhalation	0.17 mg/m³	0.17
2.1 PROC 1	ECETOC TRA	Solid substance	long term, inhalation	0.01 mg/m³	0.01
2.1 PROC 2	ECETOC TRA	Solid substance	long term, inhalation	0.01 mg/m³	0.01
2.1 PROC 3	ECETOC TRA	Solid substance	long term, inhalation	0.1 mg/m³	0.1
2.1 PROC 4	ECETOC TRA	Solid substance, LEV: 90% efficiency	long term, inhalation	0.2 mg/m³	0.2
2.1 PROC 5	ECETOC TRA	Solid substance, LEV: 90% efficiency	long term, inhalation	0.2 mg/m³	0.2
2.1 PROC 8a	ECETOC TRA	Solid substance	long term, inhalation	0.5 mg/m³	0.5
2.1 PROC 8b	ECETOC TRA	Solid substance	long term, inhalation	0.5 mg/m³	0.5
2.1 PROC 9	ECETOC TRA	Solid substance	long term, inhalation	0.5 mg/m³	0.5
2.1 PROC 10	ECETOC TRA	Solid substance	long term, inhalation	0.5 mg/m³	0.5
2.1 PROC 11	ECETOC TRA	Solid substance, LEV: 90% efficiency	long term, inhalation	0.2 mg/m³	0.2
2.1 PROC 13	ECETOC TRA	Solid substance	long term, inhalation	0.5 mg/m³	0.5
2.1 PROC 14	ECETOC TRA	Solid substance, LEV: 90% efficiency	long term, inhalation	0.2 mg/m³	0.2
2.1 PROC 15	ECETOC TRA	Solid substance	long term, inhalation	0.1 mg/m³	0.1
2.1 PROC 19	ECETOC TRA	Solid substance	long term, inhalation	0.5 mg/m³	0.5

2.1 PROC 23	ECETOC TRA	Solid substance, LEV: 90% efficiency	long term, inhalation	0.4 mg/m³	0.4
2.1 PROC 24	ECETOC TRA	Solid substance, LEV: 90% efficiency	long term, inhalation	0.5 mg/m³	0.5

*EU RAR NaOH (2007). European Union Risk Assessment Report sodium hydroxide. Office for Official Publications of the European Union. Luxembourg. Available via: http://ecb.jrc.ec.europa.eu/DOCUMENTS/Existing-Chemicals/RISK_ASSESSMENT/REPORT/sodiumhydroxide report416.pdf

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. Therefore, dermal exposure to the substance was not quantified.

Based on measurements in the pulp and paper industry, de-inking waste paper, aluminium, textile and chemical industry and following the proposed risk management measures controlling worker and professional exposure, the inhalation exposure is below the DNEL of 1 mg/m³.

In addition to the measured exposure data the ECETOC TRA tool has been used to estimate the inhalation exposure.

Based on the applied RMMs the risk towards humans and the environment is sufficiently controlled (RCR ≤ 1).

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

The risk management measures given in this exposure scenario apply to the specified substance in a concentration as indicated in the scenario. The concentration of the substance in the product may differ. A downstream user should evaluate if the risk management measures may be adapted accordingly.

sodium hydroxide (caustic soda)

A downstream user may evaluate whether he operates within the conditions set in the exposure scenario by using the information provided in section 2. This evaluation may be based on an expert judgement or on the utilisation of risk assessment tools that are recommended by ECHA.

1. Short title of Exposure Scenario: - Consumer end use (ES2)

Main User Groups	**SU 21:**	Consumer uses: Private households (=general public=consumers)
Product Category	**PC 0-40:**	Used for different purposes in a variety of sectors and categories
Environmental release category	**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 -**:** The categories mentioned above are assumed to be the most important ones but other categories could also be possible.

2.1 Contributing scenario controlling consumer exposure for: PC 0-40 [sodium hydroxide (caustic soda)] - Consumer end use

Product characteristics

Concentration of the Substance in Mixture/Article

Remarks : All concentrations covered. Typical concentrations: floor strippers (<10%), hair straighteners (<2%), oven cleaners (<5%), drain openers (liquid: 30%, solid: <100%), cleaning products (<1.1%)

Physical Form (at time of use) : Solid and liquid applications, Dustiness: Low

Amount used

: 120 g/activity

Frequency and duration of use

Duration/event : 5 min

Frequency of use : 1 event(s)/day

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. It is required that household chemicals, containing the substance for more than 2%, which may be accessible to children should be provided with a child-resistant fastening (currently applied) and a tactile warning of danger (Adaptation to Technical Progress of the Directive 1999/45/EC, annex IV, Part A and Article 15(2) of Directive 67/548 in the case of, respectively, dangerous preparations and substances intended for domestic use). This would prevent accidents by children and other sensitive groups of society. It is advisable to deliver only in very viscous preparations. It is advisable to delivery only in small amounts. For use in batteries, it is required to use completely sealed articles with a long service life maintenance.

It is required that improved use instructions, and product information should always be provided to the consumers. This clearly can efficiently reduce the risk of misuse. For reducing the number of accidents, it should be advisable to use these products in the absence of children or other potential sensitive groups. To prevent improper use of the substance, instructions for use should contain a warning against dangerous mixtures.

Do not apply product into ventilator openings or slots. For products containing the solid or liquid substance at concentrations > 2%: Wearing of permeation resistant gloves with suitable materials for safety gloves is required. If splashes are likely to occur, wear tightly fitting safety goggles, faceshield. If vapors form, respirators must be used. If product dust is present, wear an anti-dust mask with at least a P2 filter.

3. Exposure estimation and reference to its source

Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterisation ratio (Exposure value/DNEL)
2.1 Most critical use (spray oven cleaner)	Consexpo		short term, inhalation	< 1.6 mg/m³	< 1
2.1			short term, dermal	Not applicable.	

Based on the applied RMMs the risk towards humans and the environment is sufficiently controlled (RCR ≤ 1).

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

The risk management measures given in this exposure scenario apply to the specified substance in a concentration as indicated in the scenario. The concentration of the substance in the product may differ. A downstream user should evaluate if the risk management measures may be adapted accordingly.

sodium hydroxide (caustic soda)

A downstream user may evaluate whether he operates within the conditions set in the exposure scenario by using the information provided in section 2. This evaluation may be based on an expert judgement or on the utilisation of risk assessment tools that are recommended by ECHA.