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SAFETY DATA SHEET

Prepared in accordance with Commission Regulation (EU) 830/2015 amending Regulation 1907/2006, REACH

Sodium Hydroxide Flakes/Prills/Block

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Rev: 03

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Trade name	Sodium hydroxide flakes/prills/block
IUPAC Name	Sodium Hydroxide
Synonym	Caustic soda
EINECS (EC No)	215-185-5
CAS NO.	1310-73-2
Nr. Index	011-002-00-6
Molecular formula	NaOH
Molecular weight	40.01
REACH registration number	01-2119457892-27-0065
Type of substance	Inorganic mono constituent substance

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

Table 1. Identified uses

Identified use/IU number	Sector of End Use (SU)	Preparation Category (PC)	Process Category (PROC)	Environment Release Category (ERC)	Article category (AC)	Exposure Scenario
1	SU 1-24 except 21, 22	Not applicable	PROC 1-4, 8-9	ERC 1	Not applicable	ES 1: Manufacturing of liquid NaOH
2	SU 1-24 except 21, 22	Not applicable	PROC 1-4, 8-9	ERC 1	Not applicable	ES 2: Manufacturing of liquid NaOH

3	SU 1-24 except 21, 22	PC 0-40	PROC 1-27	ERC 1-7, 12	Not applicable	ES 3: Idustrial and professional use of NaOH
4	SU 1-24 except 21, 22	PC 0-40	PROC 1-27	ERC 2, 3, 8-11	Not applicable	
5	SU 21	PC 0-40	Not applicable	ERC 8-11	Not aplicable	ES 4: Consumer use of NaOH

The main uses of sodium hydroxide: are in chemical manufacturing (pH control, acid netralization, off-gas scrubbing and catalyst); pulp and paper manufacturing; in petroloum and natural gas industry (removing acidic contaminants in oil and gas processing); manufacture of soap and detergents and other cleaning products; and celluloses, such as rayon, cellophane and cellulose ethers; cotton mercerizing and scouring. Other uses include water treatment, food processingfluegas scrubbing, mining, glass making, textile processing, refiring vegetable oils, rubber reclamation, metal processing, aluminium processing, metal degreasing, adhesive preparations, paint remover, disifectant.

Uses advise against: there are no uses advised against

1.3. Details of the supplier of the safety data sheet

Supplier: SUMINISTROS AGROPECUARIOS INTERNACIONALES, S.A.
Address: C\ Juan Hurtado de Mendoza, 15, 1º post. – 28036 (Madrid) - ESPAÑA
Phone: 00.34.91.345.94.44
Fax: 00.34.91.359.45.99
E-mail: saisa@saisa.es

1.4. Emergency phone

- **National Center of Toxicology:** 00.34.91.562.04.20

2. HAZARDS IDENTIFICATION

2.1. CLASSIFICATION OF THE SUBSTANCE OR THE MIXTURE

2.1.1. CLASSIFICATION ACCORDING TO REGULATION (ec) 1272/2008 (CLP)

CLASSIFICATION	CATEGORY	H
Skin corrosive.	Category 1A	H314
Corrosive to metals	Category 1	H290

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2.1.2 Additional information

Risk advice to man and the environment

Sodium hydroxide causes severre burns of the eyes, even blindness. In skin contact can cause severe burns.Sodium hydroxide may be fatal if swallowed. Breathing the dust can irritate the mounth, nose and throat. Exposure to high levels may irritate the lungs, causing coughing and/or shortness of breath. Still higher exposure can cause a build up of fluid in the lungs (pulmonary edema).

In contact with water generates alrge amounts of heat. The high water solubility indicates that NaOH will be found predominantly in water. Significant emissions or exposure to the terrestrial environment and to the air are not expected either. The aquatic effect is due to possible pH changes related to OH discahrges, as the toxicity of the Na + ion is expected to be insignificant compared to the (potential) pH effect.

2.2. LABEL ELEMENTS – LABELING ACCORDING TO REGUALTION (EC) 1272/2008, CLP

Signal Word: Warning

Hazard Pictogram Codes and Symbols: GHS05 Corrosion

Hazard statements:
H314 – Causes severe skin burns and eye damage
H290 – May be corrosive to metals

Specofoc concentration limits

Skin Corr. 1A; H314	C ≥ 5 %
Skin Corr. 1B; H314	2 % ≤ C < 5 %
Skin Irrit. 2; H315	0,5 % ≤ C < 2 %
Eye Irrit. 2; H319	0,5 % ≤ C < 2 %

Precautionary statements:
P260 Do not breathe dust

P280	Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353	IF IN 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.
P310:	Immediately call a POISON CENTER or doctor/physician.

Other hazards:

The substance does not meet the criteria for PBT or vPvB substance according to Regulation (EC) 1907/2006, Ammex XIII. No another hazard.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Nombre Químico	CAS	EINCS (EC no)	Index no.	Concentration % (w/w)
Sodium Hydroxide	1310-73-2	215-185-5	011-002-00-6	min 98

Impuritles:

No impurities relevant for classification and labelling.

4. FIRST –AID MEASURES

4.1. Description of first aid measures

General advice : If exposed or if you feel unwell: call a poison center or doctor/physician. Show this safety data sheet to the doctor in attendance.

Following inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Apply artificial respiration if the person has stopped breathing and provide oxygen if breathing is difficult.

Following skin contact: remove/take off immediately all contaminated clothing. Rinse skin with plenty of water for at least 15 minutes until slippery feeling disappears. Seek medical attention immediately. Wash clothing before reuse.

Following eye contact: Rinse cautiously with wáter for several minutes lifting lower and upper eyelids occasionally. Remove contact lense, if present and easy to do. Continue rinsing. Seek medical attention immediately.

Following ingestion : Do not induce vomiting. Rince the mouth and lips with water if the person is conscious, then transfer to hospital urgently.

4.2. MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED

Sympthoms: Sodium hydroxide is severaly corrosive to hte eye, mucous membranes and exposed areas of skin.

Risk:

-by ingestion: severe burns to the digestive tract, risk of perforation of the alimentary canal, state of shock.

-by skin contact:very corrosive for the skin, severe burns, severe lesions, scarring (sometimes retractile) and drematitis possible in the case of repeated contact.

-by eye contact: corrosive for the eye tissues, risk of sight loss.

-by inhalation: corrosive for respiratoy tract. Causes severre skin burns and eye damage.

4.3 INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED.

Perform endoscopy in all cases of suspected sodium hydroxide ingestion. In cases of severe esophageal corrosion, the use of therapeutic doses of steroids should be considered. General supportive measures with continual monitoring of gas exchange, acid-base balance, electrolytes and fluid intake are also required. If skin burns are present, treat as any thermal burn after decontamination.

5. FIRE-FIGHTING MEASURES

5.1. EXTINGUISHING MEDIA

Suitable extinguising media:	All media. For large fire use powder, foarm extinguishing agents or carbon dioxide. Avoid water use if possible. *Adding water to caustic solution generates alrge amounts of heat and steam.*
Unsuitable extinguishing media:	none known.

5.2. SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE

Specific hazards during fire fighting/specific hazards arising from the chemical.

Not considered to be a fire hazard. Sodium hydroxide can react with certain metals, such as aluminum and zinc to generate flammable hydrogen gas. Contact withmoisture or water may generate sufficiente heat to ignite nearby combustible materials.

5.3. ADVICE FOR FIREFIGHTERS

Protection of the fire-fighters: firefighters should wear porper protecitve equipment and self contained breathing apparatus with full face-piece oerated in positive prossure mode. Avoid generation of dust. Use extinguishing measures that are appropriate to local circumstances and surroundings environment.

Fire Fighting Procedures: Keep unnecessary and unprotected personnel away from entering. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. Move container from fire area if this is possible without hazard. Contain fire water run-off if possible. Fire water run – off, if not contained, may cause environmental damage.

6. ACCIDETNAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel
Keep dust levels to a minimum.
Keep unprotected persons away.
Avoid contact with skin, eyes and clothing-wear suitable protective equipment (See section 8).
Avoid inhalation of dust – ensure that sufficient ventilation or suitable respiratory protective equipment is used, wear suitable protective equipment (see section 8).
Avoid humidification

For emergency responders
Keep dust levels to a minimum.
Ensure adequate ventilation.
Keep unprotected persons away
Avoid contact with skin, eyes and clothing-wear suitable protective equipment (See section 8).
Avoid inhalation of dust – ensure that sufficient ventilation or suitable respiratory protective equipment is used, wear suitable protective equipment (see section 8).
Avoid humidification

6.2. ENVIRONMENTAL PRECAUTIONS

Spillages or uncontrolled discharges into watercourses must be IMMEDIATELY alerted to the Environmental Agency or other appropriate regulatory body. Collect spillage in containers, seal securely and deliver for disposal according to local regulations.

6.3 METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP

Methonds for cleaning up/methonds for containment:
Contain and recover when possible. Avoid generating dusty conditions. Do not flush caustic residues to sewer. Residues from spills can be diluted with water, neutralized with diluted acid such as acetic and hydrochloric. Absorb neutralized caustic residues on clay, sand, vermiculete or other absorbent amterial and place in a chemical waste container for disposal.
Refer to section 13 dor disposal of spilled material.

6.4. Reference to other sections:
Additional advice: refer to section 8, 13.

7. HANDLING AND STORAGE

7.1 PRECAUTIONS FOR SAFE HANDLING

Protective measures: special attention is required when caustic soda is handled. All workers should be properly trained in the required safe handling and first aid procedure. Persons handling caustic soda must always wear protective clothing, close-fitting chemical worker's safety goggles, hard hat and rubber gloves, in order to avoid any contact with hand, skin or eyes. Do not wear contact lenses when handling this product. It is also advisable to have individual pocket eyewash. Keep dust levels to a minimum. Minimize dust generation.

Advice on general occupational hygiene: Avoid inhalation or ingestion and contact with skin and eyes. General occupational hygiene measures are required to ensure safe handling of the substance.These measures involve good personal and housekeeping practices (i.e. regular clearing with suitable cleaning deviceS), no drinking, eating and smoking at the workplace. Shower and change clothes at end of work shift. Do not weat contaminated clothing at home.

7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

The substance should be stored under dry conditions. Any contact with moisture should be avoided. Sodium hydroxide wrapped in original packaging will be store in a cool, dry, well-ventilated area away from incompatible substances. Protect containers from damage.

Incompatible materials: do not store in aluminum, zinc and lead containers.

Incompatible substances: Collocated storage with the following substance is prohibited: explosive sunstance, strongly oxidizing substances, organic peroxides, acids, organic solvent.ç

Shelf time: 12 months. Caustic soda is a stable product but its storage life is dependent upon the storage conditions.

Never add water to a corrosive. Always add corrosives to water. When mixing with water, stir small amounts in slowly. Use cold water to prevent excessive heat generation.

7.3 Specific end use (s)

Please check the identified uses from Section 1.2.

For more information please see the relevant exposure scenario, available via your supplier/given in the Annex I.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

8.1.1. Occupational Exposure limit values (OEL) 8 h TWA: 2 mg/m³ of sodium hydroxide with a few exceptions (Czech Republic – 1.0 mg/m³ ; Poland - 0,5 mg/m³) **Short-term exposure limit (STEL), 15 min**: 2 mg / m³ of sodium hydroxide

DNEL	**Values**
DNEL long term inhalation, general population = 1,0 mg / m3	
DNEL long term inhalation, workers = 1,0 mg / m3	

PNEC	**Values**
PNEC aqua:	not applicable
PNEC soil/groundwater:	not applicable

No PNEC was able to be calculated as the buffering capacity, the pH and its fluctuation are very specific to the ecosystem in question.

8.2 EXPOSURE CONTROL.

8.2.1. Engineering controls: A system of local and/ or general exhaust is recommended to keed employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control to emission of the contaminat at its source, preventing dispersion of it into general work area.

8.2.2. Personal Protection Equipment

Eye/Face protection: Chemical splash goggle and/or face shield must be worn when possibility exists for eye contact due to splashing or spraying liquid, airborne particles or vapor. Contact lenses must not be worm. Emergency eye wash fountains should be available in the immediate vicinity of any potential exposure area.

Skin protection: Wear impervious protective, clothing, chemical goggles/face shield, chemical resistant gloves, hard hat, pant legs outside boots, chemical resistant boots.

Hand protection: Handle with gloves which were inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. The selected protective gloves have to satisfy the specifications of the standar EN374 derived from it.

The following material are suitable for protective gloves (permeation time ≥8 hours)

Natual Rubber/Natural latex – NR (0.5 mm)

Polychloropropene-CR (0.5 mm)

Nitrile rubber/Nitrile latex- NBR(0.35 mm)

Butyl rubber-Butyl (0.5 mm)

Fluorocarbon rubber-FKM (0.4 mm)

Polyvinyl cgloride-PVC (0.5 mm)

Above recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our custormers. It should not ne construed as offering an approval for any specific use scenario.

Respiratoy protection: If the exposure limit is exceeded (up to 50 ppm) a full face-piece respirator with a chemical cartridge respirator with an adequated cartridge is recommended, aproved according to EN 14 387 standar.

For emergencies or instances where exposure levels are not known, use a full face-piece positive prossure, air supplied respirator. *Air purifying respirators do not protect workers in axygen deficient atmospheres.*

Monitoring Methods: Monitoring the substance concentration (dust) in workplace may be required to confirm compliance with an OEL and adequacy of exposure control.

Enviromental Exposure Control:

All ventilation system should be filtrered before discharge to atmosphere. Avoid releasing to the enviroment.

Contain the spillage. Any large spilalge into watercourses must be alerted to the Environment Agency or other regulatory body. For detailed explanations of the risk management measures

that adequately control exposure of the enviroment to the substance please check the relevant exposure scenario, available via your supplier.

Other precautions: Maintain shower, eye wash fountain and quick-drench facilities in work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

General information

Appearance	White and hygroscopic flakes, prills or block
Odor	odorless
Inportant health, safety and environmental information	
pH	alkaline
Boiling point	1390ºC
Flash point	NA
Flammability	non flammable
Explosive properties	no oxidizing properties
Oxidizing properties	No hay propiedades oxidantes
Vapor pressure, 20ºC	NA
Specific density (water = 1)	2,13 g / cm3
Solubility in water	completely solubre in water
in ethanol, glycerol	soluble
Partition coefficient (log $_{Kow}$)	NA
Viscosity, 20 ^{0}C	NA

Other information	
Melting point	318ºC
Autoignitiontemperature	NA

10. STABILITY AND REACTIVITY

10.1 REACTIVITY

A violent reaction occurs with ineral or organic acids and ketones. Sodium hydroxide is highly corrosive to certain metals and alloys: zinc, aluminium, tin, copper, lead, bronze, brass. Sodium hydroxide also destroys leather, strips paint and attacks certain plastics, rubbers and coatings. Contact with nitro methane and other similar nitro compounds cause formation of shock-sensitive salts.

10.2 CHEMICAL STABILITY

Under normal conditions of use and stoage (dry conditions), sodium hydroxide is stable. Hygroscopic product and is sensitive to the carbon dixine in the air (carbonation)

10.3 POSSIBILITY OF HAZARDOUS REACTIONS

Sodium hydroxide is a stable product; however certain risks exist in the presence of:
-explosives such as nitrous compounds – reaction producing enough heat to detonate the explosive.
-vinyl chloride monomer – formation of chloroacetylene
-tetrahydrofuran-explosion upon contact
-sodium tetrahydroborate – gives off hyrogen with an explosion
-pentachlorophenol-explosion and foramtion of toxic vapours.
-tetrachlorobenzene –explosion due to and increase in pressure.
-maleic anhydride –explosive decomposition

10.4 CONDITIONS TO AVOID

Substanes to be avoided: water, acid, zinc, aluminium, copper, alkali metals, alkaline earth metals, acetaldehyde, acroleine, acrylonitrile, allyl alcohol, halon, maleic anhydride, bromine, nitroparaffins, nitroaromatics, oleums, tetrahydrofuran. Minimise exposure to air and moisture to avoid degradation. Avoid contact with incompatibles.

10.5 INCOMPATIBLE MATERIALS

Certain metals and alloys: zinc, aluminium, tin, copper, lead, bronze, brass. Sodium hydroxide also detroys leather, strips paint and attacks certain plastics, rubbers andcoatings. Water contact may generate large amounts of heat.

10.6 HAZARDOUS DECOMPOSITION PRODUCTS:

Dangerous products of decomposition: by corrosion of metals, formation of flammable and explosive hydrogen.

11. TOXICOLOGICAL INFORMATION

	Conclusiones
Absorbtion	When humans are dermally exposed to low (non-irritating) concentrations, the uptake of NaOH should be relatively low due to the low absortion if ions. For this reason the uptake of NaOHis expected to be limited under normal handling and use conditions.
Acute toxicity	Sodium hydroxide is a corrosive substance and for this reason there is no need for further acute toxicity testing (EU RAR, 2007; section 4.1.2.2.3. page 65)
Irritation/Corrosion	Based on experimental results and according to the CLP Regualtion No

	1272/2008 Annez VI Table 3.1, sodium hydroxide is a skin corrosive category 1A at a concetration ≥ 5% (H314: causes severe skin burns and eye damage) the concentration range for eye/skin irritation is 0,5% ≤ C <2%
Sensitisation	Existing data do not demonstrate that NaOH is a skin sensitizer.
Repeated dose toxicity	No reliable studies were available. However, systemic effects of NaOH after repeated exposure are not expected to occur under normal handling and use and therefore NaOH has no specific organ repeated dose toxicity.
Mutagenity	Both the in vitro and the in vivo genetic toxicitu test indicated no evidence of mutagenic activity.
Carcinogenity	NaOH is of no concern with regards to carcinogenicity.
Toxicity for reproduction	NaOH is not toxic for reproduction

12. ECOLOGICAL INFORMATION

12.1. Aquatic toxicity

Acute(short-term)toxicity

Fish: LC50 /96 h/ peste= 35 – 189 ,g/l

Aquatic ivertebrates: *Ceriodaphnia sp: EC50/48h/apa dulce = 40,4 mg/l*

Algae and aquatic plants: study scientifically unjuntified

Chronic (long-term) toxicity:

Fish:: No valid long-term toxicity studies to fish are available. Despite of this, there is no meed for further toxicity testing with NAOH, as all available test resulted ina rather small range of toxicity values (chronic toxicity test: ≥ 25 mg/l) and there are sufficient data on pH ranges that are tolerated by major taxonomic groups (EU RAR, 2007; section3.2.1.1.4., page 30)

Aquatic invertebrates: study scientifically unjustified.

Algae and aquatic plats: study scientifically unjustified.

Toxicity to soil macro-organisms:

The terrestrial compartment was not included in the targeted risk assessment (EU RAR, 2007, section 3.1.3.3., page 26) because it is not considered relevant for NaOH since if emitted to the soil, sorption to soil particles will be negligible.

Toxicity to terrestrial plants: There is no direct exposure of soil to NaOH based in the available uses.

Toxicity to birds: No exposure to birds is foreseen. PNEC not applicable according to the EU RAP (2007; section 3.1.3.5., page 26) bioaccumulation in organims is not relevant for NaOH. Based on this, there is no need to perfomr risk assessment for secondary poisoning.

12.2. PERSISTENCE AND DEGRADABILITY:

NaOH will rapidly dissolve and dissociate in wáter. Therefore, NaOH does not fulfil the P criterion (EU RAR, 2007; section 3.3.1.2., page 34).

12.3. BIOACCUMULATIVE POTENCTIAL

Bioaccumulation is not relevant for NaOH, therefore Naoh does not meet the B criterion of the PBT criteria (EU RAR, 2007; section 3.3.1.2. page 34)

12.4. MOBILITY IN SOIL

High water solubility indicates that sodium hydroxide will be found prodminately in aquatic enviroment. During movement through soil some ion exchange will occur Also, some of the hydroxide may remain in the aqueous phase and will move downward through soil in the direction of gorundwater flow. Sodium hydroxide does not cause biological oxygen deficit..

12.5. RESULTS OF PBT AND VpVb assessment:

NaOH, does not fulfil the criteria for persistency, bioaccumulation and toxicity. Therefore, NaOH is not considered a PBT or vPvB substance (EU RAR, 2007; section 3.3.1.2.

13. DISPOSAL CONSIDERATIONS

Waste Code (European Waste Catalogue): 06 02 04 * sodium and potasium hydroxide.
Note: also please refer to your specific industry and take into account the waste compositio for establish the correct waste code.

13.1 Waste treatment methods

13.1.1 Product

Methods of disposal: the generation of waste should be avoided or minimised wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable rpoducts via a licensed waste disponsal contractor. Disposal if this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spill material and runoff and contact with soil, waterways, drains and sewers.

13.1.2 Packaging

Methods off disposal: The generationof waste should be avoided or minimised wherever

possible. Waste packaging should by recycled. Incineration or landfill should onñy be considered when recycling is not feasible.

European legislation regarding waste: Directive 2008/98/EC on waste (waste framework Directive)
Directive 2008/532/EC replacing Decision 94/3/Ec establishing a list of wastes pursuant to Article 1 (a) of Council Directive 75/442 EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1 (4) of Council Directive 91/689/EEC on hazardous waste regulation (Ec) No 1013/2006 of the European Parliament and of the Council on shipments of waste, with subsequent modifications and additions.

14. TRANSPORT INFORMATION

Solid Sodium hydroxide can be shipped according to trnasport regulations for dangerous good, hazard class 8, Corrosive substance.

Transport Labeling

Label nº 8
Corrosive

RID		/				**ADR**
UN No.		1823				
Proper shipping name		Solid	Sodium			Hydroxide
Hazard class		8				
UN Packing Group		II				
Classification code		C6				
Danger panel	*80/1823*	*(Hazard*	*Identification*	*N*	*°*	*80)*
		(UN	*Identification*	*No*		*1824)*
IMDG		/				**IMO**
UN No.		1823				
Hazard class		8				
UN Packing Group		II				
Proper shipping name		Solid	Sodium			Hydroxide
EmS No.		F-A,				S-B
Marine polutant		No				

IATA	/		**IT-ICAO**
Proper shipping name	Solid	Sodium	Hydroxide
Un No	1823		
Hazard class	8		
UN Packing Group	II		
IATA Label	Corrosive		
Packaging Note Passenger	814		
Packaging Note Cargo	816		
Max. Quantity Passenger	15		kg
Max. Quantity Cargo	60 kg		

15. REGULATORY INFORMATION

15.1 SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS/LEGISLATIONS SPECIFIC FOR THE SUBSTANCE OR MIXTURE

Relevant information regarding the European legislation

EU Regulation (EC) No. 1907/2006 (REACH) Regulation (EC) no 1907/2006 of the European Parliament and of the Council regarding the Registration, Evaluation, Authorization and Restriction of chemicals (REACH) Regulation

Regulation (EC) no. 1272/2008 of the European Parliament and of the Council on the Classification, Labeling and Packaging of substances and mixtures.

Directive 2012/18/EU (SEVESO III) of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances, amending and subequently repealing Council directive 96/82/EC.

Regulation (EC) No 1005/2009 of the European Parliament and of the Council on substances that deplete the ozone layer.

European Agrrement concerning the International Carriage of Dangerous Goods by Road (ADR) Regualtion referring to the International Carriage of Dangerous Goods by Rail (RID International maritme Dangerous Goods (IMDG)

EU Regulation (EC) No. 1907/2006 (REACH):

Annex XIV of REACH – Authorization: Sodium hydroxide is not subject to authorization.

Annex XVII of REACH – Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixture and articles.

Restrictions on use: no restriction

Other EU regulations: Sodium hydroxide solution 50% is not subject to:

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer

Regulation (EC) No 850/2004 on persistent organic pollutants

Regulation (EC) No 649/2012 concerning the export and import of dangerous chemicals.

Directive 2012/18/EU – SEVESO III Directive

WGK (Germany): WGK 1 slightly water endangering

15.2. CHEMICAL SAFETY ASSESSMENT

Chemical Safety Assessment have been carried out for this substance and a CSR was issued.

16. OTHER INFORMATION

Data are based on our latest knowledge but do not constitute a guarantee for any specific product features and do not establish a legally valid contractual relationsh.

16.1. Relevant H-statements (number and full text)

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

16.2. Abbreviation and acronyms (NOT ALL ARE USED IN THIS SDS)

AC – Article categoy
ADR: European agreement concerning the international carriage of dangerous goods by road
BSAF: bio soil accumulation factor
BCF: bio concentration factor
CAS: Chemical Abstracts Service
CLP: Classification, labelling and packaging
CMR: Carcinogenic, mutagenic or toxic for reproduction
CSA/CSR: Chemical safety assessment/ chemical safety report
DNEL: Derived no effect level
EC10: Concentration of a substance where 10% of the population is affected
EC50- Concentration of a substance where 50% of the population is affected
ECHA – European chemicals agency
EINECS EU - list of existing chemical substances
EmS – Emergency schedule
ERC – Environmental release categoy
ES – Exposure scenario
eSDS: Extended safety data sheet
GHS: Globally harmonised system

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IATA - DGR: International air transport association – dangerous goods regulations
ICAO: Technical Instructions for the Safe Trnasport of Dangerous Goods by Air
IU: Identified use
IUPAC: International Union of Pure and Applied Chemistry
IBC: code International code for the cosntruction and equipment of ships carrying dangerous chemicals in bulk
IMDG: International maritime dangerous goods
KP: Partition coefficient
LC10: Lethal concentration of a substance that can be expected to cause death in 10% of the population
LC50: Lethal concentration of a substance that can be expected to cause death in 50% of the population.
LD50: Lethal dose of a substance that can be expected to cause death in 50% of the population
NO (A) EC: No observed (adverse) effect concentration
NO (A) EL: No observed (adverse) effect level
OECD: Organisation for economic co-operation and development
OEL: Occupational exposure limit
PBT: Persistent, bioaccumulative and toxic
PC: Product category
PNEC: Predicted no –e effect concentration
PROC: Process category
REACH: Registration, evaluation, authoisation and restriction of chemicals (i.e. Regulation (EC) No. 1907/2006)
RID International rule for transport of dangeous substances by railway
SDS Safety data sheet
STOT Specific target organ toxicant
STP Sewage treatment plant
SU Sector of end use
TWA Time weighted average
vPvB Very persistent, very bioaccumulative

ANNEX I – EXPOSURE SCENARIO

Exposure Scenario 1: Manufacturing of liquid NaOH

List of all use descriptors

Sector of use (SU): SU 3,8 Manufacture of bulk, large-scale substances

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Producto category (PC):	not applicable
Process category (PROC):	PROC1 Use in closed process, no likelihood of exposure
	PROC2 Use in closed, continuous proceess with occasional controlled exposure
	PROC3 Use in closed batch process (synthesis of formulation=
	PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises
	PROC 8a/b Transfer of chemicals from/to vessels/large containers at (non) dedicated facilities
	PROC9 Trnasfer of chemicals into small containers (Dedicated filling line)
Article category (AC):	not applicable
Environmental Release Category (ERC)	ERC1 Manufacture of substances

EU Risk Assessment

An EU risk assessment has been performed based on the Exisiting Substances Regulation (Council Regulation 793/93). A comprehensive risk assessment report has been finalised in 2007 and is available via internet:

http://ecb.jrc.ec.europea.eu/DOCUMENTS/Existing-chemicals/RISK_ASSESSMENT/REPORT/sodiumhydroxidereport416.pdf

Contributing exposure scenario controlling environmental exposure

Product characteristics

Liquid NaOH, all concentrations

Frequency and duration of use

Continuous.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Risk management measures related to the environment aim to avoid discharching NaOH solutions into municipal wastewater or to surface water, in case such discharges are expected to cause significant pH

changes. Regular control of the pH value during iintroduction into open waters is required. In general discharges should be carried out such that pH changes in receiveing surface waters are minimised. In general most aquatic organism can tolerate pH values in the range og 6-9. This is also reflected in the descroption of standard OECD test with auqatic organisms.

Conditions and measures related to external treatment of recovery of waste for disposal

Liquid NaOH waste should be reused of discharged to the industrial wastewater and further neutralized if needed.

Contributing exposure scenario cntrolling worker exposure

Product characteristics

Liquid NaOH, all concentrations

Frequency and disration of use/exposure

8 hours/day, 200 days/year

Technical conditions and measures at process level (source) to prevent release

Replacing, where appropiated, manual processes by automated and/or closed processes. This would avoid irritating mist, spraying and subsequent potential splashes:

- Use closed systems or covering of oen 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)".

Technical conditions and measures to control dispersion from source fowards the worker

Local exhaust ventilation and/or general ventilation is good practice

Organisational measures to prevent/limit releases, dispersion and exposure

- Workers in the riskt process/areas identified shoyuld be trained a) to avoid to work without respiratory protection and b) to understand the corrosive properties and, especially, the respiratory inhalation effects of sodium hydroixe and c)to follow the safer procedures instructed by the employer.
- The employer has also to ascertain that the required PPE is available and used according to instructions.

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

- Respiratoy protection: In case of dust or aerosol formation (e.g. spraying): use respiratory protection with parroved filter (P2)

- Hand protection: impervious chemical resistant protective gloves
  - Material: butyl-rubber, PVC, polychloroprene, with natural altex liner, material thickness: 0.5mm, breakthrough time: > 480 min.
  - Material: nitrile-rubber, fluorinated rubber, material thickness: 0.5-0.4 mm breakthrough time: > 480 min.
- Eye protection: chemical resistant goggles must be worn. If splashes are likely to occur, wear tightly fitting safety goggles, face-shield.
- Wear suitable protective clothing, aprons, shield and suits. If splashes are likely to occur, wear: rubber or plastic boots.

Exposure estimation and reference to its source

Worker exposure:

NaOH is a corrosive substance. For the handling of corrosive substances and formualtions, inmediate dermal contacts occur only occasionally and it is assumed that repeated daily dermal exposure can be neglected. Therefore, dermal exposure to NaOH was not quantified.

NaOH is not expected to be systemically available in the body under normal handling and use conditions and therefore systemic effects of NaOH after dermal ir inhalation exposure are not expected to occur.

Bases on NaOH measurements and following the proposed risk management measures controlling worker exposure, the reasonable worst-case inhalation exposure of 0.33 mg/m³ (typical value is 0.14 mg/m³) is bwlow the DNEL of 1 mg/m³.

Environmental exposure:

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 Na^+ ion is expected to be insignificant compared to the (potenctial) pH effect. The high water solubility and very low vapour pressure indicate that NaOH will be found predominantly in water. When the risk management measures related to the enviromenment are implemented, ther is no exposure to the activated sludge of a sewage treatment plant and there is not exposure of the receiving surface water.

The sediment compartment is not considered, because it is not considered relevant for NaOH. If emitted to the aquatic comparment, sorption to sediment particles will be negligible.

Significant emissions to air not expecter due to the very low vapour pressure of NaOH. If emitted to air as an aerosol in water, NaOH will be rapidly neutralised as a result of its reaction with CO2 (ot other acids).

Significant emissions to the terrestrial environmental are not expected either. The sludge applicactions route is not relevant for the emissión to agricultural soil, as no sorption of NaOH 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 of the pH may increase.

Bioaccumulation will not occur.

Exposure Scenario 2: Manufacturing of solid NaOH

List of all use descriptors

Sector of use (SU):	SU 3,8 Manufacture of bulk, large-scale substances
Producto category (PC):	not applicable
Process category (PROC):	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 of formulation)
	PROC4 Use in batch and other process (synthesisi) where opportunity for exposure arises
	PROC8a/b Transfer of chemical from/to vessels/large containers at (non) dedicated facilities
	PROC9 Transfer of chemicals into small containers (dedicated filling line)
Arcicle category (AC):	not applicable
Environmental Release	
Category (ERC):	ERC1 Manufacture of substances

EU Risk Assessment

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Contributing exposure scenario controlling environmental exposure

Product characterisitics

Solid NaOH

Frequency and duration of use

Continuous.

Technical onsite conditions and measures to reduce or limit discharges, air, emissions and releases to soil.

Risk management measures related to the environment aim to avoid discharging NaOH solutions into municipal wastewater or to surface water, in case such discharges are expected to cause significiant pH changes. Regular control of the pH value during introduction into open waters is required. In general discahrges should be carried out such that pH changes in receiving surface waters are minimised. In general miost aquatic organisms can tolerate pH values in the range of 6-9. This is also reflected in the description of standar OECD test with aquatic organisms.

Conditions and measures related to external treatment or recovery of waste for disposal.

There is no solid waste of NaOH. Liquid NaOH waste be reused or dicharged to the industrial wastewater and further neutralized if needed.

Contributing exposure scenario controlling worker exposure

Product characteristic

Solid NaOH, all concentrations

Frequency and duration of use/exposure

8 hours/day, 200 days/year

Technical conditions and measures at process level (soruce) to prevent release

Replacing, where appropriated, 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 contianers (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)".

Technical conditions and measures to control dispersion from source towards the worker

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

Organisational measures to prevent/limit releases, dispersion and exposure

- 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 respiroty inhalation effects of sodium hydroxide and c)to follow the safer procedures instructed by the employer.
- The employer has also to ascertain that the required PPE is available and used according to instructions.

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

- Respiratory protection: In case of dust or aerosol formation (e.g. srpaying): use respiratory protection with approved filter (P2)
- Hand protection: imprevious chemical resistant protective gloves
  - Material : butyl-rubber, PVC, polychloroprene with natural latex liner, material thickmess: 0.5 mm, breakthrough time: > 480 min
  - Material: nitrile-rubber, fluorinated rubber, material thcikness: 0.35-0.4 mm, breakthrough time: > 480 min.
- Eye protection: chemical resistant goggles msut be worn. If splashes are likely to occur, wear tightly fitting safety goggles, face – shield
- Wear suitable protective clothing, aprons, shielf and suits, if splashes are likely to occur, wear: rubber or plastic boots, rubber or plastic boots.

Exposure estimation and reference to its source

Worker exposure:

NaOH is a corrosive substance. For the handling of corrosive substances and formulations, inmediate dermal contacts occur only occasionally and it is assumed that repeated daily dermal exposure can be neglected. Therefore, dermal exposure to NaOH was not quantified.

NaOH is not expected to be systemically available in the body under normal handling and use conditions and therefore systemic effects of NaOH after dermal or inhalation exposure are not expected to occur.

Based on NaOH measurements and following the proposed risk management measures controlling worker, the reasonable worst-case inhalation exposure of 0.26 mg/m³ (measured at the drumming/bagging place) is below the DNEL of 1 mg/m3.

Environmental exposure:

The aquatic effect and risk assessment only deals with the effect on organims/ecosystems due to possible pH changes related to OH discahrges, as the toxicity of the Na+ ion is expected to be significant compared to the (potential) pH effect. The hight ater solubility and very low vapour pressure

indicate that NaOH will be found predominantly in water. When the risk management measures related to the environment are implemented, there is no expsoure of the receiving surface water.

The sediment compartement is not considered, because it is not considered relevant for NaOH. 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 NaOH. If emitted to air as an aerosol in water, NaOH will be rapidly neutralised as a result of its reaction with CO2 (or other acids)

Significant emission to the terrestrial environment are not expected aither. The suldge application route is not relevant for the emission to agricultural soil, as no sorption of NaOH to particulate amtter 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.

Exposure Scenario 3: Industrial and Professional Use of NaOH

List of all use descriptors

Sector of use (SU): SU 1-24

Because sodium hydroxide has so many uses and is used so widely it can potentially be used in all sectors of end use (SU) described by the use descriptor syste (SU 1-24): NaOH is used for different purposes in a variety of industrial sectors.

Product category (PC): PC 0-40

Sodium hydrocxide can be used in many different chemical product categories (PC). It can be used for example as an adsorbent (P20), metal surface treatment product (PC14), non-metal-surface treatment product (PC15), intermediate (PC 19), pH regulator (PC20), laboratory chemical (PC21). Cleaning product (PC35), water softener (PC 36), water treatment chemical (PC37) or extraction agent. However, it could potentially also be used in other chemical product categories (PC 0-40)

Process category (PROC): PROC1 Use in closed process, no likelihood of exposure

PROC2 Use in close, continous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis of formulation)

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

PROC5 Mixing or blending in batch processes (multistage and/or significant contact)

PROC8a/b Transfer of chemicals from/to vessels/large containers at (non) dedicated facilities

PROC9 Transfer of chemicals into small containers (dedicated filling line)

PROC10 Roller application of brushing

PROC11 Non industrial spraying

PROC13 Treatment of articles by dipping and pouring

PROC15 Use of laboratory reagents in small sclae laboratories

The process categories mentioned above are assumed to be the mest importatn ones but other process categories could also be possible (PROC 1-27)

Article category (AC): not applicable

Although sodium hydroxide can be used during the manufacturing process of articles, the substance is not expected to be present in the article. The article categories (AC) do not seem applicable for sodium hydroxide.

Environmental Release

Category (ERC): 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 reactive 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.

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ERC9A Wide dispersive indoor use of substances in closed systems

The environmental release categories mentioned above are assumed to be the most important oes but other industrial environmental release categories could also be possible (ERC 1-12)

Further explanations

Typical uses include: production of organic and inorganic chemicals, formulation of chemicals, production and whitening of paper pulp, production of aluminium and other metals, food industry, water treatment, production of textiles, professional end use of formulated products and other industrial uses.

EU Risk Assessment

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Contributing exposure scenario controlling environmental exposure

Product characteristics

Solid or liquid NaOH, all concentrations (0-100%), if solid: low dustiness class

Frequency and duration of use

Continuous.

Technical outside conditions and measures to reduce or limit discharges, air emissions and releases to soil.

Risk management measures related to the environment aim to avoid discharging NaOH solutions into municipal wastewater or tu surface waterm in case such discharges are expected to cause significant pH cahnges. 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 standar OECD test with aquatic organisms.

Conditions and measures related to external treatmen or recovery of waste for disposal.

There is no solid waste of NaOH. Liquid NaOH waste should be reused or discharged to the industrial wastewater and further neutralized if needed.

Contributing exposure scenario controlling worker exposure

Product characteristic

Solid or liquid NaOH, all concentrations (0-100%), if solid: low dustiness class

Frequency and duration of use/exposures

8 hours/day, 200 days/year

Technical conditions and measures at process level (source) to prevent release:

For worker, both solid and liquid NaOH containing products at concentration >2%

Replacing, where appropriated, 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)
- Trnasport over pipes, technical barel filling/emptying of barrel with automatic systems (suction pumps, etc)
- Use of pliers, grip arms with long handles with manual use "to avoid duirect contact and exposure by splashes (no working over one's head)"

Technical conditions and measures to control dispersion from source owards the worker

For worker, both solid and liquid NaOH containing products at concentration > 2%

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

Organitational measures to prevent/limit releases dispersion and exposure

For worker, both solid and liquid NaOHcontaining products at concentration > 2%.

- Workers in the risky process/areas identified should be trained a)to avoid to work without respiratory protection and b) to understand to corrosive properties and, especially, the respiratory inhalation effects of sodium hydroxide and c) to follow the safer procedures instructied by the employer.
- The employer has also to ascertain that the required PPE is available and used according to instructions.
- 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 worker and professional, both solid and liquid NaOH containing products at concentration 2%:

- Respiratory protection: In case of dust or aerosol foramtion (e.g. spraying): use respiratory protection with approved filter (P2)
- Hand protection: impervious chemical resistean protective gloves.
    - Material: butyl-rubber, PVC, polychloroprene with natual latex liner, material thickness: 0.5 mm, breakthough time: > 480 min.
    - Material: butyl-rubber, fluorinated rubber, material thickmess: 0.35-0.4 mm, breakthrough time: > 480 min.

- If splashes are likey to occur, wear tightly fitting chemical resistant safety goglles, face-shield
- If splashes are likely to ocuur, wear suitable protective clothing, aprons, shield and suits, rubber or plastic boots

Exposure estimation and reference to its source

ist of all use descriptions

Sector of use (SU): SU 21 Private households

Product category (PC): PC 0-40

Sodium hydroxide can be used in many differents chemical product categories (PC): PC 20, 35, 39 (neutralisations agents, cleaning products, cosmetics, personal care products), The other PCs are not explicitly considered in this exposure scenario. However, NaOH can also be used in other PCs in low concentrations e.g. PC3 (up to 0.01 %), PC28 and PC31 (up to 0.002%) but it can be used also in the remaining oroduct categories (PC 0-40)

Process category (PROC): not applicable

Article category (AC): not applicable

Environmental Release Categoy (ERC): 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 environmental release categories mentioned above are assumed to be the most importatn ones but other wide dispersive environmental release categories could also be possible (ERC8-11b).

Further explanations

NaOH (up to 100%) is also used by consumers. It is used at home for drain and pipe clening, wood treatment and it also used to make soap at home. NaOH is also used in batteries and in oven-cleaner peds.

EU Risk Assessment

An EU risk assessment has been performed based on the Exisitng Substances Regulation (Council Regulation 793/93). A comprenhesive riskassessment report has been finalised in 2007 and is available via internet:

http://ecb.jrc.ec.europea.eu/DOCUMENTS/Existingchemical/RISK_ASSESSMENT/REPORT/SODIUMHYDROXIDEREPORT416.PDF

Contributing exposure scenario controlling environmental exposure

Product characteristic

Solid or liquid NaOH, all concentration (0-100%), if solid: low dustiness class

Conditions and measures related to external treatment or recovery of waste for disponsal.

This material and its container must be disposed of in a safe way (e.g. by retunring 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 NaOH from alkaline batteries incluldes emptying the electrolyte, collection and neutralization with sulphuric acid and carbon dioxide.

Contributing exposure scenario controlling worker exposure

Product characteristic

Solid or liquid NaOH, all concentrations (0-100%), if solid: low dustiness class

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

Conditions and measures related to the design of the product

- 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 ise instructions.

- It is required that household chemicals, containing sodium hydroxide for more that 2%. Wich 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 group 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 serice life maintance.´

Conditions and measures related to information and behavioural advice to consumers

It is required that improved use instructions, and product information should always be provided to the consumers. This clearly can efficiently reduce the riskof misuse. For reducing the number of accidents in wich (young) children or elderly people are involved, it should be advisable to use these products in the absence of children or other potential sensitive groups. To provent improper use of sodium hydroxide, instructions for use should contain a warning against dangerous mixtures.ç

Instructions addressed to consumers:

- Keep out of reach of children
- Do not apply product into ventilator openings or slots.

Conditions and measures related to personal protection and hygiene

For consumer, both solid and liquid NaOH containing products at concetration > 2%:

- Respiratory protection: In case of dust or aerosol formation (e.g. spraying): use respiratory protection with approved filter (P2)
- Hand protection: impervious chemical resistant protective gloves.
- If splashes are likely to occur, wear tightly fitting chemical resistant safety goggles, face-shield

Exposure estimation and reference to its source

Consumer exposure:

Acute/short term exposure was assessed only for the most critical use: use of NaOH in a spray ovencleaner. Consexpo and Spray Expo were used to estimate exposure. The calcualted short-term exposure of 0.3 – 1.6 mg/m³ is slightly higher thanlong term DNEL for inhalation of 1 mg/m³ but smaller than the short term occupatonal exposure limit of 2 mg/m³. Furthermore, NaOH will be rapidly neutralised as a result of its reaction with CO_2 (or other acids)

Environmental exposure:

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Consumer uses realtes to already diluted products wich will furhter be neutralized quickly in tne sewer, well before reaching a WWTP or surface water.