Safety Data Sheet

According to Annex II to REACH - Regulation 2020/878 and to Annex II to UK REACH

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

1.1. Product identifier

Code: **TC34400**
Product name **SODIUM HYDROXIDE 1N=N/1=1M**

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

Intended use **Reagent for laboratory and for process control.**

1.3. Details of the supplier of the safety data sheet

Name **TITOLCHIMICA SPA**
Full address **VIA S.PIETRO MARTIRE 1054**
District and Country **45030 PONTECCHIO POLESINE (RO)**
ITALIA

Tel. +39425492644

e-mail address of the competent person

responsible for the Safety Data Sheet **utecnico@titolchimica.it**
Supplier: **TITOLCHIMICA SPA**

1.4. Emergency telephone number

For urgent inquiries refer to **Poison Centers (24 / 24h):**
Pavia - 038224444;
Milan - 0266101029;
Bergamo - 80083300;
Verona - 800011858;
Florence - 0557947819;
Rome - Gemini 063054343;
Rome - Umberto I 0649978000;
Rome - Baby Jesus 0668593726;
Naples - 0815453333;
Foggia - 800183459.

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is classified as hazardous pursuant to the provisions set forth in (EC) Regulation 1272/2008 (CLP) (and subsequent amendments and supplements). The product thus requires a safety datasheet that complies with the provisions of (EU) Regulation 2020/878.
Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Hazard classification and indication:

Substance or mixture corrosive to metals, category 1	H290	May be corrosive to metals.
Skin corrosion, category 1B	H314	Causes severe skin burns and eye damage.
Serious eye damage, category 1	H318	Causes serious eye damage.

2.2. Label elements

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms:

Signal words: Danger

Hazard statements:

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

Precautionary statements:

P260 Do not breathe dust / fume / gas / mist / vapours / spray.
P264 Wash hands thoroughly after handling.
P280 Wear protective gloves/ protective clothing / eye protection / face protection.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or 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 / doctor.

Contains: Sodium hydroxide

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage ≥ than 0,1%.

The product does not contain substances with endocrine disrupting properties in concentration ≥ 0.1%.

SECTION 3. Composition/information on ingredients

3.2. Mixtures

Contains:

Identification	Conc. %	Classification (EC) 1272/2008 (CLP)
Sodium hydroxide		
CAS 1310-73-2	3 - 5	Met. Corr. 1 H290, Skin Corr. 1A H314, Eye Dam. 1 H318
EC 215-185-5		Met. Corr. 1 H290: ≥ 2%, Skin Irrit. 2 H315: ≥ 0,5%, Eye Irrit. 2 H319: ≥ 0,5%
INDEX 011-002-00-6		
REACH Reg. 01-2119457892-27-XXXX		

The full wording of hazard (H) phrases is given in section 16 of the sheet.

SECTION 4. First aid measures

4.1. Description of first aid measures

Immediately remove the subject contaminated by product. When the symptoms occur or if in doubt, consult a physician.
Provide resuscitation in life-threatening conditions as follows: If the subject is not breathing: artificial respiration should be initiated immediately, through mouth-to-mouth resuscitation;
Cardiac arrest: Chest Compressions should be started immediately;
Recklessness: the victim must be placed in a stable position. If vomiting occurs, keep the victim on the side to avoid aspiration of vomit into the lungs.
Do not leave affected people unattended.
Inhalation: move your subject area bena aerated and seek immediate medical attention.
In case the subject is unconscious, put him in the recovery position the transport securing device.
Skin contact: wash immediately with water and SOAP and rinse thoroughly; If skin irritation persists, consult a physician.
Contact with eyes: wash eyes out for several minutes under running water. In the event of difficulties in the opening of the eyelids, administer an analgesic eye drops (eg. oxybuprocaine). If symptoms persist, consult a physician.
Ingestion: do not induce vomiting, call your doctor.
If the patient is conscious: wash your mouth with plenty of water.

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

Sodium hydroxide
Acute dose-dependent effects
Skin: irritation, necrosis.
Eyes: irritation, corneal damage.
Lungs: irritation, bronchospasm.
Digestive system: in case of ingestion of abdominal colic, nausea, vomiting, haematemesis, melaena.
Chronic effects
Skin: irritation
Lungs: irritation.

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

Seek immediate medical attention if it comes into contact with the substance.

SECTION 5. Firefighting measures

The product is not flammable and does not feed the flames.

5.1. Extinguishing media

SUITABLE EXTINGUISHING EQUIPMENT
The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.
UNSUITABLE EXTINGUISHING EQUIPMENT
None in particular.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE
Do not breathe combustion products.
Sodium hydroxide
Sodium oxides.

5.3. Advice for firefighters

GENERAL INFORMATION
Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.
SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS
Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Sodium hydroxide
For those who do not intervene directly
The following indications are addressed to duly trained personnel operating in the plant units in which the substance is normally used and are intended to ensure, when this is possible without
risks, the preliminary safety operations before leaving and waiting for the intervention of the emergency team.
Stop the leak if the operation is safe.
Keep people not involved in emergency intervention away from the area affected by the spreading.
Whenever possible, operate above wind.

For those who intervene directly
The expert personnel, such as the personnel belonging to the emergency team and, for this purpose, specially trained, must comply with the indications referred to in the point referring to personnel who do not intervene directly and the indications relating to environmental precautions and methods of containment and quenching and tempering.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Collect the leaked product into a suitable container. Evaluate the compatibility of the container to be used, by checking section 10. Absorb the remainder with inert absorbent material.
Make sure the leakage site is well aired. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Avoid contact with eyes and skin. Do not inhale any dusts or vapors or mists. Do not eat, drink or smoke during use. Wash hands after use. Avoid the dispersion of the product in the environment.

7.2. Conditions for safe storage, including any incompatibilities

Keep only in the original container. Store in a ventilated place, away from sources of ignition. Keep containers tightly closed. Keep the product in clearly labeled containers. Avoid overheating. Avoid violent shocks. Keep containers away from any incompatible materials, checking section 10.

7.3. Specific end use(s)

Information not available

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Regulatory References:

TLV-ACGIH	ACGIH 2021

Sodium hydroxide

Threshold Limit Value

Type	Country	TWA/8h		STEL/15min		Remarks / Observations
		mg/m3	ppm	mg/m3	ppm	
TLV-ACGIH				2 (C)		URT, eye, & skin irr

Health - Derived no-effect level - DNEL / DMEL

	Effects on consumers				Effects on workers			
Route of exposure	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Inhalation			1 mg/m3	VND			1 mg/m3	VND

Legend:

(C) = CEILING ; INHAL = Inhalable Fraction ; RESP = Respirable Fraction ; THORA = Thoracic Fraction.

VND = hazard identified but no DNEL/PNEC available ; NEA = no exposure expected ; NPI = no hazard identified.

Sampling methods:
SODIUM HYDROXIDE: http://amcaw.ifa.dguv.de/substance/methoden/045-L-Sodium%20hydroxide.pdf.

8.2. Exposure controls

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration.
When choosing personal protective equipment, ask your chemical substance supplier for advice.
Personal protective equipment must be CE marked, showing that it complies with applicable standards.

Provide an emergency shower with face and eye wash station.

HAND PROTECTION
Protect hands with category III work gloves (see standard EN 374).
The following should be considered when choosing work glove material: compatibility, degradation, failure time and permeability.
The work gloves' resistance to chemical agents should be checked before use, as it can be unpredictable. The gloves' wear time depends on the duration and type of use.

SKIN PROTECTION
Wear category II professional long-sleeved overalls and safety footwear (see Regulation 2016/425 and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.

EYE PROTECTION
Wear airtight protective goggles (see standard EN 166).

RESPIRATORY PROTECTION
If the threshold value (e.g. TLV-TWA) is exceeded for the substance or one of the substances present in the product, use a mask with a type B filter whose class (1, 2 or 3) must be chosen according to the limit of use concentration. (see standard EN 14387). In the presence of gases or vapours of various kinds and/or gases or vapours containing particulate (aerosol sprays, fumes, mists, etc.) combined filters are required.
Respiratory protection devices must be used if the technical measures adopted are not suitable for restricting the worker's exposure to the threshold values considered. The protection provided by masks is in any case limited.
If the substance considered is odourless or its olfactory threshold is higher than the corresponding TLV-TWA and in the case of an emergency, wear open-circuit compressed air breathing apparatus (in compliance with standard EN 137) or external air-intake breathing apparatus (in compliance with standard EN 138). For a correct choice of respiratory protection device, see standard EN 529.

ENVIRONMENTAL EXPOSURE CONTROLS
The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Properties	Value	Information
Appearance	liquid	
Colour	colourless	
Odour	odourless	
Melting point / freezing point	Not applicable	
Initial boiling point	> 105 °C	
Flammability	Not available	
Lower explosive limit	Not available	
Upper explosive limit	Not available	
Flash point	Not applicable	
Auto-ignition temperature	Not applicable	
pH	> 13	
Kinematic viscosity	Not available	
Solubility	in water	
Partition coefficient: n-octanol/water	Not available	
Vapour pressure	Not available	
Density and/or relative density	1,04	
Relative vapour density	Not available	
Particle characteristics	Not applicable	

9.2. Other information

9.2.1. Information with regard to physical hazard classes

Information not available

9.2.2. Other safety characteristics

Risk of explosion no

SECTION 10. Stability and reactivity

In the absence of information on the mixture, the literature information on the components is reported. This information is not characteristic of the solution but of the dangerous components.

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

Sodium hydroxide
Contact with metals produces flammable hydrogen gas.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

Sodium hydroxide
Quickly absorbs carbon dioxide and water from the air.

10.3. Possibility of hazardous reactions

No hazardous reactions are foreseeable in normal conditions of use and storage.

Sodium hydroxide
The corrosion capacity increases at T> 60 ° C. Use suitable containers at elevated temperatures.

10.4. Conditions to avoid

None in particular. However the usual precautions used for chemical products should be respected.

Sodium hydroxide
Exposure to air and humidity; warm up.

10.5. Incompatible materials

Sodium hydroxide
Strong acids, ammonia, zinc, lead, aluminum, water and flammable liquids.

10.6. Hazardous decomposition products

Sodium hydroxide
Decomposes on heating, developing toxic fumes including sodium oxide.

SECTION 11. Toxicological information

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using the criteria specified in the applicable regulation for classification.
It is therefore necessary to take into account the concentration of the individual hazardous substances indicated in section 3, to evaluate the toxicological

effects of exposure to the product.

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

Metabolism, toxicokinetics, mechanism of action and other information

Sodium hydroxide
In contact with human skin, at non-irritating concentrations, the passage of ions is slight and absorption difficult.

Information on likely routes of exposure

Sodium hydroxide
In the professional environment, the main routes of exposure are inhalation and skin or eye contact.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sodium hydroxide
At the respiratory level, the inhalation of vapors or aerosols immediately causes: rhinorrhea, sneezing, nasal and pharyngeal burning sensation, cough, dyspnoea and chest pain. Complications are laryngeal edema or a bronchospasm.
At the end of exposure, symptoms may subside, but delayed pulmonary edema may also occur within 48 hours.
Other complications are superinfections. Bronchial hypersecretion and desquamation of the bronchial mucosa in case of extensive lesions are responsible for truncular obstructions and atelectasis.
Pulmonary sequelae can be: asthma (especially reactive airway dysfunction syndrome or Brooks syndrome), bronchial stenosis, bronchiectasis, pulmonary fibrosis.
Ingestion of concentrated solutions is followed by buccal, restrosternal and epigastric pain associated with hyperscialorrhea and bloody vomiting. There is metabolic acidosis, hyperleukocytosis, haemolysis and hypernatremia.
Complications are: esophageal or gastric perforations, digestive haemorrhage, fistulas, difficulty in breathing (sign of laryngeal edema or inhalation lung disease or exotracheal fistula), shock, disseminated intravascular coagulation.
Long-term evolution can lead to digestive strictures, particularly esophageal ones. There is also a risk of cancerization of scar lesions of the digestive tract.
Skin or eye contamination locally involves chemical burns, the severity of which depends on the concentration of the solution, the importance of the contamination and the duration of contact.
On the skin, depending on the depth of the damage, hot and painful erythema, blisters and necrosis are observed. Evolution can be complicated by infections, aesthetic or functional sequelae.
At the ocular level there is immediate pain, lacrimation and conjunctival hyperemia. There may be sequelae such as: conjunctival adhesions, corneal opacities, cataracts, glaucoma and even blindness.
Long-term skin exposure can cause dermatitis.

Interactive effects

Information not available

ACUTE TOXICITY

ATE (Inhalation) of the mixture:	Not classified (no significant component)
ATE (Oral) of the mixture:	Not classified (no significant component)
ATE (Dermal) of the mixture:	Not classified (no significant component)

Sodium hydroxide
Rabbit LD50 (oral) = 325 mg / kg
Rabbit LD50 (cutaneous): 1350 mg / kg
Rat LC50-4 hours (by inhalation): data not available.

SKIN CORROSION / IRRITATION

Corrosive for the skin

Sodium hydroxide
The substance causes chemical burns the severity of which is a function of the concentration of the solution, the importance of the contamination and the duration of contact. Depending on the depth of the damage, hot and painful erythema, flittene and necrosis are observed. Evolution can be complicated by infections, aesthetic or functional sequelae.

SERIOUS EYE DAMAGE / IRRITATION

Causes serious eye damage

Sodium hydroxide
The substance causes chemical burns the severity of which is a function of the concentration of the solution, the importance of the contamination and the duration of contact. At the ocular level there is immediate pain, lacrimation and conjunctival hyperemia. There may be sequelae such as: conjunctival adhesions, corneal opacities, cataracts, glaucoma and even blindness.

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

Respiratory sensitization

Sodium hydroxide
Inhalation of the substance can cause Brooks syndrome (irritant-induced asthma).

Skin sensitization

Sodium hydroxide
A study on volunteers has shown that sodium hydroxide is not a skin sensitiser. Furthermore, this substance is widely used and no case of sensitization has been reported.

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

Sodium hydroxide
In vitro and in vivo studies indicate that sodium hydroxide is not genotoxic.

CARCINOGENICITY

Does not meet the classification criteria for this hazard class

Sodium hydroxide
A dated study (1976) on workers with chronic exposure to caustic soda did not observe any relationship between neoplasms and duration or intensity of exposure.

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

Adverse effects on sexual function and fertility

Sodium hydroxide
No data are available. The substance has no systemic toxicity and the effects on reproduction do not seem plausible under normal conditions of use.

Adverse effects on development of the offspring

Sodium hydroxide
No data are available. The substance has no systemic toxicity and the effects on reproduction do not seem plausible under normal conditions of use.

Effects on or via lactation

Information not available

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

Sodium hydroxide
Inhalation of vapors or aerosols immediately causes: rhinorrhea, sneezing, nasal and pharyngeal burning sensation, cough, dyspnoea and chest pain.

Complications are laryngeal edema or a bronchospasm.
At the end of exposure, symptoms may subside, but delayed pulmonary edema may also occur within 48 hours.
The substance is corrosive and ingestion of a concentrated sodium hydroxide solution causes pain in the oral cavity, retrosternal and epigastric region associated with drool and frequent vomiting with traces of blood, esophagic or gastric perforation.

Target organs

Information not available

Route of exposure

Information not available

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

Sodium hydroxide
Following inhalation occupational exposure, a case of severe obstructive pathology with cough, dyspnea and tachypnea after 20 years of exposure is reported in the literature.
Long-term skin exposure can cause dermatitis.

Target organs

Information not available

Route of exposure

Information not available

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

11.2. Information on other hazards

Based on the available data, the product does not contain substances listed in the main European lists of potential or suspected endocrine disruptors with human health effects under evaluation.

SECTION 12. Ecological information

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity

Sodium hydroxide
Short-term effects
Fish (Gambusia affinis) LC50-96 hours: 125 mg / l (EU, 2007; OECD, 2002);
Crustaceans (Ceriodaphnia sp.) EC50-48 hours: 40 mg / l (EU, 2007; OECD, 2002);
Microorganisms (Photobacterium phosphoreum) EC50-15 min: 22 mg / l (EU, 2007; OECD, 2002).
Long-term effects
Date not available.

12.2. Persistence and degradability

Sodium hydroxide
The high water solubility and low vapor pressure indicate that sodium hydroxide will be found predominantly in the aquatic environment. The substance is present in the environment as sodium ions and ions
hydroxyl, this implies that it does not adsorb on particulates or surfaces and does not accumulate in living tissues.
Atmospheric emissions of sodium hydroxide are rapidly neutralized by carbon dioxide or other acids and salts (eg sodium carbonate).

12.3. Bioaccumulative potential

Sodium hydroxide
Not relevant.
BCF Not applicable.

12.4. Mobility in soil

Sodium hydroxide
Given the high mobility in the soil and the high solubility, it can melt following rains and infiltrate the soil.
No significant emissions are expected into the terrestrial environment during normal use of the substance, any small emissions will be neutralized by the buffer capacity of the soil.

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage ≥ than 0,1%.

12.6. Endocrine disrupting properties

Based on the available data, the product does not contain substances listed in the main European lists of potential or suspected endocrine disruptors with environmental effects under evaluation.

12.7. Other adverse effects

Information not available

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Reuse, when possible. Product residues should be considered special hazardous waste. The hazard level of waste containing this product should be evaluated according to applicable regulations.
Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.
Waste transportation may be subject to ADR restrictions.
CONTAMINATED PACKAGING
Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information

14.1. UN number or ID number

ADR / RID, IMDG, IATA: 1824

14.2. UN proper shipping name

ADR / RID:	SODIUM HYDROXIDE SOLUTION
IMDG:	SODIUM HYDROXIDE SOLUTION
IATA:	SODIUM HYDROXIDE SOLUTION

14.3. Transport hazard class(es)

ADR / RID:	Class: 8	Label: 8
IMDG:	Class: 8	Label: 8
IATA:	Class: 8	Label: 8

14.4. Packing group

ADR / RID, IMDG, IATA: III

14.5. Environmental hazards

ADR / RID:	NO
IMDG:	NO
IATA:	NO

14.6. Special precautions for user

ADR / RID:	HIN - Kemler: 80 Special provision: -	Limited Quantities: 5 L	Tunnel restriction code: (E)
IMDG:	EMS: F-A, S-B	Limited Quantities: 5 L	
IATA:	Cargo: Pass.: Special provision:	Maximum quantity: 60 L Maximum quantity: 5 L A3, A803	Packaging instructions: 856 Packaging instructions: 852

14.7. Maritime transport in bulk according to IMO instruments

Information not relevant

SECTION 15. Regulatory information

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

Seveso Category - Directive 2012/18/EU: None

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006

Product

Point	3

Contained substance

Point	75

Regulation (EU) 2019/1148 - on the marketing and use of explosives precursors

Not applicable

Substances in Candidate List (Art. 59 REACH)

On the basis of available data, the product does not contain any SVHC in percentage ≥ than 0,1%.

Substances subject to authorisation (Annex XIV REACH)

None

Substances subject to exportation reporting pursuant to Regulation (EU) 649/2012:

None

Substances subject to the Rotterdam Convention:

None

Substances subject to the Stockholm Convention:

None

Healthcare controls

Workers exposed to this chemical agent must not undergo health checks, provided that available risk-assessment data prove that the risks related to the workers' health and safety are modest and that the 98/24/EC directive is respected.

15.2. Chemical safety assessment

A chemical safety assessment has been performed for the following contained substances

Sodium hydroxide

SECTION 16. Other information

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

Met. Corr. 1	Substance or mixture corrosive to metals, category 1
Skin Corr. 1A	Skin corrosion, category 1A
Skin Corr. 1B	Skin corrosion, category 1B
Eye Dam. 1	Serious eye damage, category 1
H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.

LEGEND:
- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- ATE: Acute Toxicity Estimate
- CAS: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE: Identifier in ESIS (European archive of existing substances)
- CLP: Regulation (EC) 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: Regulation (EC) 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA: Time-weighted average exposure limit
- TWA STEL: Short-term exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY
1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 2020/878 (II Annex of REACH Regulation)
4. Regulation (EC) 790/2009 (I Atp. CLP) of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)
14. Regulation (EU) 2018/669 (XI Atp. CLP)
15. Regulation (EU) 2019/521 (XII Atp. CLP)
16. Delegated Regulation (UE) 2018/1480 (XIII Atp. CLP)
17. Regulation (EU) 2019/1148
18. Delegated Regulation (UE) 2020/217 (XIV Atp. CLP)
19. Delegated Regulation (UE) 2020/1182 (XV Atp. CLP)
20. Delegated Regulation (UE) 2021/643 (XVI Atp. CLP)
21. Delegated Regulation (UE) 2021/849 (XVII Atp. CLP)
- The Merck Index. - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:
The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.
This document must not be regarded as a guarantee on any specific product property.
The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.
Provide appointed staff with adequate training on how to use chemical products.
CALCULATION METHODS FOR CLASSIFICATION
Chemical and physical hazards: Product classification derives from criteria established by the CLP Regulation, Annex I, Part 2. The data for evaluation of chemical-physical properties are reported in section 9.
Health hazards: Product classification is based on calculation methods as per Annex I of CLP, Part 3, unless determined otherwise in Section 11.
Environmental hazards: Product classification is based on calculation methods as per Annex I of CLP, Part 4, unless determined otherwise in Section 12.
Safety data sheet n.8 dated 30/05/22. Revision of version n.7 dated 21/03/18.