

**HI50009 - pH 9.00 Buffer Solution****Safety data sheet according to Regulation (EC) No. 1907/2006****SECTION 1. Identification of the substance/mixture and of the company/undertaking****1.1. Product identifier**

Code **HI50009**  
Product name **pH 9.00 Buffer Solution**

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

Intended use **Calibration of pH Electrodes**

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

Name **Hanna Instruments S.R.L.**  
Full address **str. Hanna Nr 1**  
District and Country **457260 loc. Nusfalau (Salaj)**  
**Romania**  
Tel. **+40 260607700**  
Fax **+40 260607700**

e-mail address of the competent person responsible for the Safety Data Sheet

**msds@hanna.ro**

**1.4. Emergency telephone number**

For urgent inquiries refer to **Emergency Number - International: +1 7035273887 - UK, London: +44 8708200418 - CHEMTREC 24 hours/365 days**

**SECTION 2. Hazards identification****2.1. Classification of the substance or mixture**

The product is not classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP). However, since the product contains hazardous substances in concentrations such as to be declared in section no. 3, it requires a safety data sheet with appropriate information, compliant to EC Regulation 1907/2006 and subsequent amendments.

Hazard classification and indication: --

**2.2. Label elements**

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

Hazard pictograms: --

Signal words: --

Hazard statements:  
**EUH210** Safety data sheet available on request.

Precautionary statements: --

**2.3. Other hazards**

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

**SECTION 3. Composition/information on ingredients****3.1. Substances**

Information not relevant

**HI50009 - pH 9.00 Buffer Solution****SECTION 3. Composition/information on ingredients** ... / >>**3.2. Mixtures****Contains:**

| Identification               | x = Conc. %      | Classification 1272/2008 (CLP) |
|------------------------------|------------------|--------------------------------|
| <b>DI-SODIUM TETRABORATE</b> |                  |                                |
| CAS                          | 1303-96-4        | 0 ≤ x < 0,5                    |
| EC                           | 215-540-4        |                                |
| INDEX                        | 005-011-01-1     |                                |
| Reg. no.                     | 01-2119490790-32 |                                |
| <b>BORIC ACID</b>            |                  |                                |
| CAS                          | 10043-35-3       | 0 ≤ x < 0,5                    |
| EC                           | 233-139-2        |                                |
| INDEX                        | 005-007-00-2     |                                |

**DI-SODIUM TETRABORATE**

CAS 1303-96-4 0 ≤ x &lt; 0,5

EC 215-540-4

INDEX 005-011-01-1

Reg. no. 01-2119490790-32

**BORIC ACID**

CAS 10043-35-3 0 ≤ x &lt; 0,5

EC 233-139-2

INDEX 005-007-00-2

Repr. 1B H360FD

Repr. 1B H360FD

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**

Not specifically necessary. Observance of good industrial hygiene is recommended.

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

Specific information on symptoms and effects caused by the product are unknown.

**DI-SODIUM TETRABORATE**

Irritant effects. The following applies to boron compounds in general: resorption is followed by nausea and vomiting, agitation, spasms, CNS disorders, cardiovascular disorders.

**BORIC ACID**

Drop in temperature, agitation, spasms, Diarrhoea, Nausea, Vomiting, Tiredness, ataxia (impaired locomotor coordination).

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

Information not available

**SECTION 5. Firefighting measures****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.

**DI-SODIUM TETRABORATE**

Not combustible. Ambient fire may liberate hazardous vapours.

**BORIC ACID**

Not combustible. Ambient fire may liberate hazardous vapours. Fire may cause evolution of: boron compounds.

**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).

**HI50009 - pH 9.00 Buffer Solution****SECTION 6. Accidental release measures****6.1. Personal precautions, protective equipment and emergency procedures**

Block the leakage if there is no hazard.

Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. These indications apply for both processing staff and those involved in emergency procedures.

**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. If the product is flammable, use explosion-proof equipment. 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**

Before handling the product, consult all the other sections of this material safety data sheet. Avoid leakage of the product into the environment. Do not eat, drink or smoke during use.

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

Keep the product in clearly labelled containers. Keep containers away from any incompatible materials, see section 10 for details.

**7.3. Specific end use(s)**

Information not available

**SECTION 8. Exposure controls/personal protection****8.1. Control parameters**

Regulatory References:

|     |                  |  |
|-----|------------------|--|
| BEL | Belgique         | AR du 11/3/2002. La liste est mise à jour pour 2010  |
| CHE | Suisse / Schweiz | Valeurs limites d'exposition aux postes de travail 2014. / Grenzwerte am Arbeitsplatz  |
| DEU | Deutschland      | MAK-und BAT-Werte-Liste 2012   |
| DNK | Danmark          | Graensevaerdier per stoffer og materialer  |
| ESP | España           | INSHT - Límites de exposición profesional para agentes químicos en España 2015   |
| EST | Eesti            | Töökeskkonna keemiliste ohutegurite piirnormid 1. Vastu võetud 18.09.2001 nr 293 RT I 2001, 77, 460 - Redaktsiooni jõustumise kp: 01.01.2008 |
| FRA | France           | JORF n°0109 du 10 mai 2012 page 8773 texte n° 102  |
| GBR | United Kingdom   | EH40/2005 Workplace exposure limits  |
| GRC | Ελλάδα           | ΕΦΗΜΕΡΙΣ ΤΗΣ ΚΥΒΕΡΝΗΣΕΩΣ -ΤΕΥΧΟΣ ΠΡΩΤΟ Αρ. Φύλλου 19 - 9 Φεβρουαρίου 2012  |
| IRL | Éire             | Code of Practice Chemical Agent Regulations 2011   |
| LVA | Latvija          | Ķīmisko vielu aroda ekspozīcijas robežvērtības (AER) darba vides gaisā 2012  |
| NLD | Nederland        | Databank of the social and Economic Council of Netherlands (SER) Values, AF 2011:18  |
| NOR | Norge            | Veiledning om Administrative normer for forurensning i arbeidsatmosfære  |
| POL | Polska           | ROZPORZĄDZENIE MINISTRA PRACY I POLITYKI SPOŁECZNEJ z dnia 16 grudnia 2011r  |
| SWE | Sverige          | Occupational Exposure Limit Values, AF 2011:18   |
|     | TLV-ACGIH        | ACGIH 2016   |

## HI50009 - pH 9.00 Buffer Solution

### SECTION 8. Exposure controls/personal protection ... / >>

#### DI-SODIUM TETRABORATE

##### Threshold Limit Value

| Type      | Country | TWA/8h            |     | STEL/15min        |     |       |
|-----------|---------|-------------------|-----|-------------------|-----|-------|
|           |         | mg/m <sup>3</sup> | ppm | mg/m <sup>3</sup> | ppm |       |
| VLEP      | BEL     | 2                 |     |                   |     |       |
| MAK       | CHE     | 10                |     |                   |     | INHAL |
| AGW       | DEU     | 10                |     |                   |     | INHAL |
| TLV       | DNK     | 2                 |     |                   |     |       |
| VLA       | ESP     | 2                 |     | 6                 |     |       |
| TLV       | EST     | 2                 |     | 5                 |     | SKIN  |
| VLEP      | FRA     | 5                 |     |                   |     |       |
| WEL       | GBR     | 5                 |     |                   |     |       |
| TLV       | GRC     | 10                |     |                   |     |       |
| OEL       | IRL     | 5                 |     |                   |     |       |
| RV        | LVA     | 2                 |     | 5                 |     |       |
| OEL       | NLD     | 5                 |     |                   |     |       |
| TLV       | NOR     | 5                 |     |                   |     |       |
| NDS       | POL     | 0,5               |     | 2                 |     |       |
| MAK       | SWE     | 2                 |     | 5                 |     | SKIN  |
| TLV-ACGIH |         | 2                 |     | 6                 |     |       |

##### Predicted no-effect concentration - PNEC

|  |      |      |
|--|------|------|
| Normal value in fresh water                  | 2,9  | mg/l |
| Normal value in marine water                 | 2,9  | mg/l |
| Normal value for water, intermittent release | 13,7 | mg/l |
| Normal value of STP microorganisms           | 10   | mg/l |

##### Health - Derived no-effect level - DNEL / DMEL

| Route of exposure | Effects on consumers |            |         | Effects on workers |                   |       |       |                   |
|-------------------|----------------------|------------|---------|--------------------|-------------------|-------|-------|-------------------|
|                   | Acute                | Acute      | Chronic | Chronic            | Chronic           | Acute | Acute | Chronic           |
|                   |                      |            |         |                    |                   |       |       |                   |
| Oral              | VND                  | 0,17       | VND     | 0,17               |                   |       |       |                   |
|                   |                      | mg/kg bw/d |         | mg/kg bw/d         |                   |       |       |                   |
| Inhalation        | 2,52                 | VND        | VND     | 0,73               | 2,52              | VND   | VND   | 1,45              |
|                   | mg/m <sup>3</sup>    |            |         | mg/m <sup>3</sup>  | mg/m <sup>3</sup> |       |       | mg/m <sup>3</sup> |
| Skin              |                      |            | VND     | 34,3               |                   | VND   |       | 68                |
|                   |                      |            |         | mg/kg bw/d         |                   |       |       | mg/kg bw/d        |

#### BORIC ACID

##### Threshold Limit Value

| Type      | Country | TWA/8h            |     | STEL/15min        |     |       |
|-----------|---------|-------------------|-----|-------------------|-----|-------|
|           |         | mg/m <sup>3</sup> | ppm | mg/m <sup>3</sup> | ppm |       |
| VLEP      | BEL     | 2                 |     |                   |     |       |
| MAK       | CHE     | 10                |     | 10                |     | INHAL |
| MAK       | DEU     | 10                |     |                   |     | INHAL |
| VLA       | ESP     | 2                 |     | 6                 |     |       |
| RV        | LVA     | 10                |     |                   |     |       |
| TLV-ACGIH |         | 2                 |     | 6                 |     |       |

##### Predicted no-effect concentration - PNEC

|  |     |         |
|--|-----|---------|
| Normal value in fresh water                  | 2,9 | mg/l    |
| Normal value in marine water                 | 2,9 | mg/l    |
| Normal value of STP microorganisms           | 10  | mg/l    |
| Normal value for the terrestrial compartment | 5,7 | mg/kg/d |

##### Health - Derived no-effect level - DNEL / DMEL

| Route of exposure | Effects on consumers |       |         | Effects on workers |         |       |       |                   |
|-------------------|----------------------|-------|---------|--------------------|---------|-------|-------|-------------------|
|                   | Acute                | Acute | Chronic | Chronic            | Chronic | Acute | Acute | Chronic           |
|                   |                      |       |         |                    |         |       |       |                   |
| Inhalation        |                      |       |         | 4,15               |         |       |       | 8,3               |
|                   |                      |       |         | mg/m <sup>3</sup>  |         |       |       | mg/m <sup>3</sup> |
| Skin              |                      |       |         | 196                |         |       |       | 392               |
|                   |                      |       |         | mg/kg bw/d         |         |       |       | mg/kg bw/d        |

##### 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.

### 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

**HI50009 - pH 9.00 Buffer Solution****SECTION 8. Exposure controls/personal protection** ... / >>

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.

**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 I professional long-sleeved overalls and safety footwear (see Directive 89/686/EEC 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**

|  |                  |
|--|------------------|
| Appearance                             | liquid           |
| Colour                                 | colourless       |
| Odour                                  | odourless        |
| Odour threshold                        | Not available    |
| pH                                     | 9                |
| Melting point / freezing point         | Not available    |
| Initial boiling point                  | Not available    |
| Boiling range                          | Not available    |
| Flash point                            | Not applicable   |
| Evaporation rate                       | Not available    |
| Flammability (solid, gas)              | Not available    |
| Lower inflammability limit             | Not available    |
| Upper inflammability limit             | Not available    |
| Lower explosive limit                  | Not available    |
| Upper explosive limit                  | Not available    |
| Vapour pressure                        | Not available    |
| Vapour density                         | Not available    |
| Relative density                       | 1,00             |
| Solubility                             | soluble in water |
| Partition coefficient: n-octanol/water | Not available    |
| Auto-ignition temperature              | Not available    |
| Decomposition temperature              | Not available    |
| Viscosity                              | Not available    |
| Explosive properties                   | not applicable   |
| Oxidising properties                   | not applicable   |

**9.2. Other information**

|                              |        |
|------------------------------|--------|
| Total solids (250°C / 482°F) | 0,52 % |
| VOC (Directive 2010/75/EC) : | 0      |
| VOC (volatile carbon) :      | 0      |

**SECTION 10. Stability and reactivity****10.1. Reactivity**

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

**HI50009 - pH 9.00 Buffer Solution****SECTION 10. Stability and reactivity** ... / >>**10.2. Chemical stability**

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

**10.3. Possibility of hazardous reactions**

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

**DI-SODIUM TETRABORATE**

Risk of explosion on contact with: strong oxidising agents, acids, moisture/water, metal salts.

**BORIC ACID**

Risk of explosion on contact with: acetic anhydride.

Reacts violently with: strong oxidising agents, bases.

**10.4. Conditions to avoid**

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

**DI-SODIUM TETRABORATE**

Keep away from strong reducing agents to avoid the development of hydrogen, which is explosive.

**10.5. Incompatible materials**

Information not available

**10.6. Hazardous decomposition products****DI-SODIUM TETRABORATE**

Boron oxides, sodium oxides.

**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 toxicological effects****DI-SODIUM TETRABORATE**

CMR effects Teratogenicity: May damage the unborn child - Reproductive toxicity: May damage fertility.

**BORIC ACID**

CMR effects, Teratogenicity: May damage the unborn child. Reproductive toxicity: May damage fertility.

Metabolism, toxicokinetics, mechanism of action and other information

Information not available

Information on likely routes of exposure

Information not available

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

Information not available

Interactive effects

Information not available

ACUTE TOXICITY

LC50 (Inhalation) of the mixture:

Not classified (no significant component)

LD50 (Oral) of the mixture:

Not classified (no significant component)

LD50 (Dermal) of the mixture:

Not classified (no significant component)

**HI50009 - pH 9.00 Buffer Solution****SECTION 11. Toxicological information** ... / >>

|                       |                   |
|-----------------------|-------------------|
| DI-SODIUM TETRABORATE |                   |
| LD50 (Oral)           | 2660 mg/kg Rat    |
| LD50 (Dermal)         | 2000 mg/kg Rabbit |
| LC50 (Inhalation)     | 2,12 mg/l/4h Rat  |

|                   |                     |
|-------------------|---------------------|
| BORIC ACID        |                     |
| LD50 (Oral)       | 2660 mg/kg Rat      |
| LD50 (Dermal)     | > 2000 mg/kg Rabbit |
| LC50 (Inhalation) | 0,16 mg/l/4h Rat    |

SKIN CORROSION / IRRITATION

Does not meet the classification criteria for this hazard class

SERIOUS EYE DAMAGE / IRRITATION

Does not meet the classification criteria for this hazard class

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

CARCINOGENICITY

Does not meet the classification criteria for this hazard class

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

**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**

|                       |                             |
|-----------------------|-----------------------------|
| DI-SODIUM TETRABORATE |                             |
| LC50 - for Fish       | 96 mg/l/96h Limanda limanda |

**12.2. Persistence and degradability**

|                       |            |
|-----------------------|------------|
| DI-SODIUM TETRABORATE |            |
| Solubility in water   | 47000 mg/l |

|  |              |
|--|--------------|
| BORIC ACID                               |              |
| Solubility in water                      | > 10000 mg/l |
| Degradability: information not available |              |

**12.3. Bioaccumulative potential**

**HI50009 - pH 9.00 Buffer Solution****SECTION 12. Ecological information** ... / >>

|  |       |
|--|-------|
| DI-SODIUM TETRABORATE                  |       |
| Partition coefficient: n-octanol/water | -1,53 |
|  |       |
| BORIC ACID                             |       |
| Partition coefficient: n-octanol/water | -1,09 |
| BCF                                    | 0,7   |

**12.4. Mobility in soil**

Information not available

**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 greater than 0,1%.

**12.6. Other adverse effects**

Information not available

**SECTION 13. Disposal considerations****13.1. Waste treatment methods**

Reuse, when possible. Neat product residues should be considered special non-hazardous waste.  
Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.  
CONTAMINATED PACKAGING  
Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

**SECTION 14. Transport information**

The product is not dangerous under current provisions of the Code of International Carriage of Dangerous Goods by Road (ADR) and by Rail (RID), of the International Maritime Dangerous Goods Code (IMDG), and of the International Air Transport Association (IATA) regulations.

**14.1. UN number**

Not applicable

**14.2. UN proper shipping name**

Not applicable

**14.3. Transport hazard class(es)**

Not applicable

**14.4. Packing group**

Not applicable

**14.5. Environmental hazards**

Not applicable

**14.6. Special precautions for user**

Not applicable

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

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/EC: \_\_\_\_\_ None



**HI50009 - pH 9.00 Buffer Solution****SECTION 15. Regulatory information** ... / >>

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

Contained substance

|       |    |                            |
|-------|----|----------------------------|
| Point | 30 | DI-SODIUM TETRABORATE      |
|       |    | Reg. no.: 01-2119490790-32 |
| Point | 30 | BORIC ACID                 |

Substances in Candidate List (Art. 59 REACH)DI-SODIUM TETRABORATE  
Reg. no.: 01-2119490790-32

BORIC ACID

Substances subject to authorisation (Annex XIV REACH)

None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:

None

Substances subject to the Rotterdam Convention:

None

Substances subject to the Stockholm Convention:

None

Healthcare controls

Information not available

German regulation on the classification of substances hazardous to water (VwVwS 2005)

WGK Nwg: Not hazardous to waters

**15.2. Chemical safety assessment**

No chemical safety assessment has been processed for the mixture and the substances it contains.

**SECTION 16. Other information**

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

|                 |  |
|-----------------|--|
| <b>Repr. 1B</b> | Reproductive toxicity, category 1B                 |
| <b>H360FD</b>   | May damage fertility. May damage the unborn child. |
| <b>EUH210</b>   | Safety data sheet available on request.            |

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 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 NUMBER: 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: EC Regulation 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 STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit

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### SECTION 16. Other information ... / >>

- VOC: Volatile organic Compounds- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

#### GENERAL BIBLIOGRAPHY

1. Regulation (EU) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 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

- 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.

#### Changes to previous review:

The following sections were modified:

02 / 03 / 04 / 05 / 07 / 08 / 10 / 11 / 12 / 13 / 15 / 16.

Changed TLVs in section 8.1 for following countries:

BEL,