



## 3 - Hydroxybutyrate Dehydrogenase

### BBI Solutions

Part Number: FGM03329

Version No: 3.2

Safety data sheet according to REACH Regulation (EC) No 1907/2006, as amended by UK REACH Regulations SI 2019/758

Chemwatch Hazard Alert Code: 2

Issue Date: 06/02/2024

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S.REACH.GB.EN

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

### 1.1. Product Identifier

|                               |                                   |
|-------------------------------|-----------------------------------|
| Product name                  | 3 - Hydroxybutyrate Dehydrogenase |
| Chemical Name                 | Not Available                     |
| Synonyms                      | Not Available                     |
| Chemical formula              | Not Available                     |
| Other means of identification | FGM03329, rHBDH                   |
| CAS number                    | 9028-38-0*                        |
| EC number                     | 232-830-6                         |

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

|                          |                                                                                                                                                          |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relevant identified uses | The product is supplied for in vitro use only. To be used for research and/or further manufacturing purposes and is not to be used in humans or animals. |
| Uses advised against     | No specific uses advised against are identified.                                                                                                         |

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

|                         |                                                                    |
|-------------------------|--------------------------------------------------------------------|
| Registered company name | BBI Solutions                                                      |
| Address                 | Unit 2 Parkway Pen-y-fan Industrial Estate. Crumlin United Kingdom |
| Telephone               | +441495363000                                                      |
| Fax                     | Not Available                                                      |
| Website                 | <a href="http://bbisolutions.com">bbisolutions.com</a>             |
| Email                   | <a href="mailto:info@bbisolutions.com">info@bbisolutions.com</a>   |

### 1.4. Emergency telephone number

|                                   |                           |
|-----------------------------------|---------------------------|
| Association / Organisation        | BBI Solutions (8am - 5pm) |
| Emergency telephone numbers       | +441495363000             |
| Other emergency telephone numbers | Not Available             |

## SECTION 2 Hazards identification

### 2.1. Classification of the substance or mixture

|                                                                                   |                                                                                                                |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Classified according to GB-CLP Regulation, UK SI 2019/720 and UK SI 2020/1567 [1] | H334 - Sensitisation (Respiratory) Category 1B                                                                 |
| Legend:                                                                           | 1. Classified by Chemwatch; 2. Classification drawn from GB-CLP Regulation, UK SI 2019/720 and UK SI 2020/1567 |

### 2.2. Label elements

|                     |        |
|---------------------|--------|
| Hazard pictogram(s) |        |
| Signal word         | Danger |

Hazard statement(s)

### 3 - Hydroxybutyrate Dehydrogenase

|             |                                                                            |
|-------------|----------------------------------------------------------------------------|
| <b>H334</b> | May cause allergy or asthma symptoms or breathing difficulties if inhaled. |
|-------------|----------------------------------------------------------------------------|

#### Supplementary statement(s)

Not Applicable

#### Precautionary statement(s) Prevention

|             |                                                                  |
|-------------|------------------------------------------------------------------|
| <b>P261</b> | Avoid breathing dust/fumes.                                      |
| <b>P284</b> | [In case of inadequate ventilation] wear respiratory protection. |

#### Precautionary statement(s) Response

|                  |                                                                                          |
|------------------|------------------------------------------------------------------------------------------|
| <b>P304+P340</b> | IF INHALED: Remove person to fresh air and keep comfortable for breathing.               |
| <b>P342+P311</b> | If experiencing respiratory symptoms: Call a POISON CENTER/doctor/physician/first aider. |

#### Precautionary statement(s) Storage

Not Applicable

#### Precautionary statement(s) Disposal

|             |                                                                                                                                  |
|-------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>P501</b> | Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation. |
|-------------|----------------------------------------------------------------------------------------------------------------------------------|

#### 2.3. Other hazards

REACH - Art.57-59: The mixture does not contain Substances of Very High Concern (SVHC) at the SDS print date.

## SECTION 3 Composition / information on ingredients

### 3.1.Substances

| 1. CAS No<br>2.EC No<br>3.Index No<br>4.REACH No | %[weight] | Name                            | Classified according to GB-CLP Regulation,<br>UK SI 2019/720 and UK SI 2020/1567 | SCL /<br>M-Factor | Nanoform Particle<br>Characteristics |
|--------------------------------------------------|-----------|---------------------------------|----------------------------------------------------------------------------------|-------------------|--------------------------------------|
| Not Available                                    | >90       | 3-Hydroxybutyrate dehydrogenase | Not Applicable                                                                   | Not Applicable    | Not Available                        |

**Legend:** 1. Classified by Chemwatch; 2. Classification drawn from GB-CLP Regulation, UK SI 2019/720 and UK SI 2020/1567; 3. Classification drawn from C&L; \* EU IOELVs available; [e] Substance identified as having endocrine disrupting properties

### 3.2.Mixtures

See 'Information on ingredients' in section 3.1

## SECTION 4 First aid measures

### 4.1. Description of first aid measures

|                     |                                                                                                                                                                                                                                                                                                          |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Eye Contact</b>  | If this product comes in contact with eyes:<br><ul style="list-style-type: none"> <li>▶ Wash out immediately with water.</li> <li>▶ If irritation continues, seek medical attention.</li> <li>▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> </ul> |
| <b>Skin Contact</b> | If skin or hair contact occurs:<br><ul style="list-style-type: none"> <li>▶ Flush skin and hair with running water (and soap if available).</li> <li>▶ Seek medical attention in event of irritation.</li> </ul>                                                                                         |
| <b>Inhalation</b>   | <ul style="list-style-type: none"> <li>▶ If fumes, aerosols or combustion products are inhaled remove from contaminated area.</li> <li>▶ Other measures are usually unnecessary.</li> </ul>                                                                                                              |
| <b>Ingestion</b>    | <ul style="list-style-type: none"> <li>▶ Immediately give a glass of water.</li> <li>▶ First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.</li> </ul>                                                                                                    |

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

See Section 11

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

Treat symptomatically.

## SECTION 5 Firefighting measures

### 5.1. Extinguishing media

- ▶ There is no restriction on the type of extinguisher which may be used.
- ▶ Use extinguishing media suitable for surrounding area.

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

|                             |             |
|-----------------------------|-------------|
| <b>Fire Incompatibility</b> | None known. |
|-----------------------------|-------------|

### 5.3. Advice for firefighters

|                      |                                                                   |
|----------------------|-------------------------------------------------------------------|
| <b>Fire Fighting</b> | ▶ Alert Fire Brigade and tell them location and nature of hazard. |
|----------------------|-------------------------------------------------------------------|

|                              |                                                                                                                                                                                                                                                                                                |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              | <ul style="list-style-type: none"> <li>▶ Wear breathing apparatus plus protective gloves in the event of a fire.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water courses.</li> <li>▶ Use fire fighting procedures suitable for surrounding area.</li> </ul> |
| <b>Fire/Explosion Hazard</b> | <ul style="list-style-type: none"> <li>▶ Non combustible.</li> <li>▶ Not considered a significant fire risk, however containers may burn.</li> </ul> <p>May emit poisonous fumes.</p>                                                                                                          |

## SECTION 6 Accidental release measures

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

See section 8

### 6.2. Environmental precautions

See section 12

### 6.3. Methods and material for containment and cleaning up

|                     |                                                                                                                                                                                                                                                                                                         |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Minor Spills</b> | <ul style="list-style-type: none"> <li>▶ Clean up all spills immediately.</li> <li>▶ Avoid breathing dust and contact with skin and eyes.</li> <li>▶ Wear protective clothing, gloves, safety glasses and dust respirator.</li> <li>▶ Use dry clean up procedures and avoid generating dust.</li> </ul> |
| <b>Major Spills</b> | <p>Moderate hazard.</p> <ul style="list-style-type: none"> <li>▶ <b>CAUTION:</b> Advise personnel in area.</li> <li>▶ Alert Emergency Services and tell them location and nature of hazard.</li> <li>▶ Control personal contact by wearing protective clothing.</li> </ul>                              |

### 6.4. Reference to other sections

Personal Protective Equipment advice is contained in Section 8 of the SDS.

## SECTION 7 Handling and storage

### 7.1. Precautions for safe handling

|                                      |                                                                                                                                                                                                                                                                                       |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Safe handling</b>                 | <ul style="list-style-type: none"> <li>▶ Avoid all personal contact, including inhalation.</li> <li>▶ Wear protective clothing when risk of exposure occurs.</li> <li>▶ Use in a well-ventilated area.</li> <li>▶ Prevent concentration in hollows and sumps.</li> </ul>              |
| <b>Fire and explosion protection</b> | See section 5                                                                                                                                                                                                                                                                         |
| <b>Other information</b>             | <ul style="list-style-type: none"> <li>▶ Store in original containers.</li> <li>▶ Keep containers securely sealed.</li> <li>▶ Store in a cool, dry area protected from environmental extremes.</li> <li>▶ Store away from incompatible materials and foodstuff containers.</li> </ul> |

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

|                                                                                                                    |                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Suitable container</b>                                                                                          | <ul style="list-style-type: none"> <li>▶ Polyethylene or polypropylene container.</li> <li>▶ Check all containers are clearly labelled and free from leaks.</li> </ul> |
| <b>Storage incompatibility</b>                                                                                     | None known                                                                                                                                                             |
| <b>Hazard categories in accordance with Regulation (EC) No 1272/2008</b>                                           | Not Available                                                                                                                                                          |
| <b>Qualifying quantity (tonnes) of dangerous substances as referred to in Article 3(10) for the application of</b> | Not Available                                                                                                                                                          |

### 7.3. Specific end use(s)

See section 1.2

## SECTION 8 Exposure controls / personal protection

### 8.1. Control parameters

| Ingredient    | DNELs<br>Exposure Pattern Worker | PNECs<br>Compartment |
|---------------|----------------------------------|----------------------|
| Not Available | Not Available                    | Not Available        |

\* Values for General Population

### Occupational Exposure Limits (OEL)

#### INGREDIENT DATA

| Source        | Ingredient    | Material name | TWA           | STEL          | Peak          | Notes         |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Not Available | Not Available | Not Available | Not Available | Not Available | Not Available | Not Available |

Not Applicable

### Emergency Limits


Continued...

| Ingredient                        | TEEL-1        | TEEL-2        | TEEL-3        |
|-----------------------------------|---------------|---------------|---------------|
| 3 - Hydroxybutyrate Dehydrogenase | Not Available | Not Available | Not Available |

| Ingredient                        | Original IDLH | Revised IDLH  |
|-----------------------------------|---------------|---------------|
| 3 - Hydroxybutyrate Dehydrogenase | Not Available | Not Available |

## 8.2. Exposure controls

|                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>8.2.1. Appropriate engineering controls</b>                                      | <p>Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.</p> <p>The basic types of engineering controls are:</p> <p>Process controls which involve changing the way a job activity or process is done to reduce the risk.</p> <p>Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.</p>                                                                                                                                                                                                                                    |
| <b>8.2.2. Individual protection measures, such as personal protective equipment</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Eye and face protection</b>                                                      | <ul style="list-style-type: none"> <li>▶ "Safety glasses with side shields</li> <li>▶ Chemical goggles.</li> <li>▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Skin protection</b>                                                              | See Hand protection below                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Hands/feet protection</b>                                                        | <p>The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.</p> <p>The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.</p> <p>Personal hygiene is a key element of effective hand care.</p> <p>Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.</p> <ul style="list-style-type: none"> <li>▶ polychloroprene.</li> <li>▶ nitrile rubber.</li> <li>▶ butyl rubber.</li> </ul> |
| <b>Body protection</b>                                                              | See Other protection below                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Other protection</b>                                                             | <ul style="list-style-type: none"> <li>▶ Overalls.</li> <li>▶ P.V.C apron.</li> <li>▶ Barrier cream.</li> <li>▶ Skin cleansing cream.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

### 8.2.3. Environmental exposure controls

See section 12

## SECTION 9 Physical and chemical properties

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

|                                                     |               |                                                |                |
|-----------------------------------------------------|---------------|------------------------------------------------|----------------|
| <b>Appearance</b>                                   | Not Available |                                                |                |
| <b>Physical state</b>                               | Solid         | <b>Relative density (Water = 1)</b>            | Not Available  |
| <b>Odour</b>                                        | Not Available | <b>Partition coefficient n-octanol / water</b> | Not Available  |
| <b>Odour threshold</b>                              | Not Available | <b>Auto-ignition temperature (°C)</b>          | Not Available  |
| <b>pH (as supplied)</b>                             | 8.3           | <b>Decomposition temperature (°C)</b>          | Not Available  |
| <b>Melting point / freezing point (°C)</b>          | Not Available | <b>Viscosity (cSt)</b>                         | Not Available  |
| <b>Initial boiling point and boiling range (°C)</b> | Not Available | <b>Molecular weight (g/mol)</b>                | Not Available  |
| <b>Flash point (°C)</b>                             | Not Available | <b>Taste</b>                                   | Not Available  |
| <b>Evaporation rate</b>                             | Not Available | <b>Explosive properties</b>                    | Not Available  |
| <b>Flammability</b>                                 | Not Available | <b>Oxidising properties</b>                    | Not Available  |
| <b>Upper Explosive Limit (%)</b>                    | Not Available | <b>Surface Tension (dyn/cm or mN/m)</b>        | Not Applicable |
| <b>Lower Explosive Limit (%)</b>                    | Not Available | <b>Volatile Component (%vol)</b>               | Not Available  |
| <b>Vapour pressure (kPa)</b>                        | Not Available | <b>Gas group</b>                               | Not Available  |
| <b>Solubility in water</b>                          | Miscible      | <b>pH as a solution (1%)</b>                   | Not Available  |
| <b>Vapour density (Air = 1)</b>                     | Not Available | <b>VOC g/L</b>                                 | Not Available  |

## 3 - Hydroxybutyrate Dehydrogenase

|                            |               |                                          |               |
|----------------------------|---------------|------------------------------------------|---------------|
| <b>Nanoform Solubility</b> | Not Available | <b>Nanoform Particle Characteristics</b> | Not Available |
| <b>Particle Size</b>       | Not Available |                                          |               |

## 9.2. Other information

Not Available

## SECTION 10 Stability and reactivity

|                                                 |                                                                                                                                                                                                      |
|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>10.1. Reactivity</b>                         | See section 7.2                                                                                                                                                                                      |
| <b>10.2. Chemical stability</b>                 | <ul style="list-style-type: none"> <li>▶ Unstable in the presence of incompatible materials.</li> <li>▶ Product is considered stable.</li> <li>▶ Hazardous polymerisation will not occur.</li> </ul> |
| <b>10.3. Possibility of hazardous reactions</b> | See section 7.2                                                                                                                                                                                      |
| <b>10.4. Conditions to avoid</b>                | See section 7.2                                                                                                                                                                                      |
| <b>10.5. Incompatible materials</b>             | See section 7.2                                                                                                                                                                                      |
| <b>10.6. Hazardous decomposition products</b>   | See section 5.3                                                                                                                                                                                      |

## SECTION 11 Toxicological information

## 11.1. Information on toxicological effects

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| <b>Inhaled</b>                           | The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.                                                                                                                                                                                                                                                                                                                     |                   |
| <b>Ingestion</b>                         | The material has <b>NOT</b> been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence.                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |
| <b>Skin Contact</b>                      | The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.<br>Open cuts, abraded or irritated skin should not be exposed to this material<br>Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected. |                   |
| <b>Eye</b>                               | Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may cause transient discomfort characterised by tearing or conjunctival redness (as with windburn). Slight abrasive damage may also result.                                                                                                                                                                                                                                                                                                                                                                      |                   |
| <b>Chronic</b>                           | Inhaling this product is more likely to cause a sensitisation reaction in some persons compared to the general population.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |
| <b>3 - Hydroxybutyrate Dehydrogenase</b> | <b>TOXICITY</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>IRRITATION</b> |
|                                          | Not Available                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Not Available     |

**Legend:** 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>3 - Hydroxybutyrate Dehydrogenase</b> | Allergic reactions involving the respiratory tract are usually due to interactions between IgE antibodies and allergens and occur rapidly. Allergic potential of the allergen and period of exposure often determine the severity of symptoms. Some people may be genetically more prone than others, and exposure to other irritants may aggravate symptoms. Allergy causing activity is due to interactions with proteins.<br>Attention should be paid to atopic diathesis, characterised by increased susceptibility to nasal inflammation, asthma and eczema.<br>Exogenous allergic alveolitis is induced essentially by allergen specific immune-complexes of the IgG type; cell-mediated reactions (T lymphocytes) may be involved. Such allergy is of the delayed type with onset up to four hours following exposure. |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                          |   |                                 |   |
|------------------------------------------|---|---------------------------------|---|
| <b>Acute Toxicity</b>                    | ✗ | <b>Carcinogenicity</b>          | ✗ |
| <b>Skin Irritation/Corrosion</b>         | ✗ | <b>Reproductivity</b>           | ✗ |
| <b>Serious Eye Damage/Irritation</b>     | ✗ | <b>STOT - Single Exposure</b>   | ✗ |
| <b>Respiratory or Skin sensitisation</b> | ✓ | <b>STOT - Repeated Exposure</b> | ✗ |
| <b>Mutagenicity</b>                      | ✗ | <b>Aspiration Hazard</b>        | ✗ |

**Legend:** ✗ – Data either not available or does not fill the criteria for classification  
✓ – Data available to make classification

## 11.2 Information on other hazards

## 11.2.1. Endocrine disrupting properties

No evidence of endocrine disrupting properties were found in the current literature.

## 11.2.2. Other information

See Section 11.1

## SECTION 12 Ecological information

## 12.1. Toxicity

Continued...

## 3 - Hydroxybutyrate Dehydrogenase

| 3 - Hydroxybutyrate Dehydrogenase | Endpoint      | Test Duration (hr) | Species       | Value         | Source        |
|-----------------------------------|---------------|--------------------|---------------|---------------|---------------|
|                                   | Not Available | Not Available      | Not Available | Not Available | Not Available |

**Legend:** Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

**DO NOT** discharge into sewer or waterways.

## 12.2. Persistence and degradability

| Ingredient | Persistence: Water/Soil               | Persistence: Air                      |
|------------|---------------------------------------|---------------------------------------|
|            | No Data available for all ingredients | No Data available for all ingredients |

## 12.3. Bioaccumulative potential

| Ingredient | Bioaccumulation                       |
|------------|---------------------------------------|
|            | No Data available for all ingredients |

## 12.4. Mobility in soil

| Ingredient | Mobility                              |
|------------|---------------------------------------|
|            | No Data available for all ingredients |

## 12.5. Results of PBT and vPvB assessment

|                         | P             | B             | T             |
|-------------------------|---------------|---------------|---------------|
| Relevant available data | Not Available | Not Available | Not Available |
| PBT                     | ✗             | ✗             | ✗             |
| vPvB                    | ✗             | ✗             | ✗             |
| PBT Criteria fulfilled? | No            |               |               |
| vPvB                    | No            |               |               |

## 12.6. Endocrine disrupting properties

No evidence of endocrine disrupting properties were found in the current literature.

## 12.7. Other adverse effects

No evidence of ozone depleting properties were found in the current literature.

## SECTION 13 Disposal considerations

## 13.1. Waste treatment methods

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product / Packaging disposal</b> | <ul style="list-style-type: none"> <li>▶ Containers may still present a chemical hazard/ danger when empty.</li> <li>▶ Return to supplier for reuse/ recycling if possible.</li> </ul> Otherwise: <ul style="list-style-type: none"> <li>▶ If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.</li> <li>▶ Where possible retain label warnings and SDS and observe all notices pertaining to the product.</li> <li>▶ Recycle wherever possible or consult manufacturer for recycling options.</li> <li>▶ Consult State Land Waste Management Authority for disposal.</li> <li>▶ Bury residue in an authorised landfill.</li> <li>▶ Recycle containers if possible, or dispose of in an authorised landfill.</li> </ul> |
| <b>Waste treatment options</b>      | Not Available                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Sewage disposal options</b>      | Not Available                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## SECTION 14 Transport information

## Labels Required

|                         |                |
|-------------------------|----------------|
| <b>Marine Pollutant</b> | NO             |
| <b>HAZCHEM</b>          | Not Applicable |

## Land transport (ADR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

|                                  |                   |                |
|----------------------------------|-------------------|----------------|
| 14.1. UN number or ID number     | Not Applicable    |                |
| 14.2. UN proper shipping name    | Not Applicable    |                |
| 14.3. Transport hazard class(es) | Class             | Not Applicable |
|                                  | Subsidiary Hazard | Not Applicable |

## 3 - Hydroxybutyrate Dehydrogenase

|                                    |                                |                |
|------------------------------------|--------------------------------|----------------|
| 14.4. Packing group                | Not Applicable                 |                |
| 14.5. Environmental hazard         | Not Applicable                 |                |
| 14.6. Special precautions for user | Hazard identification (Kemler) | Not Applicable |
|                                    | Classification code            | Not Applicable |
|                                    | Hazard Label                   | Not Applicable |
|                                    | Special provisions             | Not Applicable |
|                                    | Limited quantity               | Not Applicable |
|                                    | Tunnel Restriction Code        | Not Applicable |

## Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

|                                    |                                                           |                |
|------------------------------------|-----------------------------------------------------------|----------------|
| 14.1. UN number                    | Not Applicable                                            |                |
| 14.2. UN proper shipping name      | Not Applicable                                            |                |
| 14.3. Transport hazard class(es)   | ICAO/IATA Class                                           | Not Applicable |
|                                    | ICAO / IATA Subsidiary Hazard                             | Not Applicable |
|                                    | ERG Code                                                  | Not Applicable |
| 14.4. Packing group                | Not Applicable                                            |                |
| 14.5. Environmental hazard         | Not Applicable                                            |                |
| 14.6. Special precautions for user | Special provisions                                        | Not Applicable |
|                                    | Cargo Only Packing Instructions                           | Not Applicable |
|                                    | Cargo Only Maximum Qty / Pack                             | Not Applicable |
|                                    | Passenger and Cargo Packing Instructions                  | Not Applicable |
|                                    | Passenger and Cargo Maximum Qty / Pack                    | Not Applicable |
|                                    | Passenger and Cargo Limited Quantity Packing Instructions | Not Applicable |
|                                    | Passenger and Cargo Limited Maximum Qty / Pack            | Not Applicable |

## Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

|                                    |                        |                |
|------------------------------------|------------------------|----------------|
| 14.1. UN number                    | Not Applicable         |                |
| 14.2. UN proper shipping name      | Not Applicable         |                |
| 14.3. Transport hazard class(es)   | IMDG Class             | Not Applicable |
|                                    | IMDG Subsidiary Hazard | Not Applicable |
| 14.4. Packing group                | Not Applicable         |                |
| 14.5. Environmental hazard         | Not Applicable         |                |
| 14.6. Special precautions for user | EMS Number             | Not Applicable |
|                                    | Special provisions     | Not Applicable |
|                                    | Limited Quantities     | Not Applicable |

## Inland waterways transport (ADN): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

|                                    |                     |                |
|------------------------------------|---------------------|----------------|
| 14.1. UN number                    | Not Applicable      |                |
| 14.2. UN proper shipping name      | Not Applicable      |                |
| 14.3. Transport hazard class(es)   | Not Applicable      | Not Applicable |
| 14.4. Packing group                | Not Applicable      |                |
| 14.5. Environmental hazard         | Not Applicable      |                |
| 14.6. Special precautions for user | Classification code | Not Applicable |
|                                    | Special provisions  | Not Applicable |
|                                    | Limited quantity    | Not Applicable |
|                                    | Equipment required  | Not Applicable |
|                                    | Fire cones number   | Not Applicable |

## 14.7.1. Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

## 14.7.2. Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

|              |       |
|--------------|-------|
| Product name | Group |
|--------------|-------|

Continued...

**14.7.3. Transport in bulk in accordance with the IGC Code**

| Product name | Ship Type |
|--------------|-----------|
|--------------|-----------|

**SECTION 15 Regulatory information****15.1. Safety, health and environmental regulations / legislation specific for the substance or mixture****Additional Regulatory Information**

Not Applicable

This safety data sheet is in compliance with the following EU legislation and its adaptations - as far as applicable - : Directives 98/24/EC, - 92/85/EEC, - 94/33/EC, - 2008/98/EC, - 2010/75/EU; Commission Regulation (EU) 2020/878; Regulation (EC) No 1272/2008 as updated through ATPs.

**Information according to 2012/18/EU (Seveso III):**

| Seveso Category | Not Available |
|-----------------|---------------|
|-----------------|---------------|

**15.2. Chemical safety assessment**

For further information please look at the Chemical Safety Assessment and Exposure Scenarios prepared by your Supply Chain if available.

**ECHA SUMMARY**

Not Applicable

**National Inventory Status**

| National Inventory                              | Status                                                                                                                                                                                            |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Australia - AIIC / Australia Non-Industrial Use | Not Available                                                                                                                                                                                     |
| Canada - DSL                                    | Not Available                                                                                                                                                                                     |
| Canada - NDSL                                   | Not Available                                                                                                                                                                                     |
| China - IECSC                                   | Not Available                                                                                                                                                                                     |
| Europe - EINEC / ELINCS / NLP                   | Not Available                                                                                                                                                                                     |
| Japan - ENCS                                    | Not Available                                                                                                                                                                                     |
| Korea - KECI                                    | Not Available                                                                                                                                                                                     |
| New Zealand - NZIoC                             | Not Available                                                                                                                                                                                     |
| Philippines - PICCS                             | Not Available                                                                                                                                                                                     |
| USA - TSCA                                      | Not Available                                                                                                                                                                                     |
| Taiwan - TCSI                                   | Not Available                                                                                                                                                                                     |
| Mexico - INSQ                                   | Not Available                                                                                                                                                                                     |
| Vietnam - NCI                                   | Not Available                                                                                                                                                                                     |
| Russia - FBEPH                                  | Not Available                                                                                                                                                                                     |
| <b>Legend:</b>                                  | Yes = All CAS declared ingredients are on the inventory<br>No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration. |

**SECTION 16 Other information**

|                      |            |
|----------------------|------------|
| <b>Revision Date</b> | 06/02/2024 |
| <b>Initial Date</b>  | 28/11/2023 |

**Full text Risk and Hazard codes****SDS Version Summary**

| Version | Date of Update | Sections Updated                                       |
|---------|----------------|--------------------------------------------------------|
| 2.2     | 06/02/2024     | Composition / information on ingredients - Ingredients |

**Other information**

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

For detailed advice on Personal Protective Equipment, refer to the following EU CEN Standards:

- EN 166 Personal eye-protection
- EN 340 Protective clothing
- EN 374 Protective gloves against chemicals and micro-organisms
- EN 13832 Footwear protecting against chemicals
- EN 133 Respiratory protective devices

**Definitions and abbreviations**

- PC - TWA: Permissible Concentration-Time Weighted Average
- PC - STEL: Permissible Concentration-Short Term Exposure Limit
- IARC: International Agency for Research on Cancer



- ▶ ACGIH: American Conference of Governmental Industrial Hygienists
- ▶ STEL: Short Term Exposure Limit
- ▶ TEEL: Temporary Emergency Exposure Limit,
- ▶ IDLH: Immediately Dangerous to Life or Health Concentrations
- ▶ ES: Exposure Standard
- ▶ OSF: Odour Safety Factor
- ▶ NOAEL: No Observed Adverse Effect Level
- ▶ LOAEL: Lowest Observed Adverse Effect Level
- ▶ TLV: Threshold Limit Value
- ▶ LOD: Limit Of Detection
- ▶ OTV: Odour Threshold Value
- ▶ BCF: BioConcentration Factors
- ▶ BEI: Biological Exposure Index
- ▶ DNEL: Derived No-Effect Level
- ▶ PNEC: Predicted no-effect concentration
  
- ▶ AIIC: Australian Inventory of Industrial Chemicals
- ▶ DSL: Domestic Substances List
- ▶ NDSL: Non-Domestic Substances List
- ▶ IECSC: Inventory of Existing Chemical Substance in China
- ▶ EINECS: European INventory of Existing Commercial chemical Substances
- ▶ ELINCS: European List of Notified Chemical Substances
- ▶ NLP: No-Longer Polymers
- ▶ ENCS: Existing and New Chemical Substances Inventory
- ▶ KECI: Korea Existing Chemicals Inventory
- ▶ NZIoC: New Zealand Inventory of Chemicals
- ▶ PICCS: Philippine Inventory of Chemicals and Chemical Substances
- ▶ TSCA: Toxic Substances Control Act
- ▶ TCSI: Taiwan Chemical Substance Inventory
- ▶ INSQ: Inventario Nacional de Sustancias Químicas
- ▶ NCI: National Chemical Inventory
- ▶ FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

#### Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]

| Classification according to regulation (EC) No 1272/2008 [CLP] and amendments | Classification Procedure |
|-------------------------------------------------------------------------------|--------------------------|
| Sensitisation (Respiratory)<br>Category 1B, H334                              | Expert judgement         |

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