

**Multivitamin Aqueous Formulation**

Version 3.1      Revision Date: 2023/09/30      SDS Number: 4248880-00009      Date of last issue: 2023/04/04  
Date of first issue: 2019/05/06

---

**1. PRODUCT AND COMPANY IDENTIFICATION**

Product name : Multivitamin Aqueous Formulation

**Manufacturer or supplier's details**

Company : MSD  
Address : 126 E. Lincoln Avenue  
Rahway, New Jersey U.S.A. 07065  
Telephone : 908-740-4000  
Emergency telephone number : 1-908-423-6000  
E-mail address : EHSDATASTEWARD@msd.com

**Recommended use of the chemical and restrictions on use**

Recommended use : Veterinary product  
Restrictions on use : Not applicable

---

**2. HAZARDS IDENTIFICATION****GHS Classification**

Not a hazardous substance or mixture.

**GHS label elements**

No hazard pictogram, no signal word, no hazard statement(s), no precautionary statement(s) required

**Other hazards which do not result in classification**

None known.

---

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Substance / Mixture : Mixture

**Components**

| Chemical name                             | CAS-No.  | Concentration (% w/w) |
|---|----------|-----------------------|
| Riboflavin 5'-(sodium hydrogen phosphate) | 130-40-5 | < 10                  |
| Pyridoxine hydrochloride                  | 58-56-0  | < 10                  |
| Cyanocobalamin                            | 68-19-9  | >= 0.0003 -< 0.0025   |

---

**4. FIRST AID MEASURES**

If inhaled : If inhaled, remove to fresh air.

---

## Multivitamin Aqueous Formulation

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 2023/04/04  |
| 3.1     | 2023/09/30     | 4248880-00009 | Date of first issue: 2019/05/06 |

---

|   |   |   |
|---|---|---|
| In case of skin contact                                     | : | Get medical attention if symptoms occur.<br>Wash with water and soap as a precaution.   |
| In case of eye contact                                      | : | Get medical attention if symptoms occur.<br>Flush eyes with water as a precaution.  |
| If swallowed  | : | Get medical attention if irritation develops and persists.<br>If swallowed, DO NOT induce vomiting.<br>Get medical attention if symptoms occur.<br>Rinse mouth thoroughly with water. |
| Most important symptoms and effects, both acute and delayed | : | None known.   |
| Protection of first-aiders                                  | : | No special precautions are necessary for first aid responders.  |
| Notes to physician  | : | Treat symptomatically and supportively.   |

---

### 5. FIREFIGHTING MEASURES

|   |   |   |
|---|---|---|
| Suitable extinguishing media                  | : | Water spray<br>Alcohol-resistant foam<br>Carbon dioxide (CO <sub>2</sub> )<br>Dry chemical  |
| Unsuitable extinguishing media                | : | None known.   |
| Specific hazards during fire-fighting         | : | Exposure to combustion products may be a hazard to health.  |
| Hazardous combustion products                 | : | Carbon oxides   |
| Specific extinguishing methods                | : | Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.<br>Use water spray to cool unopened containers.<br>Remove undamaged containers from fire area if it is safe to do so.<br>Evacuate area. |
| Special protective equipment for firefighters | : | Wear self-contained breathing apparatus for firefighting if necessary.<br>Use personal protective equipment.  |

---

### 6. ACCIDENTAL RELEASE MEASURES

|   |   |  |
|---|---|--|
| Personal precautions, protective equipment and emergency procedures | : | Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).   |
| Environmental precautions   | : | Avoid release to the environment.<br>Prevent further leakage or spillage if safe to do so.<br>Prevent spreading over a wide area (e.g. by containment or oil barriers).<br>Retain and dispose of contaminated wash water.<br>Local authorities should be advised if significant spillages cannot be contained. |
| Methods and materials for containment and cleaning up               | : | Soak up with inert absorbent material.<br>For large spills, provide dyking or other appropriate contain-   |

## Multivitamin Aqueous Formulation

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 2023/04/04  |
| 3.1     | 2023/09/30     | 4248880-00009 | Date of first issue: 2019/05/06 |

ment to keep material from spreading. If dyked material can be pumped, store recovered material in appropriate container. Clean up remaining materials from spill with suitable absorbent.

Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.

Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

### 7. HANDLING AND STORAGE

- Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
- Local/Total ventilation : Use only with adequate ventilation.
- Advice on safe handling : Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment  
Take care to prevent spills, waste and minimize release to the environment.
- Conditions for safe storage : Keep in properly labelled containers.  
Store in accordance with the particular national regulations.
- Materials to avoid : Do not store with the following product types:  
Strong oxidizing agents

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### Components with workplace control parameters

| Components                                | CAS-No.  | Value type (Form of exposure) | Control parameters / Permissible concentration | Basis    |
|---|----------|-------------------------------|--|----------|
| Riboflavin 5'-(sodium hydrogen phosphate) | 130-40-5 | TWA                           | 100 µg/m <sup>3</sup> (OEB 2)                  | Internal |
| Pyridoxine hydrochloride                  | 58-56-0  | TWA                           | OEB 3 (>= 10 < 100 µg/m <sup>3</sup> )         | Internal |
| Cyanocobalamin                            | 68-19-9  | TWA                           | 15 µg/m <sup>3</sup> (OEB 3)                   | Internal |
|   |          | Wipe limit                    | 150 µg/100 cm <sup>2</sup>                     | Internal |

**Engineering measures** : Ensure adequate ventilation, especially in confined areas.  
Minimize workplace exposure concentrations.

#### Personal protective equipment

Respiratory protection : No personal respiratory protective equipment normally required.

Hand protection

Remarks : Wash hands before breaks and at the end of workday.  
Eye protection : Wear the following personal protective equipment:

**Multivitamin Aqueous Formulation**

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 2023/04/04  |
| 3.1     | 2023/09/30     | 4248880-00009 | Date of first issue: 2019/05/06 |

---

|                          |   |
|--------------------------|---|
| Skin and body protection | : Safety glasses  |
| Hygiene measures         | : Skin should be washed after contact.  |
|                          | : If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place. |
|                          | When using do not eat, drink or smoke.  |
|                          | Wash contaminated clothing before re-use.   |

---

**9. PHYSICAL AND CHEMICAL PROPERTIES**

|  |                     |
|--|---------------------|
| Appearance                                       | : Aqueous solution  |
| Colour   | : red               |
| Odour  | : characteristic    |
| Odour Threshold                                  | : No data available |
| pH   | : No data available |
| Melting point/freezing point                     | : 0 °C              |
| Initial boiling point and boiling range          | : 100.5 °C          |
| Flash point                                      | : No data available |
| Evaporation rate                                 | : No data available |
| Flammability (solid, gas)                        | : Not applicable    |
| Flammability (liquids)                           | : Not applicable    |
| Upper explosion limit / Upper flammability limit | : No data available |
| Lower explosion limit / Lower flammability limit | : No data available |
| Vapour pressure                                  | : No data available |
| Relative vapour density                          | : No data available |
| Relative density                                 | : 1.01              |
| Density  | : No data available |
| Solubility(ies)                                  |                     |
| Water solubility                                 | : No data available |
| Partition coefficient: n-octanol/water           | : Not applicable    |
| Auto-ignition temperature                        | : No data available |

**Multivitamin Aqueous Formulation**

Version 3.1      Revision Date: 2023/09/30      SDS Number: 4248880-00009      Date of last issue: 2023/04/04  
Date of first issue: 2019/05/06

---

Decomposition temperature : No data available

Viscosity  
  Viscosity, kinematic : No data available

Explosive properties : Not explosive

Oxidizing properties : The substance or mixture is not classified as oxidizing.

Molecular weight : No data available

Particle size : Not applicable

---

**10. STABILITY AND REACTIVITY**

Reactivity : Not classified as a reactivity hazard.

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions : Can react with strong oxidizing agents.

Conditions to avoid : None known.

Incompatible materials : Oxidizing agents

Hazardous decomposition products : No hazardous decomposition products are known.

---

**11. TOXICOLOGICAL INFORMATION**

Information on likely routes of exposure : Inhalation  
Skin contact  
Ingestion  
Eye contact

**Acute toxicity**

Not classified based on available information.

**Components:****Riboflavin 5'-(sodium hydrogen phosphate):**

Acute oral toxicity : LD50 (Rat): > 20,000 mg/kg

**Pyridoxine hydrochloride:**

Acute oral toxicity : LD50 (Rat): 4,000 mg/kg

**Cyanocobalamin:**

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg

**Skin corrosion/irritation**

Not classified based on available information.

**Multivitamin Aqueous Formulation**

Version 3.1      Revision Date: 2023/09/30      SDS Number: 4248880-00009      Date of last issue: 2023/04/04  
Date of first issue: 2019/05/06

---

**Components:****Pyridoxine hydrochloride:**

Species : Rabbit  
Result : No skin irritation

**Serious eye damage/eye irritation**

Not classified based on available information.

**Components:****Pyridoxine hydrochloride:**

Species : Rabbit  
Result : No eye irritation

**Respiratory or skin sensitisation****Skin sensitisation**

Not classified based on available information.

**Respiratory sensitisation**

Not classified based on available information.

**Components:****Pyridoxine hydrochloride:**

Test Type : Maximisation Test  
Exposure routes : Skin contact  
Species : Guinea pig  
Method : OECD Test Guideline 406  
Result : negative

**Germ cell mutagenicity**

Not classified based on available information.

**Components:****Riboflavin 5'-(sodium hydrogen phosphate):**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative  
Remarks: Based on data from similar materials

Test Type: Chromosome aberration test in vitro  
Method: OECD Test Guideline 473  
Result: negative  
Remarks: Based on data from similar materials

**Pyridoxine hydrochloride:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative

**Multivitamin Aqueous Formulation**

Version 3.1      Revision Date: 2023/09/30      SDS Number: 4248880-00009      Date of last issue: 2023/04/04  
Date of first issue: 2019/05/06

---

**Cyanocobalamin:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative

**Carcinogenicity**

Not classified based on available information.

**Reproductive toxicity**

Not classified based on available information.

**Components:****Pyridoxine hydrochloride:**

Effects on foetal development : Test Type: Embryo-foetal development  
Species: Rat  
Application Route: Ingestion  
Result: negative

**STOT - single exposure**

Not classified based on available information.

**STOT - repeated exposure**

Not classified based on available information.

**Repeated dose toxicity****Components:****Riboflavin 5'-(sodium hydrogen phosphate):**

Species : Rat  
NOAEL : > 100 mg/kg  
Application Route : Ingestion  
Exposure time : 13 Weeks  
Method : OECD Test Guideline 408  
Remarks : Based on data from similar materials

**Aspiration toxicity**

Not classified based on available information.

---

**12. ECOLOGICAL INFORMATION****Ecotoxicity****Components:****Riboflavin 5'-(sodium hydrogen phosphate):**

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): > 64.3 mg/l  
Exposure time: 96 h  
Remarks: Based on data from similar materials

**Multivitamin Aqueous Formulation**

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 2023/04/04  |
| 3.1     | 2023/09/30     | 4248880-00009 | Date of first issue: 2019/05/06 |

---

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 47.4 mg/l  
Exposure time: 48 h  
Remarks: Based on data from similar materials

**Pyridoxine hydrochloride:**

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l  
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l  
Exposure time: 48 h

**Cyanocobalamin:**

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): > 1 - 10 mg/l  
Exposure time: 14 d  
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Ceriodaphnia dubia (water flea)): > 10 - 100 mg/l  
Exposure time: 48 h  
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants : EC50 (Champia parvula (marine algae)): > 0.1 - 1 mg/l  
Exposure time: 72 h  
Remarks: Based on data from similar materials

EC10 (Lemna minor (common duckweed)): > 0.1 - 1 mg/l  
Exposure time: 7 d  
Remarks: Based on data from similar materials

M-Factor (Acute aquatic toxicity) : 1

Toxicity to fish (Chronic toxicity) : NOEC (Danio rerio (zebra fish)): > 1 mg/l  
Exposure time: 16 d  
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): > 0.1 - 1 mg/l  
Exposure time: 28 d  
Remarks: Based on data from similar materials

**Persistence and degradability****Components:****Riboflavin 5'-(sodium hydrogen phosphate):**

Biodegradability : Result: Readily biodegradable.  
Remarks: Based on data from similar materials

**Pyridoxine hydrochloride:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 94 %  
Exposure time: 28 d



**Multivitamin Aqueous Formulation**

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 2023/04/04  |
| 3.1     | 2023/09/30     | 4248880-00009 | Date of first issue: 2019/05/06 |

---

Method: OECD Test Guideline 301E

**Bioaccumulative potential****Components:****Riboflavin 5'-(sodium hydrogen phosphate):**

Partition coefficient: n-octanol/water : log Pow: -0.651  
Remarks: Calculation

**Pyridoxine hydrochloride:**

Partition coefficient: n-octanol/water : log Pow: 4.32

**Mobility in soil**

No data available

**Other adverse effects**

No data available

---

**13. DISPOSAL CONSIDERATIONS****Disposal methods**

Waste from residues : Do not dispose of waste into sewer.  
Dispose of in accordance with local regulations.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.  
If not otherwise specified: Dispose of as unused product.

---

**14. TRANSPORT INFORMATION****International Regulations****UNRTDG**

UN number : Not applicable  
Proper shipping name : Not applicable  
Class : Not applicable  
Subsidiary risk : Not applicable  
Packing group : Not applicable  
Labels : Not applicable

**IATA-DGR**

UN/ID No. : Not applicable  
Proper shipping name : Not applicable  
Class : Not applicable  
Subsidiary risk : Not applicable  
Packing group : Not applicable  
Labels : Not applicable  
Packing instruction (cargo aircraft) : Not applicable  
Packing instruction (passen- : Not applicable

## Multivitamin Aqueous Formulation

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 2023/04/04  |
| 3.1     | 2023/09/30     | 4248880-00009 | Date of first issue: 2019/05/06 |

---

ger aircraft)

### IMDG-Code

|                      |   |                |
|----------------------|---|----------------|
| UN number            | : | Not applicable |
| Proper shipping name | : | Not applicable |
| Class                | : | Not applicable |
| Subsidiary risk      | : | Not applicable |
| Packing group        | : | Not applicable |
| Labels               | : | Not applicable |
| EmS Code             | : | Not applicable |
| Marine pollutant     | : | Not applicable |

### Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

### Special precautions for user

Not applicable

---

## 15. REGULATORY INFORMATION

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

**Minister of Industry Regulation No. 23/M-IND/PER/4/2013 concerning the Revision of Minister of Industry Regulation No. 87/M-IND/PER/9/2009 concerning Globally Harmonized System of Classification and Labelling of Chemicals.**

### Regulation of the Minister of Health No. 472 of 1996 on the Safeguarding of Substances Hazardous to Health

Hazardous substances that must be registered : Not applicable

### Government Regulation No. 74 of 2001 on the Management of Hazardous and Toxic Substances

Hazardous substances approved for use : Not applicable

Prohibited substances : Not applicable

Restricted substances : Not applicable

### Regulation of the Ministry of Trade No. 7 of 2022 on Distribution and Control of Hazardous Materials

Type of hazardous materials subject to distribution and control, Annex I : Not applicable

Type of hazardous materials subject to distribution and control, Annex II : Not applicable

### The components of this product are reported in the following inventories:

AICS : not determined

**Multivitamin Aqueous Formulation**

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 2023/04/04  |
| 3.1     | 2023/09/30     | 4248880-00009 | Date of first issue: 2019/05/06 |

---

DSL : not determined

IECSC : not determined

---

**16. OTHER INFORMATION**

Revision Date : 2023/09/30

**Further information**Sources of key data used to compile the Safety Data Sheet : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, <http://echa.europa.eu/>

Date format : yyyy/mm/dd

**Full text of other abbreviations**

AllC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be

## Multivitamin Aqueous Formulation

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 2023/04/04  |
| 3.1     | 2023/09/30     | 4248880-00009 | Date of first issue: 2019/05/06 |

---

considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

ID / EN