

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

SECTION 1. IDENTIFICATION

Product name : Betaine / Multivitamin Formulation
Product code : Supastock

Manufacturer or supplier's details

Company name of supplier : Merck & Co., Inc
Address : 126 E. Lincoln Avenue
Rahway, New Jersey U.S.A. 07065
Telephone : 908-740-4000
Emergency telephone : 1-908-423-6000
E-mail address : EHSDATASTEWARD@merck.com

Recommended use of the chemical and restrictions on use

Recommended use : Veterinary product
Restrictions on use : Not applicable

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)


Combustible dust

Skin sensitization : Category 1

Other hazards

Dust contact with the eyes can lead to mechanical irritation.
Contact with dust can cause mechanical irritation or drying of the skin.

GHS label elements

Hazard pictograms	: 
Signal Word	: Warning
Hazard Statements	: If small particles are generated during further processing, handling or by other means, may form combustible dust concentrations in air. H317 May cause an allergic skin reaction.
Precautionary Statements	: Prevention: P261 Avoid breathing dust. P272 Contaminated work clothing must not be allowed out of the workplace. P280 Wear protective gloves. Response: P302 + P352 IF ON SKIN: Wash with plenty of water. P333 + P313 If skin irritation or rash occurs: Get medical atten-

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version 4.0 Revision Date: 06/18/2025 SDS Number: 11513558-00005 Date of last issue: 04/14/2025
Date of first issue: 02/24/2025

tion.
P362 + P364 Take off contaminated clothing and wash it before reuse.

Disposal:

P501 Dispose of contents and container to an approved waste disposal plant.

Additional Labeling

The following percentage of the mixture consists of ingredient(s) with unknown acute oral toxicity: 20 %

The following percentage of the mixture consists of ingredient(s) with unknown acute dermal toxicity: 20 %

The following percentage of the mixture consists of ingredient(s) with unknown acute inhalation toxicity: 20 %

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS No./Unique ID	Concentration (% w/w)	Trade secret
Starch	9005-25-8*	>= 10 - <= 30	TSC
3,7-Dimethyl 2,6-octadienal	5392-40-5*	>= 0.1 - <= 1	TSC
Dimethyl octadienol	78-70-6*	>= 0.1 - <= 1	TSC
(dl)-a-Tocopheryl acetate	7695-91-2*	<= 0.1	TSC
Betaine hydrochloride	590-46-5*	<= 0.1	TSC
Benzyl alcohol	100-51-6*	<= 0.1	TSC
Pyridoxine Hydrochloride	58-56-0*	<= 0.1	TSC
Colecalciferol	67-97-0*	<= 0.1	TSC

* Indicates that the identifier is a CAS No.

TSC- the actual concentration or concentration range is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

General advice : In the case of accident or if you feel unwell, seek medical advice immediately.
When symptoms persist or in all cases of doubt seek medical advice.

If inhaled : If inhaled, remove to fresh air.
Get medical attention if symptoms occur.

In case of skin contact : In case of contact, immediately flush skin with soap and plenty

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

		of water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
In case of eye contact	:	If in eyes, rinse well with water. Get medical attention if irritation develops and persists.
If swallowed	:	If swallowed, DO NOT induce vomiting. Get medical attention if symptoms occur. Rinse mouth thoroughly with water.
Most important symptoms and effects, both acute and delayed	:	Contact with dust can cause mechanical irritation or drying of the skin. Dust contact with the eyes can lead to mechanical irritation. May cause an allergic skin reaction.
Protection of first-aiders	:	First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).
Notes to physician	:	Treat symptomatically and supportively.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Water spray Alcohol-resistant foam Carbon dioxide (CO ₂) Dry chemical
Unsuitable extinguishing media	:	None known.
Specific hazards during fire fighting	:	Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Exposure to combustion products may be a hazard to health.
Hazardous combustion products	:	Carbon oxides Nitrogen oxides (NO _x) Chlorine compounds Metal oxides Oxides of phosphorus
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers. Remove undamaged containers from fire area if it is safe to do so. Evacuate area.
Special protective equipment for fire-fighters	:	In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protection	:	Use personal protective equipment.
----------------------------------	---	------------------------------------

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

- | | | |
|---|---|--|
| tive 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.
Prevent further leakage or spillage if safe to do so.
Retain and dispose of contaminated wash water.
Local authorities should be advised if significant spillages cannot be contained. |
| Methods and materials for containment and cleaning up | : | Sweep up or vacuum up spillage and collect in suitable container for disposal.
Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air).
Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration.
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. |

SECTION 7. HANDLING AND STORAGE

- | | | |
|-----------------------------|---|--|
| Technical measures | : | Static electricity may accumulate and ignite suspended dust causing an explosion.
Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. |
| Local/Total ventilation | : | Use only with adequate ventilation. |
| Advice on safe handling | : | Do not get on skin or clothing.
Do not breathe dust.
Avoid breathing dust.
Do not swallow.
Avoid contact with eyes.
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment
Minimize dust generation and accumulation.
Keep container closed when not in use.
Keep away from heat and sources of ignition.
Take precautionary measures against static discharges.
Take care to prevent spills, waste and minimize release to the environment. |
| Conditions for safe storage | : | Keep in properly labeled containers.
Store in accordance with the particular national regulations. |
| Materials to avoid | : | Do not store with the following product types:
Strong oxidizing agents |

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version 4.0 Revision Date: 06/18/2025 SDS Number: 11513558-00005 Date of last issue: 04/14/2025
Date of first issue: 02/24/2025

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

inert or nuisance dust 50 Million particles per cubic foot
Value type (Form of exposure): TWA (total dust)
Basis: OSHA Z-3

15 mg/m³
Value type (Form of exposure): TWA (total dust)
Basis: OSHA Z-3

5 mg/m³
Value type (Form of exposure): TWA (respirable fraction)
Basis: OSHA Z-3

15 Million particles per cubic foot
Value type (Form of exposure): TWA (respirable fraction)
Basis: OSHA Z-3

Dust, nuisance dust and particulates 10 mg/m³
Value type (Form of exposure): PEL (Total dust)
Basis: CAL PEL

5 mg/m³
Value type (Form of exposure): PEL (respirable dust fraction)
Basis: CAL PEL

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Starch	9005-25-8	TWA	10 mg/m ³	ACGIH
		TWA (Respirable)	5 mg/m ³	NIOSH REL
		TWA (total)	10 mg/m ³	NIOSH REL
		TWA (total dust)	15 mg/m ³	OSHA Z-1
		TWA (respirable fraction)	5 mg/m ³	OSHA Z-1
3,7-Dimethyl 2,6-octadienal	5392-40-5	TWA (Inhalable fraction and vapor)	5 ppm	ACGIH
(dl)-a-Tocopheryl acetate	7695-91-2	TWA	5000 ug/m3 (OEB 1)	Internal
Betaine hydrochloride	590-46-5	TWA	>= 100< 1000 µg/m3 (OEB2)	Internal
Benzyl alcohol	100-51-6	TWA	10 ppm	US WEEL
Pyridoxine Hydrochloride	58-56-0	TWA	OEB 3 (>= 10 < 100 µg/m3)	Internal
Colecalciferol	67-97-0	TWA	5 µg/m3 (OEB 4)	Internal
		Wipe limit	50 µg/100 cm ²	Internal

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

Engineering measures : The information below is intended for larger pilot/commercial-scale operations and manufacturing. For smaller scale, clinical, or pharmacy settings, site-specific internal risk assessment practices should be conducted to determine appropriate exposure control measures. The health hazard risks of handling this material are dependent on multiple factors, including but not limited to physical form and quantity handled. If applicable, use process enclosures, local exhaust ventilation (e.g., Biosafety Cabinet, Ventilated Balance Enclosures), or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels as low as reasonably achievable. Containment technologies suitable for controlling compounds are required to control at source and to prevent migration of the compound to uncontrolled areas (e.g., vacuum conveying from a closed system, packout head with inflatable seal from stationary container, ventilated enclosure, etc.). All engineering controls should be implemented by facility design and operated in accordance with GMP principles to protect products, workers, and the environment. Essentially no open handling permitted. Use closed processing systems or containment technologies.

Personal protective equipment

Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Hand protection
Material

: Chemical-resistant gloves

Remarks
Eye protection

: Consider double gloving.
: Wear safety glasses with side shields or goggles. If the work environment or activity involves dusty conditions, mists or aerosols, wear the appropriate goggles. Wear a faceshield or other full face protection if there is a potential for direct contact to the face with dusts, mists, or aerosols.

Skin and body protection

: Work uniform or laboratory coat. Additional body garments should be used based upon the task being performed (e.g., sleevelets, apron, gauntlets, disposable suits) to avoid exposed skin surfaces. Use appropriate degowning techniques to remove potentially contaminated clothing.

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

Hygiene measures : 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.
Contaminated work clothing should not be allowed out of the workplace.
Wash contaminated clothing before re-use.
The effective operation of a facility should include review of engineering controls, proper personal protective equipment, appropriate degowning and decontamination procedures, industrial hygiene monitoring, medical surveillance and the use of administrative controls.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: powder
Color	: yellow
Odor	: characteristic
Odor Threshold	: No data available
pH	: No data available
Melting point/freezing point	: No data available
Initial boiling point and boiling range	: No data available
Flash point	: Not applicable
Evaporation rate	: Not applicable
Flammability (solid, gas)	: May form explosive dust-air mixture during processing, handling or other means.
Flammability (liquids)	: Not applicable
Upper explosion limit / Upper flammability limit	: No data available
Lower explosion limit / Lower flammability limit	: No data available
Vapor pressure	: Not applicable
Relative vapor density	: Not applicable
Relative density	: No data available
Density	: No data available
Solubility(ies)	

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

Water solubility	:	No data available
Partition coefficient: n-octanol/water	:	Not applicable
Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity	:	
Viscosity, kinematic	:	Not applicable
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.
Molecular weight	:	No data available
Particle characteristics	:	
Particle size	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Not classified as a reactivity hazard.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	May form explosive dust-air mixture during processing, handling or other means. Can react with strong oxidizing agents.
Conditions to avoid	:	Heat, flames and sparks. Avoid dust formation.
Incompatible materials	:	Oxidizing agents
Hazardous decomposition products	:	No hazardous decomposition products are known.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhalation
Skin contact
Ingestion
Eye contact

Acute toxicity

Not classified based on available information.

Components:

Starch:

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg
Acute dermal toxicity	:	LD50 (Rabbit): > 2,000 mg/kg

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

II

3,7-Dimethyl 2,6-octadienal:

Acute oral toxicity	: LD50 (Rat, female): 4,895 mg/kg
Acute inhalation toxicity	: LC50 (Rat): > 0.68 mg/l Exposure time: 7 h Test atmosphere: vapor
Acute dermal toxicity	: LD50 (Rabbit): 2,250 mg/kg

Dimethyl octadienol:

Acute oral toxicity	: LD50 (Rat): 2,790 mg/kg Method: OECD Test Guideline 401 Remarks: The test was conducted equivalent or similar to guideline
Acute inhalation toxicity	: LC50 (Mouse): > 3.2 mg/l Exposure time: 90 min Test atmosphere: vapor Remarks: No test guideline followed
Acute dermal toxicity	: LD50 (Rabbit): 5,610 mg/kg Method: OECD Test Guideline 402 Remarks: The test was conducted equivalent or similar to guideline

(dl)-a-Tocopheryl acetate:

Acute oral toxicity	: LD50 (Rat): > 5,000 mg/kg
Acute dermal toxicity	: LD50 (Rat): > 3,000 mg/kg Assessment: The substance or mixture has no acute dermal toxicity

Betaine hydrochloride:

Acute oral toxicity	: LD50 (Rat): > 5,000 mg/kg Method: OECD Test Guideline 401 Remarks: The test was conducted according to guideline Based on data from similar materials
---------------------	--

Benzyl alcohol:

Acute oral toxicity	: LD50 (Rat): 1,200 mg/kg
Acute inhalation toxicity	: LC50 (Rat): > 5.4 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: OECD Test Guideline 403 Assessment: The substance or mixture has no acute inhalation toxicity

Pyridoxine Hydrochloride:

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

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

Colecalciferol:

Acute oral toxicity : LD50 (Rat, male): 35 mg/kg

Acute inhalation toxicity : Acute toxicity estimate: 0.05 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Expert judgment

Acute dermal toxicity : Acute toxicity estimate: 50 mg/kg
Method: Expert judgment

Skin corrosion/irritation

Not classified based on available information.

Components:

3,7-Dimethyl 2,6-octadienal:

Species : Rabbit
Result : Skin irritation

Dimethyl octadienol:

Species : Rabbit
Method : OECD Test Guideline 404
Result : Skin irritation
Remarks : The test was conducted according to guideline

(dl)-a-Tocopheryl acetate:

Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation

Betaine hydrochloride:

Species : reconstructed human epidermis (RhE)
Method : OECD Test Guideline 439
Remarks : The test was conducted according to guideline

Result : No skin irritation

Benzyl alcohol:

Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation

Pyridoxine Hydrochloride:

Species : Rabbit
Result : No skin irritation

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

Serious eye damage/eye irritation

Not classified based on available information.

Components:

Starch:

Species	: Rabbit
Result	: No eye irritation

3,7-Dimethyl 2,6-octadienal:

Species	: Rabbit
Result	: Irritation to eyes, reversing within 21 days

Dimethyl octadienol:

Species	: Rabbit
Result	: Irritation to eyes, reversing within 21 days
Method	: OECD Test Guideline 405
Remarks	: The test was conducted equivalent or similar to guideline

(dl)-a-Tocopheryl acetate:

Species	: Rabbit
Result	: No eye irritation
Method	: OECD Test Guideline 405

Betaine hydrochloride:

Result	: Irreversible effects on the eye
--------	-----------------------------------

Benzyl alcohol:

Species	: Rabbit
Result	: Irritation to eyes, reversing within 21 days
Method	: OECD Test Guideline 405

Pyridoxine Hydrochloride:

Species	: Rabbit
Result	: No eye irritation

Colecalciferol:

Species	: Rabbit
Result	: No eye irritation

Respiratory or skin sensitization

Skin sensitization

May cause an allergic skin reaction.

Respiratory sensitization

Not classified based on available information.

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

Components:

Starch:

Test Type	: Maximization Test
Routes of exposure	: Skin contact
Species	: Guinea pig
Result	: negative

3,7-Dimethyl 2,6-octadienal:

Test Type	: Human repeat insult patch test (HRIPT)
Routes of exposure	: Skin contact
Result	: positive

Assessment	: Probability or evidence of skin sensitization in humans
------------	---

Dimethyl octadienol:

Test Type	: Local lymph node assay (LLNA)
Routes of exposure	: Skin contact
Species	: Mouse
Method	: OECD Test Guideline 429
Result	: positive
Remarks	: The test was conducted according to guideline

Assessment	: Probability or evidence of low to moderate skin sensitization rate in humans
------------	--

(dl)-a-Tocopheryl acetate:

Test Type	: Draize Test
Routes of exposure	: Skin contact
Species	: Humans
Result	: negative

Betaine hydrochloride:

Test Type	: Local lymph node assay (LLNA)
Routes of exposure	: Skin contact
Species	: Mouse
Method	: OECD Test Guideline 429
Result	: negative
Remarks	: The test was conducted according to guideline

Benzyl alcohol:

Test Type	: Human repeat insult patch test (HRIPT)
Routes of exposure	: Skin contact
Species	: Humans
Result	: positive

Assessment	: Probability or evidence of low to moderate skin sensitization rate in humans
------------	--

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

Pyridoxine Hydrochloride:

Test Type	: Maximization Test
Routes of exposure	: Skin contact
Species	: Guinea pig
Method	: OECD Test Guideline 406
Result	: negative

Colecalciferol:

Test Type	: Maurer optimisation test
Routes of exposure	: Skin contact
Species	: Guinea pig
Result	: negative

Germ cell mutagenicity

Not classified based on available information.

Components:

Starch:

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

3,7-Dimethyl 2,6-octadienal:

Genotoxicity in vitro	: Test Type: Bacterial reverse mutation assay (AMES) Result: negative Test Type: In vitro mammalian cell gene mutation test Method: OECD Test Guideline 476 Result: negative Test Type: Chromosome aberration test in vitro Result: negative Test Type: In vitro sister chromatid exchange assay in mam- malian cells Result: positive
Genotoxicity in vivo	: Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Mouse Application Route: Ingestion Result: negative

Dimethyl octadienol:

Genotoxicity in vitro	: Test Type: Bacterial reverse mutation assay (AMES) Method: OECD Test Guideline 471 Result: negative Remarks: The test was conducted equivalent or similar to guideline Test Type: In vitro mammalian cell gene mutation test
-----------------------	---

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

		Method: OECD Test Guideline 476 Result: negative Remarks: The test was conducted equivalent or similar to guideline
		Test Type: Chromosome aberration test in vitro Method: OECD Test Guideline 473 Result: negative Remarks: The test was conducted equivalent or similar to guideline
Genotoxicity in vivo	:	Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Mouse Application Route: Ingestion Method: OECD Test Guideline 474 Result: negative Remarks: The test was conducted according to guideline

(dl)-a-Tocopheryl acetate:

Genotoxicity in vitro	:	Test Type: Chromosome aberration test in vitro Method: OECD Test Guideline 473 Result: negative
		Test Type: Bacterial reverse mutation assay (AMES) Method: OECD Test Guideline 471 Result: negative
Genotoxicity in vivo	:	Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Mouse Application Route: Ingestion Result: negative

Betaine hydrochloride:

Genotoxicity in vitro	:	Test Type: Bacterial reverse mutation assay (AMES) Method: Directive 67/548/EEC, Annex V, B.13/14. Result: negative Remarks: The test was conducted according to guideline Based on data from similar materials
		Test Type: In vitro mammalian cell gene mutation test Method: OECD Test Guideline 476 Result: negative Remarks: The test was conducted according to guideline Based on data from similar materials
		Test Type: Chromosome aberration test in vitro Method: Directive 67/548/EEC, Annex V, B.10. Result: negative Remarks: The test was conducted according to guideline Based on data from similar materials

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Ingestion
Method: OECD Test Guideline 474
Result: negative
Remarks: The test was conducted according to guideline
Based on data from similar materials

Benzyl alcohol:

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

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Intraperitoneal injection
Result: negative

Pyridoxine Hydrochloride:

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

Colecalciferol:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: equivocal

Test Type: In vitro mammalian cell gene mutation test
Method: OECD Test Guideline 476
Result: negative

Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 474
Result: negative

Test Type: In vivo mammalian alkaline comet assay
Species: Rat
Application Route: Ingestion
Result: positive

Germ cell mutagenicity - Assessment : Weight of evidence does not support classification as a germ cell mutagen.

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

Carcinogenicity

Not classified based on available information.

Components:

3,7-Dimethyl 2,6-octadienal:

Species	: Mouse
Application Route	: Ingestion
Exposure time	: 104 - 105 weeks
Result	: negative

(dl)-a-Tocopheryl acetate:

Species	: Rat
Application Route	: Ingestion
Exposure time	: 104 weeks
Result	: negative

Betaine hydrochloride:

Species	: Rat
Application Route	: Ingestion
Exposure time	: 104 weeks
Method	: OECD Test Guideline 453
Result	: negative
Remarks	: The test was conducted equivalent or similar to guideline Based on data from similar materials

Benzyl alcohol:

Species	: Mouse
Application Route	: Ingestion
Exposure time	: 103 weeks
Method	: OECD Test Guideline 451
Result	: negative

IARC No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Not classified based on available information.

Components:

3,7-Dimethyl 2,6-octadienal:

Effects on fertility	: Test Type: One-generation reproduction toxicity study Species: Rat Application Route: Ingestion
----------------------	---

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

Method: OECD Test Guideline 443
Result: negative

Effects on fetal development : Test Type: One-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 443
Result: negative

Dimethyl octadienol:

Effects on fetal development : Test Type: Embryo-fetal development
Species: Rat
Application Route: Ingestion
Result: negative
Remarks: No test guideline followed

(dl)-a-Tocopheryl acetate:

Effects on fertility : Test Type: Reproduction/Developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Result: negative

Effects on fetal development : Test Type: Embryo-fetal development
Species: Rabbit
Application Route: Ingestion
Result: negative

Benzyl alcohol:

Effects on fertility : Test Type: Fertility/early embryonic development
Species: Rat
Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

Effects on fetal development : Test Type: Embryo-fetal development
Species: Mouse
Application Route: Ingestion
Result: negative

Pyridoxine Hydrochloride:

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

STOT-single exposure

Not classified based on available information.

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

STOT-repeated exposure

Not classified based on available information.

Components:

Colecalciferol:

Routes of exposure	: Ingestion
Target Organs	: Kidney, Blood, Bone
Assessment	: Shown to produce significant health effects in animals at concentrations of 10 mg/kg bw or less.

Repeated dose toxicity

Components:

Starch:

Species	: Rat
NOAEL	: $\geq 2,000$ mg/kg
Application Route	: Skin contact
Exposure time	: 28 Days
Method	: OECD Test Guideline 410

3,7-Dimethyl 2,6-octadienal:

Species	: Rat, female
LOAEL	: 335 mg/kg
Application Route	: Ingestion
Exposure time	: 14 Weeks

Dimethyl octadienol:

Species	: Rat, male
NOAEL	: ≥ 497.9 mg/kg
Application Route	: Ingestion
Exposure time	: 96 Days
Method	: OECD Test Guideline 408
Remarks	: The test was conducted according to guideline

Species	: Rat
NOAEL	: 250 mg/kg
Application Route	: Skin contact
Exposure time	: 91 Days
Method	: OECD Test Guideline 411
Remarks	: The test was conducted equivalent or similar to guideline

(dl)-a-Tocopheryl acetate:

Species	: Rat
NOAEL	: 500 mg/kg
Application Route	: Ingestion
Exposure time	: 90 Days

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

Betaine hydrochloride:

Species	: Rat
LOAEL	: > 100 mg/kg
Application Route	: Ingestion
Exposure time	: 90 Days
Method	: OECD Test Guideline 408
Remarks	: The test was conducted according to guideline Based on data from similar materials

Benzyl alcohol:

Species	: Rat
NOAEL	: 1.072 mg/l
Application Route	: inhalation (dust/mist/fume)
Exposure time	: 28 Days
Method	: OECD Test Guideline 412

Colecalciferol:

Species	: Rat
NOAEL	: 0.06 mg/kg
LOAEL	: 0.3 mg/kg
Application Route	: Ingestion
Exposure time	: 90 Days
Method	: OECD Test Guideline 408

Aspiration toxicity

Not classified based on available information.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

3,7-Dimethyl 2,6-octadienal:

Toxicity to fish	: LC50 (Leuciscus idus (Golden orfe)): 6.78 mg/l Exposure time: 96 h Method: DIN 38412
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): 6.8 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	: ErC50 (Desmodesmus subspicatus (green algae)): 103.8 mg/l Exposure time: 72 h EC10 (Desmodesmus subspicatus (green algae)): 3 mg/l Exposure time: 72 h
Toxicity to microorganisms	: EC50 (activated sludge): 160 mg/l Exposure time: 30 min Method: OECD Test Guideline 209

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

Dimethyl octadienol:

- | | | |
|---|---|---|
| Toxicity to fish | : | LC50 (Oncorhynchus mykiss (rainbow trout)): 27.8 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203
Remarks: The test was conducted according to guideline |
| Toxicity to daphnia and other aquatic invertebrates | : | EC50 (Daphnia magna (Water flea)): 59 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202
Remarks: The test was conducted according to guideline |
| Toxicity to algae/aquatic plants | : | ErC50 (Desmodesmus subspicatus (green algae)): 156.7 mg/l
Exposure time: 96 h

EC10 (Desmodesmus subspicatus (green algae)): 54.3 mg/l
Exposure time: 96 h |
| Toxicity to microorganisms | : | EC10 (activated sludge): > 100 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209
Remarks: The test was conducted according to guideline |

(dl)-a-Tocopheryl acetate:

- | | | |
|---|---|--|
| Toxicity to fish | : | LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203 |
| Toxicity to daphnia and other aquatic invertebrates | : | EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202 |
| Toxicity to algae/aquatic plants | : | ErC50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): >= 100 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201 |
| Toxicity to fish (Chronic toxicity) | : | NOEC (Oncorhynchus mykiss (rainbow trout)): 100 mg/l
Exposure time: 28 d |
| Toxicity to microorganisms | : | EC50: > 927 mg/l
Exposure time: 30 min
Method: ISO 8192 |

Betaine hydrochloride:

- | | | |
|---|---|---|
| Toxicity to daphnia and other aquatic invertebrates | : | EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202 |
|---|---|---|

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version 4.0 Revision Date: 06/18/2025 SDS Number: 11513558-00005 Date of last issue: 04/14/2025
Date of first issue: 02/24/2025

Remarks: The test was conducted according to guideline
Based on data from similar materials

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): > 100 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: The test was conducted according to guideline
Based on data from similar materials

EC10 (Desmodesmus subspicatus (green algae)): > 1 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: The test was conducted according to guideline
Based on data from similar materials

Benzyl alcohol:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 460 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 230 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (green algae)): 770 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): 310 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 51 mg/l
Exposure time: 21 d
Method: OECD Test Guideline 211

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

Colecalciferol:

Toxicity to fish : LL50 (Danio rerio (zebra fish)): > 100 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EL50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

Toxicity to algae/aquatic plants : EL50 (Scenedesmus capricornutum (fresh water algae)): > 100 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 201

Persistence and degradability

Components:

3,7-Dimethyl 2,6-octadienal:

Biodegradability : Result: Readily biodegradable.
Biodegradation: > 90 %
Exposure time: 28 d
Method: Directive 67/548/EEC Annex V, C.4.D.

Dimethyl octadienol:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 64.2 %
Exposure time: 28 d
Method: OECD Test Guideline 301D
Remarks: The test was conducted according to guideline

(dl)-a-Tocopheryl acetate:

Biodegradability : Result: Not readily biodegradable.
Biodegradation: 21.7 - 31 %
Exposure time: 28 d
Method: OECD Test Guideline 301C

Benzyl alcohol:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 92 - 96 %
Exposure time: 14 d

Pyridoxine Hydrochloride:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 94 %
Exposure time: 28 d
Method: OECD Test Guideline 301E

Colecalciferol:

Biodegradability : Result: Not readily biodegradable.
Biodegradation: <= 7 %
Exposure time: 28 d
Method: OECD Test Guideline 301C

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

Bioaccumulative potential

Components:

3,7-Dimethyl 2,6-octadienal:

Partition coefficient: n-octanol/water : log Pow: 2.76

Dimethyl octadienol:

Partition coefficient: n-octanol/water : log Pow: 2.84
Method: OECD Test Guideline 107
Remarks: The test was conducted equivalent or similar to guideline

Betaine hydrochloride:

Partition coefficient: n-octanol/water : log Pow: -4.93
Remarks: Calculation

Benzyl alcohol:

Partition coefficient: n-octanol/water : log Pow: 1.05

Pyridoxine Hydrochloride:

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

Colecalciferol:

Partition coefficient: n-octanol/water : log Pow: > 6.2
Method: OECD Test Guideline 107

Mobility in soil

No data available

Other adverse effects

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

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

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

Not regulated as a dangerous good

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

IATA-DGR

Not regulated as a dangerous good

IMDG-Code

Not regulated as a dangerous good

Transport in bulk according to IMO instruments

Not applicable for product as supplied.

Domestic regulation

49 CFR

Not regulated as a dangerous good

Special precautions for user

Not applicable

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

Listed substances in the product are at low enough levels to not be expected to exceed the RQ

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Combustible dust
Respiratory or skin sensitization

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

US State Regulations

Pennsylvania Right To Know

Soybean proteins	9010-10-0
Yeast, ext.	8013-01-2
Rice flour	Not Assigned
Starch	9005-25-8
Calcium hydrogenorthophosphate dihydrate	7789-77-7
Sulfuric acid, iron(2+) salt (1:1), monohydrate	17375-41-6
Manganese sulfate, monohydrate	10034-96-5

California Prop. 65

WARNING: This product can expose you to chemicals including Retinyl acetate, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

California Permissible Exposure Limits for Chemical Contaminants

Starch	9005-25-8
--------	-----------

The ingredients of this product are reported in the following inventories:

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

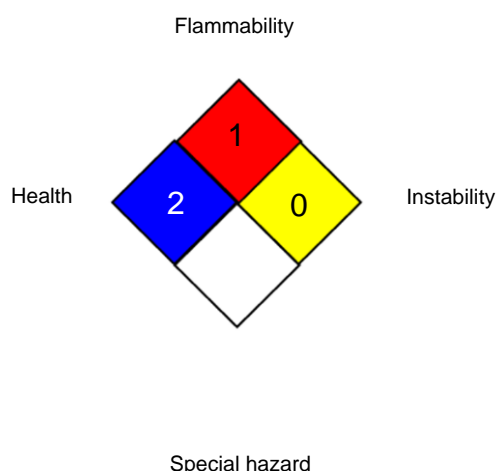
Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

AICS	:	not determined
DSL	:	not determined
IECSC	:	not determined

SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:

HEALTH	/	2
FLAMMABILITY		3
PHYSICAL HAZARD		0

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
CAL PEL	:	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
OSHA Z-3	:	USA. Occupational Exposure Limits (OSHA) - Table Z-3 Mineral Dusts
US WEEL	:	USA. Workplace Environmental Exposure Levels (WEEL)
ACGIH / TWA	:	8-hour, time-weighted average
CAL PEL / PEL	:	Permissible exposure limit
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
OSHA Z-1 / TWA	:	8-hour time weighted average
OSHA Z-3 / TWA	:	8-hour time weighted average
US WEEL / TWA	:	8-hr TWA

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Betaine / Multivitamin Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
4.0	06/18/2025	11513558-00005	Date of first issue: 02/24/2025

German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; 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; HMIS - Hazardous Materials Identification System; 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; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; 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; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; 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

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

Revision Date : 06/18/2025

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

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 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.

US / Z8